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QUARTERLY GROUNDWATER EVENT SEPTEMBER 2009

Conducted on:

Flegel Property
Ecology VCP Site No. SW 0886
407A Porter Way
Milton, Washington

WASHINGTON
DEPARTMENT OF ECOLOGY
SUNSHINE OFFICE

Prepared for:

Ms. Twila Flegel
855 NE Loper Avenue
Prineville, Oregon 97754

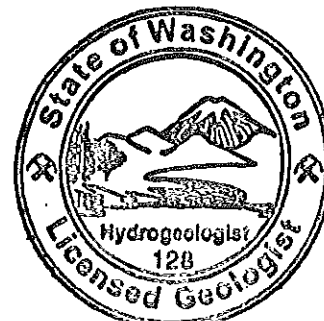
Prepared by:

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Project Geologist
ICC No. 8032278 – U2/U7

Yen-Vy Van, P.G., P.H.G.
Principal Hydrogeologist
PG, PHG # 128
AHERA No.: 1021186

AEG Project #: 07-200

Date of Report: October 23, 2009



YEN-VY VAN

INTRODUCTION

This report describes the Groundwater Monitoring and Sampling Event conducted on September 11th and 22nd, 2009 at the Flegel property, located at 407A Porter Way in Milton, Pierce County, Washington (the Site). Two separate tasks were completed during this Quarterly Event: 1) present groundwater monitoring/sampling activities and findings from this Quarterly Event; and 2) conduct a comprehensive review of historical environmental documents at the Washington State Department of Ecology (Ecology) pertaining to the Site and the adjoining property to the west, the H&H Diesel facility (H&H facility), in order to better understand the historical/current operational practices at the H&H facility, subsequent environmental impacts to the subsurface at H&H and the Site, and the long-term significance of these impacts. Figure 1, *Groundwater Contour Map*, presents the layout of the Site, adjoining H&H facility, and locations of the monitoring wells.

Based on the recent regulatory file review AEG was able to obtain a more comprehensive understanding of the subsurface conditions at the Site as it relates to the historical operations at the H&H facility. The findings from the file review on the H&H facility is presented below.

H&H FACILITY – REGULATORY FILE REVIEW/ENVIRONMENTAL HISTORY

In August 1974, the Tacoma-Pierce County Health Department (TPCHD) filed an *Environmental Complaint* with the Washington State Department of Ecology (Ecology) about wood waste fill along Hylebos Creek on the H&H Diesel property. It is unclear if filling was ceased at that time or if it was allowed to continue. TPCHD took samples of the fill; however, analytical results of these samples were not available.

In November 1975, a game warden with the State of Washington filed an *Environmental Complaint* with Ecology regarding the potential for the marshes, located directly adjacent to the south of the H&H facility, to be potentially impacted by wood waste leachate potential leaking fuel tanks at the H&H facility, or due to a tractor tipped over in August 1975. Subsequently, Ecology conducted a field visit and collected soil samples. Analytical results of these samples were not available. Ecology concluded that there was no evidence of diesel impact in the marsh.

In April 1989, TPCHD conducted a site visit at the H&H facility to inspect the newly installed underground storage tanks (USTs) which was installed for collecting waste oil and rinsate from pressure washing activities conducted on the east part of the main H&H facility building. According to the field notes from that site visit, the tanks consist of two 1,100 gallon chambered units.

In February 1991, Ecology conducted a *UBAT* (Urban Bay Action Team) *Inspection* at the H&H facility and Garner Trucking (tenants of what is now the Site). Solvents, waste oil, fuel, and

"caustic washing rinsate" were all reported to be present at the H&H property. Antifreeze mixed with waste oil was stored in a 800 gallon UST on the east side of the main H&H facility building. Fuel USTs, installed in 1969 and discontinued use in 1972, were located at the southwest corner of the main H&H facility building and were scheduled for removal. No documentation of the removal was provided to Ecology. According to the inspection summary, "the property consists of fill from various sources. Fill depth results in an elevation of approximately 8 feet above the surrounding land. The property is encircled by open drainage ditches. The fill was from the B&L log yard in 1971 and 1972. This was prior to the use of ASARCO slag at B&L. The "Duwamish Drive-In" demolition material was used to further fill the site in 1987. Most of this fill went to the east side of the site."

In March 1991, Ecology conducted a second *UBAT Inspection* concerning waste rinsate from hot caustic washing activities at the H&H facility which was discharged into the Milton Ditch and drains into Hylebos Creek. Due to dense vegetation, Ecology was not able to view the discharge point. Ecology noted that oil was floating on the surface of the waste oil UST pit.

In April 1991, TPCHD reported that a 500 gallon Stoddard Solvent (mineral spirits) UST had been removed from the H&H facility and that there was confirmed soil contamination associated with this UST. The exact location of the UST on the property was not noted. In May 1991, Ecology sent a letter to the H&H facility for failure to report the leaking UST. The nature and type of contamination associated with the leaking UST was not cited in this letter.

In June 1991, an anonymous caller to Ecology reported a spill at the H&H facility where a discharge was pumped out of the shop area and into a nearby storm drain. No actual spill was ever documented or investigated.

In August 1991, Ecology had the H&H facility listed as a hazardous waste generator due to the operations at this property. Generated wastes associated with the property included antifreeze, ethylene glycol, benzene, used washing solvents, mineral spirits, waste water, and waste oil.

In June 1992, Ecology conducted a third *UBAT Inspection* when it was discovered that the three remaining USTs (two tanks containing diesel fuel, and one tank containing waste oil) had not been removed from the H&H facility. The waste oil UST had noticeable cracks in the cement pad overlying it. Ecology also discovered a leaking aboveground storage tank (AST) located on the east side of the main H&H facility building. The AST contained waste oil and consisted of a steel tank surrounded by a cracked concrete vault. Ecology also noted that rinsate from caustic parts washing was allowed to run onto the ground and infiltrate into the subsurface.

GROUNDWATER MONITORING/ SAMPLING ACTIVITIES

This report presents results and findings of the September 2009 Quarterly Groundwater Event at the Site. AEG monitored a total of four monitoring wells (AEGMW-1 through AEGMW-3, and ADAPTMW-2) on September 11, 2009. AEGMW-3 was re-sampled on September 22, 2009.

The following groundwater monitoring and sampling activities were completed:

- Obtained depth-to-water measurements at all monitoring wells at the Site (AEGMW-1 through AEGMW-3, and ADAPTMW-2).
- Light non-aqueous phase liquid (LNAPL), i.e., free product, was encountered at AEGMW-3, located at the property boundary between the Site and the H&H facility. The thickness of the free product was measured with the EnviroTech Interface Probe (Model H01L/SM01L), and its presence was verified by a disposable bailer. A sample of this free product was obtained for hydrocarbon identification analysis.
- Conducted limited well development/purge via the peristaltic pump on all wells except AEGMW-3.
- Recorded natural attenuation field parameters including pH, conductivity, temperature, dissolved oxygen, turbidity, and salinity during purging activities.
- Collected representative groundwater samples from AEGMW-1, AEGMW-2, and ADAPTMW-2 in laboratory provided containers. The containers were labeled and placed in a portable chilled ice chest and transported to Libby Environmental Chemistry Laboratory following standard chain-of-custody procedures.
- Groundwater samples were submitted for gasoline range organics as specified in Ecology MTCA Cleanup Regulation, 173-340-900, Table 830-1, *Required Testing for Petroleum Releases*. The analyses include the following: 1) gasoline range TPH via Northwest Method NWTPH-Gx; 2) diesel, heavy oil, and mineral oil range TPH via Northwest Method NWTPH-D/Dx Extended; 3) volatile organic compounds (VOC), specifically benzene, toluene, ethylbenzene, and xylenes (BTEX), ethylene dibromide (EDB), ethylene dichloride (EDC), methyl tert-butyl ether (MTBE), and naphthalenes via EPA Method 8260B; 4) MTCA 5 total metals via EPA Method 7000 Series; and 5) dissolved metals – lead and arsenic via EPA Method 7000 Series.

- Compared the analytical results to Ecology MTCA Method A groundwater cleanup levels for the above indicated constituents.
- Completed a groundwater contour map based on groundwater elevations measured for this sampling event (refer to Figure 1 and Table 3).

GROUNDWATER ANALYTICAL RESULTS

Figure 1, *Groundwater Contour Map*, presents the direction of shallow groundwater flow at the Site observed during this sampling event (September 2009). Table 1, *Summary of Quarterly Groundwater Analytical Results – TPH and Metals* and Table 2, *Summary of Quarterly Groundwater Analytical Results – Selected VOC*, present the laboratory results for this sampling event. Table 3 presents the depth-to-water data and their respective groundwater elevation data, and Table 4, *Summary of Quarterly Groundwater Natural Attenuation Parameters*, presents the field parameters recorded. The laboratory analytical results and associated chromatograms are included in Attachment A, *Groundwater Analytical Laboratory Results*.

DISCUSSION

The findings and conclusions derived during the September 2009 Quarterly Groundwater Event for the Flegel property are as follows:

- Approximately 0.68 feet of free product was measured at AEGMW-3, located at the Site's western property boundary between the Site and the H&H facility. This well is also located adjacent to the west, within approximately 20 feet, of the pad used by H&H facility for caustic parts washing and rinsing into the ground. Groundwater from AEGMW-3 was analyzed to characterize the type of petroleum hydrocarbons present. Subsequently, AEGMW-3 was re-sampled on September 22, 2009 in order to quantify the constituents of concern. Groundwater analytical results indicated presence of heavy oil range TPH (at 1,470 ug/L), gasoline range TPH (at 370 ug/L), ethylbenzene (at 2.6 ug/L), and total xylenes at (15.3 ug/L). The concentration of heavy oil range TPH is above Ecology MTCA Method A groundwater cleanup level of 500 ug/L (refer to Table 1).
- Diesel, heavy oil, and mineral oil range TPH were not exhibited at the remaining wells.
- With the exception of well AEGMW-2, groundwater analytical results indicated presence of gasoline range TPH at the remaining three monitoring wells (AEGMW-1, AEGMW-3, and ADAPTMW-2) ranging from 156 ug/L to 370 ug/L. These concentrations are below Ecology groundwater cleanup level of 800 ug/L with the presence of benzene.

- Presence of volatile organic compounds (VOC) was exhibited AEGMW-1, AEGMW-2, and AEGMW-3. During this quarterly event, the VOC included toluene, ethylbenzene, total xylenes. .
- Groundwater analytical results indicated no detectable concentrations of either total or dissolved lead at all monitoring wells. In addition, mercury, total cadmium, and total chromium were also not exhibited at all wells sampled.
- Arsenic was detected in groundwater at elevated concentrations at AEGMW-1 (total – 70 ug/L, dissolved – 60 ug/L), AEGMW-2 (total – 203 ug/L, dissolved – 183 ug/L), and ADAPTMW-2 (total – 13 ug/L, dissolved – 12.3 ug/L). These detections are above Ecology MTCA Method A groundwater cleanup level for arsenic, at 5 ug/L. A groundwater sample for metal analysis was not obtained at AEGMW-3 due to the presence of free product.
- The static water level at the Site ranged from 2.44 feet to 6.54 feet below ground surface (bgs).
- The direction of shallow groundwater migration at the Site during the September 2009 quarterly groundwater event is generally to the south-southwest based on surveyed groundwater elevation measurements (refer to Figure 1 and Table 3).

CONCLUSIONS

The H&H facility, located adjacent to the west of the Site, has been cited for numerous environmental violations in the past. These violations and the historical and current operations at this facility continue to pose environmental concerns to the Site. More importantly, they have adversely impacted the Site's subsurface media, soil and groundwater. The primary and on-going environmental concerns connected with the H&H facility include the following factors:

- Ecology had cited the H&H facility as a hazardous waste generator due to generation of the following wastes: antifreeze, ethylene glycol, benzene, used washing solvents, mineral spirits, waste water, and waste oil.
- Ecology has cited this facility on several occasions for allowing rinsate from caustic parts washing to run onto the ground and infiltrate into the subsurface. The washing pad for historical and current caustic parts washing activities is located directly west and in the proximity to the Site's monitoring well AEGMW-3.

- H&H facility has had confirmed soil contamination associated with an underground storage tank containing Stoddard Solvent (mineral spirits).
- H&H facility has stored antifreeze mixed with waste oil in a 800 gallon UST on the east side of the main facility building. The location of this UST would have been directly west and in the proximity to the Site's monitoring well AEGMW-3.
- An aboveground storage tank containing waste oil had leaked. This tank was located on the east side of the main H&H facility building (within near proximity to the Site) and had a cracked concrete vault around the tank.

These factors, the proximity of the H&H facility and its caustic parts washing pad to the Site, the shallow depth-to-water, and the presence of loose fill in this area appear to be the primary factors for detections of numerous constituents of concern in the Site's groundwater. The detections include:

- Presence of free product, approximately 0.68 feet in thickness, at AEGMW-3. This free product was identified as heavy oil at an elevated concentration of 1,470 ug/L which is above MTCA Method A groundwater cleanup level.
- Diesel range TPH was previously detected at AEGMW-3 during the May 2009 quarterly groundwater event. The detection was also above groundwater cleanup level (refer to Table 1).
- Various volatile organic compounds (VOC) have been detected during both the May and September 2009 quarterly groundwater events at wells AEGMW-1 through AEGMW-3. Chromatograms of these groundwater samples indicate that these VOC are associated with mineral spirits and petroleum based solvents.
- Gasoline range TPH were exhibited at AEGMW-1, AEGMW-3, and ADAPTMW-2 during this quarterly event. Chromatograms of these groundwater samples indicate that these detections are associated with petroleum based solvents.

With respect to concern regarding the presence of heavy metals such as lead and arsenic in the groundwater at the Site, AEG elected to analyze the groundwater for both total and dissolved metals in order to potentially differentiate the source of the heavy metals, i.e., whether the metals are associated with the sediments or actually present in the groundwater. During this quarterly event, high concentrations of arsenic were reported in both the dissolved and total metal groundwater analyses. Lead, total and dissolved particulates, were not detected during this event. Interpretations of heavy metals and presence in the Site subsurface would benefit from additional quarterly groundwater events.

RECOMMENDATIONS

AEG recommends continued quarterly groundwater monitoring and sampling activities at the Site in order to evaluate the constituents of concern, the hydrologic regime at the Site and vicinity as it pertains to shallow groundwater migration and contamination of the Site's subsurface due to ongoing and historical operations at the H&H facility.

AEG recommends a discussion with the H&H facility regarding upgrading its housekeeping practices and installation of an oil-water separator for its parts washing area.

AEG is currently drafting a cleanup action plan for the Site with respect to dealing with the metal contamination found at the Site's subsurface. Localized areas of the Site are adversely impacted by heavy metals including total lead, chromium and arsenic. AEG recommends excavation at these areas to at least 14 feet bgs to remove and dispose offsite of metal impacted soil. This depth would include removal of artificial fill logged at these locales. Confirmation soil samples will need to be collected to ensure that the remaining soil has either detections below MTCA Method A soil cleanup levels or no detectable concentrations of heavy metals.

The source removal of impacted soil would potentially decrease the likelihood of ongoing (future) metal groundwater contamination. Excavation of metal contamination is the most expeditious and efficient cleanup method since heavy metals do not biodegrade nor attenuate over a period of time.

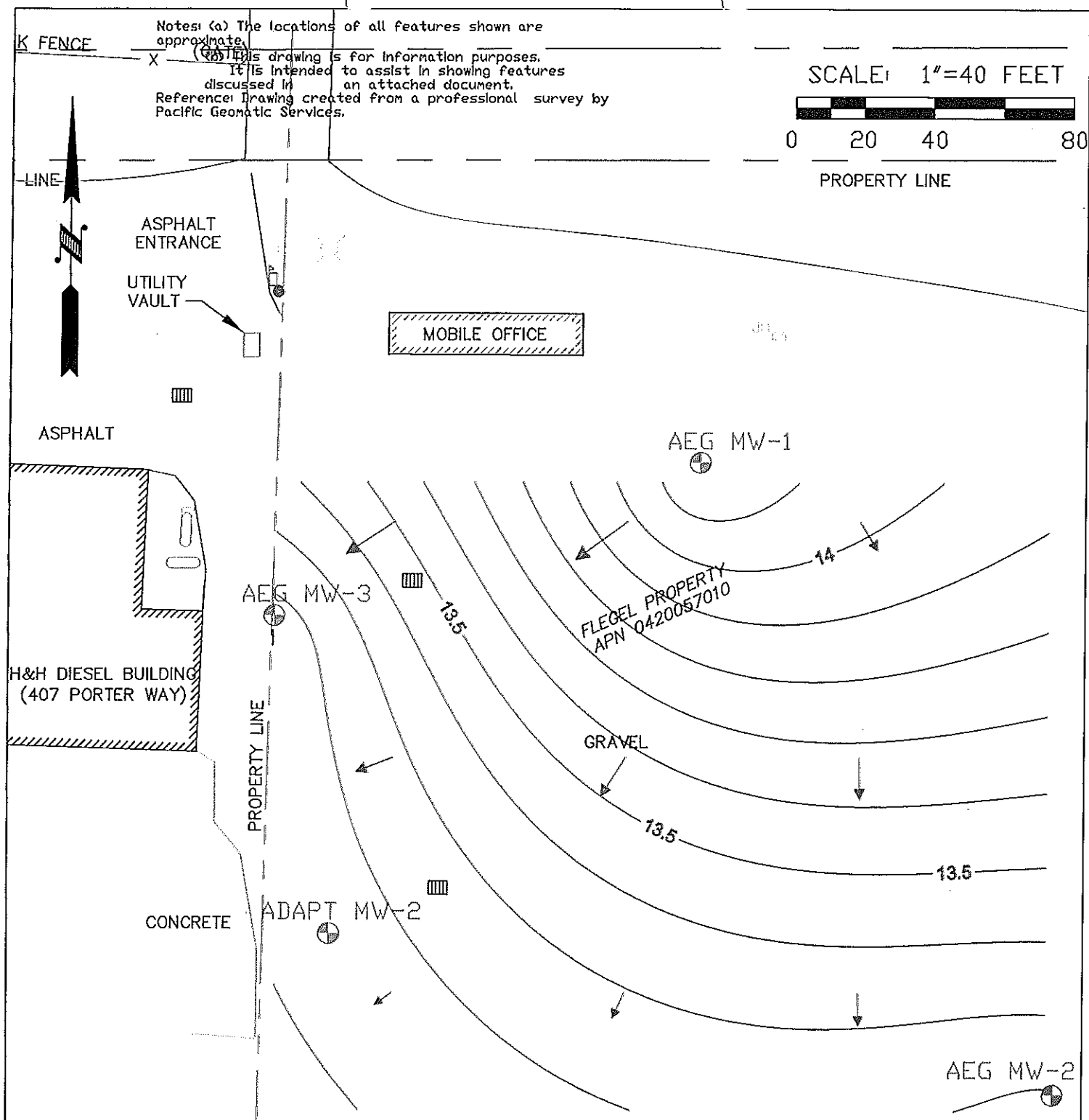
With respect to the petroleum hydrocarbons and volatile organic compounds contamination at the Site due to offsite migration of these constituents from the H&H facility, AEG recommends that Ecology, in cooperation with the Tacoma-Pierce County Health Department, conducts environmental audits and investigates the H&H facility. Enforcement action on the H&H facility should be considered by both agencies.

ENCLOSURES

Figure 1	<i>Groundwater Contour Map</i>
Table 1	<i>Summary of Quarterly Groundwater Analytical Results – TPH and Metals</i>
Table 2	<i>Summary of Quarterly Groundwater Analytical Results – Selected VOC</i>
Table 3	<i>Summary of Quarterly Groundwater Elevations</i>
Table 4	<i>Summary of Quarterly Groundwater Natural Attenuation Parameters</i>
Attachment A	<i>Groundwater Analytical Laboratory Results</i>

Limitations: We have prepared this report for use by Ms. Twila Flegel. This report may be made available to regulatory agencies and for review by other parties designated by a representative of Ms. Flegel. This report is not

intended for use by others and the information contained herein is not applicable to other sites. Within the limitations of scope, AEG has performed this groundwater sampling activity with accepted principles and practices in the field of environmental science and relevant governmental regulations at the time this report was prepared. No other warranty or conditions should be implied.



AEG MW-1

GROUNDWATER MONITORING WELL (AEG 2009)

ADAPT MW-2

GROUNDWATER MONITORING WELL (SALTBUSH 1999)

INFERRED GROUNDWATER FLOW DIRECTION

ASSOCIATED ENVIRONMENTAL GROUP, LLC
 1728 State Avenue NE, Suite 101
 Olympia, WA 98506
 (360) 352-9835 Fax (360) 352-8164

FIGURE 1
GROUNDWATER CONTOUR MAP

FLEGEL PROPERTY
 407A PORTER WAY
 MILTON, WA

Project# 07-200
 File: FLEGEL

Date: 9/11/09
 Sheet 1 OF 1

Table 1 Summary of Quarterly Groundwater Analytical Results - TPH & Metals
Flegel Property
Milton, WA

Sample Number ¹	Date Sampled	Gasoline TPH ² (ug/L)	Diesel Extended TPH ² (ug/L)			MTCA 5 Metals ⁴ (ug/L) - Total Metals					Dissolved Metals (ug/L)	
			Diesel	Heavy Oil	Mineral Oil	Mercury	Total Lead	Total Cadmium	Total Chromium ⁶	Total Arsenic	Lead	Arsenic
AEG MW1-W	5/28/09	<100	<200	<400	<400	<0.5	6.6	<1.0	<10	50.9	—	—
	9/11/09	156	<200	<400	<400	<0.5	<5	<1.0	<10	70	<5	60
AEG MW2-W	5/28/09	<100	<200	<400	<400	<0.5	40.7	<1.0	27.7	102	—	—
	9/11/09	<100	<200	<400	<400	<0.5	<5	<1.0	<10	203	<5	183
AEG MW3-W	5/28/09	<100	700	<400	<400	<0.5	<5	<1.0	7.8	20.4	—	—
	9/22/09	370	<200	1,470	<400	—	—	—	—	—	—	—
ADAPT MW2-W	5/28/09	<100	<200	<400	<400	<0.5	<5	<1.0	<10	<5	—	—
	9/11/09	205	<200	<400	<400	<0.5	<5	<1.0	<10	13	<5	12.3
PQL		100	200	400	400	0.5	5	1	10	5	5	5
Ecology MTCA Method A Clean Up Levels		800 ⁵	500	500	500	2	15	5	50	5	15	5

Notes:

- ¹ Approximate Sample locations are shown in figure 1
² Gasoline range total petroleum hydrocarbons (TPH). Analyzed by Northwest Method NWTPH-Gx.
³ Diesel extended range TPH. Analyzed by Northwest Method NWTPH-D/Dx
⁴ Analyzed by EPA Method 7000 Series
⁵ Cleanup level with presence of benzene
⁶ If detection exceeds groundwater cleanup level for total chromium, then the type of chromium needs to be differentiated.
ug/L= micrograms per liter
- = not analyzed for constituent
< = not detected above laboratory limits
* Ecology has not designated a cleanup level for this constituent
PQL = Practical Quantitation Limits
Bold indicates the detected concentration exceeds Ecology
MTCA Method A cleanup level

Table 2 Summary of Quarterly Groundwater Analytical Results - Selected VOC
Flegel Property
Milton, WA

Sample Number ¹	Date Sampled	Select Volatile Organic Compounds ² (ug/L)											
		Benzene	Toluene	Ethylbenzene	Total Xylenes	1,3,5 Trimethylbenzene	Isopropyltoluene	Dichloroethane (EDC)	1,2-Dibromoethane (EDB)	Naphthalenes	PCE	TCE	Vinyl Chloride
AEG MW1-W	5/28/09	<1	14.3	<1	<3	<1	<1	<1	<0.01	7.7	<1	<1	<0.20
	9/11/09	<1	136	<1	<1	-	-	-	-	-	-	-	-
AEG MW2-W	5/28/09	<1	<1	<1	<3	<1	<1	<1	<0.01	<5	<1	<1	<0.20
	9/11/09	<1	14.7	<1	<1	-	-	-	-	-	-	-	-
AEG MW3-W	5/28/09	1.50	11.1	6.5	54.5	37.4	10.8	<1	<0.01	89.2	<1	<1	<0.20
	9/22/09	<1	<2	2.6	15.3	-	-	-	-	-	-	-	-
ADAPT MW2-W	5/28/09	<1	<1	<1	<3	<1	<1	<1	<0.01	<5	<1	<1	<0.20
	9/11/09	<1	<1	<1	<1	-	-	-	-	-	-	-	-
PQL		1	1 or 2	1	3	1	1	1	0.01	5	1	1	0.2
Ecology MTCA Method A Clean Up Levels		5	1,000	700	1,000	*	*	5	0.01	160	5	5	0.2

Notes:

¹ Approximate Sample locations are shown in figure 3

² Select Volatile Organic Compounds. Analyzed by EPA Method 8260B.

ug/L = micrograms per liter

PCE = tetrachloroethylene

TCE = trichloroethylene

DCE = dichloroethylene

< = not detected above laboratory limits

- = not analyzed for constituent

* Ecology has not designated a cleanup level for this constituent

PQL = Practical Quantitation Limits

Bold indicates the detected concentration exceeds Ecology MTCA

Method A cleanup level.

**Table 3 Summary of Quarterly Groundwater Elevations
Flegel Property
Milton, WA**

Well Number/ TOC Elevation (feet)	Date of Measurement	DTW (feet)	DT LPH (feet)	LPH (feet)	GW Elevation (feet)	Change in GW Elevation (feet)
AEG MW-1 16.62	05/28/09	1.55	--	--	15.07	--
	09/11/09	2.44	--	--	14.18	-0.89
AEG MW-2 19.71	05/28/09	5.65	--	--	14.06	--
	09/11/09	6.54	--	--	13.17	-0.89
AEG MW-3 16.03	05/28/09	2.49	--	--	13.54	--
	09/11/09	3.44	2.76	0.68	13.13	-0.41
ADAPTMW-2 16.00	05/28/09	1.60	--	--	14.40	--
	09/11/09	2.86	--	--	13.14	-1.26

Notes:

TOC = Top of casing elevation relative to assigned benchmark.

DTW = Depth to water below top of casing.

DT LPH = Depth to liquid phase hydrocarbons (i.e., free product)

LPH = Liquid phase hydrocarbons thickness.

GW Elevation = Groundwater Elevation

-- = Not measured, not available, or not applicable

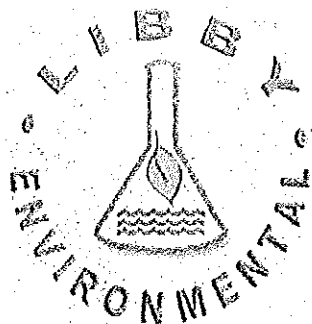
Table 4 Summary of Quarterly Groundwater Natural Attenuation Parameters
Flegel Property
Milton, WA

Well Number	Date Analyzed	pH	Conductivity (mS/cm)	TDS (NTU)	Dissolved Oxygen (mg/L)	Temp (°C)	Salinity (%)
AEGMW-1	5/27/09	6.76	0.80	0.00	0.19	13.49	0.40
	9/11/09	7.34	596.6	387.7	0.01	19.3	44.40
AEGMW-2	5/27/09	7.11	1.48	0.00	0.19	12.56	0.75
	9/11/09	8.77	963.2	622.9	0.01	16.5	19.99
AEGMW-3	5/27/09	7.04	1.62	0.00	0.22	13.69	0.82
	9/11/09	--	--	--	--	--	--
ADAPTMW-2	5/27/09	6.94	2.27	0.00	0.16	13.80	1.17
	9/11/09	8.49	1702	1108	--	20.0	8.90

Notes:

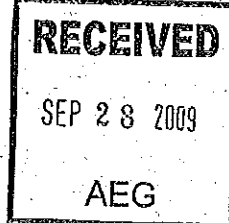
TDS=total dissolved solids

-- = Not measured, not available, or not applicable



Libby Environmental, Inc.

4139 Libby Road N.E., Olympia, WA 98506-2518



September 23, 2009

Yen Vy Van
Associated Environmental Group, Inc.
1728 State Avenue NE
Suite 101
Olympia, WA 98506

Dear Ms. Van:

Please find enclosed the analytical data report for the Flegel Property Project located in Milton, Washington. Water samples were received and analyzed for BTEX by EPA Method 8260B, Hydrocarbon Identification by NWTPH-HCID, Gasoline by NWTPH-Gx, Diesel & Oil by NWTPH-Dx/Dx Extended, Total and Dissolved Metals by EPA Method 7000 Series, and MTCA5 Metals on September 13 - 15, 2009.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt
President
Libby Environmental, Inc.

Phone (360) 352-2110 • Fax (360) 352-4154 • libbyenv@aol.com

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8260B IN WATER

Sample Description		Method Blank	AEG MW2-W	AEG MW1-W	ADAPT MW2-W	ADAPT MW2-W Dup
Date Sampled	Reporting	N/A	9/11/09	9/11/09	9/11/09	9/11/09
Date Analyzed	Limits	9/14/09	9/14/09	9/14/09	9/14/09	9/14/09
	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Benzene	1.0	nd	nd	nd	nd	nd
Toluene	1.0	nd	14.7	136	nd	nd
Ethylbenzene	1.0	nd	nd	nd	nd	nd
Total Xylenes	1.0	nd	nd	nd	nd	nd
Surrogate Recovery						
Dibromofluoromethane		105	106	109	107	107
1,2-Dichloroethane-d4		99.2	109	101	111	92.4
Toluene-d8		94.9	97.0	97.3	96.4	93.6
4-Bromofluorobenzene		99.3	96.9	107	103	100

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

* INSTRUMENT DETECTION LIMIT

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env. Project No. L090911-3

QA/QC Data - EPA 8260B Analyses

Sample Identification:							
	Matrix Spike			Matrix Spike Duplicate			RPD
	Spiked Conc. (ug/l)	Measured Conc. (ug/l)	Spike Recovery (%)	Spiked Conc. (ug/l)	Measured Conc. (ug/l)	Spike Recovery (%)	
Benzene	10	9.7	97	10	9.2	92	5.3
Toluene	10	10.1	101	10	9.8	98	3.0
Surrogate Recovery							
Dibromofluoromethane			104			109	
1,2-Dichloroethane-d4			104			107	
Toluene-d8			94.9			94.9	
4-Bromofluorobenzene			85.7			99.3	

Laboratory Control Sample			
	Spiked Conc. (ug/l)	Measured Conc. (ug/l)	Spike Recovery (%)
Benzene	10	8.9	89
Toluene	10	10.2	102
Surrogate Recovery			
Dibromofluoromethane			127
1,2-Dichloroethane-d4			123
Toluene-d8			114
4-Bromofluorobenzene			98.0

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%

ACCEPTABLE RPD IS 35%

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

Analyses of Gasoline (NWTPH-Gx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (ug/l)
Method Blank	9/14/09	94.9	nd
AEG MW2-W	9/14/09	97.0	nd
AEG MW1-W	9/14/09	97.3	156
ADAPT MW2-W	9/14/09	96.4	158
ADAPT MW2-W Dup	9/14/09	93.6	205
Practical Quantitation Limit			100

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (ug/l)	Mineral Oil (ug/l)	Oil (ug/l)
Method Blank	9/14/09	105	nd	nd	nd
AEG MW1-W	9/14/09	107	nd	nd	nd
AEG MW2-W	9/14/09	102	nd	nd	nd
ADAPT MW2-W	9/14/09	82	nd	nd	nd
Practical Quantitation Limit			200	400	400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius Shaw

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

Hydrocarbon Identification by NWTPH-HCID for Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (ug/l)	Diesel (ug/l)	Mineral Oil (ug/l)	Heavy Oil (ug/l)
Method Blank	9/14/09	107	nd	nd	nd	nd
MW3-W	9/14/09	int	D*	D	nd	D
Practical Quantitation Limit			200	500	500	500

"nd" Indicates not detected at listed detection limits.

"D" Indicates detected above the listed detection limit.

"int" Indicates that interference prevents determination.

* Product in Gasoline Range appears to be mineral spirits

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius Shaw

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

Analyses of Total Metals in Water by EPA Method 7000 Series

Sample Number	Date Analyzed	Lead (ug/l)	Cadmium (ug/l)	Chromium (ug/l)	Arsenic (ug/l)
Method Blank	9/13/09	nd	nd	nd	nd
AEG MW1-W	9/13/09	nd	nd	nd	70
AEG MW1-W Dup	9/13/09	nd	nd	nd	70
AEG MW2-W	9/13/09	nd	nd	nd	203
ADAPT MW2-W	9/13/09	nd	nd	nd	13
Practical Quantitation Limit		5.0	1.0	10.0	5.0

"nd" Indicates not detected at the listed detection limits.

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

QA/QC for Metals in Water by EPA Method 7000 Series

Sample Number	Date Analyzed	Lead (% Recovery)	Cadmium (% Recovery)	Chromium (% Recovery)	Arsenic (% Recovery)
LCS	9/13/09	115%	94%	49%	113%
AEG MW1-W MS	9/13/09	108%	92%	124%	129%
AEG MW1-W MSD	9/13/09	99%	90%	118%	124%
RPD	9/13/09	9	2.2	5.0	4.0
Practical Quantitation Limit		5.0	1.0	10.0	5.0

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%

ACCEPTABLE RPD IS 35%

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

Analyses of Mercury in Water by EPA Method 7471

Sample Number	Date Analyzed	Mercury (ug/l)
Method Blank	9/15/09	nd
AEG MW2-W	9/15/09	nd
AEG MW1-W	9/15/09	nd
ADAPT MW2-W	9/15/09	nd
ADAPT MW2-W Dup	9/15/09	nd
Practical Quantitation Limit		0.5

"nd" Indicates not detected at the listed detection limits.

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

QA/QC for Mercury by EPA Method 7471

Sample Number	Date Analyzed	Mercury Percent Recovery
LCS	9/15/09	99%
ADAPT MW2-W MS	9/15/09	108%
ADAPT MW2-W MSD	9/15/09	108%
RPD	9/15/09	0.0
Practical Quantitation Limit		0.5

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%

ACCEPTABLE RPD IS 35%

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

Analyses of Dissolved Metals in Water by EPA Method 7000 Series

Sample Number	Date Analyzed	Lead (ug/l)	Arsenic (ug/l)
Method Blank	9/13/09	nd	nd
AEG MW1-W	9/13/09	nd	60
AEG MW2-W	9/13/09	nd	183
ADAPT MW2-W	9/13/09	nd	12.3
Practical Quantitation Limit		5.0	5.0

"nd" Indicates not detected at the listed detection limits.

ANALYSES PERFORMED BY: Sherry Chilcutt

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Env.Project No.L090911-3

QA/QC for Metals in Water by EPA Method 7000 Series

Sample Number	Date Analyzed	Lead (% Recovery)	Arsenic (% Recovery)
LCS	9/13/09	115%	113%
AEG MW1-W MS	9/13/09	108%	129%
AEG MW1-W MSD	9/13/09	99%	124%
RPD	9/13/09	9	4.0
Practical Quantitation Limit		5.0	5.0

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%

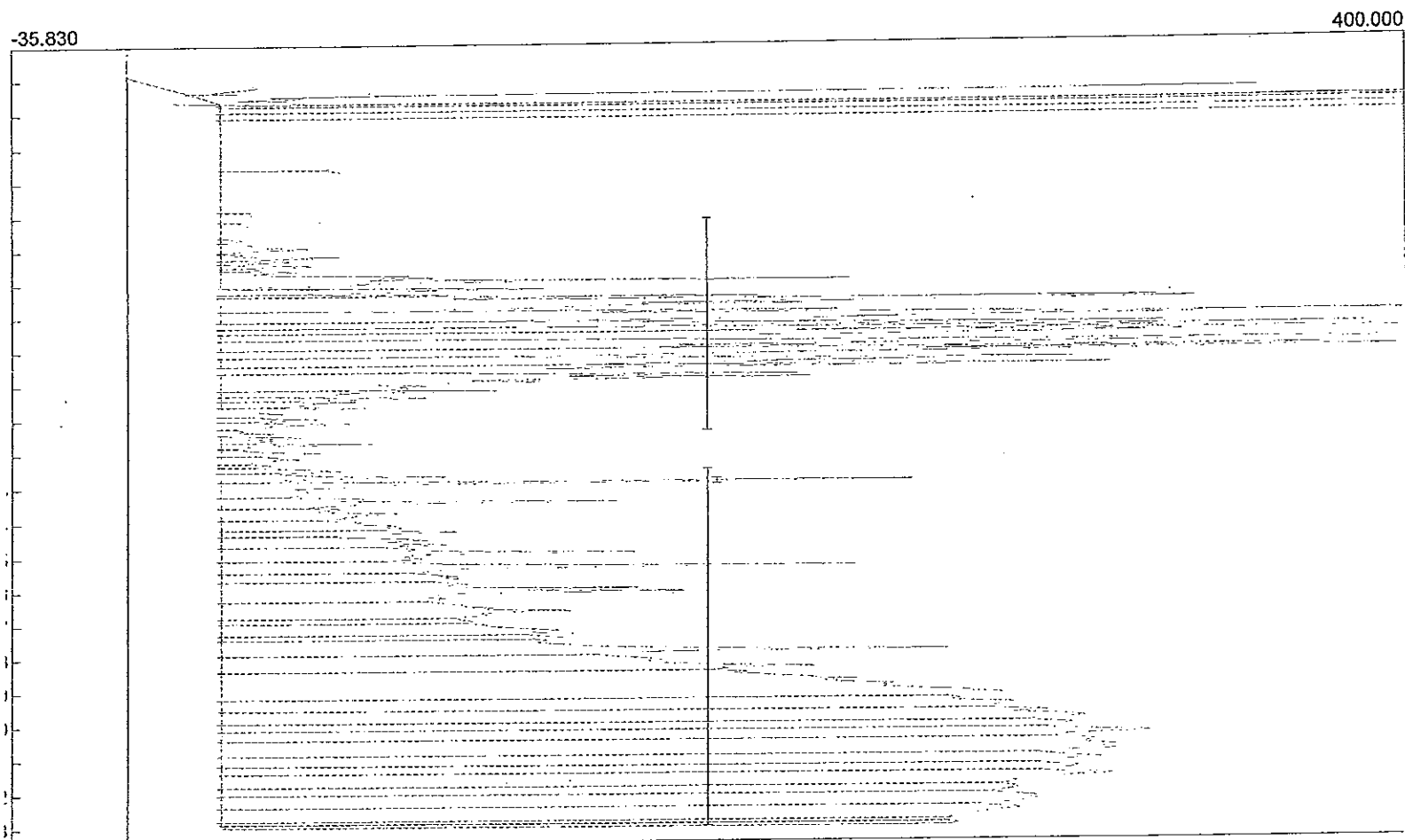
ACCEPTABLE RPD IS 35%

ANALYSES PERFORMED BY: Sherry Chilcutt

Lab name: Libby Environmental Inc.
Analysis date: 09/14/2009 13:23:18
Description: CH1 SAM
Column: RESTEK 35M XT1-5
Data file: A2593.CHR ()
Sample: MW3-W
Operator: Athan

Temperature program:

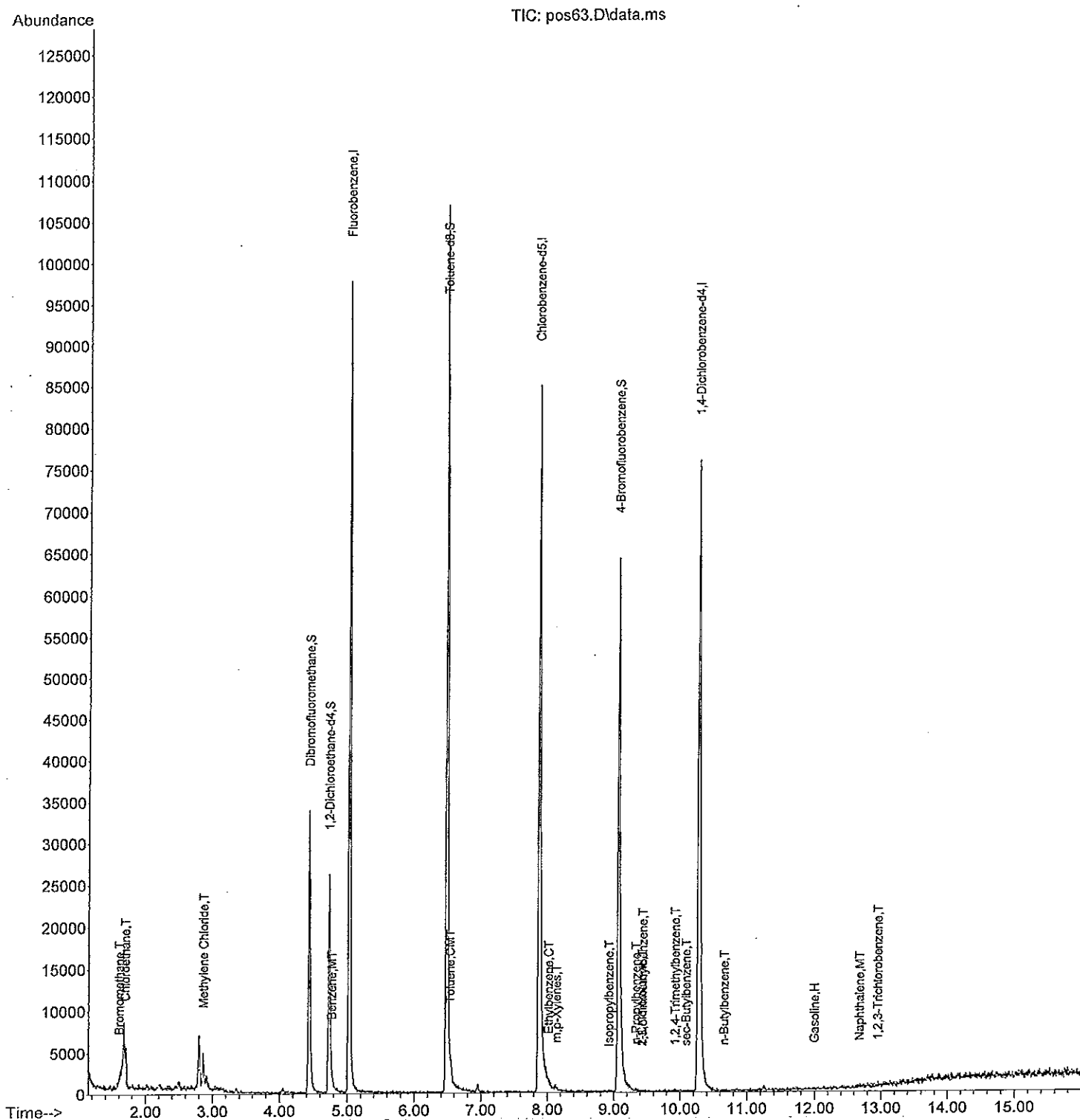
Init temp Hold Ramp Final temp



Component	Retention	Area	Height	External	Units
Diesel	5.233	34642.9880	8.509	1037.1085	ppm
mineral oil	12.683	95144.3315	72.835	2046.4931	ppm
2FBP	12.833	1253.1940	234.212	50.1278	ppm
		131040.5135		3133.7294	

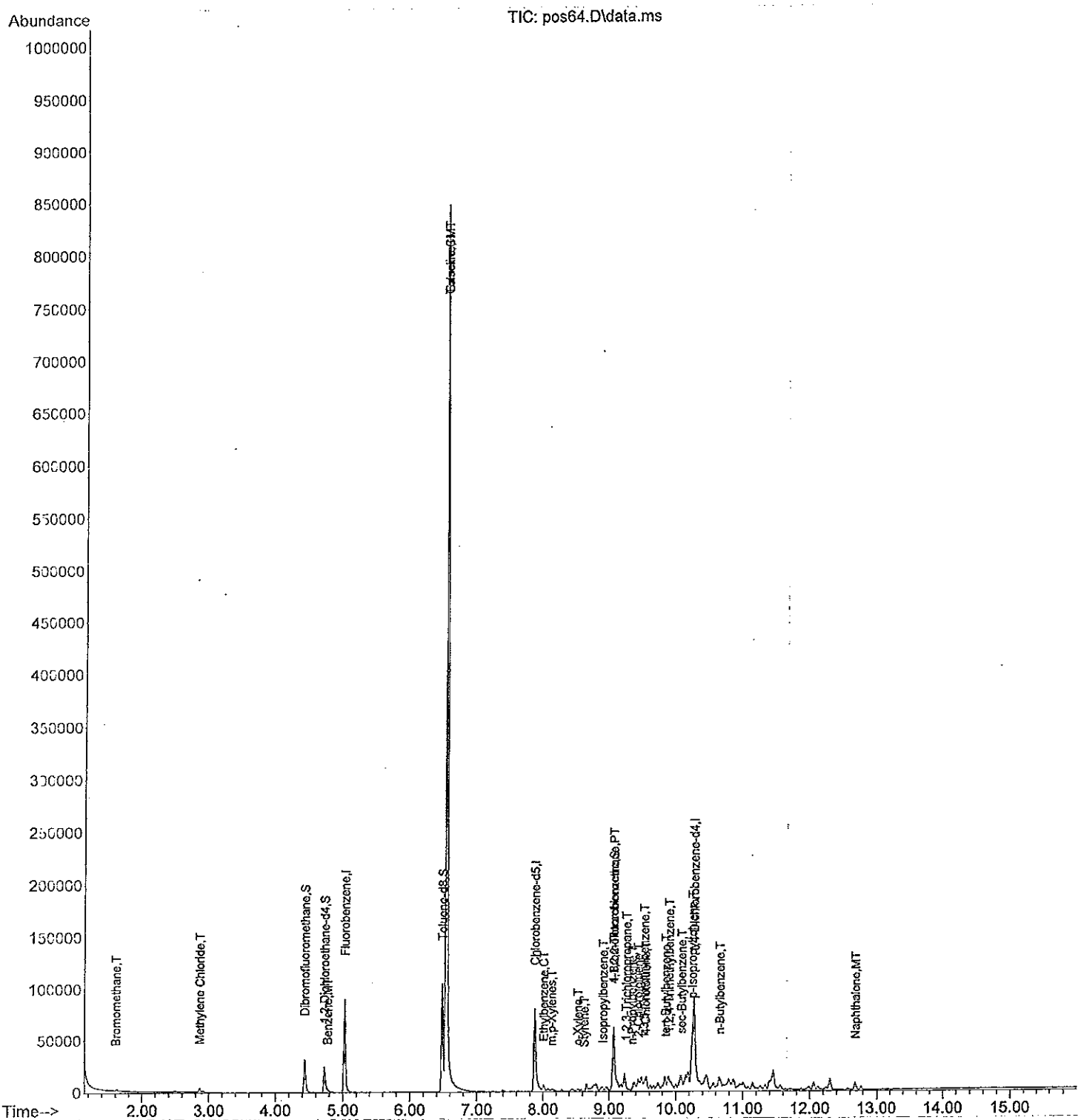
Data Path : D:\MSDCHEM\1\DATA\X0914\
Data File : pos63.D
Acq On : 14 Sep 2009 12:24 pm
Operator :
Sample : M BLANK
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 14 13:34:50 2009
Quant Method : D:\MSDCHEM\1\METHODS\VOA90806.M
Quant Title : 8260
QLast Update : Thu Aug 27 12:22:43 2009
Response via : Initial Calibration



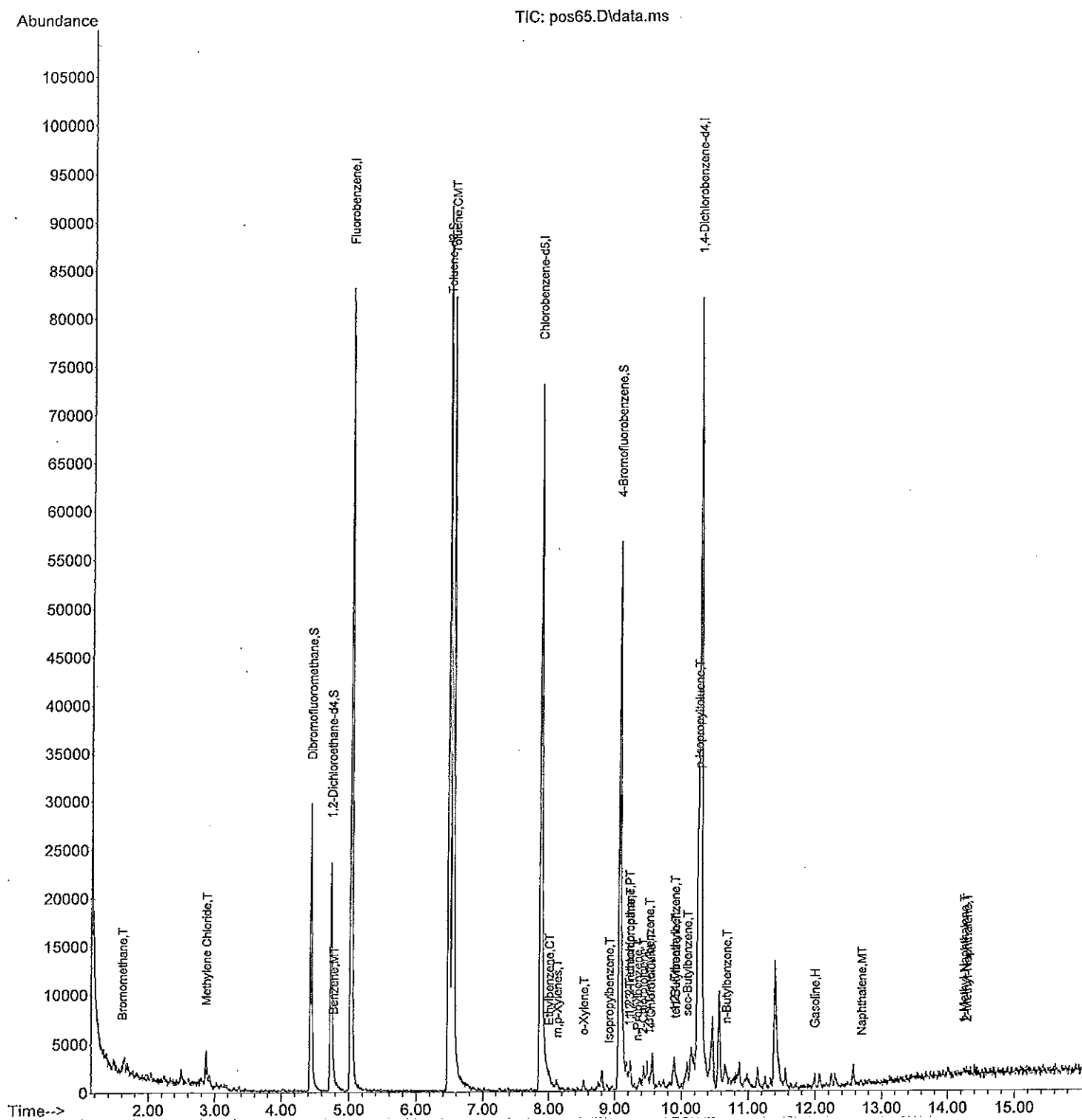
Data Path : D:\MSDCHEM\1\DATA\X0914\
Data File : pos64.D
Acq On : 14 Sep 2009 12:48 pm
Operator :
Sample : FLEGEL MW1-W
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 15 13:56:25 2009
Quant Method : D:\MSDCHEM\1\METHODS\VOA90806.M
Quant Title : 8260
QLast Update : Thu Aug 27 12:22:43 2009
Response via : Initial Calibration



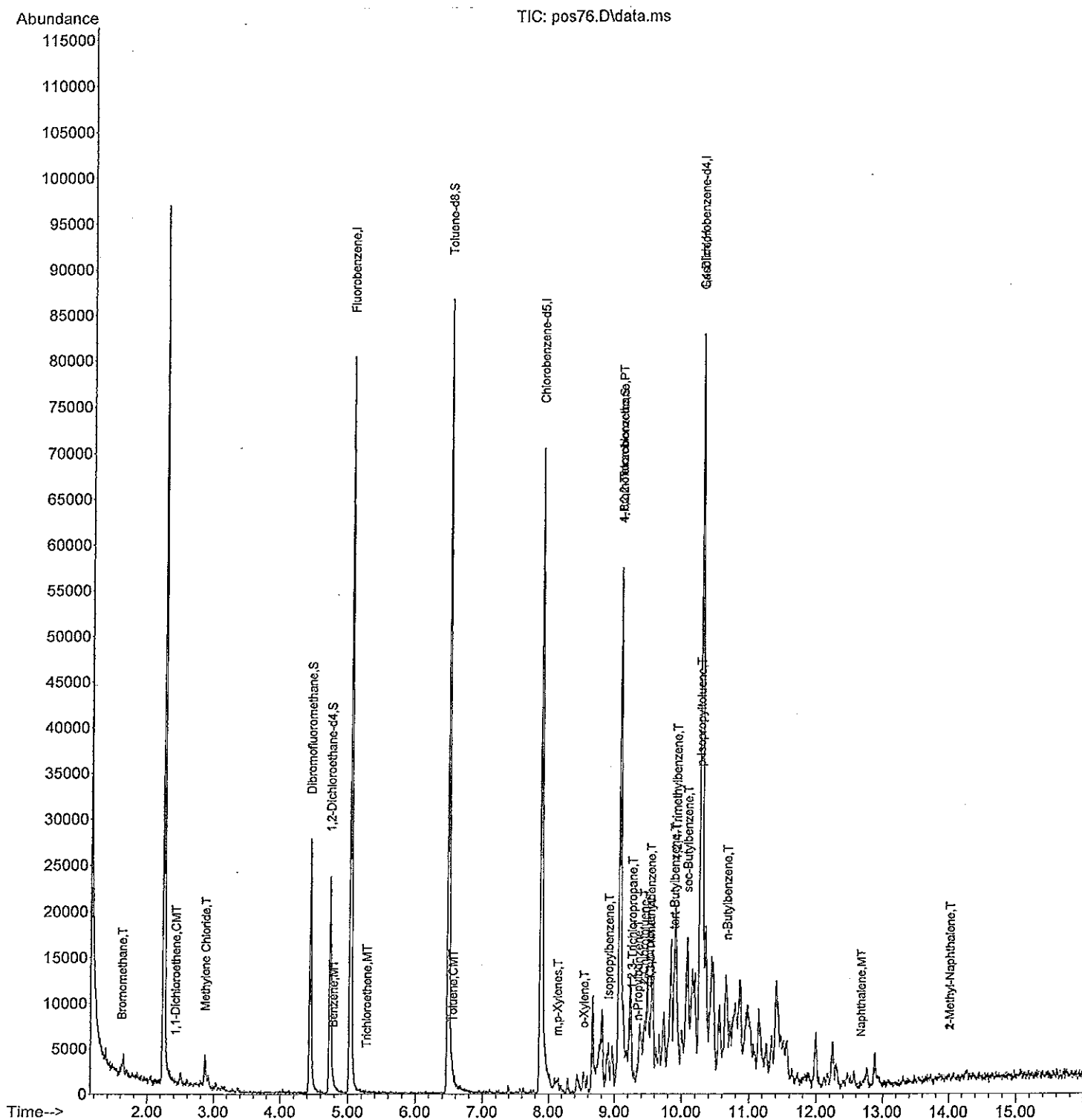
Data Path : D:\MSDCHEM\1\DATA\X0914\
Data File : pos65.D
Acq On : 14 Sep 2009 1:13 pm
Operator :
Sample : FLEGEL MW2-W
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 14 13:36:30 2009
Quant Method : D:\MSDCHEM\1\METHODS\VOA90806.M
Quant Title : 8260
QLast Update : Thu Aug 27 12:22:43 2009
Response via : Initial Calibration



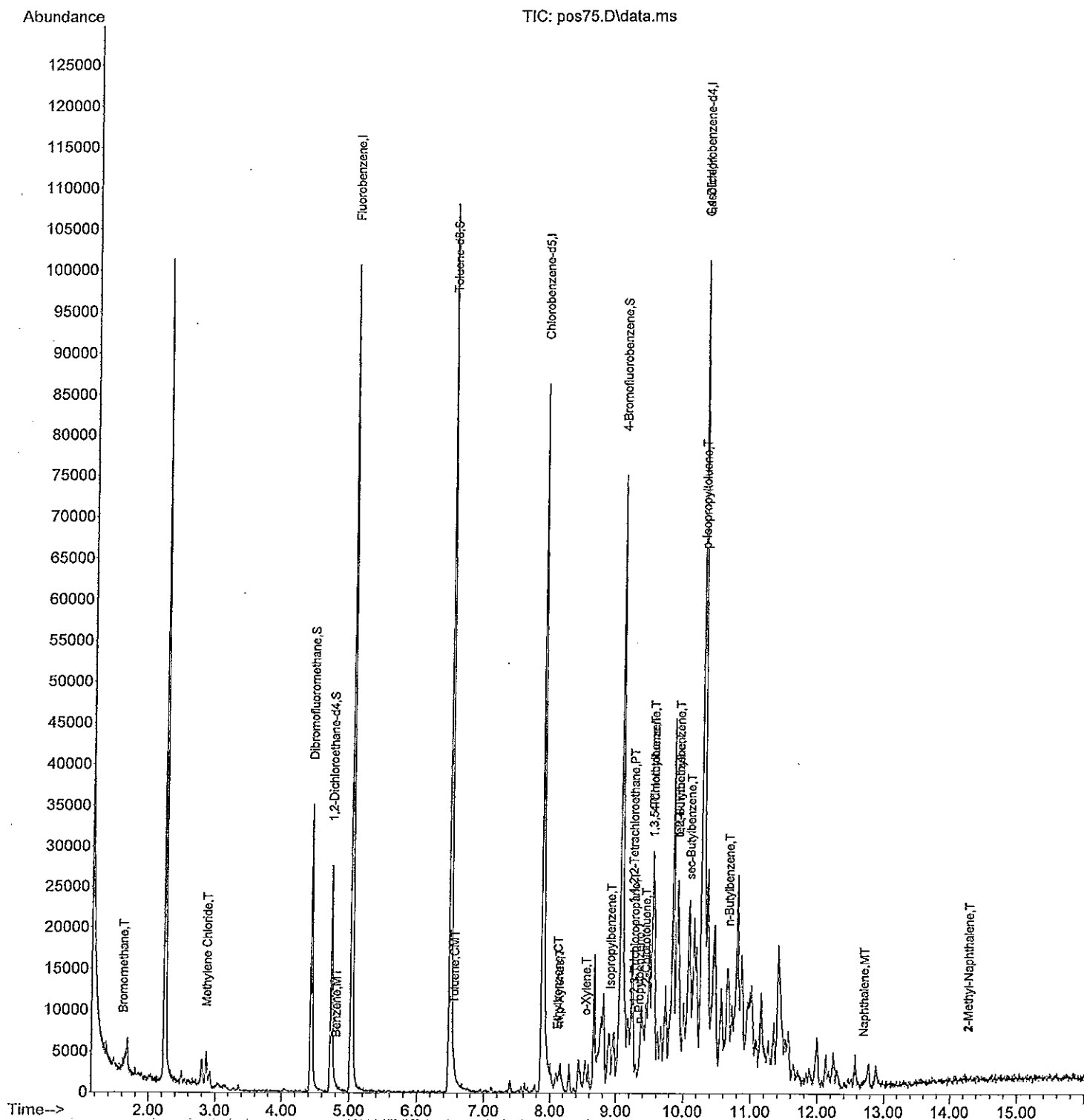
Data Path : D:\MSDCHEM\1\DATA\X0914\
Data File : pos76.D
Acq On : 14 Sep 2009 2:02 pm
Operator :
Sample : FLEGEL ADAPT MW-2 DUP
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 14 14:33:57 2009
Quant Method : D:\MSDCHEM\1\METHODS\VOA90806.M
Quant Title : 8260
QLast Update : Thu Aug 27 12:22:43 2009
Response via : Initial Calibration



Data Path : D:\MSDCHEM\1\DATA\X0914\
Data File : pos75.D
Acq On : 14 Sep 2009 1:37 pm
Operator :
Sample : FLEGEL ADAPT MW-2
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Sep 14 14:33:25 2009
Quant Method : D:\MSDCHEM\1\METHODS\VOA90806.M
Quant Title : 8260
QLast Update : Thu Aug 27 12:22:43 2009
Response via : Initial Calibration



Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 9/11/09 Page: 1 of 1

Client: 420

Project Manager: Y. VIAN

Address: 1728 State Ave NE, Olympia

Project Name: #10901

Phone: 360.352.9835 Fax: 360.352.8164

Location: Milton WA

Client Project # 07-100

Collector: K. ROSSUND

Date of Collection: 9/11/09

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	SEM VOL 8270	NWTPH-HClD	NWTPH-GX	NWTPH-DX	PAH 8270	PCBS 8082	MTCAS Metals	Field Note # Containers
1 MW1-W	11A	1024	H ₂ O		X			X	X	X	X	X	X	USA, Amber, 10L
2 MW2-W	"	1249	"		X			X	X	X	X	X	X	"
3 ADAPTAIN 2-W	1	0921	"		X			X	X	X	X	X	X	"
4 MW3-W	"	1349	"		X			X	X	X	X	X	X	UDA
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														

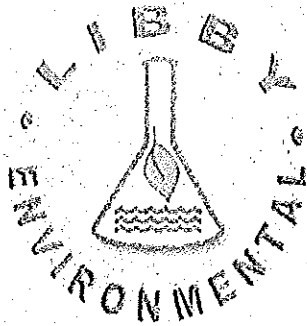
Relinquished by: [Signature] Date / Time: 9/11/09 1335 Received by: [Signature] Date / Time: 9/11/09 1:35PM

Relinquished by: [Signature] Date / Time: 9/11/09 1335 Received by: [Signature] Date / Time: 9/11/09 1:35PM

Relinquished by: [Signature] Date / Time: 9/11/09 1335 Received by: [Signature] Date / Time: 9/11/09 1:35PM

Remarks: Need Chromatograms for this set of data (see Kyle STO)

TAT 24HR 48HR 5-Day



Libby Environmental, Inc.

4139 Libby Road N.E., Olympia, WA 98506-2518

September 30, 2009

Yen Vy Van
Associated Environmental Group, Inc.
1728 State Avenue NE
Suite 101
Olympia, WA 98506

Dear Ms. Van:

Please find enclosed the analytical data report for the Flegel Property Project located in Milton, Washington. A water sample was received and analyzed for BTEX by EPA Method 8260B, Gasoline by NWTPH-Gx, and Diesel & Oil by NWTPH-Dx/Dx Extended on September 23 & 28, 2009.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt
President
Libby Environmental, Inc.

Phone (360) 352-2110 • Fax (360) 352-4154 • libbyenv@aol.com

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Project No.L090923-1

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (ug/l)	Mineral Oil (ug/l)	Oil (ug/l)
Method Blank	9/28/09	94	nd	nd	nd
MW3-W	9/28/09	104	nd	nd	1470
Practical Quantitation Limit			200	400	400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius Shaw

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

FLEGEL PROPERTY PROJECT

Milton, Washington

AEG

Client Project #07-200

Libby Project No.L090923-

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8260B) in Water

Sample Number	Date Analyzed	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	Gasoline (ug/l)	Surrogate Recovery (%)
Method Blank	9/23/09	nd	nd	nd	nd	nd	93.7
LCS	9/23/09	72%	74%				97.0
MW3-W	9/23/09	nd	nd	2.6	15.3	370	94.1
MS	9/23/09	76%	84%				97.6
MSD	9/23/09	80%	86%				93.4
Practical Quantitation Lin		1	2	1	3	100	

"nd" Indicates not detected at the listed detection limits.

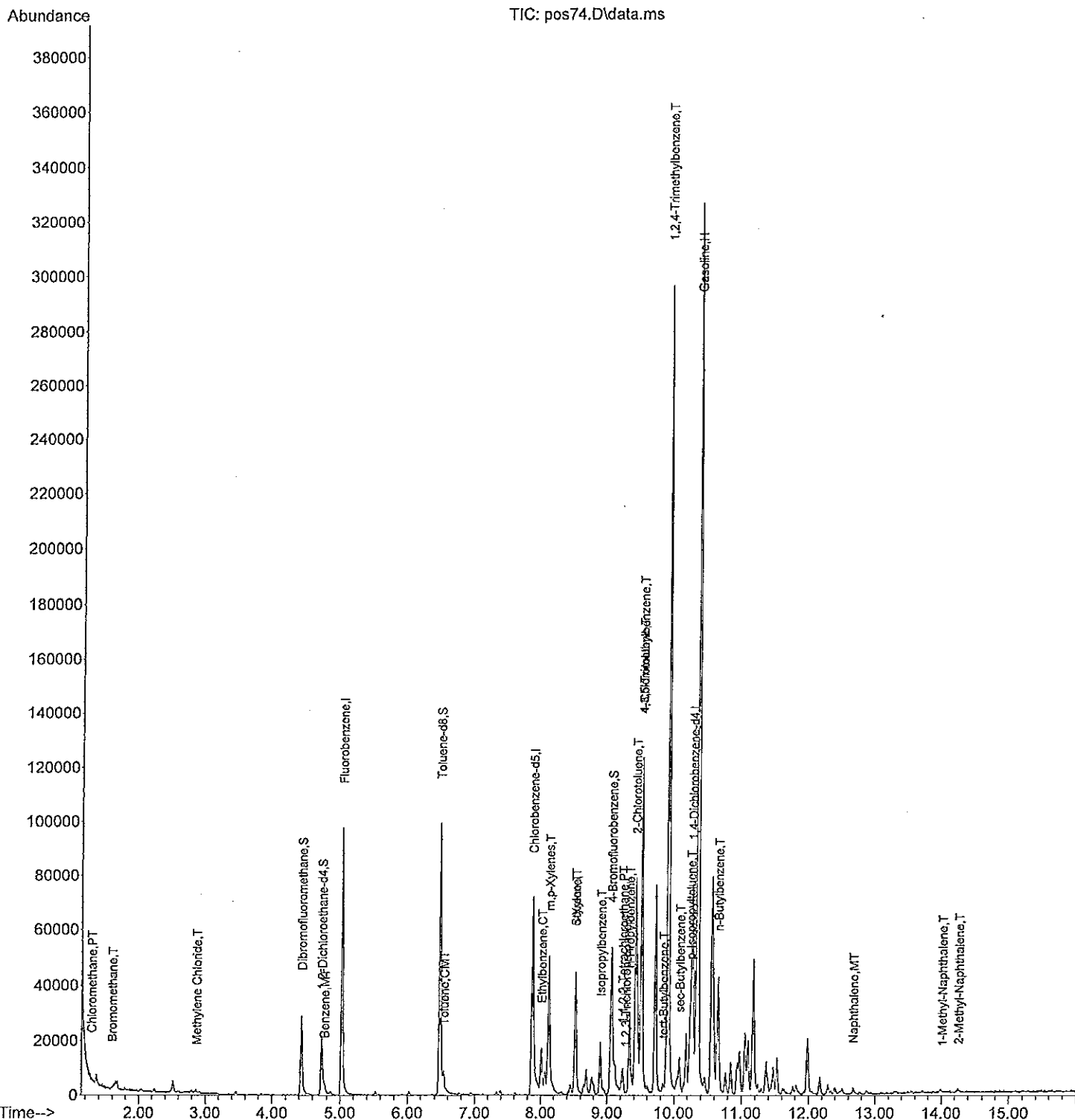
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

Data Path : D:\MSDCHEM\1\DATA\40922\
Data File : pos74.D
Acq On : 23 Sep 2009 6:41 pm
Operator :
Sample : FLEGEL NW3-W
Misc :
ALS Vial : 15 Sample Multiplier: 1

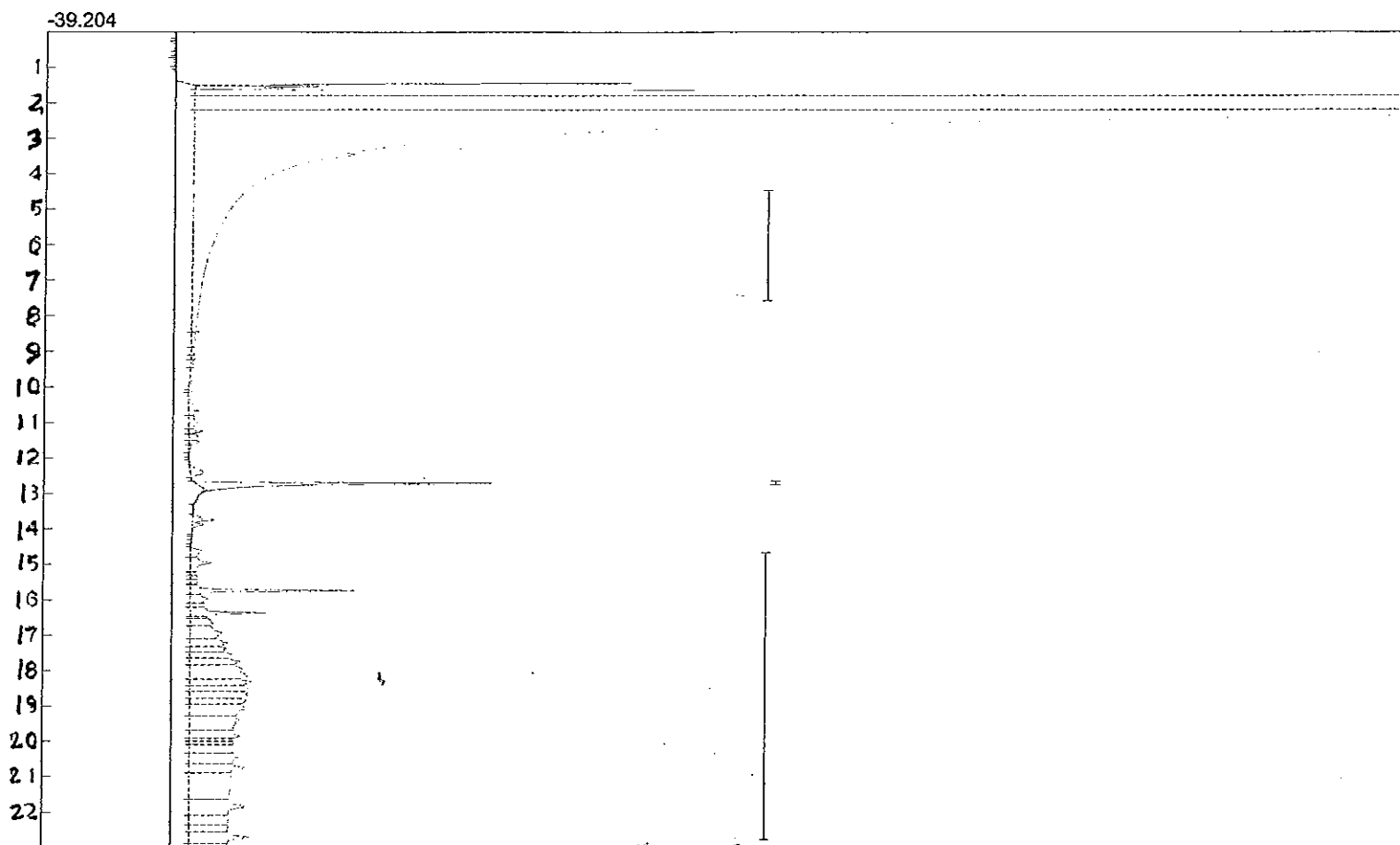
Quant Time: Sep 23 19:08:54 2009
Quant Method : D:\MSDCHEM\1\METHODS\VOA90806.M
Quant Title : 8260
QLast Update : Thu Aug 27 12:22:43 2009
Response via : Initial Calibration



Analysis date: 09/28/2009 15:30:43
 Description: CH2 SAM
 Column: 15METER MXT-1
 Data file: C:\Peak329\B2562.CHR ()
 Sample: MW3-W
 Operator: Athan

Pressure program:

Init temp Hold Ramp Final temp



Component	Retention	Area	Height	External	Units
2FBP	12.716	415.0540	90.233	20.7527	ppm
Mineral Oil	14.950	5540.9805	6.146	140.0780	
		5956.0345		160.8307	

104.0780
 140.0780

140
 - 96

 44
 30 x 1000 = 1467

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Client: AEI

Address: 1728 State Ave NE, Olympia, WA
Phone: 360.352.9835 Fax: 360.352.8164

Client Project # 07-1800

Chain of Custody Record

Date: 9/23/09 Page: 1 of 1

Project Manager: Y. UAN

Project Name: Flood

Location: Milton, WA

Collector: L. R. SUND Date of Collection: 9/22/09

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B BTEX ONLY	VOA 8021B	SEMI VOL 8270	NWTPH-GX	NWTPH-DX	NWTPH-DX EXL	PAH 8270	PCBS 8082	MTCA 5 Meals	Field Note/# Containers
1 <u>M133-W</u>	<u>11H</u>	<u>1616</u>	<u>H2O</u>	<u>VOA</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>						<u>3 VOA</u>
2														
3														
4														
5														
6														
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10														
11														
12														
13														
14														
15														
16														
17														
18														

Relinquished by: [Signature] Date / Time: 9/23/09 1030

Received by: [Signature] Date / Time: 9/23/09 1030am

Relinquished by: [Signature] Date / Time: 9/23/09 1030

Received by: [Signature] Date / Time: 9/23/09 1030

Remarks: STD

Good Condition? ☐ Cold? ☐ Seals Intact? ☐

Sample Receipt: 570

Total Number of Containers: 3 TAT 24HR 48HR 5-Day 570