Raplee Property
Stanwood
LUST 591953
VCP NW1644

SAIC
From Science to Solutions

April 30, 2009

Ms. Olivia Skance
Chevron Environmental Management Company
6111 Bollinger Canyon Road, Ste. 3636
San Ramon, CA 94583-5186

Subject: **First Quarter 2009 Groundwater Monitoring Report**
Former Chevron Service Station No. 30-5192
9816 271st Street NW
Stanwood, Washington

Dear Ms. Skance:

Science Applications International Corporation (SAIC), on behalf of Chevron Environmental Management Company (Chevron), has prepared this Groundwater Monitoring Report for Former Chevron Service Station No. 30-5192 in Stanwood, Washington. The first quarter 2009 groundwater monitoring and sampling event was conducted by Gettler-Ryan Inc. (GRI), on behalf of Chevron, on February 28, 2009.

A copy of GRI's *Groundwater Monitoring and Sampling Report, Event of February 28, 2009*, including a potentiometric map of groundwater elevations, a results table of groundwater data and analytical results, field data sheets, and a laboratory analytical report is included as Attachment A.

1.0 FIELD ACTIVITIES

Depth to groundwater measurements were collected from each of the four monitoring wells within the Site network. Additionally, each monitoring well was checked for the presence of separate phase hydrocarbons (SPH). SPH was not present in any of the monitoring wells gauged during this event.

At the time of this monitoring event, groundwater elevations ranged from 95.05 feet (ft) in monitoring well MW-1 to 97.60 ft in monitoring well MW-3, based on an arbitrary benchmark elevation of 100.0 ft. The groundwater flow was to the northwest at a gradient of 0.02 to 0.04 feet per foot (ft/ft).

Groundwater samples were collected from each of the four monitoring wells gauged and submitted to Lancaster Laboratories to be analyzed for:

- Gasoline-range hydrocarbons by Washington State Department of Ecology (WDOE) Method NWTPH-Gx;

- Diesel- and oil-range hydrocarbons by WDOE Method NWTPH-Dx with silica gel cleanup;
- Benzene, toluene, ethylbenzene, and total xylenes by Environmental Protection Agency (EPA) Method 8021B; and
- Methyl tertiary butyl ether (MTBE) by EPA Method 8021B.

2.0 ANALYTICAL RESULTS

Total Petroleum Hydrocarbons (TPH) as gasoline-range hydrocarbons (TPH-G) were detected in monitoring wells MW-2 and MW-4, but the concentrations are below the Model Toxics Control Act (MTCA) Method A Cleanup Level (CUL) of 800 micrograms per liter (µg/L).

Diesel-range hydrocarbons (TPH-D) were detected in each of the four monitoring wells sampled at concentrations ranging from 290 µg/L to 5,400 µg/L. TPH-D concentrations in monitoring wells MW-1, MW-2 and MW-4 exceeded the MTCA Method A CUL of 500 µg/L.

Oil-range hydrocarbons (TPH-O) were detected in each of the four monitoring wells sampled at concentrations ranging from 190 µg/L to 2,800 µg/L. TPH-O concentrations in monitoring wells MW-1, MW-2 and MW-4 exceeded the MTCA Method A CUL of 500 µg/L.

BTEX – Benzene, toluene, and total xylenes were each reported above the laboratory detection limits, however the concentrations were each below their respective MTCA Method A CULs. Ethylbenzene was not detected above the laboratory detection limit.

MTBE – MTBE was not detected above the laboratory detection limit in any of the groundwater samples analyzed.

3.0 DISCUSSION

Results of the first quarter 2009 groundwater monitoring event at this Site are consistent with the results of previous groundwater monitoring events, which have been performed at least annually since April 2006. Three of the four monitoring wells sampled for this event contained TPH-D and TPH-O above MTCA Method A CULs. These monitoring wells (MW-1, MW-2, and MW-4) are located either in the vicinity or downgradient of the former underground storage tank (UST) basin at the Site. In monitoring well MW-3, which appears to be slightly upgradient of the former UST basin, TPH-D and TPH-O continued to be detected at concentrations that are generally below the MTCA Method A CULs for these substances.

Semi-annual groundwater monitoring will continue at this Site. The next groundwater monitoring event is scheduled for third quarter 2009.

If you have any questions regarding the content of this report, please contact the undersigned at 425-482-3321 or at catterallp@saic.com.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Peter Catterall
Senior Project Manager

Enclosures:

Attachment A: Gettler-Ryan Inc.- *Groundwater Monitoring and Sampling Report, Event of February 28, 2009*

cc: Mr. Joe Hickey, Washington State Department of Ecology
Mr. Wayne Raplee, Property Owner
Mr. Joshua Lipsky, Cascadia Law Group PLLC
Accession #: 16102.20090430.002

Attachment A:
Gettler-Ryan Inc. – Groundwater Monitoring and Sampling Report, Event of February 28, 2009

GETTLER-RYAN INC.

TRANSMITTAL

March 27, 2009
G-R #387100

TO: Mr. Peter Catterall
SAIC
18912 North Creek Parkway, Suite 101
Bothell, Washington 98011

FROM: Deanna L. Harding
Project Coordinator
Gettler-Ryan Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

RE: Former Chevron Service Station #305192
9816 271st Street Northwest
Stanwood, Washington

WE HAVE ENCLOSED THE FOLLOWING:

COPIES	DATED	DESCRIPTION
5	March 24, 2009	Groundwater Monitoring and Sampling Report **Event of February 28, 2009**

COMMENTS:

Pursuant to your request, we are providing you with copies of the above referenced report for **your use and distribution to the following:**

Mr. Brett Hunter, Chevron Environmental Management Company, P.O. Box 6012, Room K2252, San Ramon, CA 94583
Mr. Joe Hickey, WDOE, Northwest Region, Toxics Cleanup Program, 3190 160th Avenue, SE, Bellevue, WA 98008-5452
Mr. Wayne Raplee, 14115 70th Avenue NW, Stanwood, WA 98292
Mr. Joshua Lipsky, Cascadia Law Group PLLC, 1201 Third Avenue, Suite 320, Seattle, WA 98101

☐ Current Site Check List included.

Enclosure

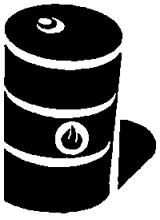
trans/305192-BH

GETTLER-RYAN INC.

CHEVRON - SITE CHECK LIST

Facility#:	**Chevron #305192**	Date: 2-28-09
Address:	**9816 271st Street**	
City/St.:	**Stanwood, WA**	
Status of Site:	VACANT LOT	

DRUMS: Please list below ALL DRUMS @ site: i.e., drum description, condition, labeling, contents, location of drum:



#	Description	Condition	Labeling	Contents	Location
	NO				
	DRUMS				

WELLS: Please check the condition of ALL WELLS @ site: i.e., well box condition, well plug, well lock, etc.:

Well ID	Well Box	Bolts	Well Plug	Well Lock	Other
MW-1	OK	OK	OK	OK	
MW-2	↓	↓	↓	↓	
MW-3	↓	↓	↓	↓	
MW-4	↓	↓	↓	↓	

Additional Comments/Observations:

GETTLER-RYAN INC.

March 24, 2009
Job #387100

Ms. Olivia Skance
Chevron Environmental Management Company
6111 Bollinger Canyon Road Room 3636
San Ramon, CA 94583

RE: Event of February 28, 2009
Groundwater Monitoring & Sampling Report
Former Chevron Service Station #305192
9816 271st Street Northwest
Stanwood, Washington

Dear Ms. Skance:

This report documents the groundwater monitoring and sampling event performed by Gettler-Ryan Inc. (G-R) at the referenced site. All field work was conducted in accordance with G-R Standard Operating Procedure - Groundwater Sampling (attached).

Static groundwater levels were measured and the wells were checked for the presence of separate-phase hydrocarbons. Separate-phase hydrocarbons were not present in any wells. Static water level data and groundwater elevations are presented in Table 1. A Potentiometric Map is included as Figure 1.

Groundwater samples were collected from the monitoring wells and submitted to a state certified laboratory for analyses. The field data sheets for this event are attached. Analytical results are presented in the table(s) listed below. Purge water was treated by filtering the water through granular activated carbon and was subsequently discharged. The chain of custody document and laboratory analytical reports are attached.

Please call if you have any questions or comments regarding this report. Thank you.

Sincerely,

Deanna L. Harding
Project Coordinator

Douglas J. Lee
Senior Geologist, L.G. No. 2660

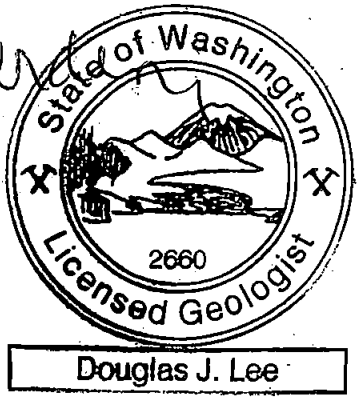
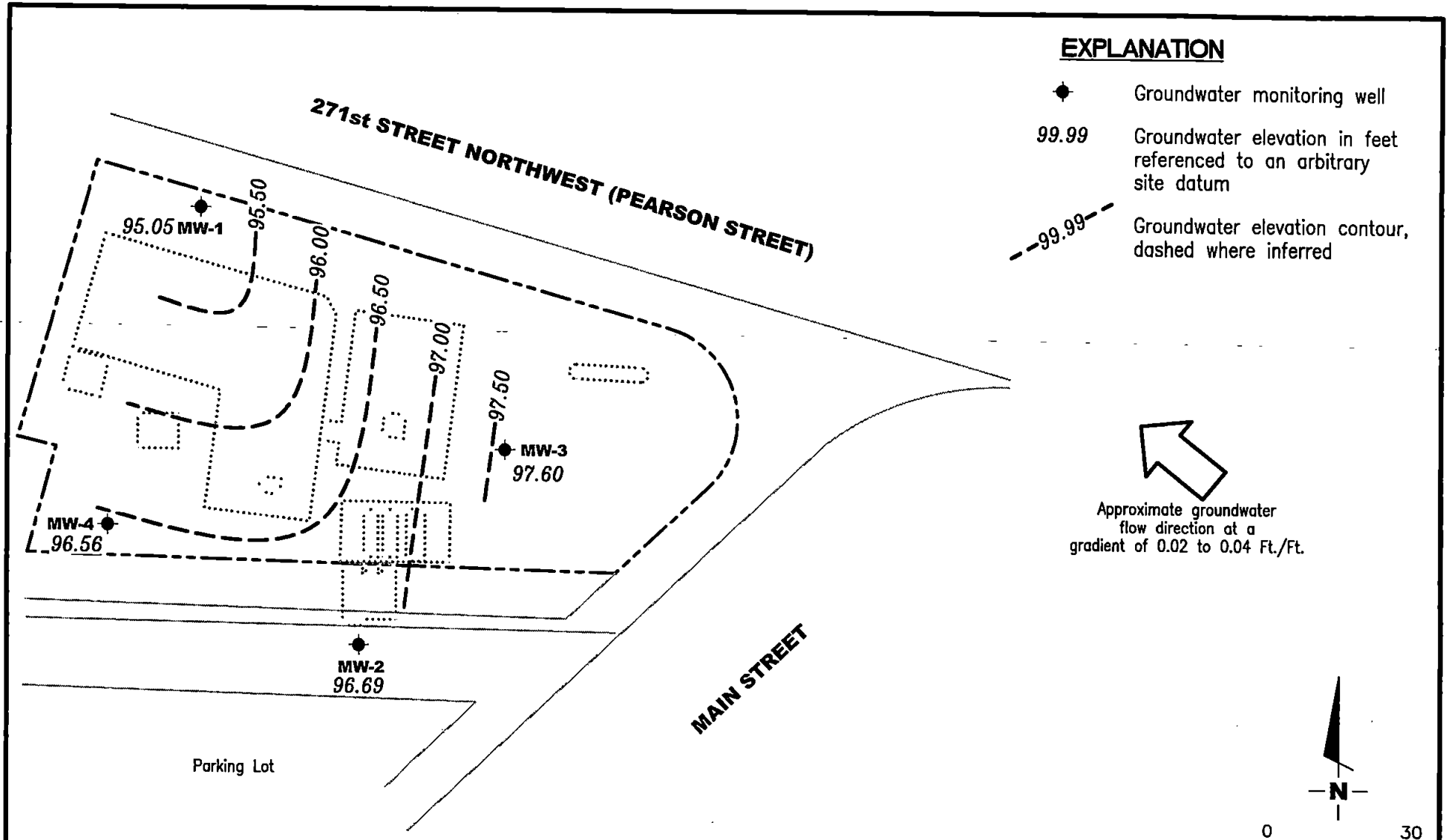


Figure 1: Potentiometric Map
Table 1: Groundwater Monitoring Data and Analytical Results
Table 2: Groundwater Analytical Results
Table 3: Field Measurements
Attachments: Standard Operating Procedure - Groundwater Sampling
Field Data Sheets
Chain of Custody Document and Laboratory Analytical Reports

6747 Sierra Court, Suite J • **Dublin**, CA 94568 • (925) 551-7555 • Fax (925) 551-7888
3140 Gold Camp Drive, Suite 170 • **Rancho Cordova**, CA 95670 • (916) 631-1300 • Fax (916) 631-1317
1364 N. McDowell Blvd., Suite B2 • **Petaluma**, CA 94954 • (707) 789-3255 • Fax (707) 789-3218



Source: Figure modified from drawing provided by SAIC, Dated: 02/06/2006.

GETTLER - RYAN INC.
6747 Sierra Court, Suite J
Dublin, CA 94568
(925) 551-7555

POTENTIOMETRIC MAP
Former Chevron Service Station #305192
9816 271st Street Northwest
Stanwood, Washington

FIGURE
1

PROJECT NUMBER
387100

REVIEWED BY

DATE
February 28, 2009

REVISED DATE

FILE NAME: P:\Enviro\Chevron\305192\Q09-305192.dwg | Layout Tab: Pot1

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #305192

9816 271st Street Northwest

Stanwood, Washington

WELL ID/ DATE		TOC* (ft.)	DTW (ft.)	GWE (ft.)	TPH-DRO (µg/L)	TPH-HRO (µg/L)	TPH-GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	D. LEAD (µg/L)
MW-1													
04/10/06		98.32	1.81	96.51	--	--	--	--	--	--	--	--	--
05/03/06		98.32	--	--	310[1]	120[1]	<240	<2.5	<2.5	4.7	11	<13	<0.87
08/02/06	PER	98.32	2.96	95.36	260[1]	330[1]	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
10/10/06	PER	98.32	2.55	95.77	150[1]	<100[1]	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
01/15/07	PER	98.32	1.64	96.68	<160[1]	<200[1]	<240	<2.5	<2.5	<2.5	<7.5	<13	--
04/25/07	PER	98.32	1.58	96.74	190[1]	130[1]	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
07/15/07	PER	98.32	2.58	95.74	<81[1]	<100[1]	<500	<5.0	<5.0	<5.0	<15	<25	--
10/03/07	PER	98.32	3.00	95.32	130[1]	<100[1]	<250	<2.5	<2.5	<2.5	<7.5	<13	--
01/03/08	PER	98.32	2.51	95.81	130[1]	<100[1]	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
02/28/09	**PER**	**98.32**	**3.27**	**95.05**	**610[1]**	**610[1]**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**<2.5**	--
MW-2													
04/10/06		99.58	2.29	97.29	--	--	--	--	--	--	--	--	--
05/03/06		99.58	--	--	1,400[1]	560[1]	<240	13	<2.5	<2.5	<7.5	<13	<0.87
08/02/06	PER	99.58	2.98	96.60	2,000[1]	1,800[1]	220	20	<0.5	<0.5	1.6	<2.5	--
10/10/06	PER	99.58	3.64	95.94	1,400[1]	790[1]	<240	16	<2.5	<2.5	<7.5	<13	--
01/15/07	PER	99.58	2.08	97.50	810[1]	270[1]	<240	9.3	<2.5	<2.5	<7.5	<13	--
04/25/07	PER	99.58	2.16	97.42	830[1]	480[1]	250	13	<0.5	<0.5	<1.5	<2.5	--
07/15/07	PER	99.58	2.95	96.63	7,800[1,3]	<1,000[1,3]	<500	13	<5.0	<5.0	<15	<25	--
10/03/07	PER	99.58	3.44	96.14	1,600[1]	1,100[1]	<250	4.9	<2.5	<2.5	<7.5	<13	--
01/03/08	PER	99.58	2.32	97.26	1,400[1]	800[1]	460	6.7	1.0	<0.5	<1.5	<2.5	--
02/28/09	**PER**	**99.58**	**2.89**	**96.69**	**2,700[1]**	**2,800[1]**	**450**	**2.5**	**0.6**	**<0.5**	**<1.5**	**<2.5**	--
MW-3													
04/10/06		99.16	0.40	98.76	--	--	--	--	--	--	--	--	--
05/03/06		99.16	--	--	580[1]	240[1]	<240	<2.5	<2.5	<2.5	<7.5	<13	<0.87
08/02/06	PER	99.16	2.61	96.55	350[1]	380[1]	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
10/10/06	PER	99.16	2.75	96.41	310[1]	140[1]	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
01/15/07	PER	99.16	0.50	98.66	250[1]	<100[1]	<240	<2.5	<2.5	<2.5	<7.5	<13	--
04/25/07	PER	99.16	0.84	98.32	260[1]	110[1]	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
07/15/07	PER	99.16	2.16	97.00	250[1]	150[1]	<500	<5.0	<5.0	<5.0	<15	<25	--

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #305192

9816 271st Street Northwest

Stanwood, Washington

WELL ID/ DATE		TOC* (ft.)	DTW (ft.)	GWE (ft.)	TPH-DRO (µg/L)	TPH-HRO (µg/L)	TPH-GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	D. LEAD (µg/L)
MW-3 (cont)													
10/03/07	PER	99.16	2.68	96.48	330[1]	260[1]	<250	<2.5	<2.5	<2.5	<7.5	<13	--
01/03/08	PER	99.16	1.62	97.54	280[1]	210[1]	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
02/28/09	**PER**	**99.16**	**1.56**	**97.60**	**290[1]**	**190[1]**	**<50**	**<0.5**	**<0.5**	**<0.5**	**1.6**	**<2.5**	--
MW-4													
04/10/06		100.00	2.08	97.92	--	--	--	--	--	--	--	--	--
05/03/06		100.00	--	--	7,900[1]	<1,000[1]	<240	<2.5	<2.5	<2.5	<7.5	<13	<0.87
08/02/06	PER	100.00	3.57	96.43	7,300[1]	<1,000[1]	73	<0.5	<0.5	<0.5	2.8	<2.5	--
10/10/06[2]	PER	100.00	4.28	95.72	7,900[1]	2,200[1]	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
01/15/07[2]	PER	100.00	2.98	97.02	8,300[1]	3,000[1]	<240	<2.5	<2.5	<2.5	<7.5	<13	--
04/25/07[2]	PER	100.00	4.35	95.65	9,300[1]	2,000[1]	89	<0.5	<0.5	<0.5	<1.5	<2.5	--
07/15/07	PER	100.00	4.06	95.94	850[1,3]	320[1,3]	<500	<5.0	<5.0	<5.0	<15	<25	--
10/03/07	PER	100.00	4.22	95.78	8,500[1]	<2,100[1]	<250	<2.5	<2.5	<2.5	<7.5	<13	--
01/03/08	PER	100.00	3.98	96.02	9,100[1]	2,200[1]	61	<0.5	<0.5	<0.5	<1.5	<2.5	--
02/28/09	**PER**	**100.00**	**3.44**	**96.56**	**5,400[1]**	**2,100[1]**	**56**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**<2.5**	--
TRIP BLANK													
QA													
05/03/06		--	--	--	--	--	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
08/02/06		--	--	--	--	--	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
10/10/06		--	--	--	--	--	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
01/15/07		--	--	--	--	--	<48	<0.5	<0.5	<0.5	<1.5	<2.5	--
04/25/07		--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
07/15/07		--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
10/03/07		--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
01/03/08		--	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	<2.5	--
02/28/09		--	--	--	--	--	**<50**	**<0.5**	**<0.5**	**<0.5**	**<1.5**	**<2.5**	--

	TPH-DRO	TPH-HRO	TPH-GRO	B	T	E	X	MTBE	D. LEAD
Standard Laboratory Reporting Limits:	--	--	50	0.5	0.5	0.5	1.5	2.5	0.001
MTCA Method A Cleanup Levels:	500	500	800/1,000	5	1,000	700	1,000	20	--
Current Method:	NWTPH-DRO + Extended		NWTPH-GRO and EPA 8021B						EPA 7421

Table 1

Groundwater Monitoring Data and Analytical Results

Former Chevron Service Station #305192

9816 271st Street Northwest

Stanwood, Washington

EXPLANATIONS:

TOC = Top of Casing
(ft.) = Feet
DTW = Depth to Water
GWE = Groundwater Elevation
TPH = Total Petroleum Hydrocarbons
DRO = Diesel Range Organics
GRO = Gasoline Range Organics
HRO = Oil Range Organics
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
MTBE = Methyl tertiary butyl ether
D. LEAD = Dissolved Lead
(µg/L) = Micrograms per liter
-- = Not Measured/Not Analyzed
PER = Peristaltic Pump used for Purging
QA = Quality Assurance/Trip Blank
MTCA = Model Toxics Control Act Cleanup Regulations [WAC 173-340-720(2)(a)(I), as amended 02/01].

* TOC elevations are expressed in feet relative to an arbitrary datum.

1 Analyzed with silica gel cleanup.

2 Incorrect TOC used to calculate GWE in past reports (99.16). Correct TOC is shown.

3 Current laboratory analytical results do not coincide with historical data, samples may have been switched in the field.

Table 2

Groundwater Analytical Results

Former Chevron Service Station #305192
9816 271st Street Northwest
Stanwood, Washington

WELL ID	DATE	ETHANOL (µg/L)	TBA (µg/L)	MTBE (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	FULL SCAN EPA 8260 (µg/L)
MW-4	05/03/06	<500	<50	<5	<5	<5	<5	<5 - <60

EXPLANATIONS:

TBA = Tertiary butyl alcohol
MTBE = Methyl tertiary butyl ether
DIPE = Di-isopropyl ether
ETBE = Ethyl tertiary butyl ether
TAME = Tertiary amyl methyl ether
(µg/L) = Micrograms per liter

ANALYTICAL METHOD:

EPA Method 8260 for Oxygenate Compounds

Table 3

Field Measurements

Former Chevron Service Station #305192
9816 271st Street Northwest
Stanwood, Washington

WELL ID	DATE	Time (2400 hr.)	pH	Conductivity (µmhos/cm - µS)	Temperature (°C/F°)	Turbidity (NTU)
MW-1	08/02/06	1055	6.72	401	15.4/--	93
	01/15/07	1140	6.79	412	12.0/--	--
		1144	6.72	408	11.8/--	--
		1149	6.68	403	11.7/--	--
	04/25/07	1259	6.39	752	13.5/--	--
	07/15/07	1542	6.31	589	17.8/--	--
	10/03/07	1204	6.46	436	15.7/--	--
		1208	6.42	430	15.6/--	--
		1214	6.39	426	15.5/--	--
	01/03/08	1125	6.79	403	11.9/--	--
		1129	6.77	398	11.8/--	--
		1133	6.74	393	11.8/--	--
	02/28/09	**1045**	**7.13**	**906**	**8.8/--**	**--**
		1048	**7.11**	**909**	**8.9/--**	**--**
		1051	**7.11**	**910**	**8.9/--**	**--**
MW-2	08/02/06	1017	6.49	430	15.2/--	371
		1025	6.47	421	15.1/--	78
	01/15/07	1106	6.82	404	11.8/--	--
		1111	6.76	398	11.7/--	--
		1116	6.75	393	11.6/--	--
	04/25/07	1158	6.60	856	12.8/--	--
	07/15/07	1442	6.56	572	17.5/--	--
	10/03/07	1349	6.46	429	15.8/--	--
		1355	6.37	426	15.7/--	--
		1401	6.36	421	15.7/--	--
	01/03/08	1231	6.72	381	11.9/--	--
		1235	6.70	378	11.9/--	--
		1239	6.67	371	11.8/--	--
	02/28/09	**1140**	**6.57**	**1102**	**8.7/--**	**--**
		1143	**6.60**	**1108**	**8.7/--**	**--**
		1146	**6.61**	**1111**	**8.7/--**	**--**
MW-3	08/02/06	957	6.56	412	15.5/--	83
	01/15/07	1041	6.70	407	11.9/--	--
		1046	6.65	401	11.8/--	--
		1051	6.62	397	11.7/--	--
	04/25/07	1227	6.52	1266	12.3/--	--
	07/15/07	1512	6.58	687	17.7/--	--
	10/03/07	1314	6.37	456	15.9/--	--
		1319	6.32	451	15.7/--	--
		1323	6.31	446	15.7/--	--
	01/03/08	1157	6.84	393	12.0/--	--
		1201	6.82	390	11.9/--	--
		1206	6.81	387	11.9/--	--
	02/28/09	**1230**	**6.86**	**1159**	**8.2/--**	**--**
		1233	**6.85**	**1162**	**8.2/--**	**--**
		1236	**6.85**	**1161**	**8.3/--**	**--**
MW-4	08/02/06	920	6.76	433	15.6/--	176
		926	6.73	429	15.5/--	72

Table 3

Field Measurements

Former Chevron Service Station #305192

9816 271st Street Northwest

Stanwood, Washington

WELL ID	DATE	Time (2400 hr.)	pH	Conductivity (µmhos/cm - µS)	Temperature (°C/F°)	Turbidity (NTU)
MW-4 (cont)	01/15/07	958	6.77	402	11.9/--	--
		1002	6.70	394	11.8/--	--
		1007	6.63	391	11.7/--	--
	04/25/07	1337	7.38	620	12.8/--	--
	07/15/07	1617	6.20	593	14.9/--	--
	10/03/07	1240	6.52	426	15.9/--	--
		1246	6.48	422	15.6/--	--
	01/03/08	1305	6.64	387	11.8/--	--
		1309	6.62	383	11.8/--	--
		1313	6.61	379	11.7/--	--
	02/28/09	**1325**	**6.69**	**821**	**8.4/--**	--
		1328	**6.71**	**824**	**8.4/--**	--
		1331	**6.71**	**827**	**8.4/--**	--

Table 3

Field Measurements

Former Chevron Service Station #305192

9816 271st Street Northwest

Stanwood, Washington

EXPLANATIONS:

pH = Potential Hydrogen Ions

(µS) = Microsiemens

(µmhos/cm) = Micromhos per centimeter

(°C/F°) = Degrees Celsius/ Fahrenheit

(NTU) = Nephelometric Turbidity Unit

-- = Not Measured

STANDARD OPERATING PROCEDURE - GROUNDWATER SAMPLING

Gettler-Ryan Inc. field personnel adhere to the following procedures for the collection and handling of groundwater samples prior to analysis by the analytical laboratory. Prior to sample collection, the type of analysis to be performed is determined. Loss prevention of volatile compounds is controlled and sample preservation for subsequent analysis is maintained.

Prior to sampling, the presence or absence of free-phase hydrocarbons is determined using an interface probe. Product thickness, if present, is measured to the nearest 0.01 foot and is noted in the field notes. In addition, all depth to water level measurements are collected with a static water level indicator and are also recorded in the field notes, prior to purging and sampling any wells.

After water levels are collected and prior to sampling, temperature, pH and electrical conductivity are measured. If purging is to occur, each well is purged a minimum of three well casing volumes of water using pre-cleaned pumps (stack, suction, Grundfos), or disposable bailers. The measurements are taken a minimum of three times during the purging. Purging continues until these parameters stabilize. Purge water is treated by filtering the water through granular activated carbon and is subsequently discharged to the ground surface at the site.

Groundwater samples are collected using disposable bailers. The water samples are transferred from the bailer into appropriate containers. Pre-preserved containers, supplied by analytical laboratories, are used for all samples. Duplicate samples are collected for the laboratory to use in maintaining quality assurance/quality control standards. The samples are labeled to include the job number, sample identification, collection date and time, analysis, preservation (if any), and the sample collector's initials. The water samples are placed in a cooler, maintained at 4°C for transport to the laboratory. Once collected in the field, all samples are maintained under chain of custody until delivered to the laboratory.

The chain of custody document includes the job number, type of preservation, if any, analysis requested, sample identification, date and time collected, and the sample collector's name. The chain of custody is signed and dated (including time of transfer) by each person who receives or surrenders the samples, beginning with the field personnel and ending with the laboratory personnel.

A laboratory supplied trip blank accompanies each sampling set. For sampling sets greater than 20 samples, 5% trip blanks are included. The trip blank is analyzed for some or all of the same compounds as the groundwater samples.

Standard Operating Procedure, Low-Flow Purging and Sampling

This procedure is designed to assist the user in taking representative groundwater samples from groundwater monitoring wells. Samples will be collected using low-flow (minimal drawdown) purging and sampling methods as discussed in U.S. EPA, Ground Water Issue, Publication Number EPA/540/S-95/504, April 1996 by Puls, R.W. and M.J. Barcelona - "Low-Flow (Minimal Drawdown) Ground-water Sampling Procedures."

The field sampler's objective is to purge and sample the well so that the water that is discharged from the pump, and subsequently collected, is representative of the formation water from the aquifer's identified zone of interest.

The wells to be sampled are equipped with QED Well Wizard™ bladder (squeeze-type) pumps or Peristaltic Pumps Each bladder pump or the suction inlet tubing of the peristaltic pump is positioned with its inlet located within the screened interval of the well. The down well equipment includes a bladder pump or Teflon-lined PE (polyethylene) tubing.

Initial Pump Flow Test Procedures

If possible, the optimum flow rate for each well will be established during well development or redevelopment, or in advance of the actual sampling event. The monitoring well must be gauged for Static Water Level (SWL) prior to the installation of the pump and before pumping of any water from the well. The measurement will be documented on a Low Flow Ground Water Sample Collection Record, or field data sheet.

After pump installation, and confirmation that the SWL has returned to its original level (as determined prior to pump installation), the bladder pump or peristaltic pump should be started at a discharge rate between 100 ml to 300 ml per minute without any in-line flow cell connected. The water level in the well casing must be monitored continuously for any change from the original measurement. If significant drawdown is observed, the pump's flow rate should be incrementally reduced until the SWL drawdown ceases and stabilizes. Total drawdown from the initial (static) water level should not exceed 25% of the distance between pump inlet location and the top of the well screen. (For example, if a well has a 10-foot screen zone and the pump inlet is located mid-screen; the maximum drawdown should be 1.25 feet.) In any case, the water level in the well should not be lowered below the top of the screen/intake zone of the well.

Once the specific well's optimum discharge rate, without an in-line flow cell connected, has been determined and documented, the in-line flow cell system to be used is connected to the well discharge and the control settings required to achieve the well's optimum discharge rate are determined with the in-line flow cell connected. (Due to the system's back-pressure, the discharge rate will be decreased by 10-20%). All control settings are to be documented on the gauging and sampling sheet as specific to that particular well's ID and will be utilized for its subsequent purging and sampling events.

Purge and Sampling Events

Prior to the initiation of purging a well, the SWL will be measured and documented. The pump will be started utilizing its documented control settings and its discharge rate will be confirmed by volumetric discharge measurement with the in-line flow cell connected. If necessary, any minor modifications to the control settings to achieve the well's optimum discharge rate will be documented on the gauging sheet. When the optimum pump flow rate has been established, the SWL draw down has stabilized within the required range and at least one pump system volume (bladder volume + discharge tubing volume) has been purged, begin taking field measurements for pH, temperature (T), conductivity (Ec), oxygen reduction potential (ORP) and dissolved oxygen (DO) using a "QED" Model MP-20 in-line flow cell, or other multi-parameter meter. All water chemistry field measurements will be documented on the field data sheet. Measurements should be taken every three to five minutes until stabilization has been achieved. Stabilization is achieved after all parameters have stabilized for three consecutive readings. In lieu of measuring all five parameters, a minimum subset would include pH, conductivity and dissolved oxygen. Three consecutive measurements indicating stability should be within:

Temperature	± 10%
pH	± 0.1 units
Conductance	± 03

When water quality parameters have stabilized, and there has been no change in the stabilized SWL (ie. No continuous draw down), sample collection may begin.

Equipment List

The following equipment is needed to conduct low flow purging and sampling:

- Bladder pump installed within the well's screened interval
- Pump controller and air source set to operate at the specific well's documented optimum discharge rate
- In-line flow cell and meter(s) with connection fittings and tubing to measure water quality
- Water level probe or installed dedicated water level measurement system
- Sample containers appropriate for the analytical requirements
- Low Flow Ground Water Sample Collection Record, or field data sheets
- 300-500 milliliter graduated cylinder or measuring cup
- 5 gallon bucket(s) for collecting purge water
- Wristwatch with second hand or stopwatch
- Sufficient cleaning and decontamination supplies if portable water level probe is utilized
- Peristaltic pump & tubing, in place of bladder pump, if applicable
- Multi-parameter meter, in place of in-line flow cell, if applicable

Procedure QED Bladder Pumps

1. Calibrate all field instruments at the start of each day's deployment per the instrument manufacturer's instructions. Record calibration data on the "Field Instruments Calibration Documentation Form."
2. Drive to the first well scheduled to be sampled (typically the least contaminated). Make notes in the field logbook, describing the well condition and activity in the vicinity of the well. Decontaminate the portable water gauging probe by washing with phosphate-free detergent, rinsing with potable water.
3. Measure the depth to water from the surveyed reference mark on the wellhead and record the measurement on the gauging and sampling sheet. Lock the water level meter in place so that the level can be monitored during purging and sampling. When placing the probe in the well, take precautions to not disturb or agitate the water.
4. Connect the compressed air source's airline to the pump controller's "AIR IN" connection (If utilizing a gas-engine operated compressor, locate the compressor at least 25 feet, down wind from the wellhead).
5. Connect the pump controller "AIR OUT" air-line to the bladder pump's air supply fitting at the wellhead.
6. Connect the pump discharge line to the in-line flow cell's "IN" fitting.
7. Connect the flow cell's "OUT" line and secure to drain the purge water into the purge water collection container.
8. Start the air supply to the pump. Set the pump controller settings to the documented settings for the specific well. Confirm the flow rate is equal to the well's established optimum flow rate. Modify as necessary (documenting any required modifications).
9. Monitor the water level and confirm that the SWL draw down has stabilized within the well's allowable limits.
10. After a single pump-system's volume (bladder volume + discharge tubing volume) has been adequately purged, read and record water quality field measurements every three to five minutes until all parameters have stabilized within their allowable ranges for at least three consecutive measurements. When stabilization has been achieved, sample collection may begin.
11. Disconnect the flow cell, and it's tubing, from the pump discharge line before collecting samples. Decrease the pump rate to 100 milliliters per minute or less by lowering the controller's air pressure setting prior to collecting samples for volatiles. Utilize the QED Model 400 Controller's 'MANUAL SAMPLE' button to ensure minimized sample exposure to the ambient air. Refer to

the task instructions for the correct order and procedures for filling sample containers. Place the samples in a cooler with enough ice to keep them at 4 degrees Centigrade.

12. Once samples for volatiles have been collected, re-establish pump flow rate to the original purge flow rate by inputting the documented controller settings for the well without the in-line flow cell connected and collect remaining samples.
13. When all sample containers have been filled, make a final measurement of the well's SWL and record the measurement on the gauging and sampling sheet. If the well has a "QED" dedicated bottom sounder, measure the well's total depth and record the measurement, as well.
14. Measure and record total purge volume collected. Consolidate generated purge water.
15. Remove and decontaminate the portable water level probe with phosphate-free detergent, rinsing with potable water.
16. Disconnect the controller air supply to the pump.
17. Secure the pump's discharge line/discharge adapter in the wellhead.
18. Secure the wellhead cover and secure with its lock. Move equipment to next well to be sampled.
19. At the end of each day, post calibrate all field instruments and record the measurements on the "Field Calibration Documentation Form".
20. Clean and decontaminate the in-line flow cell with phosphate-free detergent, rinsing with potable water.

Procedure Peristaltic Pump

1. Record all depth to water readings on field data sheets
2. Calibrate all field instruments according to manufacturer's directions.
3. Setup pump and install silicone tubing in the roller head.
4. Place suction tubing at desired intake level in well, (mid screen) and attach to the intake side of the pump roller head.
5. Attach tubing at discharge side of pump head and place in collection container.
6. Start pump and adjust flow rate to achieve flow without depressing water level more than necessary (approx. 0.30').
7. Record parameter readings after parameters have stabilized (3 consecutive readings that fall within the acceptance criteria).
8. Decrease the flow rate of the pump to achieve approximately 100ml/min. when collecting samples.
9. Change all tubing between wells and repeat procedure.

GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #305192 | Job Number: 387100
Site Address: 9816 271St Street Nw | Event Date: 2-28-09 (inclusive)
City: Stanwood,WA | Sampler: ML

Well ID: MW- 1 | Date Monitored: 2-28-09
Well Diameter: 1.5 in.
Total Depth: 14.15 ft.
Depth to Water: 3.27 ft.

Volume Factor (VF)	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

☐ Check if water column is less then 0.50 ft.

10.88 xVF ____ = ____ x3 case volume = Estimated Purge Volume: ____ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: ____

Purge Equipment:

Disposable Bailer	
Stainless Steel Bailer	
Stack Pump	
Suction Pump	
Grundfos	
Peristaltic Pump	X
QED Bladder Pump	
Other:	

Sampling Equipment:

Disposable Bailer	
Pressure Bailer	
Discrete Bailer	
Peristaltic Pump	X
QED Bladder Pump	
Other:	

Time Started: ____ (2400 hrs)
Time Completed: ____ (2400 hrs)
Depth to Product: ____ ft
Depth to Water: ____ ft
Hydrocarbon Thickness: ____ ft
Visual Confirmation/Description: ____
Skimmer / Absorbant Sock (circle one)
Amt Removed from Skimmer: ____ gal
Amt Removed from Well: ____ gal
Water Removed: ____
Product Transferred to: ____

Start Time (purge): 1030 | Weather Conditions: Sunny
Sample Time/Date: 1100 / 2-28-09 | Water Color: Clear | Odor: Y / (N)
Approx. Flow Rate: 100 ml/gpm. | Sediment Description: none
Did well de-water? NO | If yes, Time: ____ | Volume: ____ gal. | DTW @ Sampling: 3.28

Time (2400 hr.)	Volume (gal.) L	pH	Conductivity (µmhos/cm - (µS))	Temperature ((C) / F)	D.O. (mg/L)	ORP (mV)	Gauge DTW as parameters are recorded
1045	1.5	7.13	906	8.8			3.27
1048	1.8	7.11	909	8.9			3.27
1051	2.1	7.11	910	8.9			3.28

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
MW- 1	3 x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX+MTBE(8021)
	2 x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sg

COMMENTS: ____

Add/Replaced Lock: ____ Add/Replaced Plug: ____ Add/Replaced Bolt: ____

GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #305192 Job Number: 387100
Site Address: 9816 271St Street Nw Event Date: 2-28-09 (inclusive)
City: Stanwood,WA Sampler: ML

Well ID MW-2 Date Monitored: 2-28-09
Well Diameter 1.5 in.
Total Depth 14.21 ft.
Depth to Water 2.89 ft.

Volume Factor (VF)	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

☐ Check if water column is less then 0.50 ft.

11.32 xVF ___ = ___ x3 case volume = Estimated Purge Volume: ___ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: ___

Purge Equipment:
Disposable Bailer
Stainless Steel Bailer
Stack Pump
Suction Pump
Grundfos
Peristaltic Pump X
QED Bladder Pump
Other:

Sampling Equipment:
Disposable Bailer
Pressure Bailer
Discrete Bailer
Peristaltic Pump X
QED Bladder Pump
Other:

Time Started: (2400 hrs)
Time Completed: (2400 hrs)
Depth to Product: ft
Depth to Water: ft
Hydrocarbon Thickness: ft
Visual Confirmation/Description:
Skimmer / Absorbant Sock (circle one)
Amt Removed from Skimmer: gal
Amt Removed from Well: gal
Water Removed:
Product Transferred to:

Start Time (purge): 1125 Weather Conditions: Sunny
Sample Time/Date: 1155 12-2809 Water Color: Clear Odor: Y / N
Approx. Flow Rate: 100 ml/ gpm. Sediment Description: None
Did well de-water? NO If yes, Time: ___ Volume: ___ gal. DTW @ Sampling: 2.95

Time (2400 hr.)	Volume ~~gal~~ L	pH	Conductivity (µmhos/cm - (µS))	Temperature ((C) / F)	D.O. (mg/L)	ORP (mV)	Gauge DTW as parameters are recorded
1140	1.5	6.57	1102	8.7			2.90
1143	1.8	6.60	1108	8.7			2.94
1146	2.1	6.61	1111	8.7			2.95

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
MW-2	3 x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX+MTBE(8021)
	2 x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sg

COMMENTS:

Add/Replaced Lock: ___ Add/Replaced Plug: ___ Add/Replaced Bolt: ___

GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: **Chevron #305192** Job Number: **387100**
Site Address: **9816 271St Street Nw** Event Date: 2-2809 (inclusive)
City: **Stanwood,WA** Sampler: MK

Well ID **MW-3** Date Monitored: 2-2809
Well Diameter **1.5** in.
Total Depth 13.62 ft.
Depth to Water 1.56 ft.

Volume Factor (VF)	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

☐ Check if water column is less then 0.50 ft.

12.06 xVF — = — x3 case volume = Estimated Purge Volume: ____ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: ____

Purge Equipment:
Disposable Bailer ____
Stainless Steel Bailer ____
Stack Pump ____
Suction Pump ____
Grundfos ____
Peristaltic Pump X
QED Bladder Pump ____
Other: ____

Sampling Equipment:
Disposable Bailer ____
Pressure Bailer ____
Discrete Bailer ____
Peristaltic Pump X
QED Bladder Pump ____
Other: ____

Time Started: ____ (2400 hrs)
Time Completed: ____ (2400 hrs)
Depth to Product: ____ ft
Depth to Water: ____ ft
Hydrocarbon Thickness: ____ ft
Visual Confirmation/Description: ____
Skimmer / Absorbant Sock (circle one)
Amt Removed from Skimmer: ____ gal
Amt Removed from Well: ____ gal
Water Removed: ____
Product Transferred to: ____

Start Time (purge): 1215 Weather Conditions: Sunny
Sample Time/Date: 1245 12-2809 Water Color: Clear Odor: (Y) / N
Approx. Flow Rate: 100 ml/min. Sediment Description: Light
Did well de-water? NO If yes, Time: ____ Volume: ____ gal. DTW @ Sampling: 1.61

Time (2400 hr.)	Volume (gal.) L	pH	Conductivity (µmhos/cm) (µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)	Gauge DTW as parameters are recorded
1230	1.5	6.86	1159	8.2			1.60
1233	1.8	6.85	1162	8.2			1.60
1236	2.1	6.85	1161	8.3			1.61

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
MW-3	3 x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX+MTBE(8021)
	2 x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sg

COMMENTS: ____

Add/Replaced Lock: ____ Add/Replaced Plug: ____ Add/Replaced Bolt: ____

GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #305192 | Job Number: 387100
Site Address: 9816 271St Street Nw | Event Date: 2-28-09 (inclusive)
City: Stanwood,WA | Sampler: ML

Well ID: MW-4 | Date Monitored: 2-28-09
Well Diameter: 1.5 in.
Total Depth: 13.75 ft.
Depth to Water: 3.44 ft.

Volume Factor (VF)	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

☐ Check if water column is less then 0.50 ft.

10.31 xVF — = — x3 case volume = Estimated Purge Volume: — gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: —

Purge Equipment:
Disposable Bailer
Stainless Steel Bailer
Stack Pump
Suction Pump
Grundfos
Peristaltic Pump X
QED Bladder Pump
Other:

Sampling Equipment:
Disposable Bailer
Pressure Bailer
Discrete Bailer
Peristaltic Pump X
QED Bladder Pump
Other:

Time Started: (2400 hrs)
Time Completed: (2400 hrs)
Depth to Product: ft
Depth to Water: ft
Hydrocarbon Thickness: ft
Visual Confirmation/Description:
Skimmer / Absorbant Sock (circle one)
Amt Removed from Skimmer: gal
Amt Removed from Well: gal
Water Removed:
Product Transferred to:

Start Time (purge): 1310 | Weather Conditions: Sunny
Sample Time/Date: 1340 / 2-28-09 | Water Color: Cloudy | Odor: (Y) / N
Approx. Flow Rate: 100 ml/gpm. | Sediment Description: light
Did well de-water? NO If yes, Time: ____ Volume: ____ gal. DTW @ Sampling: 3.47

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm) (µS)	Temperature (C) / F	D.O. (mg/L)	ORP (mV)	Gauge DTW as parameters are recorded
1325	1.5	6.69	821	8.4			3.45
1328	1.8	6.71	824	8.4			3.45
1331	2.1	6.71	827	8.4			3.47

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
MW-4	3 x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX+MTBE(8021)
	2 x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sg

COMMENTS:

Add/Replaced Lock: ____ Add/Replaced Plug: ____ Add/Replaced Bolt: ____

Chevron Northwest Region Analysis Request/Chain of Custody

Lancaster Laboratories
Where quality is a science.

Acct. #: 11260 | For Lancaster Laboratories use only Sample #: 510133233-37 | SCR#: | Group# 1134502

Facility #: SS#305192-OML G-R#387100
Site Address: 9816 271st Street NW, STANWOOD, WA
Chevron PM: OS | Lead Consultant: SAICPC
Consultant/Office: G-R, Inc., 6747 Sierra Court, Suite J, Dublin, CA 94568
Consultant Prj. Mgr.: Deanna L. Harding (deanna@grinc.com)
Consultant Phone #: 925-551-7555 | Fax #: 925-551-7899
Sampler: Mike Lombard
Service Order #: | ☐ Non SAR:

Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: Soil	Matrix: Potable ☐ NPDES ☐ Water	Matrix: Oil ☐ Air ☐	Total Number of Containers	BTEX + MTBE 8021 ☒ 8260 ☐ Naphth ☐	8260 full scan	Oxygenates	TPH GX	TPH D ☒ Extended Rng. ☐ Silica Gel Cleanup ☒	Lead Total ☐ Diss. ☐ Method	VPH/EPH	NWTPH H HCID ☐ quantification
QA	2-28-09		X			X		2	X			X				
MW-1	↓	1100	X			X		5	X			X	X			
MW-2		1155	X			X		5	X			X	X			
MW-3		1245	X			X		5	X			X	X			
MW-4	↓	1340	X			X		5	X			X	X			

Analyses Requested — Preservation Codes: H H

Preservative Codes
H = HCl | T = Thiosulfate
N = HNO_3 | B = NaOH
S = H_2SO_4 | O = Other

☐ J value reporting needed
☐ Must meet lowest detection limits possible for 8260 compounds
8021 MTBE Confirmation
☐ Confirm MTBE + Naphthalene
☐ Confirm highest hit by 8260
☐ Confirm all hits by 8260
☐ Run ____ oxy s on highest hit
☐ Run ____ oxy s on all hits

Comments / Remarks

Turnaround Time Requested (TAT) (please circle)
STD. TAT | 72 hour | 48 hour
24 hour | 4 day | 5 day

Data Package Options (please circle if required) **EDF/EDD**
QC Summary | Type I - Full
Type VI (Raw Data) | Disk / EDD
WIP (RWQCB) | Standard Format
Disk | ____ Other.

	Date	Time		Date	Time
Relinquished by:	3-3-09	1700	Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received by:		
Relinquished by Commercial Carrier: UPS FedEx Other			Received by:	3/4/09	910

Temperature Upon Receipt 3.5 C°
Custody Seals Intact? Yes No

Lancaster Laboratories
2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared for:

Chevron
6001 Bollinger Canyon Road
L4310
San Ramon CA 94583

925-842-8582

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

SAMPLE GROUP

The sample group for this submittal is 1134502. Samples arrived at the laboratory on Wednesday, March 04, 2009. The PO# for this group is 0015040041 and the release number is SKANCE.

Client Description	Lancaster Labs Number
QA Water Sample	5613233
MW-1 Grab Water Sample	5613234
MW-2 Grab Water Sample	5613235
MW-3 Grab Water Sample	5613236
MW-4 Grab Water Sample	5613237

ELECTRONIC COPY TO SAIC c/o Gettler-Ryan Attn: Cheryl Hansen

Lancaster Laboratories

Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Questions? Contact your Client Services Representative
Jill M Parker at (717) 656-2300

Respectfully Submitted,

Valerie L. Tomayko
Group Leader

Lancaster Laboratories

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 •717-656-2300 Fax:717-656-2681• www.lancasterlabs.com

Analysis Report

Lancaster Laboratories Sample No. WW5613233 **Group No. 1134502**

QA Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

Chevron
6001 Bollinger Canyon Road
L4310
San Ramon CA 94583

271QA

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
02159	BTEX, MTBE					
02161	Benzene	71-43-2	N.D.	0.5	ug/l	1
02164	Toluene	108-88-3	N.D.	0.5	ug/l	1
02166	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
02171	Total Xylenes	1330-20-7	N.D.	1.5	ug/l	1
02172	Methyl tert-Butyl Ether	1634-04-4	N.D.	2.5	ug/l	1
08274	NWTPH-Gx water C7-C12					
01648	NWTPH-Gx water C7-C12	n.a.	N.D.	50	ug/l	1

State of Washington Lab Certification No. C259

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
02159	BTEX, MTBE	SW-846 8021B	1	03/06/2009 17:42	Jennifer B Werner	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	03/06/2009 17:42	Jennifer B Werner	1
01146	GC VOA Water Prep	SW-846 5030B	1	03/06/2009 17:42	Jennifer B Werner	1

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Analysis Report

Lancaster Laboratories Sample No. WW5613234 **Group No. 1134502**

MW-1 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 11:00 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

Chevron
6001 Bollinger Canyon Road
L4310
San Ramon CA 94583

271M1

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
02211	NWTPH-Dx water w/Si Gel					
10376	DRO C12-C24 w/Si Gel	n.a.	610	34	ug/l	1
10377	HRO C24-C40 w/Si Gel	n.a.	610	78	ug/l	1
02159	BTEX, MTBE					
02161	Benzene	71-43-2	N.D.	0.5	ug/l	1
02164	Toluene	108-88-3	N.D.	0.5	ug/l	1
02166	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
02171	Total Xylenes	1330-20-7	N.D.	1.5	ug/l	1
02172	Methyl tert-Butyl Ether	1634-04-4	N.D.	2.5	ug/l	1
08274	NWTPH-Gx water C7-C12					
01648	NWTPH-Gx water C7-C12	n.a.	N.D.	50	ug/l	1

State of Washington Lab Certification No. C259
The bottles for Dx were received at the laboratory on 03/03/09 @ 0935 with a temperature of 2.6 & 3.1 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	03/06/2009 15:56	Diane V Do	1
02159	BTEX, MTBE	SW-846 8021B	1	03/06/2009 20:09	Jennifer B Werner	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	03/06/2009 20:09	Jennifer B Werner	1
01146	GC VOA Water Prep	SW-846 5030B	1	03/06/2009 20:09	Jennifer B Werner	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	03/05/2009 16:45	Timothy J Attenberger	1

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Analysis Report

Lancaster Laboratories Sample No. WW5613234 **Group No. 1134502**

MW-1 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 11:00 by ML

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

271M1

Account Number: 11260

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Analysis Report

Lancaster Laboratories Sample No. WW5613235 **Group No. 1134502**

MW-2 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 11:55 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

Chevron
6001 Bollinger Canyon Road
L4310
San Ramon CA 94583

271M2

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
02211	NWTPH-Dx water w/Si Gel					
10376	DRO C12-C24 w/Si Gel	n.a.	2,700	33	ug/l	1
10377	HRO C24-C40 w/Si Gel	n.a.	2,800	76	ug/l	1
02159	BTEX, MTBE					
02161	Benzene	71-43-2	2.5	0.5	ug/l	1
02164	Toluene	108-88-3	0.6	0.5	ug/l	1
02166	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
02171	Total Xylenes	1330-20-7	N.D.	1.5	ug/l	1
02172	Methyl tert-Butyl Ether	1634-04-4	N.D.	2.5	ug/l	1
08274	NWTPH-Gx water C7-C12					
01648	NWTPH-Gx water C7-C12	n.a.	450	50	ug/l	1

State of Washington Lab Certification No. C259
The bottles for Dx were received at the laboratory on 03/03/09 @ 0935 with a temperature of 2.6 & 3.1 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	03/06/2009 16:16	Diane V Do	1
02159	BTEX, MTBE	SW-846 8021B	1	03/06/2009 20:33	Jennifer B Werner	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	03/06/2009 20:33	Jennifer B Werner	1
01146	GC VOA Water Prep	SW-846 5030B	1	03/06/2009 20:33	Jennifer B Werner	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	03/05/2009 16:45	Timothy J Attenberger	1

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Analysis Report

Lancaster Laboratories Sample No. WW5613235 **Group No. 1134502**

MW-2 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 11:55 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

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Analysis Report

Lancaster Laboratories Sample No. WW5613236 **Group No. 1134502**

MW-3 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 12:45 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

Chevron
6001 Bollinger Canyon Road
L4310
San Ramon CA 94583

271M3

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
02211	NWTPH-Dx water w/Si Gel					
10376	DRO C12-C24 w/Si Gel	n.a.	290	32	ug/l	1
10377	HRO C24-C40 w/Si Gel	n.a.	190	74	ug/l	1
02159	BTEX, MTBE					
02161	Benzene	71-43-2	N.D.	0.5	ug/l	1
02164	Toluene	108-88-3	N.D.	0.5	ug/l	1
02166	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
02171	Total Xylenes	1330-20-7	1.6	1.5	ug/l	1
02172	Methyl tert-Butyl Ether	1634-04-4	N.D.	2.5	ug/l	1
08274	NWTPH-Gx water C7-C12					
01648	NWTPH-Gx water C7-C12	n.a.	N.D.	50	ug/l	1

State of Washington Lab Certification No. C259
The bottles for Dx were received at the laboratory on 03/03/09 @ 0935 with a temperature of 2.6 & 3.1 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	03/06/2009 15:16	Diane V Do	1
02159	BTEX, MTBE	SW-846 8021B	1	03/06/2009 20:57	Jennifer B Werner	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	03/06/2009 20:57	Jennifer B Werner	1
01146	GC VOA Water Prep	SW-846 5030B	1	03/06/2009 20:57	Jennifer B Werner	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	03/05/2009 16:45	Timothy J Attenberger	1

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Analysis Report

Lancaster Laboratories Sample No. WW5613236 **Group No. 1134502**

MW-3 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 12:45 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

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Analysis Report

Lancaster Laboratories Sample No. WW5613237 **Group No. 1134502**

MW-4 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 13:40 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
Reported: 03/11/2009 at 11:55
Discard: 04/11/2009

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271M4

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Units	Dilution Factor
02211	NWTPH-Dx water w/Si Gel					
10376	DRO C12-C24 w/Si Gel	n.a.	5,400	300	ug/l	10
10377	HRO C24-C40 w/Si Gel	n.a.	2,100	710	ug/l	10
02159	BTEX, MTBE					
02161	Benzene	71-43-2	N.D.	0.5	ug/l	1
02164	Toluene	108-88-3	N.D.	0.5	ug/l	1
02166	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
02171	Total Xylenes	1330-20-7	N.D.	1.5	ug/l	1
02172	Methyl tert-Butyl Ether	1634-04-4	N.D.	2.5	ug/l	1
08274	NWTPH-Gx water C7-C12					
01648	NWTPH-Gx water C7-C12	n.a.	56	50	ug/l	1

State of Washington Lab Certification No. C259
The bottles for Dx were received at the laboratory on 03/03/09 @ 0935 with a temperature of 2.6 & 3.1 C.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis Date and Time	Analyst	Dilution Factor
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	03/06/2009 18:57	Diane V Do	10
02159	BTEX, MTBE	SW-846 8021B	1	03/06/2009 22:10	Jennifer B Werner	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	03/06/2009 22:10	Jennifer B Werner	1
01146	GC VOA Water Prep	SW-846 5030B	1	03/06/2009 22:10	Jennifer B Werner	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	03/05/2009 16:45	Timothy J Attenberger	1

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Analysis Report

Lancaster Laboratories Sample No. WW5613237 **Group No. 1134502**

MW-4 Grab Water Sample
Facility# 305192 Job# 387100
9816 271st Street NW - Stanwood, WA
Collected:02/28/2009 13:40 by ML

Account Number: 11260

Submitted: 03/04/2009 09:10
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Analysis Report

Quality Control Summary

Client Name: Chevron
Reported: 03/11/09 at 11:55 AM

Group Number: 1134502

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 090640009A	Sample number(s): 5613234-5613237							
DRO C12-C24 w/Si Gel	N.D.	30.	ug/l	75	74	61-106	2	20
HRO C24-C40 w/Si Gel	N.D.	70.	ug/l					
Batch number: 09065A53A	Sample number(s): 5613233-5613237							
NWTPH-Gx water C7-C12	N.D.	50.	ug/l	109	109	75-135	0	30
Benzene	N.D.	0.5	ug/l	110	100	80-120	10	30
Toluene	N.D.	0.5	ug/l	105	100	80-120	5	30
Ethylbenzene	N.D.	0.5	ug/l	105	100	80-120	5	30
Total Xylenes	N.D.	1.5	ug/l	105	100	80-120	5	30
Methyl tert-Butyl Ether	N.D.	2.5	ug/l	100	95	82-124	5	30

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD MAX	BKG Conc	DUP Conc	DUP RPD	Dup RPD Max
Batch number: 09065A53A	Sample number(s): 5613233-5613237 UNSPK: P613225, P613226								
NWTPH-Gx water C7-C12	100		48-140						
Benzene	104		70-152						
Toluene	105		78-129						
Ethylbenzene	105		75-133						
Total Xylenes	107		67-155						
Methyl tert-Butyl Ether	95		70-134						

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 090640009A

	Orthoterphenyl
5613234	91
5613235	98
5613236	63
5613237	76
Blank	91

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron
Reported: 03/11/09 at 11:55 AM

Group Number: 1134502

Surrogate Quality Control

LCS	104
LCSD	101
Limits:	50-150

Analysis Name: BTEX, MTBE
Batch number: 09065A53A

	Trifluorotoluene-P	Trifluorotoluene-F
5613233	87	81
5613234	87	77
5613235	89	84
5613236	88	78
5613237	88	79
Blank	88	81
LCS	89	93
LCSD	89	95
MS	86	86
Limits:	69-129	63-135

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.

Lancaster Laboratories
Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D.	none detected	**BMQL**	Below Minimum Quantitation Level
TNTC	Too Numerous To Count	**MPN**	Most Probable Number
IU	International Units	**CP Units**	cobalt-chloroplatinate units
umhos/cm	micromhos/cm	**NTU**	nephelometric turbidity units
C	degrees Celsius	**F**	degrees Fahrenheit
Cal	(diet) calories	**lb.**	pound(s)
meq	milliequivalents	**kg**	kilogram(s)
g	gram(s)	**mg**	milligram(s)
ug	microgram(s)	**l**	liter(s)
ml	milliliter(s)	**ul**	microliter(s)
m3	cubic meter(s)	**fib >5 um/ml**	fibers greater than 5 microns in length per ml

< less than – The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million – One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.

U.S. EPA data qualifiers:

Organic Qualifiers

A	TIC is a possible aldol-condensation product
B	Analyte was also detected in the blank
C	Pesticide result confirmed by GC/MS
D	Compound quatitated on a diluted sample
E	Concentration exceeds the calibration range of the instrument
J	Estimated value
N	Presumptive evidence of a compound (TICs only)
P	Concentration difference between primary and confirmation columns >25%
U	Compound was not detected
X,Y,Z	Defined in case narrative

Inorganic Qualifiers

B	Value is <CRDL, but ≥IDL
E	Estimated due to interference
M	Duplicate injection precision not met
N	Spike amount not within control limits
S	Method of standard additions (MSA) used for calculation
U	Compound was not detected
W	Post digestion spike out of control limits
*****	Duplicate analysis not within control limits
+	Correlation coefficient for MSA <0.995

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.