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JUNE 2010 QUARTERLY GWMR

AUG 2010

JUNE 2010 QUARTERLY GROUNDWATER MONITORING REPORT

CONOCOPHILLIPS
HOWELL K No. 1
SAN JUAN COUNTY, NEW MEXICO

OCD # _____

API 300-045-09313

Prepared for:

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Tetra Tech Project No. 114-690132

August 2010

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QUARTERLY GROUNDWATER MONITORING REPORT
HOWELL K NO. 1, SAN JUAN COUNTY, NEW MEXICO

1.0 INTRODUCTION

This report presents the results of a quarterly groundwater monitoring event conducted by Tetra Tech, Inc. (Tetra Tech) on June 8, 2010, at the ConocoPhillips Howell K No. 1 site, located on BLM land, approximately ½ mile southeast of Navajo Lake State Park and 10 miles east of Aztec in Unit Letter K, Section 21, Township 30N, Range 8W of San Juan County, New Mexico (Site). The Site consists of a gas production well and associated equipment and installations. The location and general features of the Site are shown on **Figures 1** and **2**, respectively.

1.1 Site Background

The environmental investigation at the Site began in August 2005 with the excavation of approximately 4000 cubic yards of hydrocarbon impacted soil from an area southwest of the wellhead at the Howell K No. 1 site. The hydrocarbon impacted soils were discovered in the area during below grade tank removal activities. The final dimensions of the excavation were 70 feet by 50 feet by 36 feet deep (groundwater was encountered at a depth of approximately 34 feet below ground surface (bgs). Once this extent had been reached, the excavation was stopped due to the inability of the equipment to operate safely at this depth; however, the limits of the hydrocarbon impact had not been delineated. The excavation was backfilled with clean soil. In March 2006, one groundwater monitoring well (MW-1) was installed in the general area of the backfilled excavation by Envirotech. The location of this well is shown on **Figure 2**.

Due to the transition of Site consulting responsibilities from Lode Star LLC of Farmington, NM, to Tetra Tech following the acquisition of Burlington Resources by ConocoPhillips Company in March 2006, groundwater monitoring was not performed at the Site in March and June 2007. Tetra Tech began sampling groundwater at the Howell K No. 1 site in November of 2007 using MW-1 and continued to do so until August of 2008, when 3 additional monitoring wells were installed at the Site by WDC Exploration and Wells of Peralta, NM and under Tetra Tech supervision. Additional wells were installed in response to a request by the New Mexico Oil Conservation Division (OCD) for Site characterization and enhanced laboratory analyses. This request was communicated to Tetra Tech during an April 2008 meeting conducted in Santa Fe, New Mexico with Glenn Von Gonten, OCD Environmental Bureau Hydrologist. Groundwater Monitoring Well MW-2 was installed upgradient of MW-1 and Monitoring Wells MW-3 and MW-4 were installed down-gradient of MW-1 (**Figure 2**). A generalized geologic cross-section was compiled using subsurface data collected from each boring location during installation of Monitoring Wells ; MW-2, MW-3 and MW-4. Monitoring Wells MW-2 and MW-4 are represented on the cross-section which can be seen as **Figure 3**. October 2008 marked the first quarterly groundwater monitoring event to

include all 4 monitoring wells for analysis at the Site. A summary of the Howell K No. 1 site history can be seen in **Table 1**.

2.0 MONITORING SUMMARY AND SAMPLING METHODOLOGY AND ANALYTICAL RESULTS

2.1 Monitoring Summary

Quarterly groundwater sampling was conducted by Tetra Tech on June 8, 2010. The groundwater sampling event included samples from Monitoring Wells; MW-1, MW-2, MW-3 and MW-4. Groundwater levels were measured in each site monitoring well prior to sampling and can be found in **Table 2**. Groundwater elevations for MW-1, however, can not be calculated or included on the groundwater contour map due to the gradual, continuous, upward shifting of the PVC well casing. The continual shifting of the PVC casing of MW-1 is likely due to the proximity of MW-1 to the 2005, underground tank removal excavation and the severe settling and shifting of the fill material in this area. Groundwater elevations are calculated from top of casing elevations which were derived from survey data collected from each site monitoring well by Tetra Tech on August 14, 2008. Survey data obtained from MW-1 is no longer valid due to the uplifting of the well casing which will continue to change over time, therefore; MW-1 will no longer be factored into future groundwater elevation contour maps. The groundwater flow direction is to the west based on groundwater elevation data collected on June 8, 2010 from MW-2, MW-3 and MW-4, and as seen on **Figure 4**.

2.2 Groundwater Sampling Methodology

During the sampling event, each monitoring well was purged either of three casing volumes of water or was purged until groundwater parameters had stabilized. Measured groundwater parameters included; temperature, pH, conductivity, total dissolved solids (TDS), oxidation-reduction potential (ORP) and dissolved oxygen (DO), and were collected using a YSI 556 multi-parameter sonde. A 1.5-inch clear, polyethylene, dedicated bailer was used to purge and to collect the groundwater samples from MW-2, MW-3 and MW-4. A 0.5 inch clear, polyethylene, dedicated bailer was used to purge and collect a groundwater sample from MW-1. The purge water generated during the event was disposed of in the produced water tank located on site (**Figure 2**). The groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped with chain-of-custody documentation to Southern Petroleum Laboratory (SPL) in Houston, Texas. All groundwater samples collected were analyzed for the presence of benzene, toluene, ethylbenezene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260B, dissolved iron and manganese by EPA Method 6010B, and sulfate by EPA method 300.0. The dissolved metals samples were collected in unpreserved containers supplied by the laboratory, to be filtered and preserved by laboratory personnel prior to analysis for dissolved metals. Dissolved metals testing will continue for metals exceeding NMWQCC drinking water standards.

2.3 Groundwater Sampling Analytical Results

Samples collected from MW-1, MW-2, MW-3, and MW-4 on June 8, 2010 indicate that groundwater concentrations for BTEX were below laboratory method detection limits (MDL).

Although BTEX constituents were found to be below NMWQCC standards during the March 2010 quarterly analysis, other constituents were found to be above standard. Analyses of samples collected from all four wells on Site were found to be above the NMWQCC standard for sulfate. MW-1, MW-3 and MW-4 were also above standard for dissolved manganese and MW-1 was above standard for dissolved iron. **Table 3** lists the analytical results from groundwater sampling done during June 2010. Groundwater sampling field forms showing field parameters can be found in **Appendix A** and the corresponding laboratory analysis reports including quality control summaries can be found in **Appendix B**.

3.0 CONCLUSIONS

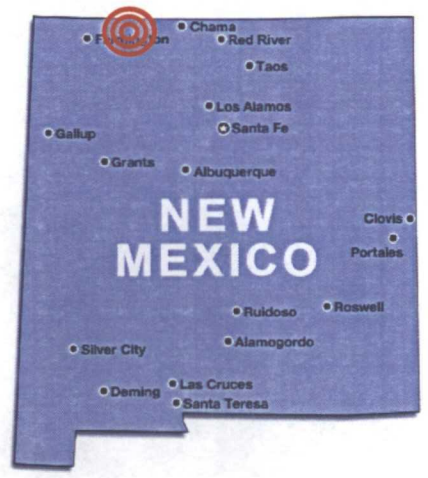
Based on the historical groundwater quality data, groundwater samples collected from MW-1 have never exceeded NMWQCC groundwater quality standards for BTEX constituents during sampling conducted from March 2006 to June 2010. BTEX concentrations were found to be below the minimum laboratory detection limits for these constituents consistently since October 2006. In addition, groundwater samples collected from MW-2, MW-3 and MW-4 have also not exceeded NMWQCC groundwater quality standards for BTEX constituents from October 2008 to March 2010. Since BTEX is below standards in all 4 monitoring wells but there are other constituents of concern above NMWQCC standard. Tetra Tech recommends the continuation of quarterly groundwater monitoring until sulfate, dissolved manganese, and dissolved iron concentrations are also below NMWQCC standards, appear stable or reach regional background levels. Please contact Kelly Blanchard at 505-237-8440 or kelly.blanchard@tetratech.com if you have any questions or require additional information.

FIGURES

ConocoPhillips - High Resolution Aerial Imagery 2008

FIGURE 1.

Site Location Map
ConocoPhillips
Howell K No. 1
Aztec, NM



Approximate ConocoPhillips Howell K No. 1 Site location

Latitude = 36.79505 deg N
Longitude = -107.68474 deg W

N

TETRA TECH, INC.

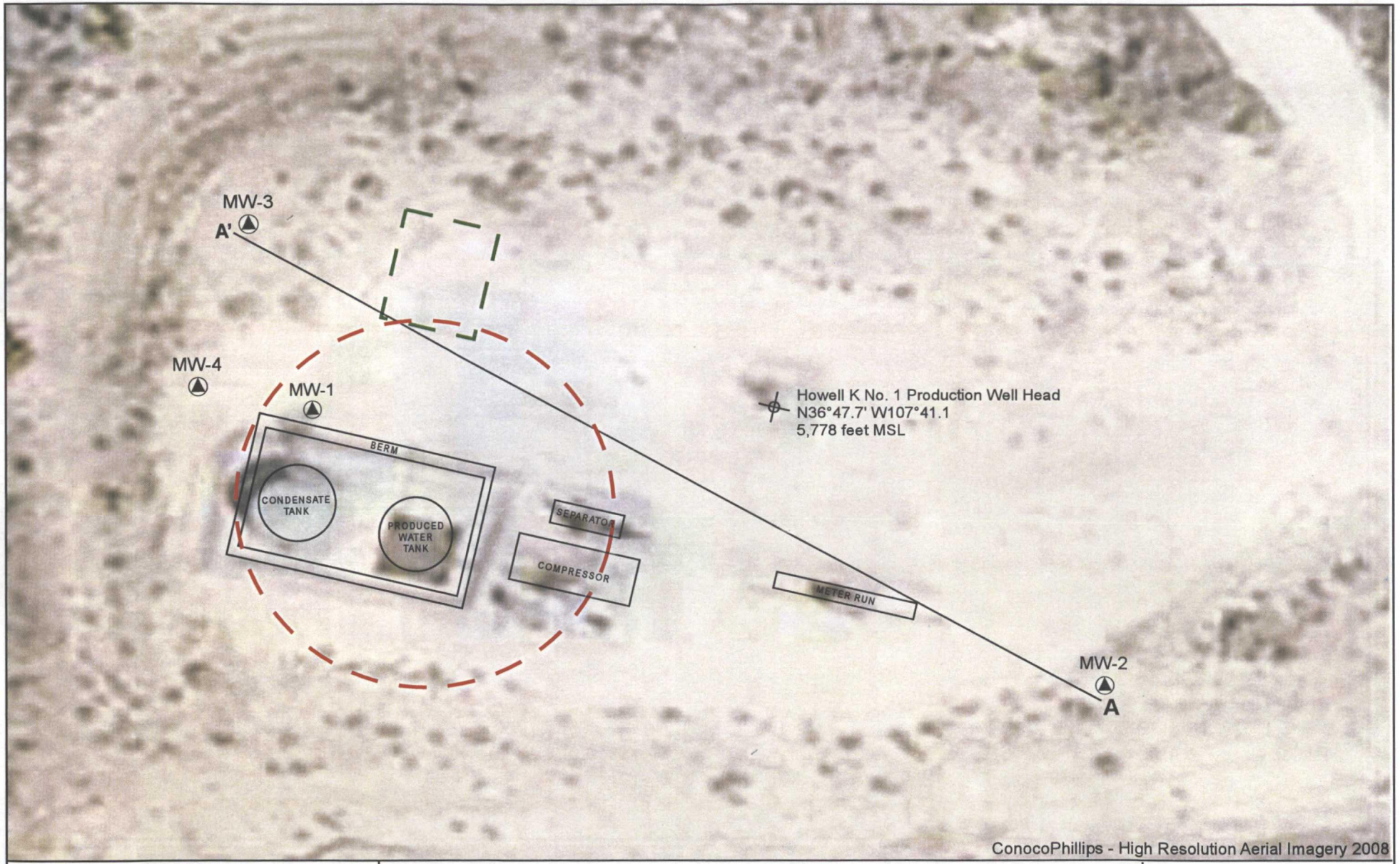


FIGURE 2:
SITE LAYOUT MAP
CONOCOPHILLIPS
HOWELL K No. 1
Unit K, Sec 21, Twp 30N, Rng 8W
San Juan County, New Mexico
Revised by CFM 06/10

LEGEND

- WELLHEAD
- MONITORING WELL
- GENERAL AREA OF UNDERGROUND TANK REMOVAL EXCAVATION
- GENERAL AREA OF UNLINED EARTHEN PIT EXCAVATION

0 15 30
FEET

N

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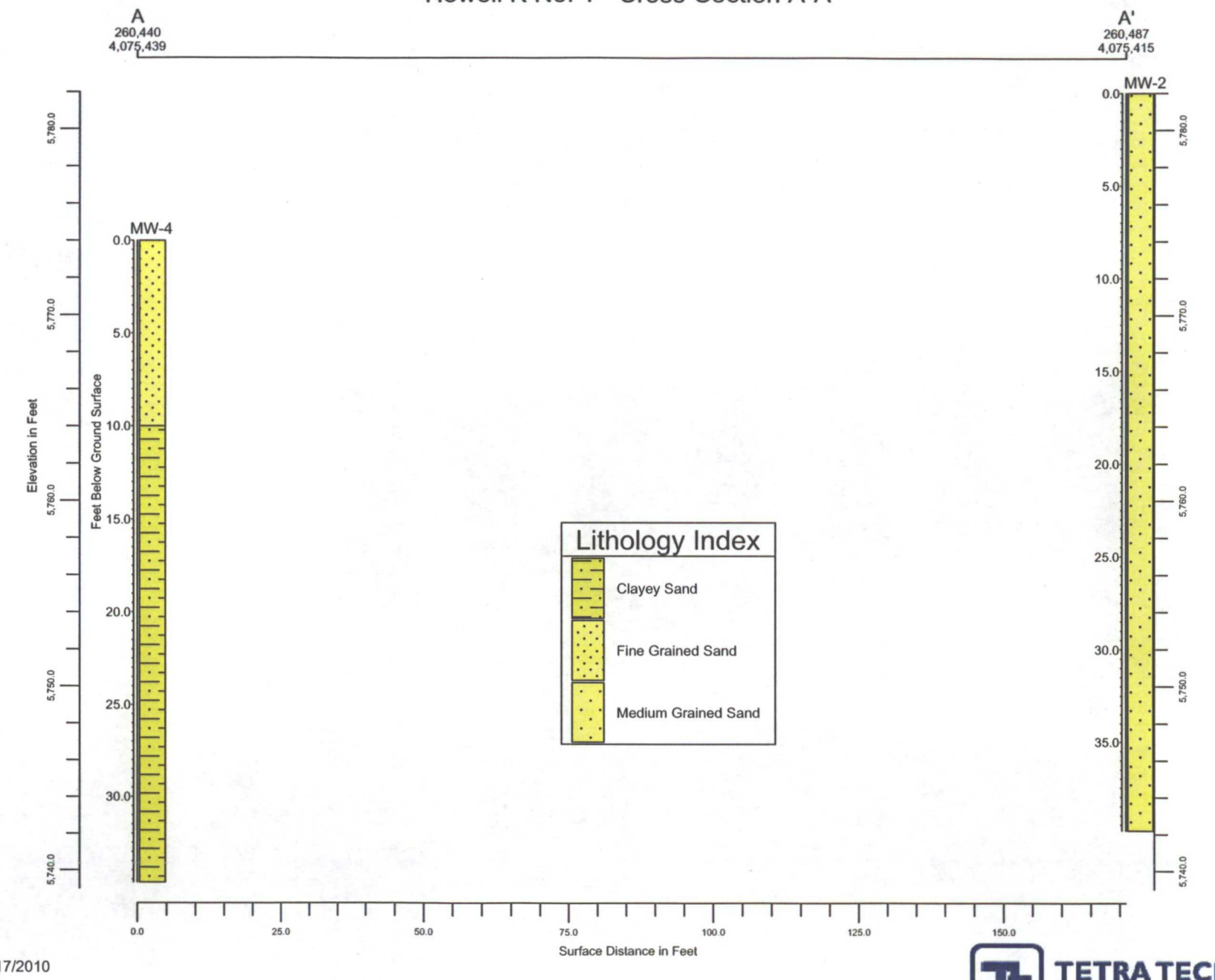
Howell K No. 1 - Cross-Section A-A'



5/17/2010

TETRA TECH

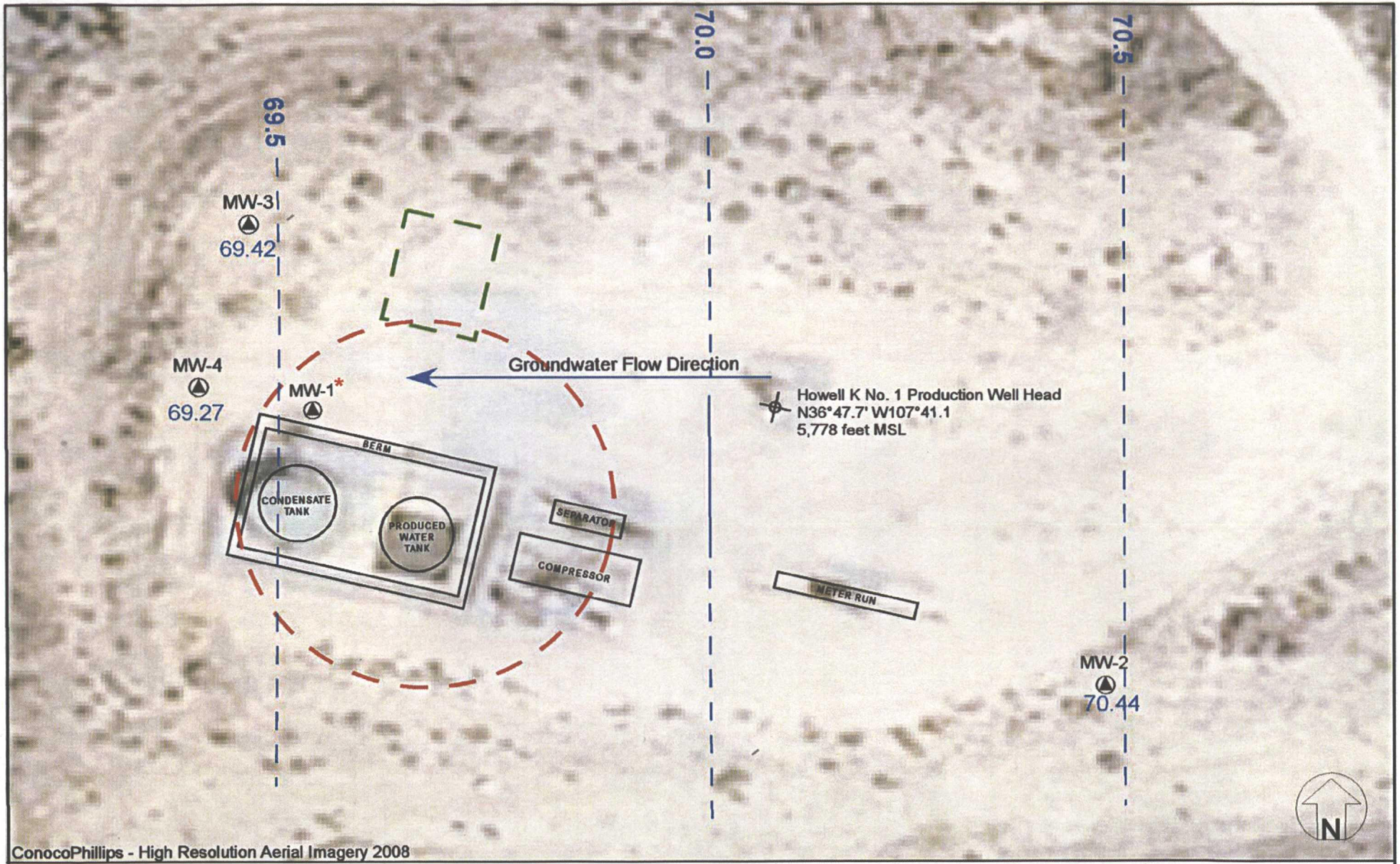


FIGURE 4:
JUNE 2010 GROUNDWATER ELEVATION CONTOUR MAP
CONOCOPHILLIPS COMPANY
HOWELL K No. 1
Unit K - T30N, R8W, Section 21
San Juan County, New Mexico
Revised by CFM 06/10

LEGEND

- WELLHEAD
- MONITORING WELL
- GENERAL AREA OF UNDERGROUND TANK REMOVAL EXCAVATION
- GENERAL AREA OF UNLINED EARTHEN PIT EXCAVATION
- GROUNDWATER ELEVATION (dashed where inferred)
- * Groundwater elevations can not be calculated accurately due to continual upward shifting of the PVC casing (see text of section 2.1, Monitoring Summary, for more information)

0 15 30
FEET

TETRA TECH, INC.

TABLES

Table 1. Site History Timeline

Date/Time Period	Event/Action	Description/Comments
July 26, through August 18, 2005	Initial Site Assessment	Environmental investigation began with the excavation of approximately 4000 cubic yards of impacted soil from an area southwest of the Howell K No.1 well head. Impacted soils were discovered during the removal activities of a below grade tank. Dimensions of the excavation were approximately 70 feet long by 50 feet wide by 36 feet deep. Groundwater was encountered at approximately 34 feet and soils were still impacted at 36 feet deep, the point at which excavation machinery was stopped at the practical limit for safe operation. The total verticle extent of hydrocarbon impacts were not completely deliniated. Soil was treated with 600 total gallons of potassium permanganate solution. The excavation area was backfilled with clean soil.
March 10, 2006	Groundwater monitoring well installation	One ground water monitoring well, MW-1, was installed in the center of the backfilled excavation by Envirotech. Total depth of well was set at 35 feet.
March 31, 2006	Site Transfer	ConocoPhillips Company completed acquisition of Burlington Resources.
March and June 2007	Groundwater monitoring not performed	After the acquisition of Burlington Resources by ConocoPhillips, consulting responsibilities were transferred from Lode Star LLC of Farmington New Mexico to Tetra Tech of Albuquerque. Due to the transition, first and second quarter sampling of 2007 was not performed.
November 9, 2007 through March 19, 2008	Groundwater monitoring	Tetra Tech began sampling the Howell K No. 1 site quarterly in November of 2007. Groundwater was sampled from MW-1 and was analyzed for BTEX constituents. No constituents were detected at levels that exceeded the NMWQCC standards at any point during this period.
April 1, 2008	Additional Monitoring Requested by OCD	Oil Conservation Division of NM Energy, Minerals, and Resources Dept. indicates additional investigation and sampling is necessary for closure consideration during a meeting with Glenn Von Gonten.
July 23, 2008	Groundwater monitoring postponed	Groundwater monitoring of MW-1 was postponed after it was found that there was an obstruction caused by settling and shifting of the MW-1 casing. It was determined that the obstruction could be avoided by using a smaller bailer to collect samples. Sampling was postponed and was set to follow upcoming monitoring well installation so that proper sampling materials could be used.
August 13 and 14, 2008	Groundwater monitoring well installation and groundwater monitoring	Three additional groundwater monitoring wells (MW-2, MW-3 and MW-4) were installed by WDC and overseen by Tetra Tech. MW-2 was installed up-gradient of MW-1. Both MW-3 and MW-4 were installed down-gradient of MW-1. All wells were developed by purging approximately 80 gallons of fluid using a surge block and a purge pump. A sample was collected from MW-1 on August 14th since sampling could not be done in July of 2008. A 3/4 inch disposable bailer was used to avoid obstruction in MW-1. Sample was analyzed for BTEX constituents. All constituents were below NMWQCC standards.
October 24, 2008	Groundwater monitoring	Third quarter 2008 groundwater monitoring was completed and was the first quarter of sampling to include all four monitoring wells on site. A baseline suite was completed including major ions, total metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs) including BTEX, diesel range organics, and gasoline range organics. All BTEX constituents were below NMWQCC standards. All four wells were above standard for sulfate, and showed elevated total iron and total manganese concentrations. MW-4 was also above the NMWWCC standard for Fluoride.
January 30, 2009	4th quarter 2008 groundwater monitoring	Tetra Tech conducted forth quarter 2008 groundwater monitoring at the site for BTEX constituents in all four monitoring wells. All wells are below NMWQCC standards for BTEX .
September 25,2009	2009 annual groundwater monitoring	Tetra Tech conducted 2009 annual groundwater monitoring of MW-2, MW-3 and MW-4 for BTEX, dissoved iron, dissolved manganese, sulfate, and fluoride. All three wells were below NMWQCC standards for BTEX. All three wells were above standard for sulfate. Dissolved manganese was above standard in MW-3 and MW-4 and flouride was above standard in MW-4. Dissolved metals analyses conducted for the first time since standards are based on dissolved metals testing. OCD concurred, allowing total metals testing to be discontinued.

Date/Time Period	Event/Action	Description/Comments
October 18, 2009	Groundwater monitoring	Tetra Tech conducted 2009 annual groundwater monitoring of MW-1 for BTEX, dissoved iron, dissolved manganese, sulfate, and fluoride. MW-1 was below NMWQCC standards for BTEX. Sulfate, dissolved manganese and dissolved iron were above standard in MW-1.
December 15, 2009	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, sulfate and flouride. All four monitoring wells are below NMWQCC standards for BTEX . All four monitoring wells were above standard for sulfate. MW-1, MW-3 and MW-4 were above standard for dissolved manganese and MW-3 and MW-1 were also above standard for dissolved iron.
March 30, 2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, and sulfate. All four monitoring wells are below NMWQCC standards for BTEX . All four monitoring wells were above standard for sulfate. MW-1, MW-3 and MW-4 were also above standard for dissolved manganese .
June 8, 2010	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, and sulfate. All four monitoring wells are below NMWQCC standards for BTEX . All four monitoring wells were above standard for sulfate. MW-1, MW-3 and MW-4 were also above standard for dissolved manganese . MW-1 was also above standard for iron.

Table 2. Groundwater Elevation Data Summary

Well ID	Total Depth (ft bgs)	Screen Interval (ft)	*Elevation (ft) (TOC)	Date Measured	Depth to Groundwater (ft below TOC)	Relative Groundwater Elevation
MW-1	37.47	21.0 - 36.0	97.84	3/22/2006	28.54	69.30
				6/21/2006	29.15	68.69
				10/19/2006	27.83	70.01
				12/12/2006	28.22	69.62
				March 2006	NS	--
				June 2006	NS	--
				11/9/2007	29.03	68.81
				1/15/2008	28.34	69.5
				3/19/2008	NM	NM
				7/23/2008	28.46	69.38
				10/24/2008	29.91	67.93
				1/30/2009	28.37	69.47
				9/25/2009	29.95	67.89
				10/18/2009	29.97	67.87
				12/15/2009	29.51	--(1)
				3/30/2010	28.18	--(1)
				6/8/2010	28.38	--(1)
MW-2	39.81	21.0 - 36.0	95.28	10/24/2008	25.74	69.54
				1/30/2009	24.74	70.54
				9/25/2009	26.48	68.80
				12/15/2009	25.97	69.31
				3/30/2010	24.67	70.61
				6/8/2010	24.84	70.44
MW-3	37.47	19.0 - 34.0	95.44	10/24/2008	26.95	68.49
				1/30/2009	25.92	69.52
				9/25/2009	27.57	67.87
				12/15/2009	27.05	68.39
				3/30/2010	25.79	69.65
				6/8/2010	26.02	69.42
MW-4	34.66	17.0 - 32.0	95.36	10/24/2008	NM	NM
				1/30/2009	26.00	69.36
				9/25/2009	27.64	67.72
				12/15/2009	27.14	68.22
				3/30/2010	25.87	69.49
				6/8/2010	26.09	69.27

ft = Feet

TOC = Top of casing

bgs = below ground surface

* = Elevation relative to wellhead

(1) = Groundwater elevations can not be calculated accurately due to continual upward shifting of the PVC casing (see text of section 2.1, Monitoring Summary, of this report for more information)

NS = Not Sampled (quarters not sampled due to change in consulting responsibilities from Lodestar LLC to Tetra Tech Inc.)

Table 3. Groundwater Analytical Results Summary

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)
MW-1	3/22/2006	ND	ND	1.00	2.00	NA	NA	NA	NA
	6/21/2006	1.40	1.40	ND	10.60	NA	NA	NA	NA
	10/19/2006	ND	ND	ND	1.10	NA	NA	NA	NA
	12/12/2006	ND	0.50	0.40	2.10	NA	NA	NA	NA
	11/9/2007	<0.5 U	<0.7 U	<0.8 U	<0.9 J	NA	NA	NA	NA
	1/15/2008	<0.5 U	<0.7 U	<0.8 U	<0.8 U	NA	NA	NA	NA
	3/19/2008	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
	8/14/2008	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
	10/24/2008	<0.5	<0.5	<0.5	<0.5	< 2.0	**2390**	32.1*	13.4*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	10/18/2009	<1.0	<1.0	<1.0	<1.0	0.88	**3840**	**2.24**	**17.40**
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 50	**3290**	**1.70**	**16.50**
	3/30/2010	<1.0	<1.0	<1.0	<1.0	NA	**2950**	0.87	**14.90**
	6/8/2010	<1.0	<1.0	<1.0	<1.0	NA	**2570**	**11.20**	**14.70**
MW-2	10/24/2008	<0.5 U	<0.5 U	<0.5 U	<0.5 U	< 2	**1480**	3.28*	0.231*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	9/25/2009	<1.0	<1.0	<1.0	<1.0	1.09	**1700**	<0.02	<0.005
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 100	**1570**	<0.02	<0.005
	3/30/2010	<1.0	<1.0	<1.0	<1.0	NA	**1410**	<0.02	0.14
	6/8/2010	<1.0	<1.0	<1.0	<1.0	NA	**1460**	0.0544	0.00930
MW-3	10/24/2008	<0.5 U	<0.5 U	<0.5 U	<0.5 U	< 2	**1480**	3.38*	1.31*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	9/25/2009	<1.0	<1.0	<1.0	<1.0	1.00	**1840**	<0.02	**0.38**
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 50	**2500**	**1.35**	**0.32**
	3/30/2010	<1.0	<1.0	<1.0	<1.0	NA	**1890**	<0.02	**0.43**
	6/8/2010	<1.0	<1.0	<1.0	<1.0	NA	**1630**	0.0573	**0.383**

Explanation

ND = Not Detected
NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
µg/L = micrograms per liter (parts per billion)
NA = Not Analyzed
<0.7 = Below laboratory detection limit of 0.7 ug/L
U = Analyte was analyzed for but not detected at the indicated MDL
Bold = concentrations that exceed the NMWQCC limits
* = Results recorded by total metals analysis, not comparable to NMWQCC standards which are based on dissolved metals concentrations

ConocoPhillips Howell K No. 1

MW-4	10/24/2008	<0.5 U	<0.5 U	<0.5 U	<0.5 U	2.43	3400	2.7*	7.79*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	9/25/2009	<1.0	<1.0	<1.0	<1.0	2.47	3860	<0.02	7.80
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 50	4540	0.03	7.40
	3/30/2010	<1.0	<1.0	<1.0	<1.0	NA	3970	<0.02	7.83
	6/8/2010	<1.0	<1.0	<1.0	<1.0	NA	3490	0.0607	7.97
NMWQCC Standards		**10 (µg/L)**	**750 (µg/L)**	**750 (µg/L)**	**620 (µg/L)**	**1.6 (mg/L)**	**600 (mg/L)**	**1 (mg/L)**	**0.2 (mg/L)**

Explanation

ND = Not Detected
NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
µg/L = micrograms per liter (parts per billion)
NA = Not Analyzed
<0.7 = Below laboratory detection limit of 0.7 ug/L
U = Analyte was analyzed for but not detected at the indicated MDL
Bold = concentrations that exceed the NMWQCC limits.
* = Results recorded by total metals analysis, not comparable to NMWQCC standards which are based on dissolved metals concentrations

APPENDIX A

GROUNDWATER SAMPLING FIELD FORMS

TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Howell K1 Page 1 of 4

act No.

Site Location San Juan County, NM

Site/Well No. MW-1 Coded/ Replicate No. Duplicate @ 1335 Date 6/8/10

Weather Sunny, hot 85° Time Sampling Began 1225 Time Sampling Completed 1345

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 ~~37.47~~ 37.46 Water-Level Elevation

Held Depth to Water Below MP 28.39 Diameter of Casing 2"

Wet Water Column in Well 9.07 Gallons Pumped/Bailed Prior to Sampling 4.5

Gallons per Foot 0.16

Gallons in Well 1.45 x 3 = 4.35 Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump/ Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	DO %	ORP (mV)	Volume (gal.)

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
Sulfate	16 oz. Plastic	None
Dissolved ~~Metals~~ Mn, Fe	16 oz. Plastic	None

Remarks No parameters collected due to low volume per bailer (.5 inch bailer)

Sampling Personnel CB, CM

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 Howell K1 Page 2 of 4

ect No.

Site Location San Juan County, NM

Site/Well No. MW-2 Coded/ Replicate No. Date 6/8/10

Weather Sunny, hot 85° Time Sampling Began 1225 Time Sampling Completed 1245

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 ~~39.81~~ 39.80 Water-Level Elevation

Held ____ Depth to Water Below MP 24.84 Diameter of Casing 2"

Wet ____ Water Column in Well 14.96 Gallons Pumped/Bailed Prior to Sampling 7.25

Gallons per Foot 0.16

Gallons in Well 2.39 x 3 = Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer 7.1808

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	DO %	ORP (mV)	Volume (gal.)
1240	16.44	7.32	2.835	—	2.63	26.5	104.5	6
1242	14.88	7.27	2.839	—	2.33	23.1	102.9	6.5
1244	13.82	7.08	2.847	—	2.63	25.9	108.3	7

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
Sulfate	16 oz. Plastic	None
Dissolved Metals Mn, Fe	16 oz. Plastic	None

Remarks H_2O is light brown, no odor or sheen observed

Sampling Personnel CB, CH

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

TETRATECH, INC.

WATER SAMPLING FIELD FORM

Project Name Howell K1 Page 3 of 4

Proj No.

Site Location San Juan County, NM

Site/Well No. MW-3 Coded/ Replicate No. Date 6/18/10

Weather Sunny, hot 85° Time Sampling Began 1400 Time Sampling Completed 1420

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface

Total Sounded Depth of Well Below MP 37.47 ~~37.22~~ MP Elevation

Water-Level Elevation

Held ____ Depth to Water Below MP 26.02 Diameter of Casing 2"

Wet ____ Water Column in Well 11.42 Gallons Pumped/Bailed Prior to Sampling 5.5

Gallons per Foot 0.16

Gallons in Well 11.42 x 3 = 5.48 Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	DO %	ORP (mV)	Volume (gal.)
1412	15.19	6.99	3.168	—	3.12	26.6	226.9	4
1414	14.62	6.96	3.143	—	1.96	19.4	227.0	4.5
1417	14.62	6.94	3.145		.95	9.4	215.2	5.0

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
Sulfate	16 oz. Plastic	None
~~Dissolved Metals~~ Mn, Fe	16 oz. Plastic	None

Remarks H2O is light brown in color, no odor or sheen observed

Sampling Personnel CM, CB

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 Howell K1 Page 4 of 4

Project No.

Site Location San Juan County, NM

Site/Well No. MW-4 Coded/ Replicate No. Date 6/8/10

Weather Sunny, hot 85° Time Sampling Began 1310 Time Sampling Completed 1325

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 ~~34.66~~ 34.55 Water-Level Elevation

Held Depth to Water Below MP 26.09 Diameter of Casing 2"

Wet Water Column in Well 8.46 Gallons Pumped/Bailed Prior to Sampling 4.25

Gallons per Foot 0.16

Gallons in Well 1.35 x 3 = 4.06

Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer MS

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	DO %	ORP (mV)	Volume (gal.)
1317	14.95	6.96	7.215	—	1.80	17.7	141.5	2.5
1319	14.77	6.91	7.361	—	1.56	15.8	133.0	3.0
1322	14.67	6.89	7.220		1.55	15.4	130.0	3.75

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
Sulfate	16 oz. Plastic	None
Dissolved ~~Metals~~ Mn, Fe	16 oz. Plastic	None

Remarks H_2O is light brown. bailer @ bottom of well collected Reddish-brown sediment

Sampling Personnel CM, CB

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

GROUNDWATER LABORATORY ANALYSIS REPORT

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

Certificate of Analysis

June 24, 2010

Workorder: H10060243

Cassandre Brown
Tetra Tech, Inc.
6121 Indian School Road NE
Suite 200
Albuquerque, NM 87110

Project: Howell K No. 1

Project Number: Howell K No. 1

Site: Aztec, NM

PO Number: ENFOS

NELAC Cert. No.: T104704205-09-1

This Report Contains A Total Of 19 Pages

Excluding Any Attachments

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Certificate of Analysis

June 24, 2010

Workorder: H10060243

Cassandre Brown
Tetra Tech, Inc.
6121 Indian School Road NE
Suite 200
Albuquerque, NM 87110

Project: Howell K No. 1

Project Number: Howell K No. 1

Site: Aztec, NM

PO Number: ENFOS

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:

Per the Conoco Phillips TSM Revision 0, a copy of the internal chain of custody is to be included in final data package. However, due to LIMS limitations, this cannot be provided at this time.

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.

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Certificate of Analysis

June 24, 2010

Workorder: H10060243

Cassandre Brown
Tetra Tech, Inc.
6121 Indian School Road NE
Suite 200
Albuquerque, NM 87110

Project: Howell K No. 1

Project Number: Howell K No. 1

Site: Aztec, NM

PO Number: ENFOS

NELAC Cert. No.: T104704205-09-1

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.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

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

SPL Inc.
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Fax: (713) 660-8975

SAMPLE SUMMARY

Workorder: H10060243 : Howell K No. 1 | Project Number: Howell K No. 1

Lab ID	Sample ID	Matrix	COC ID	Date/Time Collected	Date/Time Received
H10060243001	MW-1	Water		6/8/2010 13:45	6/10/2010 09:30
H10060243002	MW-2	Water		6/8/2010 12:45	6/10/2010 09:30
H10060243003	MW-3	Water		6/8/2010 14:20	6/10/2010 09:30
H10060243004	MW-4	Water		6/8/2010 13:25	6/10/2010 09:30
H10060243005	Duplicate	Water		6/8/2010 13:35	6/10/2010 09:30
H10060243006	Trip Blank	Water		6/9/2010 09:00	6/10/2010 09:30

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ANALYTICAL RESULTS

Workorder: H10060243 : Howell K No. 1 — Project Number: Howell K No. 1

Lab ID: **H10060243001** — Date/Time Received: 6/10/2010 09:30 — Matrix: Water

Sample ID: **MW-1** — Date/Time Collected: 6/8/2010 13:45

WET CHEMISTRY

Analysis Desc: EPA 300.0 — Analytical Batches:

Batch: 1330 EPA 300.0 on 06/11/2010 12:08 by CFS

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Sulfate	2570		250	21.8	500			1330

ICP DISSOLVED METALS

Analysis Desc: SW-846 6010B — Preparation Batches:

Batch: 1819 SW-846 3010A on 06/10/2010 15:00 by R_V

Analytical Batches:

Batch: 1456 SW-846 6010B on 06/18/2010 14:32 by EBG DF = 1.

Batch: 1460 SW-846 6010B on 06/21/2010 15:39 by EBG DF = 1.

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Iron	11.2		0.0200	0.00640	1		1819	1460
Manganese	14.7		0.00500	0.000300	1		1819	1456

VOLATILES

Analysis Desc: SW-846 8260B — SW-846 5030Analytical Batches:

Batch: 2049 SW-846 8260B on 06/16/2010 23:12 by JMC

Parameters	Results ug/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Benzene	ND		1.0	0.10	1			2049
Ethylbenzene	ND		1.0	0.15	1			2049
Toluene	ND		1.0	0.29	1			2049
m,p-Xylene	ND		1.0	0.18	1			2049
o-Xylene	ND		1.0	0.13	1			2049
Xylenes, Total	ND		1.0	0.13	1			2049
4-Bromofluorobenzene (S)	99 %		74-125		1			2049
1,2-Dichloroethane-d4 (S)	85.8 %		70-130		1			2049
Toluene-d8 (S)	94.6 %		82-118		1			2049

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ANALYTICAL RESULTS

Workorder: H10060243 : Howell K No. 1 | Project Number: Howell K No. 1

Lab ID: **H10060243002** | Date/Time Received: 6/10/2010 09:30 | Matrix: Water

Sample ID: **MW-2** | Date/Time Collected: 6/8/2010 12:45

WET CHEMISTRY

Analysis Desc: EPA 300.0 | Analytical Batches:

Batch: 1330 EPA 300.0 on 06/11/2010 12:24 by CFS

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Sulfate	1460		50.0	4.35	100			1330

ICP DISSOLVED METALS

Analysis Desc: SW-846 6010B | Preparation Batches:

Batch: 1819 SW-846 3010A on 06/10/2010 15:00 by R_V

Analytical Batches:

Batch: 1456 SW-846 6010B on 06/18/2010 14:39 by EBG DF = 1

Batch: 1460 SW-846 6010B on 06/21/2010 15:45 by EBG DF = 1

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Iron	0.0544		0.0200	0.00640	1		1819	1460
Manganese	0.00930		0.00500	0.000300	1		1819	1456

VOLATILES

Analysis Desc: SW-846 8260B | SW-846 5030Analytical Batches:

Batch: 2049 SW-846 8260B on 06/16/2010 23:40 by JMC

Parameters	Results ug/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Benzene	ND		1.0	0.10	1			2049
Ethylbenzene	ND		1.0	0.15	1			2049
Toluene	ND		1.0	0.29	1			2049
m,p-Xylene	ND		1.0	0.18	1			2049
o-Xylene	ND		1.0	0.13	1			2049
Xylenes, Total	ND		1.0	0.13	1			2049
4-Bromofluorobenzene (S)	90.1 %		74-125		1			2049
1,2-Dichloroethane-d4 (S)	85.4 %		70-130		1			2049
Toluene-d8 (S)	100 %		82-118		1			2049

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ANALYTICAL RESULTS

Workorder: H10060243 : Howell K No. 1 — Project Number: Howell K No. 1

Lab ID: **H10060243003** — Date/Time Received: 6/10/2010 09:30 — Matrix: Water

Sample ID: **MW-3** — Date/Time Collected: 6/8/2010 14:20

WET CHEMISTRY

Analysis Desc: EPA 300.0 — Analytical Batches:

Batch: 1330 EPA 300.0 on 06/11/2010 12:40 by CFS

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Sulfate	1630		50.0	4.35	100			1330

ICP DISSOLVED METALS

Analysis Desc: SW-846 6010B — Preparation Batches:

Batch: 1819 SW-846 3010A on 06/10/2010 15:00 by R_V

Analytical Batches:

Batch: 1456 SW-846 6010B on 06/18/2010 14:45 by EBG DF = 1

Batch: 1460 SW-846 6010B on 06/21/2010 15:51 by EBG DF = 1

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Iron	0.0573		0.0200	0.00640	1		1819	1460
Manganese	0.383		0.00500	0.000300	1		1819	1456

VOLATILES

Analysis Desc: SW-846 8260B — SW-846 5030Analytical Batches:

Batch: 2049 SW-846 8260B on 06/17/2010 00:08 by JMC

Parameters	Results ug/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Benzene	ND		1.0	0.10	1			2049
Ethylbenzene	ND		1.0	0.15	1			2049
Toluene	ND		1.0	0.29	1			2049
m,p-Xylene	ND		1.0	0.18	1			2049
o-Xylene	ND		1.0	0.13	1			2049
Xylenes, Total	ND		1.0	0.13	1			2049
4-Bromofluorobenzene (S)	90 %		74-125		1			2049
1,2-Dichloroethane-d4 (S)	84.6 %		70-130		1			2049
Toluene-d8 (S)	100 %		82-118		1			2049

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ANALYTICAL RESULTS

Workorder: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

Lab ID: **H10060243004** Date/Time Received: 6/10/2010 09:30 Matrix: Water

Sample ID: **MW-4** Date/Time Collected: 6/8/2010 13:25

WET CHEMISTRY

Analysis Desc: EPA 300.0 Analytical Batches:

Batch: 1330 EPA 300.0 on 06/11/2010 12:56 by CFS

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Sulfate	3490		250	21.8	500			1330

ICP DISSOLVED METALS

Analysis Desc: SW-846 6010B Preparation Batches:

Batch: 1819 SW-846 3010A on 06/10/2010 15:00 by R_V

Analytical Batches:

Batch: 1456 SW-846 6010B on 06/18/2010 14:51 by EBG DF = 1

Batch: 1460 SW-846 6010B on 06/21/2010 15:58 by EBG DF = 1

Parameters	Results mg/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Iron	0.0607		0.0200	0.00640	1		1819	1460
Manganese	7.97		0.00500	0.000300	1		1819	1456

VOLATILES

Analysis Desc: SW-846 8260B SW-846 5030Analytical Batches:

Batch: 2049 SW-846 8260B on 06/17/2010 00:36 by JMC

Parameters	Results ug/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Benzene	ND		1.0	0.10	1			2049
Ethylbenzene	ND		1.0	0.15	1			2049
Toluene	ND		1.0	0.29	1			2049
m,p-Xylene	ND		1.0	0.18	1			2049
o-Xylene	ND		1.0	0.13	1			2049
Xylenes, Total	ND		1.0	0.13	1			2049
4-Bromofluorobenzene (S)	99.7 %		74-125		1			2049
1,2-Dichloroethane-d4 (S)	83.4 %		70-130		1			2049
Toluene-d8 (S)	96.4 %		82-118		1			2049

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ANALYTICAL RESULTS

Workorder: H10060243 : Howell K No. 1 | Project Number: Howell K No. 1

Lab ID: **H10060243005** | Date/Time Received: 6/10/2010 09:30 | Matrix: Water

Sample ID: **Duplicate** | Date/Time Collected: 6/8/2010 13:35

VOLATILES

Analysis Desc: SW-846 8260B | SW-846 5030Analytical Batches:

Batch: 2049 SW-846 8260B on 06/17/2010 01:04 by JMC

Parameters	Results ug/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Benzene	ND		1.0	0.10	1			2049
Ethylbenzene	ND		1.0	0.15	1			2049
Toluene	ND		1.0	0.29	1			2049
m,p-Xylene	ND		1.0	0.18	1			2049
o-Xylene	ND		1.0	0.13	1			2049
Xylenes, Total	ND		1.0	0.13	1			2049
4-Bromofluorobenzene (S)	97.5 %		74-125		1			2049
1,2-Dichloroethane-d4 (S)	78.8 %		70-130		1			2049
Toluene-d8 (S)	98.9 %		82-118		1			2049

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ANALYTICAL RESULTS

Workorder: H10060243 : Howell K No. 1 | Project Number: Howell K No. 1

Lab ID: **H10060243006** | Date/Time Received: 6/10/2010 09:30 | Matrix: Water

Sample ID: **Trip Blank** | Date/Time Collected: 6/9/2010 09:00

VOLATILES

Analysis Desc: SW-846 8260B | SW-846 5030Analytical Batches:

Batch: 2049 SW-846 8260B on 06/16/2010 22:44 by JMC

Parameters	Results ug/l	Qual	Report Limit	MDL	DF	RegLmt	Batch Information Prep	Analysis
Benzene	ND		1.0	0.10	1			2049
Ethylbenzene	ND		1.0	0.15	1			2049
Toluene	ND		1.0	0.29	1			2049
m,p-Xylene	ND		1.0	0.18	1			2049
o-Xylene	ND		1.0	0.13	1			2049
Xylenes, Total	ND		1.0	0.13	1			2049
4-Bromofluorobenzene (S)	86.9 %		74-125		1			2049
1,2-Dichloroethane-d4 (S)	86 %		70-130		1			2049
Toluene-d8 (S)	100 %		82-118		1			2049

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QUALITY CONTROL DATA

Workorder: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

QC Batch: DIGM/1819 Analysis Method: SW-846 6010B

QC Batch Method: SW-846 3010A Preparation: 06/10/2010 15:00 by R_V

Associated Lab Samples: H10060237001 H10060237002 H10060237003 H10060237004 H10060241001 H10060241002 H10060241003 H10060243001 H10060243002 H10060243003 H10060243004 H10060245001 H10060245002 H10060245003 H10060245004 H10060247001 H10060247002 H10060247003 H10060247005

METHOD BLANK: 50257

Analysis Date/Time Analyst: 06/18/2010 13:14 EBG

Parameter	Units	Blank Result	Qualifiers	Reporting Limit
Manganese	mg/l	ND		0.00500

Analysis Date/Time Analyst: 06/21/2010 14:32 EBG

Parameter	Units	Blank Result	Qualifiers	Reporting Limit
Iron	mg/l	ND		0.0200

LABORATORY CONTROL SAMPLE: 50258

Analysis Date/Time Analyst: 06/18/2010 13:20 EBG

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits
Manganese	mg/l	0.10	0.1008	101	80-120

LABORATORY CONTROL SAMPLE: 50258

Analysis Date/Time Analyst: 06/21/2010 14:38 EBG

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits
Iron	mg/l	1.0	1.076	108	80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 50259 50260 Original: H10060241001

MS Analysis Date/Time Analyst: 06/18/2010 13:32 EBG

MSD Analysis Date/Time Analyst: 06/18/2010 13:38 EBG

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Manganese	mg/l	0.206	0.10	0.3011	0.3025	95.5	96.9	75-125	0.5	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: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 50259 50260 Original: H10060241001

MS Analysis Date/Time Analyst: 06/21/2010 14:50 EBG

MSD Analysis Date/Time Analyst: 06/21/2010 14:57 EBG

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Iron	mg/l	0.098	1.0	1.036	1.062	93.8	96.4	75-125	2.5	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: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

QC Batch: IC/1330 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: H10060241001 H10060241002 H10060241003 H10060243001 H10060243002 H10060243003 H10060243004 H10060247001 H10060247002 H10060247003 H10060247005 H10060262001 H10060269001 H10060275001 H10060283001 H10060283002 H10060283003 H10060283004

METHOD BLANK: 50605

Analysis Date/Time Analyst: 06/11/2010 09:09 CFS

Parameter	Units	Blank Result	Qualifiers	Reporting Limit
Sulfate	mg/l	ND		0.500

LABORATORY CONTROL SAMPLE & LCSD: 50606 50607

LCS Analysis Date/Time Analyst: 06/11/2010 09:25 CFS

LCSD Analysis Date/Time 06/11/2010 21:00 CFS

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD
Sulfate	mg/l	10	9.469	10.14	94.7	101	85-115	6.8	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 50610 50611 Original: H10060241001

MS Analysis Date/Time Analyst: 06/11/2010 16:58 CFS

MSD Analysis Date/Time Analyst: 06/11/2010 17:15 CFS

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Sulfate	mg/l	1330	1000	2352	2562	102	123 *	80-120	8.5	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: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

QC Batch: MSV/2048 Analysis Method: SW-846 8260B

QC Batch Method: SW-846 5030 Preparation: 06/16/2010 00:00 by JMC

Associated Lab Samples: H10060233002 H10060233003 H10060233004 H10060237001 H10060237002 H10060237003 H10060237004 H10060237005 H10060237006 H10060241001 H10060241002 H10060241003 H10060241004 H10060243001 H10060243002 H10060243003 H10060243004 H10060243005 H10060243006

METHOD BLANK: 51465

Analysis Date/Time Analyst: 06/16/2010 15:16 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)	%	90.4		74-125
1,2-Dichloroethane-d4 (S)	%	89.2		70-130
Toluene-d8 (S)	%	100		82-118

LABORATORY CONTROL SAMPLE: 51466

Analysis Date/Time Analyst: 06/16/2010 14:48 JMC

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits
Benzene	ug/l	20	16.3	81.4	74-123
Ethylbenzene	ug/l	20	17.9	89.6	72-127
Toluene	ug/l	20	20.5	102	74-126
m,p-Xylene	ug/l	40	37.3	93.3	71-129
o-Xylene	ug/l	20	19.3	96.6	74-130
Xylenes, Total	ug/l	60	56.63	94.4	71-130
4-Bromofluorobenzene (S)	%			103	74-125
1,2-Dichloroethane-d4 (S)	%			86.5	70-130
Toluene-d8 (S)	%			104	82-118

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 51467 51468 Original: H10060237001

MS Analysis Date/Time Analyst: 06/16/2010 17:35 JMC

MSD Analysis Date/Time Analyst: 06/16/2010 18:03 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	16.4	16.3	81.9	81.3	70-124	0.8	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: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 51467 51468 Original: H10060237001

MS Analysis Date/Time Analyst: 06/16/2010 17:35 JMC

MSD Analysis Date/Time Analyst: 06/16/2010 18:03 JMC

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Ethylbenzene	ug/l	ND	20	18.1	18.8	90.4	94.0	35-175	3.9	20
Toluene	ug/l	ND	20	20.6	21.4	103	107	70-131	4.0	20
m,p-Xylene	ug/l	ND	40	37.6	38.2	93.9	95.5	35-175	1.7	20
o-Xylene	ug/l	ND	20	19.0	19.6	95.2	97.9	35-175	2.8	20
Xylenes, Total	ug/l	ND	60	56.6	57.78	94.3	96.3	35-175	2.1	20
4-Bromofluorobenzene (S)	%	87.9				100	101	74-125		30
1,2-Dichloroethane-d4 (S)	%	86.1				83.5	82.0	70-130		30
Toluene-d8 (S)	%	99.7				102	105	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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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 then 25%
TNTC	Too numerous to count

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: H10060243 : Howell K No. 1 Project Number: Howell K No. 1

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H10060243001	**MW-1**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1456
H10060243002	**MW-2**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1456
H10060243003	**MW-3**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1456
H10060243004	**MW-4**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1456
H10060243001	**MW-1**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1460
H10060243002	**MW-2**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1460
H10060243003	**MW-3**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1460
H10060243004	**MW-4**	SW-846 3010A	DIGM/1819	SW-846 6010B	ICP/1460
H10060243001	**MW-1**	EPA 300.0	IC/1330		
H10060243002	**MW-2**	EPA 300.0	IC/1330		
H10060243003	**MW-3**	EPA 300.0	IC/1330		
H10060243004	**MW-4**	EPA 300.0	IC/1330		
H10060243001	**MW-1**	SW-846 5030	MSV/2048	SW-846 8260B	MSV/2049
H10060243002	**MW-2**	SW-846 5030	MSV/2048	SW-846 8260B	MSV/2049
H10060243003	**MW-3**	SW-846 5030	MSV/2048	SW-846 8260B	MSV/2049
H10060243004	**MW-4**	SW-846 5030	MSV/2048	SW-846 8260B	MSV/2049
H10060243005	**Duplicate**	SW-846 5030	MSV/2048	SW-846 8260B	MSV/2049
H10060243006	**Trip Blank**	SW-846 5030	MSV/2048	SW-846 8260B	MSV/2049

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Sample Receipt Checklist

WorkOrder:	H10060243	Received By	LOG
Date and Time	06/10/2010 09:30	Carrier Name:	FEDEXS
Temperature:	1.0°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:

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Fax: (713) 660-8975

SPL, Inc.

Analysis Request & Chain of Custody Record

H10060243

290414

page 1 of 1

Client Name: Tetra Tech / Conoco Phillips
Address: 6121 Indian School Rd #200
City ABQ State NM Zip 87110
Phone/Fax: 505-237-8440 505-237-8656
Client Contact: Kelly Blanchard Email: kelly.blanchard@tetratech.com
Project Name/No.: Howell K No. 1
Site Name:
Site Location: Aztec, NM
Invoice To: ConocoPhillips Ph:

matrix: W=water S=soil O=oil A=air SL=sludge E=encore X=other
bottle: P=plastic A=amber glass G=glass V=vial X=other
size: 1=1 liter 4=4oz 40=vial 8=8oz 16=16oz X=other
HNO3 HCl H2SO4 NaOH NONE DI H2O MeOH NaHSO4 ZnAc/NaOH
Number of Containers PRESERVATIVE

Requested Analysis: BTEX; Sulfate; Dissolved Fe, Mn

SAMPLE ID	DATE	TIME	comp	grab	matrix	bottle	size	# of containers	preservative	BTEX	Sulfate	Dissolved Fe, Mn
MW-1	6.8.10	1345		X	W	V	40	3	1	X		
MW-1	6.8.10	1345		X	W	P	16	2	NONE		X	X
MW-2	6.8.10	1245		X	W	V	40	3	1	X		
MW-2	6.8.10	1245		X	W	P	16	2	NONE		X	X
MW-3	6.8.10	1420		X	W	V	40	3	1	X		
MW-3	6.8.10	1420		X	W	P	16	2	NONE		X	X
MW-4	6.8.10	1325		X	W	V	40	3	1	X		
MW-4	6.8.10	1325		X	W	P	16	2	NONE		X	X
Duplicate	6.8.10	1335		X	W	V	40	3	1	X		
Trip	~~6.8.10~~ 6.9.10	0900			W	V	40	2	NONE			

RUSH

Client/Consultant Remarks: Please filter & preserve metals container before analysis

Laboratory remarks:

Intact? Y N
Ice? Y N
Temp: 1.0

Requested TAT

- 1 Business Day
- 2 Business Days
- 3 Business Days
- Contract
- Standard
- Other
- Rush TAT requires prior notice

Special Reporting Requirements Results: Fax Email PDF
Standard QC Level 3 QC Level 4 QC TX TRRP LA RECAP

Special Detection Limits (specify):

PM review (initial):

	date	time	
1. Relinquished by/Sampler: Amanda Mallecco	6.9.10	0915	2. Received by:
3. Relinquished by:	date	time	4. Received by:
5. Relinquished by:	date 6/10/10	time 930	6. Received by Laboratory: Amanda Vicenari

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Scott, LA 70583 (337) 237-4775

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Traverse City, MI 49686 (231) 947-5777