1044b UIC - EAST POPLAR OIL FIELD ENFORCEMENT CASE

SDWA 1431

East Poplar Oil Field

Region 8

13572

1044b UIC - EAST POPLAR OIL FIELD ENFORCEMENT CASE
SDWA 1431
Folder ID: 13572 2004 Privileged

East Poplar Oil Field
Enforcement Case
Safe Drinking Water Act §1431
Officer: Nathan Wiser

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721-0355

Region 8
13572

December 2, 2004

RECEIVED
DEC - 6 2004
ECEJ-TEP

Nathan Wiser
EPA Region 8
999 18th Street, Suite 300
Denver, CO 80202-2456

RE: PUBLIC WATER SUPPLY WELL THREAT STUDY
EAST POPLAR OIL FIELD – ANNUAL MONITORING REPORT, DECEMBER 2004

Mr. Wiser,

Enclosed you will find the *Annual Monitoring Report, December 2004* technical report for the East Poplar Oil Field. Pursuant to US Environmental Protection Agency Region 8 Emergency Administrative Order on Consent (AOC) Document No. SDWA-08-2004-0035 this report summarizes the annual sampling event under AOC Requirements B and C. The tasks completed for the annual sampling event include the following:

Please feel free to contact me at (406) 721-0354 or jane.madison@landandwater.net with any questions or comments.

Sincerely,

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

Enclosure: PWS Well Threat Study – Annual Monitoring Report, December 2004.

Copy: Sid Campbell, Murphy Exploration and Production Co.
Scott M. DuBoff, Wright & Talisman, P.C.
Wilbur Dover, Pioneer Natural Resources USA Inc.
Marc Skeen, Pioneer Natural Resources USA Inc.
Mark Dalton, Samson Hydrocarbons Company
Elizabeth E. Mack, Locke Liddell & Sapp

2004 WATER QUALITY REPORT

EAST POPLAR OILFIELD STUDY AREA

Prepared for:

SID CAMPBELL
MURPHY EXPLORATION AND PRODUCTION CO.
P.O. Box 61780
New Orleans, LA 70161-1780

WILBUR DOVER
PIONEER NATURAL RESOURCES USA INC.
1400 Williams Square West
5202 North O'Connor Blvd.
Irving, TX 75039-3746

MARK DALTON
SAMSON HYDROCARBONS COMPANY
Two West 2nd Street
Samson Plaza
Tulsa, OK 74103-3103

Prepared by:

LAND & WATER CONSULTING, INC.
P. O. Box 8254
Missoula, MT 59807

December 2, 2004

Project # 110396

LAND & WATER CONSULTING, INC.
1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721-0355

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Scope of Work 2

2.0 BACKGROUND 3

3.0 METHODS 3
3.1 Groundwater Data Collection 3
3.1.1 Groundwater Elevations 3
3.1.2 Groundwater Quality 4
3.2 Monitoring Well Installation 4

4.0 DATA EVALUATION 5
4.1 Groundwater Elevations and Flow Direction 5
4.2 Groundwater Quality 5
4.2.1 Monitoring Well Network 5
4.2.2 Domestic Water Supply Wells 6

5.0 SUMMARY 7

6.0 REFERENCES 7

FIGURES

Figure 1 – *Site Map*
Figure 2 – *November 2004 Groundwater Elevations and Contours*
Figure 3 – *Extent of Impacted Groundwater*

TABLES

Table 1-1 - *Wells Referenced in This Report*
Table 3-1 - *PWS Well Threat Study Analyte List*
Table 3-2 - *New Well Construction Summary*
Table 4-1 - *Water Quality Impact Summary*

APPENDICES

Appendix A - *Groundwater Elevation and Water Quality Data*
Appendix B – *Borehole Logs*
Appendix C - *Correspondence to Well Owners*

1.0 INTRODUCTION

This Annual Groundwater Monitoring 2004 Report for the East Poplar Oil Field was completed in fulfillment of requirements specified in US Environmental Protection Agency Region 8 Administrative Order Document No. SDWA-08-2004-0035, which replaced two earlier Emergency Administrative Orders (docket numbers SDWA-8-99-68 and SDWA-08-2001-33). This report presents the results of water samples collected during the October 2004 annual monitoring event and the installation of two additional monitoring wells. Land & Water Consulting, Inc. was retained by Murphy Exploration and Production Company (Murphy), Pioneer Natural Resources USA, Inc. (Pioneer), and Samson Hydrocarbons Company (collectively referred to as "The Companies") to collect the data and prepare this report.

The monitoring wells sampled during the annual monitoring event lie in a study area defined by Administrative Order SDWA-08-2001-33 as a rectangular area delineated in the north by Sections 30 and 27 in Township 28 North, Range 51 East; and in the south by Sections 6 and 3 in Township 27 North, Range 51 East; on the Fort Peck Indian Reservation in Roosevelt County, Montana (**Figure 1**). The City of Poplar lies adjacent to the southwest corner of the study area. This definition of the study area does not include the northern portion of the oil field. Five domestic wells north and west of the study area were sampled during the annual monitoring event.

Drinking water in the area is derived primarily from shallow Quaternary sediments. Water quality in portions of these sediments has been degraded by various dissolved solids, mainly chloride, and to a very limited areal extent by petroleum hydrocarbons. The water quality degradation has been attributed to brine generated as a by product of oil production. The brine has impacted the drinking water aquifer and impaired the use of several domestic wells in the East Poplar Oilfield area.

Previous work by Land & Water has included the delineation of the leading edge of the saline groundwater plume, estimated direction and rate of migration of the plume edge, and determined whether impacted groundwater could migrate toward the City of Poplar's public water supply wells (Land & Water 2003). Subsequent years of the study are dedicated to the monitoring of the saline groundwater plume and the reevaluation of migration routes and rate. This report evaluates the third year of the study, the second year of annual monitoring.

1.1 Scope of Work

This report includes the following:

1. Annual water level measurement in eleven monitoring wells.
2. Annual groundwater quality sampling of eleven monitoring wells.
3. Annual groundwater quality sampling of five domestic wells.
4. Installation of monitoring wells LAWM08 and LAWM09.
5. Completion of this report.

A summary of the wells referenced in this report is included as **Table 1-1**. For each well the number of data points and date range for the water level and water quality data are listed, along with the well depth if known. All monitoring network wells are located on **Figure 1** along with other Pioneer and domestic wells mentioned in this report.

The groundwater samples were collected on October 12 and 13, 2004. Pioneer collected water level and water quality data in wells PNR27, PNR28 and PNR29 on September 14 and 15, 2004. Monitoring well LAWM08 was drilled on November 12, 2004 and sampled on November 13, 2004. Laboratory results for LAWM08 were not available as of this report. Monitoring well LAWM09 was drilled on November 13, 2004 but was not sampled due to pump failure. Sampling of LAWM09 occurred on November 30, 2004. Water quality data for wells LAWM08 and LAWM09 will be submitted as an addendum to this report in December 2004. Historic data collected during this and previous investigations are shown in **Appendix A.**

Table 1-1 ***Wells Referenced in This Report***

Well	Total Depth (ft bgs)	Water Level Measurements			Water Quality Sampling		
		Pts	Start	End	Pts	Start	End
Monitoring Network Wells							
LAWM01	61	9	Sep 02	Oct 04	7	Sep 02	Oct 04
LAWM03	65	7	Dec 02	Oct 04	6	Nov 02	Oct 04
LAWM04	69	7	Dec 02	Oct 04	6	Nov 02	Oct 04
LAWM05	135	7	Dec 02	Oct 04	6	Nov 02	Oct 04
LAWM06	133	7	Dec 02	Oct 04	6	Nov 02	Oct 04
LAWM07	49	7	Dec 02	Oct 04	6	Dec 02	Oct 04
LAWM08	100	1	Nov 04	Nov 04	0	NA	NA
LAWM09	146	1	Nov 04	Nov 04	0	NA	NA
PNR27	66	13	Apr 02	Sep 04	12	Aug 01	Sep 04
PNR28	62	11	May 02	Sep 04	12	Aug 01	Sep 04
PNR29	54	11	May 02	Nov 03	12	Aug 01	Sep 04
Domestic Wells from Table 4 AOC SDWA-08-2004-0035							
(b) (6) [redacted]	NA	NA	NA	NA	1	Oct 04	Oct 04
	NA	NA	NA	NA	1	Oct 04	Oct 04
	NA	NA	NA	NA	1	Oct 04	Oct 04
	NA	NA	NA	NA	1	Oct 04	Oct 04
	NA	NA	NA	NA	1	Oct 04	Oct 04

2.0 BACKGROUND

A description of the study area was presented in the *Public Water Supply Well Threat Study* report (Land & Water, 2003). Included was a brief summary of the geology and hydrogeology, followed by a summary of previous investigations. Greater detail regarding the study area can be found in that report and the references cited.

3.0 METHODS

Field work was designed to monitor the nature and extent of saline groundwater in the study area, and to provide data for delineation of the leading edge of the saline groundwater plume. In addition, two guardian monitoring wells were installed in the study area. This section presents a discussion of the field tasks completed during 2004.

3.1 Groundwater Data Collection

The task completed in 2004 was dedicated to collecting annual groundwater data comprised of groundwater elevations, water quality sampling for the monitoring wells and water quality sampling for the domestic wells, and the installation of two additional monitoring wells. A monitoring network was established to monitor changes and migration of the saline groundwater plume. The network consists of eleven monitoring wells, three of which were installed and are monitored by HKM Engineering for Pioneer **(Figure 1)**. The sampling network is designed to monitor water quality along possible flow directions of the saline groundwater plume. Monitoring wells are located west and south of the chloride plume in sections 27 and 28.

3.1.1 Groundwater Elevations

Groundwater elevations were measured in eleven monitoring wells. Groundwater elevations were measured to the top of the well casing (TOC) using electric static water level tapes. TOC elevations were surveyed to mean sea level. The groundwater elevation data collected in October 2004, from wells LAWM01, LAWM03, LAWM04, LAWM05, LAWM06 and LAWM07 were used to create a groundwater potentiometric map, and to determine the groundwater flow direction and gradient. Groundwater elevations from the Pioneer wells and the two new monitoring wells (LAWM08 and LAWM09) were not used to create the potentiometric map as they were measured in September 2004 and November 2004, respectively.

3.1.2 Groundwater Quality

Monitoring wells were sampled in accordance with EPA guidelines. Methods included purging three well-bore volumes from the well and constant measurement of temperature, pH and conductivity to insure the collection of representative aquifer samples. A blind duplicate of LAWM05 was collected and labeled LAWM02. All domestic samples were collected at the point closest to the well. The domestic wells were purged until temperature, pH and conductivity stabilized to insure the collection of representative aquifer samples. Samples were sent to Energy Laboratories in Billings, Montana. The PNR wells were sampled by HKM Engineering, Inc. and results have been shared with Land & Water Consulting, Inc. **Table 3-1** lists the parameters, and the detection limits that are analyzed as required by administrative order.

Table 3-1 ***PWS Well Threat Study Analyte List (As Required in EPA Order SDWA-08-2004-0035)***

Analyte Parameter	Method Detection Limit-Order	Method Detection Limit-Actual	Units
pH	0.1	0.1	standard units
Total Dissolved Solids	10	10	mg/l
Dissolved Chloride	10	1	mg/l
Dissolved Sodium	10	1	mg/l
Dissolved Calcium	10	1	mg/l
Dissolved Potassium	10	1	mg/l
Dissolved Carbonate	10	1	mg/l
Dissolved Bicarbonate	10	2	mg/l
Dissolved Magnesium	10	1	mg/l
Dissolved Sulfate	10	1	mg/l
Benzene	0.05	0.0005	mg/l
Toluene	0.05	0.0005	mg/l
Ethylbenzene	0.05	0.0005	mg/l
Total Xylenes	0.05	0.0005	mg/l

Quarterly groundwater sampling was initiated in November 2002 and continued until November 2003. Annual groundwater sampling was initiated in 2004 and occurred during the fall of 2004.

3.2 Monitoring Well Installation

Two monitoring wells (**Figure 1**) were installed in the study area in November 2004. Well LAW-M08, located in the SE¼ of the SW¼ of Section 31, Township 28 North, Range 51 East, was constructed on November 12, 2004. Well LAW-M09, located in the NE¼ of the NW¼ of Section 5, Township 27 North, Range 51 East, was constructed on November 13, 2004. The construction of these wells is summarized below in **Table 3-2**, complete well logs and construction diagrams are included as **Appendix B**.

Table 3-2 *New Well Construction Summary*

Well	Date Completed	Total Depth (ft)	Depth to Screen Top (ft bgs)	Depth to Screen Btm (ft bgs)	Well Diam. (in)	Screened Geologic Unit
LAW-M08	11/12/04	100	75	85	2	Qw
LAW-M09	11/13/04	146	90	143	2	Qw

Monitoring wells LAW-M08 and LAW-M09 were completed down to Bearpaw Shale and screened in the Wiota Gravels (Qw). The Wiota Gravels are overlaid by glacial till and silt.

4.0 DATA EVALUATION

4.1 Groundwater Elevations and Flow Direction

Groundwater elevation data were used to develop groundwater contour maps to evaluate flow direction and gradient. Groundwater elevation data are included in **Appendix A**.

Historically, water levels across the study area appear to display very little seasonal fluctuation, with water levels in most wells varying one foot or less.

A groundwater contour map (potentiometric map) was developed for the October 2004 dataset collected for this study **(Figure 2).** The potentiometric surface has two distinct regions; the first includes the river plain and first terrace, and the second includes the upper terraces. Groundwater flow is generally westward toward the Poplar River from the upper terraces at a relatively steep gradient of 0.014 ft/ft. The groundwater flow changes to a more southwesterly direction in the river valley, paralleling the river, with a much flatter gradient of 0.0049 ft/ft.

4.2 Groundwater Quality

Groundwater samples were analyzed for various inorganic parameters, including benzene, toluene, ethylbenzene and xylenes. Complete groundwater quality data are included in **Appendix A**. Chloride is used as the indicator analyte in tracking the saline plume. The *Public Water Supply Well Threat Study* report (Land & Water, 2003) estimated the boundaries of moderately impacted (chloride concentration >250 mg/l) and severely impacted (chloride concentration >5,200 mg/l) groundwater. This report uses a similar definition for water quality in the study area.

4.2.1 Monitoring Well Network

Table 4-1 shows the chloride concentration in the monitoring well network for the past 2 years and the current water quality classification.

Table 4-1 ***Water Quality Impact Summary – Study Area Wells***

Well	November 2002 Chloride Concentration (mg/l)	November 2003 Chloride Concentration (mg/l)	October 2004 Chloride Concentration (mg/l)	Water Quality Classification
LAW-M01	21	17	21	Non-impacted
LAW-M03	696	900	988	Moderately Impacted
LAW-M04	615	719	821	Moderately Impacted
LAW-M05	106	155	225	Non-impacted
LAW-M05 duplicate	-	-	223	Non-impacted
LAW-M06	20	61	91	Non-impacted
LAW-M07	19[1]	14	16	Non-impacted
LAW-M08	NA	NA	Results pending	--
LAW-M09	NA	NA	Results pending	--
PNR-27	11,200	13,100	13,100	Severely Impacted
PNR-28	15,700	17,300	18,300	Severely Impacted
PNR-29	117	104	99	Non-impacted

NA = Not Analyzed

The groundwater classifications were used to develop a map of the areal extent of impacted groundwater. **Figure 3** shows the October 2004 extent of impacted groundwater. The area of greatest brine impact encompasses the northeastern portion of section 28 and the northwestern portion of section 27.

Other monitored parameters include benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds. Previous investigators discovered some petroleum hydrocarbon constituents in wells, the result of the association of hydrocarbons with brine. The area of elevated benzene is confined to a small portion of the study area and lies within the zone of severely impacted groundwater. One network monitoring well (PNR 27) had a benzene value of 1.2 μg/L in September 2004. Monitoring well PNR 21 had an ethyl benzene value of 0.52 μg/L. BTEX was not detected in any other network well.

4.2.2 Domestic Water Supply Wells

The five domestic wells listed in Table 4 of the Administrative Order Document No. SDWA-08-2004-0035 were sampled for the parameters listed in **Table 3-1**. **Table 4-2** lists the data for selected parameters. Complete laboratory analysis results are included in **Appendix A**. Domestic water quality data were sent to the respective well owner. Copies of the letters to the well owners are included in **Appendix C**.

Table 4-2 *Water Quality Summary – Domestic Wells*

Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)
(b) (6)	10/13/04	22	2220	451	895
	10/13/04	22	2080	350	1120
	10/14/04	9	973	196	464
	10/14/04	12	834	234	207
	10/14/04	35	3510	342	1550

5.0 SUMMARY

This section presents the results of the Annual Groundwater Monitoring 2004 event for the Poplar Groundwater Study Area. The monitoring was completed as required by Administrative Order on Consent Docket No. SDWA-08-2004-0035.

The groundwater monitoring evaluated the downgradient extent of brine impacted groundwater within the study area. Analytical results show no change in water quality classification from the November 2003 sampling event.

Water samples were collected from five domestic wells north of the study area. Each of these wells showed very low concentrations of chloride, less than 36 mg/L.

Two new guardian wells, LAWM08 and LAWM09, were installed in the southwest portion of the study area. Water quality data from these wells will be presented in a December 2004 addendum to this report.

6.0 REFERENCES

Land & Water, 2003. Public Water Supply Well Threat Study, EPA Emergency Order No. SDWA-8-2001-33. Prepared by Land & Water Consulting, Inc. for Murphy Oil Company, Pioneer Natural Resources, Samson Hydrocarbons, and Marathon Ashland Petroleum. March 2003.

USEPA, 2001a. Emergency Administrative Order, East Poplar Oil Field, Fort Peck Indian Reservation, Montana. Docket No. SDWA-08-2001-33 issued by the United States Environmental Protection Agency. September 2001.

USEPA, 2001b. First Amended Emergency Administrative Order, East Poplar Oil Field, Fort Peck Indian Reservation, Montana. Docket No. SDWA-08-2001-33 issued by the United States Environmental Protection Agency. October 2001.

FIGURES

Poplar 2004 Report

LAND & WATER

Figure 1. Site Map

LEGEND

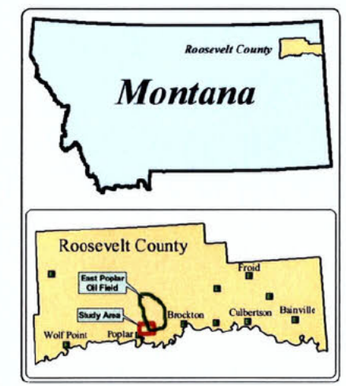
Monitoring Wells

▲ LAW-Mxx
Monitoring well installed by Land & Water

▲ PNRx
Monitoring well established by Pioneer Natural Resources

Domestic Wells

● Existing supply well with designation established by name of property owner.



N

Miles
0.5 0 0.5 1

LAND & WATER CONSULTING, INC.
P.O. Box 8254
1120 Cedar Street
Missoula, MT 59807
Tel. 406-721-0354
Fax 406-721-0355
info@landandwater.net

Figure 1. Site Map

Project: 110396
Date: December 2004
Location: Poplar, MT
Project Manager: J. Madison
Drawn By: MSA/JC
File: ...\1104_Figure_1.mxd

Figure 2.

LEGEND

Monitoring Wells

▲ LAW-Mxx
Monitoring well installed by Land & Water November 2004 Groundwater Elevation

Groundwater Contours

November 2004 = 20ft

November 2004 = 2ft

N

Miles

0.25 0 0.25 0.5

LAND & WATER CONSULTING, INC.
P.O. Box 8254
1120 Cedar Street
Missoula, MT 59807
Tel. 406-721-0354
Fax 406-721-0355
info@landandwater.net

Figure 2. November 2004
Groundwater Elevations and Contours

Project: 110396
Date: December 2004
Location: Poplar, MT
Project Manager: J. Madison
Drawn By: MSA/JJC
File: ...\1104_Figure_2.mxd

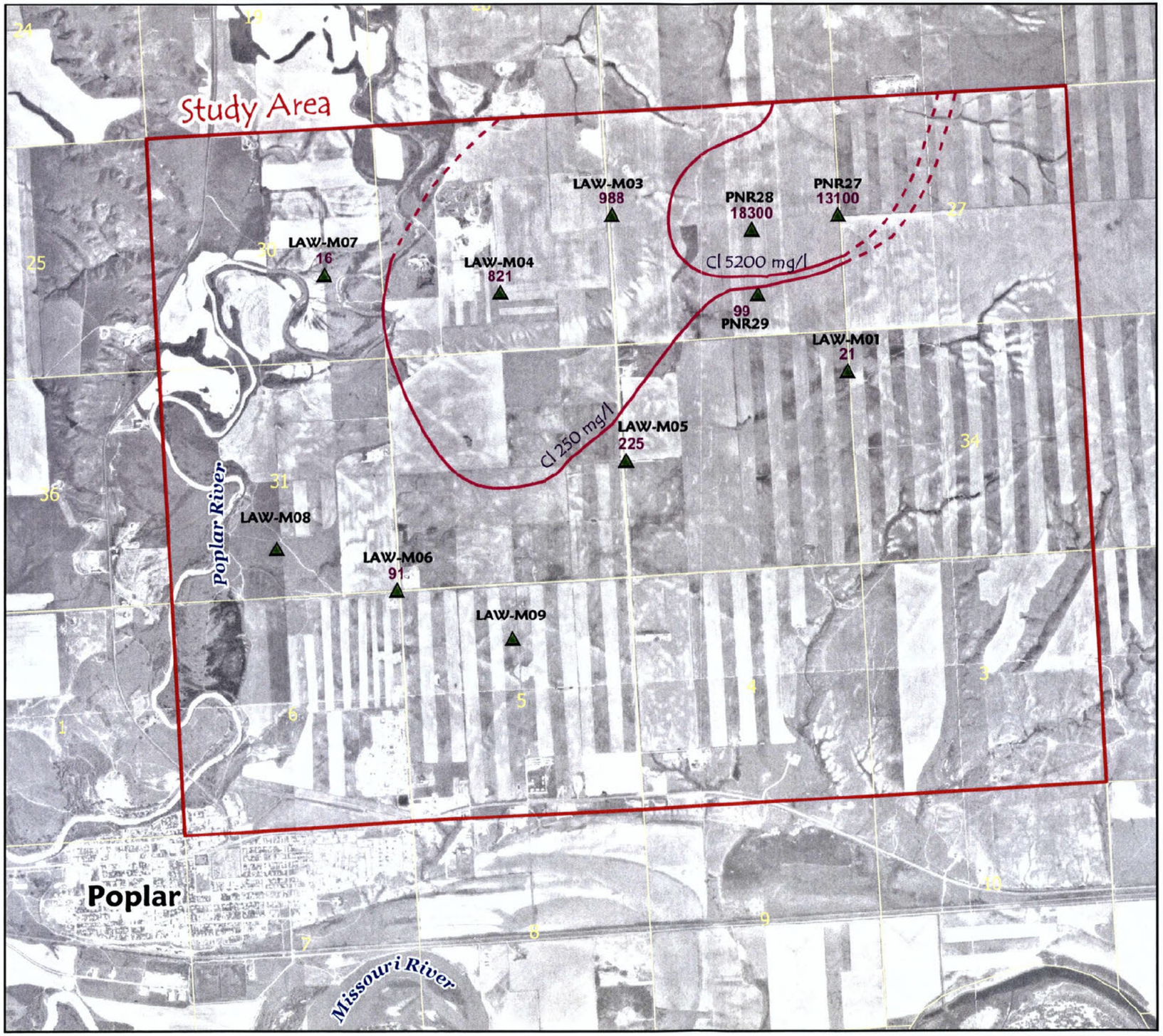


Figure 3.

LEGEND

Monitoring Wells

- LAW-Mxx
  Monitoring well installed by Land & Water
- PNRx
  Monitoring well established by Pioneer Natural Resources

Water Quality

- Chloride Concentration, mg/L
  Well #
  November 2004 Chloride
- November 2004
  November 2004 - Estimated

N

Miles
0.25 0 0.25

LAND & WATER CONSULTING, INC.
P.O. Box 8254
1120 Cedar Street
Missoula, MT 59807
Tel. 406-721-0354
Fax 406-721-0355
info@landandwater.net

Figure 3. Extent of Impacted Groundwater

Project: 110396
Date: December 2004
Location: Poplar, MT
Project Manager: J. Madison
Drawn By: MSA/JJC
File: ...\110396 Figure_3.mxd

Appendix A

GROUNDWATER ELEVATION AND WATER QUALITY DATA

- HISTORIC WATER QUALITY DATA
- WATER LEVEL ELEVATIONS
- SAMPLE FORMS
- ANALYTICAL DATA

Poplar 2004 Report

LAND & WATER

Table A-1
Groundwater Quality Summary
East Poplar Oil Field
November 2004

Well No.	Date	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Magnesium mg/l	Lab pH S.U.	Potassium mg/l	Sodium mg/l	Solids, Total Dissolved at 180° C mg/l	Sulfate mg/l	MTBE ug/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	m+p-Xylenes ug/l	o-Xylene ug/l	Xylenes, Total ug/l	Ratios CL/TDS	Ratios SO4/TDS	Ratios SO4/CL
LAW-M01[1]	09/21/02	3.2	10.3	50.5	7.1	675	824	292	<1	26	199	7.4	16	219	2870	1410								0.01	0.49	54.23
LAW-M01	11/16/02					666	813	290	<1	21	200	7.6	14	184	2910	1430	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.49	68.10
LAW-M01	02/26/03	2.9	11.0	51.8		656	800	339	<1	19	222	7	19	213	2850	1340		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.47	70.53
LAW-M01	05/14/03	3.3	9.9	49.8		675	823	324	<1	21	206	7	19	194	2840	1360		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.48	64.76
LAW-M01	08/06/03	3.1	12.2	54.0		658	803	323	<1	15	202	6.8	17	191	2650	1250	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.47	83.33
LAW-M01	11/14/03	3.1	5.6	42.1			818	304	<1	17	195	7.1	18	192	2710	1370	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.51	80.59
LAW-M01	10/13/04	3.0	9.7	49.5	7.0		837	302	<1	21	189	7	19	193	2550	1270	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.50	60.48
LAW-M03	11/16/02					475	580	214	<1	696	132	7.7	8	471	3090	945	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.23	0.31	1.36
LAW-M03	02/25/03	4.2	9.7	49.5		489	597	283	<1	726	174	7.1	9	581	3240	1000		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.22	0.31	1.38
LAW-M03	05/13/03	4.8	10.4	50.7		501	612	283	<1	752	164	7.1	11	526	3340	990		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.23	0.30	1.32
LAW-M03	08/06/03	4.8	11.0	51.8		486	592	296	<1	811	171	6.9	10	519	3330	887	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.24	0.27	1.09
LAW-M03	11/14/03	4.8	9.5	49.1			600	297	<1	900	173	7.1	11	534	3450	1070	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.26	0.31	1.19
LAW-M03	10/13/04	5.4	10.2	50.4	7.2		580	322	<1	988	189	7.1	11	556	3680	1100	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.27	0.30	1.11
LAW-M04	11/16/02					335	409	92	<1	615	62	7.9	6	339	1590	159	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.39	0.10	0.26
LAW-M04	02/25/03	2.6	10.6	51.1		328	400	116	<1	704	79	7.5	8	402	1710	172		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.41	0.10	0.24
LAW-M04	05/13/03	3.0	10.4	50.7		340	415	112	<1	647	71	7.5	8	360	1700	167		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.38	0.10	0.26
LAW-M04	08/06/03	3.1	12.3	54.1		332	406	118	<1	699	76	7.3	8	366	1730	136	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.40	0.08	0.19
LAW-M04	11/14/03	3.0	8.8	47.8			415	116	<1	719	74	7.5	8	363	1720	151	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.42	0.09	0.21
LAW-M04	11/13/04	3.4	10.1	50.2	7.4		401	139	<1	821	88	7.4	10	388	1920	196	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.43	0.10	0.24
LAW-M05	11/17/02					624	761	147	<1	106	91	7.8	7	402	2350	1020	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.43	9.62
LAW-M05	02/26/03	3.2	10.5	50.9		640	780	215	<1	114	146	7.2	8	463	2720	1180		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.04	0.43	10.35
LAW-M05	05/14/03	3.6	10.3	50.5		661	806	214	<1	125	143	6.9	11	435	2740	1240		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.45	9.92
LAW-M05	08/06/03	3.6	12.2	54.0		646	788	223	<1	118	150	7	9	427	2770	1220	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.04	0.44	10.34
LAW-M05	11/13/03	3.6	9.7	49.5			795	225	<1	155	152	7.2	10	430	2890	1360	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.47	8.77
LAW-M05	10/12/04	3.9	10.4	50.7	7.2		772	257	<1	225	174	7.2	11	440	3140	1430	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.46	6.36
LAW-M06	11/17/02					446	544	28	<1	20	15	8.2	4	216	758	172	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.03	0.23	8.60
LAW-M06	02/26/03	1.2	11.4	52.5		430	525	36	<1	53	21	7.7	4	250	790	173		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.22	3.26
LAW-M06	05/14/03	1.3	10.3	50.5		443	541	35	<1	50	19	7.5	5	223	773	170		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.06	0.22	3.40
LAW-M06	08/06/03	1.3	12.0	53.6		435	530	37	<1	56	20	7.5	4	218	786	174	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.22	3.11
LAW-M06	11/13/03	1.3	5.4	48.9			536	35	<1	61	19	7.8	5	211	787	173	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.08	0.22	2.84
LAW-M06	10/12/04	1.5	11.4	52.5	7.5		530	48	<1	91	27	7.7	5	225	890	211	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.10	0.24	2.32
LAW-M07	12/19/02	1.2	8.0	46.4	7.6		546	36	<1	19	21	6.6	4	232	771	214	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.28	11.26
LAW-M07	02/26/03	1.2	8.8	47.8	7.6	439	535	37	<1	15	23	7.7	4	242	782	200		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.26	13.33
LAW-M07	05/14/03	1.2	10.3	50.5	7.6	451	550	35	<1	15	20	7.5	5	211	754	191		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.25	12.73
LAW-M07	08/06/03	1.2	11.9	53.4	7.6	443	540	37	<1	13	21	7.5	4	208	769	204	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.27	15.69
LAW-M07	11/13/03	1.2	7.6	45.7	7.6		551	36	<1	14	21	7.8	5	210	774	205	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.26	14.64
LAW-M07	10/12/04	1.2	8.7	47.7	7.5		547	35	<1	16	20	7.7	5	205	778	200	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.26	12.50

Table A-1
Groundwater Quality Summary
East Poplar Oil Field
November 2004

Well No	Date	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Magnesium mg/l	Lab pH S.U.	Potassium mg/l	Sodium mg/l	Solids, Total Dissolved at 180° C mg/l	Sulfate mg/l	MTBE ug/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	m+p-Xylenes ug/l	o-Xylene ug/l	Xylenes, Total ug/l	Ratios CL/TDS	Ratios SO4/TDS	Ratios SO4/CL
PNR-27	08/21/01	27.6	10.7	51.3	nm	592	722	1790	<1	10300	1290	7.1	37	2440	21600	2020		<0.50	<0.50	<0.50			<0.50	0.48	0.09	0.20
PNR-27	09/05/01	25.9	12.3	54.1	7.0	594	725	1990	<1	10000	1370	6.8	39	2700	20400	1940		<0.50	<0.50	<0.50			<0.50	0.49	0.10	0.19
PNR-27	11/06/01	28.1	10.0	50.0	7.1	569	694	1960	<1	10900	1400	6.7	40	2840	21200	1750		<0.50	<0.50	<0.50			<1.0	0.51	0.08	0.16
PNR-27	02/20/02	27.5	10.5	50.9	6.7	628	767	1970	<4	11400	1390	6.8	54	3130	21000	1530		<0.50	<0.50	<0.50			<0.50	0.54	0.07	0.13
PNR-27	5/21/02	32.1	13.7	56.7	6.65	589	719	1790	<4	12000	1260	6.8	40	2990	23800	1940		<0.50	<0.50	<0.50			<0.50	0.50	0.08	0.16
PNR-27	8/20/02	29.8	14.5	58.1	6.90	580	708	1900	<4	12600	1210	6.9	32	2850	25600	1850		<0.50	<0.50	<0.50			<0.50	0.49	0.07	0.15
PNR-27	11/6/02	32.7	11.3	52.3	6.84	583	712	2090	<4	11200	1400	6.8	42	3450	24200	1820		0.49 (J)	<0.5	<0.5			<0.5	0.46	0.08	0.16
PNR-27	3/5/03	30.3	10.1	50.2	6.73	567	691	2060	<4	12900	1370	6.6	43	3740	22400	2080		<0.50	<0.50	<0.50			<0.50	0.58	0.09	0.16
PNR-27	5/28/03	25.4	14.4	57.9	6.60	589	718	1990	<1	12200	1330	6.7	57	3640	25500	1620		0.42 (J)	<0.50	<0.50			<0.50	0.48	0.06	0.13
PNR-27	8/13/03	32.7	15.1	59.2	7.50	577	705	1900	<1	13000	1320	6.6	54	3660	24400	1280		0.81	<0.50	<0.50			<0.50	0.53	0.05	0.10
PNR-27	11/5/03	41.7	9.1	48.4	7.43	568	693	1760	<4	13100	1370	6.8	53	3760	23300	1430		0.66	1	<0.50			<0.50	0.56	0.06	0.11
PNR-27	9/15/04	33.9	11.7	53.1	7.65	525	640	1990	<4	13100	1340	6.8	58	4320	27500	1760		1.2	<0.50	<0.50			<0.50	0.48	0.06	0.13
PNR-28	08/21/01	31.4	10.3	50.5	nm	501	612	1910	<1	11700	1460	7.2	39	3090	25200	1480		<0.50	<0.50	<0.50			<0.50	0.46	0.06	0.13
PNR-28	09/05/01	28.4	13.0	55.4	7.0	493	601	2020	<1	12300	1470	6.9	36	3200	22600			<0.50	<0.50	<0.50			<0.50	0.54		
PNR-28	11/06/01	29.7	12.2	54.0	7.1	519	633	1880	<1	10500	1380	6.7	34	3070	24700	1660		<0.50	<0.50	<0.50			<1.0	0.43	0.07	0.16
PNR-28	02/20/02	31.9	10.6	51.1	6.9	522	637	2060	<4	13700	1490	6.8	82	3850	23000	1430		<0.50	<0.50	<0.50			<0.50	0.60	0.06	0.10
PNR-28	5/21/02	38.8	12.4	54.3	6.67	450	549	1990	<4	14700	1430	6.8	43	3910	27400	1820		<0.50	<0.50	<0.50			<0.50	0.54	0.07	0.12
PNR-28	8/20/02	34.2	11.4	57.9	6.80	510	622	2090	<4	15200	1340	6.8	39	3510	31200	1590		<0.50	<0.50	<0.50			<0.50	0.49	0.05	0.10
PNR-28	11/5/02	36.4	10.2	50.4	6.53	516	630	2340	<4	15700	1640	6.8	46	4850	29700	1740		<0.5	<0.5	<0.5			<0.5	0.53	0.06	0.11
PNR-28	3/5/03	36.4	10.2	50.4	6.71	503	614	2260	<4	15700	1480	6.6	45	4930	26700	1880		<0.50	<0.50	<0.50			<0.50	0.59	0.07	0.12
PNR-28	5/28/03	32.8	13.1	55.6	6.53	519	633	2130	<1	15100	1450	6.7	63	4900	30200	1460		<0.50	<0.50	<0.50			<0.50	0.50	0.05	0.10
PNR-28	8/13/03	40.3	14.4	57.9	7.56	517	631	2140	<1	16800	1440	6.5	53	5200	29500	1270		0.51	<0.50	<0.50			<0.50	0.57	0.04	0.08
PNR-28	11/5/03	4.6	9.2	48.6	7.30	484	591	2180	<4	17300	1520	6.9	58	6010	29100	1350		<0.50	<0.50	<0.50			<0.50	0.59	0.05	0.08
PNR-28	9/15/04	42.9	13.5	56.3	6.61	542	661	2230	<4	18300	1490	6.8	62	6490	33700	1630		<0.50	<0.50	<0.50			<0.50	0.54	0.05	0.09
PNR-29	08/21/01	5.1	10.1	50.2	nm	606	740	390	<1	129	290	7.2	14	480	4760	1940		<0.50	<0.50	<0.50			<0.50	0.03	0.41	15.04
PNR-29	09/05/01	4.9	12.8	55.0	7.4	695	847	393	<1	104	291	6.5	11	483	4760			<0.50	<0.50	<0.50			<0.50	0.02		
PNR-29	11/06/01	4.9	11.7	53.0	7.5	691	843	400	<1	99	286	7.1	11	469	4650	1880		<0.50	0.69	<0.50			<1.0	0.02	0.40	18.99
PNR-29	02/20/02	4.8	10.1	50.2	7.0	623	760	399	<4	106	292	6.9	13	501	4640	2070		<0.50	<0.50	<0.50			<0.50	0.02	0.45	19.53
PNR-29	5/21/02	5.4	11.9	53.4	7.00	662	807	359	<4	83	262	7.3	11	449	4640	2080		<0.50	<0.50	<0.50			<0.50	0.02	0.45	25.06
PNR-29	8/20/02	4.3	13.3	55.9	7.00	669	816	376	<4	113	290	7.2	10	431	4780	2030		<0.50	<0.50	<0.50			<0.50	0.02	0.42	17.96
PNR-29	11/5/02	4.9	9.9	49.8	6.93	680	830	403	<4	117	290	7.1	12	469	4770	2070		<0.5	<0.5	<0.5			<0.5	0.02	0.43	17.69
PNR-29	3/5/03	4.8	9.2	48.6	6.66	661	807	410	<4	181	292	7.2	13	550	4730	2060		<0.50	<0.50	<0.50			<0.50	0.04	0.44	11.38
PNR-29	5/28/03	4.4	12.1	53.8	6.87	677	826	418	<1	116	292	7.1	13	489	4790	2030		<0.50	<0.50	<0.50			<0.50	0.02	0.42	17.50
PNR-29	8/13/03	4.0	11.5	52.7	7.48	674	822	404	<1	88	288	7.0	11	460	4800	1920		<0.50	<0.50	<0.50			<0.50	0.02	0.40	21.82
PNR-29	11/4/03	4.6	9.8	49.6	7.11	684	835	362	<4	104	305	7.1	13	482	4760	2120		<0.50	<0.50	<0.50			<0.50	0.02	0.45	20.38
PNR-29	9/15/04	5.0	12.7	54.9	7.00	717	875	441	<4	99	303	7.2	12	468	4780	2040		<0.50	<0.50	5.2			<0.50	0.02	0.43	20.61
Domestic Wells																										
(b) (6)	10/13/04	3.1	13.1	55.6	7.22	988	1200	118	<1	22	132	7.5	9	451	2220	895	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.40	40.68
	10/13/04	2.7	12.6	54.7	7.35	443	540	158	<1	22	91	7.6	6	350	2080	1120	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.54	50.91
	10/14/04	1.5	9.9	49.8	7.66	290	354	60	<1	9	41	7.7	4	196	973	464	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.48	51.56
	10/14/04	1.4	12.8	55.0	7.7	520	634	32	<1	12	26	7.9	6	234	834	207	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.25	17.25
	10/14/04	4.3	10.9	51.6	7.18	969	1180	169	<1	35	383	7.3	6	342	3510	1550		<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.44	44.29

Table A-2
Groundwater Elevations
East Poplar Oil Field
November 2004

Well	Casing Elevation	4/22/2002		5/21/2002		6/19/2002		7/25/2002		8/19/2002		9/12/2002		11/4/2002	
		DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.
LAWM01	2093.10											57.75	2035.35	57.32	2035.78
LAWM03	1988.63														
LAWM04	1976.85														
LAWM05	2048.90														
LAWM06	2023.68														
LAWM07	1969.95														
LAWM08	2010.58														
LAWM09	2023.31														
PNR27	2095.30	55.27	2040.03	55.25	2040.05	55.45	2039.85	54.83	2040.47	55.34	2039.96	55.80	2039.50		
PNR28	2078.44			44.45	2033.99	44.64	2033.80			44.59	2033.85	44.59	2033.85	44.55	2033.89
PNR29	2072.64			39.80	2032.84	39.96	2032.68			39.96	2032.68	39.96	2032.68	39.82	2032.82

Well	Casing Elevation	12/18/2002		1/6/2003		2/24/2003		5/13/2003		8/6/2003		11/13/2003		10/13/2004		11/30/2004	
		DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.	DTW	Elev.
LAWM01	2093.10	57.35	2035.75	57.58	2035.52	57.38	2035.72	57.60	2035.50	57.65	2035.45	57.85	2035.25	57.41	2035.69	58.04	2035.06
LAWM03	1988.63	31.41	1957.22	31.80	1956.83	31.45	1957.18	30.67	1957.96	31.66	1956.97	31.81	1956.82	31.87	1956.76	32.39	1956.24
LAWM04	1976.85	23.04	1953.81	23.55	1953.30	23.00	1953.85	22.52	1954.33	23.30	1953.55	23.42	1953.43	23.39	1953.46	24.02	1952.83
LAWM05	2048.90	96.85	1952.05	99.12	1949.78	98.39	1950.51	98.10	1950.80	98.98	1949.92	99.21	1949.69	99.01	1949.89	99.61	1949.29
LAWM06	2023.68	76.64	1947.04	76.56	1947.12	75.72	1947.96	75.50	1948.18	76.60	1947.08	76.71	1946.97	76.49	1947.19	77.08	1946.60
LAWM07	1969.95	19.95	1950.00	19.94	1950.01	19.88	1950.07	18.87	1951.08	19.99	1949.96	20.13	1949.82	19.93	1950.02	20.61	1949.34
LAWM08	2010.58													62.80[2]		63.67	1946.91
LAWM09	2023.31													75.36[2]		76.29	1947.02
PNR27	2095.30	55.65	2039.65	55.58	2039.72	55.17	2040.13	55.62	2039.68	55.67	2039.63	56.20	2039.10	55.73[1]	2039.57		
PNR28	2078.44	44.95	2033.49			44.49	2033.95	44.40	2034.04	44.89	2033.55	46.20	2032.24	45.19[1]	2033.25		
PNR29	2072.64	40.25	2032.39			39.70	2032.94	40.17	2032.47	40.21	2032.43	40.70	2031.94	40.54[1]	2032.10		

[1] Measured on 9/25/2004
[2] Measured on 11/13/2004

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/13/04 **Time:** 12:00

Personnel: TE/JM

Sample Location: MW-1

Aquifer Type: Unconfined **Well Type:** Monitoring

Total Depth: 63' **SWL:** 57.41 feet

Measuring Point Description: TOC blackmark North

Casing Type: PVC **Well ϕ** 2"

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
~~Grundfos 0.5 hp pump~~ — whale		
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg/L	Q (gpm)	Elapsed (gallons)
12:20	—	—	—	—	—		0.5	0
12:36	10.0	7.34	-36	2990	1995			8
12:52	9.7	7.09	-22	3010	1505			16
13:08	9.8	7.00	-17	3020	1510			24
13:24	9.7	6.96	-15	3030	1515			

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = 8 (6" bore calc.)

Water Description:

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-LAWM01-1	pH, TDS, Anions	Raw	1331		1 L Plastic
110396-LAWM01-2	Dissolved Metals	HNO3	1332		250ml *filter 0.45um*
110396-LAWM01-3	BTEX	HCL	1333		(2) 40 ml VOA

Samples analyzed by:	Energy Laboratories (800) 735-4489 1120 South 27th St. Billings, MT 59107

Comments:
* DO measured in situ 0.2 mg/L

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/13 **Time:** 10:40

Personnel: TE/JM

Sample Location: MW 3

Aquifer Type: Unconfined **Well Type:** Monitoring

Total Depth: 75' **SWL:** 31.87 *feet*

Measuring Point Description: TOC blackmark North

Casing Type: PVC **Well ϕ** 2"

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
~~Grundfos 0.5 hp pump~~ whale		1.75 gpm / set @ 45' bgs
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg\L	Q (gpm)	Elapsed (gallons)
10:45	–	–	–	–	–			–
11:01	11.2	7.21	-29	5490	2745			28
11:17	10.3	7.16	-26	5430	2715			56
11:33	10.2	7.15	-25	5410	2705			84
						*		

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = 28 gal (~~8"~~ 4" bore calc.)

Water Description: initial silt - saline/brine odor

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-LAWM 3 -1	pH, TDS, Anions	Raw	1141		1 L Plastic
110396-LAWM 3 -2	Dissolved Metals	HNO3	1142		250ml *filter 0.45um*
110396-LAWM 3 -3	BTEX	HCL	1143		(2) 40 ml VOA

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:
* DO Measured in situ 0.4

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/13

Time: 8:45

Personnel: TE/JM

Sample Location: MW4

Aquifer Type: Unconfined

Well Type: Monitoring

Total Depth: 75'

SWL: 23.39 *feet*

Measuring Point Description: TOC blackmark North

Casing Type:

Well ϕ

Well Log: ☑ Yes ☐ No

Well Locked: ☑ Yes ☐ No

Mount Type: ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
~~Grundfos 0.5 hp pump~~ Waterra	0.35'	1.5 gpm
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg/L	Q (gpm)	Elapsed (gallons)
9:15	—	—	—	—	—			0
9:37	9.5	7.45	-42	3390	1695			33
9:59	9.7	7.40	-39	3360	1680			66
10:21	10.1	7.38	-39	3360	1680			99
						*		

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = 3.3 gal (4" bore calc.)

Water Description: Clear

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-LAWM 4 -1	pH, TDS, Anions	Raw	1031		1 L Plastic
110396-LAWM 4 -2	Dissolved Metals	HNO3	1032		250ml *filter 0.45um*
110396-LAWM 4 -3	BTEX	HCL	1033		(2) 40 ml VOA

Samples analyzed by:	Energy Laboratories (800) 735-4489 1120 South 27th St. Billings, MT 59107

Comments:

* DO measured in situ 6.9

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/12 **Time:** 15:10

Personnel: TE/JM

Sample Location: MW5

Aquifer Type: Unconfined **Well Type:** Monitoring

Total Depth: 145' **SWL:** 99.01 *feet*

Measuring Point Description: TOC blackmark North

Casing Type: PVC **Well ϕ** 2"

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
Grundfos 0.5 hp pump		276 hrs @ 125' 3gpm
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (mS)	TDS (mg/L)	DO mg/L	Q (gpm)	Elapsed (gallons)
~~3:15~~	~~12.4~~	~~7.29~~	~~33~~	~~3.94~~				0
3:37	12.4	7.29	-33	3.94	1870			67
3:59	10.9	7.16	-26	3.95	1870			134
4:21	10.7	7.14	-25	3.94	1870			201
4:31	10.4	7.15	-26	3.93	1870			231

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = 67 gal (6" bore calc.)

Water Description: reddish & turbid, saline brine odor

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-LAWM 5 -1	pH, TDS, Anions	Raw	1641		1 L Plastic
110396-LAWM 5 -2	Dissolved Metals	HNO3	1642		250ml *filter 0.45um*
110396-LAWM 5 -3	BTEX	HCL	1643		(2) 40 ml VOA
*					

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:
Water reddish, silty, ~~no sulfur~~ odor.
DO not measured due to depth
* collected dup samples from this well.
Blind dup # LAWM02 1841, 1842, 1843

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/12 **Time:** 12:50

Personnel: TE/JM

Sample Location: MW 6

Aquifer Type: Unconfined **Well Type:** Monitoring

Total Depth: 136' **SWL:** 76.49 feet

Measuring Point Description: TOC blackmark North

Casing Type: PVC **Well ϕ** 2"

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
~~Grundfos 0.5 hp pump~~ super whale	—	set @ 100'
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg\L	Q (gpm)	Elapsed (gallons)
1300	~~12.5~~	~~7.4~~	~~-41~~	—			—	0
1330	12.5	7.40	-41	1533	766		0.25	7.5
1400	12.1	7.53	-47	1492	746		0.25	15
1430	11.4	7.52	-46	1463	731		0.25	22.5

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = 9.7 gal 2" (~~6"~~ bore calc.)

Water Description: clear

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-LAWM 6 -1	pH, TDS, Anions	Raw	1431		1 L Plastic
110396-LAWM 6 -2	Dissolved Metals	HNO3	1432		250ml *filter 0.45um*
110396-LAWM 6 -3	BTEX	HCL	1433		(2) 40 ml VOA

Samples analyzed by:	Energy Laboratories (800) 735-4489 1120 South 27th St. Billings, MT 59107

Comments:
* ~~DO measured in situ 2nd~~ No DO measurement cord was too short.

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/12/04 **Time:** 10:30

Personnel: TE/JM

Sample Location: MW 7

Aquifer Type: Unconfined **Well Type:** Monitoring

Total Depth: 50' **SWL:** 19.93 feet

Measuring Point Description: TOC blackmark North

Casing Type: **Well ϕ**

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
~~Grandfos 5.5 hp pump~~ whale	—	set @ 48' bgs
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg/L	Q (gpm)	Elapsed (gallons)
10:43						*	—	0
1100	—	—	—	—	—		2.5	43
11:23	10.3	7.37	-37	1245	623		2.5	[redacted] 10[illegible]
1140	9.2	7.47	-44	1233	617		2.5	[redacted] 14[illegible]
1157	8.7	7.50	-45	1230	615		2.5	[redacted] 18[illegible]
1214	8.7	7.53	-47	1246	629		2.5	229
						*		

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = 44 gal (6" bore calc.)

Water Description: clear - no odor

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-LAWM 7 -1	pH, TDS, Anions	Raw	1215		1 L Plastic
110396-LAWM 7 -2	Dissolved Metals	HNO3	1216		250ml *filter 0.45um*
110396-LAWM 7 -3	BTEX	HCL	1217		(2) 40 ml VOA

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:
* DO measured in situ @ 24' below casing = 3.9 ppm
— no 1st measurement ... cal multi-meter

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/13/04 **Time:** 1420

Personnel: TE/JM

Sample Location: 110396 (b) (6) [redacted]

Aquifer Type: Unconfined **Well Type:** ~~Monitoring~~ Domestic

Total Depth: **SWL:** feet

Measuring Point Description: TOC blackmark North

Casing Type: **Well ϕ**

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
Grundfos 0.5 hp pump		
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg\L	Q (gpm)	Elapsed (gallons)
1430	—	—	—	—	—			
1435	13.9	7.01	-18	3120	1560			
1440	13.6	7.13	-25	3120	1560			
1445	13.2	7.21	-29	3130	1565			
1450	13.1	7.22	-30	3130	1565			

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = (6" bore calc.)

Water Description: brown color

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-[redacted] -1	pH, TDS, Anions	Raw	1451		1 L Plastic
110396-[redacted] -2	Dissolved Metals	HNO3	1452		250ml *filter 0.45um*
110396-[redacted] -3	BTEX	HCL	1453		(2) 40 ml VOA

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/13/04 **Time:** 1520

Personnel: TE/JM

Sample Location: 110396 (b) (6)

Aquifer Type: Unconfined **Well Type:** Domestic ~~Monitoring~~

Total Depth: **SWL:** feet

Measuring Point Description: TOC blackmark North

Casing Type: **Well ϕ**

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
Grundfos 0.5 hp pump		
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg\L	Q (gpm)	Elapsed (gallons)
1525	–	–	–	–	–	–		
1535	14.1	7.42	-42	2780	1390			
1546	12.8	7.40	-40	2770	1365			
1550	12.9	7.36	-38	2780	1390			
1600	12.6	7.35	-37	2720	1360			

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = (5" bore calc.)

Water Description:

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-[redacted]	pH, TDS, Anions	Raw	1601		1 L Plastic
110396-[redacted]-2	Dissolved Metals	HNO3	1602		250ml *filter 0.45um*
110396-[redacted]-3	BTEX	HCL	1603		(2) 40 ml VOA

Samples analyzed by:	Energy Laboratories (800) 735-4489 1120 South 27th St. Billings, MT 59107

Comments:

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 1 1038

Date: 10/14/04 **Time:** 10:06

Personnel: TE/JM

Sample Location: 110396 [redacted]

Aquifer Type: Unconfied **Well Type:** Domestic ~~Monitoring~~

Total Depth: **SWL:** feet

Measuring Point Description: TOC back mrla Nolt

Casing Type: **Well ϕ**

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
Grundfos 0.5 hp pump		
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg\L	Q (gpm)	Elapsed (gallons)
10:00	—	—	—	—	—	—		
10:10	11.0	7.82	-64	1458	729			
10:20	10.1	7.75	-60	1459	729			
10:30	9.9	7.71	-57	1457	728			
10:40	9.9	7.68	-56	1457	728			
10:50	9.9	7.66	-55	1458	729			

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = (6" bore calc.)

Water Description:

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-[redacted] -1	pH, TDS, Anions	Raw	1051		1 L Plastic
110396-[redacted] -2	Dissolved Metals	HNO3	1052		250ml filter 0.45um
110396-[redacted] -3	BTEX	HCL	1053		(2) 40 ml VOA

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:
Duplicate taken - Keller

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project #: 110396

Date: 10/14

Time: 9:00

Personnel: TE/JM

Sample Location: 110396 (b) (6)

Aquifer Type: Unconfined

Well Type: ~~Monitoring~~ Domestic

Total Depth:

SWL: feet

Measuring Point Description: TOC blackmark North

Casing Type:

Well ϕ

Well Log: ☑ Yes ☐ No

Well Locked: ☑ Yes ☐ No

Mount Type: ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
Grundfos 0.5 hp pump		
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg/L	Q (gpm)	Elapsed (gallons)
9:00	–	–	–	–	–	–		
9:05	13.8	7.73	-59	1361	680			
9:15	12.6	7.70	-57	1346	673			
9:25	12.8	7.70	-57	1350	675			

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = (6" bore calc.)

Water Description:

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396-[redacted] -1	pH, TDS, Anions	Raw	926		1 L Plastic
110396-[redacted] -2	Dissolved Metals	HNO3	927		250ml filter 0.45um
110396-[redacted] -3	BTEX	HCL	928		(2) 40 ml VOA

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:

LAND & WATER

5702 GW Sampling.xls 4-99

GROUNDWATER SAMPLING & MONITORING FORM

Project: PWS Well Threat Study
Poplar, Montana

Project # 110396

Date: 10/14/04 **Time:** 11:15

Personnel: TE/JM

Sample Location: 110396 (b) (6) [redacted]

Aquifer Type: Unconfined **Well Type:** Domestic ~~Monitoring~~

Total Depth: **SWL:** feet

Measuring Point Description: TOC blackmark North

Casing Type: **Well ϕ**

Well Log: ☑ Yes ☐ No **Well Locked:** ☑ Yes ☐ No **Mount Type:** ☐ Flush ☐ Stickup:

Purge & Sampling Equipment

Instrument	Calibration	Operational Notes:
Grundfos 0.5 hp pump		
Checkmate 90 (pH/eH/Cond/TDS)		
Dissolved Oxygen meter		

Standard Operating Procedures

Number	Description
3401, 3402	Corning Checkmate 90: pH, Eh, Conductivity, TDS
4203	Well Static Water Level Measurement Using Solinst Well Probe
5201	Monitoring Well Purging & Sampling
5211	Major Minerals (INORGANICS) Sampling
5212	Volatile Organic Analysis (VOA) Sampling
6210	Groundwater Equipment Decontamination
8210	Sample Packaging & Shipping for Groundwater Samples
8300, 8400, 8500	Field QA/QC, Sample Custody, Sample ID and Analytical Results

Well Evacuation & Monitoring Data

Time	Temp (deg C)	pH	Eh (mV)	Conductivity (uS)	TDS (mg/L)	DO mg/L	Q (gpm)	Elapsed (gallons)
11:15	—	—	—	—	—			
11:25	11.5	7.30	-34	4190	2095			
11:35	11.1	7.23	-30	4240	2120			
11:45	11.0	7.19	-28	4250	2125			
11:55	10.9	7.18	-27	4260	2130			

Bore Volume Calculation: $(\pi\phi^2/4)\cdot(TD-SWL)\cdot(7.48\ gal/ft^3)$ = (6" bore calc.)

Water Description:

Sampling Data

Bottle Label	Sampling Parameter	Preservative	Sample Time	Sample Qualifier	Other
110396- [redacted]	pH, TDS, Anions	Raw	1156		1 L Plastic
110396- [redacted]	Dissolved Metals	HNO3	1157		250ml filter 0.45um
110396- [redacted]	BTEX	HCL	1158		(2) 40 ml VOA

Samples analyzed by: Energy Laboratories (800) 735-4489
1120 South 27th St. Billings, MT 59107

Comments:

LAND & WATER

5702 GW Sampling.xls 4-99

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-006
Client Sample ID: 110396 LAWM01

Report Date: 10/29/04
Collection Date: 10/13/04 13:31
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.0	s.u.		0.1		E150.1	10/15/04 17:05 / klc
Solids, Total Dissolved TDS @ 180 C	2550	mg/L		10		A2540 C	10/15/04 17:01 / qed
INORGANICS							
Bicarbonate as HCO3	837	mg/L		2		A2320 B	10/18/04 13:47 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:47 / klc
Chloride	21	mg/L		1		E300.0	10/18/04 12:54 / qed
Sulfate	1270	mg/L	D	5		E300.0	10/18/04 12:54 / qed
METALS, DISSOLVED							
Calcium	302	mg/L		1		E200.7	10/19/04 13:00 / rlh
Magnesium	189	mg/L		1		E200.7	10/19/04 13:00 / rlh
Potassium	19	mg/L		1		E200.7	10/19/04 13:00 / rlh
Sodium	193	mg/L	D	2		E200.7	10/19/04 13:00 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 22:28 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 22:28 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 22:28 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 22:28 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 22:28 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 22:28 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 22:28 / bjm
Surr: Trifluorotoluene	108	%REC			80-120	SW8021B	10/21/04 22:28 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-007
Client Sample ID: 110396 LAWM02

Report Date: 10/29/04
Collection Date: 10/12/04 18:41
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.1	s.u.		0.1		E150.1	10/15/04 17:05 / klc
Solids, Total Dissolved TDS @ 180 C	3140	mg/L		10		A2540 C	10/15/04 17:03 / qed
INORGANICS							
Bicarbonate as HCO3	667	mg/L		2		A2320 B	10/18/04 13:56 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:56 / klc
Chloride	223	mg/L	D	2		E300.0	10/18/04 13:05 / qed
Sulfate	1410	mg/L	D	10		E300.0	10/18/04 13:05 / qed
METALS, DISSOLVED							
Calcium	240	mg/L		1		E200.7	10/18/04 15:02 / rlh
Magnesium	164	mg/L		1		E200.7	10/18/04 15:02 / rlh
Potassium	10	mg/L		1		E200.7	10/18/04 15:02 / rlh
Sodium	432	mg/L	D	2		E200.7	10/18/04 15:02 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 23:38 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 23:38 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 23:38 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 23:38 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 23:38 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 23:38 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 23:38 / bjm
Surr: Trifluorotoluene	112	%REC			80-120	SW8021B	10/21/04 23:38 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-005
Client Sample ID: 110396 LAWM03

Report Date: 10/29/04
Collection Date: 10/13/04 11:41
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.1	s.u.		0.1		E150.1	10/15/04 17:05 / klc
Solids, Total Dissolved TDS @ 180 C	3680	mg/L		10		A2540 C	10/15/04 17:00 / qed
INORGANICS							
Bicarbonate as HCO3	580	mg/L		2		A2320 B	10/18/04 13:40 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:40 / klc
Chloride	988	mg/L	D	2		E300.0	10/18/04 12:42 / qed
Sulfate	1100	mg/L	D	10		E300.0	10/18/04 12:42 / qed
METALS, DISSOLVED							
Calcium	322	mg/L		1		E200.7	10/18/04 14:37 / rlh
Magnesium	189	mg/L		1		E200.7	10/18/04 14:37 / rlh
Potassium	11	mg/L		1		E200.7	10/18/04 14:37 / rlh
Sodium	556	mg/L	D	3		E200.7	10/18/04 14:37 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 21:53 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 21:53 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 21:53 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 21:53 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 21:53 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 21:53 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 21:53 / bjm
Surr: Trifluorotoluene	108	%REC			80-120	SW8021B	10/21/04 21:53 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-004
Client Sample ID: 110396 LAWM04

Report Date: 10/29/04
Collection Date: 10/13/04 10:31
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.4	s.u.		0.1		E150.1	10/15/04 17:04 / klc
Solids, Total Dissolved TDS @ 180 C	1920	mg/L		10		A2540 C	10/15/04 16:59 / qed
INORGANICS							
Bicarbonate as HCO3	401	mg/L		2		A2320 B	10/18/04 13:32 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:32 / klc
Chloride	821	mg/L		1		E300.0	10/18/04 12:31 / qed
Sulfate	196	mg/L	D	5		E300.0	10/18/04 12:31 / qed
METALS, DISSOLVED							
Calcium	139	mg/L		1		E200.7	10/19/04 12:56 / rlh
Magnesium	88	mg/L		1		E200.7	10/19/04 12:56 / rlh
Potassium	10	mg/L		1		E200.7	10/19/04 12:56 / rlh
Sodium	388	mg/L	D	2		E200.7	10/19/04 12:56 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 21:17 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 21:17 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 21:17 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 21:17 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 21:17 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 21:17 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 21:17 / bjm
Surr: Trifluorotoluene	111	%REC			80-120	SW8021B	10/21/04 21:17 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-003
Client Sample ID: 110396 LAWM05

Report Date: 10/29/04
Collection Date: 10/12/04 16:41
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	10/15/04 17:04 / klc
Solids, Total Dissolved TDS @ 180 C	3140	mg/L		10		A2540 C	10/15/04 16:57 / qed
INORGANICS							
Bicarbonate as HCO3	772	mg/L		2		A2320 B	10/18/04 13:24 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:24 / klc
Chloride	225	mg/L	D	2		E300.0	10/18/04 12:19 / qed
Sulfate	1430	mg/L	D	10		E300.0	10/18/04 12:19 / qed
METALS, DISSOLVED							
Calcium	257	mg/L		1		E200.7	10/19/04 12:51 / rlh
Magnesium	174	mg/L		1		E200.7	10/19/04 12:51 / rlh
Potassium	11	mg/L		1		E200.7	10/19/04 12:51 / rlh
Sodium	440	mg/L	D	2		E200.7	10/19/04 12:51 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 20:07 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 20:07 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 20:07 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 20:07 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 20:07 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 20:07 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 20:07 / bjm
Surr: Trifluorotoluene	110	%REC			80-120	SW8021B	10/21/04 20:07 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-002
Client Sample ID: 110396 LAWM06

Report Date: 10/29/04
Collection Date: 10/12/04 14:31
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.7	s.u.		0.1		E150.1	10/15/04 17:03 / klc
Solids, Total Dissolved TDS @ 180 C	890	mg/L		10		A2540 C	10/15/04 16:56 / qed
INORGANICS							
Bicarbonate as HCO3	530	mg/L		2		A2320 B	10/18/04 13:16 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:16 / klc
Chloride	91	mg/L		1		E300.0	10/18/04 11:44 / qed
Sulfate	211	mg/L	D	3		E300.0	10/18/04 11:44 / qed
METALS, DISSOLVED							
Calcium	48	mg/L		1		E200.7	10/19/04 12:47 / rlh
Magnesium	27	mg/L		1		E200.7	10/19/04 12:47 / rlh
Potassium	5	mg/L		1		E200.7	10/19/04 12:47 / rlh
Sodium	225	mg/L		1		E200.7	10/19/04 12:47 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 19:32 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 19:32 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 19:32 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 19:32 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 19:32 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 19:32 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 19:32 / bjm
Surr: Trifluorotoluene	101	%REC			80-120	SW8021B	10/21/04 19:32 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04100950-001
Client Sample ID: 110396 LAWM07

Report Date: 10/29/04
Collection Date: 10/12/04 12:15
Date Received: 10/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.7	s.u.		0.1		E150.1	10/15/04 17:03 / klc
Solids, Total Dissolved TDS @ 180 C	778	mg/L		10		A2540 C	10/15/04 16:55 / qed
INORGANICS							
Bicarbonate as HCO3	547	mg/L		2		A2320 B	10/18/04 13:08 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/18/04 13:08 / klc
Chloride	16	mg/L		1		E300.0	10/18/04 11:09 / qed
Sulfate	200	mg/L	D	3		E300.0	10/18/04 11:09 / qed
METALS, DISSOLVED							
Calcium	35	mg/L		1		E200.7	10/18/04 14:20 / rlh
Magnesium	20	mg/L		1		E200.7	10/18/04 14:20 / rlh
Potassium	5	mg/L		1		E200.7	10/18/04 14:20 / rlh
Sodium	205	mg/L		1		E200.7	10/18/04 14:20 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 18:57 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 18:57 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 18:57 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 18:57 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 18:57 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 18:57 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 18:57 / bjm
Surr: Trifluorotoluene	110	%REC			80-120	SW8021B	10/21/04 18:57 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04101082-006
Client Sample ID: Trip Blank

Report Date: 10/28/04
Collection Date: 10/13/04 14:51
Date Received: 10/19/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 15:30 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 15:30 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 15:30 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 15:30 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 15:30 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 15:30 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 15:30 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	10/21/04 15:30 / bjm

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene, Toluene, Ethylbenzene, and m+p-Xylenes.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES
ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/27/04
Work Order: B04101082

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: PE2_041021A	
Sample ID: CCV_1021PE205r-W	Continuing Calibration Verification Standard							10/21/04 12:18	
Methyl tert-butyl ether (MTBE)	65.0	ug/L	1.0	108	85	115			
Benzene	19.3	ug/L	0.50	96.5	85	115			
Toluene	60.3	ug/L	0.50	101	85	115			
Ethylbenzene	20.1	ug/L	0.50	101	85	115			
m+p-Xylenes	79.1	ug/L	0.50	98.9	85	115			
o-Xylene	39.3	ug/L	0.50	98.1	85	115			
Xylenes, Total	118	ug/L	0.50	98.6	85	115			
Surr: Trifluorotoluene			0.50	106	85	115			
Method: SW8021B								Batch: R49664	
Sample ID: B04101082-001CMS	Sample Matrix Spike							10/22/04 15:51	
Methyl tert-butyl ether (MTBE)	51.7	ug/L	2.0	103	70	130			
Benzene	47.5	ug/L	1.0	94.9	70	130			
Toluene	49.1	ug/L	1.0	98.3	70	130			
Ethylbenzene	47.8	ug/L	1.0	95.6	70	130			
m+p-Xylenes	93.6	ug/L	1.0	93.6	70	130			
o-Xylene	47.2	ug/L	1.0	94.4	70	130			
Xylenes, Total	141	ug/L	1.0	93.9	70	130			
Surr: Trifluorotoluene			1.0	102	80	120			
Sample ID: B04101082-001CMSD	Sample Matrix Spike Duplicate							10/22/04 16:54	
Methyl tert-butyl ether (MTBE)	52.1	ug/L	2.0	104	70	130	0.8	20	
Benzene	47.9	ug/L	1.0	95.7	70	130	0.8	20	
Toluene	49.6	ug/L	1.0	99.3	70	130	1.0	20	
Ethylbenzene	48.3	ug/L	1.0	96.5	70	130	0.9	20	
m+p-Xylenes	94.1	ug/L	1.0	94.1	70	130	0.5	20	
o-Xylene	47.9	ug/L	1.0	95.8	70	130	1.5	20	
Xylenes, Total	142	ug/L	1.0	94.7	70	130			
Surr: Trifluorotoluene			1.0	103	80	120	0	20	
Sample ID: LCS_1021PE203r	Laboratory Control Spike							10/21/04 11:15	
Methyl tert-butyl ether (MTBE)	18.5	ug/L	1.0	92.7	70	130			
Benzene	17.2	ug/L	0.50	86.1	70	130			
Toluene	19.5	ug/L	0.50	97.3	70	130			
Ethylbenzene	19.6	ug/L	0.50	97.9	70	130			
m+p-Xylenes	38.5	ug/L	0.50	96.3	70	130			
o-Xylene	19.6	ug/L	0.50	97.8	70	130			
Xylenes, Total	58.1	ug/L	0.50	96.8	70	130			
Surr: Trifluorotoluene			0.50	106	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/27/04
Work Order: B04101082

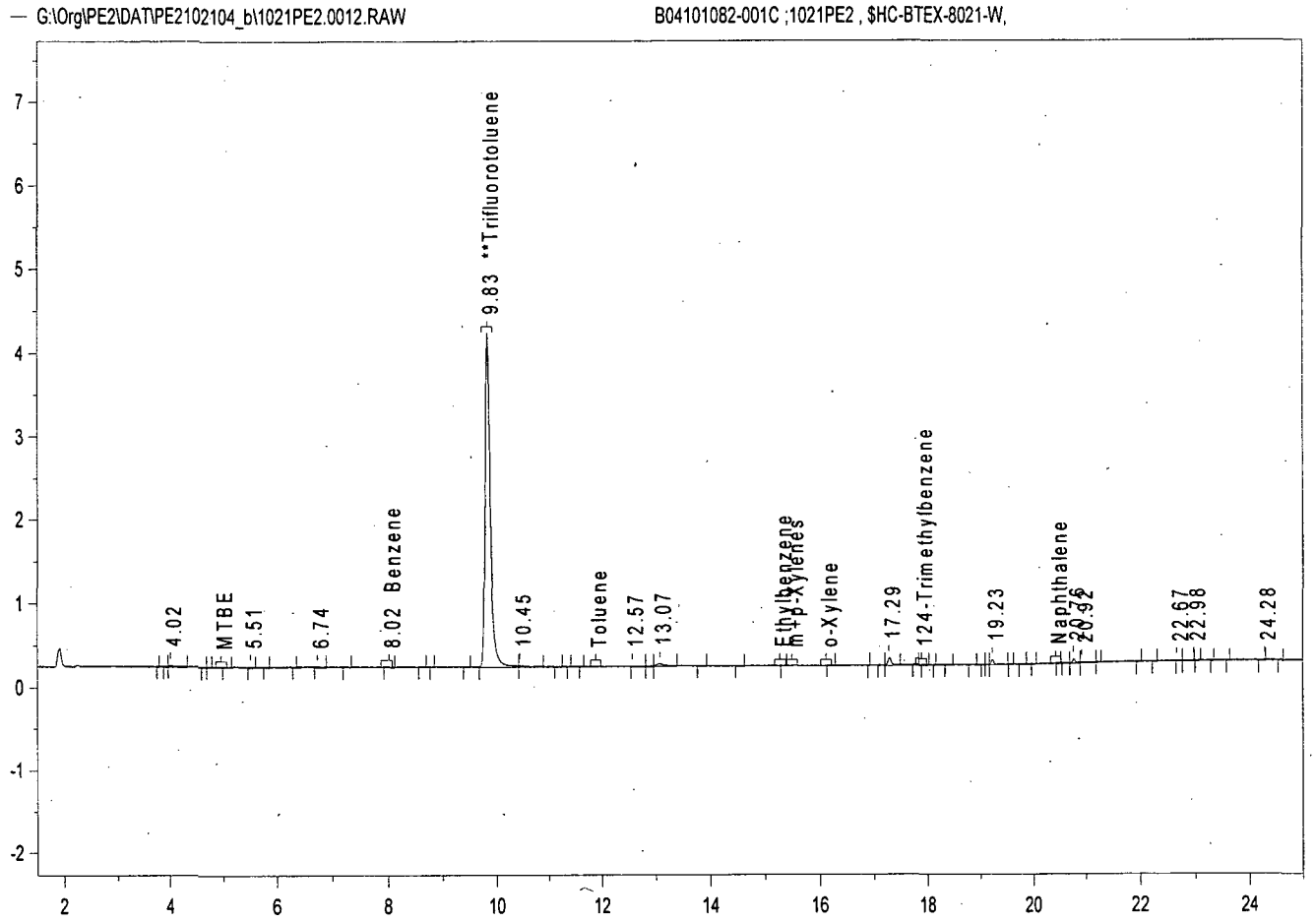
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B									Batch: R49664
Sample ID: MBLK_1021PE208r	Method Blank								10/21/04 13:53
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Benzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: Trifluorotoluene			0.50	98.6	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com



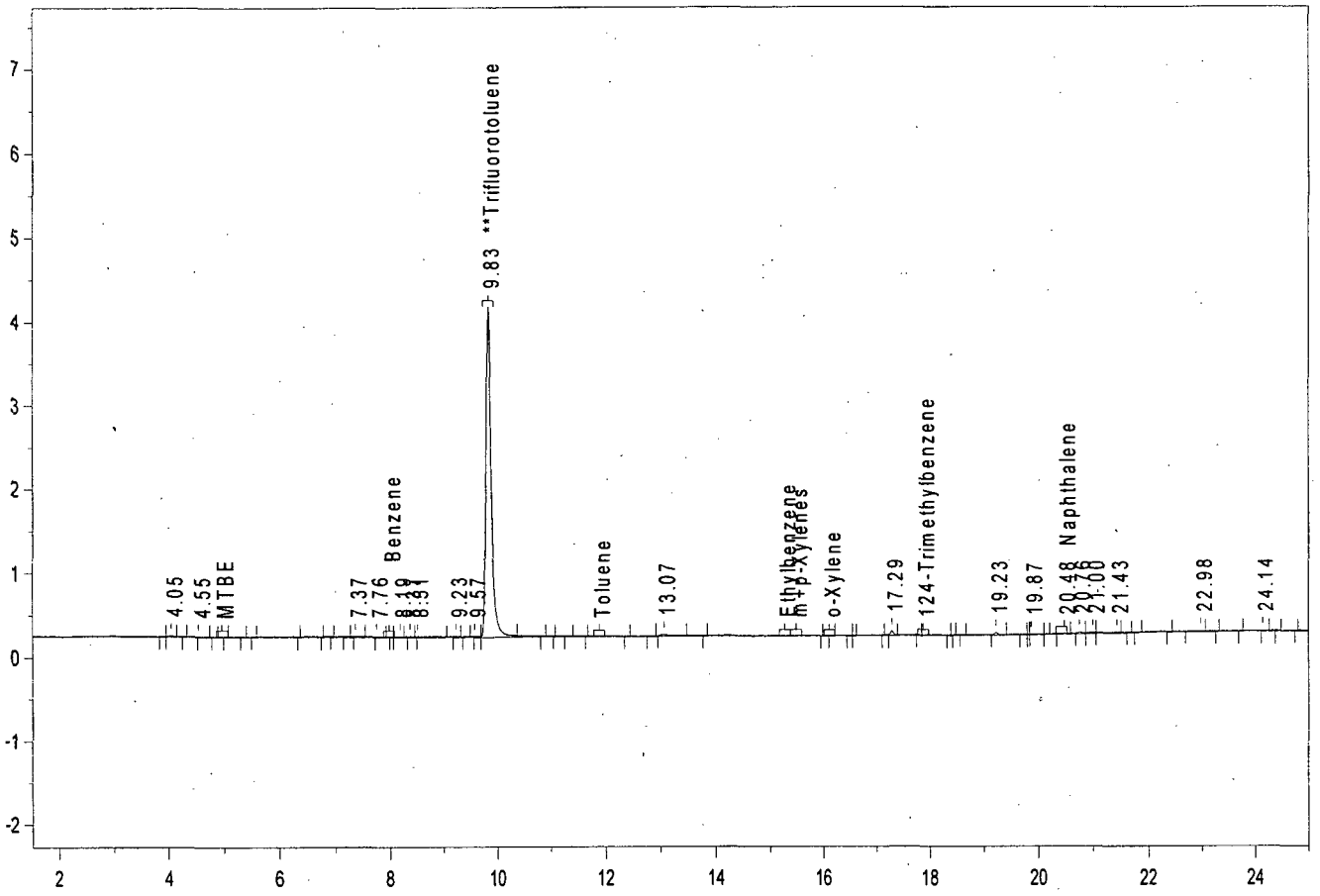
PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-001C ;1021PE2 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE2\DAT\PE2102104_b\1021PE2.0012.RAW
Date & Time Acquired: 10/21/2004 4:02:00 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	8.025	8.025	8.025	91	.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.833	50.	53.704	107.41	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

G:\Org\PE2\DAT\PE2102104_b\1021PE2.0014.RAW B04101082-002C ;1021PE2 , $HC-BTEX-8021-W,



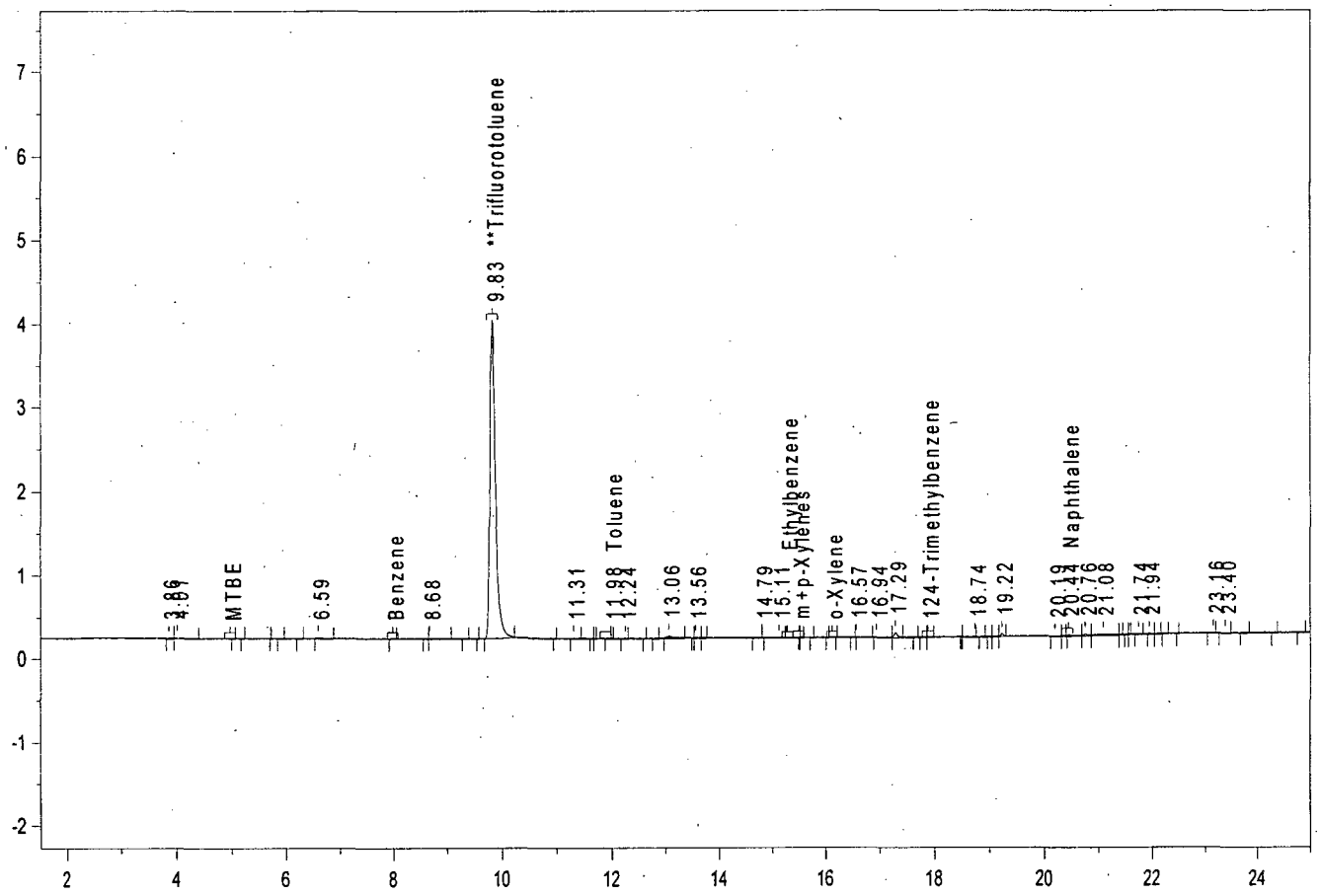
PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-002C ;1021PE2 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE2\DAT\PE2102104_b\1021PE2.0014.RAW
Date & Time Acquired: 10/21/2004 5:04:52 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	20.475	20.475	20.475	119	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.83	50.	52.932	105.86	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

G:\Org\PE2\DAT\PE2102104_b\1021PE2.0016.RAW B04101082-003C ;1021PE2 , $HC-BTEX-8021-W,

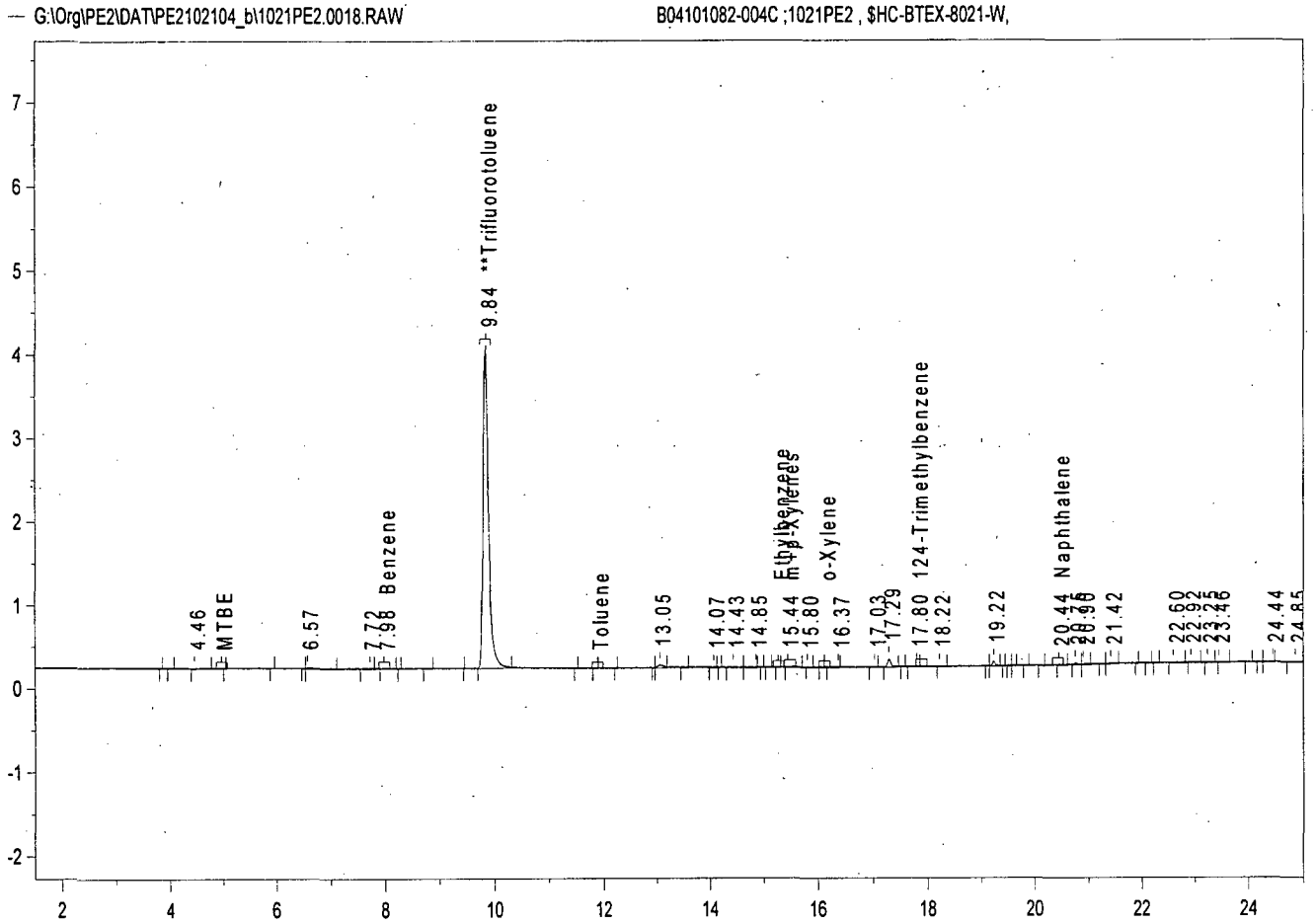


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-003C ;1021PE2 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE2\DAT\PE2102104_b\1021PE2.0016.RAW
Date & Time Acquired: 10/21/2004 6:08:40 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	11.982	11.982	11.982	83	.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	20.443	20.443	20.443	195	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.831	50.	50.641	101.28	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

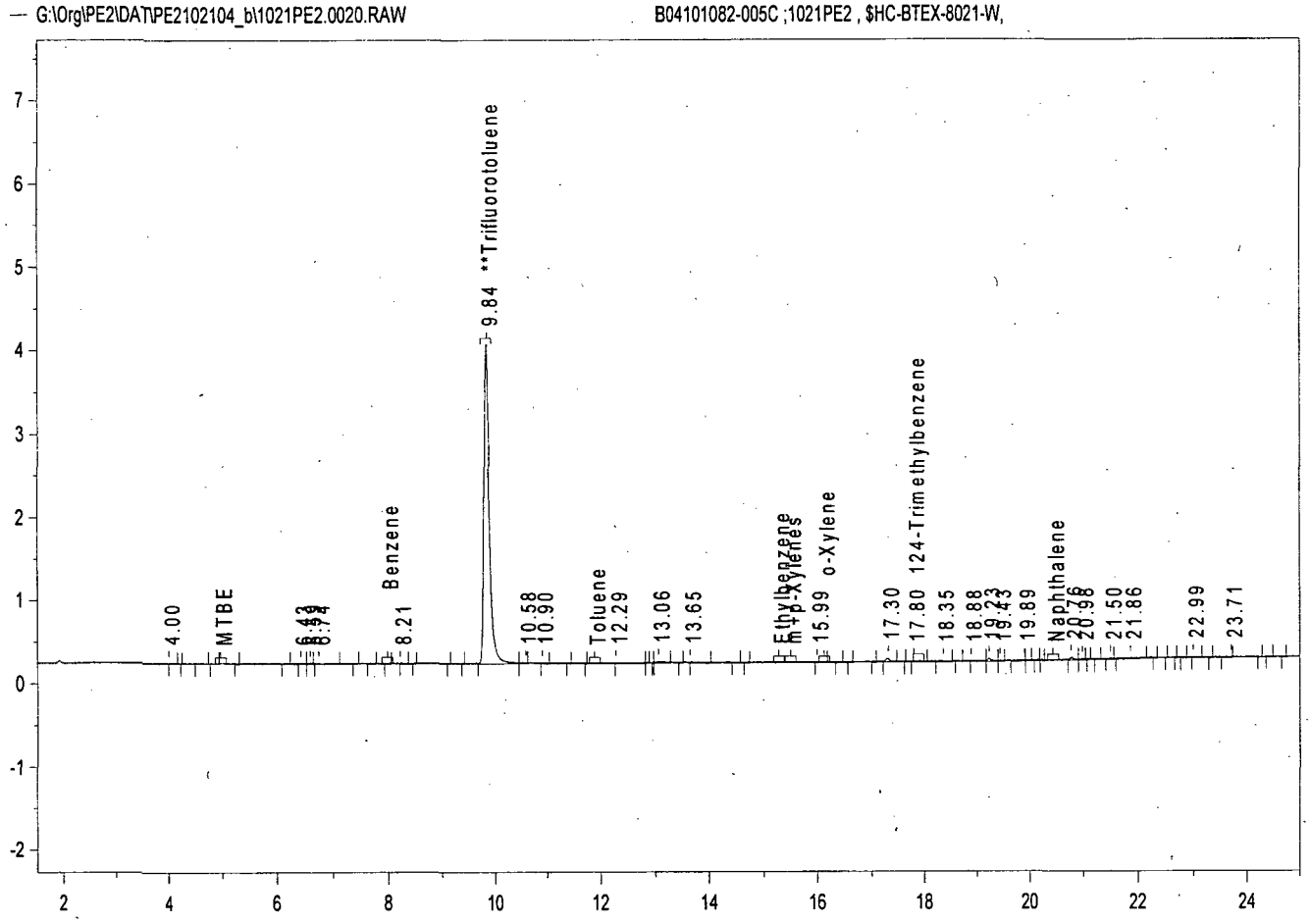


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-004C ;1021PE2 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE2\DAT\PE2102104_b\1021PE2.0018.RAW
Date & Time Acquired: 10/21/2004 7:12:16 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.978	7.978	7.978	127	.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	15.44	15.44	15.44	241	.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	17.799	17.799	17.799	134	2.	U
Naphthalene	20.442	20.442	20.442	114	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.837	50.	52.21	104.42	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

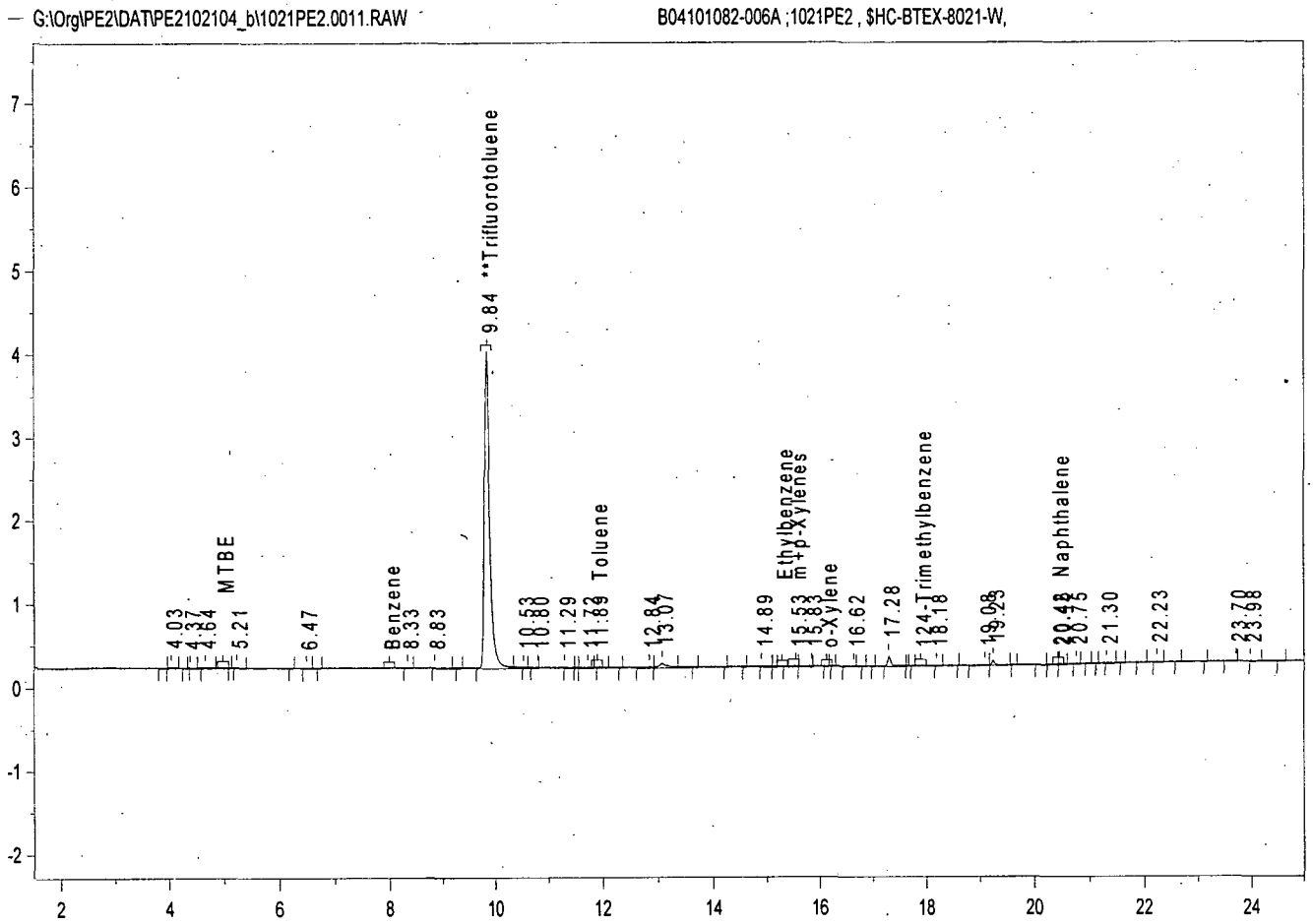


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-005C ;1021PE2 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE2\DAT\PE2102104_b\1021PE2.0020.RAW
Date & Time Acquired: 10/21/2004 8:15:57 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	17.799	17.799	17.799	174	2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.837	50.	52.433	104.87	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

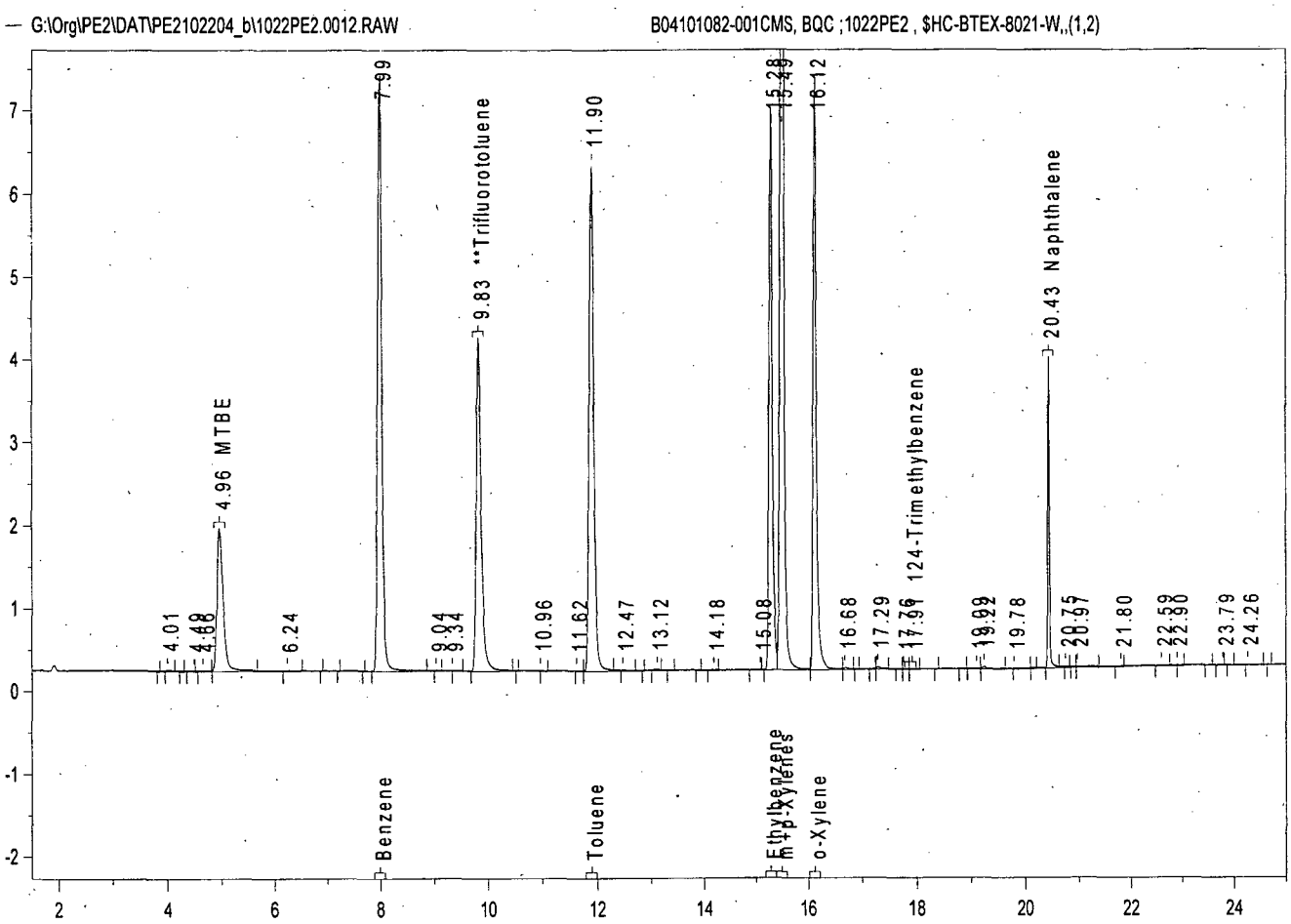


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-006A ;1021PE2 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE2\DAT\PE2102104_b\1021PE2.0011.RAW
Date & Time Acquired: 10/21/2004 3:30:37 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	11.888	11.888	11.888	148	.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	15.526	15.526	15.526	145	.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	20.419	20.419	20.419	94	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.836	50.	51.998	104.	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

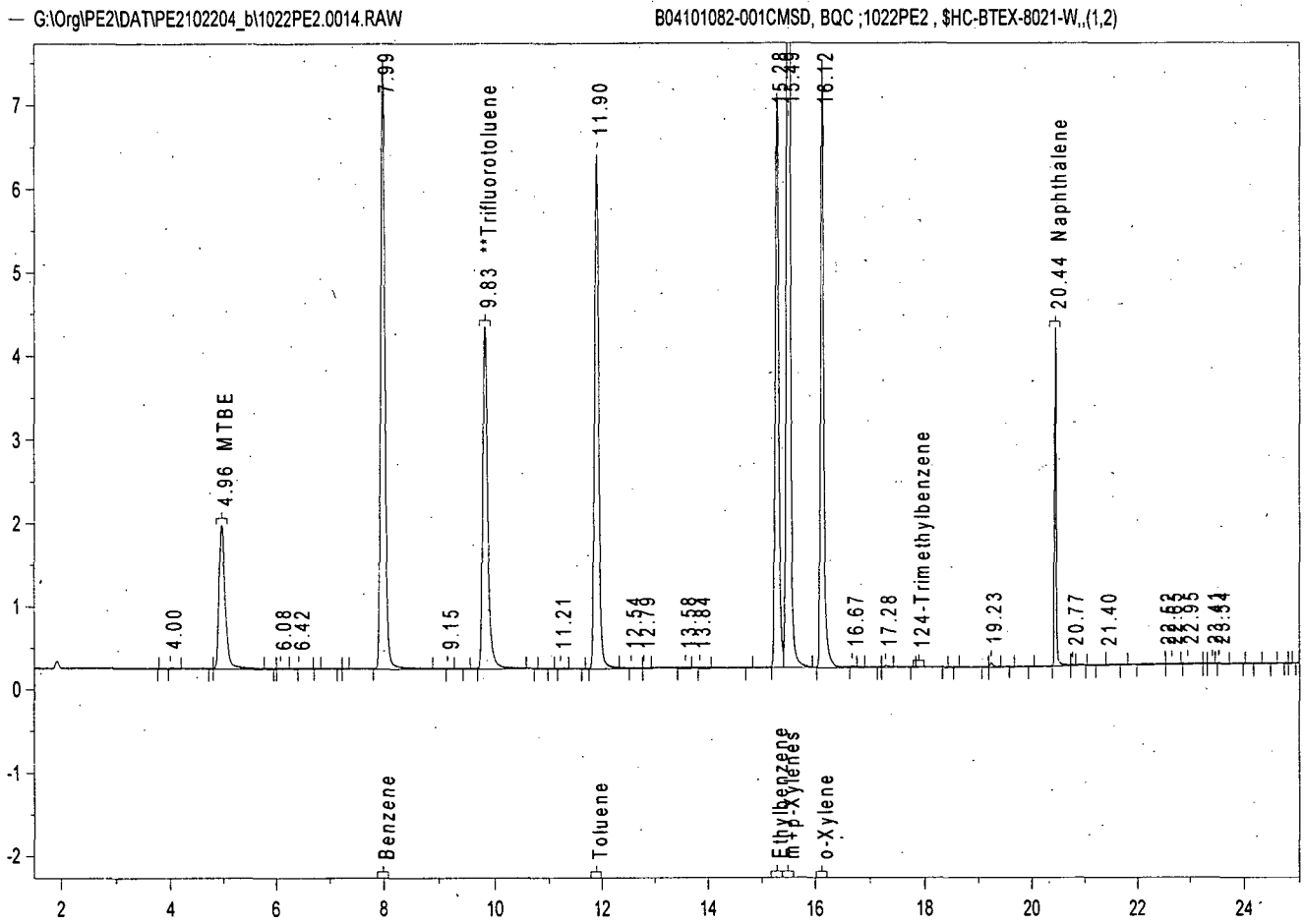


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-001CMS, BQC ;1022PE2 , $HC-BTEX-8021-W,,(1,2)
Raw File: G:\Org\PE2\DAT\PE2102204_b\1022PE2.0012.RAW
Date & Time Acquired: 10/22/2004 3:51:50 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	4.964	4.856	4.865	14348	51.721	
Benzene	7.991	1.839	1.837	39690	47.473	
Toluene	11.897	-2.064	-2.069	35769	49.132	
Ethylbenzene	15.28	-5.449	-5.451	30890	47.82	
m+p-Xylenes	15.493	-5.664	-5.664	71888	93.649	
o-Xylene	16.119	-6.292	-6.291	30428	47.197	
124-Trimethylbenzene	17.912	17.912	17.912	125	4.	U
Naphthalene	20.433	-10.6	-10.605	8507	50.416	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.829	100.	101.988	101.99	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com



PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04101082-001CMSD, BQC ;1022PE2 , $HC-BTEX-8021-W,,(1,2)
Raw File: G:\Org\PE2\DAT\PE2102204_b\1022PE2.0014.RAW
Date & Time Acquired: 10/22/2004 4:54:45 PM
Method File: G:\Org\PE2\Methods\08P204.MET
Calibration File: G:\Org\PE2\Cals\08MAQ04.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	4.964	4.856	4.862	14464	52.14	
Benzene	7.988	1.839	1.838	40007	47.852	
Toluene	11.897	-2.064	-2.071	36144	49.647	
Ethylbenzene	15.28	-5.449	-5.454	31168	48.25	
m+p-Xylenes	15.493	-5.664	-5.668	72253	94.125	
o-Xylene	16.121	-6.292	-6.295	30873	47.887	
124-Trimethylbenzene	.	.	.		4.	U
Naphthalene	20.436	-10.6	-10.61	9144	54.19	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**Trifluorotoluene	9.826	100.	103.299	103.3	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/26/04
Work Order: B04101082

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B								Batch: ALK041020A	
Sample ID: LCS_041020A	Laboratory Control Spike							10/21/04 09:05	
Alkalinity, Total as CaCO3	107	mg/L	2.0	107	90	110			
Sample ID: B04100886-004B MS	Sample Matrix Spike							10/21/04 09:17	
Alkalinity, Total as CaCO3	720	mg/L	2.0	103	80	120			
Sample ID: B04100886-004B MSD	Sample Matrix Spike Duplicate							10/21/04 09:23	
Alkalinity, Total as CaCO3	728	mg/L	2.0	104	80	120	1.1	20	
Sample ID: B04101081-005A MS	Sample Matrix Spike							10/21/04 10:29	
Alkalinity, Total as CaCO3	665	mg/L	2.0	104	80	120			
Sample ID: B04101081-005A MSD	Sample Matrix Spike Duplicate							10/21/04 10:36	
Alkalinity, Total as CaCO3	659	mg/L	2.0	105	80	120	0.9	20	
Sample ID: MBLK_041021A	Method Blank							10/21/04 11:19	
Alkalinity, Total as CaCO3	ND	mg/L	2						
Bicarbonate as HCO3	2	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Sample ID: LCS_041020A	Laboratory Control Spike							10/21/04 11:22	
Alkalinity, Total as CaCO3	105	mg/L	2.0	105	90	110			
Sample ID: B04101082-005A MS	Sample Matrix Spike							10/21/04 12:37	
Alkalinity, Total as CaCO3	1590	mg/L	2.0	105	80	120			
Sample ID: B04101082-005A MSD	Sample Matrix Spike Duplicate							10/21/04 12:46	
Alkalinity, Total as CaCO3	1580	mg/L	2.0	103	80	120	0.7	20	
Sample ID: MBLK_041021A	Method Blank							10/21/04 13:47	
Alkalinity, Total as CaCO3	ND	mg/L	2						
Bicarbonate as HCO3	ND	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Sample ID: LCS_041020A	Laboratory Control Spike							10/21/04 13:49	
Alkalinity, Total as CaCO3	106	mg/L	2.0	106	90	110			
Sample ID: B04101118-001A MS	Sample Matrix Spike							10/21/04 14:23	
Alkalinity, Total as CaCO3	776	mg/L	2.0	117	80	120			
Sample ID: B04101118-001A MSD	Sample Matrix Spike Duplicate							10/21/04 14:29	
Alkalinity, Total as CaCO3	678	mg/L	2.0	99.7	80	120	14	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/26/04
Work Order: B04101082

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C								Batch: TDS041019A	
Sample ID: MBLK1	Method Blank							10/19/04 17:05	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LFB1	Sample Matrix Spike							10/19/04 17:05	
Solids, Total Dissolved TDS @ 180 C	1060	mg/L	10	99.2	80	120			
Sample ID: B04101064-007A MS	Sample Matrix Spike							10/19/04 17:06	
Solids, Total Dissolved TDS @ 180 C	1830	mg/L	10	99.7	80	120			
Sample ID: B04101064-007A MSD	Sample Matrix Spike Duplicate							10/19/04 17:07	
Solids, Total Dissolved TDS @ 180 C	1860	mg/L	10	99.7	80	120	1.4	20	
Sample ID: MBLK2	Method Blank							10/19/04 17:24	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LFB2	Sample Matrix Spike							10/19/04 17:24	
Solids, Total Dissolved TDS @ 180 C	1070	mg/L	10	99.4	80	120			
Sample ID: B04101081-006A MS	Sample Matrix Spike							10/19/04 17:26	
Solids, Total Dissolved TDS @ 180 C	5500	mg/L	10	103	80	120			
Sample ID: B04101081-006A MSD	Sample Matrix Spike Duplicate							10/19/04 17:26	
Solids, Total Dissolved TDS @ 180 C	5430	mg/L	10	103	80	120	1.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/26/04
Work Order: B04101082

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E150.1								Batch: PHSC041019A	
Sample ID: PHC10602	Laboratory Control Spike							10/19/04 11:34	
pH	4.04	s.u.	0.10	101	90	110			
Sample ID: B04101057-007A	Sample Duplicate							10/19/04 14:39	
pH	3.65	s.u.	0.10				0.3	10	
Sample ID: B04100950-005A	Sample Duplicate							10/19/04 15:02	
pH	7.36	s.u.	0.10				0	10	
Sample ID: B04101064-007A	Sample Duplicate							10/19/04 15:57	
pH	5.14	s.u.	0.10				1.0	10	
Sample ID: B04101081-001A	Sample Duplicate							10/19/04 16:12	
pH	7.31	s.u.	0.10				0.7	10	
Sample ID: B04101082-001A	Sample Duplicate							10/19/04 16:25	
pH	7.48	s.u.	0.10				0.8	10	
Sample ID: B04101088-004A	Sample Duplicate							10/19/04 17:11	
pH	7.24	s.u.	0.10				0.1	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/26/04
Work Order: B04101082

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R49454
Sample ID: MB-SPDIS041020A	Method Blank								10/20/04 11:00
Calcium	ND	mg/L	0.02						
Magnesium	ND	mg/L	0.02						
Potassium	ND	mg/L	0.01						
Sodium	ND	mg/L	0.05						
Sample ID: B04101081-004BMS2	Sample Matrix Spike								10/20/04 13:43
Calcium	652	mg/L	1.0	98.3	69.5	130.5			
Magnesium	476	mg/L	1.0	101	69.5	130.5			
Potassium	266	mg/L	1.0	93.7	69.5	130.5			
Sodium	328	mg/L	1.5	98.3	69.5	130.5			
Sample ID: B04101081-004BMSD2	Sample Matrix Spike Duplicate								10/20/04 13:47
Calcium	659	mg/L	1.0	101	69.5	130.5	1.2	20	
Magnesium	471	mg/L	1.0	99.4	69.5	130.5	1.0	20	
Potassium	262	mg/L	1.0	92.1	69.5	130.5	1.5	20	
Sodium	320	mg/L	1.5	94.9	69.5	130.5	2.7	20	
Sample ID: B04101039-001AMS2	Sample Matrix Spike								10/20/04 14:56
Calcium	50.4	mg/L	1.0	97.6	70	130			
Magnesium	50.1	mg/L	1.0	98.1	70	130			
Potassium	49.6	mg/L	1.0	97.3	70	130			
Sodium	49.9	mg/L	1.0	95.2	70	130			
Sample ID: B04101039-001AMSD2	Sample Matrix Spike Duplicate								10/20/04 15:00
Calcium	49.2	mg/L	1.0	95.3	70	130	2.4	20	
Magnesium	48.6	mg/L	1.0	95.2	70	130	3.0	20	
Potassium	48.2	mg/L	1.0	94.6	70	130	2.8	20	
Sodium	48.6	mg/L	1.0	92.6	70	130	2.7	20	
Sample ID: B04101116-001CMS2	Sample Matrix Spike								10/20/04 19:58
Calcium	148	mg/L	1.0	94.6	69.5	130.5			
Magnesium	123	mg/L	1.0	96.6	69.5	130.5			
Potassium	108	mg/L	1.0	92.3	69.5	130.5			
Sodium	412	mg/L	1.0	100	69.5	130.5			A
Sample ID: B04101116-001CMSD2	Sample Matrix Spike Duplicate								10/20/04 20:02
Calcium	150	mg/L	1.0	96.4	69.5	130.5	1.2	20	
Magnesium	125	mg/L	1.0	98.8	69.5	130.5	1.8	20	
Potassium	108	mg/L	1.0	92.1	69.5	130.5	0.2	20	
Sodium	411	mg/L	1.0	99.1	69.5	130.5	0.3	20	A

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
A - The analyte level was greater than four times the spike level.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/26/04
Work Order: B04101082

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0									Batch: R49445
Sample ID: ICB	Method Blank								10/20/04 10:33
Chloride	ND	mg/L	0.03						
Sulfate	ND	mg/L	0.3						
Sample ID: B04101064-001A MS	Sample Matrix Spike								10/20/04 11:20
Chloride	316	mg/L	1.0	94.8	80	120			
Sulfate	2630	mg/L	5.4	101	80	120			
Sample ID: B04101064-001A MSD	Sample Matrix Spike Duplicate								10/20/04 11:43
Chloride	318	mg/L	1.0	95.9	80	120	0.7	20	
Sulfate	2650	mg/L	5.4	104	80	120	0.8	20	
Sample ID: B04101064-010A MS	Sample Matrix Spike								10/20/04 15:59
Chloride	34.7	mg/L	1.0	95.1	80	120			
Sulfate	751	mg/L	1.0	113	80	120			A
Sample ID: B04101064-010A MSD	Sample Matrix Spike Duplicate								10/20/04 16:22
Chloride	34.9	mg/L	1.0	96.4	80	120	0.7	20	
Sulfate	749	mg/L	1.0	109	80	120	0.4	20	A
Sample ID: B04101081-005A MS	Sample Matrix Spike								10/20/04 20:37
Chloride	1230	mg/L	3.1	106	80	120			
Sulfate	10800	mg/L	27	100	80	120			
Sample ID: B04101081-005A MSD	Sample Matrix Spike Duplicate								10/20/04 20:49
Chloride	1230	mg/L	3.1	105	80	120	0.2	20	
Sulfate	10900	mg/L	27	103	80	120	1.0	20	
Sample ID: B04101082-005A MS	Sample Matrix Spike								10/20/04 23:20
Chloride	572	mg/L	1.6	107	80	120			
Sulfate	3530	mg/L	14	99	80	120			
Sample ID: B04101082-005A MSD	Sample Matrix Spike Duplicate								10/20/04 23:32
Chloride	567	mg/L	1.6	106	80	120	0.8	20	
Sulfate	3500	mg/L	14	98	80	120	0.6	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
A - The analyte level was greater than four times the spike level.

Energy Laboratories Inc

Sample Receipt Checklist

Client Name Land and Water Consulting

Date and Time Received: 10/19/2004

Work Order Number B04101082

Received by klm

Checklist completed by: Krystal McDaniel 10/19/04 (Signature / Date)

Reviewed by _____ (Initials / Date)

Carrier name UPS ARS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	4 °C On Ice
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Adjusted? _____ Checked by Kn

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments:

Corrective Action

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/27/04
Work Order: B04100950

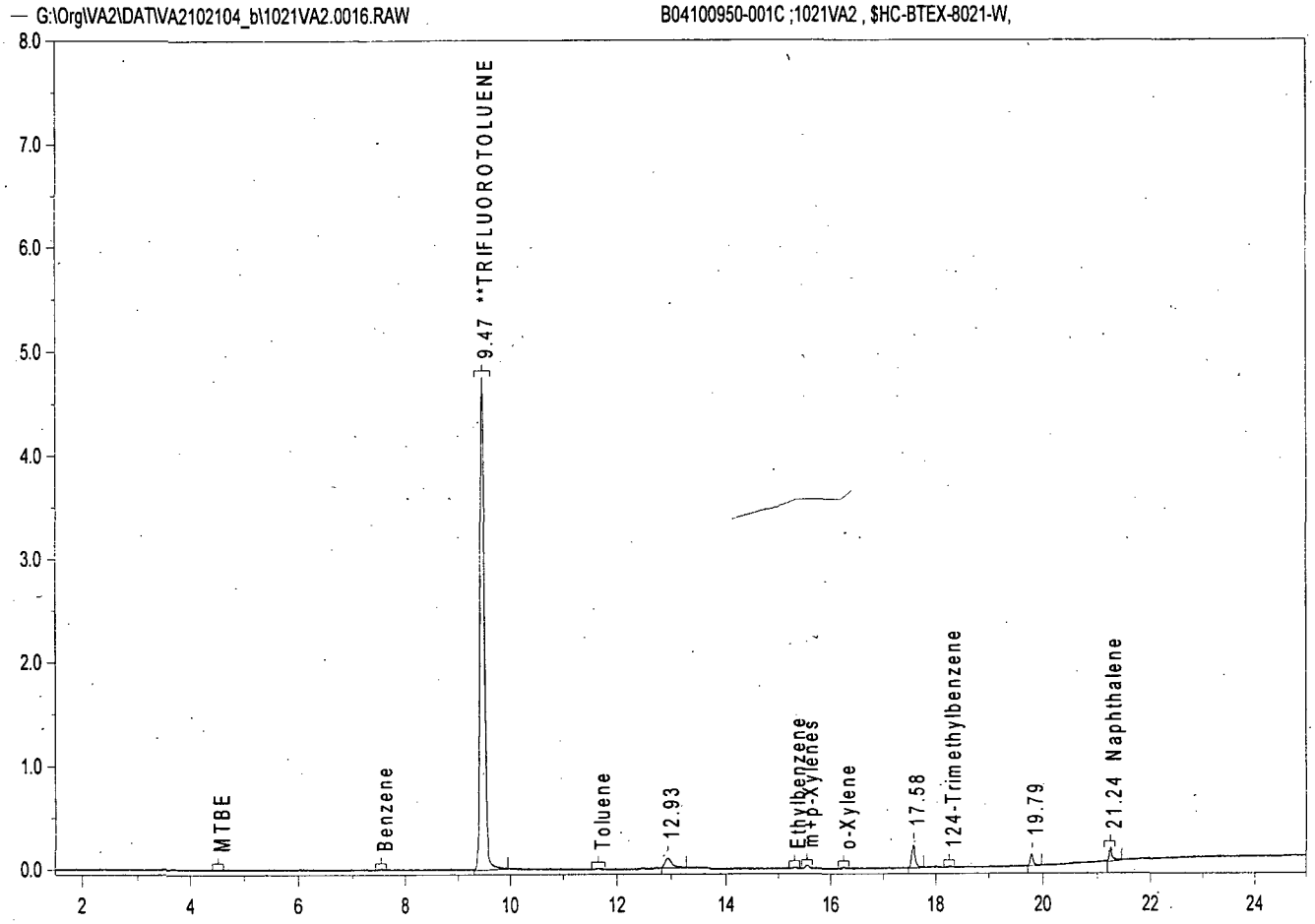
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: VARIAN2_041021B	
Sample ID: CCV_1021VA204r-W	Continuing Calibration Verification Standard							10/21/04 11:57	
Methyl tert-butyl ether (MTBE)	60.7	ug/L	1.0	101	85	115			
Benzene	21.4	ug/L	0.50	107	85	115			
Toluene	64.1	ug/L	0.50	107	85	115			
Ethylbenzene	21.6	ug/L	0.50	108	85	115			
m+p-Xylenes	84.9	ug/L	0.50	106	85	115			
o-Xylene	42.3	ug/L	0.50	106	85	115			
Xylenes, Total	127	ug/L	0.50	106	85	115			
Surr: Trifluorotoluene			0.50	112	85	115			
Method: SW8021B								Batch: R49702	
Sample ID: LCS_1021VA203r	Laboratory Control Spike							10/21/04 11:22	
Methyl tert-butyl ether (MTBE)	18.4	ug/L	1.0	92.1	70	130			
Benzene	19.0	ug/L	0.50	94.8	70	130			
Toluene	21.1	ug/L	0.50	106	70	130			
Ethylbenzene	20.7	ug/L	0.50	103	70	130			
m+p-Xylenes	44.6	ug/L	0.50	111	70	130			
o-Xylene	21.7	ug/L	0.50	108	70	130			
Xylenes, Total	66.2	ug/L	0.50	110	70	130			
Surr: Trifluorotoluene			0.50	108	80	120			
Sample ID: MBLK_1021VA209r	Method Blank							10/21/04 14:53	
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Benzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: Trifluorotoluene			0.50	101	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

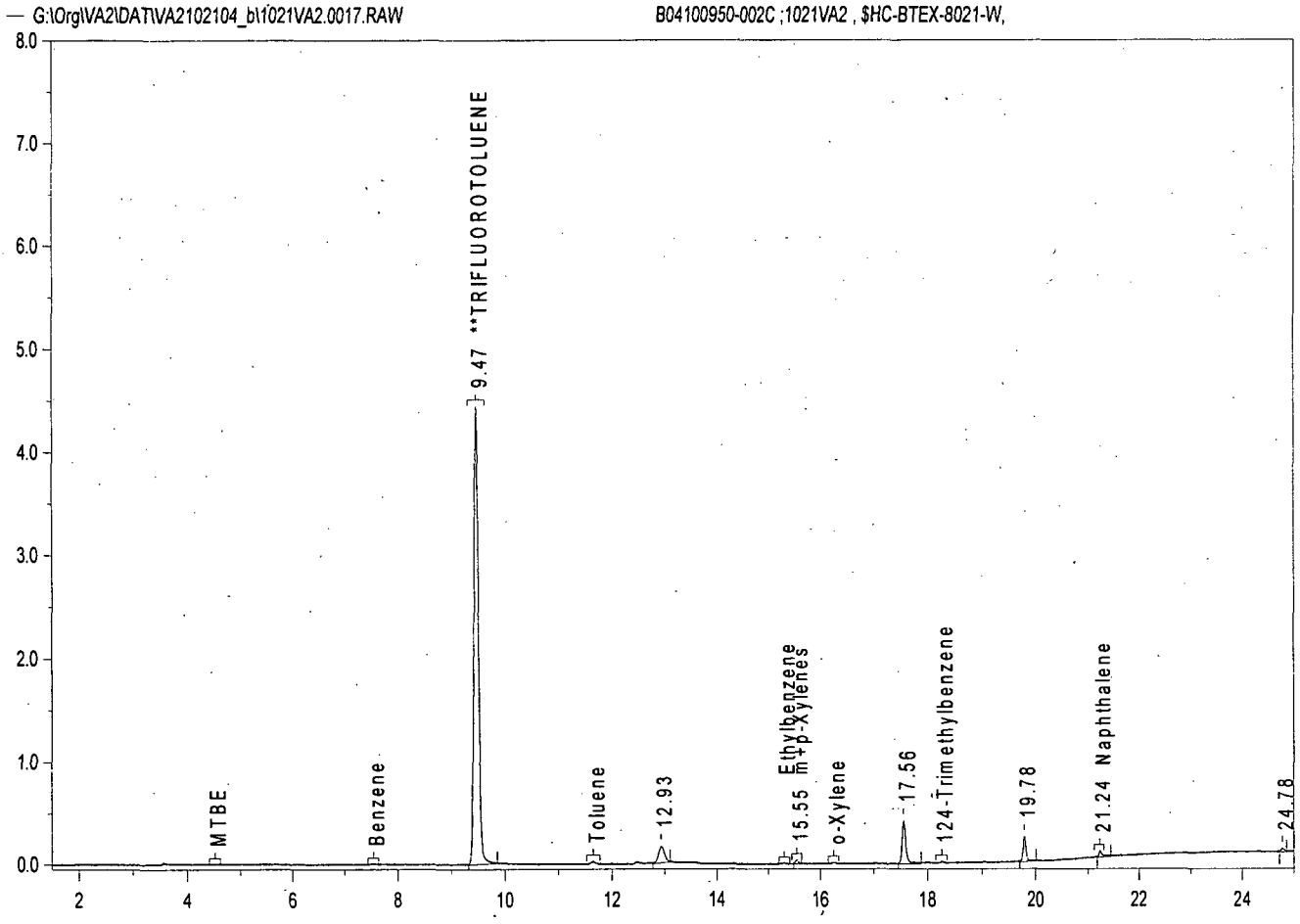


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-001C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0016.RAW
Date & Time Acquired: 10/21/2004 6:57:54 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.	558	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.47	50.	54.888	109.78	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

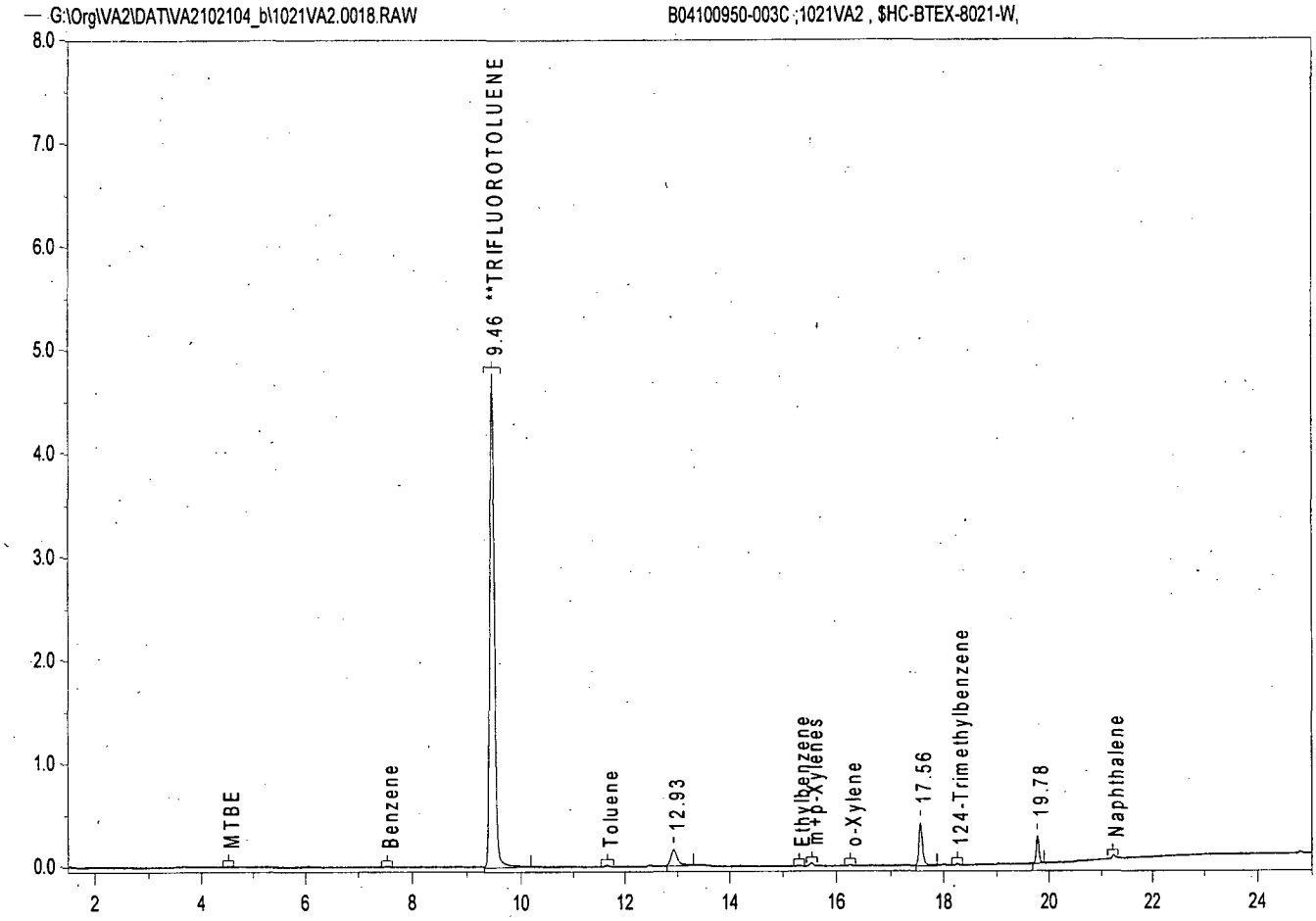


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-002C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0017.RAW
Date & Time Acquired: 10/21/2004 7:32:53 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	15.548	15.548	15.548	182	.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	21.236	21.236	21.236	352	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.471	50.	50.49	100.98	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

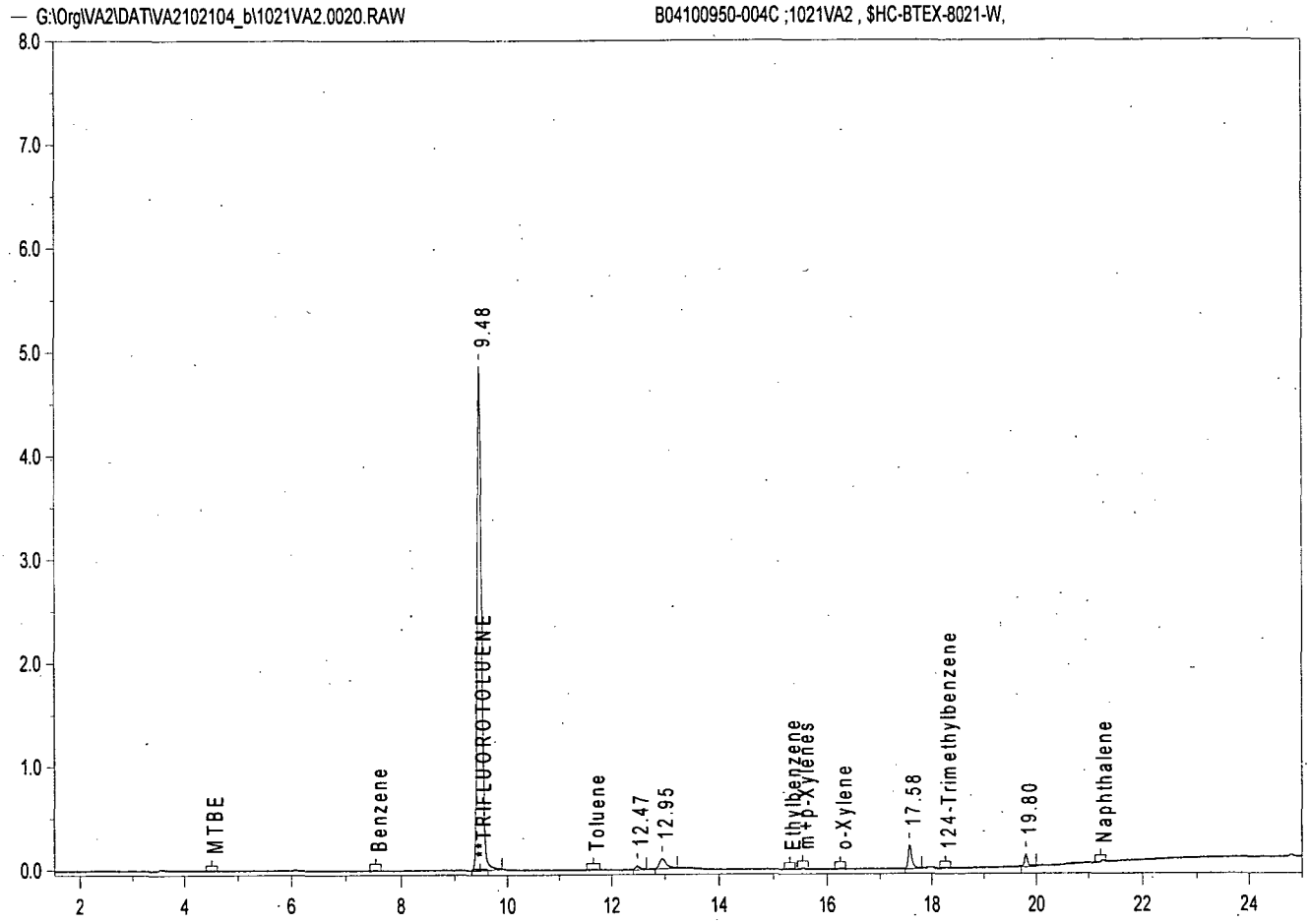


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-003C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0018.RAW
Date & Time Acquired: 10/21/2004 8:07:29 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.464	50.	54.98	109.96	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

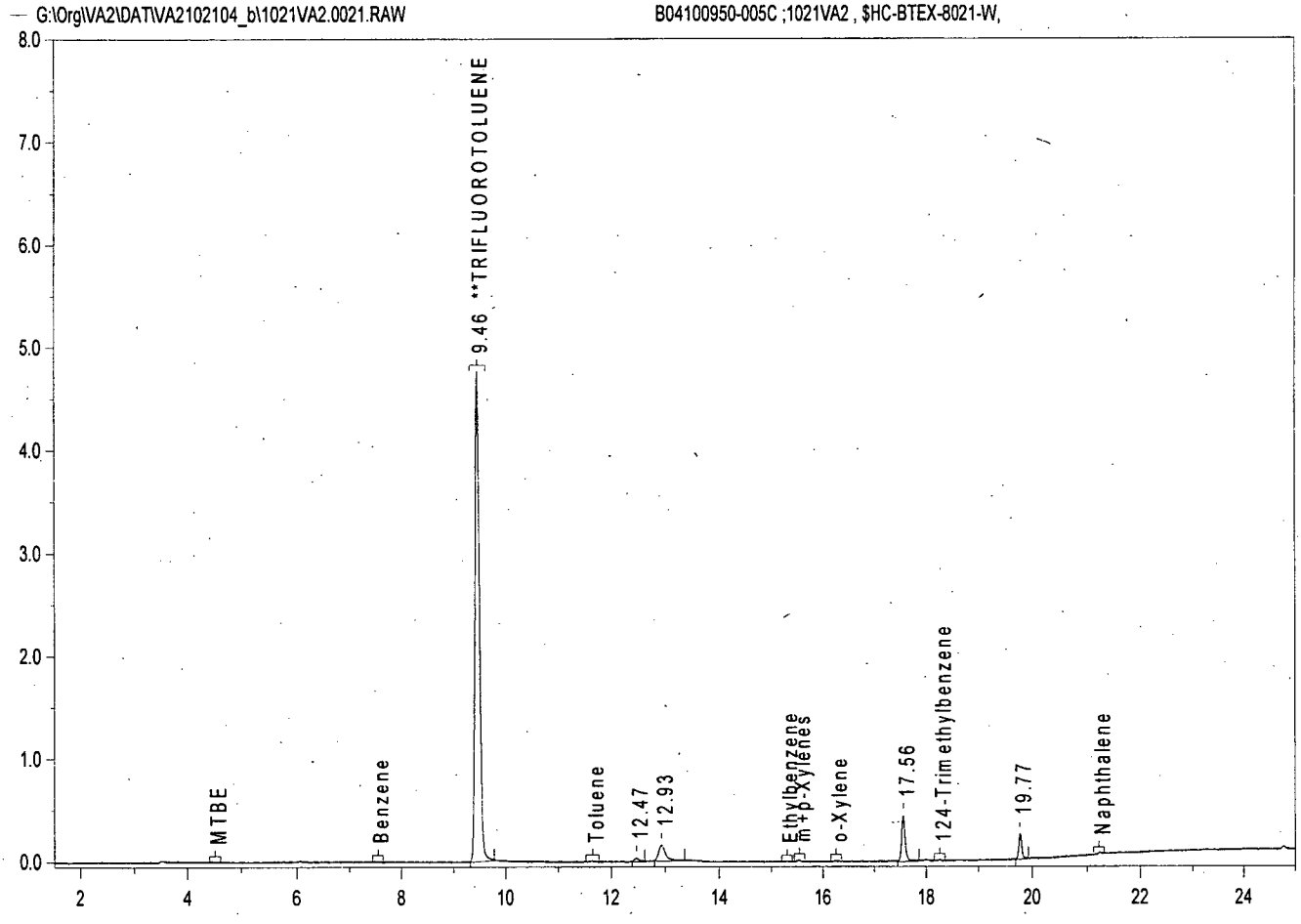


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-004C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0020.RAW
Date & Time Acquired: 10/21/2004 9:17:49 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.48	50.	55.297	110.59	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

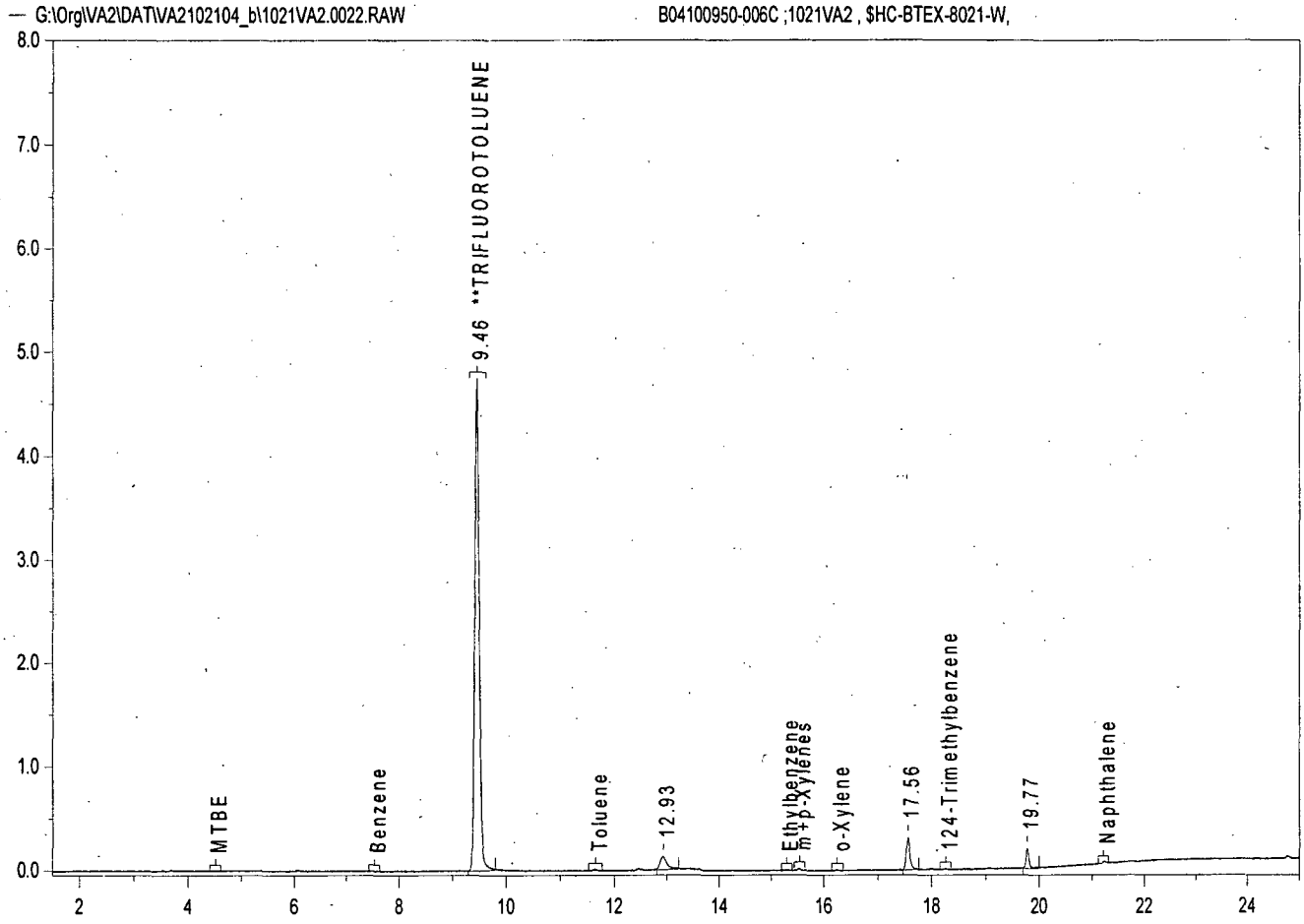


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-005C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0021.RAW
Date & Time Acquired: 10/21/2004 9:53:01 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.463	50.	54.001	108.	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

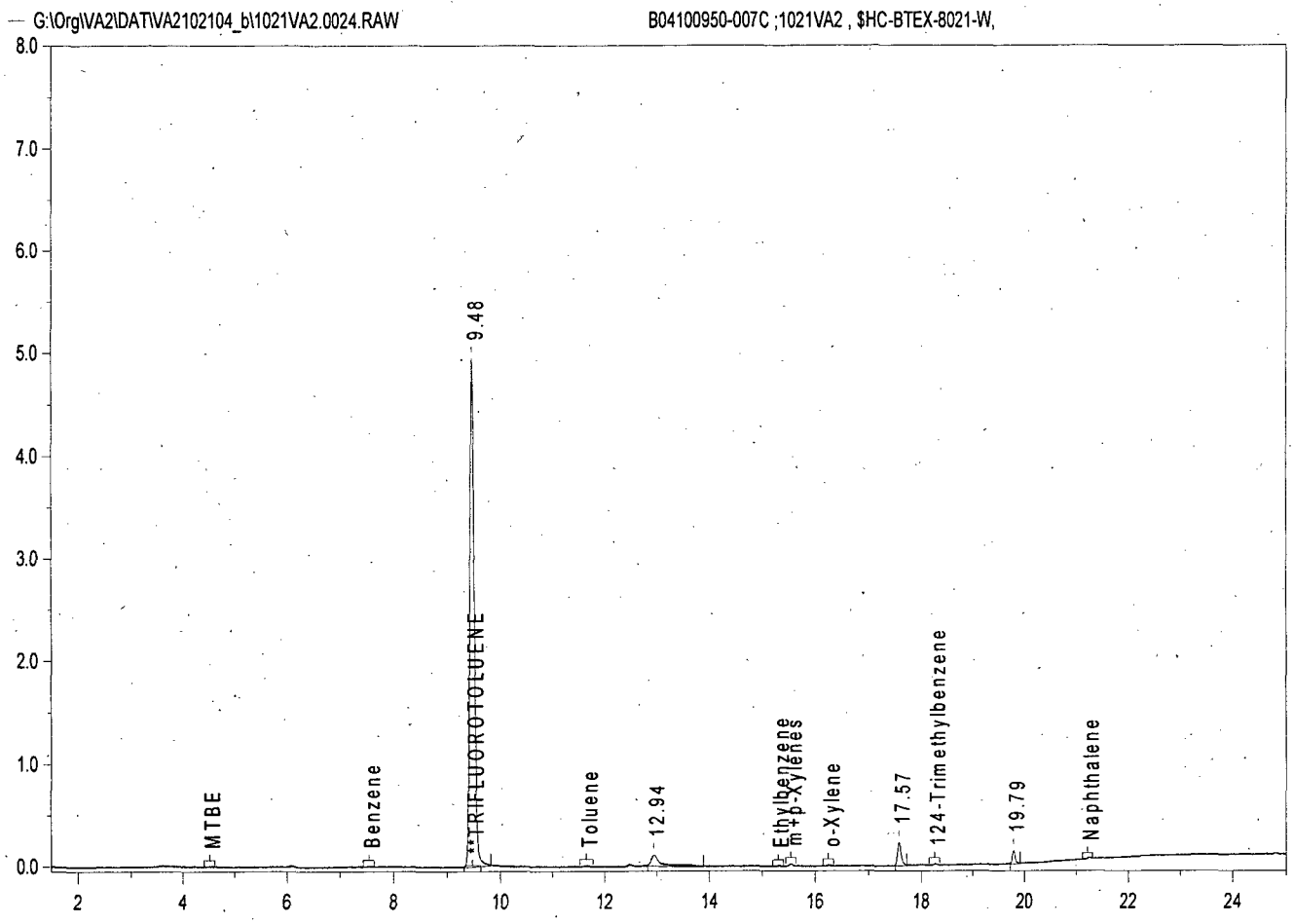


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-006C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0022.RAW
Date & Time Acquired: 10/21/2004 10:28:07 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.462	50.	54.143	108.29	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com



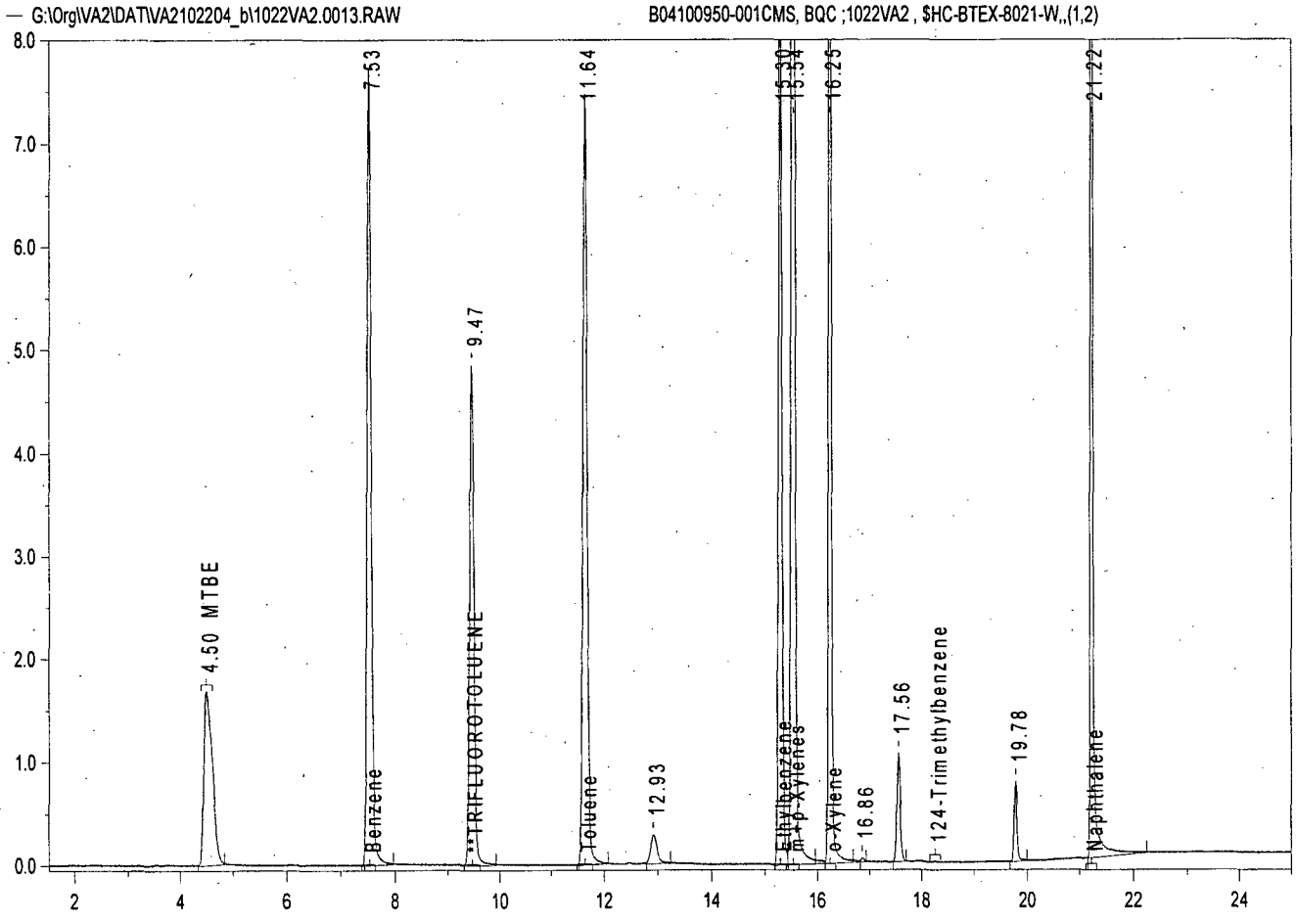
PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM

Sample Name: B04100950-007C ;1021VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2102104_b\1021VA2.0024.RAW
Date & Time Acquired: 10/21/2004 11:38:08 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	.	.	.		2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.478	50.	56.121	112.24	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

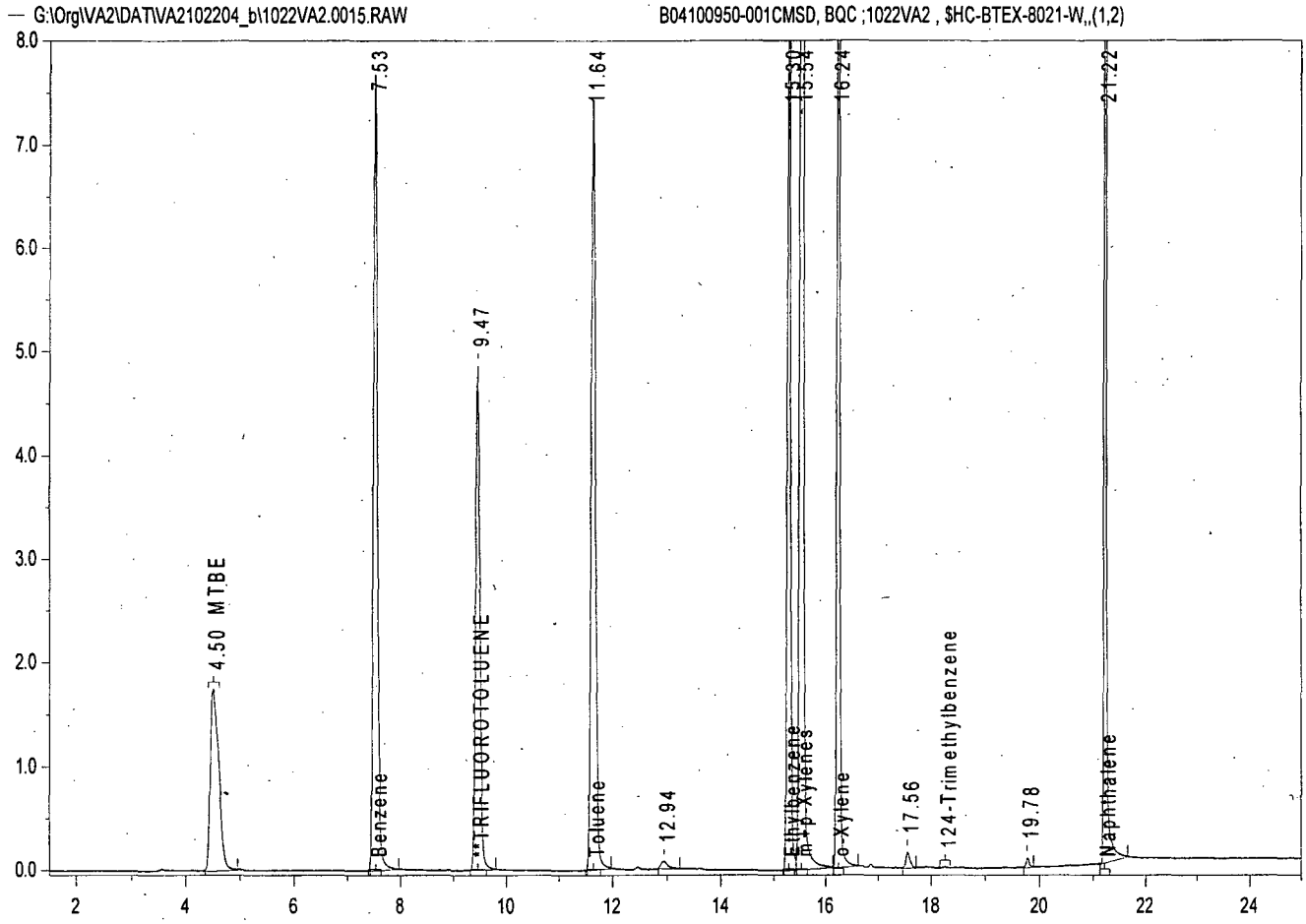


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-001CMS, BQC ;1022VA2 , $HC-BTEX-8021-W,,(1,2)
Raw File: G:\Org\VA2\DAT\VA2102204_b\1022VA2.0013.RAW
Date & Time Acquired: 10/22/2004 4:58:28 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	4.504	4.961	4.963	18015	51.957	
Benzene	7.529	1.941	1.938	41770	53.33	
Toluene	11.64	-2.172	-2.173	41716	55.656	
Ethylbenzene	15.298	-5.828	-5.831	39817	52.864	
m+p-Xylenes	15.538	-6.07	-6.071	89559	112.606	
o-Xylene	16.247	-6.775	-6.78	42413	54.723	
124-Trimethylbenzene	.	.	.		4.	U
Naphthalene	.	-11.747	9.467	49294	45.45	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.467	100.	110.898	110.9	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com



PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04100950-001CMSD, BQC ;1022VA2 , $HC-BTEX-8021-W,,(1,2)
Raw File: G:\Org\VA2\DAT\VA2102204_b\1022VA2.0015.RAW
Date & Time Acquired: 10/22/2004 6:08:56 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	4.504	4.961	4.963	18588	53.61	
Benzene	7.528	1.941	1.939	41442	52.91	
Toluene	11.641	-2.172	-2.174	41158	54.911	
Ethylbenzene	15.295	-5.828	-5.828	39393	52.3	
m+p-Xylenes	15.535	-6.07	-6.068	88512	111.289	
o-Xylene	16.244	-6.775	-6.777	41447	53.478	
124-Trimethylbenzene	.	.	.		4.	U
Naphthalene	.	-11.747	9.467	46868	43.213	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.467	100.	109.837	109.84	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/25/04
Work Order: B04100950

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B									Batch: ALK041015A
Sample ID: MBLK_041015A	Method Blank								10/15/04 16:46
Bicarbonate as HCO3	ND	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Sample ID: MBLK_041018A	Method Blank								10/18/04 12:21
Bicarbonate as HCO3	ND	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Sample ID: MBLK_041018B	Method Blank								10/18/04 18:20
Bicarbonate as HCO3	ND	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Method: A2540 C									Batch: TDS041015A
Sample ID: MBLK1	Method Blank								10/15/04 16:49
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LFB1	Sample Matrix Spike								10/15/04 16:49
Solids, Total Dissolved TDS @ 180 C	1080	mg/L	10	101	80	120			
Sample ID: B04100870-001A MS	Sample Matrix Spike								10/15/04 16:51
Solids, Total Dissolved TDS @ 180 C	4910	mg/L	10	103	80	120			
Sample ID: B04100870-001A MSD	Sample Matrix Spike Duplicate								10/15/04 16:51
Solids, Total Dissolved TDS @ 180 C	4750	mg/L	10	101	80	120	3.4	20	
Method: E150.1									Batch: PHSC041015A
Sample ID: PHC10602	Laboratory Control Spike								10/15/04 14:33
pH	7.00	s.u.	0.10	100	90	110			
Sample ID: PHC10602	Laboratory Control Spike								10/15/04 14:34
pH	4.00	s.u.	0.10	100	90	110			
Sample ID: B04100901-001A	Sample Duplicate								10/15/04 15:03
pH	7.35	s.u.	0.10				1.1	10	
Sample ID: B04100912-002A	Sample Duplicate								10/15/04 15:26
pH	4.34	s.u.	0.10				1.2	10	
Sample ID: B04100944-001D	Sample Duplicate								10/15/04 17:02
pH	8.31	s.u.	0.10				0.2	10	
Sample ID: B04100960-001B	Sample Duplicate								10/15/04 17:06
pH	7.62	s.u.	0.10				0.3	10	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/25/04
Work Order: B04100950

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R49280
Sample ID: MB-SPDIS041018A	Method Blank								10/18/04 11:09
Calcium	ND	mg/L	0.02						
Magnesium	ND	mg/L	0.02						
Potassium	ND	mg/L	0.01						
Sodium	ND	mg/L	0.05						
Sample ID: B04091685-006BMS2	Sample Matrix Spike								10/18/04 11:21
Calcium	286	mg/L	1.0	91.4	69.5	130.5			
Magnesium	139	mg/L	1.0	100	69.5	130.5			
Potassium	111	mg/L	1.0	91	69.5	130.5			
Sodium	129	mg/L	1.0	92.9	69.5	130.5			
Sample ID: B04091685-006BMSD2	Sample Matrix Spike Duplicate								10/18/04 11:25
Calcium	282	mg/L	1.0	87.9	69.5	130.5	1.2	20	
Magnesium	134	mg/L	1.0	95.5	69.5	130.5	3.6	20	
Potassium	105	mg/L	1.0	85.3	69.5	130.5	5.3	20	
Sodium	122	mg/L	1.0	86.2	69.5	130.5	5.4	20	
Sample ID: B04100898-001CMS2	Sample Matrix Spike								10/18/04 12:24
Calcium	88.1	mg/L	1.0	89.6	69.5	130.5			
Magnesium	61.9	mg/L	1.0	93.4	69.5	130.5			
Potassium	49.5	mg/L	1.0	91.5	69.5	130.5			
Sodium	65.9	mg/L	1.0	88.4	69.5	130.5			
Sample ID: B04100898-001CMSD2	Sample Matrix Spike Duplicate								10/18/04 12:28
Calcium	87.2	mg/L	1.0	87.8	69.5	130.5	1.0	20	
Magnesium	62.0	mg/L	1.0	93.6	69.5	130.5	0.2	20	
Potassium	49.4	mg/L	1.0	91.3	69.5	130.5	0.2	20	
Sodium	65.7	mg/L	1.0	88	69.5	130.5	0.3	20	
Sample ID: B04100919-001AMS2	Sample Matrix Spike								10/18/04 13:22
Calcium	75.8	mg/L	1.0	84.5	69.5	130.5			
Magnesium	52.5	mg/L	1.0	92.5	69.5	130.5			
Potassium	52.1	mg/L	1.0	88.6	69.5	130.5			
Sodium	63.0	mg/L	1.0	87.9	69.5	130.5			
Sample ID: B04100919-001AMSD2	Sample Matrix Spike Duplicate								10/18/04 13:26
Calcium	76.7	mg/L	1.0	86.3	69.5	130.5	1.2	20	
Magnesium	52.4	mg/L	1.0	92.3	69.5	130.5	0.2	20	
Potassium	51.5	mg/L	1.0	87.4	69.5	130.5	1.2	20	
Sodium	62.5	mg/L	1.0	86.9	69.5	130.5	0.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/25/04
Work Order: B04100950

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R49325
Sample ID: B04100983-009BMS2	Sample Matrix Spike								10/19/04 15:42
Calcium	115	mg/L	1.0	103	70	130			
Magnesium	108	mg/L	1.0	102	70	130			
Potassium	109	mg/L	1.0	101	70	130			
Sodium	551	mg/L	1.0	105	70	130			A
Sample ID: B04100983-009BMSD2	Sample Matrix Spike Duplicate								10/19/04 15:47
Calcium	118	mg/L	1.0	105	70	130	1.8	20	
Magnesium	110	mg/L	1.0	104	70	130	1.3	20	
Potassium	109	mg/L	1.0	101	70	130	0.2	20	
Sodium	550	mg/L	1.0	104	70	130	0.3	20	A
Sample ID: B04101041-001DMS2	Sample Matrix Spike								10/19/04 18:26
Calcium	138	mg/L	1.0	101	69.5	130.5			
Magnesium	124	mg/L	1.0	102	69.5	130.5			
Potassium	110	mg/L	1.0	96.5	69.5	130.5			
Sodium	305	mg/L	1.0	96	69.5	130.5			
Sample ID: B04101041-001DMSD2	Sample Matrix Spike Duplicate								10/19/04 18:30
Calcium	145	mg/L	1.0	108	69.5	130.5	5.0	20	
Magnesium	129	mg/L	1.0	107	69.5	130.5	3.9	20	
Potassium	110	mg/L	1.0	96.9	69.5	130.5	0.4	20	
Sodium	307	mg/L	1.0	97.6	69.5	130.5	0.5	20	
Method: E300.0									Batch: R49277
Sample ID: ICB	Method Blank								10/18/04 09:59
Chloride	ND	mg/L	0.03						
Sulfate	ND	mg/L	0.3						
Sample ID: B04100950-001A MS	Sample Matrix Spike								10/18/04 11:21
Chloride	115	mg/L	1.0	99.4	80	120			
Sulfate	591	mg/L	2.7	97.8	80	120			
Sample ID: B04100950-001A MSD	Sample Matrix Spike Duplicate								10/18/04 11:32
Chloride	115	mg/L	1.0	99.4	80	120	0	20	
Sulfate	592	mg/L	2.7	98.1	80	120	0.2	20	

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
A - The analyte level was greater than four times the spike level.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT

Report Date: 10/25/04
Work Order: B04100950

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E300.0**									Batch: R49302
Sample ID:	**B04100950-007A MS**	Sample Matrix Spike								10/18/04 13:17
Chloride		664	mg/L	1.6	88.2	80	120			
Sulfate		3120	mg/L	14	85.7	80	120			
Sample ID:	**B04100950-007A MSD**	Sample Matrix Spike Duplicate								10/18/04 13:29
Chloride		652	mg/L	1.6	85.9	80	120	1.8	20	
Sulfate		3060	mg/L	14	83	80	120	1.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

ANALYTICAL SUMMARY REPORT

October 29, 2004

Jane Madison
Land and Water Consulting
PO Box 8254
Missoula, MT 59807-

Workorder No.: B04101082

Project Name: 110396 PWS Well Threat, Poplar MT

Energy Laboratories Inc received the following 6 samples from Land and Water Consulting on 10/19/2004 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B04101082-001	110396 [redacted] 1451-3	10/13/04 14:51	10/19/04	Drinking Water	Metals by ICP/ICPMS, Dissolved Alkalinity Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved
B04101082-002	110396, [redacted] 1601-3	10/13/04 16:01	10/19/04	Drinking Water	Same As Above
B04101082-003	110396, [redacted] 926-8	10/14/04 9:28	10/19/04	Drinking Water	Same As Above
B04101082-004	110396 [redacted] 1051-3	10/14/04 10:51	10/19/04	Drinking Water	Same As Above
B04101082-005	110396, [redacted] 1156-8	10/14/04 11:56	10/19/04	Drinking Water	Same As Above
B04101082-006	Trip Blank	10/13/04 14:51	10/19/04	Aqueous	Purgeable Aromatics

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except if noted in report comments or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: _____

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04101082-001
Client Sample ID: 110396, (b) (6) 1451-3

Report Date: 10/28/04
Collection Date: 10/13/04 14:51
Date Received: 10/19/04
Matrix: Drinking Water

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.5	s.u.		0.1		E150.1	10/19/04 16:23 / klc
Solids, Total Dissolved TDS @ 180 C	2220	mg/L		10		A2540 C	10/19/04 17:33 / klc
INORGANICS							
Alkalinity, Total as CaCO3	988	mg/L		2		A2320 B	10/21/04 11:57 / klc
Bicarbonate as HCO3	1200	mg/L		2		A2320 B	10/21/04 11:57 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/21/04 11:57 / klc
Chloride	22	mg/L		1		E300.0	10/20/04 21:59 / qed
Sulfate	895	mg/L	D	5		E300.0	10/20/04 21:59 / qed
METALS, DISSOLVED							
Calcium	118	mg/L		1		E200.7	10/20/04 14:22 / rlh
Magnesium	132	mg/L		1		E200.7	10/20/04 14:22 / rlh
Potassium	9	mg/L		1		E200.7	10/20/04 14:22 / rlh
Sodium	451	mg/L	D	2		E200.7	10/20/04 14:22 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 16:02 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 16:02 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 16:02 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 16:02 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 16:02 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 16:02 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 16:02 / bjm
Surr: Trifluorotoluene	107	%REC			80-120	SW8021B	10/21/04 16:02 / bjm

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene, Toluene, Ethylbenzene, and m+p-Xylenes.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • fax 406-252-6069 • email@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04101082-002
Client Sample ID: 110396, (b) (6) 1601-3

Report Date: 10/28/04
Collection Date: 10/13/04 16:01
Date Received: 10/19/04
Matrix: Drinking Water

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.6	s.u.		0.1		E150.1	10/19/04 16:30 / klc
Solids, Total Dissolved TDS @ 180 C	2080	mg/L		10		A2540 C	10/19/04 17:35 / klc
INORGANICS							
Alkalinity, Total as CaCO3	443	mg/L		2		A2320 B	10/21/04 12:05 / klc
Bicarbonate as HCO3	540	mg/L		2		A2320 B	10/21/04 12:05 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/21/04 12:05 / klc
Chloride	22	mg/L		1		E300.0	10/20/04 22:10 / qed
Sulfate	1120	mg/L	D	5		E300.0	10/20/04 22:10 / qed
METALS, DISSOLVED							
Calcium	158	mg/L		1		E200.7	10/20/04 14:35 / rlh
Magnesium	91	mg/L		1		E200.7	10/20/04 14:35 / rlh
Potassium	6	mg/L		1		E200.7	10/20/04 14:35 / rlh
Sodium	350	mg/L	D	2		E200.7	10/20/04 14:35 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 17:04 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 17:04 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 17:04 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 17:04 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 17:04 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 17:04 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 17:04 / bjm
Surr: Trifluorotoluene	106	%REC			80-120	SW8021B	10/21/04 17:04 / bjm

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene, Toluene, Ethylbenzene, and m+p-Xylenes.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04101082-004
Client Sample ID: 110396, [redacted] 1051-3

Report Date: 10/28/04
Collection Date: 10/14/04 10:51
Date Received: 10/19/04
Matrix: Drinking Water

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.7	s.u.		0.1		E150.1	10/19/04 16:31 / klc
Solids, Total Dissolved TDS @ 180 C	973	mg/L		10		A2540 C	10/19/04 17:38 / klc
INORGANICS							
Alkalinity, Total as CaCO3	290	mg/L		2		A2320 B	10/21/04 12:21 / klc
Bicarbonate as HCO3	354	mg/L		2		A2320 B	10/21/04 12:21 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/21/04 12:21 / klc
Chloride	9	mg/L		1		E300.0	10/20/04 22:57 / qed
Sulfate	464	mg/L	D	3		E300.0	10/20/04 22:57 / qed
METALS, DISSOLVED							
Calcium	60	mg/L		1		E200.7	10/20/04 14:43 / rlh
Magnesium	41	mg/L		1		E200.7	10/20/04 14:43 / rlh
Potassium	4	mg/L		1		E200.7	10/20/04 14:43 / rlh
Sodium	196	mg/L		1		E200.7	10/20/04 14:43 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 19:12 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 19:12 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 19:12 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 19:12 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 19:12 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 19:12 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 19:12 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	10/21/04 19:12 / bjm

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene, Toluene, Ethylbenzene, and m+p-Xylenes.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04101082-003
Client Sample ID: 110396[redacted] 926-8

Report Date: 10/28/04
Collection Date: 10/14/04 09:28
Date Received: 10/19/04
Matrix: Drinking Water

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.9	s.u.		0.1		E150.1	10/19/04 16:31 / klc
Solids, Total Dissolved TDS @ 180 C	834	mg/L		10		A2540 C	10/19/04 17:36 / klc
INORGANICS							
Alkalinity, Total as CaCO3	520	mg/L		2		A2320 B	10/21/04 12:13 / klc
Bicarbonate as HCO3	634	mg/L		2		A2320 B	10/21/04 12:13 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/21/04 12:13 / klc
Chloride	12	mg/L		1		E300.0	10/20/04 22:45 / qed
Sulfate	207	mg/L	D	3		E300.0	10/20/04 22:45 / qed
METALS, DISSOLVED							
Calcium	32	mg/L		1		E200.7	10/20/04 14:39 / rlh
Magnesium	26	mg/L		1		E200.7	10/20/04 14:39 / rlh
Potassium	6	mg/L		1		E200.7	10/20/04 14:39 / rlh
Sodium	234	mg/L		1		E200.7	10/20/04 14:39 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 18:08 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 18:08 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 18:08 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 18:08 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 18:08 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 18:08 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 18:08 / bjm
Surr: Trifluorotoluene	101	%REC			80-120	SW8021B	10/21/04 18:08 / bjm

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene, Toluene, Ethylbenzene, and m+p-Xylenes.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar MT
Lab ID: B04101082-005
Client Sample ID: 110396, [redacted] 1156-8

Report Date: 10/28/04
Collection Date: 10/14/04 11:56
Date Received: 10/19/04
Matrix: Drinking Water

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.3	s.u.		0.1		E150.1	10/19/04 16:34 / klc
Solids, Total Dissolved TDS @ 180 C	3510	mg/L		10		A2540 C	10/19/04 17:39 / klc
INORGANICS							
Alkalinity, Total as CaCO3	969	mg/L		2		A2320 B	10/21/04 12:30 / klc
Bicarbonate as HCO3	1180	mg/L		2		A2320 B	10/21/04 12:30 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	10/21/04 12:30 / klc
Chloride	35	mg/L		1		E300.0	10/21/04 16:28 / qed
Sulfate	1550	mg/L	D	10		E300.0	10/20/04 23:08 / qed
METALS, DISSOLVED							
Calcium	169	mg/L		1		E200.7	10/20/04 14:47 / rlh
Magnesium	383	mg/L		1		E200.7	10/20/04 14:47 / rlh
Potassium	6	mg/L		1		E200.7	10/20/04 14:47 / rlh
Sodium	342	mg/L	D	2		E200.7	10/20/04 14:47 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	10/21/04 20:15 / bjm
Benzene	ND	ug/L		0.50		SW8021B	10/21/04 20:15 / bjm
Toluene	ND	ug/L		0.50		SW8021B	10/21/04 20:15 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	10/21/04 20:15 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	10/21/04 20:15 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	10/21/04 20:15 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	10/21/04 20:15 / bjm
Surr: Trifluorotoluene	105	%REC			80-120	SW8021B	10/21/04 20:15 / bjm

- Note 1: The C5 to C8 Aliphatics value is corrected for aromatic constituents Benzene, Toluene, Ethylbenzene, and m+p-Xylenes.
- Note 2: The C9 to C12 Aliphatics value is corrected for aromatic constituents o-Xylene and C9 to C10 Aromatics.

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

ANALYTICAL SUMMARY REPORT

October 29, 2004

Jane Madison
Land and Water Consulting
PO Box 8254
Missoula, MT 59807-

Workorder No.: B04100950

Project Name: 110396 PWS Well Threat, Poplar MT

Energy Laboratories Inc received the following 8 samples from Land and Water Consulting on 10/15/2004 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B04100950-001	110396 LAWM07	10/12/04 12:15	10/15/04	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved
B04100950-002	110396 LAWM06	10/12/04 14:31	10/15/04	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Mineral Balance Review Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved
B04100950-003	110396 LAWM05	10/12/04 16:41	10/15/04	Aqueous	Same As Above
B04100950-004	110396 LAWM04	10/13/04 10:31	10/15/04	Aqueous	Same As Above
B04100950-005	110396 LAWM03	10/13/04 11:41	10/15/04	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved
B04100950-006	110396 LAWM01	10/13/04 13:31	10/15/04	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Mineral Balance Review Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved
B04100950-007	110396 LAWM02	10/12/04 18:41	10/15/04	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved
B04100950-008	Trip Blank	10/12/04 12:15	10/15/04	Trip Blank	Purgeable Aromatics

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except if noted in report comments or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: _____

Energy Laboratories Inc

Sample Receipt Checklist

Client Name **Land and Water Consulting** Date and Time Received: **10/15/2004**

Work Order Number **B04100950** Received by dlf

Checklist completed by: 10/15/04 (Signature / Date) Reviewed by _____ (Initials / Date)

Carrier name Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	3 °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments:

Corrective Action

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: Land and Water

Project Name, PWS #, Permit #, Etc.: 110396 PWS Well Threat, Poplar, MT

Report Address: 1120 Cedar, Missoula, MT 59802

Contact Name, Phone, Fax, E-mail: Jane Madison jane.madison@landandwater.net
Phone: (406) 721-0354 Fax: (406) 721-0355

Sampler Name if other than Contact:

Invoice Address: Chris Matt, 1120 Cedar, MSLA, MT 59802

Invoice Contact & Phone #: Chris Matt (406) 721-0354

Purchase Order #: 110396

ELI Quote #:

Report Required For: POTW/WWTP (DW) Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Receipt Temp 3 °C
Cooler ID(s) NA
Custody Seal Y (N)
Intact Y N
Signature Match Y N

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other / MATRIX	pH, TDS, Alkalinity	Anions (attached)	Diss Metals (attached)	BTEX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	Lab ID
1	110396LAWM07	10/12	1215-17	3 W	X	X	X	X										1009D-001
2	110396LAWM06	10/12	1431-3	3	X	X	X	X										002
3	110396LAWM05	10/12	1641-3	3	X	X	X	X										003
4	110396LAWM04	10/13	1031-3	3	X	X	X	X										004
5	110396LAWM03	10/13	1141-3	3	X	X	X	X										005
6	110396LAWM01	10/13	1331-3	3	X	X	X	X										006
7	110396LAWM02	10/12	1841-3	3 W	X	X	X	X										007
8	Trip Blank																	008
9																		
10																		

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by: [signature] Date/Time: 10/15/04 @0900 Shipped by: Received by: Date/Time:

Relinquished by: Date/Time: Shipped by: [signature] Received by: [signature] Date/Time: 10-15-04/0905

Sample Disposal: Return to client: _____ Lab Disposal: _____

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

Chain of Custody and Analytical Request Record

Page 1 of 1

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: Land and Water	Project Name, PWS #, Permit #, Etc.: 110396 PWS Well Threat, Poplar MT
Report Address: 1120 Cedar St. Missoula, MT 59802	Contact Name, Phone, Fax, E-mail: Jane Madison Jane.Madison@landandwater.net Sampler Name if other than Contact: Phone: 721-0354 Fax: 72-0355
Invoice Address: Chris Matt 1120 Cedar St. Missoula, MT 59802	Invoice Contact & Phone #: Chris Matt 721-0354 Purchase Order #: 110396 ELI Quote #:

Report Required For: POTW/WWTP (DW) Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Receipt Temp 4 ice °C
Cooler ID(s) _____
Custody Seal (Y) N
Intact (Y) N
Signature Match (Y) N

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V B O; Air Water Soils/Solids Vegatation Bioassay Other)	pH, TDS, Alkalinity	Anions Cattached	Diss Metals Cattached	BTEX	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments:	Lab ID
1	110396 (b) (6) 1451-3	10/13/04	1451	3 W	X	X	X	X					04101082-1
2	110396 (b) (6) 1601-3	10/13/04	1601										2
3	110396 (b) (6) 926-8	10/14/04	928										3
4	110396 1051-3	10/14/04	1051										4
5	110396 (b) (6) 1156-8	10/14/04	1156										5
6	Trip Blank												6
7													
8													
9													
10													

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by: Jane Madison	Date/Time: 10/18/04	Shipped by:	Received by: Date/Time:
Relinquished by:	Date/Time:	Shipped by: Fed Ex	Received by: Krystal Mussard Date/Time: 10/19/04

Sample Disposal: Return to client: _____ Lab Disposal: X

LABORATORY USE ONLY
Sample Type: _____ # of fractions 0915

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

Appendix B

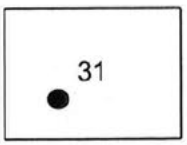
BOREHOLE LOGS

Poplar 2004 Report

LAND & WATER

Boring Log

Project Name: **PWS Well Threat Study**	L&W Personnel: **Jane Madison**	Dates Drilled: **11/12/2004**
Location: **Poplar, MT**	Boring No: **LAW-M08**	Ground Elevation:
Project No.: **110396**	Total Depth: **100 ft**	TOC Elevation:
Drilling Company/Driller: **Adair Drilling/Dave**	DTW: **62.80 ft**	Loc. Sketch:
Drilling Method: **Mud Rotary**	Measuring Point: **Top of Casing (TOC)**	**Sec 31 SWSE**
Sampling Method: **Cuttings**	Well Type: **Monitoring**	



Depth (ft)	Lithology	Material Description	Sample No.	Field Test Results	Well Construction	Comments
1		- topsoil, sandy (0-2')				- concrete seal - (-1.0-0')
5		- clay, fine sand, grey (2-10')				- bentonite chips - (0-10')
10						
15						
20		- clay and gravel, grey, stiff, iron concretio - (20-30')				
25						
30						- gravel pack - (10-85')
35						
40		- clay, fine sand, grey (30-45')				
45						
50		- clay, silty, drk grey (45-60')				

LAND & WATER

SOP's:
4302 Calibration and use of PID
5301 Surface Soil and Borehole Sampling
5302 Subsurface Soil Sampling
6220 Soil Sampling Equipment Decontamination
8106 Field Form Protocol
8510 Identification of Samples

Boring Log

Project Name: **PWS Well Threat Study**	L&W Personnel: **Jane Madison**	Dates Drilled: **11/12/2004**
Location: **Poplar, MT**	Boring No: **LAW-M08**	Ground Elevation:
Project No.: **110396**	Total Depth: **100 ft**	TOC Elevation:
Drilling Company/Driller: **Adair Drilling/Dave**	DTW: **62.80 ft**	Loc. Sketch:
Drilling Method: **Mud Rotary**	Measuring Point: **Top of Casing (TOC)**	**Sec 31 SWSE** 31
Sampling Method: **Cuttings**	Well Type: **Monitoring**	

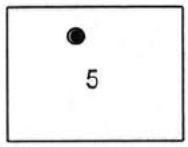
Depth (ft)	Lithology	Material Description	Sample No.	Field Test Results	Well Construction	Comments
51		- clay, silty, drk grey (45-60')				
55						- gravel pack - (10-85')
60						
65		-clay, coarse sand, drk grey, stiff -(60-70')				
70						
		- sand, fine (70-75')				
75						
80		-gravel, fine-medium pebble, well rounded - (75-87')				- 0.020 screen - (75-85')
85						
90		- Bear Paw shale (87-100')				open borehole - (85-100')
95						
100						

LAND & WATER

SOP's:
4302 Calibration and use of PID
5301 Surface Soil and Borehole Sampling
5302 Subsurface Soil Sampling
6220 Soil Sampling Equipment Decontamination
8106 Field Form Protocol
8510 Identification of Samples

Boring Log

Project Name: **PWS Well Threat Study**	L&W Personnel: **Jane Madison**	Dates Drilled: **11/13/2004**
Location: **Poplar, MT**	Boring No: **LAW-M09**	Ground Elevation:
Project No.: **110396**	Total Depth: **146 ft**	TOC Elevation:
Drilling Company/Driller: **Adair Drilling/Dave**	DTW: **75.36**	Loc. Sketch:
Drilling Method: **Mud Rotary**	Measuring Point: **Top of Casing (TOC)**	**Sec 5 NWNE**
Sampling Method: **Cuttings**	Well Type: **Monitoring**	



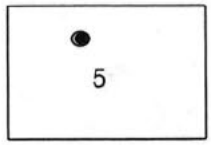
Depth (ft)	Lithology	Material Description	Sample No.	Field Test Results	Well Construction	Comments
1		- topsoil, sandy (0-2')				- concrete seal - (-1.0-0')
5						- bentonite chips - (0-10')
10						
15		- clay, coarse sand, brown, stiff (2-30')				
20						
25						
30						- gravel pack - (10-145')
35						
40		- clay, fine sand, brown, stiff, occ. gravel - (30-45')				
45						
50		- clay, coarse sand, brown (45-60')				

LAND & WATER

SOP's:
4302 Calibration and use of PID
5301 Surface Soil and Borehole Sampling
5302 Subsurface Soil Sampling
6220 Soil Sampling Equipment Decontamination
8106 Field Form Protocol
8510 Identification of Samples

Boring Log

Project Name: **PWS Well Threat Study**	L&W Personnel: **Jane Madison**	Dates Drilled: **11/13/2004**
Location: **Poplar, MT**	Boring No: **LAW-M09**	Ground Elevation:
Project No.: **110396**	Total Depth: **146 ft**	TOC Elevation:
Drilling Company/Driller: **Adair Drilling/Dave**	DTW: **75.36**	Loc. Sketch:
Drilling Method: **Mud Rotary**	Measuring Point: **Top of Casing (TOC)**	**Sec 5 NWNE**
Sampling Method: **Cuttings**	Well Type: **Monitoring**	



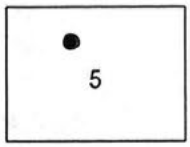
Depth	Lithology	Material Description	Sample No.	Field Test Results	Well Construction	Comments
51		- clay, coarse sand, brown (45-60')				- gravel pack - (10-145')
55						
60						
65						
70						
75		- clay, coarse sand, drk grey, stiff - (60-90')				
80						
85						
90						
95		- gravel, fine-med. pebble, well rounded - (90-143')				- 0.020 screen - (96-146')
100						

LAND & WATER

SOP's:
4302 Calibration and use of PID
5301 Surface Soil and Borehole Sampling
5302 Subsurface Soil Sampling
6220 Soil Sampling Equipment Decontamination
8106 Field Form Protocol
8510 Identification of Samples

Boring Log

Project Name: **PWS Well Threat Study**	L&W Personnel: **Jane Madison**	Dates Drilled: **11/13/2004**
Location: **Poplar, MT**	Boring No: **LAW-M09**	Ground Elevation:
Project No.: **110396**	Total Depth: **146 ft**	TOC Elevation:
Drilling Company/Driller: **Adair Drilling/Dave**	DTW: **75.36**	Loc. Sketch:
Drilling Method: **Mud Rotary**	Measuring Point: **Top of Casing (TOC)**	**Sec 5 NWNE**
Sampling Method: **Cuttings**	Well Type: **Monitoring**	



Depth	Lithology	Material Description	Sample No.	Field Test Results	Well Construction	Comments
101		- gravel, fine-med. pebble, well rounded - (90-143')				- 0.020 screen - (96-146') - gravel pack (10-145')
105						
110						
115						
120						
125						
130						
135						
140						
145		- Bear Paw shale (143-145')				

LAND & WATER

SOP's:
4302 Calibration and use of PID
5301 Surface Soil and Borehole Sampling
5302 Subsurface Soil Sampling
6220 Soil Sampling Equipment Decontamination
8106 Field Form Protocol
8510 Identification of Samples

Appendix C

CORRESPONDENCE TO WELL OWNERS

Poplar 2004 Report

LAND & WATER

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721-0355

December 2, 2004

(b) (6)
[redacted]

RE: ANNUAL WATER QUALITY SAMPLING

Dear (b) (6)

On October 14, 2004, Land & Water collected a water sample from your well. The following table summarizes the water quality data for your well and the laboratory results are attached.

Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)
(b) (6)	10/14/04	9	973	196	464

The EPA has established the secondary maximum contaminant level for chloride at 205 mg/L. The chloride concentration in your well is 9 mg/L. Additional information on EPA drinking water standards may be found at their website, http://www.epa.gov/safewater/index.html. Please feel free to contact me at (406) 721 0354 with any questions or concerns. Your well is scheduled to be sampled again in October 2005. Thank you for allowing Land & Water to sample your well.

Sincerely,

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721-0355

December 2, 2004

(b) (6) [redacted]

RE: ANNUAL WATER QUALITY SAMPLING

Dear (b) (6) [redacted],

On October 13, 2004, Land & Water collected a water sample from your well. The following table summarizes the water quality data for your well and the laboratory results are attached.

Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)
(b) (6) [redacted]	10/13/04	22	2220	451	895

The EPA has established the secondary maximum contaminant level for chloride at 250 mg/L. The chloride concentration in your well is 22 mg/L. Additional information on EPA drinking water standards may be found at their website, http://www.epa.gov/safewater/index.html. Please feel free to contact me at (406) 721-0354 with any questions or concerns. Your well is scheduled to be sampled again in October 2005. Thank you for allowing Land & Water to sample your well.

Sincerely,

Jane Madison

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721 0355

December 2, 2004

(b) (6)
[redacted]

RE: ANNUAL WATER QUALITY SAMPLING

Dear (b) (6),

On October 14, 2004, Land & Water collected a water sample from your well. The following table summarizes the water quality data for your well and the laboratory results are attached.

Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)
(b) (6)	10/14/04	12	834	234	207

The EPA has established the secondary maximum contaminant level for chloride at 250 mg/L. The chloride concentration in your well is 12 mg/L. Additional information on EPA drinking water standards may be found at their website, http://www.epa.gov/safewater/index.html. Please feel free to contact me at (406) 721-0354 with any questions or concerns. Your well is scheduled to be sampled again in October 2005. Thank you for allowing Land & Water to sample your well.

Sincerely,

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721-0355

December 2, 2004

(b) (6) [redacted]

RE: ANNUAL WATER QUALITY SAMPLING

Dear (b) (6) [redacted],

On October 14, 2004, Land & Water collected a water sample from your well. The following table summarizes the water quality data for your well and the laboratory results are attached.

Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)
(b) (6) [redacted]	10/14/04	35	3510	342	1550

The EPA has established the secondary maximum contaminant level for chloride at 250 mg/L. The chloride concentration in your well is 35 mg/L. Additional information on EPA drinking water standards may be found at their website, http://www.epa.gov/safewater/index.html. Please feel free to contact me at (406) 721-0354 with any questions or concerns. Your well is scheduled to be sampled again in October 2005. Thank you for allowing Land & Water to sample your well.

Sincerely,

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721 0354
E-mail info@landandwater.net • Fax (406) 721-0355

December 2, 2004

(b) (6)
[redacted]

RE: ANNUAL WATER QUALITY SAMPLING

Dear (b) (6),

On October 13, 2004, Land & Water collected a water sample from your well. The following table summarizes the water quality data for your well and the laboratory results are attached.

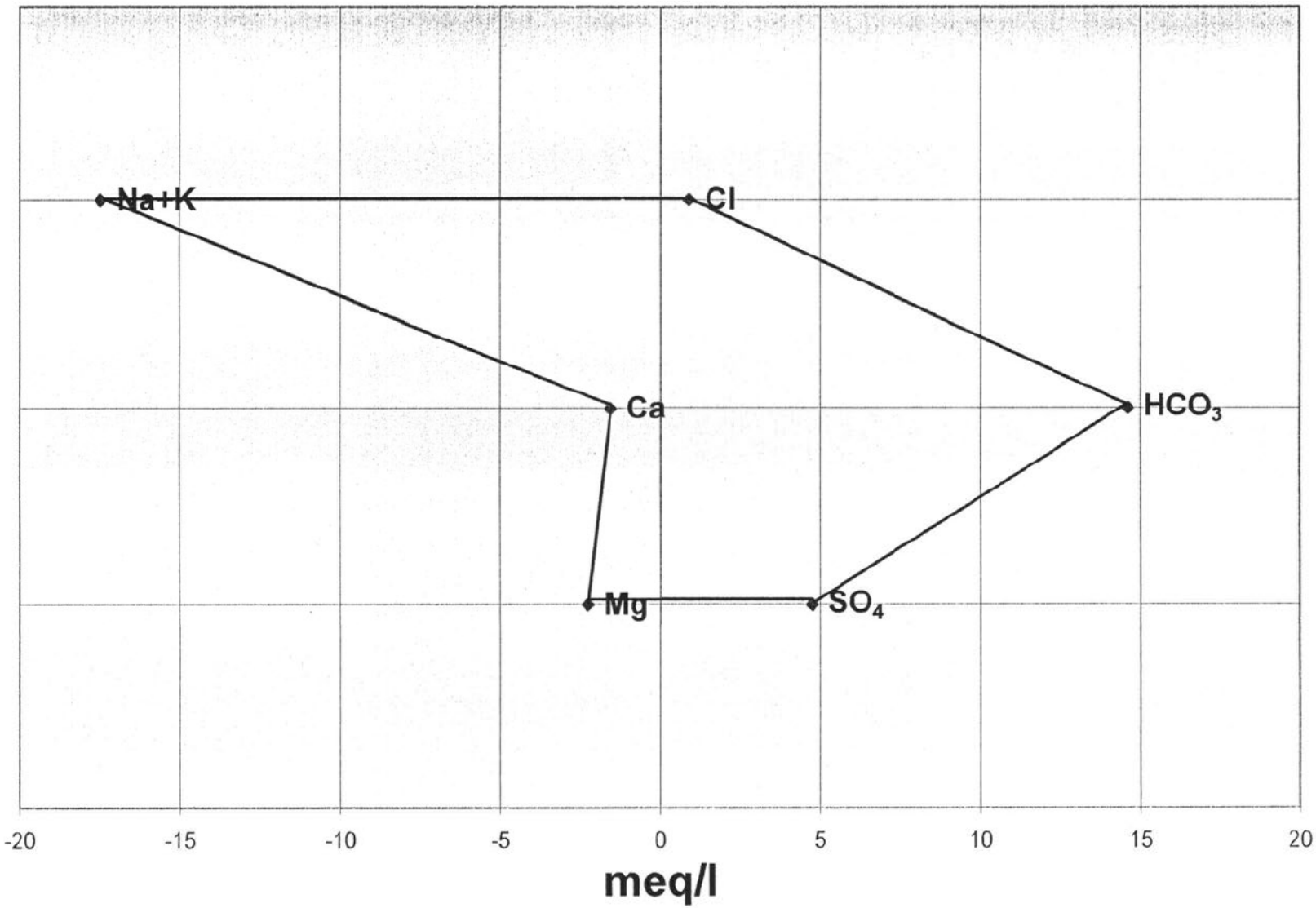
Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)
(b) (6)	10/13/04	22	2080	350	1120

The EPA has established the secondary maximum contaminant level for chloride at 250 mg/L. The chloride concentration in your well is 22 mg/L. Additional information on EPA drinking water standards may be found at their website, http://www.epa.gov/safewater/index.html. Please feel free to contact me at (406) 721-0354 with any questions or concerns. Your well is scheduled to be sampled again in October 2005. Thank you for allowing Land & Water to sample your well.

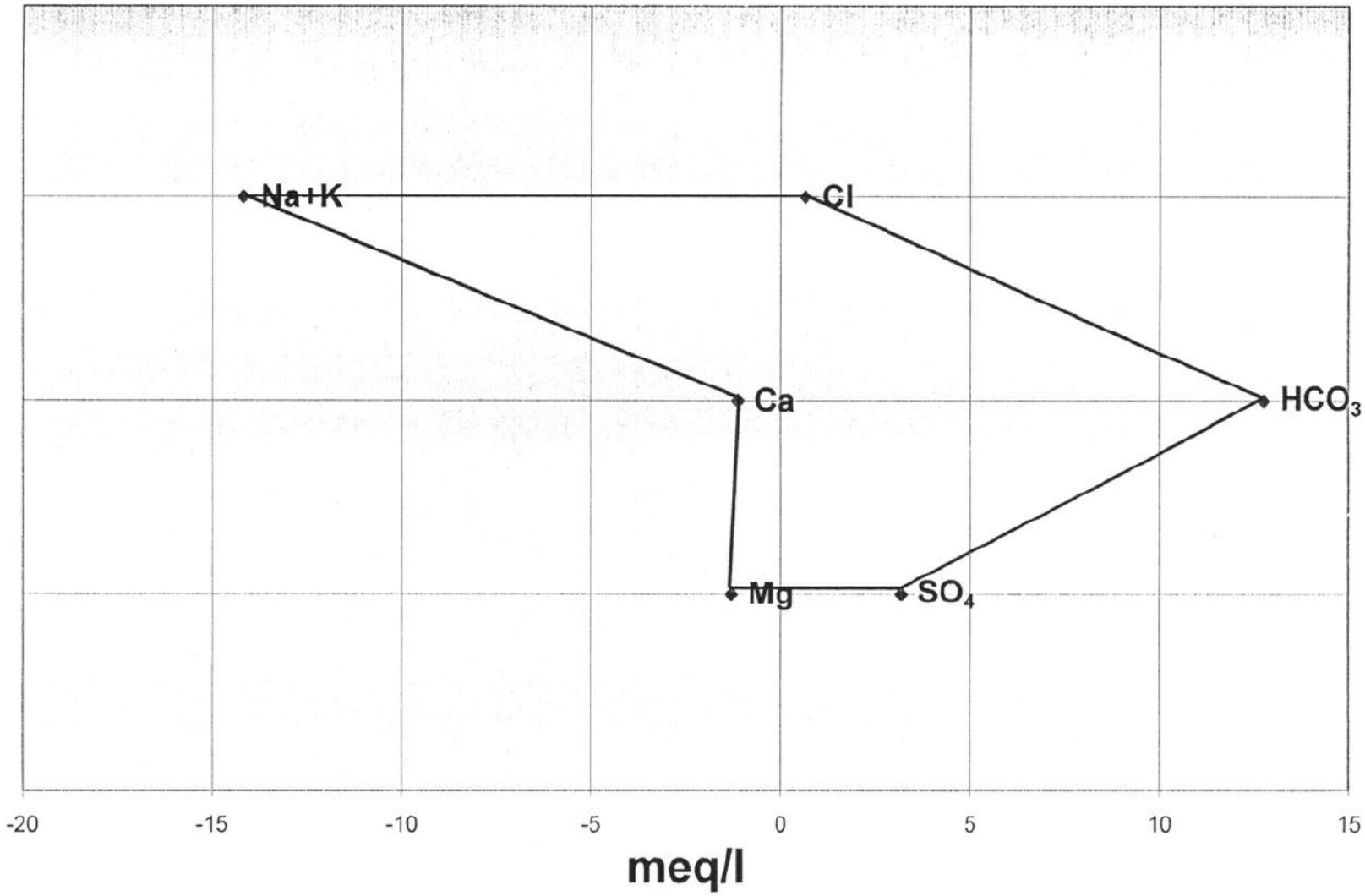
Sincerely,

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

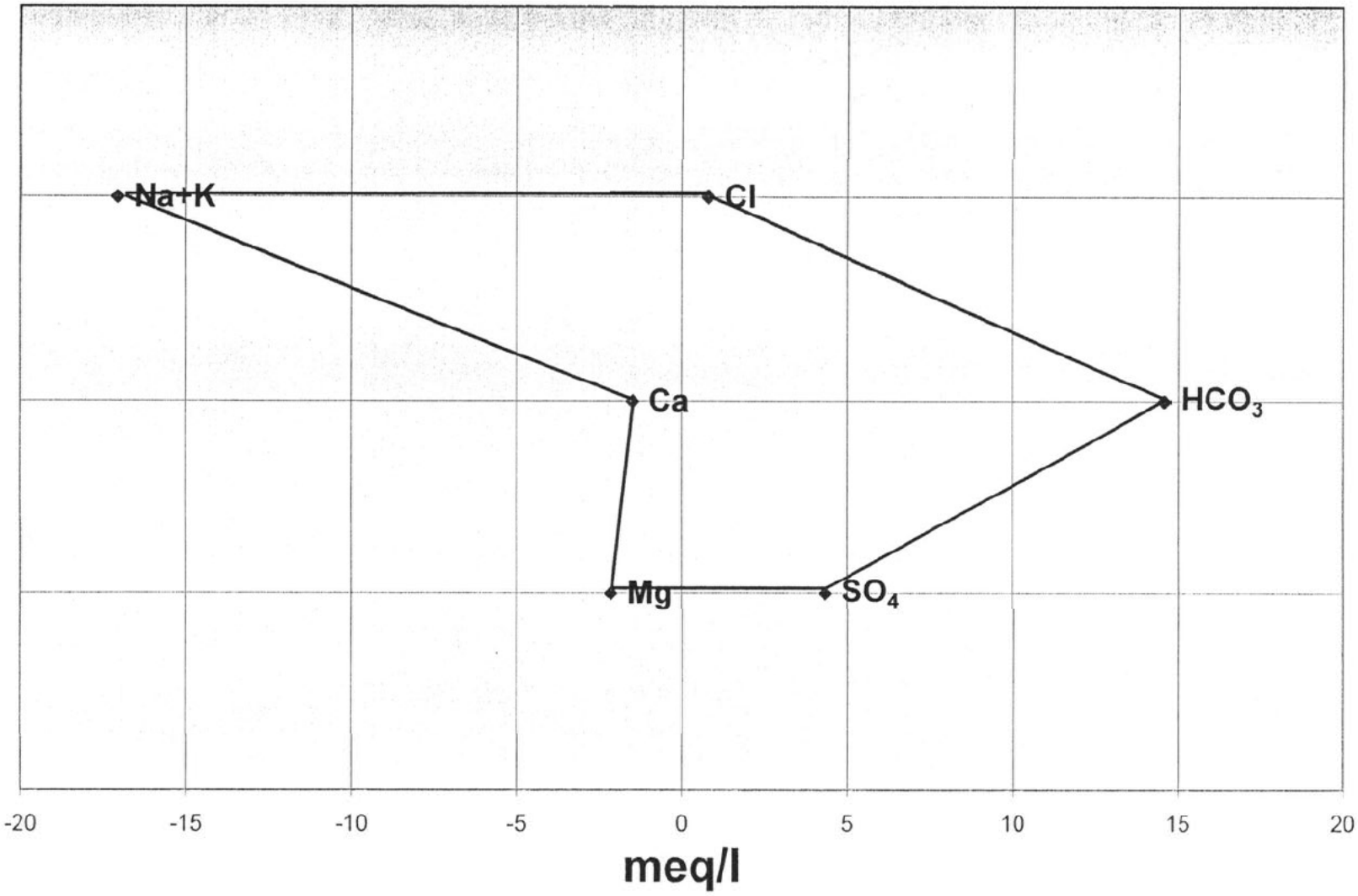
(b) (6) [redacted]



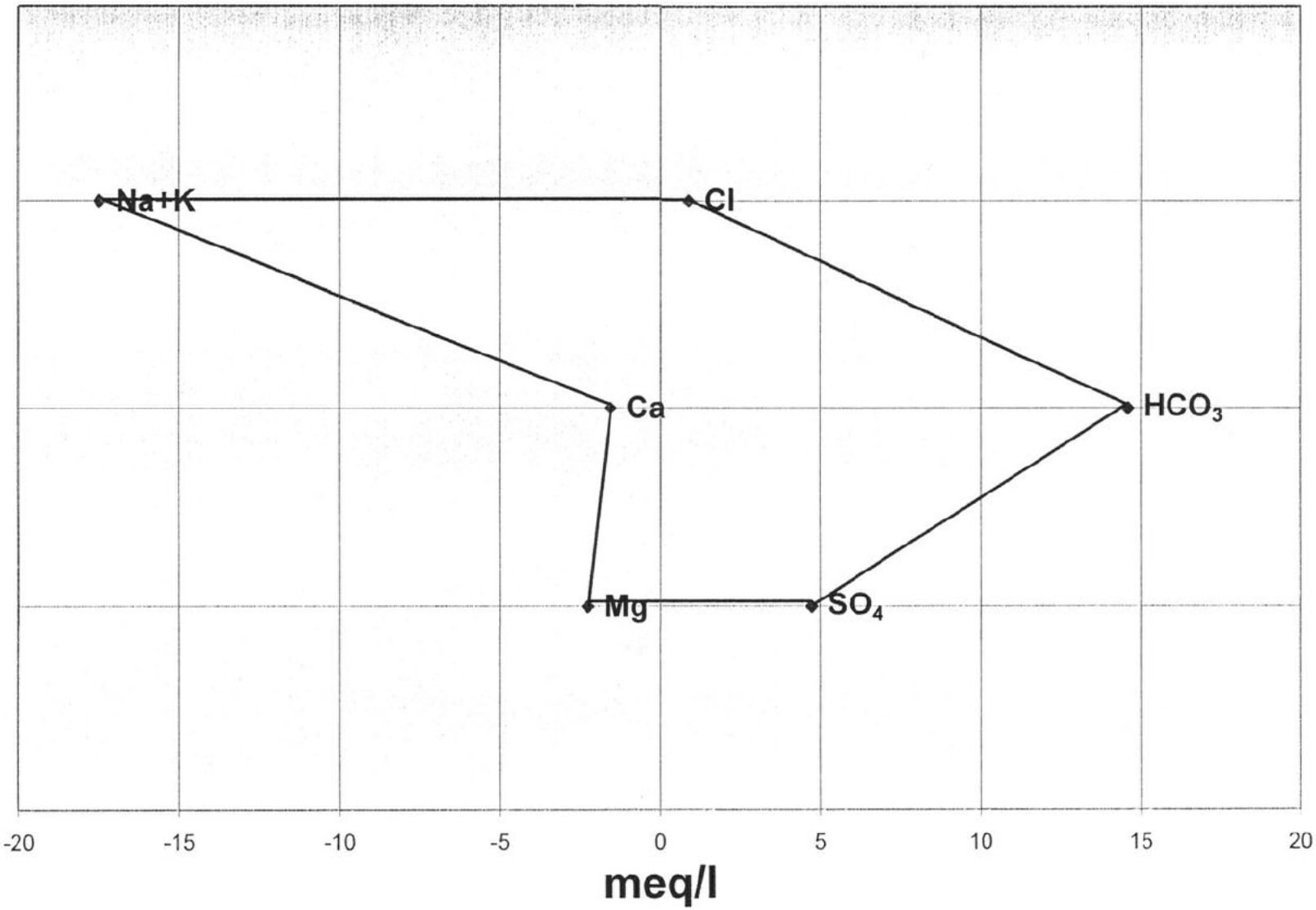
(b) (6) [redacted]



(b) (6) [redacted]



(b) (6) [redacted]



HKM ENGINEERING
222 N. 32nd Street
Suite 700
P.O. Box 31318
Billings, MT 59107.1318
Phone: 406.656.6399
Fax: 406.656.6398
www.hkminc.com

December 18, 2002
H:\14\R144102\Novqtr.doc

Mr. John Ross
Brown Law Firm
PO Drawer 840
Billings, MT 59103

RE: November 2002 Groundwater Monitoring Data Report
Pioneer Natural Resources USA, Inc.
Biere 1-22 Well Site
East Poplar Oil Well Field
Poplar, Montana

Dear Mr. Ross:

Pursuant to the United States Environmental Protection Agency, Emergency Administrative Order Upon Consent (EAOC), Pioneer Natural Resources USA, Inc. conducted quarterly groundwater monitoring and sampling in the vicinity of the Biere 1-22 oil well. The investigation was performed during November 2002 and included groundwater monitoring and sampling. This letter serves as a quarterly groundwater monitoring and sampling report under the EAOC.

During November 2002, monitoring wells and selected available existing wells were sampled. The locations of the monitoring wells are shown on the figure provided in Appendix A. Monitor wells were gauged using an electronic interface probe capable of detecting water and non-aqueous phase liquid (NAPL) with a precision of 0.01 foot. Prior to sample collection, the wells were purged by use of a decontaminated submersible electric pump or with disposal bailers.

To ensure representative groundwater samples were collected from the aquifer, water quality parameters were monitored and allowed to stabilize during the purging process prior to sample collection. Conductivity, temperature and pH of the purged groundwater were monitored. Once the parameters had stabilized, samples were collected in the appropriate laboratory containers and preserved as directed by the laboratory. Samples were labeled and packaged on ice to maintain a temperature near 4° C. Tabulated water level and depth to fluid data, water quality parameter readings, and inorganic and organic water chemistry results are presented in Tables 1, 2, and 3, respectively.

All water samples were hand delivered to Energy Laboratories, Inc., in Billings, Montana for analysis. Appendix B contains the sample chain of custody information, the laboratory analytical reports and the laboratory QA/QC data for these samples.

RECEIVED
JAN 6 2002
Office of Enforcement
Compliance & Environmental
Justice

Please do not hesitate to call us if you have any questions regarding this report or the data contained herein.

Sincerely,

HKM Engineering Inc.

Charles L. Peterson, P.G.

Feast Geosciences, LLC

Charles F. Feast, P.G.

Table 1	Water Levels and Depth to Fluid in Monitoring Wells and Domestic Wells
Table 2	Inorganic Water Chemistry Data
Table 3	BTEX and TPH Analyses

Appendix A: Well Location Figure
Appendix B: Laboratory Reports

cc: Wilbur Dover, Pioneer National Resources, USA, Inc. (3 copies)

TABLE 1

Water Levels and Depth to Fluid in Monitoring Wells and Domestic Wells

Pioneer Natural Resources, USA, Inc.- Biere 1-22 Investigation

Last update: 12/12/02

	Location and Elevation				Fluid Levels					
Well No.	Northing (ft)	Easting (ft)	GS Elev (ft msl)	MP elev. (ft msl)	Date	DTP (ft bmp)	DTW (ft bmp)	Accumulated Oil (ft)	Groundwater Elevation (ft msl)	
PNR-4	120239.6	75663.2	2080.9	2084.21	8/13/2001	27.38	56.31	28.93	2048.1	*
PNR-4	120239.6	75663.2	2080.9	2084.21	9/4/2001	27.08	69.88[1]	42.80	2044.3	*
PNR-4	120239.6	75663.2	2080.9	2084.21	11/6/2001	29.01	69.88[1]	40.87	2042.9	*
PNR-4					Plugged and abandoned					
PNR-5	119992.6	75218.1	2082.6	2085.56	5/31/2000		37.17		2048.39	
PNR-5	119992.6	75218.1	2082.6	2085.56	8/13/2001		37.04		2048.52	
PNR-5	119992.6	75218.1	2082.6	2085.56	9/5/2001		36.99		2048.57	
PNR-5	119992.6	75218.1	2082.6	2085.56	11/6/2001		37.05		2048.51	
PNR-5	119992.6	75218.1	2082.6	2085.56	2/19/2002		37.22		2048.34	
PNR-5	119992.6	75218.1	2082.6	2085.56	5/20/2002		38.25		2047.31	
PNR-5	119992.6	75218.1	2082.6	2085.56	8/19/2002		38.76		2046.80	
PNR-5	119992.6	75218.1	2082.6	2085.56	11/4/2002		38.81		2046.75	
PNR-6	119552.8	77716.9	2116.5	2119.07	5/31/2000		20.33		2098.74	
PNR-6	119552.8	77716.9	2116.5	2119.07	8/13/2001		20.55		2098.52	
PNR-6	119552.8	77716.9	2116.5	2119.07	9/5/2001		20.51		2098.56	
PNR-6	119552.8	77716.9	2116.5	2119.07	11/6/2001		21.02		2098.05	
PNR-6	119552.8	77716.9	2116.5	2119.07	2/19/2002		21.39		2097.68	
PNR-6	119552.8	77716.9	2116.5	2119.07	5/20/2002		21.65		2097.42	
PNR-6	119552.8	77716.9	2116.5	2119.07	8/19/2002		21.06		2098.01	
PNR-6	119552.8	77716.9	2116.5	2119.07	11/4/2002		21.23		2097.84	
PNR-7	120878.4	73768.5	2069.6	2072.22	5/31/2000		25.50		2046.72	
PNR-7	120878.4	73768.5	2069.6	2072.22	8/13/2001		25.19		2047.03	
PNR-7	120878.4	73768.5	2069.6	2072.22	9/5/2001		25.08		2047.14	
PNR-7	120878.4	73768.5	2069.6	2072.22	11/6/2001		25.47		2046.75	
PNR-7	120878.4	73768.5	2069.6	2072.22	2/19/2002		25.72		2046.50	
PNR-7	120878.4	73768.5	2069.6	2072.22	5/20/2002		26.20		2046.02	
PNR-7	120878.4	73768.5	2069.6	2072.22	8/19/2002		26.17		2046.05	
PNR-7	120878.4	73768.5	2069.6	2072.22	11/4/2002		26.54		2045.68	
PNR-8	118196.1	73316.9	2060.2	2062.99	5/31/2000		63.64		1999.35	
PNR-8	118196.1	73316.9	2060.2	2062.99	8/13/2001		63.53		1999.46	
PNR-8	118196.1	73316.9	2060.2	2062.99	9/5/2001		63.84		1999.15	
PNR-8	118196.1	73316.9	2060.2	2062.99	11/6/2001		64.54		1998.45	
PNR-8	118196.1	73316.9	2060.2	2062.99	2/19/2002		64.21		1998.78	
PNR-8	118196.1	73316.9	2060.2	2062.99	5/20/2002		64.40		1998.59	
PNR-8	118196.1	73316.9	2060.2	2062.99	8/19/2002		64.61		1998.38	
PNR-8	118196.1	73316.9	2060.2	2062.99	11/4/2002		64.56		1998.43	
PNR-9	119459.5	69844.4	2014.1	2017.26	5/31/2000		56.46		1960.80	
PNR-9	119459.5	69844.4	2014.1	2017.26	8/13/2001		57.29		1959.97	
PNR-9	119459.5	69844.4	2014.1	2017.26	9/5/2001		57.28		1959.98	
PNR-9	119459.5	69844.4	2014.1	2017.26	11/6/2001		57.61		1959.65	
PNR-9	119459.5	69844.4	2014.1	2017.26	2/19/2002		57.12		1960.14	
PNR-9	119459.5	69844.4	2014.1	2017.26	5/20/2002		57.08		1960.18	
PNR-9	119459.5	69844.4	2014.1	2017.26	8/19/2002		57.90		1959.36	
PNR-9	119459.5	69844.4	2014.1	2017.26	11/4/2002		57.29		1959.97	
PNR-10	117193.4	69833.0	2009.2	2011.69	5/31/2000		53.93		1957.76	
PNR-10	117193.4	69833.0	2009.2	2011.69	8/13/2001		53.93		1957.76	
PNR-10	117193.4	69833.0	2009.2	2011.69	9/5/2001		54.03		1957.66	
PNR-10	117193.4	69833.0	2009.2	2011.69	11/6/2001		54.37		1957.32	
PNR-10	117193.4	69833.0	2009.2	2011.69	2/19/2002		53.88		1957.81	
PNR-10	117193.4	69833.0	2009.2	2011.69	5/20/2002		53.79		1957.90	
PNR-10	117193.4	69833.0	2009.2	2011.69	8/19/2002		54.27		1957.42	
PNR-10	117193.4	69833.0	2009.2	2011.69	11/4/2002		54.04		1957.65	

TABLE 1

Water Levels and Depth to Fluid in Monitoring Wells and Domestic Wells

Pioneer Natural Resources, USA, Inc.- Biere 1-22 Investigation

Last update: 12/12/02

	Location and Elevation				Fluid Levels					
Well No.	Northing (ft)	Easting (ft)	GS Elev (ft msl)	MP elev. (ft msl)	Date	DTP (ft bmp)	DTW (ft bmp)	Accumulated Oil (ft)	Groundwater Elevation (ft msl)	
PNR-11	122080.9	73741.9	2053.4	N/A	8/13/2001	N/A	N/A		N/A	
PNR-12	120894.2	77696.5	2098.4	2101.23	5/31/2000		51.10		2050.13	
PNR-12	120894.2	77696.5	2098.4	2101.23	8/13/2001		49.90		2051.33	
PNR-12	120894.2	77696.5	2098.4	2101.23	9/5/2001		49.67		2051.56	
PNR-12	120894.2	77696.5	2098.4	2101.23	11/6/2001		50.52		2050.71	
PNR-12	120894.2	77696.5	2098.4	2101.23	2/19/2002		50.80		2050.43	
PNR-12	120894.2	77696.5	2098.4	2101.23	5/20/2002		51.40		2049.83	
PNR-12	120894.2	77696.5	2098.4	2101.23	8/19/2002		51.20		2050.03	
PNR-12	120894.2	77696.5	2098.4	2101.23	11/4/2002		50.86		2050.37	
PNR-13	120919.1	75568.2	2079.4	2081.12	8/13/2001		30.44		2050.68	
PNR-13	120919.1	75568.2	2079.4	2081.12	9/5/2001		30.19		2050.93	
PNR-13	120919.1	75568.2	2079.4	2081.12	11/6/2001		30.46		2050.66	
PNR-13	120919.1	75568.2	2079.4	2081.12	2/19/2002		31.48		2049.64	
PNR-13	120919.1	75568.2	2079.4	2081.12	5/20/2002		32.05		2049.07	
PNR-13	120919.1	75568.2	2079.4	2081.12	8/19/2002		32.32		2048.80	
PNR-13	120919.1	75568.2	2079.4	2081.12	11/4/2002		32.34		2048.78	
PNR-14	120383.7	75564.5	2079.8	2082.11	8/13/2001		32.50		2049.61	
PNR-14	120383.7	75564.5	2079.8	2082.11	9/4/2001		32.27		2049.84	
PNR-14	120383.7	75564.5	2079.8	2082.11	11/6/2001		32.30		2049.81	
PNR-14	120383.7	75564.5	2079.8	2082.11	2/19/2002		33.42		2048.69	
PNR-14	120383.7	75564.5	2079.8	2082.11	5/20/2002		33.77		2048.34	
PNR-14	120383.7	75564.5	2079.8	2082.11	8/19/2002		34.33		2047.78	
PNR-14	120383.7	75564.5	2079.8	2082.11	11/4/2002		34.27		2047.84	
PNR-15	120382.2	75856.5	2081.9	2084.10	8/13/2001		33.86		2050.24	
PNR-15	120382.2	75856.5	2081.9	2084.10	9/4/2001		33.84		2050.26	
PNR-15	120382.2	75856.5	2081.9	2084.10	11/6/2001		34.30		2049.80	
PNR-15	120382.2	75856.5	2081.9	2084.10	2/19/2002		35.36		2048.74	
PNR-15	120382.2	75856.5	2081.9	2084.10	5/20/2002		35.87		2048.23	
PNR-15	120382.2	75856.5	2081.9	2084.10	8/19/2002		36.20		2047.90	
PNR-15	120382.2	75856.5	2081.9	2084.10	11/4/2002		36.22		2047.88	
PNR-16	119667.9	72830.8	2053.9	2056.80	8/13/2001		13.83		2042.97	
PNR-16	119667.9	72830.8	2053.9	2056.80	9/5/2001		12.70		2044.10	
PNR-16	119667.9	72830.8	2053.9	2056.80	11/6/2001		14.50		2042.30	
PNR-16	119667.9	72830.8	2053.9	2056.80	2/19/2002		14.76		2042.04	
PNR-16	119667.9	72830.8	2053.9	2056.80	5/20/2002		13.76		2043.04	
PNR-16	119667.9	72830.8	2053.9	2056.80	8/19/2002		9.47		2047.33	
PNR-16	119667.9	72830.8	2053.9	2056.80	11/4/2002		11.69		2045.11	
PNR-17	120093.5	75846.6	2084.1	2086.14	8/13/2001	30.40	55.62	25.22	2048.2	*
PNR-17	120093.5	75846.6	2084.1	2086.14	9/4/2001	30.42	55.86	25.44	2048.1	*
PNR-17	120093.5	75846.6	2084.1	2086.14	11/6/2001	30.98	55.86	24.88	2047.7	*
PNR-17	120093.5	75846.6	2084.1	2086.14	2/19/2002	32.04	55.77	23.73	2047.0	*
PNR-17	120093.5	75846.6	2084.1	2086.14	5/20/2002	32.75	nm	nm	nm	*
PNR-17	120093.5	75846.6	2084.1	2086.14	8/19/2002	33.62	nm	nm	nm	*
PNR-17	120093.5	75846.6	2084.1	2086.14	11/4/2002	37.68	40.43	2.75	2047.6	*
PNR-18	119551.0	77712.1	2116.2	2118.16	8/13/2001		68.90		2049.26	
PNR-18	119551.0	77712.1	2116.2	2118.16	9/5/2001		68.58		2049.58	
PNR-18	119551.0	77712.1	2116.2	2118.16	11/6/2001		69.08		2049.08	
PNR-18	119551.0	77712.1	2116.2	2118.16	2/19/2002		69.11		2049.05	
PNR-18	119551.0	77712.1	2116.2	2118.16	5/20/2002		70.10		2048.06	
PNR-18	119551.0	77712.1	2116.2	2118.16	8/19/2002		69.71		2048.45	

TABLE 1

Water Levels and Depth to Fluid in Monitoring Wells and Domestic Wells

Pioneer Natural Resources, USA, Inc.- Biere 1-22 Investigation

Last update: 12/12/02

	Location and Elevation				Fluid Levels				
Well No.	Northing (ft)	Easting (ft)	GS Elev (ft msl)	MP elev. (ft msl)	Date	DTP (ft bmp)	DTW (ft bmp)	Accumulated Oil (ft)	Groundwater Elevation (ft msl)
PNR-18	119551.0	77712.1	2116.2	2118.16	11/4/2002		69.36		2048.80
PNR-19	118844.2	73751.1	2071.3	2073.23	8/13/2001		25.75		2047.48
PNR-19	118844.2	73751.1	2071.3	2073.23	9/5/2001		25.68		2047.55
PNR-19	118844.2	73751.1	2071.3	2073.23	11/6/2001		25.98		2047.25
PNR-19	118844.2	73751.1	2071.3	2073.23	2/19/2002		26.00		2047.23
PNR-19	118844.2	73751.1	2071.3	2073.23	5/20/2002		26.37		2046.86
PNR-19	118844.2	73751.1	2071.3	2073.23	8/19/2002		26.75		2046.48
PNR-19	118844.2	73751.1	2071.3	2073.23	11/4/2002		26.86		2046.37
PNR-20	117277.4	75018.8	2084.6	2087.16	8/18/2001		41.20		2045.96
PNR-20	117277.4	75018.8	2084.6	2087.16	9/5/2001		41.05		2046.11
PNR-20	117277.4	75018.8	2084.6	2087.16	11/6/2001		41.58		2045.58
PNR-20	117277.4	75018.8	2084.6	2087.16	2/19/2002		41.41		2045.75
PNR-20	117277.4	75018.8	2084.6	2087.16	5/20/2002		41.60		2045.56
PNR-20	117277.4	75018.8	2084.6	2087.16	8/19/2002		41.91		2045.25
PNR-20	117277.4	75018.8	2084.6	2087.16	11/4/2002		41.78		2045.38
PNR-21	116715.5	75819.8	2099.0	2101.59	8/13/2001		58.80		2042.79
PNR-21	116715.5	75819.8	2099.0	2101.59	9/5/2001		58.68		2042.91
PNR-21	116715.5	75819.8	2099.0	2101.59	11/6/2001		59.12		2042.47
PNR-21	116715.5	75819.8	2099.0	2101.59	2/19/2002		58.81		2042.78
PNR-21	116715.5	75819.8	2099.0	2101.59	5/20/2002		58.80		2042.79
PNR-21	116715.5	75819.8	2099.0	2101.59	8/19/2002		59.02		2042.57
PNR-21	116715.5	75819.8	2099.0	2101.59	11/4/2002		58.89		2042.70
PNR-22	118350.3	77714.4	2127.4	2129.43	8/13/2001		81.50		2047.93
PNR-22	118350.3	77714.4	2127.4	2129.43	9/5/2001		81.21		2048.22
PNR-22	118350.3	77714.4	2127.4	2129.43	11/6/2001		81.66		2047.77
PNR-22	118350.3	77714.4	2127.4	2129.43	2/19/2002		81.48		2047.95
PNR-22	118350.3	77714.4	2127.4	2129.43	5/20/2002		81.90		2047.53
PNR-22	118350.3	77714.4	2127.4	2129.43	8/19/2002		82.11		2047.32
PNR-22	118350.3	77714.4	2127.4	2129.43	11/4/2002		81.75		2047.68
PNR-23	120090.1	75562.2	2083.0	2085.27	8/13/2001		35.85		2049.42
PNR-23	120090.1	75562.2	2083.0	2085.27	9/4/2001		35.90		2049.37
PNR-23	120090.1	75562.2	2083.0	2085.27	11/6/2001		36.03		2049.24
PNR-23	120090.1	75562.2	2083.0	2085.27	2/19/2002		36.88		2048.39
PNR-23	120090.1	75562.2	2083.0	2085.27	5/20/2002		37.35		2047.92
PNR-23	120090.1	75562.2	2083.0	2085.27	8/19/2002		37.78		2047.49
PNR-23	120090.1	75562.2	2083.0	2085.27	11/4/2002		37.81		2047.46
PNR-24	120093.0	75564.0	2083.0	2085.68	8/13/2001		36.30		2049.38
PNR-24	120093.0	75564.0	2083.0	2085.68	9/4/2001		36.31		2049.37
PNR-24	120093.0	75564.0	2083.0	2085.68	11/6/2001		36.45		2049.23
PNR-24	120093.0	75564.0	2083.0	2085.68	2/19/2002		37.17		2048.51
PNR-24	120093.0	75564.0	2083.0	2085.68	5/20/2002		37.52		2048.16
PNR-24	120093.0	75564.0	2083.0	2085.68	8/19/2002		37.88		2047.80
PNR-24	120093.0	75564.0	2083.0	2085.68	11/4/2002	37.90	39.68	1.78	2047.25
PNR-25	120376.3	75850.3	2081.9	2084.03	8/13/2001	33.78	34.08	0.30	2050.2 *
PNR-25	120376.3	75850.3	2081.9	2084.03	9/4/2001		33.73		2050.30
PNR-25	120376.3	75850.3	2081.9	2084.03	11/6/2001		34.09		2049.94
PNR-25	120376.3	75850.3	2081.9	2084.03	2/19/2002	34.98	36.63	1.65	2048.56
PNR-25	120376.3	75850.3	2081.9	2084.03	5/20/2002	35.36	nm	nm	nm
PNR-25	120376.3	75850.3	2081.9	2084.03	8/19/2002	35.64	nm	nm	nm
PNR-25	120376.3	75850.3	2081.9	2084.03	11/4/2002	35.55	37.48	1.93	2047.9

TABLE 1

Water Levels and Depth to Fluid in Monitoring Wells and Domestic Wells

Pioneer Natural Resources, USA, Inc.- Biere 1-22 Investigation

Last update: 12/12/02

	Location and Elevation				Fluid Levels					
Well No.	Northing (ft)	Easting (ft)	GS Elev (ft msl)	MP elev. (ft msl)	Date	DTP (ft bmp)	DTW (ft bmp)	Accumulated Oil (ft)	Groundwater Elevation (ft msl)	
PNR-26	120096.8	75842.9	2084.1	2086.15	8/13/2001	34.65	36.85	2.20	2050.8	*
PNR-26	120096.8	75842.9	2084.1	2086.15	9/4/2001	35.96	37.12	1.16	2049.8	*
PNR-26	120096.8	75842.9	2084.1	2086.15	11/6/2001	36.24	37.12	0.88	2049.6	*
PNR-26	120096.8	75842.9	2084.1	2086.15	2/19/2002	36.98	39.30	2.32	2048.5	*
PNR-26	120096.8	75842.9	2084.1	2086.15	5/20/2002	37.43	nm	nm	nm	*
PNR-26	120096.8	75842.9	2084.1	2086.15	8/19/2002	37.78	nm	nm	nm	*
PNR-26	120096.8	75842.9	2084.1	2086.15	11/4/2002	37.76	40.15	2.39	2047.7	*
PNR-27	115617.0	75023.1	2092.9	2095.30	9/5/2001		67.28		2028.02	
PNR-27	115617.0	75023.1	2092.9	2095.30	11/6/2001		55.68		2039.62	
PNR-27	115617.0	75023.1	2092.9	2095.30	2/19/2002		55.32		2039.98	
PNR-27	115617.0	75023.1	2092.9	2095.30	5/20/2002		55.25		2040.05	
PNR-27	115617.0	75023.1	2092.9	2095.30	8/19/2002		55.34		2039.96	
PNR-27	115617.0	75023.1	2092.9	2095.30	11/4/2002		55.25		2040.05	
PNR-28	115394.9	73020.1	2079.6	2080.32	9/5/2001		46.38		2033.94	
PNR-28	115394.9	73020.1	2079.6	2078.44	11/6/2001		44.85		2033.59	
PNR-28	115394.9	73020.1	2079.6	2078.44	5/20/2002		44.45		2033.99	
PNR-28	115394.9	73020.1	2079.6	2078.44	2/19/2002		44.67		2033.77	
PNR-28	115394.9	73020.1	2079.6	2078.44	5/20/2002		44.45		2033.99	
PNR-28	115394.9	73020.1	2079.6	2078.44	8/19/2002		44.59		2033.85	
PNR-28	115394.9	73020.1	2079.6	2078.44	11/4/2002		44.55		2033.89	
PNR-29	113949.1	73049.8	2073.8	2074.69	9/5/2001		41.86		2032.83	
PNR-29	113949.1	73049.8	2073.8	2072.64	11/6/2001		40.28		2032.36	
PNR-29	113949.1	73049.8	2073.8	2072.64	2/19/2002		40.03		2032.61	
PNR-29	113949.1	73049.8	2073.8	2072.64	5/20/2002		39.80		2032.84	
PNR-29	113949.1	73049.8	2073.8	2072.64	8/19/2002		39.96		2032.68	
PNR-29	113949.1	73049.8	2073.8	2072.64	11/4/2002		39.82		2032.82	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	5/31/2001		35.07		2048.39	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	8/13/2001		nm		nm	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	9/5/2001		nm		nm	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	11/6/2001		35.22		2048.24	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	2/19/2002		35.72		2047.74	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	5/20/2002		36.30		2047.16	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	8/19/2002		36.75		2046.71	
USGS 93-3	119878.7	75070.9	2082.1	2083.46	11/4/2002		36.81		2046.65	
USGS 93-3a	119884.1	75079.3	2082.0	2083.23	8/13/2001		35.15		2048.08	
USGS 93-3a	119884.1	75079.3	2082.0	2083.23	9/5/2001		35.11		2048.12	
USGS 93-3a	119884.1	75079.3	2082.0	2083.23	11/6/2001		34.96		2048.27	
USGS 93-3a	119884.1	75079.3	2082.0	2083.23	5/20/2002		36.05		2047.18	
USGS 93-3a	119884.1	75079.3	2082.0	2083.23	8/19/2002		36.62		2046.61	
USGS 93-3a	119884.1	75079.3	2082.0	2083.23	11/4/2002		36.59		2046.64	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	5/31/2001		15.10		2050.82	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	8/13/2001		10.70		2055.22	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	9/5/2001		12.12		2053.80	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	11/6/2001		13.11		2052.81	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	2/19/2002		13.85		2052.07	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	5/20/2002		13.65		2052.27	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	8/19/2002		12.68		2053.24	
USGS 92-12	123453.5	75096.4	2063.9	2065.92	11/4/2002		12.77		2053.15	
M-27 (b) (6)	122331.8	71238.7	2029.9	2031.19	8/13/2001		67.15		1964.04	
M-27	122331.8	71238.7	2029.9	2031.19	9/5/2001		67.28		1963.91	
M-27 [redacted]	122331.8	71238.7	2029.9	2031.19	11/6/2001		67.61		1963.58	

TABLE 1

Water Levels and Depth to Fluid in Monitoring Wells and Domestic Wells

Pioneer Natural Resources, USA, Inc.- Biere 1-22 Investigation

Last update: 12/12/02

	Location and Elevation				Fluid Levels				
W (b) (6)	Northing (ft)	Easting (ft)	GS Elev (ft msl)	MP elev. (ft msl)	Date	DTP (ft bmp)	DTW (ft bmp)	Accumulated Oil (ft)	Groundwater Elevation (ft msl)
M-27	122331.8	71238.7	2029.9	2031.19	2/19/2002		67.07		1964.12
M-27	122331.8	71238.7	2029.9	2031.19	5/20/2002		67.04		1964.15
M-27	122331.8	71238.7	2029.9	2031.19	8/19/2002		67.74		1963.45
M-27	122331.8	71238.7	2029.9	2031.19	11/4/2002		67.70		1963.49
M-28	118433.6	76557.0	2102.8	2096.63	5/31/2001		49.23		2047.40
M-28	118433.6	76557.0	2102.8	2096.63	8/13/2001		48.85		2047.78
M-28	118433.6	76557.0	2102.8	2096.63	9/5/2001		48.61		2048.02
M-28	118433.6	76557.0	2102.8	2096.63	11/6/2001		49.06		2047.57
M-28	118433.6	76557.0	2102.8	2096.63	2/19/2002		49.00		2047.63
M-28	118433.6	76557.0	2102.8	2096.63	5/20/2002		49.10		2047.53
M-28	118433.6	76557.0	2102.8	2096.63	8/19/2002		49.62		2047.01
M-28	118433.6	76557.0	2102.8	2096.63	11/6/2002		49.73		2046.90
M-30 ( )	118063.2	78960.5	***2161.3***	2163.79	8/13/2001		nm		
M-30 ( )	118063.2	78960.5	***2161.3***	2163.79	9/5/2001		nm		
M-31	118180.7	75212.4	***2085.0***	2087.17	5/31/2001		40.37		2046.80
M-31	118180.7	75212.4	***2085.0***	2087.17	8/13/2001		40.26		2046.91
M-31	118180.7	75212.4	***2085.0***	2087.17	9/5/2001		40.15		2047.02
M-31	118180.7	75212.4	***2085.0***	2087.17	11/6/2001		40.33		2046.84
M-31	118180.7	75212.4	***2085.0***	2087.17	2/19/2002		40.42		2046.75
M-31	118180.7	75212.4	***2085.0***	2087.17	5/20/2002		40.77		2046.40
M-31	118180.7	75212.4	***2085.0***	2087.17	8/19/2002		41.22		2045.95
M-31	118180.7	75212.4	***2085.0***	2087.17	11/4/2002		41.18		2045.99
(b) (6)	116848.3	69257.9	1980.4	1981.44	5/31/2001		23.8		1957.62
	116848.3	69257.9	1980.4	1981.44	8/13/2001		N.M.		
	116848.3	69257.9	1980.4	1981.44	9/5/2001		N.M.		
	116848.3	69257.9	1980.4	1981.44	11/6/2001		24.3		1957.14
	116848.3	69257.9	1980.4	1981.44	2/19/2002		24.3		1957.14
	116848.3	69257.9	1980.4	1981.44	5/20/2002		24.1		1957.34
	116848.3	69257.9	1980.4	1981.44	8/19/2002		24.2		1957.24
	116848.3	69257.9	1980.4	1981.44	11/4/2002		24.3		1957.14
M-18	125151.8	72649.9	2047.1	2048.13	11/6/2001		80.80		1967.33
M-18	125151.8	72649.9	2047.1	2048.13	2/19/2002		80.25		1967.88
M-18	125151.8	72649.9	2047.1	2048.13	5/20/2002		80.60		1967.53
M-18	125151.8	72649.9	2047.1	2048.13	8/19/2002		80.60		1967.53
M-25*	125325.8	69631.8	2031.7	2033.28	11/9/2001		67.30		1965.98
M-39	110253.5	70939.4	2049.1	2050.6	11/6/2001		100.68		1949.95
MOC1B	121916.296	75090.2	2077.0474	2079.5063	11/6/2001		28.25		2051.26
	121916.296	75090.2	2077.0474	2079.5063	11/4/2002		28.66		2050.85
MOC2	123531.9	72439.8	2036.1	2038.91	11/9/2001		73.50		1965.41

Bold Italics indicated estimated value

MP = Measure point, GS = Ground surface, DTP = Depth to product, DTW = Depth to water, bmp = below measure point

[1] = PNR-4 measured product to bottom of well at 69.88' BTO 2 inch stainless steel

* = Groundwater elevation corrected for NAPL thickness; Corrected DTW = DTW - .7 x thickness of product

Table 2

Inorganic Water Chemistry Data

Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation

Last update:12/12/2002

Well No.	Date & Time	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Hardness, Total as $CaCO_3$ mg/l	Magnesium mg/l	Nitrogen, Ammonia mg/l	Nitrogen, Nitrate plus Nitrite mg/l	Lab pH S.U.	Potassium mg/l	Silica, Dissolved mg/l	Silica, Total mg/l	Sodium mg/l	Total Dissolved Solids, @ 180° C mg/l	Specific Conductance @ 25° C mS	Sulfate mg/l	Iron mg/l	Flouride mg/l
PNR-4	6/1/2000 0:00		60.0	140.0																				
PNR-4	8/10/2001 13:15	102.6	67.7	153.9	6.80	176	215	839	<1	44700	2610	125	14.1	<0.05	7.0	534	55.7		24800	71200	75.1	1800		
PNR-4	8/10/2001 13:20	102.6	67.7	153.9	6.80	190	232	793	<1	44600	2480	121	14.4	<0.05	7.0	500	52.3		24000	71200	78.2	1900		
PNR-4	11/6/2001 15:00	nm	94.4	202.0	nm	122	149	1210	<1	31800	3210	43	15.1	0.08	7.9	453		237.0	20700	61400	49.2	1310		
PNR-4	Plugged and abandoned																							
PNR-5	6/1/2000 0:00	96.6	41.6	106.9	7.30	267	325	1170	<1	38900	3810	213		<0.05	7.4	396			22600	65200	85.1	1690	0.2	
PNR-5	8/8/2001 11:00	96.0	40.8	105.4	6.60	319	390	1100	<1	40700	3850	264	16.8	<0.05	6.7	436	36.6		23400	68600	79.5	1400		
PNR-5	8/15/2001 11:00	mnw	38.6	101.5	6.80	299	365	1210	<1	41200	4140	271	17.9	<0.05	6.9	460	40.6		23800	68000	72.8	1520		
PNR-5	11/7/2001 11:10	or	43.3	110.0	5.80	335	409	1030	<1	33700	3540	234	17.9	<0.05	6.5	368		36.7	21500	67200	52.7	1290		
PNR-5	2/20/2002 10:02	92.2	41.7	107.1	6.27	449	548	1100	<4	44500	3770	248	17.3	<0.05	6.7	432	30.0		23500	67700	61.3	1270		
PNR-5	5/22/2002 10:40	93.6	41.1	106.0	6.42	335	409	975	<4	43500	3310	212	16.4	<0.05	6.7	377	39.0		21800	68800	68.4	1870		0.35
PNR-5	8/20/2002 17:10	93.3	39.2	102.6	6.30	323	394	1040	<4	42600	3590	241	15.9	< 0.05	6.6	297	36.0	37.0	23700	69700	71.9	1570		0.33
PNR-5	11/6/2002 11:10	102.1	40.0	104.0	6.37	325	397	1140	< 4	42600	3870	250	16.3	< 0.05	6.7	446	29.0	46.0	22800	68100	61.3	1730		0.33
PNR-6	5/31/2000 0:00	1.2	9.4	48.9	5.90	511	624	109	<1	14	587	77		0.06	8.0	6			75	849	1.2	229	0.09	
PNR-6	8/7/2001 9:55	1.7	10.4	50.7	6.70	555	677	111	<1	31	724	108	0.3	0.28	7.1	6	21.2		124	1350	1.8	559		
PNR-6	8/15/2001 15:30	mnw	9.2	48.6	7.60	534	652	126	<1	30	835	126	0.2	0.25	7.3	7	23.0		143	1280	1.7	530		
PNR-6	11/7/2001 8:55	0.8	7.8	46.0	7.50	534	651	109	<1	30	690	101	0.2	0.31	7.3	6		35.8	117	1210	1.6	437		
PNR-6	2/19/2002 13:30	2.1	10.3	50.5	7.22	481	587	151	<4	49	966	143	0.3	0.49	7.0	7	40.6		121	1740	2.3	869		
PNR-6	5/21/2002 12:15	2.4	11.7	53.1	7.43	513	626	142	<4	35	837	117	0.3	0.42	7.5	7	30.9		123	1370	1.9	831		0.48
PNR-6	8/19/2002 16:35	1.4	10.3	50.5	7.10	514	627	112	<4	23	710	104	0.5	0.30	7.4	5	22.5	43.5	91	1180	1.7	450		0.44
PNR-6	11/5/2002 11:25	1.3	9.3	48.7	7.27	530	647	100	< 4	19	589	82	0.4	0.19	7.5	6	21.2	27.0	97	1000	1.5	341		0.47
PNR-7	5/31/2000 0:00	52.4	10.0	50.0	6.60	343	418	2770	<1	21700	15700	2130		4.11	7.2	55			6800	35300	48.2	1540	2.6	
PNR-7	8/7/2001 17:20	53.1	9.6	49.3	6.90	368	449	2480	<1	23300	13800	1850	0.3	4.78	6.7	52	17.0		6740	39300	49.4	1370		
PNR-7	8/15/2001 17:55	33.4	9.6	49.3	7.00	347	423	2600	<1	23000	15700	2220	0.4	3.86	6.9	57	19.9		7910	40600	44.9	1590		
PNR-7	11/7/2001 11:50	or	8.9	48.0	6.60	351	428	2630	<1	22100	14600	1960	0.4	4.06	6.6	52		20.2	7060	40600	34.7	1440		
PNR-7	2/19/2002 17:05	50.4	9.4	48.9	6.49	351	429	2700	<4	23700	14800	1960	0.3	4.19	6.7	57	17.0		7550	36200	41.0	1390		
PNR-7	5/22/2002 13:10	57.7	9.5	49.1	6.66	356	435	2490	<4	23500	13900	1860	0.3	3.91	6.6	60	29.0		7450	39800	45.1	1650		0.25
PNR-7	8/20/2002 15:07	49.8	10.9	51.6	6.60	353	431	2510	<4	23900	14400	1990	0.4	3.58	6.7	47	17.0	26.0	8200	42100	45.9	1460		0.25
PNR-7	11/5/2002 14:50	55.0	10.1	50.2	6.72	356	434	2660	< 4	24100	14500	1900	0.4	3.87	6.8	57	14.0	19.0	7690	44500	37.4	1580		0.24
PNR-8	5/31/2000 0:00	5.6	9.7	49.5	5.60	464	566	272	<1	380	1500	200		<0.05	7.8	12			420	2350	4.1	738	25.2	
PNR-8	8/7/2001 13:50	4.3	9.9	49.8	7.50	459	560	266	<1	764	1470	196	0.4	<0.05	7.1	10	20.7		406	3460	4.4	1210		
PNR-8	8/16/2001 18:10	4.6	10.0	50.0	7.50	<1	<1	254	<1	647	1420	191	0.3	<0.05	2.3	8	26.1		406	4460	12.8	2990		
PNR-8	11/6/2001 16:30	or	7.8	46.0	7.10	457	557	327	<1	1020	1820	243	0.4	0.18	7.2	14		31.3	480	3940	5.0	1150		
PNR-8	2/22/2002 16:00	5.9	11.5	52.7	7.56	489	596	307	<4	888	1680	222	0.3	<0.05	7.2	15	462.0		481	3640	4.9	1180		
PNR-8	5/21/2002 17:45	5.8	9.0	48.2	7.34	424	517	290	<4	1310	1610	215	0.3	0.08	7.4	12	159.0		463	4020	5.6	1190		0.38
PNR-8	8/21/2002 10:10	4.2	10.3	50.5	7.30	404	492	320	<4	1180	1810	246	0.5	0.08	7.3	11	20.0	140.0	435	4240	5.8	1290		0.35
PNR-8	11/5/2002 15:25	5.4	10.3	50.5	7.15	445	543	340	< 4	1140	1850	242	0.4	< 0.05	7.2	12	21.0	294.0	485	3880	5.6	1260		0.30
PNR-9	6/1/2000 0:00	9.7	11.4	52.5	9.10	263	321	583	<1	3060	2920	355		<0.05	7.3	16			887	5700	9.3	609	35.4	
PNR-9	8/9/2001 9:35	10.1	10.5	50.9	7.40	305	372	637	<1	3360	3150	378	1.6	<0.05	7.1	18	17.3		965	7940	9.7	760		
PNR-9	8/16/2001 13:45	mnw	10.9	51.6	7.60	274	334	663	<1	3620	3350	412	1.2	<0.05	7.2	17	15.8		1050	8020	9.9	639		
PNR-9	11/7/2001 14:30	4.5	9.4	49.0	7.70	263	321	691	<1	3640	3450	420	1.7	<0.05	7.0	20		29.2	1060	7630	10.3	740		
PNR-9	2/20/2002 14:50	10.2	10.7	51.3	7.24	261	343	689	<4	3700	3420	413	1.8	<0.05	6.8	30	32.0		1110	7300	11.7	629		
PNR-9	5/22/2002 10:15	11.9	12.6	54.7	7.32	274	334	607	<4	4330	3060	375	1.8	<0.05	7.0	18	25.0		1030	8580	11.3	510		0.17
PNR-9	8/20/2002 16:20	11.1	12.7	54.9	7.20	251	306	670	<4	4060	3460	434	1.8	< 0.05	7.0	16	15.0	24.0	1000	9120	11.9	690		0.18
PNR-9	11/5/2002 14:05	11.5	10.9	51.6	7.50	270	330	704	< 4	4000	3470	417	1.9	< 0.05	7.1	18	14.0	25.0	1030	8340	12.1	757		0.19
PNR-10	6/1/2000 0:00	3.2	10.5	50.9	8.90	528	645	208	<1	147	978	111		<0.05	7.6	8			435	2480	3.1	1210	12.1	
PNR-10	8/8/2001 18:50	3.7	11.4	52.5	7.40	571	697	230	<1	245	1090	127	1.2	<0.05	7.2	8	24.3		449	2890	3.5	1260		
PNR-10	8/16/2001 13:15	mnw	11.3	52.3	7.70	550	672	229	<1	263	1100	128	1.2	<0.05	7.2	8	28.3		482	2900	3.5	1320		
PNR-10	11/7/2001 12:30	nm	9.4	49.0	nm	528	644	217	<1	196	1040	121	1.2	0.08	7.4	10		38.9	443	2690	3.2	1220		
PNR-10	2/20/2002 13:38	2.4	10.3	50.5	7.27	578	705	230	<4	304	1110	131	1.2	<0.05	7.0	8	30.1		448	2920	3.9	1340		
PNR-10	5/21/2002 13:35	3.8	11.6	52.9	7.31	535	653	214	<4	415	1040	124	1.3	<0.05	7.2	8	30.6		430	2810	3.8	1680		0.22
PNR-10	8/20/2002 12:20	3.4	13.1	55.6	7.20	512	624	230	<4	351	1150	139	1.3	0.07	7.2	7	23.4	31.2	407	3090	4.0	1350		0.25
PNR-10	11/5/2002 13:30	3.9	11.0	51.8	7.47	524	639	263	< 4	384	1250	145	1.4	< 0.05	7.2	11	24.0	30.7	581	3130	4.1	1380		0.25
PNR-12	5/31/2000 0:00	4.5	12.1	53.8	6.00	699	853	425	<1	78	2410	328		95.7	7.6	17			362	1020	4.6	2030	39.3	
PNR-12	8/8/2001 15:00	4.9	12.8	55.0	7.30	537	655	421	<1	74	2390	325	0.3	139.0	7.3	15	19.1		397	4720	4.8	2130		
PNR-12	8/15/2001 16:00	mnw	13.4	56.1	7.40	738	900	444	<1	72	2570	356	0.3	138.0	7.3	16	21.1		381	4610	4.6	2050		
PNR-12	11/6/2001 16:20	4.1	10.0	50.0	7.70	739	901	425	<1	72	2430	333	0.4	105.0	7.2	15		64.5	336	4590	4.7	2040		
PNR-12	2/20/2002 11:55	4.6	10.8	51.4	7.14	735	897	375	<4	67	2370	349	0.2	145.0	7.2	14	36.0		373	4700	5.1	2170		

Table 2
Inorganic Water Chemistry Data
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update:12/12/2002

Well No.	Date & Time	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Hardness, Total as $CaCO_3$ mg/l	Magnesium mg/l	Nitrogen, Ammonia mg/l	Nitrogen, Nitrate plus Nitrite mg/l	Lab pH S.U.	Potassium mg/l	Silica, Dissolved mg/l	Silica, Total mg/l	Sodium mg/l	Total Dissolved Solids, @ 180° C mg/l	Specific Conductance @ 25° C mS	Sulfate mg/l	Iron mg/l	Flouride mg/l
PNR-12	5/21/2002 11:00	4.9	14.0	57.2	7.22	666	812	409	<4	56	2360	324	<0.1	142.0	7.3	12	22.0		342	4630	5.1	2250		0.23
PNR-12	8/19/2002 16:05	4.6	12.3	54.1	6.80	744	908	328	<4	68	2070	304	1.1	82.9	7.4	11	20.5	88.4	298	3990	4.5	1830		0.30
PNR-12	11/5/2002 11:15	4.6	11.0	51.8	7.31	700	854	442	< 4	76	2470	331	< 0.1	130	7.2	12	19.0	69.0	328	4660	5.1	2200		0.21
PNR-13	8/15/2001 18:15	21.3	14.5	58.1	7.50	372	453	1050	<1	12300	4870	546	6.0	1.12	7.3	31	18.9		6050	22200	27.3	862		
PNR-13	8/15/2001 19:00	21.3	14.5	58.1	7.50	375	457	984	<1	11500	4480	492	5.1	1.46	7.2	42	20.1		5710	21200	25.6	841		
PNR-13	11/7/2001 13:35	or	9.4	49.0	7.40	424	517	529	<1	3420	2540	296	2.1	0.37	7.1	26		26.4	1610	7780	10.9	1360		
PNR-13	2/19/2002 16:30	7.7	9.5	49.1	7.09	559	682	474	<4	2220	2310	273	1.2	<0.05	7.0	17	32.0		1250	6720	9.4	1810		
PNR-13	5/22/2002 14:00	6.8	11.0	51.8	7.20	508	619	418	<4	1040	2070	249	1.2	<0.05	7.4	14	29.0		680	5120	6.3	2270		0.32
PNR-13	8/20/2002 15:45	4.4	13.3	55.9	6.90	444	541	408	<4	679	2080	257	1.4	< 0.05	7.2	12	24.0	30.0	588	4530	5.6	2000		0.36
PNR-13	11/5/2002 15:30	4.9	9.9	49.8	7.09	511	623	386	< 4	769	1900	227	1.3	< 0.05	7.2	14	22.0	30.0	493	4110	5.3	1730		0.37
PNR-14	8/9/2001 16:00	96.6	42.6	108.7	6.40	321	391	1390	<1	44200	5110	397	23.8	<0.05	6.5	327	30.7		23100	70000	80.5	1460		
PNR-14	8/14/2001 9:45	96.9	39.7	103.5	6.60	294	358	1430	<1	44300	5190	394	24.0	<0.05	6.6	310	30.8		23200	69700	74.3	1330		
PNR-14	11/7/2001 14:35	or	45.6	114.0	5.40	340	415	1690	<1	40900	6370	519	28.1	<0.05	6.3	170		37.3	22200	67400	51.1	1490		
PNR-14	2/21/2002 11:30	91.4	41.2	106.2	6.09	372	454	1570	<4	43100	5910	483	29.8	<0.05	6.6	249	25.0		22700	64200	60.4	1300		
PNR-14	5/22/2002 12:05	90.2	42.5	108.5	6.26	338	412	1260	<4	39700	4630	358	22.2	<0.05	6.4	282	42.0		22000	67200	66.7	1730		0.35
PNR-14	8/20/2002 17:45	87.8	40.0	104.0	6.10	325	397	1250	<4	39900	4800	407	18.5	< 0.05	6.5	133	30.0	29.0	21200	66300	6.9	1510		0.32
PNR-14	11/6/2002 11:28	105.5	40.9	105.6	6.30	295	360	1410	< 4	35300	5210	412	18.4	< 0.05	6.6	368	22.0	33.0	21500	65400	57.5	1590		0.30
PNR-15	8/10/2001 8:15	94.6	80.1	176.2	7.40	162	197	950	<1	43500	3370	243	14.4	<0.05	7.4	440	41.9		22700	66100	79.3	1470		
PNR-15	8/14/2001 13:00	97.2	80.1	176.2	7.10	288	351	1170	<1	40800	4060	277	15.4	<0.05	7.0	480	47.6		25200	66000	72.9	1650		
PNR-15	11/8/2001 9:10	102.0	81.7	179.0	6.20	369	450	950	<1	37400	3340	237	15.6	0.08	6.7	382		50.1	21300	62400	49.4	1430		
PNR-15	2/21/2002 14:54	104.5	84.7	148.5	6.24	338	412	991	<4	45500	3430	232	15.7	0.06	6.8	482	70.0		22700	68100	62.4	1420		
PNR-15	5/22/2002 14:55	106.9	67.2	153.0	6.41	330	402	951	<4	43000	3300	226	14.9	<0.05	6.6	398	61.0		21900	68800	69.1	2300		0.33
PNR-15	8/21/2002 14:00	101.7	60.5	140.9	6.40	346	423	1110	<4	46200	3800	250	15.4	0.07	6.8	385	38.0	43.0	22100	70100	72.7	1840		0.38
PNR-15	11/6/2002 14:35	112.6	56.5	133.7	6.43	325	396	1010	< 4	37400	3480	235	15.4	< 0.05	6.8	420	27.0	42.0	21700	67800	60.4	1750		0.31
PNR-16	8/10/2001 15:15	4.3	10.1	50.2	7.80	508	620	359	<1	33	2300	340	0.3	20.2	7.4	19	22.1		282	4260	4.2	2480		
PNR-16	8/16/2001 18:35	4.6	11.1	52.0	7.80	485	592	396	<1	33	2460	357	0.1	19.0	7.2	20	22.6		299	4260	4.1	2380		
PNR-16	11/6/2001 16:05	1.9	11.1	52.0	6.90	526	642	458	<1	26	2570	347	2.0	8.6	7.1	21		158.0	337	4650	4.6	2780		
PNR-16	2/21/2002 10:20	4.6	9.1	48.4	7.04	635	774	469	<4	28	2850	408	1.4	13.3	7.1	26	39.0		427	4960	5.1	3180		
PNR-16	5/21/2002 15:50	4.9	11.6	52.9	7.50	488	595	390	<4	16	2650	407	0.2	16.5	7.3	20	39.9		289	5090	5.0	3460		0.45
PNR-16	8/20/2002 11:40	4.2	11.2	52.2	6.80	494	603	399	<4	26	2860	452	< 0.1	17.7	7.3	14	24.2	42.1	371	5060	5.0	3270		0.46
PNR-16	11/5/2002 14:04	4.9	10.4	50.7	7.10	498	608	422	< 4	24	2810	428	< 0.1	18.2	7.2	21	22.0	30.0	286	5110	5.2	3210		0.47
PNR-17	8/22/2001 12:35	98.7	75.0	167.0	nm	220	269	1440	<1	42500	5450	449	21.8	<0.05	7.4	372	55.2		22900	68600	65.4	1520		
PNR-17	8/22/2001 13:30	97.4	76.0	168.8	nm	219	267	1420	<1	44200	5490	468	22.3	<0.05	7.3	367	55.0		22900	68700	66.4	1440		
PNR-17	11/8/2001 11:30	nm	88.9	192.0	nm	178	217	2380	<1	40300	10300	1070	31.5	0.10	7.1	289		153.0	20800	61600	47.8	1490		
PNR-17	2/21/2002 17:00	94.6	83.1	181.6	6.26	237	289	1850	<4	41500	7120	608	29.9	<0.05	6.8	291	111.0		21200	65900	59.1	1120		
PNR-17	5/23/2002 10:50	106.8	82.2	180.0	6.62	262	319	1360	<4	42300	4990	386	22.9	<0.05	6.6	289	76.0		21000	62800	67.0	1480		0.43
PNR-17	8/21/2002 15:15	103.7	71.5	160.7	6.50	358	437	1220	<4	41000	4420	334	19.3	< 0.05	6.8	316	40.0	104.0	15400	70000	53.1	1400		0.44
PNR-17	11/6/2002 15:40	114.8	68.7	155.7	6.59	291	355	1360	< 4	36300	4870	358	19.1	< 0.05	6.6	405	34.0	68.0	23500	67100	58.3	1630		0.38
PNR-18	8/8/2001 16:00	3.0	11.4	52.5	7.40	616	751	276	<1	57	1580	215	2.4	<0.05	7.3	12	19.9		193	2740	2.9	1470		
PNR-18	8/16/2001 11:00	mnw	12.2	54.0	7.50	558	681	264	<1	56	1630	235	2.3	<0.05	7.3	11	23.6		203	2900	3.0	1520		
PNR-18	11/7/2001 10:20	nm	12.2	54.0	nm	696	849	256	<1	84	1470	200	1.4	0.13	7.5	10		30.8	184	2650	2.9	1220		
PNR-18	2/20/2002 11:24		10.5	3.3	7.30	671	819	310	<4	70	1750	238	2.2	<0.05	7.3	10	26.0		241	2950	3.5	1600		
PNR-18	5/21/2002 10:30	3.5	13.1	55.6	7.22	624	761	283	<4	42	1600	217	2.8	<0.05	7.4	7	27.9		172	2960	3.4	1900		0.26
PNR-18	8/19/2002 16:50	3.2	12.3	54.1	7.00	578	703	299	<4	57	1800	256	2.5	0.05	7.1	7	23.5	31.7	152	3130	3.5	1690		0.26
PNR-18	11/5/2002 11:55	3.5	12.0	53.6	7.41	613	748	328	< 4	60	1800	240	2.4	< 0.05	7.2	8	22.8	29.6	184	3210	3.8	1790		0.27
PNR-19	8/7/2001 14:50	11.3	9.9	49.8	7.30	354	432	724	<1	3820	4410	631	<0.1	18.0	7.0	19	21.4		819	8810	10.6	1160		
PNR-19	8/15/2001 16:40	mnw	13.5	56.3	7.40	344	420	702	<1	3180	4260	610	<0.1	13.8	7.2	20	22.5		745	8260	9.5	1120		
PNR-19	11/6/2001 15:20	or	8.3	47.0	6.80	343	418	792	<1	3770	4760	675	<0.1	20.2	7.1	20		25.4	861	8650	11.4	1270		
PNR-19	2/19/2002 15:05	12.3	10.5	50.9	6.96	326	398	971	<4	4410	5710	799	<0.1	23.0	7.0	26	26.0		1130	9380	14.1	1400		
PNR-19	5/22/2002 14:55	16.2	10.0	50.0	7.01	352	430	927	<4	6080	5570	791	<0.1	23.8	7.1	25	26.0		1300	11300	15.6	1160		0.24
PNR-19	8/20/2002 12:30	11.5	12.9	55.2	6.90	360	439	908	<4	5070	5510	787	< 0.1	22.1	7.0	20	21.0	27.0	1210	11300	15.1	1470		0.26
PNR-19	11/5/2002 13:17	15.9	10.0	50.0	7.02	359	438	943	< 4	4960	5460	755	< 0.1	23.3	7.1	22	19.0	25.0	1220	11400	16.2	1380		0.28
PNR-20	8/8/2001 9:50	39.0	11.2	52.2	7.20	413	504	1750	<1	18100	9420	1230	<0.1	11.2	7.2	42	18.5		5180	29000	38.1	1190		
PNR-20	8/15/2001 17:15	mnw	10.4	50.7	7.30	412	502	1800	<1	12900	9710	1270	<0.1	10.4	7.1	46	24.2		4800	25400	29.6	1420		
PNR-20	11/8/2001 10:00	nm	11.1	52.0	nm	508	620	1610	<1	10600	8940	1200	0.2	4.3	6.9	37		68.4	3480	19900	26.8	1460		
PNR-20	2/19/2002 15:40	34.6	10.0	50.0	6.70	391	477	1830	<4	15400	9840	1280	<0.1	10.8	6.8	43	26.0		5460	25200	32.7	1180		
PNR-20	5/22/2002 11:00	40.2	11.2	52.2	6.78	398	486	1580	<1	17400	8540	1110	<0.1	11.4	7.0	40	38.0		5050	29600	36.4	1030		0.16

Table 2
Inorganic Water Chemistry Data
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update:12/12/2002

Well No.	Date & Time	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Hardness, Total as $CaCO_3$ mg/l	Magnesium mg/l	Nitrogen, Ammonia mg/l	Nitrogen, Nitrate plus Nitrite mg/l	Lab pH S.U.	Potassium mg/l	Silica, Dissolved mg/l	Silica, Total mg/l	Sodium mg/l	Total Dissolved Solids, @ 180° C mg/l	Specific Conductance @ 25° C mS	Sulfate mg/l	Iron mg/l	Flouride mg/l
PNR-20	8/20/2002 13:25	37.4	12.3	54.1	6.60	425	519	1800	<4	17100	10000	1350	< 0.1	9.5	6.8	35	21.0	45.0	6840	31400	36.8	1390		0.17
PNR-20	11/5/2002 16:05	43.9	10.3	50.5	6.92	427	521	1930	< 4	18400	10000	1260	< 0.1	11	6.9	44	16.0	27.0	6790	33600	33.3	1500		0.16
PNR-21	8/9/2001 10:15	65.5	11.0	51.8	6.80	501	611	2060	<1	26500	9670	1100	2.0	8.2	6.8	63	16.0		12500	47000	58.5	1450		
PNR-21	8/16/2001 16:40	62.0	11.4	52.5	7.00	548	669	2140	<1	26900	10200	1170	4.2	<0.05	6.9	61	17.0		13200	47000	53.4	1510		
PNR-21	11/6/2001 11:00	60.3	14.4	58.0	7.10	538	656	2090	<1	27900	9930	1140	2.4	8.5	6.7	68		38.7	13100	45300	40.4	1630		
PNR-21	2/21/2002 9:15	60.3	10.4	50.7	6.53	562	685	1970	<4	28300	9280	1060	2.1	7.5	6.9	66	27.0		12900	45800	48.1	1410		
PNR-21	5/22/2002 11:55	70.5	11.8	53.2	6.67	544	663	1800	<4	28600	8440	959	2.5	7.8	6.8	60	27.0		12600	47400	53.2	1560		0.14
PNR-21	8/21/2002 9:00	63.1	12.7	54.9	6.60	553	675	1820	<4	29200	8580	980	2.8	7.5	6.8	74	15.0	18.0	12900	51200	54.2	1690		0.15
PNR-21	11/5/2002 15:30	66.3	10.8	51.4	6.78	559	682	2000	< 4	28600	9180	1020	2.6	7.99	6.8	61	11.0	< 20	13000	49600	44.6	1700		0.15
PNR-22	8/8/2001 17:10	3.9	11.9	53.4	7.30	669	1060	205	<1	467	1250	180	3.5	<0.05	7.2	9	22.2		434	2900	3.8	969		
PNR-22	8/16/2001 11:35	11.2	11.3	52.3	7.40	853	1040	218	<1	463	1340	193	4.0	<0.05	7.2	9	26.0		464	2920	3.8	959		
PNR-22	11/7/2001 9:10	3.6	12.2	54.0	7.60	815	994	207	<1	546	1290	188	4.1	0.06	7.4	8		33.2	421	2870	3.9	833		
PNR-22	2/20/2002 14:10	3.4	11.3	52.3	7.11	790	964	205	<4	523	1310	195	3.8	<0.05	6.9	9	27.2		467	2960	4.3	943		
PNR-22	5/21/2002 12:15	4.5	12.8	55.0	7.13	777	948	203	<4	635	1260	182	5.0	<0.05	7.4	9	30.3		542	3040	4.3	824		0.26
PNR-22	8/20/2002 15:35	3.4	11.3	52.3	7.20	785	958	217	<4	676	1420	213	5.2	0.05	7.2	7	26.8	33.1	407	3150	4.6	924		0.25
PNR-22	11/5/2002 12:50	4.6	12.2	54.0	7.28	784	956	248	< 4	790	1490	213	4.3	< 0.05	7.2	9	25.7	30.6	462	3300	4.8	935		0.24
PNR-23	8/9/2001 17:30	90.5	80.1	176.2	7.30	<1	<1	850	<1	41300	3270	275	14.1	<0.05	3.7	411	59.1		20300	62400	77.3	1460		
PNR-23	8/14/2001 10:30	98.6	80.4	176.7	6.50	192	234	1030	<1	45000	3730	282	15.9	<0.05	6.5	480	68.2		23900	68000	74.2	1600		
PNR-23	11/8/2001 13:15	88.7	85.6	186.0	nm	271	331	2110	<1	33600	8520	789	22.9	3.82	6.4	312		114.0	18200	62600	47.0	1450		
PNR-23	2/21/2002 12:25	100.1	72.1	161.8	5.86	214	262	1770	<4	41500	6760	572	24.5	0.05	6.8	313	73.0		20400	63700	58.7	1180		
PNR-23	5/23/2002 11:15	112.9	82.2	180.0	6.14	188	229	1210	<4	42200	4570	376	16.8	<0.05	6.4	348	95.0		21100	68200	68.3	1490		2.13
PNR-23	8/21/2002 12:55	102.9	70.2	158.4	6.10	180	219	1220	<4	43300	4670	392	18.1	< 0.05	6.6	293	58.0	78.0	18000	70100	68.5	1710		2.26
PNR-23	11/6/2002 12:15	115.5	71.2	160.2	6.10	195	238	1180	< 4	36800	4290	324	17.4	< 0.05	6.5	410	63.0	71.0	22100	67300	60.2	1670		2.20
PNR-24	8/14/2001 12:00	97.5	73.4	164.1	6.50	237	289	997	<1	41100	3240	180	14.8	<0.05	6.8	470	73.2		24900	67700	73.8	1730		
PNR-24	8/14/2001 18:20	101.8	80.3	176.5	6.60	231	282	1040	<1	43400	3450	206	14.9	<0.05	6.8	500	65.0		23900	67000	51.3	1730		
PNR-24	11/8/2001 13:40	84.5	84.4	184.0	nm	479	584	1090	<1	34600	3750	248	14.5	<0.05	6.5	379		320.0	19400	61000	49.2	1690		
PNR-24	2/21/2002 13:55	120.4	67.1	152.8	6.24	235	287	1020	<4	44700	3160	150	17.2	<0.05	6.8	496	163.0		23500	68500	62.6	1450		
PNR-24	5/23/2002 11:50	113.3	78.3	172.9	6.43	258	315	842	<4	44700	2760	159	14.5	<0.05	6.7	404	207.0		21300	69000	71.2	1940		3.71
PNR-24	8/21/2002 13:10	104.6	70.0	158.0	6.30	175	214	1070	<4	44400	3360	170	16.0	< 0.05	6.7	435	59.0	199.0	21600	72200	73.9	1470		3.67
PNR-24	11/6/2002 12:32	113.5	69.0	156.2	6.55	171	208	1120	< 4	36900	3700	219	17	< 0.05	6.7	452	50.0	225.0	22100	68300	61.1	1670		3.53
PNR-25	8/14/2001 13:15	102.9	76.7	170.1	6.60	255	311	924	<1	39900	2890	140	15.8	<0.05	6.8	510	68.6		24000	70500	75.6	1730		
PNR-25	8/14/2001 19:05	99.2	81.1	178.0	6.80	246	301	1020	<1	45400	3180	160	15.8	<0.05	6.8	560	65.3		26600	70300	76.6	1550		
PNR-25	11/8/2001 10:15		84.4	184.0	nm	528	644	1660	<1	38300	6000	448	18.5	<0.05	6.5	433		276.0	21200	65600	48.5	2260		
PNR-25	2/21/2002 15:30	103.1	72.6	162.7	6.05	237	289	2430	<4	40100	9350	797	25.6	<0.05	6.7	278	200.0		18700	64500	57.9	1280		
PNR-25	5/22/2002 16:50	34.8	71.1	160.0	6.80	930	1130	452	<4	11500	1770	156	10.4	<0.05	7.0	78	243.0		5600	18700	28.9	756		4.20
PNR-25	8/21/2002 14:40	11.8	61.4	142.5	7.10	1040	1270	70	<4	3560	384	51	1.4	< 0.05	7.4	31	59.0	312.0	2040	6790	11.9	< 30		6.52
PNR-25	11/6/2002 14:55	14.5	56.7	134.1	7.14	877	1070	48	< 4	3110	298	43	0.9	< 0.05	7.5	33	45.0	123.0	2140	6330	13.0	< 10		6.00
PNR-26	8/14/2001 18:00	nm	79.2	174.6	nm	144	176	910	<1	45000	2820	133	14.4	<0.05	7.2	517	63.1		23800	68700	74.7	1660		
PNR-26	8/22/2001 10:00	98.0	75.0	167.0	nm	159	194	803	<1	42600	2490	118	13.6	<0.05	7.5	499	61.9		23400	68600	65.8	1670		
PNR-26	11/8/2001 14:15	nm	83.3	182.0	nm	640	781	1070	<1	40900	3740	259	18.4	0.16	7.5	437		168.0	22800	67200	51.6	1170		
PNR-26	2/21/2002 16:00	125.0	65.0	149.0	6.42	234	285	1310	<4	40800	4380	269	18.4	<0.05	6.9	453	100.0		22300	67000	61.2	1080		
PNR-26	5/23/2002 11:15	105.7	75.6	168.1	6.68	177	215	1220	<4	42400	4210	284	18.4	<0.05	6.9	392	87.0		20800	67400	67.2	1530		2.72
PNR-26	8/21/2002 16:00	100.3	67.4	153.3	6.40	301	367	1360	<4	40600	4880	361	17.5	< 0.05	6.7	403	59.0	167.0	15300	69100	50.7	1340		2.65
PNR-26	11/6/2002 16:20	107.2	62.7	144.9	6.35	181	221	1450	< 4	36000	5080	356	16.8	< 0.05	6.7	509	53.0	101.0	22900	65300	57.5	1610		2.57
PNR-27	8/21/2001 15:35	27.6	10.7	51.3	nm	592	722	1790	<1	10300	9790	1290	<0.1	28.6	7.1	37	24.4		2440	21600	23.1	2020		
PNR-27	9/5/2001 15:15	25.9	12.3	54.1	7.00	594	725	1990	<1	10000	10600	1370	<0.1	27.5	6.8	39	20.9		2700	20400	25.0	1940		
PNR-27	11/8/2001 15:30	28.1	10.0	50.0	7.10	569	694	1960	<1	10900	10700	1400	<0.1	29.7	6.7	40		43.0	2840	21200	27.1	1750		
PNR-27	2/20/2002 17:02	27.5	10.5	50.9	6.66	628	767	1970	<4	11400	10600	1390	<0.1	27.2	6.8	54	27.0		3130	21000	27.1	1530		
PNR-27	5/21/2002 18:12	32.1	13.7	56.7	6.65	589	719	1790	<4	12000	9650	1260	<0.1	34.2	6.8	40	35.0		2990	23800	29.9	1940		0.17
PNR-27	8/20/2002 19:20	29.8	14.5	58.1	6.90	580	708	1900	<4	12600	9710	1210	< 0.1	31.7	6.9	32	26.0	38.0	2850	25600	28.2	1850		0.17
PNR-27	11/6/2002 9:55	32.7	11.3	52.3	6.84	583	712	2090	< 4	11200	11000	1400	< 0.1	31.2	6.8	42	22.0	30.0	3450	24200	26.0	1820		0.17
PNR-28	8/21/2001 16:45	31.4	10.3	50.5	nm	501	612	1910	<1	11700	10800	1460	<0.1	23.1	7.2	39	21.1		3090	25200	26.2	1460		
PNR-28	9/5/2001 14:35	28.4	13.0	55.4	7.00	493	601	2020	<1	12300	11100	1470	<0.1	21.2	6.9	38	18.3		3200	22600	27.0			
PNR-28	11/6/2001 14:40	29.7	12.2	54.0	7.10	519	633	1880	<1	10500	10400	1380	<0.1	20.2	6.7	34		37.3	3070	24700	24.4	1660		
PNR-28	2/20/2002 18:30	31.9	10.6	51.1	6.88	522	637	2060	<4	13700	11300	1490	<0.1	21.6	6.8	62	23.0		3850	23000	30.6	1430		
PNR-28	5/21/2002 17:15	38.8	12.4	54.3	6.67	450	549	1990	<4	14700	10900	1430	<0.1	23.3	6.8	43	33.0		3910	27400	33.9	1820		0.17
PNR-28	8/20/2002 18:30	34.2	14.4	57.9	6.80	510	622	2090	<4	15200	10800	1340	< 0.1	22.9	6.8	39	23.0	30.0	3510	31200	32.8	1590		0.15

Table 2
Inorganic Water Chemistry Data
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update:12/12/2002

Well No.	Date & Time	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Hardness, Total as $CaCO_3$ mg/l	Magnesium mg/l	Nitrogen, Ammonia mg/l	Nitrogen, Nitrate plus Nitrite mg/l	Lab pH S.U.	Potassium mg/l	Silica, Dissolved mg/l	Silica, Total mg/l	Sodium mg/l	Total Dissolved Solids, @ 180° C mg/l	Specific Conductance @ 25° C mS	Sulfate mg/l	Iron mg/l	Flouride mg/l
PNR-28	11/5/2002 13:20	36.4	10.2	50.4	6.53	516	630	2340	< 4	15700	12800	1640	< 0.1	22.7	6.8	46	20.0	36.0	4850	29700	28.9	1740		0.17
PNR-29	8/21/2001 17:45	5.1	10.1	50.2	nm	606	740	390	<1	129	2170	290	<0.1	174.0	7.2	14	25.0		480	4760	5.0	1940		
PNR-29	9/5/2001 14:00	4.9	12.8	55.0	7.40	695	847	393	<1	104	2180	291	<0.1	162.0	6.5	11	22.4		483	4760	4.8			
PNR-29	11/8/2001 12:50	4.9	11.7	53.0	7.50	691	843	400	<1	99	2180	286	<0.1	158.0	7.1	11		30.1	469	4650	5.0	1880		
PNR-29	2/20/2002 13:03	4.8	10.1	50.2	7.01	623	760	399	<4	106	2200	292	<0.1	160.0	6.9	13	28.0		501	4640	5.4	2070		
PNR-29	5/21/2002 16:30	5.4	11.9	53.4	7.00	662	807	359	<4	83	1980	262	<0.1	169.0	7.3	11	31.0		449	4640	5.3	2080		0.24
PNR-29	8/20/2002 11:20	4.3	13.3	55.9	7.00	669	816	376	<4	113	2130	290	< 0.1	163.0	7.2	10	25.0	35.0	431	4780	5.4	2030		0.27
PNR-29	11/5/2002 12:42	4.9	9.9	49.8	6.93	680	830	403	< 4	117	2200	290	< 0.1	167	7.1	12	25.0	31.0	469	4770	5.5	2070		0.28
USGS-92-12	6/1/2000 0:00	2.7	10.8	51.4	6.50	389	474	240	<1	11	1670	260		3.9	7.9	14			95	2330	2.6	1410	12.1	
USGS-92-12	8/7/2001 11:35	2.2	9.8	49.6	6.70	422	515	203	<1	7	1420	222	<0.1	4.4	7.2	12	25.1		92	2520	2.6	1360		
USGS-92-12	8/15/2001 14:40	mnw	9.3	48.7	7.70	422	515	220	<1	8	1520	235	<0.1	4.3	7.4	13	28.3		94	2310	2.4	1450		
USGS-92-12	11/8/2001 14:30	1.7	10.0	50.0	7.10	420	512	197	<1	6	1370	212	<0.1	5.0	7.4	13		32.1	83	2150	2.3	1200		
USGS-92-12	2/20/2002 14:25	2.3	10.0	50.0	7.38	458	558	171	<4	6	1270	205	<0.1	5.1	7.3	11	29.1		84	2140	2.5	1220		
USGS 92-12	5/21/2002 14:05	2.6	12.7	54.9	7.57	403	491	174	<4	<10	1220	191	<0.1	5.0	7.6	11	26.8		85	2040	2.3	1250		0.43
USGS 92-12	8/19/2002 16:00	2.4	9.7	49.5	7.20	413	504	197	<4	6	1520	249	< 0.1	5.5	7.4	12	24.4	22.2	90	2420	2.7	1400		0.41
USGS-92-12	11/5/2002 12:00	2.6	9.8	49.6	7.31	422	514	226	< 4	6	1540	237	< 0.1	6.05	7.4	14	25.8	30.3	97	2560	2.9	1480		0.43
USGS 93-3	6/1/2000 0:00	97.6	24.8	76.6	6.50	396	483	1080	<1	39600	3770	257		<0.05	7.1	403			23400	67000	87.0	1730	<0.1	
USGS 93-3	8/7/2001 16:55	94.9	25.2	77.4	6.80	456	556	960	<1	41600	3390	241	15.0	<0.05	6.9	425	19.4		22600	68200	79.2	100		
USGS 93-3	8/15/2001 19:10	79.3	24.7	76.5	6.90	418	510	960	<1	41800	3450	257	15.7	<0.05	7.0	430	22.1		25300	68400	73.9	2320		
USGS 93-3	11/7/2001 10:05	or	24.4	76.0	6.10	472	576	930	<1	39700	3290	236	15.6	<0.05	6.7	383		21.5	23600	62300	52.3	1270		
USGS-93-3	2/20/2002 9:00	92.0	24.8	76.6	6.46	395	482	929	<4	42300	3310	241	15.9	<0.05	6.8	422	15.0		22500	67200	61.2	888		
USGS 93-3	5/22/2002 9:30	92.1	23.9	75.0	6.62	434	529	916	<4	42100	3150	210	14.9	<0.05	6.8	386	22.0		22800	68100	69.3	1870		0.19
USGS 93-3	8/20/2002 16:25	90.0	24.5	76.1	6.40	463	565	897	<4	42400	3230	242	14.9	< 0.05	6.8	284	20.0	20.0	22800	68000	71.7	1170		0.17
USGS-93-3	11/5/2002 16:10	99.4	24.0	75.2	6.56	469	572	981	< 4	38400	3420	236	14.9	< 0.05	6.8	439	12.0	20.0	22800	67700	61.7	1240		0.18
M-18	11/8/2001 15:30	nm	17.2	63.0	nm	111	135	669	<1	5190	2920	303	37.5	<0.05	5.9	32		<3	1630	8600	13.5	25		
M-27	8/16/2001 14:35	13.5	11.3	52.3	9.30	14	17	687	<1	5280	3940	540	1.8	<0.05	8.8	19	<1		1640	10400	13.1	160		
M-27	8/16/2001 14:45	13.5	11.3	52.3	9.30	12	15	681	<1	5380	3920	538	4.0	<0.05	7.7	19	<1		1610	10900	13.2	156		
M-27	11/8/2001 8:50	11.4	10.0	50.0	8.30	4	5	710	<1	5650	4050	553	4.3	<0.05	6.7	23		<3	1670	9920	14.2	433		
M-27	2/20/2002 15:42	10.9	10.6	51.1	7.88	389	475	917	<4	5710	4450	524	2.7	<0.05	6.7	42	17.0		1700	10500	16.6	814		
M-27	5/21/2002 15:05	17.2	13.1	55.6	7.28	211	258	839	<4	7110	4130	494	2.7	<0.05	6.9	20	20.0		1620	12000	16.8	1160		0.15
M-27	8/20/2002 17:45	14.9	12.8	55.0	8.10	4	5	707	<4	5750	3740	479	4.2	< 0.05	5.7	19	< 2	< 2	1560	12200	16.0	664		< 0.1
M-27	11/6/2002 9:00	16.4	11.6	52.9	8.55	< 4	4	732	< 4	5100	3990	526	2.6	< 0.05	6	23	< 2	< 2	1730	10500	17.0	619		< 0.1
M-28	6/1/2000 0:00	60.5	12.0	53.6	7.00	600	732	1530	<1	25800	6920	749		20.9	7.1	62			14200	44700	58.9	1910	6.6	
M-28	8/9/2001 12:15	57.7	11.5	52.7	6.90	676	825	1210	<1	23800	5600	628	4.0	27.9	6.9	57	17.3		11300	40500	53.5	1680		
M-28	8/16/2001 17:00	54.9	11.1	52.0	7.10	616	751	1340	<1	22600	6130	677	5.4	24.6	7.0	62	19.3		12800	41000	48.8	2260		
M-28	11/8/2001 12:00	nm	17.8	64.0	nm	761	929	217	<1	1410	1240	169	0.4	31.3	7.3	13		29.0	873	3950	6.1	687		
M-28	2/21/2002 8:40	59.3	10.2	50.4	6.63	633	772	1250	<4	25900	5620	607	6.9	15.0	7.0	77	17.0		13300	43800	47.4	1400		
M-28	5/23/2002 9:30	66.1	12.0	53.6	5.20	598	730	1220	<4	31000	5080	491	8.8	8.4	6.6	87	20.0		15600	50700	57.7	1920		0.13
M-28	8/21/2002 10:00	61.1	12.6	54.7	6.50	609	742	1240	<4	25500	5620	614	8.0	12.9	6.8	51	18.0	18.0	9540	45900	51.8	1700		0.15
M-28	11/6/2002 11:20	62.6	11.3	52.3	6.90	612	746	1210	< 4	22400	5330	562	6.7	17	6.9	71	< 20	< 10	12600	43100	44.0	1840		0.15
M-30	6/1/2000 0:00	2.6	9.8	49.6	9.20	1020	1240	126	<1	36	801	118		<0.05	8.0	7			325	1740	2.4	501	5.63	
M-30	2/22/2002 13:00	2.9	5.6	42.1	7.64	905	1100	113	<4	43	735	110	4.0	<0.05	7.5	7	27.5		325	1790	2.6	549		
M-30	5/22/2002 17:10	2.6	7.0	44.6	7.53	916	1120	111	<1	34	700	103	5.6	<0.05	7.6	6	31.5		291	1730	2.6	539		0.29
M-31	6/1/2000 0:00	87.2	11.0	51.8	7.60	481	562	1760	<1	36000	7610	783		0.17	7.1	122			20200	60800	80.5	1690	9.5	
M-31	8/9/2001 11:05	88.5	10.7	51.3	6.90	515	628	1540	<1	35900	6530	649	6.6	<0.05	6.9	150	15.6		19800	63800	74.2	1220		
M-31	8/16/2001 17:30	84.3	11.2	52.2	7.00	516	630	1640	<1	37200	6820	659	6.9	<0.05	6.9	150	15.8		21900	63300	68.3	2120		
M-31	11/8/2001 16:00	51.4	11.7	53.0	6.80	6	8	1170	<1	28300	7350	1070	11.3	0.06	6.0	110		<5	15700	50200	39.8	840		
M-31	2/21/2002 9:45	81.4	10.3	50.5	6.58	464	566	1570	<4	38600	6510	630	7.5	<0.05	7.0	207	17.0		20800	63000	58.4	1690		
M-31	5/22/2002 15:45	94.4	11.8	53.2	6.75	513	626	1440	<4	39700	5950	571	7.7	<0.05	6.8	162	24.0		20000	63700	64.7	2210		0.12
M-31	8/21/2002 10:45	83.5	12.1	53.8	6.50	504	615	1530	<4	39200	6390	626	8.4	< 0.05	6.8	136	18.0	14.0	18600	67100	67.5	1780		0.12
M-31	11/6/2002 10:35	89.2	10.8	51.4	6.84	510	622	1520	< 4	33600	6280	601	8.1	< 0.05	6.8	177	17	< 10	19100	62800	55.0	1650		0.13
M-36	9/5/2001 15:55	3.8	10.9	51.6	7.60	661	807	206	<1	259	1160	156	1.1	<0.05	6.6	7	21.3		458	2920	3.5	1230		
M-36	11/9/2001 11:05	2.7	9.6	49.3	7.40	649	792	215	<1	313	1210	163	1.0	0.05	7.2	8		27.9	478	2960	3.8	1220		
M-36	9/5/2001 16:25	3.5	13.5	56.3	7.60	654	798	212	<1	174	1080	132	1.0	<0.05	6.6	7	21.3		434	2750	3.3	1230		
M-36	11/9/2001 11:40	2.4	10.2	50.4	7.60	648	791	208	<1	183	1080	135	1.0	0.05	7.3	8		27.4	436	2690	3.5	1240		

Table 2

Inorganic Water Chemistry Data

Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation

Last update:12/12/2002

Well No.	Date & Time	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Hardness, Total as $CaCO_3$ mg/l	Magnesium mg/l	Nitrogen, Ammonia mg/l	Nitrogen, Nitrate plus Nitrite mg/l	Lab pH S.U.	Potassium mg/l	Silica, Dissolved mg/l	Silica, Total mg/l	Sodium mg/l	Total Dissolved Solids, @ 180° C mg/l	Specific Conductance @ 25° C mS	Sulfate mg/l	Iron mg/l	Flouride mg/l
M-39	11/7/2001 15:45	nm	9.4	49.0	nm	401	413	10	38	34	1020	241	8.8	<0.05	8.9	8		1.7	289	2150	2.6	1260		
[redacted]	11/9/2001 9:00	3.1	7.2	45.0	7.20	321	392	134	<1	821	701	89	0.3	<0.05	7.5	9		14.5	416	1890	3.3	172		
[redacted]	5/31/2000 0:00	3.3	10.1	50.2	9.20	353	429	133	<1	794	695	88		<0.05	8.2	8			432	1970	3.2	279	4.82	
[redacted]	6/10/2001 10:00	3.9	10.8	51.4	7.70	366	447	168	<1	1020	893	115	0.6	<0.05	7.4	10	14.2		524	2520	3.9	287		
[redacted]	6/22/2001 15:30	3.4	11.1	52.0	nm	360	439	155	<1	1020	820	105	0.7	<0.05	7.5	8	13.5		445	2470	3.8	270		
[redacted]	11/9/2001 10:20	3.5	9.7	49.5	7.60	343	418	168	<1	1060	879	111	0.8	<0.05	7.5	9		16.4	484	2410	4.0	285		
[redacted]	2/22/2002 14:45	4.7	10.7	51.3	7.76	353	430	165	<4	1110	865	110	0.8	<0.05	7.6	8	15.0		472	2530	4.2	288		
[redacted]	5/22/2002 18:35	4.4	10.2	50.4	7.63	339	414	164	<4	1290	870	112	0.7	<0.05	7.6	9	16.5		457	2650	4.3	222		0.21
[redacted]	8/21/2002 9:35	3.8	10.8	51.4	7.50	331	404	187	<4	1240	918	110	0.6	< 0.05	7.6	9	12.3	10.2	512	2710	4.4	298		0.21
[redacted]	11/5/2002 14:20	4.3	10.3	50.5	7.66	334	407	197	< 4	1250	1020	129	0.9	< 0.05	7.5	10	13.4	16.9	509	2670	4.7	309		0.23
[redacted] (new well summer 02)	8/21/2002 10:40	2.1	14.2	57.6	7.30	931	1140	114	<4	42	733	109	5.8	< 0.05	7.7	6	26.7	23.5	257	1650	2.5	528		0.33

Notes:

nm = Not measured

mnw = Meter failure, reading recorded in field notes but not used

or = Over range of meter, SC>2.0 mS

< # = Not detected, number shown is reporting limit

Table 3
BTEX and TPH Analyses
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update: 12/12/2002

Well No.	Date & Time	Benzene µg/l	Toulene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/l
PNR-4	8/10/2001 13:15	422	885(T)	233	594	628
PNR-4	8/10/2001 13:20	375	835(T)	123	349	635
PNR-4	11/8/2001 15:00	437	2040	1280	3850	992
PNR-4	Plugged and abandoned Dec. 2001					
PNR-5	6/1/2000	1.2	0.75	6.7	4.2	<0.1
PNR-5	8/8/2001 11:00	0.91	1.6	3.9	<1.0	<0.1
PNR-5	8/15/2001 11:00	2.1	8.8	2.6	8.1	1.4
PNR-5	11/7/2001 11:10	<0.50	<10	<5.0	<5.0	<0.1
PNR-5	2/20/2002 10:02	1.2	0.98	4.3	0.68	<0.1
PNR-5	5/22/2002 10:40	1.0	1.2	8.5	0.85	<0.1
PNR-5	8/20/2002 17:10	0.92	0.37	6.2	0.62	1.3
PNR-5	11/6/2002 11:10	1.4	0.93	6.9	0.57	< 0.1
PNR-6	5/31/2000	<0.50	<0.50	<0.50	<0.50	N.T.
PNR-6	8/7/2001 9:55	<0.50	0.88	<0.50	<1.0	<0.1
PNR-6	8/15/2001 15:30	<0.50	0.3(J)	<0.50	<0.50	<0.1
PNR-6	11/7/2001 8:55	<0.50	0.56	<0.50	<1.0	<0.1
PNR-6	2/19/2002 13:30	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-6	5/21/2002 12:15	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-6	8/19/2002 16:35	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-6	11/5/2002 11:25	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-7	5/31/2000	27	<0.50	<0.50	<0.50	N.T.
PNR-7	8/7/2001 17:20	35	<0.50	<0.50	<0.50	<0.1
PNR-7	8/15/2001 17:55	20(D)	<0.50	<0.50	<0.50	<0.1
PNR-7	11/7/2001 11:50	40	<0.50	<0.50	<1.0	<0.1
PNR-7	2/19/2002 17:05	39	<0.50	<0.50	<0.50	<0.1
PNR-7	5/22/2002 13:10	39	<0.50	<0.50	<0.50	<0.1
PNR-7	8/20/2002 15:07	41	< 0.5	< 0.5	< 0.5	< 0.1
PNR-7	11/5/2002 14:50	39	< 0.5	< 0.5	< 0.5	< 0.1
PNR-8	5/31/2000	<0.50	<0.50	<0.50	<0.50	N.T.
PNR-8	8/7/2001 13:50	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-8	8/16/2001 18:10	<0.50	0.55	<0.50	0.54	<0.1
PNR-8	11/6/2001 16:30	<0.50	<0.50J	<0.50	<1.0	0.5
PNR-8	2/22/2002 16:00	<0.50	<0.50J	<0.50	<0.50	<0.1
PNR-8	5/21/2002 17:45	<0.50	<0.50J	<0.50	<0.50	<0.1
PNR-8	8/21/2002 10:10	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-8	11/5/2002 15:25	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-9	6/1/2000	<0.50	0.86	<0.50	<0.50	N.T.
PNR-9	8/9/2001 9:35	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-9	8/16/2001 13:45	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-9	11/7/2001 14:30	<0.50	<0.50	<0.50	<1.0	0.9
PNR-9	2/20/2002 14:50	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-9	5/22/2002 10:15	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-9	8/20/2002 16:20	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-9	11/5/2002 14:05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-10	6/1/2000	<0.50	<0.50	<0.50	<0.50	N.T.
PNR-10	8/8/2001 18:50	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-10	8/16/2001 13:15	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-10	11/7/2001 12:30	<0.50	<0.50	<0.50	<1.0	0.6
PNR-10	2/20/2002 13:38	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-10	5/22/2002 13:35	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-10	8/20/2002 12:20	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-10	11/5/2002 13:30	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-12	5/31/2000	<0.50	<0.50	<0.50	<0.50	N.T.

Table 3
BTEX and TPH Analyses
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update: 12/12/2002

Well No.	Date & Time	Benzene µg/l	Toulene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/l
PNR-12	8/8/2001 15:00	<0.50	<0.50	<0.50	<1.0	<0.1
PNR-12	8/15/2001 16:00	<0.50	0.56	<0.50	<0.50	<0.1
PNR-12	11/6/2001 16:20	<0.50	0.56	<0.50	<1.0	<0.1
PNR-12	2/20/2002 11:55	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-12	5/21/2002 11:00	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-12	8/19/2002 16:05	< 0.5	0.43	< 0.5	< 0.5	< 0.1
PNR-12	11/5/2002 11:15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-13	8/15/2001 18:15	19(D)	0.83	<0.50	<0.50	<0.1
PNR-13	8/15/2001 19:00	32(D)	1.1	<0.50	0.49(J)	<0.1
PNR-13	11/7/2001 13:35	8.2	<0.50	<0.50	<1.0	5.4
PNR-13	2/19/2002 16:30	6.4	<0.50	<0.50	<0.50	<0.1
PNR-13	5/22/2002 14:00	4.3	<0.50	<0.50	<0.50	<0.1
PNR-13	8/20/2002 15:45	3.5	0.39	< 0.5	< 0.5	< 0.1
PNR-13	11/5/2002 15:30	2.1	0.87	< 0.5	< 0.5	< 0.1
PNR-14	8/9/2001 16:00	4.1	0.59	55	1.9	<0.1
PNR-14	8/14/2001 9:45	3.5	1.1	34(D)	0.38(J)	<0.1
PNR-14	11/7/2001 14:35	18	<0.50J	9.7	<1.0	<0.1
PNR-14	2/21/2002 11:30	0.92	<0.50	14	0.68	<0.1
PNR-14	5/22/2002 12:05	1.1	0.55	41	1.8	<0.1
PNR-14	8/20/2002 17:45	0.96	0.47	32	0.93	< 0.1
PNR-14	11/6/2002 11:28	0.78	< 0.5	36	0.7	< 0.1
PNR-15	8/10/2001 8:15	3.6	6.6	4.5	7.4	<0.1
PNR-15	8/14/2001 13:00	3.3	4.8	3.8	4.4	0.5
PNR-15	11/8/2001 9:10	4.8	6.6	24	<5.0	2.7
PNR-15	2/21/2002 14:54	1.8	<0.50	24	5.7	1.5
PNR-15	5/22/2002 14:55	2.3	0.72	18	1.4	3.4
PNR-15	8/21/2002 14:00	2.5	3.8	14	19	1.1
PNR-15	11/6/2002 14:35	2.8	< 0.5	11	8.5	2
PNR-16	8/10/2001 15:15	0.32(J)	1.00(J)	0.42(J)	1.0	14.0
PNR-16	8/16/2001 18:35	<0.50	0.37(J)	<0.50	0.34(J)	<0.1
PNR-16	11/6/2001 16:05	<0.50	<0.50J	<0.50	<1.0	<0.1
PNR-16	2/21/2002 10:20	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-16	5/21/2002 15:50	<0.50	0.83	<0.50	2.0	<0.1
PNR-16	8/20/2002 11:40	<0.50	0.52	< 0.5	<0.50	< 0.1
PNR-16	11/5/2002 14:04	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-17	8/22/2001 12:35	309	640	135	377	15.8
PNR-17	8/22/2001 13:30	206	342	75	214	30.8
PNR-17	11/8/2001 11:30	301	1220	582	1720	806
PNR-17	2/21/2002 17:00	341	682	191	511	62
PNR-17	5/23/2002 10:50	386	877	225	620	53
PNR-17	8/21/2002 15:15	230	438	98	261	140
PNR-17	11/6/2002 15:40	97	195	69	181	200
PNR-18	8/8/2001 16:00	<0.50	0.81	<0.50	<1.0	<0.1
PNR-18	8/16/2001 11:00	<0.50	0.78	<0.50	<0.50	<0.1
PNR-18	11/7/2001 10:20	<0.50	0.66	<0.50	<1.0	0.9
PNR-18	2/20/2002 11:24	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-18	5/21/2002 10:30	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-18	8/19/2002 16:50	<0.50	< 0.5	< 0.5	<0.50	< 0.1
PNR-18	11/5/2002 11:55	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-19	8/7/2001 14:50	1.1	<0.50	<0.50	<1.0	<0.1
PNR-19	8/15/2001 16:40	0.35(J)	0.41(J)	<0.50	<0.50	<0.1
PNR-19	11/6/2001 15:20	1.4	<0.50	<0.50	<1.0	<0.1
PNR-19	2/19/2002 15:05	2.3	<0.50	<0.50	<0.50	<0.1
PNR-19	5/22/2002 14:55	3.2	<0.50	<0.50	<0.50	<0.1

Table 3
BTEX and TPH Analyses
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update: 12/12/2002

Well No.	Date & Time	Benzene µg/l	Toulene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/l
PNR-19	8/20/2002 12:30	3.3	< 0.5	< 0.5	< 0.5	< 0.1
PNR-19	11/5/2002 13:17	3.7	< 0.5	< 0.5	< 0.5	< 0.1
PNR-20	8/8/2001 9:50	5.4	<0.50	<0.50	<1.0	<0.1
PNR-20	8/15/2001 17:15	5.7	<0.50	<0.50	<0.50	<0.1
PNR-20	11/8/2001 10:00	1.4	<0.50	<0.50	<1.0	<0.1
PNR-20	2/19/2002 15:40	11	<0.50	<0.50	<0.50	<0.1
PNR-20	5/22/2002 11:00	10	<0.50	<0.50	<0.50	<0.1
PNR-20	8/20/2002 13:25	13	< 0.5	< 0.5	<0.50	< 0.1
PNR-20	11/5/2002 16:05	17	< 0.5	< 0.5	< 0.5	< 0.1
PNR-21	8/9/2001 10:15	28	<0.50	<0.50	<1.0	<0.1
PNR-21	8/16/2001 16:40	26(D)	<0.50	<0.50	<0.50	<0.1
PNR-21	11/8/2001 11:00	32	<0.50	<0.50	<1.0	<0.1
PNR-21	2/21/2002 9:15	32	<0.50	<0.50	<0.50	2.2
PNR-21	5/22/2002 11:55	33	<0.50	<0.50	<0.50	<0.1
PNR-21	8/21/2002 9:00	35	<0.50	<0.50	<0.50	< 0.1
PNR-21	11/5/2002 15:30	37	< 0.5	< 0.5	< 0.5	< 0.1
PNR-22	8/8/2001 17:10	<0.50	<0.50	<0.50	<1.0	<0.1
PNR-22	8/16/2001 11:35	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-22	11/7/2001 9:10	<0.50	<0.50	<0.50	<1.0	<0.1
PNR-22	2/20/2002 14:10	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-22	5/21/2002 12:45	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-22	8/20/2002 15:35	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-22	11/5/2002 12:50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-23	8/9/2001 17:30	58	94	17	49	<0.1
PNR-23	8/14/2001 10:30	195(D)	338(D)	68	189	<0.1
PNR-23	11/8/2001 13:15	215	269	51	127	56.2
PNR-23	2/21/2002 12:25	220	224	27	84	11
PNR-23	5/23/2002 11:15	417	575	78	245	3.6
PNR-23	8/21/2002 12:55	465	666	92	283	1.4
PNR-23	11/6/2002 12:15	401	573	70	219	0.6
PNR-24	8/14/2001 12:00	195(D1)	320(D1)	66	198	74.6
PNR-24	8/14/2001 18:20	346(D)	594(D)	123	344	970
PNR-24	11/8/2001 13:40	422	601	102	316	49.7
PNR-24	2/21/2002 13:55	569	974	198	623	110
PNR-24	5/23/2002 11:50	294	633	117	455	29
PNR-24	8/21/2002 13:10	321	653	110	392	360
PNR-24	11/6/2002 12:32	292	543	77	286	170
PNR-25	8/14/2001 13:15	164(D1)	161(D)	18	156(D)	93.1
PNR-25	8/14/2001 19:05	216(D1)	224(D1)	32	266	156
PNR-25	11/8/2001 10:15	229	219	22	237	0.1
PNR-25	2/21/2002 15:30	225	541	121	495	75
PNR-25	5/22/2002 16:50	147	497	104	624	100
PNR-25	8/21/2002 14:40	6.2	48	7.8	233	500
PNR-25	11/6/2002 14:55	1.7	2.1	2.2	337	390
PNR-26	8/14/2001 18:00	124(D1)	270(D1)	80	232	2490
PNR-26	8/22/2001 10:00	188	404	105	336	55.4
PNR-26	11/8/2001 14:15	365	1920	908	2590	1160
PNR-26	2/21/2002 16:00	514	1140	225	636	76
PNR-26	5/23/2002 11:15	365	998	200	610	150
PNR-26	8/21/2002 16:00	328	632	116	377	220
PNR-26	11/6/2002 16:20	398	685	91	335	66
PNR-27	8/21/2001 15:35	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-27	9/5/2001 15:15	<0.50	<0.50	<0.50	<0.50	<0.1

Table 3
BTEX and TPH Analyses
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update: 12/12/2002

Well No.	Date & Time	Benzene µg/l	Toulene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/l
PNR-27	11/6/2001 15:30	<0.50	<0.50	<0.50	<1.0	0.4
PNR-27	2/20/2002 17:02	<0.50	<0.50	<0.50	<0.50	1.0
PNR-27	5/21/2002 18:12	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-27	8/20/2002 19:20	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-27	11/6/2002 9:55	0.49 (J)	< 0.5	< 0.5	< 0.5	< 0.1
PNR-28	8/21/2001 16:45	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-28	9/5/2001 14:35	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-28	11/6/2001 14:40	<0.50	<0.50	<0.50	<1.0	<0.1
PNR-28	2/20/2002 16:30	<0.50	<0.50	<0.50	<0.50	1.2
PNR-28	5/21/2002 17:15	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-28	8/20/2002 18:30	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-28	11/5/2002 13:20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
PNR-29	8/21/2001 17:45	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-29	9/5/2001 14:00	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-29	11/6/2001 12:50	<0.50	0.69	<0.50	<1.0	<0.1
PNR-29	2/20/2002 13:03	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-29	5/21/2002 16:30	<0.50	<0.50	<0.50	<0.50	<0.1
PNR-29	8/20/2002 11:20	<0.50	<0.50	<0.50	<0.50	< 0.1
PNR-29	11/5/2002 12:42	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
USGS-92-12	6/1/2000	<0.50	<0.50	<0.50	<0.50	N.T.
USGS-92-12	8/7/2001 11:35	<0.50	<0.50	<0.50	<1.0	<0.1
USGS-92-12	8/15/2001 14:40	<0.50	0.36(J)	<0.50	0.29(J)	0.7
USGS-92-12	11/6/2001 14:30	<0.50	<0.50J	<0.50	<1.0	2.9
USGS-92-12	2/19/2002 14:25	<0.50	<0.50	<0.50	<0.50	<1.0
USGS-92-12	5/212002 14:05	<0.50	<0.50	<0.50	<0.50	<1.0
USGS-92-12	8/19/2002 16:00	<0.50	<0.50	<0.50	<0.50	< 0.1
USGS-92-12	11/5/2002 12:00	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
USGS-93-3	6/1/2000	4.4	<0.50	<0.50	<0.50	N.T.
USGS-93-3	8/7/2001 18:55	3.0	<0.50	<0.50	<1.0	<0.1
USGS-93-3	8/15/2001 19:10	3.4	<0.50	<0.50	<0.50	<0.1
USGS-93-3	11/7/2001 10:05	3	<0.50	<0.50	<1.0J	0.3
USGS-93-3	2/20/2002 9:00	2.7	<0.50	<0.50	<0.50	<0.1
USGS-93-3	5/22/2002 9:30	2.5	<0.50	<0.50	<0.50	<0.1
USGS-93-3	8/20/2002 16:25	3	< 0.5	< 0.5	< 0.5	< 0.1
USGS-93-3	11/5/2002 16:10	3.8	0.49 (J)	< 0.5	< 0.5	< 0.1
(b) (6)	5/31/2000	<0.50	<0.50	<0.50	<0.50	N.T.
	8/10/2001 10:00	<0.50	<0.50	<0.50	<1.0	<0.1
	8/22/2001 15:30	<0.50	<0.50	<0.50	<0.50	<0.1
	11/9/2001 10:20	<0.50	<0.50	<0.50	<1.0	
	2/22/2002 14:45	<0.50	<0.50	<0.50	<0.50	<1.0
	5/22/2002 16:35	<0.50	<0.50	<0.50	<0.50	<1.0
	8/21/2002 9:35	<0.50	<0.50	<0.50	<0.50	< 0.1
	11/5/2002 14:20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
M-18	11/8/2001 15:30	53	21	1.8	10	0.2
M-27	8/16/2001 14:35	<0.50	0.32(J)	<0.50	<0.50	<0.1
M-27	8/16/2001 14:45	<0.50	0.28(J)	<0.50	<0.50	<0.1
M-27	11/8/2001 8:50	<0.50	<0.50	<0.50	<1.0	<0.1
M-27	2/20/2002 15:42	<0.50	<0.50	<0.50	<0.50	1.5
M-27	5/21/2002 15:05	<0.50	<0.50	<0.50	<0.50	1.3
M-27	8/20/2002 17:45	<0.50	<0.50	<0.50	<0.50	< 0.1
M-27	11/6/2002 9:00	< 0.5	< 0.5	< 0.5	< 0.5	< 0.1
M-28	6/1/2000	14	2.8	<0.50	<0.50	N.T.
M-28	8/9/2001 12:15	19	<0.50(J)	<0.50	<1.0	<0.1

Table 3
BTEX and TPH Analyses
Pioneer Natural Resources USA, Inc. - Biere 1-22 Investigation
Last update: 12/12/2002

Well No.	Date & Time	Benzene µg/l	Toulene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/l
M-28	8/16/2001 17:00	19	<0.50	<0.50	<0.50	<0.1
M-28	11/8/2001 12:00	<0.50	<0.50	<0.50	<1.0	<0.1
M-28	2/21/2002 8:40	20	<0.50	<0.50	<0.50	2.7
M-28	5/23/2002 9:30	21	<0.50	<0.50	<0.50	<0.1
M-28 (Dup.)	5/23/2002 9:30	23	<0.50	<0.50	<0.50	nm
M-28	8/21/2002 10:00	23	<0.50	<0.50	<0.50	< 0.1
M-28	11/6/2002 11:20	22	< 0.5	< 0.5	< 0.5	< 0.1
M-30	6/1/2000	<0.50	<0.50	<0.50	<0.50	N.T.
M-30	2/22/2002 13:00	<0.50	<0.50	<0.50	<0.50	<0.1
M-30	5/22/2002 17:10	<0.50	<0.50	<0.50	<0.50	<0.1
M-31	6/1/2000	41	0.88	<0.50	<0.50	N.T.
M-31	8/9/2001 11:05	47	<0.50	<0.50	<1.0	<0.1
M-31	8/16/2001 17:30	38(D)	<0.50	<0.50	<0.50	<0.1
M-31	11/8/2001 16:00	24	<0.50	<0.50	<1.0	<0.1
M-31	2/21/2002 9:45	42	<0.50	<0.50	<0.50	3.4
M-31	5/22/2002 15:45	38	<0.50	<0.50	<0.50	<0.1
M-31	8/21/2002 10:45	41	<0.50	<0.50	<0.50	< 0.1
M-31	11/6/2002 10:35	23	< 0.5	< 0.5	< 0.5	< 0.1
M-32	11/9/2001 9:00	<0.50	<0.50	<0.50	<1.0	<0.1
M-36	9/5/2001 15:55	<0.50	<0.50	<0.50	<0.50	<0.1
	11/9/2001 11:00	<0.50	<0.50	<0.50	<1.0	
M-38	9/5/2001 16:25	<0.50	<0.50	<0.50	<0.50	<0.1
	11/9/2001 11:40	<0.50	<0.50	<0.50	<0.1	
M-39	11/7/2001 15:45	<0.50	<0.50	<0.50	<1.0	<0.1
(b) (6)	8/21/2002 10:40	<0.50	0.49	< 0.5	<0.50	

(new well summer 02)

Notes

< # = Analyte not detected, number shown is reporting limit

D = Value was derived from a 10 times dilution.

D1 = Value was derived from a 100 times dilution.

J = Estimated value. Present but less than the limit of quantitation.

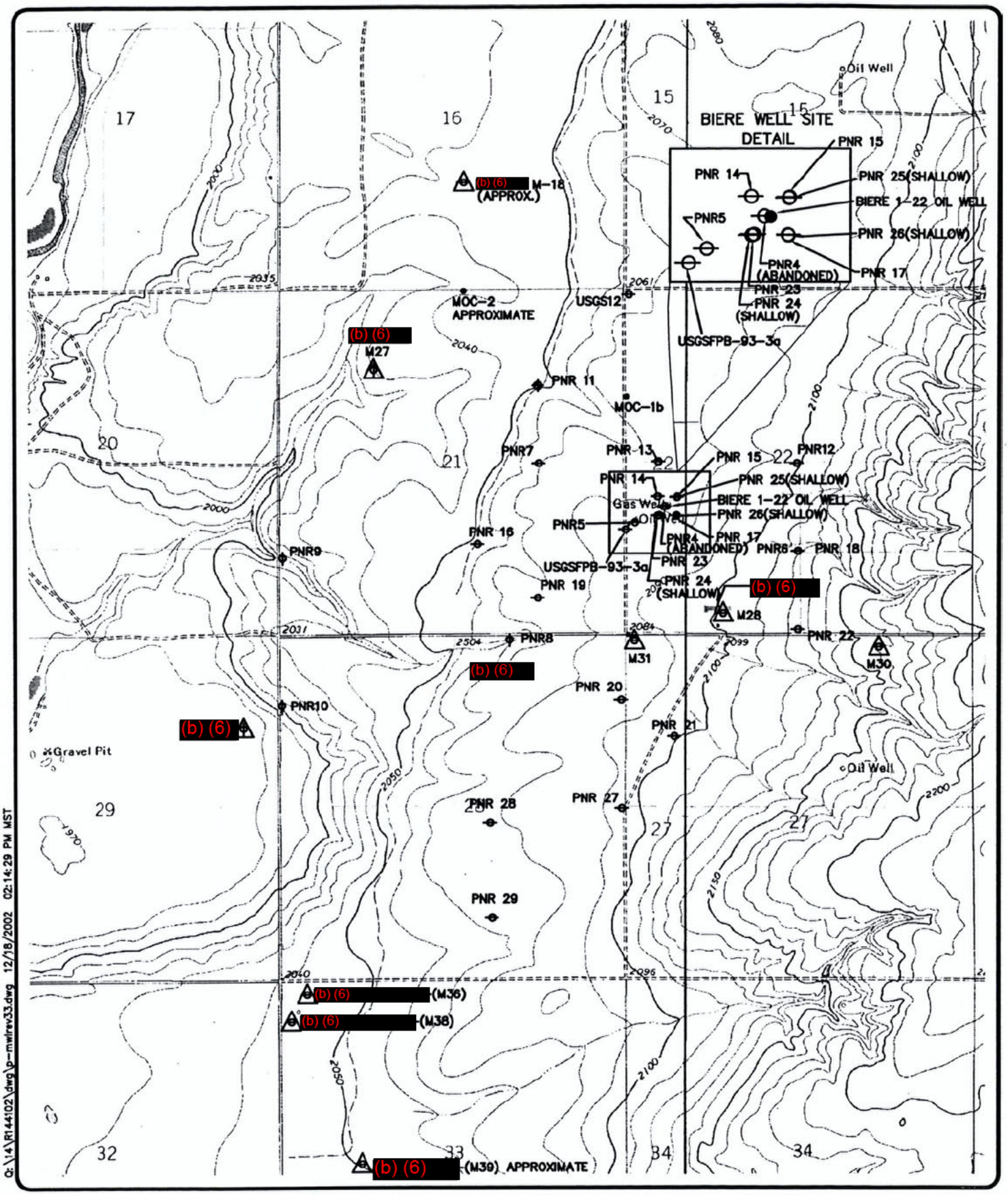
N.M. = Not measured.

N.T. = Not tested.

T = This target analyte was found in the associated trip blank as well as the sample.

APPENDIX A

FIGURE



Q:\14\R144102\dwg\p-mwlrev33.dwg 12/18/2002 02:14:29 PM MST

WELL LOCATION MAP
BIERE 1-22 OIL WELL
POPLAR, MONTANA
PIONEER NATURAL RESOURCES USA INC.

FIGURE #1

HKM ENGINEERING

14R144.102 | DEC 19, 2002

APPENDIX B

LABORATORY REPORTS

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-001
Client Sample ID: USGS-12

Report Date: 11/27/02
Collection Date: 11/05/02 12:00
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.4	s.u.		0.1		E150.1	11/07/02 17:17 / jb
Conductivity	2900	umhos/cm		1		A2510 B	11/07/02 17:05 / jb
Solids, Total Dissolved TDS @ 180 C	2560	mg/L		10		A2540 C	11/08/02 16:29 / qed
INORGANICS							
Alkalinity, Total as CaCO3	422	mg/L		4		A2320 B	11/08/02 13:53 / rlh
Bicarbonate as HCO3	514	mg/L		4		A2320 B	11/08/02 13:53 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 13:53 / rlh
Chloride	6	mg/L		1		E300.0	11/09/02 08:11 / rlh
Sulfate	1480	mg/L	D	3		E300.0	11/09/02 08:11 / rlh
Fluoride	0.43	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1540	mg/L		1		A2340 B	11/19/02 12:34 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:26 / bls
Nitrogen, Nitrate+Nitrite as N	6.05	mg/L		0.05		E353.2	11/11/02 15:07 / bls
METALS, DISSOLVED							
Calcium	226	mg/L		1		E200.7	11/15/02 03:01 / jjw
Magnesium	237	mg/L		1		E200.7	11/16/02 12:22 / jjw
Potassium	14	mg/L		1		E200.7	11/16/02 12:22 / jjw
Silica	25.8	mg/L	D	0.5		E200.7	11/16/02 12:22 / jjw
Sodium	97	mg/L	D	2		E200.7	11/16/02 12:22 / jjw
METALS, TOTAL							
Silica	30.3	mg/L	D	0.5		E200.7	11/12/02 02:54 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/08/02 22:34 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/08/02 22:34 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/08/02 22:34 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/08/02 22:34 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/08/02 22:34 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/08/02 22:34 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/08/02 22:34 / bjm
Surr: Trifluorotoluene	114	%REC			80-120	SW8021B	11/08/02 22:34 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-002
Client Sample ID: PNR-19

Report Date: 11/27/02
Collection Date: 11/05/02 13:17
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.1	s.u.		0.1		E150.1	11/07/02 17:19 / jb
Conductivity	16200	umhos/cm		1		A2510 B	11/07/02 17:06 / jb
Solids, Total Dissolved TDS @ 180 C	11400	mg/L		10		A2540 C	11/08/02 16:31 / qed
INORGANICS							
Alkalinity, Total as CaCO3	359	mg/L		4		A2320 B	11/08/02 14:01 / rlh
Bicarbonate as HCO3	438	mg/L		4		A2320 B	11/08/02 14:01 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:01 / rlh
Chloride	4960	mg/L	D	2		E300.0	11/09/02 08:21 / rlh
Sulfate	1380	mg/L	D	10		E300.0	11/09/02 08:21 / rlh
Fluoride	0.28	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	5460	mg/L		1		A2340 B	11/19/02 12:35 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:27 / bls
Nitrogen, Nitrate+Nitrite as N	23.3	mg/L		0.05		E353.2	11/11/02 15:07 / bls
METALS, DISSOLVED							
Calcium	943	mg/L	D	6		E200.7	11/16/02 12:26 / jjw
Magnesium	755	mg/L	D	2		E200.7	11/16/02 12:26 / jjw
Potassium	22	mg/L		1		E200.7	11/16/02 12:26 / jjw
Silica	19	mg/L	D	2		E200.7	11/16/02 12:26 / jjw
Sodium	1220	mg/L	D	6		E200.7	11/16/02 12:26 / jjw
METALS, TOTAL							
Silica	25	mg/L	D	2		E200.7	11/19/02 22:28 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/08/02 23:07 / bjm
Benzene	3.7	ug/L		0.50		SW8021B	11/08/02 23:07 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/08/02 23:07 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/08/02 23:07 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/08/02 23:07 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/08/02 23:07 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/08/02 23:07 / bjm
Surr: Trifluorotoluene	96.0	%REC			80-120	SW8021B	11/08/02 23:07 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-003
Client Sample ID: PNR-16

Report Date: 11/27/02
Collection Date: 11/05/02 14:04
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:20 / jb
Conductivity	5160	umhos/cm		1		A2510 B	11/07/02 17:06 / jb
Solids, Total Dissolved TDS @ 180 C	5110	mg/L		10		A2540 C	11/08/02 16:32 / qed
INORGANICS							
Alkalinity, Total as CaCO3	498	mg/L		4		A2320 B	11/08/02 14:08 / rlh
Bicarbonate as HCO3	608	mg/L		4		A2320 B	11/08/02 14:08 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:08 / rlh
Chloride	24	mg/L		1		E300.0	11/09/02 08:54 / rlh
Sulfate	3210	mg/L	D	5		E300.0	11/09/02 08:54 / rlh
Fluoride	0.47	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	2810	mg/L		1		A2340 B	11/19/02 12:35 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:28 / bls
Nitrogen, Nitrate+Nitrite as N	18.2	mg/L		0.05		E353.2	11/11/02 15:08 / bls
METALS, DISSOLVED							
Calcium	422	mg/L	D	3		E200.7	11/16/02 12:29 / jjw
Magnesium	428	mg/L		1		E200.7	11/16/02 12:29 / jjw
Potassium	21	mg/L		1		E200.7	11/16/02 12:29 / jjw
Silica	22	mg/L	D	1		E200.7	11/16/02 12:29 / jjw
Sodium	286	mg/L	D	3		E200.7	11/16/02 12:29 / jjw
METALS, TOTAL							
Silica	30	mg/L	D	1		E200.7	11/19/02 22:31 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/08/02 23:40 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/08/02 23:40 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/08/02 23:40 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/08/02 23:40 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/08/02 23:40 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/08/02 23:40 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/08/02 23:40 / bjm
Surr: Trifluorotoluene	94.0	%REC			80-120	SW8021B	11/08/02 23:40 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-004
Client Sample ID: PNR-6

Report Date: 11/27/02
Collection Date: 11/05/02 11:25
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.5	s.u.		0.1		E150.1	11/07/02 17:22 / jb
Conductivity	1530	umhos/cm		1		A2510 B	11/07/02 17:07 / jb
Solids, Total Dissolved TDS @ 180 C	1000	mg/L		10		A2540 C	11/08/02 16:34 / qed
INORGANICS							
Alkalinity, Total as CaCO3	530	mg/L		4		A2320 B	11/08/02 14:18 / rlh
Bicarbonate as HCO3	647	mg/L		4		A2320 B	11/08/02 14:18 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:18 / rlh
Chloride	19	mg/L		1		E300.0	11/09/02 09:04 / rlh
Sulfate	341	mg/L		1		E300.0	11/09/02 09:04 / rlh
Fluoride	0.47	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	589	mg/L		1		A2340 B	11/19/02 12:35 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	0.4	mg/L		0.1		E350.1	11/12/02 16:32 / bls
Nitrogen, Nitrate+Nitrite as N	0.19	mg/L		0.05		E353.2	11/11/02 15:09 / bls
METALS, DISSOLVED							
Calcium	100	mg/L		1		E200.7	11/16/02 12:33 / jjw
Magnesium	82	mg/L		1		E200.7	11/16/02 12:33 / jjw
Potassium	6	mg/L		1		E200.7	11/16/02 12:33 / jjw
Silica	21.2	mg/L	D	0.2		E200.7	11/16/02 12:33 / jjw
Sodium	97	mg/L		1		E200.7	11/16/02 12:33 / jjw
METALS, TOTAL							
Silica	27.0	mg/L	D	0.2		E200.7	11/19/02 22:35 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/09/02 00:46 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/09/02 00:46 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/09/02 00:46 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/09/02 00:46 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/09/02 00:46 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/09/02 00:46 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/09/02 00:46 / bjm
Surr: Trifluorotoluene	118	%REC			80-120	SW8021B	11/09/02 00:46 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-005
Client Sample ID: PNR-29

Report Date: 11/27/02
Collection Date: 11/05/02 12:42
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.1	s.u.		0.1		E150.1	11/07/02 17:23 / jb
Conductivity	5450	umhos/cm		1		A2510 B	11/07/02 17:08 / jb
Solids, Total Dissolved TDS @ 180 C	4770	mg/L		10		A2540 C	11/08/02 16:35 / qed
INORGANICS							
Alkalinity, Total as CaCO3	680	mg/L		4		A2320 B	11/08/02 14:28 / rlh
Bicarbonate as HCO3	830	mg/L		4		A2320 B	11/08/02 14:28 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:28 / rlh
Chloride	117	mg/L		1		E300.0	11/09/02 09:15 / rlh
Sulfate	2070	mg/L	D	5		E300.0	11/09/02 09:15 / rlh
Fluoride	0.28	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	2200	mg/L		1		A2340 B	11/19/02 12:36 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:33 / bls
Nitrogen, Nitrate+Nitrite as N	167	mg/L		0.05		E353.2	11/11/02 15:10 / bls
METALS, DISSOLVED							
Calcium	403	mg/L	D	3		E200.7	11/16/02 12:53 / jjw
Magnesium	290	mg/L		1		E200.7	11/16/02 12:53 / jjw
Potassium	12	mg/L		1		E200.7	11/16/02 12:53 / jjw
Silica	25	mg/L	D	1		E200.7	11/16/02 12:53 / jjw
Sodium	469	mg/L	D	3		E200.7	11/16/02 12:53 / jjw
METALS, TOTAL							
Silica	31	mg/L	D	1		E200.7	11/19/02 22:47 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 15:35 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 15:35 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 15:35 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 15:35 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 15:35 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 15:35 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 15:35 / bjm
Surr: Trifluorotoluene	106	%REC			80-120	SW8021B	11/10/02 15:35 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-006
Client Sample ID: PNR-28

Report Date: 11/27/02
Collection Date: 11/05/02 13:20
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 17:24 / jb
Conductivity	28900	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	29700	mg/L		10		A2540 C	11/08/02 16:37 / qed
INORGANICS							
Alkalinity, Total as CaCO3	516	mg/L		4		A2320 B	11/08/02 14:37 / rlh
Bicarbonate as HCO3	630	mg/L		4		A2320 B	11/08/02 14:37 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:37 / rlh
Chloride	15700	mg/L	D	3		E300.0	11/09/02 09:26 / rlh
Sulfate	1740	mg/L	D	30		E300.0	11/09/02 09:26 / rlh
Fluoride	0.17	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	12600	mg/L		1		A2340 B	11/19/02 12:36 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:33 / bls
Nitrogen, Nitrate+Nitrite as N	22.7	mg/L		0.05		E353.2	11/11/02 15:10 / bls
METALS, DISSOLVED							
Calcium	2340	mg/L	D	20		E200.7	11/16/02 12:57 / jjw
Magnesium	1640	mg/L	D	5		E200.7	11/16/02 12:57 / jjw
Potassium	46	mg/L	D	2		E200.7	11/16/02 12:57 / jjw
Silica	20	mg/L	D	5		E200.7	11/16/02 12:57 / jjw
Sodium	4850	mg/L	D	20		E200.7	11/16/02 12:57 / jjw
METALS, TOTAL							
Silica	36	mg/L	D	20		E200.7	11/19/02 23:03 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 17:31 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 17:31 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 17:31 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 17:31 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 17:31 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 17:31 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 17:31 / bjm
Surr: Trifluorotoluene	86.0	%REC			80-120	SW8021B	11/10/02 17:31 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-007
Client Sample ID: (b) (6)

Report Date: 11/27/02
Collection Date: 11/05/02 14:20
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.5	s.u.		0.1		E150.1	11/07/02 17:26 / jb
Conductivity	4650	umhos/cm		1		A2510 B	11/07/02 17:08 / jb
Solids, Total Dissolved TDS @ 180 C	2670	mg/L		10		A2540 C	11/08/02 16:39 / qed
INORGANICS							
Alkalinity, Total as CaCO3	334	mg/L		4		A2320 B	11/08/02 14:44 / rlh
Bicarbonate as HCO3	407	mg/L		4		A2320 B	11/08/02 14:44 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:44 / rlh
Chloride	1250	mg/L		1		E300.0	11/09/02 09:36 / rlh
Sulfate	309	mg/L	D	3		E300.0	11/09/02 09:36 / rlh
Fluoride	0.23	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1020	mg/L		1		A2340 B	11/19/02 12:36 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	0.9	mg/L		0.1		E350.1	11/12/02 16:34 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:11 / bls
METALS, DISSOLVED							
Calcium	197	mg/L	D	2		E200.7	11/16/02 13:01 / jjw
Magnesium	129	mg/L		1		E200.7	11/16/02 13:01 / jjw
Potassium	10	mg/L		1		E200.7	11/16/02 13:01 / jjw
Silica	13.4	mg/L	D	0.5		E200.7	11/16/02 13:01 / jjw
Sodium	509	mg/L	D	2		E200.7	11/16/02 13:01 / jjw
METALS, TOTAL							
Silica	16.9	mg/L	D	0.5		E200.7	11/12/02 02:58 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 18:04 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Surr: Trifluorotoluene	86.0	%REC			80-120	SW8021B	11/10/02 18:04 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-008
Client Sample ID: PNR-8

Report Date: 11/27/02
Collection Date: 11/05/02 15:25
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:30 / jb
Conductivity	5610	umhos/cm		1		A2510 B	11/07/02 17:09 / jb
Solids, Total Dissolved TDS @ 180 C	3880	mg/L		10		A2540 C	11/08/02 17:08 / qed
INORGANICS							
Alkalinity, Total as CaCO3	445	mg/L		4		A2320 B	11/08/02 14:52 / rlh
Bicarbonate as HCO3	543	mg/L		4		A2320 B	11/08/02 14:52 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 14:52 / rlh
Chloride	1140	mg/L		1		E300.0	11/09/02 09:47 / rlh
Sulfate	1260	mg/L	D	5		E300.0	11/09/02 09:47 / rlh
Fluoride	0.30	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1850	mg/L		1		A2340 B	11/19/02 12:37 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	0.4	mg/L		0.1		E350.1	11/12/02 16:35 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:16 / bls
METALS, DISSOLVED							
Calcium	340	mg/L	D	3		E200.7	11/16/02 13:05 / jjw
Magnesium	242	mg/L		1		E200.7	11/16/02 13:05 / jjw
Potassium	12	mg/L		1		E200.7	11/16/02 13:05 / jjw
Silica	21	mg/L	D	1		E200.7	11/16/02 13:05 / jjw
Sodium	485	mg/L	D	3		E200.7	11/16/02 13:05 / jjw
METALS, TOTAL							
Silica	294	mg/L	D	2		E200.7	11/19/02 23:15 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 18:38 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 18:38 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 18:38 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 18:38 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 18:38 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 18:38 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 18:38 / bjm
Surr: Trifluorotoluene	100	%REC			80-120	SW8021B	11/10/02 18:38 / bjm
- The sample was received in the laboratory with a pH > 2. The pH was 7.							
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-009
Client Sample ID: PNR-13

Report Date: 11/27/02
Collection Date: 11/05/02 15:30
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:32 / jb
Conductivity	5270	umhos/cm		1		A2510 B	11/07/02 17:09 / jb
Solids, Total Dissolved TDS @ 180 C	4110	mg/L		10		A2540 C	11/08/02 17:12 / qed
INORGANICS							
Alkalinity, Total as CaCO3	511	mg/L		4		A2320 B	11/08/02 15:00 / rlh
Bicarbonate as HCO3	623	mg/L		4		A2320 B	11/08/02 15:00 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 15:00 / rlh
Chloride	769	mg/L		1		E300.0	11/09/02 10:19 / rlh
Sulfate	1730	mg/L	D	5		E300.0	11/09/02 10:19 / rlh
Fluoride	0.37	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1900	mg/L		1		A2340 B	11/19/02 12:37 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	1.3	mg/L		0.1		E350.1	11/12/02 16:35 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:17 / bls
METALS, DISSOLVED							
Calcium	386	mg/L	D	3		E200.7	11/16/02 13:09 / jjw
Magnesium	227	mg/L		1		E200.7	11/16/02 13:09 / jjw
Potassium	14	mg/L		1		E200.7	11/16/02 13:09 / jjw
Silica	22	mg/L	D	1		E200.7	11/16/02 13:09 / jjw
Sodium	493	mg/L	D	3		E200.7	11/16/02 13:09 / jjw
METALS, TOTAL							
Silica	30	mg/L	D	1		E200.7	11/19/02 23:23 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 19:44 / bjm
Benzene	2.1	ug/L		0.50		SW8021B	11/10/02 19:44 / bjm
Toluene	0.87	ug/L		0.50		SW8021B	11/10/02 19:44 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 19:44 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 19:44 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 19:44 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 19:44 / bjm
Surr: Trifluorotoluene	100	%REC			80-120	SW8021B	11/10/02 19:44 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-010
Client Sample ID: PNR-9

Report Date: 11/27/02
Collection Date: 11/05/02 14:05
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.1	s.u.		0.1		E150.1	11/07/02 17:34 / jb
Conductivity	12100	umhos/cm		1		A2510 B	11/07/02 17:10 / jb
Solids, Total Dissolved TDS @ 180 C	8340	mg/L		10		A2540 C	11/08/02 17:13 / qed
INORGANICS							
Alkalinity, Total as CaCO3	270	mg/L		4		A2320 B	11/08/02 15:09 / rlh
Bicarbonate as HCO3	330	mg/L		4		A2320 B	11/08/02 15:09 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 15:09 / rlh
Chloride	4000	mg/L	D	2		E300.0	11/09/02 10:30 / rlh
Sulfate	757	mg/L	D	10		E300.0	11/09/02 10:30 / rlh
Fluoride	0.19	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	3470	mg/L		1.		A2340 B	11/19/02 12:39 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	1.9	mg/L		0.1		E350.1	11/12/02 16:36 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:17 / bls
METALS, DISSOLVED							
Calcium	704	mg/L	D	6		E200.7	11/16/02 13:13 / jjw
Magnesium	417	mg/L	D	2		E200.7	11/16/02 13:13 / jjw
Potassium	18	mg/L		1		E200.7	11/16/02 13:13 / jjw
Silica	14	mg/L	D	2		E200.7	11/16/02 13:13 / jjw
Sodium	1030	mg/L	D	6		E200.7	11/16/02 13:13 / jjw
METALS, TOTAL							
Silica	25	mg/L	D	10		E200.7	11/19/02 23:35 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/11/02 16:58 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/11/02 16:58 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/11/02 16:58 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/11/02 16:58 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/11/02 16:58 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/11/02 16:58 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/11/02 16:58 / bjm
Surr: Trifluorotoluene	114	%REC			80-120	SW8021B	11/11/02 16:58 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-011
Client Sample ID: PNR-7

Report Date: 11/27/02
Collection Date: 11/05/02 14:50
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 17:35 / jb
Conductivity	37400	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	44500	mg/L		10		A2540 C	11/08/02 17:15 / qed
INORGANICS							
Alkalinity, Total as CaCO3	356	mg/L		4		A2320 B	11/08/02 15:33 / rlh
Bicarbonate as HCO3	434	mg/L		4		A2320 B	11/08/02 15:33 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 15:33 / rlh
Chloride	24100	mg/L	D	3		E300.0	11/09/02 11:02 / rlh
Sulfate	1580	mg/L	D	30		E300.0	11/09/02 11:02 / rlh
Fluoride	0.24	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	14500	mg/L		1		A2340 B	11/19/02 12:39 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	0.4	mg/L		0.1		E350.1	11/12/02 16:37 / bls
Nitrogen, Nitrate+Nitrite as N	3.87	mg/L		0.05		E353.2	11/11/02 15:18 / bls
METALS, DISSOLVED							
Calcium	2660	mg/L	D	20		E200.7	11/16/02 13:17 / jjw
Magnesium	1900	mg/L	D	5		E200.7	11/16/02 13:17 / jjw
Potassium	57	mg/L	D	2		E200.7	11/16/02 13:17 / jjw
Silica	14	mg/L	D	5		E200.7	11/16/02 13:17 / jjw
Sodium	7690	mg/L	D	20		E200.7	11/16/02 13:17 / jjw
METALS, TOTAL							
Silica	19	mg/L	D	5		E200.7	11/12/02 03:06 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 16:48 / bjm
Benzene	39	ug/L		0.50		SW8021B	11/10/02 16:48 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 16:48 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 16:48 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 16:48 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 16:48 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 16:48 / bjm
Surr: Trifluorotoluene	102	%REC			80-120	SW8021B	11/10/02 16:48 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-012
Client Sample ID: PNR-21

Report Date: 11/27/02
Collection Date: 11/05/02 15:30
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 17:35 / jb
Conductivity	44600	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	49600	mg/L		10		A2540 C	11/08/02 17:16 / qed
INORGANICS							
Alkalinity, Total as CaCO3	559	mg/L		4		A2320 B	11/08/02 15:40 / rlh
Bicarbonate as HCO3	682	mg/L		4		A2320 B	11/08/02 15:40 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 15:40 / rlh
Chloride	28600	mg/L	D	3		E300.0	11/09/02 11:13 / rlh
Sulfate	1700	mg/L	D	30		E300.0	11/09/02 11:13 / rlh
Fluoride	0.15	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	9180	mg/L		1		A2340 B	11/19/02 12:39 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	2.6	mg/L		0.1		E350.1	11/12/02 16:37 / bls
Nitrogen, Nitrate+Nitrite as N	7.99	mg/L		0.05		E353.2	11/11/02 15:19 / bls
METALS, DISSOLVED							
Calcium	2000	mg/L	D	20		E200.7	11/16/02 13:21 / jjw
Magnesium	1020	mg/L	D	5		E200.7	11/16/02 13:21 / jjw
Potassium	61	mg/L	D	2		E200.7	11/16/02 13:21 / jjw
Silica	11	mg/L	D	5		E200.7	11/16/02 13:21 / jjw
Sodium	13000	mg/L	D	20		E200.7	11/16/02 13:21 / jjw
METALS, TOTAL							
Silica	ND	mg/L	D	20		E200.7	11/19/02 23:39 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 17:26 / bjm
Benzene	37	ug/L		0.50		SW8021B	11/10/02 17:26 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 17:26 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 17:26 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 17:26 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 17:26 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 17:26 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	11/10/02 17:26 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-013
Client Sample ID: PNR-20

Report Date: 11/27/02
Collection Date: 11/05/02 16:05
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.9	s.u.		0.1		E150.1	11/07/02 17:36 / jb
Conductivity	33300	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	33600	mg/L		10		A2540 C	11/08/02 17:18 / qed
INORGANICS							
Alkalinity, Total as CaCO3	427	mg/L		4		A2320 B	11/08/02 15:48 / rlh
Bicarbonate as HCO3	521	mg/L		4		A2320 B	11/08/02 15:48 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 15:48 / rlh
Chloride	18400	mg/L	D	3		E300.0	11/09/02 11:24 / rlh
Sulfate	1500	mg/L	D	30		E300.0	11/09/02 11:24 / rlh
Fluoride	0.16	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	10000	mg/L		1		A2340 B	11/19/02 12:40 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:42 / bls
Nitrogen, Nitrate+Nitrite as N	11.0	mg/L		0.05		E353.2	11/11/02 15:19 / bls
METALS, DISSOLVED							
Calcium	1930	mg/L	D	20		E200.7	11/16/02 13:33 / jjw
Magnesium	1260	mg/L	D	5		E200.7	11/16/02 13:33 / jjw
Potassium	44	mg/L	D	2		E200.7	11/16/02 13:33 / jjw
Silica	16	mg/L	D	5		E200.7	11/16/02 13:33 / jjw
Sodium	6790	mg/L	D	20		E200.7	11/16/02 13:33 / jjw
METALS, TOTAL							
Silica	27	mg/L	D	20		E200.7	11/19/02 23:43 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 18:04 / bjm
Benzene	17	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 18:04 / bjm
Surr: Trifluorotoluene	120	%REC			80-120	SW8021B	11/10/02 18:04 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-014
Client Sample ID: USGS-93-3

Report Date: 11/27/02
Collection Date: 11/05/02 16:10
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 17:37 / jb
Conductivity	61700	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	67700	mg/L		10		A2540 C	11/08/02 17:19 / qed
INORGANICS							
Alkalinity, Total as CaCO3	469	mg/L		4		A2320 B	11/08/02 15:55 / rlh
Bicarbonate as HCO3	572	mg/L		4		A2320 B	11/08/02 15:55 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 15:55 / rlh
Chloride	38400	mg/L	D	6		E300.0	11/20/02 13:31 / rlh
Sulfate	1240	mg/L	D	50		E300.0	11/20/02 13:31 / rlh
Fluoride	0.18	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	3420	mg/L		1		A2340 B	11/20/02 14:22 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	14.9	mg/L		0.1		E350.1	11/12/02 16:42 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:20 / bls
METALS, DISSOLVED							
Calcium	981	mg/L	D	30		E200.7	11/16/02 13:37 / jjw
Magnesium	236	mg/L	D	10		E200.7	11/16/02 13:37 / jjw
Potassium	439	mg/L	D	5		E200.7	11/16/02 13:37 / jjw
Silica	12	mg/L	D	10		E200.7	11/16/02 13:37 / jjw
Sodium	22800	mg/L	D	30		E200.7	11/16/02 13:37 / jjw
METALS, TOTAL							
Silica	20	mg/L	D	10		E200.7	11/12/02 03:18 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 19:21 / bjm
Benzene	3.8	ug/L		0.50		SW8021B	11/10/02 19:21 / bjm
Toluene	0.49	ug/L	J	0.50		SW8021B	11/10/02 19:21 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 19:21 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 19:21 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 19:21 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 19:21 / bjm
Surr: Trifluorotoluene	112	%REC			80-120	SW8021B	11/10/02 19:21 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-015
Client Sample ID: PNR-10

Report Date: 11/27/02
Collection Date: 11/05/02 13:30
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:52 / jb
Conductivity	4110	umhos/cm		1		A2510 B	11/07/02 17:41 / jb
Solids, Total Dissolved TDS @ 180 C	3130	mg/L		10		A2540 C	11/08/02 17:21 / qed
INORGANICS							
Alkalinity, Total as CaCO3	524	mg/L		4		A2320 B	11/08/02 16:03 / rlh
Bicarbonate as HCO3	639	mg/L		4		A2320 B	11/08/02 16:03 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 16:03 / rlh
Chloride	384	mg/L		1		E300.0	11/09/02 11:45 / rlh
Sulfate	1380	mg/L	D	3		E300.0	11/09/02 11:45 / rlh
Fluoride	0.25	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1250	mg/L		1		A2340 B	11/19/02 12:43 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	1.4	mg/L		0.1		E350.1	11/12/02 16:43 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:21 / bls
METALS, DISSOLVED							
Calcium	263	mg/L	D	2		E200.7	11/16/02 13:49 / jjw
Magnesium	145	mg/L		1		E200.7	11/16/02 13:49 / jjw
Potassium	11	mg/L		1		E200.7	11/16/02 13:49 / jjw
Silica	24.0	mg/L	D	0.5		E200.7	11/16/02 13:49 / jjw
Sodium	581	mg/L	D	2		E200.7	11/16/02 13:49 / jjw
METALS, TOTAL							
Silica	30.7	mg/L	D	0.5		E200.7	11/19/02 23:47 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 20:03 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 20:03 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 20:03 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 20:03 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 20:03 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 20:03 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 20:03 / bjm
Surr: Trifluorotoluene	118	%REC			80-120	SW8021B	11/10/02 20:03 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-016
Client Sample ID: PNR-12

Report Date: 11/27/02
Collection Date: 11/05/02 11:15
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:53 / jb
Conductivity	5110	umhos/cm		1		A2510 B	11/07/02 17:41 / jb
Solids, Total Dissolved TDS @ 180 C	4660	mg/L		10		A2540 C	11/08/02 17:22 / qed
INORGANICS							
Alkalinity, Total as CaCO3	700	mg/L		4		A2320 B	11/08/02 16:11 / rlh
Bicarbonate as HCO3	854	mg/L		4		A2320 B	11/08/02 16:11 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 16:11 / rlh
Chloride	76	mg/L		1		E300.0	11/09/02 11:56 / rlh
Sulfate	2200	mg/L	D	5		E300.0	11/09/02 11:56 / rlh
Fluoride	0.21	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	2470	mg/L		1		A2340 B	11/19/02 12:43 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:44 / bls
Nitrogen, Nitrate+Nitrite as N	130	mg/L		0.05		E353.2	11/11/02 15:26 / bls
METALS, DISSOLVED							
Calcium	442	mg/L	D	3		E200.7	11/16/02 13:58 / jjw
Magnesium	331	mg/L		1		E200.7	11/16/02 13:58 / jjw
Potassium	12	mg/L		1		E200.7	11/16/02 13:58 / jjw
Silica	19	mg/L	D	1		E200.7	11/16/02 13:58 / jjw
Sodium	328	mg/L	D	3		E200.7	11/16/02 13:58 / jjw
METALS, TOTAL							
Silica	69	mg/L	D	1		E200.7	11/19/02 23:51 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 20:45 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 20:45 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 20:45 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 20:45 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 20:45 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 20:45 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 20:45 / bjm
Surr: Trifluorotoluene	116	%REC			80-120	SW8021B	11/10/02 20:45 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-017
Client Sample ID: PNR-18

Report Date: 11/27/02
Collection Date: 11/05/02 11:55
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:53 / jb
Conductivity	3630	umhos/cm		1		A2510 B	11/07/02 17:41 / jb
Solids, Total Dissolved TDS @ 180 C	3210	mg/L		10		A2540 C	11/08/02 17:24 / qed
INORGANICS							
Alkalinity, Total as CaCO3	613	mg/L		4		A2320 B	11/08/02 16:39 / rlh
Bicarbonate as HCO3	748	mg/L		4		A2320 B	11/08/02 16:39 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 16:39 / rlh
Chloride	60	mg/L		1		E300.0	11/09/02 12:06 / rlh
Sulfate	1790	mg/L	D	3		E300.0	11/09/02 12:06 / rlh
Fluoride	0.27	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1800	mg/L		1		A2340 B	11/19/02 12:43 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	2.4	mg/L		0.1		E350.1	11/12/02 16:45 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:27 / bls
METALS, DISSOLVED							
Calcium	328	mg/L	D	2		E200.7	11/16/02 14:02 / jjw
Magnesium	240	mg/L		1		E200.7	11/16/02 14:02 / jjw
Potassium	8	mg/L		1		E200.7	11/16/02 14:02 / jjw
Silica	22.8	mg/L	D	0.5		E200.7	11/16/02 14:02 / jjw
Sodium	184	mg/L	D	2		E200.7	11/16/02 14:02 / jjw
METALS, TOTAL							
Silica	29.6	mg/L	D	0.5		E200.7	11/19/02 23:55 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 22:04 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 22:04 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 22:04 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 22:04 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 22:04 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 22:04 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 22:04 / bjm
Surr: Trifluorotoluene	112	%REC			80-120	SW8021B	11/10/02 22:04 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-018
Client Sample ID: PNR-22

Report Date: 11/27/02
Collection Date: 11/05/02 12:50
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.2	s.u.		0.1		E150.1	11/07/02 17:55 / jb
Conductivity	4800	umhos/cm		1		A2510 B	11/07/02 17:42 / jb
Solids, Total Dissolved TDS @ 180 C	3300	mg/L		10		A2540 C	11/08/02 17:25 / qed
INORGANICS							
Alkalinity, Total as CaCO3	784	mg/L		4		A2320 B	11/08/02 16:47 / rlh
Bicarbonate as HCO3	956	mg/L		4		A2320 B	11/08/02 16:47 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 16:47 / rlh
Chloride	790	mg/L		1		E300.0	11/09/02 12:17 / rlh
Sulfate	935	mg/L	D	3		E300.0	11/09/02 12:17 / rlh
Fluoride	0.24	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	1490	mg/L		1		A2340 B	11/19/02 12:43 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	4.3	mg/L		0.1		E350.1	11/12/02 16:45 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:27 / bls
METALS, DISSOLVED							
Calcium	248	mg/L	D	2		E200.7	11/16/02 14:06 / jjw
Magnesium	213	mg/L		1		E200.7	11/16/02 14:06 / jjw
Potassium	9	mg/L		1		E200.7	11/16/02 14:06 / jjw
Silica	25.7	mg/L	D	0.5		E200.7	11/16/02 14:06 / jjw
Sodium	462	mg/L	D	2		E200.7	11/16/02 14:06 / jjw
METALS, TOTAL							
Silica	30.6	mg/L	D	0.5		E200.7	11/12/02 03:22 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 22:42 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/10/02 22:42 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/10/02 22:42 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/10/02 22:42 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/10/02 22:42 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 22:42 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/10/02 22:42 / bjm
Surr: Trifluorotoluene	110	%REC			80-120	SW8021B	11/10/02 22:42 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-019
Client Sample ID: PNR-5

Report Date: 11/27/02
Collection Date: 11/06/02 11:10
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.7	s.u.		0.1		E150.1	11/07/02 17:56 / jb
Conductivity	61300	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	68100	mg/L		10		A2540 C	11/08/02 17:31 / qed
INORGANICS							
Alkalinity, Total as CaCO3	325	mg/L		4		A2320 B	11/08/02 16:56 / rlh
Bicarbonate as HCO3	397	mg/L		4		A2320 B	11/08/02 16:56 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 16:56 / rlh
Chloride	42800	mg/L	D	3		E300.0	11/09/02 13:11 / rlh
Sulfate	1730	mg/L	D	30		E300.0	11/09/02 13:11 / rlh
Fluoride	0.33	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	3870	mg/L		1		A2340 B	11/19/02 12:44 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	16.3	mg/L		0.1		E350.1	11/12/02 17:41 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:28 / bls
METALS, DISSOLVED							
Calcium	1140	mg/L	D	30		E200.7	11/16/02 14:10 / jjw
Magnesium	250	mg/L	D	10		E200.7	11/16/02 14:10 / jjw
Potassium	446	mg/L	D	5		E200.7	11/16/02 14:10 / jjw
Silica	29	mg/L	D	10		E200.7	11/16/02 14:10 / jjw
Sodium	22800	mg/L	D	30		E200.7	11/16/02 14:10 / jjw
METALS, TOTAL							
Silica	46	mg/L	D	20		E200.7	11/19/02 23:59 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/10/02 23:20 / bjm
Benzene	1.4	ug/L		0.50		SW8021B	11/10/02 23:20 / bjm
Toluene	0.93	ug/L		0.50		SW8021B	11/10/02 23:20 / bjm
Ethylbenzene	6.9	ug/L		0.50		SW8021B	11/10/02 23:20 / bjm
m+p-Xylenes	0.57	ug/L		0.50		SW8021B	11/10/02 23:20 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/10/02 23:20 / bjm
Xylenes, Total	0.57	ug/L		0.50		SW8021B	11/10/02 23:20 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	11/10/02 23:20 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-020
Client Sample ID: PNR-23

Report Date: 11/27/02
Collection Date: 11/06/02 12:15
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.5	s.u.		0.1		E150.1	11/07/02 17:56 / jb
Conductivity	60200	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	67300	mg/L		10		A2540 C	11/08/02 17:34 / qed
INORGANICS							
Alkalinity, Total as CaCO3	195	mg/L		4		A2320 B	11/08/02 17:03 / rlh
Bicarbonate as HCO3	238	mg/L		4		A2320 B	11/08/02 17:03 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 17:03 / rlh
Chloride	36800	mg/L	D	3		E300.0	11/11/02 15:13 / rlh
Sulfate	1670	mg/L	D	30		E300.0	11/11/02 15:13 / rlh
Fluoride	2.20	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	4290	mg/L		1		A2340 B	11/25/02 10:24 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	17.4	mg/L		0.1		E350.1	11/12/02 17:42 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:29 / bls
METALS, DISSOLVED							
Calcium	1180	mg/L	D	30		E200.7	11/22/02 09:14 / rlh
Magnesium	324	mg/L	D	10		E200.7	11/22/02 09:14 / rlh
Potassium	410	mg/L	D	5		E200.7	11/22/02 09:14 / rlh
Silica	63	mg/L	D	10		E200.7	11/22/02 09:14 / rlh
Sodium	22100	mg/L	D	30		E200.7	11/22/02 09:14 / rlh
METALS, TOTAL							
Silica	71	mg/L	D	20		E200.7	11/20/02 00:03 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L	D	20		SW8021B	11/11/02 19:16 / bjm
Benzene	401	ug/L		10		SW8021B	11/11/02 19:16 / bjm
Toluene	573	ug/L		10		SW8021B	11/11/02 19:16 / bjm
Ethylbenzene	70	ug/L		10		SW8021B	11/11/02 19:16 / bjm
m+p-Xylenes	150	ug/L		10		SW8021B	11/11/02 19:16 / bjm
o-Xylene	69	ug/L		10		SW8021B	11/11/02 19:16 / bjm
Xylenes, Total	219	ug/L		10		SW8021B	11/11/02 19:16 / bjm
Surr: Trifluorotoluene	99.5	%REC			80-120	SW8021B	11/11/02 19:16 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	0.60	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-021
Client Sample ID: PNR-24

Report Date: 11/27/02
Collection Date: 11/06/02 12:32
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.7	s.u.		0.1		E150.1	11/07/02 17:57 / jb
Conductivity	61100	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	68300	mg/L		10		A2540 C	11/08/02 17:35 / qed
INORGANICS							
Alkalinity, Total as CaCO3	171	mg/L		4		A2320 B	11/08/02 17:26 / rlh
Bicarbonate as HCO3	208	mg/L		4		A2320 B	11/08/02 17:26 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 17:26 / rlh
Chloride	36900	mg/L	D	3		E300.0	11/11/02 15:45 / rlh
Sulfate	1670	mg/L	D	30		E300.0	11/11/02 15:45 / rlh
Fluoride	3.53	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	3700	mg/L		1		A2340 B	11/19/02 12:45 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	17.0	mg/L		0.1		E350.1	11/12/02 17:42 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:29 / bls
METALS, DISSOLVED							
Calcium	1120	mg/L	D	30		E200.7	11/16/02 14:26 / jjw
Magnesium	219	mg/L	D	10		E200.7	11/16/02 14:26 / jjw
Potassium	452	mg/L	D	5		E200.7	11/16/02 14:26 / jjw
Silica	50	mg/L	D	10		E200.7	11/16/02 14:26 / jjw
Sodium	22100	mg/L	D	30		E200.7	11/16/02 14:26 / jjw
METALS, TOTAL							
Silica	225	mg/L	D	20		E200.7	11/20/02 00:07 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L	D	10		SW8021B	11/11/02 21:29 / bjm
Benzene	292	ug/L		5.0		SW8021B	11/11/02 21:29 / bjm
Toluene	543	ug/L		5.0		SW8021B	11/11/02 21:29 / bjm
Ethylbenzene	77	ug/L		5.0		SW8021B	11/11/02 21:29 / bjm
m+p-Xylenes	200	ug/L		5.0		SW8021B	11/11/02 21:29 / bjm
o-Xylene	86	ug/L		5.0		SW8021B	11/11/02 21:29 / bjm
Xylenes, Total	286	ug/L		5.0		SW8021B	11/11/02 21:29 / bjm
Surr: Trifluorotoluene	80.2	%REC			80-120	SW8021B	11/11/02 21:29 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	170	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-022
Client Sample ID: M-27

Report Date: 11/27/02
Collection Date: 11/06/02 09:00
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.0	s.u.		0.1		E150.1	11/07/02 17:59 / jb
Conductivity	17000	umhos/cm		1		A2510 B	11/07/02 17:44 / jb
Solids, Total Dissolved TDS @ 180 C	10500	mg/L		10		A2540 C	11/08/02 17:36 / qed
INORGANICS							
Alkalinity, Total as CaCO3	ND	mg/L		4		A2320 B	11/08/02 17:32 / rlh
Bicarbonate as HCO3	4	mg/L		4		A2320 B	11/08/02 17:32 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 17:32 / rlh
Chloride	5100	mg/L	D	2		E300.0	11/11/02 15:56 / rlh
Sulfate	619	mg/L	D	10		E300.0	11/11/02 15:56 / rlh
Fluoride	ND	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	3990	mg/L		1		A2340 B	11/19/02 12:46 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	2.6	mg/L		0.1		E350.1	11/12/02 17:53 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:30 / bls
METALS, DISSOLVED							
Calcium	732	mg/L	D	6		E200.7	11/16/02 14:30 / jjw
Magnesium	526	mg/L	D	2		E200.7	11/16/02 14:30 / jjw
Potassium	23	mg/L		1		E200.7	11/16/02 14:30 / jjw
Silica	ND	mg/L	D	2		E200.7	11/16/02 14:30 / jjw
Sodium	1730	mg/L	D	6		E200.7	11/16/02 14:30 / jjw
METALS, TOTAL							
Silica	ND	mg/L	D	2		E200.7	11/12/02 03:30 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/11/02 18:16 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/11/02 18:16 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/11/02 18:16 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/11/02 18:16 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/11/02 18:16 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/11/02 18:16 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/11/02 18:16 / bjm
Surr: Trifluorotoluene	114	%REC			80-120	SW8021B	11/11/02 18:16 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-023
Client Sample ID: PNR-27

Report Date: 11/27/02
Collection Date: 11/06/02 09:55
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 18:00 / jb
Conductivity	26000	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	24200	mg/L		10		A2540 C	11/08/02 17:38 / qed
INORGANICS							
Alkalinity, Total as CaCO3	583	mg/L		4		A2320 B	11/08/02 17:36 / rlh
Bicarbonate as HCO3	712	mg/L		4		A2320 B	11/08/02 17:36 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 17:36 / rlh
Chloride	11200	mg/L	D	3		E300.0	11/11/02 16:06 / rlh
Sulfate	1820	mg/L	D	30		E300.0	11/11/02 16:06 / rlh
Fluoride	0.17	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	11000	mg/L		1		A2340 B	11/19/02 12:46 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	ND	mg/L		0.1		E350.1	11/12/02 16:52 / bls
Nitrogen, Nitrate+Nitrite as N	31.2	mg/L		0.05		E353.2	11/11/02 16:50 / bls
METALS, DISSOLVED							
Calcium	2090	mg/L	D	20		E200.7	11/16/02 14:34 / jjw
Magnesium	1400	mg/L	D	5		E200.7	11/16/02 14:34 / jjw
Potassium	42	mg/L	D	2		E200.7	11/16/02 14:34 / jjw
Silica	22	mg/L	D	5		E200.7	11/16/02 14:34 / jjw
Sodium	3450	mg/L	D	20		E200.7	11/16/02 14:34 / jjw
METALS, TOTAL							
Silica	30	mg/L	D	20		E200.7	11/20/02 00:11 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/11/02 19:34 / bjm
Benzene	0.49	ug/L	J	0.50		SW8021B	11/11/02 19:34 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/11/02 19:34 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/11/02 19:34 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/11/02 19:34 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/11/02 19:34 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/11/02 19:34 / bjm
Surr: Trifluorotoluene	100	%REC			80-120	SW8021B	11/11/02 19:34 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less thar the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-024
Client Sample ID: M-31

Report Date: 11/27/02
Collection Date: 11/06/02 10:35
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 18:03 / jb
Conductivity	55000	umhos/cm		1		A2510 B	11/07/02 17:02 / jb
Solids, Total Dissolved TDS @ 180 C	62800	mg/L		10		A2540 C	11/08/02 17:39 / qed
INORGANICS							
Alkalinity, Total as CaCO3	510	mg/L		4		A2320 B	11/08/02 17:45 / rlh
Bicarbonate as HCO3	622	mg/L		4		A2320 B	11/08/02 17:45 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 17:45 / rlh
Chloride	33600	mg/L	D	3		E300.0	11/11/02 16:39 / rlh
Sulfate	1650	mg/L	D	30		E300.0	11/11/02 16:39 / rlh
Fluoride	0.13	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	6280	mg/L		1		A2340 B	11/19/02 12:46 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	8.1	mg/L		0.1		E350.1	11/12/02 17:43 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:38 / bls
METALS, DISSOLVED							
Calcium	1520	mg/L	D	30		E200.7	11/16/02 14:38 / jjw
Magnesium	601	mg/L	D	10		E200.7	11/16/02 14:38 / jjw
Potassium	177	mg/L	D	5		E200.7	11/16/02 14:38 / jjw
Silica	ND	mg/L	D	10		E200.7	11/16/02 14:38 / jjw
Sodium	19100	mg/L	D	30		E200.7	11/16/02 14:38 / jjw
METALS, TOTAL							
Silica	17	mg/L	D	10		E200.7	11/12/02 03:34 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/11/02 20:12 / bjm
Benzene	23	ug/L		0.50		SW8021B	11/11/02 20:12 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/11/02 20:12 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/11/02 20:12 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/11/02 20:12 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/11/02 20:12 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/11/02 20:12 / bjm
Surr: Trifluorotoluene	100	%REC			80-120	SW8021B	11/11/02 20:12 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-025
Client Sample ID: M-28

Report Date: 11/27/02
Collection Date: 11/06/02 11:20
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.9	s.u.		0.1		E150.1	11/07/02 18:04 / jb
Conductivity	44000	umhos/cm		1		A2510 B	11/07/02 17:03 / jb
Solids, Total Dissolved TDS @ 180 C	43100	mg/L		10		A2540 C	11/08/02 17:41 / qed
INORGANICS							
Alkalinity, Total as CaCO3	612	mg/L		4		A2320 B	11/08/02 17:53 / rlh
Bicarbonate as HCO3	746	mg/L		4		A2320 B	11/08/02 17:53 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 17:53 / rlh
Chloride	22400	mg/L	D	3		E300.0	11/11/02 16:49 / rlh
Sulfate	1840	mg/L	D	30		E300.0	11/11/02 16:49 / rlh
Fluoride	0.15	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	5330	mg/L		1		A2340 B	11/19/02 12:47 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	6.7	mg/L		0.1		E350.1	11/12/02 17:44 / bls
Nitrogen, Nitrate+Nitrite as N	17.0	mg/L		0.05		E353.2	11/11/02 16:50 / bls
METALS, DISSOLVED							
Calcium	1210	mg/L	D	30		E200.7	11/16/02 14:50 / jjw
Magnesium	562	mg/L	D	10		E200.7	11/16/02 14:50 / jjw
Potassium	71	mg/L	D	5		E200.7	11/16/02 14:50 / jjw
Silica	ND	mg/L	D	10		E200.7	11/16/02 14:50 / jjw
Sodium	12600	mg/L	D	30		E200.7	11/16/02 14:50 / jjw
METALS, TOTAL							
Silica	ND	mg/L	D	20		E200.7	11/20/02 00:23 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/11/02 20:54 / bjm
Benzene	22	ug/L		0.50		SW8021B	11/11/02 20:54 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/11/02 20:54 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/11/02 20:54 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/11/02 20:54 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/11/02 20:54 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/11/02 20:54 / bjm
Surr: Trifluorotoluene	100	%REC			80-120	SW8021B	11/11/02 20:54 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-026
Client Sample ID: PNR-25

Report Date: 11/27/02
Collection Date: 11/06/02 14:55
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.5	s.u.		0.1		E150.1	11/07/02 18:04 / jb
Conductivity	13000	umhos/cm		1		A2510 B	11/07/02 17:45 / jb
Solids, Total Dissolved TDS @ 180 C	6330	mg/L		10		A2540 C	11/08/02 17:42 / qed
INORGANICS							
Alkalinity, Total as CaCO3	877	mg/L		4		A2320 B	11/08/02 18:01 / rlh
Bicarbonate as HCO3	1070	mg/L		4		A2320 B	11/08/02 18:01 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 18:01 / rlh
Chloride	3110	mg/L	D	2		E300.0	11/11/02 17:00 / rlh
Sulfate	ND	mg/L	D	10		E300.0	11/11/02 17:00 / rlh
Fluoride	8.00	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	298	mg/L		1		A2340 B	11/19/02 12:47 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	0.9	mg/L		0.1		E350.1	11/12/02 17:45 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 16:51 / bls
METALS, DISSOLVED							
Calcium	48	mg/L	D	20		E200.7	11/16/02 14:54 / jjw
Magnesium	43	mg/L	D	5		E200.7	11/16/02 14:54 / jjw
Potassium	33	mg/L	D	2		E200.7	11/16/02 14:54 / jjw
Silica	45	mg/L	D	5		E200.7	11/16/02 14:54 / jjw
Sodium	2140	mg/L	D	20		E200.7	11/16/02 14:54 / jjw
METALS, TOTAL							
Silica	123	mg/L	D	10		E200.7	11/20/02 00:27 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L	D	5.0		SW8021B	11/15/02 18:48 / bjm
Benzene	1.7	ug/L		0.50		SW8021B	11/15/02 18:48 / bjm
Toluene	2.1	ug/L		0.50		SW8021B	11/15/02 18:48 / bjm
Ethylbenzene	2.2	ug/L		0.50		SW8021B	11/15/02 18:48 / bjm
m+p-Xylenes	327	ug/L		0.50		SW8021B	11/15/02 18:48 / bjm
o-Xylene	10	ug/L		0.50		SW8021B	11/15/02 18:48 / bjm
Xylenes, Total	337	ug/L		0.50		SW8021B	11/15/02 18:48 / bjm
Surr: Trifluorotoluene	98.0	%REC			80-120	SW8021B	11/15/02 18:48 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	390	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-027
Client Sample ID: PNR-26

Report Date: 11/27/02
Collection Date: 11/06/02 16:20
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.7	s.u.		0.1		E150.1	11/07/02 18:05 / jb
Conductivity	57500	umhos/cm		1		A2510 B	11/07/02 17:03 / jb
Solids, Total Dissolved TDS @ 180 C	65300	mg/L		10		A2540 C	11/08/02 17:44 / qed
INORGANICS							
Alkalinity, Total as CaCO3	181	mg/L		4		A2320 B	11/08/02 18:10 / rlh
Bicarbonate as HCO3	221	mg/L		4		A2320 B	11/08/02 18:10 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 18:10 / rlh
Chloride	36000	mg/L	D	3		E300.0	11/11/02 17:11 / rlh
Sulfate	1610	mg/L	D	30		E300.0	11/11/02 17:11 / rlh
Fluoride	2.57	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	5080	mg/L		1		A2340 B	11/19/02 12:47 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	16.8	mg/L		0.1		E350.1	11/12/02 17:45 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:40 / bls
METALS, DISSOLVED							
Calcium	1450	mg/L	D	30		E200.7	11/16/02 14:58 / jjw
Magnesium	356	mg/L	D	10		E200.7	11/16/02 14:58 / jjw
Potassium	509	mg/L	D	5		E200.7	11/16/02 14:58 / jjw
Silica	53	mg/L	D	10		E200.7	11/16/02 14:58 / jjw
Sodium	22900	mg/L	D	30		E200.7	11/16/02 14:58 / jjw
METALS, TOTAL							
Silica	101	mg/L	D	20		E200.7	11/20/02 00:31 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L	D	10		SW8021B	11/11/02 23:41 / bjm
Benzene	398	ug/L		5.0		SW8021B	11/11/02 23:41 / bjm
Toluene	685	ug/L		5.0		SW8021B	11/11/02 23:41 / bjm
Ethylbenzene	91	ug/L		5.0		SW8021B	11/11/02 23:41 / bjm
m+p-Xylenes	231	ug/L		5.0		SW8021B	11/11/02 23:41 / bjm
o-Xylene	104	ug/L		5.0		SW8021B	11/11/02 23:41 / bjm
Xylenes, Total	335	ug/L		5.0		SW8021B	11/11/02 23:41 / bjm
Surr: Trifluorotoluene	91.0	%REC			80-120	SW8021B	11/11/02 23:41 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	66	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-028
Client Sample ID: PNR-15

Report Date: 11/27/02
Collection Date: 11/06/02 14:35
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 18:06 / jb
Conductivity	60400	umhos/cm		1		A2510 B	11/07/02 17:03 / jb
Solids, Total Dissolved TDS @ 180 C	67800	mg/L		10		A2540 C	11/08/02 17:45 / qed
INORGANICS							
Alkalinity, Total as CaCO3	325	mg/L		4		A2320 B	11/08/02 18:16 / rlh
Bicarbonate as HCO3	396	mg/L		4		A2320 B	11/08/02 18:16 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 18:16 / rlh
Chloride	37400	mg/L	D	3		E300.0	11/11/02 17:21 / rlh
Sulfate	1750	mg/L	D	30		E300.0	11/11/02 17:21 / rlh
Fluoride	0.31	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	3480	mg/L		1		A2340 B	11/19/02 12:47 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	15.4	mg/L		0.1		E350.1	11/12/02 17:46 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:41 / bls
METALS, DISSOLVED							
Calcium	1010	mg/L	D	30		E200.7	11/16/02 15:10 / jjw
Magnesium	235	mg/L	D	10		E200.7	11/16/02 15:10 / jjw
Potassium	420	mg/L	D	5		E200.7	11/16/02 15:10 / jjw
Silica	27	mg/L	D	10		E200.7	11/16/02 15:10 / jjw
Sodium	21700	mg/L	D	30		E200.7	11/16/02 15:10 / jjw
METALS, TOTAL							
Silica	42	mg/L	D	20		E200.7	11/20/02 00:35 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/11/02 23:31 / bjm
Benzene	2.8	ug/L		0.50		SW8021B	11/11/02 23:31 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/11/02 23:31 / bjm
Ethylbenzene	11	ug/L		0.50		SW8021B	11/11/02 23:31 / bjm
m+p-Xylenes	8.5	ug/L		0.50		SW8021B	11/11/02 23:31 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/11/02 23:31 / bjm
Xylenes, Total	8.5	ug/L		0.50		SW8021B	11/11/02 23:31 / bjm
Surr: Trifluorotoluene	99.0	%REC			80-120	SW8021B	11/11/02 23:31 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	2.0	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-029
Client Sample ID: PNR-14

Report Date: 11/27/02
Collection Date: 11/06/02 11:28
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.6	s.u.		0.1		E150.1	11/07/02 18:07 / jb
Conductivity	57500	umhos/cm		1		A2510 B	11/07/02 17:03 / jb
Solids, Total Dissolved TDS @ 180 C	65400	mg/L		10		A2540 C	11/08/02 17:47 / qed
INORGANICS							
Alkalinity, Total as CaCO3	295	mg/L		4		A2320 B	11/08/02 18:24 / rlh
Bicarbonate as HCO3	360	mg/L		4		A2320 B	11/08/02 18:24 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 18:24 / rlh
Chloride	35300	mg/L	D	3		E300.0	11/11/02 17:32 / rlh
Sulfate	1590	mg/L	D	30		E300.0	11/11/02 17:32 / rlh
Fluoride	0.30	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	5210	mg/L		1		A2340 B	11/19/02 12:48 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	18.4	mg/L		0.1		E350.1	11/12/02 17:47 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:45 / bls
METALS, DISSOLVED							
Calcium	1410	mg/L	D	30		E200.7	11/16/02 15:14 / jjw
Magnesium	412	mg/L	D	10		E200.7	11/16/02 15:14 / jjw
Potassium	368	mg/L	D	5		E200.7	11/16/02 15:14 / jjw
Silica	22	mg/L	D	10		E200.7	11/16/02 15:14 / jjw
Sodium	21500	mg/L	D	30		E200.7	11/16/02 15:14 / jjw
METALS, TOTAL							
Silica	33	mg/L	D	10		E200.7	11/12/02 03:38 / jjw
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/12/02 00:51 / bjm
Benzene	0.78	ug/L		0.50		SW8021B	11/12/02 00:51 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/12/02 00:51 / bjm
Ethylbenzene	36	ug/L		0.50		SW8021B	11/12/02 00:51 / bjm
m+p-Xylenes	0.70	ug/L		0.50		SW8021B	11/12/02 00:51 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/12/02 00:51 / bjm
Xylenes, Total	0.70	ug/L		0.50		SW8021B	11/12/02 00:51 / bjm
Surr: Trifluorotoluene	95.0	%REC			80-120	SW8021B	11/12/02 00:51 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-030
Client Sample ID: PNR-17

Report Date: 11/27/02
Collection Date: 11/06/02 15:40
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	6.8	s.u.		0.1		E150.1	11/07/02 18:08 / jb
Conductivity	58300	umhos/cm		1		A2510 B	11/07/02 17:03 / jb
Solids, Total Dissolved TDS @ 180 C	67100	mg/L		10		A2540 C	11/08/02 18:58 / qed
INORGANICS							
Alkalinity, Total as CaCO3	291	mg/L		4		A2320 B	11/08/02 18:30 / rlh
Bicarbonate as HCO3	355	mg/L		4		A2320 B	11/08/02 18:30 / rlh
Carbonate as CO3	ND	mg/L		4		A2320 B	11/08/02 18:30 / rlh
Chloride	36300	mg/L	D	3		E300.0	11/11/02 17:43 / rlh
Sulfate	1630	mg/L	D	30		E300.0	11/11/02 17:43 / rlh
Fluoride	0.38	mg/L		0.10		A4500-F C	11/14/02 10:00 / dlr
Hardness as CaCO3	4870	mg/L		1		A2340 B	11/19/02 12:48 / lab
NUTRIENTS							
Nitrogen, Ammonia as N	19.1	mg/L		0.1		E350.1	11/12/02 17:51 / bls
Nitrogen, Nitrate+Nitrite as N	ND	mg/L		0.05		E353.2	11/11/02 15:46 / bls
METALS, DISSOLVED							
Calcium	1360	mg/L	D	30		E200.7	11/16/02 15:18 / jjw
Magnesium	358	mg/L	D	10		E200.7	11/16/02 15:18 / jjw
Potassium	405	mg/L	D	5		E200.7	11/16/02 15:18 / jjw
Silica	34	mg/L	D	10		E200.7	11/16/02 15:18 / jjw
Sodium	23500	mg/L	D	30		E200.7	11/16/02 15:18 / jjw
METALS, TOTAL							
Silica	88	mg/L	D	20		E200.7	11/20/02 00:39 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L	D	5.0		SW8021B	11/18/02 16:47 / bjm
Benzene	97	ug/L		0.50		SW8021B	11/18/02 16:47 / bjm
Toluene	195	ug/L		0.50		SW8021B	11/18/02 16:47 / bjm
Ethylbenzene	69	ug/L		0.50		SW8021B	11/18/02 16:47 / bjm
m+p-Xylenes	128	ug/L		0.50		SW8021B	11/18/02 16:47 / bjm
o-Xylene	53	ug/L		0.50		SW8021B	11/18/02 16:47 / bjm
Xylenes, Total	181	ug/L		0.50		SW8021B	11/18/02 16:47 / bjm
Surr: Trifluorotoluene	96.0	%REC			80-120	SW8021B	11/18/02 16:47 / bjm
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	200	mg/L		0.10		E418.1	11/11/02 10:45 / bdw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-031
Client Sample ID: Trip Blank #1

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/13/02 18:12 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/13/02 18:12 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/13/02 18:12 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/13/02 18:12 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/13/02 18:12 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/13/02 18:12 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/13/02 18:12 / bjm
Surr: Trifluorotoluene	114	%REC			80-120	SW8021B	11/13/02 18:12 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-032
Client Sample ID: Trip Blank #2

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/15/02 18:45 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/15/02 18:45 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/15/02 18:45 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/15/02 18:45 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/15/02 18:45 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/15/02 18:45 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/15/02 18:45 / bjm
Surr: Trifluorotoluene	108	%REC			80-120	SW8021B	11/15/02 18:45 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-033
Client Sample ID: Trip Blank #3

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/14/02 15:01 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/14/02 15:01 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/14/02 15:01 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/14/02 15:01 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/14/02 15:01 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/14/02 15:01 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/14/02 15:01 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	11/14/02 15:01 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-034
Client Sample ID: Trip Blank #4

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/14/02 15:41 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/14/02 15:41 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/14/02 15:41 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/14/02 15:41 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/14/02 15:41 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/14/02 15:41 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/14/02 15:41 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	11/14/02 15:41 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-035
Client Sample ID: Trip Blank #5

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/14/02 16:19 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/14/02 16:19 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/14/02 16:19 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/14/02 16:19 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/14/02 16:19 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/14/02 16:19 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/14/02 16:19 / bjm
Surr: Trifluorotoluene	102	%REC			80-120	SW8021B	11/14/02 16:19 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-036
Client Sample ID: Trip Blank #6

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/14/02 16:59 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/14/02 16:59 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/14/02 16:59 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/14/02 16:59 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/14/02 16:59 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/14/02 16:59 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/14/02 16:59 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	11/14/02 16:59 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-037
Client Sample ID: Trip Blank #7

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/14/02 17:40 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/14/02 17:40 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/14/02 17:40 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/14/02 17:40 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/14/02 17:40 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/14/02 17:40 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/14/02 17:40 / bjm
Surr: Trifluorotoluene	102	%REC			80-120	SW8021B	11/14/02 17:40 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site
Lab ID: B02110370-038
Client Sample ID: Trip Blank #8

Report Date: 11/27/02
Collection Date: Not Provided
Date Received: 11/07/02
Matrix: AQUEOUS

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/15/02 16:16 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/15/02 16:16 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/15/02 16:16 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/15/02 16:16 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/15/02 16:16 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/15/02 16:16 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/15/02 16:16 / bjm
Surr: Trifluorotoluene	102	%REC			80-120	SW8021B	11/15/02 16:16 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B								Batch: ALK021108A	
Sample ID: MBLK_021108A	Method Blank							11/08/02 08:25	
Alkalinity, Total as CaCO3	ND	mg/L	2.00						
Bicarbonate as HCO3	ND	mg/L	2.00						
Carbonate as CO3	ND	mg/L	1.00						
Sample ID: LCS_021108A	Laboratory Control Spike							11/08/02 08:28	
Alkalinity, Total as CaCO3	106	mg/L	2.00	106	90	110			
Sample ID: B02110352-001AMS	Sample Matrix Spike							11/08/02 08:43	
Alkalinity, Total as CaCO3	928	mg/L	2.00	107	80	120			
Sample ID: B02110352-001AMSD	Sample Matrix Spike Duplicate							11/08/02 08:51	
Alkalinity, Total as CaCO3	928	mg/L	2.00	106	80	120	0	20	
Sample ID: B02110359-010AMS	Sample Matrix Spike							11/08/02 10:21	
Alkalinity, Total as CaCO3	698	mg/L	2.00	92.2	80	120			
Sample ID: B02110359-010AMSD	Sample Matrix Spike Duplicate							11/08/02 10:27	
Alkalinity, Total as CaCO3	683	mg/L	2.00	89	80	120	2.2	20	
Sample ID: B02110370-010BMS	Sample Matrix Spike							11/08/02 15:17	
Alkalinity, Total as CaCO3	885	mg/L	2.00	104	80	120			
Sample ID: B02110370-010BMSD	Sample Matrix Spike Duplicate							11/08/02 15:24	
Alkalinity, Total as CaCO3	892	mg/L	2.00	104	80	120	0.8	20	
Sample ID: B02110370-020BMS	Sample Matrix Spike							11/08/02 17:10	
Alkalinity, Total as CaCO3	797	mg/L	2.00	107	80	120			
Sample ID: B02110370-020BMSD	Sample Matrix Spike Duplicate							11/08/02 17:17	
Alkalinity, Total as CaCO3	806	mg/L	2.00	107	80	120	1.2	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2510 B								Batch: PHSC021107A	
Sample ID: PHC10417	Laboratory Control Spike - Low							11/07/02 13:32	
Conductivity	150	umhos/cm	1.00	100	90	110			
Sample ID: PHC10418	Laboratory Control Spike							11/07/02 13:32	
Conductivity	4970	umhos/cm	1.00	99.4	90	110			
Sample ID: B02110350-003A	Sample Duplicate							11/07/02 13:59	
Conductivity	6.89	umhos/cm	1.00				2.2	10	
Sample ID: B02110359-007A	Sample Duplicate							11/07/02 14:57	
Conductivity	739	umhos/cm	1.00						
Sample ID: B02110370-014B	Sample Duplicate							11/07/02 17:02	
Conductivity	61800	umhos/cm	1.00				0.2	10	
Sample ID: B02110370-024B	Sample Duplicate							11/07/02 17:03	
Conductivity	54900	umhos/cm	1.00				0.2	10	
Sample ID: B02110370-004B	Sample Duplicate							11/07/02 17:07	
Conductivity	1520	umhos/cm	1.00				0.7	10	
Sample ID: B02110379-001A	Sample Duplicate							11/07/02 17:46	
Conductivity	1890	umhos/cm	1.00				0	10	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C								Batch: TDS021108A	
Sample ID: MBLK1	Method Blank							11/08/02 15:52	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10.0						
Sample ID: LFB1	Sample Matrix Spike							11/08/02 15:53	
Solids, Total Dissolved TDS @ 180 C	1170	mg/L	10.0	100	80	120			
Sample ID: B02110359-006A MS	Sample Matrix Spike							11/08/02 15:54	
Solids, Total Dissolved TDS @ 180 C	3030	mg/L	10.0	98.6	80	120			
Sample ID: B02110359-006A MSD	Sample Matrix Spike Duplicate							11/08/02 15:55	
Solids, Total Dissolved TDS @ 180 C	3010	mg/L	10.0	98	80	120	0.8	20	
Sample ID: MBLK2	Method Blank							11/08/02 16:19	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10.0						
Sample ID: LFB2	Sample Matrix Spike							11/08/02 16:19	
Solids, Total Dissolved TDS @ 180 C	1190	mg/L	10.0	101	80	120			
Sample ID: B02110359-016A MS	Sample Matrix Spike							11/08/02 16:21	
Solids, Total Dissolved TDS @ 180 C	2080	mg/L	10.0	100	80	120			
Sample ID: B02110359-016A MSD	Sample Matrix Spike Duplicate							11/08/02 16:22	
Solids, Total Dissolved TDS @ 180 C	2090	mg/L	10.0	96.2	80	120	0.5	20	

Qualifiers: ND - Not Detected at the Reporting Limit
R - RPD outside of recommended recovery limits
S - Spike Recovery outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C								Batch: TDS021108B	
Sample ID: MBLK3	Method Blank							11/08/02 17:06	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10.0						
Sample ID: LFB3	Sample Matrix Spike							11/08/02 17:07	
Solids, Total Dissolved TDS @ 180 C	1160	mg/L	10.0	99.9	80	120			
Sample ID: B02110370-008B MS	Sample Matrix Spike							11/08/02 17:08	
Solids, Total Dissolved TDS @ 180 C	5940	mg/L	10.0	104	80	120			
Sample ID: B02110370-008B MSD	Sample Matrix Spike Duplicate							11/08/02 17:09	
Solids, Total Dissolved TDS @ 180 C	5860	mg/L	10.0	104	80	120	1.4	20	
Sample ID: MBLK4	Method Blank							11/08/02 17:29	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10.0						
Sample ID: LFB4	Sample Matrix Spike							11/08/02 17:29	
Solids, Total Dissolved TDS @ 180 C	982	mg/L	10.0	99.1	80	120			
Sample ID: B02110370-019B MS	Sample Matrix Spike							11/08/02 17:31	
Solids, Total Dissolved TDS @ 180 C	75800	mg/L	10.0	100	80	120			
Sample ID: B02110370-019B MSD	Sample Matrix Spike Duplicate							11/08/02 17:31	
Solids, Total Dissolved TDS @ 180 C	76600	mg/L	10.0	103	80	120	1.0	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C								Batch: TDS021108C	
Sample ID: MBLK5	Method Blank							11/08/02 18:56	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10.0						
Sample ID: LFB5	Sample Matrix Spike							11/08/02 18:57	
Solids, Total Dissolved TDS @ 180 C	1210	mg/L	10.0	99.3	80	120			
Sample ID: B02110370-030B MS	Sample Matrix Spike							11/08/02 18:59	
Solids, Total Dissolved TDS @ 180 C	76300	mg/L	10.0	104	80	120			
Sample ID: B02110370-030B MSD	Sample Matrix Spike Duplicate							11/08/02 18:59	
Solids, Total Dissolved TDS @ 180 C	76100	mg/L	10.0	107	80	120	0.3	20	
Sample ID: MBLK6	Method Blank							11/08/02 19:18	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10.0						
Sample ID: LFB6	Sample Matrix Spike							11/08/02 19:18	
Solids, Total Dissolved TDS @ 180 C	1200	mg/L	10.0	98.6	80	120			
Sample ID: B02110400-003A MS	Sample Matrix Spike							11/08/02 19:20	
Solids, Total Dissolved TDS @ 180 C	3170	mg/L	10.0	100	80	120			
Sample ID: B02110400-003A MSD	Sample Matrix Spike Duplicate							11/08/02 19:20	
Solids, Total Dissolved TDS @ 180 C	3090	mg/L	10.0	102	80	120	2.4	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**A4500-F C**								Batch: 021114A-F-ISE-W	
Sample ID:	**MBLK1_021114A**	Method Blank							11/14/02 10:00	
Fluoride		ND	mg/L	0.100						
Sample ID:	**B02110342-001EMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.08	mg/L	0.100	93	80	120			
Sample ID:	**B02110342-001EMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.08	mg/L	0.100	93	80	120	0	10	
Sample ID:	**B02110370-008BMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.21	mg/L	0.100	91	80	120			
Sample ID:	**B02110370-008BMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.26	mg/L	0.100	96	80	120	4.0	10	
Sample ID:	**B02110370-018BMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.17	mg/L	0.100	93	80	120			
Sample ID:	**B02110370-018BMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.17	mg/L	0.100	93	80	120	0	10	
Sample ID:	**B02110370-028BMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.12	mg/L	0.100	81	80	120			
Sample ID:	**B02110370-028BMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.12	mg/L	0.100	81	80	120	0	10	
Sample ID:	**B02110399-008BMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.42	mg/L	0.100	93	80	120			
Sample ID:	**B02110399-008BMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.42	mg/L	0.100	93	80	120	0	10	
Sample ID:	**B02110400-010AMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.00	mg/L	0.100	92	80	120			
Sample ID:	**B02110400-010AMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.08	mg/L	0.100	100	80	120	7.7	10	
Sample ID:	**B02110400-020AMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.08	mg/L	0.100	91	80	120			
Sample ID:	**B02110400-020AMSD**	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride		1.12	mg/L	0.100	95	80	120	3.6	10	
Sample ID:	**B02110414-002CMS**	Sample Matrix Spike							11/14/02 10:00	
Fluoride		1.21	mg/L	0.100	94	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-F C								Batch: 021114A-F-ISE-W	
Sample ID: B02110414-002CMSD	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride	1.26	mg/L	0.100	99	80	120	4.0	10	
Sample ID: B02110555-001AMS	Sample Matrix Spike							11/14/02 10:00	
Fluoride	1.67	mg/L	0.100	100	80	120			
Sample ID: B02110555-001AMSD	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride	1.73	mg/L	0.100	106	80	120	3.5	10	
Sample ID: B02110578-007AMS	Sample Matrix Spike							11/14/02 10:00	
Fluoride	1.48	mg/L	0.100	95	80	120			
Sample ID: B02110578-007AMSD	Sample Matrix Spike Duplicate							11/14/02 10:00	
Fluoride	1.54	mg/L	0.100	101	80	120	4.0	10	
Method: E150.1								Batch: PHSC021107A	
Sample ID: B02110350-003A	Sample Duplicate							11/07/02 14:17	
pH	7.56	s.u.	0.100				0.1	10	
Sample ID: B02110359-007A	Sample Duplicate							11/07/02 15:16	
pH	7.18	s.u.	0.100				0.1	10	
Sample ID: B02110370-004B	Sample Duplicate							11/07/02 17:22	
pH	7.46	s.u.	0.100				0	10	
Sample ID: B02110370-014B	Sample Duplicate							11/07/02 17:37	
pH	6.85	s.u.	0.100				0	10	
Sample ID: B02110370-024B	Sample Duplicate							11/07/02 18:03	
pH	6.85	s.u.	0.100				0	10	
Sample ID: B02110379-001A	Sample Duplicate							11/07/02 18:10	
pH	8.13	s.u.	0.100				0.1	10	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: 3876
Sample ID: B02110370-004FMS2	Sample Matrix Spike								11/16/02 12:45
Calcium	199	mg/L	1.00	98.7	70	130			
Magnesium	182	mg/L	1.00	99.6	70	130			
Potassium	107	mg/L	1.00	101	70	130			
Silicon	29.6	mg/L	0.100	98.6	70	130			
Sodium	197	mg/L	1.00	100	70	130			
Sample ID: B02110370-004FMSD2	Sample Matrix Spike Duplicate								11/16/02 12:49
Calcium	199	mg/L	1.00	98.7	70	130	0	20	
Magnesium	180	mg/L	1.00	98.2	70	130	0.8	20	
Potassium	108	mg/L	1.00	102	70	130	0.9	20	
Silicon	29.4	mg/L	0.100	97.5	70	130	0.8	20	
Sodium	196	mg/L	1.00	99.4	70	130	0.5	20	
Sample ID: B02110370-014FMS2	Sample Matrix Spike								11/16/02 13:41
Calcium	6090	mg/L	30.6	100	70	130			
Magnesium	5260	mg/L	10.2	98.6	70	130			
Potassium	5420	mg/L	5.10	97.6	70	130			
Silicon	1020	mg/L	3.06	99.2	70	130			
Sodium	27800	mg/L	30.6	99.5	70	130			
Sample ID: B02110370-014FMSD2	Sample Matrix Spike Duplicate								11/16/02 13:45
Calcium	6040	mg/L	30.6	99.1	70	130	0.9	20	
Magnesium	5190	mg/L	10.2	97.1	70	130	1.5	20	
Potassium	5400	mg/L	5.10	97.4	70	130	0.2	20	
Silicon	1020	mg/L	3.06	99.7	70	130	0.5	20	
Sodium	27700	mg/L	30.6	96.6	70	130	0.5	20	
Sample ID: B02110370-024FMS2	Sample Matrix Spike								11/16/02 14:42
Calcium	6760	mg/L	30.6	103	70	130			
Magnesium	5780	mg/L	10.2	101	70	130			
Potassium	5380	mg/L	5.10	102	70	130			
Silicon	993	mg/L	3.06	97	70	130			
Sodium	24700	mg/L	30.6	109	70	130			
Sample ID: B02110370-024FMSD2	Sample Matrix Spike Duplicate								11/16/02 14:46
Calcium	6480	mg/L	30.6	97.3	70	130	4.3	20	
Magnesium	5370	mg/L	10.2	93.5	70	130	7.3	20	
Potassium	5050	mg/L	5.10	95.5	70	130	6.3	20	
Silicon	996	mg/L	3.06	97.3	70	130	0.3	20	
Sodium	24400	mg/L	30.6	104	70	130	1.1	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0									Batch: R17130
Sample ID: ICB	Method Blank								11/08/02 13:26
Chloride	0.0920	mg/L	1.00						
Sulfate	ND	mg/L	1.00						
Sample ID: B02110116-010A MS	Sample Matrix Spike								11/08/02 14:09
Chloride	514	mg/L	3.06	94.7	80	120			
Sulfate	4140	mg/L	26.5	96.1	80	120			
Sample ID: B02110116-010A MSD	Sample Matrix Spike Duplicate								11/08/02 14:20
Chloride	516	mg/L	3.06	95.1	80	120	0.4	20	
Sulfate	4150	mg/L	26.5	97	80	120	0.4	20	
Sample ID: B02110243-008K MS	Sample Matrix Spike								11/08/02 16:07
Chloride	5.04	mg/L	1.00	101	80	120			
Sulfate	20.6	mg/L	1.00	103	80	120			
Sample ID: B02110243-008K MSD	Sample Matrix Spike Duplicate								11/08/02 16:18
Chloride	5.07	mg/L	1.00	101	80	120	0.7	20	
Sulfate	20.8	mg/L	1.00	104	80	120	0.9	20	
Sample ID: B02110251-008A MS	Sample Matrix Spike								11/08/02 18:15
Chloride	221	mg/L	1.00	98.3	80	120			
Sulfate	3400	mg/L	2.65	104	80	120			
Sample ID: B02110251-008A MSD	Sample Matrix Spike Duplicate								11/08/02 18:26
Chloride	221	mg/L	1.00	99.1	80	120	0.2	20	
Sulfate	3410	mg/L	2.65	107	80	120	0.2	20	
Sample ID: B02110253-001C MS	Sample Matrix Spike								11/08/02 20:45
Chloride	8.40	mg/L	1.00	107	80	120			
Sulfate	114	mg/L	1.00	110	80	120			
Sample ID: B02110253-001C MSD	Sample Matrix Spike Duplicate								11/08/02 20:56
Chloride	8.44	mg/L	1.00	108	80	120	0.5	20	
Sulfate	115	mg/L	1.00	113	80	120	0.6	20	
Sample ID: B02110257-008A MS	Sample Matrix Spike								11/08/02 23:15
Chloride	6.33	mg/L	1.00	105	80	120			
Sulfate	64.7	mg/L	1.00	114	80	120			
Sample ID: B02110257-008A MSD	Sample Matrix Spike Duplicate								11/08/02 23:26
Chloride	6.27	mg/L	1.00	104	80	120	1.0	20	
Sulfate	64.1	mg/L	1.00	111	80	120	0.9	20	
Sample ID: B02110286-003A MS	Sample Matrix Spike								11/09/02 01:45
Chloride	7.50	mg/L	1.00	104	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0									Batch: R17130
Sample ID: B02110286-003A MS	Sample Matrix Spike								11/09/02 01:45
Sulfate	55.4	mg/L	1.00	103	80	120			
Sample ID: B02110286-003A MSD	Sample Matrix Spike Duplicate								11/09/02 01:56
Chloride	7.47	mg/L	1.00	104	80	120	0.4	20	
Sulfate	55.5	mg/L	1.00	103	80	120	0	20	
Sample ID: B02110359-001A MS	Sample Matrix Spike								11/09/02 04:58
Chloride	37.0	mg/L	1.00	92.9	80	120			
Sulfate	815	mg/L	1.00	103	80	120			
Sample ID: B02110359-001A MSD	Sample Matrix Spike Duplicate								11/09/02 05:09
Chloride	37.0	mg/L	1.00	93	80	120	0	20	
Sulfate	815	mg/L	1.00	102	80	120	0	20	
Sample ID: B02110359-011A MS	Sample Matrix Spike								11/09/02 07:28
Chloride	10.2	mg/L	1.00	97.6	80	120			
Sulfate	162	mg/L	1.00	80.3	80	120			
Sample ID: B02110359-011A MSD	Sample Matrix Spike Duplicate								11/09/02 07:39
Chloride	10.2	mg/L	1.00	98.5	80	120	0.4	20	
Sulfate	163	mg/L	1.00	85.3	80	120	0.6	20	
Sample ID: B02110370-008B MS	Sample Matrix Spike								11/09/02 09:58
Sulfate	1650	mg/L	5.30	99.6	80	120			
Sample ID: B02110370-008B MSD	Sample Matrix Spike Duplicate								11/09/02 10:09
Sulfate	1650	mg/L	5.30	99.3	80	120	0	20	
Sample ID: B02110370-018B MS	Sample Matrix Spike								11/09/02 12:28
Sulfate	1120	mg/L	2.65	92.2	80	120			
Sample ID: B02110370-018B MSD	Sample Matrix Spike Duplicate								11/09/02 12:39
Sulfate	1130	mg/L	2.65	95.5	80	120	0.6	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E300.0**									Batch: R17210
Sample ID:	**ICB**	Method Blank								11/11/02 12:11
Chloride		ND	mg/L	1.00						
Sulfate		ND	mg/L	1.00						
Sample ID:	**B02110437-001A MS**	Sample Matrix Spike								11/11/02 12:54
Sulfate		1930	mg/L	26.5	96.7	80	120			
Sample ID:	**B02110437-001A MSD**	Sample Matrix Spike Duplicate								11/11/02 13:04
Sulfate		1940	mg/L	26.5	96.9	80	120	0.1	20	
Sample ID:	**B02110370-020B MS**	Sample Matrix Spike								11/11/02 15:24
Sulfate		3720	mg/L	26.5	102	80	120			
Sample ID:	**B02110370-020B MSD**	Sample Matrix Spike Duplicate								11/11/02 15:34
Sulfate		3670	mg/L	26.5	99.9	80	120	1.2	20	
Sample ID:	**B02110370-030B MS**	Sample Matrix Spike								11/11/02 17:53
Sulfate		3600	mg/L	26.5	98.4	80	120			
Sample ID:	**B02110370-030B MSD**	Sample Matrix Spike Duplicate								11/11/02 18:04
Sulfate		3620	mg/L	26.5	99.3	80	120	0.5	20	
Sample ID:	**B02110400-003A MS**	Sample Matrix Spike								11/11/02 20:23
Chloride		16.9	mg/L	1.00	99	80	120			
Sulfate		562	mg/L	1.00	97.7	80	120			
Sample ID:	**B02110400-003A MSD**	Sample Matrix Spike Duplicate								11/11/02 20:56
Chloride		17.0	mg/L	1.00	99.9	80	120	0.5	20	
Sulfate		563	mg/L	1.00	99.3	80	120	0.1	20	
Sample ID:	**B02110400-013A MS**	Sample Matrix Spike								11/11/02 23:15
Chloride		24.2	mg/L	1.00	95.3	80	120			
Sulfate		1000	mg/L	1.00	82.2	80	120			
Sample ID:	**B02110400-013A MSD**	Sample Matrix Spike Duplicate								11/11/02 23:26
Chloride		24.5	mg/L	1.00	98.8	80	120	1.4	20	
Sulfate		1010	mg/L	1.00	116	80	120	1.4	20	
Sample ID:	**B02110400-023A MS**	Sample Matrix Spike								11/12/02 01:45
Chloride		10.9	mg/L	1.00	102	80	120			
Sulfate		282	mg/L	1.00	91.6	80	120			
Sample ID:	**B02110400-023A MSD**	Sample Matrix Spike Duplicate								11/12/02 01:55
Chloride		11.0	mg/L	1.00	104	80	120	0.9	20	
Sulfate		286	mg/L	1.00	112	80	120	1.5	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**E300.0**									Batch: R17210
Sample ID:	**B02110414-002C MS**	Sample Matrix Spike								11/12/02 04:15
Chloride		7.93	mg/L	1.00	99.3	80	120			
Sulfate		178	mg/L	1.00	119	80	120			
Sample ID:	**B02110414-002C MSD**	Sample Matrix Spike Duplicate								11/12/02 04:25
Chloride		8.20	mg/L	1.00	105	80	120	3.3	20	
Sample ID:	**B02110428-002A MS**	Sample Matrix Spike								11/12/02 06:45
Chloride		7.69	mg/L	1.00	104	80	120			
Sulfate		61.7	mg/L	1.00	108	80	120			
Sample ID:	**B02110428-002A MSD**	Sample Matrix Spike Duplicate								11/12/02 06:56
Chloride		7.67	mg/L	1.00	104	80	120	0.3	20	
Sulfate		61.6	mg/L	1.00	107	80	120	0.3	20	
Sample ID:	**B02110429-006A MS**	Sample Matrix Spike								11/12/02 09:15
Chloride		65.4	mg/L	1.00	101	80	120			
Sample ID:	**B02110429-006A MSD**	Sample Matrix Spike Duplicate								11/12/02 09:47
Chloride		66.2	mg/L	1.00	103	80	120	1.3	20	
Sulfate		1170	mg/L	2.65	81.6	80	120	1.4	20	
Method:	**E300.0**									Batch: R17689
Sample ID:	**ICB**	Method Blank								11/20/02 12:59
Chloride		ND	mg/L	1.00						
Sulfate		ND	mg/L	1.00						
Sample ID:	**B02110370-014B MS**	Sample Matrix Spike								11/20/02 13:42
Sulfate		4960	mg/L	53.0	92.8	80	120			
Sample ID:	**B02110370-014B MSD**	Sample Matrix Spike Duplicate								11/20/02 13:52
Sulfate		5120	mg/L	53.0	97	80	120	3.3	20	
Sample ID:	**B02110660-009A MS**	Sample Matrix Spike								11/20/02 16:12
Chloride		253	mg/L	1.53	90.1	80	120			
Sample ID:	**B02110660-009A MSD**	Sample Matrix Spike Duplicate								11/20/02 16:22
Chloride		252	mg/L	1.53	89.6	80	120	0.4	20	

Qualifiers: ND - Not Detected at the Reporting Limit
R - RPD outside of recommended recovery limits
S - Spike Recovery outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E350.1								Batch: 02111202-A1	
Sample ID: B02110247-001A MS	Sample Matrix Spike							11/12/02 16:01	
Nitrogen, Ammonia as N	1.06	mg/L	0.100	105	80	120			
Sample ID: B02110247-001A MSD	Sample Matrix Spike Duplicate							11/12/02 16:01	
Nitrogen, Ammonia as N	1.06	mg/L	0.100	105	80	120	0.2	10	
Sample ID: B02110286-001B MS	Sample Matrix Spike							11/12/02 16:11	
Nitrogen, Ammonia as N	0.998	mg/L	0.100	102	80	120			
Sample ID: B02110286-001B MSD	Sample Matrix Spike Duplicate							11/12/02 16:11	
Nitrogen, Ammonia as N	0.992	mg/L	0.100	101	80	120	0.6	10	
Sample ID: B02110325-001B MS	Sample Matrix Spike							11/12/02 16:21	
Nitrogen, Ammonia as N	3.89	mg/L	0.100	104	80	120			
Sample ID: B02110325-001B MSD	Sample Matrix Spike Duplicate							11/12/02 16:21	
Nitrogen, Ammonia as N	3.90	mg/L	0.100	104	80	120	0	10	
Sample ID: B02110340-001A MS	Sample Matrix Spike							11/12/02 16:30	
Nitrogen, Ammonia as N	1.07	mg/L	0.100	104	80	120			
Sample ID: B02110340-001A MSD	Sample Matrix Spike Duplicate							11/12/02 16:31	
Nitrogen, Ammonia as N	1.04	mg/L	0.100	102	80	120	2.6	10	
Sample ID: B02110454-003C MS	Sample Matrix Spike							11/12/02 16:40	
Nitrogen, Ammonia as N	1.05	mg/L	0.100	107	80	120			
Sample ID: B02110454-003C MSD	Sample Matrix Spike Duplicate							11/12/02 16:41	
Nitrogen, Ammonia as N	1.05	mg/L	0.100	107	80	120	0	10	
Sample ID: B02110454-004C MS	Sample Matrix Spike							11/12/02 16:50	
Nitrogen, Ammonia as N	1.05	mg/L	0.100	107	80	120			
Sample ID: B02110454-004C MSD	Sample Matrix Spike Duplicate							11/12/02 16:51	
Nitrogen, Ammonia as N	1.04	mg/L	0.100	106	80	120	0.6	10	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E350.1									Batch: 02111203-A1
Sample ID: B02110454-005C MS	Sample Matrix Spike								11/12/02 17:40
Nitrogen, Ammonia as N	1.03	mg/L	0.100	106	80	120			
Sample ID: B02110454-005C MSD	Sample Matrix Spike Duplicate								11/12/02 17:40
Nitrogen, Ammonia as N	1.04	mg/L	0.100	106	80	120	0.2	10	
Sample ID: B02110454-006C MS	Sample Matrix Spike								11/12/02 17:49
Nitrogen, Ammonia as N	1.04	mg/L	0.100	106	80	120			
Sample ID: B02110454-006C MSD	Sample Matrix Spike Duplicate								11/12/02 17:50
Nitrogen, Ammonia as N	1.04	mg/L	0.100	106	80	120	0.2	10	
Method: E353.2									Batch: 02111102-NN2
Sample ID: B02110359-019C MS	Sample Matrix Spike								11/11/02 15:04
Nitrogen, Nitrate+Nitrite as N	1.04	mg/L	0.0500	102	80	120			
Sample ID: B02110359-019C MSD	Sample Matrix Spike Duplicate								11/11/02 15:05
Nitrogen, Nitrate+Nitrite as N	1.03	mg/L	0.0500	101	80	120	1.0	10	
Sample ID: B02110400-002D MS	Sample Matrix Spike								11/11/02 15:34
Nitrogen, Nitrate+Nitrite as N	1.06	mg/L	0.0500	108	80	120			
Sample ID: B02110400-002D MSD	Sample Matrix Spike Duplicate								11/11/02 15:35
Nitrogen, Nitrate+Nitrite as N	1.04	mg/L	0.0500	106	80	120	1.4	10	
Sample ID: B02110400-004D MS	Sample Matrix Spike								11/11/02 15:53
Nitrogen, Nitrate+Nitrite as N	1.06	mg/L	0.0500	107	80	120			
Sample ID: B02110400-004D MSD	Sample Matrix Spike Duplicate								11/11/02 15:54
Nitrogen, Nitrate+Nitrite as N	1.05	mg/L	0.0500	106	80	120	1.2	10	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/25/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E353.2									Batch: 02111103-NN2
Sample ID: B02110291-001A MS	Sample Matrix Spike								11/11/02 16:48
Nitrogen, Nitrate+Nitrite as N	3.02	mg/L	0.0500	90.8	80	120			
Sample ID: B02110291-001A MSD	Sample Matrix Spike Duplicate								11/11/02 16:49
Nitrogen, Nitrate+Nitrite as N	3.00	mg/L	0.0500	89.7	80	120	0.7	10	
Sample ID: B02110291-003A MS	Sample Matrix Spike								11/11/02 16:58
Nitrogen, Nitrate+Nitrite as N	3.95	mg/L	0.0500	102	80	120			
Sample ID: B02110291-003A MSD	Sample Matrix Spike Duplicate								11/11/02 16:59
Nitrogen, Nitrate+Nitrite as N	3.94	mg/L	0.0500	101	80	120	0.4	10	
Sample ID: B02110400-028D MS	Sample Matrix Spike								11/11/02 17:08
Nitrogen, Nitrate+Nitrite as N	1.06	mg/L	0.0500	105	80	120			
Sample ID: B02110400-028D MSD	Sample Matrix Spike Duplicate								11/11/02 17:09
Nitrogen, Nitrate+Nitrite as N	1.05	mg/L	0.0500	104	80	120	1.0	10	
Sample ID: B02110401-001A MS	Sample Matrix Spike								11/11/02 17:15
Nitrogen, Nitrate+Nitrite as N	2.87	mg/L	0.0500	102	80	120			
Sample ID: B02110401-001A MSD	Sample Matrix Spike Duplicate								11/11/02 17:16
Nitrogen, Nitrate+Nitrite as N	2.84	mg/L	0.0500	101	80	120	1.1	10	
Method: E418.1									Batch: R17155
Sample ID: LCS	Laboratory Control Spike								11/11/02 10:44
Total Petroleum Hydrocarbons	5.1	mg/L	0.10	102	80	120			
Sample ID: MBLK	Method Blank								11/11/02 10:44
Total Petroleum Hydrocarbons	ND	mg/L	0.10						

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: VARIAN2_021111A	
Sample ID: CCV_1111WA205r-W	Continuing Calibration Verification Standard							11/10/02 13:55	
Methyl tert-butyl ether (MTBE)	59.0	ug/L	1.00	98.3	85	115			
Benzene	19.0	ug/L	0.500	95	85	115			
Toluene	62.0	ug/L	0.500	103	85	115			
Ethylbenzene	20.0	ug/L	0.500	100	85	115			
m+p-Xylenes	80.0	ug/L	0.500	100	85	115			
o-Xylene	40.0	ug/L	0.500	100	85	115			
Xylenes, Total	120	ug/L	0.500	100	85	115			
Surr: Trifluorotoluene			0.500	94	85	115			
Method: SW8021B								Batch: R17222	
Sample ID: LCS_1111WA204r	Laboratory Control Spike							11/10/02 13:22	
Methyl tert-butyl ether (MTBE)	18.0	ug/L	1.00	90	70	130			
Benzene	19.0	ug/L	0.500	95	70	130			
Toluene	22.0	ug/L	0.500	110	70	130			
Ethylbenzene	21.0	ug/L	0.500	105	70	130			
m+p-Xylenes	46.0	ug/L	0.500	115	70	130			
o-Xylene	22.0	ug/L	0.500	110	70	130			
Xylenes, Total	68.0	ug/L	0.500	113	70	130			
Surr: Trifluorotoluene			0.500	102	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: PE2_021112A	
Sample ID: CCV_1112QE208r-W	Continuing Calibration Verification Standard							11/11/02 14:56	
Methyl tert-butyl ether (MTBE)	64.0	ug/L	1.00	107	85	115			
Benzene	20.0	ug/L	0.500	100	85	115			
Toluene	51.0	ug/L	0.500	85	85	115			
Ethylbenzene	17.0	ug/L	0.500	85	85	115			
m+p-Xylenes	71.0	ug/L	0.500	88.8	85	115			
o-Xylene	36.0	ug/L	0.500	90	85	115			
Xylenes, Total	107	ug/L	0.500	89.2	85	115			
Surr: Trifluorotoluene			0.500	104	85	115			
Method: SW8021B								Batch: R17314	
Sample ID: LCS_1112QE203r	Laboratory Control Spike							11/11/02 11:41	
Methyl tert-butyl ether (MTBE)	22.0	ug/L	1.00	110	70	130			
Benzene	20.0	ug/L	0.500	100	70	130			
Toluene	18.0	ug/L	0.500	90	70	130			
Ethylbenzene	19.0	ug/L	0.500	95	70	130			
m+p-Xylenes	35.0	ug/L	0.500	87.5	70	130			
o-Xylene	18.0	ug/L	0.500	90	70	130			
Xylenes, Total	53.0	ug/L	0.500	88.3	70	130			
Surr: Trifluorotoluene			0.500	96	80	120			
Sample ID: MBLK_1112QE210r	Method Blank							11/11/02 16:17	
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	108	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: VARIAN2_021112A	
Sample ID: CCV_1112WA204r-W	Continuing Calibration Verification Standard							11/11/02 11:57	
Methyl tert-butyl ether (MTBE)	54.0	ug/L	1.00	90	85	115			
Benzene	18.0	ug/L	0.500	90	85	115			
Toluene	56.0	ug/L	0.500	93.3	85	115			
Ethylbenzene	18.0	ug/L	0.500	90	85	115			
m+p-Xylenes	75.0	ug/L	0.500	93.8	85	115			
o-Xylene	36.0	ug/L	0.500	90	85	115			
Xylenes, Total	111	ug/L	0.500	92.5	85	115			
Surr: Trifluorotoluene			0.500	88	85	115			
Method: SW8021B								Batch: R17315	
Sample ID: LCS_1112WA207r	Laboratory Control Spike							11/11/02 15:57	
Methyl tert-butyl ether (MTBE)	22.0	ug/L	1.00	110	70	130			
Benzene	22.0	ug/L	0.500	110	70	130			
Toluene	23.0	ug/L	0.500	115	70	130			
Ethylbenzene	22.0	ug/L	0.500	110	70	130			
m+p-Xylenes	47.0	ug/L	0.500	118	70	130			
o-Xylene	22.0	ug/L	0.500	110	70	130			
Xylenes, Total	69.0	ug/L	0.500	115	70	130			
Surr: Trifluorotoluene			0.500	106	80	120			
Sample ID: MBLK_1112WA208r	Method Blank							11/11/02 16:30	
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	98	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: VARIAN2_021115A	
Sample ID: CCV_1115WA206r-W	Continuing Calibration Verification Standard								11/15/02 13:13
Methyl tert-butyl ether (MTBE)	62.0	ug/L	1.00	103	85	115			
Benzene	21.0	ug/L	0.500	105	85	115			
Toluene	68.0	ug/L	0.500	113	85	115			
Ethylbenzene	22.0	ug/L	0.500	110	85	115			
m+p-Xylenes	88.0	ug/L	0.500	110	85	115			
o-Xylene	43.0	ug/L	0.500	108	85	115			
Xylenes, Total	131	ug/L	0.500	109	85	115			
Surr: Trifluorotoluene			0.500	104	85	115			
Method: SW8021B									Batch: R17475
Sample ID: LCS_1115WA205r	Laboratory Control Spike								11/15/02 12:40
Methyl tert-butyl ether (MTBE)	21.0	ug/L	1.00	105	70	130			
Benzene	20.0	ug/L	0.500	100	70	130			
Toluene	21.0	ug/L	0.500	105	70	130			
Ethylbenzene	20.0	ug/L	0.500	100	70	130			
m+p-Xylenes	45.0	ug/L	0.500	112	70	130			
o-Xylene	21.0	ug/L	0.500	105	70	130			
Xylenes, Total	66.0	ug/L	0.500	110	70	130			
Surr: Trifluorotoluene			0.500	96	80	120			
Sample ID: MBLK_1115WA208r	Method Blank								11/15/02 14:20
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	0	80	120			S

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: PE2_021115A	
Sample ID: CCV_1115QE208r-W	Continuing Calibration Verification Standard							11/15/02 14:55	
Methyl tert-butyl ether (MTBE)	68.0	ug/L	1.00	113	85	115			
Benzene	21.0	ug/L	0.500	105	85	115			
Toluene	60.0	ug/L	0.500	100	85	115			
Ethylbenzene	20.0	ug/L	0.500	100	85	115			
m+p-Xylenes	76.0	ug/L	0.500	95	85	115			
o-Xylene	40.0	ug/L	0.500	100	85	115			
Xylenes, Total	116	ug/L	0.500	96.7	85	115			
Surr: Trifluorotoluene			0.500	102	85	115			
Method: SW8021B								Batch: R17476	
Sample ID: LCS_1115QE204r	Laboratory Control Spike							11/15/02 12:23	
Methyl tert-butyl ether (MTBE)	21.0	ug/L	1.00	105	70	130			
Benzene	18.0	ug/L	0.500	90	70	130			
Toluene	19.0	ug/L	0.500	95	70	130			
Ethylbenzene	18.0	ug/L	0.500	90	70	130			
m+p-Xylenes	36.0	ug/L	0.500	90	70	130			
o-Xylene	19.0	ug/L	0.500	95	70	130			
Xylenes, Total	55.0	ug/L	0.500	91.7	70	130			
Surr: Trifluorotoluene			0.500	88	80	120			
Sample ID: MBLK_1115QE209r	Method Blank							11/15/02 15:38	
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	100	80	120			
Sample ID: B02110370-011EMS	Sample Matrix Spike							11/11/02 01:23	
Methyl tert-butyl ether (MTBE)	54.0	ug/L	2.00	108	70	130			
Benzene	82.0	ug/L	1.00	86	70	130			
Toluene	47.0	ug/L	1.00	94	70	130			
Ethylbenzene	48.0	ug/L	1.00	96	70	130			
m+p-Xylenes	89.0	ug/L	1.00	89	70	130			
o-Xylene	46.0	ug/L	1.00	92	70	130			
Xylenes, Total	135	ug/L	1.00	90	70	130			
Surr: Trifluorotoluene			1.00	103	80	120			
Sample ID: B02110370-011EMSD	Sample Matrix Spike Duplicate							11/11/02 02:01	
Methyl tert-butyl ether (MTBE)	54.0	ug/L	2.00	108	70	130	0	20	
Benzene	82.0	ug/L	1.00	86	70	130	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B									Batch: R17476
Sample ID: B02110370-011EMSD	Sample Matrix Spike Duplicate								11/11/02 02:01
Toluene	45.0	ug/L	1.00	90	70	130	4.3	20	
Ethylbenzene	48.0	ug/L	1.00	96	70	130	0	20	
m+p-Xylenes	88.0	ug/L	1.00	88	70	130	1.1	20	
o-Xylene	46.0	ug/L	1.00	92	70	130	0	20	
Xylenes, Total	134	ug/L	1.00	89.3	70	130			
Surr: Trifluorotoluene			1.00	102	80	120	0	20	
Method: SW8021B									Analytical Run: PE2_021114A
Sample ID: CCV_1114QE204r-W	Continuing Calibration Verification Standard								11/14/02 11:51
Methyl tert-butyl ether (MTBE)	64.0	ug/L	1.00	107	85	115			
Benzene	20.0	ug/L	0.500	100	85	115			
Toluene	60.0	ug/L	0.500	100	85	115			
Ethylbenzene	20.0	ug/L	0.500	100	85	115			
m+p-Xylenes	75.0	ug/L	0.500	93.8	85	115			
o-Xylene	40.0	ug/L	0.500	100	85	115			
Xylenes, Total	115	ug/L	0.500	95.8	85	115			
Surr: Trifluorotoluene			0.500	104	85	115			
Method: SW8021B									Batch: R17477
Sample ID: LCS_1114QE203r	Laboratory Control Spike								11/14/02 11:13
Methyl tert-butyl ether (MTBE)	24.0	ug/L	1.00	120	70	130			
Benzene	21.0	ug/L	0.500	105	70	130			
Toluene	22.0	ug/L	0.500	110	70	130			
Ethylbenzene	22.0	ug/L	0.500	110	70	130			
m+p-Xylenes	43.0	ug/L	0.500	108	70	130			
o-Xylene	22.0	ug/L	0.500	110	70	130			
Xylenes, Total	65.0	ug/L	0.500	108	70	130			
Surr: Trifluorotoluene			0.500	108	80	120			
Sample ID: MBLK_1114QE207r	Method Blank								11/14/02 13:45
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	100	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: VARIAN2_021113A	
Sample ID: CCV_1113WA205r-W	Continuing Calibration Verification Standard							11/13/02 12:07	
Methyl tert-butyl ether (MTBE)	54.0	ug/L	1.00	90	85	115			
Benzene	18.0	ug/L	0.500	90	85	115			
Toluene	57.0	ug/L	0.500	95	85	115			
Ethylbenzene	18.0	ug/L	0.500	90	85	115			
m+p-Xylenes	74.0	ug/L	0.500	92.5	85	115			
o-Xylene	36.0	ug/L	0.500	90	85	115			
Xylenes, Total	110	ug/L	0.500	91.7	85	115			
Surr: Trifluorotoluene			0.500	88	85	115			
Method: SW8021B								Batch: R17505	
Sample ID: B02110370-020EMS	Sample Matrix Spike							11/11/02 19:49	
Methyl tert-butyl ether (MTBE)	1180	ug/L	50.0	94.2	70	130			
Benzene	1570	ug/L	25.0	93.4	70	130			
Toluene	1840	ug/L	25.0	101	70	130			
Ethylbenzene	1250	ug/L	25.0	94.6	70	130			
m+p-Xylenes	2720	ug/L	25.0	103	70	130			
o-Xylene	1280	ug/L	25.0	97	70	130			
Xylenes, Total	4000	ug/L	25.0	101	70	130			
Surr: Trifluorotoluene			25.0	90	80	120			
Sample ID: B02110370-020EMSD	Sample Matrix Spike Duplicate							11/11/02 20:22	
Methyl tert-butyl ether (MTBE)	1230	ug/L	50.0	98.6	70	130	4.6	20	
Benzene	1690	ug/L	25.0	103	70	130	7.7	20	
Toluene	1980	ug/L	25.0	112	70	130	7.0	20	
Ethylbenzene	1340	ug/L	25.0	102	70	130	6.9	20	
m+p-Xylenes	2900	ug/L	25.0	110	70	130	6.2	20	
o-Xylene	1360	ug/L	25.0	103	70	130	5.8	20	
Xylenes, Total	4260	ug/L	25.0	108	70	130			
Surr: Trifluorotoluene			25.0	97.8	80	120	0	20	
Sample ID: LCS_1113WA206r	Laboratory Control Spike							11/13/02 12:40	
Methyl tert-butyl ether (MTBE)	24.0	ug/L	1.00	120	70	130			
Benzene	24.0	ug/L	0.500	120	70	130			
Toluene	25.0	ug/L	0.500	125	70	130			
Ethylbenzene	24.0	ug/L	0.500	120	70	130			
m+p-Xylenes	53.0	ug/L	0.500	132	70	130			S
o-Xylene	24.0	ug/L	0.500	120	70	130			
Xylenes, Total	77.0	ug/L	0.500	128	70	130			
Surr: Trifluorotoluene			0.500	112	80	120			
Sample ID: MBLK_1113WA210r	Method Blank							11/13/02 14:53	
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B									Batch: R17505
Sample ID: MBLK_1113WA210r	Method Blank								11/13/02 14:53
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	106	80	120			
Method: SW8021B									Analytical Run: PE2_021111A
Sample ID: CCV_1111QE208r-W	Continuing Calibration Verification Standard								11/10/02 15:03
Methyl tert-butyl ether (MTBE)	66.0	ug/L	1.00	110	85	115			
Benzene	20.0	ug/L	0.500	100	85	115			
Toluene	58.0	ug/L	0.500	96.7	85	115			
Ethylbenzene	20.0	ug/L	0.500	100	85	115			
m+p-Xylenes	75.0	ug/L	0.500	93.8	85	115			
o-Xylene	38.0	ug/L	0.500	95	85	115			
Xylenes, Total	113	ug/L	0.500	94.2	85	115			
Surr: Trifluorotoluene			0.500	106	85	115			
Method: SW8021B									Batch: R17532
Sample ID: LCS_1111QE205r	Laboratory Control Spike								11/10/02 13:07
Methyl tert-butyl ether (MTBE)	20.0	ug/L	1.00	100	70	130			
Benzene	18.0	ug/L	0.500	90	70	130			
Toluene	18.0	ug/L	0.500	90	70	130			
Ethylbenzene	19.0	ug/L	0.500	95	70	130			
m+p-Xylenes	34.0	ug/L	0.500	85	70	130			
o-Xylene	18.0	ug/L	0.500	90	70	130			
Xylenes, Total	52.0	ug/L	0.500	86.7	70	130			
Surr: Trifluorotoluene			0.500	100	80	120			
Sample ID: MBLK_1111QE211r	Method Blank								11/10/02 16:10
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	110	80	120			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: HKM Engineering Inc-Billings
Project: Pioneer Natural Resources-Poplar Biere Well Site

Report Date: 11/26/02
Work Order: B02110370

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: PE2_021118A	
Sample ID: CCV_1118QE205r-W	Continuing Calibration Verification Standard								11/18/02 12:54
Methyl tert-butyl ether (MTBE)	70.0	ug/L	1.00	117	85	115			S
Benzene	22.0	ug/L	0.500	110	85	115			
Toluene	65.0	ug/L	0.500	108	85	115			
Ethylbenzene	22.0	ug/L	0.500	110	85	115			
m+p-Xylenes	80.0	ug/L	0.500	100	85	115			
o-Xylene	42.0	ug/L	0.500	105	85	115			
Xylenes, Total	122	ug/L	0.500	102	85	115			
Surr: Trifluorotoluene			0.500	106	85	115			
Method: SW8021B								Batch: R17576	
Sample ID: MBLK_1118QE209r	Method Blank								11/18/02 15:29
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.00						
Benzene	ND	ug/L	0.500						
Toluene	ND	ug/L	0.500						
Ethylbenzene	ND	ug/L	0.500						
m+p-Xylenes	ND	ug/L	0.500						
o-Xylene	ND	ug/L	0.500						
Xylenes, Total	ND	ug/L	0.500						
Surr: Trifluorotoluene			0.500	106	80	120			
Method: SW8021B								Analytical Run: VARIAN2_021108A	
Sample ID: CCV_1108WA214r-W	Continuing Calibration Verification Standard								11/08/02 18:09
Methyl tert-butyl ether (MTBE)	53.0	ug/L	1.00	88.3	85	115			
Benzene	17.0	ug/L	0.500	85	85	115			
Toluene	57.0	ug/L	0.500	95	85	115			
Ethylbenzene	18.0	ug/L	0.500	90	85	115			
m+p-Xylenes	74.0	ug/L	0.500	92.5	85	115			
o-Xylene	36.0	ug/L	0.500	90	85	115			
Xylenes, Total	110	ug/L	0.500	91.7	85	115			
Surr: Trifluorotoluene			0.500	86	85	115			
Method: SW8021B								Batch: R17849	
Sample ID: LCS_1108WA213r	Laboratory Control Spike								11/08/02 17:36
Methyl tert-butyl ether (MTBE)	19.0	ug/L	1.00	95	70	130			
Benzene	20.0	ug/L	0.500	100	70	130			
Toluene	22.0	ug/L	0.500	110	70	130			
Ethylbenzene	22.0	ug/L	0.500	110	70	130			
m+p-Xylenes	48.0	ug/L	0.500	120	70	130			
o-Xylene	22.0	ug/L	0.500	110	70	130			
Xylenes, Total	70.0	ug/L	0.500	117	70	130			
Surr: Trifluorotoluene			0.500	104	80	120			

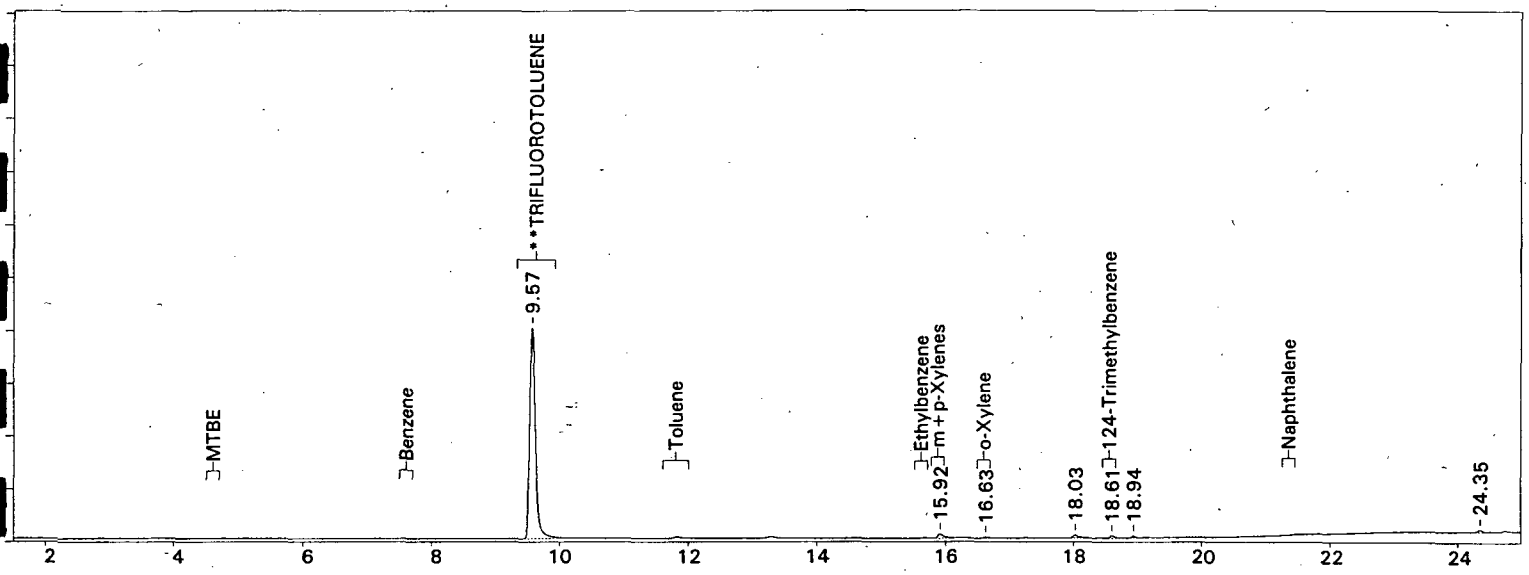
Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside of recommended recovery limits
R - RPD outside of recommended recovery limits

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1108WA2.22R Date printed=11-26-2002 Time= 15:29:40

Sample Name=B02110370-001E ;1108WA2 , $HC-BTEX-8021-W,

1.5 to 25.0 min. Low Y=0.532 High Y=8.532 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-001E ;1108WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1108WA2.22A
Date & Time Collected: Nov 8, 2002 22:34:57
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

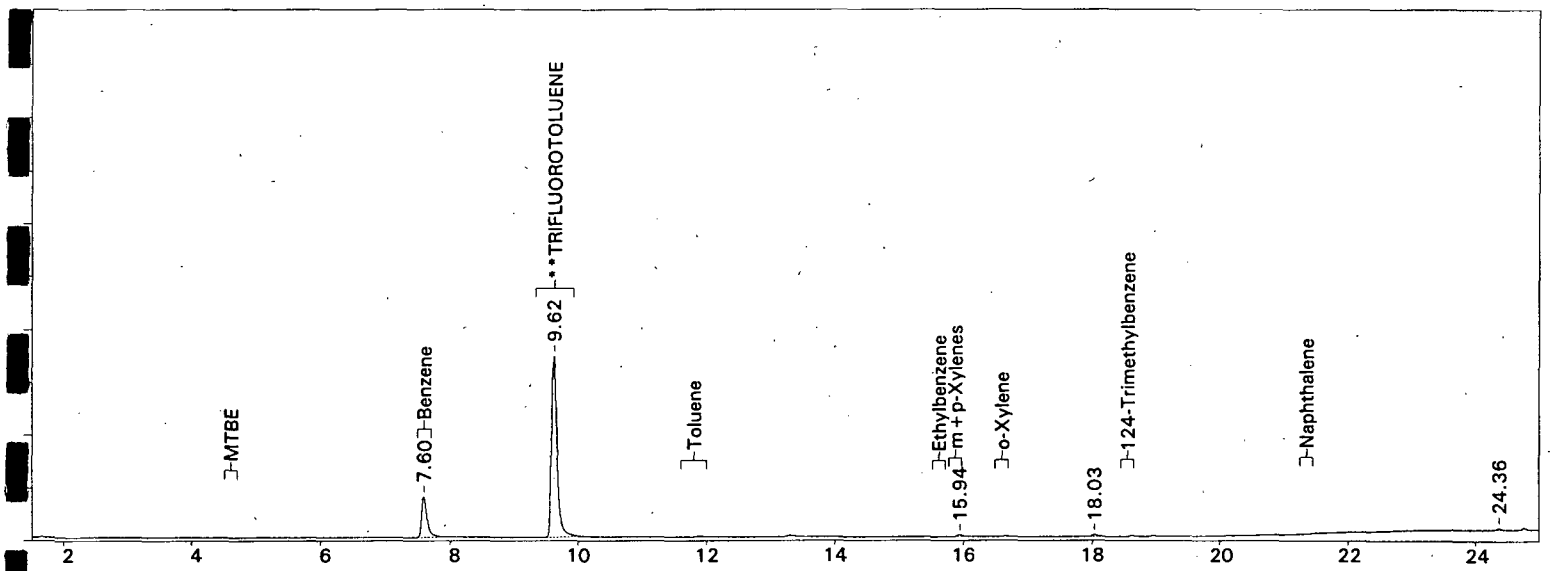
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	15.92	-6.24	-6.35	473	0.452	J
o-Xylene	16.63	16.63	16.63	96	< 0.500	U
124-Trimethylbenzene	18.61	18.61	18.61	189	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.57	50.000	57.207	114	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1108WA2.23R Date printed=11-08-2002 Time= 23:07:35
Sample Name=B02110370-002E ;1108WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.535 High Y=8.535 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-002E ;1108WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1108WA2.23A
Date & Time Collected: Nov 8, 2002 23:07:28
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

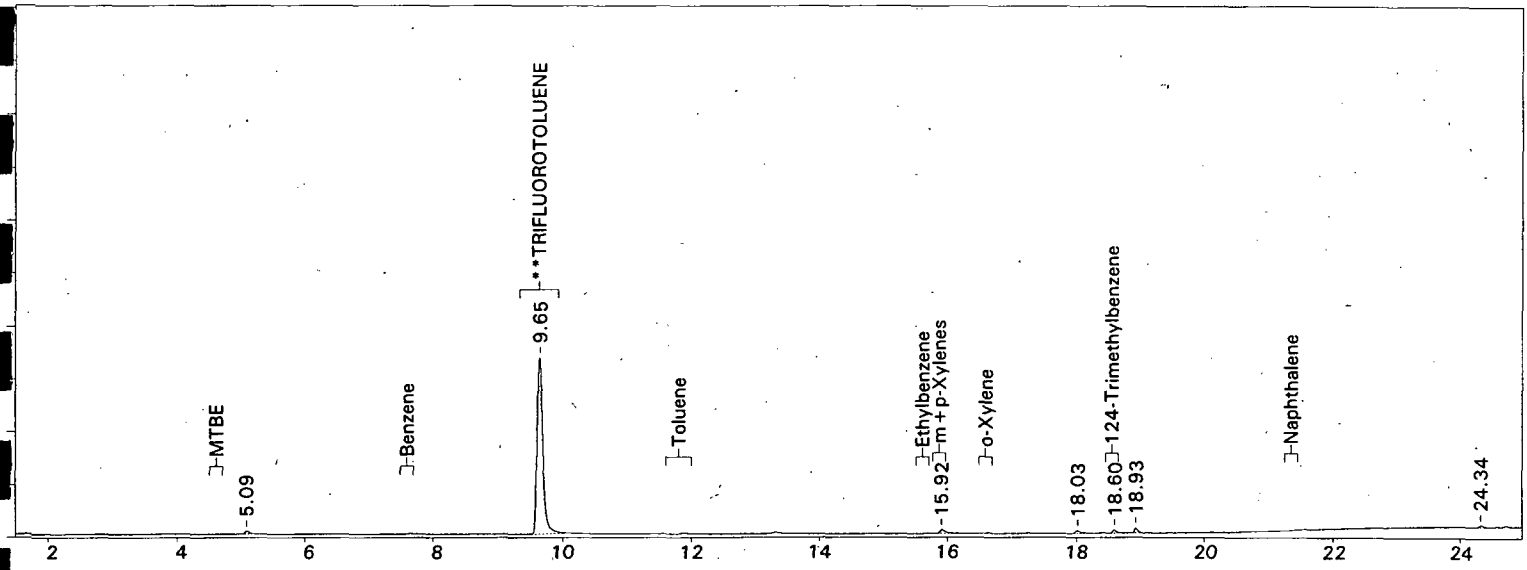
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	7.60	2.03	2.02	3608	3.691	
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	15.94	15.94	15.94	176	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	0.00	0.00	0.00	0	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.62	50.000	48.407	97	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1108WA2.24R Date printed=11-10-2002 Time= 09:13:05
Sample Name=B02110370-003E ;1108WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.535 High Y=8.535 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-003E ;1108WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1108WA2.24A
Date & Time Collected: Nov 8, 2002 23:40:15
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

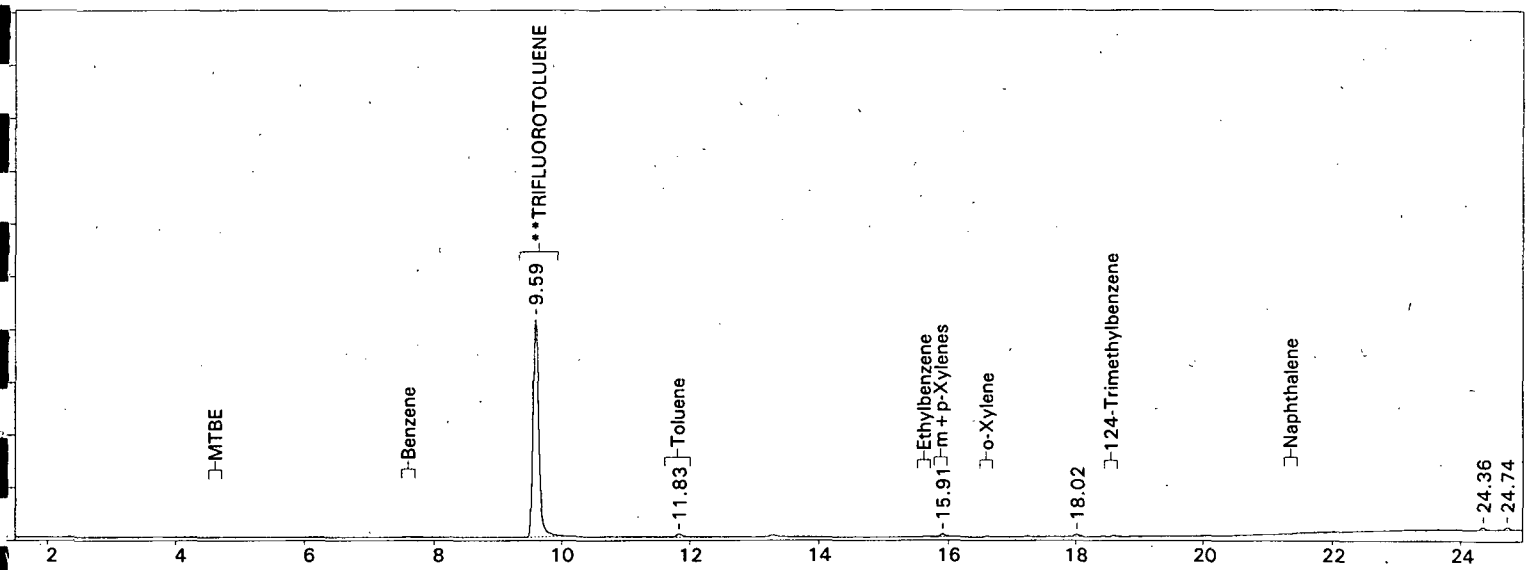
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	15.92	15.92	15.92	350	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	18.60	18.60	18.60	182	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.65	50.000	47.009	94	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1108WA2.26R Date printed=11-10-2002 Time= 09:17:58
Sample Name=B02110370-004E ;1108WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.537 High Y=8.537 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-004E ;1108WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1108WA2.26A
Date & Time Collected: Nov 9, 2002 00:46:21
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

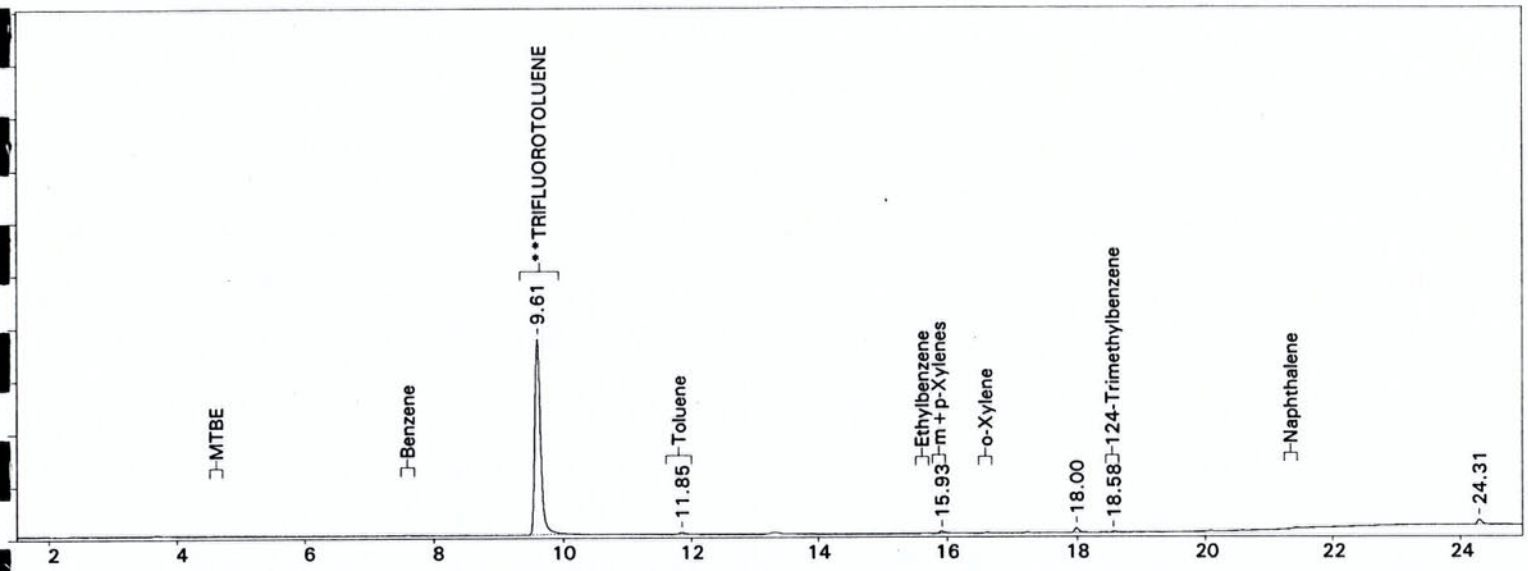
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	11.83	-2.17	-2.24	337	0.369	J
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	15.91	15.91	15.91	207	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	0.00	0.00	0.00	0	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.59	50.000	58.532	117	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1111WA2.08R Date printed=11-10-2002 Time= 15:35:08
Sample Name=B02110370-005E ;1111WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.537 High Y=8.537 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-005E ;1111WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1111WA2.08A
Date & Time Collected: Nov 10, 2002 15:35:02
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

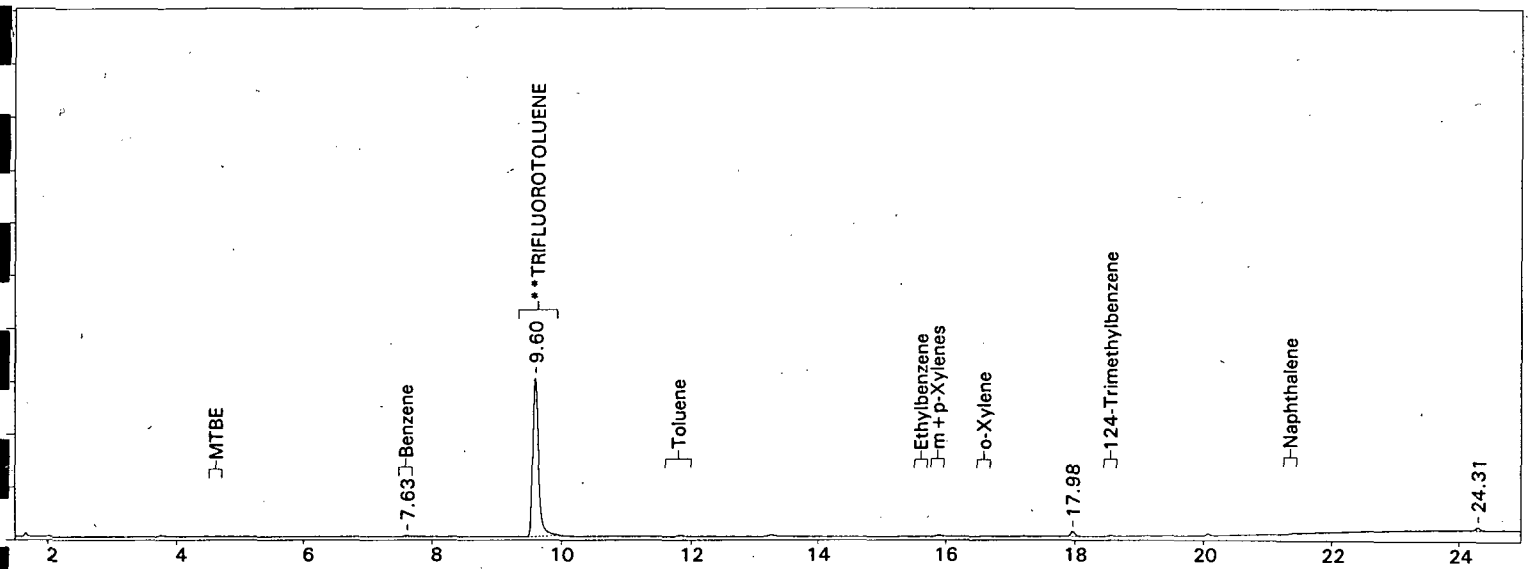
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	11.85	11.85	11.85	199	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	15.93	15.93	15.93	167	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	18.58	18.58	18.58	117	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.61	50.000	53.075	106	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1111WA2.09R Date printed=11-10-2002 Time= 17:31:47
Sample Name=B02110370-006E ;1111WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.539 High Y=8.539 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-006E ;1111WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1111WA2.09A
Date & Time Collected: Nov 10, 2002 17:31:41
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

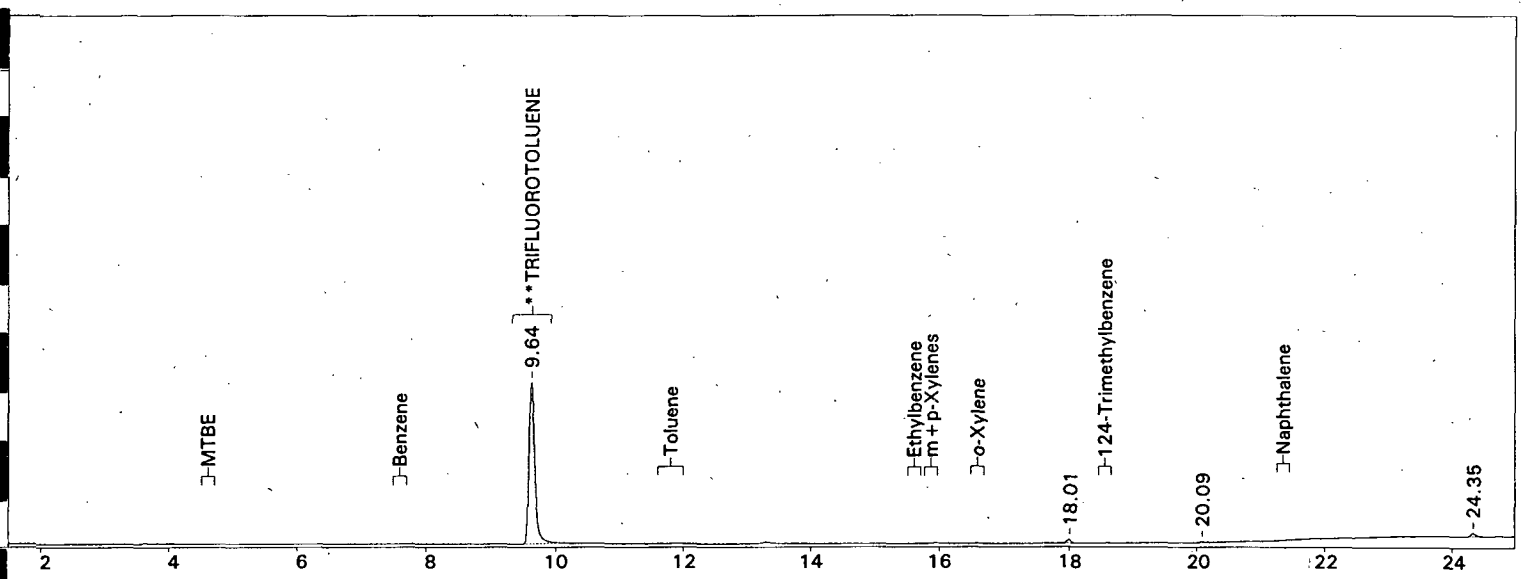
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	7.63	7.63	7.63	92	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	0.00	0.00	0.00	0	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	0.00	0.00	0.00	0	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.60	50.000	42.928	86	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1111WA2.10R Date printed=11-10-2002 Time= 18:04:59
Sample Name=B02110370-007E ;1111WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.533 High Y=8.533 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-007E ;1111WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1111WA2.10A
Date & Time Collected: Nov 10, 2002 18:04:53
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

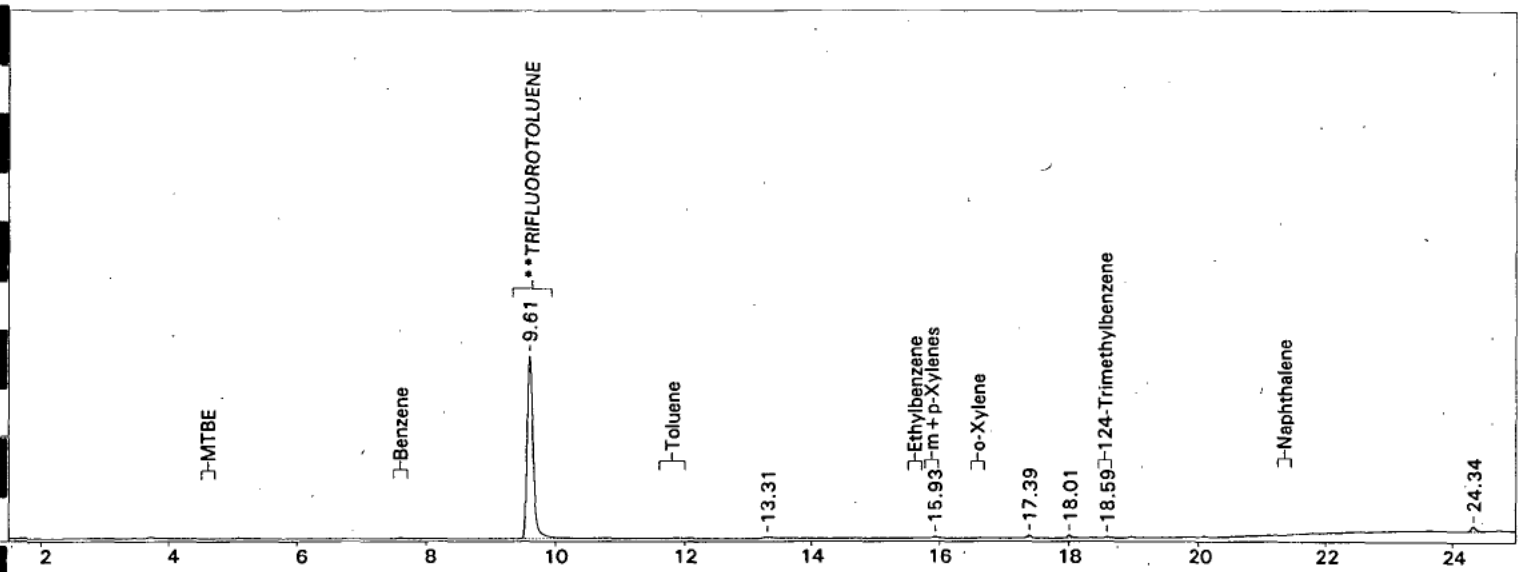
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	0.00	0.00	0.00	0	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	0.00	0.00	0.00	0	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.64	50.000	43.453	87	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1111WA2.11R Date printed=11-10-2002 Time= 18:38:12
Sample Name=B02110370-008E ;1111WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.539 High Y=8.539 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-008E ;1111WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1111WA2.11A
Date & Time Collected: Nov 10, 2002 18:38:06
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

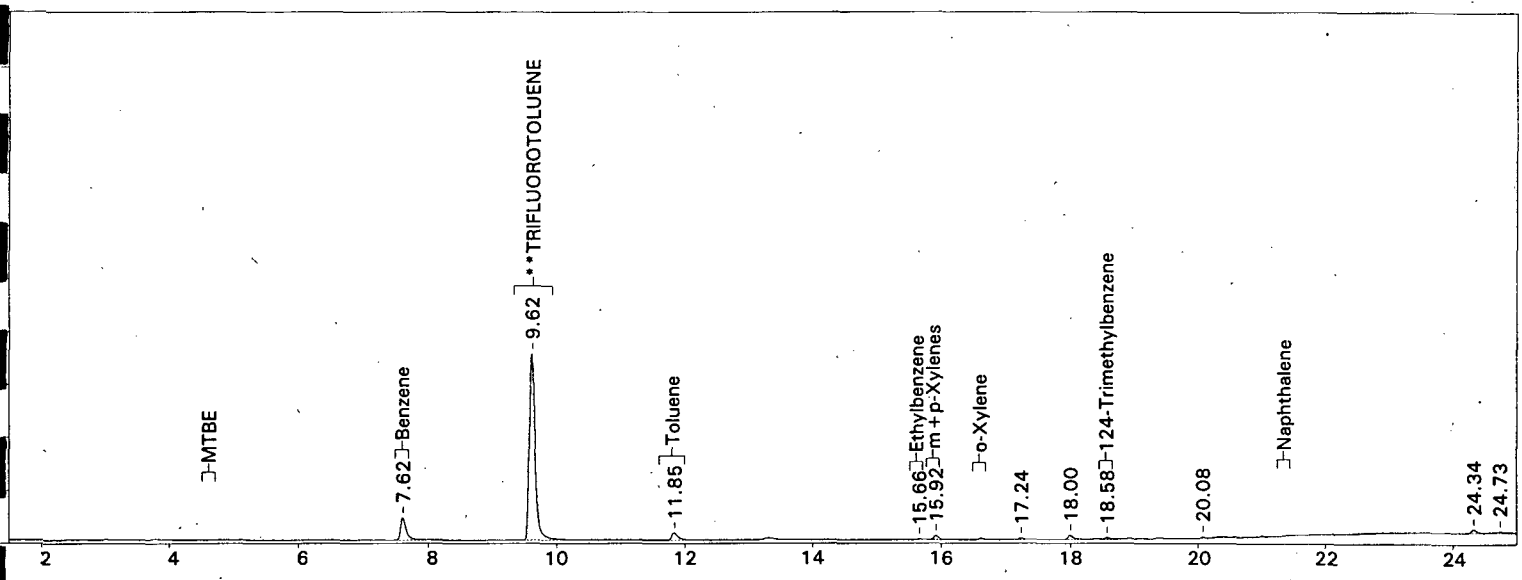
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	15.93	15.93	15.93	115	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	18.59	18.59	18.59	94	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.61	50.000	50.078	100	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1111WA2.13R Date printed=11-10-2002 Time= 19:44:36
Sample Name=B02110370-009E ;1111WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.533 High Y=8.533 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-009E ;1111WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1111WA2.13A
Date & Time Collected: Nov 10, 2002 19:44:30
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	7.62	2.03	2.01	2049	2.097	
Toluene	11.85	-2.17	-2.22	797	0.874	
Ethylbenzene	15.66	15.66	15.66	83	< 0.500	U
m+p-Xylenes	15.92	15.92	15.92	389	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	18.58	18.58	18.58	145	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

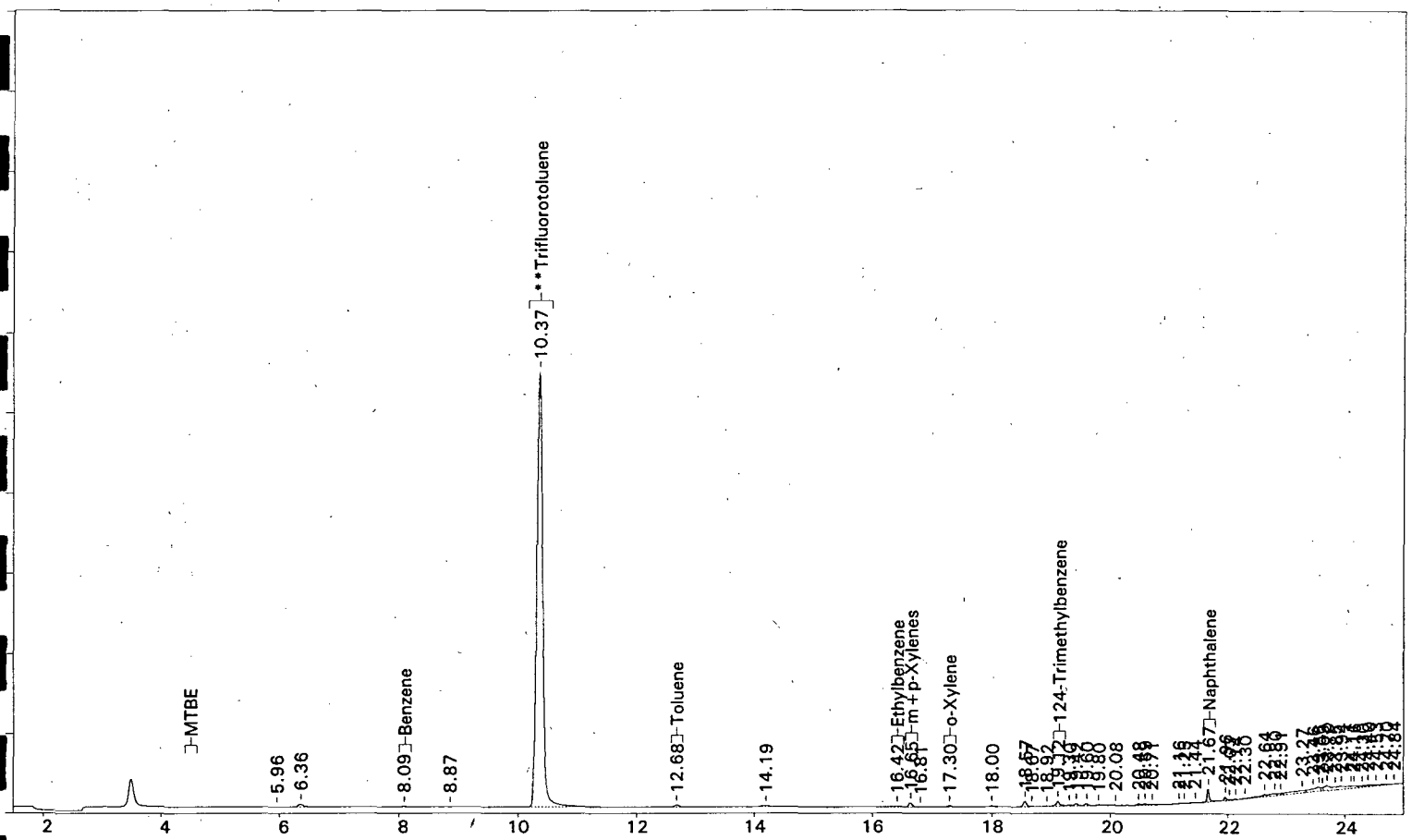
SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.62	50.000	50.468	101	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.11R Date printed=11-13-2002 Time= 11:50:36

Sample Name=B02110370-010E ;1112QE2 , $HC-BTEX-8021-W,

1.5 to 25.0 min. Low Y=1.36 High Y=36.36 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-010E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.11A
Date & Time Collected: Nov 11, 2002 16:58:06
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

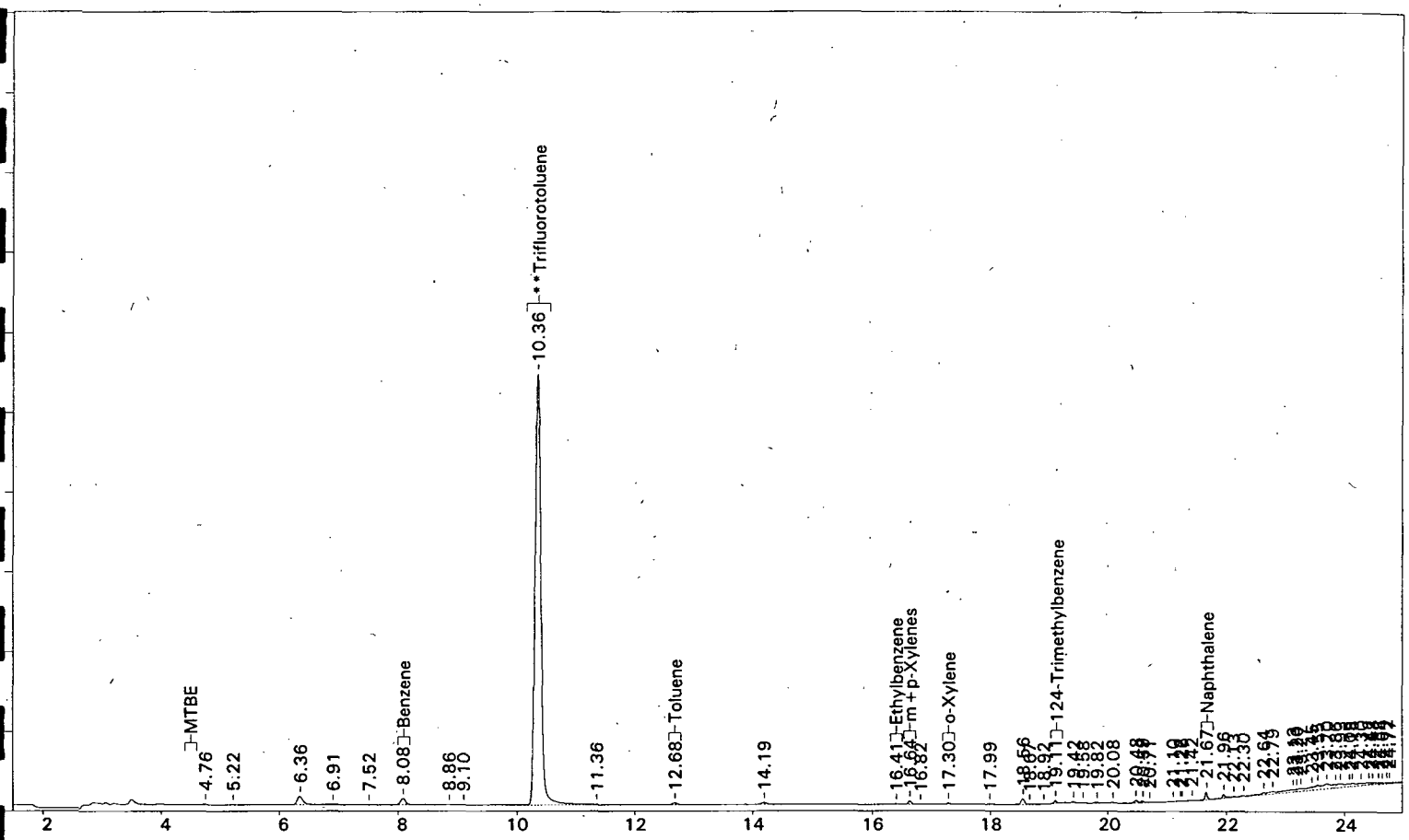
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.09	8.09	8.09	235	< 0.500	U
Toluene	12.68	12.68	12.68	641	< 0.500	U
Ethylbenzene	16.42	16.42	16.42	202	< 0.500	U
m+p-Xylenes	16.65	16.65	16.65	811	< 0.500	U
o-Xylene	17.30	17.30	17.30	282	< 0.500	U
124-Trimethylbenzene	19.12	19.12	19.12	1137	< 2.000	U
Naphthalene	21.67	21.67	21.67	1550	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.37	50.000	56.972	114	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.12R Date printed=11-13-2002 Time= 11:50:49
Sample Name=B02110370-022E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.36 High Y=36.36 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-022E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.12A
Date & Time Collected: Nov 11, 2002 17:37:48
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

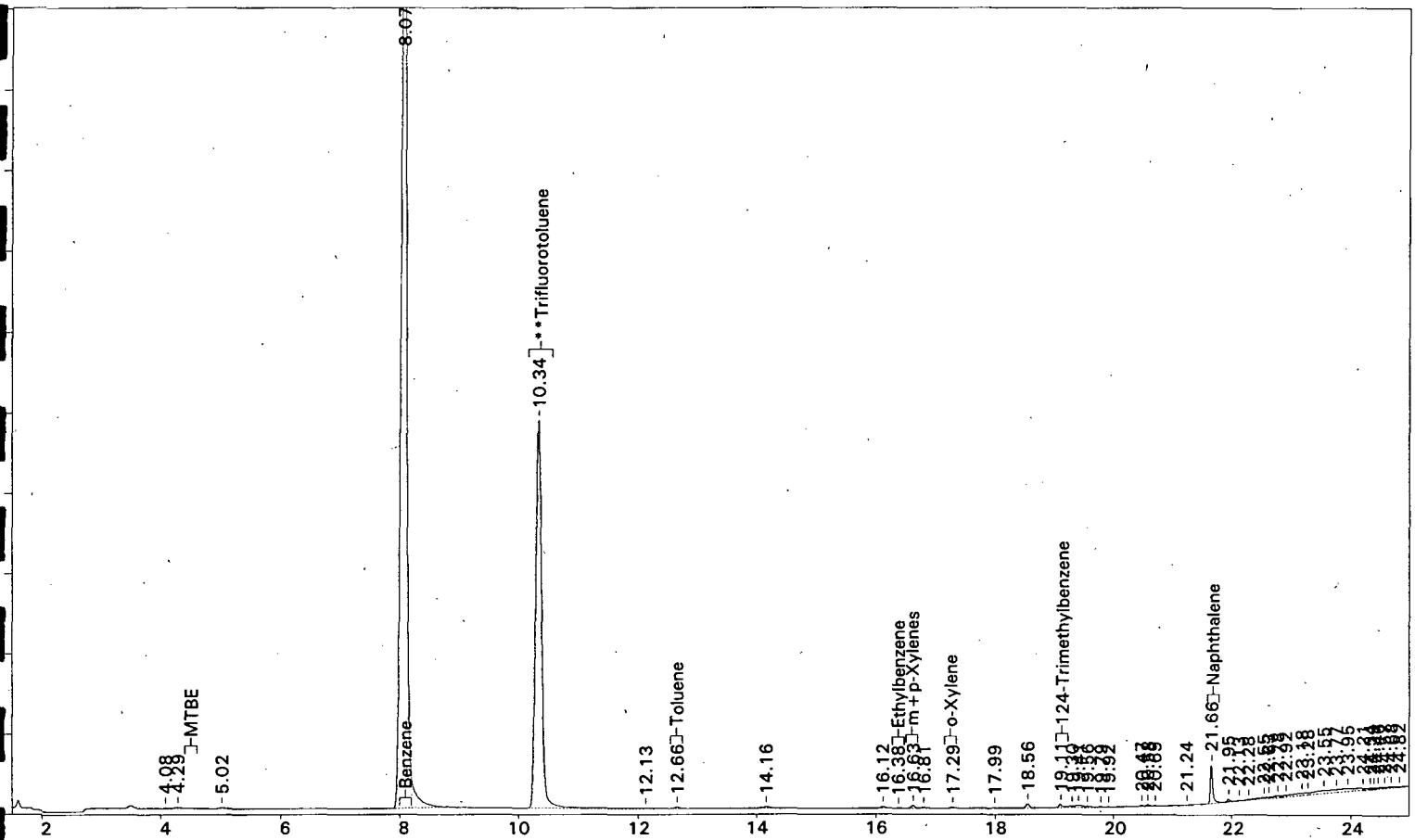
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	8.08	8.08	1758	< 0.500	U
Toluene	12.68	12.68	12.68	507	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	180	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	653	< 0.500	U
o-Xylene	17.30	17.30	17.30	306	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	448	< 2.000	U
Naphthalene	21.67	21.67	21.67	936	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.36	50.000	56.827	114	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.10R Date printed=11-10-2002 Time= 16:48:33
Sample Name=B02110370-011E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.362 High Y=36.362 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-011E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.10A
Date & Time Collected: Nov 10, 2002 16:48:27
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

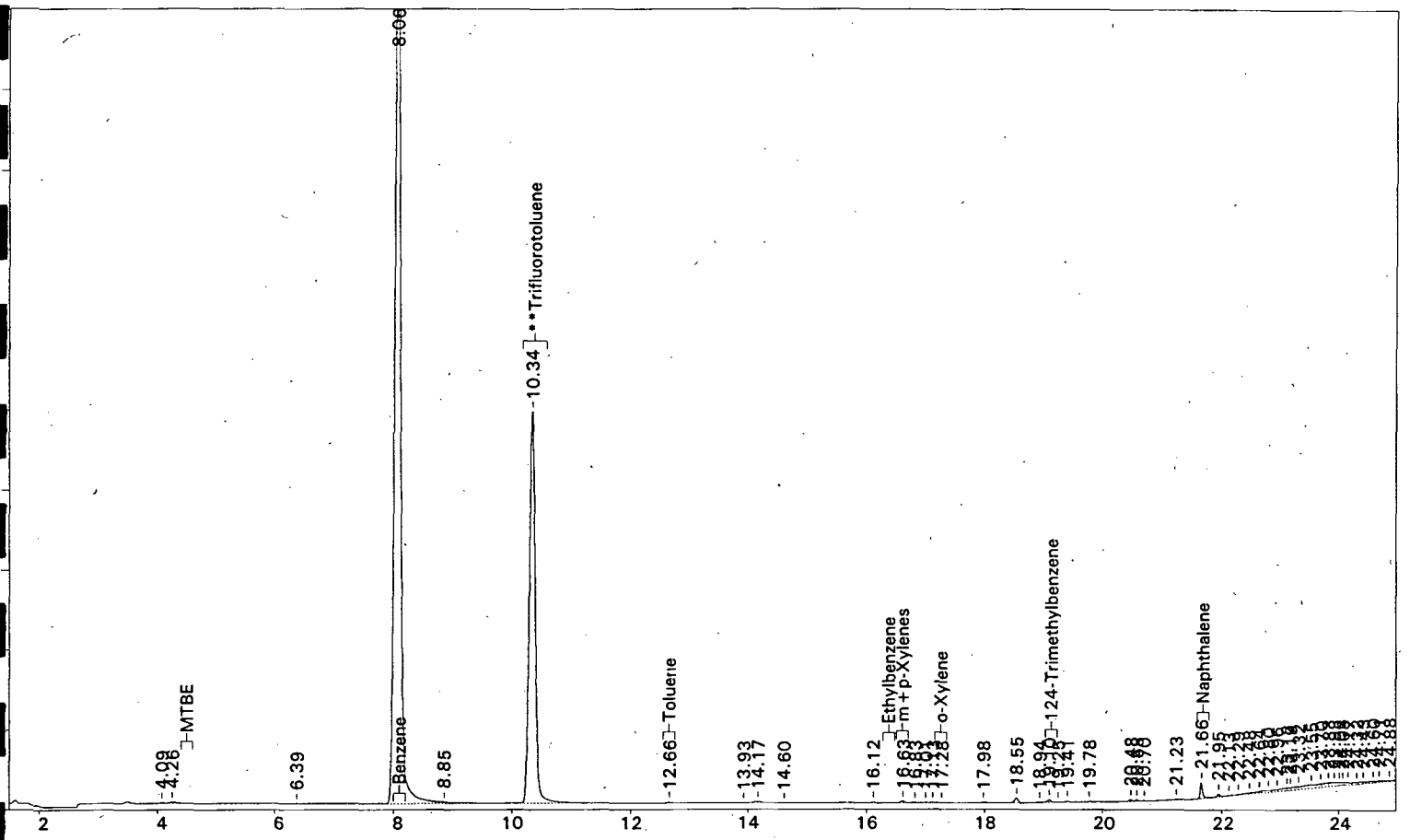
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.07	2.28	2.27	296042	39.128	
Toluene	12.66	12.66	12.66	456	< 0.500	U
Ethylbenzene	16.38	16.38	16.38	166	< 0.500	U
m+p-Xylenes	16.63	16.63	16.63	621	< 0.500	U
o-Xylene	17.29	17.29	17.29	240	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	601	< 2.000	U
Naphthalene	21.66	-11.31	-11.32	5112	1.139	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	50.715	101	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.11R Date printed=11-10-2002 Time= 17:26:55
Sample Name=B02110370-012E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.36 High Y=36.36 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-012E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.11A
Date & Time Collected: Nov 10, 2002 17:26:48
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

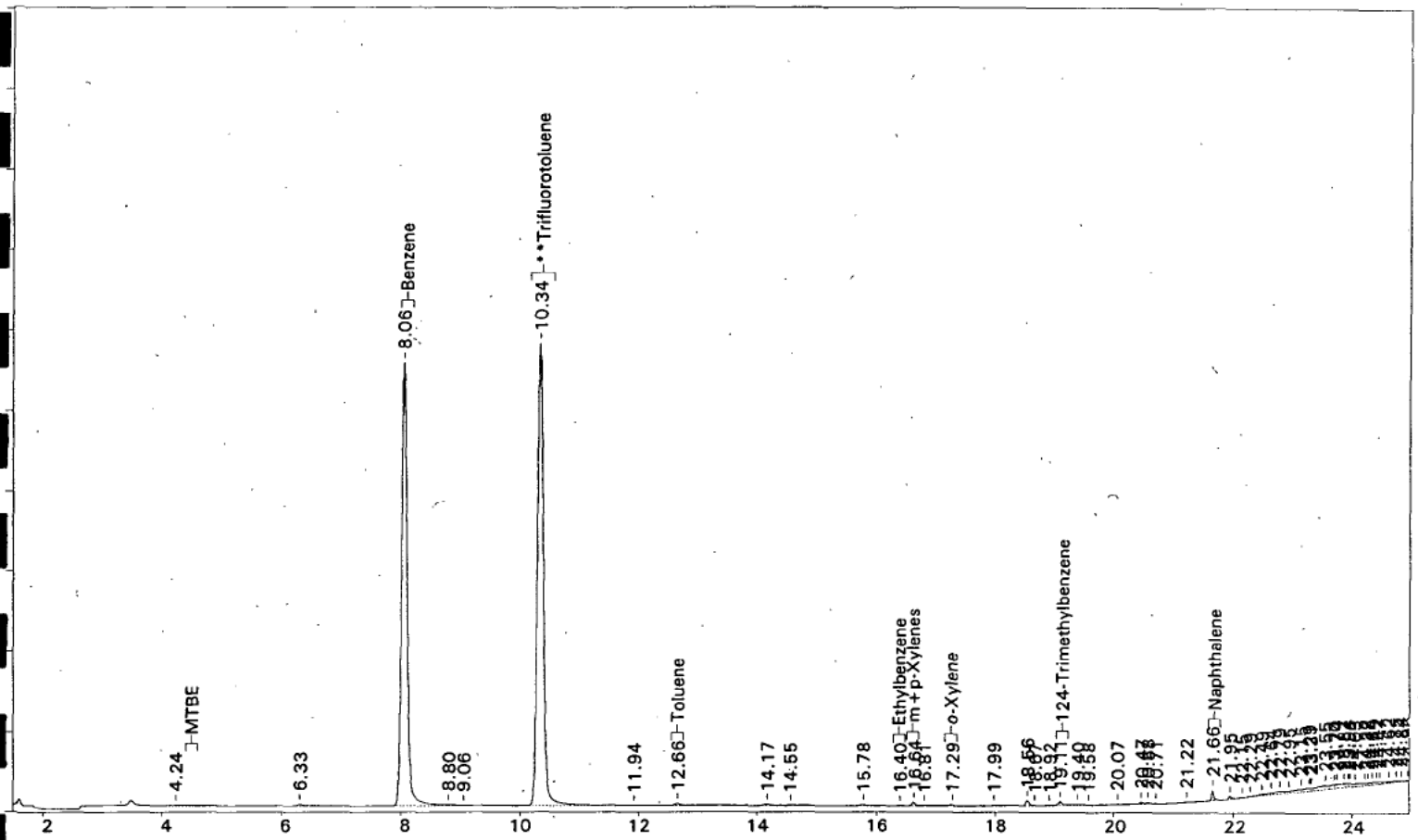
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.06	2.28	2.28	276404	36.532	
Toluene	12.66	12.66	12.66	278	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	16.63	16.63	16.63	439	< 0.500	U
o-Xylene	17.28	17.28	17.28	293	< 0.500	U
124-Trimethylbenzene	19.10	19.10	19.10	576	< 2.000	U
Naphthalene	21.66	21.66	21.66	2020	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	51.651	103	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.12R Date printed=11-10-2002 Time= 18:05:53
Sample Name=B02110370-013E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.385 High Y=36.385 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-013E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.12A
Date & Time Collected: Nov 10, 2002 18:04:54
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

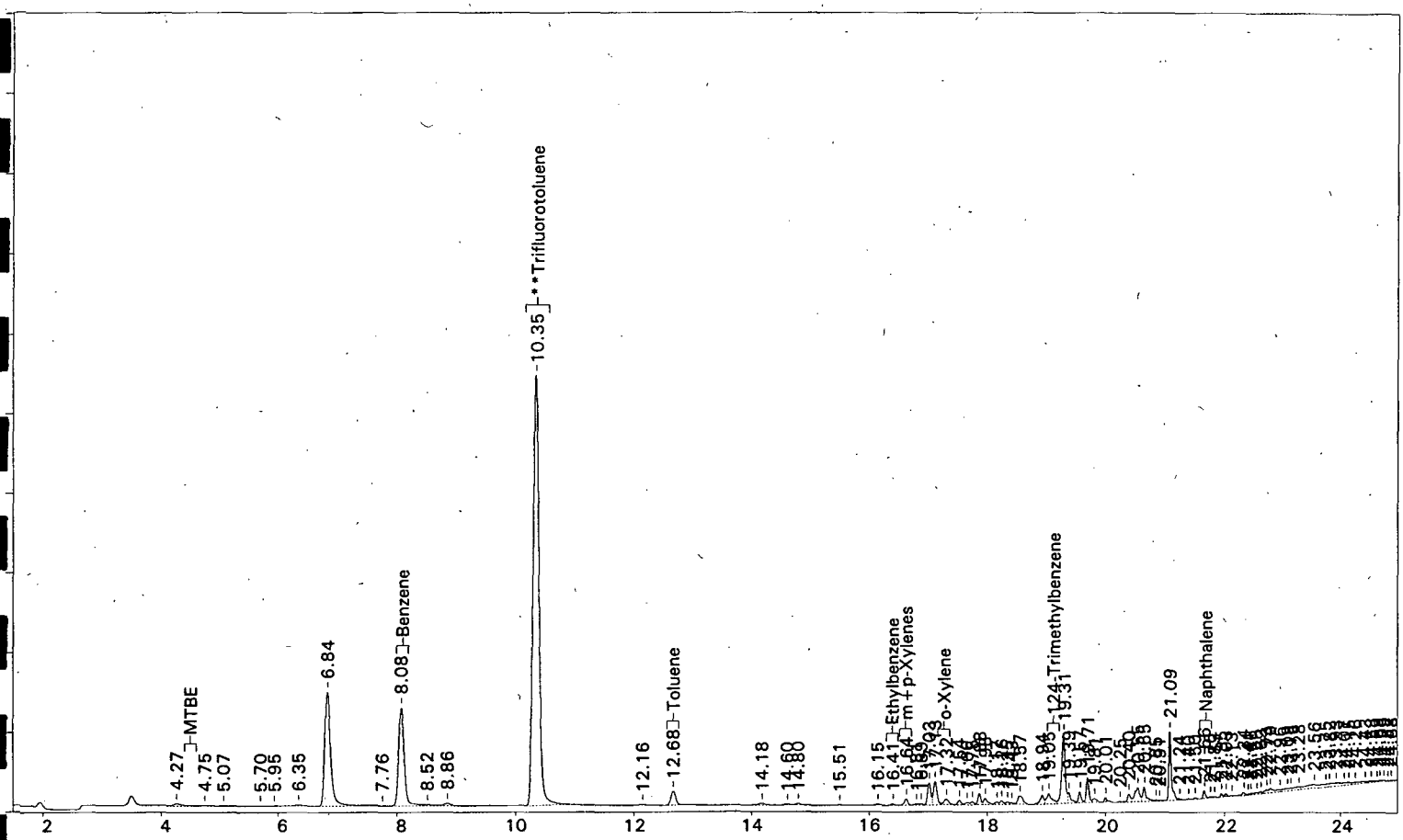
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.06	2.28	2.28	127720	16.881	
Toluene	12.66	12.66	12.66	575	< 0.500	U
Ethylbenzene	16.40	16.40	16.40	149	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	605	< 0.500	U
o-Xylene	17.29	17.29	17.29	325	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	779	< 2.000	U
Naphthalene	21.66	21.66	21.66	1252	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	59.932	120	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.14R Date printed=11-10-2002 Time= 19:22:05
Sample Name=B02110370-014E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.374 High Y=36.374 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-014E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.14A
Date & Time Collected: Nov 10, 2002 19:21:58
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

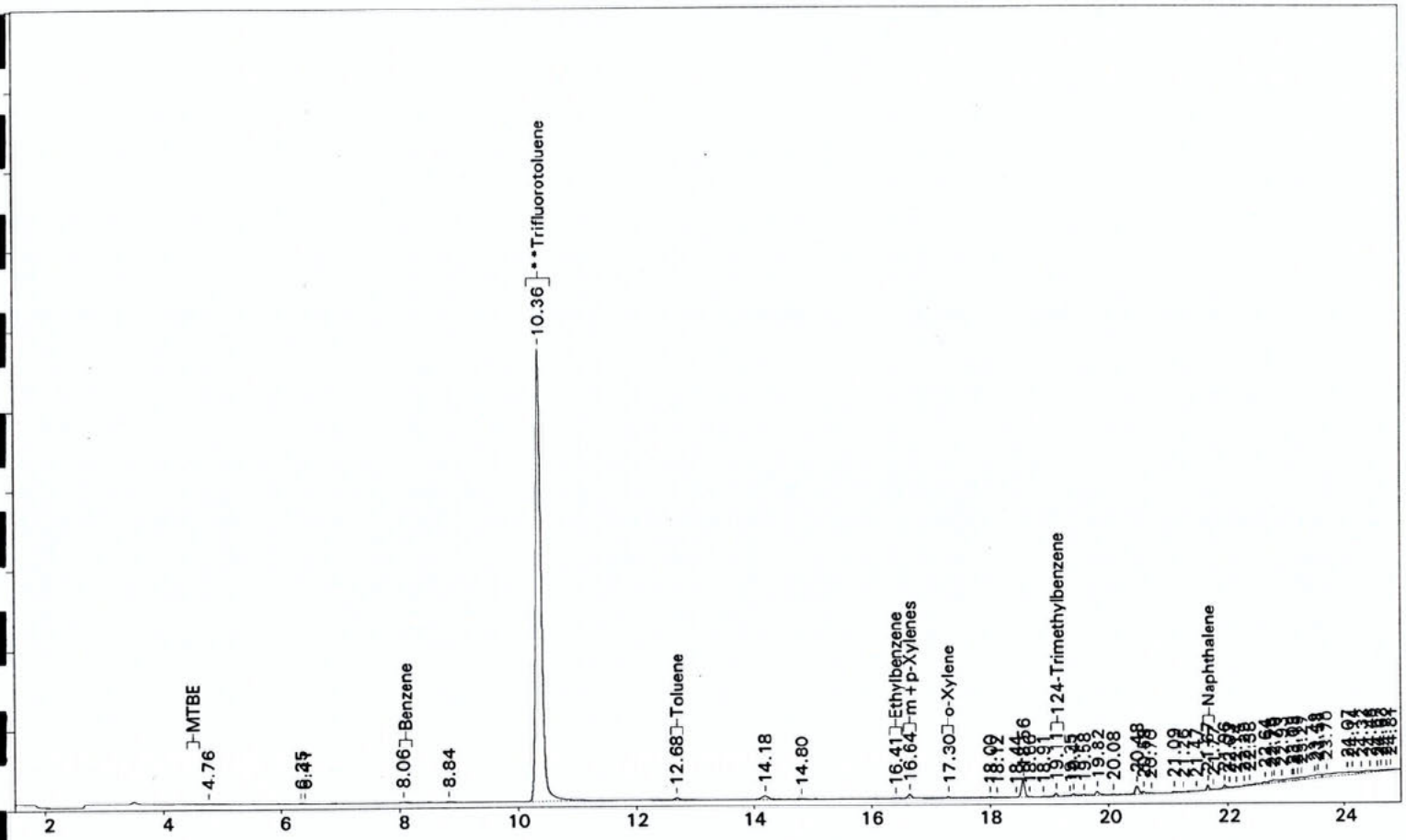
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	2.28	2.27	28485	3.765	
Toluene	12.68	-2.32	-2.32	3479	0.488	J
Ethylbenzene	16.41	16.41	16.41	287	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	1120	< 0.500	U
o-Xylene	17.32	17.32	17.32	1375	< 0.500	U
124-Trimethylbenzene	19.05	19.05	19.05	3005	< 2.000	U
Naphthalene	21.66	21.66	21.66	951	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	55.678	111	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.15R Date printed=11-10-2002 Time= 20:04:03
Sample Name=B02110370-015E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.362 High Y=36.362 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-015E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.15A
Date & Time Collected: Nov 10, 2002 20:03:57
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

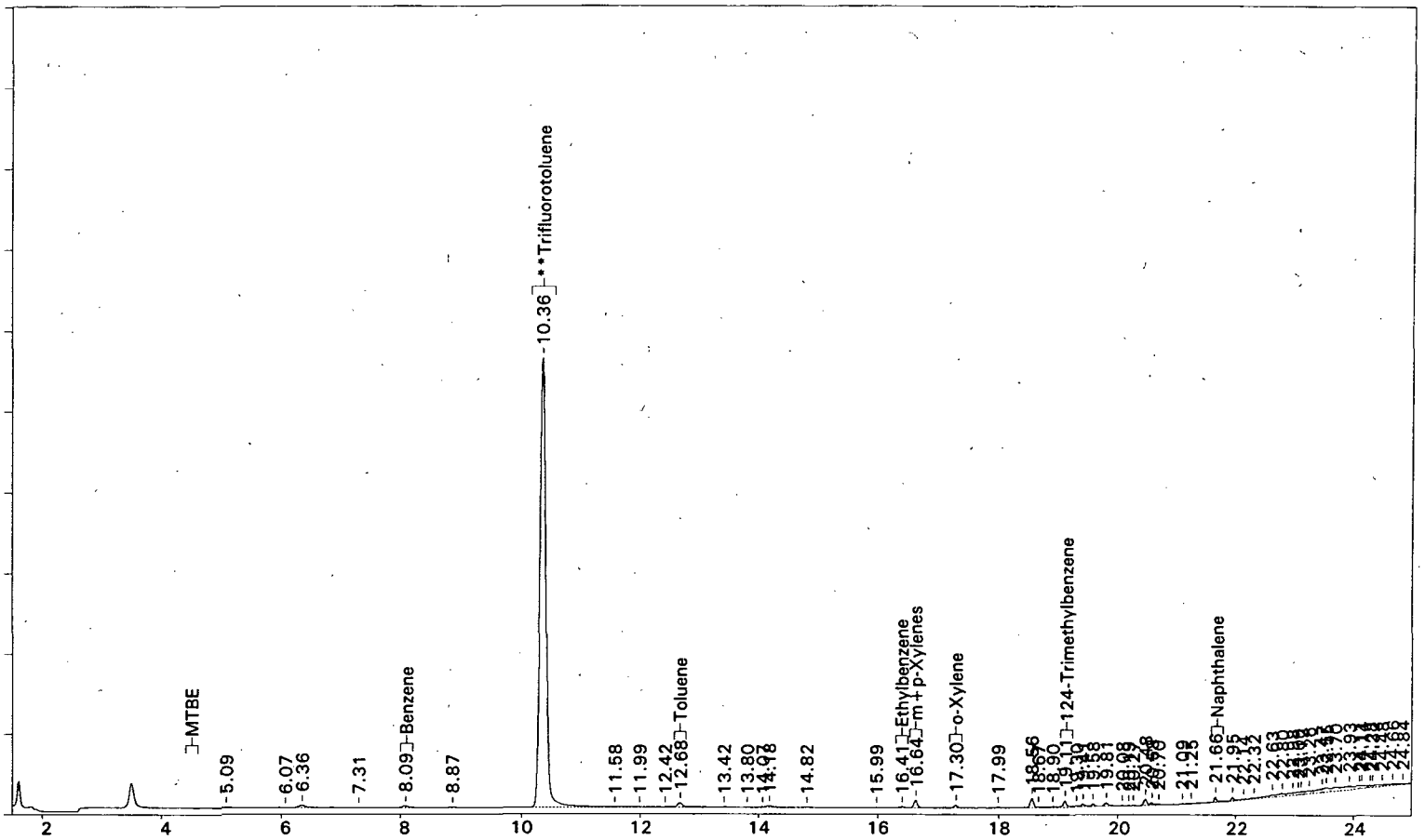
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.06	8.06	8.06	99	< 0.500	U
Toluene	12.68	12.68	12.68	539	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	162	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	682	< 0.500	U
o-Xylene	17.30	17.30	17.30	306	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	496	< 2.000	U
Naphthalene	21.67	21.67	21.67	602	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.36	50.000	59.453	119	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.16R Date printed=11-10-2002 Time= 20:46:02
Sample Name=B02110370-016E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.358 High Y=36.358 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-016E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.16A
Date & Time Collected: Nov 10, 2002 20:45:55
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

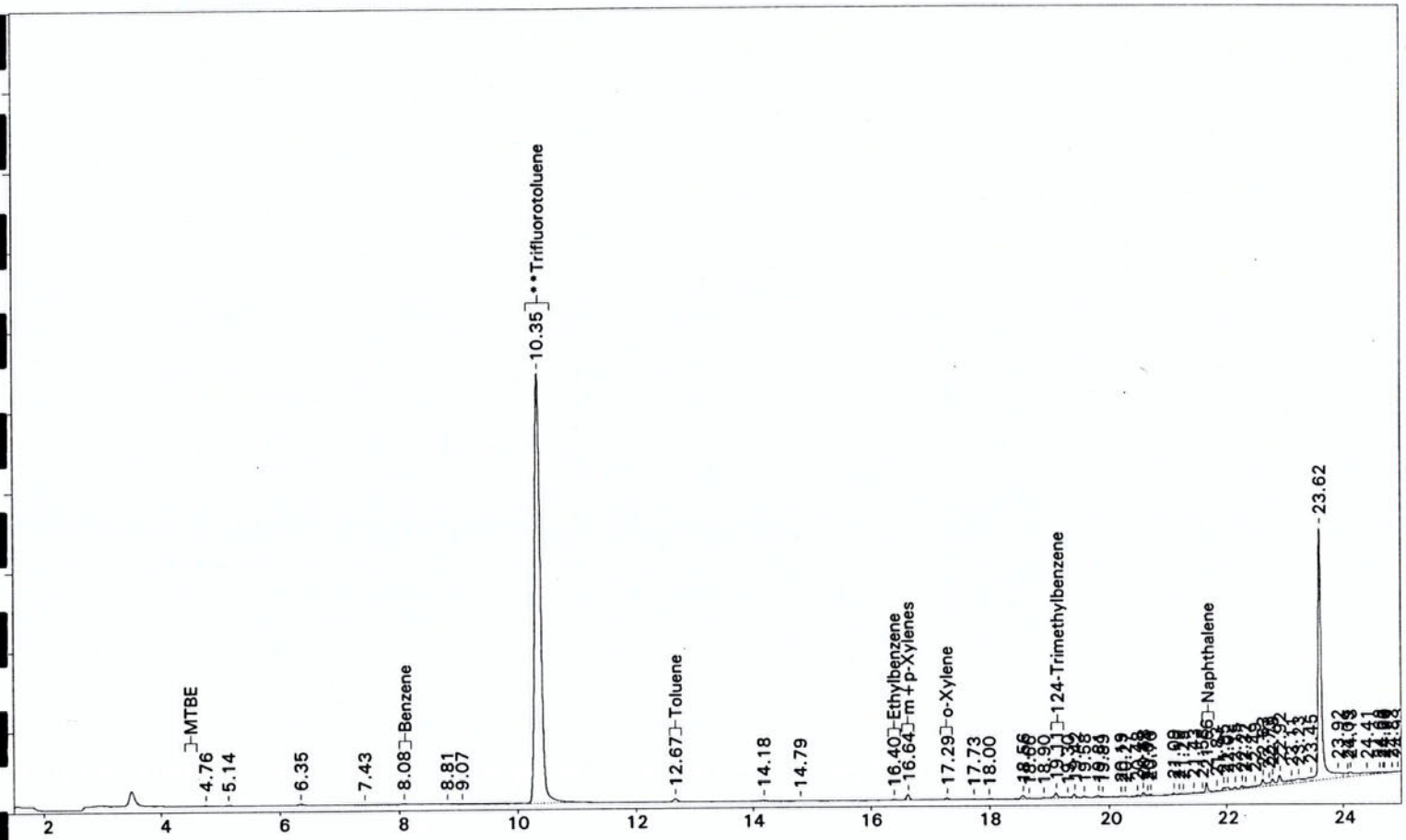
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.09	8.09	8.09	543	< 0.500	U
Toluene	12.68	12.68	12.68	1374	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	285	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	1431	< 0.500	U
o-Xylene	17.30	17.30	17.30	560	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	1209	< 2.000	U
Naphthalene	21.66	21.66	21.66	722	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.36	50.000	58.456	117	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.18R Date printed=11-10-2002 Time= 22:04:40
Sample Name=B02110370-017E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.367 High Y=36.367 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-017E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.18A
Date & Time Collected: Nov 10, 2002 22:04:34
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

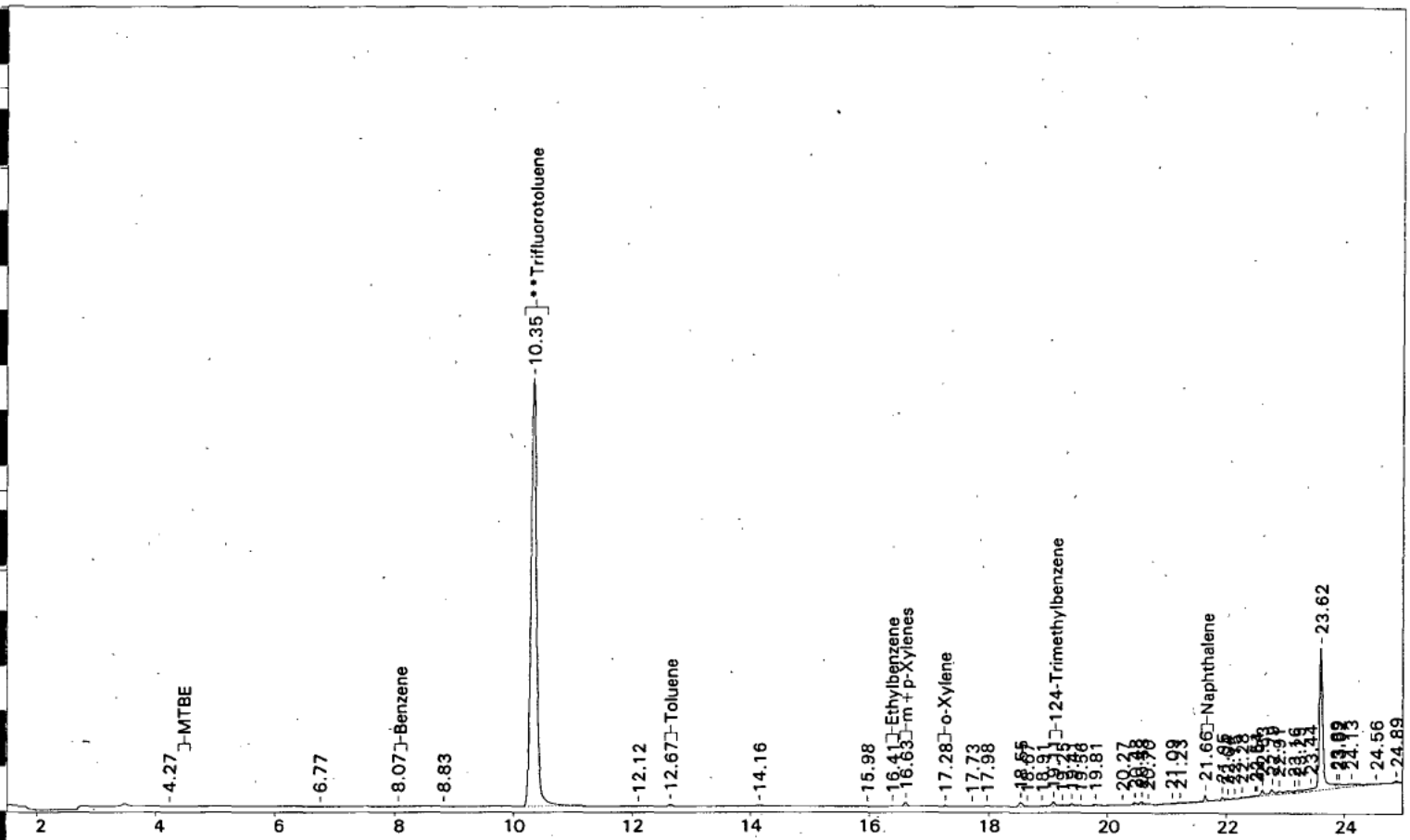
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	8.08	8.08	262	< 0.500	U
Toluene	12.67	12.67	12.67	766	< 0.500	U
Ethylbenzene	16.40	16.40	16.40	143	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	903	< 0.500	U
o-Xylene	17.29	17.29	17.29	377	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	1128	< 2.000	U
Naphthalene	21.66	21.66	21.66	1168	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	55.597	111	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.19R Date printed=11-10-2002 Time= 22:42:25
Sample Name=B02110370-018E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.365 High Y=36.365 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-018E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.19A
Date & Time Collected: Nov 10, 2002 22:42:19
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

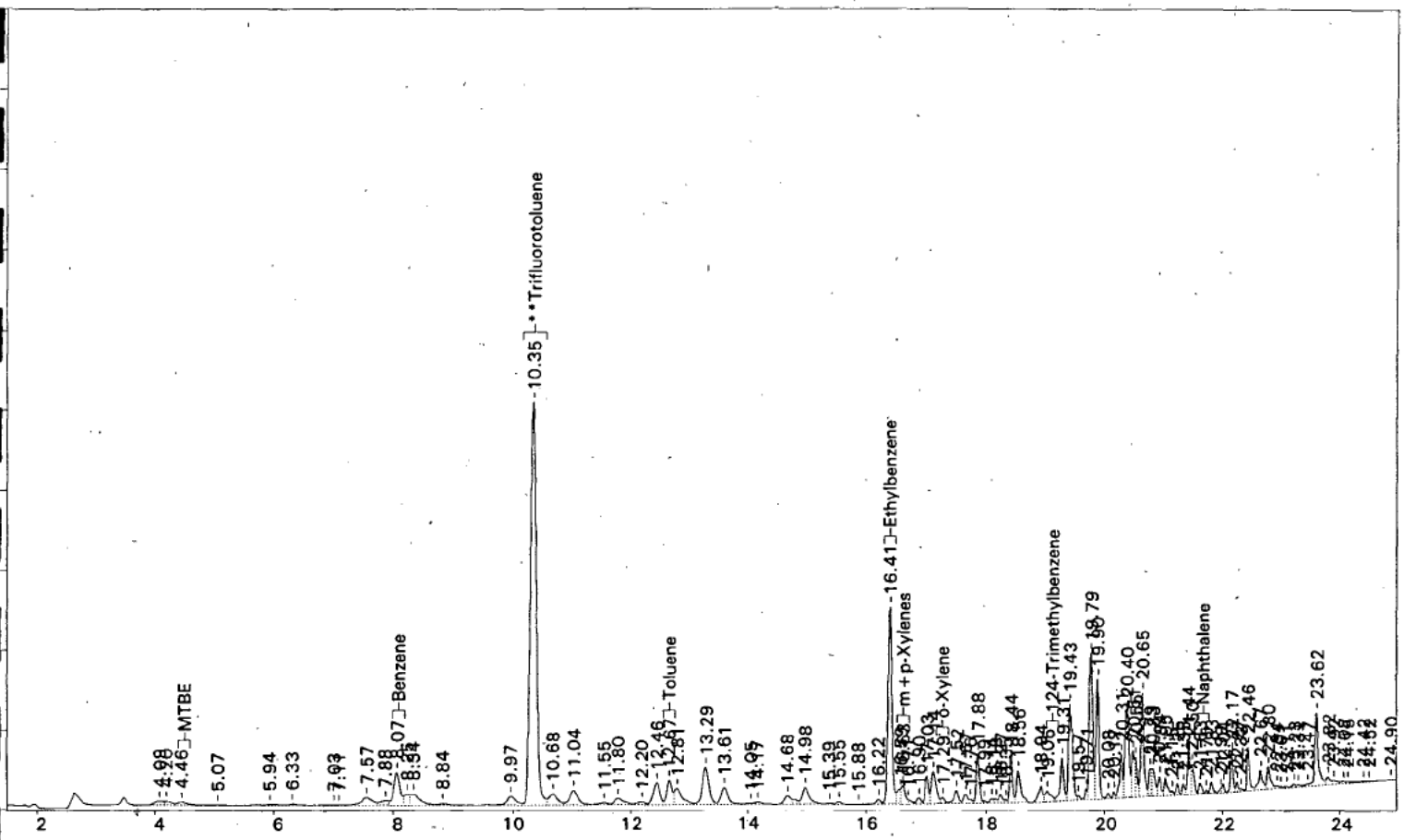
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.07	8.07	8.07	180	< 0.500	U
Toluene	12.67	12.67	12.67	576	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	142	< 0.500	U
m+p-Xylenes	16.63	16.63	16.63	719	< 0.500	U
o-Xylene	17.28	17.28	17.28	271	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	848	< 2.000	U
Naphthalene	21.66	21.66	21.66	777	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	55.399	111	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.20R Date printed=11-12-2002 Time= 13:58:32
Sample Name=B02110370-019E ;1111QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.374 High Y=36.374 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-019E ;1111QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1111QE2.20A
Date & Time Collected: Nov 10, 2002 23:20:23
Method File: G:\ORG\PE2\1102Q2.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

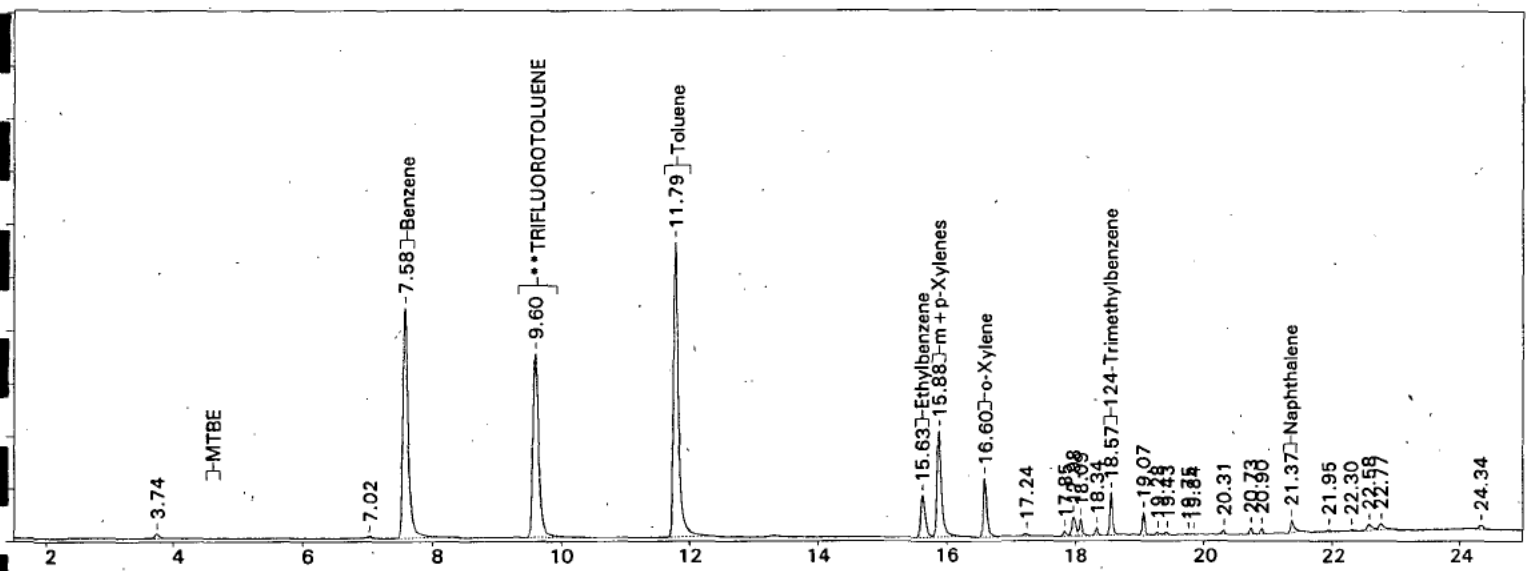
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.46	4.46	4.46	1781	< 1.000	U
Benzene	8.07	2.28	2.28	10504	1.388	
Toluene	12.67	-2.32	-2.32	6608	0.926	
Ethylbenzene	16.41	-6.05	-6.06	39261	6.873	
m+p-Xylenes	16.63	-6.28	-6.28	4258	0.572	
o-Xylene	17.29	17.29	17.29	1156	< 0.500	U
124-Trimethylbenzene	19.06	19.06	19.06	3582	< 2.000	U
Naphthalene	21.63	21.63	21.63	1702	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	51.935	104	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1112WA2.13R Date printed=11-13-2002 Time= 09:59:11
Sample Name=B02110370-020E ;1112WA2 , $HC-BTEX-8021-W,,(1,20)
1.5 to 25.0 min. Low Y=0.532 High Y=8.532 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-020E ;1112WA2 , $HC-BTEX-8021-W,,(1,20)
Area File: G:\ORG\VA2\1112WA2.13A
Date & Time Collected: Nov 11, 2002 19:16:17
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 20 S.A.: 20

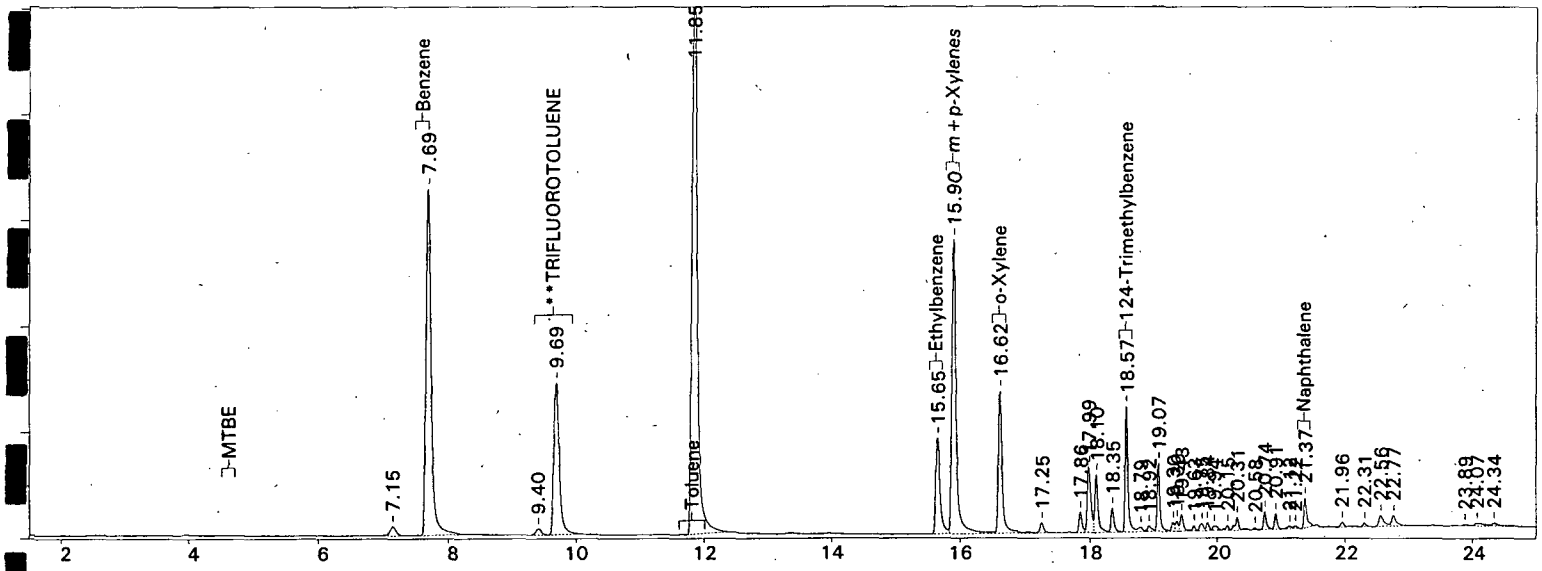
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 20.000	U
Benzene	7.58	2.03	2.03	19592	400.877	
Toluene	11.79	-2.17	-2.19	26130	572.797	
Ethylbenzene	15.63	-5.98	-6.02	3197	69.852	
m+p-Xylenes	15.88	-6.24	-6.28	7864	150.369	
o-Xylene	16.60	-6.96	-7.00	3594	69.253	
124-Trimethylbenzene	18.57	-8.92	-8.96	2058	35.209	J
Naphthalene	21.37	21.37	21.37	750	< 20.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.60	1000.000	994.943	99	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1112WA2.17R Date printed=11-13-2002 Time= 09:59:44
Sample Name=B02110370-021E ;1112WA2 , $HC-BTEX-8021-W,,(1,10)
1.5 to 25.0 min. Low Y=0.537 High Y=8.537 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-021E ;1112WA2 , $HC-BTEX-8021-W,,(1,10)
Area File: G:\ORG\VA2\1112WA2.17A
Date & Time Collected: Nov 11, 2002 21:29:06
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 10 S.A.: 10

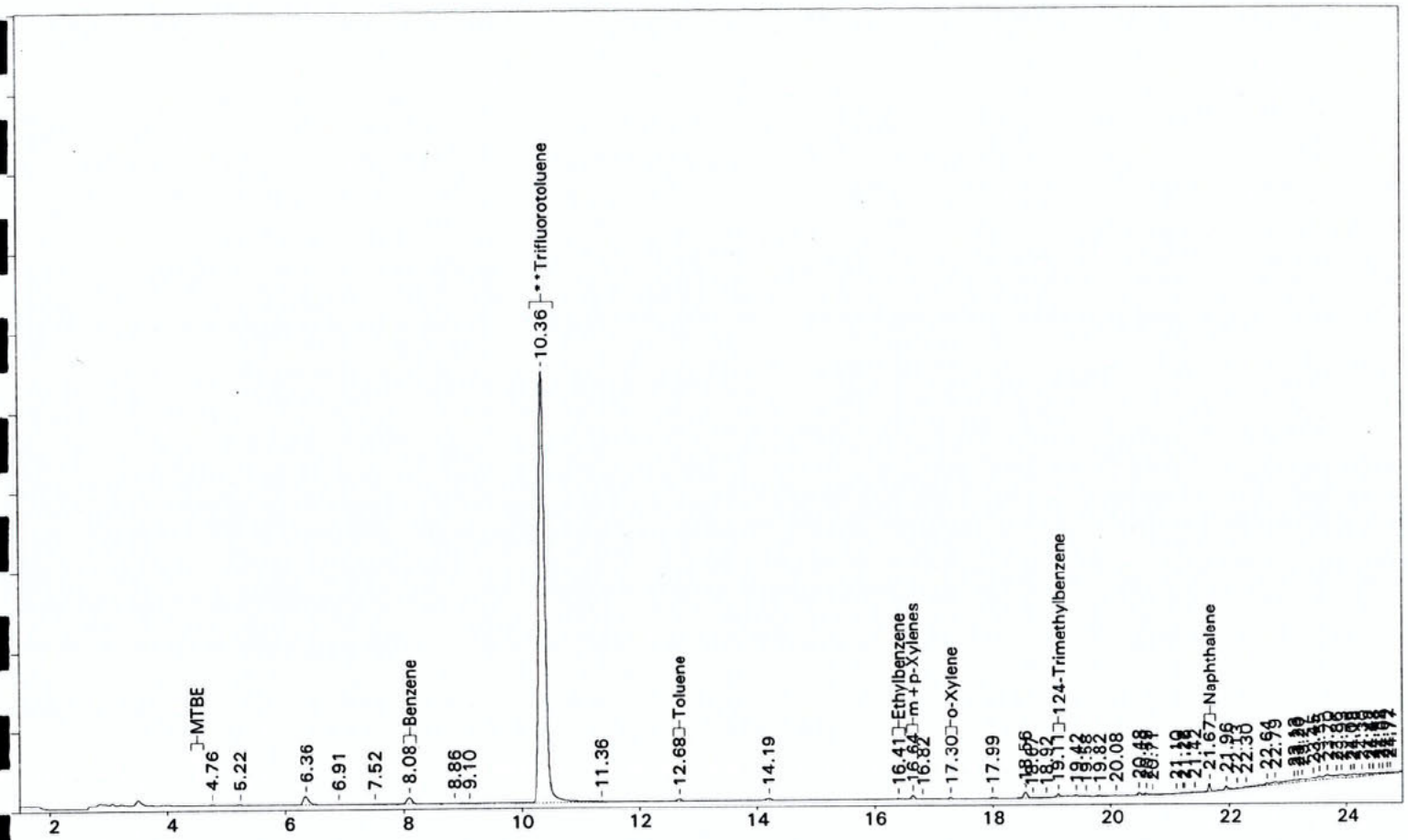
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 10.000	U
Benzene	7.69	2.03	2.00	28538	291.952	
Toluene	11.85	-2.17	-2.16	49528	542.843	
Ethylbenzene	15.65	-5.98	-5.96	7012	76.600	
m+p-Xylenes	15.90	-6.24	-6.21	20926	200.076	
o-Xylene	16.62	-6.96	-6.93	8912	85.853	
124-Trimethylbenzene	18.57	-8.92	-8.88	5912	50.565	
Naphthalene	21.37	-11.71	-11.68	1585	14.973	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.69	500.000	400.708	80	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.12R Date printed=11-26-2002 Time= 16:38:44
Sample Name=B02110370-022E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.36 High Y=36.36 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-022E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.12A
Date & Time Collected: Nov 11, 2002 17:37:48
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

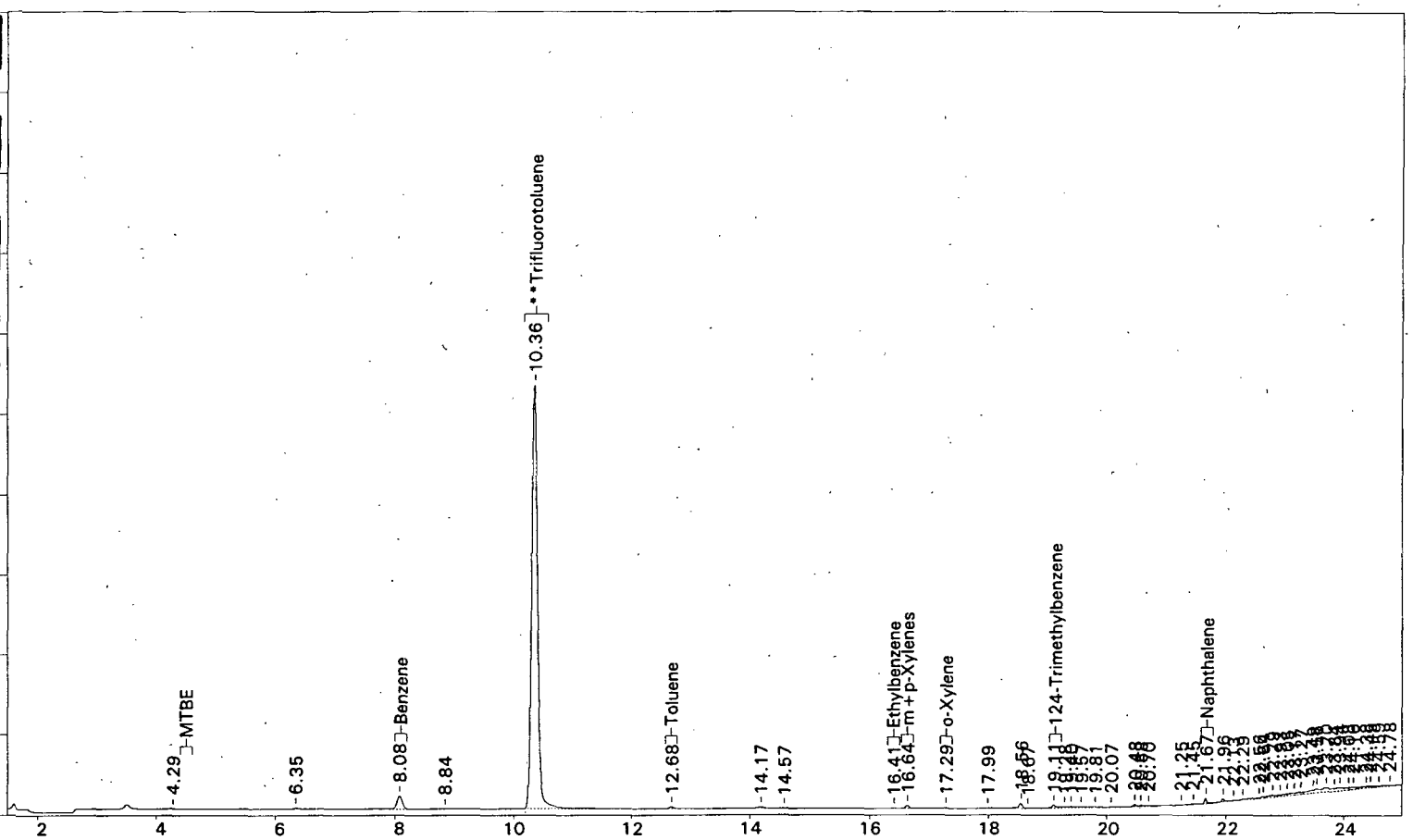
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	8.08	8.08	1758	< 0.500	U
Toluene	12.68	12.68	12.68	507	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	180	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	653	< 0.500	U
o-Xylene	17.30	17.30	17.30	306	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	448	< 2.000	U
Naphthalene	21.67	21.67	21.67	936	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.36	50.000	56.827	114	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.13R Date printed=11-13-2002 Time= 11:51:01
Sample Name=B02110370-023E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.355 High Y=36.355 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-023E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.13A
Date & Time Collected: Nov 11, 2002 18:16:43
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

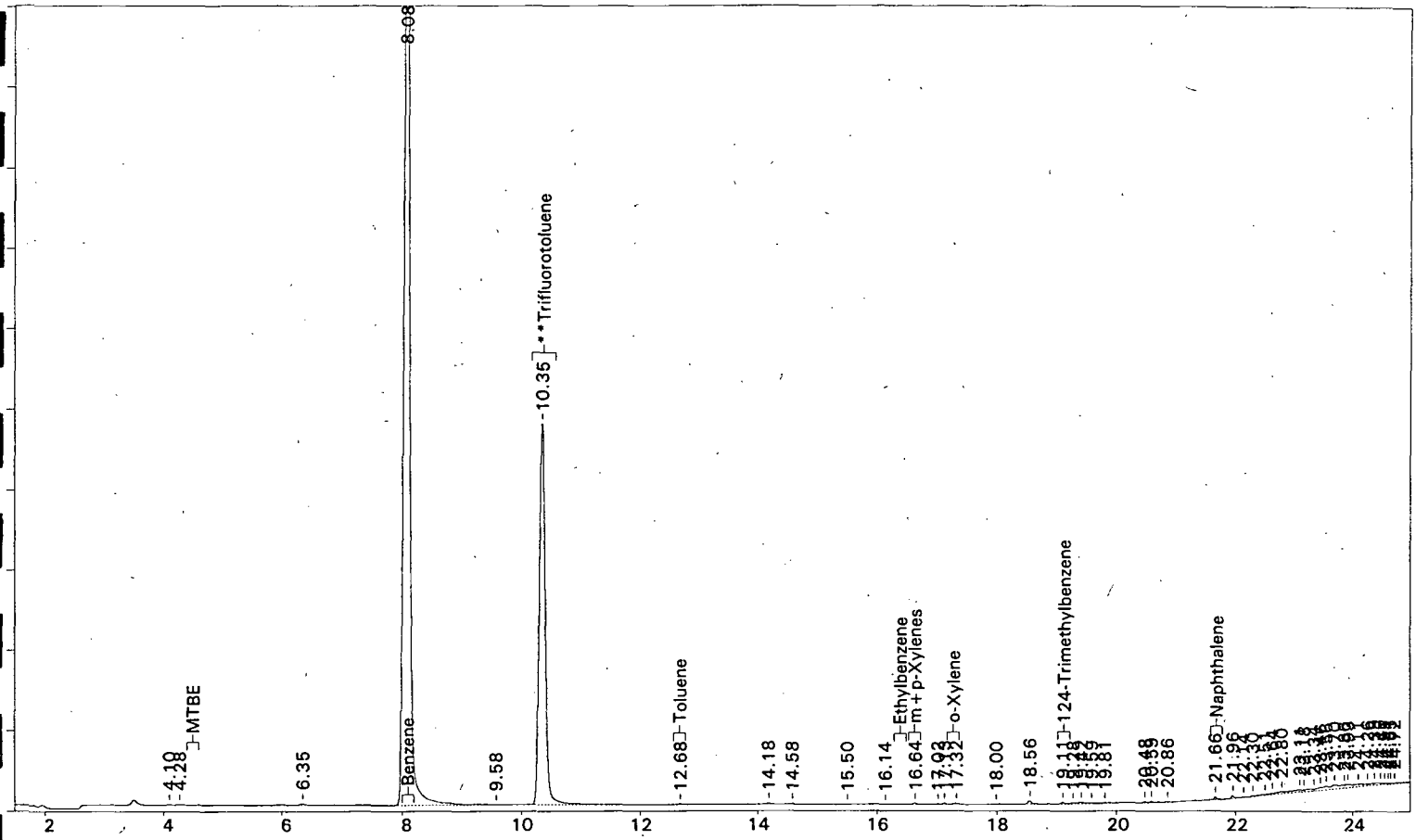
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	2.28	2.28	3741	0.494	J
Toluene	12.68	12.68	12.68	469	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	135	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	610	< 0.500	U
o-Xylene	17.29	17.29	17.29	238	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	642	< 2.000	U
Naphthalene	21.67	21.67	21.67	628	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.36	50.000	55.427	111	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.15R Date printed=11-13-2002 Time= 11:51:24
Sample Name=B02110370-024E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.355 High Y=36.355 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-024E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.15A
Date & Time Collected: Nov 11, 2002 19:34:05
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

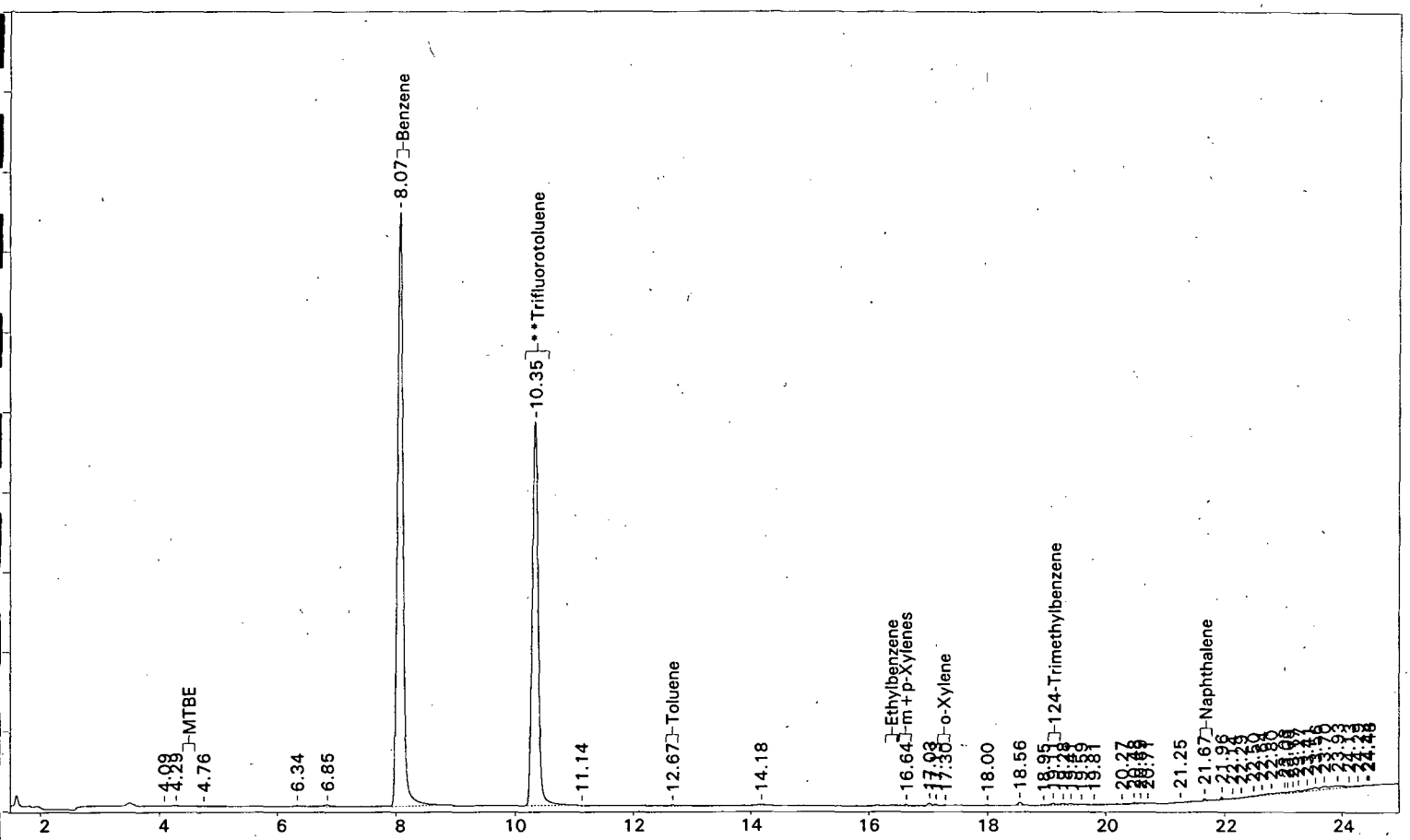
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	2.28	2.27	300446	39.710	
Toluene	12.68	12.68	12.68	260	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	300	< 0.500	U
o-Xylene	17.32	17.32	17.32	349	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	342	< 2.000	U
Naphthalene	21.66	21.66	21.66	357	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	49.641	99	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.16R Date printed=11-13-2002 Time= 11:51:38
Sample Name=B02110370-025E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.36 High Y=36.36 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-025E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.16A
Date & Time Collected: Nov 11, 2002 20:12:45
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

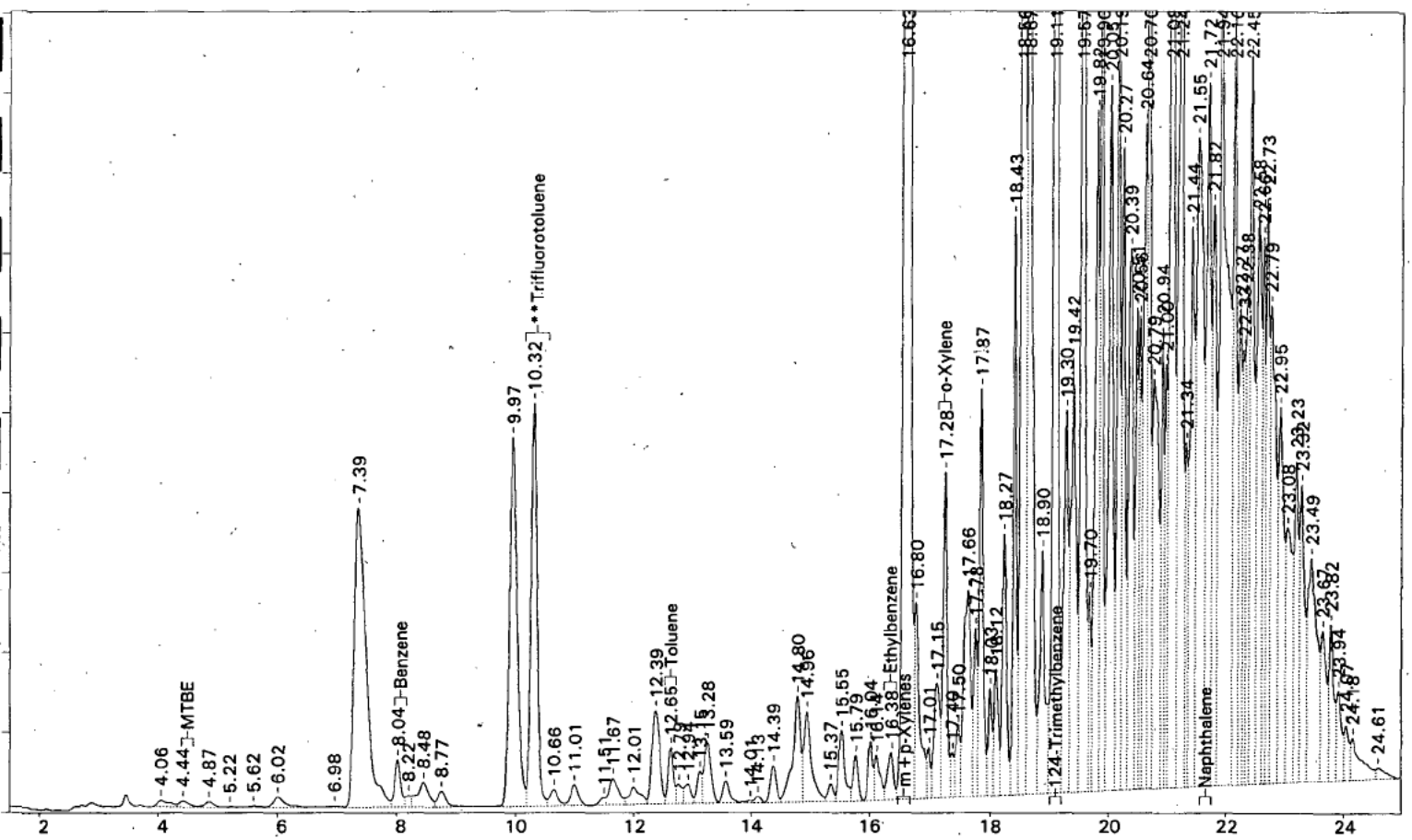
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.07	2.28	2.28	170272	22.505	
Toluene	12.67	12.67	12.67	228	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	289	< 0.500	U
o-Xylene	17.30	17.30	17.30	135	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	603	< 2.000	U
Naphthalene	21.67	21.67	21.67	346	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	50.472	101	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1115QE2.14R Date printed=11-15-2002 Time= 18:48:36
Sample Name=B02110370-026E ;1115QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.362 High Y=14.362 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-026E ;1115QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1115QE2.14A
Date & Time Collected: Nov 15, 2002 18:48:30
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

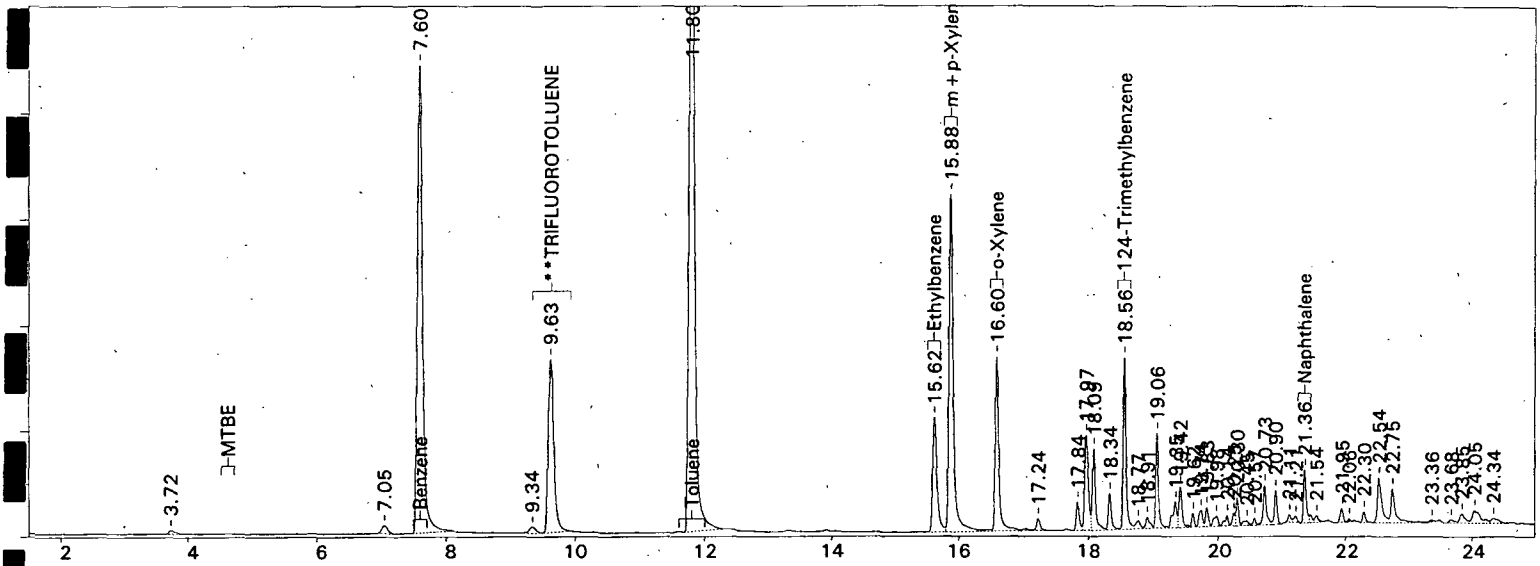
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.44	5.86	5.89	1172	1.196	
Benzene	8.04	2.27	2.29	5373	1.746	
Toluene	12.65	-2.32	-2.32	5697	2.117	
Ethylbenzene	16.38	-6.06	-6.06	5148	2.238	
m+p-Xylenes	16.63	-6.29	-6.31	884024	326.845	
o-Xylene	17.28	-6.94	-6.96	24188	10.385	
124-Trimethylbenzene	19.11	-8.76	-8.78	343306	150.980	
Naphthalene	21.72	-11.32	-11.40	65736	40.054	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.32	50.000	49.395	99	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1112WA2.21R Date printed=11-13-2002 Time= 10:00:08
Sample Name=B02110370-027E ;1112WA2 , $HC-BTEX-8021-W,,(1,10)
1.5 to 25.0 min. Low Y=0.537 High Y=8.537 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-027E ;1112WA2 , $HC-BTEX-8021-W,,(1,10)
Area File: G:\ORG\VA2\1112WA2.21A
Date & Time Collected: Nov 11, 2002 23:41:54
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 10 S.A.: 10

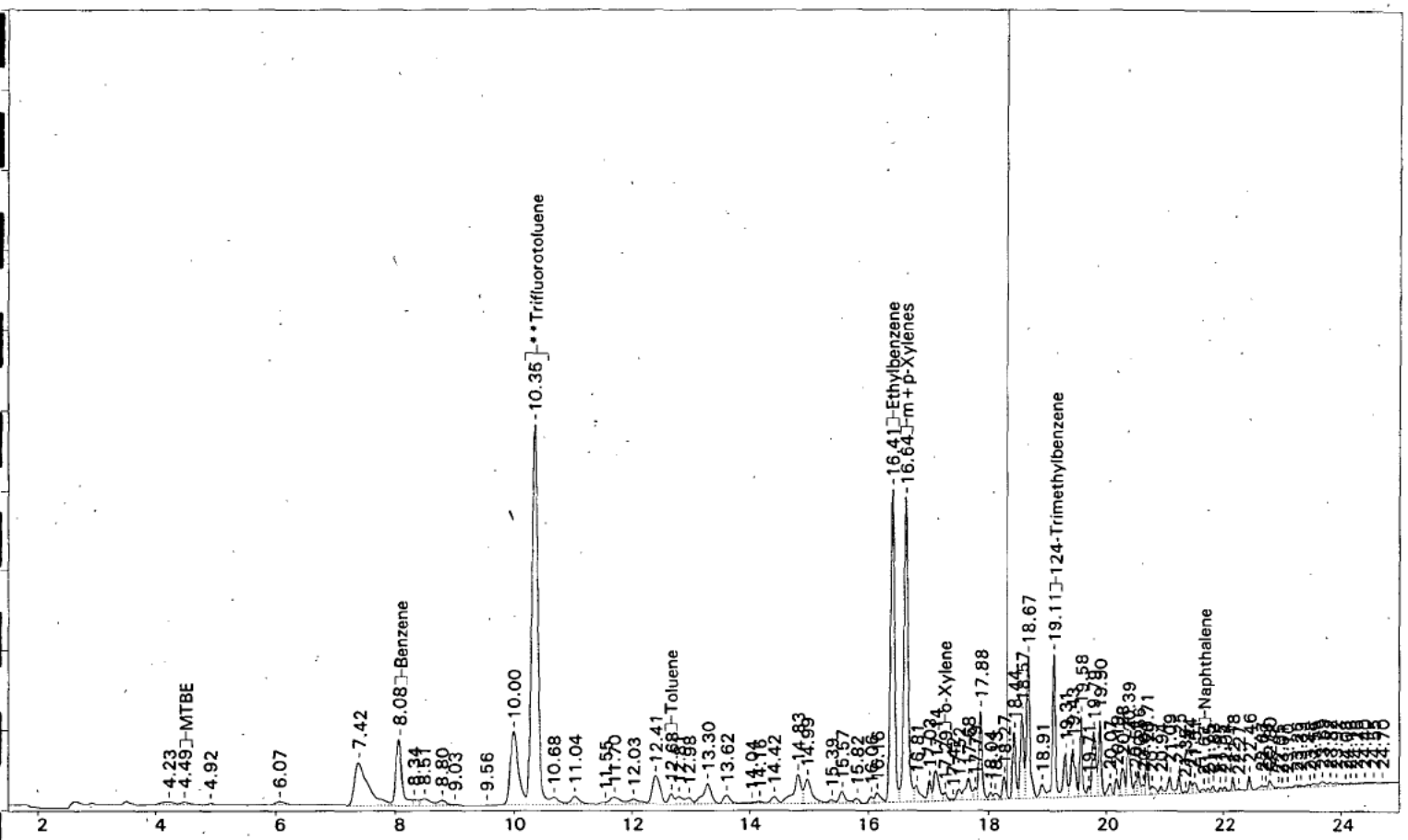
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 10.000	U
Benzene	7.60	2.03	2.03	38896	397.925	
Toluene	11.80	-2.17	-2.18	62498	685.002	
Ethylbenzene	15.62	-5.98	-6.00	8324	90.926	
m+p-Xylenes	15.88	-6.24	-6.25	24115	230.569	
o-Xylene	16.60	-6.96	-6.97	10801	104.054	
124-Trimethylbenzene	18.56	-8.92	-8.94	7882	67.417	
Naphthalene	21.36	-11.71	-11.73	2443	23.069	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.63	500.000	454.779	91	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.17R Date printed=11-13-2002 Time= 11:51:50
Sample Name=B02110370-028E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.346 High Y=36.346 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-028E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.17A
Date & Time Collected: Nov 11, 2002 20:54:14
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

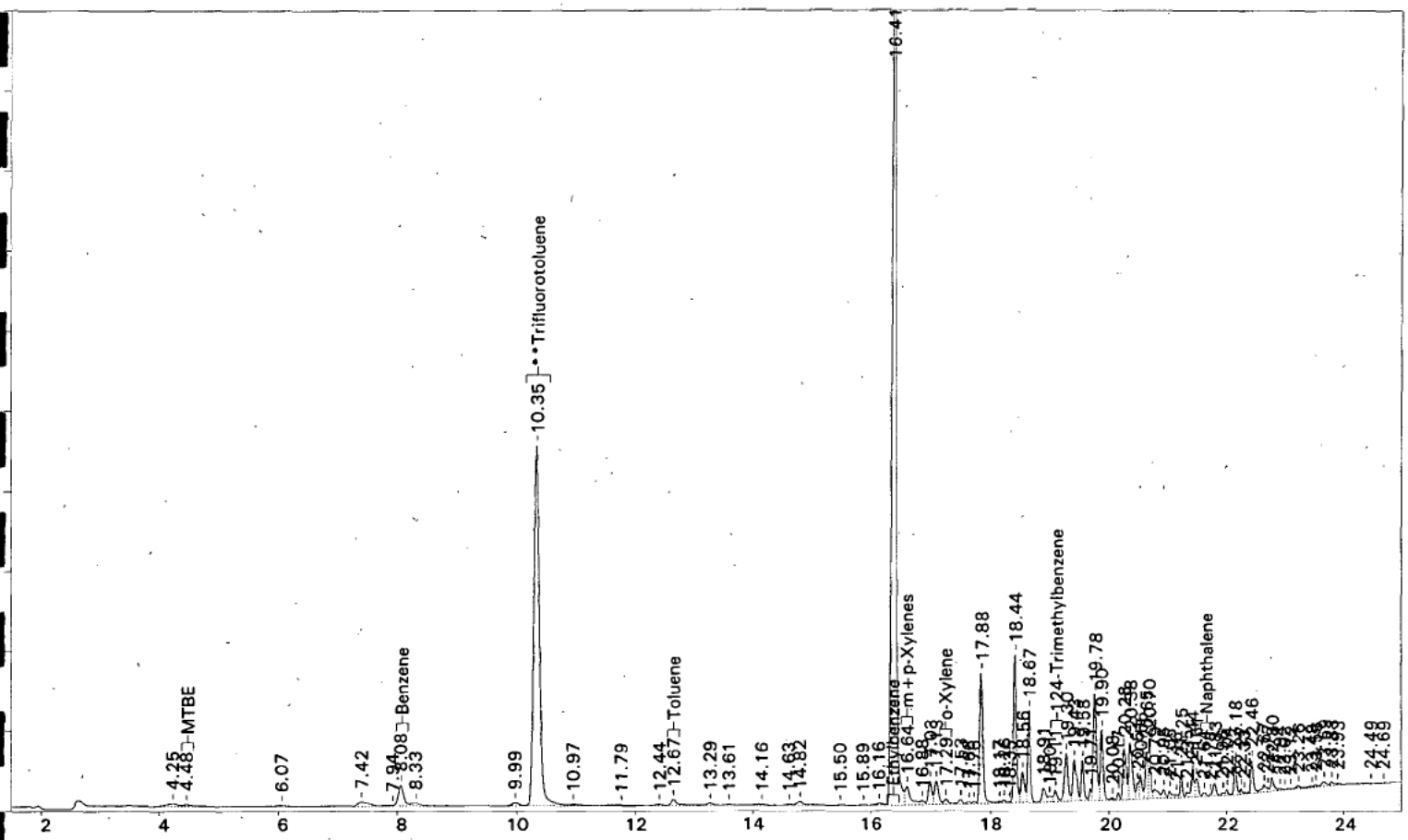
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.49	4.49	4.49	1584	< 1.000	U
Benzene	8.08	2.28	2.28	20852	2.756	
Toluene	12.68	12.68	12.68	2776	< 0.500	U
Ethylbenzene	16.41	-6.05	-6.06	62105	10.871	
m+p-Xylenes	16.64	-6.28	-6.29	63439	8.518	
o-Xylene	17.29	17.29	17.29	1621	< 0.500	U
124-Trimethylbenzene	19.11	-8.75	-8.76	21914	3.642	
Naphthalene	21.67	21.67	21.67	767	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	49.650	99	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1112QE2.19R Date printed=11-13-2002 Time= 11:52:16
Sample Name=B02110370-029E ;1112QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.358 High Y=36.358 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-029E ;1112QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1112QE2.19A
Date & Time Collected: Nov 11, 2002 22:11:56
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

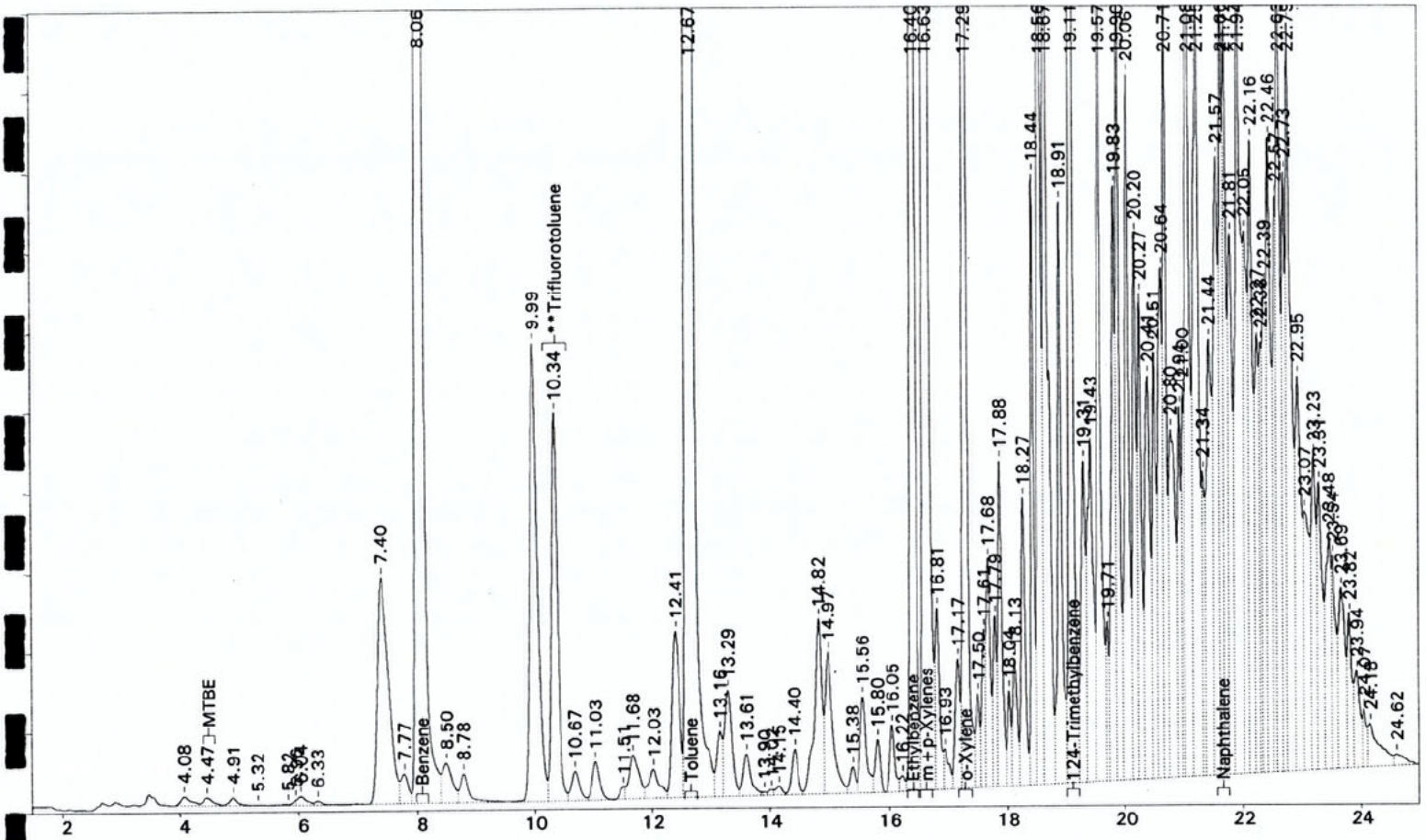
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.48	4.48	4.48	658	< 1.000	U
Benzene	8.08	2.28	2.27	5870	0.776	
Toluene	12.67	12.67	12.67	2138	< 0.500	U
Ethylbenzene	16.41	-6.05	-6.05	206088	36.075	
m+p-Xylenes	16.64	-6.28	-6.28	5241	0.704	
o-Xylene	17.29	17.29	17.29	884	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	1968	< 2.000	U
Naphthalene	21.64	21.64	21.64	845	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	47.392	95	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1118QE2.11R Date printed=11-19-2002 Time= 10:38:13
Sample Name=B02110370-030E ;1118QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.358 High Y=14.358 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-030E ;1118QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1118QE2.11A
Date & Time Collected: Nov 18, 2002 16:47:27
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

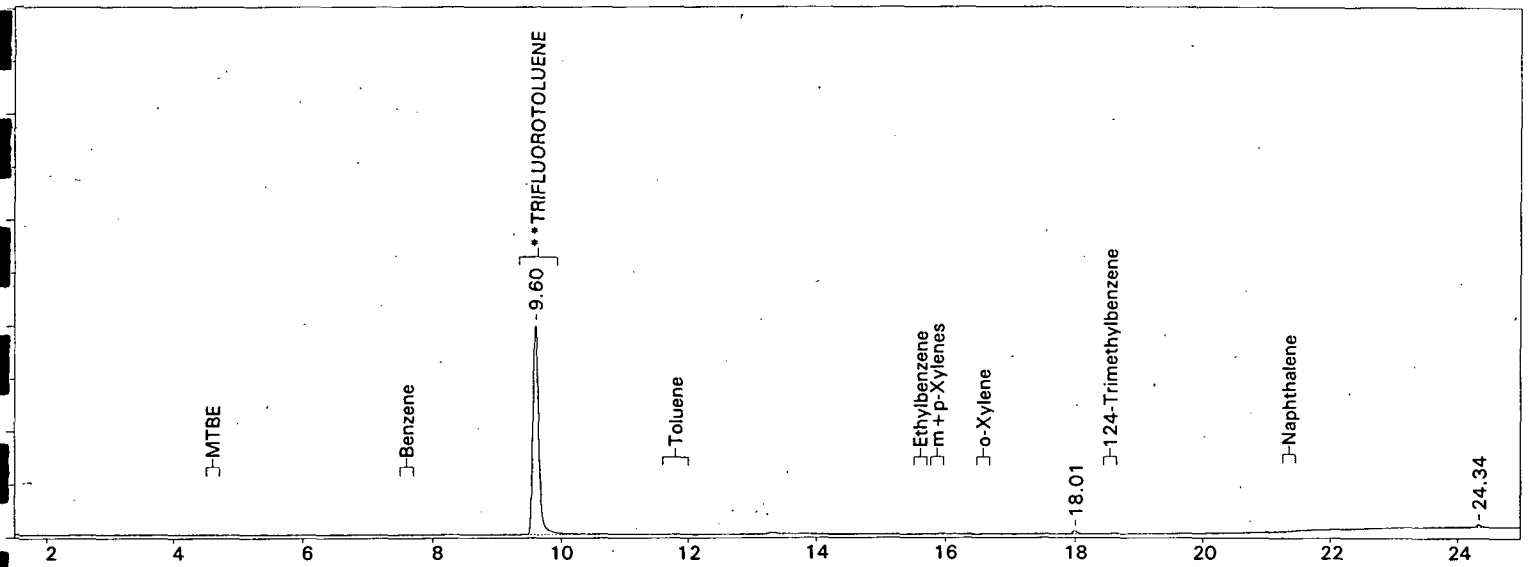
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.47	5.86	5.87	1521	1.553	
Benzene	8.06	2.27	2.28	297070	96.529	
Toluene	12.67	-2.32	-2.33	525101	195.102	
Ethylbenzene	16.40	-6.06	-6.06	159499	69.325	
m+p-Xylenes	16.63	-6.29	-6.29	346234	128.011	
o-Xylene	17.29	-6.94	-6.95	124521	53.463	
124-Trimethylbenzene	19.11	-8.76	-8.77	148423	65.274	
Naphthalene	21.66	-11.32	-11.32	45668	27.826	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	48.239	96	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1113WA2.16R Date printed=11-14-2002 Time= 09:54:54
Sample Name=B02110370-031A ;1113WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.535 High Y=8.535 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-031A ;1113WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1113WA2.16A
Date & Time Collected: Nov 13, 2002 18:12:37
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

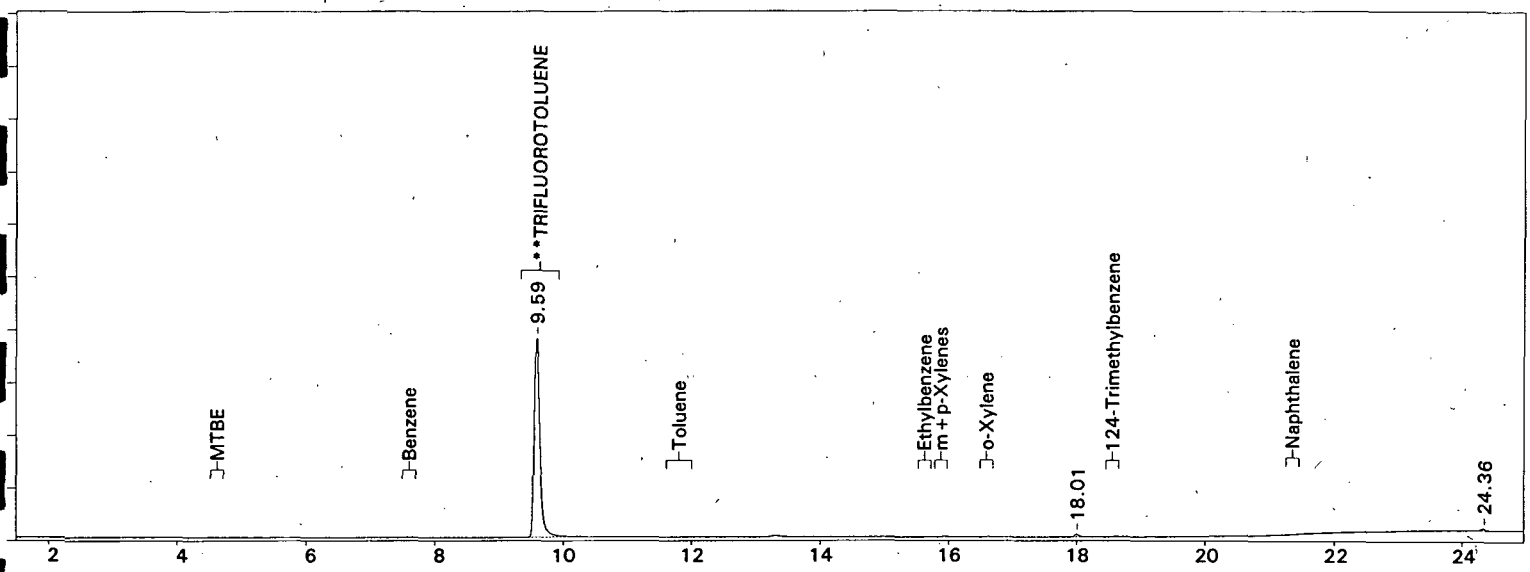
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	0.00	0.00	0.00	0	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	0.00	0.00	0.00	0	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.60	50.000	57.279	115	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1115WA2.16R Date printed=11-15-2002 Time= 18:45:50
Sample Name=B02110370-032A ;1115WA2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=0.535 High Y=8.535 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-032A ;1115WA2 , $HC-BTEX-8021-W,
Area File: G:\ORG\VA2\1115WA2.16A
Date & Time Collected: Nov 15, 2002 18:45:44
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

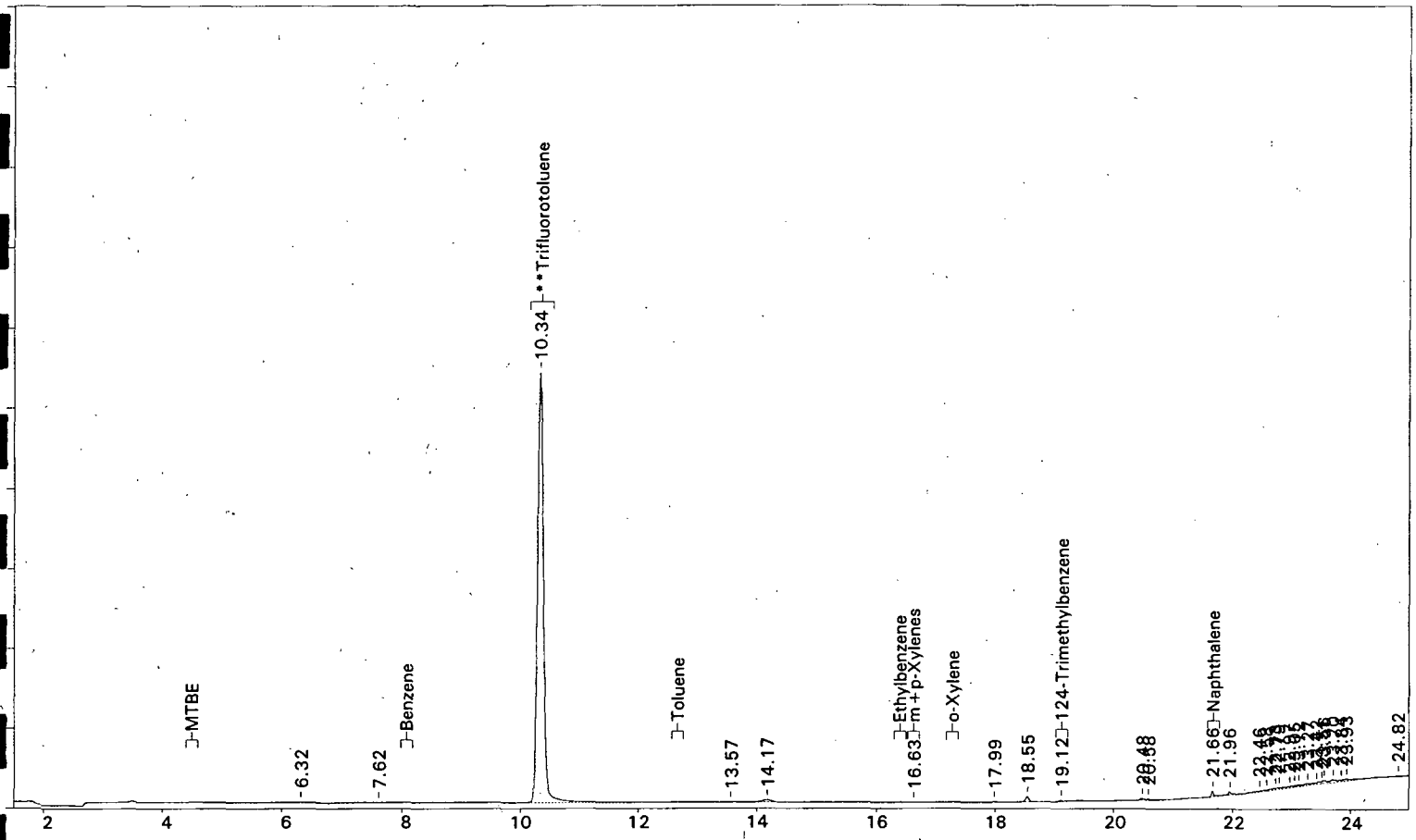
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	0.00	0.00	0.00	0	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	0.00	0.00	0.00	0	< 2.000	U
Naphthalene	0.00	0.00	0.00	0	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.59	50.000	54.101	108	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1114QE2.09R Date printed=11-14-2002 Time= 15:05:31
Sample Name=B02110370-033A ;1114QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.36 High Y=14.36 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-033A ;1114QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1114QE2.09A
Date & Time Collected: Nov 14, 2002 15:01:39
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

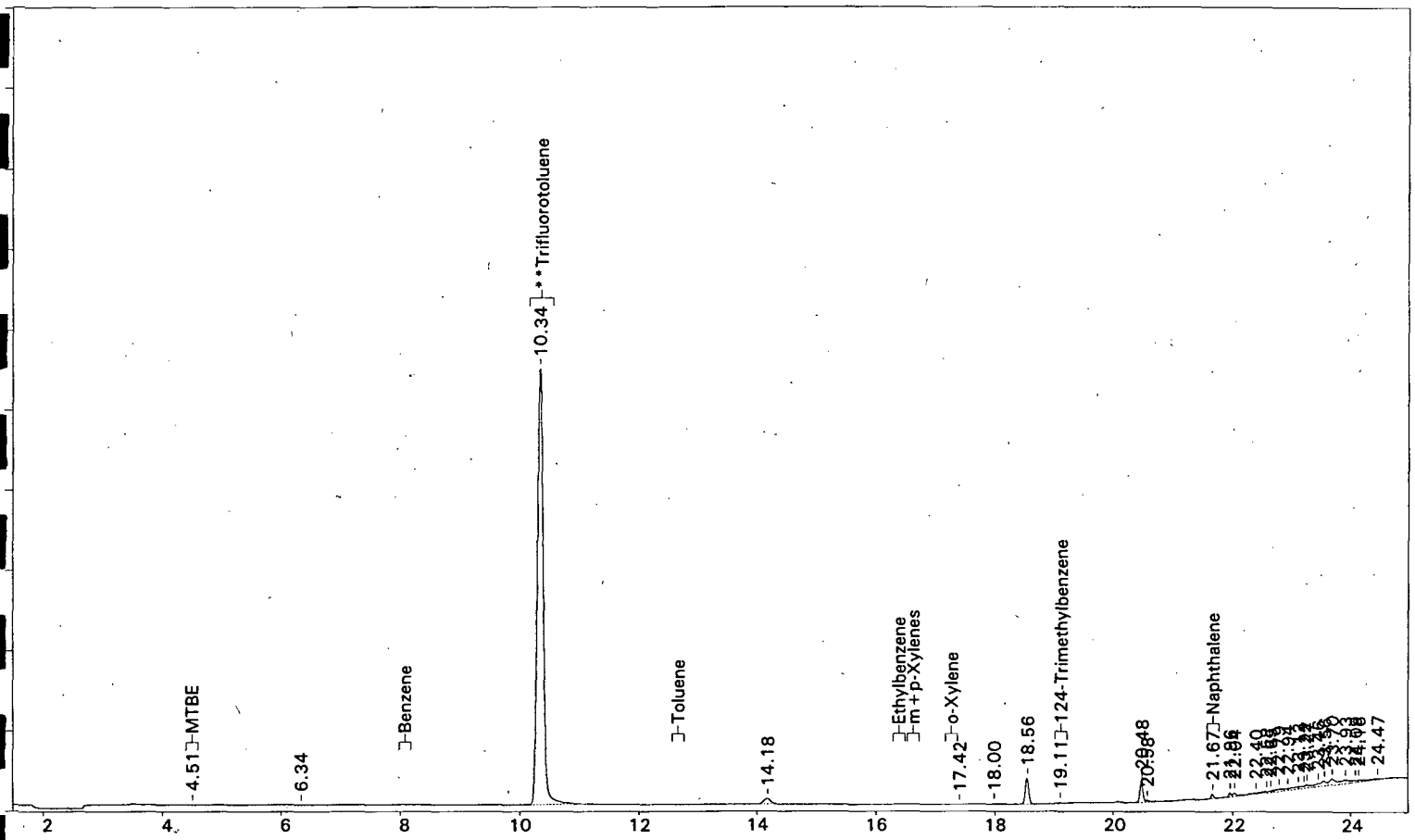
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	16.63	16.63	16.63	92	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	19.12	19.12	19.12	119	< 2.000	U
Naphthalene	21.66	21.66	21.66	221	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	52.359	105	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1114QE2.10R Date printed=11-14-2002 Time= 15:41:59
Sample Name=B02110370-034A ;1114QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.351 High Y=14.351 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-034A ;1114QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1114QE2.10A
Date & Time Collected: Nov 14, 2002 15:41:53
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.51	4.51	4.51	169	< 1.000	U
Benzene	0.00	0.00	0.00	0	< 0.500	U
Toluene	0.00	0.00	0.00	0	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	0.00	0.00	0.00	0	< 0.500	U
o-Xylene	0.00	0.00	0.00	0	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	78	< 2.000	U
Naphthalene	21.67	21.67	21.67	242	< 1.000	U

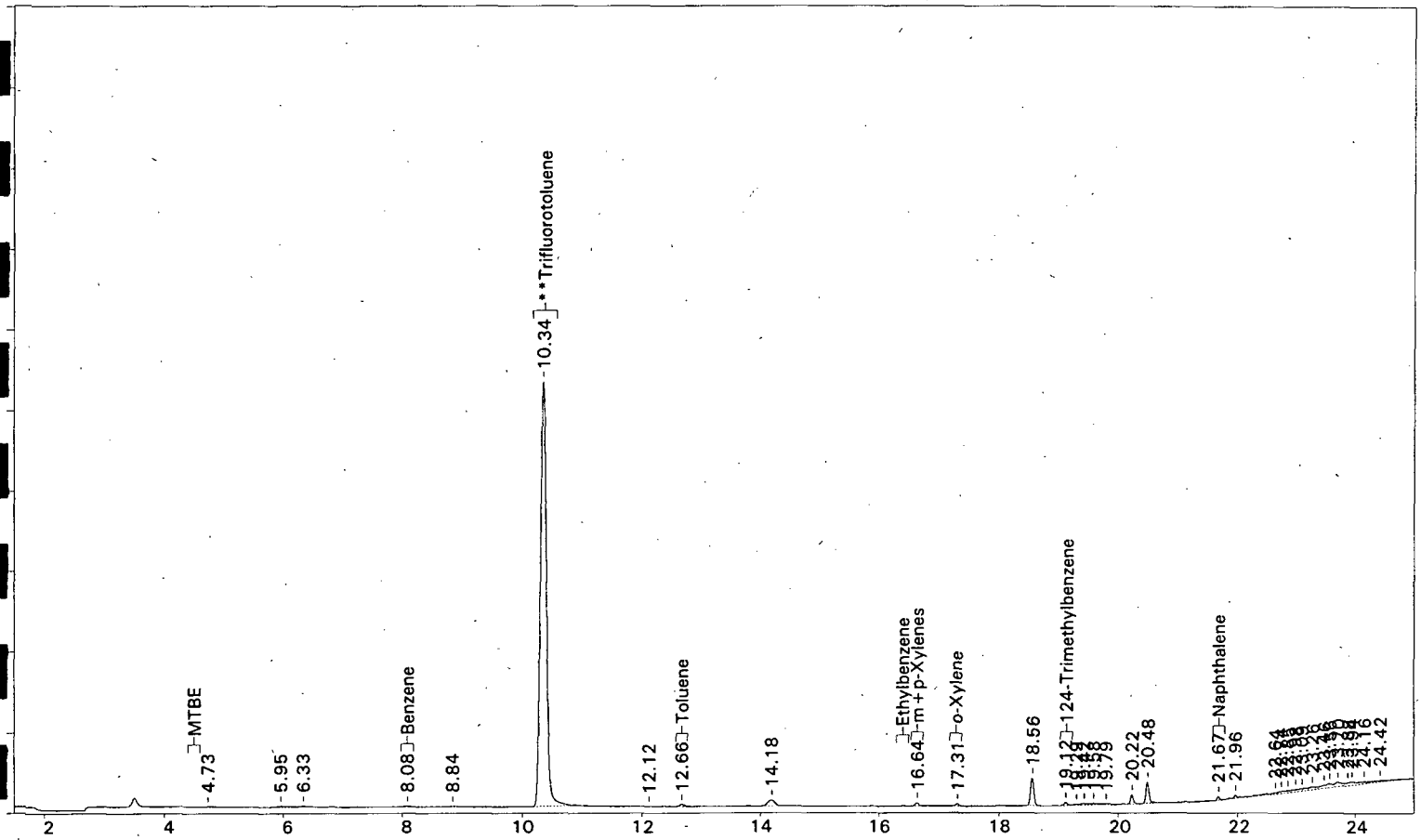
SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	52.464	105	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File: G:\ORG\PE2\1114QE2.11R Date printed=11-14-2002 Time= 16:22:31

Sample Name=B02110370-035A ;1114QE2 , $HC-BTEX-8021-W,

.5 to 25.0 min. Low Y=1.356 High Y=14.356 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-035A ;1114QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1114QE2.11A
Date & Time Collected: Nov 14, 2002 16:19:52
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

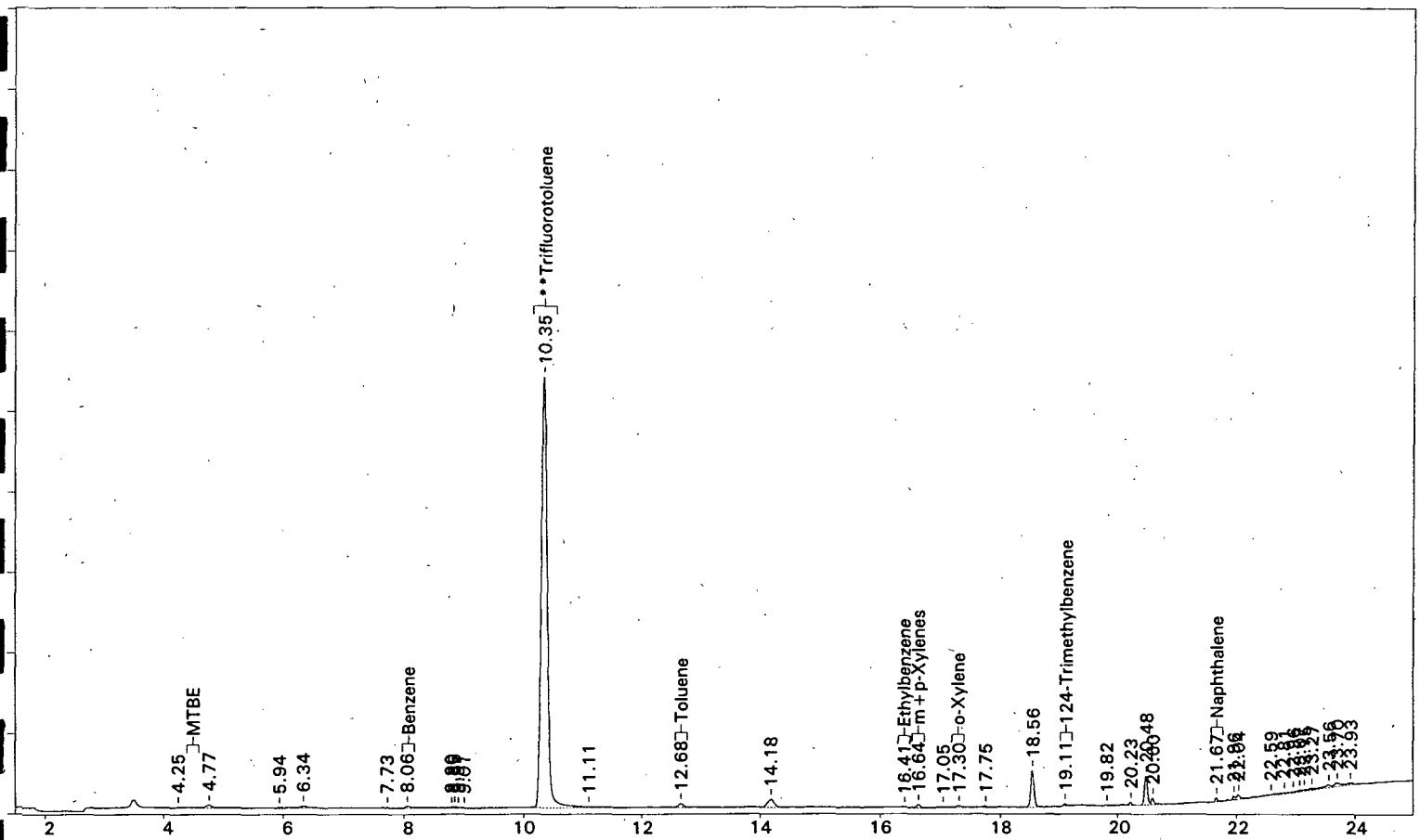
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.08	8.08	8.08	168	< 0.500	U
Toluene	12.66	12.66	12.66	288	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	306	< 0.500	U
o-Xylene	17.31	17.31	17.31	174	< 0.500	U
124-Trimethylbenzene	19.12	19.12	19.12	251	< 2.000	U
Naphthalene	21.67	21.67	21.67	182	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.34	50.000	50.860	102	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1114QE2.12R Date printed=11-14-2002 Time= 16:59:58
Sample Name=B02110370-036A ;1114QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.355 High Y=14.355 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-036A ;1114QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1114QE2.12A
Date & Time Collected: Nov 14, 2002 16:59:52
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

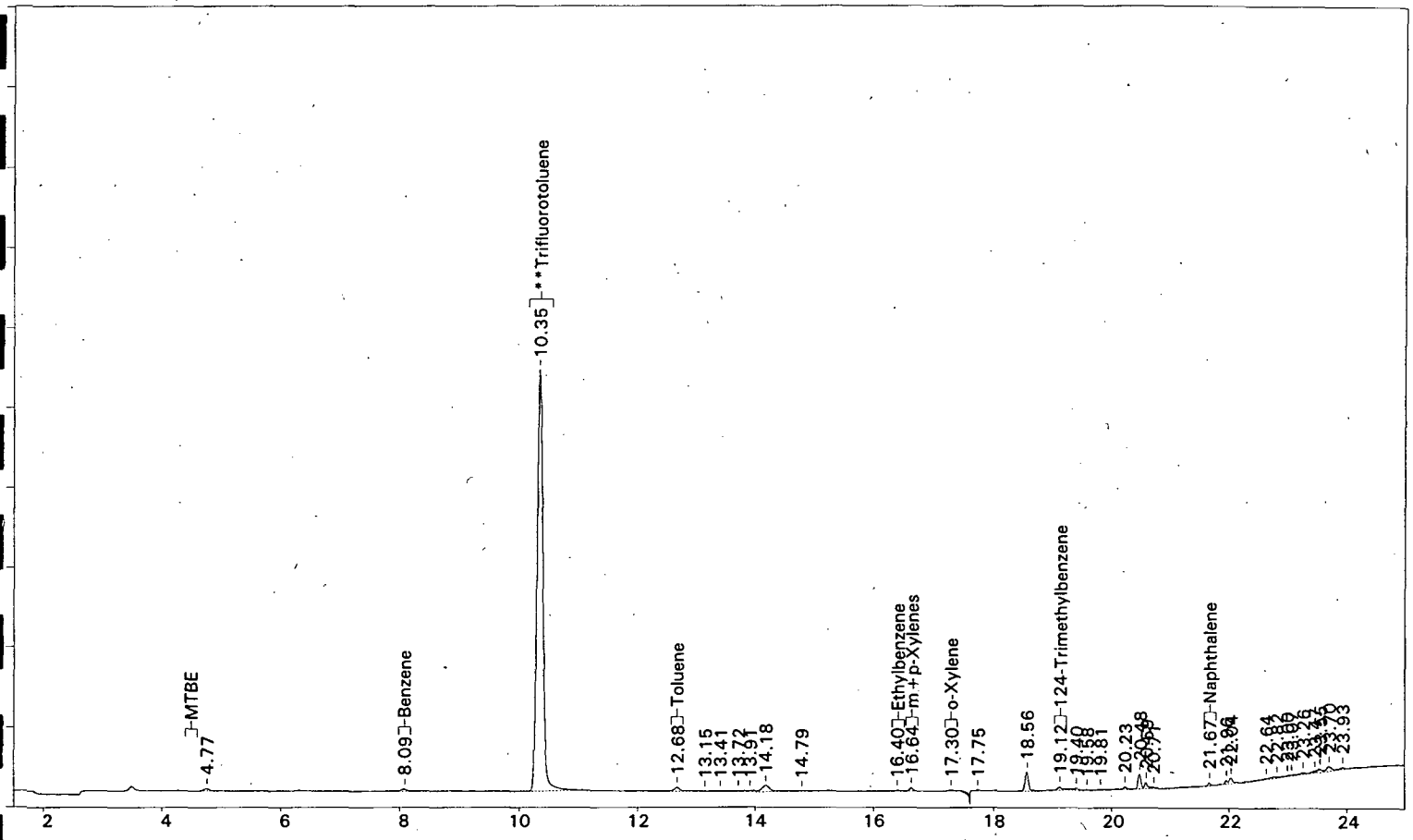
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.06	8.06	8.06	263	< 0.500	U
Toluene	12.68	12.68	12.68	365	< 0.500	U
Ethylbenzene	16.41	16.41	16.41	99	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	273	< 0.500	U
o-Xylene	17.30	17.30	17.30	273	< 0.500	U
124-Trimethylbenzene	19.11	19.11	19.11	123	< 2.000	U
Naphthalene	21.67	21.67	21.67	204	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	52.174	104	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1114QE2.13R Date printed=11-15-2002 Time= 14:11:45
Sample Name=B02110370-037A ;1114QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.198 High Y=14.198 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-037A ;1114QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1114QE2.13A
Date & Time Collected: Nov 14, 2002 17:40:59
Method File: G:\ORG\PE2\1115Q2.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

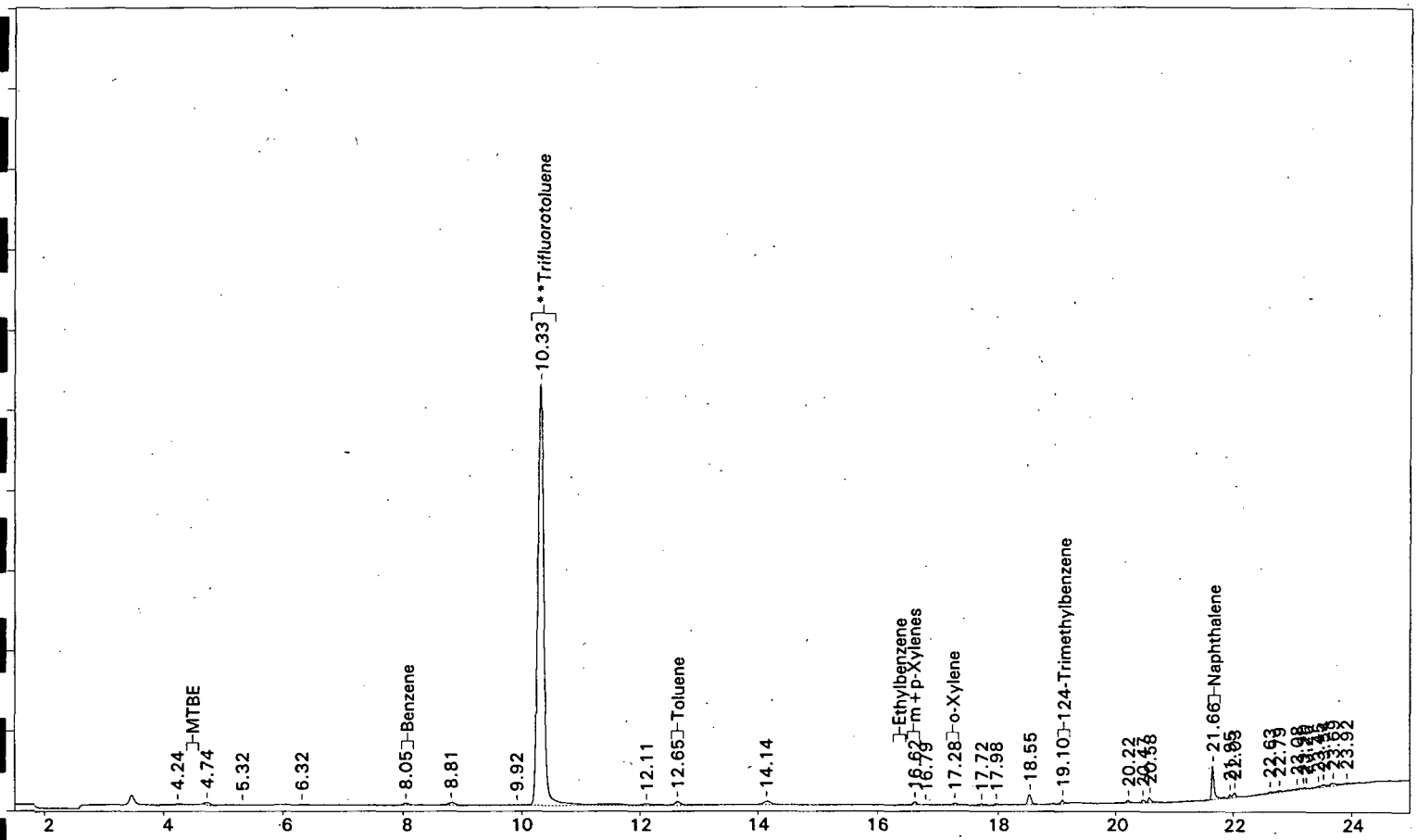
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.09	8.09	8.09	269	< 0.500	U
Toluene	12.68	12.68	12.68	760	< 0.500	U
Ethylbenzene	16.40	16.40	16.40	81	< 0.500	U
m+p-Xylenes	16.64	16.64	16.64	250	< 0.500	U
o-Xylene	17.30	17.30	17.30	165	< 0.500	U
124-Trimethylbenzene	19.12	19.12	19.12	379	< 2.000	U
Naphthalene	21.67	21.67	21.67	171	< 1.000	U

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	50.000	51.027	102	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1115QE2.10R Date printed=11-15-2002 Time= 16:16:39
Sample Name=B02110370-038A ;1115QE2 , $HC-BTEX-8021-W,
1.5 to 25.0 min. Low Y=1.355 High Y=14.355 mv Span=13.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-038A ;1115QE2 , $HC-BTEX-8021-W,
Area File: G:\ORG\PE2\1115QE2.10A
Date & Time Collected: Nov 15, 2002 16:16:32
Method File: G:\ORG\PE2\41P202.MET
Calibration File: G:\ORG\PE2\41MAQ02.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

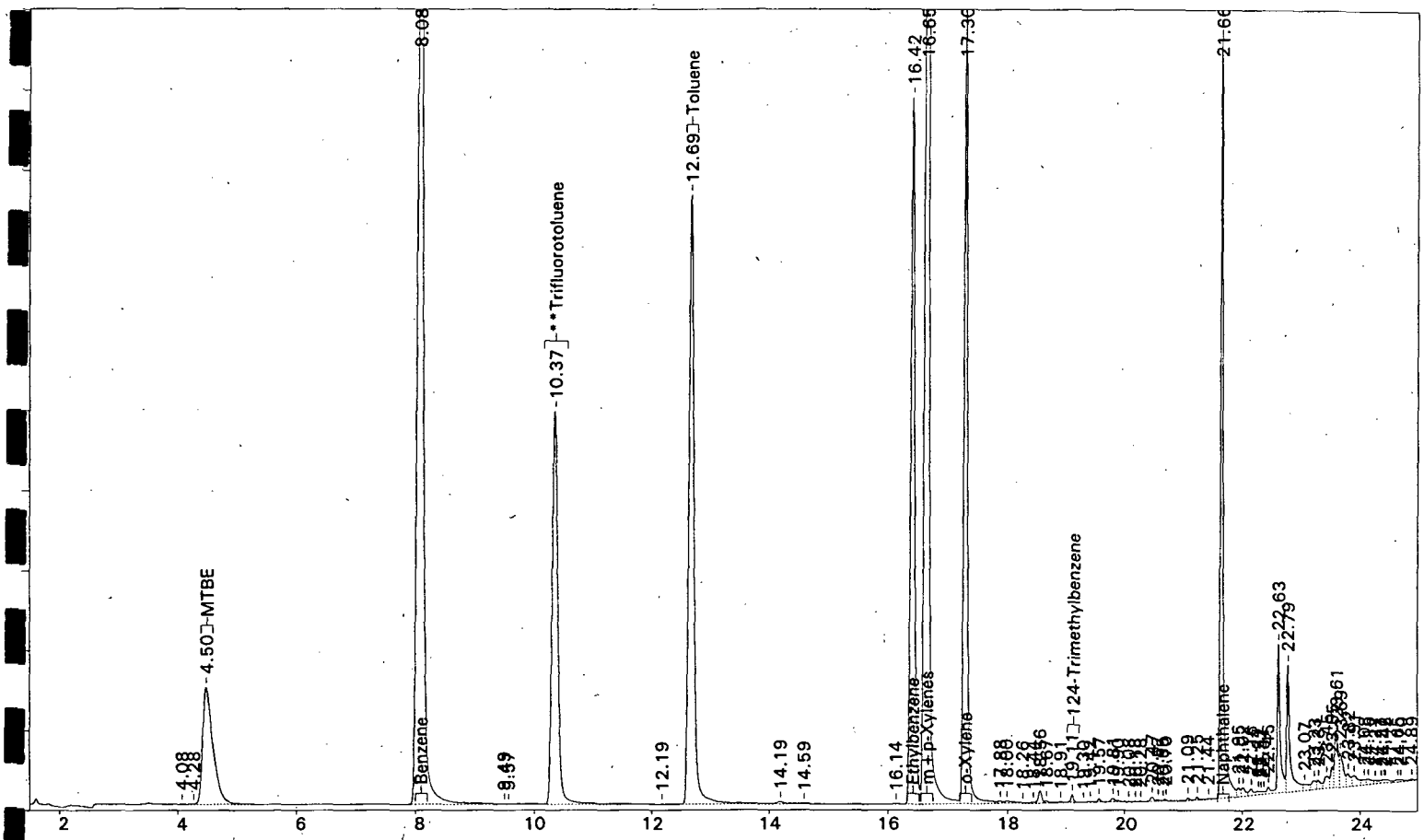
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	0.00	0.00	0.00	0	< 1.000	U
Benzene	8.05	8.05	8.05	291	< 0.500	U
Toluene	12.65	12.65	12.65	425	< 0.500	U
Ethylbenzene	0.00	0.00	0.00	0	< 0.500	U
m+p-Xylenes	16.62	16.62	16.62	238	< 0.500	U
o-Xylene	17.28	17.28	17.28	284	< 0.500	U
124-Trimethylbenzene	19.10	19.10	19.10	236	< 2.000	U
Naphthalene	21.66	-11.32	-11.33	1684	1.026	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.33	50.000	51.226	102	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.23R Date printed=11-11-2002 Time= 01:24:01
Sample Name=B02110370-011EMS, BQC ;1111QE2 , $HC-BTEX-8021-W,,(1,2)
1.5 to 25.0 min. Low Y=1.377 High Y=36.377 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-011EMS, BQC ;1111QE2 , $HC-BTEX-8021-W,,(1,2)
Area File: G:\ORG\PE2\1111QE2.23A
Date & Time Collected: Nov 11, 2002 01:23:54
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

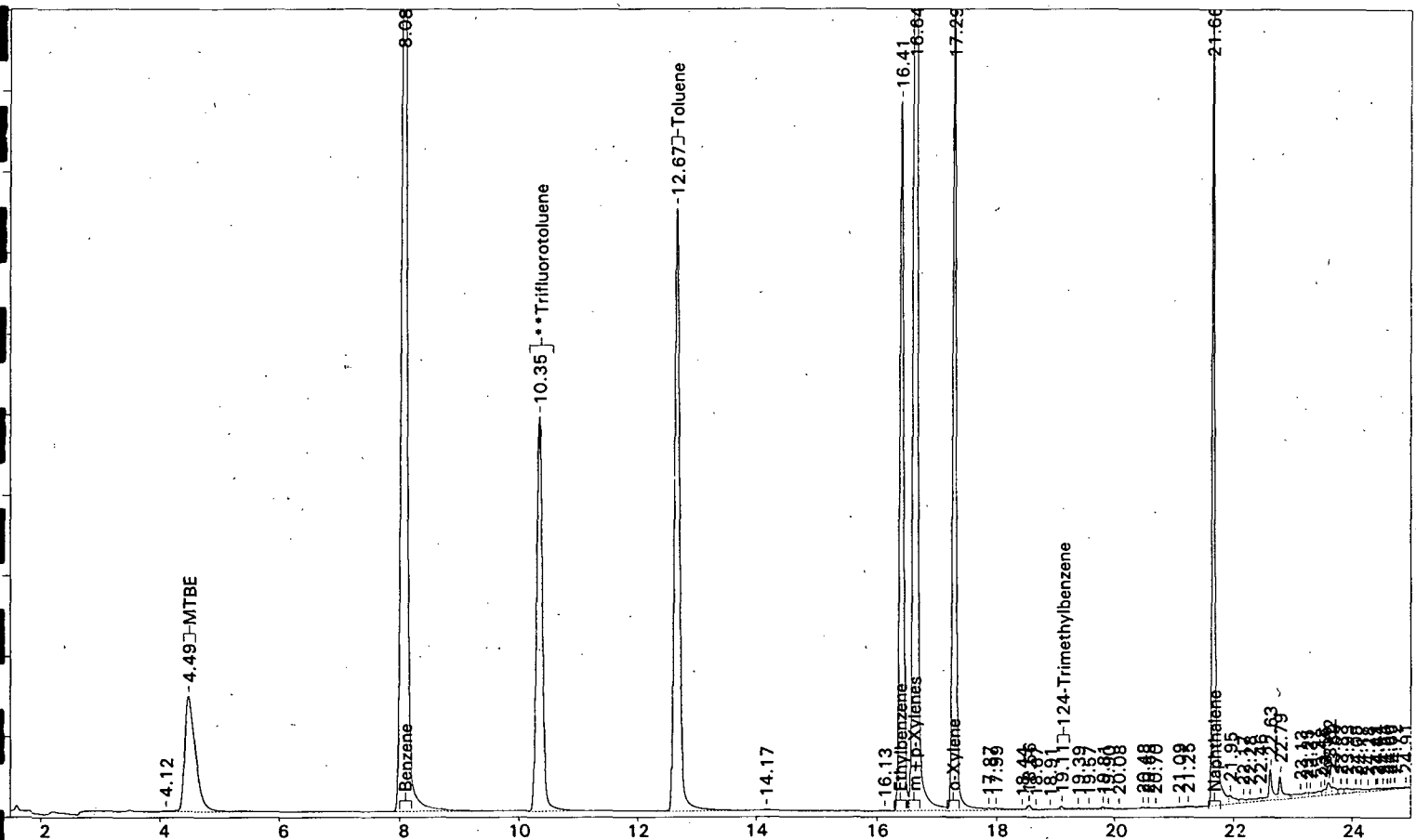
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.50	5.87	5.87	62891	53.678	
Benzene	8.08	2.28	2.28	311913	82.451	
Toluene	12.69	-2.32	-2.32	166208	46.609	
Ethylbenzene	16.42	-6.05	-6.05	136588	47.819	
m+p-Xylenes	16.65	-6.28	-6.28	329633	88.518	
o-Xylene	17.30	-6.94	-6.93	140562	45.999	
124-Trimethylbenzene	19.11	19.11	19.11	1122	< 4.000	U
Naphthalene	21.66	-11.31	-11.29	103190	45.991	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.37	100.000	102.910	103	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\PE2\1111QE2.24R Date printed=11-11-2002 Time= 02:01:43
Sample Name=B02110370-011EMSD, BQC ;1111QE2 , $HC-BTEX-8021-W,,(1,2)
1.5 to 25.0 min. Low Y=1.369 High Y=36.369 mv Span=35.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-011EMSD, BQC ;1111QE2 , $HC-BTEX-8021-W,,(1,2)
Area File: G:\ORG\PE2\1111QE2.24A
Date & Time Collected: Nov 11, 2002 02:01:37
Method File: G:\ORG\PE2\40P202.MET
Calibration File: G:\ORG\PE2\40MAQ02.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

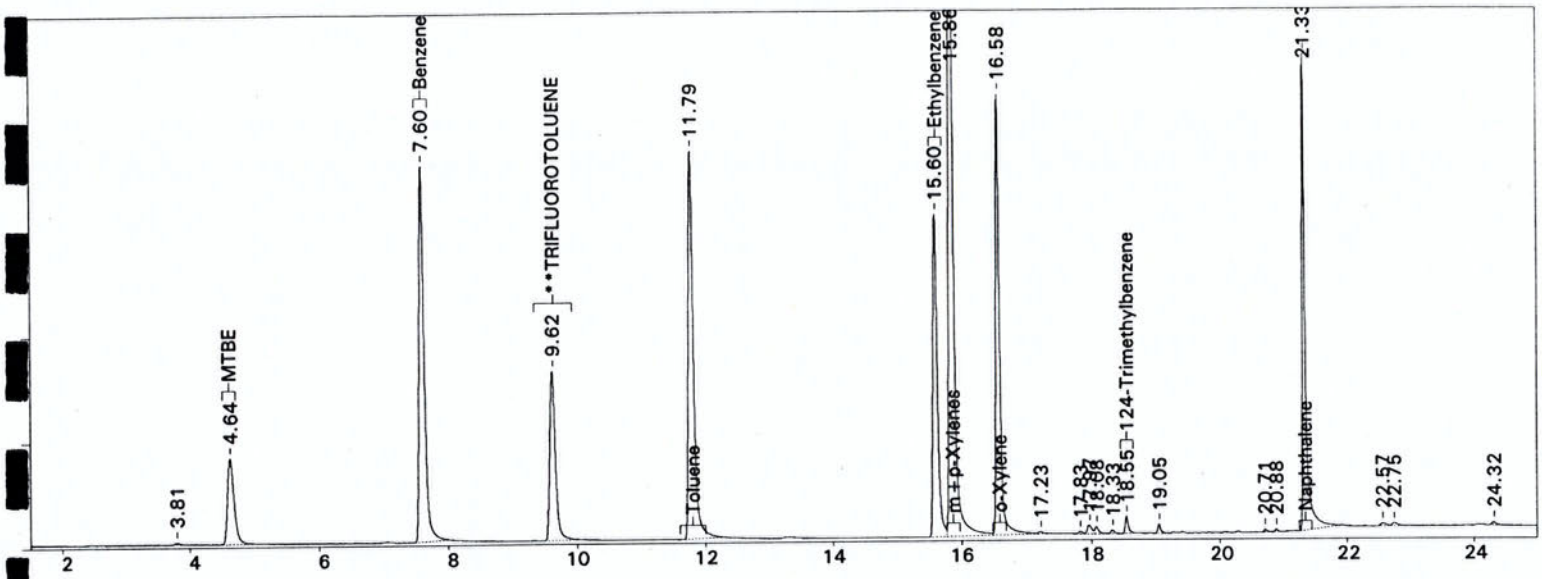
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.49	5.87	5.86	63059	53.822	
Benzene	8.08	2.28	2.27	308842	81.640	
Toluene	12.67	-2.32	-2.32	161303	45.234	
Ethylbenzene	16.41	-6.05	-6.06	136356	47.737	
m+p-Xylenes	16.64	-6.28	-6.29	328202	88.133	
o-Xylene	17.29	-6.94	-6.94	140503	45.979	
124-Trimethylbenzene	19.11	19.11	19.11	719	< 4.000	U
Naphthalene	21.66	-11.31	-11.31	109554	48.828	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**Trifluorotoluene	10.35	100.000	101.699	102	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

ile=G:\ORG\VA2\1112WA2.14R Date printed=11-13-2002 Time= 09:59:22
ample Name=B02110370-020EMS, BQC ;1112WA2 , $HC-BTEX-8021-W,,(1,50)
1.5 to 25.0 min. Low Y=0.537 High Y=8.537 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-020EMS, BQC ;1112WA2 , $HC-BTEX-8021-W,,(1,50)
Area File: G:\ORG\VA2\1112WA2.14A
Date & Time Collected: Nov 11, 2002 19:49:29
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 50 S.A.: 50

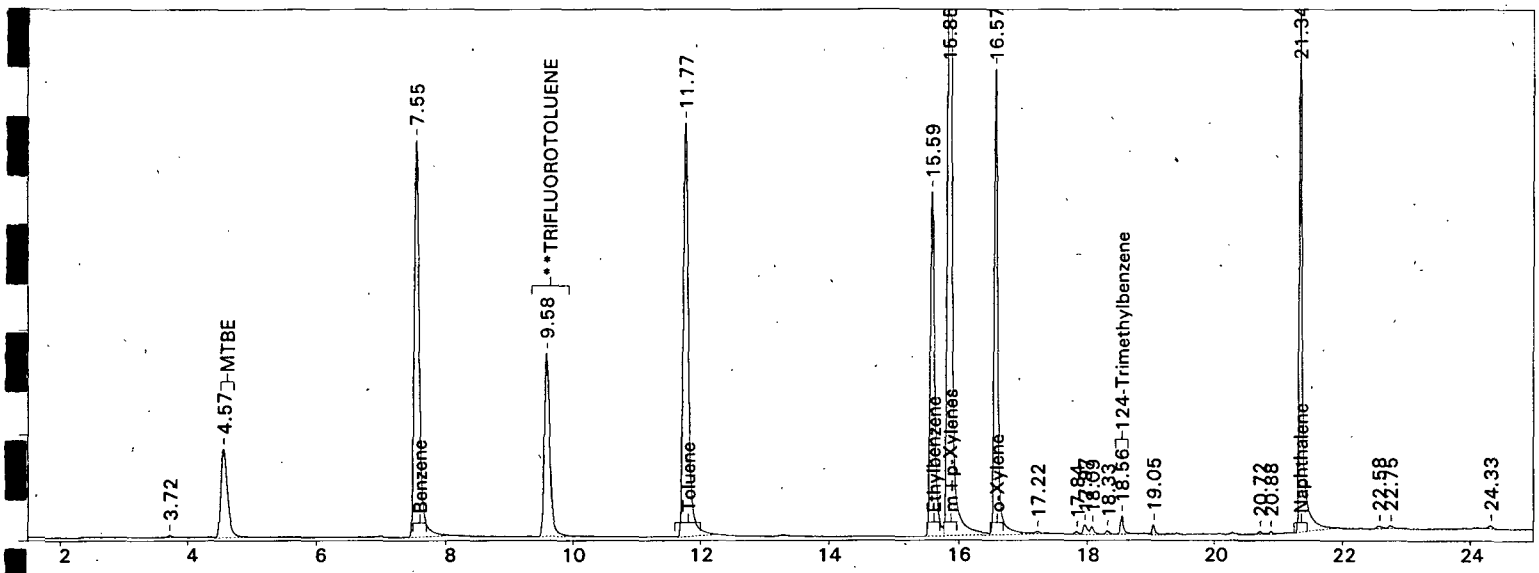
Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.64	5.01	4.98	9044	1176.682	
Benzene	7.60	2.03	2.02	30658	1568.204	
Toluene	11.79	-2.17	-2.17	33595	1841.083	
Ethylbenzene	15.60	-5.98	-5.98	22917	1251.687	
m+p-Xylenes	15.86	-6.24	-6.24	56990	2724.415	
o-Xylene	16.58	-6.96	-6.96	26596	1281.135	
124-Trimethylbenzene	18.55	18.55	18.55	905	<100.000	U
Naphthalene	21.33	-11.71	-11.71	24547	1159.210	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.62	2500.000	2250.237	90	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

File=G:\ORG\VA2\1112WA2.15R Date printed=11-13-2002 Time= 09:59:33
Sample Name=B02110370-020EMSD, BQC ;1112WA2 , $HC-BTEX-8021-W,,(1,50)
1.5 to 25.0 min. Low Y=0.537 High Y=8.537 mv Span=8.0



ENERGY LABORATORIES, INC.----TARGET COMPOUND CHROMATOGRAM
Sample Name: B02110370-020EMSD, BQC ;1112WA2 , $HC-BTEX-8021-W,,(1,50)
Area File: G:\ORG\VA2\1112WA2.15A
Date & Time Collected: Nov 11, 2002 20:22:42
Method File: G:\ORG\VA2\31W202.MET
Calibration File: G:\ORG\VA2\31MAS02.CAL
Sample Weight: 5 Dilution: 50 S.A.: 50

Target Analytes:

COMPOUND	RT	Cal RRT	RRT	Area	Amount	Flag
MTBE	4.57	5.01	5.02	9478	1233.058	
Benzene	7.55	2.03	2.03	33091	1692.643	
Toluene	11.77	-2.17	-2.18	36035	1974.798	
Ethylbenzene	15.59	-5.98	-6.01	24571	1342.030	
m+p-Xylenes	15.85	-6.24	-6.27	60642	2898.992	
o-Xylene	16.57	-6.96	-6.99	28181	1357.477	
124-Trimethylbenzene	18.56	18.56	18.56	964	<100.000	U
Naphthalene	21.34	-11.71	-11.75	26928	1271.630	

SURROGATE CMPND	RT	ACTUAL	MEASURED	%RECOVERY	
**TRIFLUOROTOLUENE	9.58	2500.000	2445.286	98	80-120

Energy Laboratories Inc

Sample Receipt Checklist

Client Name **HKM-ENGNRNG-INC-BLLNG** Date and Time Received: **11/7/2002**

Work Order Number **B02110370** Received by rln

Checklist completed b Signature 11/07/02 Date Reviewed by Initials Date

Carrier name Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	4 °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Adjusted? _____ Checked by JB

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments:

Corrective Action _____

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: HKM Engineering	Project Name, PWS #, Permit #, Etc.: Pioneer Natural Resources USA, Inc Biere Well Site
Report Address: P.O. Box 31318 Billings, MT 59107	Contact Name, Phone, Fax, E-mail: Charlie Peterson 656-6399 — Sampler Name if other than Contact: CC: Chuck Feast
Invoice Address: Same	Invoice Contact & Phone #: Same — Purchase Order #: — ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Number of Containers — Sample Type: A W S V U O — Air Water Soils/Solids Vegetation Urine Other

ANALYSIS REQUESTED

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Receipt Temp 4 °C
Cooler ID(s) _____
Custody Seal Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	BTEX	TPHby 418.1	Nitrogen (Nitrate + Nitrite)	Ammonia, pH, SC, Na,	TDS, Cl, Ca, K, Alk,	CO3, Mg, HCO3,	Hardness, Total Silica, Dissolved	Sulfate	Flouride	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments:	Lab ID
1	USGS-12	11-5-02	12:00	7W											X			B02110370-001
2	PNR-19	11-5-02	13:17	7W													Cooler #1	002
3	PNR-16	11-5-02	14:04	7W														003
4	Trip Blank #1			1W	X													031
5	PNR-6	11-5-02	11:25	7W														004
6	PNR-29	11-5-02	12:42	7W													Cooler #2	005
7	PNR-28	11-5-02	13:20	7W														006
8	Trip Blank #2				X													032
9																		
10																		

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by: [signature]	Date/Time: 11-7-02 13:40	Shipped by:	Received by: [signature] Date/Time: 11-7-02 13:45
Relinquished by: [signature]	Date/Time: 11-7-02 14:02	Shipped by: Hand Delivered	Received by: Randa Rees 11/07/02 @ 1402 Date/Time:

Sample Disposal: Return to client: _____ Lab Disposal: X

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Visit our web site at ***www.energylab.com*** for additional information, downloadable fee schedule, forms, & links.

Contact us through one of our five branches or through our web site *www.energylab.com*

BILLINGS, MT	Toll Free	800.735.4489
1120 South 27th (59101)	Voice	406.252.6325
PO Box 30916 (59107)	Fax	406.252.6069
CASPER, WY	Toll Free	888.235.0515
2393 Salt Creek Highway (82601)	Voice	307.235.0515
PO Box 3258 (82602)	Fax	307.234.1639
GILLETTE, WY	Toll Free	866.686.7175
1105 West First Street (82716)	Voice	307.686.7175
	Fax	307.682.4625
HELENA, MT	Toll Free	877.472.0711
2704 Billings Avenue (59601)	Voice	406.442.0711
PO Box 5688 (59604)	Fax	406.442.0712
RAPID CITY, SD	Toll Free	888.672.1225
2821 Plant Street (57702)	Voice	605.342.1225
	Fax	605.342.1397

1. Please complete the Chain of Custody with as much detailed information as possible. This information is required so that the appropriate analytical services, reporting and invoicing can be provided for your project.

2. If services other than standard are required for your analytical project, contact ELI *PRIOR* to sample submittal. Additional charges will be applied for the following services: RUSH TAT, NELAC, A2LA, or Level IV reporting, EDD/EDT, etc.

3. ELI provides quotes for project specific sampling requirements that may include, but are not limited to, non-standard reporting limits, odd matrices, RUSH TAT and specific method requests. It is very important to provide the ELI quote number to assure that you receive the quoted pricing for your project.

4. Basic Aqueous Sampling Instructions: Analytical services include preserved and unpreserved sample bottles, preservatives, and shipping containers at no additional cost. In certain cases, additional charges will be made for special sampling containers (i.e. Tedlar or equivalent bags, 3M or equivalent passive monitors). Preservatives are contained in small vials with color-coded caps and labels that correspond to the table below.

Preservative	Cap Color	Label Color
Hydrochloric Acid	Blue	Blue
Nitric Acid	Red	Fluorescent Red
Non-Preserved (raw)	None	White w/ Red Print
Phosphoric Acid	White	White w/ Black Print
Sodium Hydroxide	Green	Fluorescent Green w/ Black Print
Sulfuric Acid	Yellow	Fluorescent Yellow
Zinc Acetate	Purple	Fluorescent Green w/ Black Print

Fill container with sample and empty contents of preservative vial into container or as instructed. If sample containers are pre-preserved, **DO NOT FLUSH or RINSE PRESERVATIVE**. Secure lid and invert slowly to mix.

If you are uncertain of the preservative or preparation required for your sampling project, please contact an ELI representative for instructions.

Proper cooling for specific sample matrices is required. ELI provides resealable bags for crushed ice to be packed around the sample(s). Blue ice or equivalent does not maintain the required 4ºC temperature. Samples should be securely packed in the shipping containers provided.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page 2 of ___

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: ABC Corporation	Project Name, PWS #, Permit #, Etc.: Rockport Reclamation Project
Report Address: 1234 Main St. Anywhere, MT 59101	Contact Name, Phone, Fax, E-mail: John Smith 605-444-1234 anyone@email.com — Sampler Name if other than Contact: SAME
Invoice Address: P.O. Box 222 City, ST 11111	Invoice Contact & Phone #: Jane Doe 406-555-1212 — Purchase Order #: A98765 — ELI Quote #: H01-172

Report Required For: POTW/WWTP ☐ DW ☐ Other Internal use

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other ____
EDD/EDT ☐ Format ____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments: Spoke to Joe RE: Rush TAT

Receipt Temp ____ °C
Cooler ID(s)
Custody Seal Y N
Intact Y N
Signature Match Y N

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Sample Type: A W S V U O; Air Water Solid/Solids Vegetation Urine Other)	Number of Containers	Mercury	VOCs 8260	TOX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Lab ID
1	MW-1	08/01/01	13:10	3-W		x	x	x								x	
2	Soil From Pad	08/02/01	09:47	1-S										x		x	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

LABORATORY USE ONLY

Custody Record MUST be Signed	Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
	John Smith	08/09/01 14:15	Hand Deliver	Mary Cook	08/09/01 14:15
	Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:

Sample Disposal: Return to client: ____ Lab Disposal: ____

LABORATORY USE ONLY
Sample Type: ____ # of fractions ____

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

5. Sample Disposal: ELI, when applicable, will dispose of all non-hazardous samples. Routinely, hazardous samples will be returned to client. If requested, ELI will dispose of hazardous samples at client's expense.

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: HKM Engineering

Project Name, PWS #, Permit #, Etc.: Pioneer Natural Resources, USA, Biere Well, Poplar, MT

Report Address: PO Box 31318, Billings, MT 59107

Contact Name, Phone, Fax, E-mail: Charlie Peterson 656-6399 cc: Chuck Feist

Sampler Name if other than Contact:

Invoice Address: Same

Invoice Contact & Phone #: Same

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

ANALYSIS REQUESTED: See page #1

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Receipt Temp _____ °C
Cooler ID(s) _____
Custody Seal Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V U O / Air Water Soils/Solids Vegetation Urine Other / MATRIX	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	Lab ID (LABORATORY USE ONLY)
	(b) (6) [redacted]	11-5-02	14:20	7W		X		Cooler #3	007
2	PNR-8	11-5-02	15:25	7W					008
3	PNR-13	11-5-02	15:30	7W					009
4	Trip Blank #3			1W	X				033
5	PNR-9	11-5-02	14:05	7W				Cooler #4	010
6	PNR-7	11-5-02	14:50	7W					011
7	PNR-21	11-5-02	15:30	7W					012
8	PNR-20	11-5-02	16:05	7W					013
9	USGS-93-3	11-5-02	16:10	7W					014
10	Trip Blank #4			1W	X				034

Custody Record MUST be Signed

Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
[signature]	11/7/02 13:40		[signature]	11-7-02 13:45
[signature]	11-7-02 14:02	Hand Deliver	[signature]	11/07/02 @ 1402

Sample Disposal: Return to client: _____ Lab Disposal: _____

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Contact us through one of our five branches or through our web site *www.energylab.com*

BILLINGS, MT	Toll Free	800.735.4489
1120 South 27th (59101)	Voice	406.252.6325
PO Box 30916 (59107)	Fax	406.252.6069
CASPER, WY	Toll Free	888.235.0515
2393 Salt Creek Highway (82601)	Voice	307.235.0515
PO Box 3258 (82602)	Fax	307.234.1639
GILLETTE, WY	Toll Free	866.686.7175
1105 West First Street (82716)	Voice	307.686.7175
	Fax	307.682.4625
HELENA, MT	Toll Free	877.472.0711
2704 Billings Avenue (59601)	Voice	406.442.0711
PO Box 5688 (59604)	Fax	406.442.0712
RAPID CITY, SD	Toll Free	888.672.1225
2821 Plant Street (57702)	Voice	605.342.1225
	Fax	605.342.1397

1. Please complete the Chain of Custody with as much detailed information as possible. This information is required so that the appropriate analytical services, reporting and invoicing can be provided for your project.

2. If services other than standard are required for your analytical project, contact ELI *PRIOR* to sample submittal. Additional charges will be applied for the following services: RUSH TAT, NELAC, A2LA, or Level IV reporting, EDD/EDT, etc.

3. ELI provides quotes for project specific sampling requirements that may include, but are not limited to, non-standard reporting limits, odd matrices, RUSH TAT and specific method requests. It is very important to provide the ELI quote number to assure that you receive the quoted pricing for your project.

4. Basic Aqueous Sampling Instructions: Analytical services include preserved and unpreserved sample bottles, preservatives, and shipping containers at no additional cost. In certain cases, additional charges will be made for special sampling containers (i.e. Tedlar or equivalent bags, 3M or equivalent passive monitors). Preservatives are contained in small vials with color-coded caps and labels that correspond to the table below.

Preservative	Cap Color	Label Color
Hydrochloric Acid	Blue	Blue
Nitric Acid	Red	Fluorescent Red
Non-Preserved (raw)	None	White w/ Red Print
Phosphoric Acid	White	White w/ Black Print
Sodium Hydroxide	Green	Fluorescent Green w/ Black Print
Sulfuric Acid	Yellow	Fluorescent Yellow
Zinc Acetate	Purple	Fluorescent Green w/ Black Print

Fill container with sample and empty contents of preservative vial into container or as instructed. If sample containers are pre-preserved, **DO NOT FLUSH or RINSE PRESERVATIVE**. Secure lid and invert slowly to mix.

If you are uncertain of the preservative or preparation required for your sampling project, please contact an ELI representative for instructions.

Proper cooling for specific sample matrices is required. ELI provides resealable bags for crushed ice to be packed around the sample(s). Blue ice or equivalent does not maintain the required 4ºC temperature. Samples should be securely packed in the shipping containers provided.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page ___ of ___

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: ABC Corporation	Project Name, PWS #, Permit #, Etc.: Rockport Reclamation Project
Report Address: 1234 Main St. Anywhere, MT 59101	Contact Name, Phone, Fax, E-mail: John Smith 605-444-1234 anyone@email.com — Sampler Name if other than Contact: SAME
Invoice Address: P.O. Box 222 City, ST 11111	Invoice Contact & Phone #: Jane Doe 406-555-1212 — Purchase Order #: A98765 — ELI Quote #: H01-172

Report Required For: POTW/WWTP ☐ DW ☐ Other Internal use

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other ____
EDD/EDT ☐ Format ____

ANALYSIS REQUESTED

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments: Spoke to Joe RE: Rush TAT

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers / Sample Type: A W S V U O / Air Water Solids/Solids Vegetation Urine Other / MATRIX	Mercury	VOCs 8260	TOX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)
MW-1	08/01/01	13:10	3-W	X	X	X								X
2 Soil From Pad	08/02/01	09:47	1-S									X		X
3														
4														
5														
6														
7														
8														
9														
10														

Receipt Temp ____ °C
Cooler ID(s) ____
Custody Seal Y N
Intact Y N
Signature Match Y N
Lab ID

LABORATORY USE ONLY

Custody Record MUST be Signed			
Relinquished by: John Smith — Date/Time: 08/09/01 14:15	Shipped by: Hand Deliver	Received by: Mary Cook — Date/Time: 08/09/01 14:15	
Relinquished by: — Date/Time:	Shipped by:	Received by: — Date/Time:	
Sample Disposal: Return to client: ____ Lab Disposal: ____		LABORATORY USE ONLY Sample Type: ____ # of fractions ____	

Visit our web site at ***www.energylab.com*** for additional information, downloadable fee schedule, forms, & links.

5. Sample Disposal: ELI, when applicable, will dispose of all non-hazardous samples. Routinely, hazardous samples will be returned to client. If requested, ELI will dispose of hazardous samples at client's expense.

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: HKM Eng

Project Name, PWS #, Permit #, Etc.: Pioneer Natural Resources, USA, Bierce Well, Poplar, MT

Report Address: P.O. Box 31318, Billings, MT 59107

Contact Name, Phone, Fax, E-mail: Charlie Peterson, cc: Chuck Forest

Sampler Name if other than Contact:

Invoice Address: Same

Invoice Contact & Phone #: Same

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other_____
EDD/EDT ☐ Format_____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Receipt Temp _____ ° C
Cooler ID(s) _____
Custody Seal Y N
Intact Y N
Signature Match Y N

Number of Containers / Sample Type: A W S V U O / Air Water Soils/Solids Vegetation Urine Other

See page #1

SEE ATTACHED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX											Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	Lab ID
1	PNR-10	11-5-02	13:30	TW											X		Cooler #5	015
2	PNR-12	11-5-02	11:15	TW														016
3	PNR-18	11-5-02	11:55	TW														017
4	PNR-22	11-5-02	12:50	TW														018
5	Trip Blank # 5			IW	X													035
6	PNR-5	11-6-02	11:10	TW													Cooler #6	019
7	PNR-23	11-6-02	12:15	TW														020
8	PNR-24	11-6-02	12:32	TW														021
9	Trip Blank #6			IW	X													036
10																		

Custody Record MUST be Signed

Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
[signature]	11/7/02 13:40		[signature]	11-7-02 13:45
[signature]	11/7/02 14:02	Hand Delivered	[signature]	11/07/02 @1402

Sample Disposal: Return to client: _____ Lab Disposal: X

LABORATORY USE ONLY
Sample Type:_____ # of fractions _____

Contact us through one of our five branches or through our web site *www.energylab.com*

BILLINGS, MT	Toll Free	800.735.4489
1120 South 27th (59101)	Voice	406.252.6325
PO Box 30916 (59107)	Fax	406.252.6069
CASPER, WY	Toll Free	888.235.0515
2393 Salt Creek Highway (82601)	Voice	307.235.0515
PO Box 3258 (82602)	Fax	307.234.1639
GILLETTE, WY	Toll Free	866.686.7175
1105 West First Street (82716)	Voice	307.686.7175
	Fax	307.682.4625
HELENA, MT	Toll Free	877.472.0711
2704 Billings Avenue (59601)	Voice	406.442.0711
PO Box 5688 (59604)	Fax	406.442.0712
RAPID CITY, SD	Toll Free	888.672.1225
2821 Plant St. (57702)	Voice	605.342.1225
	Fax	605.342.1397

1. Please complete the Chain of Custody with as much detailed information as possible. This information is required so that the appropriate analytical services, reporting and invoicing can be provided for your project.

2. If services other than standard are required for your analytical project, contact ELI *PRIOR* to sample submittal. Additional charges will be applied for the following services: RUSH TAT, NELAC, A2LA, or Level IV reporting, EDD/EDT, etc.

3. ELI provides quotes for project specific sampling requirements that may include, but are not limited to, non-standard reporting limits, odd matrices, RUSH TAT and specific method requests. It is very important to provide the ELI quote number to assure that you receive the quoted pricing for your project.

4. Basic Aqueous Sampling Instructions: Analytical services include preserved and unpreserved sample bottles, preservatives, and shipping containers at no additional cost. In certain cases, additional charges will be made for special sampling containers (i.e. Tedlar or equivalent bags, 3M or equivalent passive monitors). Preservatives are contained in small vials with color-coded caps and labels that correspond to the table below.

Preservative	Cap Color	Label Color
Hydrochloric Acid	Blue	Blue
Nitric Acid	Red	Fluorescent Red
Non-Preserved (raw)	None	White w/ Red Print
Phosphoric Acid	White	White w/ Black Print
Sodium Hydroxide	Green	Fluorescent Green w/ Black Print
Sulfuric Acid	Yellow	Fluorescent Yellow
Zinc Acetate	Purple	Fluorescent Green w/ Black Print

Fill container with sample and empty contents of preservative vial into container or as instructed. If sample containers are pre-preserved, **DO NOT FLUSH or RINSE PRESERVATIVE**. Secure lid and invert slowly to mix.

If you are uncertain of the preservative or preparation required for your sampling project, please contact an ELI representative for instructions.

Proper cooling for specific sample matrices is required. ELI provides resealable bags for crushed ice to be packed around the sample(s). Blue ice or equivalent does not maintain the required 4°C temperature. Samples should be securely packed in the shipping containers provided.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page ____ of ____

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: ABC Corporation	Project Name, PWS #, Permit #, Etc.: Rockport Reclamation Project
Report Address: 1234 Main St. Anywhere, MT 59101	Contact Name, Phone, Fax, E-mail: John Smith 605-444-1234 anyone@email.com — Sampler Name if other than Contact: SAME
Invoice Address: P.O. Box 222 City, ST 11111	Invoice Contact & Phone #: Jane Doe 406-555-1212 — Purchase Order #: A98765 — ELI Quote #: H01-172

Report Required For: POTW/WWTP ☐ DW ☐ Other Internal use

Special Report Formats -- ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other ____
EDD/EDT ☐ Format ____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments: Spoke to Joe RE: Rush TAT

Receipt Temp ____ °C
Cooler ID(s) ____
Custody Seal Y N
Intact Y N
Signature Match Y N

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Sample Type: A W S V U O; Air Water Soil/Solids Vegetation Liquid Other)	Mercury	VOCs 8260	TOX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Lab ID
1 MW-1	08/01/01	13:10	3-W	x	x	x							x		
2 Soil From Pad	08/02/01	09:47	1-S									x		x	
3															
4															
5															
6															
7															
8															
9															
10															

LABORATORY USE ONLY

Example

Custody Record MUST be Signed

Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
John Smith	08/09/01 14:15	Hand Deliver	Mary Cook	08/09/01 14:15

Sample Disposal: Return to client: ____ Lab Disposal: ____

LABORATORY USE ONLY
Sample Type: ____ # of fractions ____

Visit our web site at ***www.energylab.com*** for additional information, downloadable fee schedule, forms, & links.

5. Sample Disposal: ELI, when applicable, will dispose of all non-hazardous samples. Routinely, hazardous samples will be returned to client. If requested, ELI will dispose of hazardous samples at client's expense.

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: HKM Eng	Project Name, PWS #, Permit #, Etc.: Pioneer Natural Resources, USA, Biere Well Poplar, MT
Report Address: P.O. Box 31318 Billings, MT 59107	Contact Name, Phone, Fax, E-mail: Charlie Peterson cc: Chuck Feast — Sampler Name if other than Contact:
Invoice Address: Same	Invoice Contact & Phone #: Same — Purchase Order #: — ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Number of Containers — Sample Type: A W S V U O — Air Water Soils/Solids Vegetation Urine Other

See page #1

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Receipt Temp _____ °C
Cooler ID(s) _____
Custody Seal Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments:	Lab ID
1	M-27	11-6-02	9:00	7W		X		Cooler #7	022
2	PNR-27	11-6-02	9:55	7W					023
3	M-31	11-6-02	10:35	7W					024
4	M-28	11-6-02	11:20	7W					025
5	Trip Blank #7			1W	X				037
6									
7									
8									
9									
10									

Custody Record MUST be Signed

Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
[signature]	11/7/02 13:40		[signature]	11-7-02 13:45
[signature]	11/7/02 14:02	Hand Delivered	[signature]	11/07/02 @ 1402

Sample Disposal: Return to client: _____ Lab Disposal: _____

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Visit our web site at ***www.energylab.com*** for additional information, downloadable fee schedule, forms, & links.

Contact us through one of our five branches or through our web site *www.energylab.com*

BILLINGS, MT	Toll Free	800.735.4489
1120 South 27th (59101)	Voice	406.252.6325
PO Box 30916 (59107)	Fax	406.252.6069
CASPER, WY	Toll Free	888.235.0515
2393 Salt Creek Highway (82601)	Voice	307.235.0515
PO Box 3258 (82602)	Fax	307.234.1639
GILLETTE, WY	Toll Free	866.686.7175
1105 West First Street (82716)	Voice	307.686.7175
	Fax	307.682.4625
HELENA, MT	Toll Free	877.472.0711
2704 Billings Avenue (59601)	Voice	406.442.0711
PO Box 5688 (59604)	Fax	406.442.0712
RAPID CITY, SD	Toll Free	888.672.1225
2821 Plant St. (57702)	Voice	605.342.1225
	Fax	605.342.1397

1. Please complete the Chain of Custody with as much detailed information as possible. This information is required so that the appropriate analytical services, reporting and invoicing can be provided for your project.

2. If services other than standard are required for your analytical project, contact ELI *PRIOR* to sample submittal. Additional charges will be applied for the following services: RUSH TAT, NELAC, A2LA, or Level IV reporting, EDD/EDT, etc.

3. ELI provides quotes for project specific sampling requirements that may include, but are not limited to, non-standard reporting limits, odd matrices, RUSH TAT and specific method requests. It is very important to provide the ELI quote number to assure that you receive the quoted pricing for your project.

4. Basic Aqueous Sampling Instructions: Analytical services include preserved and unpreserved sample bottles, preservatives, and shipping containers at no additional cost. In certain cases, additional charges will be made for special sampling containers (i.e. Tedlar or equivalent bags, 3M or equivalent passive monitors). Preservatives are contained in small vials with color-coded caps and labels that correspond to the table below.

Preservative	Cap Color	Label Color
Hydrochloric Acid	Blue	Blue
Nitric Acid	Red	Fluorescent Red
Non-Preserved (raw)	None	White w/ Red Print
Phosphoric Acid	White	White w/ Black Print
Sodium Hydroxide	Green	Fluorescent Green w/ Black Print
Sulfuric Acid	Yellow	Fluorescent Yellow
Zinc Acetate	Purple	Fluorescent Green w/ Black Print

Fill container with sample and empty contents of preservative vial into container or as instructed. If sample containers are pre-preserved, **DO NOT FLUSH or RINSE PRESERVATIVE**. Secure lid and invert slowly to mix.

If you are uncertain of the preservative or preparation required for your sampling project, please contact an ELI representative for instructions.

Proper cooling for specific sample matrices is required. ELI provides resealable bags for crushed ice to be packed around the sample(s). Blue ice or equivalent does not maintain the required 4°C temperature. Samples should be securely packed in the shipping containers provided.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page ____ of ____

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: ABC Corporation	Project Name, PWS #, Permit #, Etc.: Rockport Reclamation Project
Report Address: 1234 Main St. Anywhere, MT 59101	Contact Name, Phone, Fax, E-mail: John Smith 605-444-1234 anyone@email.com — Sampler Name if other than Contact: SAME
Invoice Address: P.O. Box 222 City, ST 11111	Invoice Contact & Phone #: Jane Doe 406-555-1212 — Purchase Order #: A98765 — ELI Quote #: H01-172

Report Required For: POTW/WWTP ☐ DW ☐ Other Internal use

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other
EDD/EDT ☐ Format

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments: Spoke to Joe RE: Rush TAT

Receipt Temp ____ °C
Cooler ID(s)
Custody Seal Y N
Intact Y N
Signature Match Y N

ANALYSIS REQUESTED

Lab ID	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Sample Type: A W S V U O; Air Water Biosolids/Soils Vegetation Liquid Other)	Mercury	VOCs 8260	TOX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)
1	MW-1	08/01/01	13:10	3-W	x	x	x							x	
2	Soil From Pad	08/02/01	09:47	1-S									x		x
3															
4															
5															
6															
7															
8															
9															
10															

LABORATORY USE ONLY

Example

Custody Record MUST be Signed	Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
	John Smith	08/09/01 14:15	Hand Deliver	Mary Cook	08/09/01 14:15
	Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:

Sample Disposal: Return to client: ____ Lab Disposal: ____

LABORATORY USE ONLY
Sample Type: ____ # of fractions ____

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

5. Sample Disposal: ELI, when applicable, will dispose of all non-hazardous samples. Routinely, hazardous samples will be returned to client. If requested, ELI will dispose of hazardous samples at client's expense.

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: HKM Eng.

Project Name, PWS #, Permit #, Etc.: Pioneer Natural Resources USA, Inc. Bierelwell Site

Report Address: P.O. Box 31318, Billings, MT 59107

Contact Name, Phone, Fax, E-mail: Charlie Peterson 656-6399 cc: Chuck Forest

Sampler Name if other than Contact:

Invoice Address: Same

Invoice Contact & Phone #: Same

Purchase Order #:

ELI Quote #:

Report Required For: POTW/WWTP ☐ DW ☐ Other _____

Special Report Formats – ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Receipt Temp _____ ° C
Cooler ID(s) _____
Custody Seal Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V U O; Air Water Solids/Solids Vegetation Urine Other)	See page #1	SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	Lab ID
1	PNR-25	11-6-02	14:55	7W					Cooler #8	026
2	PNR-26	11-6-02	16:20	7W						027
3	PNR-15	11-6-02	14:35	7W						028
4	PNR-14	11-6-02	11:28	7W						029
5	PNR-17	11-6-02	15:40	7W						030
6	Trip Blank #8			~~3~~ 1W						038
7										
8										
9										
10										

Custody Record MUST be Signed

Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
[signature]	11-7-02 13:40		[signature]	11-7-02 13:45
[signature]	11-7-02 14:02	Hand Delivered	[signature]	11/07/02 @ 1402

Sample Disposal: Return to client: _____ Lab Disposal: _____

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Visit our web site at ***www.energylab.com*** for additional information, downloadable fee schedule, forms, & links.

Contact us through one of our five branches or through our web site *www.energylab.com*

BILLINGS, MT	Toll Free	800.735.4489
1120 South 27th (59101)	Voice	406.252.6325
PO Box 30916 (59107)	Fax	406.252.6069
CASPER, WY	Toll Free	888.235.0515
2393 Salt Creek Highway (82601)	Voice	307.235.0515
PO Box 3258 (82602)	Fax	307.234.1639
GILLETTE, WY	Toll Free	866.686.7175
1105 West First Street (82716)	Voice	307.686.7175
	Fax	307.682.4625
HELENA, MT	Toll Free	877.472.0711
2704 Billings Avenue (59601)	Voice	406.442.0711
PO Box 5688 (59604)	Fax	406.442.0712
RAPID CITY, SD	Toll Free	888.672.1225
2821 Plant St. (57702)	Voice	605.342.1225
	Fax	605.342.1397

1. Please complete the Chain of Custody with as much detailed information as possible. This information is required so that the appropriate analytical services, reporting and invoicing can be provided for your project.

2. If services other than standard are required for your analytical project, contact ELI *PRIOR* to sample submittal. Additional charges will be applied for the following services: RUSH TAT, NELAC, A2LA, or Level IV reporting, EDD/EDT, etc.

3. ELI provides quotes for project specific sampling requirements that may include, but are not limited to, non-standard reporting limits, odd matrices, RUSH TAT and specific method requests. It is very important to provide the ELI quote number to assure that you receive the quoted pricing for your project.

4. Basic Aqueous Sampling Instructions: Analytical services include preserved and unpreserved sample bottles, preservatives, and shipping containers at no additional cost. In certain cases, additional charges will be made for special sampling containers (i.e. Tedlar or equivalent bags, 3M or equivalent passive monitors). Preservatives are contained in small vials with color-coded caps and labels that correspond to the table below.

Preservative	Cap Color	Label Color
Hydrochloric Acid	Blue	Blue
Nitric Acid	Red	Fluorescent Red
Non-Preserved (raw)	None	White w/ Red Print
Phosphoric Acid	White	White w/ Black Print
Sodium Hydroxide	Green	Fluorescent Green w/ Black Print
Sulfuric Acid	Yellow	Fluorescent Yellow
Zinc Acetate	Purple	Fluorescent Green w/ Black Print

Fill container with sample and empty contents of preservative vial into container or as instructed. If sample containers are pre-preserved, **DO NOT FLUSH or RINSE PRESERVATIVE**. Secure lid and invert slowly to mix.

If you are uncertain of the preservative or preparation required for your sampling project, please contact an ELI representative for instructions.

Proper cooling for specific sample matrices is required. ELI provides resealable bags for crushed ice to be packed around the sample(s). Blue ice or equivalent does not maintain the required 4°C temperature. Samples should be securely packed in the shipping containers provided.

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page ____ of ____

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: ABC Corporation

Project Name, PWS #, Permit #, Etc.: Rockport Reclamation Project

Report Address: 1234 Main St. Anywhere, MT 59101

Contact Name, Phone, Fax, E-mail: John Smith anyone@email.com 605-444-1234

Sampler Name if other than Contact: SAME

Invoice Address: P.O. Box 222 City, ST 11111

Invoice Contact & Phone #: Jane Doe 406-555-1212

Purchase Order #: A98765

ELI Quote #: H01-172

Report Required For: POTW/WWTP ☐ DW ☐ Other *Internal use*

Special Report Formats -- ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other
EDD/EDT ☐ Format

ANALYSIS REQUESTED

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments: Spoke to Joe RE: Rush TAT

Receipt Temp ____ °C
Cooler ID(s)
Custody Seal Y N
Intact Y N
Signature Match Y N

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V U O; Air Water Soils/Solids Vegetation Liquid Other)	Mercury	VOCs 8260	TOX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Lab ID
1 MW-1	08/01/01	13:10	3-W	x	x	x							x		
2 Soil From Pad	08/02/01	09:47	1-S										x	x	
3															
4															
5															
6															
7															
8															
9															
10															

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:
John Smith	08/09/01 14:15	Hand Deliver	*Mary Cook*	08/09/01 14:15
Relinquished by:	Date/Time:	Shipped by:	Received by:	Date/Time:

Sample Disposal: Return to client: ____ Lab Disposal: ____

LABORATORY USE ONLY
Sample Type: ____ # of fractions ____

Visit our web site at ***www.energylab.com*** for additional information, downloadable fee schedule, forms, & links.

Example

5. Sample Disposal: ELI, when applicable, will dispose of all non-hazardous samples. Routinely, hazardous samples will be returned to client. If requested, ELI will dispose of hazardous samples at client's expense.

LAND & WATER CONSULTING, INC.

1120 Cedar Street • P.O. Box 8254 • Missoula, Montana 59807 • Tel (406) 721-0354
E-mail info@landandwater.net • Fax (406) 721-0355

January 3, 2005

RECEIVED
JAN 07 2005
ECEJ-TEP

Nathan Wiser
EPA Region 8
999 18th Street, Suite 300
Denver, CO 80202-2456

RE: PUBLIC WATER SUPPLY WELL THREAT STUDY
EAST POPLAR OIL FIELD – ADDENDUM TO THE ANNUAL MONITORING REPORT, DECEMBER 2004

Mr. Wiser,

This Addendum to the Annual Groundwater Monitoring 2004 Report for the East Poplar Oil Field presents the water quality data from monitoring wells LAW-M08 and LAW-M09, installed on November 12, 2004 and November 13, 2004 and sampled on November 13, 2004 and November 30, 2004, respectively. Water quality sampling was completed in fulfillment of requirements specified in US Environmental Protection Agency Region 8 Administrative Order Document No. SDWA-08-2004-0035. Land & Water Consulting, Inc. was retained by Murphy Exploration and Production Company (Murphy), Pioneer Natural Resources USA, Inc. (Pioneer), and Samson Hydrocarbons Company (collectively referred to as "The Companies") to collect the data and prepare this addendum. Well location, construction details and groundwater elevations are presented in the Annual Groundwater Monitoring 2004 Report for the East Poplar Oil Field.

Groundwater samples were analyzed for various inorganic parameters, including benzene, toluene, ethylbenzene and xylenes. Complete groundwater quality data are included as an attachment with this addendum. **Table 1** lists the data for selected parameters. Chloride is used as the indicator analyte in tracking the saline plume. The *Public Water Supply Well Threat Study* report (Land & Water, 2003) estimated the boundaries of moderately impacted (chloride concentration >250 mg/l) and severely impacted (chloride concentration >5,200 mg/l) groundwater. This addendum uses a similar definition for water quality in the study area.

Table 1 ***Water Quality Summary***

Well	Date	Chloride (mg/L)	Solids, Total Dissolved at 180° (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Water Quality Classification
LAW-M08	11/13/04	61	1280	296	495	Non-impacted
LAW-M09	11/30/04	80	1200	326	448	Non-impacted

LAW-M08 had a chloride concentration of 61 mg/L and LAW-M09 had a chloride concentration of 80 mg/L. Both wells are classified as non-impacted. The chloride concentrations in LAW-M08 and LAW-M09 are consistent with those shown on the Extent of Impacted Groundwater map presented in the Annual Groundwater Monitoring 2004 Report (Figure 3). Thus, a new map was not generated.

Please feel free to contact me at (406) 721-0354 or jane.madison@landandwater.net with any questions or comments.

Sincerely,

Jane Madison

Jane Madison
Hydrogeologist
Land & Water Consulting, Inc.

Copy: Sid Campbell, Murphy Exploration and Production Co.
Scott M. DuBoff, Wright & Talisman, P.C.
Wilbur Dover, Pioneer Natural Resources USA Inc.
Marc Skeen, Pioneer Natural Resources USA Inc.
Mark Dalton, Samson Hydrocarbons Company
Elizabeth E. Mack, Locke Liddell & Sapp

LAND & WATER

Groundwater Quality Summary
East Poplar Oil Field
November 2004

Well No.	Date	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U.	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Magnesium mg/l	Lab pH S.U.	Potassium mg/l	Sodium mg/l	Solids, Total Dissolved at 180° C mg/l	Sulfate mg/l	MTBE ug/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	m+p-Xylenes ug/l	o-Xylene ug/l	Xylenes, Total ug/l	Ratios CL/TDS	Ratios SO4/TDS	Ratios SO4/CL
LAW-M01[1]	09/21/02	3.2	10.3	50.5	7.1	675	824	292	<1	26	199	7.4	16	219	2870	1410								0.01	0.49	54.23
LAW-M01	11/16/02					666	813	290	<1	21	200	7.6	14	184	2910	1430	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.49	68.10
LAW-M01	02/26/03	2.9	11.0	51.8		656	800	339	<1	19	222	7	19	213	2850	1340		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.47	70.53
LAW-M01	05/14/03	3.3	9.9	49.8		675	823	324	<1	21	206	7	19	194	2840	1360		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.48	64.76
LAW-M01	08/06/03	3.1	12.2	54.0		658	803	323	<1	15	202	6.8	17	191	2650	1250	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.47	83.33
LAW-M01	11/14/03	3.1	5.6	42.1			818	304	<1	17	195	7.1	18	192	2710	1370	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.51	80.59
LAW-M01	10/13/04	3.0	9.7	49.5	7.0		837	302	<1	21	189	7	19	193	2550	1270	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.50	60.48
LAW-M03	11/16/02					475	580	214	<1	696	132	7.7	8	471	3090	945	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.23	0.31	1.36
LAW-M03	02/25/03	4.2	9.7	49.5		489	597	283	<1	726	174	7.1	9	581	3240	1000		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.22	0.31	1.38
LAW-M03	05/13/03	4.8	10.4	50.7		501	612	283	<1	752	164	7.1	11	526	3340	990		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.23	0.30	1.32
LAW-M03	08/06/03	4.8	11.0	51.8		486	592	296	<1	811	171	6.9	10	519	3330	887	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.24	0.27	1.09
LAW-M03	11/14/03	4.8	9.5	49.1			600	297	<1	900	173	7.1	11	534	3450	1070	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.26	0.31	1.19
LAW-M03	10/13/04	5.4	10.2	50.4	7.2		580	322	<1	988	189	7.1	11	556	3680	1100	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.27	0.30	1.11
LAW-M04	11/16/02					335	409	92	<1	615	62	7.9	6	339	1590	159	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.39	0.10	0.26
LAW-M04	02/25/03	2.6	10.6	51.1		328	400	116	<1	704	79	7.5	8	402	1710	172		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.41	0.10	0.24
LAW-M04	05/13/03	3.0	10.4	50.7		340	415	112	<1	647	71	7.5	8	360	1700	167		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.38	0.10	0.26
LAW-M04	08/06/03	3.1	12.3	54.1		332	406	118	<1	699	76	7.3	8	366	1730	136	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.40	0.08	0.19
LAW-M04	11/14/03	3.0	8.8	47.8			415	116	<1	719	74	7.5	8	363	1720	151	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.42	0.09	0.21
LAW-M04	11/13/04	3.4	10.1	50.2	7.4		401	139	<1	821	88	7.4	10	388	1920	196	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.43	0.10	0.24
LAW-M05	11/17/02					624	761	147	<1	106	91	7.8	7	402	2350	1020	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.43	9.62
LAW-M05	02/26/03	3.2	10.5	50.9		640	780	215	<1	114	146	7.2	8	463	2720	1180		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.04	0.43	10.35
LAW-M05	05/14/03	3.6	10.3	50.5		661	806	214	<1	125	143	6.9	11	435	2740	1240		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.45	9.92
LAW-M05	08/06/03	3.6	12.2	54.0		646	788	223	<1	118	150	7	9	427	2770	1220	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.04	0.44	10.34
LAW-M05	11/13/03	3.6	9.7	49.5			795	225	<1	155	152	7.2	10	430	2890	1360	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.47	8.77
LAW-M05	10/12/04	3.9	10.4	50.7	7.2		772	257	<1	225	174	7.2	11	440	3140	1430	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.46	6.36
LAW-M06	11/17/02					446	544	28	<1	20	15	8.2	4	216	758	172	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.03	0.23	8.60
LAW-M06	02/26/03	1.2	11.4	52.5		430	525	36	<1	53	21	7.7	4	250	790	173		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.22	3.26
LAW-M06	05/14/03	1.3	10.3	50.5		443	541	35	<1	50	19	7.5	5	223	773	170		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.06	0.22	3.40
LAW-M06	08/06/03	1.3	12.0	53.6		435	530	37	<1	56	20	7.5	4	218	786	174	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.22	3.11
LAW-M06	11/13/03	1.3	9.4	48.9			536	35	<1	61	19	7.8	5	211	787	173	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.08	0.22	2.84
LAW-M06	10/12/04	1.5	11.4	52.5	7.5		530	48	<1	91	27	7.7	5	225	890	211	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.10	0.24	2.32
LAW-M07	12/19/02	1.2	8.0	46.4	7.6		546	36	<1	19	21	6.6	4	232	771	214	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.28	11.26
LAW-M07	02/26/03	1.2	8.8	47.8	7.6	439	535	37	<1	15	23	7.7	4	242	782	200		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.26	13.33
LAW-M07	05/14/03	1.2	10.3	50.5	7.6	451	550	35	<1	15	20	7.5	5	211	754	191		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.25	12.73
LAW-M07	08/06/03	1.2	11.9	53.4	7.6	443	540	37	<1	13	21	7.5	4	208	769	204	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.27	15.69
LAW-M07	11/13/03	1.2	7.6	45.7	7.6		551	36	<1	14	21	7.8	5	210	774	205	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.26	14.64
LAW-M07	10/12/04	1.2	8.7	47.7	7.5		547	35	<1	16	20	7.7	5	205	778	200	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.02	0.26	12.50
LAW-M08	11/13/04	1.9	10.2	50.4	7.3		547	77	<1	61	44	7.3	6	296	1280	495	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	0.39	8.11

Groundwater Quality Summary
East Poplar Oil Field
November 2004

Well No.	Date	Field SC mS	Field Temp. °C	Field Temp. °F	Field pH S.U	Alkalinity as $CaCO_3$ mg/l	Bicarbonate mg/l	Calcium mg/l	Carbonate mg/l	Chloride mg/l	Magnesium mg/l	Lab pH S.U.	Potassium mg/l	Sodium mg/l	Solids, Total Dissolved at 180° C mg/l	Sulfate mg/l	MTBE ug/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	m+p-Xylenes ug/l	o-Xylene ug/l	Xylenes, Total ug/l	Ratios CL/TDS	Ratios SO4/TDS	Ratios SO4/CL
LAW-M09	12/02/04	1.9	10.5	50.9	7.5		570	68	<4	80	36	8.0	6	326	1200	448	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.07	0.37	5.60
PNR-27	08/21/01	27.6	10.7	51.3	nm	592	722	1790	<1	10300	1290	7.1	37	2440	21600	2020		<0.50	<0.50	<0.50			<0.50	0.48	0.09	0.20
PNR-27	09/05/01	25.9	12.3	54.1	7.0	594	725	1990	<1	10000	1370	6.8	39	2700	20400	1940		<0.50	<0.50	<0.50			<0.50	0.49	0.10	0.19
PNR-27	11/06/01	28.1	10.0	50.0	7.1	569	694	1960	<1	10900	1400	6.7	40	2840	21200	1750		<0.50	<0.50	<0.50			<1.0	0.51	0.08	0.16
PNR-27	02/20/02	27.5	10.5	50.9	6.7	628	767	1970	<4	11400	1390	6.8	54	3130	21000	1530		<0.50	<0.50	<0.50			<0.50	0.54	0.07	0.13
PNR-27	5/21/02	32.1	13.7	56.7	6.65	589	719	1790	<4	12000	1260	6.8	40	2990	23800	1940		<0.50	<0.50	<0.50			<0.50	0.50	0.08	0.16
PNR-27	8/20/02	29.8	14.5	58.1	6.90	580	708	1900	<4	12600	1210	6.9	32	2850	25600	1850		<0.50	<0.50	<0.50			<0.50	0.49	0.07	0.15
PNR-27	11/6/02	32.7	11.3	52.3	6.84	583	712	2090	<4	11200	1400	6.8	42	3450	24200	1820		0.49 (J)	<0.5	<0.5			<0.5	0.46	0.08	0.16
PNR-27	3/5/03	30.3	10.1	50.2	6.73	567	691	2060	<4	12900	1370	6.6	43	3740	22400	2080		<0.50	<0.50	<0.50			<0.50	0.58	0.09	0.16
PNR-27	5/28/03	25.4	14.4	57.9	6.60	589	718	1990	<1	12200	1330	6.7	57	3640	25500	1620		0.42 (J)	<0.50	<0.50			<0.50	0.48	0.06	0.13
PNR-27	8/13/03	32.7	15.1	59.2	7.50	577	705	1900	<1	13000	1320	6.6	54	3660	24400	1280		0.81	<0.50	<0.50			<0.50	0.53	0.05	0.10
PNR-27	11/5/03	41.7	9.1	48.4	7.43	568	693	1760	<4	13100	1370	6.8	53	3760	23300	1430		0.66	1	<0.50			<0.50	0.56	0.06	0.11
PNR-27	9/15/04	33.9	11.7	53.1	7.65	525	640	1990	<4	13100	1340	6.8	58	4320	27500	1760		1.2	<0.50	<0.50			<0.50	0.48	0.06	0.13
PNR-28	08/21/01	31.4	10.3	50.5	nm	501	612	1910	<1	11700	1460	7.2	39	3090	25200	1480		<0.50	<0.50	<0.50			<0.50	0.46	0.06	0.13
PNR-28	09/05/01	28.4	13.0	55.4	7.0	493	601	2020	<1	12300	1470	6.9	36	3200	22600			<0.50	<0.50	<0.50			<0.50	0.54		
PNR-28	11/06/01	29.7	12.2	54.0	7.1	519	633	1880	<1	10500	1380	6.7	34	3070	24700	1660		<0.50	<0.50	<0.50			<1.0	0.43	0.07	0.16
PNR-28	02/20/02	31.9	10.6	51.1	6.9	522	637	2060	<4	13700	1490	6.8	82	3850	23000	1430		<0.50	<0.50	<0.50			<0.50	0.60	0.06	0.10
PNR-28	5/21/02	38.8	12.4	54.3	6.67	450	549	1990	<4	14700	1430	6.8	43	3910	27400	1820		<0.50	<0.50	<0.50			<0.50	0.54	0.07	0.12
PNR-28	8/20/02	34.2	14.4	57.9	6.80	510	622	2090	<4	15200	1340	6.8	39	3510	31200	1590		<0.50	<0.50	<0.50			<0.50	0.49	0.05	0.10
PNR-28	11/5/02	36.4	10.2	50.4	6.53	516	630	2340	<4	15700	1640	6.8	46	4850	29700	1740		<0.5	<0.5	<0.5			<0.5	0.53	0.06	0.11
PNR-28	3/5/03	36.4	10.2	50.4	6.71	503	614	2260	<4	15700	1480	6.6	45	4930	26700	1880		<0.50	<0.50	<0.50			<0.50	0.59	0.07	0.12
PNR-28	5/28/03	32.8	13.1	55.6	6.53	519	633	2130	<1	15100	1450	6.7	63	4900	30200	1460		<0.50	<0.50	<0.50			<0.50	0.50	0.05	0.10
PNR-28	8/13/03	40.3	14.4	57.9	7.56	517	631	2140	<1	16800	1440	6.5	53	5200	29500	1270		0.51	<0.50	<0.50			<0.50	0.57	0.04	0.08
PNR-28	11/5/03	4.6	9.2	48.6	7.30	484	591	2180	<4	17300	1520	6.9	58	6010	29100	1350		<0.50	<0.50	<0.50			<0.50	0.59	0.05	0.08
PNR-28	9/15/04	42.9	13.5	56.3	6.61	542	661	2230	<4	18300	1490	6.8	62	6490	33700	1630		<0.50	<0.50	<0.50			<0.50	0.54	0.05	0.09
PNR-29	08/21/01	5.1	10.1	50.2	nm	606	740	390	<1	129	290	7.2	14	480	4760	1940		<0.50	<0.50	<0.50			<0.50	0.03	0.41	15.04
PNR-29	09/05/01	4.9	12.8	55.0	7.4	695	847	393	<1	104	291	6.5	11	483	4760			<0.50	<0.50	<0.50			<0.50	0.02		
PNR-29	11/06/01	4.9	11.7	53.0	7.5	691	843	400	<1	99	286	7.1	11	469	4650	1880		<0.50	0.69	<0.50			<1.0	0.02	0.40	18.99
PNR-29	02/20/02	4.8	10.1	50.2	7.0	623	760	399	<4	106	292	6.9	13	501	4640	2070		<0.50	<0.50	<0.50			<0.50	0.02	0.45	19.53
PNR-29	5/21/02	5.4	11.9	53.4	7.00	662	807	359	<4	83	262	7.3	11	449	4640	2080		<0.50	<0.50	<0.50			<0.50	0.02	0.45	25.06
PNR-29	8/20/02	4.3	13.3	55.9	7.00	669	816	376	<4	113	290	7.2	10	431	4780	2030		<0.50	<0.50	<0.50			<0.50	0.02	0.42	17.96
PNR-29	11/5/02	4.9	9.9	49.8	6.93	680	830	403	<4	117	290	7.1	12	469	4770	2070		<0.5	<0.5	<0.5			<0.5	0.02	0.43	17.69
PNR-29	3/5/03	4.8	9.2	48.6	6.66	661	807	410	<4	181	292	7.2	13	550	4730	2060		<0.50	<0.50	<0.50			<0.50	0.04	0.44	11.38
PNR-29	5/28/03	4.4	12.1	53.8	6.87	677	826	418	<1	116	292	7.1	13	489	4790	2030		<0.50	<0.50	<0.50			<0.50	0.02	0.42	17.50
PNR-29	8/13/03	4.0	11.5	52.7	7.48	674	822	404	<1	88	288	7.0	11	460	4800	1920		<0.50	<0.50	<0.50			<0.50	0.02	0.40	21.82
PNR-29	11/4/03	4.6	9.8	49.6	7.11	684	835	362	<4	104	305	7.1	13	482	4760	2120		<0.50	<0.50	<0.50			<0.50	0.02	0.45	20.38
PNR-29	9/15/04	5.0	12.7	54.9	7.00	717	875	441	<4	99	303	7.2	12	468	4780	2040		<0.50	<0.50	5.2			<0.50	0.02	0.43	20.61
Domestic Wells																										
(b) (6)	10/13/04	3.1	13.1	55.6	7.22	988	1200	118	<1	22	132	7.5	9	451	2220	895	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.40	40.68
	10/13/04	2.7	12.6	54.7	7.35	443	540	158	<1	22	91	7.6	6	350	2080	1120	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.54	50.91
	10/14/04	1.5	9.9	49.8	7.66	290	354	60	<1	9	41	7.7	4	196	973	464	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.48	51.56
	10/14/04	1.4	12.8	55.0	7.7	520	634	32	<1	12	26	7.9	6	234	834	207	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.25	17.25
	10/14/04	4.3	10.9	51.6	7.18	969	1180	169	<1	35	383	7.3	6	342	3510	1550		<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.01	0.44	44.29

ANALYTICAL SUMMARY REPORT

Addendum to the Annual Groundwater Monitoring 2004 Report
East Poplar Oil Field

LAND & WATER

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

ANALYTICAL SUMMARY REPORT

November 29, 2004

Jane Madison
Land and Water Consulting
PO Box 8254
Missoula, MT 59807-

Workorder No.: B04110764
Project Name: 110396 Poplar

Energy Laboratories Inc received the following 1 sample from Land and Water Consulting on 11/15/2004 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B04110764-001	110396 LAWM-08	11/13/04 16:00	11/15/04	Aqueous	Metals by ICP/ICPMS, Dissolved Alkalinity Mineral Balance Review Anions by ion chromatography Purgeable Aromatics pH Solids, Total Dissolved

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except if noted in report comments or the Case Narrative.

If you have any questions regarding these tests results, please call.

Report Approved By: _____

RECEIVED
DEC 1 2004
LAND & WATER

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 Poplar
Lab ID: B04110764-001
Client Sample ID: 110396 LAWM-08

Report Date: 11/29/04
Collection Date: 11/13/04 16:00
Date Received: 11/15/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	7.3	s.u.		0.1		E150.1	11/15/04 11:13 / klc
Solids, Total Dissolved TDS @ 180 C	1280	mg/L		10		A2540 C	11/15/04 15:59 / klc
INORGANICS							
Bicarbonate as HCO3	547	mg/L		2		A2320 B	11/18/04 10:29 / klc
Carbonate as CO3	ND	mg/L		1		A2320 B	11/18/04 10:29 / klc
Chloride	61	mg/L		1		E300.0	11/16/04 17:47 / qed
Sulfate	495	mg/L	D	3		E300.0	11/16/04 17:47 / qed
METALS, DISSOLVED							
Calcium	77	mg/L		1		E200.7	11/16/04 14:34 / rlh
Magnesium	44	mg/L		1		E200.7	11/16/04 14:34 / rlh
Potassium	6	mg/L		1		E200.7	11/16/04 14:34 / rlh
Sodium	296	mg/L		1		E200.7	11/16/04 14:34 / rlh
VOLATILE ORGANIC COMPOUNDS							
Methyl tert-butyl ether (MTBE)	ND	ug/L		1.0		SW8021B	11/16/04 18:38 / bjm
Benzene	ND	ug/L		0.50		SW8021B	11/16/04 18:38 / bjm
Toluene	ND	ug/L		0.50		SW8021B	11/16/04 18:38 / bjm
Ethylbenzene	ND	ug/L		0.50		SW8021B	11/16/04 18:38 / bjm
m+p-Xylenes	ND	ug/L		0.50		SW8021B	11/16/04 18:38 / bjm
o-Xylene	ND	ug/L		0.50		SW8021B	11/16/04 18:38 / bjm
Xylenes, Total	ND	ug/L		0.50		SW8021B	11/16/04 18:38 / bjm
Surr: Trifluorotoluene	104	%REC			80-120	SW8021B	11/16/04 18:38 / bjm

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix interference.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 Poplar

Report Date: 11/22/04
Work Order: B04110764

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B								Batch: ALK041118A	
Sample ID: MBLK_041118A	Method Blank							11/18/04 10:14	
Bicarbonate as HCO3	ND	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Sample ID: MBLK_041118A	Method Blank							11/18/04 15:39	
Bicarbonate as HCO3	ND	mg/L	2						
Carbonate as CO3	ND	mg/L	1						
Method: A2540 C								Batch: TDS041115A	
Sample ID: MBLK1	Method Blank							11/15/04 15:53	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LFB1	Sample Matrix Spike							11/15/04 15:54	
Solids, Total Dissolved TDS @ 180 C	1100	mg/L	10	101	80	120			
Sample ID: B04110753-001D MS	Sample Matrix Spike							11/15/04 15:56	
Solids, Total Dissolved TDS @ 180 C	11900	mg/L	10	102	80	120			
Sample ID: B04110753-001D MSD	Sample Matrix Spike Duplicate							11/15/04 15:57	
Solids, Total Dissolved TDS @ 180 C	11900	mg/L	10	101	80	120	0	20	
Sample ID: MBLK2	Method Blank							11/15/04 16:15	
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LFB2	Sample Matrix Spike							11/15/04 16:15	
Solids, Total Dissolved TDS @ 180 C	1100	mg/L	10	99.7	80	120			
Sample ID: B04110770-007A MS	Sample Matrix Spike							11/15/04 16:16	
Solids, Total Dissolved TDS @ 180 C	20300	mg/L	10	114	80	120			
Sample ID: B04110770-007A MSD	Sample Matrix Spike Duplicate							11/15/04 16:16	
Solids, Total Dissolved TDS @ 180 C	20200	mg/L	10	113	80	120	0.1	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 Poplar

Report Date: 11/22/04
Work Order: B04110764

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E150.1								Batch: PHSC041115A	
Sample ID: PHC10607	Laboratory Control Spike							11/15/04 10:51	
pH	6.98	s.u.	0.10	99.7	90	110			
Sample ID: PHC10609	Laboratory Control Spike							11/15/04 10:51	
pH	4.08	s.u.	0.10	102	90	110			
Sample ID: B04110770-001A	Sample Duplicate							11/15/04 11:18	
pH	7.20	s.u.	0.10				0.7	10	
Sample ID: B04110770-011A	Sample Duplicate							11/15/04 11:38	
pH	6.81	s.u.	0.10				0.1	10	
Method: E200.7								Batch: R50806	
Sample ID: MB-TJADIS041116A	Method Blank							11/16/04 13:48	
Calcium	ND	mg/L	0.03						
Magnesium	ND	mg/L	0.05						
Potassium	ND	mg/L	0.06						
Sodium	0.09	mg/L	0.07						
Sample ID: B04110337-001BMS2	Sample Matrix Spike							11/16/04 14:01	
Calcium	255	mg/L	1.0	94.2	69.5	130.5			
Magnesium	188	mg/L	1.0	102	69.5	130.5			
Potassium	110	mg/L	1.0	103	69.5	130.5			
Sodium	232	mg/L	1.0	105	69.5	130.5			
Sample ID: B04110337-001BMSD2	Sample Matrix Spike Duplicate							11/16/04 14:05	
Calcium	258	mg/L	1.0	96.9	69.5	130.5	1.0	20	
Magnesium	189	mg/L	1.0	104	69.5	130.5	0.6	20	
Potassium	113	mg/L	1.0	106	69.5	130.5	2.6	20	
Sodium	230	mg/L	1.0	103	69.5	130.5	0.5	20	
Sample ID: B04110770-006BMS2	Sample Matrix Spike							11/16/04 15:04	
Calcium	611	mg/L	1.0	99.3	69.5	130.5			
Magnesium	584	mg/L	1.0	106	69.5	130.5			
Potassium	282	mg/L	1.0	109	69.5	130.5			
Sodium	396	mg/L	2.0	110	69.5	130.5			
Sample ID: B04110770-006BMSD2	Sample Matrix Spike Duplicate							11/16/04 15:16	
Calcium	600	mg/L	1.0	95	69.5	130.5	1.8	20	
Magnesium	578	mg/L	1.0	104	69.5	130.5	1.0	20	
Potassium	278	mg/L	1.0	107	69.5	130.5	1.5	20	
Sodium	388	mg/L	2.0	107	69.5	130.5	2.0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 Poplar

Report Date: 11/22/04
Work Order: B04110764

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0									Batch: R50845
Sample ID: ICB	Method Blank								11/16/04 12:10
Chloride	ND	mg/L	0.03						
Sulfate	ND	mg/L	0.3						
Sample ID: B04110687-004B MS	Sample Matrix Spike								11/16/04 12:45
Sulfate	42.3	mg/L	1.0	101	80	120			
Sample ID: B04110687-004B MSD	Sample Matrix Spike Duplicate								11/16/04 12:57
Sulfate	41.9	mg/L	1.0	99.7	80	120	0.9	20	
Sample ID: MB-759	Method Blank								11/16/04 14:41
Chloride	ND	mg/L	2						
Sulfate	30000	mg/L	10						
Sample ID: B04110759-001A MS	Sample Matrix Spike								11/16/04 15:16
Chloride	461	mg/L	1.6	92.2	80	120			
Sample ID: B04110759-001A MSD	Sample Matrix Spike Duplicate								11/16/04 15:28
Chloride	455	mg/L	1.6	90.9	80	120	1.4	20	
Sample ID: B04110764-001A MS	Sample Matrix Spike								11/16/04 17:59
Chloride	161	mg/L	1.0	100	80	120			
Sulfate	917	mg/L	2.7	106	80	120			
Sample ID: B04110764-001A MSD	Sample Matrix Spike Duplicate								11/16/04 18:10
Chloride	159	mg/L	1.0	97.7	80	120	1.6	20	
Sulfate	904	mg/L	2.7	102	80	120	1.5	20	
Sample ID: B04110770-010A MS	Sample Matrix Spike								11/16/04 20:42
Chloride	106	mg/L	1.0	97.9	80	120			
Sulfate	2100	mg/L	2.7	98.5	80	120			A
Sample ID: B04110770-010A MSD	Sample Matrix Spike Duplicate								11/16/04 20:53
Chloride	106	mg/L	1.0	97.8	80	120	0.1	20	
Sulfate	2090	mg/L	2.7	96.1	80	120	0.5	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 Poplar

Report Date: 11/22/04
Work Order: B04110764

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B									Analytical Run: PE2_041116A
Sample ID: CCV_1116VA204r-W	Continuing Calibration Verification Standard								11/16/04 13:23
Methyl tert-butyl ether (MTBE)	61.0	ug/L	1.0	102	85	115			
Benzene	21.2	ug/L	0.50	106	85	115			
Toluene	63.0	ug/L	0.50	105	85	115			
Ethylbenzene	21.4	ug/L	0.50	107	85	115			
m+p-Xylenes	83.7	ug/L	0.50	105	85	115			
o-Xylene	42.0	ug/L	0.50	105	85	115			
Xylenes, Total	126	ug/L	0.50	105	85	115			
Surr: Trifluorotoluene			0.50	102	85	115			
Method: SW8021B									Batch: R51122
Sample ID: B04110764-001CMS	Sample Matrix Spike								11/18/04 23:44
Methyl tert-butyl ether (MTBE)	47.1	ug/L	2.0	94.3	70	130			
Benzene	48.5	ug/L	1.0	97	70	130			
Toluene	53.9	ug/L	1.0	108	70	130			
Ethylbenzene	52.1	ug/L	1.0	104	70	130			
m+p-Xylenes	111	ug/L	1.0	111	70	130			
o-Xylene	54.5	ug/L	1.0	109	70	130			
Xylenes, Total	166	ug/L	1.0	110	70	130			
Surr: Trifluorotoluene			2.0	102	80	120			
Sample ID: B04110764-001CMSD	Sample Matrix Spike Duplicate								11/19/04 00:54
Methyl tert-butyl ether (MTBE)	47.3	ug/L	2.0	94.5	70	130	0.3	20	
Benzene	47.4	ug/L	1.0	94.9	70	130	2.2	20	
Toluene	53.0	ug/L	1.0	106	70	130	1.7	20	
Ethylbenzene	51.4	ug/L	1.0	103	70	130	1.2	20	
m+p-Xylenes	110	ug/L	1.0	110	70	130	1.1	20	
o-Xylene	53.7	ug/L	1.0	107	70	130	1.4	20	
Xylenes, Total	164	ug/L	1.0	109	70	130	1.2	20	
Surr: Trifluorotoluene			2.0	101	80	120			
Sample ID: LCS_1116VA203r	Laboratory Control Spike								11/16/04 12:48
Methyl tert-butyl ether (MTBE)	19.0	ug/L	1.0	95	70	130			
Benzene	19.5	ug/L	0.50	97.6	70	130			
Toluene	21.0	ug/L	0.50	105	70	130			
Ethylbenzene	20.5	ug/L	0.50	102	70	130			
m+p-Xylenes	44.3	ug/L	0.50	111	70	130			
o-Xylene	21.7	ug/L	0.50	109	70	130			
Xylenes, Total	66.0	ug/L	0.50	110	70	130			
Surr: Trifluorotoluene			0.50	100	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 Poplar

Report Date: 11/22/04
Work Order: B04110764

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B								Analytical Run: PE2_041116A	
Sample ID: CCV_1116VA204r-W	Continuing Calibration Verification Standard							11/16/04 13:23	
Methyl tert-butyl ether (MTBE)	61.0	ug/L	1.0	102	85	115			
Benzene	21.2	ug/L	0.50	106	85	115			
Toluene	63.0	ug/L	0.50	105	85	115			
Ethylbenzene	21.4	ug/L	0.50	107	85	115			
m+p-Xylenes	83.7	ug/L	0.50	105	85	115			
o-Xylene	42.0	ug/L	0.50	105	85	115			
Xylenes, Total	126	ug/L	0.50	105	85	115			
Surr: Trifluorotoluene			0.50	102	85	115			
Method: SW8021B								Batch: R51122	
Sample ID: B04110764-001CMS	Sample Matrix Spike							11/18/04 23:44	
Methyl tert-butyl ether (MTBE)	47.1	ug/L	2.0	94.3	70	130			
Benzene	48.5	ug/L	1.0	97	70	130			
Toluene	53.9	ug/L	1.0	108	70	130			
Ethylbenzene	52.1	ug/L	1.0	104	70	130			
m+p-Xylenes	111	ug/L	1.0	111	70	130			
o-Xylene	54.5	ug/L	1.0	109	70	130			
Xylenes, Total	166	ug/L	1.0	110	70	130			
Surr: Trifluorotoluene			2.0	102	80	120			
Sample ID: B04110764-001CMSD	Sample Matrix Spike Duplicate							11/19/04 00:54	
Methyl tert-butyl ether (MTBE)	47.3	ug/L	2.0	94.5	70	130	0.3	20	
Benzene	47.4	ug/L	1.0	94.9	70	130	2.2	20	
Toluene	53.0	ug/L	1.0	106	70	130	1.7	20	
Ethylbenzene	51.4	ug/L	1.0	103	70	130	1.2	20	
m+p-Xylenes	110	ug/L	1.0	110	70	130	1.1	20	
o-Xylene	53.7	ug/L	1.0	107	70	130	1.4	20	
Xylenes, Total	164	ug/L	1.0	109	70	130	1.2	20	
Surr: Trifluorotoluene			2.0	101	80	120			
Sample ID: LCS_1116VA203r	Laboratory Control Spike							11/16/04 12:48	
Methyl tert-butyl ether (MTBE)	19.0	ug/L	1.0	95	70	130			
Benzene	19.5	ug/L	0.50	97.6	70	130			
Toluene	21.0	ug/L	0.50	105	70	130			
Ethylbenzene	20.5	ug/L	0.50	102	70	130			
m+p-Xylenes	44.3	ug/L	0.50	111	70	130			
o-Xylene	21.7	ug/L	0.50	109	70	130			
Xylenes, Total	66.0	ug/L	0.50	110	70	130			
Surr: Trifluorotoluene			0.50	100	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 Poplar

Report Date: 11/22/04
Work Order: B04110764

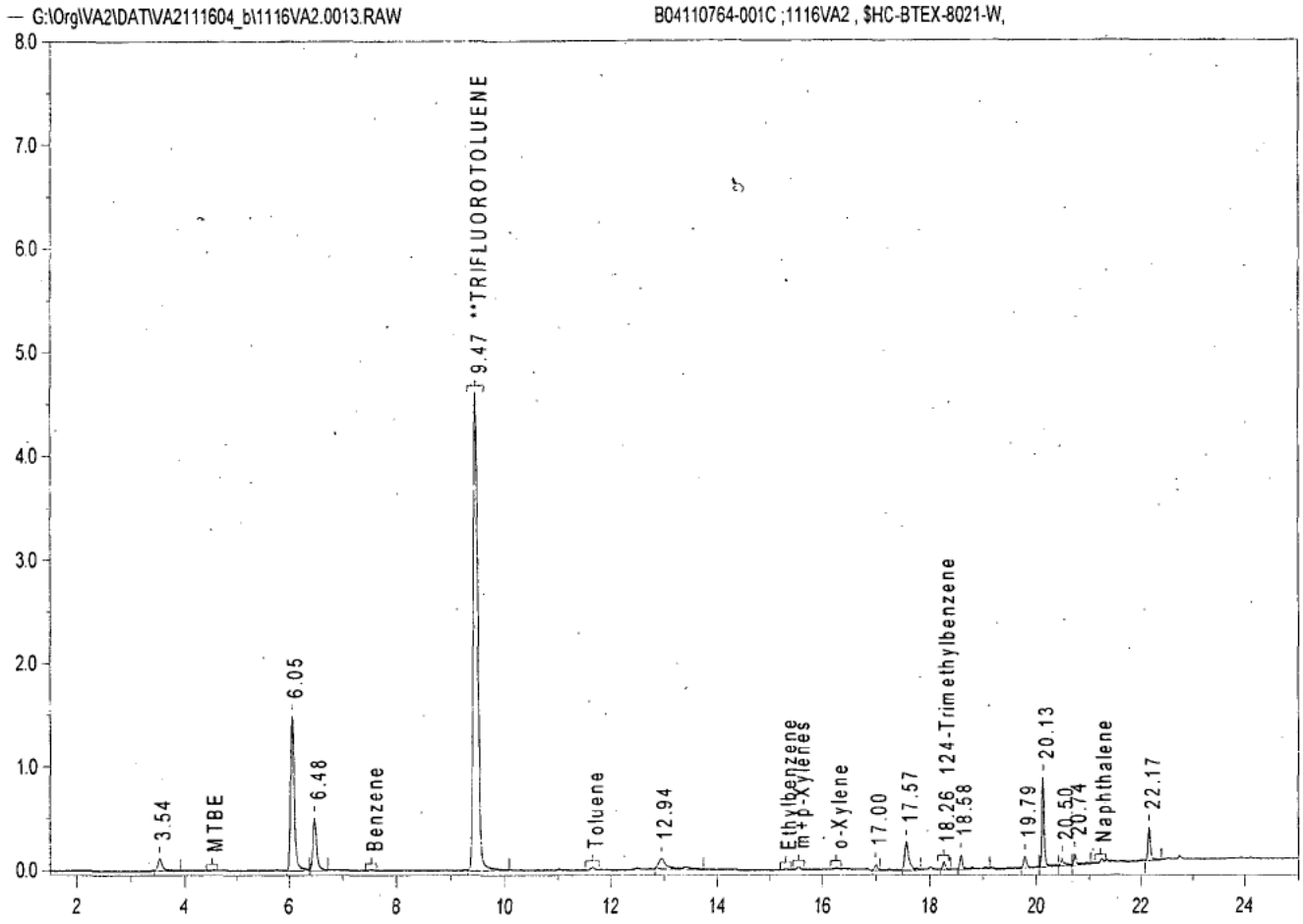
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8021B									Batch: R51122
Sample ID: MBLK_1116VA207r	Method Blank								11/16/04 15:08
Methyl tert-butyl ether (MTBE)	ND	ug/L	1.0						
Benzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: Trifluorotoluene			0.50	95.1	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

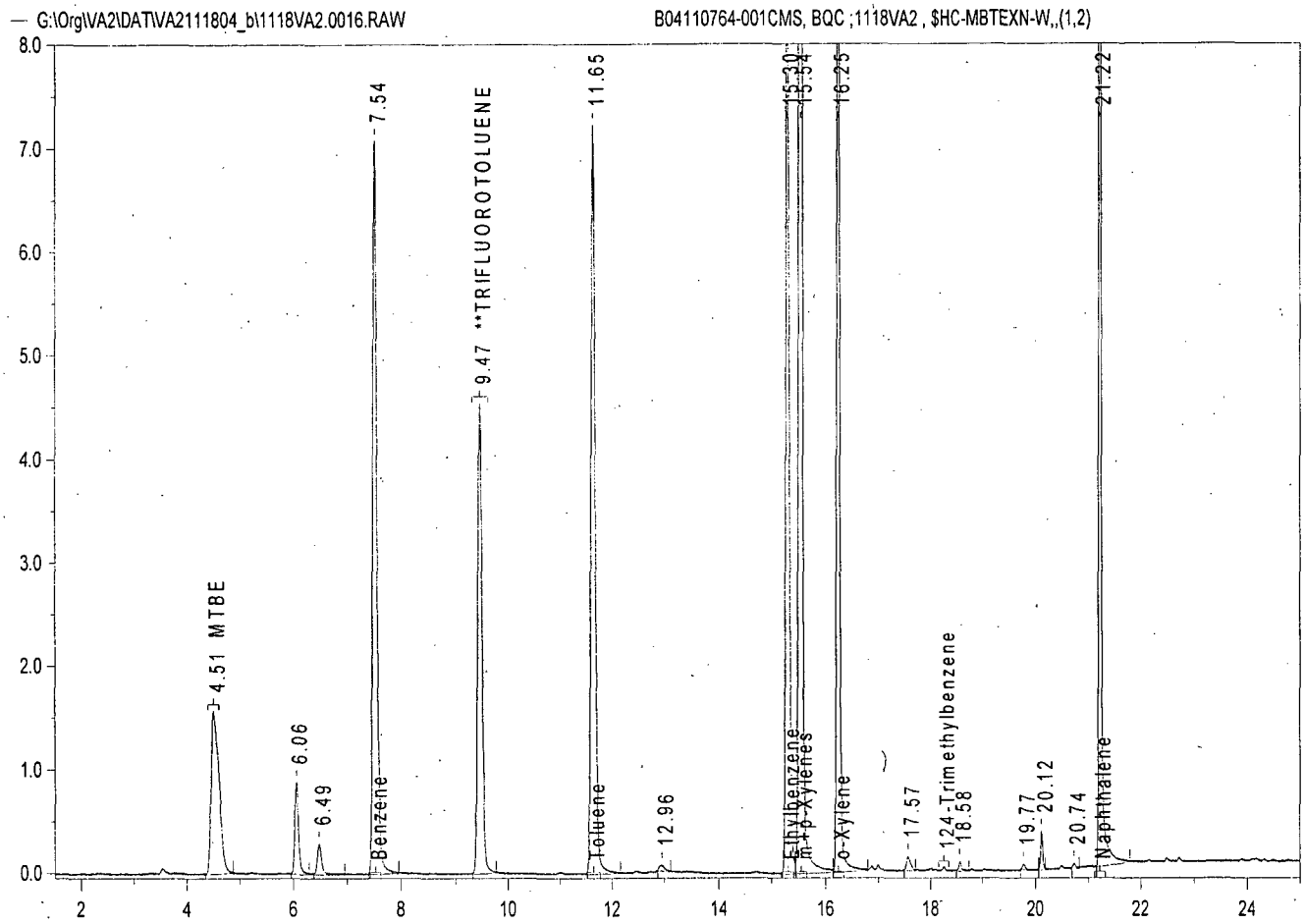


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04110764-001C ;1116VA2 , $HC-BTEX-8021-W,
Raw File: G:\Org\VA2\DAT\VA2111604_b\1116VA2.0013.RAW
Date & Time Acquired: 11/16/2004 6:38:25 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	.	.	.		.5	U
Toluene	.	.	.		.5	U
Ethylbenzene	.	.	.		.5	U
m+p-Xylenes	.	.	.		.5	U
o-Xylene	.	.	.		.5	U
124-Trimethylbenzene	18.258	18.258	18.258	275	2.	U
Naphthalene	.	.	.		1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.474	50.	52.165	104.33	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com

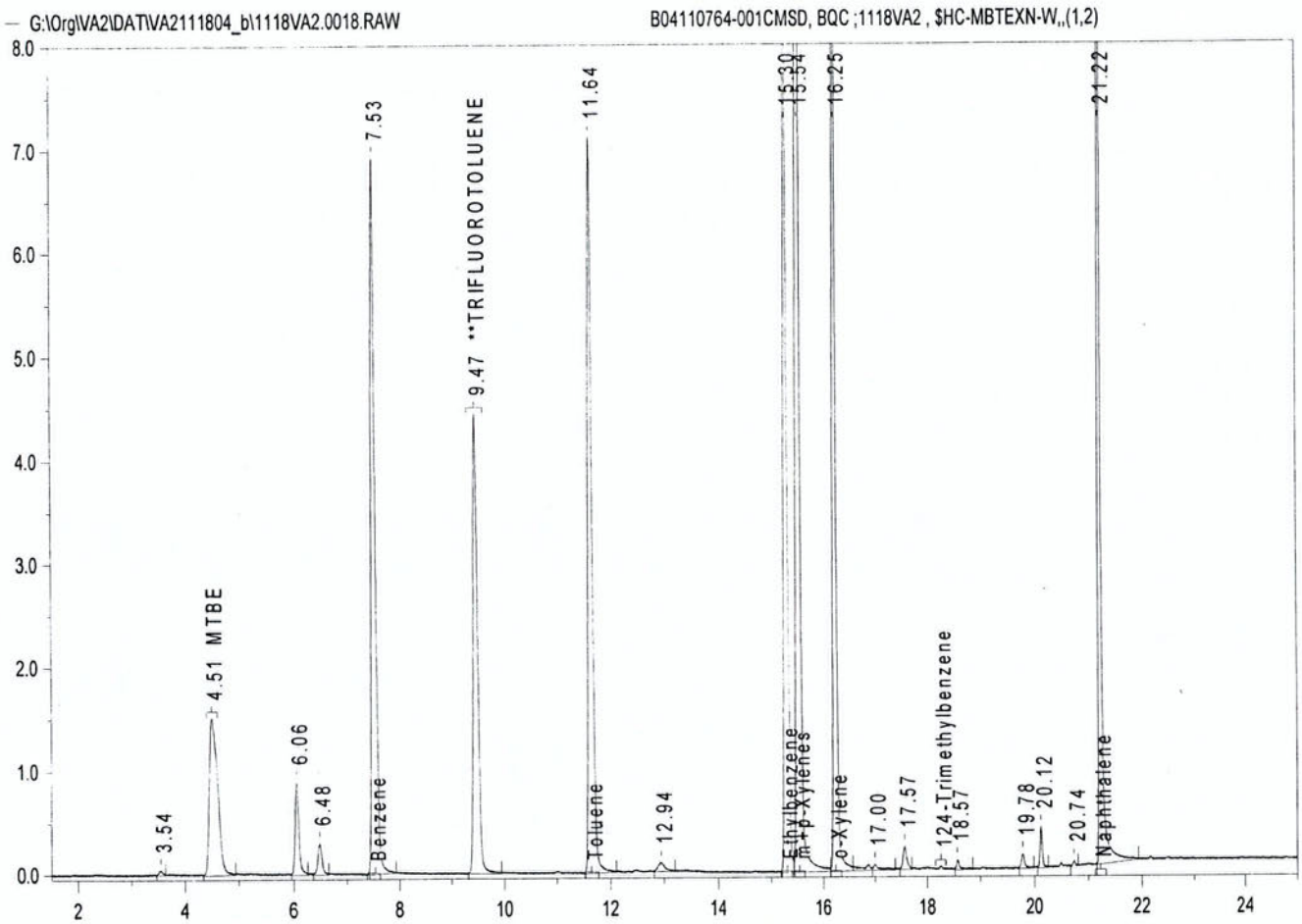


PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04110764-001CMS, BQC ;1118VA2 , $HC-MBTEXN-W,,(1,2)
Raw File: G:\Org\VA2\DAT\VA2111804_b\1118VA2.0016.RAW
Date & Time Acquired: 11/18/2004 11:44:25 PM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	4.509	4.961	4.963	16339	47.125	
Benzene	7.536	1.941	1.936	37972	48.48	
Toluene	11.646	-2.172	-2.174	40375	53.867	
Ethylbenzene	15.301	-5.828	-5.829	39211	52.059	
m+p-Xylenes	15.541	-6.07	-6.069	88338	111.071	
o-Xylene	16.249	-6.775	-6.777	42239	54.5	
124-Trimethylbenzene	.	.	.		4.	U
Naphthalene	.	-11.747	9.472	50052	46.149	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.472	100.	102.359	102.36	80-120

ENERGY LABORATORIES, INC. • P.O. Box 30916 • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com



PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM

Sample Name: B04110764-001CMSD, BQC ;1118VA2 , $HC-MBTEXN-W,,(1,2)
Raw File: G:\Org\VA2\DAT\VA2111804_b\1118VA2.0018.RAW
Date & Time Acquired: 11/19/2004 12:54:31 AM
Method File: G:\Org\VA2\Methods\08W204.MET
Calibration File: G:\Org\VA2\Cals\08MAS04.CAL
Sample Weight: 5 Dilution: 2 S.A.: 2

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	4.507	4.961	4.962	16384	47.253	
Benzene	7.534	1.941	1.935	37161	47.445	
Toluene	11.642	-2.172	-2.172	39705	52.973	
Ethylbenzene	15.3	-5.828	-5.831	38751	51.448	
m+p-Xylenes	15.54	-6.07	-6.071	87352	109.831	
o-Xylene	16.247	-6.775	-6.778	41642	53.729	
124-Trimethylbenzene	.	.	.		4.	U
Naphthalene	.	-11.747	9.469	50273	46.352	

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	9.469	100.	101.045	101.04	80-120

Energy Laboratories Inc

Sample Receipt Checklist

Client Name Land and Water Consulting

Date and Time Received: 11/15/2004

Work Order Number B04110764

Received by rln

Checklist completed by: Randa Ives 11/15/04
Signature | Date

Reviewed by _____
Initials | Date

Carrier name Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	4 °C On Ice
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Adjusted? _____ Checked by [signature]

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments:

Corrective Action _____

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

Page ____ of ____

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: Land and Water	Project Name, PWS #, Permit #, Etc.: 110396 Poplar
Report Address: 1120 Cedar Street Missoula, MT 59802	Contact Name, Phone, Fax, E-mail: Jane Madison (406) 721-0354 — Sampler Name if other than Contact:
Invoice Address: Same as invoice	Invoice Contact & Phone #: Chris Matt (406) 721-0354 — Purchase Order #: 110396 — ELI Quote #:

Report Required For: POTW/WWTP (DW) Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids Vegatation Bioassay Other

ANALYSIS REQUESTED

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Receipt Temp 4-Ice °C
Cooler ID(s) NA
Custody Seal Y (N)
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Inorganics - see list	Metals - see List	BTEX							SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Comments	Lab ID
1	110396 LAWM-08	11/13/04	1600	W	X	X	X							X				B4110764-001
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by: Jane Madison 11/14/04	Date/Time: 1645	Shipped by: Delivered to lab	Received by: [signature] Date/Time:
Relinquished by:	Date/Time:	Shipped by: Hand	Received by: Randa Loos 11/15/04 Date/Time: @ 0800

Sample Disposal: Return to client: _____ Lab Disposal: _____

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.

ENERGY LABORATORIES, INC. • P.O. Box 3658 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT
Lab ID: H04120016-001
Client Sample ID: 110396 LAW-M09-3

Report Date: 12/16/04
Collection Date: 11/30/04 14:20
Date Received: 12/02/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	8.0	s.u.		0.1		E150.1	12/06/04 13:36 / cwh
Solids, Total Dissolved TDS @ 180 C	1200	mg/L		10		A2540 C	12/06/04 13:05 / ljm
INORGANICS							
Sulfate	448	mg/L		1		A4500-SO4 E	12/14/04 09:37 / cwh
Alkalinity, Total as CaCO3	460	mg/L		4		A2320 B	12/02/04 14:59 / ljm
Bicarbonate as HCO3	570	mg/L		4		A2320 B	12/02/04 14:59 / ljm
Carbonate as CO3	ND	mg/L		4		A2320 B	12/02/04 14:59 / ljm
Chloride	80	mg/L		1		A4500-Cl B	12/16/04 10:50 / cwh
METALS, DISSOLVED							
Calcium	68	mg/L		1		E200.7	12/09/04 02:04 / jdh
Magnesium	36	mg/L		1		E200.7	12/09/04 02:04 / jdh
Potassium	6	mg/L		1		E200.7	12/09/04 02:04 / jdh
Sodium	326	mg/L		1		E200.7	12/09/04 02:04 / jdh
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Toluene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Ethylbenzene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
m+p-Xylenes	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
o-Xylene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Xylenes, Total	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Surr: Trifluorotoluene	105	%REC			80-120	SW8021B	12/14/04 11:34 / brw

RECEIVED
DEC 17 2004
LAND & WATER

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 5668 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

LABORATORY ANALYTICAL REPORT

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT
Lab ID: H04120016-001
Client Sample ID: 110396 LAW-M09-3

Report Date: 12/16/04
Collection Date: 11/30/04 14:20
Date Received: 12/02/04
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
pH	8.0	s.u.		0.1		E150.1	12/06/04 13:36 / cwh
Solids, Total Dissolved TDS @ 180 C	1200	mg/L		10		A2540 C	12/06/04 13:05 / ljm
INORGANICS							
Sulfate	448	mg/L		1		A4500-SO4 E	12/14/04 09:37 / cwh
Alkalinity, Total as CaCO3	460	mg/L		4		A2320 B	12/02/04 14:59 / ljm
Bicarbonate as HCO3	570	mg/L		4		A2320 B	12/02/04 14:59 / ljm
Carbonate as CO3	ND	mg/L		4		A2320 B	12/02/04 14:59 / ljm
Chloride	80	mg/L		1		A4500-Cl B	12/16/04 10:50 / cwh
METALS, DISSOLVED							
Calcium	68	mg/L		1		E200.7	12/09/04 02:04 / jdh
Magnesium	36	mg/L		1		E200.7	12/09/04 02:04 / jdh
Potassium	6	mg/L		1		E200.7	12/09/04 02:04 / jdh
Sodium	326	mg/L		1		E200.7	12/09/04 02:04 / jdh
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Toluene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Ethylbenzene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
m+p-Xylenes	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
o-Xylene	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Xylenes, Total	ND	ug/L		0.50		SW8021B	12/14/04 11:34 / brw
Surr: Trifluorotoluene	105	%REC			80-120	SW8021B	12/14/04 11:34 / brw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 3658 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT

Report Date: 12/16/04
Work Order: H04120016

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2320 B								Analytical Run: TITTR_041202B	
Sample ID: CCV1_041202A	Continuing Calibration Verification							12/02/04 14:17	
Alkalinity, Total as CaCO3	970	mg/L	4.0	97	90	110			
Bicarbonate as HCO3	20	mg/L	4.0	0	0	0			
Carbonate as CO3	700	mg/L	4.0	0	0	0			
Method: A2320 B								Batch: 041202A-ALK-W	
Sample ID: MBLK1_041202A	Method Blank							12/02/04 13:03	
Alkalinity, Total as CaCO3	1	mg/L	0.9						
Bicarbonate as HCO3	1	mg/L	0.9						
Carbonate as CO3	ND	mg/L	0.9						
Sample ID: LCS1_041202A	Laboratory Control Spike							12/02/04 13:10	
Alkalinity, Total as CaCO3	570	mg/L	4.0	95.3	90	110			
Sample ID: H04110167-005BDUP	Sample Duplicate							12/02/04 13:24	
Alkalinity, Total as CaCO3	100	mg/L	4.0				2.0	20	
Bicarbonate as HCO3	120	mg/L	4.0				2.0	20	
Carbonate as CO3	ND	mg/L	4.0				0	20	
Sample ID: H04110192-004AMS	Sample Matrix Spike							12/02/04 14:04	
Alkalinity, Total as CaCO3	950	mg/L	4.0	91.7	90	110			
Sample ID: H04110192-004AMSD	Sample Matrix Spike Duplicate							12/02/04 14:11	
Alkalinity, Total as CaCO3	960	mg/L	4.0	93.7	90	110	1.3	20	
Sample ID: H04110192-008ADUP	Sample Duplicate							12/02/04 14:42	
Alkalinity, Total as CaCO3	310	mg/L	4.0				1.3	20	
Bicarbonate as HCO3	380	mg/L	4.0				1.3	20	
Carbonate as CO3	ND	mg/L	4.0				0	20	
Sample ID: H04120016-001AMS	Sample Matrix Spike							12/02/04 15:06	
Alkalinity, Total as CaCO3	1000	mg/L	4.0	92.3	90	110			
Sample ID: H04120016-001AMSD	Sample Matrix Spike Duplicate							12/02/04 15:12	
Alkalinity, Total as CaCO3	1100	mg/L	4.0	111	90	110	11	20	S
Sample ID: H04120020-002BDUP	Sample Duplicate							12/02/04 15:30	
Alkalinity, Total as CaCO3	140	mg/L	4.0				1.4	20	
Bicarbonate as HCO3	170	mg/L	4.0				1.1	20	
Carbonate as CO3	3.0	mg/L	4.0				0	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

ENERGY LABORATORIES, INC. • P.O. Box 3658 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT

Report Date: 12/16/04
Work Order: H04120016

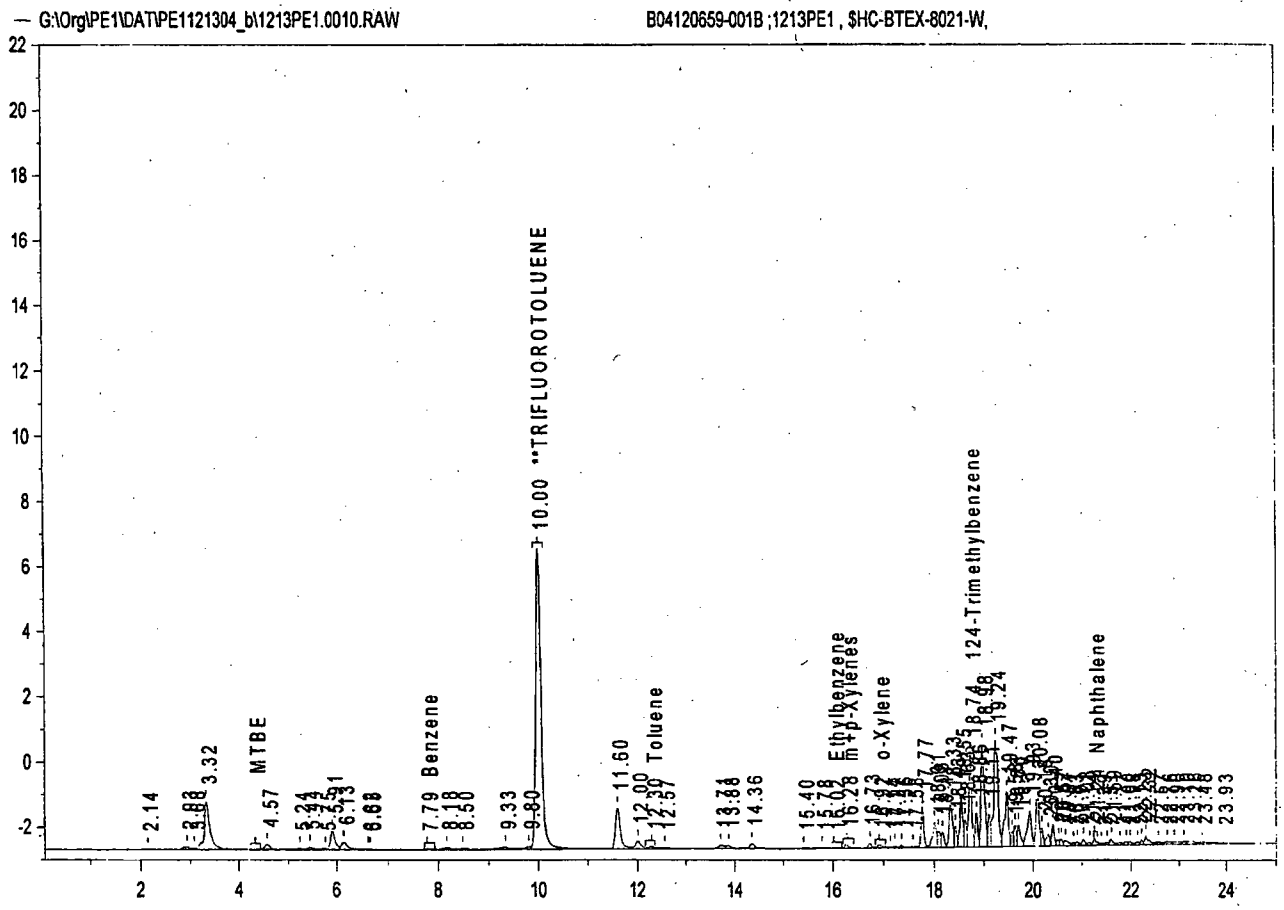
Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C								Batch: 041206A-SLDS-TDS-W	
Sample ID: MBLK1_041206A	Method Blank							12/06/04 13:05	
Solids, Total Dissolved TDS @ 180 C	7	mg/L	6						
Sample ID: LCS1_041206A	Laboratory Control Spike							12/06/04 13:05	
Solids, Total Dissolved TDS @ 180 C	980	mg/L	10	97.3	90	110			
Sample ID: H04120016-001AMS	Sample Matrix Spike							12/06/04 13:06	
Solids, Total Dissolved TDS @ 180 C	3230	mg/L	10	102	80	120			
Sample ID: H04120016-001AMSD	Sample Matrix Spike Duplicate							12/06/04 13:06	
Solids, Total Dissolved TDS @ 180 C	3230	mg/L	10	101	80	120	0	10	
Method: A4500-Cl B								Batch: 041216A-CL-TTR-W	
Sample ID: MBLK1_041216A	Method Blank							12/16/04 10:45	
Chloride	ND	mg/L	0.3						
Sample ID: LCS1_041216A	Laboratory Control Spike							12/16/04 10:47	
Chloride	100	mg/L	1.0	97	90	110			
Sample ID: H04120032-001BMS	Sample Matrix Spike							12/16/04 10:59	
Chloride	20	mg/L	1.0	102	90	110			
Sample ID: H04120032-001BMSD	Sample Matrix Spike Duplicate							12/16/04 11:17	
Chloride	20	mg/L	1.0	103	90	110	0.5	20	
Sample ID: H04120100-001ADUP	Sample Duplicate							12/16/04 11:07	
Chloride	20	mg/L	1.0				3.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 3658 • 3161 East Lyndale Ave. • Helena, MT 59604
ENERGY LABORATORIES, INC. • 1120 South 27th Street • Billings, MT 59107-0916
800-735-4489 • 406-252-6325 • 406-252-6069 fax • eli@energylab.com



PHOTOIONIZATION DETECTOR TARGET COMPOUND CHROMATOGRAM
Sample Name: B04120659-001B ;1213PE1 , $HC-BTEX-8021-W,
Raw File: G:\Org\PE1\DAT\PE1121304_b\1213PE1.0010.RAW
Date & Time Acquired: 12/13/2004 2:36:55 PM
Method File: G:\Org\PE1\Methods\2004PK1.MET
Calibration File: G:\Org\PE1\Cals\2004MAP.CAL
Sample Weight: 5 Dilution: 1 S.A.: 1

TARGET ANALYTES	RT	CAL RRT	RRT	AREA	AMOUNT	FLAG
MTBE	.	.	.		1.	U
Benzene	7.79	7.79	7.79	311	.5	U
Toluene	12.301	12.301	12.301	709	.5	U
Ethylbenzene	16.019	16.019	16.019	108	.5	U
m+p-Xylenes	16.276	16.276	16.276	763	.5	U
o-Xylene	16.923	16.923	16.923	699	.5	U
124-Trimethylbenzene	18.735	-8.71	-8.733	11413	3.058	
Naphthalene	21.24	21.24	21.24	1191	1.	U

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	QC LIMITS
**TRIFLUOROTOLUENE	10.003	50.	45.719	91.44	80-120

ENERGY LABORATORIES, INC. • P.O. Box 3658 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT

Report Date: 12/16/04
Work Order: H04120016

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A4500-SO4 E								Batch: 041214A-SO4-TURB-W	
Sample ID: MBLK1_041214A	Method Blank							12/14/04 09:35	
Sulfate	ND	mg/L	0.2						
Sample ID: LCS1_041214A	Laboratory Control Spike							12/14/04 09:36	
Sulfate	53.7	mg/L	1.0	107	90	110			
Sample ID: H04120024-001ADUP	Sample Duplicate							12/14/04 09:53	
Sulfate	591	mg/L	1.0				7.9	20	
Sample ID: H04120024-004ADUP	Sample Duplicate							12/14/04 09:56	
Sulfate	1240	mg/L	1.0				4.8	20	
Sample ID: H04120087-001AMS	Sample Matrix Spike							12/14/04 09:55	
Sulfate	51.8	mg/L	1.0	101	80	120			
Sample ID: H04120087-001AMSD	Sample Matrix Spike Duplicate							12/14/04 09:55	
Sulfate	52.5	mg/L	1.0	104	80	120	1.3	10	
Method: E150.1								Batch: 041206A-PH-W	
Sample ID: LCS1_041206A	Laboratory Control Spike							12/06/04 13:34	
pH	4.00	s.u.	0.10	100	98.6	101.4			
Sample ID: H04120016-001ADUP	Sample Duplicate							12/06/04 13:36	
pH	7.97	s.u.	0.10				0.3	2	
Sample ID: H04120024-008ADUP	Sample Duplicate							12/06/04 13:50	
pH	3.43	s.u.	0.10				0	2	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

ENERGY LABORATORIES, INC. • P.O. Box 5668 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT

Report Date: 12/16/04
Work Order: H04120016

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7								Analytical Run: ICP1-HE_041209A	
Sample ID: ICV	Initial Calibration Verification Standard								12/09/04 01:38
Calcium	53.8	mg/L	1.0	108	90	110			
Magnesium	50.5	mg/L	1.0	101	90	110			
Potassium	21.4	mg/L	1.0	107	90	110			
Sodium	51.9	mg/L	1.0	104	90	110			
Sample ID: CRI	CRDL Standard for ICP								12/09/04 01:46
Calcium	10.7	mg/L	1.0	107	90	110			
Magnesium	9.87	mg/L	1.0	98.7	90	110			
Potassium	10.6	mg/L	1.0	106	90	110			
Sodium	9.95	mg/L	1.0	99.5	90	110			
Sample ID: CCV	Continuing Calibration Verification								12/09/04 01:52
Calcium	260	mg/L	1.0	104	90	110			
Magnesium	252	mg/L	1.0	101	90	110			
Potassium	50.6	mg/L	1.0	101	90	110			
Sodium	261	mg/L	1.0	104	90	110			
Sample ID: CCB	Continuing Calibration Blank								12/09/04 01:55
Calcium	0.799	mg/L	1.0						
Magnesium	0.325	mg/L	1.0						
Potassium	-0.0884	mg/L	1.0						
Sodium	-0.257	mg/L	1.0						
Sample ID: CRI	CRDL Standard for ICP								12/09/04 02:21
Calcium	10.8	mg/L	1.0	108	90	110			
Magnesium	9.73	mg/L	1.0	97.3	90	110			
Potassium	10.7	mg/L	1.0	107	90	110			
Sodium	10.1	mg/L	1.0	101	90	110			
Method: E200.7									Batch: R17219
Sample ID: H04110175-004CDUP	Sample Duplicate								12/09/04 02:01
Calcium	124	mg/L	1.0				0.4	20	
Magnesium	17.7	mg/L	1.0				0.7	20	
Potassium	3.27	mg/L	1.0				1.0	20	
Sodium	19.3	mg/L	1.0				1.6	20	
Sample ID: H04120016-001BMS	Sample Matrix Spike								12/09/04 02:07
Calcium	173	mg/L	1.0	105	70	130			
Magnesium	134	mg/L	1.0	97.5	70	130			
Potassium	104	mg/L	1.0	97.6	70	130			
Sodium	436	mg/L	1.0	110	70	130			A

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
A - The analyte level was greater than four times the spike level.

ENERGY LABORATORIES, INC. • P.O. Box 5666 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

QA/QC Summary Report

Client: Land and Water Consulting
Project: 110396 PWS Well Threat, Poplar, MT

Report Date: 12/16/04
Work Order: H04120016

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Batch: R17219
Sample ID: H04120016-001BMSD	Sample Matrix Spike Duplicate								12/09/04 02:10
Calcium	176	mg/L	1.0	107	70	130	1.5	20	
Magnesium	136	mg/L	1.0	99.5	70	130	1.5	20	
Potassium	105	mg/L	1.0	98.6	70	130	1.0	20	
Sodium	422	mg/L	1.0	96.3	70	130	3.1	20	A
Sample ID: LCS	Laboratory Control Spike								12/09/04 02:18
Calcium	107	mg/L	1.0	107	90	110			
Magnesium	98.5	mg/L	1.0	98.5	90	110			
Potassium	83.6	mg/L	1.0	104	90	110			
Sodium	103	mg/L	1.0	103	90	110			
Method: SW8021B									Batch: B_R52162
Sample ID: LCS_1214PE103r	Laboratory Control Spike								12/14/04 09:50
Benzene	19.8	ug/L	0.50	99.2	70	130			
Toluene	19.6	ug/L	0.50	98.1	70	130			
Ethylbenzene	20.1	ug/L	0.50	101	70	130			
m+p-Xylenes	40.7	ug/L	0.50	102	70	130			
o-Xylene	20.2	ug/L	0.50	101	70	130			
Xylenes, Total	60.9	ug/L	0.50	102	70	130			
Surr: Trifluorotoluene			0.50	102	80	120			
Sample ID: MBLK_1214PE105r	Method Blank								12/14/04 10:59
Benzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: Trifluorotoluene			0.50	105	80	120			

Qualifiers:

RL - Analyte reporting limit.
ND - Not detected at the reporting limit.
A - The analyte level was greater than four times the spike level.

ENERGY LABORATORIES, INC. • P.O. Box 3658 • 3161 East Lyndale Ave. • Helena, MT 59604
877-472-0711 • 406-442-0711 • 406-442-0712 fax • helena@energylab.com

Energy Laboratories Inc

Sample Receipt Checklist

Client Name Land and Water Consulting

Date and Time Received: 12/2/2004

Work Order Number H04120016

Received by: ljm

Checklist completed by: [signature] 12/2/04 (Signature / Date)

Reviewed by HBB 12/2/04 (Initials / Date)

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	2°C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments:

Corrective Action _____

ENERGY LABORATORIES

Chain of Custody and Analytical Request Record

PLEASE PRINT, provide as much information as possible.
Refer to corresponding notes on reverse side.

Company Name: Land and Water

Project Name, PWS #, Permit #, Etc.: 110396 PWS Well Threat, Poplar, MT

Report Address: 1120 Cedar St. Missoula, MT 59802

Contact Name, Phone, Fax, E-mail: Jane Madison Jane.Madison@landandwater.net

Sampler Name if other than Contact: Fax 721-0355 Phone: 721-0354

Invoice Address: Chris Matt 1120 Cedar St. Missoula, MT 59802

Invoice Contact & Phone #: Chris Matt 721-0354

Purchase Order #: 110396

ELI Quote #:

Report Required For: POTW/WWTP (DW) Other _____

Special Report Formats - ELI must be notified prior to sample submittal for the following:
NELAC ☐ A2LA ☐ Level IV ☐
Other _____
EDD/EDT ☐ Format _____

Notify ELI prior to RUSH sample submittal for additional charges and scheduling

Comments:

Receipt Temp 2.0 °C
Cooler ID(s) _____
Custody Seal Y N
Intact Y N
Signature Match Y N

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX (Number of Containers; Sample Type: A W S V B O; Air Water Soils/Solids Vegetation Bioassay Other)	pH, TDS, Alkalinity	Anions (Attached)	Diss Metals (attached)	BTEX						SEE ATTACHED	Normal Turnaround (TAT)	RUSH Turnaround (TAT)	Lab ID
1	110396 LAW-MO9-3	11/30/04	1420	3 W	X	X	X	X						X			0412001 6
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by: Jane Madison Date/Time: 12/1/04 Shipped by: Received by: Matt Date/Time: 12/2/04 10:15

Relinquished by: Date/Time: Shipped by: Received by: Date/Time:

Sample Disposal: Return to client: _____ Lab Disposal: Y

LABORATORY USE ONLY
Sample Type: _____ # of fractions _____

Visit our web site at *www.energylab.com* for additional information, downloadable fee schedule, forms, & links.