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2014

04 / 16 / 2015

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ConocoPhillips

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

April 16, 2015

Re: API No.30-045-10070, 2014 Annual Groundwater Monitoring Report

Dear Mr. von Gonten:

Enclosed is the 2014 Annual Groundwater Monitoring Report for the State Com J6 site. This report, prepared by Conestoga-Rovers & Associates (CRA), contains the results of the annual groundwater monitoring and mobile dual phase extraction events conducted during 2014 at the referenced site.

Please let me know if you have any questions.

Sincerely,

Rick Greiner

Enc

CONESTOGA-ROVERS & ASSOCIATES

www.CRAworld.com

Report

2014 Groundwater Monitoring and Remediation Report

STATE COM J6
AZTEC, NM
API No. 30-045-10070

Prepared for: ConocoPhillips Company

Conestoga-Rovers & Associates
6121 Indian School Road, NE Suite 200
Albuquerque, New Mexico 87110

February 2015 • 081773 • Report No. 2

Partners in Sustainability

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Section 1.0 Introduction

Groundwater investigation and remediation activities were performed at the ConocoPhillips Company (COP) State Com J6 site in 2014 to address impacts from a pipeline release in the spring of 2013. The project area consists of the release site from the pipeline in a large wash between the State Com J6 natural gas wellhead and the State Com J6 Compressor site. Four groundwater recovery wells and one monitoring well were installed followed by three consecutive groundwater recovery events in May 2014. Mobile dual-phase extraction (MDPE) events were conducted in August 2014 and again in November 2014. Groundwater monitoring events were conducted after the groundwater recovery events in May 2014, and after both MDPE events, in September and December 2014, respectively. These activities are discussed in detail below. The State Com J6 site (hereafter referred to as the "Site"), is located in an area known as Pump Canyon on land controlled by the New Mexico State Land Office within Section 36, Township 31 North, Range 9 West San Juan County, New Mexico (see **Figure 1**).

Conestoga-Rovers and Associates (CRA) on behalf of COP performed project management, general oversight of the investigation and remediation activities, soil and groundwater sampling, and documentation of the field work. Drilling and monitoring well installation was performed by National Exploration, Wells, and Pumps (National EWP) of Peralta, New Mexico. Initial groundwater extraction of the recovery wells and soil and groundwater waste disposal was performed by Industrial Ecosystems Incorporated (IEI) of Aztec, New Mexico. Mobile dual-phase extraction (MDPE) was performed by AcuVac of Houston, Texas. The agreed upon scope of services included:

- Obtaining site specific training, permits, and involving appropriate stakeholders needed to complete the scope of work;
- Installing four recovery wells to remediate dissolved phase hydrocarbon impacted groundwater and free product, or phase-separated hydrocarbons (PSH) and one monitoring well to assess the down-gradient extent of hydrocarbons in the groundwater
- Overseeing three separate remediation events to effect mass removal of residual hydrocarbons in soil and groundwater.

Section 2.0 Site History

CRA conducted soil and groundwater assessment at the Site in July 2013 after impacted soils were removed in response to the March 2013 release of produced water and natural gas condensate from a pipeline. After the release, COP removed 275 cubic yards of soil in an attempt to assess the extent of impacted soils.

In addition, 60 barrels of hydrocarbon-impacted water were removed by COP from the excavation and disposed of offsite. Depth to groundwater during excavation was noted as 5 feet below ground surface (ft bgs).

In July 2013, CRA conducted additional assessment activities to further assess the extent of soil contamination. Hand-auger boreholes were advanced in the wash in the area of the March 2013 release. Field headspace readings were collected using a photoionization detector and confirmation laboratory samples were submitted for analysis of total petroleum hydrocarbons (TPH). Groundwater was encountered at 5 ft bgs in hand auger borings. Four inches of PSH above the groundwater were measured in one boring placed near the center of the wash.

Four groundwater recovery wells were recommend for installation due to the presence of PSH on top of the shallow groundwater. One down-gradient monitoring well was also recommended to monitor down-gradient groundwater quality **(Figure 2)**.

Section 3.0 Recovery Well and Groundwater Monitoring Well Installation

Four 4-inch diameter PVC recovery wells were installed in May 2014 to depths of 13.5 ft bgs and were completed with 10 feet of slotted screen straddling the water table. The recovery wells were installed with a 10/20 silica sand pack surrounding the screened section with a hydrated bentonite plug above the sand pack. The well casing was completed with 3 ft above grade and encased in a 6 inch diameter steel shroud with locking well cap set in a 3 ft by 3 ft by 4 inch thick concrete pad. The two recovery wells completed next to the well traveled access road (RW-3 and RW-4) are protected by concrete-filled steel bollards. The down-gradient 2-inch diameter PVC groundwater monitoring well was installed approximately 95 feet down-gradient from the recovery wells (**see Figure 2**). This well was completed with 10/20 silica sand pack surrounding the screened section with a hydrated bentonite plug above the sand pack. One foot of bentonite grout was placed in the wells from the top of the bentonite plug to the surface. The well casing was completed 3 ft above grade and encased in a 4 inch diameter steel shroud with locking well cap set in a 3 ft by 3 ft by 4 inch thick concrete pad. All wells were developed by National EWP using a decontaminated stainless steel bailer. Approximately 25 to 30 gallons were removed from each well until turbidity decreased.

3.1 Soil Types

The soils consisted primarily of brown, medium to fine-grained, brown silty-sand. The sands were observed to be non-cemented and contained varying concentrations of poorly-graded sands, silts and clays. Strong petroleum odors were observed in soil samples from all recovery well borings with saturated conditions at 4 ft bgs. PSH was observed in the RW-4 boring. Soils logged from the down-gradient MW-1 boring did not exhibit any petroleum odor. Boring logs from recovery and monitoring well installation activities are presented as **Appendix A**.

Section 4.0 Groundwater and PSH Remediation

Three vacuum extraction events were conducted to remove groundwater and PSH from the four recovery wells and two MDPE events were performed to effect mass removal of petroleum hydrocarbons in the Site groundwater and near surface soils.

4.1 Groundwater Vacuum Extraction – May 2014

Groundwater/PSH extraction events using a vacuum truck were conducted on May 13, 20 and 27, 2014, and recovered approximately 2000 gallons of total fluids during each event. The four recovery wells were pumped individually with a vacuum of approximately 20 inches of water for about 10 to 20 minutes each until approximately 2000 gallons total fluids were collected. Wells recovered to within 97% of their original static groundwater elevation within 30 minutes of being pumped. The exact volume of PSH recovered during each event was not measurable, but is estimated at 15 to 20 gallons. The total fluids extraction mobilized PSH in the subsurface, especially at RW-1 where the PSH thickness was measured at 0.84 ft prior to initiation of the second vacuum truck recovery event. PSH was measured at less than 0.01 ft prior to starting the vacuum extraction events. A PSH thickness of 0.76 ft was measured in RW-1 prior to the third event on May 27, 2014.

4.2 MDPE Event 1– August 2014

CRA's MDPE subcontractor, AccuVac Remediation, LLC (AccuVac) conducted three 8-hour MDPE events at the Site August 25, 26 and 27, 2014. The 4-inch diameter recovery well MW-4 was initially selected as the extraction well for the MDPE process. The objectives of the MDPE event were to:

- Evaluate the potential for removing liquid and vapor phase PSH from the groundwater and soils in the subsurface.
- Expose the capillary fringe area and below to the extraction well induced vacuums.
- Increase the groundwater and contaminant specific yields with high induced vacuums.

- Provide an induced hydraulic gradient to gain hydraulic control of the area during the event period.
- Select the groundwater depression and pump rates to accomplish the above objectives.

The MDPE event mobilized PSH into the vicinity of the recovery wells, increasing thicknesses of PSH measured in the wells over the course of the 3-day event. Hydrocarbon vapors diminished after two days using RW-4 as the extraction well and thus RW-3 was used for extraction on day 3 of the event. Mass removal for MDPE Event 1 is summarized in **Table 1** below:

Table 1 – MDPE Event 1 – August 25-27, 2014			
Date/Extraction Well	RW-4 – 8/25/14	RW-4 – 8/26/14	RW-3 – 8/27/14
Total Liquid Recovered (gal)	2,320	600	2,118
% PSH	6.56	3.5	2.51
PSH gallons	152.27	21	53.16
Vapor PSH (gal. equiv.)	11.39	1.69	2.47
Total PSH (gal)	**163.66**	**22.69**	**55.63**

Total recovered hydrocarbons for the MDPE Event 1 were 241.98 gallons

4.3 MDPE Event 2– November 2014

CRA and MDPE subcontractor AccuVac again mobilized to the site to conduct three 8-hour MDPE events on November 10, 11 and 14, 2014. AccuVac alternated between RW-3 and RW-4 as the extraction wells, similar to MDPE Event 1. Mass removal for MDPE Event 2 is summarized in **Table 2** below.

Table 2 – MDPE Event 2 – November 10, 11 and 14, 2014			
Date/Extraction Well	RW-4 –11/10/14	RW-3 – 11/11/14	RW-4 – 11/14/14
Total Liquid Recovered (gal)	2,471	2,688	1,200
% PSH	4.14	2.14	1.81
PSH gallons	102.33	57.63	21.75
Vapor PSH (gal. equiv.)	1.70	1.52	0.84
Total PSH (gal)	**104.03**	**59.15**	**22.59**

Total recovered hydrocarbons for the MDPE Event 2 were 185.77 gallons. The AccuVac Event 1 and Event 2 reports are presented in **Appendix B**.

Section 5.0 Groundwater Monitoring and Sampling

The monitor and recovery wells were gauged and sampled after installation on May 12, 2014 prior to beginning the groundwater/PSH vacuum truck recovery events, and in August and November after MDPE Events 1 and 2, respectively. A thin layer of PSH was measured in recovery wells RW-2 and RW-4 when gauged in May 2014 and therefore were not sampled for dissolved-phase organic compounds. After MDPE events, all recovery wells contained PSH and the downgradient well MW-1 was the only well sampled in August and November 2014. Groundwater elevations are detailed in **Table 3**.

A groundwater potentiometric surface map was created using the December 2014 gauging data. Groundwater elevations for the recovery wells were corrected for the presence of PSH. However, the potentiometric surface map generated using recovery well data, corrected for PSH, and monitoring well data (MW-1), provided anomalous results and so only the recovery well data was used in generation of the potentiometric surface map presented as **Figure 3**. Groundwater flow is thus shown to be to the southwest. A more accurate representation of groundwater flow at the Site will be possible once additional groundwater monitoring wells are installed cross and down-gradient (see Section 5 below).

5.1 Groundwater Monitoring Methodology

Prior to collection of groundwater samples, depth to groundwater in each well was measured using an oil/water interface probe (see **Table 2**). During groundwater monitoring events, Site monitoring and recovery wells with no measurable PSH were purged of at least three casing volumes of groundwater using a 1.5-inch diameter, polyethylene, dedicated bailer. While purging each well, groundwater parameters were recorded using a YSI 556 multi-parameter meter.

Groundwater samples were placed in laboratory-supplied containers, labeled, placed on ice, and transported via overnight delivery under chain of custody documentation. Groundwater samples were sent to Pace Analytical Services, Inc., for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA method 8260, and for semi-volatile compounds by EPA Method 8270. A summary of analytical results is presented as **Table 4**. The full analytical laboratory reports are presented in **Appendix C**.

5.2 Groundwater Monitoring Analytical Results

The New Mexico Water Quality Control Commission (NMWQCC) mandates that groundwater quality in New Mexico be protected, and has issued groundwater quality standards in Title 20, Chapter 6, Part 2, Section 3103 of the New Mexico Administrative Code (20.6.2.3103 NMAC).

The RW-1 and RW-3 groundwater samples collected in May 2014 after their installation and before groundwater/PSH remediation events contained naphthalene, benzene, toluene etheylbenzene (RW-1 only) and xylenes at concentrations above the New Mexico Water Quality Control Commission (NMWQCC) standards for these constituents. The groundwater sample collected from monitor well MW-1 contained benzene at a concentration above the NMWQCC standard for all events. Results of the groundwater monitoring event are discussed below:

May 2014

- BTEX: The NMWQCC groundwater standards for benzene, toluene, ethylbenzene, and xylenes are 0.01 milligrams per liter (mg/L), 0.75 mg/L, 0.75 mg/L, and 0.62 mg/L, respectively. In May 2014, groundwater of recovery wells RW-1 and RW-3 returned analytical results that were above NMWQCC groundwater standards for nearly all BTEX constituents. Groundwater of monitoring well MW-1 had a benzene concentration of 0.013 mg/L, above the NMWQCC standard.
- Naphthalene: The NMWQCC groundwater standard for naphthalene is 0.030 mg/L. In May 2014, The concentration of naphthalene in the groundwater samples collected from groundwater of recovery wells RW-1 and RW-3 were 0.109 mg/L and 0.060 mg/L, respectively.

September 2014

- BTEX: In September 2014, all recovery wells had a measureable thickness of PSH and therefore were not sampled for dissolved-phase constituents. Groundwater of monitoring well MW-1 had a benzene concentration of 0.010 mg/L, above the NMWQCC standard.

December 2014

- BTEX: In December 2014, all recovery wells again had a measureable thickness of PSH and therefore were not sampled for dissolved-phase constituents. Groundwater of monitoring well MW-1 had a benzene concentration of 0.025 mg/L, above the NMWQCC standard.

Section 6.0 Conclusion and Recommendations

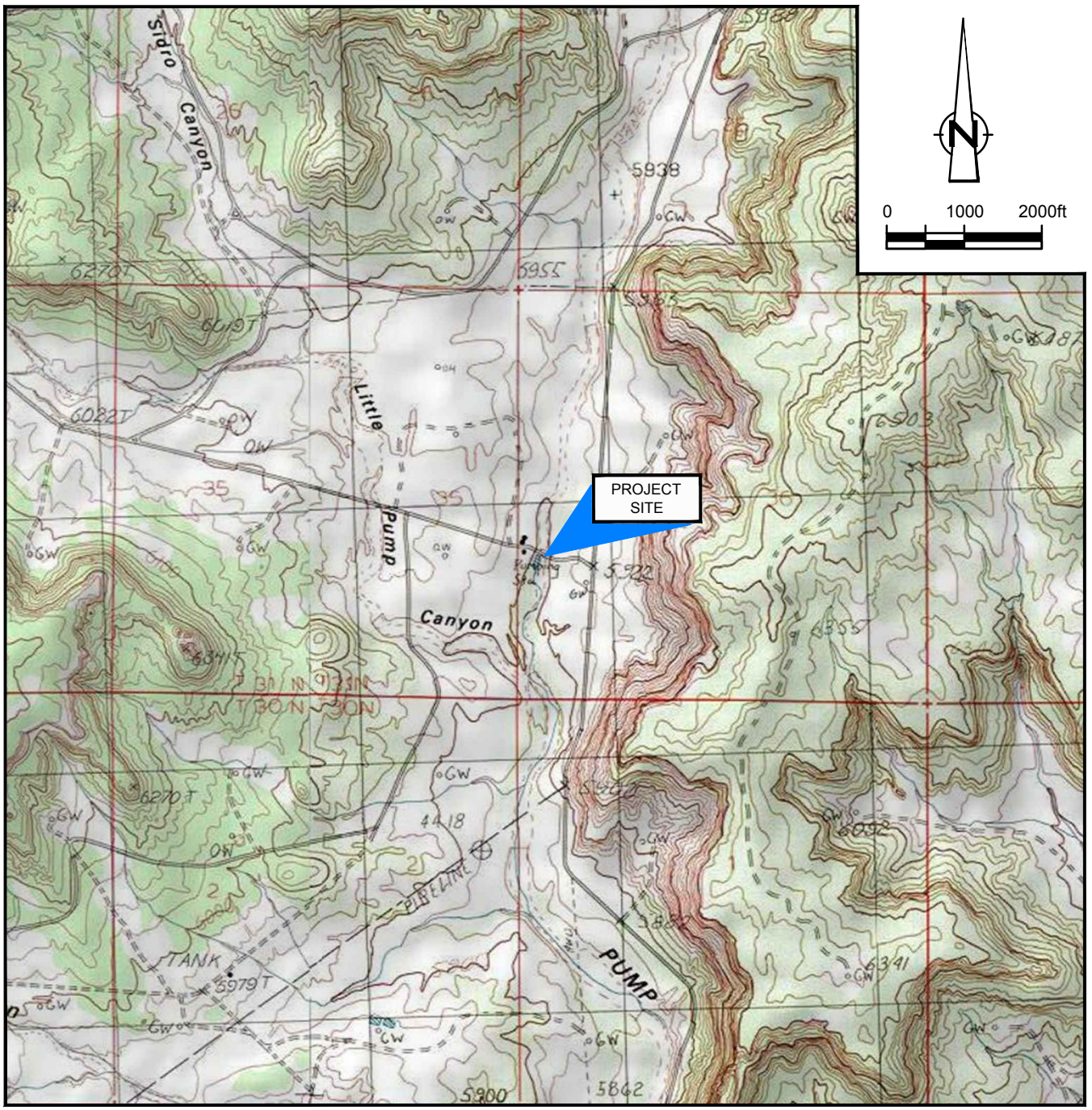
A measurable thickness of PSH remains in Site recovery wells RW-1, RW-2, RW-3 and RW-4. The presence of PSH in the shallow groundwater of the Site will continue to contribute to dissolved-phase hydrocarbon impacts on site and down-gradient, as evident in monitoring well MW-1.

Mass removal of PSH and hydrocarbon vapors via MDPE has proven very effective. CRA recommends the continuation of this remedial method to remove as much of the released product as possible to prevent further migration of the resulting dissolved-phase plume.

CRA met with the New Mexico Oil Conservation Division (NMOCD) and COP on October 30, 2014 and the NMOCD to discuss Site status and path forward. The NMOCD agreed that MDPE was an effect remedial option for removal of PSH and at that time provided approval for the November MDPE event (MDPE Event 2– November 2014). NMOCD in that meeting have also required additional groundwater quality assessment at the Site and have requested one monitoring well be placed further down-gradient from MW-1 and one monitoring well to the west of the recovery wells. CRA recommends the installation of these wells.

Please feel free to contact the CRA Albuquerque office if there are any questions or additional information is required.

Figures



SOURCE: USGS 7.5 MINUTE QUAD
"ARCHULETA, NEW MEXICO"

LAT/LONG: 36.8524° NORTH, 107.7401° WEST
COORDINATE: NAD83 DATUM, U.S. FOOT
STATE PLANE ZONE - NEW MEXICO WEST

Figure 1

SITE LOCATION MAP
STATE COM J6
NW 1/4 / SW 1/4 OF SEC. 36, T31N, R9W
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

SOURCE: © 2015 - TerraServer®

LEGEND
Recovery Well Location
Monitoring Well Location
Proposed Monitoring Well

Figure 2

LNAPL RECOVERY WELL AND GROUNDWATER MONITOR WELL LCOATION MAP
STATE COM J6
NW 1/4 / SW 1/4 OF SEC. 36, T31N, R9W
SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

081773-00(001)GN-DL001 JAN 21/2015

SOURCE: © 2015 - TerraServer®

Figure 3

GROUNDWATER POTENTIOMETRIC SURFACE MAP - DECEMBER 2014
STATE COM J6
SECTION 36, T31N, R9W, SAN JUAN COUNTY, NEW MEXICO
ConocoPhillips Company

081773-00(001)GN-DL001 FEB 25/2015

Tables

Table 3

Monitor Well Specifications and Groundwater Elevations
ConocoPhillips Company
State Com J6
San Juan County

Well	*TOC Elevation (ft)*	*Sample Date*	*Depth to PSH (ft)*	*Depth to Water (ft)*	*PSH Thickness (ft)*	*GW Elevation (ft)*
MW-1	100	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
			--		--	
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	92.40
		12/17/2014	8.33	8.72	0.39	91.87
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
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

Table 3

Monitor Well Specifications and Groundwater Elevations
ConocoPhillips Company
State Com J6
San Juan County

Well	*TOC Elevation (ft)*	*Sample Date*	*Depth to PSH (ft)*	*Depth to Water (ft)*	*PSH Thickness (ft)*	*GW Elevation (ft)*
RW-4	99.67	5/12/2014	7.29	7.30	0.01	92.38
		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

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

Table 4
Groundwater Analytical Summary
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)*	*Naphthalene (mg/L)*
MW-1	GW-081773-051214-MW-1	5/12/2014	**0.013**	0.030	0.015	0.228	0.002
	GW-081773-092314-CBMW-1	9/23/2014	**0.010**	<0.001	0.003	0.023	<0.0005
	GW-081773-121714-JW-MW-1	12/17/20104	**0.025**	<0.001	0.012	0.049	0.001
RW-1	GW-081773-051214-RW-1	5/12/2014	**1.880**	**6.270**	**0.567**	**8.960**	**0.109**
RW-2		Not sampled due to presense of PSH					
RW-3	GW-081773-051214-RW-3	5/12/2014	**0.416**	**0.889**	0.153	**4.580**	**0.060**
RW-4		Not sampled due to presense of PSH					
NMWQCC Groundwater Quality Standards			**0.01**	**0.75**	**0.75**	**0.62**	**0.03**

Notes:

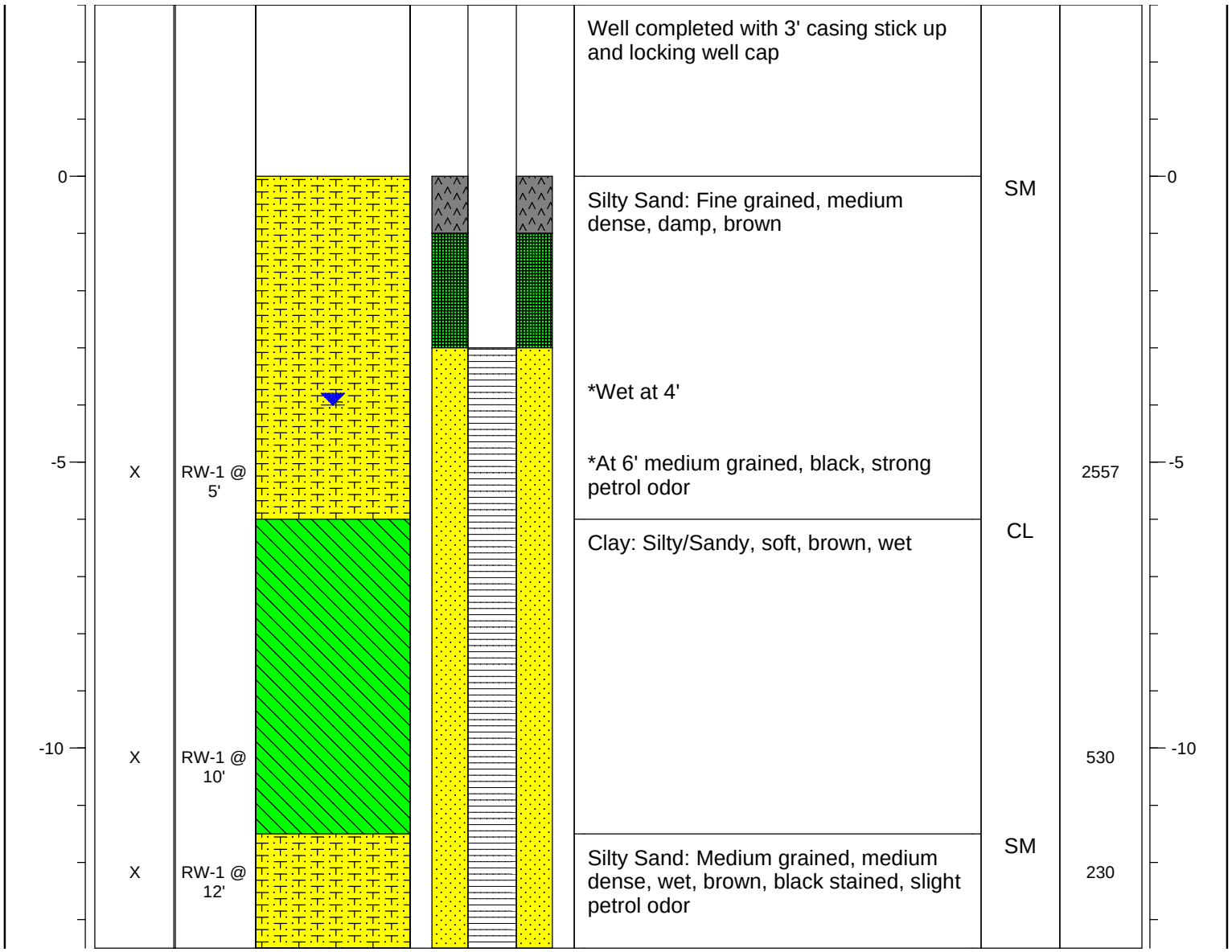
NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
< 0.001 = Below Laboratory Detection Limit of 0.001 mg/L

Appendix A

Boring Logs

PROJECT NAME: State Com J6
LOCATION: Pump Canyon
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): N/A
GROUNDWATER ELEVATION: 4' bgs
REMARKS: 4" diameter well
COORDINATES: N 36° 51.151', W 107° 44.408'

SOIL BORING NO: RW-1
DRILL TYPE: Hollow Stem Auger
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: National EWP
DATE/TIME HOLE STARTED: May 08, 2014 at 0830
DATE/TIME HOLE COMPLETED: May 08, 2014 at 1100



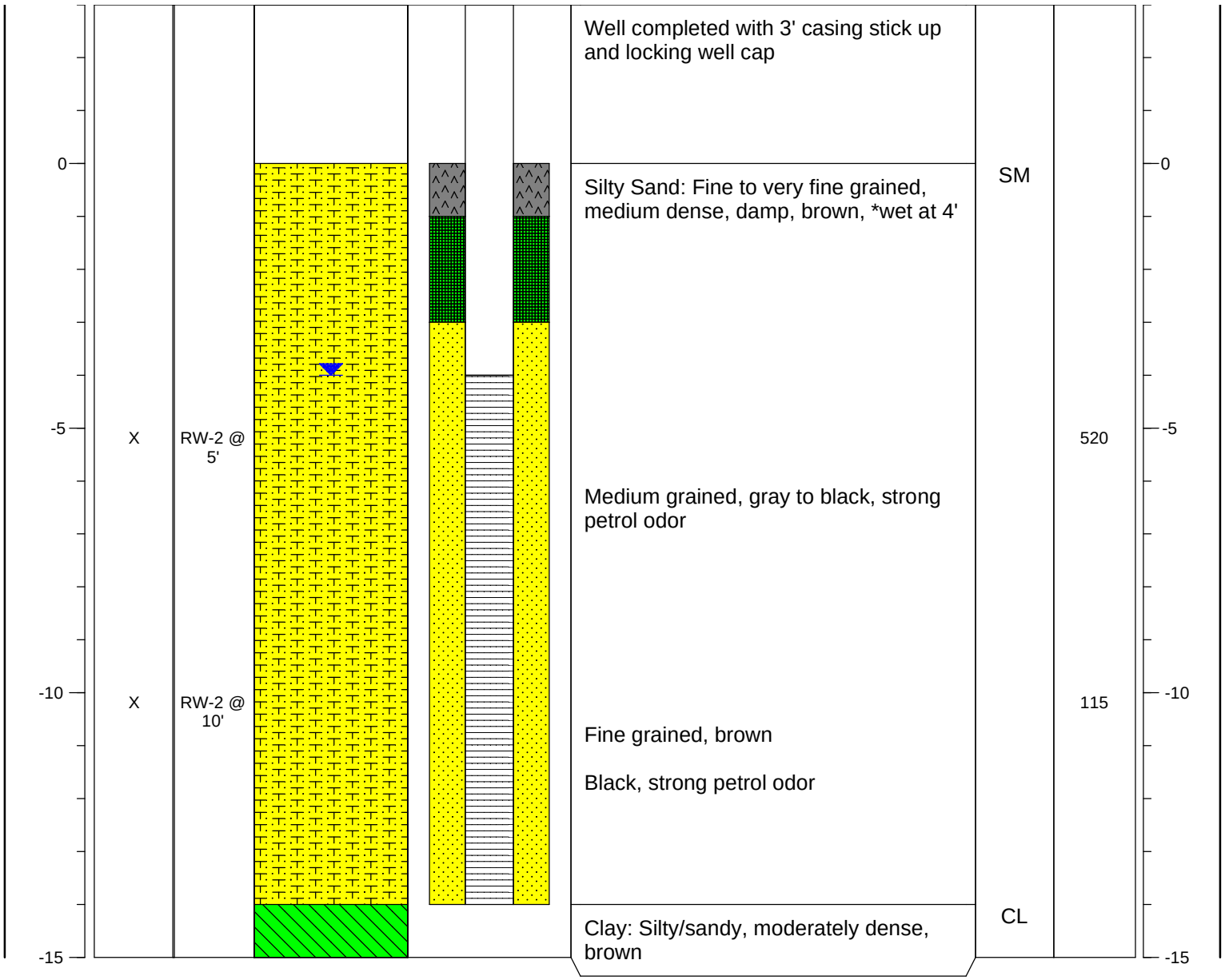
TD = 13.5 feet

CONESTOGA-ROVERS & ASSOCIATES

BORING LOG AND WELL COMPLETION FORM

PROJECT NAME: State Com J6
LOCATION: Pump Canyon
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): N/A
GROUNDWATER ELEVATION: 4' bgs
REMARKS: 4" diameter well
Boring drilled to 15' bgs and well set at 14' bgs
COORDINATES: N 36° 51.149', W 107° 44.407'

SOIL BORING NO: RW-2
DRILL TYPE: Hollow Stem Auger
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: National EWP
DATE/TIME HOLE STARTED: May 07, 2014 at 1420
DATE/TIME HOLE COMPLETED: May 07, 2014 at 1645



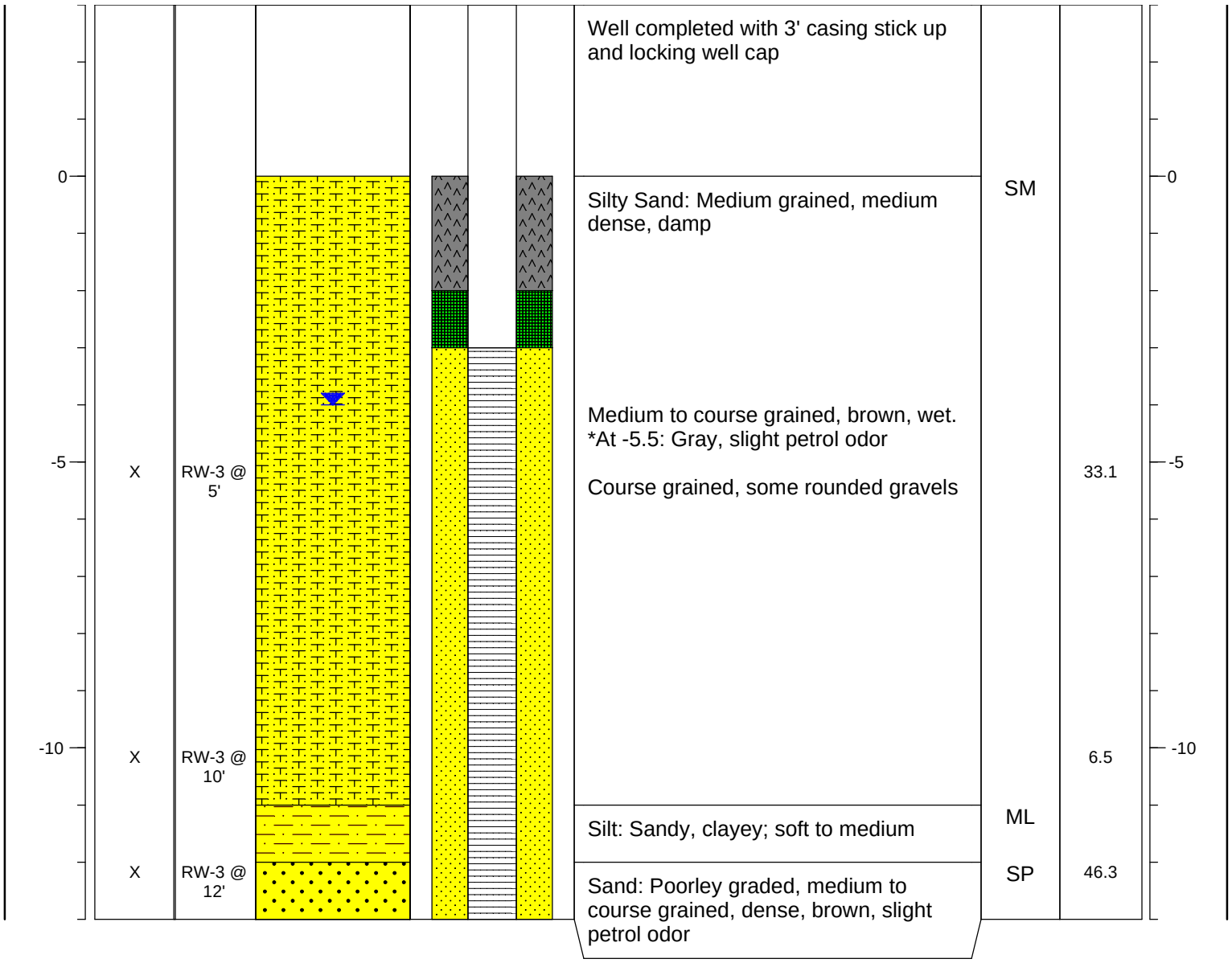
TD = 14 feet

CONESTOGA-ROVERS & ASSOCIATES

BORING LOG AND WELL COMPLETION FORM

PROJECT NAME: State Com J6
LOCATION: Pump Canyon
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): N/A
GROUNDWATER ELEVATION: 4' bgs
REMARKS: 4" diameter well
COORDINATES: N 36° 51.145', W 107° 44.409'

SOIL BORING NO: RW-3
DRILL TYPE: Hollow Stem Auger
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: National EWP
DATE/TIME HOLE STARTED: May 08, 2014 at 1406
DATE/TIME HOLE COMPLETED: May 08, 2014 at 1540



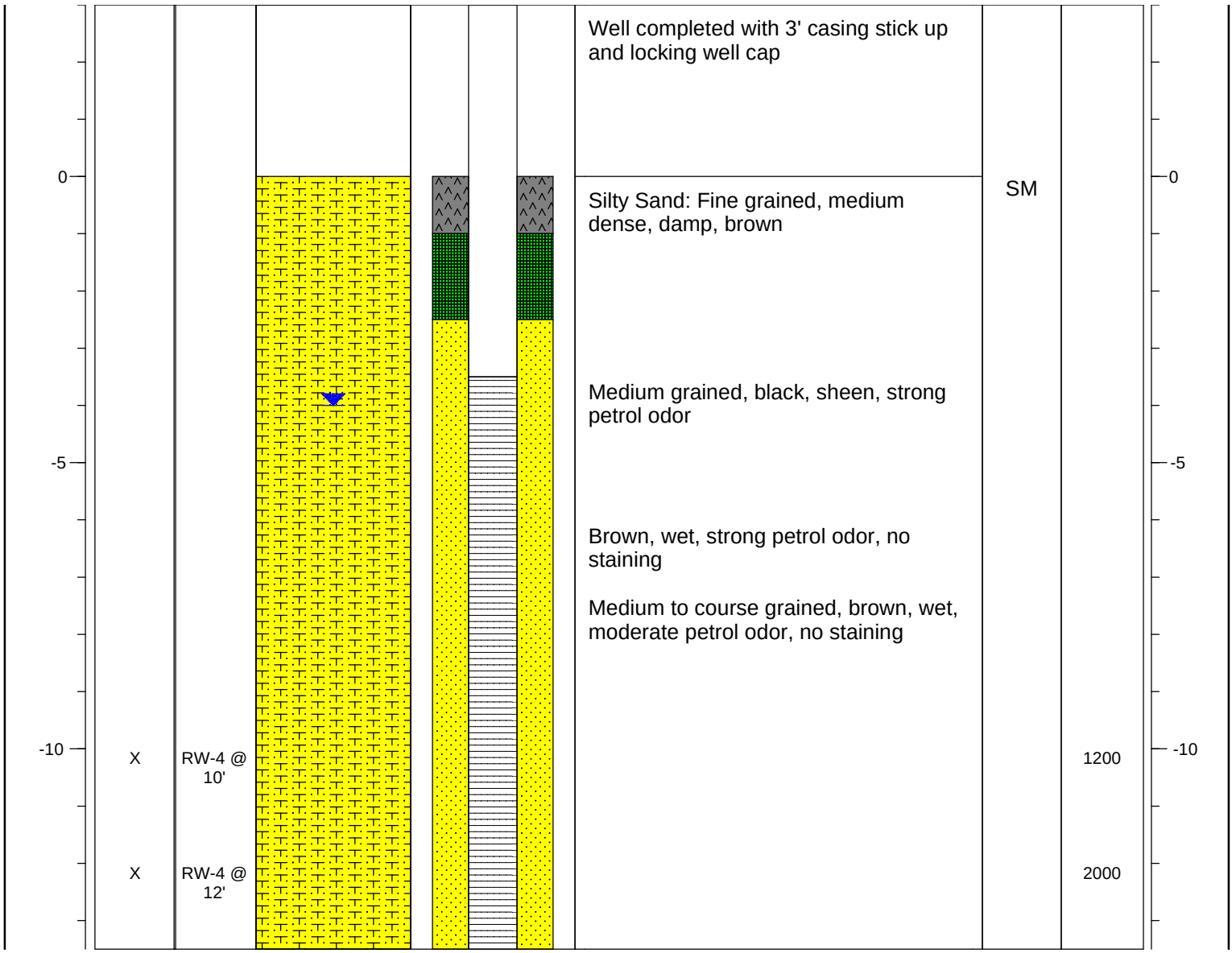
TD = 13 feet

CONESTOGA-ROVERS & ASSOCIATES

BORING LOG AND WELL COMPLETION FORM

PROJECT NAME: State Com J6
LOCATION: Pump Canyon
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): N/A
GROUNDWATER ELEVATION: N/A
REMARKS: 4" diameter well
COORDINATES: N 36° 51.145', W 107° 44.407'

SOIL BORING NO: RW-4
DRILL TYPE: Hollow Stem Auger
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: National EWP
DATE/TIME HOLE STARTED: May 08, 2014 at 1130
DATE/TIME HOLE COMPLETED: May 08, 2014 at 1340



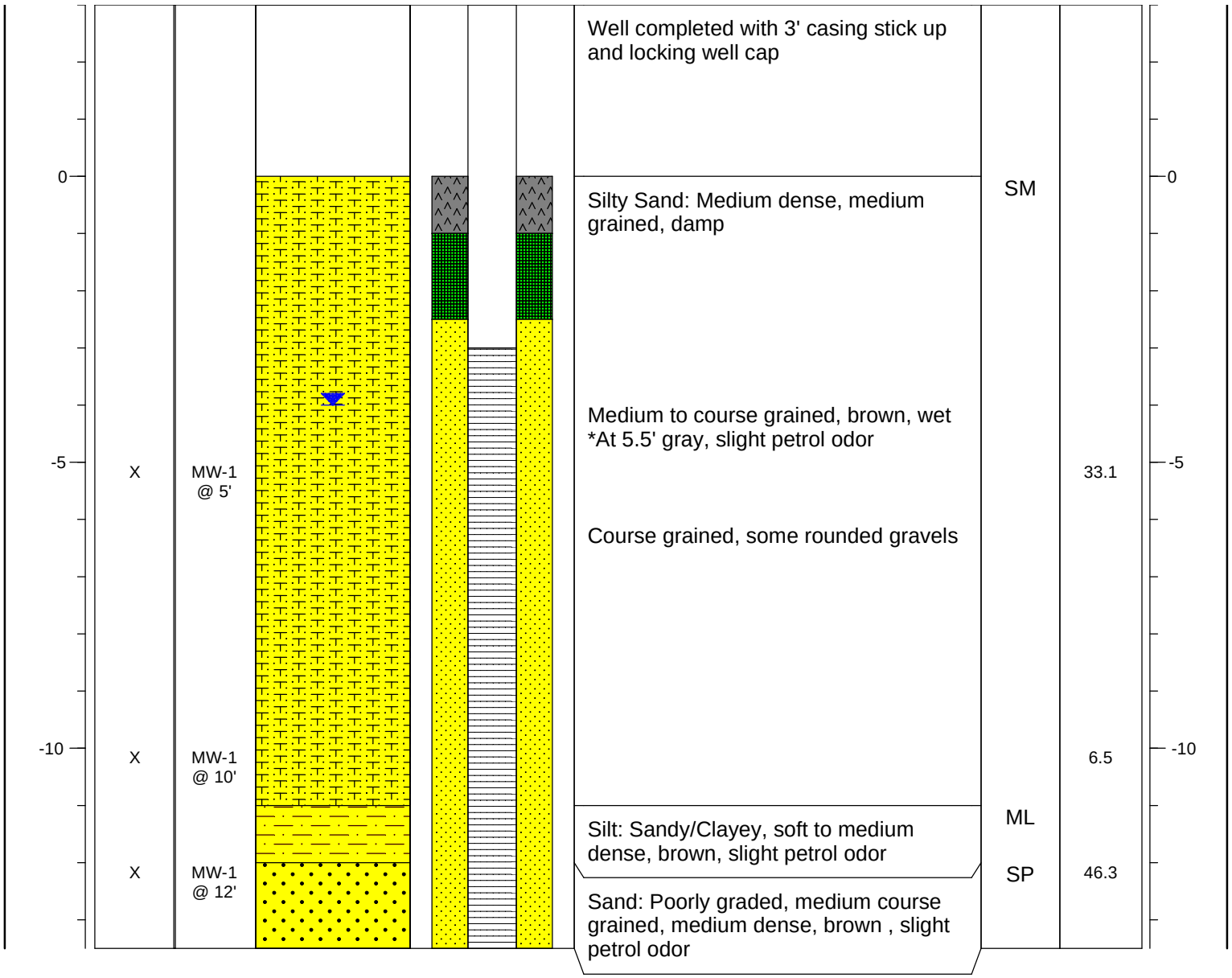
TD = 13.5 feet

CONESTOGA-ROVERS & ASSOCIATES

BORING LOG AND WELL COMPLETION FORM

PROJECT NAME: State Com J6
LOCATION: Pump Canyon
FIELD LOGGED BY: Jeff Walker
SURFACE ELEVATION (msl): N/A
GROUNDWATER ELEVATION: 4' bgs
REMARKS: 2" diameter well
COORDINATES: N 36° 51.130', W 107° 44.416'

SOIL BORING NO: MW-1
DRILL TYPE: Hollow Stem Auger
BORE HOLE DIAMETER: 7 7/8"
DRILLED BY: National EWP
DATE/TIME HOLE STARTED: May 08, 2014 at 1600
DATE/TIME HOLE COMPLETED: May 08, 2014 at 1745



TD = 13.5 feet

CONESTOGA-ROVERS & ASSOCIATES

BORING LOG AND WELL COMPLETION FORM

Appendix B

AccuVac MDPE Event Reports

AcuVac Remediation, LLC

1656-H Townhurst, Houston, Texas 77043
713.468.6688 • www.acuvac.com

September 3, 2014

Mr. Jeff Walker, P.G.
Project Manager
Conestoga-Rovers & Associates
6121 Indian School Road NE
Albuquerque, NM 67110

Dear Jeff:

Re: MDP Events, State Com J6, San Juan County, NM

At your request, we performed three 8.0-hour Mobile Dual Phase (MDP) Events divided between #1A, 1B, 1C, 1D and 1E on Wells RW-4 and RW-3 at the above referenced site.

Following is the Report and a copy of the Operating Data collected during the above referenced Event #1. Tables #1A and 2A are the Summary Well Data and Tables #1B and 2B are the Summary Recovery Data on wells RW-4 and RW-3 respectively. PSH is referred to as LNAPL in this report. GW samples are taken frequently in a 2,000 ml beaker, to determine the average LNAPL percentage and volume.

OBJECTIVES

The Objectives of an MDP Event are to:

- Evaluate the potential for removing liquid and vapor phase LNAPL (PSH) from the GW and soils in the subsurface formations.
- Expose the capillary fringe area and below to the Extraction Well (EW) induced vacuums.
- Increase the GW and contaminant specific yields with high induced vacuums.
- Provide an induced hydraulic gradient (IHG) to gain hydraulic control of the area during the Event period.
- Select the GW depression and pump rates to accomplish the above objectives.

METHODS AND EQUIPMENT

The tests were conducted using AcuVac's I-6 System, with Roots RAI-33 and RAI-22 blowers, various instrumentation, including the HORIBA® Analyzer, Solinst Interface Probes, Lumidor O_2 Meter, flow gauges, a sensitive instrument to determine barometric pressure, V-1 vacuum box to capture non-diluted vapor samples, Redi-Flo 2 total fluids pump and other special equipment.

The vacuum extraction portion of the AcuVac System consists of a vacuum pump driven by an internal combustion (IC) engine. The vacuum pump is connected to the extraction well and the vacuum created on the extraction well causes light hydrocarbons in the soil and on the GW to volatilize and flow through a moisture knockout tank to the vacuum pump and the IC Engine where they are burned as part of the normal combustion process. Propane is used as auxiliary fuel to help power the engine if the well vapors do not provide the required BTU.

Emissions from the engine are passed through three catalytic converters to ensure maximum destruction of removed hydrocarbon vapors. The engine's fuel to air ratio can be adjusted to maintain efficient combustion. Because the engine is the power source for all equipment, all systems stop when the engine stops. This eliminates any uncontrolled release of hydrocarbons. Since the AcuVac System is held entirely under vacuum, any leaks in the seals or connections are leaked into the System and not emitted into the atmosphere. The engine is automatically shut down by vacuum loss, low oil pressure or overheating.

The GW Extraction is provided by an in-well, Redi-Flo 2 total fluids pump that has the discharge line connected to a total volume meter. The discharge line from the volume meter is then connected to the stand-by tank. The electrical power for the GW pump was supplied from a 120v Honda generator. The GW flow rate can be adjusted to maintain a target level. Interface meters are used to measure all DTGW/DTLNAPL.

The design of the AcuVac System enables complete independent control of both the Induced Well Vacuum and the GW pumping functions such that the AcuVac team can control the IHG to expose the maximum amount of the formation to SVE. The ability to separate the vacuum and liquid flows improves the LNAPL recovery rates, and enables the AcuVac team to record data specific to each.

SUMMARY OF MDP EVENT #1A WELL RW-4

- The total Event time was 8.0 hours. There is no comparative data. The Event was conducted on August 25, 2014.
- The total liquid volume recovered was 2,320 gals, of which 6.88% or 152.27 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 11.39 gals, **for a total liquid and vapor LNAPL recovery of 163.66 gals. This equates to an average of 20.46 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 14,828 ppmv, CO_2 = 1.16%, CO = 0.06%, O_2 = 18.3% and H_2S = 0 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 25,220 ppmv.
- The Average Induced Vacuum was 40.88"H_2O with a maximum vacuum of 45.00"H_2O.
- The average EW well vapor flow was 44.44 scfm with a maximum well vapor flow of 46.51 scfm.
- The GW pump was set at 9.0 ft BTOC. The average GW pump rate was 4.8 gpm, and the maximum GW pump rate was 5.0 gpm.
- The average GW depression, based on the positioning of the GW pump, was 3.0 ft below static level.
- A LNAPL thickness of 1.33 ft was recorded prior to the start of Event #1A and a LNAPL thickness of 0.32 ft was recorded at the conclusion of the Event.

The total LNAPL removed, including liquid and vapor, during the 8.0 hour Event #1A Well RW-4 was 163.66 gals.

ADDITIONAL INFORMATION- WELL RW-4

- The moderate TPH levels indicate contaminant in the LNAPL range.
- The LNAPL recovery rate remained mostly steady throughout the Event.
- Of the LNAPL recovered, 93.04% was recovered as liquid.

SUMMARY OF MDP EVENT #1B: WELL RW-4

- The total Event time was 2.0 hours. The Event was conducted on August 26, 2014. The data is compared to Event #1A conducted on August 25, 2014 which had a total Event time of 8.0 hours.
- The total liquid volume recovered was 600 gals, of which 3.50% or 21.0 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 1.69 gals, **for a total liquid and vapor LNAPL recovery of 22.69 gals. This equates to an average of 11.34 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 8,403 ppmv, CO_2 = 0.62%, CO = 0%, O_2 = 18.6% and H_2S = 0 ppm.
- Compared with MDP Event #1A data, the average TPH levels decreased 6,424 ppmv, CO_2 decreased 0.54%, CO decreased 0.06%, O_2 increased 0.3% and H_2S remained steady at 0 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 11,630 ppmv. Compared with MDP Event #1A data, the maximum TPH levels decreased 13,590 ppmv.
- The Average Induced Vacuum was 45"H_2O with a maximum vacuum of 45"H_2O. Compared with MDP Event #1A data, the average induced vacuum increased 4.12"H_2O and the maximum induced vacuum was steady at 45"H_2O.
- The average EW well vapor flow was 46.51 scfm with a maximum well vapor flow of 46.51 scfm. Compared with MDP Event #1A data, the average EW well vapor flow increased 2.07 scfm, and the maximum well flow remained steady at 46.51 scfm.
- The GW pump was set at 9 ft BTOC. The average GW pump rate was 5.0 gpm, and the maximum GW pump rate was 5.0 gpm.
- The average GW depression, based on the positioning of the GW pump, was 3.0 ft below static level.
- A LNAPL thickness of 0.66 ft was recorded prior to the start of Event #1B and no LNAPL was recorded at the conclusion of the Event.

The total LNAPL removed, including liquid and vapor, during the 2.0 hour Event #1B Well RW-4 was 22.69 gals.

ADDITIONAL INFORMATION

- The moderate TPH levels indicate contaminant in the LNAPL range.
- The LNAPL recovery rate remained mostly steady throughout the Event.
- Of the LNAPL recovered, 92.55% was recovered as liquid.

SUMMARY OF MDP EVENT #1C: WELL RW-3

- The total Event time was 6.0 hours. There is no comparative data. The Event was conducted on August 26, 2013.
- The total liquid volume recovered was 2,118 gals, of which 2.51% or 53.10 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 2.47 gals, **for a total liquid and vapor LNAPL recovery of 55.57 gals. This equates to an average of 9.26 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 39,328 ppmv, CO_2 = 1.74%, CO =0.69%, O_2 =16.9% and H_2S = 0 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 42,920 ppmv.
- The Average Induced Vacuum was 10"H_2O with a maximum vacuum of 10"H_2O.
- The average EW well vapor flow was 4.84 scfm with a maximum well vapor flow of 4.84 scfm.
- The GW pump was set at 9.0 ft BTOC. The average GW pump rate was 5.9 gpm and the maximum GW pump rate was 5.9 gpm.
- The average GW depression, based on the positioning of the GW pump, was 3.0 ft below static level.
- A LNAPL thickness of 1.73 ft was recorded prior to the start of Event #1C and a LNAPL thickness of 0.13 ft was recorded at the conclusion of the Event.
-

The total LNAPL removed, including liquid and vapor, during the 6.0 hour Event #1C (Well RW-3) was 55.57 gals.

ADDITIONAL INFORMATION

- The high TPH levels indicate contaminant in the LNAPL range.
- The LNAPL recovery rate remained mostly steady throughout the Event.
- Of the LNAPL recovered, 95.56% was recovered as liquid.

SUMMARY OF MDP EVENT #1D: WELL RW-3

- The total Event time was 2.0 hours. The Event was conducted on August 27, 2014. The data is compared to Event #1C conducted on August 26, 2014 which had a total Event time of 6.0 hours.
- The total liquid volume recovered was 768 gals, of which 1.50% or 11.52 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 0.77 gals, **for a total liquid and vapor LNAPL recovery of 12.29 gals. This equates to an average of 6.15 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 36,657 ppmv, CO_2 = 2.99%, CO = 0.54%, O_2 = 11.2% and H_2S = 0 ppm.
- Compared with MDP Event #1C data, the average TPH levels decreased 2,671 ppmv, CO_2 increased 1.25%, CO decreased 0.14%, O_2 decreased 5.7% and H_2S remained steady at 0 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 38,350 ppmv. Compared with MDP Event #1C data, the maximum TPH levels decreased 4,570 ppmv.

- The Average Induced Vacuum was 10"H_2O with a maximum vacuum of 10"H_2O. Compared with MDP Event #1C data, the average and the maximum induced vacuum remained steady at 10"H_2O.
- The average EW well vapor flow was 4.86 scfm with a maximum well vapor flow of 4.86 scfm. Compared with MDP Event #1C data, the average and the maximum EW well flow increased 0.02 scfm.
- The GW pump was set at 9 ft BTOC. The average GW pump rate was 6.4 gpm, and the maximum GW pump rate was 6.4 gpm.
- The average GW depression, based on the positioning of the GW pump, was 3.0 ft below static level.
- A LNAPL thickness of 0.25 ft was recorded prior to the start of Event #1C and a LNAPL thickness of 0.21 ft was recorded at the conclusion of the Event.
-

ADDITIONAL INFORMATION

- The high TPH levels indicate contaminant in the LNAPL range.
- The LNAPL recovery rate remained mostly steady throughout the Event.
- Of the LNAPL recovered, 93.73% was recovered as liquid.

The total LNAPL removed, including liquid and vapor, during the 6.0 hour Event #1D Well RW-3 was 12.29 gals.

SUMMARY OF MDP EVENT #1E: WELL MW-4

- The total Event time was 6.0 hours. The Event was conducted on August 27, 2014. The data is compared to Event #1B conducted on August 26, 2014 which had a total Event time of 2.0 hours.
- The total liquid volume recovered was 1,800 gals, of which 3.55% or 58.50 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 5.26 gals, **for a total liquid and vapor LNAPL recovery of 63.76 gals. This equates to an average of 10.63 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 8,727 ppmv, CO_2 = 0.68%, CO = 0.01%, O_2 = 18.7% and H_2S = 0 ppm.
- Compared with MDP Event #1B data, the average TPH levels increased 323 ppmv, CO_2 increased 0.06%, CO increased 0.01%, O_2 increased 0.1% and H_2S remained steady at 0 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 15,040 ppmv. Compared with MDP Event #1B data, the maximum TPH levels increased 3,410 ppmv.
- The Average Induced Vacuum was 45"H_2O with a maximum vacuum of 45"H_2O. Compared with MDP Event #1B data, the average and the maximum induced vacuum remained steady at 45"H_2O.
- The average EW well vapor flow was 46.51 scfm with a maximum well vapor flow of 46.51 scfm. Compared with MDP Event #1B data, the average and the maximum EW well flow remained steady at 46.51 scfm.
- The GW pump was set at 9 ft BTOC. The average GW pump rate was 5.0 gpm, and the maximum GW pump rate was 5.0 gpm.

- The average GW depression, based on the positioning of the GW pump, was 3.0 ft below static level.
- A LNAPL thickness of 1.11 ft was recorded prior to the start of Event #1B and a LNAPL thickness of 0.27 ft was recorded at the conclusion of the Event.

The total LNAPL removed, including liquid and vapor, during the 2.0 hour Event #1E Well RW-4 was 63.76 gals.

GENERAL OVERVIEW

Event #1 proved that Mobile Dual Phase is a very effective methodology to remediate this site. The total LNAPL removed, including liquid and vapor from Well RW-4 was 250.12 gal in16 hours for an average recovery rate of 15.63 gals/hr. The total LNAPL removed, including liquid and vapor from Well RW-3 in 8 hours was 67.86 gal for an average recovery rate of 8.48 gals/hr. The total liquid and vapor LNAPL removed was 317.97 gals.

The Event alternated between Wells RW-3 and RW-4 to allow for a rebound of the liquid LNAPL around each well bore. Future Events should be designed to perform MDP on each well for an 8 hour period and then spend 4 hours in each well on the third day.This will maximize the LNAPL recovery.

The beginning LNAPL thickness at the start of Event #1E (Well RW-4), of 1.11 ft, was slightly less than the beginning of Event #1A, of 1.33 ft. This indicates that the LNAPL rebounded quickly in this well.

METHOD OF CALIBRATION AND CALCULATIONS

The HORIBA® Analytical instrument is calibrated with Hexane and CO_2. In all subsequent Events, the test data will be compared to the previous Event to evaluate the progress for this remediation project.

The formula used to calculate the emission rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

ADDITIONAL INFORMATION INCLUDED WITH REPORT

- Table #1A Summary Well Data Well RW-4
- Table #1B Summary Recovery Data Well RW-4
- Table #1A Summary Well Data Well RW-3
- Table #1B Summary Recovery Data Well RW-3
- Recorded Data
- Photographs of the MDP System and Wells RW-3 and RW-4.

After you have reviewed the report and if you have any questions, please contact me. We appreciate you selecting AcuVac to provide this service.

Sincerely,
ACUVAC REMEDIATION, LLC

Paul D. Faucher
Vice President, Operations

Summary Well Data
Table #1A

Event		1A	1B	1E
WELL NO.		**RW-4**	**RW-4**	**RW-4**
Total Event Hours		8.0	2.0	6.0
Cumulative Event Hours		8.0	10.0	16.0
TD	ft	13.5	13.5	13.5
Well Screen	ft	10.0 to 13.5 ft	10.0 to 13.5 ft	10.0 to 13.5 ft
Well Size	in	4.0	4.0	4.0
Well Data				
DTGW - Static - Start Event	ft	9.80	9.23	9.82
DTLNAPL - Static - Start Event	ft	8.47	8.57	8.71
LNAPL	ft	1.33	0.66	1.11
Hydro-Equivalent- Beginning	ft	8.87	8.77	9.04
DTGW - End Event	ft	8.95	8.81	9.00
DTLNAPL - End Event	ft	8.63	-	8.73
LNAPL	ft	0.32	-	0.27
Hydro-Equivalent- Ending	ft	8.73	8.81	8.81
Extraction Data				
Average Extraction Well Vacuum	"H_2O	40.88	45.00	45.00
Maximum Extraction Well Vacuum	"H_2O	45.00	45.00	45.00
Average Extraction Well Vapor Flow	scfm	44.44	46.51	46.51
Maximum Extraction Well Vapor Flow	scfm	46.51	46.51	46.51
Average GW/LNAPL Pump Rate	gpm	4.80	5.00	5.00
Maximum GW/LNAPL Pump Rate	gpm	5.00	5.00	5.00
Influent Data				
Maximum TPH	ppmv	25,220	11,630	15,040
Average TPH	ppmv	14,828	8,403	8,727
Average CO_2	%	1.16	0.62	0.68
Average CO	%	0.06	0	0.01
Average O_2	%	18.3	18.6	18.7
Average H_2S	ppm	0	0	0

Summary Recovery Data

Table #1B

Event		1A	1B	1E
WELL NO.		**RW-4**	**RW-4**	**RW-4**
Recovery Data- Current Event				
Total Liquid Volume Recovered	gals	2,320	600	1,800
Total Liquid LNAPL Recovered	gals	152.27	21.00	58.50
Total Liquid LNAPL Recovered / Total Liquid	%	6.88	3.50	3.55
Total Liquid LNAPL Recovered / Total LNAPL	%	93.04	92.55	91.75
Total Vapor LNAPL Recovered	gals	11.39	1.69	5.26
Total Vapor LNAPL Recovered / Total LNAPL	%	6.96	7.45	8.25
Total Vapor and Liquid LNAPL Recovered	gals	163.66	22.69	63.76
Average LNAPL Recovery	gals/hr	20.46	11.34	10.63
Total LNAPL Recovered	lbs	863	159	446
Total Volume of Well Vapors	cu. ft	22,118	5,581	16,744
Recovery Data- Cumulative				
Total Liquid Volume Recovered	gals	2,320	2,920	4,720
Total Liquid LNAPL Recovered	gals	152.27	173.27	231.77
Total Vapor LNAPL Recovered	gals	11.39	13.08	18.35
Total Vapor and Liquid LNAPL Recovered	gals	163.66	186.35	250.12
Average LNAPL Recovery	gals/hr	20.46	18.64	15.63
Total LNAPL Recovered	lbs	863	1,022	1,468
Total Volume of Well Vapors	cu. ft	22,118	27,699	44,443

Summary Well Data
Table #2A

Event		1C	1D
WELL NO.		**RW-3**	**RW-3**
Total Event Hours		6.0	2.0
Cumulative Event Hours		6.0	8.0
TD	ft	14.0	14.0
Well Screen	ft	10.0 to 13.0 ft	10.0 to 13.0 ft
Well Size	in	4.0	4.0
Well Data			
DTGW - Static - Start Event	ft	10.43	9.17
DTLNAPL - Static - Start Event	ft	8.70	8.92
LNAPL	ft	1.73	0.25
Hydro-Equivalent- Beginning	ft	9.22	9.00
DTGW - End Event	ft	9.12	9.33
DTLNAPL - End Event	ft	8.99	9.12
LNAPL	ft	0.13	0.21
Hydro-Equivalent- Ending	ft	9.03	9.18
Extraction Data			
Average Extraction Well Vacuum	"H_2O	10.00	10.00
Maximum Extraction Well Vacuum	"H_2O	10.00	10.00
Average Extraction Well Vapor Flow	scfm	4.84	4.86
Maximum Extraction Well Vapor Flow	scfm	4.84	4.86
Average GW/LNAPL Pump Rate	gpm	5.90	6.40
Maximum GW/LNAPL Pump Rate	gpm	5.90	6.40
Influent Data			
Maximum TPH	ppmv	42,920	38,350
Average TPH	ppmv	39,328	36,657
Average CO_2	%	1.74	2.99
Average CO	%	0.69	0.54
Average O_2	%	16.9	11.2
Average H_2S	ppm	0	0

Summary Recovery Data

Table #2B

Event		1C	1D
WELL NO.		RW-3	RW-3
Recovery Data- Current Event			
Total Liquid Volume Recovered	gals	2,118	768
Total Liquid LNAPL Recovered	gals	53.10	11.52
Total Liquid LNAPL Recovered / Total Liquid	%	2.51	1.50
Total Liquid LNAPL Recovered / Total LNAPL	%	95.56	93.73
Total Vapor LNAPL Recovered	gals	2.47	0.77
Total Vapor LNAPL Recovered / Total LNAPL	%	4.44	6.27
Total Vapor and Liquid LNAPL Recovered	gals	55.57	12.29
Average LNAPL Recovery	gals/hr	9.26	6.15
Total LNAPL Recovered	lbs	863	86
Total Volume of Well Vapors	cu. ft	22,118	583
Recovery Data- Cumulative			
Total Liquid Volume Recovered	gals	2,118	2,886
Total Liquid LNAPL Recovered	gals	53.10	64.62
Total Vapor LNAPL Recovered	gals	2.47	3.24
Total Vapor and Liquid LNAPL Recovered	gals	55.57	67.86
Average LNAPL Recovery	gals/hr	9.26	8.48
Total LNAPL Recovered	lbs	863	949
Total Volume of Well Vapors	cu. ft	22,118	22,701

OPERATING DATA - EVENT #1 A **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Date:	08-25-14	-	-	—	—	—
	Parameters	Time 0900	Time 0930	Time 1000	Time 1030	Time 1100	Time 1130
	WELL # **RW-4**	Hr Meter 6858.0	Hr Meter 6858.5	Hr Meter 6859.0	Hr Meter 6859.5	Hr Meter 6860.0	Hr Meter 6860.5
ENGINE/BLOWER	R.P.M.	2100	2100	2100	2100	2200	2300
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	13	13	13	13	12	12
	Gas Flow Fuel/Propane cfh	90	90	90	90	70	70
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	38.34	38.34	39.20	39.20	42.25	46.51
	Extraction Well Vacuum "H_2O	30	30	30	30	35	45
	Pump Rate gals/min	4.25	4.25	4.25	4.25	4.60	5.0
	Total Volume gals	-	127	256	382	520	670
	Influent Vapor Temp. °F	69	69	69	69	70	70
	Air Temperature °F	71	71.8	72.6	74.0	76.7	79.0
	Barometric Pressure "Hg	30.11	30.11	30.12	30.12	30.12	30.12
	Absolute Pressure "Hg	24.23	24.23	24.24	24.24	24.24	24.24
VAPOR /INFLUENT	HC ppmv	-	23,220	-	21,220	-	17,240
	CO_2 %	-	4.44	-	2.08	-	1.04
	CO %	-	.22	-	.13	-	.07
	O_2 %	-	16.2	-	17.9	-	18.1
	H_2S ppm	-	0		0	-	0
NOTES	Set GW pump inlet @ 9.0ft BGS - Mobilized all equipment - Safety checks all OK - Initial EW induced vacuum set @ 30" H_2O, VWF = scfm						
	GWR = 4.25 gpm - 1030 Hrs - Increased EW vacuum = 35" H_2O, VWF = 42.25 scfm						
	GWR = 4.6 gpm - 1100 Hrs - Increased EW vacuum = 45" H_2O, VWF = 46.51 scfm						
	GWR = 5.0 gpm						
	Well RW-3 - Well Vacuum @ 14.44 " H_2O			-	3.76	4.04	4.39
MANIFOLD	LNAPL % Vol Gals	-	8 / 10.2	7 / 8.9	5 / 6.4	6 / 8.3	7 / 10.5
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	Extraction Well DTLNAPL ft	8.47					
	Extraction Well DTGW ft	9.80					

( ) Indicates Well Pressure

LNAPL = 1.33

7FORMS/TestForms/1210017B

OPERATING DATA - EVENT #1 A **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

		Date:	08-25-14	-	-	-	-	-
	Parameters		Time 1200	Time 1230	Time 1300	Time 1330	Time 1400	Time 1430
	WELL # **RW-4**		Hr Meter 6861.0	Hr Meter 6861.5	Hr Meter 6862.0	Hr Meter 6862.5	Hr Meter 6863.0	Hr Meter 6863.5
ENGINE/BLOWER	R.P.M.		2300	2300	2300	2300	2300	2300
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	160	160	160	160	160	160
	Volts		13	13	13	13	13	13
	Intake Vacuum	"Hg	12	12	12	12	12	12
	Gas Flow Fuel/Propane	cfh	70	70	70	70	70	70
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	46.51	46.51	46.51	46.51	46.51	46.51
	Extraction Well Vacuum	"H_2O	45	45	45	45	45	45
	Pump Rate	gals/min	5.0	5.0	5.0	5.0	5.0	5.0
	Total Volume	gals	820	970	1120	1270	1420	1570
	Influent Vapor Temp.	°F	70	71	71	71	71	72
	Air Temperature	°F	79.6	80.4	82.6	81.7	83.9	85.0
	Barometric Pressure	"Hg	30.10	30.09	30.08	30.07	30.06	30.05
	Absolute Pressure	"Hg	24.23	24.22	24.21	24.20	24.19	24.18
VAPOR /INFLUENT	HC	ppmv	-	14,800	-	11,260	-	11,600
	CO_2	%	-	.72	-	.48	-	.48
	CO	%	-	.04	-	.01	-	.01
	O_2	%	-	18.2	-	18.6	-	18.9
	H_2S	ppm	-	0	-	0	-	0
NOTES	EW induced vacuum and VWF steady @ 45" H_2O, 46.51 scfm EW @ 5.0 gpm. Notes: TPH on decreasing trend - Note BP on decreasing trend							
	Well RW-3 "/H_2O		4.56	4.74	4.70	4.62	4.50	4.26
MANIFOLD	LNAPL % Vol / Gals		.7 / 10.5	10 / 15.0	12 / 18.0	10 / 15.0	.7 / 10.5	6 / 9.0
	Depth of GW Depression	ft	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	Extraction Well DTLNAPL	ft						
	Extraction Well DTGW	ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #1 A **PAGE #3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Date:	8-25-14	"	"	"	"	"
	Parameters	Time 1300	Time 1530	Time 1600	Time 1630	Time 1700	Time
	WELL # **RW-4**	Hr Meter 6884.0	Hr Meter 6864.5	Hr Meter 6865.0	Hr Meter 6865.3	Hr Meter 6866.0	Hr Meter
ENGINE/BLOWER	R.P.M.	2300	2300	2300	2300	2300	
	Oil Pressure psi	50	50	50	50	50	
	Water Temp °F	160	160	160	160	160	
	Volts	13	13	13	13	13	
	Intake Vacuum "Hg	12	12	12	12	12	
	Gas Flow Fuel/Propane cfh	70	70	70	70	70	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	
	Extraction Well Flow scfm	46.51	46.51	46.51	46.51	46.51	
	Extraction Well Vacuum "H_2O	45	45	45	45	45	
	Pump Rate gals/min	3.6	5.0	5.0	5.0	5.0	
	Total Volume gals	1720	1870	2020	2170	2320	
	Influent Vapor Temp. °F	72	72	72	72	72	
	Air Temperature °F	84.7	84.5	84.3	85.0	84.6	
	Barometric Pressure "Hg	30.04	30.02	30.01	30.00	29.99	
	Absolute Pressure "Hg	24.15	24.15	24.15	24.14	24.14	
VAPOR /INFLUENT	HC ppmv	-	9,380	-	7,840	-	
	CO_2 %	-	0	-	0	-	
	CO %	-	0	-	0	-	
	O_2 %	-	19.1	-	19.3	-	
	H_2S ppm	-	0	-	0	-	
NOTES	EW induced vacuum and UWF steady @ 45" H_2O, 46.51 scfm GWR @ maximum (5.0gpm) Steady flow of LNAPL visable in site tube. - NOTE LNAPL steady @ 6% of volum = 18gals/hr 1600 HRS - Liquid LNAPL recovery on a decreasing % trend						
	Well RW-3 "/H2O	4.69	4.74	4.76	=	-	
MANIFOLD	LNAPL % Vol Gals	6/9.0	6/9.0	5/7.5	4/6	4/6	
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	
	Extraction Well DTLNAPL ft					8.63	
	Extraction Well DTGW ft					8.95	

( ) Indicates Well Pressure

7FORMS/TestForms/1210017B

LNAPL - 0.32'

OPERATING DATA - EVENT #1 B **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Parameters							
	Date:		08-26-14	-	-	-	-	-
	Time		0730	0800	0830	0900	0930	
	WELL # RW-4		Hr Meter 6866.0	Hr Meter 6866.5	Hr Meter 6867.0	Hr Meter 6867.5	Hr Meter 6868.0	Hr Meter
ENGINE/BLOWER	R.P.M.		2300	2300	2300	2300	2300	
	Oil Pressure	psi	50	50	50	50	50	
	Water Temp	°F	130	160	160	160	160	
	Volts		13	13	13	13	13	
	Intake Vacuum	"Hg	12	12	12	12	12	
	Gas Flow Fuel/Propane	cfh	70	70	70	70	70	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	
	Extraction Well Flow	scfm	46.51	46.51	46.51	46.51	46.51	
	Extraction Well Vacuum	"H_2O	45	45	45	45	45	
	Pump Rate	gals/min	5.0	5.0	5.0	5.0	5.6	
	Total Volume	gals	-	150	300	450	600	
	Influent Vapor Temp.	°F	68	68	68	68	68	
	Air Temperature	°F	60.2	61.1	63.4	63.8	68.3	
	Barometric Pressure	"Hg	30.17	30.17	30.17	30.18	30.17	
	Absolute Pressure	"Hg	24.28	24.28	24.28	24.29	24.28	
VAPOR /INFLUENT	HC	ppmv	11,630	-	7,230	-	6,350	-
	CO_2	%	1.06	-	.62	-	.18	-
	CO	%	.01	-	0	-	0	-
	O_2	%	18.6	-	18.7	-	18.6	-
	H_2S	ppm	0	-	0	-	0	-

NOTES

Set GW/LNAPL pump inlet @ 9.0 ft BGS - Mobilized MDP System for well RW-4 - Safety checks - all OK - START EVENT 1B
Induced vacuum @ 45" H_2O, VWF = 46.51 scfm - GWR = 5.0 gpm
0930 Hrs - Discontinued Event 1B - moved to well RW-3 to conduct Event 1C

MANIFOLD								
	LNAPL % Vol / Gals		-	4 / 6.0	4 / 6.0	4 / 6.0	2 / 3.0	
	Depth of GW Depression	ft	-3.0	-3.0	-3.0	-3.0	-3.0	
	Extraction Well DTLNAPL	ft	8.57					
	Extraction Well DTGW	ft	9.23					

( ) Indicates Well Pressure

LNAPL = 0.66 ft

7FORMS/TestForms/1210017B

OPERATING DATA - EVENT #1 C **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Date:	08-26-14	-	-	-	-	-
	Parameters	Time 0930	Time 1000	Time 1030	Time 1100	Time 1130	Time 1200
	WELL # **RW-3**	Hr Meter 6868.0	Hr Meter 6868.5	Hr Meter 6869.0	Hr Meter 6869.5	Hr Meter 6870.0	Hr Meter 6870.5
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	16	16	16	16	16	16
	Gas Flow Fuel/Propane cfh	100	100	100	100	100	90
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	4.84	4.84	4.84	4.84	4.84	4.84
	Extraction Well Vacuum "H_2O	10	10	10	10	10	10
	Pump Rate gals/min	5.9	5.9	5.9	5.9	5.9	5.9
	Total Volume gals	-	177	354	531	708	885
	Influent Vapor Temp. °F	69	69	69	69	69	69
	Air Temperature °F	68.3 Elevated	70.1	68.7	68.8	70.4	73.1
	Barometric Pressure "Hg	30.17	30.18	30.19	30.19	30.19	30.19
	Absolute Pressure "Hg	24.28	24.29	24.30	24.30	24.30	24.30
VAPOR /INFLUENT	HC ppmv	33,720	"	32,480	-	42,546	
	CO_2 %	1.64	"	1.56	-	1.88	
	CO %	.44	"	.42	-	.83	
	O_2 %	18.2	"	18.0	-	16.4	
	H_2S ppm	0	"	0	-	0	
NOTES	Set GW/LNAPL pump 9.0 ft BGS - Initial EW induced vacuum set at 10 "H_2O, VWF = 4.84scfm - GWR = 5.90 gpm Very heavy initial LNAPL emulsion, 16% of volume, decreasing to 2% of volume NOTE: Must maintain a GW pump rate of 5.9 gpm to create a GW depression, drawdown, in the 3.0ft range. If induced vacuum is increased, LNAPL recovery ceases and only clear GW						
MANIFOLD	LNAPL % Vol Gals	-	8/14.2	2/3.5	2/3.5	2/3.5	2/3.5
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	Extraction Well DTLNAPL ft	8.70					
	Extraction Well DTGW ft	10.43					

( ) Indicates Well Pressure LNAPL = 1.73 ft.

OPERATING DATA - EVENT #1 C **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Parameters							
	Date:		08/26/14	-	-	-	-	-
	WELL # RW-3		Time / Hr Meter	Time / Hr Meter	Time / Hr Meter	Time / Hr Meter	Time / Hr Meter	Time / Hr Meter
			1230 / 6871.0	1300 / 6871.5	1330 / 6872.0	1400 / 6872.5	1430 / 6873.0	1530 / 6874.0
ENGINE/BLOWER	R.P.M.		2000	2000	2000	2000	2000	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	160	160	160	160	160	160
	Volts		13	13	13	13	13	13
	Intake Vacuum	"Hg	16	16	16	16	16	16
	Gas Flow Fuel/Propane	cfh	70	70	70	70	70	70
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	4.84	4.84	4.84	4.84	4.84	4.84
	Extraction Well Vacuum	"H_2O	10	10	10	10	10	10
	Pump Rate	gals/min	5.9	5.9	5.9	5.9	5.9	5.9
	Total Volume	gals	1056	1233	1410	1587	1764	2118
	Influent Vapor Temp.	°F	69	69	69	69	69	69
	Air Temperature	°F	74.1	75.0	78.8	81.2	83.3	
	Barometric Pressure	"Hg	31.17	31.16	30.15	30.14	30.13	
	Absolute Pressure	"Hg	24.29	24.28	24.27	24.26	24.25	
VAPOR /INFLUENT	HC	ppmv	42,920	-	43,530	-	41,720	
	CO_2	%	1.86	-	1.76	-	1.74	
	CO	%	.84	-	.80	-	.78	
	O_2	%	16.5	-	16.2	-	16.1	
	H_2S	ppm	0	-	0	-	0	
MANIFOLD	LNAPL	% Vol / Gals	2/3.0	2/3.0	2/3.0	2/3.0	2/	2/60
	Depth of GW Depression	ft	-3.0	-3.0	-3.0	-3.0	-3.0	
	Extraction Well DTLNAPL	ft						8.99
	Extraction Well DTGW	ft						9.12

OVE HOUR DATA

NOTES

EW induced vacuum and UWF steady @ 10"Hg, 4.84 scfm, GWR = 5.9 gpm

Liquid LNAPL recovery @ 2.0% of volume

NOTE: LAST DATA ENTRY FOR 1.0 HOUR

( ) Indicates Well Pressure

7FORMS/TestForms/1210017B

LNAPL = 0.131

OPERATING DATA - EVENT #1 D **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Date:	08/22/09	-	-	-	-	
	Parameters	Time 0730	Time 0800	Time 0830	Time 0900	Time 0930	Time
	WELL # RW-3	Hr Meter 6874.0	Hr Meter 6874.5	Hr Meter 6875.0	Hr Meter 6875.5	Hr Meter 6876.0	Hr Meter
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	
	Oil Pressure psi	50	50	50	50	50	
	Water Temp °F	140	160	160	160	160	
	Volts	13	13	13	13	13	
	Intake Vacuum "Hg	16	16	16	16	16	
	Gas Flow Fuel/Propane cfh	70	70	70	70	70	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	
	Extraction Well Flow scfm	4.86	4.86	4.86	4.86	4.86	
	Extraction Well Vacuum "H_2O	10	10	10	10	10	
	Pump Rate gals/min	6.4	6.4	6.4	6.4	6.4	
	Total Volume gals	-	192	384	576	768	
	Influent Vapor Temp °F	63	63	63	63	63	
	Air Temperature °F	58.3	58.9	59.2	59.6	60.8	
	Barometric Pressure "Hg	30.26	30.26	30.26	30.26	30.27	
	Absolute Pressure "Hg	24.35	24.35	24.35	24.35	24.36	
VAPOR /INFLUENT	HC ppmv	38,350	-	35,100	-	36,320	
	CO_2 %	3.30	-	2.94	-	2.74	
	CO %	.56	-	.44	-	.58	
	O_2 %	10.5	-	10.7	-	10.3	
	H_2S ppm	0	-	0	-	0	
NOTES	Set GW/LNAPL pump inlet @ 9.0 ft BGS - Mobilized SVE System and equipment - Initial EW induced vacuum set @ 10"H2O, VWF = 4.86 scfm GW R; 6.4 gpm to maintain a 3.0 ft drawdown - Recent rain added more GW Liquid LNAPL recovery on a decreasing trend 0930 Discontinue MDP - Restart on well RW-4 - Vapor Sample collected @ 0920 hrs						
MANIFOLD	LNAPL % Vol Gals	-	2 / 3.8	1.5 / 2.9	1.5 / 2.9	1.0 / 1.9	
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	
	Extraction Well DTLNAPL ft	8.92				9.12	
	Extraction Well DTGW ft	9.17				9.33	

( ) Indicates Well Pressure

LNAPL = 0.25'

OPERATING DATA - EVENT #1 E **PAGE #** 1

ACUVAC
MOBILE DUAL PHASE SYSTEM

Location: State Com J6, San Juan County, NM **Project Managers:** Sadler/Faucher

	Date:	08/27/14	-	-	-	-	-
	Parameters	Time 0930	Time 1000	Time 1030	Time 1100	Time 1130	Time 1200
	WELL # **RW-4**	Hr Meter 6876.0	Hr Meter 6876.5	Hr Meter 6877.0	Hr Meter 6877.5	Hr Meter 6878.0	Hr Meter 6878.5
ENGINE/BLOWER	R.P.M.	2400	2400	2400	2400	2400	2400
	Oil Pressure psi	50	50	50	50	50	56
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	12	12	12	12	12	12
	Gas Flow Fuel/Propane cfh	70	70	70	70	70	80
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	46.51	46.51	46.51	46.51	46.51	46.51
	Extraction Well Vacuum "H_2O	45	45	45	45	45	45
	Pump Rate gals/min	5.0	5.0	5.0	5.0	5.0	5.0
	Total Volume gals	-	150	300	450	600	750
	Influent Vapor Temp. °F	68	68	68	68	68	68
	Air Temperature °F	68.3	70.5	71.3	71.7	72.3	73.0
	Barometric Pressure "Hg	30.27	30.27	30.27	30.26	30.24	30.23
	Absolute Pressure "Hg	24.36	24.36	24.36	24.35	24.34	24.33
VAPOR /INFLUENT	HC ppmv	15,040	-	10,450	-	9,020	-
	CO_2 %	1.92	-	.66	-	.54	-
	CO %	.05	-	0	-	0	-
	O_2 %	18.3	-	18.5	-	18.6	-
	H_2S ppm	0		0	-	0	-
NOTES	Set GW/LNAPL Pump inlet @ 9.0 ft BGS - Initial FLW induced vacuum set @ 45 "H_2O, VWF = 46.51 scfm - GWR = 5.0 gpm Vapor sample collected @ 0940 Hrs, immediately after start up.						
MANIFOLD	LNAPL % Vol / Gals	-	8 / 12.0	5 / 7.5	5 / 7.5	4 / 6	3 / 4.5
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	Extraction Well DTLNAPL ft	8.71					
	Extraction Well DTGW ft	9.82					

( ) Indicates Well Pressure

LNAPL = 1.11 ft

OPERATING DATA - EVENT #1 E **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Sadler/Faucher**

	Date:	08/27/14	-	-	-	-	-
	Parameters	Time 1230	Time 1300	Time 1330	Time 1400	Time 1430	Time 1530
	WELL # **RW-4**	Hr Meter 6879.0	Hr Meter 6879.5	Hr Meter 6880.0	Hr Meter 6880.5	Hr Meter 6881.0	Hr Meter 6882.0
ENGINE/BLOWER	R.P.M.	2400	2400	2,400	2,400	2,400	2,400
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	160	160	160	160	160	160
	Volts	13	13	13	13	13	13
	Intake Vacuum "Hg	12	12	12	12	12	12
	Gas Flow Fuel/Propane cfh	80	80	80	80	80	80
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	46.51	46.51	46.51	46.51	46.51	46.51
	Extraction Well Vacuum "H_2O	45	45	45	45	45	45
	Pump Rate gals/min	5.0	5.0	5.0	5.0	5.0	5.0
	Total Volume gals	900	1050	1200	1350	1500	1800
	Influent Vapor Temp. °F	68	68	68	68	68	68
	Air Temperature °F	72.7	74.1	74.6	74.9	75.6	76.5
	Barometric Pressure "Hg	30.23	30.22	30.21	30.20	30.18	30.16
	Absolute Pressure "Hg	24.33	24.32	24.31	24.30	24.29	24.26
VAPOR /INFLUENT	HC ppmv	7,950	-	5,540	-	4,310	-
	CO_2 %	.44	-	.32	-	.22	-
	CO %	0	-	0	-	0	-
	O_2 %	18.8	-	18.9	-	19.1	-
	H_2S ppm	0	-	0	-	0	-

NOTES

EW induced vacuum and VWF steady @ 45" H_2O, 46.51 scfm
GWR @ 5.0 gpm. LNAPL liquid recovery recording a decreasing trend during the last 1.5 Hrs - NOTE TPH levels on a rapid decreasing trend.
1530 - Discontinued MAP. Event #6 IE completed

RW-3
9.07
9.49
.42

NOTE: LAST COLUMN OF DATA - FOR 1.0 HR

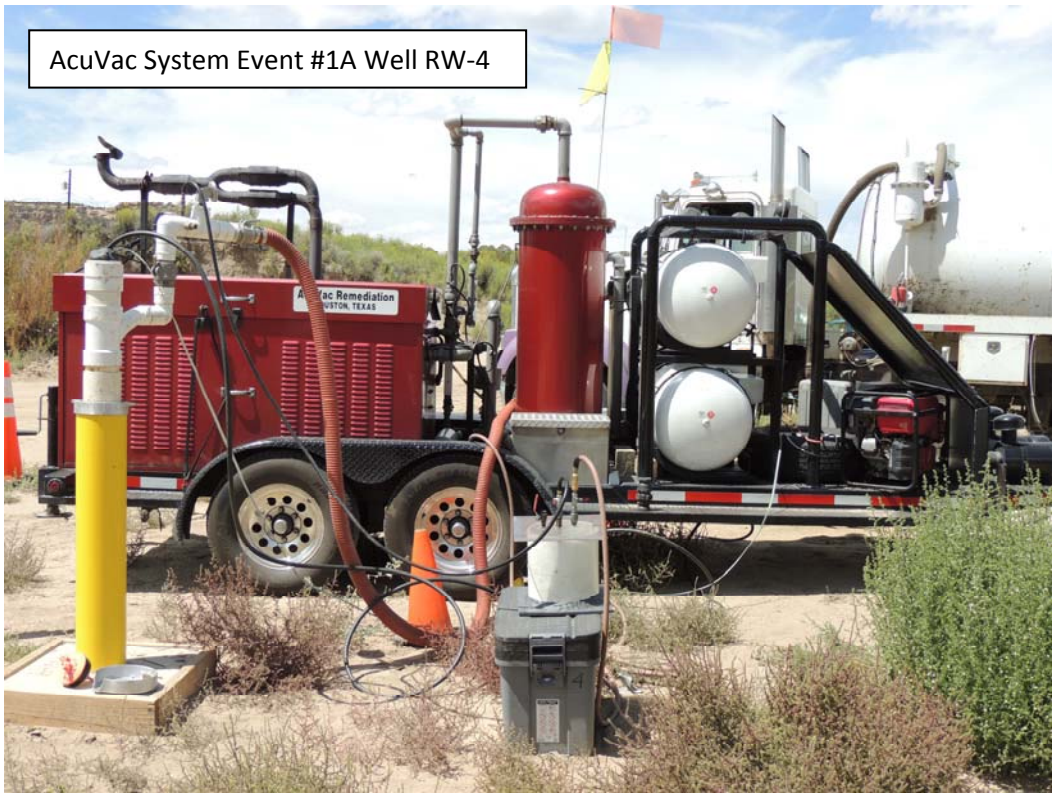
MANIFOLD	LNAPL % Vol / Gals	2.5 / 3.8	2.5 / 3.8	2.5 / 3.8	2.5 / 3.8	2 / 3.0	2 / 6.0
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	Extraction Well DTLNAPL ft						8.73
	Extraction Well DTGW ft						9.00

( ) Indicates Well Pressure

LNAPL = 0.07'

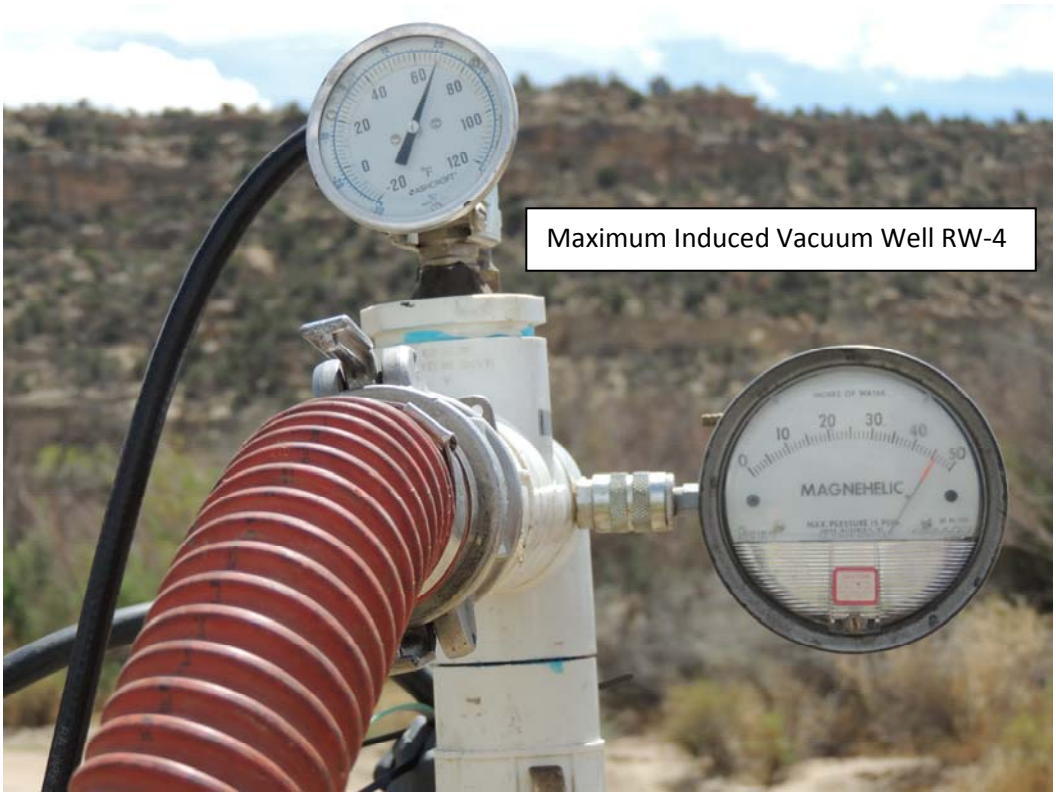
STATE COM J6
SAN JUAN COUNTY, NM

AcuVac System Event #1A Well RW-4



AcuVac System Event #1A Well RW-4

STATE COM J6
SAN JUAN COUNTY, NM



STATE COM J6
SAN JUAN COUNTY, NM

AcuVac Remediation, LLC
1656-H Townhurst, Houston, Texas 77043
713.468.6688 • www.acuvac.com

November 17, 2014

Mr. Jeff Walker, CPG,PMP
Project Manager
Conestoga-Rovers & Associates
6121 Indian School Road NE
Albuquerque, NM 67110

Dear Jeff:

Re: MDP Events, State Com J6, San Juan County, NM

At your request, we performed two 8.0-hour Mobile Dual Phase (MDP) Events #2A on Well RW-4 and #2B on Well RW-3, and one 4.0 hour Event #1C on Well RW-4 at the above referenced site. The Events were conducted on November 10, 11 and 14, 2014.

Following is the Report and a copy of the Operating Data collected during the above referenced Event #2. Table #1A is the Summary Well Data and Table #1B is the Summary Recovery Data on well RW-4. Table #2A is the Summary Well Data and Table #2B is the Summary Recovery Data on well RW-3. PSH is referred to as LNAPL in this report. GW samples are taken frequently in a 2,000 ml beaker, to determine the average LNAPL percentage and volume.

OBJECTIVES

The Objectives of an MDP Event are to:

- Evaluate the potential for removing liquid and vapor phase LNAPL (PSH) from the groundwater (GW) and soils in the subsurface formations.
- Expose the capillary fringe area and below to the Extraction Well (EW) induced vacuums.
- Increase the GW and contaminant specific yields with high induced vacuums.
- Provide an induced hydraulic gradient (IHG) to gain hydraulic control of the area during the Event period.
- Select the GW depression and pump rates to accomplish the above objectives.

METHODS AND EQUIPMENT

The tests were conducted using AcuVac's I-6 System, with Roots RAI-33 and RAI-22 blowers, various instrumentation, including the HORIBA® Analyzer, Solinst Interface Probes, Lumidor O_2 Meter, flow gauges, a sensitive instrument to determine barometric pressure, V-1 vacuum box to capture non-diluted vapor samples, Redi-Flo 2 total fluids pump and other special equipment.

The vacuum extraction portion of the AcuVac System consists of a vacuum pump driven by an internal combustion (IC) engine. The vacuum pump is connected to the extraction well and the vacuum created on the extraction well causes light hydrocarbons in the soil and on the GW to volatilize and flow through a moisture knockout tank to the vacuum pump and the IC Engine where they are burned as part of the normal combustion process. Propane is used as auxiliary fuel to help power the engine if the well vapors do not provide the required BTU.

Emissions from the engine are passed through three catalytic converters to ensure maximum destruction of removed hydrocarbon vapors. The engine's fuel to air ratio can be adjusted to maintain efficient combustion. Because the engine is the power source for all equipment, all systems stop when the engine stops. This eliminates any uncontrolled release of hydrocarbons. Since the AcuVac System is held entirely under vacuum, any leaks in the seals or connections are leaked into the System and not emitted into the atmosphere. The engine is automatically shut down by vacuum loss, low oil pressure or overheating.

The GW Extraction is provided by an in-well, Redi-Flo 2 total fluids pump that has the discharge line connected to a total volume meter. The discharge line from the volume meter is then connected to the stand-by tank. The electrical power for the GW pump was supplied from a 120v Honda generator. The GW flow rate can be adjusted to maintain a target level. Interface meters are used to measure all DTGW/DTLNAPL.

In order to monitor the TPH content of the well vapors, AcuVac utilizes a HORIBA® gas analyzer that is capable of detecting hydrocarbons up to 100,000 ppmv with undiluted samples. The samples are collected directly from the Well Vapor Flow within the manifold attached to the Extraction Well. The undiluted samples are processed immediately on site and the results recorded. Samples are generally collected every 60 minutes during the course of the Event, and more often if the circumstances dictate. The average of the vapor samples obtained along with the average Well Vapor Flow Rate are used to calculate the volume of vapors recovered in pounds per day and burned as IC Engine fuel in gallons per hour. The volume of vapors burned as fuel along with any auxiliary propane that is consumed is then reconciled to the known capabilities of the IC Engine of the AcuVac System to ensure overall accuracy.

The design of the AcuVac System enables complete independent control of both the Induced Well Vacuum and the GW pumping functions such that the AcuVac team can control the IHG to expose the maximum amount of the formation to SVE. The ability to separate the vacuum and liquid flows improves the LNAPL recovery rates, and enables the AcuVac team to record data specific to each.

SUMMARY OF MDP EVENT #2A Well RW-4

- The total Event time was 8.0 hours. The Event was conducted on November 10, 2014. The data is compared to Event #1E conducted on August 27, 2014 which had a total Event time of 6.0 hours.
- The total liquid volume recovered was 2,471 gals, of which 102.33 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 1.70 gals, **for a total liquid and vapor LNAPL recovery of 104.03 gals. This equates to an average of 13.00 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 2,983 ppmv, CO_2 = 1.05%, CO = 0%, O_2 = 19.2% and H_2S = 0.88 ppm.
- Compared with MDP Event #1E data, the average TPH levels decreased 5,744 ppmv, CO_2 increased 0.37%, CO decreased 0.01%, O_2 increased 0.5% and H_2S decreased 0.12 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 3,910 ppmv. Compared with MDP Event #1E data, the maximum TPH levels decreased 11,130 ppmv.

- The Average Induced Vacuum was 39.71"H_2O with a maximum vacuum of 40"H_2O. Compared with MDP Event #1E data, the average induced vacuum decreased 5.29"H_2O and the maximum induced vacuum decreased 5"H_2O.
- The average EW well vapor flow was 32.94 scfm with a maximum well vapor flow of 33.51 scfm. Compared with MDP Event #1E data, the average EW well vapor flow decreased 13.57 scfm, and the maximum well flow decreased at 13.00 scfm.
- The GW pump was set at 11.5 ft BTOC. The average GW pump rate was 5.15 gpm, and the maximum GW pump rate was 5.25 gpm .
- The average GW depression, based on the positioning of the GW pump, was 3.00 ft below static level.
- A LNAPL thickness of 0.53 ft was recorded prior to the start of Event #2A and a LNAPL thickness of 0.23 ft was recorded at the conclusion of the Event.

The total LNAPL removed, including liquid and vapor, during the 8.0 hour Event #2A Well RW-4 was 104.03 gals.

ADDITIONAL INFORMATION

- An estimated volume of 102.33 gal of liquid LNAPL was recovered during the 8.0 hour Event #2A. The vac truck operator reported on November 11, 2014, that when the liquid was separated into GW and LNAPL at the disposal site, 118 gals of LNAPL were recorded.
- Of the LNAPL recovered, 98.37% was recovered as liquid.
- TPH levels are on a decreasing trend compared to previous Events on Well RW-4.
- The TPH levels remained mostly steady throughout the Event.
- The high O_2 levels in the influent vapors indicate SVE short circuiting from the ground surface most likely occurred.

SUMMARY OF MDP EVENT #2B: WELL RW-3

- The total Event time was 8.0 hours. The Event was conducted on November 11, 2014. The data is compared to Event #1D conducted on August 27, 2014 which had a total Event time of 2.0 hours.
- The total liquid volume recovered was 2,688 gals, of which 57.63 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 1.52 gals, **for a total liquid and vapor LNAPL recovery of 59.15 gals. This equates to an average of 7.39 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 18,384 ppmv, CO_2 = 1.62%, CO = 0.06%, O_2 = 16.9% and H_2S = 0 ppm.
- Compared with MDP Event #1D data, the average TPH levels decreased 18,273 ppmv, CO_2 decreased 1.38%, CO decreased 0.49%, O_2 increased 5.7% and H_2S was steady at 0 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 20,080 ppmv. Compared with MDP Event #1D data, the maximum TPH levels decreased 18,270 ppmv.
- The Average Induced Vacuum was 9.71"H_2O with a maximum vacuum of 15"H_2O. Compared with MDP Event #1D data, the average induced vacuum decreased 0.29"H_2O and the maximum induced vacuum increased 5.00"H_2O.

- The average EW well vapor flow was 4.78 scfm with a maximum well vapor flow of 5.67 scfm. Compared with MDP Event #1D data, the average EW well vapor flow decreased 0.08 scfm, and the maximum well flow increased 0.82 scfm.
- The GW pump was set at 13.0 ft BTOC. The average GW pump rate was 5.62 gpm, and the maximum GW pump rate was 6.0 gpm.
- The average GW depression, based on the positioning of the GW pump, was 2.29 ft below static level.
- A LNAPL thickness of 0.42 ft was recorded prior to the start of Event #2B and no LNAPL was recorded at the conclusion of the Event.

The total LNAPL removed, including liquid and vapor, during the 8.0 hour Event #2B Well RW-3 was 59.15 gals.

ADDITIONAL INFORMATION

- Of the LNAPL recovered, 97.43% was recovered as liquid.
- TPH levels are on a decreasing trend compared to previous Events on Well RW-3.
- The TPH levels remained mostly steady throughout the Event.
- The high O_2 levels in the influent vapors indicate SVE short circuiting from the ground surface most likely occurred.

SUMMARY OF MDP EVENT #2C: WELL RW-4

- The total Event time was 4.0 hours. The Event was conducted on November 14, 2013. The data is compared to Event #2A conducted on November 10, 2013 which had a total Event time of 8.0 hours.
- The total liquid volume recovered was 1,200 gals, of which 21.75 gals were LNAPL.
- Total vapor LNAPL burned as IC engine fuel was 0.84 gals, **for a total liquid and vapor LNAPL recovery of 22.59 gals. This equates to an average of 5.65 gals/hr.**
- Average HORIBA® Analytical Data from the influent vapor samples was: HC = 2,554 ppmv, CO_2 = 1.07%, CO =0%, O_2 =19.0% and H_2S = 0 ppm.
- Compared with MDP Event #2A data, the TPH levels decreased 429 ppmv, CO_2 increased 0.02%, CO was steady at 0%, O_2 decreased 0.2% and H_2S decreased 0.88 ppm.
- The maximum HORIBA® Analytical Data from the influent vapor samples for TPH was 2,850 ppmv. Compared with MDP Event #2A data, the maximum TPH levels decreased 1,060 ppmv.
- The Average Induced Vacuum was 43.89"H_2O with a maximum vacuum of 45"H_2O. Compared with MDP Event #2A data, the average induced vacuum increased 4.18"H_2O and the maximum induced vacuum increased 5.00"H_2O.
- The average EW well vapor flow was 37.99 scfm with a maximum well vapor flow of 39.45 scfm. Compared with MDP Event #2A data, the average EW well vapor flow increased 5.05 scfm, and the maximum well flow increased 5.94 scfm.
- The GW pump was set at 11 ft BTOC. The average GW pump rate was 5.0 gpm, and the maximum GW pump rate was 5.0 gpm.
- The average GW depression, based on the positioning of the GW pump, was 2.22 ft below static level.

- A LNAPL thickness of 0.21 ft was recorded prior to the start of Event #2A and no LNAPL was recorded at the conclusion of the Event.

The total LNAPL removed, including liquid and vapor, during the 4.0 hour Event #2C (Well RW-4) was 22.59 gals.

ADDITIONAL INFORMATION

- Of the LNAPL recovered, 96.29% was recovered as liquid.
- TPH levels are on a decreasing trend compared to previous Events on Well RW-4.
- The TPH levels remained mostly steady throughout the Event.
- The low O_2 levels in the influent vapors indicate SVE short circuiting from the ground surface most likely occurred.

GENERAL OVERVIEW

Event #2 proved that Mobile Dual Phase is a very effective methodology to remediate this site. The total LNAPL removed, including liquid and vapor from Well RW-4 was 126.62 gals in 12 hours for an average recovery rate of 10.55 gals/hr. The total LNAPL removed, including liquid and vapor from Well RW-3 in 8 hours was 59.15 gals for an average recovery rate of 7.39 gals/hr. The total liquid and vapor LNAPL removed for Event #2 was 185.77 gals.

The Event alternated between Wells RW-3 and RW-4 to allow for a rebound of the liquid LNAPL around each well bore. Future Events should be designed to perform MDP on each well for an 8 hour period and then spend 4 hours in each well on the third day. This will maximize the LNAPL recovery.

METHOD OF CALIBRATION AND CALCULATIONS

The HORIBA® Analytical instrument is calibrated with Hexane and CO_2. In all subsequent Events, the test data will be compared to the previous Event to evaluate the progress for this remediation project.

The formula used to calculate the emission rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

ADDITIONAL INFORMATION INCLUDED WITH REPORT

- Table #1A Summary Well Data for Well RW-4
- Table #1B Summary Recovery Data for Well RW-4
- Table #2A Summary Well Data for Well RW-3
- Table #2B Summary Recovery Data for Well RW-3
- Graphical Summary of Events #1A Through #2C Well RW-4
- Recorded Data
- Photographs of the MDP System and well RW-4 and RW-3.

After you have reviewed the report and if you have any questions, please contact me. We appreciate you selecting AcuVac to provide this service.

Sincerely,
ACUVAC REMEDIATION, LLC

Paul D. Faucher
Vice President, Operations

Summary Well Data

Table #1A

Event		2A	2C
WELL NO.		**RW-4**	**RW-4**
Total Event Hours		8.0	4.0
Cumulative Event Hours		8.0	28.0
TD	ft	13.5	13.5
Well Screen	ft	10.0 to 13.5 ft	10.0 to 13.5 ft
Well Size	in	4.0	4.0
Well Data			
DTGW - Static - Start Event	ft	8.41	8.15
DTLNAPL - Static - Start Event	ft	7.88	7.94
LNAPL	ft	0.53	0.21
Hydro-Equivalent- Beginning	ft	8.04	8.00
DTGW - End Event	ft	8.18	8.59
DTLNAPL - End Event	ft	7.95	-
LNAPL	ft	0.23	-
Hydro-Equivalent- Ending	ft	8.02	8.59
Extraction Data			
Average Extraction Well Vacuum	"H_2O	39.71	43.89
Maximum Extraction Well Vacuum	"H_2O	40.00	45.00
Average Extraction Well Vapor Flow	scfm	32.94	37.99
Maximum Extraction Well Vapor Flow	scfm	33.51	39.45
Average GW/LNAPL Pump Rate	gpm	5.15	5.00
Maximum GW/LNAPL Pump Rate	gpm	5.25	5.00
Influent Data			
Maximum TPH	ppmv	3,910	2,850
Average TPH	ppmv	2,983	2,554
Average CO_2	%	1.05	1.07
Average CO	%	0	0
Average O_2	%	19.2	19.0
Average H_2S	ppm	0.88	0

Summary Recovery Data

Table #1B

Event		2A	2C
WELL NO.		**RW-4**	**RW-4**
Recovery Data- Current Event			
Total Liquid Volume Recovered	gals	2,471	1,200
Total Liquid LNAPL Recovered	gals	102.33	21.75
Total Liquid LNAPL Recovered / Total Liquid	%	4.14	1.81
Total Liquid LNAPL Recovered / Total LNAPL	%	98.37	96.29
Total Vapor LNAPL Recovered	gals	1.70	0.84
Total Vapor LNAPL Recovered / Total LNAPL	%	1.63	3.71
Total Vapor and Liquid LNAPL Recovered	gals	104.03	22.59
Average LNAPL Recovery	gals/hr	13.00	5.65
Total LNAPL Recovered	lbs	728	158
Total Volume of Well Vapors	cu. ft	15,811	9,118
Recovery Data- Cumulative			
Total Liquid Volume Recovered	gals	7,191	8,391
Total Liquid LNAPL Recovered	gals	334.10	355.85
Total Vapor LNAPL Recovered	gals	20.05	20.88
Total Vapor and Liquid LNAPL Recovered	gals	354.15	376.73
Average LNAPL Recovery	gals/hr	14.76	13.45
Total LNAPL Recovered	lbs	2,196	2,354
Total Volume of Well Vapors	cu. ft	60,254	69,372

Summary Well Data
Table #2A

Event		2B
WELL NO.		**RW-3**
Total Event Hours		8.0
Cumulative Event Hours		16.0
TD	ft	13.5
Well Screen	ft	10.0 to 13.5 ft
Well Size	in	4.0
Well Data		
DTGW - Static - Start Event	ft	8.64
DTLNAPL - Static - Start Event	ft	8.22
LNAPL	ft	0.42
Hydro-Equivalent- Beginning	ft	8.35
DTGW - End Event	ft	8.69
DTLNAPL - End Event	ft	-
LNAPL	ft	-
Hydro-Equivalent- Ending	ft	8.69
Extraction Data		
Average Extraction Well Vacuum	"H_2O	9.71
Maximum Extraction Well Vacuum	"H_2O	15.00
Average Extraction Well Vapor Flow	scfm	4.78
Maximum Extraction Well Vapor Flow	scfm	5.67
Average GW/LNAPL Pump Rate	gpm	5.62
Maximum GW/LNAPL Pump Rate	gpm	6.00
Influent Data		
Maximum TPH	ppmv	20,080
Average TPH	ppmv	18,384
Average CO_2	%	1.62
Average CO	%	0.06
Average O_2	%	17.2
Average H_2S	ppm	0

Summary Recovery Data

Table #2B

Event		2B
WELL NO.		**RW-3**
Recovery Data- Current Event		
Total Liquid Volume Recovered	gals	2,688
Total Liquid LNAPL Recovered	gals	57.63
Total Liquid LNAPL Recovered / Total Liquid	%	2.19
Total Liquid LNAPL Recovered / Total LNAPL	%	97.43
Total Vapor LNAPL Recovered	gals	1.52
Total Vapor LNAPL Recovered / Total LNAPL	%	2.57
Total Vapor and Liquid LNAPL Recovered	gals	59.15
Average LNAPL Recovery	gals/hr	7.39
Total LNAPL Recovered	lbs	414
Total Volume of Well Vapors	cu. ft	2,294
Recovery Data- Cumulative		
Total Liquid Volume Recovered	gals	5,574
Total Liquid LNAPL Recovered	gals	122.25
Total Vapor LNAPL Recovered	gals	4.76
Total Vapor and Liquid LNAPL Recovered	gals	127.01
Average LNAPL Recovery	gals/hr	7.94
Total LNAPL Recovered	lbs	1,363
Total Volume of Well Vapors	cu. ft	24,996

OPERATING DATA - EVENT #2 A **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers:** Faucher/George

	Date:	11/10/14	-	-	-	-	-
	Parameters	Time 0800	Time 0830	Time 0900	Time 0930	Time 1000	Time 1030
	WELL # **RW-4**	Hr Meter 6986.0	Hr Meter 6986.5	Hr Meter 6987.0	Hr Meter 6987.5	Hr Meter 6988.0	Hr Meter 6988.5
ENGINE/BLOWER	R.P.M.	2200	2200	2100	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	120	120	120	120	120	120
	Volts	14	14	14	14	14	14
	Intake Vacuum "Hg	12	12	14	14	14	14
	Gas Flow Fuel/Propane cfh	120	120	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	29.57	32.67	32.67	32.67	32.67	32.67
	Extraction Well Vacuum "H_2O	35	40	40	40	40	40
	Pump Rate gals/min	4.5	4.6	5.0	5.25	5.25	5.25
	Total Volume gals	-	135	273	423	581	738
	Influent Vapor Temp. °F	48	48	50	50	50	50
	Air Temperature °F	34.1	38.2	42.3	46.1	48.2	51.5
	Barometric Pressure "Hg	29.82	29.82	29.82	29.82	29.82	29.82
	Absolute Pressure "Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC ppmv	-	3910	-	3570	-	3040
	CO_2 %	-	2.44	-	1.68	-	1.10
	CO %	-	0	-	0	-	0
	O_2 %	-	17.1	-	18.5	-	19.4
	H_2S ppm	-	0	-	0	-	0

NOTES

ARRIVED ON SITE AT 0645 HRS. GAUGED WELL MW-4 HE WAS 8.04 BTOC. PLACED TOTAL FLUIDS PUMP AT 11.0 FT BTOC. MOBILIZED THE ACUVAC SYSTEM. HELD TAILGATE SAFETY MEETING. PERFORMED SAFETY CHECKS. STARTED EVENT AT 0800 HRS. SET INITIAL WELL VAC AT 35"H_2O RESULTING IN INITIAL WELL FLOW OF 29.57SCFM. SET INITIAL PUMP RATE AT 4.5 GPM. AT 0830 HRS ↑ WELL VAC TO 40"H_2O, ↑ WVF TO 32.67. INCREASED PUMP RATE TO 4.6 GPM @ 0830 HRS, ↑ 5.0GPM AT 0900 HRS, 5.25GPM AT 1000 HRS.

MANIFOLD	LNAPL % Vol / Gals	- / -	7.0 / 9.45	6 / 8.28	6 / 9.00	6 / 9.45	6 / 9.45
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
	Extraction Well DTLNAPL ft	7.98					
	Extraction Well DTGW ft	8.41					

( ) Indicates Well Pressure

LNAPL 0.53

OPERATING DATA - EVENT #2 A PAGE # 2

ACUVAC
MOBILE DUAL PHASE SYSTEM

Location: State Com J6, San Juan County, NM **Project Managers: Faucher/George**

		Date:	11/10/14					
	Parameters		Time 1100	Time 1130	Time 1200	Time 1230	Time 1300	Time 1330
	WELL # RW-4		Hr Meter 6989.0	Hr Meter 6989.5	Hr Meter 6990.0	Hr Meter 6990.5	Hr Meter 6991.0	Hr Meter 6991.5
ENGINE/BLOWER	R.P.M.		2000	2000	2000	2000	2000	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	130	130	130	130	130	130
	Volts		14	14	14	14	14	14
	Intake Vacuum	"Hg	14	14	14	14	14	14
	Gas Flow Fuel/Propane	cfh	110	110	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow	scfm	32.67	32.67	33.51	33.51	33.51	33.51
	Extraction Well Vacuum	"H_2O	40	40	40	40	40	40
	Pump Rate	gals/min	5.25	5.25	5.25	5.25	5.25	5.25
	Total Volume	gals	896	1,053	1211	1368	1526	1683
	Influent Vapor Temp.	°F	50	50	50	50	50	50
	Air Temperature	°F	54.3	57.5	61.2	63.4	63.9	64.1
	Barometric Pressure	"Hg	29.82	29.82	29.81	29.80	29.79	29.78
	Absolute Pressure	"Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC	ppmv	-	2870	-	2820	-	2630
	CO_2	%	-	0.86	-	0.70	-	0.54
	CO	%	-	0	-	0	-	0
	O_2	%	-	19.5	-	19.7	-	19.8
	H_2S	ppm	-	0	-	0	-	0
MANIFOLD	LNAPL	% Vol Gals	6/9.45	4/6.30	4/6.30	4/6.30	4/6.30	4/6.30
	Depth of GW Depression	ft	-3.0	-3.0	-3.0	-3.0	-3.0	-30
	Extraction Well DTLNAPL	ft						
	Extraction Well DTGW	ft						

NOTES

WELL VAC AND WVF STEADY DURING PERIOD AT 33.51* SCFM AND 40"H_2O.
TFP RATE STEADY AT 5.25 GPM. LNAPL RECOVERY ↓ TO 4 90 AT 1130 HRS AND THEN STEADY DURING REST OF PERIOD.
TPH VAPORS ON A SLIGHLY DECREASING TREND DURING PERIOD. TPH VAPORS SIGNIFICANTLY LESS THAN EVENT #1
IF INDUCED WELL VAC IS INCREASED LNAPL RECOVERY STOPS AND ONLY CLEAR GW
* AFTER INCREASING AT 1200 HRS.

( ) Indicates Well Pressure

OPERATING DATA - EVENT #2 A **PAGE #** 3

ACUVAC MOBILE DUAL PHASE SYSTEM

Location: State Com J6, San Juan County, NM **Project Managers:** Faucher/George

	Date:	11/10/14					
	Parameters	Time 1400	Time 1430	Time 1500	Time 1530	Time 1600	Time
	WELL # **RW-4**	Hr Meter 6992.0	Hr Meter 6992.5	Hr Meter 6993.0	Hr Meter 6993.5	Hr Meter 6994.0	Hr Meter
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	
	Oil Pressure psi	50	50	50	50	50	
	Water Temp °F	130	130	130	130	130	
	Volts	14	14	14	14	14	
	Intake Vacuum "Hg	14	14	14	14	14	
	Gas Flow Fuel/Propane cfh	110	110	110	110	110	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	OFF	
	Extraction Well Flow scfm	33.51	33.51	33.51	33.51	33.51	
	Extraction Well Vacuum "H_2O	40	40	40	40.	40	
	Pump Rate gals/min	5.25	5.25	5.25	5.25	5.25	
	Total Volume gals	1841	1998	2156	2313	2471	
	Influent Vapor Temp. °F	50	50	50	50	50	
	Air Temperature °F	66.3	66.5	63.2	62.1	61.5	
	Barometric Pressure "Hg	29.78	29.78	29.78	29.78	29.78	
	Absolute Pressure "Hg	—	—	—	—	—	
VAPOR /INFLUENT	HC ppmv	—	2600	—	2420	—	
	CO_2 %	—	0.56	—	0.52	—	
	CO %	—	0	—	0	—	
	O_2 %	—	19.9	—	19.9	—	
	H_2S ppm	—	0	—	0	—	

NOTES

WELL VAC AND WVF STEADY AT 40"H_2O AND 33.57 SCFM DURING PERIOD. TPP RATE STEADY AT 5.25 GPM. LNAPL RECOVERY STEADY AT 2% DURING PERIOD. THE RECOVERED LIQUID LNAPL WAS RECORDED AS 102.33 GALLONS. THE VAC TRUCK OPERATOR REPORTED THAT 118 GALS WERE SEPARATED FROM THE RECOVERED LIQUID.

AT 1600 HRS EVENT CONCLUDED. WELL WAS GAUGED. SITE WAS SECURED ACUVAC SYSTEM DEMOBILIZED.

MANIFOLD	LNAPL % Vol / Gals	2/3.15	2/3.15	2/3.15	2/3.15	2/3.15	
	Depth of GW Depression ft	-3.0	-3.0	-3.0	-3.0	-3.0	
	Extraction Well DTLNAPL ft					7.95	
	Extraction Well DTGW ft					8.18	

( ) Indicates Well Pressure

7FORMS/TestForms/1210017B

LNAPL 0.23

OPERATING DATA - EVENT #2 B **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Faucher/George**

	Date:	11/11/14					
	Parameters	Time 0730	Time 0800	Time 0830	Time 0900	Time 0930	Time 1000
	WELL # **RW-3**	Hr Meter 6994.5	Hr Meter 6995.0	Hr Meter 6995.5	Hr Meter 6996.0	Hr Meter 6996.5	Hr Meter 6997.0
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	120	120	120	120	120	120
	Volts	14	14	14	14	14	14
	Intake Vacuum "Hg	16	16	16	16	16	16
	Gas Flow Fuel/Propane cfh	110	110	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	3.99	3.99	3.99	3.99	3.99	3.99
	Extraction Well Vacuum "H_2O	5	5	5	5	5	5
	Pump Rate gals/min	5.0	5.0	5.0	5.0	5.7	5.7
	Total Volume gals	-	150	300	450	600	771
	Influent Vapor Temp. °F	50	50	50	50	50	50
	Air Temperature °F	34.1	35.4	37.9	41.3	43.5	48.2
	Barometric Pressure "Hg	29.94	29.94	29.94	29.94	29.95	29.95
	Absolute Pressure "Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC ppmv	-	17980	-	17800	-	17780
	CO_2 %	-	2.08	-	1.98	-	1.53
	CO %	-	.07	-	.07	-	0.04
	O_2 %	-	17.9	-	17.8	-	17.10
	H_2S ppm	-	0	-	0	-	

NOTES

ARRIVED ON SITE AT 0645 HRS. MOBILIZED THE ACUVAC SYSTEM. GAUGED THE WELL AND PLACED TOTAL FLUIDS PUMP AT 13 BTOC RESULTING IN A 3 FT GWD. PERFORMED TAILGATE SAFETY MEETING AND ALL SAFETY CHECKS. ALL OK. AT 0800 HRS RELOCATED TFP TO 12.5 FT BTOC. PRODUCT RECOVERY IMPROVED. SET INITIAL WELL VAC AT 5" H_2O RESULTING IN WVF OF 3.99 SCFM. TFP RATE SET A 5.0 GPM INITIALLY AND INCREASED RATE TO 5.7 GPM AT 0930 HRS. TPH VAPORS SIGNIFICANTLY LESS THAN EVENT #1

MANIFOLD	LNAPL % Vol / Gals	-/-	6/9.0	4/6.0	2/3.0	2/3.42	2/3.42
	Depth of GW Depression ft	-3.0	-2.5	-2.5	-2.5	-2.5	-2.5
	Extraction Well DTLNAPL ft	8.22					
	Extraction Well DTGW ft	8.64					

( ) Indicates Well Pressure

LNAPL .42

OPERATING DATA - EVENT #2B **PAGE # 2** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Faucher/George**

	Parameters						
	Date:	11/11/14					
	Time	1030	1100	1130	1200	1230	1300
	WELL # **RW-3** Hr Meter	6997.5	6998.0	6998.5	6999.0	6999.5	7000.0
ENGINE/BLOWER	R.P.M.	2000	2000	2000	2000	2000	2000
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	120	120	120	120	120	120
	Volts	14	14	14	14	14	14
	Intake Vacuum "Hg	16	16	16	16	16	16
	Gas Flow Fuel/Propane cfh	110	110	110	110	110	110
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	3.99	3.99	3.99	5.67	5.67	5.67
	Extraction Well Vacuum "H_2O	5	5	5	15	15	15
	Pump Rate gals/min	5.7	5.7	5.7	5.7	5.7	5.7
	Total Volume gals	942	1113	1284	1455	1626	1797
	Influent Vapor Temp. °F	52	52	54	54	56	56
	Air Temperature °F	51.1	52.8	54.6	55.3	55.7	56.3
	Barometric Pressure "Hg	29.95	29.94	29.93	29.92	29.91	29.90
	Absolute Pressure "Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC ppmv	-	17810	-	19650	-	19620
	CO_2 %	-	1.66	-	1.64	-	1.52
	CO %	-	.08	-	0	-	08
	O_2 %	-	16.8	-	16.5	-	16.3
	H_2S ppm	-	0	-	0	-	0

NOTES

AT 1030 HRS THE LNAPL RECOVERY RATE ↓ 1% BASED ON LIQUID SAMPLES.
AT 1200 HRS THE TOTAL FLUIDS PUMP WAS RELOCATED TO 12 FT BTOC RESULTING IN A GWD OF 2.0 FT. THE INDUCED WELL VAC WAS INCREASED TO 15" H_2O RESULTING IN A WVF OF 5.67 SCFM. THE TPH VAPORS INCREASED AS A RESULT OF THE INCREASED INDUCED WELL VAC. LIQUID LNAPL RECOVERY INCREASED TO 2% BASED ON LIQUID SAMPLES.

MANIFOLD							
	LNAPL % Vol / Gals	1 / 1.71	1 / 1.71	1 / 1.71	2 / 3.42	2 / 3.42	2 / 3.42
	Depth of GW Depression ft	-2.5	-2.5	-2.5	-2.0	-2.0	-2.0
	Extraction Well DTLNAPL ft						
	Extraction Well DTGW ft						

( ) Indicates Well Pressure

OPERATING DATA - EVENT #2 B **PAGE # 3** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers: Faucher/George**

	Parameters							
	Date:							
	Time		1330	1400	1430	1500	1530	
	WELL # RW-3	Hr Meter	6700.5	6701.0	6701.5	6702.0	6702.5	
ENGINE/BLOWER	R.P.M.		2000	2000	2000	2000	2000	
	Oil Pressure	psi	50	50	50	50	50	
	Water Temp	°F	120	120	130	130	130	
	Volts		14	14	14	14	14	
	Intake Vacuum	"Hg	16	16	16	16	16	
	Gas Flow Fuel/Propane	cfh	110	110	110	110	110	
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump	ON/OFF	ON	ON	ON	ON	OFF	
	Extraction Well Flow	scfm	5.67	5.67	5.67	5.67	5.67	
	Extraction Well Vacuum	"H_2O	15	15	15	15	15	
	Pump Rate	gals/min	6.0	6.0	6.0	6.0	6.0	
	Total Volume	gals	1968	2148	2328	2508	2688	
	Influent Vapor Temp.	°F	56	56	56	56	56	
	Air Temperature	°F	56.9	57.4	59.2	60.7	61.5	
	Barometric Pressure	"Hg	29.90	29.90	29.90	29.90	29.90	
	Absolute Pressure	"Hg	-	-	-	-	-	
VAPOR /INFLUENT	HC	ppmv	-	20,080	-	19330	-	
	CO_2	%	-	1.40	-	1.10	-	
	CO	%	-	.08	-	.02	-	
	O_2	%	-	16.5	-	16.1	-	
	H_2S	ppm	-	0	-	0	-	
MANIFOLD	LNAPL % Vol Gals		2/3.60	2/3.60	2/3.60	2/3.60	2/3.60	
	Depth of GW Depression	ft	-2.0	-2.0	-2.0	-2.0	-2.0	
	Extraction Well DTLNAPL	ft					-	
	Extraction Well DTGW	ft					8.69	

NOTES

INDUCED WELL VAC AND WVF STEADY DURING PERIOD AT 15"H_2O AND 5.67SCFM TOTAL FLUIDS PUMP RATE INCREASED TO 6.0 GPM. TPH WELL VAPORS MOSTLY STEADY DURING PERIOD. AT 1530 EVENT CONCLUDED. WELL MW-3 WAS GAUGED AND NO LNAPL WAS PRESENT IN THE WELL. DEMOBILIZED THE ACUVAC SYSTEM. SECURED SITE AND DEPARTED.

( ) Indicates Well Pressure

7FORMS/TestForms/1210017B

LNAPL Ø

OPERATING DATA - EVENT #2C **PAGE # 1** **ACUVAC MOBILE DUAL PHASE SYSTEM**

Location: State Com J6, San Juan County, NM **Project Managers:** Faucher/George

	Parameters						
	Date:	11/14/14					
	Time	0730	0800	0830	0900	0930	1000
	WELL # RW-4 Hr Meter	7019.0	7019.5	7020.0	7020.5	7021.0	7021.5
ENGINE/BLOWER	R.P.M.	2200	2200	2200	2200	2200	2200
	Oil Pressure psi	50	50	50	50	50	50
	Water Temp °F	120	120	120	120	120	120
	Volts	14	14	14	14	14	14
	Intake Vacuum "Hg	14	14	14	14	14	14
	Gas Flow Fuel/Propane cfh	120	120	120	120	120	120
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump ON/OFF	ON	ON	ON	ON	ON	ON
	Extraction Well Flow scfm	31.00	35.19	39.04	39.45	39.45	39.45
	Extraction Well Vacuum "H_2O	40	40	45	45	45	45
	Pump Rate gals/min	5.0	5.0	5.0	5.0	5.0	5.0
	Total Volume gals	-	150	300	450	600	750
	Influent Vapor Temp. °F	48	48	48	48	48	48
	Air Temperature Cloudy °F	38.1	39.6	41.2	43.4	45.3	46.5
	Barometric Pressure "Hg	30.28	30.28	30.28	30.28	30.28	30.28
	Absolute Pressure "Hg	-	-	-	-	-	-
VAPOR /INFLUENT	HC ppmv	-	2850	2630	2560	-	2420
	CO_2 %	-	1.94	1.12	.98	-	.74
	CO %	-	0	0	0	-	0
	O_2 %	-	17	18.3	19.6	-	20
	H_2S ppm	-	0	0	0	-	0
NOTES	ARRIVED ON SITE AT 0645 HRS MOBILIZED THE ACUVAC SYSTEM. PERFORMED TAILGATE SAFETY MEETING. GANGED THE WELL. PLACED THE TOTAL FLUIDS PUMP AT 11.0 FT BTOC. PERFORMED ALL SAFETY CHECKS. ALL OK. SET INITIAL INDUCED WELL VAC AT 40" H_2O RESULTING IN A WVF OF 31.00 SCFM. AT 0830 HRS RAISED THE TOTAL FLUIDS PUMP TO 10 FT BTOC AND INCREASED INDUCED WELL VAC TO 45" H_2O RESULTING IN A WVF OF 39.04 SCFM. TPH VAPORS LOWER IN THE SAME RANGE AS THE END OF EVENT 2A.						
MANIFOLD	LNAPL % Vol / Gals	-/-	2/3.0	2/3.0	2/3.0	2/3.0	2/3.0
	Depth of GW Depression ft	-3.0	-3.0	-2.0	-2.0	-2.0	-2.0
	Extraction Well DTLNAPL ft	7.54					
	Extraction Well DTGW ft	8.15					

( ) Indicates Well Pressure

LNAPL .21

7FORMS/TestForms/1210017B

AVR

OPERATING DATA - EVENT #2C **PAGE # 2**

ACUVAC
MOBILE DUAL PHASE SYSTEM

Location: State Com J6, San Juan County, NM **Project Managers: Faucher/George**

	Date:	11/14/14					
	Parameters	Time 1030	Time 1100	Time 1130	Time	Time	Time
	WELL # **RW-4**	Hr Meter 7022.0	Hr Meter 7022.5	Hr Meter 7023.0	Hr Meter	Hr Meter	Hr Meter
ENGINE/BLOWER	R.P.M.	2200	2200	2200			
	Oil Pressure psi	50	50	50			
	Water Temp °F	120	120	120			
	Volts	14	14	14			
	Intake Vacuum "Hg	14	14	14			
	Gas Flow Fuel/Propane cfh	120	120	120			
ATMOSPHERE/VACUUM/AIR PUMP/VOLUME	GW Pump **ON/OFF**	ON	ON	OFF			
	Extraction Well Flow scfm	39.45	39.45	39.45			
	Extraction Well Vacuum "H_2O	45	45	45			
	Pump Rate gals/min	5.0	5.0	5.0			
	Total Volume gals	500	1050	1200			
	Influent Vapor Temp. °F	48	48	48			
	Air Temperature CLOUDY °F	46.9	47.2	47.4			
	Barometric Pressure "Hg	30.28	30.28	30.28			
	Absolute Pressure "Hg	–	–	–			
VAPOR /INFLUENT	HC ppmv	–	2310	–			
	CO_2 %	–	.58	–			
	CO %	–	0	–			
	O_2 %	–	20.2	–			
	H_2S ppm	–	0	–			
NOTES	INDUCED WELL VAC AND WVF STEADY DURING PERIOD. LNAPL RECOVERY DECREASED TO 1.5% AT 1000 HRS. TPH VAPORS ON A DECREASING TREND DURING EVENT. AT 1130 HRS A STOP WORK ORDER WAS AGREED TO BY ALL PARTIES DUE TO INCLIMATE WEATHER. ACUVAC SYSTEM DEMOBILIZED AND SITE SECURED DEPARTED SITE AT 1215 HRS.						
MANIFOLD	LNAPL % Vol Gals	1.5/2.25	1.5/2.25	1.5/2.25			
	Depth of GW Depression ft	-2.0	-2.0	-2.0			
	Extraction Well DTLNAPL ft			–			
	Extraction Well DTGW ft			8.59			

( ) Indicates Well Pressure

LNAPL 0

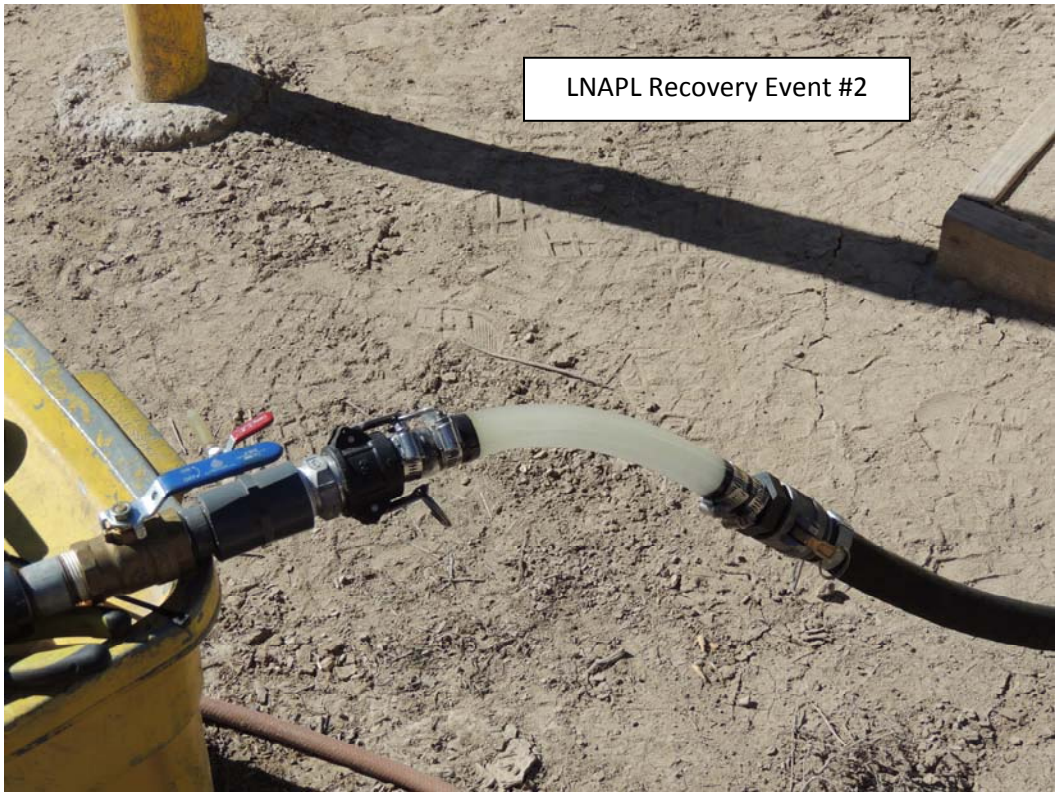
STATE COM J6
SAN JUAN COUNTY, NM

AcuVac System Event #2

AcuVac System Event #2

STATE COM J6
SAN JUAN COUNTY, NM

STATE COM J6
SAN JUAN COUNTY, NM



Appendix C

Analytical Laboratory Reports

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

May 30, 2014

Jeffrey Walker
COP Conestoga-Rovers & Associa
6121 Indian School Rd. NE
Ste. 200
Albuquerque, NM 87110

RE: Project: 081773 State Com J-6
Pace Project No.: 60169315

Dear Jeffrey Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on May 15, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Alice Flanagan
alice.flanagan@pacelabs.com
Project Manager

Enclosures

cc: Christine Mathews, COP Conestoga-Rovers & Associa

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

CERTIFICATIONS

Project: 081773 State Com J-6
Pace Project No.: 60169315

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-13-4
Utah Certification #: KS000212013-3
Illinois Certification #: 003097

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 081773 State Com J-6
Pace Project No.: 60169315

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60169315001	**GW-081773-051214-MW-1**	Water	05/12/14 16:25	05/15/14 08:20
60169315002	**GW-081773-051214-RW-1**	Water	05/12/14 16:35	05/15/14 08:20
60169315003	**GW-081773-051214-RW-3**	Water	05/12/14 16:45	05/15/14 08:20
60169315004	**DRUM CONTENTS**	Solid	05/08/14 13:20	05/15/14 08:20
60169315005	**TRIP BLANK**	Water	05/08/14 13:20	05/15/14 08:20

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SAMPLE ANALYTE COUNT

Project: 081773 State Com J-6
Pace Project No.: 60169315

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60169315001	**GW-081773-051214-MW-1**	EPA 8270C by SIM	NAW	18
		EPA 8260/OA1	JTK, JTS	8
60169315002	**GW-081773-051214-RW-1**	EPA 8270C by SIM	NAW	18
		EPA 8260/OA1	JTS, RAB	8
60169315003	**GW-081773-051214-RW-3**	EPA 8270C by SIM	NAW	18
		EPA 8260/OA1	JTS, RAB	8
60169315004	**DRUM CONTENTS**	EPA 6010	SMW	1
		ASTM D2974	DWC	1
60169315005	**TRIP BLANK**	EPA 8260/OA1	RAB	8

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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 081773 State Com J-6
Pace Project No.: 60169315

Method: **EPA 6010**
Description: 6010 MET ICP, TCLP
Client: COP Conestoga-Rovers & Associates, Inc. NM
Date: May 30, 2014

General Information:
1 sample was analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3010 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.

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.

Additional Comments:

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

PROJECT NARRATIVE

Project: 081773 State Com J-6
Pace Project No.: 60169315

Method: **EPA 8270C by SIM**
Description: 8270 MSSV PAH by SIM
Client: COP Conestoga-Rovers & Associates, Inc. NM
Date: May 30, 2014

General Information:
3 samples were analyzed for EPA 8270C by SIM. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3510C 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.

Additional Comments:

Pace Analytical Services, Inc.
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Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 081773 State Com J-6
Pace Project No.: 60169315

Method: **EPA 8260/OA1**
Description: 8260/OA1 UST, Water
Client: COP Conestoga-Rovers & Associates, Inc. NM
Date: May 30, 2014

General Information:
4 samples were analyzed for EPA 8260/OA1. All samples were received in acceptable condition with any exceptions noted below.

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: MSV/61658
A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: MSV/61734
A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: MSV/61781
A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

QC Batch: MSV/61950
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, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 081773 State Com J-6
Pace Project No.: 60169315

Sample: GW-081773-051214-MW-1 **Lab ID: 60169315001** Collected: 05/12/14 16:25 Received: 05/15/14 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270C by SIM Preparation Method: EPA 3510C							
Acenaphthene	**0.10**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	83-32-9	
Acenaphthylene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	208-96-8	
Anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	207-08-9	
Chrysene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	218-01-9	
Dibenz(a,h)anthracene	**0.11**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	53-70-3	
Fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	206-44-0	
Fluorene	**0.36**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	193-39-5	
Naphthalene	**1.7**	ug/L	0.50	1	05/17/14 00:00	05/27/14 15:13	91-20-3	
Phenanthrene	ND	ug/L	0.50	1	05/17/14 00:00	05/27/14 15:13	85-01-8	
Pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:13	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	84	%	36-120	1	05/17/14 00:00	05/27/14 15:13	321-60-8	
Terphenyl-d14 (S)	103	%	29-134	1	05/17/14 00:00	05/27/14 15:13	1718-51-0	
8260/OA1 UST, Water	Analytical Method: EPA 8260/OA1							
Benzene	**13.4**	ug/L	1.0	1		05/21/14 20:27	71-43-2	
Toluene	**30.4**	ug/L	1.0	1		05/21/14 20:27	108-88-3	
Ethylbenzene	**15.2**	ug/L	1.0	1		05/21/14 20:27	100-41-4	
Xylene (Total)	**228**	ug/L	30.0	10		05/30/14 14:32	1330-20-7	
Surrogates								
Toluene-d8 (S)	101	%	80-120	1		05/21/14 20:27	2037-26-5	
4-Bromofluorobenzene (S)	107	%	80-120	1		05/21/14 20:27	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	80-120	1		05/21/14 20:27	17060-07-0	
Preservation pH	**1.0**		0.10	1		05/21/14 20:27		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 081773 State Com J-6
Pace Project No.: 60169315

Sample: GW-081773-051214-RW-1 **Lab ID: 60169315002** Collected: 05/12/14 16:35 Received: 05/15/14 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270C by SIM Preparation Method: EPA 3510C							
Acenaphthene	**0.41**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	83-32-9	
Acenaphthylene	**0.15**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	208-96-8	
Anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	207-08-9	
Chrysene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	53-70-3	
Fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	206-44-0	
Fluorene	**1.3**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	193-39-5	
Naphthalene	**109**	ug/L	5.0	10	05/17/14 00:00	05/29/14 16:06	91-20-3	
Phenanthrene	ND	ug/L	0.50	1	05/17/14 00:00	05/27/14 15:34	85-01-8	
Pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:34	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	87	%	36-120	1	05/17/14 00:00	05/27/14 15:34	321-60-8	
Terphenyl-d14 (S)	93	%	29-134	1	05/17/14 00:00	05/27/14 15:34	1718-51-0	
8260/OA1 UST, Water	Analytical Method: EPA 8260/OA1							
Benzene	**1880**	ug/L	10.0	10		05/21/14 20:43	71-43-2	
Toluene	**6270**	ug/L	50.0	50		05/22/14 17:13	108-88-3	
Ethylbenzene	**567**	ug/L	10.0	10		05/21/14 20:43	100-41-4	
Xylene (Total)	**8960**	ug/L	150	50		05/22/14 17:13	1330-20-7	
Surrogates								
Toluene-d8 (S)	100	%	80-120	10		05/21/14 20:43	2037-26-5	
4-Bromofluorobenzene (S)	104	%	80-120	10		05/21/14 20:43	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	80-120	10		05/21/14 20:43	17060-07-0	
Preservation pH	**1.0**		0.10	10		05/21/14 20:43		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 081773 State Com J-6
Pace Project No.: 60169315

Sample: GW-081773-051214-RW-3 **Lab ID: 60169315003** Collected: 05/12/14 16:45 Received: 05/15/14 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270C by SIM Preparation Method: EPA 3510C							
Acenaphthene	**0.34**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	83-32-9	
Acenaphthylene	**0.12**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	208-96-8	
Anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	207-08-9	
Chrysene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	53-70-3	
Fluoranthene	**0.14**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	206-44-0	
Fluorene	**1.3**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	193-39-5	
Naphthalene	**59.6**	ug/L	2.5	5	05/17/14 00:00	05/29/14 16:27	91-20-3	
Phenanthrene	**0.74**	ug/L	0.50	1	05/17/14 00:00	05/27/14 15:54	85-01-8	
Pyrene	**0.17**	ug/L	0.10	1	05/17/14 00:00	05/27/14 15:54	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	85	%	36-120	1	05/17/14 00:00	05/27/14 15:54	321-60-8	
Terphenyl-d14 (S)	104	%	29-134	1	05/17/14 00:00	05/27/14 15:54	1718-51-0	
8260/OA1 UST, Water	Analytical Method: EPA 8260/OA1							
Benzene	**416**	ug/L	10.0	10		05/21/14 21:00	71-43-2	
Toluene	**889**	ug/L	10.0	10		05/21/14 21:00	108-88-3	
Ethylbenzene	**153**	ug/L	10.0	10		05/21/14 21:00	100-41-4	
Xylene (Total)	**4580**	ug/L	150	50		05/22/14 17:28	1330-20-7	
Surrogates								
Toluene-d8 (S)	100	%	80-120	10		05/21/14 21:00	2037-26-5	
4-Bromofluorobenzene (S)	104	%	80-120	10		05/21/14 21:00	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	80-120	10		05/21/14 21:00	17060-07-0	
Preservation pH	**1.0**		0.10	10		05/21/14 21:00		

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ANALYTICAL RESULTS

Project: 081773 State Com J-6
Pace Project No.: 60169315

Sample: DRUM CONTENTS **Lab ID: 60169315004** Collected: 05/08/14 13:20 Received: 05/15/14 08:20 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Leachate Method/Date: EPA 1311; 05/20/14 00:00							
Barium	ND	ug/L	2500	1	05/21/14 09:20	05/21/14 15:07	7440-39-3	
Percent Moisture	Analytical Method: ASTM D2974							
Percent Moisture	**14.1**	%	0.50	1		05/19/14 00:00		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 081773 State Com J-6
Pace Project No.: 60169315

Sample: TRIP BLANK **Lab ID: 60169315005** Collected: 05/08/14 13:20 Received: 05/15/14 08:20 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		05/18/14 03:38	71-43-2	
Toluene	ND	ug/L	1.0	1		05/18/14 03:38	108-88-3	
Ethylbenzene	ND	ug/L	1.0	1		05/18/14 03:38	100-41-4	
Xylene (Total)	ND	ug/L	3.0	1		05/18/14 03:38	1330-20-7	
Surrogates								
Toluene-d8 (S)	100	%	80-120	1		05/18/14 03:38	2037-26-5	
4-Bromofluorobenzene (S)	95	%	80-120	1		05/18/14 03:38	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	80-120	1		05/18/14 03:38	17060-07-0	
Preservation pH	**1.0**		0.10	1		05/18/14 03:38		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: MPRP/27319
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET TCLP
Associated Lab Samples: 60169315004

METHOD BLANK: 1381575 Matrix: Water
Associated Lab Samples: 60169315004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Barium	ug/L	ND	2500	05/21/14 14:27	

LABORATORY CONTROL SAMPLE: 1381576

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	938	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1381577 1381578

Parameter	Units	60169337001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	ND	10000	10000	11300	11800	94	99	75-125	4	20	

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: MSV/61658
QC Batch Method: EPA 8260/OA1
Analysis Method: EPA 8260/OA1
Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60169315005

METHOD BLANK: 1379989 Matrix: Water
Associated Lab Samples: 60169315005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	05/18/14 03:23	
Ethylbenzene	ug/L	ND	1.0	05/18/14 03:23	
Toluene	ug/L	ND	1.0	05/18/14 03:23	
Xylene (Total)	ug/L	ND	3.0	05/18/14 03:23	
1,2-Dichloroethane-d4 (S)	%	102	80-120	05/18/14 03:23	
4-Bromofluorobenzene (S)	%	105	80-120	05/18/14 03:23	
Toluene-d8 (S)	%	95	80-120	05/18/14 03:23	

LABORATORY CONTROL SAMPLE: 1379990

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	16.3	81	80-120	
Ethylbenzene	ug/L	20	18.1	91	80-121	
Toluene	ug/L	20	17.0	85	80-122	
Xylene (Total)	ug/L	60	56.3	94	80-121	
1,2-Dichloroethane-d4 (S)	%			104	80-120	
4-Bromofluorobenzene (S)	%			91	80-120	
Toluene-d8 (S)	%			95	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: MSV/61734 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60169315001, 60169315002, 60169315003

METHOD BLANK: 1381444 Matrix: Water
Associated Lab Samples: 60169315001, 60169315002, 60169315003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	05/21/14 20:11	
Ethylbenzene	ug/L	ND	1.0	05/21/14 20:11	
Toluene	ug/L	ND	1.0	05/21/14 20:11	
1,2-Dichloroethane-d4 (S)	%	94	80-120	05/21/14 20:11	
4-Bromofluorobenzene (S)	%	101	80-120	05/21/14 20:11	
Toluene-d8 (S)	%	98	80-120	05/21/14 20:11	

LABORATORY CONTROL SAMPLE: 1381445

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	18.8	94	80-120	
Ethylbenzene	ug/L	20	19.9	100	80-121	
Toluene	ug/L	20	18.4	92	80-122	
1,2-Dichloroethane-d4 (S)	%			95	80-120	
4-Bromofluorobenzene (S)	%			99	80-120	
Toluene-d8 (S)	%			98	80-120	

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: MSV/61781 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60169315002, 60169315003

METHOD BLANK: 1382528 Matrix: Water
Associated Lab Samples: 60169315002, 60169315003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Toluene	ug/L	ND	1.0	05/22/14 15:56	
Xylene (Total)	ug/L	ND	3.0	05/22/14 15:56	
1,2-Dichloroethane-d4 (S)	%	90	80-120	05/22/14 15:56	
4-Bromofluorobenzene (S)	%	90	80-120	05/22/14 15:56	
Toluene-d8 (S)	%	108	80-120	05/22/14 15:56	

LABORATORY CONTROL SAMPLE: 1382529

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Toluene	ug/L	20	22.0	110	80-122	
Xylene (Total)	ug/L	60	67.8	113	80-121	
1,2-Dichloroethane-d4 (S)	%			93	80-120	
4-Bromofluorobenzene (S)	%			97	80-120	
Toluene-d8 (S)	%			106	80-120	

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: MSV/61950
QC Batch Method: EPA 8260/OA1
Analysis Method: EPA 8260/OA1
Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60169315001

METHOD BLANK: 1386218 Matrix: Water
Associated Lab Samples: 60169315001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Xylene (Total)	ug/L	ND	3.0	05/30/14 14:17	
1,2-Dichloroethane-d4 (S)	%	85	80-120	05/30/14 14:17	
4-Bromofluorobenzene (S)	%	96	80-120	05/30/14 14:17	
Toluene-d8 (S)	%	101	80-120	05/30/14 14:17	

LABORATORY CONTROL SAMPLE: 1386219

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Xylene (Total)	ug/L	60	62.2	104	80-121	
1,2-Dichloroethane-d4 (S)	%			85	80-120	
4-Bromofluorobenzene (S)	%			96	80-120	
Toluene-d8 (S)	%			101	80-120	

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: OEXT/44226 Analysis Method: EPA 8270C by SIM
QC Batch Method: EPA 3510C Analysis Description: 8270 Water PAH by SIM MSSV
Associated Lab Samples: 60169315001, 60169315002, 60169315003

METHOD BLANK: 1379972 Matrix: Water
Associated Lab Samples: 60169315001, 60169315002, 60169315003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	05/23/14 21:24	
Acenaphthylene	ug/L	ND	0.10	05/23/14 21:24	
Anthracene	ug/L	ND	0.10	05/23/14 21:24	
Benzo(a)anthracene	ug/L	ND	0.10	05/23/14 21:24	
Benzo(a)pyrene	ug/L	ND	0.10	05/23/14 21:24	
Benzo(b)fluoranthene	ug/L	ND	0.10	05/23/14 21:24	
Benzo(g,h,i)perylene	ug/L	ND	0.10	05/23/14 21:24	
Benzo(k)fluoranthene	ug/L	ND	0.10	05/23/14 21:24	
Chrysene	ug/L	ND	0.10	05/23/14 21:24	
Dibenz(a,h)anthracene	ug/L	ND	0.10	05/23/14 21:24	
Fluoranthene	ug/L	ND	0.10	05/23/14 21:24	
Fluorene	ug/L	ND	0.10	05/23/14 21:24	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	05/23/14 21:24	
Naphthalene	ug/L	ND	0.50	05/23/14 21:24	
Phenanthrene	ug/L	ND	0.50	05/23/14 21:24	
Pyrene	ug/L	ND	0.10	05/23/14 21:24	
2-Fluorobiphenyl (S)	%	101	36-120	05/23/14 21:24	
Terphenyl-d14 (S)	%	109	29-134	05/23/14 21:24	

LABORATORY CONTROL SAMPLE: 1379973

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	10	7.8	78	45-120	
Acenaphthylene	ug/L	10	7.7	77	42-120	
Anthracene	ug/L	10	7.6	76	39-120	
Benzo(a)anthracene	ug/L	10	8.4	84	40-125	
Benzo(a)pyrene	ug/L	10	8.5	85	39-122	
Benzo(b)fluoranthene	ug/L	10	8.8	88	33-134	
Benzo(g,h,i)perylene	ug/L	10	8.3	83	27-126	
Benzo(k)fluoranthene	ug/L	10	8.2	82	43-123	
Chrysene	ug/L	10	7.9	79	44-120	
Dibenz(a,h)anthracene	ug/L	10	7.8	78	21-129	
Fluoranthene	ug/L	10	7.9	79	45-126	
Fluorene	ug/L	10	8.5	85	44-120	
Indeno(1,2,3-cd)pyrene	ug/L	10	8.1	81	25-127	
Naphthalene	ug/L	10	7.8	78	44-120	
Phenanthrene	ug/L	10	8.2	82	43-120	
Pyrene	ug/L	10	8.4	84	39-120	
2-Fluorobiphenyl (S)	%			80	36-120	
Terphenyl-d14 (S)	%			84	29-134	

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1379974 1379975

Parameter	Units	60169411002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/L	ND	10	10	7.8	8.1	78	81	40-120	3	37	
Acenaphthylene	ug/L	ND	10	10	7.7	7.8	77	78	41-120	2	32	
Anthracene	ug/L	ND	10	10	7.7	7.8	77	78	33-121	2	26	
Benzo(a)anthracene	ug/L	ND	10	10	8.6	8.9	86	89	40-125	4	28	
Benzo(a)pyrene	ug/L	ND	10	10	8.8	8.9	88	89	43-122	1	29	
Benzo(b)fluoranthene	ug/L	ND	10	10	9.0	9.3	90	93	34-130	2	38	
Benzo(g,h,i)perylene	ug/L	ND	10	10	8.9	9.1	89	91	42-127	3	29	
Benzo(k)fluoranthene	ug/L	ND	10	10	8.1	8.0	81	80	49-120	1	27	
Chrysene	ug/L	ND	10	10	7.8	8.2	78	82	47-120	5	25	
Dibenz(a,h)anthracene	ug/L	ND	10	10	9.4	8.9	94	89	40-120	6	25	
Fluoranthene	ug/L	ND	10	10	8.0	8.0	80	80	45-125	1	31	
Fluorene	ug/L	ND	10	10	8.8	8.7	88	87	42-120	1	27	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10	10	9.4	9.3	94	93	34-130	1	24	
Naphthalene	ug/L	ND	10	10	8.4	8.5	84	85	24-128	1	25	
Phenanthrene	ug/L	ND	10	10	8.1	8.3	81	83	38-120	2	29	
Pyrene	ug/L	ND	10	10	8.2	8.0	82	80	44-120	2	34	
2-Fluorobiphenyl (S)	%						83	92	36-120			
Terphenyl-d14 (S)	%						83	79	29-134			

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QUALITY CONTROL DATA

Project: 081773 State Com J-6
Pace Project No.: 60169315

QC Batch: PMST/9666
QC Batch Method: ASTM D2974
Analysis Method: ASTM D2974
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 60169315004

METHOD BLANK: 1380368
Matrix: Solid
Associated Lab Samples: 60169315004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Percent Moisture	%	ND	0.50	05/19/14 00:00	

SAMPLE DUPLICATE: 1380369

Parameter	Units	60168786012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.3	3.8	13	20	

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QUALIFIERS

Project: 081773 State Com J-6
Pace Project No.: 60169315

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

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.

BATCH QUALIFIERS

Batch: MSV/61658
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/61734
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/61781
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

Batch: MSV/61950
[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 081773 State Com J-6
Pace Project No.: 60169315

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60169315004	**DRUM CONTENTS**	EPA 3010	MPRP/27319	EPA 6010	ICP/20687
60169315001	**GW-081773-051214-MW-1**	EPA 3510C	OEXT/44226	EPA 8270C by SIM	MSSV/14180
60169315002	**GW-081773-051214-RW-1**	EPA 3510C	OEXT/44226	EPA 8270C by SIM	MSSV/14180
60169315003	**GW-081773-051214-RW-3**	EPA 3510C	OEXT/44226	EPA 8270C by SIM	MSSV/14180
60169315001	**GW-081773-051214-MW-1**	EPA 8260/OA1	MSV/61734		
60169315001	**GW-081773-051214-MW-1**	EPA 8260/OA1	MSV/61950		
60169315002	**GW-081773-051214-RW-1**	EPA 8260/OA1	MSV/61734		
60169315002	**GW-081773-051214-RW-1**	EPA 8260/OA1	MSV/61781		
60169315003	**GW-081773-051214-RW-3**	EPA 8260/OA1	MSV/61734		
60169315003	**GW-081773-051214-RW-3**	EPA 8260/OA1	MSV/61781		
60169315005	**TRIP BLANK**	EPA 8260/OA1	MSV/61658		
60169315004	**DRUM CONTENTS**	ASTM D2974	PMST/9666		

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Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60169315

60169315

Client Name: ConocoPhillips NM

Optional
Proj Due Date:
Proj Name:

Courier: Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other ☐

Tracking #: 8046 9412 3159 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-239) / T-194 **Type of Ice:** (Wet) Blue None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 4.0

Date and initials of person examining contents: JD 5/15/14 1035

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☒Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☒Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☒Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	7.
Sufficient volume:	☒Yes ☐No ☐N/A	8.
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	9.
Containers intact:	☒Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☒N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	12.
Sample labels match COC: Includes date/time/ID/analyses Matrix: water/soil	☒Yes ☐No ☐N/A	13.
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	14.
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	☐Yes ☐No	Initial when completed: MAP / Lot # of added preservative:
Trip Blank present: Pace Trip Blank lot # (if purchased): 041419-3	☒Yes ☐No ☐N/A	15.
Headspace in VOA vials (>6mm):	☐Yes ☒No ☐N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☒N/A	17. List State:

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Temp Log: Record start and finish times when unpacking cooler. if >20 min, recheck sample temps.	
Start: 1030	Start:
End: 1035	End:
Temp:	Temp:

Project Manager Review: MAF Date: 5/15/14

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

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	COP CRA NM	Report To:	Jeff Walker	Attention:	COP ePayables
Address:	6121 Indian School Rd NE suite 200	Copy To:	Christine Mathews	Company Name:	
	Albuquerque, NM 87110		edds@craworld.com	Address:	
Email To:	jwalker@craworld.com	Purchase Order No.:	4517878899	Pace Quote Reference:	
Phone:	505-884-0672 Fax:	Project Name:	081773 State Com J-6	Pace Project Manager:	Alice Flanagan
Requested Due Date/TAT:		Project Number:		Pace Profile #:	5514,29

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NM

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	8260 BTEX	8270 PAHs	TCLP Barium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60169315
1	GW-081773-051214-MW-1	WT	G	5/12/14		5/12/14	1625		5	2			3						X	X		N	3(DRH) 2(AGW) 001
2	GW-081773-051214-RW-1	WT	G			5/12/14	1635		5	2			3						X	X			002
3	GW-081773-051214-RW-3	WT	G			5/12/14	1645		5	2			3						X	X			003
4	DRUM CONTENTS	SL	G			5/8/14	1320		2												X		1(WGKU) 1(BPBU) 004
5	TRIP BLANK	WT							3				3						X				3(DRH) 005
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Please perform 5-Day TAT on TCLP-Barium Soil Sample	CRA	5/13/14	1235		5/15/14	~~0850~~ 820	4.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:					
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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October 08, 2014

Christine Matthews
CRA
6121 Indian School Rd NE
Suite 200
Albuquerque, NM 87110

RE: Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Dear Christine Matthews:
Enclosed are the analytical results for sample(s) received by the laboratory on September 24, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Alice Flanagan
alice.flanagan@pacelabs.com
Project Manager

Enclosures

cc: Angela Bown, COP Conestoga-Rovers & Associa
Chris Fetters, COP Conestoga-Rovers & Associa
Jeff Walker, COP Conestoga-Rovers & Associa

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CERTIFICATIONS

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Kansas Certification IDs
9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021

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SAMPLE SUMMARY

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60178792001	**GW-081773-092314-CB-MW-1**	Water	09/23/14 12:40	09/24/14 08:15
60178792002	**GW-081773-092314-CB-DUP**	Water	09/23/14 08:00	09/24/14 08:15
60178792003	**TRIP BLANK**	Water	09/23/14 17:00	09/24/14 08:15

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SAMPLE ANALYTE COUNT

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60178792001	**GW-081773-092314-CB-MW-1**	EPA 8270C by SIM	NAW	18
		EPA 8260/OA1	JTK	8
60178792002	**GW-081773-092314-CB-DUP**	EPA 8260/OA1	RAB	8
60178792003	**TRIP BLANK**	EPA 8260/OA1	RAB	8

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Method: **EPA 8270C by SIM**
Description: 8270 MSSV PAH by SIM
Client: COP Conestoga-Rovers & Associates, Inc. NM
Date: October 08, 2014

General Information:
1 sample was analyzed for EPA 8270C by SIM. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3510C 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.

Additional Comments:

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PROJECT NARRATIVE

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Method: **EPA 8260/OA1**
Description: 8260/OA1 UST, Water
Client: COP Conestoga-Rovers & Associates, Inc. NM
Date: October 08, 2014

General Information:
3 samples were analyzed for EPA 8260/OA1. All samples were received in acceptable condition with any exceptions noted below.

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: MSV/64817

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

QC Batch: MSV/64867

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.

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ANALYTICAL RESULTS

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Sample: GW-081773-092314-CB-MW-1 **Lab ID: 60178792001** Collected: 09/23/14 12:40 Received: 09/24/14 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270C by SIM Preparation Method: EPA 3510C							
Acenaphthene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	83-32-9	
Acenaphthylene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	208-96-8	
Anthracene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	120-12-7	
Benzo(a)anthracene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	56-55-3	
Benzo(a)pyrene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	207-08-9	
Chrysene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	53-70-3	
Fluoranthene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	206-44-0	
Fluorene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	193-39-5	
Naphthalene	ND	ug/L	0.50	1	09/29/14 00:00	10/01/14 21:21	91-20-3	
Phenanthrene	ND	ug/L	0.50	1	09/29/14 00:00	10/01/14 21:21	85-01-8	
Pyrene	ND	ug/L	0.10	1	09/29/14 00:00	10/01/14 21:21	129-00-0	
Surrogates								
2-Fluorobiphenyl (S)	70	%	36-120	1	09/29/14 00:00	10/01/14 21:21	321-60-8	
Terphenyl-d14 (S)	82	%	29-134	1	09/29/14 00:00	10/01/14 21:21	1718-51-0	
8260/OA1 UST, Water	Analytical Method: EPA 8260/OA1							
Benzene	**10.0**	ug/L	1.0	1		09/30/14 23:29	71-43-2	
Toluene	ND	ug/L	1.0	1		09/30/14 23:29	108-88-3	
Ethylbenzene	**3.3**	ug/L	1.0	1		09/30/14 23:29	100-41-4	
Xylene (Total)	**23.3**	ug/L	3.0	1		09/30/14 23:29	1330-20-7	
Surrogates								
Toluene-d8 (S)	104	%	80-120	1		09/30/14 23:29	2037-26-5	
4-Bromofluorobenzene (S)	101	%	80-120	1		09/30/14 23:29	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	80-120	1		09/30/14 23:29	17060-07-0	
Preservation pH	**1.0**		0.10	1		09/30/14 23:29		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Sample: GW-081773-092314-CB-DUP **Lab ID: 60178792002** Collected: 09/23/14 08:00 Received: 09/24/14 08:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/OA1 UST, Water	Analytical Method: EPA 8260/OA1							
Benzene	**8.7**	ug/L	1.0	1		10/07/14 11:19	71-43-2	
Toluene	ND	ug/L	1.0	1		10/07/14 11:19	108-88-3	
Ethylbenzene	**2.9**	ug/L	1.0	1		10/07/14 11:19	100-41-4	
Xylene (Total)	**21.1**	ug/L	3.0	1		10/07/14 11:19	1330-20-7	
Surrogates								
Toluene-d8 (S)	100	%	80-120	1		10/07/14 11:19	2037-26-5	
4-Bromofluorobenzene (S)	94	%	80-120	1		10/07/14 11:19	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	80-120	1		10/07/14 11:19	17060-07-0	
Preservation pH	**1.0**		0.10	1		10/07/14 11:19		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Sample: TRIP BLANK **Lab ID: 60178792003** Collected: 09/23/14 17:00 Received: 09/24/14 08:15 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		10/03/14 20:03	71-43-2	
Toluene	ND	ug/L	1.0	1		10/03/14 20:03	108-88-3	
Ethylbenzene	ND	ug/L	1.0	1		10/03/14 20:03	100-41-4	
Xylene (Total)	ND	ug/L	3.0	1		10/03/14 20:03	1330-20-7	
Surrogates								
Toluene-d8 (S)	105	%	80-120	1		10/03/14 20:03	2037-26-5	
4-Bromofluorobenzene (S)	99	%	80-120	1		10/03/14 20:03	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	80-120	1		10/03/14 20:03	17060-07-0	
Preservation pH	**1.0**		0.10	1		10/03/14 20:03		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

QC Batch: MSV/64757
QC Batch Method: EPA 8260/OA1
Analysis Method: EPA 8260/OA1
Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60178792001

METHOD BLANK: 1451489 Matrix: Water
Associated Lab Samples: 60178792001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	09/30/14 20:29	
Ethylbenzene	ug/L	ND	1.0	09/30/14 20:29	
Toluene	ug/L	ND	1.0	09/30/14 20:29	
Xylene (Total)	ug/L	ND	3.0	09/30/14 20:29	
1,2-Dichloroethane-d4 (S)	%	102	80-120	09/30/14 20:29	
4-Bromofluorobenzene (S)	%	101	80-120	09/30/14 20:29	
Toluene-d8 (S)	%	104	80-120	09/30/14 20:29	

LABORATORY CONTROL SAMPLE: 1451490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	20.7	103	80-120	
Ethylbenzene	ug/L	20	21.4	107	80-121	
Toluene	ug/L	20	21.4	107	80-122	
Xylene (Total)	ug/L	60	65.9	110	80-121	
1,2-Dichloroethane-d4 (S)	%			100	80-120	
4-Bromofluorobenzene (S)	%			98	80-120	
Toluene-d8 (S)	%			101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1451491 1451492

Parameter	Units	60178731001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	7.8	20	20	27.9	28.2	101	102	37-157	1	32	
Ethylbenzene	ug/L	ND	20	20	21.7	21.7	109	108	31-160	0	32	
Toluene	ug/L	ND	20	20	21.8	21.8	108	108	35-157	0	37	
Xylene (Total)	ug/L	ND	60	60	66.0	65.6	110	109	34-156	1	37	
1,2-Dichloroethane-d4 (S)	%						100	101	80-120			
4-Bromofluorobenzene (S)	%						98	98	80-120			
Toluene-d8 (S)	%						101	100	80-120			
Preservation pH		1.0			1.0	1.0				0		

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

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QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

QC Batch: MSV/64817 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60178792003

METHOD BLANK: 1453502 Matrix: Water
Associated Lab Samples: 60178792003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	10/03/14 15:58	
Ethylbenzene	ug/L	ND	1.0	10/03/14 15:58	
Toluene	ug/L	ND	1.0	10/03/14 15:58	
Xylene (Total)	ug/L	ND	3.0	10/03/14 15:58	
1,2-Dichloroethane-d4 (S)	%	96	80-120	10/03/14 15:58	
4-Bromofluorobenzene (S)	%	101	80-120	10/03/14 15:58	
Toluene-d8 (S)	%	94	80-120	10/03/14 15:58	

LABORATORY CONTROL SAMPLE: 1453503

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	19.7	98	80-120	
Ethylbenzene	ug/L	20	19.6	98	80-121	
Toluene	ug/L	20	19.8	99	80-122	
Xylene (Total)	ug/L	60	61.2	102	80-121	
1,2-Dichloroethane-d4 (S)	%			95	80-120	
4-Bromofluorobenzene (S)	%			99	80-120	
Toluene-d8 (S)	%			98	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

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QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

QC Batch: MSV/64867 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60178792002

METHOD BLANK: 1455179 Matrix: Water
Associated Lab Samples: 60178792002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	10/07/14 11:03	
Ethylbenzene	ug/L	ND	1.0	10/07/14 11:03	
Toluene	ug/L	ND	1.0	10/07/14 11:03	
Xylene (Total)	ug/L	ND	3.0	10/07/14 11:03	
1,2-Dichloroethane-d4 (S)	%	95	80-120	10/07/14 11:03	
4-Bromofluorobenzene (S)	%	96	80-120	10/07/14 11:03	
Toluene-d8 (S)	%	101	80-120	10/07/14 11:03	

LABORATORY CONTROL SAMPLE: 1455180

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	17.6	88	80-120	
Ethylbenzene	ug/L	20	18.5	92	80-121	
Toluene	ug/L	20	18.1	91	80-122	
Xylene (Total)	ug/L	60	58.0	97	80-121	
1,2-Dichloroethane-d4 (S)	%			95	80-120	
4-Bromofluorobenzene (S)	%			94	80-120	
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, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

QC Batch: OEXT/46346
QC Batch Method: EPA 3510C
Analysis Method: EPA 8270C by SIM
Analysis Description: 8270 Water PAH by SIM MSSV
Associated Lab Samples: 60178792001

METHOD BLANK: 1450611 Matrix: Water
Associated Lab Samples: 60178792001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/L	ND	0.10	10/01/14 20:39	
Acenaphthylene	ug/L	ND	0.10	10/01/14 20:39	
Anthracene	ug/L	ND	0.10	10/01/14 20:39	
Benzo(a)anthracene	ug/L	ND	0.10	10/01/14 20:39	
Benzo(a)pyrene	ug/L	ND	0.10	10/01/14 20:39	
Benzo(b)fluoranthene	ug/L	0.14	0.10	10/01/14 20:39	
Benzo(g,h,i)perylene	ug/L	ND	0.10	10/01/14 20:39	
Benzo(k)fluoranthene	ug/L	ND	0.10	10/01/14 20:39	
Chrysene	ug/L	ND	0.10	10/01/14 20:39	
Dibenz(a,h)anthracene	ug/L	ND	0.10	10/01/14 20:39	
Fluoranthene	ug/L	0.18	0.10	10/01/14 20:39	
Fluorene	ug/L	ND	0.10	10/01/14 20:39	
Indeno(1,2,3-cd)pyrene	ug/L	ND	0.10	10/01/14 20:39	
Naphthalene	ug/L	ND	0.50	10/01/14 20:39	
Phenanthrene	ug/L	ND	0.50	10/01/14 20:39	
Pyrene	ug/L	0.17	0.10	10/01/14 20:39	
2-Fluorobiphenyl (S)	%	74	36-120	10/01/14 20:39	
Terphenyl-d14 (S)	%	90	29-134	10/01/14 20:39	

LABORATORY CONTROL SAMPLE: 1450612

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/L	10	8.3	83	45-120	
Acenaphthylene	ug/L	10	8.7	87	42-120	
Anthracene	ug/L	10	8.6	86	39-120	
Benzo(a)anthracene	ug/L	10	8.3	83	40-125	
Benzo(a)pyrene	ug/L	10	8.3	83	39-122	
Benzo(b)fluoranthene	ug/L	10	7.9	79	33-134	
Benzo(g,h,i)perylene	ug/L	10	7.0	70	27-126	
Benzo(k)fluoranthene	ug/L	10	9.4	94	43-123	
Chrysene	ug/L	10	8.1	81	44-120	
Dibenz(a,h)anthracene	ug/L	10	6.6	66	21-129	
Fluoranthene	ug/L	10	8.8	88	45-126	
Fluorene	ug/L	10	8.8	88	44-120	
Indeno(1,2,3-cd)pyrene	ug/L	10	6.9	69	25-127	
Naphthalene	ug/L	10	8.4	84	44-120	
Phenanthrene	ug/L	10	8.0	80	43-120	
Pyrene	ug/L	10	9.5	95	39-120	
2-Fluorobiphenyl (S)	%			76	36-120	
Terphenyl-d14 (S)	%			82	29-134	

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, Inc.
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QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1450613 1450614

Parameter	Units	60178912001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/L	ND	10	10	7.4	6.9	73	68	40-120	7	37	
Acenaphthylene	ug/L	ND	10	10	7.5	7.0	75	70	41-120	7	32	
Anthracene	ug/L	ND	10	10	8.4	7.5	84	75	33-121	10	26	
Benzo(a)anthracene	ug/L	ND	10	10	8.8	8.4	88	84	40-125	4	28	
Benzo(a)pyrene	ug/L	ND	10	10	9.1	8.9	91	89	43-122	3	29	
Benzo(b)fluoranthene	ug/L	ND	10	10	8.4	8.3	84	83	34-130	1	38	
Benzo(g,h,i)perylene	ug/L	ND	10	10	8.5	7.9	85	79	42-127	8	29	
Benzo(k)fluoranthene	ug/L	ND	10	10	9.3	9.3	93	93	49-120	0	27	
Chrysene	ug/L	ND	10	10	8.3	8.2	83	82	47-120	2	25	
Dibenz(a,h)anthracene	ug/L	ND	10	10	8.6	8.0	86	80	40-120	7	25	
Fluoranthene	ug/L	ND	10	10	9.4	8.5	94	85	45-125	10	31	
Fluorene	ug/L	ND	10	10	8.4	7.5	84	75	42-120	12	27	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10	10	8.7	8.1	87	81	34-130	7	24	
Naphthalene	ug/L	ND	10	10	7.3	6.6	73	66	24-128	10	25	
Phenanthrene	ug/L	ND	10	10	7.6	6.9	75	68	38-120	10	29	
Pyrene	ug/L	ND	10	10	8.5	7.9	85	79	44-120	6	34	
2-Fluorobiphenyl (S)	%						66	60	36-120			
Terphenyl-d14 (S)	%						74	73	29-134			

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, Inc.
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Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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 (8270 listed analyte) decomposes to Azobenzene.

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.

BATCH QUALIFIERS

Batch: MSV/64817

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

Batch: MSV/64867

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 081773 STATE COM J-6
Pace Project No.: 60178792

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60178792001	**GW-081773-092314-CB-MW-1**	EPA 3510C	OEXT/46346	EPA 8270C by SIM	MSSV/14909
60178792001	**GW-081773-092314-CB-MW-1**	EPA 8260/OA1	MSV/64757		
60178792002	**GW-081773-092314-CB-DUP**	EPA 8260/OA1	MSV/64867		
60178792003	**TRIP BLANK**	EPA 8260/OA1	MSV/64817		

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Sample Condition Upon Receipt

WO#: 60178792

60178792

Client Name: COP CRANM

Optional
Proj Due Date:
Proj Name:

Courier: Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other ☐

Tracking #: 6113 5280 1291 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-239 / T-194 **Type of Ice:** (Wet) Blue None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 2.8

Date and initials of person examining contents: CW 9/24/14

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☑Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☑Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☑Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	7.
Sufficient volume:	☑Yes ☐No ☐N/A	8.
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	9.
Containers intact:	☑Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☑N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	12.
Sample labels match COC:	☑Yes ☐No ☐N/A	
Includes date/time/ID/analyses Matrix: WT		13.
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	14.
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water), Phenolics	☐Yes ☐No	Initial when completed / Lot # of added preservative
Trip Blank present:	☑Yes ☐No ☐N/A	
Pace Trip Blank lot # (if purchased): 081814-332m		15.
Headspace in VOA vials (>6mm):	☐Yes ☑No ☐N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☑N/A	17. List State:

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AK Date: 9/25/14

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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:	COP CRA NM	Report To:	Jeff Walker	Attention:	COP ePayables
Address:	6121 Indian School Rd NE suite 200	Copy To:	Christine Mathews	Company Name:	
	Albuquerque, NM 87110		edds@craworld.com	Address:	
Email To:	jwalker@craworld.com	Purchase Order No.:	4517878899	Pace Quote Reference:	
Phone:	505-884-0672 Fax:	Project Name:	081773 State Com J-6	Pace Project Manager:	Alice Flanagan
Requested Due Date/TAT:		Project Number:		Pace Profile #:	5514,29

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NM

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

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 COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	8260 BTEX	8270 PAHs	TCLP Barium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60178792
1	GW-081773-092314-CB-MW-1	WT	G	—	—	9-23-14	1240		5	X			X						X	X		N	3(DG9H) 2(AG4U)
2	GW-081773-092314-CB-dup	WT	G	—	—	9-23-14			3				X						X				
3	trip Blank	WT	—	—	—	9-23-14	1700		3				X						X				
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)
	Cassie Brown/CRA	9/23/14	1700	[illegible] PACE	9/24	0815	2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Cassie Brown
SIGNATURE of SAMPLER: Cassie Brown DATE Signed (MM/DD/YY): 9/23/14

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

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

January 06, 2015

Christine Mathews
CRA
6121 Indian School Rd NE
Suite 200
Albuquerque, NM 87110

RE: Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Dear Christine Mathews:
Enclosed are the analytical results for sample(s) received by the laboratory on December 19, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI 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,

Alice Flanagan
alice.flanagan@pacelabs.com
Project Manager

Enclosures

cc: Angela Bown, COP Conestoga-Rovers & Associa
Angela Bown, Conestoga Rovers & Associates
Chris Fetters, COP Conestoga-Rovers & Associa
Jeff Walker, COP Conestoga-Rovers & Associa

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CERTIFICATIONS

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Kansas Certification IDs
9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 13-012-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021

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SAMPLE SUMMARY

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60185042001	**GW-081773-121714-SW-MW-1**	Water	12/17/14 10:00	12/19/14 10:00
60185042002	**TRIP BLANK**	Water	12/17/14 10:00	12/19/14 10:00

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SAMPLE ANALYTE COUNT

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Lab ID	Sample ID	Method	Analysts	Analytes Reported
60185042001	**GW-081773-121714-SW-MW-1**	EPA 8270C by SIM	NAW	3
		EPA 8260/OA1	RAB	8

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PROJECT NARRATIVE

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Method: **EPA 8270C by SIM**
Description: 8270 MSSV PAH by SIM
Client: CRA Conoco New Mexico
Date: January 06, 2015

General Information:
1 sample was analyzed for EPA 8270C by SIM. All samples were received in acceptable condition with any exceptions noted below.

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

Sample Preparation:
The samples were prepared in accordance with EPA 3510C 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: OEXT/47623

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

Additional Comments:

Pace Analytical Services, Inc.
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PROJECT NARRATIVE

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Method: **EPA 8260/OA1**
Description: 8260/OA1 UST, Water
Client: CRA Conoco New Mexico
Date: January 06, 2015

General Information:
1 sample was analyzed for EPA 8260/OA1. All samples were received in acceptable condition with any exceptions noted below.

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: MSV/66716

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.

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ANALYTICAL RESULTS

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Sample: GW-081773-121714-SW-MW-1 **Lab ID: 60185042001** Collected: 12/17/14 10:00 Received: 12/19/14 10:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270C by SIM Preparation Method: EPA 3510C							
Naphthalene	**0.85**	ug/L	0.45	1	12/23/14 00:00	12/29/14 16:16	91-20-3	
Surrogates								
2-Fluorobiphenyl (S)	65	%	58-115	1	12/23/14 00:00	12/29/14 16:16	321-60-8	
Terphenyl-d14 (S)	70	%	53-127	1	12/23/14 00:00	12/29/14 16:16	1718-51-0	
8260/OA1 UST, Water	Analytical Method: EPA 8260/OA1							
Benzene	**25.2**	ug/L	1.0	1		12/24/14 18:30	71-43-2	
Toluene	ND	ug/L	1.0	1		12/24/14 18:30	108-88-3	
Ethylbenzene	**12.1**	ug/L	1.0	1		12/24/14 18:30	100-41-4	
Xylene (Total)	**48.8**	ug/L	3.0	1		12/24/14 18:30	1330-20-7	
Surrogates								
Toluene-d8 (S)	96	%	91-107	1		12/24/14 18:30	2037-26-5	
4-Bromofluorobenzene (S)	98	%	88-111	1		12/24/14 18:30	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	82-119	1		12/24/14 18:30	17060-07-0	
Preservation pH	**1.0**		0.10	1		12/24/14 18:30		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

QC Batch: MSV/66716 Analysis Method: EPA 8260/OA1
QC Batch Method: EPA 8260/OA1 Analysis Description: 8260/OA1 UST-WATER
Associated Lab Samples: 60185042001

METHOD BLANK: 1499904 Matrix: Water
Associated Lab Samples: 60185042001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	12/24/14 17:59	
Ethylbenzene	ug/L	ND	1.0	12/24/14 17:59	
Toluene	ug/L	ND	1.0	12/24/14 17:59	
Xylene (Total)	ug/L	ND	3.0	12/24/14 17:59	
1,2-Dichloroethane-d4 (S)	%	96	82-119	12/24/14 17:59	
4-Bromofluorobenzene (S)	%	96	80-120	12/24/14 17:59	
Toluene-d8 (S)	%	100	80-120	12/24/14 17:59	

LABORATORY CONTROL SAMPLE: 1499905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	21.5	107	80-120	
Ethylbenzene	ug/L	20	21.5	107	80-120	
Toluene	ug/L	20	20.8	104	80-120	
Xylene (Total)	ug/L	60	65.1	109	80-120	
1,2-Dichloroethane-d4 (S)	%			96	82-119	
4-Bromofluorobenzene (S)	%			100	80-120	
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

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QUALITY CONTROL DATA

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

QC Batch: OEXT/47623
QC Batch Method: EPA 3510C
Analysis Method: EPA 8270C by SIM
Analysis Description: 8270 Water PAH by SIM MSSV
Associated Lab Samples: 60185042001

METHOD BLANK: 1499102 Matrix: Water
Associated Lab Samples: 60185042001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Naphthalene	ug/L	ND	0.50	12/29/14 15:14	
2-Fluorobiphenyl (S)	%	65	58-115	12/29/14 15:14	
Terphenyl-d14 (S)	%	77	53-127	12/29/14 15:14	

LABORATORY CONTROL SAMPLE: 1499103

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	10	7.4	74	47-113	
2-Fluorobiphenyl (S)	%			66	58-115	
Terphenyl-d14 (S)	%			67	53-127	

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, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

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 (8270 listed analyte) decomposes to Azobenzene.

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.

BATCH QUALIFIERS

Batch: OEXT/47623

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

Batch: MSV/66716

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 081773 STATE COM J-6
Pace Project No.: 60185042

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60185042001	**GW-081773-121714-SW-MW-1**	EPA 3510C	OEXT/47623	EPA 8270C by SIM	MSSV/15389
60185042001	**GW-081773-121714-SW-MW-1**	EPA 8260/OA1	MSV/66716		

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Sample Condition Upon Receipt

WO# : 60185042

60185042

Client Name: CRA COP NM

Optional
Proj Due Date:
Proj Name:

Courier: Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other ☐

Tracking #: 8066 6814 4900 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-239 / T-194 **Type of Ice:** (Wet) Blue None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 1.5

Temperature should be above freezing to 6°C

Date and initials of person examining contents: BR 12/19/14

Chain of Custody present:	☑Yes ☐No ☐N/A	1.
Chain of Custody filled out:	☑Yes ☐No ☐N/A	2.
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	3.
Sampler name & signature on COC:	☑Yes ☐No ☐N/A	4.
Samples arrived within holding time:	☑Yes ☐No ☐N/A	5.
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	7.
Sufficient volume:	☑Yes ☐No ☐N/A	8.
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	9.
Containers intact:	☑Yes ☐No ☐N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	☐Yes ☐No ☑N/A	11.
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	12.
Sample labels match COC:	☑Yes ☐No ☐N/A	
Includes date/time/ID/analyses Y Matrix: water		13.
All containers needing preservation have been checked.	☐Yes ☐No ☑N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☑N/A	14.
Exceptions: (VOA), coliform, TOC, O&G, WI-DRO (water), Phenolics	☐Yes ☐No	Initial when completed / Lot # of added preservative
Trip Blank present:	☑Yes ☐No ☐N/A	BR 12/18
Pace Trip Blank lot # (if purchased): 112414-382m		15.
Headspace in VOA vials (>6mm):	☐Yes ☑No ☐N/A	16.
Project sampled in USDA Regulated Area:	☐Yes ☐No ☑N/A	17. List State:

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: AAF Date: 12/19/14

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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:	CRA COP NM	Report To:	Jeff Walker	Attention:	CRA
Address:	6121 Indian School Rd NE suite 200	Copy To:	Christine Mathews	Company Name:	
	Albuquerque, NM 87110			Address:	
Email To:	jwalker@craworld.com	Purchase Order No.:	4071720	Pace Quote Reference:	
Phone:	505-884-0672 Fax:	Project Name:	081773 State Com J-6	Pace Project Manager:	Alice Flanagan
Requested Due Date/TAT:		Project Number:	81773	Pace Profile #:	7801,29

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NM

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

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 COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	8260 BTEX	8270 PAH Naphthalene									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	~~SW-17~~																										N	60185042
2	SW-081773-121714-SW-MW-1	WT	G			12/17/14	1000		5	2			3					X	X	2AG4U			3	DG9H				001
3																								↓	T	B		002
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Cale Kanack / CRA	12/18/14	1100	Ben Burgett Pasi	12/19	1000	1.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	CALE KANACK				
SIGNATURE of SAMPLER:					
DATE Signed (MM/DD/YY):	12/18/14				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.