# 2018 Annual Groundwater Monitoring Report

State Com J6
San Juan County, New Mexico
NMOCD# 3R-468

Hilcorp Energy Company

RCVD Via Email 1/25/19
Accepted with conditions Sent Via Email
NJK1323741691

**GHD** | 6121 Indian School Rd NE Suite 200 Albuquerque NM 87110 USA

11145955 | Report No 2 | January 2019

## Smith, Cory, EMNRD

**From:** Smith, Cory, EMNRD
**Sent:** Thursday, April 25, 2019 2:40 PM
**To:** Jennifer Deal
**Cc:** Griswold, Jim, EMNRD; 'Jeff.Walker@ghd.com'
**Subject:** RE: 3R-468 State Com J6 2018 Annual GWM Rpt ~COR-11145955~

Mrs. Deal,

OCD has reviewed the 2018 AGWM report for 3RP-468 which was assigned incident# nJK1326741691 please make sure future report include the incident# with them. The OCD has approved the 2018 report with the following conditions of approval:

- HEC will design and implement in 2019 an **active** remediation plan to remove NAPL from the ground water table. Please submit the plan to OCD for comments/record keeping however, the Plan Does not need to be approved prior to implementation.

If you have any questions

Cory Smith
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 115
cory.smith@state.nm.us

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**From:** Jeff.Walker@ghd.com <Jeff.Walker@ghd.com>
**Sent:** Friday, January 25, 2019 1:36 PM
**To:** Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>; Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
**Cc:** Jennifer Deal <jdeal@hilcorp.com>; filing@craworld.com
**Subject:** [EXT] 3R-468 State Com J6 2018 Annual GWM Rpt ~COR-11145955~

Vanessa/Cory,

Please find attached the 2018 Annual Groundwater Monitoring report for the subject site, submitted on behalf of Hilcorp Energy. Please let Jennifer or me know if you have any questions regarding this document or the site.

Also, please acknowledge receipt for record keeping.

Thank you-Jeff

**Jeffrey L. Walker**
**Sr. Project Manager**

**GHD**

# Table of Contents



# Figure Index



# Table Index



# Appendix Index

# 1. Introduction

This report presents the results of quarterly groundwater monitoring conducted in 2018. The work was performed on behalf of Hilcorp Energy Company (Hilcorp) by GHD Services, Inc. (GHD) at the State Com J6 site (hereafter referred to as the "Site"). Hilcorp performed 4th quarter 2018 groundwater monitoring field activities without the services of GHD. The Site consists of the release area from the pipeline in the Pump Canyon Wash (wash) between the State Com J6 natural gas wellhead and the State Com J6 Compressor site. A Site Detail Map is included as Figure 2.The Site is located on land controlled by the New Mexico State Land Office within Section 36, Township 31 North, Range 9 West San Juan County, New Mexico (Figure 1).

# 2. Site History

The previous Site producer, Conoco Phillips Company (COP), removed approximately 275 cubic yards of impacted soil in an attempt to assess the extent of the March 2013 pipeline release. In addition, 60 barrels of hydrocarbon impacted water were also removed from the excavation by COP with a vacuum truck and disposed of off Site. Depth to groundwater during the excavation was noted to be approximately 5 feet below ground surface (ft bgs). GHD conducted soil and groundwater assessment activities at the Site in July 2013 after the COP soil and groundwater removals to further assess impacts. Hand auger boreholes were advanced in the wash in the area of the 2013 release. Four inches of non-aqueous phase liquid (NAPL) was measured on top of the groundwater in one hand-augered borehole near the center of the release area in the wash.

Four groundwater recovery wells and one monitoring well were installed at the Site in early 2014. The recovery wells were installed near the center of the release area, straddling the pipeline from where the condensate was released. The monitoring well was installed hydraulically down gradient from this area to monitor dissolved phase groundwater concentrations. Three consecutive groundwater recovery events followed whereby commingled groundwater and NAPL was removed from recovery wells via vacuum truck for off-Site disposal. Mobile dual-phase extraction (MDPE) events were conducted in August and November 2014, April 2015 and November 2017 to recover hydrocarbons from the release area. The MDPE events proved to be very productive with respect to mass removal of hydrocarbons, removing a combined total of 777 gallons of hydrocarbon from the four events. At the direction of then New Mexico Oil Conservation Division, one additional down-gradient monitoring well and one cross-gradient well (MW-2 and MW-3, respectively) were installed in September 2016 to provide better monitoring of Site groundwater quality. Groundwater monitoring at the Site is currently on a quarterly schedule.

Monitor wells MW-1, MW-2 and MW-3 were gauged and sampled in March, June, September by GHD and sampled by Hilcorp in December 2018. Recovery wells RW-1, RW-2, RW-3 and RW-4 are not sampled due to the presence of NAPL in these wells.

# 3. Groundwater Monitoring

Prior to collection of groundwater samples, depth to groundwater and/or NAPL in each Site well was measured using an oil/water interface probe. Pig® absorbent socks were installed periodically in the recovery wells to recover NAPL. The socks were removed from the wells as far in advance as possible to allow fluid level equilibration prior to gauging fluid levels. Fluid levels and groundwater elevations are detailed in Table 1.

A groundwater potentiometric surface map was created using gauging data from each quarterly monitoring event and are presented as Figures 3, 4, 5 and 6. Groundwater elevations for the recovery wells were corrected for the presence of NAPL but this data was not used in contouring. NAPL was present in one or more recovery wells during each quarterly monitoring event in 2018. Groundwater flow is to the southwest, consistent with historical monitoring data.

Site wells were purged of at least 3 casing volumes of groundwater using a 1.5 inch diameter, polyethylene bailer prior to sampling. Groundwater quality parameters including pH, temperature, conductivity, dissolved oxygen, and oxidation reduction potential were collected using a multi-parameter groundwater quality sonde and are summarized on Table 2. Field parameters were not collected during the December monitoring event. Following collection, groundwater samples were labeled, placed on ice, and submitted to Pace Analytical for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8260.

## 3.1 Groundwater Monitoring Analytical Results

Benzene, ethylbenzene and xylenes were detected in groundwater of MW-1 during the June sampling event but at concentrations below the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards. BTEX constituents were not detected above laboratory reporting limits in any of the other sampling events during 2018.

A summary of laboratory results is included as Table 3. Copies of Laboratory Analytical Reports for the 2018 groundwater sampling events are included in Appendix A.

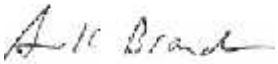
# 4. Conclusion and Recommendations

Though NAPL continues to be detected in on-Site recovery wells, dissolved phase concentrations of BTEX constituents appears to be diminishing in down-gradient monitor wells, evidence of intrinsic biodegradation of petroleum hydrocarbons in the subsurface. There were no exceedances of NMWQCC groundwater standards during the 2018 monitoring events.

The continuation of the removal of NAPL form Site wells is recommended and is necessary for Site closure in accordance with 20.6.2 NMAC. NAPL removal can be achieved by additional MDPE events, hand bailing or, at a minimum, the continued use of absorbent socks. The continuation of quarterly groundwater monitoring is also recommended. The next quarterly monitoring event is scheduled for March 2019.

Respectfully Submitted,

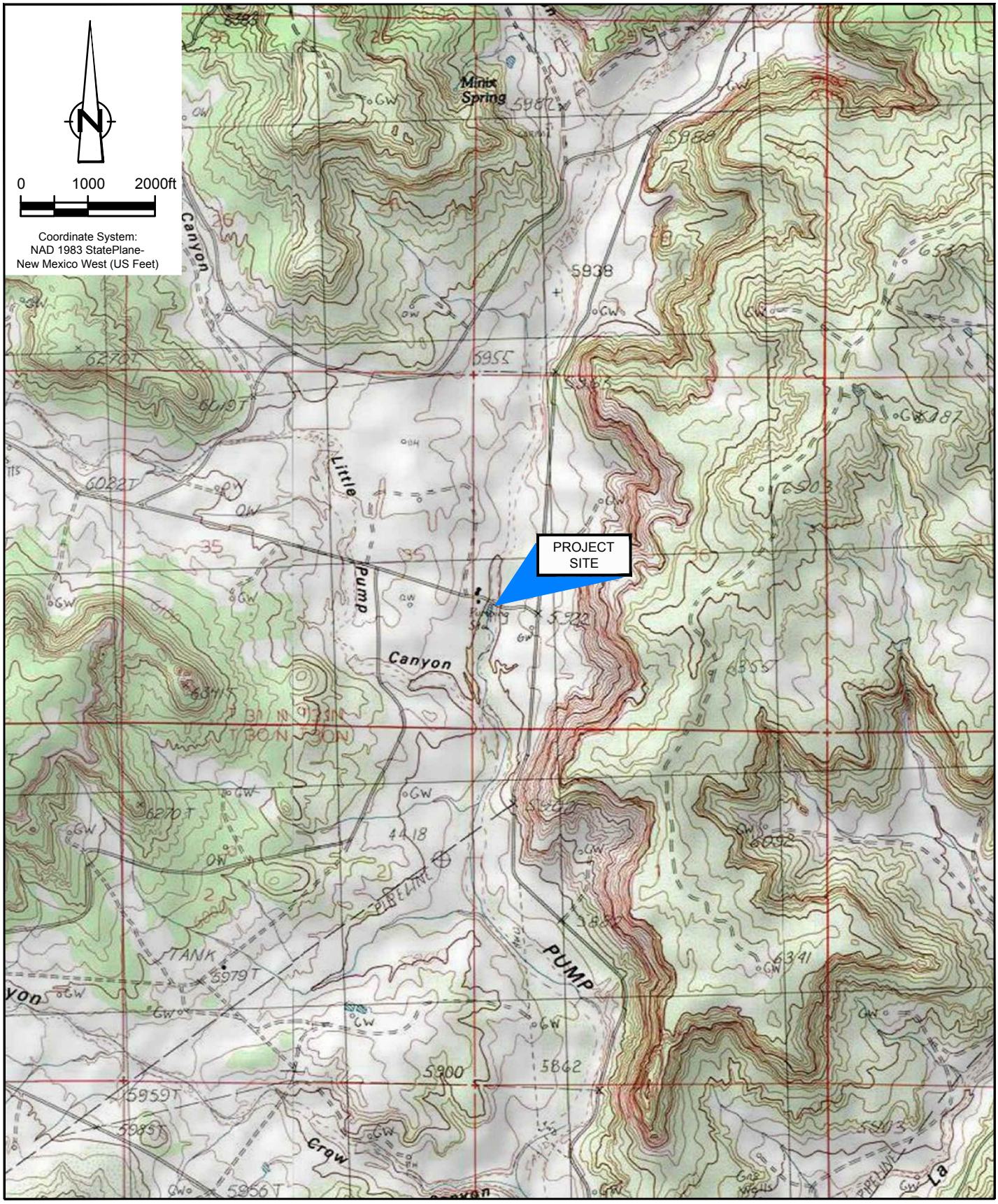
GHD



Jeff Walker
Sr. Project Manager

Alan Brandon
Albuquerque Operations Manager

# Figures




Source: USGS 7.5 Minute Quad "Archuleta and Turley, New Mexico"

Lat/Long: 36.8524° North, 107.7401° West

HILCORP ENERGY COMPANY
SECTION 36, T31N, R9W, SAN JUAN COUNTY, NEW MEXICO
STATE COM J6

11145955-00

Jan 7, 2019

# SITE LOCATION MAP

# FIGURE 1

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11145955-Hilcorp-State Com J6\11145955-00\11145955-00(002)\11145955-00(002)GN-DL001.dwg


Source: Image © 2016 Google - Image Date: March 16, 2016

Lat/Long: 36.8524° North, 107.7401° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

LEGEND

- Recovery Well Location
- Monitoring Well Location
- Pipeline

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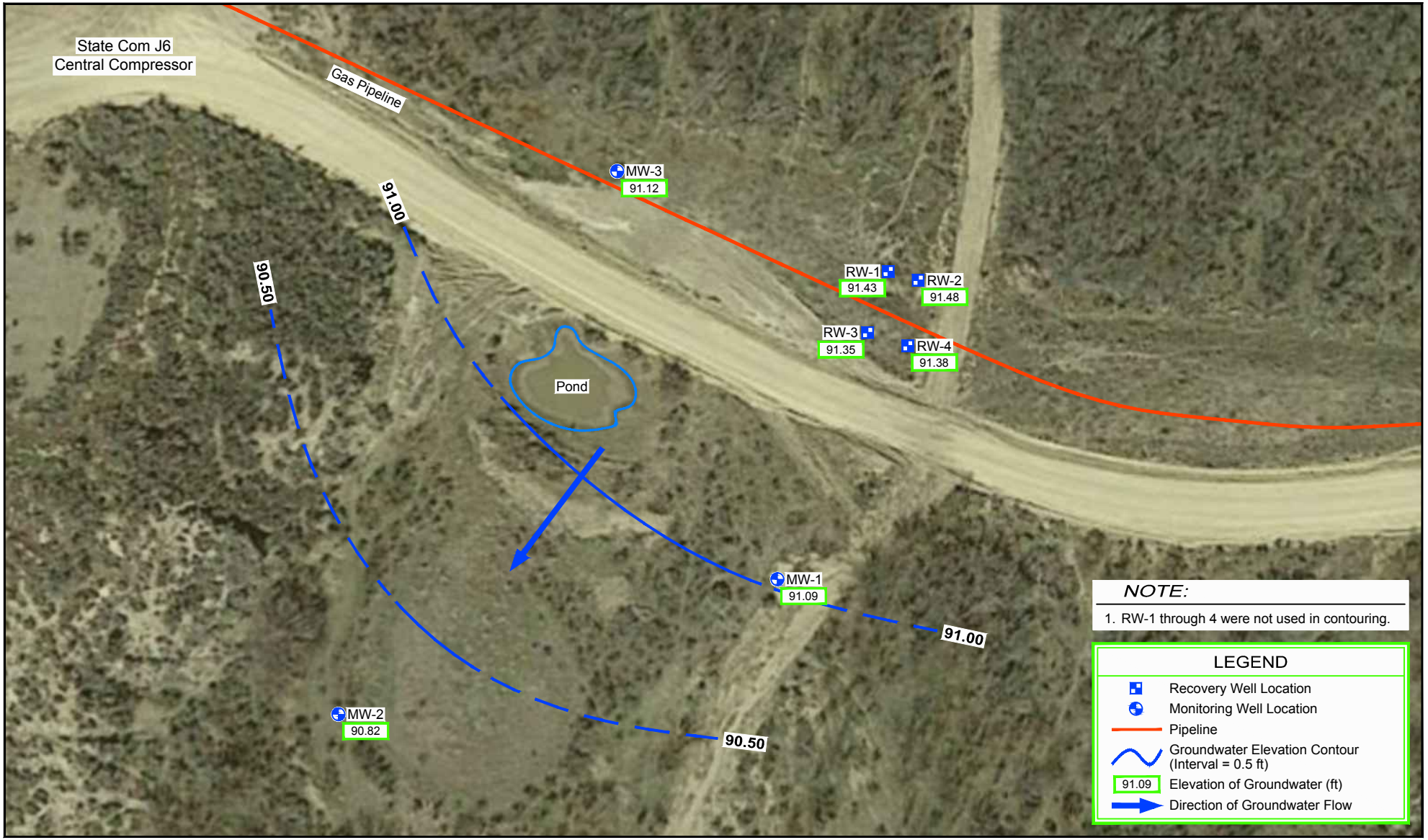
# SITE DETAIL MAP

FIGURE 2

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11145955-Hilcorp-State Com J6\11145955-00\11145955-00(002)\11145955-00(002)GN-DL001.dwg




Source: Image © 2016 Google - Image Date: March 16, 2016

Lat/Long: 36.8524° North, 107.7401° West

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Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

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STATE COM J6

# GROUNDWATER POTENTIOMETRIC SURFACE MAP - MARCH 2018

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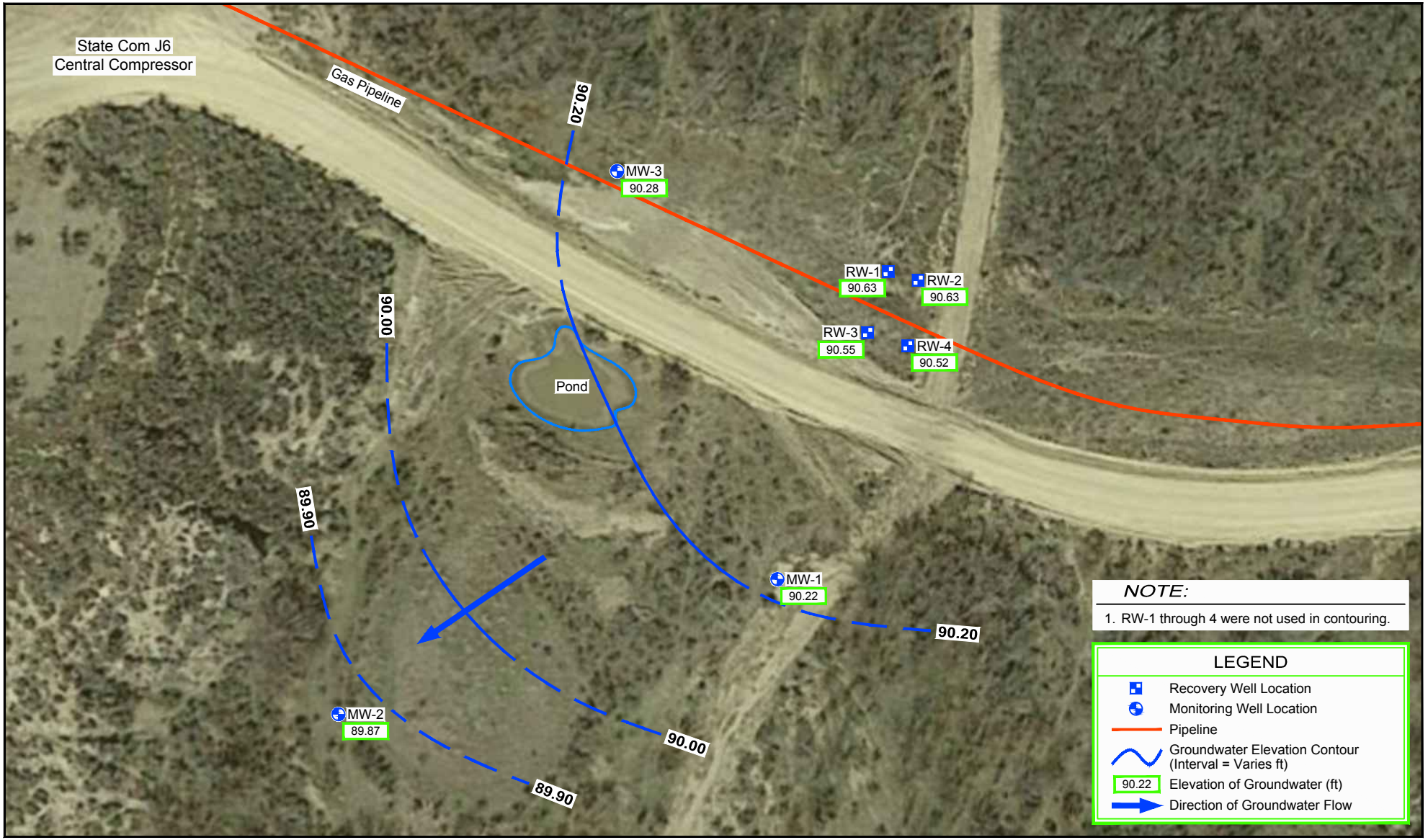
FIGURE 3

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11145955-Hilcorp-State Com J6\11145955-00\11145955-00(002)\11145955-00(002)GN-DL001.dwg




Source: Image © 2016 Google - Image Date: March 16, 2016

Lat/Long: 36.8524° North, 107.7401° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

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STATE COM J6

# GROUNDWATER POTENTIOMETRIC SURFACE MAP - JUNE 2018

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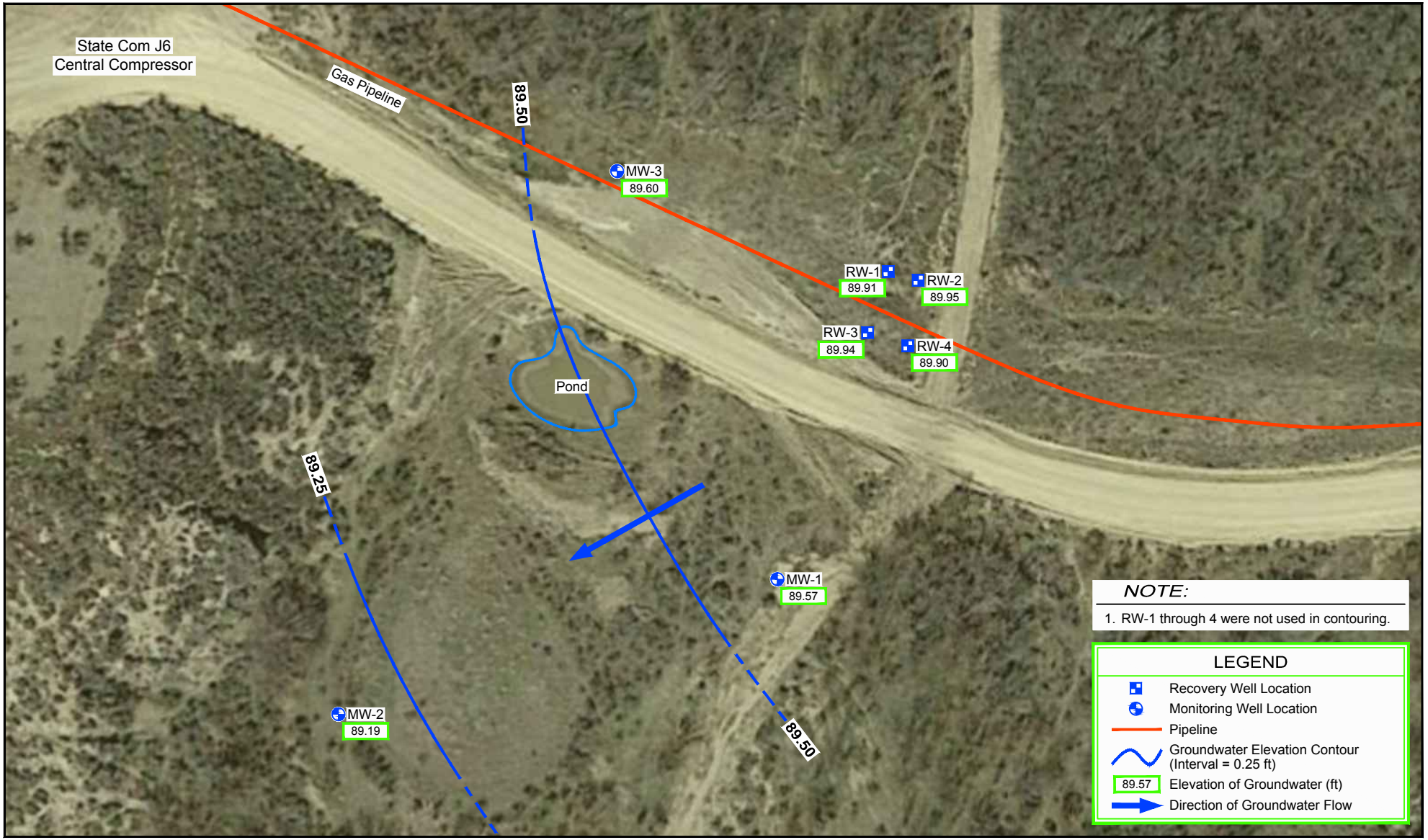
Jan 7, 2019

FIGURE 4

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11145955-Hilcorp-State Com J6\11145955-00\11145955-00(002)\11145955-00(002)GN-DL001.dwg




Source: Image © 2016 Google - Image Date: March 16, 2016

Lat/Long: 36.8524° North, 107.7401° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

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STATE COM J6

# GROUNDWATER POTENTIOMETRIC SURFACE MAP - SEPTEMBER 2018

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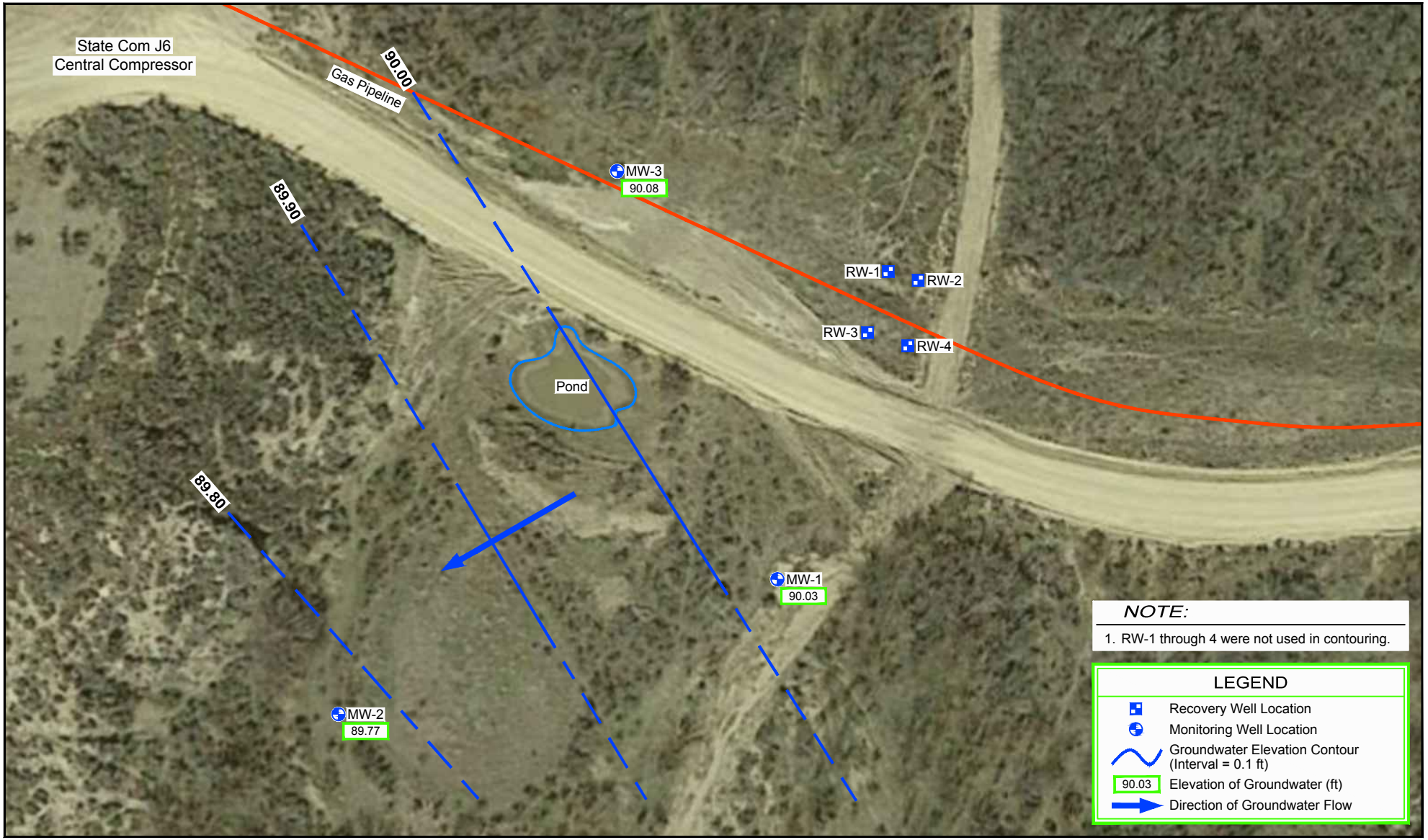
FIGURE 5

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11145955-Hilcorp-State Com J6\11145955-00\11145955-00(002)\11145955-00(002)GN-DL001.dwg




Source: Image © 2016 Google - Image Date: March 16, 2016

Lat/Long: 36.8524° North, 107.7401° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

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STATE COM J6

# GROUNDWATER POTENTIOMETRIC SURFACE MAP - DECEMBER 2018

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FIGURE 6

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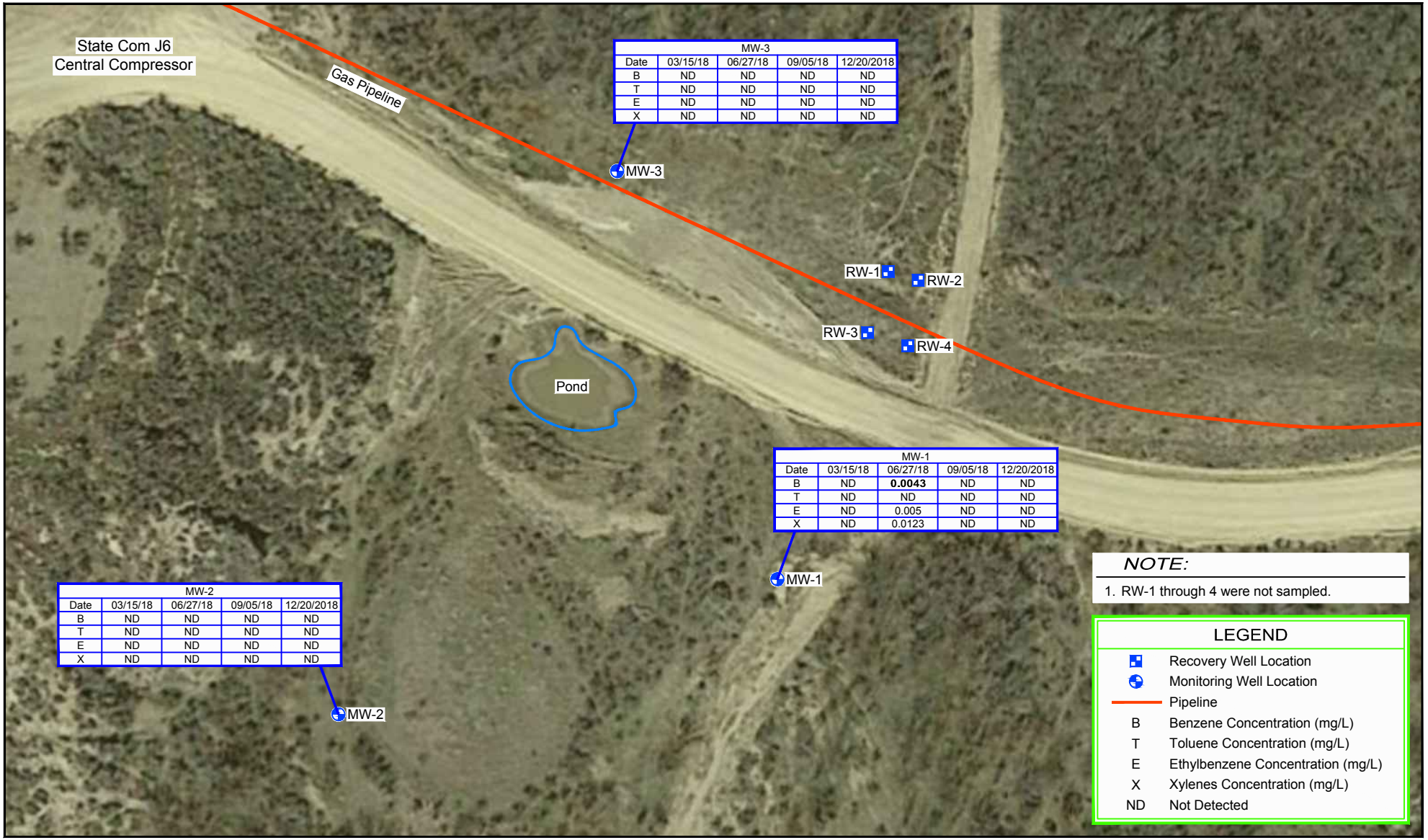


Source: Image © 2016 Google - Image Date: March 16, 2016

Lat/Long: 36.8524° North, 107.7401° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

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# 2018 GROUNDWATER CONCENTRATION MAP

FIGURE 7

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# Tables

Table 1

Fluid Levels and Groundwater Elevations
Hilcorp Energy Company
State Com J6
San Juan County

| Well | TOC Elevation (ft) | Sample Date | Depth to NAPL (ft) | Depth to Water (ft) | NAPL Thickness (ft) | GW Elevation (ft) |
|---|---|---|---|---|---|---|
| MW-1 | 100.00 | 5/12/2014 | -- | 7.98 | -- | 92.02 |
| | | 5/20/2014 | -- | 8.14 | -- | 91.86 |
| | | 5/27/2014 | -- | 8.10 | -- | 91.90 |
| | | 12/17/2014 | -- | 8.53 | -- | 91.47 |
| | | 4/21/2015 | -- | 8.20 | -- | 91.80 |
| | | 5/14/2015 | -- | 8.18 | -- | 91.82 |
| | | 9/22/2015 | -- | 8.43 | -- | 91.57 |
| | | 12/2/2015 | -- | 8.29 | -- | 91.71 |
| | | 3/30/2016 | -- | 7.92 | -- | 92.08 |
| | | 9/8/2016 | -- | 9.55 | | 90.45 |
| | | 12/1/2016 | -- | 8.96 | -- | 91.04 |
| | | 3/9/2017 | -- | 8.09 | -- | 91.91 |
| | | 6/15/2017 | -- | 8.54 | -- | 91.46 |
| | | 9/27/2017 | -- | 9.97 | -- | 90.03 |
| | | 12/6/2017 | -- | 9.25 | -- | 90.75 |
| | | 3/15/2018 | -- | 8.91 | -- | 91.09 |
| | | 6/27/2018 | -- | 9.78 | -- | 90.22 |
| | | 9/5/2018 | -- | 10.43 | -- | 89.57 |
| | | 12/20/2018 | -- | 9.97 | -- | 90.03 |
| MW-2 | 99.36 | 12/1/2016 | -- | 8.57 | -- | 90.79 |
| | | 3/9/2017 | -- | 7.73 | -- | 91.63 |
| | | 6/15/2017 | -- | 8.27 | -- | 91.09 |
| | | 9/27/2017 | -- | 9.70 | -- | 89.66 |
| | | 12/6/2017 | -- | 8.90 | -- | 90.46 |
| | | 3/15/2018 | -- | 8.54 | -- | 90.82 |
| | | 6/27/2018 | -- | 9.49 | -- | 89.87 |
| | | 9/5/2018 | -- | 10.17 | -- | 89.19 |
| | | 12/20/2018 | -- | 9.59 | -- | 89.77 |
| MW-3 | 99.59 | 12/1/2016 | -- | 8.51 | -- | 91.08 |
| | | 3/9/2017 | -- | 7.64 | -- | 91.95 |
| | | 6/15/2017 | -- | 8.05 | -- | 91.54 |
| | | 9/27/2017 | -- | 9.51 | -- | 90.08 |
| | | 12/6/2017 | -- | 8.80 | -- | 90.79 |
| | | 3/15/2018 | -- | 8.47 | -- | 91.12 |
| | | 6/27/2018 | -- | 9.31 | -- | 90.28 |
| | | 9/5/2018 | -- | 9.99 | -- | 89.60 |
| | | 12/20/2018 | -- | 9.51 | | 90.08 |
| RW-1 | 100.30 | 5/12/2014 | -- | 7.80 | -- | 92.50 |
| | | 5/20/2014 | -- | 7.85 | -- | 92.45 |
| | | 5/27/2014 | 7.89 | 7.90 | 0.01 | 92.41 |
| | | 12/17/2014 | 8.33 | 8.72 | 0.39 | 91.87 |
| | | 5/14/2015 | -- | 7.99 | -- | 92.31 |
| | | 6/17/2015 | 7.96 | 7.98 | 0.02 | 92.34 |
| | | 9/22/2015 | 8.57 | 8.72 | 0.15 | 91.69 |
| | | 12/2/2015 | 8.17 | 8.19 | 0.02 | 92.13 |
| | | 9/14/2016 | 9.11 | 10.10 | 0.99 | 90.94 |
| | | 12/1/2016 | -- | -- | -- | Dry |
| | | 3/9/2017 | -- | 8.01 | -- | 92.29 |
| | | 6/15/2017 | 8.35 | 8.50 | 0.15 | 91.76 |
| | | 9/27/2017 | 9.60 | 10.82 | 1.22 | 90.40 |
| | | 12/6/2017 | 9.09 | 9.59 | 0.50 | 91.09 |
| | | 3/15/2018 | 8.83 | 8.98 | 0.15 | 91.43 |
| | | 6/27/2018 | 9.52 | 10.11 | 0.59 | 90.63 |
| | | 9/5/2018 | 10.18 | 11.01 | 0.83 | 89.91 |
| | | 1/4/2019 | 9.77 | 10.12 | 0.35 | 90.44 |

Table 1

Fluid Levels and Groundwater Elevations
Hilcorp Energy Company
State Com J6
San Juan County

| *Well* | *TOC Elevation (ft)* | *Sample Date* | *Depth to NAPL (ft)* | *Depth to Water (ft)* | *NAPL Thickness (ft)* | *GW Elevation (ft)* |
|---|---|---|---|---|---|---|
| RW-2 | 99.96 | 5/12/2014 | 7.44 | 7.45 | 0.01 | 92.52 |
| | | 5/20/2014 | 7.66 | 7.67 | 0.01 | 92.30 |
| | | 5/27/2014 | -- | 7.56 | -- | 92.40 |
| | | 12/17/2014 | 7.98 | 8.39 | 0.41 | 91.88 |
| | | 5/14/2015 | -- | 7.65 | -- | 92.31 |
| | | 6/17/2015 | -- | 7.61 | -- | 92.35 |
| | | 9/22/2015 | -- | 8.25 | -- | 91.71 |
| | | 12/2/2015 | -- | 7.82 | -- | 92.14 |
| | | 9/14/2016 | 8.77 | 9.68 | 0.91 | 90.96 |
| | | 12/1/2016 | 8.51 | 8.65 | 0.41 | 91.21 |
| | | 3/9/2017 | -- | 7.74 | -- | 92.22 |
| | | 6/15/2017 | -- | 8.03 | -- | 91.93 |
| | | 9/27/2017 | 9.33 | 10.14 | 0.81 | 90.43 |
| | | 12/6/2017 | 8.72 | 9.22 | 0.50 | 91.12 |
| | | 3/15/2018 | 8.46 | 8.55 | 0.09 | 91.48 |
| | | 6/27/2017 | 9.25 | 9.59 | 0.34 | 90.63 |
| | | 9/5/2018 | 9.90 | 10.36 | 0.46 | 89.95 |
| | | 1/4/2019 | -- | 9.51 | -- | 90.45 |
| RW-3 | 99.84 | 5/12/2014 | -- | 7.46 | -- | 92.38 |
| | | 5/20/2014 | -- | 7.66 | -- | 92.18 |
| | | 5/27/2014 | -- | 7.59 | -- | 92.25 |
| | | 8/26/2014 | 8.70 | 10.43 | 1.73 | 90.71 |
| | | 11/11/2014 | 8.22 | 8.64 | 0.42 | 91.52 |
| | | 12/17/2014 | 7.94 | 8.55 | 0.61 | 91.75 |
| | | 5/14/2015 | 7.625 | 7.63 | 0.005 | 92.21 |
| | | 6/17/2015 | 7.58 | 7.76 | 0.18 | 92.22 |
| | | 9/22/2015 | 8.20 | 8.45 | 0.25 | 91.58 |
| | | 12/2/2015 | 7.74 | 8.11 | 0.37 | 92.01 |
| | | 9/14/2016 | 8.71 | 9.94 | 1.23 | 90.82 |
| | | 12/1/2016 | 8.46 | 8.98 | 0.52 | 90.47 |
| | | 3/9/2017 | 7.70 | 7.73 | 0.03 | 92.13 |
| | | 6/15/2017 | -- | 7.95 | -- | 91.89 |
| | | 9/27/2017 | 9.22 | 10.50 | 1.28 | 90.30 |
| | | 12/6/2017 | 8.69 | 9.28 | 0.59 | 91.00 |
| | | 3/15/2018 | 8.40 | 8.77 | 0.37 | 91.35 |
| | | 6/27/2018 | 9.14 | 9.73 | 0.59 | 90.55 |
| | | 9/5/2018 | 9.69 | 10.94 | 1.25 | 89.84 |
| | | 1/4/2019 | -- | 9.39 | -- | 90.84 |

Table 1

Fluid Levels and Groundwater Elevations
Hilcorp Energy Company
State Com J6
San Juan County

| *Well* | *TOC Elevation (ft)* | *Sample Date* | *Depth to NAPL (ft)* | *Depth to Water (ft)* | *NAPL Thickness (ft)* | *GW Elevation (ft)* |
|---|---|---|---|---|---|---|
| RW-4 | 99.67 | 5/12/2014 | 7.29 | 7.30 | 0.01 | 92.37 |
| | | 5/20/2014 | 7.26 | 8.12 | 0.86 | 92.20 |
| | | 5/27/2014 | 7.22 | 7.98 | 0.76 | 92.26 |
| | | 8/25/2014 | 8.47 | 9.80 | 1.33 | 90.87 |
| | | 11/10/2014 | 7.94 | 8.15 | 0.21 | 91.68 |
| | | 12/17/2014 | 7.84 | 8.10 | 0.26 | 91.77 |
| | | 4/20/2015 | 7.36 | 7.61 | 0.25 | 92.25 |
| | | 5/14/2015 | -- | 7.46 | -- | 92.21 |
| | | 6/17/2015 | 7.43 | 7.48 | 0.05 | 92.23 |
| | | 9/22/2015 | 8.04 | 8.17 | 0.13 | 91.60 |
| | | 12/2/2015 | 7.65 | 7.70 | 0.05 | 92.01 |
| | | 9/14/2016 | 8.53 | 9.75 | 1.22 | 90.84 |
| | | 12/1/2016 | 8.46 | 8.66 | 0.20 | 90.86 |
| | | 3/9/2017 | 7.47 | 7.54 | 0.07 | 92.18 |
| | | 6/15/2017 | -- | 7.69 | -- | 91.98 |
| | | 9/27/2017 | 9.04 | 10.33 | 1.29 | 90.31 |
| | | 12/6/2017 | 8.59 | 8.82 | 0.23 | 91.02 |
| | | 3/15/2018 | 8.29 | 8.30 | 0.01 | 91.38 |
| | | 6/27/2018 | 8.91 | 9.86 | 0.95 | 90.52 |
| | | 9/5/2018 | 9.5 | 10.59 | 1.09 | 89.90 |
| | | 1/4/2019 | -- | 9.19 | -- | 90.48 |

Notes:
ft = feet
GW Elevation datum established 12/17/2014. MW-1 top of casing = 100 ft.
DTW = Depth to water
NA = Not available
NAPL = non-aqueous phase liquid
When NAPL present: GW Elevation = GW Elevation + (NAPL Thickness X NAPL Density [0.75])

Table 2

Field Parameters Summary
Hilcorp Energy Company
State Com J6
San Juan County, New Mexico

| Well ID | Sample Date | Temperature (°C) | pH | TDS (g/L) | Conductivity (µS/cm) | DO (mg/L) | ORP (mV) | Volume (gallons) |
|---|---|---|---|---|---|---|---|---|
| MW-1 | 5/14/2015 | 11.68 | 7.52 | 3.221 | 4976 | 10.88 | -205.0 | 1.50 |
| | 5/14/2015 | 11.32 | 7.35 | 3.309 | 5096 | 2.83 | -205.0 | 1.75 |
| | 5/14/2015 | 11.34 | 7.28 | 3.341 | 5139 | 1.66 | -204.0 | 2.25 |
| | 9/22/2015 | 16.41 | 7.01 | 1.164 | 1792 | 9.11 | -117.5 | 3.00 |
| | 9/22/2015 | 16.42 | 6.98 | 1.177 | 1811 | 2.96 | -117.6 | 3.50 |
| | 9/22/2015 | 16.43 | 6.99 | 1.152 | 1771 | 2.48 | -117.0 | 4.00 |
| | 3/30/2016 | 10.36 | 7.48 | 1.200 | 1.92 | 5.62 | -104.0 | 4.25 |
| | 9/8/2016 | 16.10 | 7.10 | 0.877 | 1353 | 1.52 | -91.1 | 3.50 |
| | 12/1/2016 | 12.55 | 7.49 | -- | 1.664 | 2.64 | -110.6 | 3.50 |
| | 3/9/2017 | 8.45 | 7.31 | 1.403 | 2157 | 1.81 | -158.2 | 4.25 |
| | 6/15/2017 | 11.52 | 7.27 | 1.390 | 2125 | 0.74 | -203.1 | 4.50 |
| | 9/27/2017 | 15.35 | 6.93 | -- | 1790 | -- | -- | 3.50 |
| | 12/6/2017 | 12.14 | 7.00 | 1.318 | 2022 | 2.15 | -69.5 | 3.50 |
| | 3/15/2018 | 9.90 | 7.35 | -- | 1790 | 0.62 | -112.6 | 3.50 |
| | 6/27/2018 | 16.73 | 6.97 | -- | 1959 | 1.04 | -96.4 | 3.25 |
| | 9/5/2018 | 17.1 | 7.46 | -- | 1898 | 4.17 | -109.1 | 3 |
| MW-2 | 12/1/2016 | 9.75 | 8.11 | -- | 0.198 | 6.29 | -128.8 | 4.25 |
| | 3/9/2017 | 7.58 | 7.24 | 1.812 | 2788 | 1.72 | -144.7 | 4.75 |
| | 6/15/2017 | 10.24 | 7.64 | 1.494 | 2298 | 4.09 | -148.3 | 4.50 |
| | 9/27/2017 | 13.76 | 7.12 | -- | 2009 | -- | -- | 4.00 |
| | 12/6/2017 | 11.09 | 6.96 | 1.394 | 2145 | 4.22 | -63.1 | 4.00 |
| | 3/15/2018 | 8.19 | 7.32 | -- | 2302 | 0.13 | -75.6 | 4.25 |
| | 6/27/2018 | 12.49 | 7.17 | -- | 2103.7 | 0.57 | -41.9 | 4.0 |
| | 6/5/2018 | 16.74 | 7.52 | -- | 1954 | 4.76 | -13.1 | 3.5 |
| MW-3 | 12/1/2016 | 12.09 | 7.39 | -- | 2200 | 2.30 | -53.7 | 4.50 |
| | 3/9/2017 | 7.48 | 7.42 | 1.709 | 2614 | 3.58 | -124.2 | 5.00 |
| | 6/15/2017 | 10.06 | 7.41 | 1.407 | 2164 | 2.53 | -149.4 | 4.75 |
| | 9/27/2017 | 12.76 | 7.39 | -- | 1914 | -- | -- | 4.00 |
| | 12/6/2017 | 10.06 | 6.93 | 1.339 | 2060 | 1.74 | -58.2 | 4.25 |
| | 3/15/2018 | 8.10 | 7.23 | -- | 2141.69 | 0.75 | 18.0 | -- |
| | 6/27/18 | 12.49 | 7.17 | -- | 2104 | 0.57 | -41.9 | 4.00 |
| | 9/5/18 | 14.22 | 7.46 | -- | 2064 | 1.17 | -4.3 | 4.00 |
| RW-1 | 5/14/2015 | 11.76 | 7.21 | 1.938 | 2965 | 3.04 | -234.9 | 6.00 |
| | 5/14/2015 | 11.56 | 7.23 | 1.928 | 2965 | 2.31 | -293.0 | 8.00 |
| | 5/14/2015 | 11.48 | 7.25 | 1.962 | 3017 | 2.35 | -319.1 | 9.50 |
| | | | | | | | | |

Notes:
TDS = total dissolved solids
DO = dissolved oxygen
ORP = oxidation-reduction potential

Table 3

Groundwater Analytical Summary
Hilcorp Energy Company
State Com J6
San Juan County, New Mexico

| Well ID | Sample ID | Sample Date | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | Xylenes (mg/L) | Naphthalenes (mg/L) |
|---|---|---|---|---|---|---|---|
| **NMWQCC Groundwater Quality Standards** | | | **0.005*** | **1.0*** | **0.70*** | **0.62** | **0.03** |
| MW-1 | GW-081773-051214-MW-1 | 5/12/2014 | **0.0134** | 0.0304 | 0.0152 | 0.228 | 0.0017 |
| | GW-081773-092314-CB-MW-1 | 9/23/2014 | **0.01** | < 0.001 | 0.0033 | 0.0233 | < 0.0005 |
| | GW-081773-121714-JW-MW-1 | 12/17/2014 | **0.0252** | < 0.001 | 0.0121 | 0.0488 | 0.00085 |
| | GW-081773-051415-CB-MW-1 | 5/14/2015 | 0.0041 | < 0.001 | 0.0056 | 0.0121 | < 0.00045 |
| | GW-081773-092215-CB-MW-1 | 9/22/2015 | **0.0463** | < 0.001 | 0.0214 | 0.115 | 0.0012 |
| | GW-081773-092215-CB-DUP | 9/22/2015 | **0.0215** | < 0.001 | 0.0097 | 0.0521 | -- |
| | GW-081773-033016-CM-DUP | 3/30/2016 | 0.0074 | < 0.001 | 0.0030 | 0.0122 | < 0.0005 |
| | GW-081773-090816-SP-MW-1 | 9/8/2016 | **0.0121** | < 0.001 | 0.0124 | 0.0817 | 0.001 |
| | GW-081773-090816-SP-DUP | 9/8/2016 | **0.0106** | < 0.001 | 0.0109 | 0.0720 | -- |
| | GW-081773-120116-JK-MW-1 | 12/1/2016 | <0.001 | <0.001 | <0.001 | <0.003 | <0.0005 |
| | GW-081773-031917-CNMW-1 | 3/9/2017 | 0.0028 | <0.001 | <0.001 | <0.003 | -- |
| | WT-081773-06152017-CN-MW1 | 6/15/2017 | **0.0431** | <0.001 | 0.0022 | 0.0038 | |
| | GW-11145955-092717-SP-MW-1 | 9/27/2017 | 0.0067 | <0.001 | 0.0056 | 0.0338 | -- |
| | GW-11145955-120617-SP-MW-1 | 12/6/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-031518-JW-MW-1 | 3/15/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-062718-CM-MW-1 | 6/27/2018 | 0.0043 | <0.001 | 0.005 | 0.0123 | -- |
| | GW-11145955-090518-CN-MW-1 | 9/5/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | MW-1 | 12/20/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| MW-2 | GW-081773-092616-JW-MW-2 | 9/26/2016 | <0.001 | <0.001 | <0.001 | <0.003 | <0.0005 |
| | GW-081773-120116-JK-MW-2 | 12/1/2016 | <0.001 | <0.001 | <0.001 | <0.003 | <0.0005 |
| | GW-081773-031917-CNMW-2 | 3/9/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | WT-081773-061517-CNMW-2 | 6/15/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-092717-SP-MW-2 | 9/27/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-120617-SP-MW-2 | 12/6/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-031518-JW-MW-2 | 3/15/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-062718-CM-MW-2 | 6/27/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-090518-CN-MW-2 | 9/5/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | MW-2 | 12/20/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| MW-3 | GW-081773-09/16/2016-JW-MW2 | 9/26/2016 | <0.001 | <0.001 | <0.001 | <0.003 | <0.0005 |
| | GW-081773-120116-JK-MW-3 | 12/1/2016 | <0.001 | <0.001 | <0.001 | <0.003 | <0.0005 |
| | GW-081773-031917-CNMW-3 | 3/9/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | WT-081773-061517-CN-MW3 | 6/15/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-092717-SP-MW-3 | 9/27/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-120617-SP-MW-3 | 12/6/2017 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-031518-JW-MW-3 | 3/15/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-062718-CM-MW-3 | 6/27/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | GW-11145955-090518-CN-MW-2 | 9/5/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| | MW-3 | 12/20/2018 | <0.001 | <0.001 | <0.001 | <0.003 | -- |
| RW-1 | GW-081773-051214-RW-1 | 5/12/2014 | **1.88** | **6.27** | **0.567** | **8.96** | **0.109** |
| | GW-081773-051415-CB-RW-1 | 5/14/2015 | **0.688** | **0.764** | 0.388 | **5.65** | **0.121** |
| | GW-081773-051415-CB-DUP | 5/14/2015 | **0.681** | **0.737** | 0.383 | **5.39** | -- |
| RW-2 | | Not sampled due to presence of LNAPL | | | | | |
| RW-3 | GW-081773-051214-RW-3 | 5/12/2014 | **0.416** | **0.889** | 0.153 | **4.58** | **0.0596** |
| RW-4 | | Not sampled due to presence of LNAPL | | | | | |

Notes:
LNAPL = light non-aqueous phase liquid
NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
< 0.001 = Below Laboratory Detection Limit of 0.001 mg/L
-- = Not Analyzed
Naphthalenes = this standard applies to the sum of naphthalene and monomethylnaphthalene isomers (1-methyl, 2-methyl)
* = NMWQCC standards revised 12/2018

# Appendix A
# Groundwater Laboratory Analytical Reports

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

March 23, 2018

Jeff Walker
GHD Services
6121 indian School Rd
Ste 200
Albuquerque, NM 87110

RE: Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

Dear Jeff Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on March 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colleen Clyne
colleen.clyne@pacelabs.com
1(913)563-1406
Project Manager

Enclosures

cc: Angela Bown, GHD Services
Christine Mathews, GHD Services

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## CERTIFICATIONS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

**Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## SAMPLE SUMMARY

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60266193001** | **GW-11145955-031518-JW-MW1** | Water | 03/15/18 13:40 | 03/17/18 08:05 |
| **60266193002** | **GW-11145955-031518-JW-MW2** | Water | 03/15/18 13:45 | 03/17/18 08:05 |
| **60266193003** | **GW-11145955-031518-JW-MW3** | Water | 03/15/18 13:50 | 03/17/18 08:05 |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## SAMPLE ANALYTE COUNT

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60266193001** | **GW-11145955-031518-JW-MW1** | EPA 8260/OA1 | EAG | 8 | PASI-K |
| **60266193002** | **GW-11145955-031518-JW-MW2** | EPA 8260/OA1 | EAG | 8 | PASI-K |
| **60266193003** | **GW-11145955-031518-JW-MW3** | EPA 8260/OA1 | EAG | 8 | PASI-K |

**Pace Analytical Services, LLC**
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# PROJECT NARRATIVE

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

**Method:** **EPA 8260/OA1**
**Description:** 8260/OA1 UST, Water
**Client:** GHD Services, New Mexico
**Date:** March 23, 2018

**General Information:**
3 samples were analyzed for EPA 8260/OA1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 518745

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

**Sample: GW-11145955-031518-JW-MW1** **Lab ID: 60266193001** Collected: 03/15/18 13:40 Received: 03/17/18 08:05 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 03/22/18 21:45 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 03/22/18 21:45 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 03/22/18 21:45 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 03/22/18 21:45 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80-120 | 1 | | 03/22/18 21:45 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 97 | % | 85-119 | 1 | | 03/22/18 21:45 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 102 | % | 80-117 | 1 | | 03/22/18 21:45 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 03/22/18 21:45 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

**Sample: GW-11145955-031518-JW-MW2** **Lab ID: 60266193002** Collected: 03/15/18 13:45 Received: 03/17/18 08:05 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 03/22/18 21:59 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 03/22/18 21:59 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 03/22/18 21:59 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 03/22/18 21:59 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80-120 | 1 | | 03/22/18 21:59 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 99 | % | 85-119 | 1 | | 03/22/18 21:59 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 101 | % | 80-117 | 1 | | 03/22/18 21:59 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 03/22/18 21:59 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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Lenexa, KS 66219
(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

**Sample: GW-11145955-031518-JW-MW3** **Lab ID: 60266193003** Collected: 03/15/18 13:50 Received: 03/17/18 08:05 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 03/22/18 22:13 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 03/22/18 22:13 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 03/22/18 22:13 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 03/22/18 22:13 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80-120 | 1 | | 03/22/18 22:13 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 99 | % | 85-119 | 1 | | 03/22/18 22:13 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 101 | % | 80-117 | 1 | | 03/22/18 22:13 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 03/22/18 22:13 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

QC Batch: 518745 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60266193001, 60266193002, 60266193003

METHOD BLANK: 2123212 Matrix: Water
Associated Lab Samples: 60266193001, 60266193002, 60266193003

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Benzene | ug/L | ND | 1.0 | 03/22/18 17:57 | |
| Ethylbenzene | ug/L | ND | 1.0 | 03/22/18 17:57 | |
| Toluene | ug/L | ND | 1.0 | 03/22/18 17:57 | |
| Xylene (Total) | ug/L | ND | 3.0 | 03/22/18 17:57 | |
| 1,2-Dichloroethane-d4 (S) | % | 103 | 80-117 | 03/22/18 17:57 | |
| 4-Bromofluorobenzene (S) | % | 97 | 85-119 | 03/22/18 17:57 | |
| Toluene-d8 (S) | % | 100 | 80-120 | 03/22/18 17:57 | |

LABORATORY CONTROL SAMPLE: 2123213

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | ug/L | 20 | 18.1 | 91 | 81-118 | |
| Ethylbenzene | ug/L | 20 | 18.0 | 90 | 80-118 | |
| Toluene | ug/L | 20 | 18.2 | 91 | 82-118 | |
| Xylene (Total) | ug/L | 60 | 56.2 | 94 | 81-120 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 101 | 80-117 | |
| 4-Bromofluorobenzene (S) | % | | | 99 | 85-119 | |
| Toluene-d8 (S) | % | | | 99 | 80-120 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

# QUALIFIERS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## LABORATORIES

PASI-K Pace Analytical Services - Kansas City

## BATCH QUALIFIERS

Batch: 518745

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11145955 COP STATE COM J6
Pace Project No.: 60266193

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60266193001** | **GW-11145955-031518-JW-MW1** | EPA 8260/OA1 | 518745 | | |
| **60266193002** | **GW-11145955-031518-JW-MW2** | EPA 8260/OA1 | 518745 | | |
| **60266193003** | **GW-11145955-031518-JW-MW3** | EPA 8260/OA1 | 518745 | | |

Pace Analytical
www.pacelabs.com

**Sample Condition Upon Receipt**
**ESI Tech Spec Client**

**WO# : 60266193**

60266193

Client Name: GHD COP

**Courier:** FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

**Tracking #:** 7801 1642 0336 Pace Shipping Label Used? Yes ☐ No ☐

**Custody Seal on Cooler/Box Present:** Yes ☐ No ☐ Seals intact: Yes ☐ No ☐

**Packing Material:** Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☐

**Thermometer Used:** 266 **Type of Ice:** (Wet) Blue None

LK

**Cooler Temperature (°C):** **As-read** 1.8 **Corr. Factor** +0.2 **Corrected** 2.0

**Date and initials of person examining contents:** 3/21/18

Temperature should be above freezing to 6°C

| | | |
|---|---|---|
| Chain of Custody present: | ☑Yes ☐No ☐N/A | |
| Chain of Custody relinquished: | ☑Yes ☐No ☐N/A | |
| Samples arrived within holding time: | ☑Yes ☐No ☐N/A | |
| **Short Hold Time analyses (<72hr):** | ☐Yes ☑No ☐N/A | |
| **Rush Turn Around Time requested:** | ☐Yes ☑No ☐N/A | |
| Sufficient volume: | ☑Yes ☐No ☐N/A | |
| Correct containers used: | ☑Yes ☐No ☐N/A | |
| Pace containers used: | ☑Yes ☐No ☐N/A | |
| Containers intact: | ☐Yes ☑No ☐N/A | 20c 3DGal MW1 broken |
| Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? | ☐Yes ☐No ☑N/A | |
| Filtered volume received for dissolved tests? | ☐Yes ☐No ☑N/A | |
| Sample labels match COC: Date / time / ID / analyses | ☑Yes ☐No ☐N/A | |
| Samples contain multiple phases? Matrix: WT | ☐Yes ☑No ☐N/A | |
| Containers requiring pH preservation in compliance? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) | ☐Yes ☐No ☑N/A | List sample IDs, volumes, lot #'s of preservative and the date/time added. |
| Cyanide water sample checks: Lead acetate strip turns dark? (Record only) | ☐Yes ☐No | |
| Potassium iodide test strip turns blue/purple? (Preserve) | ☐Yes ☐No | |
| Trip Blank present: | ☐Yes ☑No ☐N/A | |
| Headspace in VOA vials ( >6mm): | ☐Yes ☑No ☐N/A | |
| Samples from USDA Regulated Area: State: | ☐Yes ☐No ☑N/A | |
| Additional labels attached to 5035A / TX1005 vials in the field? | ☐Yes ☐No ☑N/A | |

**Client Notification/ Resolution:** Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Colleen Clyne Date: 03/21/2018

**Temp Log**: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

| | |
|---|---|
| Start: 1320 | Start: |
| End: 1325 | End: |
| Temp: | Temp: |

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | GHD Services_COP NM | Report To: | Christine Mathews | Attention: | |
| Address: | 6212 Indian School Rd. NE St2 | Copy To: | | Company Name: | |
| Albuquerque, NM 87110 | | | | Address: | |
| Email: | christine.mathews@ghd.com | Purchase Order #: | | Pace Quote: | |
| Phone: | 505-884-0672 Fax: | Project Name: | 11145955 COP State Com J6 | Pace Project Manager: | Colleen.Clyne@pacelabs.com |
| Requested Due Date: | | Project #: | | Pace Profile #: | 8644, line 29 |

Regulatory Agency

State / Location: NM

**SAMPLE ID**
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

| MATRIX | CODE |
|---|---|
| Drinking Water | DW |
| Water | WT |
| Waste Water | WW |
| Product | P |
| Soil/Solid | SL |
| Oil | OL |
| Wipe | WP |
| Air | AR |
| Other | OT |
| Tissue | TS |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED START DATE | COLLECTED START TIME | COLLECTED END DATE | COLLECTED END TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | H2SO4 | HNO3 | HCl | NaOH | Na2S2O3 | Methanol | Other | Analyses Test Y/N | 8260 BTEX | Residual Chlorine (Y/N) | 6926643 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GW-11145955-031518-JW-MW1 | W | G | | | 3-15-18 | 1340 | | 3 | | | | 3 | | | | | | X | | (1) DG9H 001 |
| 2 | GW-11145955-03/5/8-JW-MW2 | " | " | | | " | 1345 | | 3 | | | | 3 | | | | | | X | | (3) DG9H 002 |
| 3 | GW-11145955-03/5/8-JW-MW3 | " | " | | | " | 1350 | | 3 | | | | 3 | | | | | | X | | ↓ 003 |
| 4 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS: TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Jeff Walker / GHD | 3-16-18 | 0955 | | 3/17 | 0805 | 2.0 | Y | Y | N |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Walker

SIGNATURE of SAMPLER: Jeff Walker DATE Signed: 3-15-18

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 11, 2018

Jeffrey Walker
GHD Services, Inc
6121 Indian School Rd NE
Ste 200
Albuquerque, NM 87110

RE: Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

Dear Jeffrey Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on June 29, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,
Christine Mathews, GHD Services, Inc.

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## CERTIFICATIONS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

**Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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## SAMPLE SUMMARY

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60273796001** | **GW-11145955-062718-OM-MW-1** | Water | 06/27/18 09:50 | 06/29/18 09:00 |
| **60273796002** | **GW-11145955-062718-OM-MW-2** | Water | 06/27/18 10:15 | 06/29/18 09:00 |
| **60273796003** | **GW-11145955-062718-OM-MW-3** | Water | 06/27/18 10:00 | 06/29/18 09:00 |

**Pace Analytical Services, LLC**
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## SAMPLE ANALYTE COUNT

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60273796001** | **GW-11145955-062718-OM-MW-1** | EPA 8260/OA1 | PGH | 8 | PASI-K |
| **60273796002** | **GW-11145955-062718-OM-MW-2** | EPA 8260/OA1 | PGH | 8 | PASI-K |
| **60273796003** | **GW-11145955-062718-OM-MW-3** | EPA 8260/OA1 | PGH | 8 | PASI-K |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

# PROJECT NARRATIVE

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

**Method:** **EPA 8260/OA1**
**Description:** 8260/OA1 UST, Water
**Client:** GHD Services_COP NM
**Date:** July 11, 2018

**General Information:**
3 samples were analyzed for EPA 8260/OA1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 533452

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: 533647

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

**Pace Analytical Services, LLC**
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Lenexa, KS 66219
(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

**Sample: GW-11145955-062718-OM-MW-1** **Lab ID: 60273796001** Collected: 06/27/18 09:50 Received: 06/29/18 09:00 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | **4.3** | ug/L | 1.0 | 1 | | 07/11/18 07:20 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 07/11/18 07:20 | 108-88-3 | |
| Ethylbenzene | **5.0** | ug/L | 1.0 | 1 | | 07/11/18 07:20 | 100-41-4 | |
| Xylene (Total) | **12.3** | ug/L | 3.0 | 1 | | 07/11/18 07:20 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80-120 | 1 | | 07/11/18 07:20 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 94 | % | 85-119 | 1 | | 07/11/18 07:20 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 95 | % | 80-117 | 1 | | 07/11/18 07:20 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 07/11/18 07:20 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

**Sample: GW-11145955-062718-OM-MW-2** **Lab ID: 60273796002** Collected: 06/27/18 10:15 Received: 06/29/18 09:00 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 07/10/18 18:45 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 07/10/18 18:45 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 07/10/18 18:45 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 07/10/18 18:45 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 101 | % | 80-120 | 1 | | 07/10/18 18:45 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 95 | % | 85-119 | 1 | | 07/10/18 18:45 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 90 | % | 80-117 | 1 | | 07/10/18 18:45 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 07/10/18 18:45 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

**Sample: GW-11145955-062718-OM-MW-3** **Lab ID: 60273796003** Collected: 06/27/18 10:00 Received: 06/29/18 09:00 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 07/10/18 19:01 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 07/10/18 19:01 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 07/10/18 19:01 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 07/10/18 19:01 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 99 | % | 80-120 | 1 | | 07/10/18 19:01 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 94 | % | 85-119 | 1 | | 07/10/18 19:01 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 95 | % | 80-117 | 1 | | 07/10/18 19:01 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 07/10/18 19:01 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

QC Batch: 533452 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60273796002, 60273796003

METHOD BLANK: 2184877 Matrix: Water
Associated Lab Samples: 60273796002, 60273796003

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Benzene | ug/L | ND | 1.0 | 07/10/18 18:00 | |
| Ethylbenzene | ug/L | ND | 1.0 | 07/10/18 18:00 | |
| Toluene | ug/L | ND | 1.0 | 07/10/18 18:00 | |
| Xylene (Total) | ug/L | ND | 3.0 | 07/10/18 18:00 | |
| 1,2-Dichloroethane-d4 (S) | % | 93 | 80-117 | 07/10/18 18:00 | |
| 4-Bromofluorobenzene (S) | % | 95 | 85-119 | 07/10/18 18:00 | |
| Toluene-d8 (S) | % | 103 | 80-120 | 07/10/18 18:00 | |

LABORATORY CONTROL SAMPLE: 2184878

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | ug/L | 20 | 19.3 | 97 | 81-118 | |
| Ethylbenzene | ug/L | 20 | 22.7 | 113 | 80-118 | |
| Toluene | ug/L | 20 | 20.9 | 105 | 82-118 | |
| Xylene (Total) | ug/L | 60 | 67.2 | 112 | 81-120 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 98 | 80-117 | |
| 4-Bromofluorobenzene (S) | % | | | 93 | 85-119 | |
| Toluene-d8 (S) | % | | | 103 | 80-120 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

QC Batch: 533647 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60273796001

METHOD BLANK: 2185429 Matrix: Water
Associated Lab Samples: 60273796001

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Benzene | ug/L | ND | 1.0 | 07/11/18 05:49 | |
| Ethylbenzene | ug/L | ND | 1.0 | 07/11/18 05:49 | |
| Toluene | ug/L | ND | 1.0 | 07/11/18 05:49 | |
| Xylene (Total) | ug/L | ND | 3.0 | 07/11/18 05:49 | |
| 1,2-Dichloroethane-d4 (S) | % | 98 | 80-117 | 07/11/18 05:49 | |
| 4-Bromofluorobenzene (S) | % | 93 | 85-119 | 07/11/18 05:49 | |
| Toluene-d8 (S) | % | 100 | 80-120 | 07/11/18 05:49 | |

LABORATORY CONTROL SAMPLE: 2185430

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | ug/L | 20 | 19.1 | 96 | 81-118 | |
| Ethylbenzene | ug/L | 20 | 22.3 | 112 | 80-118 | |
| Toluene | ug/L | 20 | 21.0 | 105 | 82-118 | |
| Xylene (Total) | ug/L | 60 | 67.4 | 112 | 81-120 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 109 | 80-117 | |
| 4-Bromofluorobenzene (S) | % | | | 91 | 85-119 | |
| Toluene-d8 (S) | % | | | 102 | 80-120 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

# QUALIFIERS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## LABORATORIES

PASI-K Pace Analytical Services - Kansas City

## BATCH QUALIFIERS

Batch: 533452

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: 533647

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

**Pace Analytical Services, LLC**
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Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11145955 COP STATE COM J6
Pace Project No.: 60273796

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60273796001** | **GW-11145955-062718-OM-MW-1** | EPA 8260/OA1 | 533647 | | |
| **60273796002** | **GW-11145955-062718-OM-MW-2** | EPA 8260/OA1 | 533452 | | |
| **60273796003** | **GW-11145955-062718-OM-MW-3** | EPA 8260/OA1 | 533452 | | |

Pace Analytical
www.pacelabs.com

## Sample Condition Upon Receipt

WO# : 60273796

60273796

Client Name: GHD

**Courier:** FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

**Tracking #:** 7816 3632 7851 Pace Shipping Label Used? Yes ☐ No ☑

**Custody Seal on Cooler/Box Present:** Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

**Packing Material:** Bubble Wrap ☐ Bubble Bags ☑ Foam ☐ None ☐ Other ☐

**Thermometer Used:** T-296 **Type of Ice:** Wet Blue None

**Date and initials of person examining contents:** 10/29/18 JLS

**Cooler Temperature (°C):** **As-read** 1.4 **Corr. Factor** +1.3 **Corrected** 2.7

Temperature should be above freezing to 6°C

| | | |
|---|---|---|
| Chain of Custody present: | ☑Yes ☐No ☐N/A | |
| Chain of Custody relinquished: | ☑Yes ☐No ☐N/A | |
| Samples arrived within holding time: | ☑Yes ☐No ☐N/A | |
| **Short Hold Time analyses (<72hr):** | ☐Yes ☑No ☐N/A | |
| **Rush Turn Around Time requested:** | ☐Yes ☑No ☐N/A | |
| Sufficient volume: | ☑Yes ☐No ☐N/A | |
| Correct containers used: | ☑Yes ☐No ☐N/A | |
| Pace containers used: | ☑Yes ☐No ☐N/A | |
| Containers intact: | ☑Yes ☐No ☐N/A | |
| Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? | ☐Yes ☐No ☑N/A | |
| Filtered volume received for dissolved tests? | ☐Yes ☐No ☑N/A | |
| Sample labels match COC: Date / time / ID / analyses | ☑Yes ☐No ☐N/A | |
| Samples contain multiple phases? Matrix: WT | ☐Yes ☑No ☐N/A | |
| Containers requiring pH preservation in compliance? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) | ☐Yes ☐No ☑N/A | List sample IDs, volumes, lot #'s of preservative and the date/time added. |
| Cyanide water sample checks: Lead acetate strip turns dark? (Record only) | ☐Yes ☐No | |
| Potassium iodide test strip turns blue/purple? (Preserve) | ☐Yes ☐No | |
| Trip Blank present: | ☑Yes ☐No ☐N/A | |
| Headspace in VOA vials ( >6mm): | ☐Yes ☑No ☐N/A | |
| Samples from USDA Regulated Area: State: | ☐Yes ☐No ☑N/A | |
| Additional labels attached to 5035A / TX1005 vials in the field? | ☐Yes ☐No ☑N/A | |

**Client Notification/ Resolution:** Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Jami Check 7/2/18

Project Manager Review: Date:

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | GHD Services_COP NM | Report To: | Christine Mathews | Attention: | |
| Address: | 6212 Indian School Rd. NE St2 | Copy To: | | Company Name: | |
| | Albuquerque, NM 87110 | | | Address: | |
| Email: | christine.mathews@ghd.com | Purchase Order #: | | Pace Quote: | |
| Phone: | 505-884-0672 Fax: | Project Name: | 11145955 COP State Com J6 | Pace Project Manager: | Colleen.Clyne@pacelabs.com |
| Requested Due Date: | Standard TAT | Project #: | | Pace Profile #: | 8644, line 29 |

| Regulatory Agency | |
|---|---|
| State / Location | NM |

| ITEM # | SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique) | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED START DATE | COLLECTED START TIME | COLLECTED END DATE | COLLECTED END TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | H2SO4 | HNO3 | HCl | NaOH | Na2S2O3 | Methanol | Other | Analyses Test Y/N | 8260 BTEX | Residual Chlorine (Y/N) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GW-11145955-062718-CM-MW-1 | WT | G | 6/27/18 | 0950 | | | | 3 | | | | 3 | | | | | | X | | 3DA9H 001 |
| 2 | GW-11145955-062718-CM-MW-2 | WT | G | 6/27/18 | 1015 | | | | 3 | | | | 3 | | | | | | X | | 002 |
| 3 | GW-11145955-062718-CM-MW-3 | WT | G | 6/27/18 | 1000 | | | | 3 | | | | 3 | | | | | | X | | 003 |
| 4 | | | | | | | | | | | | | | | | | | | | | 2DA9HCTB) 004 |
| 5 | | | | | | | | | | | | | | | | | | | | | |
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Lab # 6273796

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [signature] GHD | 6/28/18 | 1600 | E Brockett / Pace | 6/29 | 0900 | 2.7 | Y | Y | Y |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| SAMPLER NAME AND SIGNATURE | | | | | |
|---|---|---|---|---|---|
| PRINT Name of SAMPLER: | Christine Mathews | | | | |
| SIGNATURE of SAMPLER: | [signature] | DATE Signed: | 6/28/18 | | |

| TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

September 20, 2018

Jeffrey Walker
GHD Services, Inc
6121 Indian School Rd NE
Ste 200
Albuquerque, NM 87110

RE: Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

Dear Jeffrey Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on September 08, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,
Christine Mathews, GHD Services, Inc.

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## CERTIFICATIONS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

**Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

**Pace Analytical Services, LLC**
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Lenexa, KS 66219
(913)599-5665

## SAMPLE SUMMARY

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60280035001** | **GW-11145955-090518-CN-MW-1** | Water | 09/05/18 17:45 | 09/08/18 08:30 |
| **60280035002** | **GW-11145955-090518-CN-MW-2** | Water | 09/05/18 17:35 | 09/08/18 08:30 |
| **60280035003** | **GW-11145955-090518-CN-MW-3** | Water | 09/05/18 18:00 | 09/08/18 08:30 |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## SAMPLE ANALYTE COUNT

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60280035001** | **GW-11145955-090518-CN-MW-1** | EPA 8260/OA1 | EAG | 8 | PASI-K |
| **60280035002** | **GW-11145955-090518-CN-MW-2** | EPA 8260/OA1 | EAG | 8 | PASI-K |
| **60280035003** | **GW-11145955-090518-CN-MW-3** | EPA 8260/OA1 | EAG | 8 | PASI-K |

**Pace Analytical Services, LLC**
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# PROJECT NARRATIVE

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

**Method:** **EPA 8260/OA1**
**Description:** 8260/OA1 UST, Water
**Client:** GHD Services_COP NM
**Date:** September 20, 2018

**General Information:**
3 samples were analyzed for EPA 8260/OA1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**
The samples were analyzed within the method required hold times with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**
All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**
All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**
All internal standards were within QC limits with any exceptions noted below.

**Surrogates:**
All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**
All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 545284

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

**Pace Analytical Services, LLC**
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(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

**Sample: GW-11145955-090518-CN-MW-1** **Lab ID: 60280035001** Collected: 09/05/18 17:45 Received: 09/08/18 08:30 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:29 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:29 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:29 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 09/19/18 13:29 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 100 | % | 80-120 | 1 | | 09/19/18 13:29 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 105 | % | 85-119 | 1 | | 09/19/18 13:29 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 103 | % | 80-117 | 1 | | 09/19/18 13:29 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 09/19/18 13:29 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

**Sample: GW-11145955-090518-CN-MW-2** **Lab ID: 60280035002** Collected: 09/05/18 17:35 Received: 09/08/18 08:30 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:43 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:43 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:43 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 09/19/18 13:43 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 92 | % | 80-120 | 1 | | 09/19/18 13:43 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 100 | % | 85-119 | 1 | | 09/19/18 13:43 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 105 | % | 80-117 | 1 | | 09/19/18 13:43 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 09/19/18 13:43 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## ANALYTICAL RESULTS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

**Sample: GW-11145955-090518-CN-MW-3** **Lab ID: 60280035003** Collected: 09/05/18 18:00 Received: 09/08/18 08:30 Matrix: Water

| Parameters | Results | Units | Report Limit | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|
| **8260/OA1 UST, Water** | Analytical Method: EPA 8260/OA1 | | | | | | | |
| Benzene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:57 | 71-43-2 | |
| Toluene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:57 | 108-88-3 | |
| Ethylbenzene | ND | ug/L | 1.0 | 1 | | 09/19/18 13:57 | 100-41-4 | |
| Xylene (Total) | ND | ug/L | 3.0 | 1 | | 09/19/18 13:57 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | |
| Toluene-d8 (S) | 99 | % | 80-120 | 1 | | 09/19/18 13:57 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 101 | % | 85-119 | 1 | | 09/19/18 13:57 | 460-00-4 | |
| 1,2-Dichloroethane-d4 (S) | 102 | % | 80-117 | 1 | | 09/19/18 13:57 | 17060-07-0 | |
| Preservation pH | **1.0** | | 0.10 | 1 | | 09/19/18 13:57 | | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

QC Batch: 545284 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60280035001, 60280035002, 60280035003

METHOD BLANK: 2234443 Matrix: Water
Associated Lab Samples: 60280035001, 60280035002, 60280035003

| Parameter | Units | Blank Result | Reporting Limit | Analyzed | Qualifiers |
|---|---|---|---|---|---|
| Benzene | ug/L | ND | 1.0 | 09/19/18 13:15 | |
| Ethylbenzene | ug/L | ND | 1.0 | 09/19/18 13:15 | |
| Toluene | ug/L | ND | 1.0 | 09/19/18 13:15 | |
| Xylene (Total) | ug/L | ND | 3.0 | 09/19/18 13:15 | |
| 1,2-Dichloroethane-d4 (S) | % | 103 | 80-117 | 09/19/18 13:15 | |
| 4-Bromofluorobenzene (S) | % | 104 | 85-119 | 09/19/18 13:15 | |
| Toluene-d8 (S) | % | 104 | 80-120 | 09/19/18 13:15 | |

LABORATORY CONTROL SAMPLE: 2234444

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | ug/L | 20 | 17.7 | 89 | 81-118 | |
| Ethylbenzene | ug/L | 20 | 17.8 | 89 | 80-118 | |
| Toluene | ug/L | 20 | 18.9 | 95 | 82-118 | |
| Xylene (Total) | ug/L | 60 | 54.8 | 91 | 81-120 | |
| 1,2-Dichloroethane-d4 (S) | % | | | 97 | 80-117 | |
| 4-Bromofluorobenzene (S) | % | | | 99 | 85-119 | |
| Toluene-d8 (S) | % | | | 100 | 80-120 | |

**Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.**

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

# QUALIFIERS

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## LABORATORIES

PASI-K Pace Analytical Services - Kansas City

## BATCH QUALIFIERS

Batch: 545284

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

**Pace Analytical Services, LLC**
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11145955 COP STATE COM J6
Pace Project No.: 60280035

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60280035001** | **GW-11145955-090518-CN-MW-1** | EPA 8260/OA1 | 545284 | | |
| **60280035002** | **GW-11145955-090518-CN-MW-2** | EPA 8260/OA1 | 545284 | | |
| **60280035003** | **GW-11145955-090518-CN-MW-3** | EPA 8260/OA1 | 545284 | | |

Pace Analytical
www.pacelabs.com

## Sample Condition Upon Receipt

JLS

WO# : 60280035

60280035

Client Name: GHD Services

**Courier:** FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

**Tracking #:** 782680038717 Pace Shipping Label Used? Yes ☐ No ☒

**Custody Seal on Cooler/Box Present:** Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

**Packing Material:** Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other ☐

**Thermometer Used:** T.700 **Type of Ice:** (Wet) Blue None

**Cooler Temperature (°C):** **As-read** 1.8 **Corr. Factor** +0.2 **Corrected** 2.0

**Date and initials of person examining contents:** 9/8/18 HE

Temperature should be above freezing to 6°C

| | | |
|---|---|---|
| Chain of Custody present: | ☒Yes ☐No ☐N/A | |
| Chain of Custody relinquished: | ☒Yes ☐No ☐N/A | |
| Samples arrived within holding time: | ☒Yes ☐No ☐N/A | |
| **Short Hold Time analyses (<72hr):** | ☐Yes ☒No ☐N/A | |
| **Rush Turn Around Time requested:** | ☐Yes ☒No ☐N/A | |
| Sufficient volume: | ☒Yes ☐No ☐N/A | |
| Correct containers used: | ☒Yes ☐No ☐N/A | |
| Pace containers used: | ☒Yes ☐No ☐N/A | |
| Containers intact: | ☒Yes ☐No ☐N/A | |
| Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? | ☐Yes ☐No ☒N/A | |
| Filtered volume received for dissolved tests? | ☐Yes ☐No ☒N/A | |
| Sample labels match COC: Date / time / ID / analyses | ☒Yes ☐No ☐N/A | |
| Samples contain multiple phases? Matrix: WT | ☐Yes ☒No ☐N/A | |
| Containers requiring pH preservation in compliance? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) | ☐Yes ☐No ☒N/A | List sample IDs, volumes, lot #'s of preservative and the date/time added. |
| Cyanide water sample checks: Lead acetate strip turns dark? (Record only) | ☐Yes ☐No | |
| Potassium iodide test strip turns blue/purple? (Preserve) | ☐Yes ☐No | |
| Trip Blank present: | ☐Yes ☒No ☐N/A | |
| Headspace in VOA vials ( >6mm): | ☐Yes ☒No ☐N/A | |
| Samples from USDA Regulated Area: State: | ☐Yes ☐No ☒N/A | |
| Additional labels attached to 5035A / TX1005 vials in the field? | ☐Yes ☐No ☒N/A | |

**Client Notification/ Resolution:** Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jann Church 9/10/18

Project Manager Review: _____ Date: _____

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | GHD Services_COP NM | Report To: | Christine Mathews | Attention: | |
| Address: | 6212 Indian School Rd. NE St2 | Copy To: | | Company Name: | |
| Albuquerque, NM 87110 | | | | Address: | |
| Email: | christine.mathews@ghd.com | Purchase Order #: | | Pace Quote: | |
| Phone: | 505-884-0672 Fax: | Project Name: | 11145955 COP State Com J6 | Pace Project Manager: | Colleen.Clyne@pacelabs.com |
| Requested Due Date: | | Project #: | | Pace Profile #: | 8644, line 29 |

| Regulatory Agency | |
|---|---|
| | |
| State / Location | |
| NM | |

| ITEM # | SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique) | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED START DATE | COLLECTED START TIME | COLLECTED END DATE | COLLECTED END TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | H2SO4 | HNO3 | HCl | NaOH | Na2S2O3 | Methanol | Other | Analyses Test Y/N | 8260 BTEX | Residual Chlorine (Y/N) | 60280035 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GW-11145955-COP-090518-CN-MW-1 | | G | 9-5-18 | 1745 | | | | 3 | | | | ↓ | | | | | ✓ | 3D69H | | 001 |
| 2 | GW-11145955-090518-CN-MW-2 | | G | ↓ | 1735 | | | | ↓ | | | | | | | | | ✓ | ↓ | | 002 |
| 3 | GW-11145955-090518-CN-MW-3 | | G | ↓ | 1900 | | | | ↓ | | | | | | | | | ✓ | ↓ | | 003 |
| 4 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
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| 12 | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Chas Nelig | 9-7-18 | 1300 | Weight Basi | 9/8/18 | 0830 | 20 | Y | Y | Y |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Charles Nelig

SIGNATURE of SAMPLER: Chas Nelig DATE Signed: 9-7-18

| TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|
| | | | |

Pace Analytical®
National Center for Testing & Innovation

# ANALYTICAL REPORT

December 28, 2018

## HilCorp-Farmington, NM

| | |
|---|---|
| Sample Delivery Group: | L1055125 |
| Samples Received: | 12/20/2018 |
| Project Number: | |
| Description: | State Com J6 |
| Site: | STATE COM J #6 |
| Report To: | Kurt Hoekstra and Jennifer Deal<br>382 Road 3100<br>Aztec, NM 87401 |

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Project Manager



# TABLE OF CONTENTS

## MW1 L1055125-01 GW

Collected by: Kurt
Collected date/time: 12/18/18 15:05
Received date/time: 12/20/18 08:30

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1214892 | 1 | 12/22/18 09:09 | 12/22/18 09:09 | TJJ |

## MW2 L1055125-02 GW

Collected by: Kurt
Collected date/time: 12/18/18 14:20
Received date/time: 12/20/18 08:30

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1214892 | 1 | 12/22/18 09:29 | 12/22/18 09:29 | TJJ |

## MW3 L1055125-03 GW

Collected by: Kurt
Collected date/time: 12/18/18 13:15
Received date/time: 12/20/18 08:30

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst |
|---|---|---|---|---|---|
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1214892 | 1 | 12/22/18 09:49 | 12/22/18 09:49 | TJJ |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Project Manager

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Benzene | ND | | 0.00100 | 1 | 12/22/2018 09:09 | WG1214892 |
| Toluene | ND | | 0.00100 | 1 | 12/22/2018 09:09 | WG1214892 |
| Ethylbenzene | ND | | 0.00100 | 1 | 12/22/2018 09:09 | WG1214892 |
| Total Xylenes | ND | | 0.00300 | 1 | 12/22/2018 09:09 | WG1214892 |
| *(S) Toluene-d8* | *110* | | *80.0-120* | | *12/22/2018 09:09* | WG1214892 |
| *(S) Dibromofluoromethane* | *91.0* | | *75.0-120* | | *12/22/2018 09:09* | WG1214892 |
| *(S) a,a,a-Trifluorotoluene* | *104* | | *80.0-120* | | *12/22/2018 09:09* | WG1214892 |
| *(S) 4-Bromofluorobenzene* | *100* | | *77.0-126* | | *12/22/2018 09:09* | WG1214892 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result | Qualifier | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|
| | mg/l | | mg/l | | date / time | |
| Benzene | ND | | 0.00100 | 1 | 12/22/2018 09:29 | WG1214892 |
| Toluene | ND | | 0.00100 | 1 | 12/22/2018 09:29 | WG1214892 |
| Ethylbenzene | ND | | 0.00100 | 1 | 12/22/2018 09:29 | WG1214892 |
| Total Xylenes | ND | | 0.00300 | 1 | 12/22/2018 09:29 | WG1214892 |
| *(S) Toluene-d8* | *110* | | *80.0-120* | | *12/22/2018 09:29* | WG1214892 |
| *(S) Dibromofluoromethane* | *89.3* | | *75.0-120* | | *12/22/2018 09:29* | WG1214892 |
| *(S) a,a,a-Trifluorotoluene* | *100* | | *80.0-120* | | *12/22/2018 09:29* | WG1214892 |
| *(S) 4-Bromofluorobenzene* | *101* | | *77.0-126* | | *12/22/2018 09:29* | WG1214892 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Benzene | ND | | 0.00100 | 1 | 12/22/2018 09:49 | WG1214892 |
| Toluene | ND | | 0.00100 | 1 | 12/22/2018 09:49 | WG1214892 |
| Ethylbenzene | ND | | 0.00100 | 1 | 12/22/2018 09:49 | WG1214892 |
| Total Xylenes | ND | | 0.00300 | 1 | 12/22/2018 09:49 | WG1214892 |
| *(S) Toluene-d8* | *107* | | *80.0-120* | | *12/22/2018 09:49* | WG1214892 |
| *(S) Dibromofluoromethane* | *89.7* | | *75.0-120* | | *12/22/2018 09:49* | WG1214892 |
| *(S) a,a,a-Trifluorotoluene* | *103* | | *80.0-120* | | *12/22/2018 09:49* | WG1214892 |
| *(S) 4-Bromofluorobenzene* | *104* | | *77.0-126* | | *12/22/2018 09:49* | WG1214892 |

## Method Blank (MB)

(MB) R3371162-3 12/22/18 05:16

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Benzene | U | | 0.000331 | 0.00100 |
| Ethylbenzene | U | | 0.000384 | 0.00100 |
| Toluene | U | | 0.000412 | 0.00100 |
| Xylenes, Total | U | | 0.00106 | 0.00300 |
| *(S) Toluene-d8* | *112* | | | *80.0-120* |
| *(S) Dibromofluoromethane* | *89.4* | | | *75.0-120* |
| *(S) a,a,a-Trifluorotoluene* | *103* | | | *80.0-120* |
| *(S) 4-Bromofluorobenzene* | *101* | | | *77.0-126* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3371162-1 12/22/18 04:16 • (LCSD) R3371162-2 12/22/18 04:36

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCSD Result mg/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0224 | 0.0218 | 89.4 | 87.0 | 70.0-123 | | | 2.76 | 20 |
| Ethylbenzene | 0.0250 | 0.0239 | 0.0245 | 95.6 | 97.9 | 79.0-123 | | | 2.36 | 20 |
| Toluene | 0.0250 | 0.0248 | 0.0250 | 99.1 | 99.8 | 79.0-120 | | | 0.730 | 20 |
| Xylenes, Total | 0.0750 | 0.0751 | 0.0767 | 100 | 102 | 79.0-123 | | | 2.11 | 20 |
| *(S) Toluene-d8* | | | | *104* | *107* | *80.0-120* | | | | |
| *(S) Dibromofluoromethane* | | | | *91.6* | *90.4* | *75.0-120* | | | | |
| *(S) a,a,a-Trifluorotoluene* | | | | *103* | *103* | *80.0-120* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *95.9* | *94.2* | *77.0-126* | | | | |

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| ND | Not detected at the Reporting Limit (or MDL where applicable). |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| | The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG. |

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN-03-2002-34 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | n/a |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO00356 |
| Kentucky [1 6] | 90010 | South Carolina | 84004 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana [1] | LA180010 | Texas | T 104704245-17-14 |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN00003 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 460132 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |

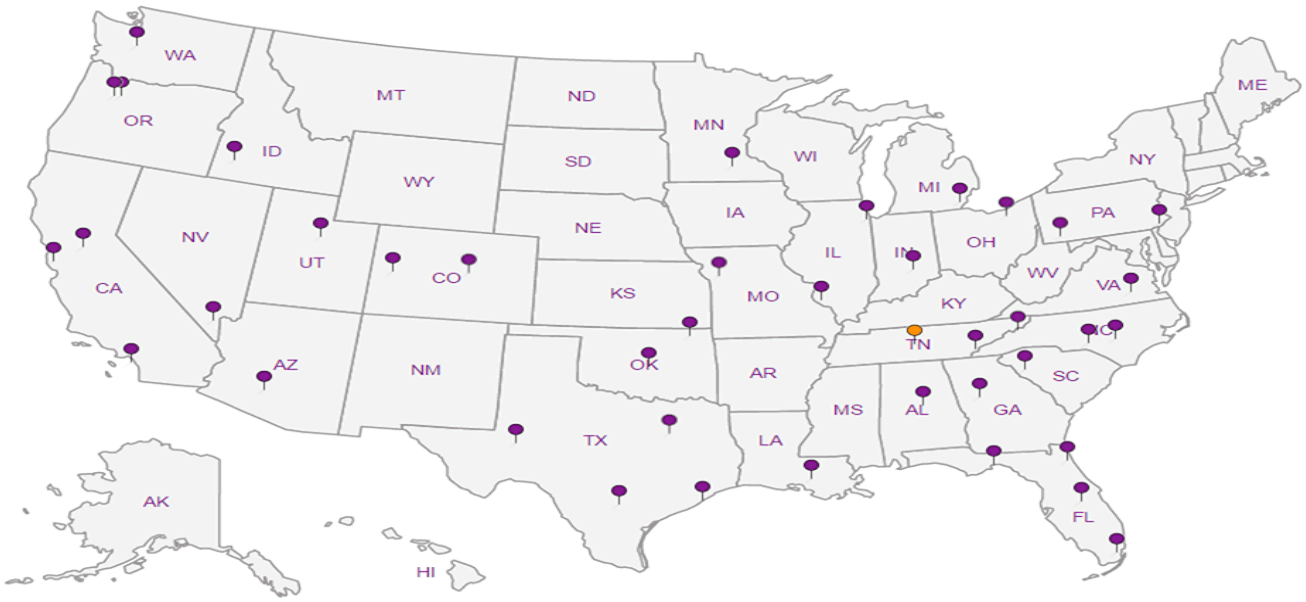
## Third Party Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



**HilCorp-Farmington, NM**

382 Road 3100
Aztec, NM 87401

Billing Information:

PO Box 61529
Houston, TX 77208

Report to: Kurt Hoekstra

Email To: khoekstra@hilcorp.com ccardoza@hilcorp.com

Project Description:

City/State Collected:

Phone: 505-486-9543
Fax:

Client Project #

Lab Project # HILCORANM-HOEKSTRA

Collected by (print): KURT

Site/Facility ID # STATE COM J # 6

P.O. #

Collected by (signature): Kurt Hoekstra

Immediately Packed on Ice N ___ Y X

*Rush?* (Lab MUST Be Notified)
___ Same Day X Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | V8260BTEX 40mlAmb-HCl | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|
| MW1 | | GW | 9.97 | 12-18 | 3:05 | 3 | X | | 01 |
| MW2 | | GW | 9.59 | 12-18 | 2:20 | 3 | X | | 02 |
| MW3 | | GW | 9.51 | 12-18 | 1:15 | 3 | X | | 03 |
| | | GW | | | | 3 | X | | |

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1055125

H205

Acctnum: HILCORANM

Template: T142966

Prelogin: P680923

TSR: 288 - Daphne Richards

PB: 11-14-18

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 4529300517 03

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

RAD SCREEN: <0.5 mR/hr

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
|---|---|---|---|
| Kurt Hoekstra | 12-19-18 | 6:40 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by (Signature) |

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: °C Bottles Received: 0.3 to 0.4=0.7 8

Date: 12/20/18 Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)