CDM

2010 Natural Attenuation Monitoring Report
Former Bingo Fuel Stop Cleanup Action
Thorp, Washington

April 7, 2010

FIS # 388

Prepared For:

Burns Brothers, Inc
4800 S.W. Meadows Road, Suite 475
Lake Oswego, Oregon

Prepared By:

CDM
14432 SE Eastgate Way, Suite 100
Bellevue, Washington 98007

CDM Project No. 19956.64415.GWM2010

A Report Prepared For:

Burns Brothers, Inc.
4800 S.W. Meadows Road, Suite 475
Lake Oswego, Oregon 97035-3283

2010 NATURAL ATTENUATION MONITORING REPORT
FORMER BINGO FUEL STOP CLEANUP ACTION
THORP, WASHINGTON

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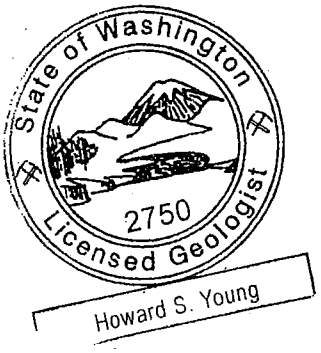


Howard S. Young, LG
Project Manager

CDM
14432 SE Eastgate Way, Suite 100
Bellevue, Washington 98007
425/516-0197

CDM Project No. 19956.64415.GWM2010

Contents

Tables

Figures

Section 1
Introduction

This report summarizes 2010 natural attenuation monitoring conducted by Camp Dresser & McKee Inc. (CDM) adjacent to the former Bingo Fuel Stop site in Thorp, Washington. The site location is shown in **Figure 1**. CDM has conducted monitoring well sampling at or adjacent to the former Bingo Fuel Stop site on behalf of Burns Brothers, Inc. (Burns Brothers) since 1993. Work was performed in general accordance with procedures outlined in the April 7, 1995 Sampling and Analysis Plan and September 19, 1994 Health and Safety Plan approved for the site, and the August 15, 2002 Operation and Maintenance Plan developed for the areas adjacent to the former Bingo Fuel Stop site.

On February 12, 2010, CDM gauged the groundwater levels and collected groundwater samples from offsite monitoring wells MW6A, MW8, and MW12. Well locations are shown in **Figure 2**. Groundwater monitoring of the offsite areas is being conducted as part of the Agreed Order between Burns Brothers and Washington Department of Ecology (Ecology).

1.1 Background

Cleanup activities performed at the former Bingo Fuel Stop facility include removing the contamination source, excavating and treating approximately 15,700 cubic yards of petroleum-contaminated soil, and recovering and treating onsite and offsite groundwater. Analytical results show that soil containing petroleum hydrocarbon concentrations above cleanup levels, has been removed from the subsurface of the legal description of the property and successfully treated. Analytical results also show that groundwater underlying the site does not contain petroleum hydrocarbon concentrations above site cleanup levels.

Ecology has agreed, as stated in its February 5, 2001 letter, that soil and groundwater remediation within the legal boundaries of the property is complete. Monitored natural attenuation coupled with institutional controls was selected as the remediation alternative for the areas adjacent to (and downgradient of) the Former Bingo Fuel Stop and underlying the Interstate 90 and Thorp Highway rights-of-way (ROW). Natural attenuation occurs passively via a combination of physical, chemical, and biological processes to reduce the mass, toxicity, mobility, volume, and concentration of contaminants in soil and groundwater without further human intervention.

1.2 Purpose and Scope of Services

The purpose of ongoing sampling and monitoring is to evaluate natural attenuation processes and changes in petroleum hydrocarbon contamination in the offsite areas. CDM's specific scope of services consisted of:

- Measuring water levels in three offsite monitoring wells (MW6A, MW8, and MW12).

- Measuring field parameters (pH, temperature, conductivity, oxidation/reduction potential (ORP), dissolved oxygen, and turbidity) prior to collecting groundwater samples and at 5-minute intervals during sampling.
- Collecting groundwater samples from these wells.
- Submitting groundwater samples to an analytical laboratory for analysis of gasoline- and diesel-range petroleum hydrocarbons by Northwest Method NWTPH-Gx and NWTPH-Dx extended, respectively; benzene, ethylbenzene, toluene, and total xylenes (BETX) by EPA Method 8020; and nitrate and sulfate by EPA Method 353.2 and 375.4.
- Preparing this report documenting our site activities, observations, laboratory analytical results, and conclusions regarding natural attenuation at the site.

Field parameters and groundwater levels measured during the sampling event are included on the groundwater sampling records included in Appendix A Groundwater samples were delivered to OnSite Environmental Inc. (OnSite) for laboratory analysis. Analytical results reported by the laboratory were reviewed for quality assurance/quality control (QA/QC). The QA/QC review and analytical laboratory reports are included in **Appendix B**.

Section 2
Monitoring Results

Field measured water quality parameters measured on February 12, 2010 and the results of the nitrate and sulfate analyses are presented in **Table 1**. **Table 2** presents analytical results for BETX and gasoline- and diesel-range hydrocarbons for the February 2010 sampling round, along with previous sample rounds. Monitoring results for the February 2010 groundwater sampling round indicate concentrations of gasoline and benzene in MW6A exceeding cleanup levels established for the offsite areas.

At MW8, gasoline and BETX were not detected in the primary and duplicate sample for the first time in the sampling record for this well. During the previous sampling event in February 2009, gasoline and BETX were detected at 442 µg/L and 1,400 µg/L. The nondetection of gasoline and BETX at MW8 in February 2010 is not consistent with the historic data trend at this well. In addition, the nitrate, sulfate, dissolved oxygen, and specific conductance concentrations were significantly higher in February 2010 than any other sampling event.

Section 3
Natural Attenuation Evaluation

Natural attenuation processes were evaluated following the decision flow chart presented in the August 15, 2002 Operation and Maintenance Plan. **Figure 3** shows the decision flow chart with the decisions applicable to these rounds of sampling highlighted as blue text.

Based on historical groundwater monitoring results, we have established that water levels and contaminant concentrations vary seasonally throughout the year and that the contaminant concentrations are highest during the winter months when irrigation of surrounding farmlands is not occurring. Therefore, only the groundwater sampling results from the winter months are compared in evaluating natural attenuation processes at the site.

Biodegradation of BETX and gasoline within the plume was evaluated by comparing dissolved oxygen (DO), nitrate, and sulfate concentrations within the plume area to concentrations downgradient of the plume. Lower concentrations of DO, nitrate, and sulfate within the plume area indicate increased biological activity and conditions favorable for biodegradation of BETX and gasoline. The results of the February 2010 sampling event indicate that DO, nitrate, and sulfate concentrations are lower in the plume area well MW6A relative to downgradient well that is outside of the plume (MW12). Data from MW8 was excluded from the natural attenuation evaluation due to the anomalous concentrations of gasoline, BETX, DO, and nitrate measured during the February 2010 sampling event. Within the plume area wells, DO concentrations have been low (below 2 mg/L) for the last nine years of monitoring, while nitrate and sulfate concentrations have shown decreasing trends over this same period. In the downgradient well, DO, sulfate, and nitrate concentratiosn have shown stable to slightly increasing trends. The low DO concentrations and decreasing sulfate and nitrate concentrations in the plume area compared to the stable to slightly increasing concentrations of DO, nitrate, and sulfate in the downgradient well indicate that increased aerobic, nitrate- and sulfate-reducing biodegradation is occurring within the plume.

The assimilative capacity of groundwater was calculated using February 2010 DO, nitrate, and sulfate results to confirm that complete biodegradation of BETX within the plume continues to occur. The calculation methods presented in the August 15, 2002 Operation and Maintenance Plan were followed for calculation of the assimilative capacity. DO, nitrate, and sulfate concentrations at MW12 were assumed to represent background conditions and DO, nitrate, and sulfate concentrations at MW6A were assumed to represent conditions within the plume. The result of the calculations indicates that groundwater at the site has an assimilative capacity of 4.4 mg/L for BETX. This exceeds the maximum concentration of BETX that was detected in February 2010, which was 0.42 mg/L.

Section 4
Discussion and Conclusions

The February 2010 sampling results show that off-site water quality conditions continue to improve at MW6A. Analytical results for MW6A showed a decrease in benzene to below cleanup levels established for this site; however, the concentration of gasoline increased over the last year and continues to exceed the site cleanup level. Gasoline and BETX were not detected in the downgradient well MW12.

The nondetection of gasoline and BETX and the high DO, nitrate, and sulfate concentrations detected at MW8 during the February 2010 sampling event are not consistent with the historic trend and are for now considered anomalous. The well is located within 15 feet of an unlined drainage canal and the significant reduction of gasoline and BETX concentrations could be a result of increased clean water recharge to the well from surface water infiltrating the nearby canal during the heavy rainfall events that preceded the February 2010 sampling event. Contaminant trends will be further evaluated after the February 2011 sampling event.

Based on our evaluation of the analytical data, we conclude that natural attenuation continues to occur in off-site areas adjacent to the former Bingo Fuel Stop and that contamination has not migrated to the downgradient well MW12. Decreased levels of DO, nitrate, and sulfate within the plume indicate favorable conditions for biodegradation of BETX and gasoline. The assimilative capacity for biodegradation of BETX continues to exceed the maximum BETX concentrations detected within the plume. We recommend that groundwater in the offsite areas continue to be monitored annually during the winter to verify that natural attenuation continues, and that groundwater contaminants are not migrating.

Section 5
Limitations

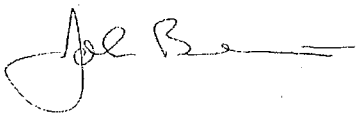
This report has been prepared for exclusive use by Burns Brothers for this project only. The analyses and conclusions included herein are based on conditions encountered at the time of our groundwater monitoring and our experience and judgment. CDM cannot be responsible for interpretation by others of the data contained in this report.

CDM's services were performed in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.

Distribution

1 Copy	Burns Brothers, Inc. 4949 Meadows Rd, Suite 330 Lake Oswego, OR 97035-3162 Attention: Mr. Bruce Burns
1 Copy	Washington State Department of Ecology 15 West Yakima Avenue, Suite 200 Yakima, Washington 98902-3452 Attention: Ms. Valerie Drew

Quality Assurance / Technical Review by:



John Bennett
Hydrogeologist

Table 1
General Parameters - Groundwater
Burns Bros./Bingo Fuel Stop Cleanup Action
Thorp, Washington

Well ID	Sample Date	Dissolved Oxygen mg/L	ORP mV	Specific Conductance µmhos/cm	Temperature °F	pH	Sulfate mg/L	Nitrate mg/L	Turbidity NTU
MW6A	07/13/01	0.09	308	550	69.4	6.97	57	11	26.1
	02/28/02	0.48	221	768	50.5	7.45	57.1	26.4	NM
	01/15/03	1.64	NM [a]	990	50.4	7.20	36.2	2.47	NM [a]
	02/10/04	0.87	178	1,600	42.2	7.57	28.4	0.486	54.1
	02/15/05	0.15	172	499	51.8	6.89	15	1.8	0.1
	02/15/06	0.21	237	318	48.9	6.63	52	10	19.0
	02/16/07	0.035	94	1,456	51.62	6.47	40	8.5 [b]	0.0
	03/19/08	0.16	-111	524	51.21	7.17	19	1.8	0.0
	02/09/09	1.44	NM [a]	507	46.95	7.92	11	1.2	NM [a]
	02/11/10	0.26	-358.6	636	51.73	6.94	10	0.85	1.78
MW8	07/13/01	0.98	308	259	60.6	6.7	4.8	0.13	12.8
	07/13/01(dup)	0.98	308	259	60.6	6.7	5	0.12	12.8
	02/28/02	0.10	44	642	59.4	7.33	9.18	<0.3	NM
	01/14/03	0.28	NM [a]	710	51.9	7.30	8.97	1.25	NM [a]
	01/14/03 (dup)	0.28	NM [a]	710	51.9	7.30	8.66	1.15	NM [a]
	02/10/04	1.36	235	633	50.4	7.66	9.08	0.391	4.9
	02/10/04 (dup)	1.36	235	633	50.4	7.66	8.79	0.36	4.9
	02/15/05	1.45	219	489	51.4	6.88	<5	0.094	0.2
	02/15/05 (dup)	1.45	219	489	51.4	6.88	<5	0.10	0.2
	02/15/06	1.99	325	290	50.5	6.74	21	0.16	7.8
	02/15/06 (dup)	1.99	325	290	50.5	6.74	20	0.94	7.8
	02/16/07	2.00	85	632	51.26	6.78	18	4.0 [b]	3.2
	02/16/07 (dup)	2.00	85	632	51.26	6.78	15	3.9 [b]	3.2
	03/18/08	0.56	18	607	50.29	7.18	<5	0.47	34.8
	02/09/09	1.10	NM [a]	778	47.89	8.07	8.7	5.7	NM [a]
	02/11/10	5.46	-115.2	934	42.30	7.38	26	18	5.61
	2/11/2010 (dup)	5.46	-115.2	934	42.30	7.38	27	16	5.61
MW12	02/28/02	NM [a]	NM [a]	NM [a]	NM [a]	NM [a]	12.8	2.72	NM
	01/15/03	5.77	NM [a]	451	47.1	7.48	13.6	2.86	NM [a]
	02/10/04	5.37	233	507	44.5	6.92	14.7	2.99	2.4
	02/15/05	5.74	239	447	47.6	7.07	14.0	3.0	0.0
	02/15/06	6.40	308	644	48.1	6.64	15.0	<0.050	5.5
	02/16/07	4.97	97	538	48.92	6.67	16.0	3.3 [b]	0.0
	03/18/08	6.31	129	650	46.76	6.98	15.0	3.9	94.1
	02/09/09	6.33	NM [a]	713	45.41	7.90	14.0	3.4	NM [a]
	02/11/10	6.95	-93.4	674	46.27	7.41	18.0	3.3	0.42

Notes:

a) Reading not obtained due to equipment malfunction.
b) Nitrate+nitrite (as nitrogen).
NM - not measured.
mg/L - milligrams per liter.
mV - millivolt.
NTU - nephelometric turbidity units.
ORP - oxidation reduction potential.
µmhos/cm - micromhos per centimeter.
°F - degrees Fahrenheit.
< - analyte not detected at or greater than the listed concentration.

Table 2
Summary of Chemical Analyses - Groundwater
Burns Bros./Bingo Fuel Stop Cleanup Action
Thorp, Washington

Well I.D.	Sample I.D.	Date	EPA Method 8020				TPH	
			Benzene	Ethylbenzene	Toluene	Xylenes	Gasoline	Diesel [a]
			µg/L				mg/L	
MW6A	MW6A	09/21/99	72	1,000	96	3,650	34	5.1/<0.50
	MW6A	12/16/99	190	610	1,000	2,300	26	<0.25/<0.50
	MW6A	03/23/00	84	100	47	1,600	18	3.3/<0.50
	MW6A	06/15/00	63	28	50	1,580	14	<0.25/<0.50
	MW6A	11/20/00	39	230	21	465	7.5	2.1/<0.50
	MW6A	03/08/01	40	190	30	660	10.0	1.2/<0.50
	MW6A Duplicate	03/08/01	39	200	33	720	10.0	1.6/<0.50
	MW6A	07/13/01	20	2.0	<1.0	11.1	0.63	<0.25/<0.50
	MW-6A-2/02	02/28/02	24	110	11	250	2.5	<0.25/<0.50
	MW-6A	01/15/03	23	87	14	240	2.3	0.6/<0.41
	MW-6A	02/10/04	23	120	19	250	2.2	<0.26/<0.41
	MW-6A	02/15/05	10	110	13	263	2.1	<0.25/<0.40
	MW6A	02/15/06	8.9	190	29	740	4.3	<0.25/<0.40
	MW6A	02/16/07	<1.0	6.6	<1.0	14.4	<0.1	<0.25/<0.40
	MW6A	03/19/08	7.1	220	7.4	534	2.1	<0.25/<0.40
	MW6A	02/09/09	4.6	170	7.9	477	3.0	<0.26/<0.41
	MW6A	02/11/10	5.4	130	3.4	286	2.3	<0.28/<0.41
MW8	MW8-10/93	10/29/93	2,800	410	79	950	3.0	<1.0
	MW8-4/95	04/06/95	1,500	330	19	490	3.3	<0.24
	MW8-01/96	01/31/96	1,920	536	33	874	6.32	<0.25/<0.75
	MW8-05/96	05/30/96	267	72	4	58	0.63	<0.25/ 0.76
	MW8-08/96	08/29/96	72.5	17	<1.0	2	0.12	<0.25/<0.75
	MW8-11/96	11/25/96	1,360	338	36	630	2.89	<0.25/<0.75
	MW8-02/97	02/26/97	24.8	8	<1.0	<1.0	0.05	NA
	MW8-5/28/97	05/28/97	799.0	199	11	200	1.84	<0.25/<0.75
	MW8	08/28/97	385	128	3	60	0.87	<0.25
	MW8	11/18/97	411	136	3	41	0.90	0.28
	MW8	02/17/98	47	28	<1.0	<1.0	0.27	<0.25/<0.50
	MW8	03/27/98	760	300	7.5	80	2.4	<0.25/<0.50
	MW8	04/27/98	520	230	<1.0	6.6	1.5	<0.25/<0.50
	MW8	05/22/98	200	75	<1.0	<5.0	0.51	<0.25
	MW8	06/18/98	490	180	21	101	1.60	<0.25/<0.50
	MW8	09/28/98	74	19	9.6	10	0.19	<0.25/<0.50
	MW8	12/09/98	380	120	10.0	113	1.10	<0.25/<0.50
	MW8	03/10/99	320	210	17	200	1.50	<0.25/<0.50
	MW8	06/16/99	250	98	5.3	44	0.70	<0.25/<0.50
	MW8	09/21/99	260	65	5.6	43	0.59	<0.25/<0.50
	MW8	12/16/99	1,700	680	33	640	7.1	<0.25/<0.50
	MW8	03/23/00	700	490	22	414	3.9	<0.25/<0.50
	MW8	06/15/00	94	9.5	<1.0	<1.0	<0.10	<0.25/<0.50
	MW8	11/20/00	550	150	6.6	18.8	1.2	<0.25/<0.50
	MW8	03/08/01	850	250	26	130.0	2.9	<0.25/<0.50
	MW8	07/13/01	120	<5.0	<5.0	<5.0	<0.5	<0.25/<0.50
	MW8 Duplicate	07/13/01	100	<5.0	5.5	<5.0	<0.5	<0.25/<0.50

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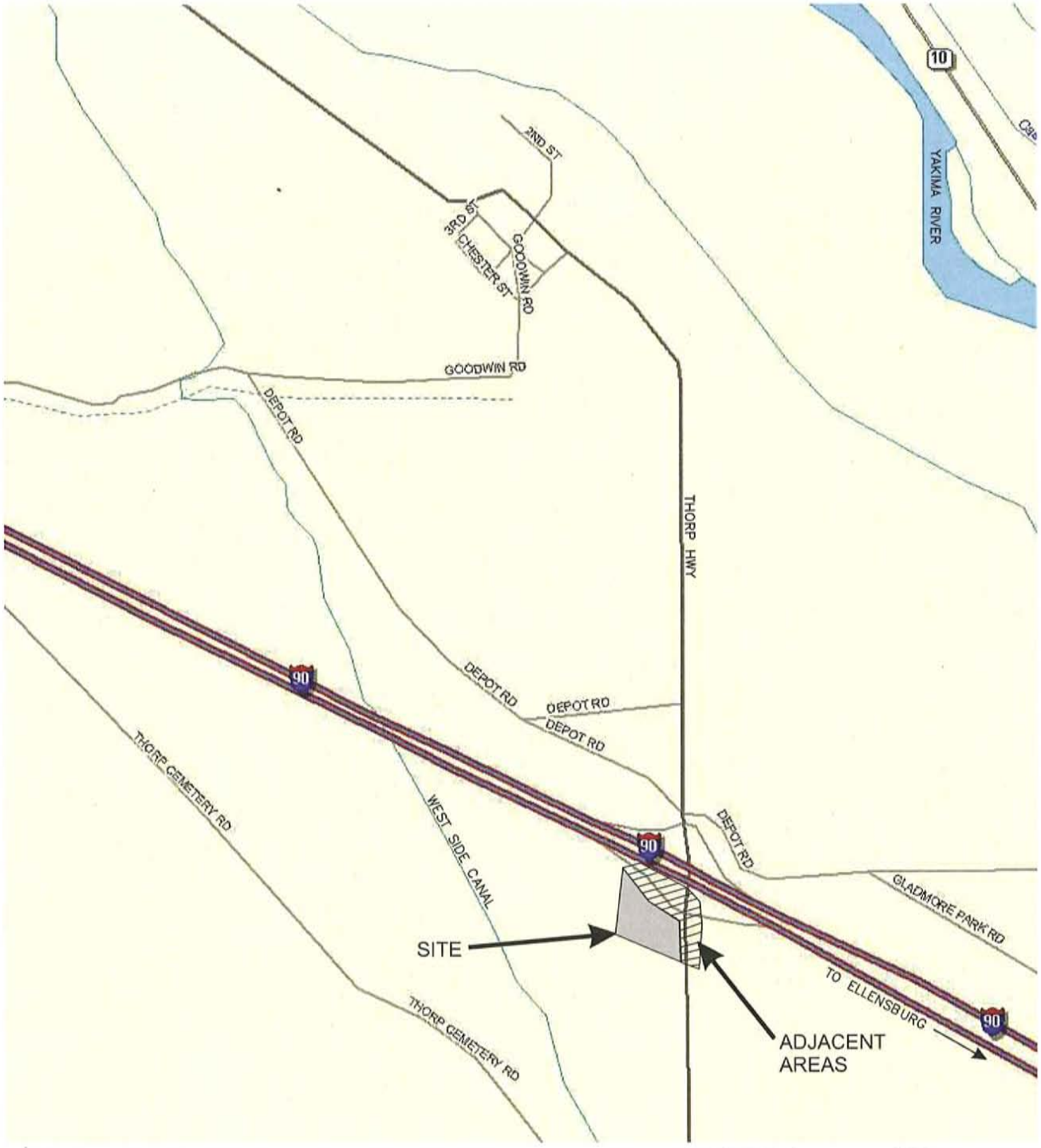
Table 2
Summary of Chemical Analyses - Groundwater
Burns Bros./Bingo Fuel Stop Cleanup Action
Thorp, Washington

Well I.D.	Sample I.D.	Date	EPA Method 8020				TPH	
			Benzene	Ethylbenzene	Toluene	Xylenes	Gasoline	Diesel [a]
			µg/L				mg/L	
	MW8-2/02	02/28/02	960	56	6.1	12.0	1.0	<0.25/<0.50
	MW8	01/14/03	1,100	580	81	499	5.2	<0.25/<0.50
	MW8A (Duplicate)	01/14/03	1,100	590	89	516	5.6	<0.25/<0.50
	MW8	02/10/04	640	530	81	820	6.2	<0.26/<0.41
	MW8A (Duplicate)	02/10/04	660	550	86	840	6.5	<0.26/<0.41
	MW8	02/15/05	120	1.2	<1.0	<1.0	0.38	<0.26/<0.41
	MW8A (Duplicate)	02/15/05	120	<1.0	<1.0	<1.0	0.28	<0.26/<0.41
	MW8	02/15/06	340	130	26	55	1.1	<0.26/<0.41
	MW8A (Duplicate)	02/15/06	360	140	29	58	1.1	<0.26/<0.41
	MW8	02/16/07	100	10	5.0	1.8	0.35	<0.25/<0.40
	MW8A (Duplicate)	02/16/07	120	11	5.7	1.9	0.38	<0.25/<0.40
	MW8	03/18/08	180	52	5.7	5.3	0.47	<0.25/<0.41
	MW8A (Duplicate)	03/18/08	190	59	6.3	6.3	0.52	<0.25/<0.40
	MW8	02/09/09	210	100	14.0	118.4	1.4	<0.25/<0.40
	MW8	02/11/10	<1.0	<1.0	<1.0	<1.0	<0.10	<0.26/<0.41
	MW8 (Duplicate)	02/11/10	<1.0	<1.0	<1.0	<1.0	<0.10	<0.25/<0.40
MW12	MW12	07/14/01	<1.0	<1.0	<1.0	<1.0	<0.10	<0.25/<0.50
	MW12-2/02	02/28/02	<1.0	<1.0	<1.0	<1.0	<0.10	<0.25/<0.50
	MW12	01/15/03	<1.0	<1.0	<1.0	<1.0	<0.10	<0.25/<0.40
	MW12	02/10/04	<1.0	<1.0	<1.0	<1.0	<0.10	<0.26/<0.41
	MW12	02/15/05	<1.0	<1.0	<1.0	<1.0	<0.10	<0.26/<0.41
	MW12	02/15/06	<1.0	<1.0	<1.0	<1.0	<0.10	<0.26/<0.41
	MW12	02/16/07	<1.0	<1.0	<1.0	<1.0	<0.10	<0.26/<0.41
	MW12	03/18/08	<1.0	<1.0	<1.0	<1.0	<0.10	<0.26/<0.41
	MW12	02/09/09	<1.0	<1.0	<1.0	<1.0	<0.10	<0.25/<0.40
	MW12	02/11/10	<1.0	<1.0	<1.0	<1.0	<0.10	<0.25/<0.40
Bingo Fuel Stop Cleanup Levels			5.0	400	800	8,000	1.0	1.0

Notes:

Well MW6 was replaced in September 1999 by well MW6A.
a) WTPH-Diesel Extended, quantified as diesel/oil.
mg/L - milligrams per liter.
µg/L - micrograms per liter.
NA - not analyzed.
TPH-G and TPH-D analyses in 1993 performed using EPA 8015 Modified.
< - analyte not detected at/or greater than the stated concentration.



Washington

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Scale in Feet

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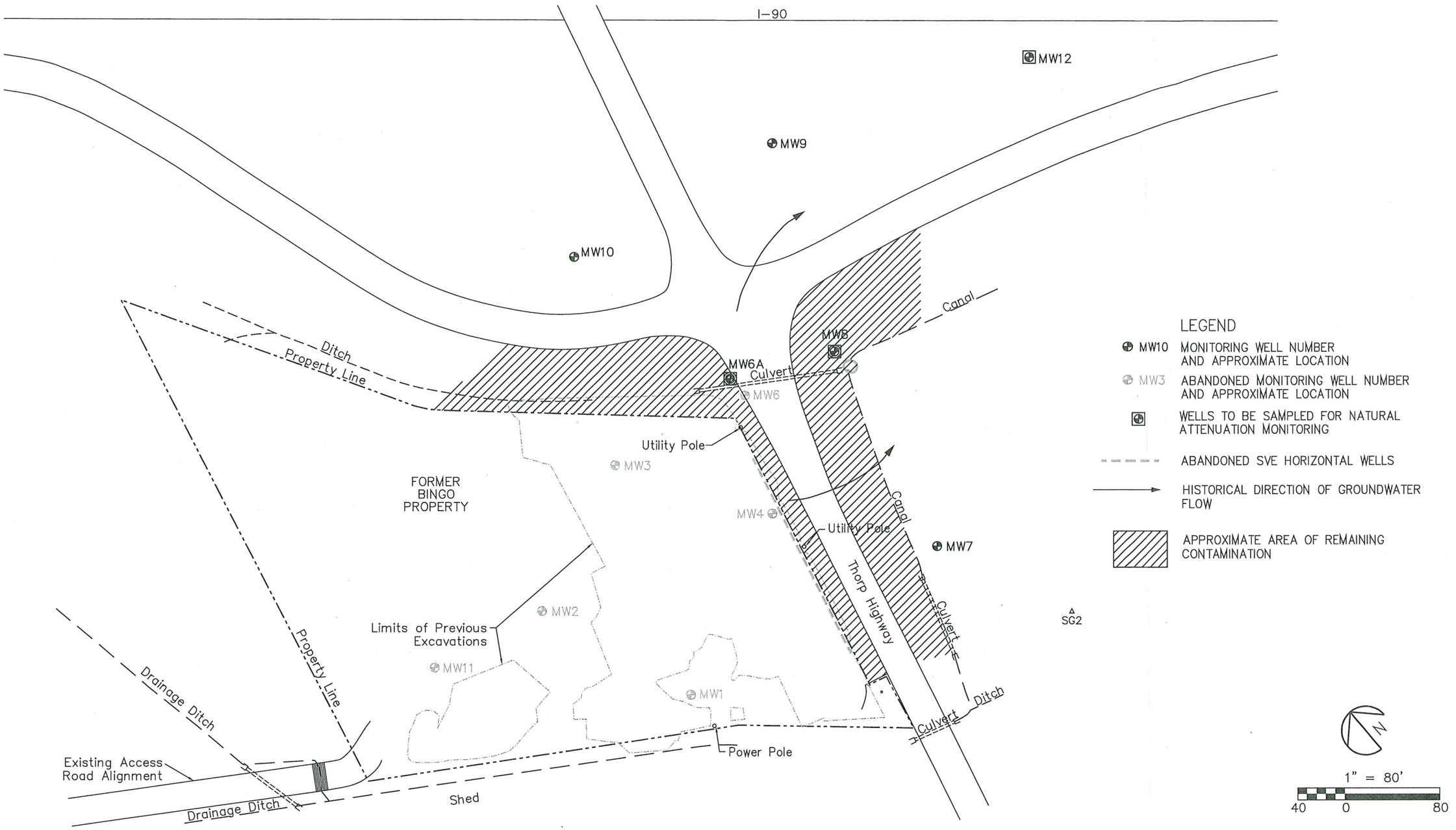
BURNS BROTHERS, INC. / BINGO FUEL STOP
NATURAL ATTENUATION MONITORING REPORT
THORP, WASHINGTON

Figure No. 1
Vicinity Map

CDM



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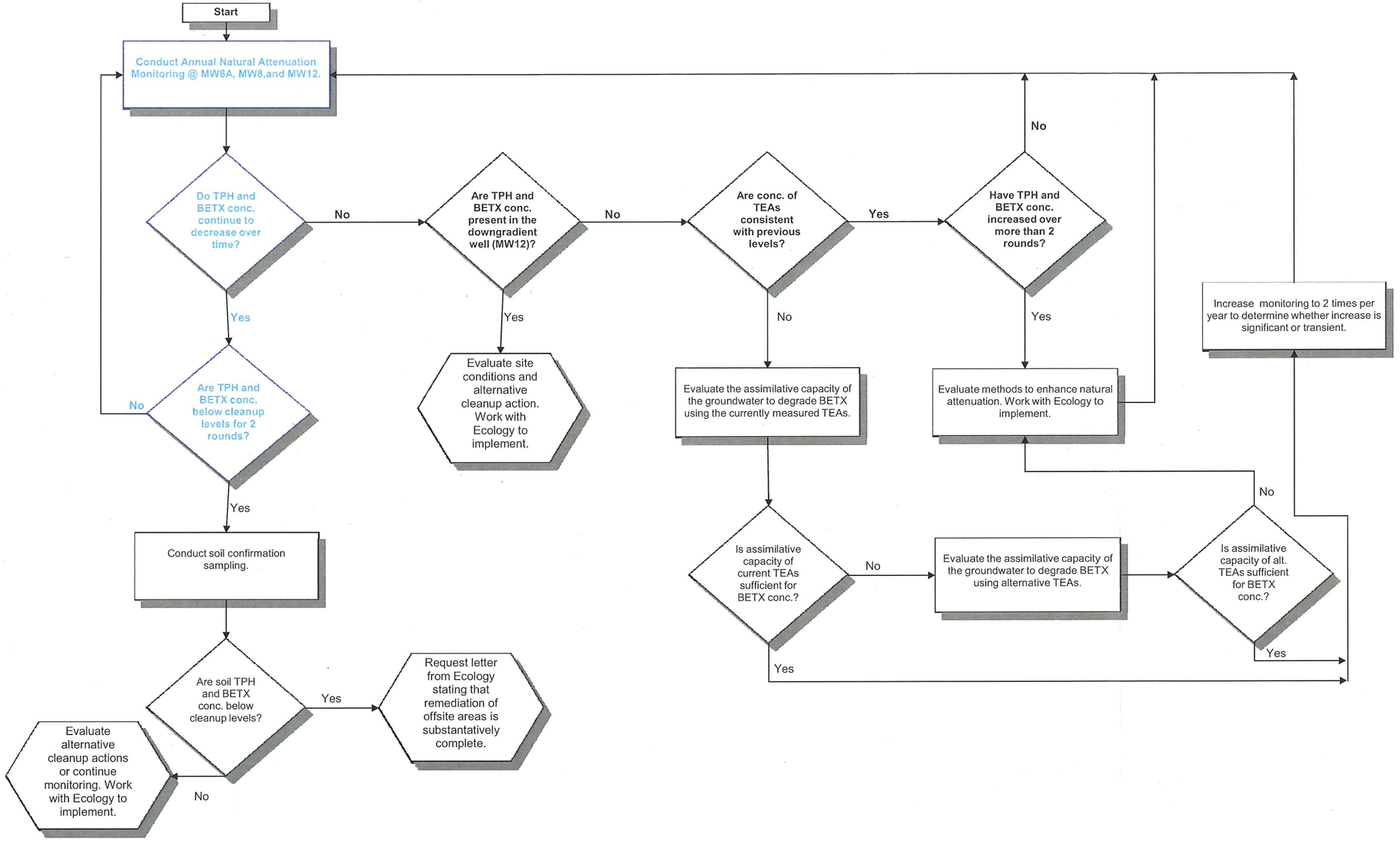
Reference: Portland State University, Department of Geology; dated 8/24/93, and CDM Field Measurements; dated 5/96, 5/97, 7/98, and 5/99.

BURNS BROTHERS, INC. / BINGO FUEL STOP
NATURAL ATTENUATION MONITORING REPORT
THORP, WASHINGTON

Figure No. 2
Site Plan

CDM



Q:\19956-Burns Bros\64415\Figure 3 NA Decision flowchart

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BURNS BROTHERS, INC./BINGO FUEL STOP NATURAL ATTENUATION MONITORING REPORT
THORP, WASHINGTON

Figure No. 3
Natural Attenuation
Decision Flow Chart

Appendix A
Groundwater Sampling Records

CDM

GROUNDWATER SAMPLING RECORD

Sample ID MW-6A | Well No. MW-6A

Project: Burns Bros.
Project No. 195 19956-64416
Weather: overcast, ~40°F
Date: 02/11/10
Sampled By: AAL
Reviewed By:

PURGING

Depth to water (TOC)
Time 1055
Comments soft bottom bladder pump @ ~28ft
Water Volume in Casing 22.13 ft
Total Well Depth (TOC) 30.44 ft
Volume Purged Before Sampling ~10 L
Screened Interval (TOC)
Purging Method bladder pump
Purge Volume Measurement Method 1L measuring cup

Time	Flow Rate (ml/min)	Cumulative Volume	WL (ft)	Temp (°C)	Specific Conductance (microsiemens/cm)	pH	Turbidity	Dissolved Oxygen (%)	Comments
1130									Begin purge ORP = -416.9
1135	~300	1.5L	22.32	10.72	1241 uS/cm	6.82	17.8	23.0	-403.9
1140	"	3.0L	22.28	10.39	1197	6.82	16.6	12.2	-383.2
1145	"	4.5L	22.37	10.86	1080	6.85	11.1	7.9	-400.0 DO = 0.69 mg/L
1150	"	6.0L	22.38	10.93	995	6.88	10.3	6.3	-387.2
1155	"	7.5L	22.38	10.99	891	6.90	8.59	4.7% 0.51 mg/L	-370.0
1200	"	9.0	22.39	10.98	828	6.90	6.94	4.0% 0.47 mg/L	-372.5
1205	"	10.5	22.37	11.08	770	6.90	5.30	2.5% 0.30 mg/L	

SAMPLING

Sampling Method bladder pump
Analytical Matrix ☐ Yes ☑ No ☐ Attached
Time Sampled 1235

Sample Container	Preserved By	At What pH	Filter Type	Cooled By
3 x 40 mL VOA	HCl	<2	—	Blue Ice
2 x 500mL amber	"	"	—	"
1 x 500 mL poly	—	—	—	"

SAMPLE DATA

Appearance / Odor clear, no sheen / HC-like odor
pH (last stabilized) 6.94
Temperature (°C) 10.96
Eh (millivolts) -358.6
Specific Conductance (microsiemens/cm) 636 uS/cm
OVM-PID Headspace (ppm) 0.9 ppm
Comments

Disposition

Chain-of-Custody ☑ Yes ☐ No
Chain-of-Custody ID —
Duplicate Sample ID —
Replicate Sample Nos. —
ANALYTICAL LAB: Lab Name OnSite Env. | Date Sent to Lab 02/12/10 | Shipment Method Courier
SPLIT WITH: Name (s) — | Organization (s) —
Other

CDM

GROUNDWATER SAMPLING RECORD

Pg 2

Continued

Sample ID MW6A

Well No. MW-6A

Project: Burns Bros. Date: 02/11/10

Project No.: Sampled By: AAL

Weather: Reviewed By:

PURGING

Depth to water (TOC)		Time	Comments continued
Water Volume in Casing		Total Well Depth (TOC)	
Volume Purged Before Sampling		Screened Interval (TOC)	
Purging Method		Purge Volume Measurement Method	

Time	Flow Rate (mL/min)	Cumulative Volume (L)	Cumulative Volume (Wt (lbs))	Temp (°C)	Specific Conductance (microsiemens/cm)	pH	Turbidity (NTU)	Dissolved Oxygen %	Dissolved Oxygen mg/L	~~Comments~~ ORP
1210	~300	12.0	22.38	11.03	733	6.91	4.24	3.0	0.33	-372.9
1215	"	13.5	22.38	11.05	702	6.92	3.84	2.7	0.29	-380.4
1220	"	15.0	22.38	10.99	676	6.92	2.94	2.6	0.28	-379.9
1225	"	16.5	22.37	11.00	654	6.93	2.26	2.5	0.27	-373.6
1230	"	18.0	22.38	10.96	636	6.94	1.78	2.4	0.26	-358.6

SAMPLING

Sampling Method

Analytical Matrix ☐Yes ☐No ☐Attached Time Sampled

Sample Container	Preserved By	At What pH	Filter Type	Cooled By

SAMPLE DATA

Appearance / Odor see pg. 1

pH (last stabilized) Temperature (°C)

Eh (millivolts) Specific Conductance (microsiemens/cm)

OVM-PID Headspace (ppm) Comments

Disposition

Chain-of-Custody ☐ Yes ☐ No Chain-of-Custody ID

Duplicate Sample ID Replicate Sample Nos.

ANALYTICAL LAB: Lab Name; Date Sent to Lab; Shipment Method

SPLIT WITH: Name (s); Organization (s)

Other

CDM

GROUNDWATER SAMPLING RECORD

Sample ID MW-8 | Well No. MW-8

Project: Burns Bros. | Date: 02/11/10

Project No.: 19956-64415 | Sampled By: AAL

Weather: overcast, ~40°F | Reviewed By:

PURGING

Depth to water (TOC) 9.71 ft | Time 1310 | Comments tubing @ ~14 ft

Water Volume in Casing | Total Well Depth (TOC) 16.02 ft

Volume Purged Before Sampling ~6 L | Screened Interval (TOC)

Purging Method peristaltic pump | Purge Volume Measurement Method 1 L measuring cup

Time	Flow Rate (mL/min)	Cumulative Volume (L)	DTW (ft)	Temp (°C)	Specific Conductance (microsiemens/cm)	pH	Turbidity (NTU)	Dissolved Oxygen %	Dissolved Oxygen mg/L	~~Comments~~ ORP
1325										→ Begin purge
1330	~300	1.5	9.95	9.52	932	7.39	19.9	50.3	5.70	-122.9
1335	"	3.0	9.97	9.55	934	7.42	20.8	50.3	5.72	-118.8
1340	"	4.5	10.04	9.58	935	7.40	9.52	50.7	5.76	-115.9
1345	"	6.0	10.11	9.61	934	7.38	5.61	49.2	5.46	-115.2

SAMPLING

Sampling Method low-flow peristaltic pump

Analytical Matrix ☐ Yes ☑ No ☐ Attached | Time Sampled 1400

Sample Container	Preserved By	At What pH	Filter Type	Cooled By
3 x 40mL VOA	HCl	<2	—	Blue Ice
2 x 500mL amber	"	"	—	↓
1 x 500mL poly	—	—	—	

SAMPLE DATA

Appearance / Odor clear, no odor

pH (last stabilized) 7.38 | Temperature (°C) 9.61

Eh (millivolts) -115.2 | Specific Conductance (microsiemens/cm) 934 uS/cm

OVM-PID Headspace (ppm) 0.0 | Comments

Disposition

Chain-of-Custody ☑ Yes ☐ No | Chain-of-Custody ID —

Duplicate Sample ID MW-8A | Replicate Sample Nos. —

ANALYTICAL LAB: Lab Name OnSite Env. | Date Sent to Lab 02/12/10

Shipment Method Courier

SPLIT WITH: Name (s) — | Organization (s)

Other

CDM

GROUNDWATER SAMPLING RECORD

Sample ID MW-12 | Well No. MW-12

Project: Burns Bros. | Date: 02/11/10

Project No.: 19956-644185 | Sampled By: AAL

Weather: overcast, ~40°F | Reviewed By: _____

PURGING

Depth to water (TOC) 7.35ft | Time 1430 | Comments Tubing @ ~14ft

Water Volume in Casing | Total Well Depth (TOC) 15.83ft

Volume Purged Before Sampling 9.0L | Screened Interval (TOC)

Purging Method peristaltic pump | Purge Volume Measurement Method 1L measuring cup

Time	Flow Rate	Cumulative Volume	WL (ft)	Temp (°C)	Specific Conductance (microsiemens/cm)	pH	Turbidity (NTU)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	~~Comments~~ ORP
1435										Begin purge
1440	~300 mL/min	1.5	7.33	7.74	684	7.57	1.13	55.1	6.64	-101.2
1445	"	3.0	7.36	7.79	681	7.57	0.95	57.8	6.86	-98.6
1450	"	4.5	7.36	7.86	680	7.51	0.77	58.9	6.99	-97.3
1455	"	6.0	7.36	7.90	678	7.46	0.77	59.2	7.01	-95.7
1500	"	7.5	7.36	7.98	675	7.43	0.52	58.5	6.91	-94.6
1505	"	9.0	7.36	7.93	674	7.41	0.42	58.7	6.95	-93.4

SAMPLING

Sampling Method low-flow peristaltic pump

Analytical Matrix ☐Yes ☑No ☐Attached | Time Sampled 1500

Sample Container	Preserved By	At What pH	Filter Type	Cooled By
3x40mL VOA	HCl	<2	—	Blue Ice
2x500mL amber	"	"	—	↓
1x500mL poly	—	—	—	

SAMPLE DATA

Appearance / Odor clear, no sheen / slight HC-like odor

pH (last stabilized) 7.41 | Temperature (°C) 7.93

Eh (millivolts) -93.4 | Specific Conductance (microsiemens/cm) 674 uS/cm

OVM-PID Headspace (ppm) 0.9 ppm | Comments

Disposition

Chain-of-Custody ☑Yes ☐No | Chain-of-Custody ID —

Duplicate Sample ID — | Replicate Sample Nos. —

ANALYTICAL LAB: Lab Name OnSite Env. | Date Sent to Lab 02/12/10

Shipment Method Courier

SPLIT WITH: Name (s) — | Organization (s) —

Other

Appendix B
Laboratory Data and Quality Assurance Report

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Burns Brothers - Thorp, WA
Project No:	19956-64415
Lab Name:	OnSite Environmental Inc. (OnSite) - Redmond, WA
Lab Numbers:	1002-092
Samples No.:	MW-6A, MW-8, MW-8A, and MW-12
Matrix:	Water

REPORT ORGANIZATION

The Quality Assurance Report (QAR) provides a summary of QA findings. Associated worksheets are stored with project files and can be provided upon request.

QUALITY ASSURANCE SUMMARY

Three groundwater samples were collected by Camp, Dresser, & McKee Inc. (CDM) of Bellevue on February 11, 2010 and submitted to OnSite Environmental (OnSite) of Redmond, Washington for analyses. Samples were analyzed for benzene, ethyl benzene, toluene, and xylenes (BTEX), gasoline-range hydrocarbons (NWTPH-Gx), diesel and lube oil - range hydrocarbons (NWTPH-Dx), nitrate as nitrogen, and sulfate. Cursory review included the review of holding times, method blanks, surrogate and matrix spike recoveries, laboratory and matrix spike duplicate data, and chain of custody records. This cursory data review was performed using OnSite control limit criteria, National Functional Guidelines for Organic data review (EPA, 1999) and National Functional Guidelines for Inorganic Data Review (EPA, 2002). Laboratory QA limits were judged to be acceptable.

All data are of known quality and acceptable for use. The NWTPH-Dx results were flagged with a Y in the laboratory report, indicating that the sample extract was treated with an acid/silica gel cleanup procedure prior to analysis. The acid/silica gel cleanup procedure is used to minimize interference from naturally occurring organic material in the soil, thus providing more representative results for diesel and lubrication oil reporting.

ANALYTICAL METHODS

Parameter	Technique	Method
Gasoline-Range Hydrocarbons/BTEX	GC/FID/PID	NWTPH-Gx/EPA 8021B
Diesel and Lube Oil - Range Hydrocarbons	GC/FID	NWTPH-Dx
Nitrate as Nitrogen	Spectrophotometric	EPA 353.2
Sulfate	Turbidimetric	EPA 375.4

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Burns Brothers - Thorp, WA
Project No:	19956-64415
Lab Name:	OnSite Environmental Inc. (OnSite) - Redmond, WA
Lab Numbers:	1002-092
Samples No.:	MW-6A, MW-8, MW-8A, and MW-12
Matrix:	Water

TIMELINESS

All samples were extracted and/or analyzed within the recommended holding times for NW-TPH-Gx/BTEX, NWTPH-Dx, EPA 353.2, and EPA 375.4.

CHAIN OF CUSTODY

Field chain of custody forms (COCs) were present and complete. All chain of custody forms were signed and dated. No problems with sample receipt conditions were indicated on the field COCs and all samples listed on the COCs were analyzed. The laboratory submitted sufficient deliverables for a cursory data review.

FIELD QUALITY CONTROL ANALYSES

Field duplicate sample MW-8A was collected at well MW-8 and the sample was analyzed by NW-TPH-Gx/BTEX, NWTPH-Dx, EPA 353.2, and EPA 375.4. The relative percent difference (RPD) between the duplicate and primary sample was less than ten percent. The results from the duplicate analyses are acceptable.

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Burns Brothers - Thorp, WA
Project No:	19956-64415
Lab Name:	OnSite Environmental Inc. (OnSite) - Redmond, WA
Lab Numbers:	1002-092
Samples No.:	MW-6A, MW-8, MW-8A, and MW-12
Matrix:	Water

LAB QUALITY CONTROL SAMPLES

Method Blanks: NWTPH-Gx/BTEX: No target compounds were detected in the blank at concentrations greater than or equal to OnSite reporting limits.

NWTPH-Dx: No target compounds were detected in the blank at concentrations greater than or equal to OnSite reporting limits.

Nitrate as Nitrogen: No target compounds were detected in the blank at concentrations greater than or equal to OnSite reporting limits.

Sulfate: No target compounds were detected in the blank at concentrations greater than or equal to OnSite reporting limits.

Surrogates: NWTPH-Gx/BTEX: The laboratory used fluorobenzene as the surrogate compound for the NWTPH-G/BTEX analyses. All surrogate % recovery (% R) values were within the laboratory control limits.

NWTPH-Dx: The laboratory used o-terphenyl as the surrogate compound for the NWTPH-G/BTEX analyses. All surrogate % R values were within the laboratory control limits.

Matrix Spikes: NWTPH-Gx/BTEX: Matrix spike and matrix spike duplicates were performed for the NWTPH-G/BTEX analyses and relative percent difference (RPD) values are within OnSite's control limit criteria for NWTPH-G/BTEX.

Nitrate as Nitrogen: A matrix spike was performed for the nitrate as nitrogen analyses. The %R value for the matrix spike is within OnSite's control limit criteria for nitrate as nitrogen.

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Burns Brothers - Thorp, WA
Project No:	19956-64415
Lab Name:	OnSite Environmental Inc. (OnSite) - Redmond, WA
Lab Numbers:	1002-092
Samples No.:	MW-6A, MW-8, MW-8A, and MW-12
Matrix:	Water

Matrix Spikes continued:

Sulfate: A matrix spike was performed for the sulfate analyses. The %R value for the matrix spike is within OnSite's control limit criteria for sulfate.

Laboratory Duplicates:

NWTPH-Gx/BTEX: A sample duplicate was performed for the NWTPH-Gx analyses. RPDs could not be calculated because no analytes were detected above the laboratory's reporting limits.

NWTPH-Dx: A sample duplicate was performed for the NWTPH-Dx analyses. An RPD could not be calculated because diesel-range hydrocarbons were not detected above the laboratory's reporting limit.

Nitrate as Nitrogen: A sample duplicate was performed for the nitrate as nitrogen analyses. The RPD value for the duplicate is within OnSite's control limit criteria for nitrate as nitrogen.

Sulfate: A sample duplicate was performed for the sulfate analyses. The RPD value for the duplicate is within OnSite's control limit criteria for sulfate.

Laboratory Spike Blanks:

Nitrate as Nitrogen: A spike blank was performed for the nitrate as nitrogen analysis. The %R value for the spike blank is within OnSite's control limits criteria for nitrate as nitrogen.

QUALITY ASSURANCE REPORT

PROJECT AND SAMPLE INFORMATION

Project Name:	Burns Brothers - Thorp, WA
Project No:	19956-64415
Lab Name:	OnSite Environmental Inc. (OnSite) - Redmond, WA
Lab Numbers:	1002-092
Samples No.:	MW-6A, MW-8, MW-8A, and MW-12
Matrix:	Water

Laboratory Spike Blanks continued:

Sulfate: A spike blank was performed for the sulfate analyses. The %R value for the spike blank is within OnSite's control limits criteria for sulfate.

Reporting Limits: The laboratory met the reporting limits levels for all analyses.

SIGNATURES

Prepared by _____ Date 4/7/2010

Checked by _____ Date 4/6/2010

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 24, 2010

Don Clabaugh
CDM
P.O. Box 3885
Bellevue, WA 98009

Re: Analytical Data for Project 19956-64415
Laboratory Reference No. 1002-092

Dear Don:

Enclosed are the analytical results and associated quality control data for samples submitted on February 12, 2010.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

Case Narrative

Samples were collected on February 11, 2010, and received by the laboratory on February 12, 2010. They were maintained at the laboratory at a temperature of 2°C to 6°C except as noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-6A**					
Laboratory ID:	02-092-01					
Benzene	**5.4**	1.0	EPA 8021	2-16-10	2-16-10	
Toluene	**3.4**	1.0	EPA 8021	2-16-10	2-16-10	
Ethyl Benzene	**130**	10	EPA 8021	2-16-10	2-16-10	
m,p-Xylene	**240**	10	EPA 8021	2-16-10	2-16-10	
o-Xylene	**46**	1.0	EPA 8021	2-16-10	2-16-10	
Gasoline	**2300**	100	NWTPH-Gx	2-16-10	2-16-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*120*	*74-121*				
Client ID:	**MW-8**					
Laboratory ID:	02-092-02					
Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Toluene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Ethyl Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
m,p-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
o-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Gasoline	**ND**	100	NWTPH-Gx	2-16-10	2-16-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*88*	*74-121*				
Client ID:	**MW-8A**					
Laboratory ID:	02-092-03					
Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Toluene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Ethyl Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
m,p-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
o-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Gasoline	**ND**	100	NWTPH-Gx	2-16-10	2-16-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*97*	*74-121*				

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NWTPH-Gx/BTEX

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-12**					
Laboratory ID:	02-092-04					
Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Toluene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Ethyl Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
m,p-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
o-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Gasoline	**ND**	100	NWTPH-Gx	2-16-10	2-16-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*98*	*74-121*				

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NWTPH-Gx/BTEX
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0216W1					
Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Toluene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Ethyl Benzene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
m,p-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
o-Xylene	**ND**	1.0	EPA 8021	2-16-10	2-16-10	
Gasoline	**ND**	100	NWTPH-Gx	2-16-10	2-16-10	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*97*	*74-121*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	02-092-02										
	ORIG	DUP									
Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Toluene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Ethyl Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
m,p-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
o-Xylene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Gasoline	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*88*	*87*	*74-121*			
MATRIX SPIKES											
Laboratory ID:	02-092-02										
	MS	MSD	MS	MSD		MS	MSD				
Benzene	**50.5**	**51.6**	50.0	50.0	ND	**101**	**103**	80-122	2	9	
Toluene	**48.1**	**48.9**	50.0	50.0	ND	**96**	**98**	81-121	2	10	
Ethyl Benzene	**48.6**	**49.4**	50.0	50.0	ND	**97**	**99**	82-120	2	10	
m,p-Xylene	**48.8**	**50.0**	50.0	50.0	ND	**98**	**100**	81-121	2	10	
o-Xylene	**48.1**	**48.8**	50.0	50.0	ND	**96**	**98**	81-121	1	10	
Surrogate:											
Fluorobenzene						*96*	*94*	*74-121*			

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NWTPH-Dx

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Date Prepared	Date Analyzed	Flags
Lab ID:	02-092-01				
Client ID:	**MW-6A**				
Diesel Range	**ND**	0.28	2-16-10	2-16-10	Y
Lube Oil Range	**ND**	0.41	2-16-10	2-16-10	Y
Surrogate: o-terphenyl	88%	50-150			
Lab ID:	02-092-02				
Client ID:	**MW-8**				
Diesel Range	**ND**	0.26	2-16-10	2-16-10	Y
Lube Oil Range	**ND**	0.41	2-16-10	2-16-10	Y
Surrogate: o-terphenyl	89%	50-150			
Lab ID:	02-092-03				
Client ID:	**MW-8A**				
Diesel Range	**ND**	0.25	2-16-10	2-16-10	Y
Lube Oil Range	**ND**	0.40	2-16-10	2-16-10	Y
Surrogate: o-terphenyl	85%	50-150			
Lab ID:	02-092-04				
Client ID:	**MW-12**				
Diesel Range	**ND**	0.25	2-16-10	2-16-10	Y
Lube Oil Range	**ND**	0.40	2-16-10	2-16-10	Y
Surrogate: o-terphenyl	83%	50-150			

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	2-16-10
Date Analyzed:	2-16-10
Matrix:	Water
Units:	mg/L (ppm)
Lab ID:	MB0216W1
Diesel Range:	**ND**
PQL:	0.25
Identification:	---
Lube Oil Range:	**ND**
PQL:	0.40
Identification:	---
Surrogate Recovery	
o-Terphenyl:	69%
Flags:	Y

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	2-16-10	
Date Analyzed:	2-16-10	
Matrix:	Water	
Units:	mg/L (ppm)	
Lab ID:	02-092-01	02-092-01 DUP
Diesel Range:	**ND**	**ND**
PQL:	0.28	0.28
RPD:	N/A	
Surrogate Recovery		
o-Terphenyl:	88%	87%
Flags:	Y	Y

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NITRATE (as Nitrogen)
EPA 353.2

Date Analyzed: 2-13-10

Matrix: Water
Units: mg /L

Client ID	Lab ID	Result	PQL
MW-6A	02-092-01	**0.85**	0.050
MW-8	02-092-02	**18**	0.50
MW-8A	02-092-03	**16**	0.50
MW-12	02-092-04	**3.3**	0.050

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

NITRATE (as Nitrogen)
EPA 353.2
QUALITY CONTROL

Date Analyzed: 2-13-10

Matrix: Water
Units: mg /L

METHOD BLANK QUALITY CONTROL

Lab ID	Result	PQL
MB0213W1	ND	0.050

SPIKE BLANK QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
SB0213W1	2.00	2.00	100	82-119	

MATRIX SPIKE QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
02-092-01	0.849				
Matrix Spike	2.85	2.00	100	81-121	

DUPLICATE QUALITY CONTROL

Lab ID	Result	Duplicate Result	RPD	Control Limit	Flag
02-092-01	0.849	0.839	1	12	

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

SULFATE
ASTM D516-02

Date Analyzed: 2-17-10

Matrix: Water
Units: mg/L

Client ID	Lab ID	Result	PQL
MW-6A	02-092-01	**10**	5.0
MW-8	02-092-02	**26**	5.0
MW-8A	02-092-03	**27**	5.0
MW-12	02-092-04	**18**	5.0

Date of Report: February 24, 2010
Samples Submitted: February 12, 2010
Laboratory Reference: 1002-092
Project: 19956-64415

SULFATE
ASTM D516-02
QUALITY CONTROL

Date Analyzed: 2-17-10

Matrix: Water
Units: mg/L

METHOD BLANK QUALITY CONTROL

Lab ID	Result	PQL
MB0217W1	ND	5.0

SPIKE BLANK QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
SB0217W1	27.2	25.0	109	80-120	

MATRIX SPIKE QUALITY CONTROL

Lab ID	Result	Spiked Amount	Percent Recovery	Control Limit	Flag
02-063-03	13.0				
Matrix Spike	30.8	25.0	123	75-125	

DUPLICATE QUALITY CONTROL

Lab ID	Sample Result	Duplicate Result	RPD	Control Limit	Flag
02-063-03	13.0	13.4	3	20	

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in the diesel range are impacting the lube oil range result.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: CDM
Project Number: 19956-64415
Project Name: Burns Bros.
Project Manager: Don Clabaugh
Sampled by: Alexis Lopez

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☑ Standard (7 working days) (TPH analysis 5 working days)
- ☐ _____ (other)

Laboratory Number: 02-092

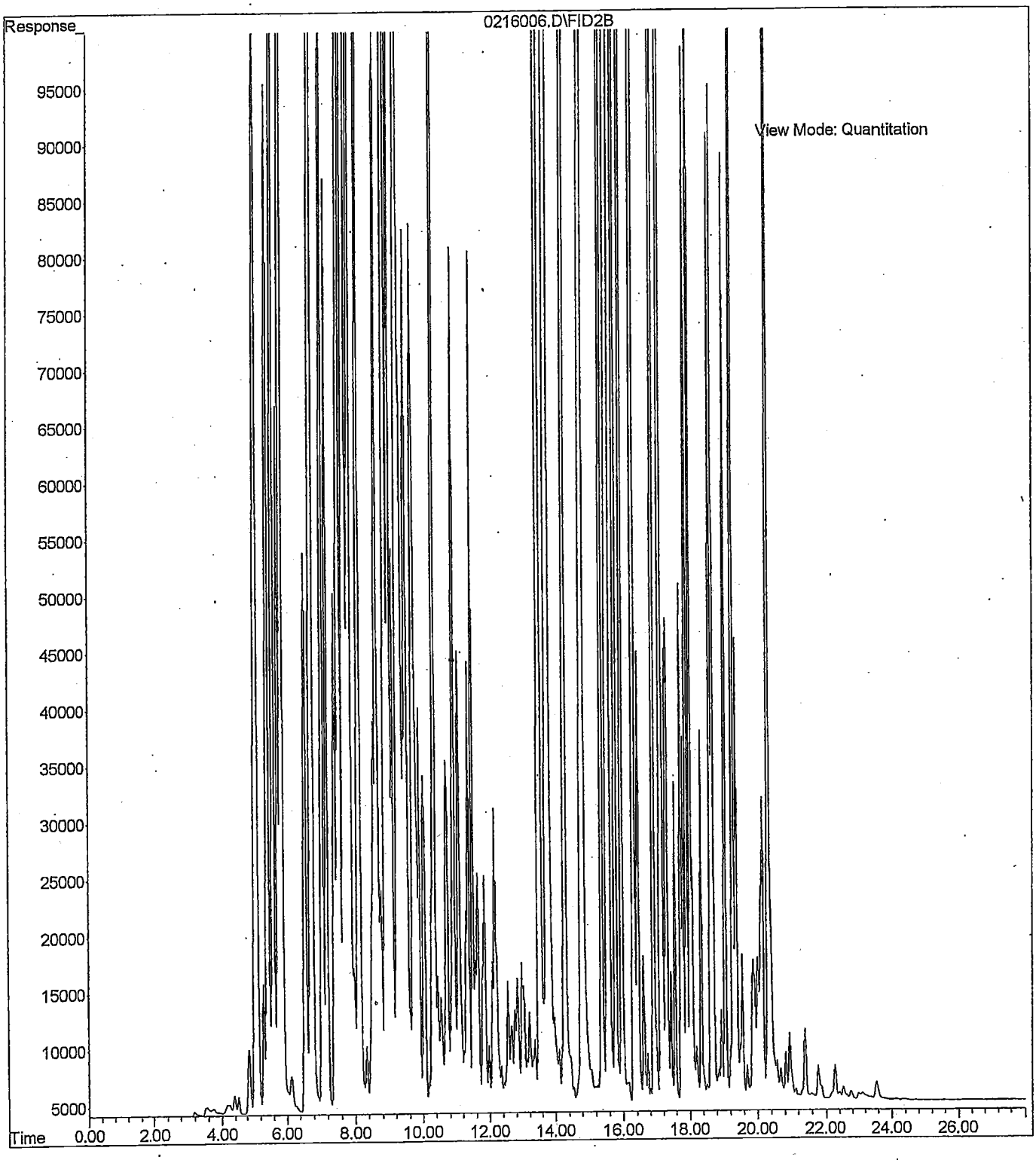
Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	VPH	EPH	Nitrate	Sulfate			% Moisture
1	MW-6A	02/11/10	1235	W	6		X	X													X	X			
2	MW-8	↓	1400	↓	↓		X	X													X	X			
3	MW-8A		1400				X	X													X	X			
4	MW-12		1500				X	X													X	X			

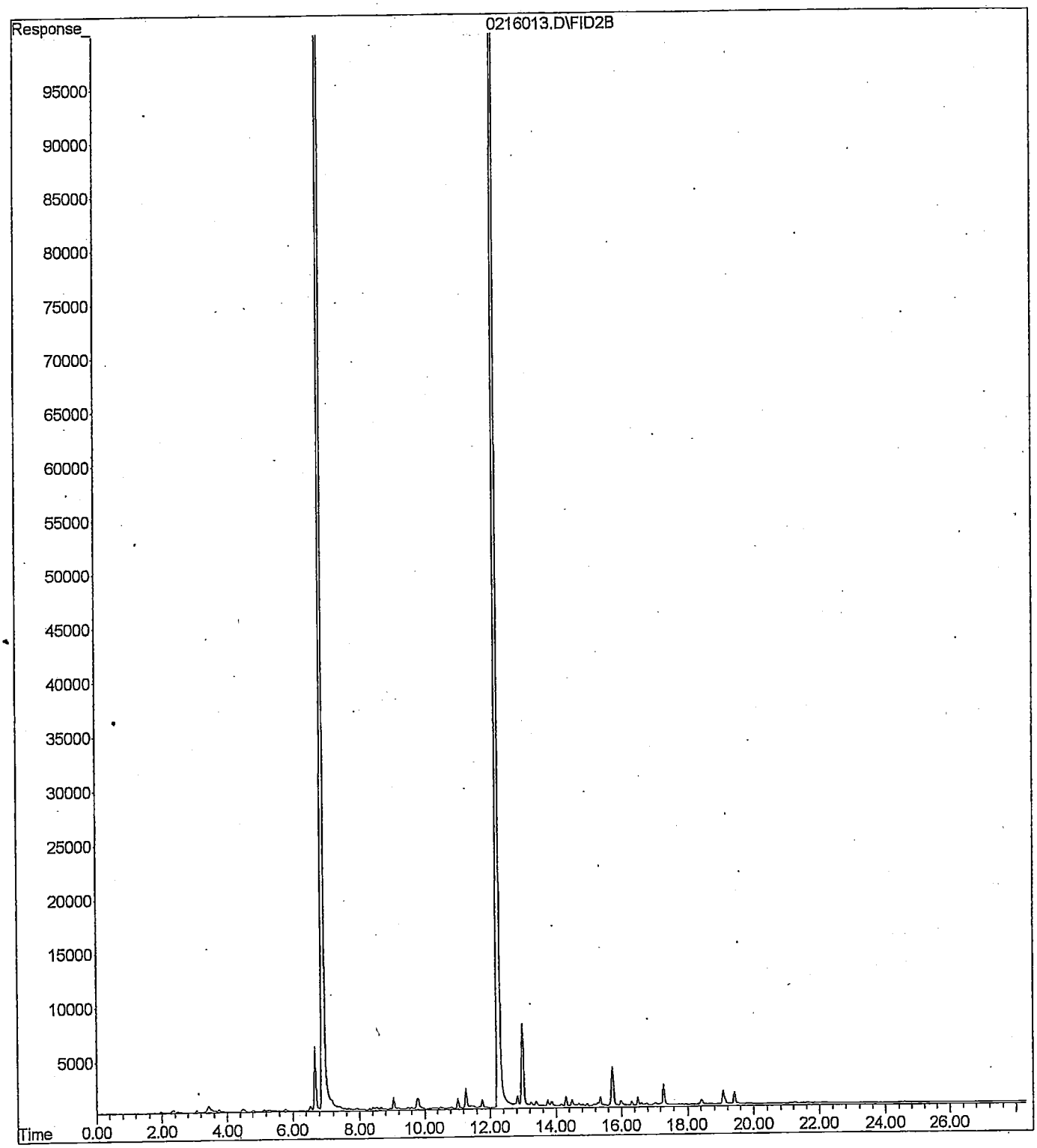
	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished by		CDM	02/12/10	1400	Please also send report to:
Received by			2/12/10	1610	- lopezaa@cdm.com
Relinquished by					- younghs@cdm.com
Received by					
Relinquished by					
Received by					
Reviewed by		Reviewed by/Date			Chromatograms with final report ☑

DISTRIBUTION: - Ons[illegible] w Ye[illegible]eport Pink - Conv

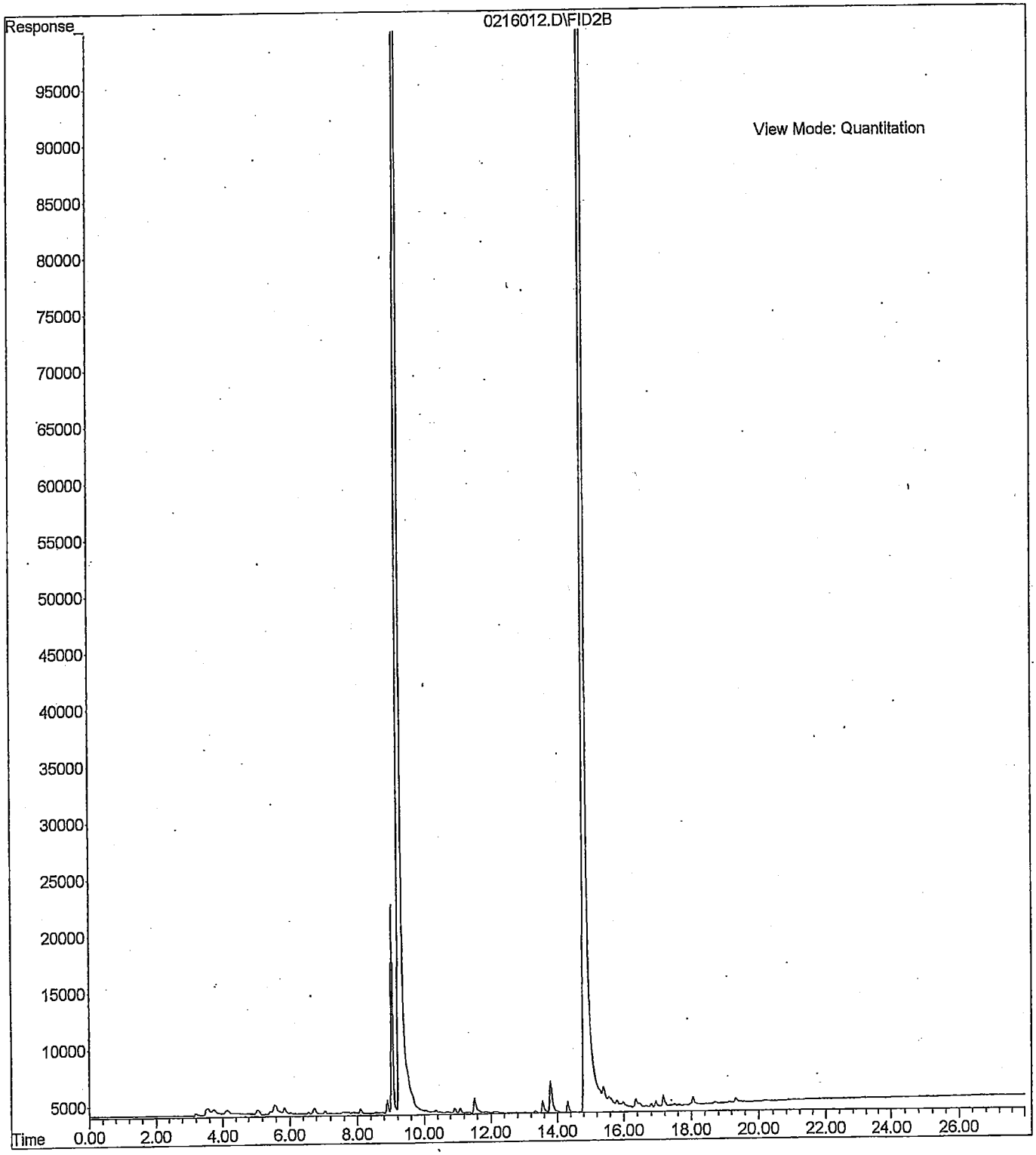
File : X:\BTEX\HOPE\DATA\H100216\0216006.D
Operator :
Acquired : 16 Feb 2010 11:56 using AcqMethod 100209.M
Instrument : HOPE
Sample Name: 02-092-01d
Misc Info : V2-21-14
Vial Number: 6



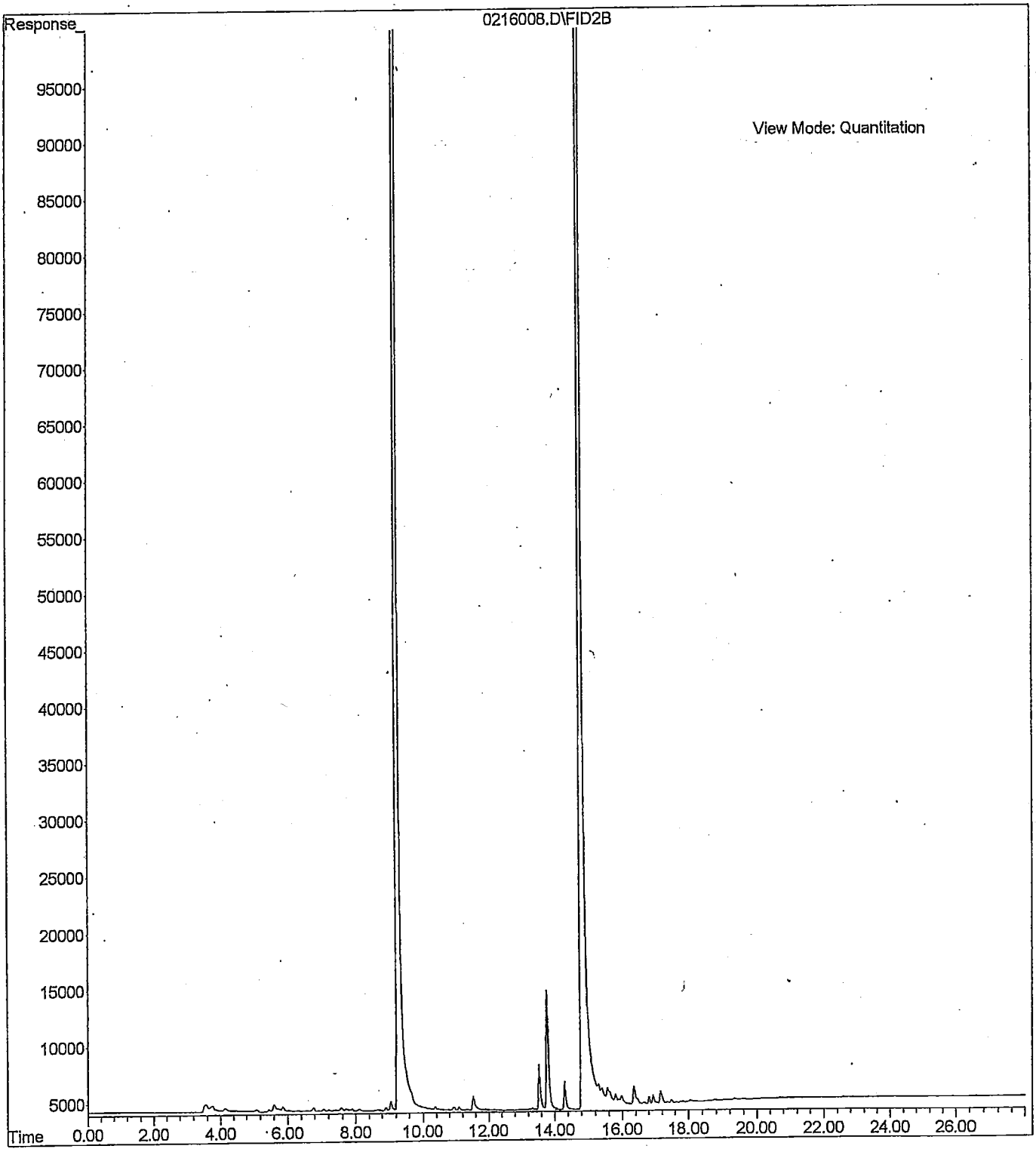
File : X:\BTEX\DARYL\DATA\D100216\0216013.D
Operator :
Acquired : 16 Feb 2010 17:05 using AcqMethod 100112N.M
Instrument : Daryl
Sample Name: 02-092-02d
Misc Info : V2-22-02
Vial Number: 13



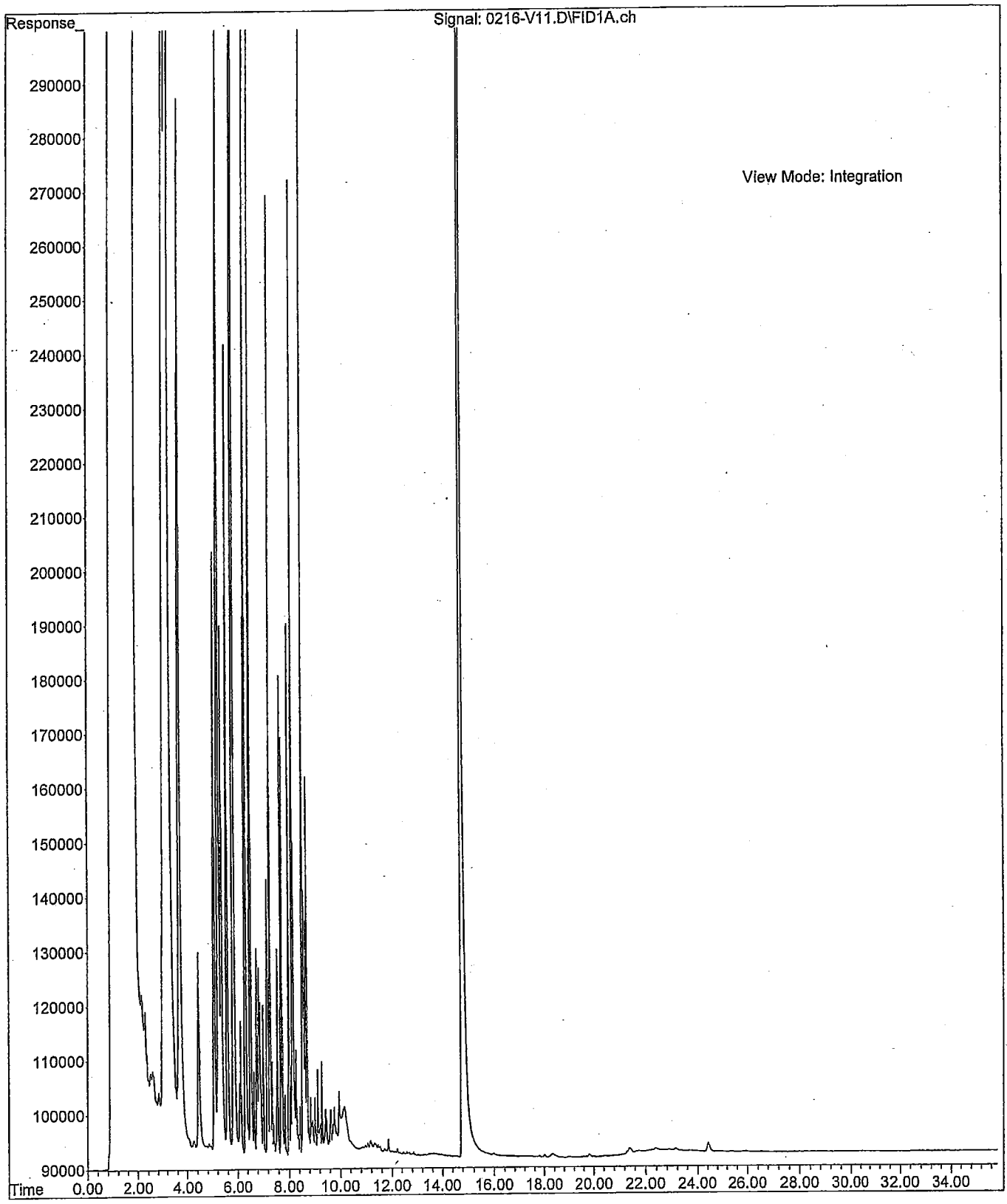
File : X:\BTEX\HOPE\DATA\H100216\0216012.D
Operator :
Acquired : 16 Feb 2010 15:20 using AcqMethod 100209.M
Instrument : HOPE
Sample Name: 02-092-03d RR
Misc Info : V2-21-14
Vial Number: 12



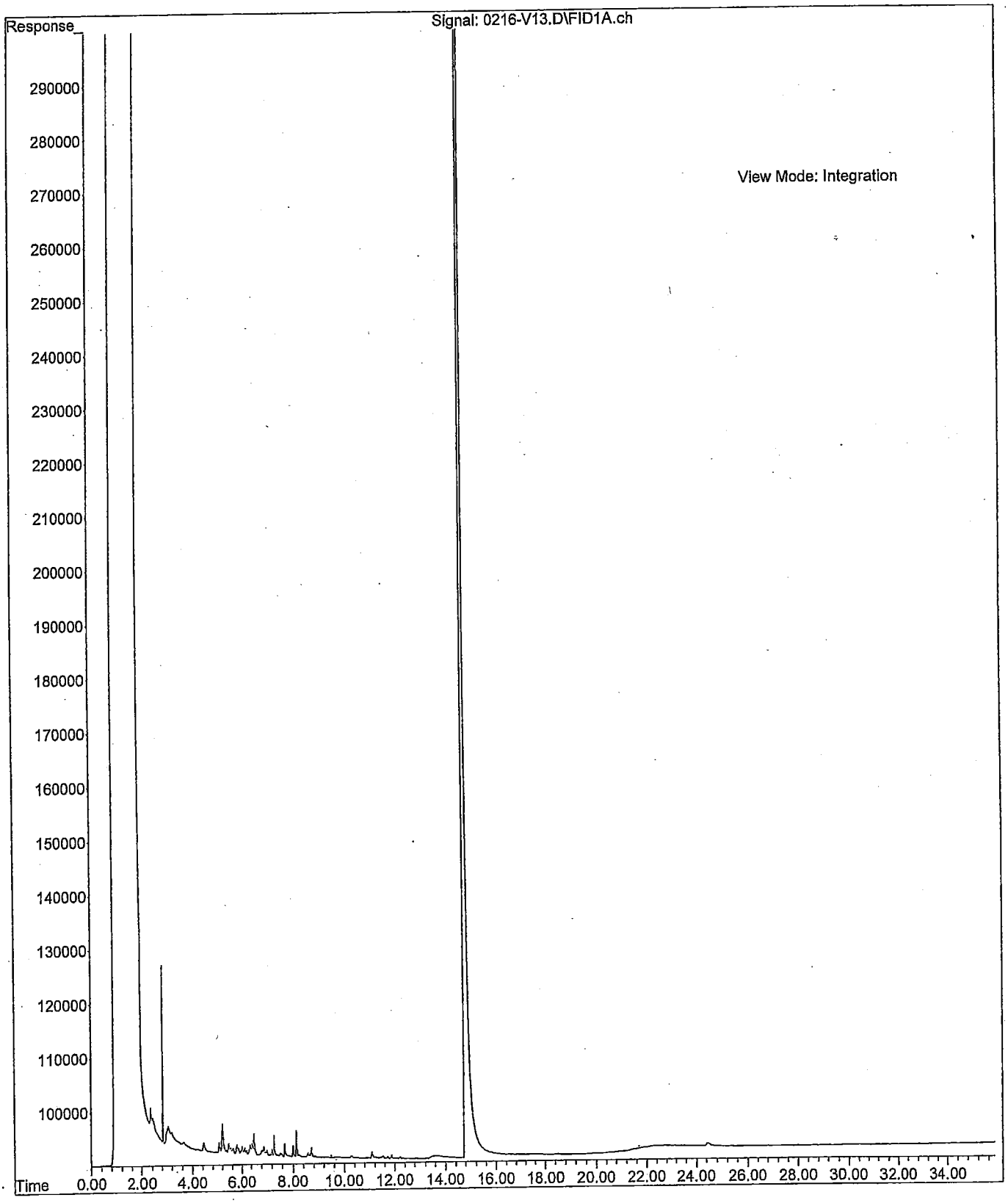
File : X:\BTEX\HOPE\DATA\H100216\0216008.D
Operator :
Acquired : 16 Feb 2010 13:04 using AcqMethod 100209.M
Instrument : HOPE
Sample Name: 02-092-04d
Misc Info : V2-21-14
Vial Number: 8



File :X:\DIESELS\VIGO\DATA\V100216\0216-V11.D
Operator : ZT
Acquired : 16 Feb 10 10124 p using AcqMethod V091125F.M
Instrument : Vigo
Sample Name: 02-092-01
Misc Info :
Vial Number: 11



File :X:\DIESELS\VIGO\DATA\V100216\0216-V13.D
Operator : ZT
Acquired : 16 Feb 10 11124 p using AcqMethod V091125F.M
Instrument : Vigo
Sample Name: 02-092-02
Misc Info :
Vial Number: 13



File :X:\DIESELS\VIGO\DATA\V100216\0216-V15.D
Operator : ZT
Acquired : 17 Feb 10 12:53 a using AcqMethod V091125F.M
Instrument : Vigo
Sample Name: 02-092-04
Misc Info :
Vial Number: 15