

2019 Annual Groundwater Monitoring Report

Plains All American Pipeline, L.P.

14-Inch Vac to Jal Legacy

Plains SRS No. 2009-092

Lea County, New Mexico

NMOCD Reference No. 1R-2162

Terracon Project No. AR197010

March 19, 2020



Prepared for:



Plains All American Pipeline, L.P.

10 Desta Drive, Suite 550E

Midland, Texas 79705

Prepared by:

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terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

March 17, 2020

Plains All American Pipeline, LP
10 Desta Drive, Suite 550E
Midland, Texas 79705

Attn: Mrs. Camille Bryant
Telephone: (432) 758-8008
Email: CJBryant@paalp.com

Re: 2019 Annual Groundwater Monitoring Report
14-Inch Vac to Jal Legacy
U/L "F", Sec. 25, T25S, R37E
Lea County, New Mexico
NMOCD Reference No. 1R – 2162
Plains All American Pipeline, L.P. SRS No. 2009-092
Terracon Project No. AR197010

Dear Mrs. Bryant:

Terracon is pleased to submit one electronic copy and one CD attached to the cover page of the 2019 Annual Groundwater Monitoring Report for the above-referenced site.

We appreciate the opportunity to perform these services for Plains All American Pipeline, L.P. Please contact either of the undersigned at (806) 300-0140 if you have questions regarding the information provided in the report.

Sincerely,
Terracon

Prepared by:



Paige Gaona
Project Manager
Lubbock

Reviewed by:



Erin Loyd, P.G.
Principal
Office Manager – Lubbock

2019 Annual Groundwater Monitoring Report

Plains – 14-Inch Vac to Jal Legacy ■ Lea County, New Mexico

March 19, 2020 ■ Terracon Project No. AR197010



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1.0 INTRODUCTION

1.1 Site Description

The legal description of the 14-Inch Vac to Jal Legacy release site is Unit Letter “F” (SE/NW), Section 25, Township 25 South, Range 37 East, in Lea County, New Mexico. The property affected by the release is owned by Concho Resources, Inc. The geographic coordinates of the release site are 32.102541° North latitude and 103.119411° West longitude. A “Topographic Map” depicting the site’s location is provided as Exhibit 1 in Appendix A.

Site Name	14-Inch Vac to Jal Legacy
Site Location	Latitude 32.102541° North, Longitude 103.119411° West
General Site Description	The site consists of 14 groundwater monitoring wells located in, and adjacent to, a pipeline right-of-way surrounding land used for oil and gas production.
Landowner	Concho Resources, Inc.

1.2 Background Information

Based on information provided by the client, on April 9, 2009, Plains Pipeline, L.P. (Plains) discovered a crude oil release from a 14-inch steel pipeline. During initial response activities, Plains installed a temporary clamp to mitigate the release. Approximately 250 barrels (bbls) of crude oil were released, with no recovery. Plains notified the New Mexico Oil Conservation Division (NMOCD) Hobbs District 1 Office of the release, and a "Release Notification and Corrective Action" (Form C-141) was submitted. The cause of the release was attributed to external corrosion of the pipeline.

Subsequent to initial response activities on April 9, 2009, excavation of the crude oil impacted soil commenced at the site. To facilitate remediation activities, the excavation was divided into two management sections: Main Excavation and West Excavation. Approximately 18,000 cubic yards (cy) of impacted soil were excavated from the two excavation areas, stockpiled on-site up a non-permeable plastic liner to mitigate the potential leaching of contaminants into the vadose zone. Final dimensions of the Main Excavation were approximately 400 feet (ft.) in length, approximately 200 ft. in width, and 5 ft. to 14 ft. in depth. Final dimensions of the West Excavation were approximately 150 ft. in length, approximately 105 ft. in width, and approximately 10 ft. in depth. Due to safety concerns associated with excavating near and supporting two 14-inch diameter pipelines that bisect the release site, Plains requested and received NMOCD approval to leave the soil beneath and adjacent to the pipelines in-situ.

On July 2 and 3, 2009, three soil borings (SB-1, SB-2, and SB-3) were drilled at the release site to evaluate the vertical extent of soil impact. While advancing the soil borings, groundwater was encountered at approximately 64 ft. below ground surface (bgs). On July 2, 2009, monitoring well MW-1 was constructed and completed using SB-1. For soil borings SB-2 and SB-3, temporary casing was installed on July 2, 2009 to allow a preliminary groundwater sample to be collected for analysis. Following sample collection, the temporary casing was removed, and each boring was plugged with cement and bentonite, pursuant to NMOCD and New Mexico Office of the State Engineer (NMOSE) standards.

On December 10, 2009, two soil borings (SB-4 and SB-5) were drilled up-gradient of the excavation to evaluate the potential groundwater impact from an up-gradient, off-site source. While advancing soil borings SB-4 and SB-5, groundwater was encountered at approximately 64 ft. bgs. Temporary casing was installed in each boring to allow a preliminary groundwater sample to be collected for analysis. Following sample collection, the temporary casing was removed, and each boring was plugged with cement and bentonite, pursuant to NMOCD and NMOSE standards.

From May 6 through May 8, 2013, five additional monitoring wells (MW-2 through MW-6) were installed to evaluate the status of the groundwater at the site. These monitoring wells were advanced to a total depth of approximately 80 ft. bgs. Monitoring well MW-2 is located approximately 380 ft. to the northwest (up-gradient) of monitoring well MW-1. Monitoring well MW-3 is located approximately 200 ft. to the northeast (cross-gradient) of monitoring well MW-1. Monitoring well MW-4 is located approximately 100 ft. Monitoring well MW-5 is located approximately 208 ft. to the west-northwest (cross-gradient) of monitoring well MW-1. Monitoring well MW-6 is located approximately 150 ft. to the southeast (down-gradient) of monitoring well MW-1.

Phase separated hydrocarbons (PSH) were not observed in monitoring wells MW-2 through MW-6. Laboratory analytical results of soil samples collected during the installation of the monitoring wells indicated benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH), and chloride concentrations were less than NMOCD regulatory standards in each of the submitted samples.

From June 25 through June 26, 2014, three additional monitoring wells (MW-7, MW-8, and MW-9) were installed to further monitor the down- and cross-gradient migration of the dissolved-phase plume. These monitoring wells were installed to total depths of approximately 80 ft. bgs. Monitoring well MW-7 is located approximately 45 ft. to the southeast (down-gradient) of monitoring well MW-1. Monitoring well MW-8 is located approximately 180 ft. to the east-northeast (cross-gradient) of monitoring well MW-1. Monitoring well MW-9 is located approximately 150 ft. to the southeast (down-gradient) of monitoring well MW-1.

PSH was not observed in monitoring wells MW-7 through MW-9. Laboratory analytical results of soil samples collected during the installation of the monitor wells indicated benzene, BTEX, TPH, and chloride concentrations were less than NMOCD regulatory standards in each of the submitted samples.

The 14-Inch Vac to Jal Legacy release site is located approximately 1,147 ft. to the south-southeast of a documented groundwater remediation site (Arco South Justis Unit F-230). Information regarding this site can be found in the NMOCD imaging system.

Based on laboratory analytical results of groundwater samples collected from monitoring well MW-5, which is located approximately 260 ft. to the west-southwest (cross-gradient) of the release point, and the absence of elevated chloride concentrations in the soil columns of monitoring wells MW-2 through MW-6, Plains requested permission to cease monitoring of total dissolved solids (TDS) and chloride in the *2013 Annual Monitoring Report*, dated March 2014. The request was subsequently approved by the NMOCD, with the caveat that a chloride sample would be collected from monitoring well MW-2 on a quarterly basis. Quarterly chloride monitoring of monitoring well MW-2 commenced in November 2014.

On October 18, 2016, Terracon assumed project management responsibilities and oversight of groundwater monitoring activities at the 14-Vac to Jal Legacy project site. At the time, there were a total of nine monitoring wells located at the site. Monitoring wells MW-2 through MW-9 were gauged and sampled on a quarterly schedule and monitoring well MW-1 was not sampled due to the presence of PSH.

On February 20, 2018, five additional monitoring wells MW-10 through MW-14 were installed to evaluate the status of the groundwater at the site. These monitoring wells were advanced to a total depth of approximately 80 ft. bgs. Monitoring well MW-10 is located approximately 210 ft. to the north-northwest (up-gradient) of monitoring well MW-1. Monitoring well MW-11 is located approximately 350 ft. to the north-northeast (up-gradient and cross-gradient) of monitoring well MW-1. Monitoring well MW-12 is located approximately 260 ft. to the east-northeast (cross-gradient) of monitoring well MW-1. Monitoring well MW-13 is located approximately 260 ft. to the east (cross-gradient) of monitoring well MW-1. Monitoring well MW-14 is located approximately 225 ft. to the southeast (down-gradient) of monitoring well MW-1. A “Site Diagram” depicting monitoring well locations is provided as Exhibit 2 in Appendix A.

On November 9, 2018, West Company professionally surveyed all site monitoring wells.

1.3 Scope of Work

Terracon’s scope of work includes project management responsibilities, oversight of groundwater monitoring activities, and preparation of an *Annual Groundwater Monitoring Report* in accordance with the NMOCD letter, dated May 1998, requiring submittal of and *Annual Groundwater*

Monitoring Report by April 1st of each year. In accordance with the approved scope of work, Terracon conducted quarterly groundwater monitoring events on February 19 (1Q19), May 20 (2Q19), August 27 (3Q19), and November 25-26, 2019 (4Q19).

2.0 GROUNDWATER REMEDIATION PROGRAM

2.1 Groundwater Monitoring

Quarterly groundwater monitoring events were conducted on February 19, May 20, August 27, and November 25, 2019. Monitoring event activities included measuring the static water levels in all the site's monitoring wells, checking for the presence of PSH, and purging and collecting groundwater samples from wells not exhibiting a measurable thickness of PSH.

Groundwater samples were collected utilizing low-flow sampling equipment, including a bladder pump and multi-parameter meter. Prior to sample collection, readings on the multi-parameter meter were recorded for a minimum of four cycles of five minutes each. Each collected sample was placed in laboratory-supplied containers appropriate to the analyses requested and placed on ice in a cooler. The sample coolers and completed chain-of-custody forms were delivered to Xenco Laboratories in Lubbock, Texas for analysis of (BTEX) using Environmental Protection Agency (EPA) SW-846 Method 8021B and PAH SW-846 EPA Method 8310. Groundwater samples collected from monitoring well MW-2 were also analyzed for chloride using EPA Method E300. Purged water was placed into a polystyrene aboveground storage tank (AST) and disposed of at an NMOCD-approved disposal facility.

Groundwater elevation gauging data collected during the respective quarterly monitoring events were used to construct groundwater gradient maps, which are included as Exhibits 3 through 6 in Appendix A. The groundwater flow direction was relatively consistent to the southeast for each quarter of 2019. Groundwater elevation and PSH thickness data is summarized in Table 1 in Appendix B.

A yearly monitoring event for polyaromatic hydrocarbons (PAH) was conducted November 25, 2019. Based on the sampling criteria provided by NMOCD, only monitoring wells MW-10 through MW-14 were subject to annual PAH monitoring due to their lack of sampling since installation. PAH sample requirements were met on monitoring well MW-2 through MW-9 in June 2013 and May 2014, respectively.

3.0 LABORATORY ANALYTICAL METHODS

The groundwater samples collected were analyzed for BTEX using EPA SW-846 Method 8021B, chloride using EPA Method E300 and/or PAH constituent concentrations by Environmental Protection Agency (EPA) Method SW-846 8270C, respectively. Laboratory results from the

analysis of groundwater samples collected from the monitoring wells are summarized in Table 2 and Table 6 in Appendix B and presented as Exhibits 7 through 11 in Appendix A. Copies of the certified laboratory reports and chain-of-custody documentation are provided in Appendix C.

4.0 GROUNDWATER DATA EVALUATION

4.1 Groundwater Sample Results

Laboratory analytical results from each quarterly monitoring event were compared to NMOCD regulatory standards based on New Mexico Water Quality Control Commission (NMWQCC) groundwater standards found in Section 20.6.2.3103 of the New Mexico Administrative Code (NMAC).

4.1.1 Monitoring Well MW-1

- Monitoring well MW-1 was not sampled due to the presence of PSH. PSH thicknesses of 0.59 ft. (1Q19), 0.68ft. (2Q19), and 1.04 ft. (3Q19) were observed during the quarterly monitoring events. Monitoring well MW-1 was not gauged during the 4th quarter monitoring event; however, during the next weekly gauging and recovery event there was a PSH thickness of 0.35 ft.

4.1.2 Monitoring Well MW-2

- Laboratory analytical results indicated benzene concentrations exceeded the NMOCD regulatory standard during the four quarterly monitoring events. The detected benzene concentrations ranged from 0.0529 milligrams per liter (mg/L) for the 2nd quarter to 0.0322 mg/L for the 4th quarter.
- Laboratory analytical results indicated the concentrations of toluene, ethylbenzene and total xylene were below the respective laboratory sample detection limit (SDLs) for the 3rd and 4th quarters. For the 1st quarter, the concentrations of ethylbenzene and total xylenes were above the laboratory SDLs but below the respective NMOCD regulatory standard for each constituent. For the 2nd quarter, the concentrations of toluene were above the laboratory SDLs but below the respective NMOCD regulatory standard for each constituent.
- Laboratory analytical results indicated chloride concentrations exceeded the NMOCD regulatory standard during each quarterly monitoring event. The detected chloride concentrations ranged from 8,790 mg/L for the 1st quarter to 9,610 mg/L for the 2nd quarter.

4.1.3 Monitoring Well MW-3

- Laboratory analytical results indicated benzene concentrations exceeded the NMOCD regulatory standard during the first three quarterly monitoring events. The detected

benzene concentrations ranged from 0.0011 mg/L for the 4th quarter to 0.762mg/L for the 3rd quarter.

- Laboratory analytical results indicated toluene and ethylbenzene concentrations were below the respective laboratory SDLs for each constituent during the four quarterly monitoring events except toluene during the 2nd quarterly monitoring event.
- Laboratory analytical results indicated the concentration for total xylenes was below the laboratory SDLs for the 2nd and 4th quarter. For the 3rd and 4th quarters, the concentrations of total xylenes were above the laboratory SDLs but below the NMOCD regulatory standard.

4.1.4 Monitoring Well MW-4

- Laboratory analytical results indicated benzene concentrations were below the laboratory SDLs for the 3rd and 4th quarters. For the 1st and 2nd quarters, the benzene concentrations exceeded the laboratory SDLs, but were below the NMOCD regulatory standard. The detected benzene concentrations ranged from 0.00130 mg/L for the 1st quarter to 0.000410 mg/L for the 2nd quarter.
- Laboratory analytical results indicated the concentrations of toluene were above the laboratory SDLs, but below the NMOCD regulatory standard during the 1st and 2nd quarter monitoring event.
- During the 3rd quarter, total xylenes were above the laboratory SDLs, but below the NMOCD regulatory standard during the 1st and 2nd quarter monitoring event.

4.1.5 Monitoring Wells MW-5, MW-6, MW-7, MW-11, and MW-12

- Laboratory analytical results indicated BTEX concentrations were below the respective laboratory SDLs for each constituent during the four quarterly monitoring events.
- During the 2nd quarterly monitoring event, all 5 of the monitoring wells showed a spike in toluene which appeared to be the result of laboratory interference considering monitoring well MW-9, MW-10, and MW-14 also had a change in toluene. Correspondence from Xenco representatives provided an explanation that sample interference due to laboratory contamination was not probable based on the review of the results being reported without error. Xenco did however present the possibility of toluene interference due to the tendency of toluene absorption by the HCL VOA septum. Xenco's letter of explanation is provided in Appendix C.

4.1.6 Monitoring Well MW-8

- Laboratory analytical results indicated benzene concentrations exceeded the NMOCD regulatory standard during the four quarterly monitoring events. The detected benzene concentrations ranged from 0.00150 mg/L for the 2nd quarter to 0.281 mg/L for the 3rd quarter.

- Laboratory analytical results indicated the concentrations of toluene and ethylbenzene were below the respective laboratory SDLs for each constituent during the four quarterly monitoring events.
- Laboratory analytical results indicated the concentrations for total xylenes were below the laboratory SDLs for the 1st and 4th quarters. For the 2nd and 3rd quarters, the concentration was above the laboratory SDLs but below the NMOCD regulatory limit.

4.1.7 Monitoring Wells MW-9 and MW-14

- Laboratory analytical results indicated a spike in benzene, toluene, and total BTEX during the 2nd quarterly event the concentration was above the laboratory SDLs but below the NMOCD regulatory limit.

4.1.8 Monitoring Well MW-10

- Laboratory analytical results indicated the concentrations for benzene, toluene, and total BTEX were above the laboratory SDLs but below the NMOCD regulatory limit during the 2nd and 4th quarterly monitoring events.

4.1.9 Monitoring Well MW-13

- For all four quarters, laboratory analytical results indicated benzene concentrations exceeded the NMOCD regulatory standard during each quarter. The detected benzene concentrations ranged from 0.0609 mg/L during the 4th quarter to 0.712 mg/L during the 1st quarter.
- Laboratory analytical results indicated the concentrations of toluene and ethylbenzene were below the respective laboratory SDLs for each constituent for the 1st, 3rd, and 4th quarters. Toluene was detected above the laboratory SDLs but below the NMOCD regulatory limit, for the 2nd quarter.
- Total xylenes and total BTEX during the first three quarters were detected above the laboratory SDLs but below the NMOCD regulatory limit.

4.1.2 PAH Sampling on Monitoring Well MW-10, MW-11, MW-12, MW-13, MW-14

- PAH constituent concentrations in the groundwater sample collected on November 25, 2019, were both less than the appropriate laboratory SDLs and less than NMOCD regulatory standards.

5.0 CORRECTIVE ACTION

5.1 Product Recovery

During the quarterly monitoring event on April 12, 2012, a measurable thickness of PSH was gauged in monitoring well MW-1. In April 2012, monthly gauging and PSH recovery activities commenced and were conducted until November 2013. In November 2013, the frequency of PSH recovery was increased to bi-monthly (2 times per month) until June 2014. In June 2014, the frequency was increased to weekly. For 2019, approximately 1.762 gallons (0.042 bbls) of PSH were recovered from monitoring well MW-1 via weekly manual recovery and the average PSH thickness was 0.51 ft. PSH Recovery Data is summarized in Table 4a in Appendix B.

A Mobile Dual Phase Extraction (MDPE) unit, provided by Talon LPE, performed two 12-hour recovery events on monitoring well MW-1 on March 13th and May 29th (see Table 3a and 3b in Appendix B). An estimated 4.28 gallons (0.1 bbls) of PSH in the vapor phase and an estimated 6.0 gallons (0.14 bbls) of PSH in the liquid phase were recovered by the MDPE unit, for a total estimated 10.28 gallons (0.24 bbls) of PSH during the first event. An estimated 5.63 gallons (0.13 bbls) of PSH in the vapor phase and an estimated 7.0 gallons (0.17 bbls) of PSH in the liquid phase were recovered by the MDPE unit, for a total estimated 12.63 gallons (0.30 bbls) of PSH during the second event. To date, an estimated 22.9 equivalent gallons (0.55 bbls) of PSH has been recovered from monitoring well MW-1 by MDPE. Recovered fluids are disposed at an NMOCD-approved disposal facility. Quarterly MDPE unit System Operation Data & Mass Recovery Calculations, provided by Talon LPE, are summarized in Tables 3a and 3b in Appendix B.

An Aggressive Fluid Recovery (AFR) event was performed on monitoring wells MW-1, MW-3, and MW-8. Due to the method utilizing a hose which is lowered into a well's fluid column and then connected to a vacuum truck to recover both groundwater impacted with dissolve phase hydrocarbons and PSH, the exact amount of PSH recovered cannot be determined. A calculated amount was determined based on the volume of PSH in the well gauged prior to the AFR event and then recorded as minimum recovery. Monitoring well MW-3 and MW-8 were not part of the AFR event in the 2nd and 3rd quarter. For the AFR event on April 25th, a calculated minimum of 0.2 gallons (0.005 bbls) of PSH and 1,645 gallons (39.17 bbls) of total fluids was recovered from monitoring well MW-1. For the AFR event on September 12th, a calculated minimum of 1.02 gallons (0.024 bbls) of PSH and 2,330 gallons (55.48 bbls) of total fluids was recovered from monitoring well MW-1. For the AFR event on November 18 -20th, monitoring well MW-1 recovered 875 total fluids, MW-3 recovered 1,680 total fluids, MW-8 recovered 1,050 total fluids. For the AFR event on December 10-12th, monitoring well MW-1 recovered 1,260 total fluids, MW-3 recovered 1,596 total fluids, MW-8 recovered 1,050 total fluids. PSH was not gauged in monitoring well MW-3 and MW-8; therefore, PSH was not recovered from the wells. For 2019, monitoring well MW-1 had an approximate total of 22.96 gallons (0.55 bbls) of PSH recovered via weekly manual recovery, MDPE, and AFR events. Since April 2012, an approximate cumulative total of 1,449.96 gallons (34.52 bbls) of PSH have been recovered from monitoring well MW-1.

5.2 Groundwater Recovery

For monitoring well MW-1, an estimated 61 gallons (1.45 bbls) of hydrocarbon impacted groundwater were recovered via weekly manual recovery. In addition, approximately 7,034 gallons (167.5 bbls) of hydrocarbon impacted groundwater were recovered via the AFR event conducted in 2019.

For monitoring well MW-3, an estimated 194 gallons (4.62 bbls) of hydrocarbon impacted groundwater were recovered via weekly manual recovery. In addition, approximately 3,276 gallons (77.99 bbls) of hydrocarbon impacted groundwater were recovered via the AFR event conducted in 2019.

For monitoring well MW-4, an estimated 347 gallons (8.26 bbls) of hydrocarbon impacted groundwater were recovered via weekly manual recovery.

For monitoring well MW-8, an estimated 359 gallons (8.55 bbls) of hydrocarbon impacted groundwater were recovered via weekly manual recovery. In addition, approximately 2,100 gallons (49.99 bbls) of hydrocarbon impacted groundwater were recovered via the AFR event conducted on December 5, 2019.

For monitoring well MW-13, an estimated 485 gallons (11.55 bbl) of hydrocarbon impacted groundwater were recovered via weekly manual recovery in 2019.

For 2019, an approximate total of 13,021.6 gallons (310.04 bbls) of hydrocarbon impacted groundwater were recovered from the site via weekly manual recovery and AFR events. Recovered fluids were disposed at an NMOCD-approved disposal facility.

6.0 SUMMARY OF FINDINGS

The findings of the 2019 Quarterly groundwater monitoring activities are as follows:

- Currently, there are 14 groundwater monitoring wells MW-1 through MW-14 located at the site. Monitoring well MW-10 through MW-14 were installed in February 2018.
- Quarterly groundwater monitoring events were conducted on February 19th (1Q19), May 20th (2Q19), September 27th (3Q19), and November 25th, 2019 (4Q19).
- The groundwater flow direction remained relatively consistent to the southeast for the four quarters.
- Monitoring well MW-1 was not sampled due to PSH being gauged in the well during the four quarterly monitoring events.
- Monitoring well MW-2 through MW-14 were sampled during the four quarterly monitoring events.
- The benzene concentrations in monitoring well MW-2, MW-3, MW-8, and MW-13 exceeded the NMOCD regulatory standard during the four quarterly monitoring events.

- The chloride concentrations in monitoring well MW-2 (up-gradient) exceeded the NMOCD regulatory standard during the four quarterly monitoring events.
- The benzene concentrations in monitoring well MW-4 were above the laboratory SDLs but below the NMOCD regulatory standard during the monitoring events for the 3rd and 4th quarters.
- The concentrations of BTEX in monitoring wells MW-5, MW-6, and MW-9 were below the laboratory SDLs during the four quarterly monitoring events.
- The concentrations of BTEX in monitoring wells MW-10, MW-11, MW-12, and MW-14 were below the laboratory SDLs during the monitoring events for the 2nd, 3rd, and 4th quarters.
- The benzene concentrations in monitoring well MW-13 exceeded the NMOCD regulatory standard during the monitoring events conducted for all four quarters.
- Toluene concentrations were not reported above the laboratory SDLs for wells sampled during the four quarterly monitoring events.
- Toluene concentrations were reported during the 2Q quarterly monitoring event. Laboratory reported possible toluene interference due to toluene absorption by the VOA septum.
- Ethylbenzene and total xylene concentrations were reported above the laboratory SDLs but below the NMOCD regulatory standard during at least one quarterly monitoring event for monitoring wells MW-2, MW-3, MW-8, and MW-13.
- PAH constituent concentrations in the groundwater sample collected on May 12, 2014, were both less than the appropriate laboratory SDLs and less than NMOCD regulatory standards.
- The average PSH thickness in monitoring well MW-1 for 2019 was 1.48 ft.
- Monitoring well MW-1 had an approximate total of 22.96 gallons (0.55 bbls) of PSH recovered via weekly manual recovery, MDPE, and AFR events.
- An approximate total of 13,021.6 gallons (310.04 bbls) of hydrocarbon impacted groundwater were recovered from the site via weekly manual recovery and AFR events.

7.0 ANTICIPATED ACTIONS

- Conduct quarterly monitoring well gauging, groundwater purging and sampling for BTEX and chloride from monitoring well MW-2.
- Collect chloride samples from monitoring well MW-2 during each quarterly monitoring event.
- Collect PAH samples during the annual monitoring event scheduled for the 4th quarter of 2020.
- Conduct weekly manual recovery of PSH from monitoring well MW-1, if applicable.
- Conduct weekly manual recovery of hydrocarbon impacted groundwater from monitoring wells MW-1, MW-3, MW-8, and MW-13.
- Continue MDPE events on monitoring well MW-1 to enhance PSH recovery.

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- Continue AFR events on monitoring well MW-1, MW-3, and MW-8 to enhance recovery of hydrocarbon impacted groundwater.
- Initiate AFR events on monitoring well MW-13 to enhance recovery of hydrocarbon impacted groundwater.
- An *Annual Groundwater Monitoring Report* will be prepared detailing field activities and the results of groundwater monitoring activities conducted during the 2020 reporting period.

2019 Annual Groundwater Monitoring Report

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March 19, 2020 ■ Terracon Project No. AR197010



8.0 DISTRIBUTION

Copy 1: Bradford Billings, Hydrologist E Spec. A.
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APPENDIX A

Exhibit 1 – Topographic Map

Exhibit 2 – Site Diagram

Exhibit 3 – 1Q19 Groundwater Gradient Map (02/19/19)

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Exhibit 6 – 4Q19 Groundwater Gradient Map (11/19/19)

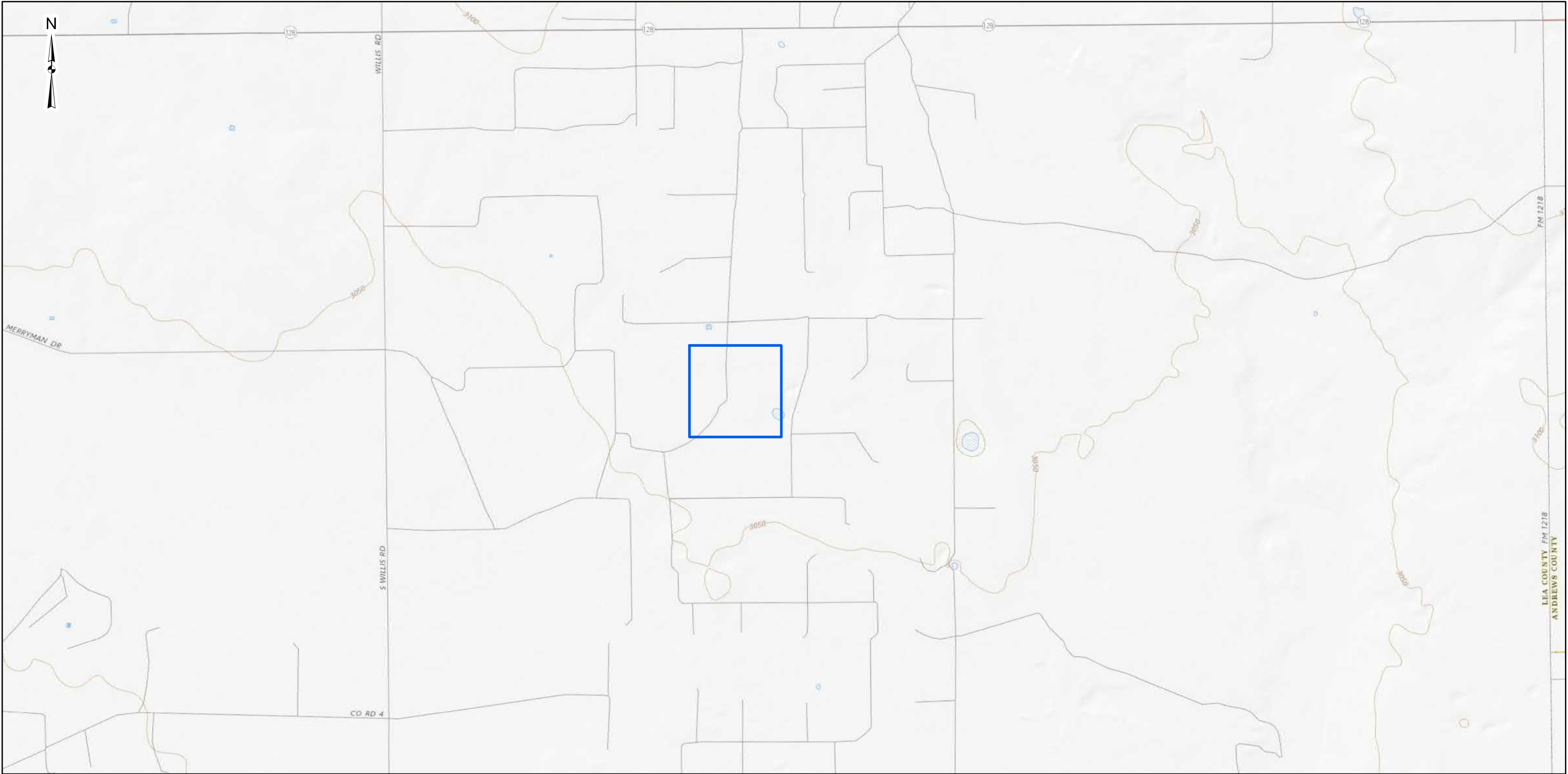
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Exhibit 9 – 3Q19 Groundwater Contaminant Concentration Map (08/27/19)

Exhibit 10 – 4Q19 Groundwater Contaminant Concentration Map (11/25-26/19)

Exhibit 11 - PAH Groundwater Contaminant Concentration Map (11/25/19)



Groundwater Monitoring Site

 Release Site

Notes:
- Exhibit is for general location only, is not indented for construction purposes, and should not be used separately from original report.



Fractional Scale: 1:24,279

DATA SOURCES:
USGS Topographic Map

Project No.:	AR197010
Date:	Mar 2019
Drawn By:	SW
Reviewed By:	ELL



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PH. (806) 300-0104 terracon.com

Topographic Map
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP Lea County, New Mexico GPS: 32.102541°, -103.119411°

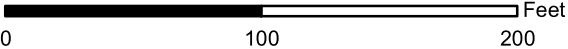
Exhibit
1



Groundwater Monitoring Site

 Monitoring Well (MW)

Notes:
- Exhibit is for general location only, is not intended for construction purposes, and should not be used separately from original report.



Fractional Scale: 1:900

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

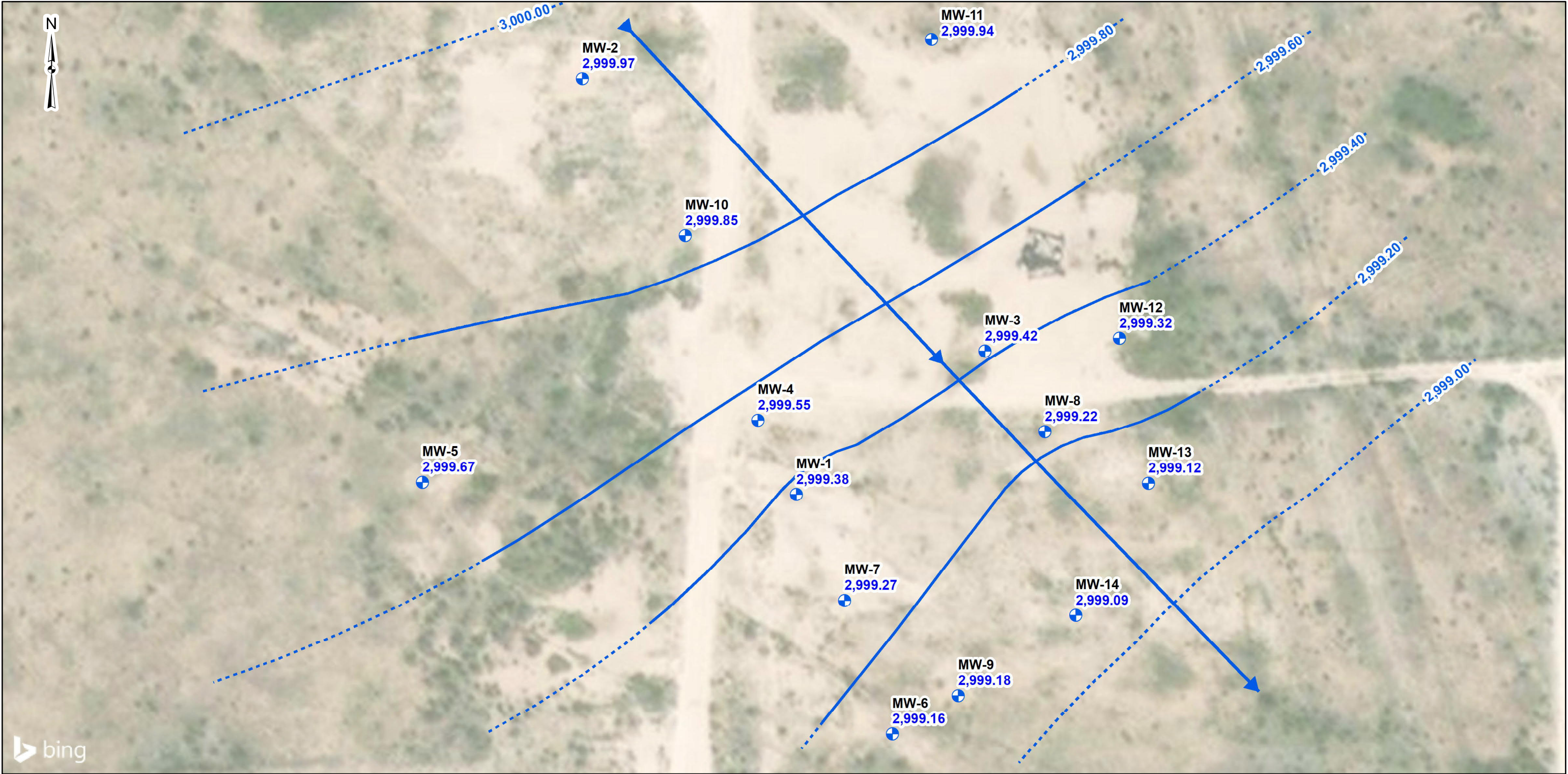
Project No.:	AR197010
Date:	Mar 2019
Drawn By:	SW
Reviewed By:	ELL



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Site Diagram
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP Lea County, New Mexico GPS: 32.102541°, -103.119411°

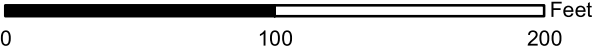
Exhibit
2



Groundwater Monitoring Site

- Monitoring Well (MW)
- Groundwater Contour
- Inferred Groundwater Contour
- Groundwater Flow Direction

Notes:
- All groundwater elevations are measured in feet above mean sea level.
- Groundwater contours were interpolated with ArcGIS's kriging algorithm.
- Groundwater contour interval: 0.20 ft.



Fractional Scale: 1:856

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

Project No.:	AR197010
Date:	Apr 2019
Drawn By:	SW
Reviewed By:	ELL

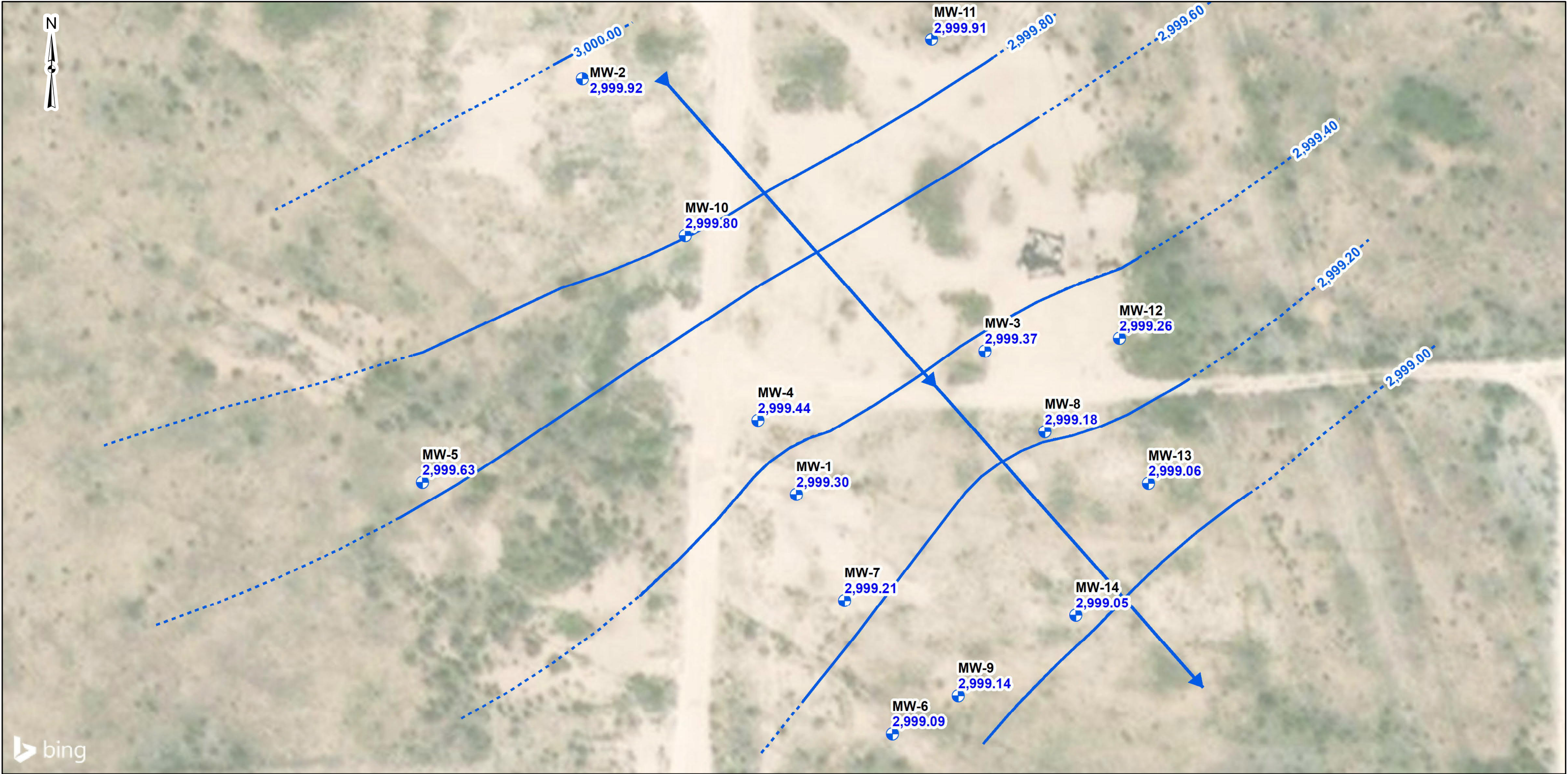
Terracon

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1Q19 Groundwater Gradient Map (02/19/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP Lea County, New Mexico GPS: 32.527330°, -103.290600°

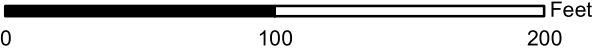
Exhibit
3



Groundwater Monitoring Site

- Monitoring Well (MW)
- Groundwater Contour
- Inferred Groundwater Contour
- Groundwater Flow Direction

Notes:
- All groundwater elevations are measured in feet above mean sea level.
- Groundwater contours were interpolated with ArcGIS's kriging algorithm.
- Groundwater contour interval: 0.20 ft.
- Groundwater gradient: 0.002 ft/ft



Fractional Scale: 1:856

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

Project No.:	AR197010
Date:	Jul 2019
Drawn By:	SW
Reviewed By:	ELL

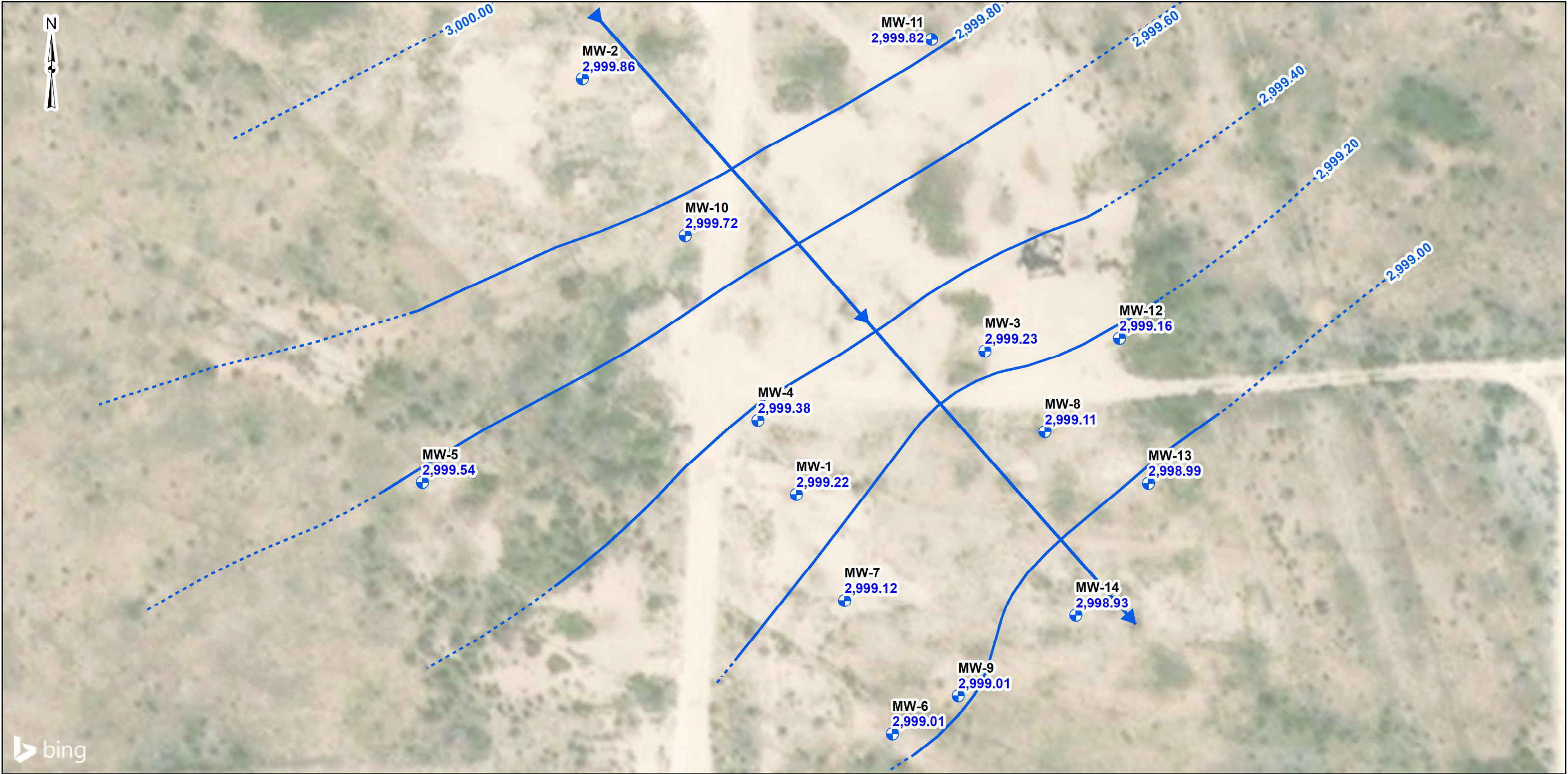
Terracon

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2Q19 Groundwater Gradient Map (05/20/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP U/L "F", Sec. 25, T25S, R37E Lea County, New Mexico GPS: 32.102541°, -103.119411°

Exhibit
4

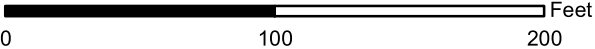


Groundwater Monitoring Site

-  Monitoring Well (MW)
-  Groundwater Contour
-  Inferred Groundwater Contour
-  Groundwater Flow Direction

Notes:

- All groundwater elevations are measured in feet above mean sea level.
- Groundwater contours were interpolated with ArcGIS's kriging algorithm.
- Groundwater contour interval: 0.20 ft.
- Groundwater gradient: 0.002 ft/ft



Fractional Scale: 1:856

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

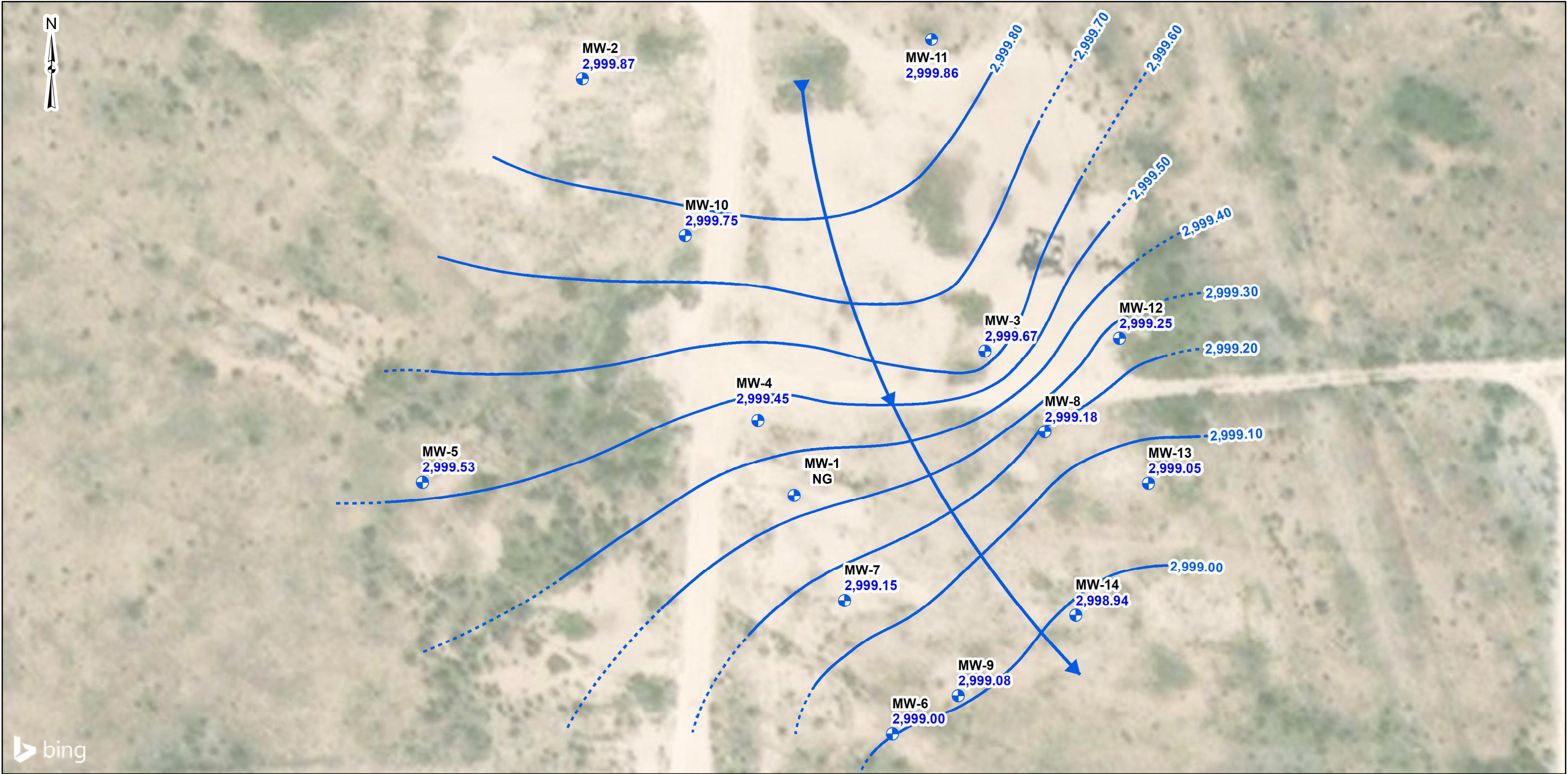
Project No.:	AR197010
Date:	Oct 2019
Drawn By:	SW
Reviewed By:	ELL



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3Q19 Groundwater Gradient Map (08/27/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP U/L "F", Sec. 25, T25S, R37E Lea County, New Mexico GPS: 32.102541°, -103.119411°

Exhibit
5



Groundwater Monitoring Site

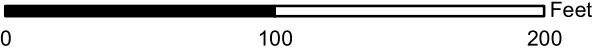
-  Monitoring Well (MW)
-  Groundwater Contour
-  Inferred Groundwater Contour
-  Groundwater Flow Direction

- Notes:**
- All groundwater elevations are measured in feet above mean sea level.
 - Groundwater contours were interpolated with ArcGIS's kriging algorithm.
 - Groundwater contour interval: 0.10 ft.
 - Groundwater gradient: 0.002 ft/ft.
 - MW-1 inadvertently not gauged during 4Q19 sampling event.

Project No.:	AR197010
Date:	Jan 2020
Drawn By:	SW
Reviewed By:	ELL



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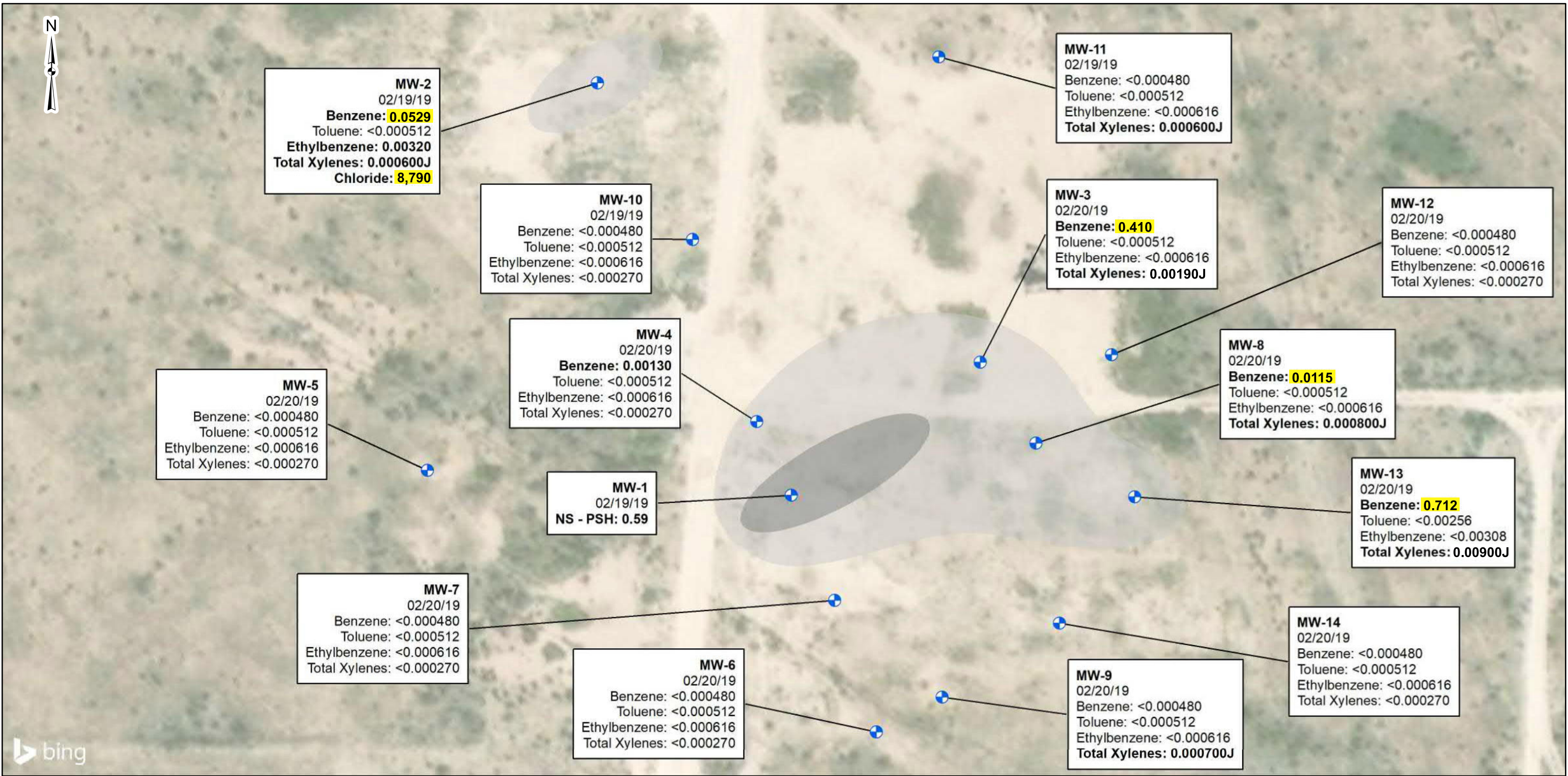


Fractional Scale: 1:856

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

4Q19 Groundwater Gradient Map (11/19/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP U/L "F", Sec. 25, T25S, R37E Lea County, New Mexico GPS: 32.102541°, -103.119411°

Exhibit
6



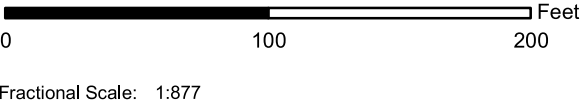
Groundwater Monitoring Site

- Monitoring Well (MW)
- Free Phase Plume: Outlines Wells w/ Phase Separated Hydrocarbons (PSH)
- Dissolved Phase Plume: Outlines Wells w/ BTEX

New Mexico - Oil Conservation Division (NMOCD) Criteria:
B (Benzene) - 0.01 mg/L
T (Toluene) - 0.75 mg/L
E (Ethylbenzene) - 0.75 mg/L
X (Total Xylenes) - 0.62 mg/L
J: The identification of the analyte is acceptable; the reported value is an estimate.
NS: Monitoring well was not sampled due to presence of PSH.
Bold concentrations indicate a concentration above the laboratory sample detection limit (SDL).
Highlighted concentrations indicate a concentration exceeding the RRC Delineation and Remediation Limits. PSH thicknesses are measured in tenths of feet.

Project No.:	AR197010
Date:	Apr 2019
Drawn By:	SW
Reviewed By:	ELL

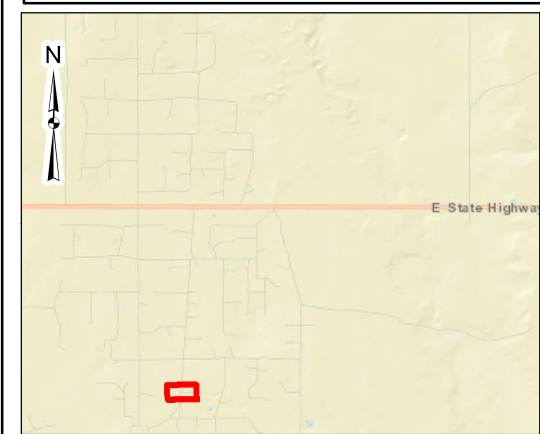
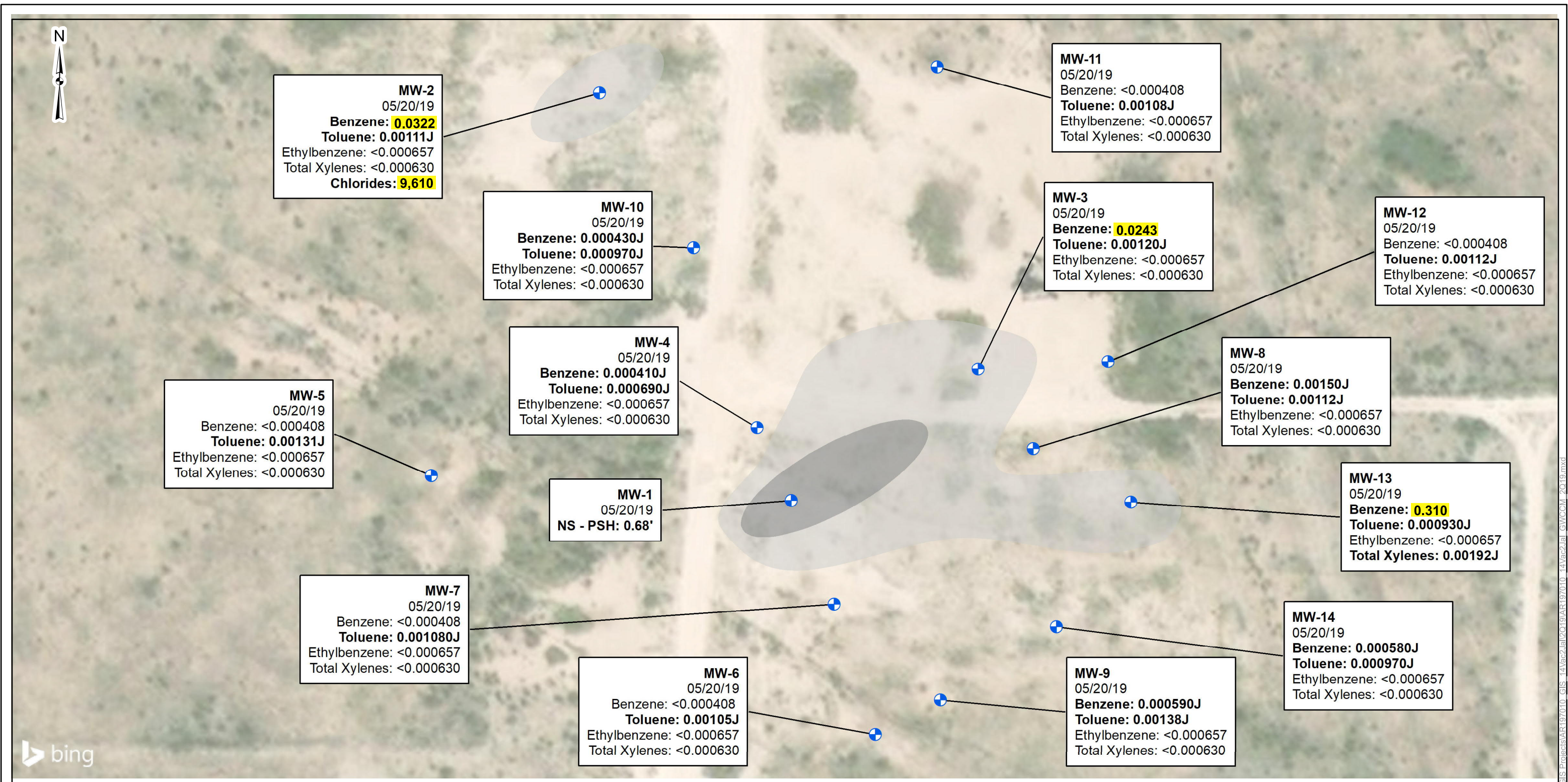
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DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

1Q19 Groundwater Contaminant Concentration Map (02/19/19 & 02/20/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP Lea County, New Mexico GPS: 32.527330°, -103.290600°

Exhibit
7



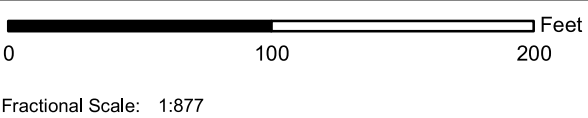
Groundwater Monitoring Site

- Monitoring Well (MW)
- Free Phase Plume: Outlines Wells w/ Phase Separated Hydrocarbons (PSH)
- Dissolved Phase Plume: Outlines Wells w/ BTEX

New Mexico - Oil Conservation Division (NMOCD) Criteria:
B (Benzene) - 0.01 mg/L
T (Toluene) - 0.75 mg/L
E (Ethylbenzene) - 0.75 mg/L
X (Total Xylenes) - 0.62 mg/L
Chlorides - 3,000 mg/L
J: The identification of the analyte is acceptable; the reported value is an estimate.
NS: Monitoring well was not sampled due to presence of PSH.
Bold concentrations indicate a concentration above the laboratory sample detection limit (SDL).
Highlighted concentrations indicate a concentration exceeding the NMOCD Recommended Remediation Action Level (RRAL) Criteria. PSH thicknesses are measured in tenths of a foot.

Project No.:	AR197010
Date:	Jun 2019
Drawn By:	SW
Reviewed By:	ELL

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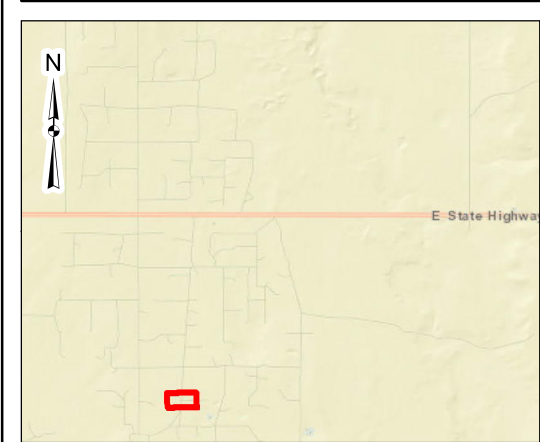
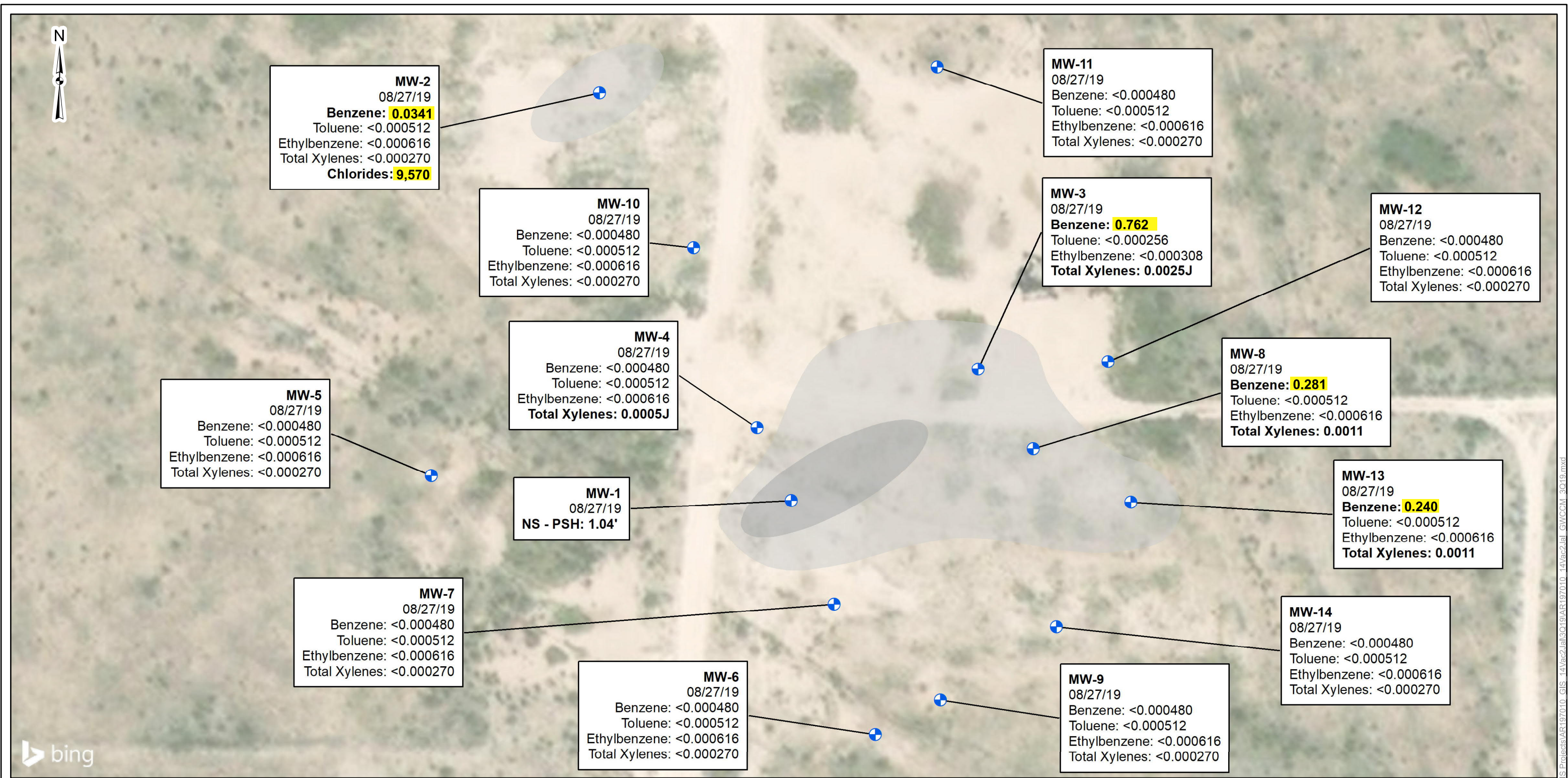


DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

2Q19 Groundwater Contaminant Concentration Map (05/20/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP U/L "F", Sec. 25, T25S, R37E Lea County, New Mexico GPS: 32.102541°, -103.119411°

Exhibit
8

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Groundwater Monitoring Site

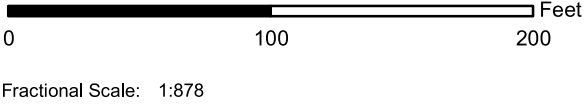
- Monitoring Well (MW)
- Free Phase Plume: Outlines Wells w/ Phase Separated Hydrocarbons (PSH)
- Dissolved Phase Plume: Outlines Wells w/ BTEX

New Mexico - Oil Conservation Division (NMOCD) Criteria:
B (Benzene) - 0.01 mg/L
T (Toluene) - 0.75 mg/L
E (Ethylbenzene) - 0.75 mg/L
X (Total Xylenes) - 0.62 mg/L
Chlorides - 3,000 mg/L
J: The identification of the analyte is acceptable; the reported value is an estimate.
NS: Monitoring well was not sampled due to presence of PSH.
Bold concentrations indicate a concentration above the laboratory sample detection limit (SDL).
Highlighted concentrations indicate a concentration exceeding the NMOCD Recommended Remediation Action Level (RRAL) Criteria. PSH thicknesses are measured in tenths of a foot.

Project No.:	AR197010
Date:	Sep 2019
Drawn By:	SW
Reviewed By:	ELL

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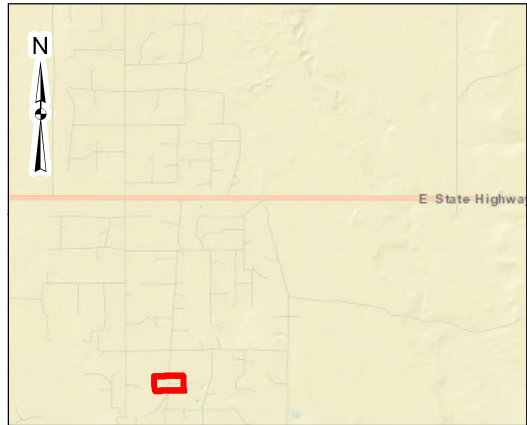
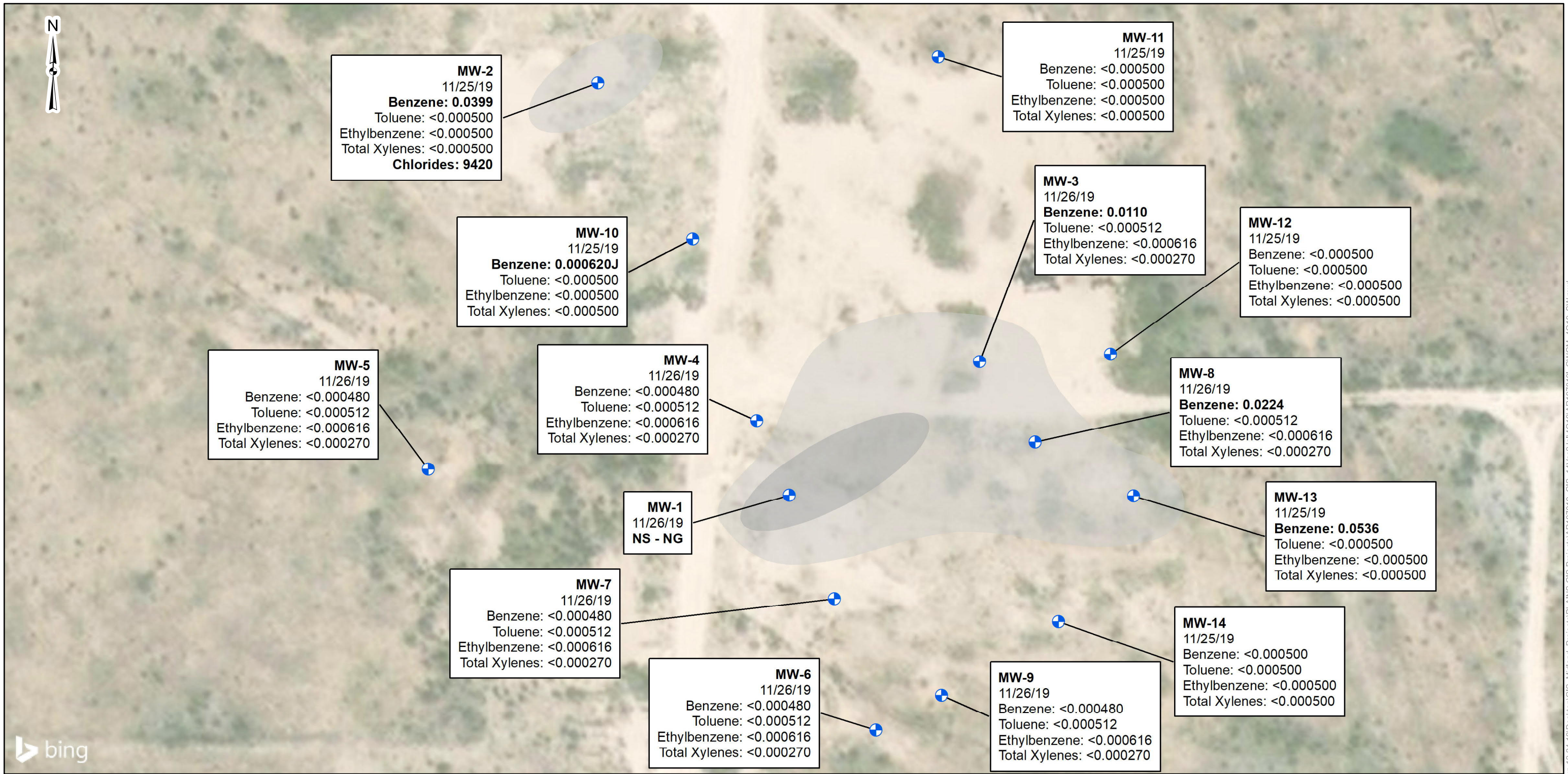
PH. (806) 300-0104 terracon.com



DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

3Q19 Groundwater Contaminant Concentration Map (08/27/19 & 08/28/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP U/L "F", Sec. 25, T25S, R37E Lea County, New Mexico GPS: 32.102541°, -103.119411°

Exhibit
9



Groundwater Monitoring Site

- Monitoring Well (MW)
- Free Phase Plume: Outlines Wells w/ Phase Separated Hydrocarbons (PSH)
- Dissolved Phase Plume: Outlines Wells w/ BTEX

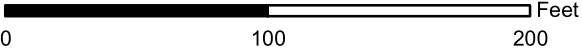
New Mexico - Oil Conservation Division (NMOCD) Criteria:
B (Benzene) - 0.01 mg/L
T (Toluene) - 0.75 mg/L
E (Ethylbenzene) - 0.75 mg/L
X (Total Xylenes) - 0.62 mg/L
J: The identification of the analyte is acceptable; the reported value is an estimate.
NS: Monitoring well was not sampled due to presence of PSH.
- MW-1 inadvertently not gauged during 4Q19 sampling event. PSH inferred based on historical data.
Bold concentrations detected above the laboratory sample detection limit (SDL). Highlighted concentrations exceeded the applicable RRC standards. All concentrations are measured in milligrams per liter (mg/L). PSH thicknesses are measured in tenths of feet.

Project No.:	AR197010
Date:	Jan 2020
Drawn By:	SW
Reviewed By:	ELL

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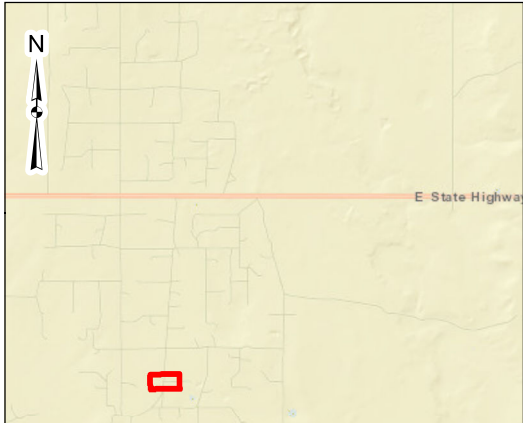
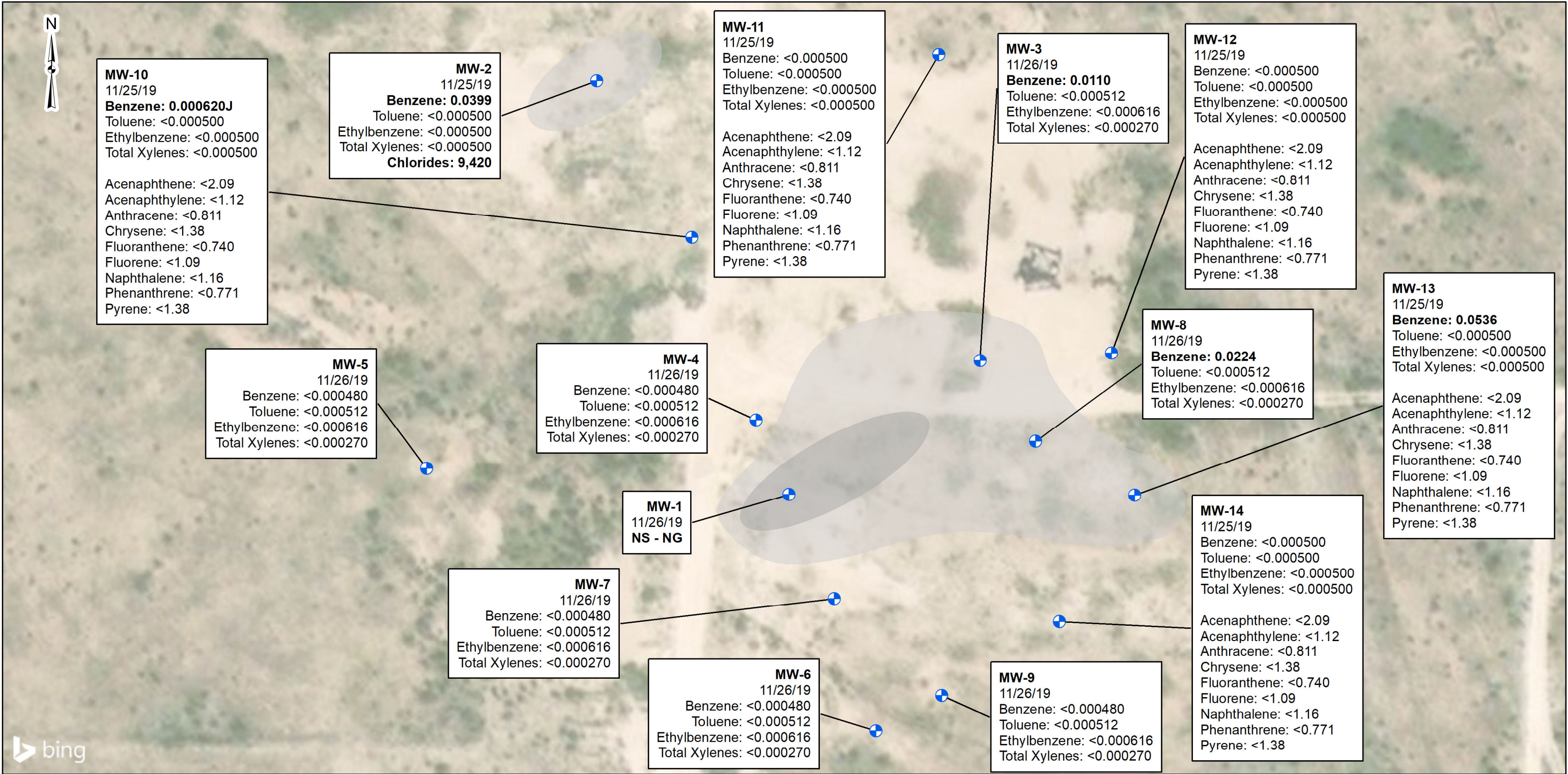
Fractional Scale: 1:878

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

4Q19 Groundwater Contaminant Concentration Map (11/25/19 & 11/26/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP U/L "F", Sec. 25, T25S, R37E Lea County, New Mexico GPS: 32.102541°, -103.119411°

Exhibit
10

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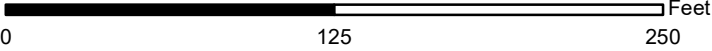
Groundwater Monitoring Site

- Monitoring Well (MW)
- Free Phase Plume: Outlines Wells w/ Phase Separated Hydrocarbons (PSH)
- Dissolved Phase Plume: Outlines Wells w/ BTEX

New Mexico - Oil Conservation Division (NMOCD) Criteria:
B (Benzene) - 0.01 mg/L
T (Toluene) - 0.75 mg/L
E (Ethylbenzene) - 0.75 mg/L
X (Total Xylenes) - 0.62 mg/L
J: The identification of the analyte is acceptable; the reported value is an estimate.
NS: Monitoring well was not sampled due to presence of PSH.
NG: Monitoring well was not gauged
Bold concentrations indicates a concentration above the laboratory sample detection limit (SDL).
Highlighted concentrations indicate a concentration exceeding the RRC Delineation and Remediation Limits. PSH thicknesses are measured in tenths of feet.

Project No.:	AR197010
Date:	Jan 2020
Drawn By:	SW
Reviewed By:	ELL

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Fractional Scale: 1:877

DATA SOURCES:
Bing Maps - Aerial Imagery, World Street Map

4Q19 Groundwater Contaminant Concentration Map (11/25/19 & 11/26/19)
14" Vac to Jal Legacy Plains SRS # 2009-092 NMOCD Ref. # 1RP-2162 Plains Pipeline, LP Lea County, New Mexico GPS: 32.527330°, -103.290600°

Exhibit
11

APPENDIX B

Table 1 – Groundwater Elevation and PSH Thickness Summary

Table 2 – Groundwater BTEX and Chloride Analytical Summary

Table 3a – 2019 Q1 System Operation Data & Mass Recovery Calculations

Table 3b – 2019 Q2 System Operation Data & Mass Recovery Calculations

Table 3c – 2019 Q4 System Operation Data & Mass Recovery Calculations

Table 4a – MW-1 PSH Thickness and Recovery Summary

Table 4b – MW-3 Gauging and BTEX Impacted Groundwater Recovery Summary

Table 4c – MW-4 Gauging and BTEX Impacted Groundwater Recovery Summary

Table 4d – MW-8 Gauging and BTEX Impacted Groundwater Recovery Summary

Table 4e – MW-13 Gauging and BTEX Impacted Groundwater Recovery Summary

Table 5- Quarterly AFR Event Results

Table 6 – Concentrations of PAH in Groundwater Summary

Table 1
Groundwater Elevation & PSH¹ Thickness Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Reference#: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well (Well Diameter ")	Date Gauged	Top of Casing (TOC) ³ Elevation*	Depth to PSH Below TOC (feet)	Depth to Water Below TOC (feet)	PSH Thickness (feet)	Corrected Groundwater Elevation**
MW-1 (2")	02/02/2016	3,065.33	62.40	63.12	0.72	3,002.82
	05/06/2016		62.50	63.71	1.21	3,002.65
	08/03/2016		62.48	63.70	1.22	3,002.67
	12/22/2016		62.74	63.85	1.11	3,002.42
	02/28/2017		62.90	63.27	0.37	3,002.37
	06/29/2017		63.06	63.10	0.04	3,002.26
	09/28/2017		62.92	64.40	1.48	3,002.19
	12/29/2017		62.69	64.69	2.00	3,002.34
	01/12/2018		62.74	64.28	1.54	3,002.36
	04/12/2018		62.89	64.61	1.72	3,002.18
	08/13/2018		63.09	64.11	1.02	3,002.09
	12/02/2018	3,062.62	63.09	63.10	0.01	2,999.53
	02/19/2019		63.15	63.74	0.59	2,999.38
	05/20/2019		63.22	63.90	0.68	2,999.30
	08/27/2019		63.24	64.28	1.04	2,999.22
	11/25/2019		-	-	-	-
MW-2 (2")	02/05/2016	3,065.28	-	62.70	-	3,002.58
	05/06/2016		-	62.20	-	3,003.08
	08/03/2016		-	62.16	-	3,003.12
	12/22/2016		-	62.36	-	3,002.92
	02/28/2017		-	62.37	-	3,002.91
	06/29/2017		-	62.50	-	3,002.78
	09/25/2017		-	62.35	-	3,002.93
	11/16/2017		-	62.36	-	3,002.92
	01/17/2018		-	62.38	-	3,002.90
	04/17/2018		-	62.42	-	3,002.86
	08/13/2018		-	62.05	-	3,003.23
	12/02/2018	3,062.56	-	62.48	-	3,000.08
	02/19/2019		-	62.59	-	2,999.97
	05/20/2019		-	62.64	-	2,999.92
	08/27/2019		-	62.70	-	2,999.86
	11/25/2019		-	62.69	-	2,999.87
MW-3 (2")	02/05/2016	3,065.43	-	62.46	-	3,002.97
	05/06/2016		-	62.39	-	3,003.04
	08/03/2016		-	62.43	-	3,003.00
	12/22/2016		-	63.02	-	3,002.41
	02/28/2017		-	62.97	-	3,002.46
	06/29/2017		-	63.20	-	3,002.23
	09/25/2017		-	63.05	-	3,002.38
	11/16/2017		-	63.05	-	3,002.38
	01/12/2018		-	63.00	-	3,002.43
	04/18/2018		-	63.20	-	3,002.23
	08/13/2018		-	63.27	-	3,002.16
	12/02/2018	3,062.73	-	63.24	-	2,999.49
	02/19/2019		-	63.31	-	2,999.42
	05/20/2019		-	63.36	-	2,999.37
	08/27/2019		-	63.50	-	2,999.23
	11/25/2019		-	63.06	-	2,999.67

Table 1
Groundwater Elevation & PSH¹ Thickness Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Refernece#: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well (Well Diameter ")	Date Gauged	Top of Casing (TOC) ³ Elevation*	Depth to PSH Below TOC (feet)	Depth to Water Below TOC (feet)	PSH Thickness (feet)	Corrected Groundwater Elevation**
MW-4 (4")	02/05/2016	3,065.15	-	62.23	-	3,002.92
	05/06/2016		-	62.40	-	3,002.75
	08/03/2016		-	62.40	-	3,002.75
	12/22/2016		-	62.47	-	3,002.68
	02/28/2017		-	62.56	-	3,002.59
	06/29/2017		-	62.80	-	3,002.35
	09/25/2017		-	62.64	-	3,002.51
	11/16/2017		-	62.60	-	3,002.55
	01/17/2018	3,062.43	-	62.67	-	3,002.48
	04/17/2018		-	62.86	-	3,002.29
	08/13/2018		-	62.86	-	3,002.29
	12/02/2018		-	63.66	-	2,998.77
	02/19/2019		-	62.88	-	2,999.55
	05/20/2019		-	62.99	-	2,999.44
	08/27/2019		-	63.05	-	2,999.38
	11/25/2019		-	62.98	-	2,999.45
MW-5 (2")	02/05/2016	3,065.95	-	63.04	-	3,002.91
	05/06/2016		-	63.10	-	3,002.85
	08/03/2016		-	63.08	-	3,002.87
	12/22/2016		-	63.33	-	3,002.62
	02/28/2017		-	63.33	-	3,002.62
	06/29/2017		-	63.47	-	3,002.48
	09/25/2017		-	63.35	-	3,002.60
	11/16/2017		-	63.32	-	3,002.63
	01/22/2018	3,063.23	-	63.32	-	3,002.63
	04/17/2018		-	63.38	-	3,002.57
	08/13/2018		-	63.52	-	3,002.43
	12/02/2018		-	63.44	-	2,999.79
	02/19/2019		-	63.56	-	2,999.67
	05/20/2019		-	63.60	-	2,999.63
	08/27/2019		-	63.69	-	2,999.54
	11/25/2019		-	63.70	-	2,999.53
MW-6 (4")	02/05/2016	3,065.35	-	62.79	-	3,002.56
	05/06/2016		-	62.90	-	3,002.45
	08/03/2016		-	63.03	-	3,002.32
	12/22/2016		-	63.05	-	3,002.30
	02/28/2017		-	63.09	-	3,002.26
	06/29/2017		-	63.33	-	3,002.02
	09/25/2017		-	63.19	-	3,002.16
	11/16/2017		-	63.22	-	3,002.13
	01/22/2018	3,062.60	-	63.21	-	3,002.14
	04/18/2018		-	63.33	-	3,002.02
	08/13/2018		-	63.37	-	3,001.98
	12/02/2018		-	63.33	-	2,999.27
	02/19/2019		-	63.44	-	2,999.16
	05/20/2019		-	63.51	-	2,999.09
	08/27/2019		-	63.59	-	2,999.01
	11/25/2019		-	63.60	-	2,999.00

Table 1
Groundwater Elevation & PSH¹ Thickness Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Refernece#: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well (Well Diameter ")	Date Gauged	Top of Casing (TOC) ³ Elevation*	Depth to PSH Below TOC (feet)	Depth to Water Below TOC (feet)	PSH Thickness (feet)	Corrected Groundwater Elevation**
MW-7 (4")	02/05/2016	3,065.38	-	62.74	-	3,002.64
	05/06/2016		-	62.88	-	3,002.50
	08/03/2016		-	62.85	-	3,002.53
	12/22/2016		-	62.98	-	3,002.40
	02/28/2017		-	63.10	-	3,002.28
	06/29/2017		-	63.31	-	3,002.07
	09/25/2017		-	63.17	-	3,002.21
	11/16/2017		-	63.20	-	3,002.18
	01/19/2018	3,062.69	-	63.28	-	3,002.10
	04/17/2018		-	63.25	-	3,002.13
	08/13/2018		-	63.41	-	3,001.97
	12/02/2018		-	63.24	-	2,999.45
	02/19/2019		-	63.42	-	2,999.27
	05/20/2019		-	63.48	-	2,999.21
	08/27/2019		-	63.57	-	2,999.12
	11/25/2019		-	63.54	-	2,999.15
MW-8 (2")	02/05/2016	3,065.10	-	62.46	-	3,002.64
	05/06/2016		-	62.41	-	3,002.69
	08/03/2016		-	62.40	-	3,002.70
	12/22/2016		-	62.85	-	3,002.25
	02/28/2017		-	62.78	-	3,002.32
	06/29/2017		-	63.03	-	3,002.07
	09/25/2017		-	62.91	-	3,002.19
	11/16/2017		-	62.91	-	3,002.19
	01/12/2018	3,062.42	-	63.00	-	3,002.10
	04/18/2018		-	63.03	-	3,002.07
	08/13/2018		-	63.12	-	3,001.98
	12/02/2018		-	63.02	-	2,999.40
	02/19/2019		-	63.20	-	2,999.22
	05/20/2019		-	63.24	-	2,999.18
	08/27/2019		-	63.31	-	2,999.11
	11/25/2019		-	63.24	-	2,999.18
MW-9 (4")	02/05/2016	3,065.42	-	62.88	-	3,002.54
	05/06/2016		-	63.05	-	3,002.37
	08/03/2016		-	63.11	-	3,002.31
	12/22/2016		-	63.14	-	3,002.28
	02/28/2017		-	63.23	-	3,002.19
	06/29/2017		-	63.44	-	3,001.98
	09/25/2017		-	63.38	-	3,002.04
	11/16/2017		-	63.40	-	3,002.02
	01/19/2018	3,062.77	-	63.36	-	3,002.06
	04/17/2018		-	63.41	-	3,002.01
	08/13/2018		-	63.53	-	3,001.89
	12/02/2018		-	63.40	-	2,999.37
	02/19/2019		-	63.59	-	2,999.18
	05/20/2019		-	63.63	-	2,999.14
	08/27/2019		-	63.76	-	2,999.01
	11/25/2019		-	63.69	-	2,999.08

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Reference#: 1RP-2162

Monitoring Well (Well Diameter ")	Date Gauged	Top of Casing (TOC) ³ Elevation*	Depth to PSH Below TOC (feet)	Depth to Water Below TOC (feet)	PSH Thickness (feet)	Corrected Groundwater Elevation**
MW-10 (2")	02/20/2018	3,062.40	Installation			
	04/17/2018		-	62.61	-	2,999.79
	08/13/2018		-	62.65	-	2,999.75
	12/02/2018	3,062.50	-	62.48	-	3,000.02
	02/19/2019		-	62.65	-	2,999.85
	05/20/2019		-	62.70	-	2,999.80
	08/27/2019		-	62.78	-	2,999.72
	11/25/2019		-	62.75	-	2,999.75
MW-11 (2")	02/20/2018	3,063.50	Installation			
	04/17/2018		-	64.51	-	2,998.99
	08/13/2018		-	63.52	-	2,999.98
	12/02/2018		-	63.44	-	3,000.06
	02/19/2019		-	63.55	-	2,999.95
	05/20/2019		-	63.58	-	2,999.92
	08/27/2019		-	63.68	-	2,999.82
	11/25/2019		-	63.64	-	2,999.86
MW-12 (2")	02/21/2018	3,062.20	Installation			
	04/18/2018		-	62.78	-	2,999.42
	08/13/2018		-	62.82	-	2,999.38
	12/02/2018		-	62.73	-	2,999.47
	02/19/2019		-	62.88	-	2,999.32
	05/20/2019		-	62.94	-	2,999.26
	08/27/2019		-	63.04	-	2,999.16
	11/25/2019		-	62.95	-	2,999.25
MW-13 (2")	02/21/2018	3,062.40	Installation			
	04/18/2018		-	63.45	-	2,998.95
	08/13/2018		-	63.55	-	2,998.85
	12/02/2018	3,062.71	-	63.43	-	2,999.28
	02/19/2019		-	63.59	-	2,999.12
	05/20/2019		-	63.65	-	2,999.06
	08/27/2019		-	63.72	-	2,998.99
	11/25/2019		-	63.66	-	2,999.05
MW-14 (2")	02/21/2018	3,062.70	Installation			
	04/18/2018		-	63.30	-	2,999.40
	08/13/2018		-	63.40	-	2,999.30
	12/02/2018	3,062.50	-	63.28	-	2,999.22
	02/19/2019		-	63.41	-	2,999.09
	05/20/2019		-	63.45	-	2,999.05
	08/27/2019		-	63.57	-	2,998.93
	11/25/2019		-	63.56	-	2,998.94

Notes:

1. PSH: Phase Separated Hydrocarbons
2. NMOCD: New Mexico Oil Conservation Division
3. TOC: Top of Casing

* Elevations based on the North American Vertical Datum of 1988.

** Corrected groundwater elevations were extrapolated using a PSH specific gravity of 0.85, if PSH was gauged in the monitoring well.

Table 2
Groundwater BTEX¹ & Chloride Concentration Analytical Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Reference #: 1RP-2162

All concentrations are in milligrams per liter (mg/L)

Monitoring Well	Date Sampled	EPA SW 846-8021B							
		Benzene	Toluene	Ethylbenzene	M,P-Xylenes	O-Xylenes	Total Xylenes	Total BTEX	Chloride
NMOCD RRAL CRITERIA ³		0.01	0.75	0.75	TOTAL XYLENES 0.62			NE ⁴	250
MW-2	02/05/2016	0.0205	<0.0020	<0.0010	<0.0020	<0.0010	<0.0020	0.0205	9,570
	05/06/2016	0.0279	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0279	-
	09/27/2016	0.0570	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0570	10,200
	12/29/2016	0.0199	<0.00100	<0.00100	<0.00200	<0.00100	<0.00200	0.0199	10,600
	02/28/2017	0.0418	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0418	10,400
	06/29/2017	0.0800	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0800	9,100
	09/25/2017	0.0430	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0430	9,560
	11/16/2017	0.0632	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0430	10,400
	01/17/2018	0.0626	<0.000512	<0.000616	<0.00454	<0.000270	<0.000270	0.0626	9,200
	04/17/2018	0.0591	<0.000512	0.0028	<0.000454	0.001	0.001	0.0629	10,400
	08/15/2018	0.0547	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0547	10,100
	12/03/2018	0.0485	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0485	9,100
	02/19/2019	0.0529	<0.000512	0.00320	<0.000454	0.000600 J	0.000600 J	0.0567	8,790
	05/20/2019	0.0322	0.00111J	<.000657	<0.000630	<0.000642	<0.000630	0.0333	9,610
08/27/2019	0.0341	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0341	9,570	
11/25/2019	0.0339	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	0.0399	9,420	
MW-3	02/05/2016	2.59	<0.0200	<0.0100	<0.0200	<0.0100	<0.0200	2.59	-
	05/06/2016	2.68	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	2.68	-
	09/27/2016	2.70	0.00260	<0.00200	0.0254	0.00937	0.0348	2.74	-
	12/29/2016	3.57	<0.0200	<0.0200	<0.0400	<0.0200	<0.0400	3.57	-
	02/28/2017	6.65	<0.0020	<0.0020	0.255	<0.0020	0.255	6.91	-
	06/29/2017	1.80	<0.0020	<0.0020	0.0292	<0.0020	0.0292	1.83	-
	09/25/2017	0.50	<0.0020	<0.0020	0.004	<0.0020	0.004	0.506	-
	11/16/2017	0.815	<0.0020	<0.0020	<0.200	<0.0020	<0.200	0.815	-
	01/17/2018	3.78	<0.0256	<0.0308	<0.0227	<0.0135	<0.0135	3.78	-
	04/18/2018	3.12	<0.00512	<0.00616	0.008	<0.00270	0.008	3.13	-
	08/15/2018	2.07	<0.00512	<0.00616	0.007	<0.00270	0.007	2.08	-
	12/03/2018	0.644	<0.00256	<0.00308	0.00350 J	<0.00135	0.00350 J	0.648	-
	02/20/2019	0.410	<0.000512	<0.000616	0.00160 J	0.000300 J	0.00190 J	0.412	-
	05/20/2019	0.0243	0.00120J	<0.000657	<0.000630	<0.000642	<0.000630	0.0255	-
08/27/2019	0.762	<0.00256	<0.00308	0.00250 J	<0.00135	0.00250	0.765	-	
11/26/2019	0.0011	<0.00512	<0.00616	<0.00454	<0.00270	<0.00270	0.011	-	
MW-4	02/05/2016	0.0021	<0.0020	<0.0010	<0.0020	<0.0010	<0.0020	0.0021	-
	05/06/2016	0.0101	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0101	-
	09/27/2016	0.00660	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.00660	-
	12/29/2016	0.00110	<0.00100	<0.00100	<0.00200	<0.00100	<0.00200	0.00110	-
	02/28/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	06/29/2017	0.00138	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.00138	-
	09/25/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	11/16/2017	0.00280	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.00280	-
	01/17/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	04/17/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/15/2018	0.0008	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0008	-
	12/03/2018	0.00150	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.00150	-
	02/20/2019	0.00130	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.00130	-
	05/20/2019	0.000410J	0.000690J	<0.000657	<0.000630	<0.000642	<0.000630	0.00110J	-
	DUP-2	0.000840J	0.000660J	<0.000657	<0.000630	<0.000642	<0.000630	0.00150J	-
	08/27/2019	<0.000480	<0.000512	<0.000616	0.000500 J	<0.000270	0.000500 J	0.000500 J	-
	DUP-2	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	11/26/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-

Table 2
Groundwater BTEX¹ & Chloride Concentration Analytical Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Reference #: 1RP-2162

All concentrations are in milligrams per liter (mg/L)

Monitoring Well	Date Sampled	EPA SW 846-8021B							
		Benzene	Toluene	Ethylbenzene	M,P-Xylenes	O-Xylenes	Total Xylenes	Total BTEX	Chloride
MW-5	02/05/2016	<0.0010	<0.0020	<0.0010	<0.0020	<0.0010	<0.0020	<0.0020	-
	05/06/2016	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-
	09/27/2016	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	12/29/2016	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00200	<0.00200	-
	02/28/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	06/29/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	09/25/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	11/16/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	01/22/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	04/17/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/14/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/20/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	05/20/2019	<0.000408	0.00131J	<0.000657	<0.000630	<0.000642	<0.000630	0.00131J	-
	08/27/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	11/26/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
MW-6	02/05/2016	<0.0010	<0.0020	<0.0010	<0.0020	<0.0010	<0.0020	<0.0020	-
	05/06/2016	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-
	09/27/2016	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	12/29/2016	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00200	<0.00200	-
	02/28/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	06/29/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	09/25/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	11/16/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	01/22/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	04/18/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/14/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/20/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	DUP-2	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	05/20/2019	<0.000408	0.00105J	<0.000657	<0.000630	<0.000642	<0.000630	0.00105J	-
	08/27/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	11/26/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
MW-7	02/05/2016	0.0061	<0.0020	<0.0010	<0.0020	<0.0010	<0.0020	0.0061	-
	05/06/2016	0.0211	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0211	-
	09/27/2016	<0.00200	0.00309	<0.00200	<0.00200	<0.00200	<0.00200	0.00309	-
	12/29/2016	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00200	<0.00200	-
	02/28/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	06/29/2017	0.00117	<0.00200	0.00307	<0.00200	<0.00200	<0.00200	0.00424	-
	09/25/2017	0.00140	<0.00200	0.01560	<0.00200	<0.00200	<0.00200	0.01700	-
	11/16/2017	<0.00200	<0.00200	0.01560	<0.00200	<0.00200	<0.00200	<0.00200	-
	01/19/2018	0.0006	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0006	-
	04/17/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/14/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/20/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	05/20/2019	<0.000480	0.00108J	<0.000657	<0.000630	<0.000642	<0.000630	0.00108J	-
	08/27/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	11/26/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-

Table 2
Groundwater BTEX¹ & Chloride Concentration Analytical Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOCD² Reference #: 1RP-2162

All concentrations are in milligrams per liter (mg/L)

Monitoring Well	Date Sampled	EPA SW 846-8021B							
		Benzene	Toluene	Ethylbenzene	M,P-Xylenes	O-Xylenes	Total Xylenes	Total BTEX	Chloride
MW-8	02/05/2016	0.262	<0.0020	<0.0010	0.0033	<0.0010	0.0033	0.265	-
	05/06/2016	0.52	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.52	-
	09/27/2016	0.967	0.00246	<0.00200	0.0177	0.00244	0.0201	0.990	-
	12/29/2016	0.417	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	0.417	-
	02/28/2017	0.0417	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.0417	-
	06/29/2017	0.420	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.420	-
	09/25/2017	0.368	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.368	-
	11/16/2017	0.080	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.080	-
	01/17/2018	0.0478	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0478	-
	4/18/2018	0.81	<0.00256	<0.00308	0.0035	<0.00135	0.0035	0.814	-
	8/15/2018	0.548	<0.00256	<0.00308	<0.00227	<0.00135	<0.00135	0.548	-
	12/03/2018	0.875	<0.00512	<0.00616	<0.00454	<0.00270	<0.00270	0.875	-
	02/20/2019	0.0115	<0.000512	<0.000616	0.000800J	<0.000270	0.000800J	0.0123	-
	05/20/2019	0.00150J	0.00112J	<0.000657	<0.000630	<0.000642	<0.000630	0.00262	-
	08/27/2019	0.281	<0.000512	<0.000616	0.00110 J	<0.000270	0.00110	0.282	-
MW-9	DUP-1	0.335	<0.000512	<0.000616	0.00150 J	<0.000270	0.00150	0.337	-
	11/26/2019	0.0224	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.0224	-
	02/05/2016	<0.0010	<0.0020	<0.0010	<0.0020	<0.0010	<0.0020	<0.0020	-
	05/06/2016	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-
	09/27/2016	<0.00200	<0.00200	<0.00200	0.00241	<0.00200	0.00241	0.00241	-
	12/29/2016	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00200	<0.00200	-
	02/28/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	06/29/2017	0.00233	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.00233	-
	09/25/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	11/16/2017	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	-
	01/19/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	04/17/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/14/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/20/2019	<0.000480	<0.000512	<0.000616	0.000700J	<0.000270	0.000700J	0.000700J	-
MW-10	02/20/2018	Installation							
	04/17/2018	<0.00048	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/13/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/19/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	05/20/2019	0.000430J	0.000970J	<0.000657	<0.000630	<0.000642	<0.000630	0.00140J	-
	08/27/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
MW-11	11/25/2019	0.000620 J	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	0.00062 J	-
	02/20/2018	Installation							
	04/17/2018	<0.00048	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/13/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/19/2019	<0.000480	<0.000512	<0.000616	0.000600J	<0.000270	0.000600J	0.000600J	-
	05/20/2019	<0.000480	0.00108J	<0.000657	<0.000630	<0.000642	<0.000630	0.00108J	-
MW-12	08/27/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	11/25/2019	<0.000500	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	<0.000500	-
	02/21/2018	Installation							
	04/18/2018	<0.00048	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/15/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/20/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197010
NMOC² Reference #: 1RP-2162

Monitoring Well	Date Sampled	EPA SW 846-8021B							
		Benzene	Toluene	Ethylbenzene	M,P-Xylenes	O-Xylenes	Total Xylenes	Total BTEX	Chloride
MW-13	02/21/2018								
	04/18/2018	0.0339	<0.00512	<0.00616	<0.000454	<0.000270	<0.000270	0.0339	-
	08/15/2018	1.22	<0.00512	<0.00616	0.010	<0.00270	0.010	1.23	-
	12/03/2018	1.06	<0.00512	<0.00616	0.00600J	<0.00270	0.00600J	1.07	-
	02/20/2019	0.712	<0.00256	<0.00308	0.00900J	<0.00135	0.00900J	0.721	-
	05/20/2019	0.310	0.000930J	<0.00657	0.00192J	<0.000642	0.00192J	0.313	-
	DUP-1	0.316	0.00118J	<0.00657	0.00202J	<0.000642	0.00202J	0.319	-
	08/27/2019	0.240	<0.000512	<0.000616	0.00110 J	<0.000270	0.00110	0.241	-
	11/25/2019	0.0536	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	0.0536	-
	DUP-2	0.0609	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	0.0609	-
MW-14	02/21/2018								
	04/18/2018	<0.00048	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	08/14/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	12/03/2018	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	02/20/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	DUP-1	0.000500J	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	0.000500J	-
	05/20/2019	0.000580J	0.000970J	<0.000657	<0.000630	<0.000642	<0.000630	0.00155J	-
	08/27/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270	-
	11/25/2019	<0.000500	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	<0.000500	-
	DUP-1	<0.000500	<0.000500	<0.000500	<0.00100	<0.000500	<0.000500	<0.000500	-

Notes:

1. BTEX: Benzene, Toluene, Ethylbenzene, and Total Xylenes
2. NMOCD: New Mexico Oil Conservation Division
3. RRAL Criteria: Recommended Remediation Action Level Criteria
4. NE: Not Established
J: The target analyte was positively identified below the quantitation limit and above the detection limit
Bold text indicates a concentration above the laboratory detection limit.

Highlighted text indicates a concentration exceeding the NMOCD RRAL Criteria

Table 3a
Q1 System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h2O)	Differential pressure (In. h2O)	Flow (SCFM)	fID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
3:30	1	50	21	285.79	23.2	93.86	31287	8440.00	8440.00	1.00	8440	10.76	3.77	3.77	3.77
4:30	1	50	21	285.79	21.4	90.14	29851	-	8440.00	0.95	8053	10.26	3.46	3.46	7.23
5:30	1	50	21	285.79	19.8	86.71	30660	-	8440.00	0.98	8271	10.54	3.42	3.42	10.65
6:30	1	50	21	285.79	19.7	86.49	27322	-	8440.00	0.87	7370	9.39	3.04	3.04	13.69
7:30	1	48	21	285.79	19.2	85.55	24807	-	8440.00	0.79	6692	8.56	2.74	2.74	16.42
8:30	1	48	21	285.79	19.2	85.55	29778	-	8440.00	0.95	8033	10.28	3.29	3.29	19.71
9:30	1	50	20	272.18	3.12	36.29	27954	-	8620.00	1.09	9378	12.01	1.63	1.63	21.34
10:30	1	54	21	285.79	4.46	40.99	24372	-	8620.00	0.95	8176	10.39	1.59	1.59	22.93
11:30	1	58	21	285.79	3.93	38.33	25057	-	8620.00	0.98	8406	10.60	1.52	1.52	24.45
12:30	1	62	21	285.79	4.21	39.52	26059	-	8620.00	1.01	8742	10.94	1.62	1.62	26.06
13:30	1	70	21	285.79	4.81	41.92	25694	8620.00	8620.00	1.00	8620	10.62	1.66	1.66	27.73
14:30	1	72	21	285.79	4.57	40.79	24972		8620.00	0.97	8378	10.28	1.57	1.57	29.30
Averages:		55.17	20.92	284.65	12.30	63.84	27317.75						Total	29.30	

PSH Mass Recovered in Vapor Phase = 4.28 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)						
Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
8440	29.6092	1	0.0821	50	283	10.75571376

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

Liquid-phase Hydrocarbon Recovery

∅² * r2 * h = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase = 29.30 lbs
4.28 gallons

PSH Mass Recovered in Liquid Phase = 41.04 lbs
6.00 galons

TOTAL = 70.34 lbs
10.28 gallons

Gallons removed determined at time of pick up			
PSH Volume in Gallons=		6	
PSH Mass in Pounds=		41.04	

% Vol. Hydrocarbon to ppmv - Influent 1					Molecular Weight Calculations		
Compound	Molecular Weight (g/mol)	% Vol	=	ppmv	component	Molecular Weight (g/mol)	mol%
Methane (CH4)	16.04	0		0.00	Nitrogen (N2)	28.016	90.9340
Ethane (C2H6)	30.07	0		0.00	Methane (CH4)	16.0425	0.0000
Propane (C3H8)	44.10	0		0.00	Carbon Dioxide (CO2)	44.011	8.7980
Iso-Butane (C4H10)	58.12	0		0.00	Ethane (C2H6)	30.069	0.0000
N-Butane (C4H10)	58.12	0		0.00	Propane (C3H8)	44.0956	0.0000
Iso-Pentane (C4H12)	72.15	0		0.00	Iso-Butane (C4H10)	58.1222	0.0000
N-Pentane (C5H12)	72.15	0		0.00	N-Butane (C4H10)	58.1222	0.0000
Hexane+ (C6H14)	97.40	0.844		8440.00	Iso-Pentane (C4H12)	72.1488	0.0000
					N-Pentane (C5H12)	72.1488	0.0000
					Hexane+	97.3966	0.2680
					Total		100
					Calculated MW		29.6092
*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966							

% Vol. Hydrocarbon to ppmv - Influent 2					Molecular Weight Calculations		
Compound	Molecular Weight (g/mol)	% Vol	=	ppmv	component	Molecular Weight (g/mol)	mol%
Methane (CH4)	16.04	0		0.00	Nitrogen (N2)	28.016	90.1000
Ethane (C2H6)	30.07	0		0.00	Methane (CH4)	16.0425	0.0000
Propane (C3H8)	44.10	0		0.00	Carbon Dioxide (CO2)	44.011	9.6250
Iso-Butane (C4H10)	58.12	0		0.00	Ethane (C2H6)	30.069	0.0000
N-Butane (C4H10)	58.12	0		0.00	Propane (C3H8)	44.0956	0.0000
Iso-Pentane (C4H12)	72.15	0		0.00	Iso-Butane (C4H10)	58.1222	0.0000
N-Pentane (C5H12)	72.15	0		0.00	N-Butane (C4H10)	58.1222	0.0000
Hexane+ (C6H14)	97.40	0.862		8620.00	Iso-Pentane (C4H12)	72.1488	0.0000
					N-Pentane (C5H12)	72.1488	0.0000
					Hexane+	97.3966	0.2750
					Total		100
					Calculated MW		29.7463
*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966							

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= % Vol x 10,000

Table 3b
Q2 System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h2O)	Differential pressure (In. h2O)	Flow (SCFM)	FID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
12:00	1	84	18	244.96	9.1	65.76	50000	12530.00	12530.00	1.00	12530	15.28	3.76	3.76	3.76
13:00	1	84	18	244.96	9.1	65.76	50000	-	12530.00	1.00	12530	15.28	3.76	3.76	7.51
14:00	1	84	18	244.96	8.8	64.66	50000	-	12530.00	1.00	12530	15.28	3.69	3.69	11.20
15:00	1	84	18	244.96	8.5	63.55	50000	-	12530.00	1.00	12530	15.28	3.63	3.63	14.83
16:00	1	86	18	244.96	8.2	62.31	50000	-	12530.00	1.00	12530	15.22	3.54	3.54	18.38
17:00	1	86	19	258.57	6.7	53.91	50000	-	12530.00	1.00	12530	15.22	3.07	3.07	21.44
18:00	1	86	19	258.57	6.5	53.10	50000	-	13250.00	1.00	13250	16.19	3.21	3.21	24.66
19:00	1	86	19	258.57	5.8	50.16	50000	-	13250.00	1.00	13250	16.19	3.04	3.04	27.69
20:00	1	84	19	258.57	5.3	48.04	50000	-	13250.00	1.00	13250	16.25	2.92	2.92	30.61
21:00	1	84	19	258.57	4.1	42.25	50000	-	13250.00	1.00	13250	16.25	2.57	2.57	33.18
22:00	1	80	19	258.57	4.2	42.92	50000	13250.00	13250.00	1.00	13250	16.37	2.63	2.63	35.81
23:00	1	80	19	258.57	4.4	43.93	50000		13250.00	1.00	13250	16.37	2.69	2.69	38.49
Averages:		84.00	18.58	252.90	6.73	54.70	50000.00						Total	38.49	

PSH Mass Recovered in Vapor Phase = 5.63 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
12530	30.2163	1	0.0821	84	301.888889	15.275726

Inputs are the green values.

Calculated values are yellow.

Constants are purple values.

Output are the blue values.

Liquid-phase Hydrocarbon Recovery

$\square \cdot r^2 \cdot h$ = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase = 38.49 lbs

5.63 gallons

PSH Mass Recovered in Liquid Phase = 47.88 lbs

7.00 gallons

**TOTAL = 86.37 lbs
12.63 gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=

7

PSH Mass in Pounds=

47.88

% Vol. Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	1.253		12530.00
Total				12530.00

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its
(0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	87.5990
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	11.9950
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.4060
Total		100
Calculated MW		30.2163

% Vol. Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	% Vol	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	1.325		13250.00
Total				13250.00

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its
(0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	86.5590
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	13.0090
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.4320
Total		100
Calculated MW		30.3965

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= % Vol x 10,000

Table 3c
4Q System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h2O)	Differential pressure (In. h2O)	Flow (SCFM)	FID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
20:30	1	44	21.0	285.79	46.8	134.10	50000	3690.00	3690.00	1.00	3690	4.75	2.38	2.38	2.38
21:30	1	40	21.0	285.79	46.6	134.34	50000	-	3690.00	1.00	3690	4.79	2.41	2.41	4.79
22:30	1	39	21.0	285.79	47.2	135.34	50000	-	3690.00	1.00	3690	4.80	2.43	2.43	7.21
23:30	1	32	21.0	285.79	47.5	136.73	50000	-	3690.00	1.00	3690	4.87	2.49	2.49	9.70
0:30	1	30	21.0	285.79	46.9	136.14	50000	-	3690.00	1.00	3690	4.89	2.49	2.49	12.19
1:30	1	28	21.0	285.79	45.7	134.67	50000	-	3690.00	1.00	3690	4.91	2.47	2.47	14.66
2:30	1	28	21.0	285.79	46.1	135.25	50000	-	3240.00	1.00	3240	4.27	2.16	2.16	16.82
3:30	1	28	21.0	285.79	46.4	135.69	50000	-	3240.00	1.00	3240	4.27	2.17	2.17	18.99
4:30	1	26	21.0	285.79	47.0	136.85	50000	-	3240.00	1.00	3240	4.29	2.19	2.19	21.18
5:30	1	26	21.0	285.79	46.2	135.68	50000	-	3240.00	1.00	3240	4.29	2.18	2.18	23.36
6:30	1	26	21.0	285.79	46.8	136.56	50000	3240.00	3240.00	1.00	3240	4.29	2.19	2.19	25.55
7:30	1	30	21.0	285.79	46.5	135.56	50000		3240.00	1.00	3240	4.25	2.16	2.16	27.70
Averages:		31.42	21.00	285.79	46.64	135.58	50000.00						Total	27.70	

PSH Mass Recovered in Vapor Phase = 4.05 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)						
Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
3690	29.5638	1	0.0821	44	279.666667	4.75118701

Inputs are the green values.

Calculated values are yellow.

Constants are purple values.

Output are the blue values.

Liquid-phase Hydrocarbon Recovery

$V = r^2 \cdot h$ = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase = 27.70 lbs
4.05 gallons
PSH Mass Recovered in Liquid Phase = 27.36 lbs
4.00 gallons

**TOTAL = 55.06 lbs
8.05 gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=

4

PSH Mass in Pounds=

27.36

% Vol. Hydrocarbon to ppmv - Influent 1					Molecular Weight Calculations		
Compound	Molecular Weight (g/mol)	% Vol	=	ppmv	component	Molecular Weight (g/mol)	mol%
Methane (CH4)	16.04	0		0.00	Nitrogen (N2)	28.016	90.7140
Ethane (C2H6)	30.07	0		0.00	Methane (CH4)	16.0425	0.0000
Propane (C3H8)	44.10	0		0.00	Carbon Dioxide (CO2)	44.011	9.1690
Iso-Butane (C4H10)	58.12	0		0.00	Ethane (C2H6)	30.069	0.0000
N-Butane (C4H10)	58.12	0		0.00	Propane (C3H8)	44.0956	0.0000
Iso-Pentane (C4H12)	72.15	0		0.00	Iso-Butane (C4H10)	58.1222	0.0000
N-Pentane (C5H12)	72.15	0		0.00	N-Butane (C4H10)	58.1222	0.0000
Hexane+ (C6H14)	97.40	0.369		3690.00	Iso-Pentane (C4H12)	72.1488	0.0000
				Total	N-Pentane (C5H12)	72.1488	0.0000
					Hexane+	97.3966	0.1170
					Total		100
					Calculated MW		29.5638

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its
(0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

% Vol. Hydrocarbon to ppmv - Influent 2					Molecular Weight Calculations		
Compound	Molecular Weight (g/mol)	% Vol	=	ppmv	component	Molecular Weight (g/mol)	mol%
Methane (CH4)	16.04	0		0.00	Nitrogen (N2)	28.016	92.2710
Ethane (C2H6)	30.07	0		0.00	Methane (CH4)	16.0425	0.0000
Propane (C3H8)	44.10	0		0.00	Carbon Dioxide (CO2)	44.011	7.6270
Iso-Butane (C4H10)	58.12	0		0.00	Ethane (C2H6)	30.069	0.0000
N-Butane (C4H10)	58.12	0		0.00	Propane (C3H8)	44.0956	0.0000
Iso-Pentane (C4H12)	72.15	0		0.00	Iso-Butane (C4H10)	58.1222	0.0000
N-Pentane (C5H12)	72.15	0		0.00	N-Butane (C4H10)	58.1222	0.0000
Hexane+ (C6H14)	97.40	0.324		3240.00	Iso-Pentane (C4H12)	72.1488	0.0000
				Total	N-Pentane (C5H12)	72.1488	0.0000
					Hexane+	97.3966	0.1020
					Total		100
					Calculated MW		29.3067

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its
(0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= % Vol x 10,000

TABLE 4a
MW-1 PSH¹ Thickness and Recovery Summary

14-inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #2009-092
Terracon Project #: AR197010
NMOCD² REFERENCE #: 1RP-2162

All measurements are in feet above mean sea level

All measurements are in feet above mean sea level								
Monitoring Well	Date	Top of Casing (TOC) ³ Elevation*	Depth to PSH Below TOC (feet)	Depth to Water Below TOC (feet)	PSH Thickness (feet)	Corrected Groundwater Elevation**	Recovered (gallons)	PSH Recovered (gallons)
MW-1	05/02/2019	3,062.62	63.22	-	-	-	3.0	-
	05/08/2019		63.22	63.71	0.49	2,999.33	3.0	0.080
	05/16/2019		63.21	63.80	0.59	2,999.32	-	0.096
	06/12/2019		63.22	63.83	0.61	2,999.31	3.0	0.099
	06/19/2019		63.20	63.86	0.66	2,999.32	3.0	0.108
	06/26/2019		63.23	63.88	0.65	2,999.29	3.0	0.106
	07/02/2019		63.22	63.86	0.64	2,999.30	3.0	0.104
	07/09/2019		63.22	64.09	0.87	2,999.27	4.0	0.142
	08/06/2019		63.25	64.10	0.85	2,999.24	3.0	0.139
	08/15/2019		63.23	64.09	0.86	2,999.26	3.5	0.140
	08/22/2019		-	-	-	-	-	-
	09/18/2019		63.32	63.69	0.37	2,999.24	3.0	0.060
	10/01/2019		63.37	63.79	0.42	2,999.19	3.0	0.068
	10/08/2019		63.29	63.64	0.35	2,999.28	2.5	0.057
	10/16/2019		63.27	63.58	0.31	2,999.30	3.0	0.051
	10/24/2019		63.30	63.67	0.37	2,999.26	3.0	0.060
	10/30/2019		63.26	63.65	0.39	2,999.30	3.0	0.064
	11/07/2019		-	63.41	-	-	3.0	-
	11/13/2019		62.42	63.39	0.97	3,000.05	3.0	0.158
	12/04/2019		63.34	63.69	0.35	2,999.23	3.0	0.057
	12/27/2019		63.31	63.75	0.44	2,999.24	3.0	0.072
	01/02/2020		63.28	63.90	0.62	2,999.25	3.0	0.101
4Q19 Average PSH Thickness					0.55	4Q19 Total Recovered	18.0	0.452

Notes:

1. PSH: Phase Separated Hydrocarbons
2. NMOCD: New Mexico Oil Conservation Division
3. TOC: Top Of Casing

* Elevations based on the North American Vertical Datum of 1988.

** Corrected groundwater elevations were extrapolated using a PSH specific gravity of 0.85, if PSH was gauged in the monitoring well.

Table 4b
MW-3 Gauging and BTEX¹ Impacted Groundwater Recovery Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #2009-092
Terracon Project #: AR197010
NMOCD² REFERENCE #: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well	Date	Top of Casing (TOC) ³ Elevation*	Depth to Water Below TOC (feet)	Corrected Groundwater Elevation**	Groundwater Recovered (gallons)
MW-3	04/25/2019	3,062.73	63.42	2,999.31	25.0
	05/02/2019		63.40	2,999.33	3.0
	05/08/2019		-	-	4.0
	05/16/2019		-	-	5.0
	06/12/2019		63.40	2,999.33	4.0
	06/19/2019		63.41	2,999.32	3.0
	06/26/2019		63.43	2,999.30	4.0
	07/02/2019		64.45	2,998.28	3.0
	07/09/2019		63.44	2,999.29	3.0
	08/06/2019		-	-	3.0
	08/15/2019		-	-	3.0
	08/22/2019		-	-	3.0
	09/18/2019		-	-	3.0
	10/01/2019		-	-	3.0
	10/08/2019		-	-	3.0
	10/16/2019		-	-	3.0
	10/24/2019		-	-	3.0
	10/30/2019		-	-	20.0
	11/07/2019		-	-	3.0
	11/13/2019		-	-	3.0
	11/19/2019		-	-	40.0
	12/04/2019		-	-	65.0
	12/11/2019		-	-	1596.0
	12/27/2019		-	-	3.0
	01/02/2020		-	-	65.0
4Q19 Total GW Recovered					1,795.0
Notes:					
1. BTEX: Benzene, Toluene, Ethylbenzene, Total Xylenes					
2. NMOCD: New Mexico Oil Conservation Division					
3. TOC: Top Of Casing					
4. GW: Groundwater					
* Elevations based on the North American Vertical Datum of 1988.					
** Corrected groundwater elevations were extrapolated using a PSH specific gravitv of 0.85. if PSH was gauged in the					

Table 4c
MW-4 Gauging and BTEX¹ Impacted Groundwater Recovery Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #2009-092
Terracon Project #: AR197010
NMOCD² REFERENCE #: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well	Date	Top of Casing (TOC) ³ Elevation*	Depth to Water Below TOC (feet)	Corrected Groundwater Elevation**	Groundwater Recovered (gallons)
MW-4	04/25/2019	3,062.43	63.00	2,999.43	40.0
	05/02/2019		63.95	2,998.48	4.0
	05/08/2019		-	-	4.0
	05/16/2019		-	-	5.0
	06/12/2019		62.99	2,999.44	3.0
	06/19/2019		62.96	2,999.47	3.0
	06/26/2019		63.00	2,999.43	4.0
	07/02/2019		63.00	2,999.43	3.0
	07/09/2019		63.00	2,999.43	3.0
	08/06/2019		-	-	3.0
	08/15/2019		-	-	3.0
	08/22/2019		-	-	3.0
	09/18/2019		-	-	3.0
	10/01/2019		-	-	3.0
	10/08/2019		-	-	3.0
	10/16/2019		-	-	3.0
	10/24/2019		-	-	3.0
	10/30/2019		-	-	20.0
	11/07/2019		-	-	3.0
	11/13/2019		-	-	3.0
	11/18/2019		-	-	65.0
	12/04/2019		-	-	65.0
	12/12/2019		-	-	30.0
	12/27/2019		-	-	3.0
	01/02/2020		-	-	65.0
4Q19 Total GW ⁴ Recovered					254.0

Notes:

1. BTEX: Benzene, Toluene, Ethylbenzene, Total Xylenes

2. NMOCD: New Mexico Oil Conservation Division

3. TOC: Top Of Casing

4. GW: Groundwater

* Elevations based on the North American Vertical Datum of 1988.

** Corrected groundwater elevations were extrapolated using a PSH specific gravity of 0.85, if PSH was gauged in

Table 4d
MW-8 Gauging and BTEX¹ Impacted Groundwater Recovery Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #2009-092
Terracon Project #: AR197010
NMOCD² REFERENCE #: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well	Date	Top of Casing (TOC) ³ Elevation*	Depth to Water Below TOC (feet)	Corrected Groundwater Elevation**	Groundwater Recovered (gallons)
MW-8	04/25/2019	3,062.42	63.24	2,999.18	45.0
	05/02/2019		63.23	2,999.19	4.0
	05/08/2019		-	-	4.0
	05/16/2019		-	-	7.0
	06/12/2019		63.24	2,999.18	3.0
	06/19/2019		63.23	2,999.19	3.0
	06/26/2019		63.28	2,999.14	4.0
	07/02/2019		63.27	2,999.15	3.0
	07/09/2019		63.28	2,999.14	3.0
	08/06/2019		-	-	3.0
	08/15/2019		-	-	3.0
	08/22/2019		-	-	3.0
	09/18/2019		-	-	3.0
	10/01/2019		-	-	3.0
	10/08/2019		-	-	3.0
	10/16/2019		-	-	3.0
	10/24/2019		-	-	3.0
	10/30/2019		-	-	20.0
	11/07/2019		-	-	3.0
	11/13/2019		-	-	3.0
	11/20/2019		-	-	1050.0
	12/04/2019		-	-	65.0
	12/12/2019		-	-	1050.0
	12/27/2019		-	-	3.0
	01/02/2020		-	-	65.0
4Q19 Total GW ⁴ Recovered					2,259.0

Notes:

1. BTEX: Benzene, Toluene, Ethylbenzene, Total Xylenes

2. NMOCD: New Mexico Oil Conservation Division

3. TOC: Top Of Casing

4. GW: Groundwater

* Elevations based on the North American Vertical Datum of 1988.

** Corrected groundwater elevations were extrapolated using a PSH specific gravity of 0.85, if PSH was gauged in

Table 4e
MW-13 Gauging and BTEX¹ Impacted Groundwater Recovery Summary

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #2009-092
Terracon Project #: AR197010
NMOCD² REFERENCE #: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well	Date	Top of Casing (TOC) ³ Elevation*	Depth to Water Below TOC (feet)	Corrected Groundwater Elevation**	Groundwater Recovered (gallons)
MW-13	04/19/2019	3,062.71	63.65	2,999.06	20.0
	05/02/2019		63.65	2,999.06	4.0
	05/08/2019		-	-	4.0
	05/16/2019		-	-	7.0
	06/12/2019		63.66	2,999.05	4.0
	06/19/2019		63.64	2,999.07	3.0
	06/26/2019		63.67	2,999.04	4.0
	07/02/2019		63.70	2,999.01	3.0
	07/09/2019		63.69	2,999.02	3.0
	08/06/2019		-	-	3.0
	08/15/2019		-	-	3.0
	08/22/2019		-	-	3.0
	09/18/2019		-	-	3.0
	10/01/2019		-	-	3.0
	10/08/2019		-	-	3.0
	10/16/2019		-	-	3.0
	10/24/2019		-	-	3.0
	10/30/2019		-	-	20.0
	11/07/2019		-	-	3.0
	11/13/2019		-	-	3.0
	11/18/2019		-	-	140.0
	12/04/2019		-	-	65.0
	12/12/2019		-	-	30.0
	12/27/2019		-	-	3.0
	01/02/2020		-	-	65.0
4Q19 Total GW ⁴ Recovered					329.0

Notes:

1. BTEX: Benzene, Toluene, Ethylbenzene, Total Xylenes

2. NMOCD: New Mexico Oil Conservation Division

3. TOC: Top Of Casing

4. GW: Groundwater

* Elevations based on the North American Vertical Datum of 1988.

** Corrected groundwater elevations were extrapolated using a PSH specific gravity of 0.85, if PSH was gauged in

TABLE 5
Quarterly AFR¹ Event Results

14-inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #2009-092
Terracon Project #: AR197010
NMOCD² REFERENCE #: 1RP-2162

All measurements are in feet above mean sea level

Monitoring Well	Date	Targeted Constituent	PSH ³ Fluid Volume (gallons)	Fluid Volume (gallons)	Notes
MW-1	04/25/2019	PSH/BTEX ⁴	5.00	1,654	325 gallons were removed from the horizontal leg near MW-1
MW-3	04/25/2019	BTEX		25	
MW-4	04/25/2019	BTEX		40	
MW-8	04/25/2019	BTEX		45	
MW-13	04/25/2019	BTEX		20	
2Q19 Total Recovered				1,789	
MW-1	09/12/2019	PSH/BTEX	N/A	2860	Vac Truck
MW-3	09/12/2019	BTEX		50	Tornado pump
MW-4	09/12/2019	BTEX		75	Tornado pump
MW-8	09/12/2019	BTEX		50	Tornado pump
MW-13	09/12/2019	BTEX		50	Tornado pump
3Q19 Total Recovered				3,085	
MW-1	11/18/2019	PSH/BTEX	N/A	1260	Vac Truck, 180 gallons removed from buffalo tank
MW-3	11/19/2019	BTEX		1680	Vac Truck
MW-4	11/18/2019	BTEX		65	Tornado pump
MW-8	11/20/2019	BTEX		1050	Vac Truck
MW-13	11/18/2019	BTEX		140	Tornado pump
MW-1	12/10/2019	PSH/BTEX	N/A	1260	Vac Truck, 325 gallons removed from buffalo tank
MW-3	12/11/2019	BTEX		1596	Vac Truck
MW-4	12/12/2019	BTEX		30	Tornado pump
MW-8	12/12/2019	BTEX		1050	Vac Truck
MW-13	12/12/2019	BTEX		30	Tornado pump
4Q19 Total Recovered				8,161	
Notes: 1. AFR: Aggressive Fluid Recovery 2. NMOCD: New Mexico Oil Conservation Division 3. PSH: Phase Separated Hydrocarbons 4. BTEX: Benzene, Toluene, Ethylbenzene, and Total Xylenes					

14-Inch Vac to Jal Legacy
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2009-092
Terracon Project #: AR197011
NMOCD2 Reference#: 1RP-2162

EPA 8310

Monitoring Well	Date Sampled	Air concentrations are in milligrams per liter (mg/L)																
		Naphthalene	Benzo(a)pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)Pyrene	Phenanthrene	Pyrene
NMWQCC Groundwater Criteria ⁴		0.03	0.0007	NE ⁵														
MW-1	11/25/2019	Well Note Sampled due to PSH Presence																
MW-2	6/7/2013	N/A	<0.00021	<0.005	<0.005	<0.00017	<0.005	<0.00039	<0.005	<0.00053	<0.005	<0.005	N/A	<0.00026	<0.00032	<0.005	<0.00029	<0.00029
	5/12/2014	N/A	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	N/A	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053
	11/25/2019	N/A	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	N/A	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053
MW-3	6/7/2013	N/A	<0.00021	<0.005	<0.005	<0.00017	<0.005	<0.00039	<0.005	<0.00054	<0.005	<0.005	N/A	<0.00026	<0.00032	<0.005	<0.00029	<0.00029
	5/12/2014	N/A	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051	N/A	<0.000051	<0.000051	<0.000051	<0.000051	<0.000051
	11/25/2019	Well Note Sampled																
MW-4	6/7/2013	N/A	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053	N/A	<0.000053	<0.000053	<0.000053	<0.000053	<0.000053
	5/12/2014	N/A	<0.00021	<0.005	<0.005	<0.00017	<0.005	<0.00040	<0.005	<0.00054	<0.005	<0.005	N/A	<0.00027	<0.00032	<0.005	<0.00029	<0.00030
	11/25/2019	Well Note Sampled																
MW-5	6/7/2013	N/A	<0.00021	<0.005	<0.005	<0.00017	<0.005	<0.00039	<0.005	<0.00054	<0.005	<0.005	N/A	<0.00026	<0.00032	<0.005	<0.00029	<0.00029
	5/12/2014	N/A	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	N/A	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052
	11/25/2019	Well Note Sampled																
MW-6	6/7/2013	N/A	<0.00021	<0.005	<0.005	<0.00017	<0.005	<0.00040	<0.005	<0.00055	<0.005	<0.005	N/A	<0.00027	<0.00033	<0.005	<0.00030	<0.00030
	5/12/2014	N/A	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052	N/A	<0.000052	<0.000052	<0.000052	<0.000052	<0.000052
	11/25/2019	Well Note Sampled																
MW-7	7/2/2014	N/A	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	N/A	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	11/25/2019	Well Note Sampled																
MW-8	7/2/2014	N/A	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	N/A	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	11/25/2019	Well Note Sampled																
MW-9	7/2/2014	N/A	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	N/A	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	11/25/2019	Well Note Sampled																

MW-10	11/25/2019	<1.16	N/A	<2.09	<1.12	<0.811	N/A	N/A	N/A	N/A	<1.38	N/A	N/A	<0.740	<1.09	N/A	<0.771	<1.38
MW-11	11/25/2019	<1.16	N/A	<2.09	<1.12	<0.811	N/A	N/A	N/A	N/A	<1.38	N/A	N/A	<0.740	<1.09	N/A	<0.771	<1.38
MW-12	11/25/2019	<1.16	N/A	<2.09	<1.12	<0.811	N/A	N/A	N/A	N/A	<1.38	N/A	N/A	<0.740	<1.09	N/A	<0.771	<1.38
MW-13	11/25/2019	<1.16	N/A	<2.09	<1.12	<0.811	N/A	N/A	N/A	N/A	<1.38	N/A	N/A	<0.740	<1.09	N/A	<0.771	<1.38
MW-14	11/25/2019	<1.16	N/A	<2.09	<1.12	<0.811	N/A	N/A	N/A	N/A	<1.38	N/A	N/A	<0.740	<1.09	N/A	<0.771	<1.38
Notes: 1. PAH: Polycyclic Aromatic Hydrocarbons 2. NMOCD: New Mexico Oil Conservation Division 3. mg/L, milligrams per liter 4. NMWQCC Groundwater Criteria: Recommended Remediation Action Level Criteria 5. NE: Not Established J: The target analyte was positively identified below the quantitation limit and above the detection limit Bold text indicates a concentration above the laboratory detection limit. Highlighted text indicates a concentration exceeding the NMOCD RRAL Criteria																		

APPENDIX C

Certified Xenco Laboratories Analytical Reports:

1Q19 Groundwater Reports 615439

2Q19 Groundwater Reports 624944

Xenco Letter of Toluene Explanation

3Q19 Groundwater Reports 635468

4Q19 Groundwater Reports (PAHs) 644521

4Q19 Groundwater Reports 644601

Analytical Report 615439

for Terracon-Lubbock

Project Manager: John Fergerson

14" Vac to Jal Legacy

AR197010

28-FEB-19

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)

Xenco-Atlanta (LELAP Lab ID #04176)

Xenco-Tampa: Florida (E87429), North Carolina (483)

Xenco-Lakeland: Florida (E84098)

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28-FEB-19

Project Manager: **John Fergerson**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: XENCO Report No(s): **615439**

14" Vac to Jal Legacy

Project Address:

John Fergerson:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 615439. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 615439 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-2	W	02-19-19 14:26		615439-001
MW-3	W	02-20-19 11:08		615439-002
MW-4	W	02-20-19 12:02		615439-003
MW-5	W	02-20-19 12:50		615439-004
MW-6	W	02-20-19 14:15		615439-005
MW-7	W	02-20-19 13:53		615439-006
MW-8	W	02-20-19 11:05		615439-007
MW-9	W	02-20-19 13:25		615439-008
MW-10	W	02-19-19 15:28		615439-009
MW-11	W	02-19-19 16:22		615439-010
MW-12	W	02-20-19 09:56		615439-011
MW-13	W	02-20-19 11:59		615439-012
MW-14	W	02-20-19 12:45		615439-013
DUP-1	W	02-20-19 12:50		615439-014
DUP-2	W	02-20-19 14:20		615439-015



CASE NARRATIVE

Client Name: Terracon-Lubbock

Project Name: 14" Vac to Jal Legacy

Project ID: AR197010
Work Order Number(s): 615439

Report Date: 28-FEB-19
Date Received: 02/21/2019

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3080644 BTEX-MTBE by EPA 8021B

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 615254-001 S, 615254-001 SD.



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW-2

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 615439-001

Date Collected: 02.19.19 14.26

Date Received: 02.21.19 16.00

Analytical Method: Inorganic Anions by EPA 300

Prep Method: E300P

Analyst: RNL

% Moist:

Tech: RNL

Seq Number: 3080697

Date Prep: 02.28.19 09.00

Prep seq: 7672721

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	8790	1250	173	mg/L	02.28.19 09:55	D	500

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3080644

Date Prep: 02.27.19 18.08

Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0529	0.00100	0.000480	mg/L	02.27.19 23:50		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.27.19 23:50	U	1
Ethylbenzene	100-41-4	0.00320	0.00100	0.000616	mg/L	02.27.19 23:50		1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.27.19 23:50	U	1
o-Xylene	95-47-6	0.000600	0.00100	0.000270	mg/L	02.27.19 23:50	J	1
Total Xylenes	1330-20-7	0.000600		0.000270	mg/L	02.27.19 23:50	J	
Total BTEX		0.0567		0.000270	mg/L	02.27.19 23:50		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	106	66 - 120	%		
4-Bromofluorobenzene	114	67 - 120	%		



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-3** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-002 Date Collected: 02.20.19 11.08 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.410	0.00100	0.000480	mg/L	02.28.19 00:14		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.28.19 00:14	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.28.19 00:14	U	1
m,p-Xylenes	179601-23-1	0.00160	0.00200	0.000454	mg/L	02.28.19 00:14	J	1
o-Xylene	95-47-6	0.000300	0.00100	0.000270	mg/L	02.28.19 00:14	J	1
Total Xylenes	1330-20-7	0.00190		0.000270	mg/L	02.28.19 00:14		
Total BTEX		0.412		0.000270	mg/L	02.28.19 00:14		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	107	66 - 120	%		
4-Bromofluorobenzene	113	67 - 120	%		

Sample Id: **MW-4** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-003 Date Collected: 02.20.19 12.02 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.00130	0.00100	0.000480	mg/L	02.28.19 00:39		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.28.19 00:39	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.28.19 00:39	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.28.19 00:39	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.28.19 00:39	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.28.19 00:39	U	
Total BTEX		0.00130		0.000270	mg/L	02.28.19 00:39		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	104	66 - 120	%		
4-Bromofluorobenzene	113	67 - 120	%		



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW-5 Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-004 Date Collected: 02.20.19 12.50 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.28.19 01:03	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.28.19 01:03	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.28.19 01:03	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.28.19 01:03	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.28.19 01:03	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.28.19 01:03	U	
Total BTEX		<0.000270		0.000270	mg/L	02.28.19 01:03	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	103	66 - 120	%		
4-Bromofluorobenzene	110	67 - 120	%		

Sample Id: MW-6 Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-005 Date Collected: 02.20.19 14.15 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.28.19 01:28	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.28.19 01:28	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.28.19 01:28	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.28.19 01:28	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.28.19 01:28	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.28.19 01:28	U	
Total BTEX		<0.000270		0.000270	mg/L	02.28.19 01:28	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	102	66 - 120	%		
4-Bromofluorobenzene	109	67 - 120	%		



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-7** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-006 Date Collected: 02.20.19 13.53 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.28.19 01:52	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.28.19 01:52	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.28.19 01:52	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.28.19 01:52	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.28.19 01:52	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.28.19 01:52	U	
Total BTEX		<0.000270		0.000270	mg/L	02.28.19 01:52	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	105	66 - 120	%		
4-Bromofluorobenzene	113	67 - 120	%		

Sample Id: **MW-8** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-007 Date Collected: 02.20.19 11.05 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080451 Date Prep: 02.22.19 18.03
Prep seq: 7672499

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0115	0.00100	0.000480	mg/L	02.24.19 03:46		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 03:46	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 03:46	U	1
m,p-Xylenes	179601-23-1	0.000800	0.00200	0.000454	mg/L	02.24.19 03:46	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 03:46	U	1
Total Xylenes	1330-20-7	0.000800		0.000270	mg/L	02.24.19 03:46	J	
Total BTEX		0.0123		0.000270	mg/L	02.24.19 03:46		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	102	66 - 120	%		
4-Bromofluorobenzene	109	67 - 120	%		



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-9** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-008 Date Collected: 02.20.19 13.25 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080451 Date Prep: 02.22.19 18.03
Prep seq: 7672499

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.24.19 04:10	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 04:10	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 04:10	U	1
m,p-Xylenes	179601-23-1	0.000700	0.00200	0.000454	mg/L	02.24.19 04:10	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 04:10	U	1
Total Xylenes	1330-20-7	0.000700		0.000270	mg/L	02.24.19 04:10	J	
Total BTEX		0.000700		0.000270	mg/L	02.24.19 04:10	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	104	66 - 120	%		
4-Bromofluorobenzene	110	67 - 120	%		

Sample Id: **MW-10** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-009 Date Collected: 02.19.19 15.28 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080451 Date Prep: 02.22.19 18.03
Prep seq: 7672499

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.24.19 04:34	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 04:34	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 04:34	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.24.19 04:34	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 04:34	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.24.19 04:34	U	
Total BTEX		<0.000270		0.000270	mg/L	02.24.19 04:34	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	105	66 - 120	%		
4-Bromofluorobenzene	111	67 - 120	%		



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-11**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 615439-010

Date Collected: 02.19.19 16.22

Date Received: 02.21.19 16.00

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3080459

Date Prep: 02.22.19 18.03

Prep seq: 7672500

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.24.19 09:51	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 09:51	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 09:51	U	1
m,p-Xylenes	179601-23-1	0.000600	0.00200	0.000454	mg/L	02.24.19 09:51	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 09:51	U	1
Total Xylenes	1330-20-7	0.000600		0.000270	mg/L	02.24.19 09:51	J	
Total BTEX		0.000600		0.000270	mg/L	02.24.19 09:51	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	103	66 - 120	%		
4-Bromofluorobenzene	109	67 - 120	%		

Sample Id: **MW-12**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 615439-011

Date Collected: 02.20.19 09.56

Date Received: 02.21.19 16.00

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3080459

Date Prep: 02.22.19 18.03

Prep seq: 7672500

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.24.19 10:14	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 10:14	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 10:14	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.24.19 10:14	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 10:14	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.24.19 10:14	U	
Total BTEX		<0.000270		0.000270	mg/L	02.24.19 10:14	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	103	66 - 120	%		
4-Bromofluorobenzene	110	67 - 120	%		



Certificate of Analytical Results

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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-13** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-012 Date Collected: 02.20.19 11.59 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.712	0.00500	0.00240	mg/L	02.28.19 07:33		5
Toluene	108-88-3	<0.00256	0.00500	0.00256	mg/L	02.28.19 07:33	U	5
Ethylbenzene	100-41-4	<0.00308	0.00500	0.00308	mg/L	02.28.19 07:33	U	5
m,p-Xylenes	179601-23-1	0.00900	0.0100	0.00227	mg/L	02.28.19 07:33	J	5
o-Xylene	95-47-6	<0.00135	0.00500	0.00135	mg/L	02.28.19 07:33	U	5
Total Xylenes	1330-20-7	0.00900		0.00135	mg/L	02.28.19 07:33		
Total BTEX		0.721		0.00135	mg/L	02.28.19 07:33		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	100	66 - 120	%		
4-Bromofluorobenzene	108	67 - 120	%		

Sample Id: **MW-14** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-013 Date Collected: 02.20.19 12.45 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080644 Date Prep: 02.27.19 18.08
Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.28.19 02:17	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.28.19 02:17	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.28.19 02:17	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.28.19 02:17	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.28.19 02:17	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.28.19 02:17	U	
Total BTEX		<0.000270		0.000270	mg/L	02.28.19 02:17	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	105	66 - 120	%		
4-Bromofluorobenzene	113	67 - 120	%		



Certificate of Analytical Results

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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **DUP-1** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-014 Date Collected: 02.20.19 12.50 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080459 Date Prep: 02.22.19 18.03
Prep seq: 7672500

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000500	0.00100	0.000480	mg/L	02.24.19 13:38	J	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 13:38	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 13:38	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.24.19 13:38	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 13:38	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.24.19 13:38	U	
Total BTEX		0.000500		0.000270	mg/L	02.24.19 13:38	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	98	66 - 120	%		
4-Bromofluorobenzene	97	67 - 120	%		

Sample Id: **DUP-2** Matrix: Ground Water Sample Depth:
Lab Sample Id: 615439-015 Date Collected: 02.20.19 14.20 Date Received: 02.21.19 16.00
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3080459 Date Prep: 02.22.19 18.03
Prep seq: 7672500

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.24.19 14:02	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 14:02	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 14:02	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.24.19 14:02	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 14:02	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	02.24.19 14:02	U	
Total BTEX		<0.000270		0.000270	mg/L	02.24.19 14:02	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	103	66 - 120	%		
4-Bromofluorobenzene	112	67 - 120	%		



Certificate of Analytical Results

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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7672499-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7672499-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3080451

Date Prep: 02.22.19 18.03

Prep seq: 7672499

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.23.19 18:03	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.23.19 18:03	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.23.19 18:03	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.23.19 18:03	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.23.19 18:03	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	101	66 - 120	%		
4-Bromofluorobenzene	108	67 - 120	%		

Sample Id: 7672500-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7672500-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3080459

Date Prep: 02.22.19 18.03

Prep seq: 7672500

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.24.19 07:49	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.24.19 07:49	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.24.19 07:49	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.24.19 07:49	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.24.19 07:49	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	102	66 - 120	%		
4-Bromofluorobenzene	109	67 - 120	%		



Certificate of Analytical Results

615439



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7672664-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7672664-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3080644

Date Prep: 02.27.19 18.08

Prep seq: 7672664

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	02.27.19 21:48	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	02.27.19 21:48	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	02.27.19 21:48	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	02.27.19 21:48	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	02.27.19 21:48	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	108	66 - 120	%		
4-Bromofluorobenzene	114	67 - 120	%		

Sample Id: 7672721-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7672721-1-BLK

Date Collected:

Date Received:

Analytical Method: Inorganic Anions by EPA 300

Prep Method: E300P

Analyst: RNL

% Moist:

Tech: RNL

Seq Number: 3080697

Date Prep: 02.28.19 09.00

Prep seq: 7672721

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	<0.347	2.50	0.347	mg/L	02.28.19 09:28	U	1

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 615439,

Project ID: AR197010

Lab Batch #: 3080451

Sample: 7672499-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 02/23/19 16:26	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.104	0.100	104	66-120
4-Bromofluorobenzene		0.106	0.100	106	67-120

Lab Batch #: 3080451

Sample: 7672499-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 02/23/19 16:50	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.103	0.100	103	66-120
4-Bromofluorobenzene		0.108	0.100	108	67-120

Lab Batch #: 3080451

Sample: 7672499-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 02/23/19 18:03	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.101	0.100	101	66-120
4-Bromofluorobenzene		0.108	0.100	108	67-120

Lab Batch #: 3080451

Sample: 615254-003 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 02/23/19 18:52	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.103	0.100	103	66-120
4-Bromofluorobenzene		0.109	0.100	109	67-120

Lab Batch #: 3080451

Sample: 615254-003 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 02/23/19 19:17	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.101	0.100	101	66-120
4-Bromofluorobenzene		0.105	0.100	105	67-120

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 615439,

Project ID: AR197010

Lab Batch #: 3080459

Sample: 7672500-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 02/24/19 06:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	0.103	0.100	103	66-120	
4-Bromofluorobenzene	0.102	0.100	102	67-120	

Lab Batch #: 3080459

Sample: 7672500-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 02/24/19 06:36

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	0.102	0.100	102	66-120	
4-Bromofluorobenzene	0.100	0.100	100	67-120	

Lab Batch #: 3080459

Sample: 7672500-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 02/24/19 07:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	0.102	0.100	102	66-120	
4-Bromofluorobenzene	0.109	0.100	109	67-120	

Lab Batch #: 3080459

Sample: 615254-009 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L

Date Analyzed: 02/24/19 08:38

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	0.0962	0.100	96	66-120	
4-Bromofluorobenzene	0.0982	0.100	98	67-120	

Lab Batch #: 3080459

Sample: 615254-009 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L

Date Analyzed: 02/24/19 09:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
a,a,a-Trifluorotoluene	0.0976	0.100	98	66-120	
4-Bromofluorobenzene	0.101	0.100	101	67-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 615439,

Project ID: AR197010

Lab Batch #: 3080644

Sample: 7672664-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 02/27/19 20:09	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0917	0.100	92	66-120
4-Bromofluorobenzene		0.0950	0.100	95	67-120

Lab Batch #: 3080644

Sample: 7672664-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 02/27/19 20:34	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.109	0.100	109	66-120
4-Bromofluorobenzene		0.114	0.100	114	67-120

Lab Batch #: 3080644

Sample: 7672664-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 02/27/19 21:48	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.108	0.100	108	66-120
4-Bromofluorobenzene		0.114	0.100	114	67-120

Lab Batch #: 3080644

Sample: 615254-001 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 02/27/19 22:37	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.528	0.500	106	66-120
4-Bromofluorobenzene		0.128	0.100	128	67-120 ***

Lab Batch #: 3080644

Sample: 615254-001 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 02/27/19 23:01	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.526	0.500	105	66-120
4-Bromofluorobenzene		0.126	0.100	126	67-120 ***

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 615439

Project ID: AR197010

Analyst: MIT

Date Prepared: 02/22/2019

Date Analyzed: 02/23/2019

Lab Batch ID: 3080451

Sample: 7672499-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.0997	100	0.100	0.0997	100	0	74-120	20	
Toluene	<0.000512	0.100	0.102	102	0.100	0.101	101	1	74-120	20	
Ethylbenzene	<0.000616	0.100	0.105	105	0.100	0.106	106	1	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.211	106	0.200	0.214	107	1	73-120	25	
o-Xylene	<0.000270	0.100	0.107	107	0.100	0.108	108	1	73-120	25	

Analyst: MIT

Date Prepared: 02/22/2019

Date Analyzed: 02/24/2019

Lab Batch ID: 3080459

Sample: 7672500-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.0985	99	0.100	0.0998	100	1	74-120	20	
Toluene	<0.000512	0.100	0.0997	100	0.100	0.0998	100	0	74-120	20	
Ethylbenzene	<0.000616	0.100	0.103	103	0.100	0.103	103	0	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.207	104	0.200	0.207	104	0	73-120	25	
o-Xylene	<0.000270	0.100	0.104	104	0.100	0.105	105	1	73-120	25	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 615439

Project ID: AR197010

Analyst: MIT

Date Prepared: 02/27/2019

Date Analyzed: 02/27/2019

Lab Batch ID: 3080644

Sample: 7672664-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.101	101	0.100	0.100	100	1	74-120	20	
Toluene	<0.000512	0.100	0.107	107	0.100	0.107	107	0	74-120	20	
Ethylbenzene	<0.000616	0.100	0.112	112	0.100	0.113	113	1	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.228	114	0.200	0.226	113	1	73-120	25	
o-Xylene	<0.000270	0.100	0.112	112	0.100	0.110	110	2	73-120	25	

Analyst: RNL

Date Prepared: 02/28/2019

Date Analyzed: 02/28/2019

Lab Batch ID: 3080697

Sample: 7672721-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<0.347	25.0	24.4	98	25.0	23.9	96	2	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order # : 615439

Project ID: AR197010

Lab Batch ID: 3080451

QC- Sample ID: 615254-003 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 02/23/2019

Date Prepared: 02/22/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	0.387	0.100	0.494	107	0.100	0.486	99	2	15-147	25	
Toluene	0.104	0.100	0.212	108	0.100	0.210	106	1	11-147	25	
Ethylbenzene	0.0769	0.100	0.185	108	0.100	0.184	107	1	10-149	25	
m,p-Xylenes	0.219	0.200	0.436	109	0.200	0.432	107	1	62-124	25	
o-Xylene	0.132	0.100	0.242	110	0.100	0.240	108	1	62-124	25	

Lab Batch ID: 3080459

QC- Sample ID: 615254-009 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 02/24/2019

Date Prepared: 02/22/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000480	0.100	0.102	102	0.100	0.102	102	0	15-147	25	
Toluene	<0.000512	0.100	0.101	101	0.100	0.0999	100	1	11-147	25	
Ethylbenzene	<0.000616	0.100	0.100	100	0.100	0.101	101	1	10-149	25	
m,p-Xylenes	<0.000454	0.200	0.199	100	0.200	0.202	101	1	62-124	25	
o-Xylene	<0.000270	0.100	0.102	102	0.100	0.103	103	1	62-124	25	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 615439

Project ID: AR197010

Lab Batch ID: 3080644

QC- Sample ID: 615254-001 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 02/27/2019

Date Prepared: 02/27/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	0.0445	0.500	0.557	103	0.500	0.555	102	0	15-147	25	
Toluene	<0.00256	0.500	0.542	108	0.500	0.539	108	1	11-147	25	
Ethylbenzene	0.682	0.500	1.25	114	0.500	1.27	118	2	10-149	25	
m,p-Xylenes	<0.00227	1.00	1.12	112	1.00	1.13	113	1	62-124	25	
o-Xylene	<0.00135	0.500	0.547	109	0.500	0.557	111	2	62-124	25	

Lab Batch ID: 3080697

QC- Sample ID: 615439-001 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 02/28/2019

Date Prepared: 02/28/2019

Analyst: RNL

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	7230	12500	21200	112	12500	21000	110	1	80-120	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

615439

CHAIN OF CUSTODY RECORD

Terracon						Laboratory: Xenco Laboratories 6701 Aberdeen Avenue, Suite 9 Lubbock, TX 79424		LAB USE ONLY DUE DATE: TEMP OF COOLER WHEN RECEIVED (°C) Page <u> 1 </u> of <u> 2 </u>	
Office Location Lubbock								Phone: (806) 794-1296	
Project Manager: John Fergerson								Contact: _____	
Sampler's Name: Aaron Adams								PO/SO #: _____	
Sampler's Signature									

Project Number		Project Name		Identifying Marks of Sample(s)		No. Type of Containers		ANALYSIS REQUESTED	
Matrix	Date	Time	Comp	Grab	Start Depth	End Depth	40 ml VOA	250 ml Poly	
GW	02/19/19	1440		X	MW-2		X	X	BTEX (EPA Method 8021B)
GW	02/19/19	1108		X	MW-3		X		Chloride (Total) (EPA 300)
GW	02/19/19	1202		X	MW-4		X		
GW	02/19/19	1250		X	MW-5		X		
GW	02/19/19	1415		X	MW-6		X		
GW	02/19/19	1353		X	MW-7		X		
GW	02/19/19	1105		X	MW-8		X		
GW	02/19/19	1325		X	MW-9		X		
GW	02/19/19	1528		X	MW-10		X		
GW	02/19/19	1622		X	MW-11		X		

TURNAROUND TIME		Normal		48-Hour Rush		24-Hour Rush		TRRP Laboratory Review Checklist	
Relinquished by (Signature)	Date	Time	Received by (Signature)	Date	Time	Received by (Signature)	Date	Time	Notes
[Signature]	2-20-19	8:03 pm	[Signature]	2-20-19	8:03 pm				E-MAIL RESULTS TO: 1. CIBRYANT@PAALP.COM 2. ALGROVES@PAALP.COM 3. JOHN.FERGERTSON@TERRACON.COM 4. ERIN.LLOYD@TERRACON.COM 5. AARON.ADAMS@TERRACON.COM 6. KATHRASH@TERRACON.COM
[Signature]	2-21-19	4:00 pm	[Signature]						
[Signature]			[Signature]						
[Signature]			[Signature]						

Lubbock Office ■ 5827 50th Street ■ Lubbock, Texas 79424 ■ 806-300-0140

Responsive ■ Resourceful ■ Reliable

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615 439

Terracon

Office Location Lubbock

Project Manager: John Fergerson

Sampler's Name: _____ Sampler's Signature _____

Aaron Adams

Project Number

Project Number	Project Name
AR197010	14" Vac to Jal Legacy (SRS # 2009-092)

Matrix	Date	Time	Component	Identifying Marks of Sample(s)
--------	------	------	-----------	--------------------------------

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ω

BTEX (EPA)

Lab Sample ID

ANALYSIS
REQUESTS

LAB USE ONLY
DUE DATE:

TEMP OF COOLER
WHEN RECEIVED (°C)

Page 2 of 2

TURNAROUND TIME

Relinquished by (Signature)

Date: _____ Time: _____

received by (Signature) _____

Date: _____ Time: _____

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NOTES:

1. CJBRYANT@PAALP.COM
2. ALGROVES@PAALP.COM
3. JOHN.FERGERTSON@TERRACON.COM
4. ERIN.LOYD@TERRACON.COM
5. AARON.ADAMS@TERRACON.COM
6. KATHRASH@TERRACON.COM

Matrix container	WW-Wastewater	W - Water	S - Soil	L - Liquid	A - Air Bag	C - Charcoal tube	SL - Sludge
	VOA - 40 ml vial	A/G - Amber Glass 1L	250 ml = Glass wide mouth	P/O - Plastic or other			

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Responsive ■ Resourceful ■ Reliable



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Terracon-Lubbock

Date/ Time Received: 02/21/2019 04:00:00 PM

Work Order #: 615439

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-3

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	3.5
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	Yes

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: ASD

PH Device/Lot#: 0917

Checklist completed by:

Brenda Ward
Brenda Ward

Date: 02/22/2019

Checklist reviewed by:

Jessica Kramer
Jessica Kramer

Date: 02/22/2019

Analytical Report 624944

for
Terracon-Midland

Project Manager: John Fergerson

14" Vac to Jal Legacy (SRS#2009-092)

AR197010

28-MAY-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-29), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (T104704295-19-19), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-20)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Atlanta (LELAP Lab ID #04176)

Xenco-Tampa: Florida (E87429), North Carolina (483)

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28-MAY-19

Project Manager: **John Ferguson**

Terracon-Midland

10400 State Hwy 191

Midland, TX 79707

Reference: XENCO Report No(s): **624944**

14" Vac to Jal Legacy (SRS#2009-092)

Project Address:

John Ferguson:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 624944. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 624944 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 624944



Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-2	W	05-20-19 14:55		624944-001
MW-3	W	05-20-19 13:05		624944-002
MW-4	W	05-20-19 21:15		624944-003
MW-5	W	05-20-19 16:45		624944-004
MW-6	W	05-20-19 17:45		624944-005
MW-7	W	05-20-19 20:15		624944-006
MW-8	W	05-20-19 11:05		624944-007
MW-9	W	05-20-19 19:25		624944-008
MW-10	W	05-20-19 15:45		624944-009
MW-11	W	05-20-19 14:00		624944-010
MW-12	W	05-20-19 12:05		624944-011
MW-13	W	05-20-19 10:00		624944-012
MW-14	W	05-20-19 18:30		624944-013
DUP-1	W	05-20-19 10:05		624944-014
DUP-2	W	05-20-19 21:15		624944-015



CASE NARRATIVE

Client Name: Terracon-Midland

Project Name: 14" Vac to Jal Legacy (SRS#2009-092)

Project ID: AR197010
Work Order Number(s): 624944

Report Date: 28-MAY-19
Date Received: 05/21/2019

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results

624944



Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: MW-2

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-001

Date Collected: 05.20.19 14.55

Date Received: 05.21.19 09.37

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Analyst: CHE

% Moist:

Tech: CHE

Seq Number: 3089804

Date Prep: 05.21.19 13.00

Prep seq: 7678210

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	9610	50.0	8.58	mg/L	05.21.19 21:46		100

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0322	0.00200	0.000408	mg/L	05.24.19 15:00		1
Toluene	108-88-3	0.00111	0.00200	0.000367	mg/L	05.24.19 15:00	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 15:00	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 15:00	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 15:00	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 15:00	U	
Total BTEX		0.0333		0.000367	mg/L	05.24.19 15:00		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	95	70 - 130	%		
4-Bromofluorobenzene	83	70 - 130	%		



Certificate of Analytical Results

624944



Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: MW-3

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-002

Date Collected: 05.20.19 13.05

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0243	0.00200	0.000408	mg/L	05.24.19 15:20		1
Toluene	108-88-3	0.00120	0.00200	0.000367	mg/L	05.24.19 15:20	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 15:20	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 15:20	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 15:20	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 15:20	U	
Total BTEX		0.0255		0.000367	mg/L	05.24.19 15:20		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	81	70 - 130	%		

Sample Id: MW-4

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-003

Date Collected: 05.20.19 21.15

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000410	0.00200	0.000408	mg/L	05.24.19 15:41	J	1
Toluene	108-88-3	0.000690	0.00200	0.000367	mg/L	05.24.19 15:41	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 15:41	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 15:41	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 15:41	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 15:41	U	
Total BTEX		0.00110		0.000367	mg/L	05.24.19 15:41	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	70 - 130	%		
4-Bromofluorobenzene	81	70 - 130	%		



Certificate of Analytical Results

624944



Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: MW-5

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-004

Date Collected: 05.20.19 16.45

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	05.24.19 16:01	U	1
Toluene	108-88-3	0.00131	0.00200	0.000367	mg/L	05.24.19 16:01	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 16:01	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 16:01	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 16:01	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 16:01	U	
Total BTEX		0.00131		0.000367	mg/L	05.24.19 16:01	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	82	70 - 130	%		

Sample Id: MW-6

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-005

Date Collected: 05.20.19 17.45

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	05.24.19 16:22	U	1
Toluene	108-88-3	0.00105	0.00200	0.000367	mg/L	05.24.19 16:22	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 16:22	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 16:22	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 16:22	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 16:22	U	
Total BTEX		0.00105		0.000367	mg/L	05.24.19 16:22	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	70 - 130	%		
4-Bromofluorobenzene	83	70 - 130	%		



Certificate of Analytical Results

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Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: MW-7

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-006

Date Collected: 05.20.19 20.15

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	05.24.19 18:02	U	1
Toluene	108-88-3	0.00108	0.00200	0.000367	mg/L	05.24.19 18:02	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 18:02	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 18:02	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 18:02	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 18:02	U	
Total BTEX		0.00108		0.000367	mg/L	05.24.19 18:02	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	94	70 - 130	%		
4-Bromofluorobenzene	89	70 - 130	%		

Sample Id: MW-8

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-007

Date Collected: 05.20.19 11.05

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.00150	0.00200	0.000408	mg/L	05.24.19 18:21	J	1
Toluene	108-88-3	0.00112	0.00200	0.000367	mg/L	05.24.19 18:21	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 18:21	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 18:21	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 18:21	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 18:21	U	
Total BTEX		0.00262		0.000367	mg/L	05.24.19 18:21		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	87	70 - 130	%		



Certificate of Analytical Results

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Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: **MW-9**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-008

Date Collected: 05.20.19 19.25

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000590	0.00200	0.000408	mg/L	05.24.19 18:41	J	1
Toluene	108-88-3	0.00138	0.00200	0.000367	mg/L	05.24.19 18:41	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 18:41	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 18:41	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 18:41	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 18:41	U	
Total BTEX		0.00197		0.000367	mg/L	05.24.19 18:41	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	93	70 - 130	%		
4-Bromofluorobenzene	85	70 - 130	%		

Sample Id: **MW-10**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-009

Date Collected: 05.20.19 15.45

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000430	0.00200	0.000408	mg/L	05.24.19 19:00	J	1
Toluene	108-88-3	0.000970	0.00200	0.000367	mg/L	05.24.19 19:00	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 19:00	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 19:00	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 19:00	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 19:00	U	
Total BTEX		0.00140		0.000367	mg/L	05.24.19 19:00	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	84	70 - 130	%		



Certificate of Analytical Results

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Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: **MW-11**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-010

Date Collected: 05.20.19 14.00

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	05.24.19 19:20	U	1
Toluene	108-88-3	0.00108	0.00200	0.000367	mg/L	05.24.19 19:20	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 19:20	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 19:20	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 19:20	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 19:20	U	
Total BTEX		0.00108		0.000367	mg/L	05.24.19 19:20	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	85	70 - 130	%		

Sample Id: **MW-12**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-011

Date Collected: 05.20.19 12.05

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	05.24.19 19:39	U	1
Toluene	108-88-3	0.00112	0.00200	0.000367	mg/L	05.24.19 19:39	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 19:39	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 19:39	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 19:39	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 19:39	U	
Total BTEX		0.00112		0.000367	mg/L	05.24.19 19:39	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	84	70 - 130	%		



Certificate of Analytical Results

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Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: **MW-13**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-012

Date Collected: 05.20.19 10.00

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.310	0.00200	0.000408	mg/L	05.24.19 19:59		1
Toluene	108-88-3	0.000930	0.00200	0.000367	mg/L	05.24.19 19:59	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 19:59	U	1
m,p-Xylenes	179601-23-1	0.00192	0.00400	0.000630	mg/L	05.24.19 19:59	J	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 19:59	U	1
Total Xylenes	1330-20-7	0.00192		0.000630	mg/L	05.24.19 19:59	J	
Total BTEX		0.313		0.000367	mg/L	05.24.19 19:59		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	102	70 - 130	%		
4-Bromofluorobenzene	84	70 - 130	%		

Sample Id: **MW-14**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-013

Date Collected: 05.20.19 18.30

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000580	0.00200	0.000408	mg/L	05.24.19 20:18	J	1
Toluene	108-88-3	0.000970	0.00200	0.000367	mg/L	05.24.19 20:18	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 20:18	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 20:18	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 20:18	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 20:18	U	
Total BTEX		0.00155		0.000367	mg/L	05.24.19 20:18	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	84	70 - 130	%		



Certificate of Analytical Results

624944



Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: **DUP-1**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-014

Date Collected: 05.20.19 10.05

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.316	0.00200	0.000408	mg/L	05.24.19 20:37		1
Toluene	108-88-3	0.00118	0.00200	0.000367	mg/L	05.24.19 20:37	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 20:37	U	1
m,p-Xylenes	179601-23-1	0.00202	0.00400	0.000630	mg/L	05.24.19 20:37	J	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 20:37	U	1
Total Xylenes	1330-20-7	0.00202		0.000630	mg/L	05.24.19 20:37		
Total BTEX		0.319		0.000367	mg/L	05.24.19 20:37		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	103	70 - 130	%		
4-Bromofluorobenzene	83	70 - 130	%		

Sample Id: **DUP-2**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 624944-015

Date Collected: 05.20.19 21.15

Date Received: 05.21.19 09.37

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000840	0.00200	0.000408	mg/L	05.24.19 20:57	J	1
Toluene	108-88-3	0.000660	0.00200	0.000367	mg/L	05.24.19 20:57	J	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 20:57	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 20:57	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 20:57	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 20:57	U	
Total BTEX		0.00150		0.000367	mg/L	05.24.19 20:57	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	70 - 130	%		
4-Bromofluorobenzene	84	70 - 130	%		



Certificate of Analytical Results

624944



Terracon-Midland, Midland, TX

14" Vac to Jal Legacy (SRS#2009-092)

Sample Id: 7678210-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7678210-1-BLK

Date Collected:

Date Received:

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Analyst: CHE

% Moist:

Tech: CHE

Seq Number: 3089804

Date Prep: 05.21.19 13.00

Prep seq: 7678210

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	<0.0858	0.500	0.0858	mg/L	05.21.19 18:02	U	1

Sample Id: 7678557-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7678557-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: SCM

% Moist:

Tech: SCM

Seq Number: 3090171

Date Prep: 05.24.19 08.15

Prep seq: 7678557

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	05.24.19 13:22	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	05.24.19 13:22	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	05.24.19 13:22	U	1
m,p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	05.24.19 13:22	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	05.24.19 13:22	U	1
Total Xylenes	1330-20-7	<0.000630		0.000630	mg/L	05.24.19 13:22	U	
Total BTEX		<0.000367		0.000367	mg/L	05.24.19 13:22	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	70 - 130	%		
4-Bromofluorobenzene	82	70 - 130	%		

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy (SRS#2009-092)

Work Orders : 624944,

Project ID: AR197010

Lab Batch #: 3090171

Sample: 7678557-1-BSD / BSD

Batch: 1 **Matrix:** Water

Units: mg/L Date Analyzed: 05/24/19 12:07		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
1,4-Difluorobenzene		0.0318	0.0300	106	70-130
4-Bromofluorobenzene		0.0314	0.0300	105	70-130

Lab Batch #: 3090171

Sample: 624683-001 S / MS

Batch: 1 **Matrix:** Water

Units: mg/L Date Analyzed: 05/24/19 12:26		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
1,4-Difluorobenzene		0.0316	0.0300	105	70-130
4-Bromofluorobenzene		0.0310	0.0300	103	70-130

Lab Batch #: 3090171

Sample: 624683-001 SD / MSD

Batch: 1 **Matrix:** Water

Units: mg/L Date Analyzed: 05/24/19 12:45		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
1,4-Difluorobenzene		0.0318	0.0300	106	70-130
4-Bromofluorobenzene		0.0318	0.0300	106	70-130

Lab Batch #: 3090171

Sample: 7678557-1-BLK / BLK

Batch: 1 **Matrix:** Water

Units: mg/L Date Analyzed: 05/24/19 13:22		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
1,4-Difluorobenzene		0.0273	0.0300	91	70-130
4-Bromofluorobenzene		0.0245	0.0300	82	70-130

Lab Batch #: 3090171

Sample: 7678557-1-BKS / BKS

Batch: 1 **Matrix:** Water

Units: mg/L Date Analyzed: 05/24/19 23:47		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
1,4-Difluorobenzene		0.0313	0.0300	104	70-130
4-Bromofluorobenzene		0.0304	0.0300	101	70-130

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy (SRS#2009-092)

Work Order #: 624944

Project ID: AR197010

Analyst: SCM

Date Prepared: 05/24/2019

Date Analyzed: 05/24/2019

Lab Batch ID: 3090171

Sample: 7678557-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000408	0.100	0.113	113	0.100	0.124	124	9	70-130	25	
Toluene	<0.000367	0.100	0.104	104	0.100	0.113	113	8	70-130	25	
Ethylbenzene	<0.000657	0.100	0.111	111	0.100	0.120	120	8	70-130	25	
m,p-Xylenes	<0.000630	0.200	0.232	116	0.200	0.251	126	8	70-130	25	
o-Xylene	<0.000642	0.100	0.112	112	0.100	0.122	122	9	70-130	25	

Analyst: CHE

Date Prepared: 05/21/2019

Date Analyzed: 05/21/2019

Lab Batch ID: 3089804

Sample: 7678210-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<0.0858	25.0	24.0	96	25.0	24.4	98	2	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy (SRS#2009-092)

Work Order # : 624944

Project ID: AR197010

Lab Batch ID: 3090171

QC- Sample ID: 624683-001 S

Batch #: 1 Matrix: Water

Date Analyzed: 05/24/2019

Date Prepared: 05/24/2019

Analyst: SCM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000408	0.100	0.124	124	0.100	0.124	124	0	70-130	25	
Toluene	<0.000367	0.100	0.112	112	0.100	0.114	114	2	70-130	25	
Ethylbenzene	<0.000657	0.100	0.121	121	0.100	0.121	121	0	70-130	25	
m,p-Xylenes	<0.000630	0.200	0.247	124	0.200	0.242	121	2	70-130	25	
o-Xylene	<0.000642	0.100	0.121	121	0.100	0.122	122	1	70-130	25	

Lab Batch ID: 3089804

QC- Sample ID: 624888-001 S

Batch #: 1 Matrix: Drinking Water

Date Analyzed: 05/22/2019

Date Prepared: 05/21/2019

Analyst: CHE

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	50.7	25.0	72.7	88	25.0	72.6	88	0	90-110	20	X

Lab Batch ID: 3089804

QC- Sample ID: 624890-001 S

Batch #: 1 Matrix: Drinking Water

Date Analyzed: 05/21/2019

Date Prepared: 05/21/2019

Analyst: CHE

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	5.50	25.0	30.3	99	25.0	30.4	100	0	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Laboratory: Xenco Laboratories
Address: 1211 West Florida Avenue
Midland, TX 79701

CHAIN OF CUSTODY RECORD

Wahquah

Phone: (432) 563-1800

Contact: Jessica Kramer
PO/SO #:

Sampler's Signature

No. Type of Containers

14" Vac to Jail Legacy (SRS # 2009-092)

Start Depth
End Depth

40 ml VOA
250 ml
Poly

BTEX (EPA Method 8021B)	
Chloride (Total) (EPA 300)	

Lab Sample ID:

[illegible]☐ 24-Hour Rush
Received by (Signature) _____

TRRP Laboratory Review Checklist

☐ Yes ☐ No

○

5/2/19	0908
--------	------

E-MAIL RESULTS TO:

Received by (Signature)

Date:	Time:
-------	-------

2. ALGNOVE3@TFAHF.COM

Received by (Signature)

Date:	Time:
-------	-------

5 AARON ADAMS@TEBRACON.COM

Matrix	W-Wastewater	W-Water	S-Soil	L-Liquid	A-Air Bag	C-Charcoal tube	SL-Sludge
Container	VOA-40 ml vial	A/G- Amber Glass 1L	250 ml = glass wide mouth		P/O- Plastic or other		

Lubbock Office ■ 5827 50th Street ■ Lubbock, Texas 79424 ■ 806-300-0140

Responsive ■ Resourceful ■ Reliable

Terracon

Office Location Lubbock

Project Manager: John Fergerson

Sample's Name:

Kimble Thrash

Laboratory: Xenco Laboratories
Address: 1211 West Florida Avenue
Midland, TX 79701

Phone: (432) 563-1800

Contact: Jessica Kramer

PO/SO #:

Sample's Signature

CHAIN OF CUSTODY RECORD

ANALYSIS REQUESTED

LAB USE ONLY
DUE DATE:

TEMP OF COOLER
WHEN RECEIVED (°C)

Page 2 of 2

Project Number AR197010 Project Name 14" Vac to Jal Legacy (SRS # 2009-092)

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	No. Type of Containers	40 ml VOA	250 ml	Polv	BTEX (EPA Method 8021B)	Chloride (Total) (EPA 300)	Lab Sample ID
--------	------	------	------	------	--------------------------------	-------------	-----------	------------------------	-----------	--------	------	-------------------------	----------------------------	---------------

GW	05/20/19	1205		X	MW-12			X				3		
GW	05/20/19	1000		X	MW-13			X				3		
GW	05/20/19	1830		X	MW-14			X				3		
GW	05/20/19	1005		X	DUP-1			X				3		
GW	05/20/19	2115		X	DUP-2			X				3		

*****END OF COC*****

TURAROUND TIME	☒ Normal	☐ 48-Hour Rush	☐ 24-Hour Rush	TRRP Laboratory Review Checklist	☐ Yes	☐ No
----------------	--	---------------------------------------	---------------------------------------	----------------------------------	------------------------------	-----------------------------

Relinquished by (Signature)	Date: 5/21/19	Time: 0800	Received by (Signature)	Date: 5/21/19	Time: 0900
-----------------------------	---------------	------------	-------------------------	---------------	------------

Relinquished by (Signature)	Date: 5/21/19	Time: 0937	Received by (Signature)	Date: 5/21/19	Time: 0937
-----------------------------	---------------	------------	-------------------------	---------------	------------

Relinquished by (Signature)	Date:	Time:	Received by (Signature)	Date:	Time:
-----------------------------	-------	-------	-------------------------	-------	-------

Matrix Container	WW-Wastewater	W-Water	S-Soil	L-Liquid	A-Air Bag	C-Charcoal tube	SL-Sludge
	VOA - 40 ml Vial	AGS - Amber Glass 1L	250 ml = Glass wide mouth		P/O - Plastic or other		

Lubbock Office ■ 5827 50th Street ■ Lubbock, Texas 79424 ■ 806-300-0140

Responsive ■ Resourceful ■ Reliable

NOTES:

E-MAIL RESULTS TO:

1. CIBRYANT@PAALP.COM
2. ALGROVES@PAALP.COM
3. JOHN.FERGERSON@TERRACON.COM
4. ERIN.LOYD@TERRACON.COM
5. AARON.ADAMS@TERRACON.COM
6. KATHRASH@TERRACON.COM

0.316.1

March 16, 2020

Mr. Erin Loyd

Terracon

RE: Data review

Mr. Loyd,

After careful review of the BTEX chromatography produced for Job ID 624944 by Xenco Laboratories, it was concluded that the data from Xenco Laboratories was properly reported with no errors. Xenco-Midland has a protocol to test for contamination in each lot of vials received and during that particular timeframe there were no traces of toluene contamination; however, it is rare to detect isolated Toluene hits, they are normally accompanied by hits from compounds with a higher boiling point such as Xylene.

Other samples in the batch as well as the method blank have no hits above the method detection limit (MDL). The hits detected for Toluene over the MDL but under the reporting limit with no trace of heavier compounds for this particular job may have possibly come from small contamination in the HCL VOA vials since there is a tendency for the septum in the vials to absorb Toluene during transportation or other exposures; however, it is difficult to tell at this point because the laboratory QC is clean and there is no sample left to reanalyze for confirmation purposes.

Please feel free to contact me at 432-246-0447, or via email (Linda.riviello@xenco.com) with any questions you may have.

Respectfully,



Linda Riviello
Quality Assurance Manager

Analytical Report 635468

for Terracon-Lubbock

Project Manager: Paige Gaona

14" Vac to Jal Legacy

AR197010

03-SEP-19

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-29), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)

Oklahoma (2017-142), North Carolina (681)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (T104704295-19-19), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-20)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Atlanta (LELAP Lab ID #04176)

Xenco-Tampa: Florida (E87429), North Carolina (483)

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03-SEP-19

Project Manager: **Paige Gaona**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: XENCO Report No(s): **635468**

14" Vac to Jal Legacy

Project Address: SRS #2009-092

Paige Gaona:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 635468. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 635468 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

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Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 635468



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-2	W	08-27-19 13:00		635468-001
MW-3	W	08-27-19 13:00		635468-002
MW-4	W	08-27-19 13:00		635468-003
MW-5	W	08-27-19 13:00		635468-004
MW-6	W	08-27-19 13:00		635468-005
MW-7	W	08-27-19 13:00		635468-006
MW-8	W	08-27-19 14:25		635468-007
MW-9	W	08-27-19 13:50		635468-008
MW-10	W	08-27-19 14:35		635468-009
MW-11	W	08-27-19 13:10		635468-010
MW-12	W	08-27-19 12:35		635468-011
MW-13	W	08-27-19 11:55		635468-012
MW-14	W	08-27-19 13:55		635468-013
DUP-1	W	08-27-19 15:20		635468-014
DUP-2	W	08-27-19 10:25		635468-015



CASE NARRATIVE

Client Name: Terracon-Lubbock

Project Name: 14" Vac to Jal Legacy

Project ID: AR197010

Work Order Number(s): 635468

Report Date: 03-SEP-19

Date Received: 08/29/2019

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results

635468



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-2** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-001 Date Collected: 08.27.19 13.00 Date Received: 08.29.19 09.50
Analytical Method: Inorganic Anions by EPA 300 Prep Method: E300P
Analyst: JYM % Moist: Tech: JYM
Seq Number: 3100214 Date Prep: 08.30.19 09.50
Subcontractor: SUB: E871002 Prep seq: 7685352

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	9570	25.0	3.69	mg/L	08.30.19 14:29		50

Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100144 Date Prep: 08.29.19 14.00
Prep seq: 7685281

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0341	0.00100	0.000480	mg/L	08.30.19 03:02		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 03:02	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 03:02	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 03:02	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 03:02	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 03:02	U	
Total BTEX		0.0341		0.000270	mg/L	08.30.19 03:02		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	92	66 - 120	%		
4-Bromofluorobenzene	88	67 - 120	%		



Certificate of Analytical Results

635468



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-3** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-002 Date Collected: 08.27.19 13.00 Date Received: 08.29.19 09.50
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100312 Date Prep: 08.30.19 14.00
Prep seq: 7685457

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.762	0.00500	0.00240	mg/L	08.31.19 03:51		5
Toluene	108-88-3	<0.00256	0.00500	0.00256	mg/L	08.31.19 03:51	U	5
Ethylbenzene	100-41-4	<0.00308	0.00500	0.00308	mg/L	08.31.19 03:51	U	5
m,p-Xylenes	179601-23-1	0.00250	0.0100	0.00227	mg/L	08.31.19 03:51	J	5
o-Xylene	95-47-6	<0.00135	0.00500	0.00135	mg/L	08.31.19 03:51	U	5
Total Xylenes	1330-20-7	0.00250		0.00135	mg/L	08.31.19 03:51	J	
Total BTEX		0.765		0.00135	mg/L	08.31.19 03:51		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	94	66 - 120	%		
4-Bromofluorobenzene	90	67 - 120	%		

Sample Id: **MW-4** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-003 Date Collected: 08.27.19 13.00 Date Received: 08.29.19 09.50
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100312 Date Prep: 08.30.19 14.00
Prep seq: 7685457

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.31.19 05:27	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.31.19 05:27	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.31.19 05:27	U	1
m,p-Xylenes	179601-23-1	0.000500	0.00200	0.000454	mg/L	08.31.19 05:27	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.31.19 05:27	U	1
Total Xylenes	1330-20-7	0.000500		0.000270	mg/L	08.31.19 05:27	J	
Total BTEX		0.000500		0.000270	mg/L	08.31.19 05:27	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	95	66 - 120	%		
4-Bromofluorobenzene	98	67 - 120	%		



Certificate of Analytical Results

635468



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-5** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-004 Date Collected: 08.27.19 13.00 Date Received: 08.29.19 09.50
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100144 Date Prep: 08.29.19 14.00
Prep seq: 7685281

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 04:14	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 04:14	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 04:14	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 04:14	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 04:14	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 04:14	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 04:14	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	99	66 - 120	%		
4-Bromofluorobenzene	98	67 - 120	%		

Sample Id: **MW-6** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-005 Date Collected: 08.27.19 13.00 Date Received: 08.29.19 09.50
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100167 Date Prep: 08.29.19 14.00
Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 04:31	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 04:31	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 04:31	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 04:31	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 04:31	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 04:31	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 04:31	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	96	66 - 120	%		
4-Bromofluorobenzene	96	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-7** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-006 Date Collected: 08.27.19 13.00 Date Received: 08.29.19 09.50
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100167 Date Prep: 08.29.19 14.00
Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 04:58	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 04:58	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 04:58	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 04:58	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 04:58	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 04:58	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 04:58	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	94	66 - 120	%		
4-Bromofluorobenzene	101	67 - 120	%		

Sample Id: **MW-8** Matrix: Ground Water Sample Depth:
Lab Sample Id: 635468-007 Date Collected: 08.27.19 14.25 Date Received: 08.29.19 09.50
Analytical Method: BTEX by EPA 8021B Prep Method: 5030B
Analyst: MIT % Moist: Tech: MIT
Seq Number: 3100167 Date Prep: 08.29.19 14.00
Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.281	0.00100	0.000480	mg/L	08.30.19 05:24		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 05:24	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 05:24	U	1
m,p-Xylenes	179601-23-1	0.00110	0.00200	0.000454	mg/L	08.30.19 05:24	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 05:24	U	1
Total Xylenes	1330-20-7	0.00110		0.000270	mg/L	08.30.19 05:24		
Total BTEX		0.282		0.000270	mg/L	08.30.19 05:24		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	96	66 - 120	%		
4-Bromofluorobenzene	100	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-9**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-008

Date Collected: 08.27.19 13.50

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 07:10	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 07:10	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 07:10	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 07:10	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 07:10	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 07:10	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 07:10	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	98	66 - 120	%		
4-Bromofluorobenzene	100	67 - 120	%		

Sample Id: **MW-10**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-009

Date Collected: 08.27.19 14.35

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 07:36	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 07:36	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 07:36	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 07:36	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 07:36	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 07:36	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 07:36	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	98	66 - 120	%		
4-Bromofluorobenzene	102	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-11**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-010

Date Collected: 08.27.19 13.10

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 08:03	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 08:03	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 08:03	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 08:03	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 08:03	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 08:03	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 08:03	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	97	66 - 120	%		
4-Bromofluorobenzene	100	67 - 120	%		

Sample Id: **MW-12**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-011

Date Collected: 08.27.19 12.35

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 08:29	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 08:29	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 08:29	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 08:29	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 08:29	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 08:29	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 08:29	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	98	66 - 120	%		
4-Bromofluorobenzene	98	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW-13**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-012

Date Collected: 08.27.19 11.55

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.240	0.00100	0.000480	mg/L	08.30.19 08:56		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 08:56	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 08:56	U	1
m,p-Xylenes	179601-23-1	0.00110	0.00200	0.000454	mg/L	08.30.19 08:56	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 08:56	U	1
Total Xylenes	1330-20-7	0.00110		0.000270	mg/L	08.30.19 08:56		
Total BTEX		0.241		0.000270	mg/L	08.30.19 08:56		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	93	66 - 120	%		
4-Bromofluorobenzene	100	67 - 120	%		

Sample Id: **MW-14**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-013

Date Collected: 08.27.19 13.55

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 09:22	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 09:22	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 09:22	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 09:22	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 09:22	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 09:22	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 09:22	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	97	66 - 120	%		
4-Bromofluorobenzene	99	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **DUP-1**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-014

Date Collected: 08.27.19 15.20

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.335	0.00100	0.000480	mg/L	08.30.19 09:49		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 09:49	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 09:49	U	1
m,p-Xylenes	179601-23-1	0.00150	0.00200	0.000454	mg/L	08.30.19 09:49	J	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 09:49	U	1
Total Xylenes	1330-20-7	0.00150		0.000270	mg/L	08.30.19 09:49		
Total BTEX		0.337		0.000270	mg/L	08.30.19 09:49		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	104	66 - 120	%		
4-Bromofluorobenzene	97	67 - 120	%		

Sample Id: **DUP-2**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 635468-015

Date Collected: 08.27.19 10.25

Date Received: 08.29.19 09.50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.30.19 10:15	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.30.19 10:15	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.30.19 10:15	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.30.19 10:15	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.30.19 10:15	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.30.19 10:15	U	
Total BTEX		<0.000270		0.000270	mg/L	08.30.19 10:15	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	95	66 - 120	%		
4-Bromofluorobenzene	101	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7685276-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7685276-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100167

Date Prep: 08.29.19 14.00

Prep seq: 7685276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.29.19 23:37	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.29.19 23:37	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.29.19 23:37	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.29.19 23:37	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.29.19 23:37	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.29.19 23:37	U	
Total BTEX		<0.000270		0.000270	mg/L	08.29.19 23:37	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	103	66 - 120	%		
4-Bromofluorobenzene	96	67 - 120	%		

Sample Id: 7685281-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7685281-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100144

Date Prep: 08.29.19 14.00

Prep seq: 7685281

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.29.19 17:47	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.29.19 17:47	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.29.19 17:47	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.29.19 17:47	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.29.19 17:47	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.29.19 17:47	U	
Total BTEX		<0.000270		0.000270	mg/L	08.29.19 17:47	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	99	66 - 120	%		
4-Bromofluorobenzene	99	67 - 120	%		



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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7685352-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7685352-1-BLK

Date Collected:

Date Received:

Analytical Method: Inorganic Anions by EPA 300

Prep Method: E300P

Analyst: JYM

% Moist:

Tech: JYM

Seq Number: 3100214

Date Prep: 08.30.19 09.50

Subcontractor: SUB: E871002

Prep seq: 7685352

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	<0.0738	0.500	0.0738	mg/L	08.30.19 08:19	U	1

Sample Id: 7685457-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7685457-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3100312

Date Prep: 08.30.19 14.00

Prep seq: 7685457

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	08.31.19 03:03	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	08.31.19 03:03	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	08.31.19 03:03	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	08.31.19 03:03	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	08.31.19 03:03	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	08.31.19 03:03	U	
Total BTEX		<0.000270		0.000270	mg/L	08.31.19 03:03	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	94	66 - 120	%		
4-Bromofluorobenzene	91	67 - 120	%		

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 635468,

Project ID: AR197010

Lab Batch #: 3100144

Sample: 7685281-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 08/29/19 16:10	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.104	0.100	104	66-120
4-Bromofluorobenzene		0.101	0.100	101	67-120

Lab Batch #: 3100144

Sample: 7685281-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 08/29/19 16:34	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.104	0.100	104	66-120
4-Bromofluorobenzene		0.102	0.100	102	67-120

Lab Batch #: 3100144

Sample: 7685281-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 08/29/19 17:47	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0991	0.100	99	66-120
4-Bromofluorobenzene		0.0991	0.100	99	67-120

Lab Batch #: 3100144

Sample: 635465-002 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 08/29/19 19:24	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.102	0.100	102	66-120
4-Bromofluorobenzene		0.103	0.100	103	67-120

Lab Batch #: 3100144

Sample: 635465-002 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 08/29/19 19:48	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0996	0.100	100	66-120
4-Bromofluorobenzene		0.0971	0.100	97	67-120

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 635468,

Project ID: AR197010

Lab Batch #: 3100167

Sample: 7685276-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L Date Analyzed: 08/29/19 21:49		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0903	0.100	90	66-120
4-Bromofluorobenzene		0.101	0.100	101	67-120

Lab Batch #: 3100167

Sample: 7685276-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L Date Analyzed: 08/29/19 22:16		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0912	0.100	91	66-120
4-Bromofluorobenzene		0.101	0.100	101	67-120

Lab Batch #: 3100167

Sample: 7685276-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L Date Analyzed: 08/29/19 23:37		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.103	0.100	103	66-120
4-Bromofluorobenzene		0.0956	0.100	96	67-120

Lab Batch #: 3100167

Sample: 635465-013 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L Date Analyzed: 08/30/19 00:31		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0893	0.100	89	66-120
4-Bromofluorobenzene		0.101	0.100	101	67-120

Lab Batch #: 3100167

Sample: 635465-013 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L Date Analyzed: 08/30/19 00:58		SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0879	0.100	88	66-120
4-Bromofluorobenzene		0.0977	0.100	98	67-120

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 635468,

Project ID: AR197010

Lab Batch #: 3100312

Sample: 7685457-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 08/31/19 01:28	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0929	0.100	93	66-120
4-Bromofluorobenzene		0.0893	0.100	89	67-120

Lab Batch #: 3100312

Sample: 7685457-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 08/31/19 01:52	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0985	0.100	99	66-120
4-Bromofluorobenzene		0.0967	0.100	97	67-120

Lab Batch #: 3100312

Sample: 7685457-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 08/31/19 03:03	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0936	0.100	94	66-120
4-Bromofluorobenzene		0.0907	0.100	91	67-120

Lab Batch #: 3100312

Sample: 635468-002 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 08/31/19 04:15	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.454	0.500	91	66-120
4-Bromofluorobenzene		0.0874	0.100	87	67-120

Lab Batch #: 3100312

Sample: 635468-002 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 08/31/19 04:39	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021B		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.476	0.500	95	66-120
4-Bromofluorobenzene		0.0888	0.100	89	67-120

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 635468

Project ID: AR197010

Analyst: MIT

Date Prepared: 08/29/2019

Date Analyzed: 08/29/2019

Lab Batch ID: 3100167

Sample: 7685276-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.103	103	0.100	0.104	104	1	74-120	20	
Toluene	<0.000512	0.100	0.105	105	0.100	0.106	106	1	74-120	20	
Ethylbenzene	<0.000616	0.100	0.105	105	0.100	0.107	107	2	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.211	106	0.200	0.212	106	0	73-120	25	
o-Xylene	<0.000270	0.100	0.105	105	0.100	0.107	107	2	73-120	25	

Analyst: MIT

Date Prepared: 08/29/2019

Date Analyzed: 08/29/2019

Lab Batch ID: 3100144

Sample: 7685281-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.0960	96	0.100	0.0985	99	3	74-120	20	
Toluene	<0.000512	0.100	0.0929	93	0.100	0.0958	96	3	74-120	20	
Ethylbenzene	<0.000616	0.100	0.0981	98	0.100	0.102	102	4	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.192	96	0.200	0.200	100	4	73-120	25	
o-Xylene	<0.000270	0.100	0.0961	96	0.100	0.0994	99	3	73-120	25	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 635468

Project ID: AR197010

Analyst: MIT

Date Prepared: 08/30/2019

Date Analyzed: 08/31/2019

Lab Batch ID: 3100312

Sample: 7685457-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.0886	89	0.100	0.0949	95	7	74-120	20	
Toluene	<0.000512	0.100	0.0869	87	0.100	0.0919	92	6	74-120	20	
Ethylbenzene	<0.000616	0.100	0.0929	93	0.100	0.0973	97	5	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.183	92	0.200	0.191	96	4	73-120	25	
o-Xylene	<0.000270	0.100	0.0933	93	0.100	0.0957	96	3	73-120	25	

Analyst: JYM

Date Prepared: 08/30/2019

Date Analyzed: 08/30/2019

Lab Batch ID: 3100214

Sample: 7685352-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<0.0738	10.0	10.2	102	10.0	10.2	102	0	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order # : 635468

Project ID: AR197010

Lab Batch ID: 3100144

QC- Sample ID: 635465-002 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 08/29/2019

Date Prepared: 08/29/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000480	0.100	0.0993	99	0.100	0.0969	97	2	15-147	25	
Toluene	<0.000512	0.100	0.0974	97	0.100	0.0940	94	4	11-147	25	
Ethylbenzene	<0.000616	0.100	0.102	102	0.100	0.0996	100	2	10-149	25	
m,p-Xylenes	<0.000454	0.200	0.201	101	0.200	0.196	98	3	62-124	25	
o-Xylene	<0.000270	0.100	0.101	101	0.100	0.0992	99	2	62-124	25	

Lab Batch ID: 3100167

QC- Sample ID: 635465-013 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 08/30/2019

Date Prepared: 08/29/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000480	0.100	0.100	100	0.100	0.0995	100	1	15-147	25	
Toluene	<0.000512	0.100	0.103	103	0.100	0.101	101	2	11-147	25	
Ethylbenzene	<0.000616	0.100	0.105	105	0.100	0.103	103	2	10-149	25	
m,p-Xylenes	<0.000454	0.200	0.206	103	0.200	0.202	101	2	62-124	25	
o-Xylene	<0.000270	0.100	0.103	103	0.100	0.101	101	2	62-124	25	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order # : 635468

Project ID: AR197010

Lab Batch ID: 3100312

QC- Sample ID: 635468-002 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 08/31/2019

Date Prepared: 08/30/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	0.762	0.500	1.20	88	0.500	1.18	84	2	15-147	25	
Toluene	<0.00256	0.500	0.448	90	0.500	0.452	90	1	11-147	25	
Ethylbenzene	<0.00308	0.500	0.466	93	0.500	0.473	95	1	10-149	25	
m,p-Xylenes	0.00250	1.00	0.913	91	1.00	0.931	93	2	62-124	25	
o-Xylene	<0.00135	0.500	0.461	92	0.500	0.472	94	2	62-124	25	

Lab Batch ID: 3100214

QC- Sample ID: 635503-001 S

Batch #: 1 Matrix: Water

Date Analyzed: 08/30/2019

Date Prepared: 08/30/2019

Analyst: JYM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	26.2	10.0	35.1	89	10.0	35.1	89	0	90-110	20	X

Lab Batch ID: 3100214

QC- Sample ID: 635503-003 S

Batch #: 1 Matrix: Water

Date Analyzed: 08/30/2019

Date Prepared: 08/30/2019

Analyst: JYM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	24.9	10.0	34.2	93	10.0	34.2	93	0	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

635468

Lubbock Office ■ 5827 50th Street, Suite 1 ■ Lubbock, Texas 79424 ■ 806-300-0140

Responsive ■ Resourceful ■ Reliable

Inter-Office Shipment

IOS Number : **47149**

Date/Time: 08.29.2019

Created by: Brenda Ward

Please send report to: Jessica Kramer

Lab# From: **Lubbock**

Delivery Priority:

Address: 6701 Aberdeen, Suite 9 Lubbock, TX 79424

Lab# To: **Houston**

Air Bill No.: 776118582116

E-Mail: jessica.kramer@xenco.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
635468-001	W	MW-2	08.27.2019 13:00	E300	Inorganic Anions by EPA 300	09.05.201		JKR	CL	

Inter Office Shipment or Sample Comments:

Relinquished By:



Brenda Ward

Date Relinquished: 08.29.2019

Received By:



Travis Simmons

Date Received: 08.30.2019

Cooler Temperature: 1.3



XENCO Laboratories



Inter Office Report- Sample Receipt Checklist

Sent To: Houston

IOS #: 47149

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : HOU-068

Sent By: Brenda Ward

Date Sent: 08.29.2019 12.14 PM

Received By: Travis Simmons

Date Received: 08.30.2019 09.00 AM

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1.3
#2 *Shipping container in good condition?	Yes
#3 *Samples received with appropriate temperature?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 *Custody Seals Signed and dated for Containers/coolers	N/A
#6 *IOS present?	Yes
#7 Any missing/extra samples?	No
#8 IOS agrees with sample label(s)/matrix?	Yes
#9 Sample matrix/ properties agree with IOS?	Yes
#10 Samples in proper container/ bottle?	Yes
#11 Samples properly preserved?	Yes
#12 Sample container(s) intact?	Yes
#13 Sufficient sample amount for indicated test(s)?	Yes
#14 All samples received within hold time?	Yes

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

NonConformance:

Corrective Action Taken:

Nonconformance Documentation

Contact: _____ Contacted by : _____ Date: _____

Checklist reviewed by:

Travis Simmons

Date: 08.30.2019



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Terracon-Lubbock

Date/ Time Received: 08/29/2019 09:50:00 AM

Work Order #: 635468

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-4

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	3.3
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	Yes

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by:

Brenda Ward
Brenda Ward

Date: 08/29/2019

Checklist reviewed by:

Jessica Kramer
Jessica Kramer

Date: 08/29/2019

Analytical Report 644521

for Terracon-Lubbock

Project Manager: Paige Gaona

14" Vac to Jal Legacy

AR197010

05-DEC-19

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (19-037-0)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)

Xenco-Carlsbad (LELAP): Louisiana (05092)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Tampa: Florida (E87429), North Carolina (483)

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05-DEC-19

Project Manager: **Paige Gaona**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: XENCO Report No(s): **644521**

14" Vac to Jal Legacy

Project Address: SRS #2009-092

Paige Gaona:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 644521. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 644521 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW #2	W	11-25-19 10:52		644521-001
MW #10	W	11-25-19 11:42		644521-002
MW #11	W	11-25-19 12:41		644521-003
MW #12	W	11-25-19 13:37		644521-004
MW #14	W	11-25-19 14:33		644521-005
MW #13	W	11-25-19 15:36		644521-006
MW DUP-1	W	11-25-19 14:38		644521-007
MW DUP-2	W	11-25-19 15:41		644521-008



CASE NARRATIVE

Client Name: Terracon-Lubbock

Project Name: 14" Vac to Jal Legacy

Project ID: AR197010
Work Order Number(s): 644521

Report Date: 05-DEC-19
Date Received: 11/26/2019

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3109289 PAHs by SW846 8270D SIM

Surrogate 2-Fluorobiphenyl recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 644521-006.

Surrogate Nitrobenzene-d5 recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7691581-1-BLK, 644521-004, 644521-006.

It was not enough volume for extracting MS/MSD.



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **MW #2** Matrix: Ground Water Sample Depth:
Lab Sample Id: 644521-001 Date Collected: 11.25.19 10.52 Date Received: 11.26.19 09.50
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Analyst: JYM % Moist: Tech: JYM
Seq Number: 3108967 Date Prep: 11.27.19 14.40
Subcontractor: SUB: T104704215-19-30 Prep seq: 7691285

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	9420	10.0	1.48	mg/L	11.27.19 15:35		20

Analytical Method: BTEX by SW 8260B Prep Method: 5030B
Analyst: SAD % Moist: Tech: SAD
Seq Number: 3109378 Date Prep: 12.03.19 14.00
Subcontractor: SUB: T104704215-19-30 Prep seq: 7691665

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0399	0.00100	0.000500	mg/L	12.03.19 17:52		1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 17:52	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 17:52	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 17:52	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 17:52	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 17:52	U	
Total BTEX		0.0399		0.000500	mg/L	12.03.19 17:52		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	96	75 - 131	%		
1,2-Dichloroethane-D4	99	63 - 144	%		
Toluene-D8	99	80 - 117	%		
4-Bromofluorobenzene	106	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW #10

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-002

Date Collected: 11.25.19 11.42

Date Received: 11.26.19 09.50

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 16:38	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 16:38	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 16:38	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 16:38	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 16:38	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 16:38	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 16:38	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 16:38	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 16:38	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	108	43 - 130	%		
Nitrobenzene-d5	111	36 - 130	%		

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: SAD

% Moist:

Tech: SAD

Seq Number: 3109378

Date Prep: 12.03.19 14.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691665

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000620	0.00100	0.000500	mg/L	12.03.19 18:15	J	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 18:15	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 18:15	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 18:15	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 18:15	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 18:15	U	
Total BTEX		0.000620		0.000500	mg/L	12.03.19 18:15	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	93	75 - 131	%		
1,2-Dichloroethane-D4	95	63 - 144	%		
Toluene-D8	100	80 - 117	%		
4-Bromofluorobenzene	102	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW #11

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-003

Date Collected: 11.25.19 12.41

Date Received: 11.26.19 09.50

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 17:02	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 17:02	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 17:02	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 17:02	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 17:02	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 17:02	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 17:02	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 17:02	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 17:02	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	100	43 - 130	%		
Nitrobenzene-d5	103	36 - 130	%		

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:24	U	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:24	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:24	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 02:24	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:24	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 02:24	U	
Total BTEX		<0.000500		0.000500	mg/L	12.03.19 02:24	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	105	75 - 131	%		
1,2-Dichloroethane-D4	102	63 - 144	%		
Toluene-D8	98	80 - 117	%		
4-Bromofluorobenzene	102	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW #12

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-004

Date Collected: 11.25.19 13.37

Date Received: 11.26.19 09.50

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 17:26	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 17:26	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 17:26	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 17:26	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 17:26	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 17:26	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 17:26	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 17:26	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 17:26	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	127	43 - 130	%		
Nitrobenzene-d5	131	36 - 130	%		**

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:46	U	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:46	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:46	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 02:46	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 02:46	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 02:46	U	
Total BTEX		<0.000500		0.000500	mg/L	12.03.19 02:46	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	105	75 - 131	%		
1,2-Dichloroethane-D4	101	63 - 144	%		
Toluene-D8	98	80 - 117	%		
4-Bromofluorobenzene	99	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW #14

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-005

Date Collected: 11.25.19 14.33

Date Received: 11.26.19 09.50

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 17:51	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 17:51	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 17:51	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 17:51	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 17:51	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 17:51	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 17:51	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 17:51	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 17:51	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	125	43 - 130	%		
Nitrobenzene-d5	130	36 - 130	%		

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:09	U	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:09	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:09	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 03:09	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:09	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 03:09	U	
Total BTEX		<0.000500		0.000500	mg/L	12.03.19 03:09	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	102	75 - 131	%		
1,2-Dichloroethane-D4	104	63 - 144	%		
Toluene-D8	102	80 - 117	%		
4-Bromofluorobenzene	99	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW #13

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-006

Date Collected: 11.25.19 15.36

Date Received: 11.26.19 09.50

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 18:15	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 18:15	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 18:15	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 18:15	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 18:15	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 18:15	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 18:15	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 18:15	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 18:15	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	131	43 - 130	%		**
Nitrobenzene-d5	142	36 - 130	%		**

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0536	0.00100	0.000500	mg/L	12.03.19 03:32		1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:32	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:32	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 03:32	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:32	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 03:32	U	
Total BTEX		0.0536		0.000500	mg/L	12.03.19 03:32		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	102	75 - 131	%		
1,2-Dichloroethane-D4	101	63 - 144	%		
Toluene-D8	101	80 - 117	%		
4-Bromofluorobenzene	99	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW DUP-1

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-007

Date Collected: 11.25.19 14.38

Date Received: 11.26.19 09.50

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000500	0.00100	0.000500	mg/L	12.03.19 04:18	U	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 04:18	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 04:18	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 04:18	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 04:18	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 04:18	U	
Total BTEX		<0.000500		0.000500	mg/L	12.03.19 04:18	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	103	75 - 131	%		
1,2-Dichloroethane-D4	101	63 - 144	%		
Toluene-D8	100	80 - 117	%		
4-Bromofluorobenzene	100	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW DUP-2

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644521-008

Date Collected: 11.25.19 15.41

Date Received: 11.26.19 09.50

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 18:40	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 18:40	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 18:40	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 18:40	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 18:40	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 18:40	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 18:40	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 18:40	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 18:40	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	107	43 - 130	%		
Nitrobenzene-d5	121	36 - 130	%		

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0609	0.00100	0.000500	mg/L	12.03.19 03:55		1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:55	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:55	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 03:55	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 03:55	U	1
Total Xylenes	1330-20-7	<0.000500		0.000500	mg/L	12.03.19 03:55	U	
Total BTEX		0.0609		0.000500	mg/L	12.03.19 03:55		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	103	75 - 131	%		
1,2-Dichloroethane-D4	103	63 - 144	%		
Toluene-D8	98	80 - 117	%		
4-Bromofluorobenzene	96	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7691285-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7691285-1-BLK

Date Collected:

Date Received:

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Analyst: JYM

% Moist:

Tech: JYM

Seq Number: 3108967

Date Prep: 11.27.19 08.44

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691285

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Chloride	16887-00-6	<0.0738	0.500	0.0738	mg/L	11.27.19 09:28	U	1

Sample Id: 7691523-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7691523-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: KRP

% Moist:

Tech: KRP

Seq Number: 3109191

Date Prep: 12.02.19 15.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691523

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000500	0.00100	0.000500	mg/L	12.03.19 01:38	U	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 01:38	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 01:38	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 01:38	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 01:38	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	106	75 - 131	%		
1,2-Dichloroethane-D4	102	63 - 144	%		
Toluene-D8	101	80 - 117	%		
4-Bromofluorobenzene	99	74 - 124	%		



Certificate of Analytical Results

644521



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7691581-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7691581-1-BLK

Date Collected:

Date Received:

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: CHD

% Moist:

Tech: BNS

Seq Number: 3109289

Date Prep: 12.02.19 18.15

Subcontractor: SUB: T104704295-19-22

Prep seq: 7691581

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<2.09	3.64	2.09	ug/L	12.03.19 16:13	U	1
Acenaphthylene	208-96-8	<1.12	1.82	1.12	ug/L	12.03.19 16:13	U	1
Anthracene	120-12-7	<0.811	1.82	0.811	ug/L	12.03.19 16:13	U	1
Chrysene	218-01-9	<1.38	1.82	1.38	ug/L	12.03.19 16:13	U	1
Fluoranthene	206-44-0	<0.740	1.82	0.740	ug/L	12.03.19 16:13	U	1
Fluorene	86-73-7	<1.09	1.82	1.09	ug/L	12.03.19 16:13	U	1
Naphthalene	91-20-3	<1.16	1.82	1.16	ug/L	12.03.19 16:13	U	1
Phenanthrene	85-01-8	<0.771	1.82	0.771	ug/L	12.03.19 16:13	U	1
Pyrene	129-00-0	<1.38	1.82	1.38	ug/L	12.03.19 16:13	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	130	43 - 130	%		
Nitrobenzene-d5	132	36 - 130	%		**

Sample Id: 7691665-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7691665-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by SW 8260B

Prep Method: 5030B

Analyst: SAD

% Moist:

Tech: SAD

Seq Number: 3109378

Date Prep: 12.03.19 12.00

Subcontractor: SUB: T104704215-19-30

Prep seq: 7691665

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000500	0.00100	0.000500	mg/L	12.03.19 13:44	U	1
Toluene	108-88-3	<0.000500	0.00100	0.000500	mg/L	12.03.19 13:44	U	1
Ethylbenzene	100-41-4	<0.000500	0.00100	0.000500	mg/L	12.03.19 13:44	U	1
m,p-Xylenes	179601-23-1	<0.00100	0.00200	0.00100	mg/L	12.03.19 13:44	U	1
o-Xylene	95-47-6	<0.000500	0.00100	0.000500	mg/L	12.03.19 13:44	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
Dibromofluoromethane	94	75 - 131	%		
1,2-Dichloroethane-D4	93	63 - 144	%		
Toluene-D8	100	80 - 117	%		
4-Bromofluorobenzene	101	74 - 124	%		

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 644521,

Project ID: AR197010

Lab Batch #: 3109191

Sample: 7691523-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/02/19 23:43

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0561	0.0500	112	75-131	
1,2-Dichloroethane-D4	0.0506	0.0500	101	63-144	
Toluene-D8	0.0490	0.0500	98	80-117	
4-Bromofluorobenzene	0.0496	0.0500	99	74-124	

Lab Batch #: 3109191

Sample: 7691523-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/03/19 00:06

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0552	0.0500	110	75-131	
1,2-Dichloroethane-D4	0.0489	0.0500	98	63-144	
Toluene-D8	0.0496	0.0500	99	80-117	
4-Bromofluorobenzene	0.0495	0.0500	99	74-124	

Lab Batch #: 3109191

Sample: 644521-003 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L

Date Analyzed: 12/03/19 00:29

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0541	0.0500	108	75-131	
1,2-Dichloroethane-D4	0.0493	0.0500	99	63-144	
Toluene-D8	0.0509	0.0500	102	80-117	
4-Bromofluorobenzene	0.0503	0.0500	101	74-124	

Lab Batch #: 3109191

Sample: 7691523-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/03/19 01:38

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0530	0.0500	106	75-131	
1,2-Dichloroethane-D4	0.0508	0.0500	102	63-144	
Toluene-D8	0.0503	0.0500	101	80-117	
4-Bromofluorobenzene	0.0495	0.0500	99	74-124	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 644521,

Project ID: AR197010

Lab Batch #: 3109378

Sample: 7691665-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/03/19 11:16

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0495	0.0500	99	75-131	
1,2-Dichloroethane-D4	0.0503	0.0500	101	63-144	
Toluene-D8	0.0494	0.0500	99	80-117	
4-Bromofluorobenzene	0.0507	0.0500	101	74-124	

Lab Batch #: 3109378

Sample: 7691665-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/03/19 11:41

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0493	0.0500	99	75-131	
1,2-Dichloroethane-D4	0.0499	0.0500	100	63-144	
Toluene-D8	0.0498	0.0500	100	80-117	
4-Bromofluorobenzene	0.0520	0.0500	104	74-124	

Lab Batch #: 3109378

Sample: 644558-001 S / MS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/03/19 12:13

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0494	0.0500	99	75-131	
1,2-Dichloroethane-D4	0.0494	0.0500	99	63-144	
Toluene-D8	0.0491	0.0500	98	80-117	
4-Bromofluorobenzene	0.0518	0.0500	104	74-124	

Lab Batch #: 3109378

Sample: 7691665-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12/03/19 13:44

SURROGATE RECOVERY STUDY

BTEX by SW 8260B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Dibromofluoromethane	0.0468	0.0500	94	75-131	
1,2-Dichloroethane-D4	0.0467	0.0500	93	63-144	
Toluene-D8	0.0502	0.0500	100	80-117	
4-Bromofluorobenzene	0.0503	0.0500	101	74-124	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 644521,

Project ID: AR197010

Lab Batch #: 3109289

Sample: 7691581-1-BKS / BKS

Batch: 1 Matrix: Water

Units: ug/L

Date Analyzed: 12/03/19 15:04

SURROGATE RECOVERY STUDY

PAHs by SW846 8270D SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
2-Fluorobiphenyl	556000	500000	111	43-130	
Nitrobenzene-d5	629000	500000	126	36-130	

Lab Batch #: 3109289

Sample: 7691581-1-BSD / BSD

Batch: 1 Matrix: Water

Units: ug/L

Date Analyzed: 12/03/19 15:50

SURROGATE RECOVERY STUDY

PAHs by SW846 8270D SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
2-Fluorobiphenyl	540000	500000	108	43-130	
Nitrobenzene-d5	564000	500000	113	36-130	

Lab Batch #: 3109289

Sample: 7691581-1-BLK / BLK

Batch: 1 Matrix: Water

Units: ug/L

Date Analyzed: 12/03/19 16:13

SURROGATE RECOVERY STUDY

PAHs by SW846 8270D SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
2-Fluorobiphenyl	650000	500000	130	43-130	
Nitrobenzene-d5	660000	500000	132	36-130	**

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 644521

Project ID: AR197010

Analyst: KRP

Date Prepared: 12/02/2019

Date Analyzed: 12/02/2019

Lab Batch ID: 3109191

Sample: 7691523-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by SW 8260B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000500	0.0500	0.0506	101	0.0500	0.0469	94	8	66-142	20	
Toluene	<0.000500	0.0500	0.0470	94	0.0500	0.0446	89	5	59-139	20	
Ethylbenzene	<0.000500	0.0500	0.0492	98	0.0500	0.0471	94	4	75-125	20	
m,p-Xylenes	<0.00100	0.100	0.0985	99	0.100	0.0938	94	5	75-125	20	
o-Xylene	<0.000500	0.0500	0.0492	98	0.0500	0.0476	95	3	75-125	20	

Analyst: SAD

Date Prepared: 12/03/2019

Date Analyzed: 12/03/2019

Lab Batch ID: 3109378

Sample: 7691665-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by SW 8260B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000500	0.0500	0.0478	96	0.0500	0.0496	99	4	66-142	20	
Toluene	<0.000500	0.0500	0.0465	93	0.0500	0.0485	97	4	59-139	20	
Ethylbenzene	<0.000500	0.0500	0.0476	95	0.0500	0.0504	101	6	75-125	20	
m,p-Xylenes	<0.00100	0.100	0.0926	93	0.100	0.0987	99	6	75-125	20	
o-Xylene	<0.000500	0.0500	0.0465	93	0.0500	0.0493	99	6	75-125	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 644521

Project ID: AR197010

Analyst: JYM

Date Prepared: 11/27/2019

Date Analyzed: 11/27/2019

Lab Batch ID: 3108967

Sample: 7691285-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<0.0738	10.0	10.2	102	10.0	10.3	103	1	90-110	20	

Analyst: CHD

Date Prepared: 12/02/2019

Date Analyzed: 12/03/2019

Lab Batch ID: 3109289

Sample: 7691581-1-BKS

Batch #: 1

Matrix: Water

Units: ug/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

PAHs by SW846 8270D SIM	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Acenaphthene	<2.09	9090	8230	91	9090	8080	89	2	16-130	30	
Acenaphthylene	<1.12	9090	7860	86	9090	7730	85	2	50-120	30	
Anthracene	<0.811	9090	8440	93	9090	8350	92	1	55-115	30	
Chrysene	<1.38	9090	6020	66	9090	6050	67	0	55-120	30	
Fluoranthene	<0.740	9090	8870	98	9090	9300	102	5	55-115	30	
Fluorene	<1.09	9090	9730	107	9090	10000	110	3	50-120	30	
Naphthalene	<1.16	9090	9140	101	9090	9500	105	4	40-118	30	
Phenanthrene	<0.771	9090	8260	91	9090	8290	91	0	50-115	30	
Pyrene	<1.38	9090	7450	82	9090	7080	78	5	13-130	30	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS Recoveries

Project Name: 14" Vac to Jal Legacy



Work Order #: 644521

Lab Batch #: 3109191

Date Analyzed: 12/03/2019

QC- Sample ID: 644521-003 S

Reporting Units: mg/L

Date Prepared: 12/02/2019

Batch #: 1

Project ID: AR197010

Analyst: KRP

Matrix: Ground Water

MATRIX / MATRIX SPIKE RECOVERY STUDY						
BTEX by SW 8260B	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Benzene	<0.000500	0.0500	0.0450	90	66-142	
Toluene	<0.000500	0.0500	0.0442	88	59-139	
Ethylbenzene	<0.000500	0.0500	0.0466	93	75-125	
m,p-Xylenes	<0.00100	0.100	0.0932	93	75-125	
o-Xylene	<0.000500	0.0500	0.0479	96	75-125	

Lab Batch #: 3109378

Date Analyzed: 12/03/2019

QC- Sample ID: 644558-001 S

Reporting Units: mg/L

Date Prepared: 12/03/2019

Batch #: 1

Analyst: SAD

Matrix: Water

MATRIX / MATRIX SPIKE RECOVERY STUDY						
BTEX by SW 8260B	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Benzene	<0.000500	0.0500	0.0480	96	66-142	
Toluene	<0.000500	0.0500	0.0464	93	59-139	
Ethylbenzene	<0.000500	0.0500	0.0486	97	75-125	
m,p-Xylenes	<0.00100	0.100	0.0950	95	75-125	
o-Xylene	<0.000500	0.0500	0.0478	96	75-125	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$

Relative Percent Difference [E] = $200 \times (C-A)/(C+B)$

All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order # : 644521

Project ID: AR197010

Lab Batch ID: 3108967

QC- Sample ID: 644524-001 S

Batch #: 1 Matrix: Waste Water

Date Analyzed: 11/27/2019

Date Prepared: 11/27/2019

Analyst: JYM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	45.4	10.0	55.5	101	10.0	55.5	101	0	90-110	20	

Lab Batch ID: 3108967

QC- Sample ID: 644529-001 S

Batch #: 1 Matrix: Water

Date Analyzed: 11/27/2019

Date Prepared: 11/27/2019

Analyst: JYM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride <11/27/2019 11:13>	111	200	322	106	200	323	106	0	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

644521

Terracon

CHAIN OF CUSTODY RECORD

644521

Office Location

Lubbock

Laboratory: Xenco
Address: 6701 Aberdeen
Lubbock, Texas 79424

Phone:

Contact: Paige Gaona
PO/SO #:Project Manager
Paige Gaona
Sampler's Name
Aaron AdamsSampler's Signature
Project Number
AR197010Project Name
14" Vac to Jal Legacy (SRS # 2009-092)Matrix
Date
Time
Comp
Grab
Identifying Marks of Sample(s)Start Depth
End Depth

No. Type of Containers

BTEX (EPA Method 8260B)
PAHs (EPA Method 8310)
Chloride (EPA Method 300)LAB USE ONLY
DUE DATE:TEMP OF COOLER
WHEN RECEIVED (°C)

Page 1 of 1

Lab Sample ID

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	40 ml VOA	60 ml VOA	250 ml Poly	BTEX (EPA Method 8260B)	PAHs (EPA Method 8310)	Chloride (EPA Method 300)	Lab Sample ID
GW	11/25/2019	10:52	X		MW# 2			3		1	X	X		
GW	11/25/2019	11:42	X		MW# 10			3			X	X		
GW	11/25/2019	12:41	X		MW# 11			3			X	X		
GW	11/25/2019	13:37	X		MW# 12			3			X	X		
GW	11/25/2019	14:33	X		MW# 14			3			X	X		
GW	11/25/2019	15:36	X		MW# 13			3			X	X		
GW	11/25/2019	14:38	X		DUP - 1			3			X	X		
GW	11/25/2019	15:41	X		DUP - 2			3			X	X		

TURNAROUND TIME

☐ Normal☐ 48-Hour Rush☐ 24-Hour Rush

IRBP Laboratory Review Checklist

NOTES: ☐ Yes ☐ No

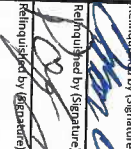
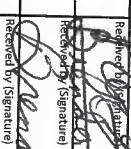
e-mail results to:

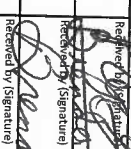
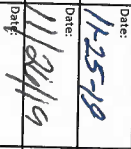
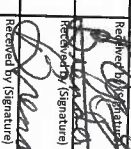
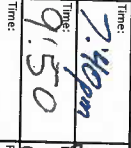
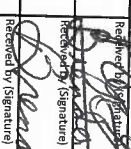
paige.gaona@terracon.com

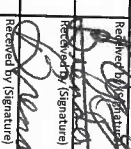
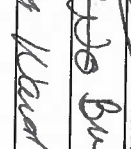
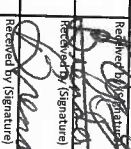
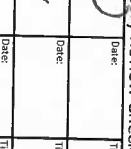
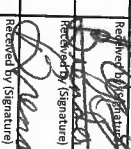
erin.loyd@terracon.com

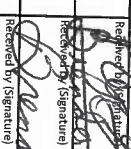
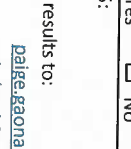
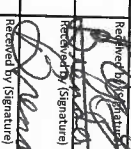
cibryant@paalp.com

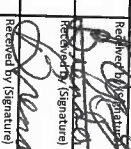
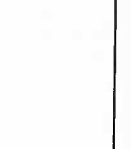
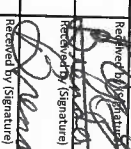
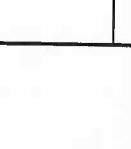
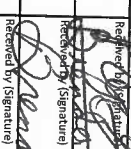
algroves@paalp.com

Requisitioned by (Signature)

Date: 11/25/19
Time: 7:40pm
Received by (Signature)

Date: 11/24/19
Time: 9:50Requisitioned by (Signature)

Date: 11/24/19
Time: 9:50
Received by (Signature)

Date: 11/24/19
Time: 9:50Requisitioned by (Signature)

Date: 11/24/19
Time: 9:50
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Time: 9:50Requisitioned by (Signature)

Date: 11/24/19
Time: 9:50
Received by (Signature)

Date: 11/24/19
Time: 9:50Requisitioned by (Signature)

Date: 11/24/19
Time: 9:50
Received by (Signature)

Date: 11/24/19
Time: 9:50Matrix
Container
VQA - 40 ml vialW - Water
A/G - Amber Glass TLS - Soil
250 ml = Glass wide mouthL - Liquid
P/O - Plastic or other

A - Air Bag

C - Charcoal tube

S - Sludge

Lubbock Office ■ 5827 50th Street, Suite 1 ■ Lubbock, Texas 79424 ■ 806-300-0140

Responsive ■ Resourceful ■ Reliable

Inter-Office Shipment

IOS Number : 53192

Date/Time: 11.26.2019

Created by: Brenda Ward

Please send report to: Jessica Kramer

Lab# From: **Lubbock**

Delivery Priority:

Address: 6701 Aberdeen, Suite 9 Lubbock, TX 79424

Lab# To: **Houston**

Air Bill No.: 777094092509

E-Mail: jessica.kramer@xenco.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
644521-001	W	MW #2	11.25.2019 10:52	E300	Inorganic Anions by EPA 300/300.1	12.04.2019	12.23.2019	JKR	CL	
644521-001	W	MW #2	11.25.2019 10:52	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-002	W	MW #10	11.25.2019 11:42	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-003	W	MW #11	11.25.2019 12:41	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-004	W	MW #12	11.25.2019 13:37	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-005	W	MW #14	11.25.2019 14:33	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-006	W	MW #13	11.25.2019 15:36	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-007	W	MW DUP-1	11.25.2019 14:38	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	
644521-008	W	MW DUP-2	11.25.2019 15:41	SW8260BTX	BTEX by SW 8260B	12.04.2019	12.09.2019	JKR	BZ BZME EBZ XYLMP	

Inter Office Shipment or Sample Comments:

Relinquished By:



Brenda Ward

Date Relinquished: 11.26.2019

Received By:



Monica Shakhshir

Date Received: 11.27.2019

Cooler Temperature: 2.1



Inter-Office Shipment

Page 1 of 1

IOS Number **53193**

Date/Time: 11/26/19 15:51

Created by: Brenda Ward

Please send report to: Jessica Kramer

Lab# From: **Lubbock**

Delivery Priority: Fedex

Address: 6701 Aberdeen, Suite 9 Lubbock, TX 79424

Lab# To: **Dallas**

Air Bill No.: 777094096546

F-Mail: jessica.kramer@xenco.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
644521-002	W	MW #10	11/25/19 11:42	SW8270D_SIM_PAH	PAHs by SW846 8270D SIM	12/04/19	12/02/19 11:42	JKR	ACNP ACNPY ANTH BZA	
644521-003	W	MW #11	11/25/19 12:41	SW8270D_SIM_PAH	PAHs by SW846 8270D SIM	12/04/19	12/02/19 12:41	JKR	ACNP ACNPY ANTH BZA	
644521-004	W	MW #12	11/25/19 13:37	SW8270D_SIM_PAH	PAHs by SW846 8270D SIM	12/04/19	12/02/19 13:37	JKR	ACNP ACNPY ANTH BZA	
644521-005	W	MW #14	11/25/19 14:33	SW8270D_SIM_PAH	PAHs by SW846 8270D SIM	12/04/19	12/02/19 14:33	JKR	ACNP ACNPY ANTH BZA	
644521-006	W	MW #13	11/25/19 15:36	SW8270D_SIM_PAH	PAHs by SW846 8270D SIM	12/04/19	12/02/19 15:36	JKR	ACNP ACNPY ANTH BZA	
644521-008	W	MW DUP-2	11/25/19 15:41	SW8270D_SIM_PAH	PAHs by SW846 8270D SIM	12/04/19	12/02/19 15:41	JKR	ACNP ACNPY ANTH BZA	

Inter Office Shipment or Sample Comments:

Relinquished By:

Brenda Ward

Brenda Ward

Date Relinquished: 11/26/2019

Received By:

Angelica Martinez

Angelica Martinez

Date Received: 11/27/2019 11:00

Cooler Temperature: 1.5



XENCO Laboratories



Inter Office Report- Sample Receipt Checklist

Sent To: Houston

IOS #: 53192

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : HOU-068

Sent By: Brenda Ward

Date Sent: 11.26.2019 03.49 PM

Received By: Monica Shakhshir

Date Received: 11.27.2019 10.30 AM

Sample Receipt Checklist

Comments

- | | |
|---|-----|
| #1 *Temperature of cooler(s)? | 2.1 |
| #2 *Shipping container in good condition? | Yes |
| #3 *Samples received with appropriate temperature? | Yes |
| #4 *Custody Seals intact on shipping container/ cooler? | Yes |
| #5 *Custody Seals Signed and dated for Containers/coolers | Yes |
| #6 *IOS present? | Yes |
| #7 Any missing/extra samples? | No |
| #8 IOS agrees with sample label(s)/matrix? | Yes |
| #9 Sample matrix/ properties agree with IOS? | Yes |
| #10 Samples in proper container/ bottle? | Yes |
| #11 Samples properly preserved? | Yes |
| #12 Sample container(s) intact? | Yes |
| #13 Sufficient sample amount for indicated test(s)? | Yes |
| #14 All samples received within hold time? | Yes |

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

NonConformance:

Corrective Action Taken:

Nonconformance Documentation

Contact: _____ Contacted by : _____ Date: _____

Checklist reviewed by:

Monica Shakhshir

Date: 11.27.2019



XENCO Laboratories



Inter Office Report- Sample Receipt Checklist

Sent To: Dallas

IOS #: 53193

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : XDA

Sent By: Brenda Ward

Date Sent: 11/26/2019 03:51 PM

Received By: Angelica Martinez

Date Received: 11/27/2019 11:00 AM

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1.5
#2 *Shipping container in good condition?	Yes
#3 *Samples received with appropriate temperature?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	Yes
#5 *Custody Seals Signed and dated for Containers/coolers	Yes
#6 *IOS present?	Yes
#7 Any missing/extra samples?	No
#8 IOS agrees with sample label(s)/matrix?	Yes
#9 Sample matrix/ properties agree with IOS?	Yes
#10 Samples in proper container/ bottle?	Yes
#11 Samples properly preserved?	Yes
#12 Sample container(s) intact?	Yes
#13 Sufficient sample amount for indicated test(s)?	Yes
#14 All samples received within hold time?	Yes

* Must be completed for after-hours delivery of samples prior to placing in the refrigerator

NonConformance:

Corrective Action Taken:

Nonconformance Documentation

Contact: _____ Contacted by : _____ Date: _____

Checklist reviewed by:

Angelica Martinez

Angelica Martinez

Date: 11/27/2019



XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In



Client: Terracon-Lubbock

Date/ Time Received: 11/26/2019 09:50:00 AM

Work Order #: 644521

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-4

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	4.3
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	Yes Test sent to Stafford and Dallas (PAH)
#18 Water VOC samples have zero headspace?	Yes

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: BRW

PH Device/Lot#: 132451

Checklist completed by:	<u>Brenda Ward</u> Brenda Ward	Date: <u>11/26/2019</u>
Checklist reviewed by:	<u>Jessica Kramer</u> Jessica Kramer	Date: <u>11/27/2019</u>

Analytical Report 644601

for Terracon-Lubbock

Project Manager: Paige Gaona

14" Vac to Jal Legacy

AR197010

05-DEC-19

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-19-30), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (19-037-0)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (TX104704295-19-22), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-19-16)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-19-21)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)

Xenco-Carlsbad (LELAP): Louisiana (05092)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-19-5)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Tampa: Florida (E87429), North Carolina (483)

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05-DEC-19

Project Manager: **Paige Gaona**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: XENCO Report No(s): **644601**

14" Vac to Jal Legacy

Project Address: SRS #2009-092

Paige Gaona:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 644601. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 644601 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Project Assistant

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 644601



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW - #5	W	11-26-19 09:26		644601-001
MW - #6	W	11-26-19 10:25		644601-002
MW - #9	W	11-26-19 11:20		644601-003
MW - #7	W	11-26-19 12:00		644601-004
MW - #4	W	11-26-19 12:40		644601-005
MW - #8	W	11-26-19 13:25		644601-006
MW - #3	W	11-26-19 14:10		644601-007
DUP - 3	W	11-26-19 10:30		644601-008
DUP - 4	W	11-26-19 12:45		644601-009
DUP - 5	W	11-26-19 13:30		644601-010
DUP - 6	W	11-26-19 14:15		644601-011



CASE NARRATIVE

Client Name: Terracon-Lubbock

Project Name: 14" Vac to Jal Legacy

Project ID: AR197010

Work Order Number(s): 644601

Report Date: 05-DEC-19

Date Received: 11/27/2019

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results

644601



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW - #5

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-001

Date Collected: 11.26.19 09.26

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 16:58	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 16:58	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 16:58	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 16:58	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 16:58	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 16:58	U	
Total BTEX		<0.000270		0.000270	mg/L	12.02.19 16:58	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	83	66 - 120	%		
4-Bromofluorobenzene	86	67 - 120	%		

Sample Id: MW - #6

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-002

Date Collected: 11.26.19 10.25

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 20:11	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 20:11	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 20:11	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 20:11	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 20:11	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 20:11	U	
Total BTEX		<0.000270		0.000270	mg/L	12.02.19 20:11	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	107	66 - 120	%		
4-Bromofluorobenzene	104	67 - 120	%		



Certificate of Analytical Results

644601



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW - #9

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-003

Date Collected: 11.26.19 11.20

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 20:35	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 20:35	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 20:35	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 20:35	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 20:35	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 20:35	U	
Total BTEX		<0.000270		0.000270	mg/L	12.02.19 20:35	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	106	66 - 120	%		
4-Bromofluorobenzene	102	67 - 120	%		

Sample Id: MW - #7

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-004

Date Collected: 11.26.19 12.00

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 20:59	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 20:59	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 20:59	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 20:59	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 20:59	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 20:59	U	
Total BTEX		<0.000270		0.000270	mg/L	12.02.19 20:59	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	89	66 - 120	%		
4-Bromofluorobenzene	84	67 - 120	%		



Certificate of Analytical Results

644601



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW - #4

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-005

Date Collected: 11.26.19 12.40

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 21:24	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 21:24	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 21:24	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 21:24	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 21:24	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 21:24	U	
Total BTEX		<0.000270		0.000270	mg/L	12.02.19 21:24	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	86	66 - 120	%		
4-Bromofluorobenzene	85	67 - 120	%		

Sample Id: MW - #8

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-006

Date Collected: 11.26.19 13.25

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0224	0.00100	0.000480	mg/L	12.02.19 21:48		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 21:48	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 21:48	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 21:48	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 21:48	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 21:48	U	
Total BTEX		0.0224		0.000270	mg/L	12.02.19 21:48		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	112	66 - 120	%		
4-Bromofluorobenzene	110	67 - 120	%		



Certificate of Analytical Results

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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: MW - #3

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-007

Date Collected: 11.26.19 14.10

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.00110	0.00100	0.000480	mg/L	12.02.19 23:26		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 23:26	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 23:26	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 23:26	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 23:26	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 23:26	U	
Total BTEX		0.00110		0.000270	mg/L	12.02.19 23:26		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	104	66 - 120	%		
4-Bromofluorobenzene	101	67 - 120	%		

Sample Id: DUP - 3

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-008

Date Collected: 11.26.19 10.30

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 23:50	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 23:50	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 23:50	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 23:50	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 23:50	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.02.19 23:50	U	
Total BTEX		<0.000270		0.000270	mg/L	12.02.19 23:50	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	106	66 - 120	%		
4-Bromofluorobenzene	102	67 - 120	%		



Certificate of Analytical Results

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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **DUP - 4**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-009

Date Collected: 11.26.19 12.45

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.03.19 00:14	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.03.19 00:14	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.03.19 00:14	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.03.19 00:14	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.03.19 00:14	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.03.19 00:14	U	
Total BTEX		<0.000270		0.000270	mg/L	12.03.19 00:14	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	104	66 - 120	%		
4-Bromofluorobenzene	102	67 - 120	%		

Sample Id: **DUP - 5**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-010

Date Collected: 11.26.19 13.30

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.0194	0.00100	0.000480	mg/L	12.03.19 00:38		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.03.19 00:38	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.03.19 00:38	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.03.19 00:38	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.03.19 00:38	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.03.19 00:38	U	
Total BTEX		0.0194		0.000270	mg/L	12.03.19 00:38		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	102	66 - 120	%		
4-Bromofluorobenzene	100	67 - 120	%		



Certificate of Analytical Results

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Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: **DUP - 6**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 644601-011

Date Collected: 11.26.19 14.15

Date Received: 11.27.19 09.43

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.00130	0.00100	0.000480	mg/L	12.03.19 01:02		1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.03.19 01:02	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.03.19 01:02	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.03.19 01:02	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.03.19 01:02	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	12.03.19 01:02	U	
Total BTEX		0.00130		0.000270	mg/L	12.03.19 01:02		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	101	66 - 120	%		
4-Bromofluorobenzene	98	67 - 120	%		



Certificate of Analytical Results

644601



Terracon-Lubbock, Lubbock, TX

14" Vac to Jal Legacy

Sample Id: 7691443-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7691443-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3109308

Date Prep: 12.02.19 13.30

Prep seq: 7691443

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	12.02.19 16:34	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	12.02.19 16:34	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	12.02.19 16:34	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	12.02.19 16:34	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	12.02.19 16:34	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	110	66 - 120	%		
4-Bromofluorobenzene	109	67 - 120	%		

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: 14" Vac to Jal Legacy

Work Orders : 644601,

Project ID: AR197010

Lab Batch #: 3109308

Sample: 7691443-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 12/02/19 14:57	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.113	0.100	113	66-120
4-Bromofluorobenzene		0.112	0.100	112	67-120

Lab Batch #: 3109308

Sample: 7691443-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 12/02/19 15:21	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.114	0.100	114	66-120
4-Bromofluorobenzene		0.112	0.100	112	67-120

Lab Batch #: 3109308

Sample: 7691443-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 12/02/19 16:34	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.110	0.100	110	66-120
4-Bromofluorobenzene		0.109	0.100	109	67-120

Lab Batch #: 3109308

Sample: 644601-001 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 12/02/19 17:22	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.111	0.100	111	66-120
4-Bromofluorobenzene		0.111	0.100	111	67-120

Lab Batch #: 3109308

Sample: 644601-001 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 12/02/19 17:46	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.111	0.100	111	66-120
4-Bromofluorobenzene		0.107	0.100	107	67-120

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order #: 644601

Project ID: AR197010

Analyst: MIT

Date Prepared: 12/02/2019

Date Analyzed: 12/02/2019

Lab Batch ID: 3109308

Sample: 7691443-1-BKS

Batch #: 1

Matrix: Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000480	0.100	0.0929	93	0.100	0.0915	92	2	74-120	20	
Toluene	<0.000512	0.100	0.0912	91	0.100	0.0909	91	0	74-120	20	
Ethylbenzene	<0.000616	0.100	0.0954	95	0.100	0.0918	92	4	74-120	20	
m_p-Xylenes	<0.000454	0.200	0.187	94	0.200	0.188	94	1	73-120	25	
o-Xylene	<0.000270	0.100	0.0952	95	0.100	0.0962	96	1	73-120	25	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: 14" Vac to Jal Legacy

Work Order # : 644601

Project ID: AR197010

Lab Batch ID: 3109308

QC- Sample ID: 644601-001 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 12/02/2019

Date Prepared: 12/02/2019

Analyst: MIT

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000480	0.100	0.0945	95	0.100	0.0954	95	1	15-147	25	
Toluene	<0.000512	0.100	0.0923	92	0.100	0.0943	94	2	11-147	25	
Ethylbenzene	<0.000616	0.100	0.0955	96	0.100	0.0964	96	1	10-149	25	
m_p-Xylenes	<0.000454	0.200	0.180	90	0.200	0.182	91	1	62-124	25	
o-Xylene	<0.000270	0.100	0.0943	94	0.100	0.0959	96	2	62-124	25	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$
Relative Percent Difference RPD = $200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery [G] = $100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

CHAIN OF CUSTODY RECORD

Lubbock Office ■ 5827 50th Street, Suite 1 ■ Lubbock, Texas 79424 ■ 806-300-0140

Responsive ■ Resourceful ■ Reliable



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Terracon-Lubbock

Date/ Time Received: 11/27/2019 09:43:00 AM

Work Order #: 644601

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-4

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	3.8
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6 *Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	No
#18 Water VOC samples have zero headspace?	Yes

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by:

Brenda Ward
Brenda Ward

Date: 11/27/2019

Checklist reviewed by:

Jessica Kramer
Jessica Kramer

Date: 11/27/2019

APPENDIX D

Terracon Standard of Care, Limitation, and Reliance

Standard of Care

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Additional Scope Limitations

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable or not present during these services, and we cannot represent that the Site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this confirmation sampling. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

Reliance

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