# 3R - 431

# 2009 AGWMR

# 05/17/2010

3R431

# 2009 ANNUAL GROUNDWATER MONITORING REPORT

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

OCD # _____

API 300-045-09313

**Prepared for:**

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May 17, 2010

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# ANNUAL GROUNDWATER MONITORING
# HOWELL K NO. 1, SAN JUAN COUNTY, NEW MEXICO

## 1.0 INTRODUCTION

This report presents the results of an annual groundwater monitoring event conducted by Tetra Tech, Inc. (Tetra Tech) in September and October of 2009, 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**). October 2008 marks 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

Annual groundwater sampling was conducted by Tetra Tech on September 25 and October 18, 2009. Groundwater sampling included samples from 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**. The groundwater flow direction is to the west/southwest based on groundwater elevation data collected on September 25, 2009 and can be 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), dissolved oxygen (DO) and turbidity, and were collected using a YSI 556 multi-parameter sonde and a Micro TPW handheld turbidimeter. A 1.5-inch clear, poly-vinyl chloride, disposable bailer was used to purge each well and to collect the groundwater samples. 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 and fluoride by EPA method 300.0.

Total metals testing was conducted during prior sampling events as requested by the OCD in April of 2008; however, since all New Mexico Water Quality Control Comission (NMWQCC) drinking water standards pertain to dissolved metals concentrations, Tetra Tech requested and received approval from the OCD on September 8, 2009 to run dissolved metals analyses for only those metals which had exceeded the NMWQCC drinking water standards for metals previously run by total metals analysis. The dissolved metals samples were collected in unpreserved containers supplied by the laboratory, which were 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 site monitoring wells MW-2, MW-3, MW-4 on September 25 and MW-1 on October 18, 2009 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 September 2009 annual analysis, other constituents were found to be above standards. All 4 wells on Site were found to be above the NMWQCC standard for sulfate. MW-1, MW-3 and MW-4 were found to be above standard for dissolved manganese. Also, dissolved iron was found to be above standard in MW-1 and fluoride was found to be above standard in MW-4. **Table 3** lists the analytical results from groundwater sampling done during September and October of 2009. 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

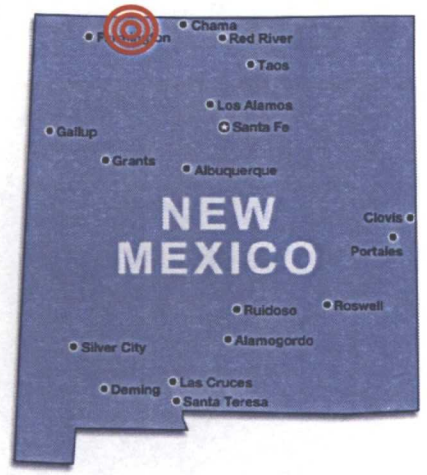
Based on the historical groundwater quality data, groundwater samples collected from groundwater monitoring well MW-1 have never exceeded NMWQCC groundwater quality standards for BTEX constituents during sampling conducted from March 2006 to October 2009. Frequently, BTEX concentrations were found to be below the minimum detection limits for these constituents. 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 September 2009. Since BTEX is below standards in all 4 monitoring wells but there are other constituents of concern above NMWQCC standard, Tetra Tech recommends quarterly groundwater monitoring in order to closely monitor the levels of sulfate, manganese and fluoride until these constituent concentrations are also bellow NMWQCC standards or until concentrations 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

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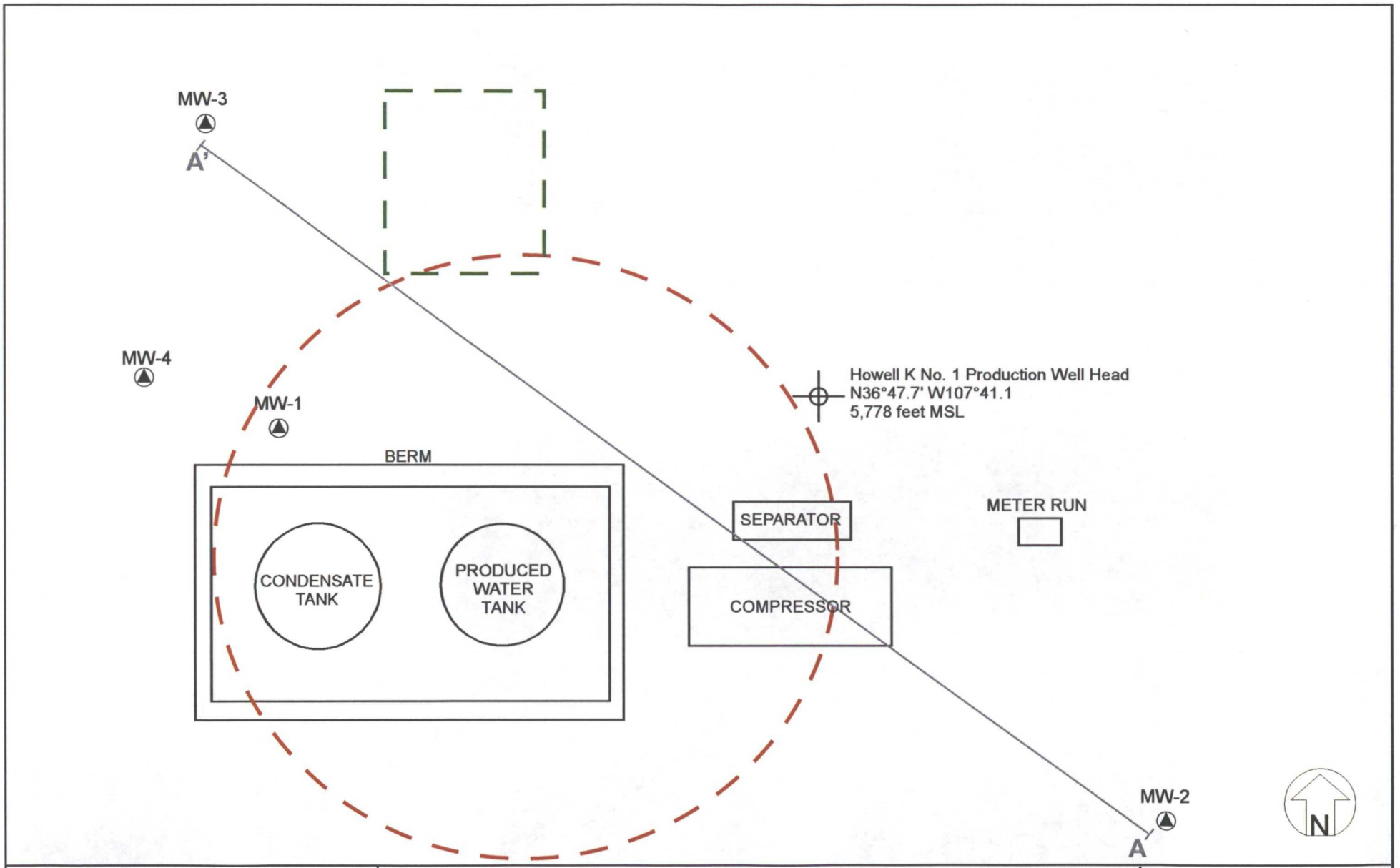



**FIGURE 2:**
SITE LAYOUT MAP
CONOCOPHILLIPS
HOWELL K No. 1
Unit K, Sec 21, Twp 30N, Rng 8W
San Juan County, New Mexico
Revised by CFM 05/10

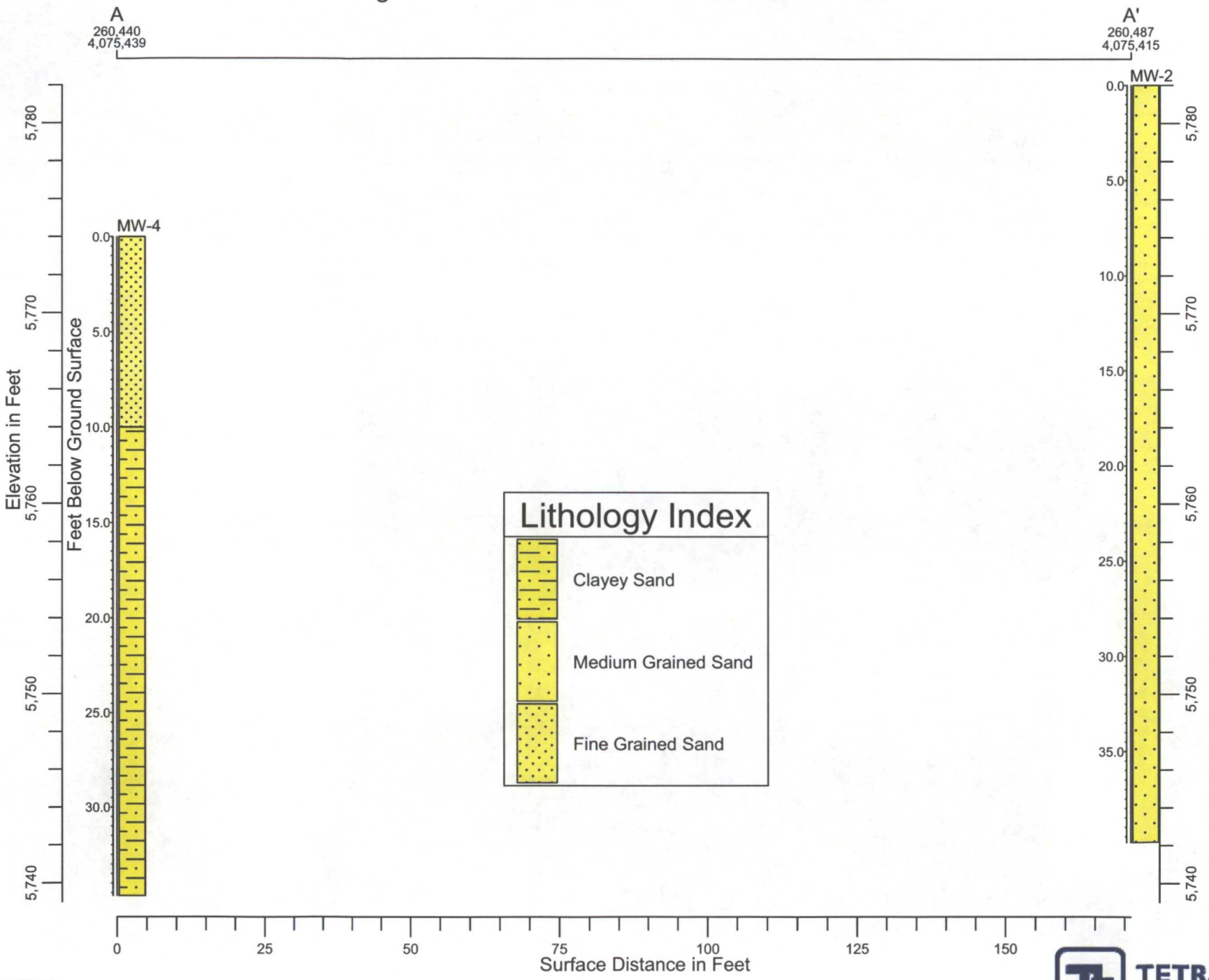
LEGEND

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

0 15 30
FEET

TETRA TECH, INC.

Figure 3. Howell K No. 1 - Cross-Section A-A'




5/19/2010

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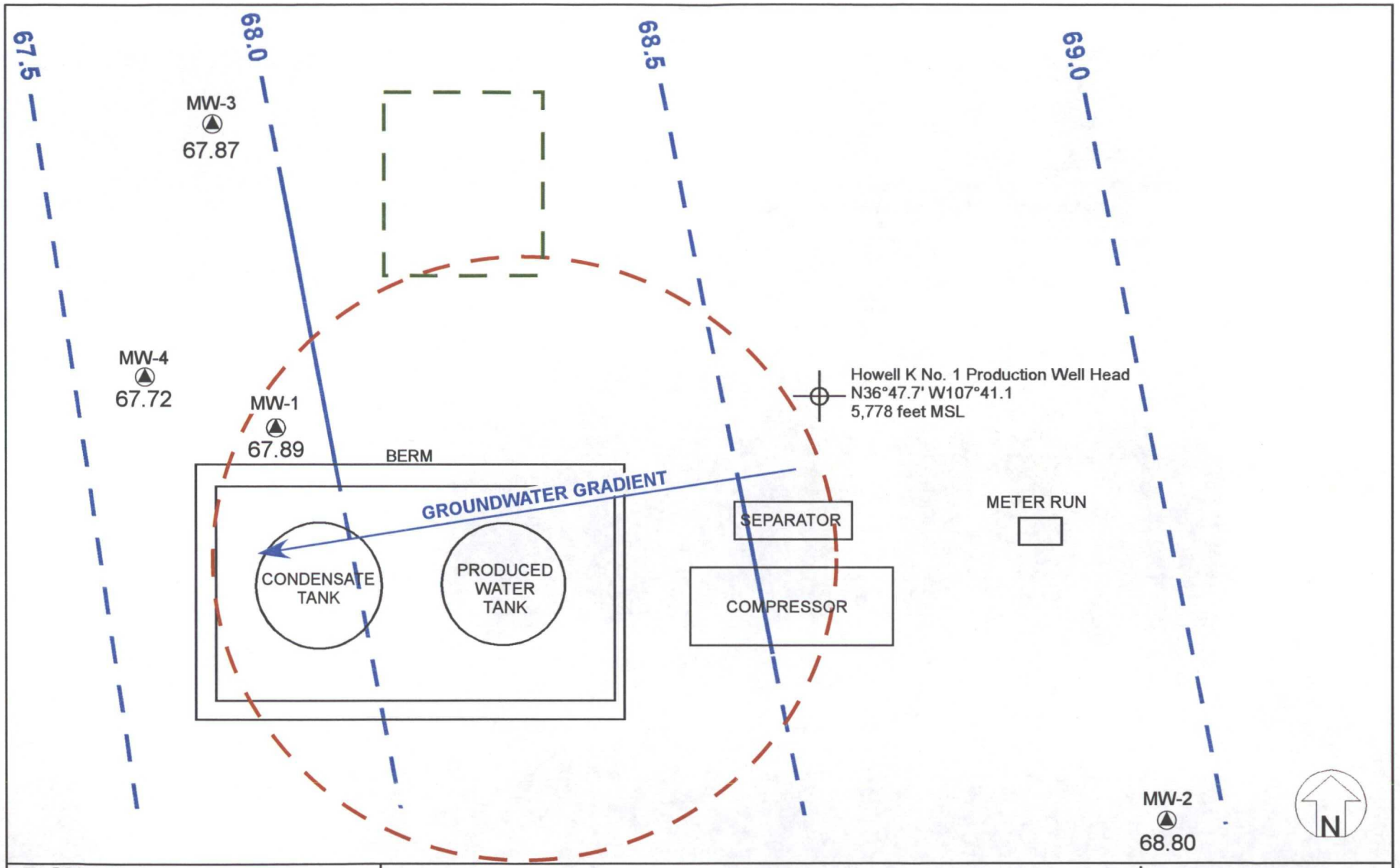


**FIGURE 4:**
SEPTEMBER 2009 GROUNDWATER ELEVATION CONTOUR MAP
CONOCOPHILLIPS COMPANY
HOWELL K No. 1
Unit K - T30N, R8W, Section 21
San Juan County, New Mexico
Revised by CFM 05/10

LEGEND

- WELLHEAD
- MONITORING WELL
- GENERAL AREA OF UNDERGROUND TANK REMOVAL EXCAVATION
- GENERAL AREA OF UNLINED EARTHEN PIT EXCAVATION
- GROUNDWATER ELEVATION (dashed where inferred)

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 are 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 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 Concervation 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 standards for sulfate, iron and manganese. MW-4 was also above the standard for Fluoride. |
| January 30, 2009 | 4th quarter 2009 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 stince standards are based on dissolved metals testing. OCD concurred, allowing total metals testing to be discontinued. |
| October 18, 2009 | 2009 annual 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. |

**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 |
| 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 |
| 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 |
| 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 |

ft = Feet

TOC = Top of casing

bgs = below ground surface

* Elevation relative to wellhead

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

**Table 3. Groundwater Analytical Results Summary**

| Well ID | Date | Benzene (µg/L) | Toluene (µg/L) | Ethylbenzene (µg/L) | Xylenes (µg/L) | Fluoride (µg/L) | Sulfate (µg/L) | Dissolved Iron (µg/L) | Dissolved Manganese (µg/L) |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 3/22/2006 | ND | ND | 1 | 2 | NA | NA | NA | NA |
| | 6/21/2006 | 1.4 | 1.4 | ND | 10.6 | NA | NA | NA | NA |
| | 10/19/2006 | ND | ND | ND | 1.1 | NA | NA | NA | NA |
| | 12/12/2006 | ND | 0.5 | 0.4 | 2.1 | 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 | 0.881 | **3840** | **2.24** | **17.4** |
| 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 |
| 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 | 0.995 | **1840** | <0.02 | **0.377** |
| MW-4 | 10/24/2008 | <0.5 U | <0.5 U | <0.5 U | <0.5 U | **2.43** | **3,400** | 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 | **7.8** |
| **NMWQCC Standards** | | **10 (µg/L)** | **750 (µg/L)** | **750 (µg/L)** | **620 (µg/L)** | **1.6 (µg/L)** | **600 (µg/L)** | **1 (µg/L)** | **0.2 (µg/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

Project No.

Site Location San Juan County, NM

Site/Well No. MW-1 Coded/ Replicate No. Date 9/25/09

Weather breezy, 70° Time Sampling Began — Time Sampling Completed —

## 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 Water-Level Elevation

Held Depth to Water Below MP 29.95 Diameter of Casing 2"

Wet Water Column in Well 7.49 Gallons Pumped/Bailed Prior to Sampling —

Gallons per Foot 0.16

Gallons in Well 1.19 x 3 = 3.57 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) | ORP (mV) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Sampling Equipment Purge Pump/Bailer

| Constituents Sampled | Container Description | Preservative |
|---|---|---|
| BTEX, Dissolved Iron, Dissolved manganese, sulfate, Fluoride | (3) 40mL VOA's, (2) 1 liter clear plastic | HCl, None |

Remarks Can't get 1" bailer down well; no samples collected

Sampling Personnel GD, AM

### 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

Project No.:

Site Location: San Juan County, NM

Site/Well No.: MW-2 — Coded/ Replicate No.: — Date: 9/25/09

Weather: hot, windy — Time Sampling Began: 1310 — Time Sampling Completed: 1330

## 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 — Water-Level Elevation: —

Held — Depth to Water Below MP: 26.48 — Diameter of Casing: 2"

Wet — Water Column in Well: 13.33 — Gallons Pumped/Bailed Prior to Sampling: 6.5

Gallons per Foot: 0.16

Gallons in Well: 2.13 x 3 = 6.39

Sampling Pump Intake Setting (feet below land surface): N/A

Purging Equipment: Purge pump / Bailer

## SAMPLING DATA/FIELD PARAMETERS

| Vol | Time | Temperature (°C) | pH | Conductivity (µS/cm³) | TDS (g/L) | DO (mg/L) | ORP (mV) | Turb |
|---|---|---|---|---|---|---|---|---|
| 2 | 1317 | 14.26 | 6.63 | 2842 | 1.848 | 5.87 | -0.4 | 835.2 |
| 4 | 1322 | 14.12 | 6.74 | 2840 | 1.846 | 3.67 | -2.0 | >1100 |
| 6.5 | 1328 | 14.04 | 6.79 | 2843 | 1.848 | 3.67 | 4.6 | >1100 |
| | | | | | | | | |
| | | | | | | | | |

Sampling Equipment: Purge Pump/Bailer

| Constituents Sampled | Container Description | Preservative |
|---|---|---|
| BTEX, Dissolved Iron, dissolved manganese, sulfate, Fluoride | 3 40mL VOA's; (2) 16oz. clear plastic | HCl; None |

Remarks:

Sampling Personnel: AM, GD

### 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 3 of 4

Project No.

Site Location San Juan County, NM

Site/Well No. MW-3 Coded/ Replicate No. Duplicate Date 9/25/09

Weather Sunny, ~~windy~~ ~~breeze~~ ~68° Time Sampling Began 1250 Time Sampling Completed 1310

DUP @ 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 37.47 Water-Level Elevation

Held ____ Depth to Water Below MP 27.57 Diameter of Casing 2"

Wet ____ Water Column in Well 9.9 Gallons Pumped/Bailed Prior to Sampling 4.74

Gallons per Foot 0.16

Gallons in Well 1.58 x 3 = 4.74 Sampling Pump Intake Setting (feet below land surface) N/A

Purging Equipment Purge pump / Bailer Dedicated

## SAMPLING DATA/FIELD PARAMETERS

| Time | Temperature (°C) | pH | Conductivity (µS/cm) | TDS (g/L) | DO (mg/L) | ORP (mV) | TURB |
|---|---|---|---|---|---|---|---|
| 1257 | 14.94 | 6.60 | 3197 | 2.062 | 3.89 | -39.8 | >400 |
| 1303 | 14.95 | 6.63 | 3142 | 2.043 | 2.75 | -30.2 | >1000 |
| 1308 | 14.85 | 6.82 | 3140 | 2.041 | 2.33 | -26.1 | >1000 |
| | | | | | | | |
| | | | | | | | |

Sampling Equipment Purge Pump/Bailer

| Constituents Sampled | Container Description | Preservative |
|---|---|---|
| BTEX, dissolved iron, dissolved manganese, sulfate, fluoride | (3) 40mL VOA's, (2) 1L or clear plastics | HCl, None |

Remarks Water is highly turbid (brown). No odor or sheen

Sampling Personnel GP

### 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 9/25/09

Weather Warm breezy 75° Time Sampling Began 1245 Time Sampling Completed 1255

## 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 Water-Level Elevation

Hold Depth to Water Below MP 27.64 Diameter of Casing 2"

Wet Water Column in Well 7.02 Gallons Pumped/Bailed Prior to Sampling 4.25

Gallons per Foot 0.16

Gallons in Well 1.12 x 3 = 3.36 Sampling Pump Intake Setting (feet below land surface) N/A

Purging Equipment Purge pump / Bailer

## SAMPLING DATA/FIELD PARAMETERS

| Time | Temperature (°C) | pH | Conductivity (µS/cm³) | TDS (g/L) | DO (mg/L) | ORP (mV) | Turb |
|---|---|---|---|---|---|---|---|
| 1249 ~~15.74~~ | 15.74 | 6.27 | 65164 | 4.266 | 4.00 | -73.6 | >1100 |
| 1252 | 15.38 | 6.30 | 64550 | 4.257 | 3.10 | -49.1 | >1100 |
| 1255 | 15.27 | 6.30 | 64176 | 4.209 | 3.39 | -41.0 | >1100 |
| | | | | | | | |
| | | | | | | | |

Sampling Equipment Purge Pump/Bailer

| Constituents Sampled | Container Description | Preservative |
|---|---|---|
| BTEX, dissolved iron, dissolved manganese, Sulfate, Fluoride | 3 40mL VOA's; (2) 1 liter plastics | HCl; None |

Remarks

Sampling Personnel AM, BD

### 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 1 of 1

Project No.:

Site Location: San Juan County, NM

Site/Well No.: MW-1 — Coded/Replicate No.: — Date: 10/18/09

Weather: sunny, warm — Time Sampling Began: 1710 — Time Sampling Completed: 1800

## 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 — Water-Level Elevation:

Held ____ Depth to Water Below MP: 29.97 — Diameter of Casing: 2"

Wet ____ Water Column in Well: 7.48 — Gallons Pumped/Bailed Prior to Sampling: 3.75

Gallons per Foot: 0.16

Gallons in Well: 1.1968 — Sampling Pump Intake Setting (feet below land surface): N/A

Purging Equipment: Purge pump / Bailer — X3 = 3.59

## SAMPLING DATA/FIELD PARAMETERS

| Time | Temperature (°C) | pH | Conductivity (µS/cm³) | TDS (g/L) | DO (mg/L) | ORP (mV) |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Sampling Equipment: Purge Pump/Bailer

| Constituents Sampled | Container Description | Preservative |
|---|---|---|
| BTEX, Dissolved Iron, Dissolved manganese, sulfate, Fluoride | 3 40mL VOA's<br>2 16oz clear plastic | HCl<br>None |

Remarks: Brown sediment noticed in bailer after sitting @ well bottom; no para-

Sampling Personnel: Kelly Blanchard, Christine Mathews, Casie Brown

**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 |



Remarks (cont.) - meters collected due to low volume retrieved per bailer

# APPENDIX B

## GROUNDWATER LABORATORY ANALYSIS REPORT

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

## Conoco Phillips

**Certificate of Analysis Number:**

**09091285**

| Report To: | | Project Name: | COP Howell K-1 |
|---|---|---|---|
| Tetra Tech, Inc. | | Site: | Aztec, NM |
| Kelly Blanchard | | Site Address: | |
| 6121 Indian School Road, N.E. | | | |
| Suite 200 | | PO Number: | |
| Albuquerque | | State: | New Mexico |
| NM | | State Cert. No.: | |
| 87110- | | Date Reported: | 10/7/2009 |
| ph: (505) 237-8440 | fax: | | |

This Report Contains A Total Of 17 Pages

Excluding This Page, Chain Of Custody

And

Any Attachments

10/7/2009

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

## Case Narrative for:
## Conoco Phillips

### Certificate of Analysis Number:
### 09091285

| Report To: | | Project Name: | COP Howell K-1 |
|---|---|---|---|
| Tetra Tech, Inc. | | Site: | Aztec, NM |
| Kelly Blanchard | | Site Address: | |
| 6121 Indian School Road, N.E. | | | |
| Suite 200 | | PO Number: | |
| Albuquerque | | State: | New Mexico |
| NM | | State Cert. No.: | |
| 87110- | | | |
| ph: (505) 237-8440 | fax: | Date Reported: | 10/7/2009 |

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.

Volatile Organics (8260):

Sample ID "MW-4" (SPL ID: 09091285-03) was randomly selected for use in SPL's quality control program for Batch ID: R285471. The Matrix Spike Duplicate (MSD) recovery was outside of the advisable quality control limits due to possible matrix interference for the following analyte: Benzene. A Laboratory Control Sample (LCS) was analyzed as a quality control check for the analytical batch and all recoveries were within acceptable limits.

III. GENERAL REPORTING COMMENTS:

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.



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.



10/7/2009

Erica Cardenas — Date

Project Manager

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Conoco Phillips

## Certificate of Analysis Number:

## 09091285

**Report To:** Tetra Tech, Inc.
Kelly Blanchard
6121 Indian School Road, N.E.
Suite 200
Albuquerque
NM
87110-
ph: (505) 237-8440 fax: (505) 881-3283

**Fax To:**

**Project Name:** COP Howell K-1
**Site:** Aztec, NM
**Site Address:**
**PO Number:**
**State:** New Mexico
**State Cert. No.:**
**Date Reported:** 10/7/2009

| Client Sample ID | Lab Sample ID | Matrix | Date Collected | Date Received | COC ID | HOLD |
|---|---|---|---|---|---|---|
| MW-2 | 09091285-01 | Water | 9/25/2009 1:30:00 PM | 9/26/2009 9:30:00 AM | 331742 | ☐ |
| MW-3 | 09091285-02 | Water | 9/25/2009 1:10:00 PM | 9/26/2009 9:30:00 AM | 331742 | ☐ |
| MW-4 | 09091285-03 | Water | 9/25/2009 12:55:00 PM | 9/26/2009 9:30:00 AM | 331742 | ☐ |
| Duplicate | 09091285-04 | Water | 9/25/2009 1:25:00 PM | 9/26/2009 9:30:00 AM | 331742 | ☐ |
| Trip Blank | 09091285-05 | Water | 9/25/2009 2:35:00 PM | 9/26/2009 9:30:00 AM | 331742 | ☐ |

Erica Cardenas
Project Manager

10/7/2009
Date

Kesavalu M. Bagawandoss Ph.D., J.D.
Laboratory Director

Ted Yen
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

**Client Sample ID:** MW-2 **Collected:** 09/25/2009 13:30 **SPL Sample ID:** 09091285-01

**Site: Aztec, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **ION CHROMATOGRAPHY** | | | | **MCL** | **E300.0** | **Units: mg/L** | |
| Fluoride | 1.09 | | 0.5 | 1 | 09/26/09 23:58 | BDG | 5222116 |
| Sulfate | 1700 | | 250 | 500 | 09/28/09 14:40 | BDG | 5222032 |
| **METALS BY METHOD 6010B, DISSOLVED** | | | | **MCL** | **SW6010B** | **Units: mg/L** | |
| Iron | ND | | 0.02 | 1 | 10/06/09 11:13 | AB1 | 5233413 |
| Manganese | ND | | 0.005 | 1 | 10/06/09 11:13 | AB1 | 5233413 |

| Prep Method | Prep Date | Prep Initials | Prep Factor |
|---|---|---|---|
| SW3005A | 09/28/2009 10:00 | R_V | 1.00 |

| VOLATILE ORGANICS BY METHOD 8260B | | | | **MCL** | **SW8260B** | **Units: ug/L** | |
|---|---|---|---|---|---|---|---|
| Benzene | ND | | 1 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| Ethylbenzene | ND | | 1 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| Toluene | ND | | 1 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| m,p-Xylene | ND | | 2 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| o-Xylene | ND | | 1 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| Xylenes,Total | ND | | 1 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| Surr: 1,2-Dichloroethane-d4 | 94.6 | % | 78-116 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| Surr: 4-Bromofluorobenzene | 102 | % | 74-125 | 1 | 10/02/09 23:00 | LU_L | 5229676 |
| Surr: Toluene-d8 | 95.8 | % | 82-118 | 1 | 10/02/09 23:00 | LU_L | 5229676 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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(713) 660-0901

**Client Sample ID:** MW-3 **Collected:** 09/25/2009 13:10 **SPL Sample ID:** 09091285-02

**Site: Aztec, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **ION CHROMATOGRAPHY** | | | | **MCL** | **E300.0** | **Units: mg/L** | |
| Fluoride | 0.995 | | 0.5 | 1 | 09/27/09 0:15 | BDG | 5222117 |
| Sulfate | 1840 | | 250 | 500 | 09/28/09 14:57 | BDG | 5222033 |
| **METALS BY METHOD 6010B, DISSOLVED** | | | | **MCL** | **SW6010B** | **Units: mg/L** | |
| Iron | ND | | 0.02 | 1 | 10/06/09 11:18 | AB1 | 5233414 |
| Manganese | 0.377 | | 0.005 | 1 | 10/06/09 11:18 | AB1 | 5233414 |

| Prep Method | Prep Date | Prep Initials | Prep Factor |
|---|---|---|---|
| SW3005A | 09/28/2009 10:00 | R_V | 1.00 |

| VOLATILE ORGANICS BY METHOD 8260B | | | | **MCL** | **SW8260B** | **Units: ug/L** | |
|---|---|---|---|---|---|---|---|
| Benzene | ND | | 1 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| Ethylbenzene | ND | | 1 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| Toluene | ND | | 1 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| m,p-Xylene | ND | | 2 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| o-Xylene | ND | | 1 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| Xylenes,Total | ND | | 1 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| Surr: 1,2-Dichloroethane-d4 | 95.7 | % | 78-116 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| Surr: 4-Bromofluorobenzene | 101 | % | 74-125 | 1 | 10/02/09 23:28 | LU_L | 5229677 |
| Surr: Toluene-d8 | 95.2 | % | 82-118 | 1 | 10/02/09 23:28 | LU_L | 5229677 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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8880 INTERCHANGE DRIVE
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(713) 660-0901

**Client Sample ID:** MW-4 **Collected:** 09/25/2009 12:55 **SPL Sample ID:** 09091285-03

**Site: Aztec, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **ION CHROMATOGRAPHY** | | | | **MCL** | **E300.0** | **Units: mg/L** | |
| Fluoride | 2.47 | | 0.5 | 1 | 09/27/09 0:32 | BDG | 5222118 |
| Sulfate | 3860 | | 250 | 500 | 09/28/09 15:14 | BDG | 5222034 |
| **METALS BY METHOD 6010B, DISSOLVED** | | | | **MCL** | **SW6010B** | **Units: mg/L** | |
| Iron | ND | | 0.02 | 1 | 10/06/09 11:22 | AB1 | 5233415 |
| Manganese | 7.8 | | 0.005 | 1 | 10/06/09 11:22 | AB1 | 5233415 |

| Prep Method | Prep Date | Prep Initials | Prep Factor |
|---|---|---|---|
| SW3005A | 09/28/2009 10:00 | R_V | 1.00 |

| **VOLATILE ORGANICS BY METHOD 8260B** | | | | **MCL** | **SW8260B** | **Units: ug/L** | |
|---|---|---|---|---|---|---|---|
| Benzene | ND | | 1 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| Ethylbenzene | ND | | 1 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| Toluene | ND | | 1 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| m,p-Xylene | ND | | 2 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| o-Xylene | ND | | 1 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| Xylenes,Total | ND | | 1 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| Surr: 1,2-Dichloroethane-d4 | 93.6 | % | 78-116 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| Surr: 4-Bromofluorobenzene | 99.0 | % | 74-125 | 1 | 10/03/09 14:35 | LU_L | 5231284 |
| Surr: Toluene-d8 | 95.7 | % | 82-118 | 1 | 10/03/09 14:35 | LU_L | 5231284 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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**Client Sample ID:** Duplicate **Collected:** 09/25/2009 13:25 **SPL Sample ID:** 09091285-04

**Site: Aztec, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **VOLATILE ORGANICS BY METHOD 8260B** | | | **MCL** | **SW8260B** | **Units: ug/L** | | |
| Benzene | ND | | 1 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| Ethylbenzene | ND | | 1 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| Toluene | ND | | 1 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| m,p-Xylene | ND | | 2 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| o-Xylene | ND | | 1 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| Xylenes,Total | ND | | 1 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| Surr: 1,2-Dichloroethane-d4 | 93.1 | | % 78-116 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| Surr: 4-Bromofluorobenzene | 103 | | % 74-125 | 1 | 10/03/09 15:57 | LU_L | 5231287 |
| Surr: Toluene-d8 | 99.1 | | % 82-118 | 1 | 10/03/09 15:57 | LU_L | 5231287 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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**Client Sample ID:** Trip Blank **Collected:** 09/25/2009 14:35 **SPL Sample ID:** 09091285-05

**Site: Aztec, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **VOLATILE ORGANICS BY METHOD 8260B** | | | **MCL** | **SW8260B** | **Units: ug/L** | | |
| Benzene | ND | | 1 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| Ethylbenzene | ND | | 1 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| Toluene | ND | | 1 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| m,p-Xylene | ND | | 2 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| o-Xylene | ND | | 1 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| Xylenes,Total | ND | | 1 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| Surr: 1,2-Dichloroethane-d4 | 97.5 | | % 78-116 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| Surr: 4-Bromofluorobenzene | 101 | | % 74-125 | 1 | 10/02/09 22:33 | LU_L | 5229675 |
| Surr: Toluene-d8 | 96.3 | | % 82-118 | 1 | 10/02/09 22:33 | LU_L | 5229675 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

# *Quality Control Documentation*

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Metals by Method 6010B, Dissolved
**Method:** SW6010B
**WorkOrder:** 09091285
**Lab Batch ID:** 94143

### Method Blank

RunID: ICP2_091006A-5233393 Units: mg/L
Analysis Date: 10/06/2009 9:44 Analyst: AB1
Preparation Date: 09/28/2009 10:00 Prep By: R_V Method SW3005A

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09091285-01C | MW-2 |
| 09091285-02C | MW-3 |
| 09091285-03C | MW-4 |

| Analyte | Result | Rep Limit |
|---|---|---|
| Iron | ND | 0.02 |
| Manganese | ND | 0.005 |

### Laboratory Control Sample (LCS)

RunID: ICP2_091006A-5233394 Units: mg/L
Analysis Date: 10/06/2009 9:48 Analyst: AB1
Preparation Date: 09/28/2009 10:00 Prep By: R_V Method SW3005A

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Iron | 1.000 | 1.053 | 105.3 | 80 | 120 |
| Manganese | 1.000 | 1.067 | 106.7 | 80 | 120 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09091275-02
RunID: ICP2_091006A-5233396 Units: mg/L
Analysis Date: 10/06/2009 9:57 Analyst: AB1
Preparation Date: 09/28/2009 10:00 Prep By: R_V Method SW3005A

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 0.3398 | 1 | 1.416 | 107.6 | 1 | 1.413 | 107.3 | 0.2121 | 20 | 75 | 125 |
| Manganese | 0.02860 | 1 | 1.092 | 106.3 | 1 | 1.092 | 106.3 | 0 | 20 | 75 | 125 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09091285
**Method:** SW8260B **Lab Batch ID:** R285380

### Method Blank

RunID: K_091002B-5229668 Units: ug/L
Analysis Date: 10/02/2009 17:34 Analyst: LU_L

| Analyte | Result | Rep Limit |
|---|---|---|
| Benzene | ND | 1.0 |
| Ethylbenzene | ND | 1.0 |
| Toluene | ND | 1.0 |
| m,p-Xylene | ND | 2.0 |
| o-Xylene | ND | 1.0 |
| Xylenes,Total | ND | 1.0 |
| Surr: 1,2-Dichloroethane-d4 | 98.7 | 78-116 |
| Surr: 4-Bromofluorobenzene | 99.3 | 74-125 |
| Surr: Toluene-d8 | 97.3 | 82-118 |

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09091285-01A | MW-2 |
| 09091285-02A | MW-3 |
| 09091285-05A | Trip Blank |

### Laboratory Control Sample (LCS)

RunID: K_091002B-5229667 Units: ug/L
Analysis Date: 10/02/2009 16:39 Analyst: LU_L

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Benzene | 20.0 | 22.2 | 111 | 74 | 123 |
| Ethylbenzene | 20.0 | 19.2 | 96.1 | 72 | 127 |
| Toluene | 20.0 | 19.6 | 97.9 | 74 | 126 |
| m,p-Xylene | 40.0 | 37.8 | 94.5 | 71 | 129 |
| o-Xylene | 20.0 | 19.4 | 97.2 | 74 | 130 |
| Xylenes,Total | 60.0 | 57.2 | 95.4 | 71 | 130 |
| Surr: 1,2-Dichloroethane-d4 | 50.0 | 49 | 97.9 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | 50.0 | 50.2 | 100 | 74 | 125 |
| Surr: Toluene-d8 | 50.0 | 48.4 | 96.7 | 82 | 118 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09091280-06
RunID: K_091002B-5229670 Units: ug/L
Analysis Date: 10/02/2009 20:18 Analyst: LU_L

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

## Quality Control Report

### Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09091285
**Method:** SW8260B **Lab Batch ID:** R285380

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 613 | 200 | 823 | 105 | 200 | 836 | 112 | 1.58 | 22 | 70 | 124 |
| Ethylbenzene | 15.9 | 200 | 204 | 93.8 | 200 | 191 | 87.7 | 6.18 | 20 | 76 | 122 |
| Toluene | 13.5 | 200 | 214 | 100 | 200 | 200 | 93.4 | 6.41 | 24 | 80 | 117 |
| m,p-Xylene | 21.0 | 400 | 401 | 95.0 | 400 | 382 | 90.3 | 4.78 | 20 | 69 | 127 |
| o-Xylene | ND | 200 | 201 | 101 | 200 | 194 | 97.1 | 3.54 | 20 | 84 | 114 |
| Xylenes,Total | 21.0 | 600 | 602 | 96.9 | 600 | 576 | 92.6 | 4.37 | 20 | 69 | 127 |
| Surr: 1,2-Dichloroethane-d4 | ND | 500 | 490 | 98.0 | 500 | 481 | 96.3 | 1.82 | 30 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | ND | 500 | 508 | 102 | 500 | 494 | 98.9 | 2.60 | 30 | 74 | 125 |
| Surr: Toluene-d8 | ND | 500 | 486 | 97.2 | 500 | 476 | 95.3 | 2.01 | 30 | 82 | 118 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B
**Method:** SW8260B

**WorkOrder:** 09091285
**Lab Batch ID:** R285471

### Method Blank

RunID: K_091003B-5231283 Units: ug/L
Analysis Date: 10/03/2009 11:52 Analyst: LU_L

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09091285-03A | MW-4 |
| 09091285-04A | Duplicate |

| Analyte | Result | Rep Limit |
|---|---|---|
| Benzene | ND | 1.0 |
| Ethylbenzene | ND | 1.0 |
| Toluene | ND | 1.0 |
| m,p-Xylene | ND | 2.0 |
| o-Xylene | ND | 1.0 |
| Xylenes,Total | ND | 1.0 |
| Surr: 1,2-Dichloroethane-d4 | 96.8 | 78-116 |
| Surr: 4-Bromofluorobenzene | 102.7 | 74-125 |
| Surr: Toluene-d8 | 97.1 | 82-118 |

### Laboratory Control Sample (LCS)

RunID: K_091003B-5231282 Units: ug/L
Analysis Date: 10/03/2009 11:25 Analyst: LU_L

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Benzene | 20.0 | 22.8 | 114 | 74 | 123 |
| Ethylbenzene | 20.0 | 20.1 | 100 | 72 | 127 |
| Toluene | 20.0 | 19.8 | 99.0 | 74 | 126 |
| m,p-Xylene | 40.0 | 38.8 | 96.9 | 71 | 129 |
| o-Xylene | 20.0 | 19.7 | 98.6 | 74 | 130 |
| Xylenes,Total | 60.0 | 58.5 | 97.5 | 71 | 130 |
| Surr: 1,2-Dichloroethane-d4 | 50.0 | 50.6 | 101 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | 50.0 | 49.2 | 98.4 | 74 | 125 |
| Surr: Toluene-d8 | 50.0 | 49.3 | 98.6 | 82 | 118 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09091285-03
RunID: K_091003B-5231285 Units: ug/L
Analysis Date: 10/03/2009 15:02 Analyst: LU_L

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

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## Quality Control Report

### Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09091285
**Method:** SW8260B **Lab Batch ID:** R285471

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 20 | 22.7 | 113 | 20 | 26.9 | 134 * | 17.0 | 22 | 70 | 124 |
| Ethylbenzene | ND | 20 | 19.1 | 95.6 | 20 | 18.3 | 91.6 | 4.25 | 20 | 76 | 122 |
| Toluene | ND | 20 | 20.5 | 102 | 20 | 18.8 | 94.1 | 8.49 | 24 | 80 | 117 |
| m,p-Xylene | ND | 40 | 36.5 | 91.3 | 40 | 36.6 | 91.4 | 0.170 | 20 | 69 | 127 |
| o-Xylene | ND | 20 | 18.7 | 93.3 | 20 | 18.9 | 94.4 | 1.16 | 20 | 84 | 114 |
| Xylenes,Total | ND | 60 | 55.2 | 92.0 | 60 | 55.5 | 92.4 | 0.504 | 20 | 69 | 127 |
| Surr: 1,2-Dichloroethane-d4 | ND | 50 | 50 | 100 | 50 | 57.4 | 115 | 13.8 | 30 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | ND | 50 | 50.2 | 100 | 50 | 48.6 | 97.3 | 3.16 | 30 | 74 | 125 |
| Surr: Toluene-d8 | ND | 50 | 48.9 | 97.7 | 50 | 47.9 | 95.7 | 2.10 | 30 | 82 | 118 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

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# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Ion Chromatography
**Method:** E300.0

**WorkOrder:** 09091285
**Lab Batch ID:** R284791A

### Method Blank

RunID: IC2_090926A-5220323 Units: mg/L
Analysis Date: 09/26/2009 14:12 Analyst: BDG

| Analyte | Result | Rep Limit |
|---|---|---|
| Fluoride | ND | 0.50 |

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09091285-01B | MW-2 |
| 09091285-02B | MW-3 |
| 09091285-03B | MW-4 |

### Laboratory Control Sample (LCS)

RunID: IC2_090926A-5220324 Units: mg/L
Analysis Date: 09/26/2009 14:29 Analyst: BDG

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Fluoride | 10.00 | 10.21 | 102.1 | 85 | 115 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09091285-03
RunID: IC2_090926A-5222121 Units: mg/L
Analysis Date: 09/27/2009 1:22 Analyst: BDG

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | 2.466 | 10 | 12.91 | 104.4 | 10 | 12.91 | 104.4 | 0.007748 | 20 | 80 | 120 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits



QC results presented on the QC Summary Report 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.

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# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Ion Chromatography **WorkOrder:** 09091285
**Method:** E300.0 **Lab Batch ID:** R284904

### Method Blank

RunID: IC2_090928A-5222022 Units: mg/L
Analysis Date: 09/28/2009 9:56 Analyst: BDG

| Analyte | Result | Rep Limit |
|---|---|---|
| Sulfate | ND | 0.50 |

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09091285-01B | MW-2 |
| 09091285-02B | MW-3 |
| 09091285-03B | MW-4 |

### Laboratory Control Sample (LCS)

RunID: IC2_090928A-5222023 Units: mg/L
Analysis Date: 09/28/2009 10:12 Analyst: BDG

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Sulfate | 10.00 | 10.25 | 102.5 | 85 | 115 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09091282-01
RunID: IC2_090928A-5222044 Units: mg/L
Analysis Date: 09/28/2009 18:01 Analyst: BDG

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 428.9 | 500 | 984.7 | 111.2 | 500 | 909.4 | 96.10 | 7.947 | 20 | 80 | 120 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



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*Sample Receipt Checklist*

*And*

*Chain of Custody*

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

# Sample Receipt Checklist

| | | | |
|---|---|---|---|
| Workorder: | 09091285 | Received By: | AMV |
| Date and Time Received: | 9/26/2009 9:30:00 AM | Carrier name: | SPL |
| Temperature: | 1.8°C | Chilled by: | Water Ice |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Shipping container/cooler in good condition? | Yes | ☑ | No | ☐ | Not Present ☐ |
| 2. | Custody seals intact on shippping container/cooler? | Yes | ☑ | No | ☐ | Not Present ☐ |
| 3. | Custody seals intact on sample bottles? | Yes | ☐ | No | ☐ | Not Present ☑ |
| 4. | Chain of custody present? | Yes | ☑ | No | ☐ | |
| 5. | Chain of custody signed when relinquished and received? | Yes | ☑ | No | ☐ | |
| 6. | Chain of custody agrees with sample labels? | Yes | ☑ | No | ☐ | |
| 7. | Samples in proper container/bottle? | Yes | ☑ | No | ☐ | |
| 8. | Sample containers intact? | Yes | ☑ | No | ☐ | |
| 9. | Sufficient sample volume for indicated test? | Yes | ☑ | No | ☐ | |
| 10. | All samples received within holding time? | Yes | ☑ | No | ☐ | |
| 11. | Container/Temp Blank temperature in compliance? | Yes | ☑ | No | ☐ | |
| 12. | Water - VOA vials have zero headspace? | Yes | ☑ | No | ☐ | VOA Vials Not Present ☐ |
| 13. | Water - Preservation checked upon receipt (except VOA*)? | Yes | ☑ | No | ☐ | Not Applicable ☐ |

*VOA Preservation Checked After Sample Analysis

SPL Representative: _____ Contact Date & Time: _____

Client Name Contacted: _____

Non Conformance Issues: _____

Client Instructions: _____

**SPL, Inc.**
Analysis Request & Chain of Custody Record

SPL Workorder No: 1909 1285 | 331742 | page ____ of ____

Client Name: Tetra Tech / ConocoPhillips
Address: (12) Indian School Rd Ste 200
City: Albuquerque State: NM Zip: 87110
Phone/Fax: 505.237.8440 505.237.8456
Client Contact: Kelly Blanchard Email: kelly.blanchard@tetratech.com
Project Name/No.: Howell K-1
Site Name:
Site Location: Aztec, NM
Invoice To: ConocoPhillips Ph:

| SAMPLE ID | DATE | TIME | comp | grab | 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) | pres. (1=HCl 2=HNO3 3=H2SO4 X=other) | Number of Containers | Requested Analysis: BTEX ONLY | Sulfate & Fluoride | Dissolved Iron and Manganese |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~MW-1~~ | ~~9/25/09~~ | | | X | W | V | 40 | 1 | 3 | X | | |
| ~~MW-1~~ | ~~9/25/09~~ | | | X | W | P | 16/32 | NONE | 2 | | X | X |
| MW-2 | 9/25/09 | 1330 | | X | W | V | 40 | 1 | 3 | X | | |
| MW-2 | 9/25/09 | 1330 | | X | W | P | 16/32 | NONE | 2 | | X | X |
| MW-3 | 9/25/09 | 1310 | | X | W | V | 40 | 1 | 3 | X | | |
| MW-3 | 9/25/09 | 1310 | | X | W | P | 16/32 | NONE | 2 | | X | X |
| MW-4 | 9/25/09 | 1255 | | X | W | V | 40 | 1 | 3 | X | | |
| MW-4 | 9/25/09 | 1255 | | X | W | P | 16/32 | NONE | 2 | | X | X |
| ~~Duplicate~~ OK | ~~9/25/09~~ | ~~1325~~ | | X | W | V | ~~40~~ | 1 | 3 | X | | OK |
| Trip Blank | 9/25/09 | 1435 | | | W | V | 40 | 1 | 3 | X | | |

Client/Consultant Remarks: Please filter and preserve metals container prior to analysis

Laboratory remarks:

Intact? Y N
Ice? Y N
Temp: 1.8

**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: | 9/25/09 | 1440 | 2. Received by: |
| 3. Relinquished by: | date | time | 4. Received by: |
| 5. Relinquished by: | 9/26/09 | 9:30 | 6. Received by Laboratory: Amanda Vickers |

☒ 8880 Interchange Drive, Houston, TX 77054 (713) 660-0901
☐ 500 Ambassador Caffery Parkway, Scott, LA 70583 (337) 237-4775
☐ 459 Hughes Drive, Traverse City, MI 49686 (231) 947-5777

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HOUSTON, TX 77054
(713) 660-0901

## Conoco Phillips

**Certificate of Analysis Number:**

**09100901**

| Report To: | | Project Name: | COP Howell K-1 |
|---|---|---|---|
| Tetra Tech, Inc. | | Site: | Navajo, NM |
| Kelly Blanchard | | Site Address: | |
| 6121 Indian School Road, N.E. | | | |
| Suite 200 | | PO Number: | 4510016701 |
| Albuquerque | | State: | New Mexico |
| NM | | State Cert. No.: | |
| 87110- | | Date Reported: | 10/30/2009 |
| ph: (505) 237-8440 | fax: | | |

This Report Contains A Total Of 13 Pages

Excluding This Page, Chain Of Custody

And

Any Attachments

10/30/2009

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

## Case Narrative for:

# Conoco Phillips

## Certificate of Analysis Number:

## 09100901

| Report To: | | Project Name: | COP Howell K-1 |
|---|---|---|---|
| Tetra Tech, Inc. | | Site: | Navajo, NM |
| Kelly Blanchard | | Site Address: | |
| 6121 Indian School Road, N.E. | | | |
| Suite 200 | | PO Number: | 4510016701 |
| Albuquerque | | State: | New Mexico |
| NM | | State Cert. No.: | |
| 87110- | | | |
| ph: (505) 237-8440 | fax: | Date Reported: | 10/30/2009 |

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: ANALYSIS AND EXCEPTIONS:

Sample ID "MW-1" (SPL ID: 09100901-01) was randomly selected for use in SPL's quality control program for Batch ID: R287119. The Matrix Spike Duplicate (MSD) recovery was outside of the advisable quality control limits due to possible matrix interference for the following analyte: o-Xylene. A Laboratory Control Sample (LCS) was analyzed as a quality control check for the analytical batch and all recoveries were within acceptable limits.

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.

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.



10/30/2009

Erica Cardenas
Project Manager

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Conoco Phillips

## Certificate of Analysis Number:

## 09100901

**Report To:** Tetra Tech, Inc.
Kelly Blanchard
6121 Indian School Road, N.E.
Suite 200
Albuquerque
NM
87110-
ph: (505) 237-8440 fax: (505) 881-3283

**Fax To:**

**Project Name:** COP Howell K-1
**Site:** Navajo, NM
**Site Address:**
**PO Number:** 4510016701
**State:** New Mexico
**State Cert. No.:**
**Date Reported:** 10/30/2009

| Client Sample ID | Lab Sample ID | Matrix | Date Collected | Date Received | COC ID | HOLD |
|---|---|---|---|---|---|---|
| MW-1 | 09100901-01 | Water | 10/18/2009 6:00:00 PM | 10/20/2009 9:00:00 AM | 329232 | ☐ |
| Trip Blank | 09100901-02 | Water | 10/18/2009 | 10/20/2009 9:00:00 AM | 329232 | ☐ |

Erica Cardenas 10/30/2009

Erica Cardenas
Project Manager

Date

Kesavalu M. Bagawandoss Ph.D., J.D.
Laboratory Director

Ted Yen
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

**Client Sample ID:** MW-1 **Collected:** 10/18/2009 18:00 **SPL Sample ID:** 09100901-01

**Site: Navajo, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **ION CHROMATOGRAPHY** | | | | **MCL** | **E300.0** | **Units: mg/L** | |
| Fluoride | 0.881 | | 0.5 | 1 | 10/29/09 19:35 | BDG | 5267870 |
| Sulfate | 3840 | | 500 | 1000 | 10/29/09 19:52 | BDG | 5267871 |
| **METALS BY METHOD 6010B, DISSOLVED** | | | | **MCL** | **SW6010B** | **Units: mg/L** | |
| Iron | 2.24 | | 0.02 | 1 | 10/21/09 20:56 | AB1 | 5255744 |
| Manganese | 17.4 | | 0.005 | 1 | 10/21/09 20:56 | AB1 | 5255744 |

| Prep Method | Prep Date | Prep Initials | Prep Factor |
|---|---|---|---|
| SW3005A | 10/20/2009 21:00 | R_V | 1.00 |

| VOLATILE ORGANICS BY METHOD 8260B | | | | MCL | SW8260B | Units: ug/L | |
|---|---|---|---|---|---|---|---|
| Benzene | ND | | 1 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| Ethylbenzene | ND | | 1 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| Toluene | ND | | 1 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| m,p-Xylene | ND | | 1 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| o-Xylene | ND | | 1 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| Xylenes,Total | ND | | 1 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| Surr: 1,2-Dichloroethane-d4 | 102 | % | 78-116 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| Surr: 4-Bromofluorobenzene | 99.1 | % | 74-125 | 1 | 10/22/09 13:20 | LU_L | 5257230 |
| Surr: Toluene-d8 | 95.4 | % | 82-118 | 1 | 10/22/09 13:20 | LU_L | 5257230 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

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HOUSTON, TX 77054
(713) 660-0901

**Client Sample ID:** Trip Blank **Collected:** 10/18/2009 0:00 **SPL Sample ID:** 09100901-02

**Site: Navajo, NM**

| Analyses/Method | Result | QUAL | Rep.Limit | Dil. Factor | Date Analyzed | Analyst | Seq. # |
|---|---|---|---|---|---|---|---|
| **VOLATILE ORGANICS BY METHOD 8260B** | | | **MCL** | **SW8260B** | **Units: ug/L** | | |
| Benzene | ND | | 1 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| Ethylbenzene | ND | | 1 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| Toluene | ND | | 1 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| m,p-Xylene | ND | | 1 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| o-Xylene | ND | | 1 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| Xylenes,Total | ND | | 1 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| Surr: 1,2-Dichloroethane-d4 | 98.3 | | % 78-116 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| Surr: 4-Bromofluorobenzene | 95.3 | | % 74-125 | 1 | 10/21/09 13:43 | LU_L | 5255777 |
| Surr: Toluene-d8 | 97.7 | | % 82-118 | 1 | 10/21/09 13:43 | LU_L | 5255777 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

# *Quality Control Documentation*

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Metals by Method 6010B, Dissolved
**Method:** SW6010B
**WorkOrder:** 09100901
**Lab Batch ID:** 94827

### Method Blank

RunID: ICP2_091021A-5255727 Units: mg/L
Analysis Date: 10/21/2009 19:59 Analyst: AB1
Preparation Date: 10/20/2009 21:00 Prep By: R_V Method: SW3005A

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09100901-01B | MW-1 |

| Analyte | Result | Rep Limit |
|---|---|---|
| Iron | ND | 0.02 |
| Manganese | ND | 0.005 |

### Laboratory Control Sample (LCS)

RunID: ICP2_091021A-5255728 Units: mg/L
Analysis Date: 10/21/2009 20:04 Analyst: AB1
Preparation Date: 10/20/2009 21:00 Prep By: R_V Method: SW3005A

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Iron | 1.000 | 0.9648 | 96.48 | 80 | 120 |
| Manganese | 1.000 | 1.004 | 100.4 | 80 | 120 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09100933-02
RunID: ICP2_091021A-5255730 Units: mg/L
Analysis Date: 10/21/2009 20:13 Analyst: AB1
Preparation Date: 10/20/2009 21:00 Prep By: R_V Method: SW3005A

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | ND | 0.1 | 0.08830 | 88.30 | 0.1 | 0.08700 | 87.00 | 1.483 | 20 | 75 | 125 |
| Manganese | ND | 0.1 | 0.1033 | 100.3 | 0.1 | 0.1044 | 101.4 | 1.059 | 20 | 75 | 125 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

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# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09100901
**Method:** SW8260B **Lab Batch ID:** R287020

### Method Blank

RunID: K_091021D-5255774 Units: ug/L
Analysis Date: 10/21/2009 13:16 Analyst: LU_L

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09100901-02A | Trip Blank |

| Analyte | Result | Rep Limit |
|---|---|---|
| Benzene | ND | 1.0 |
| Ethylbenzene | ND | 1.0 |
| Toluene | ND | 1.0 |
| m,p-Xylene | ND | 1.0 |
| o-Xylene | ND | 1.0 |
| Xylenes,Total | ND | 1.0 |
| Surr: 1,2-Dichloroethane-d4 | 103.0 | 78-116 |
| Surr: 4-Bromofluorobenzene | 97.1 | 74-125 |
| Surr: Toluene-d8 | 96.9 | 82-118 |

### Laboratory Control Sample (LCS)

RunID: K_091021D-5255773 Units: ug/L
Analysis Date: 10/21/2009 12:48 Analyst: LU_L

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Benzene | 20.0 | 18.8 | 93.8 | 74 | 123 |
| Ethylbenzene | 20.0 | 16.1 | 80.7 | 72 | 127 |
| Toluene | 20.0 | 16.9 | 84.3 | 74 | 126 |
| m,p-Xylene | 40.0 | 32.3 | 80.7 | 71 | 129 |
| o-Xylene | 20.0 | 16.6 | 82.8 | 74 | 130 |
| Xylenes,Total | 60.0 | 48.9 | 81.4 | 71 | 130 |
| Surr: 1,2-Dichloroethane-d4 | 50.0 | 47.5 | 94.9 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | 50.0 | 49 | 98.0 | 74 | 125 |
| Surr: Toluene-d8 | 50.0 | 47.3 | 94.7 | 82 | 118 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09100895-01
RunID: K_091021D-5255783 Units: ug/L
Analysis Date: 10/21/2009 20:57 Analyst: LU_L

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

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## Quality Control Report

### Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09100901
**Method:** SW8260B **Lab Batch ID:** R287020

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 11.7 | 20 | 32.0 | 101 | 20 | 31.2 | 97.5 | 2.45 | 22 | 70 | 124 |
| Ethylbenzene | ND | 20 | 17.6 | 88.1 | 20 | 17.2 | 85.8 | 2.71 | 20 | 76 | 122 |
| Toluene | ND | 20 | 18.3 | 91.3 | 20 | 17.3 | 86.5 | 5.41 | 24 | 80 | 117 |
| m,p-Xylene | ND | 40 | 34.8 | 87.0 | 40 | 34.0 | 84.9 | 2.40 | 20 | 69 | 127 |
| o-Xylene | ND | 20 | 17.7 | 88.7 | 20 | 18.1 | 90.3 | 1.85 | 20 | 84 | 114 |
| Xylenes,Total | ND | 60 | 52.5 | 87.5 | 60 | 52.1 | 86.7 | 0.943 | 20 | 69 | 127 |
| Surr: 1,2-Dichloroethane-d4 | ND | 50 | 46 | 92.0 | 50 | 48.8 | 97.6 | 5.89 | 30 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | ND | 50 | 49.6 | 99.2 | 50 | 48.1 | 96.2 | 3.07 | 30 | 74 | 125 |
| Surr: Toluene-d8 | ND | 50 | 47.9 | 95.8 | 50 | 46.3 | 92.6 | 3.37 | 30 | 82 | 118 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits



QC results presented on the QC Summary Report 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.

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# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09100901
**Method:** SW8260B **Lab Batch ID:** R287119

### Method Blank

RunID: K_091022A-5257229 Units: ug/L
Analysis Date: 10/22/2009 12:53 Analyst: LU_L

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09100901-01A | MW-1 |

| Analyte | Result | Rep Limit |
|---|---|---|
| Benzene | ND | 1.0 |
| Ethylbenzene | ND | 1.0 |
| Toluene | ND | 1.0 |
| m,p-Xylene | ND | 1.0 |
| o-Xylene | ND | 1.0 |
| Xylenes,Total | ND | 1.0 |
| Surr: 1,2-Dichloroethane-d4 | 98.7 | 78-116 |
| Surr: 4-Bromofluorobenzene | 97.3 | 74-125 |
| Surr: Toluene-d8 | 97.0 | 82-118 |

### Laboratory Control Sample (LCS)

RunID: K_091022A-5257228 Units: ug/L
Analysis Date: 10/22/2009 12:25 Analyst: LU_L

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Benzene | 20.0 | 19.7 | 98.3 | 74 | 123 |
| Ethylbenzene | 20.0 | 16.4 | 82.1 | 72 | 127 |
| Toluene | 20.0 | 17.0 | 85.0 | 74 | 126 |
| m,p-Xylene | 40.0 | 33.2 | 83.1 | 71 | 129 |
| o-Xylene | 20.0 | 16.2 | 80.8 | 74 | 130 |
| Xylenes,Total | 60.0 | 49.4 | 82.3 | 71 | 130 |
| Surr: 1,2-Dichloroethane-d4 | 50.0 | 50.2 | 100 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | 50.0 | 49.2 | 98.3 | 74 | 125 |
| Surr: Toluene-d8 | 50.0 | 47.4 | 94.8 | 82 | 118 |

### Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 09100901-01
RunID: K_091022A-5257231 Units: ug/L
Analysis Date: 10/22/2009 13:47 Analyst: LU_L

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



QC results presented on the QC Summary Report 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.

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## Quality Control Report

### Conoco Phillips

**COP Howell K-1**

**Analysis:** Volatile Organics by Method 8260B **WorkOrder:** 09100901
**Method:** SW8260B **Lab Batch ID:** R287119

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 20 | 20.8 | 104 | 20 | 20.2 | 101 | 3.11 | 22 | 70 | 124 |
| Ethylbenzene | ND | 20 | 17.0 | 84.9 | 20 | 17.2 | 86.1 | 1.41 | 20 | 76 | 122 |
| Toluene | ND | 20 | 18.0 | 90.0 | 20 | 17.3 | 86.5 | 4.00 | 24 | 80 | 117 |
| m,p-Xylene | ND | 40 | 34.6 | 86.5 | 40 | 33.5 | 83.9 | 3.08 | 20 | 69 | 127 |
| o-Xylene | ND | 20 | 17.3 | 86.6 | 20 | 16.8 | 84.0 * | 3.11 | 20 | 84 | 114 |
| Xylenes,Total | ND | 60 | 51.9 | 86.5 | 60 | 50.3 | 83.9 | 3.09 | 20 | 69 | 127 |
| Surr: 1,2-Dichloroethane-d4 | ND | 50 | 46.2 | 92.4 | 50 | 47.4 | 94.8 | 2.56 | 30 | 78 | 116 |
| Surr: 4-Bromofluorobenzene | ND | 50 | 48.9 | 97.8 | 50 | 51.0 | 102 | 4.14 | 30 | 74 | 125 |
| Surr: Toluene-d8 | ND | 50 | 47.5 | 95.0 | 50 | 47.2 | 94.3 | 0.723 | 30 | 82 | 118 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



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HOUSTON, TX 77054
(713) 660-0901

# Quality Control Report

## Conoco Phillips

**COP Howell K-1**

**Analysis:** Ion Chromatography **WorkOrder:** 09100901
**Method:** E300.0 **Lab Batch ID:** R287819

**Method Blank**

RunID: IC2_091029C-5267852 Units: mg/L
Analysis Date: 10/29/2009 13:07 Analyst: BDG

**Samples in Analytical Batch:**

| Lab Sample ID | Client Sample ID |
|---|---|
| 09100901-01C | MW-1 |

| Analyte | Result | Rep Limit |
|---|---|---|
| Fluoride | ND | 0.50 |
| Sulfate | ND | 0.50 |

**Laboratory Control Sample (LCS)**

RunID: IC2_091029C-5267853 Units: mg/L
Analysis Date: 10/29/2009 13:24 Analyst: BDG

| Analyte | Spike Added | Result | Percent Recovery | Lower Limit | Upper Limit |
|---|---|---|---|---|---|
| Fluoride | 10.00 | 10.80 | 108.0 | 85 | 115 |
| Sulfate | 10.00 | 10.29 | 102.9 | 85 | 115 |

**Matrix Spike (MS) / Matrix Spike Duplicate (MSD)**

Sample Spiked: 09101141-01
RunID: IC2_091029C-5267885 Units: mg/L
Analysis Date: 10/30/2009 3:08 Analyst: BDG

| Analyte | Sample Result | MS Spike Added | MS Result | MS % Recovery | MSD Spike Added | MSD Result | MSD % Recovery | RPD | RPD Limit | Low Limit | High Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | ND | 10 | 10.58 | 105.8 | 10 | 11.09 | 110.9 | 4.661 | 20 | 80 | 120 |
| Sulfate | ND | 10 | 9.711 | 97.11 | 10 | 10.16 | 101.6 | 4.529 | 20 | 80 | 120 |

**Qualifiers:**

ND/U - Not Detected at the Reporting Limit
B/V - Analyte detected in the associated Method Blank
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count



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*Sample Receipt Checklist*

*And*

*Chain of Custody*

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

# Sample Receipt Checklist

| | | | |
|---|---|---|---|
| Workorder: | 09100901 | Received By: | CAW |
| Date and Time Received: | 10/20/2009 9:00:00 AM | Carrier name: | Fedex-Priority |
| Temperature: | 3.0°C | Chilled by: | Water Ice |

| | | | | |
|---|---|---|---|---|
| 1. | Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ |
| 2. | Custody seals intact on shippping container/cooler? | Yes ☑ | No ☐ | Not Present ☐ |
| 3. | Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| 4. | Chain of custody present? | Yes ☑ | No ☐ | |
| 5. | Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | |
| 6. | Chain of custody agrees with sample labels? | Yes ☐ | No ☑ | |
| | 1. Trip blanks received not listed on chain. | | | |
| 7. | Samples in proper container/bottle? | Yes ☑ | No ☐ | |
| 8. | Sample containers intact? | Yes ☑ | No ☐ | |
| 9. | Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | |
| 10. | All samples received within holding time? | Yes ☑ | No ☐ | |
| 11. | Container/Temp Blank temperature in compliance? | Yes ☑ | No ☐ | |
| 12. | Water - VOA vials have zero headspace? | Yes ☑ | No ☐ | VOA Vials Not Present ☐ |
| 13. | Water - Preservation checked upon receipt (except VOA*)? | Yes ☑ | No ☐ | Not Applicable ☐ |

*VOA Preservation Checked After Sample Analysis

SPL Representative: | Contact Date & Time:

Client Name Contacted:

Non Conformance Issues: 1. Logged for analysis.

Client Instructions:

**SPL, Inc.**
Analysis Request & Chain of Custody Record

SPL Workorder No. 329232

09100901

page 1 of 1

Client Name: Tetra Tech / ConocoPhillips
Address: 6121 Indian School Rd NE Ste 200
City: Albuquerque State: NM Zip: 87110
Phone/Fax: 505.237.8440 505.237.8656
Client Contact: kelly.blanchard@tetratech.com Email: Contact: Kelly Blanchard
Project Name/No.: Howell K-1
Site Name:
Site Location: Navajo, NM
Invoice To: ConocoPhillips Ph:

| SAMPLE ID | DATE | TIME | comp | grab | 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) | pres. (1=HCl 2=HNO3 3=H2SO4 X=other) | Number of Containers | Requested Analysis: BTEX ONLY | Dissolved Iron, Manganese | Sulfate, Fluoride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 10-18-09 | 1800 | | X | W | V | 40 | 1 | 3 | X | | |
| MW-1 | 10-18-09 | 1800 | | X | W | P | 16 | NONE | 2 | | X | X |

RUSH

Client/Consultant Remarks:
please filter & preserve metals containers at lab prior to ~~sampling~~ running.

Laboratory remarks:

Intact? Y N
Ice? Y N
Temp: 8.0°C

**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: | 10/19/09 CDT | 1200 | 2. Received by: |
| 3. Relinquished by: | date | time | 4. Received by: |
| 5. Relinquished by: | date 10/20/09 | time 900 | 6. Received by Laboratory: |

☐ 8880 Interchange Drive
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☐ 500 Ambassador Caffery Parkway
Scott, LA 70583 (337) 237-4775

☐ 459 Hughes Drive
Traverse City, MI 49686 (231) 947-5777