

3R - 432

2010 GWMR

08/09/2010



TETRA TECH, INC.

3R432

6121 Indian School Rd. NE Suite 200
Albuquerque, NM 87110
(505) 237-8440

August 9, 2010

Mr. Steve Austin
Navajo Nation Environmental Protection Agency
PO Box 1999
Shiprock, New Mexico 87420

RE: ConocoPhillips Company Charles et al. No. 1 - Groundwater Monitoring Report, San Juan
County, New Mexico

Dear Mr. Austin:

Enclosed please find one copy of the above-referenced document as compiled by Tetra Tech, Inc., for this
San Juan County site.

Please do not hesitate to contact me at (505) 237-8440 if you have any questions or require additional
information.

Sincerely,

Kelly E. Blanchard
Project Manager/Geologist

Cc: Glen von Gonten, NMOCD
Brandon Powell, NMOCD

Enclosures (1)

QUARTERLY GROUNDWATER MONITORING REPORT

CONOCOPHILLIPS COMPANY CHARLES ET AL. NO. 1 PRODUCTION FACILITY SAN JUAN COUNTY, NEW MEXICO

OCD #

API # 30-045-06623

Prepared for:



Risk Management and Remediation
420 South Keeler Avenue
Bartlesville, OK 74004

Prepared by:



TETRA TECH, INC.

6121 Indian School Rd. NE, Suite 200
Albuquerque, NM 87110
Tetra Tech Project No. 1158690090

August 2010

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QUARTERLY GROUNDWATER MONITORING REPORT

CHARLES ET AL. NO.1, SAN JUAN COUNTY, NEW MEXICO

MARCH 2010

1.0 INTRODUCTION

This report discusses the groundwater sampling event performed by Tetra Tech, Inc. (Tetra Tech) on March 30, 2010 at the ConocoPhillips Company Charles et al. No. 1 remediation site located near the Angel Peak area of northwestern New Mexico (Site). The Site is situated on Navajo Nation land in Section 12, Township 27N, Range 9W, of San Juan County, New Mexico. A site location map and detail map are included as **Figures 1** and **2**, respectively.

1.1 Site Background

The historical timeline for the Site is summarized below, and is also presented in **Table 1**.

The Charles et al. No. 1 natural gas production well was spudded in April 1965 by the Austral Oil Company of Houston, TX. Operatorship of the well was transferred several times before a subsidiary of Burlington Resources became the operator in August 1992. The well was abandoned shortly thereafter due to low production. The well was recompleted and production was restored on May 20, 2003. ConocoPhillips acquired Burlington Resources in March 2006.

A ConocoPhillips employee discovered an area of dead vegetation approximately 100 feet from the Blanco Wash while investigating a pipeline release on June 23, 2008 (**Figure 2**). ConocoPhillips reported the release to the NMOCD by phone and E-mail on June 24, 2008 and followed-up with submittal of a Form C-141 to NMOCD on June 30, 2008. Envirotech, Inc. (Envirotech) advanced several soil borings and installed seven piezometer/monitor wells using a hand auger between the dates of June 25 and 26, 2008. Solar-powered soil vapor extraction (SVE) equipment was installed over Monitor Well MW-1 on August 14, 2008 to facilitate the remediation of the area (Envirotech, 2009).

Envirotech conducted quarterly groundwater sampling events beginning June 25, 2008; and recommended discontinuing sampling Monitor Wells MW-5, MW-6, and MW-7 in March 2009. Tetra Tech began monitoring the Charles et al. No. 1 remediation site in March, 2010. This report represents the first round of monitoring conducted by Tetra Tech at the Site.

2.0 MONITORING SUMMARY, SAMPLING METHODOLOGY AND RESULTS

2.1 Monitoring Summary

A groundwater sampling event was conducted at the Site on March 30, 2010. Prior to collection of groundwater samples from Monitor Wells MW-1, MW-2, MW-3 and MW-4, depth to groundwater in each well was measured using a dual interface probe (**Table 2**). A groundwater elevation map reflecting March 30, 2010 groundwater elevations is presented as **Figure 3**. During the March 2010 sampling event, Tetra Tech did not measure depth to groundwater in Monitor Wells MW-5, MW-6, or MW-7; Tetra Tech will collect groundwater level measurements from all Site monitoring wells during future sampling events. A historical groundwater elevation summary is included as **Table 2**.

2.2 Groundwater Sampling Methodology

During the March 30, 2010 groundwater monitoring event, Monitor Wells MW-1, MW-2, MW-3, and MW-4 were purged of at least 3 casing volumes of groundwater using a 1.5-inch diameter, polyethylene dedicated bailer. While bailing Monitor Wells MW-1, MW-2, MW-3, and MW-4, groundwater parameters were collected using a YSI 556 multi-parameter sonde and results were recorded on a Tetra Tech Water Sampling Field Form (**Appendix A**). A light non-aqueous phase liquid (LNAPL) sheen was observed in purge water from MW-1. Groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped under chain-of-custody documentation to Southern Petroleum Laboratory (SPL) of Houston, Texas. March 2010 groundwater samples were analyzed for BTEX by EPA Method 8260B (**Table 3**). The Laboratory analytical report is included as **Appendix B**.

2.3 Groundwater Sampling Analytical Results

The Navajo Nation Environmental Protection Agency (NNEPA) has not established groundwater quality standards; however drinking water quality on Navajo Nation land is mandated in Part II of the Navajo Nation Primary Drinking Water Regulations (NNPDWR). Drinking water quality standards have been set for the protection of human health, domestic water supply, and irrigation use. Exceedences of NNPDWR water quality standards in Site monitoring wells are discussed below.

- **Benzene**

- The NNPDWR drinking water quality standard for benzene is 5 µg/L. Laboratory analysis of groundwater samples collected from Monitor Well MW-1 revealed a concentration of 480 µg/L.

The corresponding laboratory analytical report for the March 2010 groundwater sampling event is included as **Appendix B**. A historical laboratory analytical summary is available as **Table 3**.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Tetra Tech recommends continued quarterly groundwater sampling at the Site in order to provide sufficient data for Site closure. Site closure will be requested when groundwater analytical results indicate that all constituents of concern are consistently below NNPDWR drinking water quality standards. Please contact Kelly Blanchard at 505-237-8440 or kelly.blanchard@tetrattech.com if you have any questions or require additional information.

4.0 REFERENCES

Envirotech Incorporated (2009). *June 2009 Groundwater Monitoring Report*. Prepared for ConocoPhillips. Report Dated August 2009.

State of New Mexico Energy Minerals and Natural Resources Form C-141 (2003). *Release Notification and Corrective Action*. Dated June 30, 2008.

FIGURES

1. Site Location Map
2. Site Detail Map
3. Groundwater Elevation Map – March 2010



FIGURE 1.

Site Location Map
ConocoPhillips
Company
Charles et al. No. 1
San Juan County, NM



ConocoPhillips Company
Charles et al. No. 1
Remediation Site Location

Latitude: 36.58643° N
Longitude: -107.73593° W



TETRA TECH, INC.

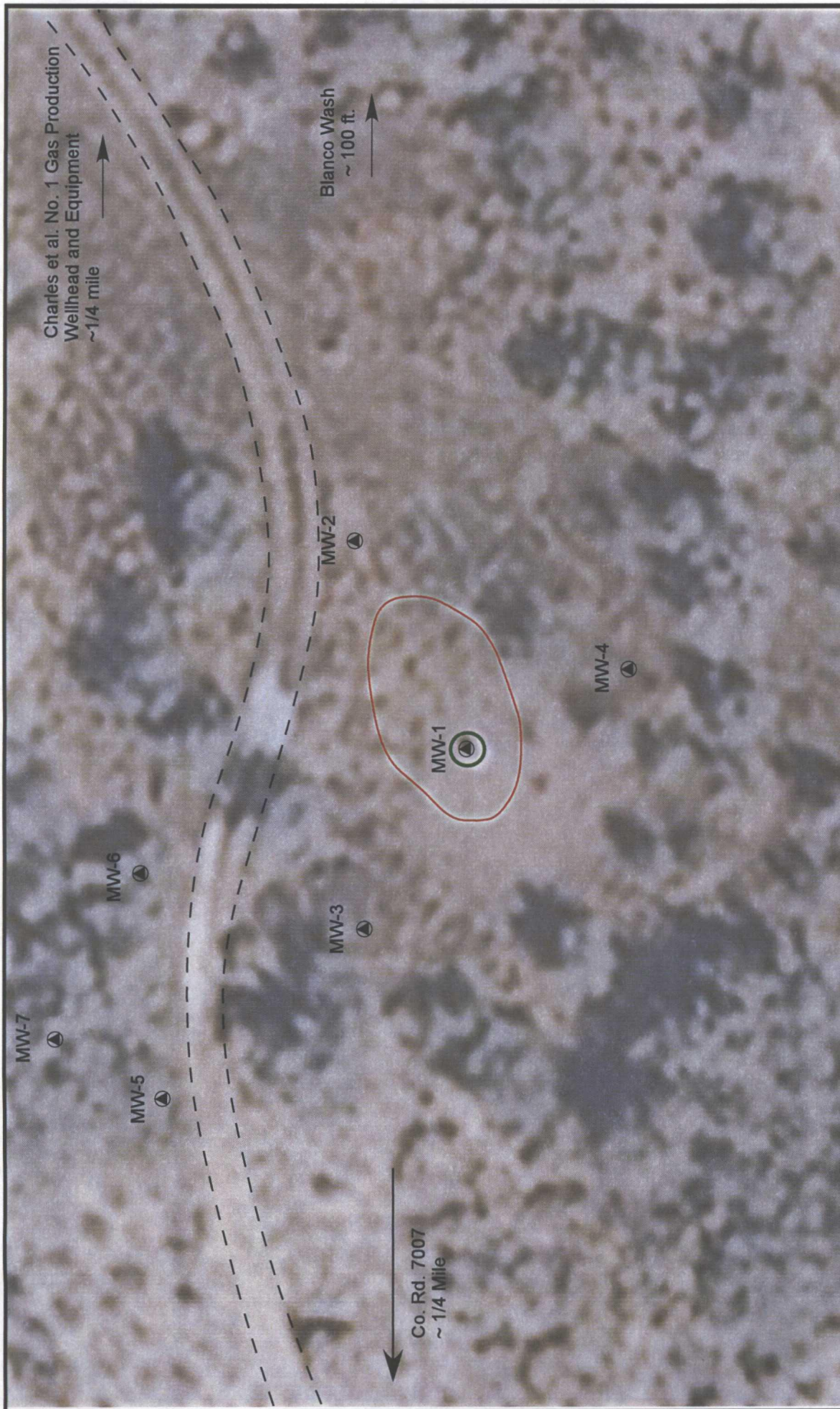


FIGURE 2:
 SITE LAYOUT MAP
 CONOCOPHILLIPS COMPANY
 Charles et al. No. 1
 GAS PRODUCTION WELL
 Sec 12, T27N, R9W
 San Juan County, New Mexico

LEGEND

- MONITORING WELL
- SOLAR POWERED SVE EQUIPMENT
- == ACCESS ROAD
- APPROXIMATE AREA OF DEAD VEGETATION IN JUNE 2008

NOT TO SCALE



TETRA TECH, INC.



FIGURE 3:
 GROUNDWATER ELEVATION MAP
 3/30/2010
 CONOCOPHILLIPS COMPANY
 Charles et al. No. 1
 GAS PRODUCTION WELL
 Sec 12, T27N, R9W
 San Juan County, New Mexico

LEGEND

- MONITORING WELL
- SOLAR POWERED SVE EQUIPMENT
- == ACCESS ROAD
- GROUNDWATER ELEVATION CONTOUR LINE
- - - DASHED WHERE INFERRED
- APPROXIMATE AREA OF DEAD VEGETATION IN JUNE 2008
- NOT TO SCALE



TETRA TECH, INC.

TABLES

- I. Site History Timeline
2. Groundwater Elevation Data Summary (March 2010)
3. Groundwater Laboratory Analytical Results Summary (March 2010)

Table 1. Charles et al. No. 1 Site History Timeline

DATE	ACTIVITY
April 12, 1965	Well spudded by Austral Oil Company Inc.
March 30, 1978	Change in operatorship to the Superior Oil Company.
September 1, 1986	Change in operatorship to Mobil Producing TX and NM Inc.
August 1, 1992	Change in operatorship to Meridian Oil Inc, a subsidiary of Burlington Resources.
August 1, 2001	Burlington Resources abandons well due to low production.
May 20, 2003	The Charles et al. No. 1 natural gas Well returned to production.
March 31, 2006	ConocoPhillips acquired Burlington Resources.
June 23, 2008	A release was discovered from the pipe running from the wellhead to the meter house; upon walking the pipeline, an area of dead vegetation was also discovered approximately 100 feet from Blanco Wash.
June 24, 2008	ConocoPhillips reported the release to the New Mexico Oil Conservation Division (NMOCD) via phone and email.
June 25-26, 2008	Envirotech, Inc. of Farmington, NM advances several soil borings and installed piezometers using a hand auger to determine the extent of impact (Envirotech, 2009). Envirotech also installed Monitoring Wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7; and obtained water level measurements and samples from all of the wells.
August 14, 2008	Envirotech, Inc. installed solar-powered Soil Vapor Extraction (SVE) equipment over the existing Monitor Well, MW-1; and obtained water level measurements and samples from all of the wells.
October 2, 2008	Envirotech, Inc. completed the third round of groundwater sampling.
January 13, 2009	Envirotech, Inc. completed the fourth round of groundwater sampling.
March 23, 2009	Envirotech, Inc. completed the fifth round of groundwater sampling and recommended sampling only Monitor Wells MW-1, MW-2, MW-3, and MW-4.
June 29, 2009	Envirotech, Inc. completed the sixth round of groundwater sampling and recommended drilling additional monitoring wells down-gradient of MW-2.
March 30, 2010	Tetra Tech, Inc. completed the seventh round of groundwater sampling.

Table 2. ConocoPhillips Company Charles et al. No. 1 - Groundwater Elevation Summary

Monitor Well	TOC Elevation* (ft AMSL)	Sample Date	Depth to Water (ft)	GW Elevation (ft AMSL)
MW-1	5917.87	6/25/2008	4.71	5913.16
		8/14/2008	5.21	5912.66
	5917.05	10/2/2008	5.13	5911.92
		1/13/2009	4.41	5912.64
		3/23/2009	3.01	5914.04
		6/29/2009	2.12	5914.93
		3/30/2010	2.68	5914.37
MW-2	5917.33	6/25/2008	4.66	5912.67
		8/14/2008	5.35	5911.98
	5916.53	10/2/2008	5.12	5911.41
		1/13/2009	3.15	5913.38
		3/23/2009	2.65	5913.88
		6/29/2009	4.20	5912.33
		3/30/2010	2.57	5913.96
MW-3	5920.57	6/25/2008	7.16	5913.41
		8/14/2008	8.86	5911.71
	5919.8	10/2/2008	7.63	5912.17
		1/13/2009	5.56	5914.24
		3/23/2009	5.56	5914.24
		6/29/2009	1.10	5918.70
		3/30/2010	5.38	5914.42
MW-4	5920.48	6/25/2008	4.27	5916.21
		8/14/2008	7.89	5912.59
	5919.69	10/2/2008	7.73	5911.96
		1/13/2009	5.94	5913.75
		3/23/2009	5.64	5914.05
		6/29/2009	6.84	5912.85
		3/30/2010	5.40	5914.29
MW-5	5923.63	6/26/2008	8.23	5915.4
		8/14/2008	8.68	5914.95
	5921.55	10/2/2008	8.70	5912.85
		1/13/2009	6.96	5914.59
		3/23/2009	6.58	5914.97
		6/29/2009	4.10	5917.45
		3/30/2010	Not Measured	NA
MW-6	5920.68	6/26/2008	6.75	5913.93
		8/14/2008	6.97	5913.71
	5918.64	10/2/2008	6.83	5911.81
		1/13/2009	4.89	5913.75
		3/23/2009	4.12	5914.52
		6/29/2009	1.80	5916.84
		3/30/2010	Not Measured	NA
MW-7	5920.75	6/26/2008	6.32	5914.43
		8/14/2008	7.17	5913.58
	5918.74	10/2/2008	6.42	5912.32
		1/13/2009	Not Measured	NA
		3/23/2009	4.67	5914.07
		6/29/2009	1.56	5917.18
		3/30/2010	Not Measured	NA

Explanation

ft = feet

AMSL = Above mean sea level

DTW = Depth to water

NA = Not available

* Elevation Measurements obtained from 2009 Envirotech investigation

Note: Measurements between 6/25/2008 and 6/29/2009 obtained by Envirotech, Inc.

Table 3. ConocoPhillips Charles et al. No. 1 - Quarterly Groundwater Analytical Results Summary

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-1	6/25/2008	1850	486	971	379
	9/25/2008	575	660	293	1547
	1/13/2009	494	581	474	3572
	3/23/2009	210	311	378	1418
	6/29/2009	839	107	674	3404
	3/30/2010	480	110	250	1573
MW-2	6/25/2008	4.2	4.6	1.6	1.1
	9/25/2008	19.5	25.8	5.1	100.8
	1/13/2009	2.1	2	2.2	28.1
	3/23/2009	1.4	0.4	0.6	7.3
	6/29/2009	1.5	ND	0.2	0.4
	3/30/2010	< 1.0	< 1.0	< 1.0	< 1.0
MW-3	6/25/2008	ND	ND	ND	ND
	9/25/2008	ND	2.3	0.9	12.1
	1/13/2009	ND	ND	ND	ND
	3/23/2009	ND	0.2	0.2	1.4
	6/29/2009	ND	1.7	0.7	8.2
	3/30/2010	< 1.0	< 1.0	< 1.0	< 1.0
MW-4	6/25/2008	3.8	19.9	1.4	7
	9/25/2008	ND	ND	ND	ND
	1/13/2009	ND	ND	ND	ND
	3/23/2009	ND	ND	ND	ND
	6/29/2009	ND	ND	0.2	2.9
	3/30/2010	< 1.0	< 1.0	< 1.0	< 1.0
MW-5	6/26/2008	ND	ND	ND	ND
	9/25/2008	ND	ND	ND	ND
	1/13/2009	ND	ND	ND	ND
	3/23/2009	ND	ND	ND	ND
	6/29/2009	NS	NS	NS	NS
	3/30/2010	NS	NS	NS	NS
MW-6	6/26/2008	ND	ND	ND	ND
	9/25/2008	ND	ND	ND	ND
	1/13/2009	ND	ND	ND	ND
	3/23/2009	ND	ND	ND	ND
	6/29/2009	NS	NS	NS	NS
	3/30/2010	NS	NS	NS	NS
MW-7	6/26/2008	ND	ND	ND	ND
	9/25/2008	ND	ND	ND	ND
	1/13/2009	NS	NS	NS	NS
	3/23/2009	ND	ND	ND	ND
	6/29/2009	NS	NS	NS	NS
	3/30/2010	NS	NS	NS	NS
NNEPA Standards		10 (µg/L)	750 (µg/L)	750 (µg/L)	620 (µg/L)

Explanation

ND = Not Detected

NS = Not Sampled

NNEPA = Navajo Nation Environmental Protection Agency

mg/L = milligrams per liter (parts per million)

µg/L = micrograms per liter (parts per billion)

< 1.0= Below laboratory detection limit of 1.0 ug/L

Bold = concentrations that exceed the NNEPA limits

Note: Analytes sampled between 6/25/2008 and 6/29/2009 obtained by Envirotech, Inc.

APPENDICES

APPENDIX A

Groundwater Sampling Field Forms



TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Charles Et Al #1Page 1 of 4

Project No. _____

Site Location _____

Site/Well No. MW-1Coded/
Replicate No.Duplicate @ 1050Date 3-30-10Weather Sunny, warm 50°Time Sampling
Began 1042Time Sampling
Completed 1055

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface _____

MP Elevation _____

Total Sounded Depth of Well Below MP 7.07

Water-Level Elevation _____

Held _____ Depth to Water Below MP 2.68Diameter of Casing 2"Wet _____ Water Column in Well 4.39Gallons Pumped/Bailed
Prior to Sampling 2.5Gallons per Foot 0.16Gallons in Well 0.7024 x 3Sampling Pump Intake Setting
(feet below land surface) _____Purging Equipment Purge pump / Bailer = 2.107

SAMPLING DATA/FIELD PARAMETERS

Vol	Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	DO %
1.25	1048	6.61	6.30	4419	2.871	3.63	-225.5	26.2
1.75	1050	6.58	6.27	4400	2.861	2.19	-231.9	18.0
2.0	1051	6.49	6.25	4392	2.852	2.08	-241.0	17.0

Sampling Equipment Purge Pump/Bailer

Constituents Sampled

Container Description

Preservative

BTEX 3 40mL VOA's HClRemarks Hydrocarbon sheen + strong odor, water blackSampling Personnel Christine Matthews & Kelly Blanchard

Well Casing Volumes

Gal./ft.	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46



TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Charles Et Al #1Page 2 of 4

Project No. _____

Site Location _____

Site/Well No. MW-2 Coded/
Replicate No. _____Date 3-30-10Weather Sunny, warm 50° Time Sampling
Began 930Time Sampling
Completed 940

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface _____ MP Elevation _____

Total Sounded Depth of Well Below MP 7.49 Water-Level Elevation _____Held _____ Depth to Water Below MP 2.57 Diameter of Casing 2"Wet _____ Water Column in Well 4.92 Gallons Pumped Bailed 2.5
Prior to SamplingGallons per Foot 0.16Gallons in Well .787 x 3 Sampling Pump Intake Setting
(feet below land surface) _____Purging Equipment Purge pump / Bailer = 2.36

SAMPLING DATA/FIELD PARAMETERS

Vol	Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	DO %
2	936	5.60	6.28	6719	4.367	3.82	-71.4	31.1
2.25	936	5.60	6.31	6654	4.325	3.63	-68.1	32.6
2.5	939	5.64	6.32	6573	4.271	3.98	-66.6	32.5

Sampling Equipment Purge Pump/Bailer

Constituents Sampled

Container Description

Preservative

BTEX 3 40mL VOA's HClRemarks Water black to dark graySampling Personnel Christine Matthews & Kelly Blanchard

Well Casing Volumes

Gal./ft.	1 1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 1/2" = 0.10	2 1/2" = 0.24	3 1/2" = 0.50	6" = 1.46



TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Charles Et Al #1Page 3 of 4

Project No. _____

Site Location Angel Peak Area South of Bloomfield NMSite/Well No. MW-3Coded/
Replicate No. _____Date 3-30-10Weather Sunny, warm 50°Time Sampling
Began 1015Time Sampling
Completed 1030

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface _____ MP Elevation _____

Total Sounded Depth of Well Below MP 10.39 Water-Level Elevation _____Held _____ Depth to Water Below MP ~~5.40~~ 5.38 Diameter of Casing 2"Wet _____ Water Column in Well 5.01 Gallons Pumped/Bailed Prior to Sampling 2.5Gallons per Foot 0.16Gallons in Well 8016 x 3 Sampling Pump Intake Setting
(feet below land surface) _____Purging Equipment Purge pump / Bailer = 2.40

SAMPLING DATA/FIELD PARAMETERS

Vol	Time	Temperature (°C)	pH	Conductivity (µS/cm ³)	TDS (g/L)	DO (mg/L)	ORP (mV)	DO%
1.5	1023	8.08	6.24	3.229	2.67	5.15	-62.1	44.2
2.25	1026	8.68	6.32	3.274	2.72	5.21	-66.3	45.4
	1027	8.91	6.40	3.522	3.301	5.30	-66.3	45.8

Sampling Equipment Purge Pump/BailerConstituents SampledContainer DescriptionPreservativeBTEX 3 40mL VOA's HClRemarks H₂O is dark gray in color, odor of tannic acid observed, H₂O lightens in colorSampling Personnel Christine Matthews & Kelly Blanchard around 1.25 gal to light gray-brown

Well Casing Volumes

Gal./ft.	1 1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 1/2" = 0.10	2 1/2" = 0.24	3 1/2" = 0.50	6" = 1.46



TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Charles Et Al #1Page 4 of 4

Project No. _____

Site Location _____

Site/Well No. MW-4 Coded/
Replicate No. _____Date 3-30-10Weather Sunny, Warm 50° Time Sampling
Began 954Time Sampling
Completed 1005

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface _____ MP Elevation _____

Total Sounded Depth of Well Below MP 10.38 Water-Level Elevation _____Held _____ Depth to Water Below MP 5.40 Diameter of Casing 2"Wet _____ Water Column in Well 4.98 Gallons Pumped/Bailed
Prior to Sampling 2.5Gallons per Foot 0.16Gallons in Well 0.7968 x 3 Sampling Pump Intake Setting
(feet below land surface) _____Purging Equipment Purge pump / Bailer = 2.39

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	DO%
<u>957</u>	<u>5.05</u>	<u>6.05</u>	<u>6884</u>	<u>4.48</u>	<u>14.77</u>	<u>-117.7</u>	<u>103.0%</u>
<u>959</u>	<u>5.04</u>	<u>6.13</u>	<u>6897</u>	<u>4.57</u>	<u>4.23</u>	<u>-113.0</u>	<u>34.1</u>
<u>1002</u>	<u>5.06</u>	<u>6.17</u>	<u>7134</u>	<u>4.637</u>	<u>4.33</u>	<u>-98.0</u>	<u>34.8</u>

Sampling Equipment Purge Pump/Bailer

Constituents Sampled

Container Description

Preservative

BTEX 3 40mL VOA's HClRemarks Water black to dark graySampling Personnel Christine Matthews & Kelly Blanchard

Well Casing Volumes

Gal./ft.	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46

APPENDIX B

Laboratory Analytical Report



SPL Inc.
8880 Interchange Drive
Houston, TX 77054
Phone: (713) 660-0901
Fax: (713) 660-8975

Certificate of Analysis

April 15, 2010

Workorder: H10040014

Kelly Blanchard
Tetra Tech
6121 Indian School Road NE
Suite 200
Albuquerque, NM 87110

Project: Charles E + A1
Project Number: Charles E + A1
Site: Albuquerque, New Mexico
PO Number: 4512810987
NELAC Cert. No.: T104704205-09-1

This Report Contains A Total Of 18 Pages

Excluding Any Attachments



SPL Inc.
8880 Interchange Drive
Houston, TX 77054
Phone: (713) 660-0901
Fax: (713) 660-8975

Certificate of Analysis

April 15, 2010

Workorder: H10040014

Kelly Blanchard
Tetra Tech
6121 Indian School Road NE
Suite 200
Albuquerque, NM 87110

Project: Charles E + A1
Project Number: Charles E + A1
Site: Albuquerque, New Mexico
PO Number: 4512810987
NELAC Cert. No.: T104704205-09-1

I. SAMPLE RECEIPT:

All samples were received intact. The internal ice chest temperatures were measured on receipt and are recorded on the attached Sample Receipt Checklist.

II: ANALYSES AND EXCEPTIONS:

There were no exceptions noted.

III. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report (" mg/kg-dry " or " ug/kg-dry ").

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Some of the percent recoveries and RPD's on the QC report for the MS/MSD may be different than the calculated recoveries and RPD's using the sample result and the MS/MSD results that appear on the report because, the actual raw result is used to perform the calculations for percent recovery and RPD.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

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Certificate of Analysis

April 15, 2010

Workorder: H10040014

Kelly Blanchard
Tetra Tech
6121 Indian School Road NE
Suite 200
Albuquerque, NM 87110

Project: Charles E + A1
Project Number: Charles E + A1
Site: Albuquerque, New Mexico
PO Number: 4512810987
NELAC Cert. No.: T104704205-09-1

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or by his designee, as verified by the following signature.

Erica Cardenas, Senior Project Manager

Enclosures



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SAMPLE SUMMARY

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID	Sample ID	Matrix	COC ID	Date/Time Collected	Date/Time Received
H10040014001	MW-1	Water		3/30/2010 10:55	4/1/2010 09:00
H10040014002	MW-2	Water		3/30/2010 09:40	4/1/2010 09:00
H10040014003	MW-3	Water		3/30/2010 10:30	4/1/2010 09:00
H10040014004	MW-4	Water		3/30/2010 10:05	4/1/2010 09:00
H10040014005	Duplicate	Water		3/30/2010 10:50	4/1/2010 09:00
H10040014006	Trip Blank	Water		3/30/2010 11:00	4/1/2010 09:00



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ANALYTICAL RESULTS

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID: H10040014001

Date/Time Received: 4/1/2010 09:00

Matrix: Water

Sample ID: MW-1

Date/Time Collected: 3/30/2010 10:55

VOLATILES

Analysis Desc: SW-846 8260B

SW-846 5030 Analytical Batches:

Batch: 1709 SW-846 8260B on 04/05/2010 19:15 by JMC DF = 1

Batch: 1715 SW-846 8260B on 04/07/2010 13:37 by JMC DF = 50

Parameters	Results				Batch Information		
	ug/l	Qual	Report Limit	MDL	DF	RegLmt	Prep Analysis
Benzene	480		50	5.0	50		1715
Ethylbenzene	250		50	7.6	50		1715
Toluene	110		1.0	0.29	1		1709
m,p-Xylene	1500		50	9.2	50		1715
o-Xylene	79		1.0	0.13	1		1709
Xylenes, Total	1579		1.0	0.13	50		1715
4-Bromofluorobenzene (S)	94.5 %		74-125		50		1715
4-Bromofluorobenzene (S)	98.8 %		74-125		1		1709
1,2-Dichloroethane-d4 (S)	92.5 %		70-130		1		1709
1,2-Dichloroethane-d4 (S)	98.2 %		70-130		50		1715
Toluene-d8 (S)	103 %		82-118		1		1709



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ANALYTICAL RESULTS

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID: H10040014002

Date/Time Received: 4/1/2010 09:00

Matrix: Water

Sample ID: MW-2

Date/Time Collected: 3/30/2010 09:40

VOLATILES

Analysis Desc: SW-846 8260B

SW-846 5030 Analytical Batches:

Batch: 1715 SW-846 8260B on 04/07/2010 11:18 by JMC

Parameters	Results				Batch Information			
	ug/l	Qual	Report Limit	MDL	DF	RegLmt	Prep	Analysis
Benzene	ND		1.0	0.10	1			1715
Ethylbenzene	ND		1.0	0.15	1			1715
Toluene	ND		1.0	0.29	1			1715
m,p-Xylene	ND		1.0	0.18	1			1715
o-Xylene	ND		1.0	0.13	1			1715
Xylenes, Total	ND		1.0	0.13	1			1715
4-Bromofluorobenzene (S)	92.8 %		74-125		1			1715
1,2-Dichloroethane-d4 (S)	97.3 %		70-130		1			1715
Toluene-d8 (S)	98 %		82-118		1			1715



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ANALYTICAL RESULTS

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID: H10040014003

Date/Time Received: 4/1/2010 09:00

Matrix: Water

Sample ID: MW-3

Date/Time Collected: 3/30/2010 10:30

VOLATILES

Analysis Desc: SW-846 8260B

SW-846 5030 Analytical Batches:

Batch: 1709 SW-846 8260B on 04/05/2010 20:10 by JMC

Parameters	Results					Batch Information	
	ug/l	Qual	Report Limit	MDL	DF	RegLmt	Prep Analysis
Benzene	ND		1.0	0.10	1		1709
Ethylbenzene	ND		1.0	0.15	1		1709
Toluene	ND		1.0	0.29	1		1709
m,p-Xylene	ND		1.0	0.18	1		1709
o-Xylene	ND		1.0	0.13	1		1709
Xylenes, Total	ND		1.0	0.13	1		1709
4-Bromofluorobenzene (S)	95.6 %		74-125		1		1709
1,2-Dichloroethane-d4 (S)	103 %		70-130		1		1709
Toluene-d8 (S)	101 %		82-118		1		1709



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ANALYTICAL RESULTS

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID: H10040014004

Date/Time Received: 4/1/2010 09:00

Matrix: Water

Sample ID: MW-4

Date/Time Collected: 3/30/2010 10:05

VOLATILES

Analysis Desc: SW-846 8260B

SW-846 5030 Analytical Batches:

Batch: 1709 SW-846 8260B on 04/05/2010 20:37 by JMC

Parameters	Results				Batch Information			
	ug/l	Qual	Report Limit	MDL	DF	RegLmt	Prep	Analysis
Benzene	ND		1.0	0.10	1			1709
Ethylbenzene	ND		1.0	0.15	1			1709
Toluene	ND		1.0	0.29	1			1709
m,p-Xylene	ND		1.0	0.18	1			1709
o-Xylene	ND		1.0	0.13	1			1709
Xylenes, Total	ND		1.0	0.13	1			1709
4-Bromofluorobenzene (S)	94.7 %		74-125		1			1709
1,2-Dichloroethane-d4 (S)	103 %		70-130		1			1709
Toluene-d8 (S)	100 %		82-118		1			1709



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ANALYTICAL RESULTS

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID: H10040014005

Date/Time Received: 4/1/2010 09:00 Matrix: Water

Sample ID: Duplicate

Date/Time Collected: 3/30/2010 10:50

VOLATILES

Analysis Desc: SW-846 8260B

SW-846 5030 Analytical Batches:

Batch: 1709 SW-846 8260B on 04/05/2010 21:05 by JMC DF = 1.

Batch: 1715 SW-846 8260B on 04/07/2010 14:05 by JMC DF = 50.

Parameters	Results					Batch Information	
	ug/l	Qual	Report Limit	MDL	DF	RegLmt	Prep Analysis
Benzene	630		50	5.0	50		1715
Ethylbenzene	250		50	7.6	50		1715
Toluene	120		1.0	0.29	1		1709
m,p-Xylene	1600		50	9.2	50		1715
o-Xylene	82		1.0	0.13	1		1709
Xylenes, Total	1682		1.0	0.13	50		1715
4-Bromofluorobenzene (S)	98.9 %		74-125		50		1715
4-Bromofluorobenzene (S)	101 %		74-125		1		1709
1,2-Dichloroethane-d4 (S)	93.9 %		70-130		1		1709
1,2-Dichloroethane-d4 (S)	99.3 %		70-130		50		1715
Toluene-d8 (S)	101 %		82-118		50		1715
Toluene-d8 (S)	103 %		82-118		1		1709



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ANALYTICAL RESULTS

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID: H10040014006

Date/Time Received: 4/1/2010 09:00

Matrix: Water

Sample ID: Trip Blank

Date/Time Collected: 3/30/2010 11:00

VOLATILES

Analysis Desc: SW-846 8260B

SW-846 5030 Analytical Batches:

Batch: 1715 SW-846 8260B on 04/07/2010 12:42 by JMC

Parameters	Results				Batch Information			
	ug/l	Qual	Report Limit	MDL	DF	RegLmt	Prep	Analysis
Benzene	ND		1.0	0.10	1			1715
Ethylbenzene	ND		1.0	0.15	1			1715
Toluene	ND		1.0	0.29	1			1715
m,p-Xylene	ND		1.0	0.18	1			1715
o-Xylene	ND		1.0	0.13	1			1715
Xylenes, Total	ND		1.0	0.13	1			1715
4-Bromofluorobenzene (S)	93.8 %		74-125		1			1715
1,2-Dichloroethane-d4 (S)	102 %		70-130		1			1715
Toluene-d8 (S)	99.9 %		82-118		1			1715



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QUALITY CONTROL DATA

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

QC Batch: MSV/1708 Analysis Method: SW-846 8260B
QC Batch Method: SW-846 5030 Preparation: 04/05/2010 00:00 by JMC
Associated Lab Samples: H10040006001 H10040006002 H10040006003 H10040006004 H10040006005 H10040006006
H10040006007 H10040014001 H10040014003 H10040014004 H10040014005 H10040019001
H10040019002 H10040019003 H10040019004 H10040019005 H10040019006

METHOD BLANK: 37519

Analysis Date/Time Analyst: 04/05/2010 11:55 JMC

Parameter	Units	Blank Result	Qualifiers	Reporting Limit
Benzene	ug/l	ND		1.0
Ethylbenzene	ug/l	ND		1.0
Toluene	ug/l	ND		1.0
m,p-Xylene	ug/l	ND		1.0
o-Xylene	ug/l	ND		1.0
Xylenes, Total	ug/l	ND		1.0
4-Bromofluorobenzene (S)	%	95.4		74-125
1,2-Dichloroethane-d4 (S)	%	94.2		70-130
Toluene-d8 (S)	%	102		82-118

LABORATORY CONTROL SAMPLE: 37520

Analysis Date/Time Analyst: 04/05/2010 11:28 JMC

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits
Benzene	ug/l	20	19.4	97.2	74-123
Ethylbenzene	ug/l	20	19.0	95.1	72-127
Toluene	ug/l	20	19.6	98.2	74-126
m,p-Xylene	ug/l	40	39.1	97.8	71-129
o-Xylene	ug/l	20	19.5	97.7	74-130
Xylenes, Total	ug/l	60	58.64	97.7	71-130
4-Bromofluorobenzene (S)	%			96.8	74-125
1,2-Dichloroethane-d4 (S)	%			96.8	70-130
Toluene-d8 (S)	%			100	82-118

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 37521

37522

Original: H10040006001

MS Analysis Date/Time Analyst: 04/05/2010 12:50 JMC

MSD Analysis Date/Time Analyst: 04/05/2010 13:18 JMC

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Benzene	ug/l	ND	20	19.2	19.5	95.8	97.4	70-124	1.7	20
Ethylbenzene	ug/l	ND	20	20.0	18.8	99.9	94.2	35-175	5.9	20

QC results presented in the QC Control Data have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules. Also, MS/MSD % recoveries are calculated by the SPL LIMS using any detected value greater than the MDL.



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QUALITY CONTROL DATA

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 37521

37522

Original: H10040006001

MS Analysis Date/Time Analyst: 04/05/2010 12:50 JMC

MSD Analysis Date/Time Analyst: 04/05/2010 13:18 JMC

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Toluene	ug/l	ND	20	19.8	19.7	98.9	98.5	70-131	0.4	20
m,p-Xylene	ug/l	ND	40	40.2	38.7	100	96.8	35-175	3.7	20
o-Xylene	ug/l	ND	20	19.9	19.6	99.3	97.8	35-175	1.6	20
Xylenes, Total	ug/l	ND	60	60.04	58.27	100	97.1	35-175	3.0	20
4-Bromofluorobenzene (S)	%	91.8				98.6	98.1	74-125		30
1,2-Dichloroethane-d4 (S)	%	104				95.2	101	70-130		30
Toluene-d8 (S)	%	100				102	101	82-118		30

QC results presented in the QC Control Data have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules. Also, MS/MSD % recoveries are calculated by the SPL LIMS using any detected value greater than the MDL.



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QUALITY CONTROL DATA

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

QC Batch: MSV/1714

Analysis Method: SW-846 8260B

QC Batch Method: SW-846 5030

Preparation: 04/07/2010 00:00 by JMC

Associated Lab Samples:	H10040014001	H10040014002	H10040014005	H10040014006	H10040050001	H10040050002
	H10040050003	H10040051001	H10040051002	H10040051003	H10040051004	H10040051005
	H10040051006	H10040057016	H10040057017	H10040057018		

METHOD BLANK: 38036

Analysis Date/Time Analyst: 04/07/2010 10:50 JMC

Parameter	Units	Blank Result	Qualifiers	Reporting Limit
Benzene	ug/l	ND		1.0
Ethylbenzene	ug/l	ND		1.0
Toluene	ug/l	ND		1.0
m,p-Xylene	ug/l	ND		1.0
o-Xylene	ug/l	ND		1.0
Xylenes, Total	ug/l	ND		1.0
4-Bromofluorobenzene (S)	%	94.9		74-125
1,2-Dichloroethane-d4 (S)	%	96.8		70-130
Toluene-d8 (S)	%	99.8		82-118

LABORATORY CONTROL SAMPLE: 38037

Analysis Date/Time Analyst: 04/07/2010 10:23 JMC

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits
Benzene	ug/l	20	19.7	98.5	74-123
Ethylbenzene	ug/l	20	20.0	100	72-127
Toluene	ug/l	20	19.2	96.1	74-126
m,p-Xylene	ug/l	40	40.2	100	71-129
o-Xylene	ug/l	20	20.0	100	74-130
Xylenes, Total	ug/l	60	60.19	100	71-130
4-Bromofluorobenzene (S)	%			100	74-125
1,2-Dichloroethane-d4 (S)	%			93.8	70-130
Toluene-d8 (S)	%			100	82-118

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38042

38043

Original: H10040014002

MS Analysis Date/Time Analyst: 04/07/2010 11:46 JMC

MSD Analysis Date/Time Analyst: 04/07/2010 12:13 JMC

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Benzene	ug/l	ND	20	20.4	20.4	102	102	70-124	0.1	20
Ethylbenzene	ug/l	ND	20	20.4	19.7	102	98.3	35-175	3.9	20

QC results presented in the QC Control Data have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules. Also, MS/MSD % recoveries are calculated by the SPL LIMS using any detected value greater than the MDL.



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QUALITY CONTROL DATA

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 38042 38043 Original: H10040014002

MS Analysis Date/Time Analyst: 04/07/2010 11:46 JMC

MSD Analysis Date/Time Analyst: 04/07/2010 12:13 JMC

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Toluene	ug/l	ND	20	20.6	20.3	103	101	70-131	1.4	20
m,p-Xylene	ug/l	ND	40	41.9	40.0	105	99.9	35-175	4.7	20
o-Xylene	ug/l	ND	20	21.4	19.8	107	98.8	35-175	8.0	20
Xylenes, Total	ug/l	ND	60	63.3	59.75	106	99.6	35-175	5.8	20
4-Bromofluorobenzene (S)	%	92.8				103	95.5	74-125		30
1,2-Dichloroethane-d4 (S)	%	97.3				96.1	97.2	70-130		30
Toluene-d8 (S)	%	98				100	99.9	82-118		30

QC results presented in the QC Control Data have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules. Also, MS/MSD % recoveries are calculated by the SPL LIMS using any detected value greater than the MDL.



Legend

(S) - Indicates analyte is a surrogate

Qualifier	Qualifier Description
MI	Matrix Interference
I	Estimated value, between MDL and PQL (Florida)
JN	The analysis indicates the presence of an analyte
C	MTBE results were not confirmed by GCMS
NC	Not Calculated - Sample concentration > 4 times the spike
*	Recovery/RPD value outside QC limits
E	Results exceed calibration range
H	Exceeds holding time
J	Estimated value
Q	Received past holding time
B	Analyte detected in the Method Blank
N	Recovery outside of control limits
D	Recovery out of range due to dilution
NC	Not Calculable (Sample Duplicate)
P	Pesticide dual column results, greater than 25%



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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: H10040014 : Charles E + A1

Project Number: Charles E + A1

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H10040014001	MW-1	SW-846 5030	MSV/1708	SW-846 8260B	MSV/1709
H10040014003	MW-3	SW-846 5030	MSV/1708	SW-846 8260B	MSV/1709
H10040014004	MW-4	SW-846 5030	MSV/1708	SW-846 8260B	MSV/1709
H10040014005	Duplicate	SW-846 5030	MSV/1708	SW-846 8260B	MSV/1709
H10040014001	MW-1	SW-846 5030	MSV/1714	SW-846 8260B	MSV/1715
H10040014002	MW-2	SW-846 5030	MSV/1714	SW-846 8260B	MSV/1715
H10040014005	Duplicate	SW-846 5030	MSV/1714	SW-846 8260B	MSV/1715
H10040014006	Trip Blank	SW-846 5030	MSV/1714	SW-846 8260B	MSV/1715



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Sample Receipt Checklist

WorkOrder:	H10040014	Received By	BAF
Date and Time	04/01/2010 09:00	Carrier Name:	FEDEXS
Temperature:	2.0°C	Chilled By:	Water Ice

1. Shipping container/cooler in good condition? YES
2. Custody seals intact on shipping container/cooler? YES
3. Custody seals intact on sample bottles? Not Present
4. Chain of custody present? YES
5. Chain of custody signed when relinquished and received? YES
6. Chain of custody agrees with sample labels? YES
7. Samples in proper container/bottle? YES
8. Samples containers intact? YES
9. Sufficient sample volume for indicated test? YES
10. All samples received within holding time? YES
11. Container/Temp Blank temperature in compliance? YES
12. Water - VOA vials have zero headspace? YES
13. Water - Preservation checked upon receipt(except VOA*)? Not Applicable

*VOA Preservation Checked After Sample Analysis

SPL Representative:

Contact Date & Time:

Client Name Contacted:

Client Instructions:

Report ID: H10040014_6089
Printed: 04/15/2010 18:56