

APPROVED

By Nelson Velez at 10:54 am, Jan 11, 2022

2020 Annual Groundwater Monitoring Report

Review of 2020 ANNUAL GROUNDWATER MONITORING REPORT:

Content satisfactory

Contractor anticipated actions approved by OCD and are as follows;

1. Continue quarterly gauging, purging, and sampling of monitoring wells MW-2 through MW-8 for the presence of PSH and BTEX
2. Continue PSH recovery by SVE from monitoring well MW-1, with emission sampling events occurring monthly, during 2021
3. Monthly manual PSH recovery, if applicable, will continue on monitoring well MW-1
4. Continue monthly recovery of hydrocarbon impacted groundwater from monitoring well MW-5
5. Submit annual report to OCD no later than March 31, 2022.

**Plains All American Pipeline, L.P.
Livingston Line – Bob McCasland
Plains SRS Number: 2001-11226
Lea County, New Mexico
NMOCD Reference No. 1RP-0395
NMOCD Incident No. nAPP2109736613**

**Terracon Project No. AR207011
April 8, 2021**

Prepared for:



Plains All American Pipeline, L.P.
1106 Griffith Drive
Midland, Texas 79706

Prepared by:

Terracon Consultants, Inc.
Lubbock, Texas



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Environmental ■ Facilities ■ Geotechnical ■ Materials



April 8, 2021

Plains All American Pipeline, L.P.
1106 Griffith Drive
Midland, Texas 79706

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

Re: 2020 Annual Groundwater Monitoring Report
Livingston Line – Bob McCasland Site
NE ¼ of the SW ¼, Section 3, T21S, R37E
Lea County, New Mexico
NMOCD Reference No. 1RP-0395
NMOCD Incident No. nAPP2109736613
Plains All American Pipeline, L.P. SRS Number 2001-11226
Terracon Project Number AR207011

Dear Mrs. Bryant:

Terracon is pleased to submit one electronic copy and one CD attached to the cover page of the 2020 Annual Groundwater Monitoring Report for the above-referenced site.

We appreciate the opportunity to perform these services for Plains All American Pipeline (Plains), L.P. (Plains). 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:

A blue ink signature of Brett Dennis, consisting of a stylized 'B' followed by a cursive 'Dennis'.

Brett Dennis
Staff Scientist
Lubbock

Reviewed by:

A blue ink signature of Erin Loyd, featuring a stylized 'E' and 'L'.

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

2020 Annual Groundwater Monitoring Report

Plains – Livingston Line – Bob McCasland Site ■ Lea County, New Mexico

April 8, 2021 ■ Terracon Project No. AR207011

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Appendix C:

Certified Laboratory Analytical Reports:

1Q20 Groundwater Report 649986

2Q20 Groundwater Report 664259

3Q20 Groundwater Report 672977

4Q20 Groundwater Report 681578

Appendix D:

Standard of Care, Limitations and Reliance Policies

2020 Annual Groundwater Monitoring Report

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March 17, 2020 ■ Terracon Project No. AR207011



1.0 INTRODUCTION

1.1 Site Description

The legal description of the Livingston Line to Bob McCasland Pipeline Release site is Unit Letter "K" (NE/SW), Section 3, Township 21 South, Range 37 East, in Lea County, New Mexico. The property affected by the release is owned by Mr. Bob McCasland. The geographic coordinates of the release site are 32.504135° North latitude and 103.151345° West longitude. A "Topographic Map" depicting the site's location is provided as Exhibit 1 in Appendix A.

Site Name	Livingston Line – Bob McCasland Pipeline Release
Site Location	West of Loop 207 approximately 5 miles north-northeast of Eunice, Lea County, New Mexico. Latitude 32.504135° North, Longitude 103.151345° West.
General Site Description	The site consists of 11 groundwater monitoring wells located in, and adjacent to, a pipeline right-of-way surrounded by native pasture land, in close proximity of a former Carbon Black Plant.
Landowner	Mr. Bob McCasland

1.2 Background Information

Based on information provided by the client, on July 13, 2001, an estimated release of 4 barrels (bbls) of crude oil was reported to the New Mexico Oil Conservation District (NMOCD). The release covered an area of approximately 1,600 square feet (sq. ft.) along a pipeline right-of-way and an adjacent caliche road. Initial excavation activities were reportedly conducted by Environmental Plus, Inc. (EPI) in an effort to stockpile saturated soils and expose the leak origin to facilitate repair of the pipeline. The pipeline excavation activities continued into December 2001. A total of approximately 11,445 cubic yards (cy) of hydrocarbon impacted soil were excavated and stockpiled at the site. Earthen berms were constructed around the stockpiles to prevent constituent runoff. Analytical results for soil samples collected from the excavation indicated benzene, toluene, ethylbenzene, and total xylenes (BTEX) concentrations above NMOCD remedial threshold limits. A *Soil Characterization Report and Remediation Plan Report* dated June 2006, by EPI was submitted to the NMOCD. This report detailed remediation activities conducted at the site, in-place soil concentrations, and recommendations for in-situ hydrocarbon-impacted soil closure.

Investigation activities were conducted from August 16 through 22, 2001, which included the advancement of 17 exploratory soil borings. It was determined during this time that groundwater,

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approximately 30 feet below ground surface (bgs), had been impacted. Based on these field observations, three groundwater monitor wells (MW-1, MW-2 and MW-3) were installed proximate to the release area to evaluate the extent and magnitude of the release. Groundwater samples collected from the groundwater monitor wells exhibited concentrations of BTEX above applicable New Mexico Water Quality Control Commission (NMWQCC) Groundwater Standards. Subsequently, three additional groundwater monitoring wells (MW-4, MW-5 and MW-6) were installed at the site. A measurable thickness of phase separated hydrocarbons (PSH) was detected in groundwater monitoring well MW-4 following installation.

To delineate the lateral extent of groundwater impact at the site, three additional groundwater monitoring wells MW-7, MW-8 and MW-9 were installed in June of 2004. Two additional monitoring wells MW-10 and MW-11 were installed in November of 2004. During installation of these five groundwater monitor wells, soil samples were collected and submitted to AnalySys, Inc., Austin, Texas, for analysis of total petroleum hydrocarbons (TPH) (gasoline and diesel range organics) and BTEX constituents. BTEX constituents for all soil samples from the monitor wells were below NMOCD remedial threshold limits. TPH concentrations from soil samples collected from groundwater monitoring wells MW-7, MW-10 and MW-11 were at, or below, laboratory analytical method detection limits (MDLs).

On February 1, 2007, Terracon assumed project management responsibilities and oversight of groundwater monitoring activities at the Livingston Line to Bob McCasland Pipeline Release project site. Available files for this site were provided to Terracon at this time. There are a total of 11 monitoring wells MW-1 through MW-11 at the site. Monitoring wells MW-2 through MW-11 are gauged and sampled on a quarterly schedule. Monitoring well MW-1 is not sampled as it has been gauged as "dry" and monitoring well MW-4 is currently not sampled due to the presence of PSH. A "Site Diagram" depicting monitoring well locations is provided as Exhibit 2 in Appendix A.

During May of 2020, due to COVID-19, manual recovery events were reduced from a frequency of once per week to once per month.

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 an *Annual Groundwater Monitoring Report* by April 1st of each year. Quarterly groundwater monitoring activities include measuring the static water levels in the monitoring wells, checking for the presence of PSH, and the collection of groundwater samples from each of the on-site wells not exhibiting a measurable thickness of PSH. In accordance with the approved scope of work, Terracon conducted quarterly groundwater monitoring events on January 27 (1Q20), June 9 (2Q20), September 16 (3Q20), and December 14, 2020 (4Q20).

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2.0 GROUNDWATER REMEDIATION PROGRAM

2.1 Groundwater Monitoring

Quarterly groundwater monitoring events were conducted on January 27 (1Q20), June 9 (2Q20), September 16 (3Q20), and December 14, 2020 (4Q20). Monitoring event activities included measuring the static water levels in the site's monitoring wells, checking for the presence of PSH, purging, and the collection of groundwater samples from each of the 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 Eurofins/Xenco Laboratories in Lubbock, Texas for analysis of BTEX using EPA Method SW-846 8021B and PAH EPA Method SW-846 8270C. Purged water was placed into a polystyrene aboveground storage tank and disposed at an NMOC 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 2020. Groundwater elevation and PSH thickness data is summarized in Table 1 in Appendix B.

A yearly monitoring event for polyaromatic hydrocarbons (PAH) was conducted December 14, 2020. Based on the sampling criteria provided by NMOC, only monitoring wells MW-4 and MW-5 were subject to annual PAH monitoring. However, monitor wells MW-2, MW-3, MW-6, and MW-9 were inadvertently analyzed for PAHs as well. Therefore, monitor wells MW-2 through MW-6 and MW-9 will be analyzed for PAHs in the 4th quarter of 2021.

3.0 LABORATORY ANALYTICAL METHODS

The groundwater samples collected were analyzed for BTEX using EPA Method SW-846 8021B. Laboratory results from the analysis of groundwater samples collected from the monitoring wells are summarized in Table 2 in Appendix B and presented as Exhibits 7 through 10 in Appendix A. Copies of the certified laboratory reports and chain-of-custody documentation are provided in Appendix C.

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4.0 GROUNDWATER DATA EVALUATION

4.1 Groundwater Sample Results

Laboratory analytical results from each quarterly monitoring event were compared to NMOCD regulatory guidelines based on 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 gauged dry during all four quarters of 2020.

4.1.2 Monitoring Wells MW-7, MW-8, MW-10, and MW-11

- Monitoring wells MW-7, MW-8, MW-10, and MW-11 were gauged, but inadvertently not sampled, during the 2020 reporting period. Therefore, these monitor wells will be sampled during the 1st quarter of 2021 and continue to be sampled annually per NMOCD approval of the 2019 annual groundwater monitoring report.

4.1.3 Monitoring Wells MW-2, MW-3, and MW-6

- Monitoring wells MW-2, MW-3, and MW-6 were sampled during all four quarterly monitoring events. Laboratory analytical results indicated benzene, toluene, ethylbenzene, total xylene and PAH concentrations were below the applicable laboratory sample detection Limits (SDLs).

4.1.4 Monitoring Well MW-4

- Monitoring well MW-4 was not sampled during the 2020 reporting period due to the presence of PSH.
- During 2020, PSH thickness detected in MW-4 ranged from 0.07 ft in the 1st quarter to 2.06 in the 4th quarter.

4.1.5 Monitoring Well MW-5

- Laboratory analytical results indicated that BTEX concentrations were below laboratory SDLs for the 1st, 2nd, and 3rd quarters. During the 4th quarter, BTEX was detected at concentrations above the laboratory SDLs but not above the method quantitation limit (MQL) resulting in the results being J flagged.
- PAH constituent concentrations collected from monitoring well MW-5 on December 14, 2020 were less than the appropriate laboratory SDLs and less than NMWQCC criteria.

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5.0 CORRECTIVE ACTION

5.1 Product Recovery

An estimated 1.14 gallons of PSH were recovered from monitoring well MW-4 by manual recovery in 2020. An estimated 41.5 gallons of hydrocarbon impacted groundwater were recovered manually from monitoring well MW-4 in 2020. Since recovery operations began in 2018, 145.0 gallons of hydrocarbon impacted groundwater have been manually recovered from monitoring well MW-4. Recovery Data is summarized in Table 3a in Appendix B.

5.2 Groundwater Recovery

Since May of 2019, monitoring well MW-5 had an estimated 90.5 gallons (2.15 bbls) of hydrocarbon impacted groundwater recovered via weekly, monthly, and quarterly, manual recovery. Recovered fluids were disposed at an NMOCD-approved disposal facility. Recovery data is summarized in Table 3b in Appendix B.

6.0 SUMMARY OF FINDINGS

The findings of the 2020 Quarterly groundwater monitoring activities are as follows:

- Currently, there are 11 groundwater monitoring wells MW-1 through MW-11 located at the site.
- Quarterly groundwater monitoring events were conducted on January 27 (1Q20), June 9 (2Q20), September 16 (3Q20), and December 14, 2020 (4Q20).
- The groundwater flow direction remained relatively consistent to the southeast during all four quarters.
- Monitoring well MW-1 was gauged dry during all four quarterly monitoring events.
- Monitoring wells MW-7, MW-8, MW-10, and MW-11 were inadvertently not sampled during the 2020 reporting period.
- Monitoring well MW-4 was not sampled during the 2020 reporting period due to the presence of PSH.
- Monitoring well MW-4 had an approximate total of 1.14 gallons of PSH recovered via weekly and quarterly recovery.
- Monitoring well MW-5 had an approximate total of 90.5 gallons (2.15 bbl) of hydrocarbon impacted groundwater recovered via weekly, monthly, and quarterly manual recovery.
- Monitoring wells MW-2, MW-3, MW-5, MW-6, MW-9 were purged and sampled during all four quarterly monitoring events.
- BTEX concentrations were below NMOCD Action Levels for all wells sampled during the 2020 reporting period.
- Samples collected from monitoring wells MW-2, MW-3, MW-5, MW-6, and MW-9 during the 4th quarter indicated that PAH constituents were below regulatory action levels

2020 Annual Groundwater Monitoring Report

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7.0 ANTICIPATED ACTIONS

- Conduct quarterly monitoring well gauging for all site wells.
- Continue quarterly groundwater purging and sampling on monitoring wells MW-2, MW-3, MW-4 (if PSH is not present), MW-5, MW-6, and MW-9.
- Monitoring wells MW-7, MW-8, MW-10, and MW-11 will be sampled during the 1st quarter of 2021 and continue to be sampled annually per NMOCD approval of the 2019 annual groundwater monitoring report.
- Conduct monthly manual recovery of PSH hydrocarbon impacted groundwater from monitoring well MW-4 and MW-5, if present.
- An *Annual Groundwater Monitoring Report* will be prepared detailing field activities and the results of groundwater monitoring activities conducted during the 2020 reporting period.

2020 Annual Groundwater Monitoring Report

Plains – Livingston Line – Bob McCasland Site ■ Lea County, New Mexico

March 17, 2020 ■ Terracon Project No. AR207011

Terracon

8.0 DISTRIBUTION

Copy 1: Bradford Billings, Hydrologist E Spec. A
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
bradford.billings@state.nm.us

Copy 2: New Mexico Oil Conservation Division
District 1 Office
1625 N. French Drive
Hobbs, New Mexico 88240
emnrd-ocd-district1spills@state.nm.us

Copy 3: Mrs. Camille Bryant
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cjbryant@paalp.com

Copy 4: Mr. Jeff Dann
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Houston, Texas 77002
jpdann@paalp.com

APPENDIX A

Exhibit 1 – Topographic Map

Exhibit 2 – Site Diagram

Exhibit 3 – 1Q20 Groundwater Gradient Map (01/27/20)

Exhibit 4 – 2Q20 Groundwater Gradient Map (06/09/20)

Exhibit 5 – 3Q20 Groundwater Gradient Map (09/16/20)

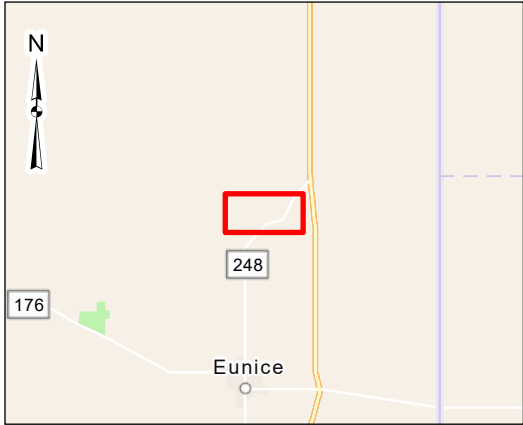
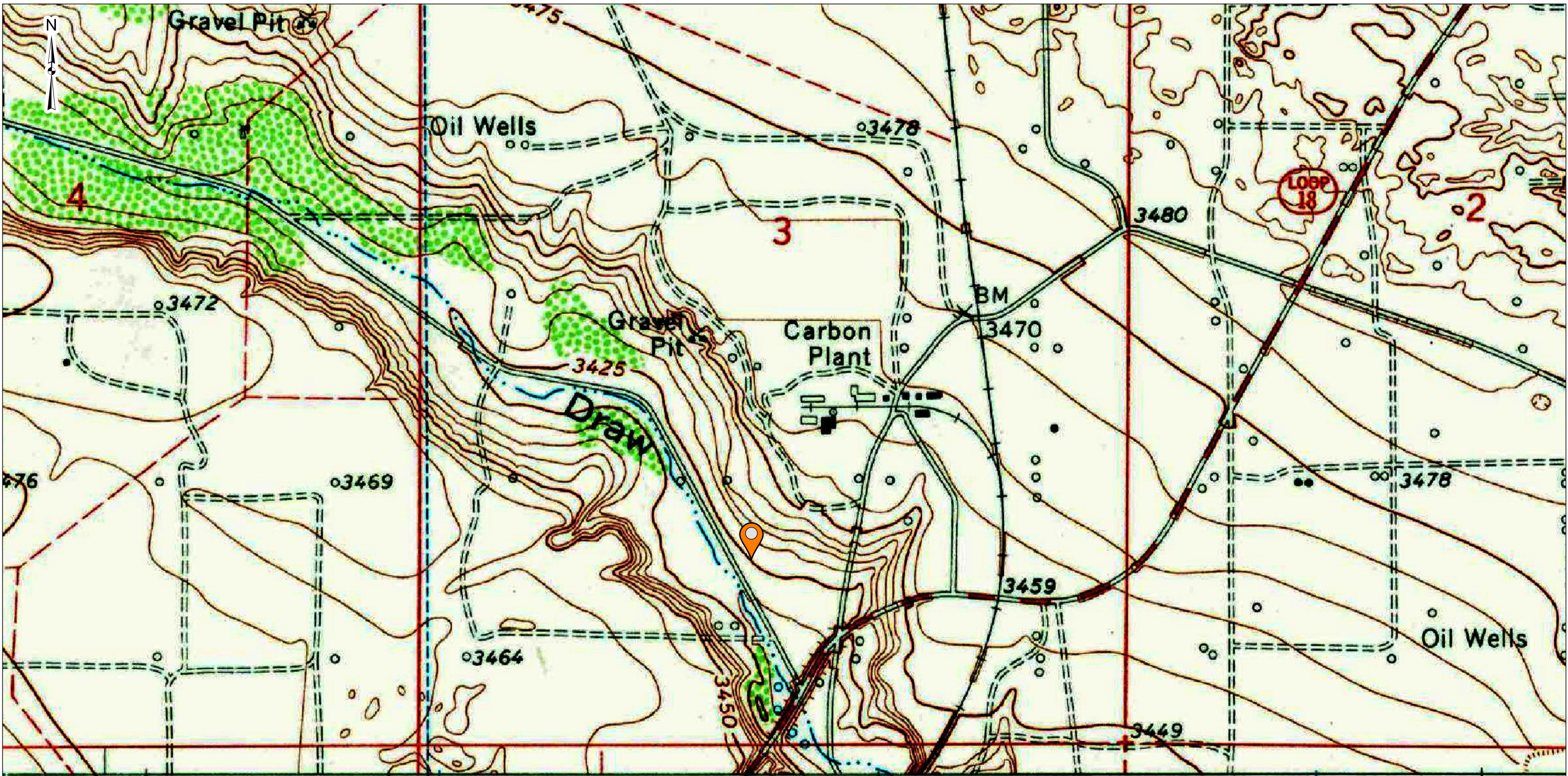
Exhibit 6 – 4Q20 Groundwater Gradient Map (12/14/20)

Exhibit 7 – 1Q20 Groundwater Contaminant Concentration Map (01/21/20)

Exhibit 8 – 2Q20 Groundwater Contaminant Concentration Map (06/09/20)

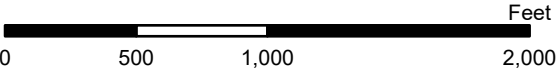
Exhibit 9 – 3Q20 Groundwater Contaminant Concentration Map (09/16/20)

Exhibit 10 – 4Q20 Groundwater Contaminant Concentration Map (12/14/20)



Legend:
 Site Location

DATA SOURCES:
USGS Topoview - Hobbs SW, NM 1969



Project No.:
AR207011
Date:
Jan 2021
Drawn By:
BAD
Reviewed By:
ELL

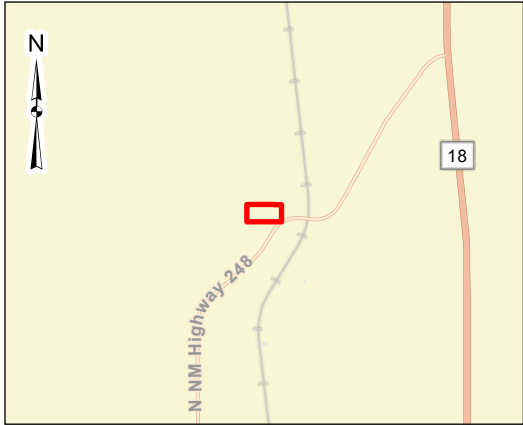


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Topographic Map
Livingston Line - Bob McCasland Pipeline Release
Plains SRS # 2001-11226
NMOCD Ref. # 1RP-0395
NE 1/4 of the SW 1/4, Sec 3, T21S, R37E
GPS: 32.504135, -103.151345

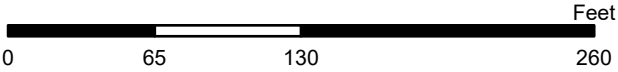
Exhibit

1



Legend:
● Monitor Well (MW)

DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap



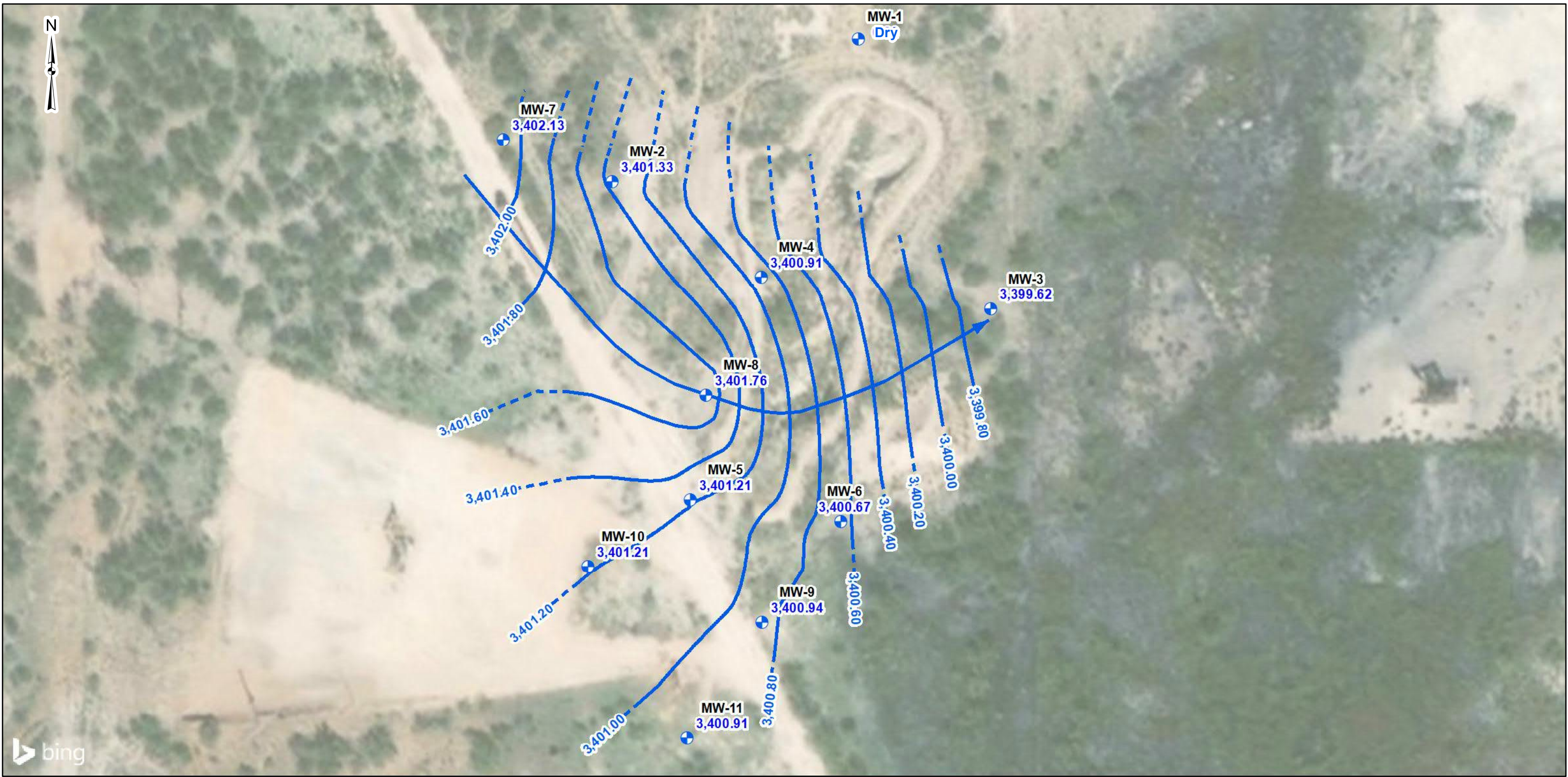
Project No.:
AR207011
Date:
Jan 2021
Drawn By:
BAD
Reviewed By:
ELL



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Site Diagram
Livingston Line - Bob McCasland Pipeline Release Plains SRS # 2001-11226 NMOCD Ref. # 1RP-0395 NE 1/4 of the SW 1/4, Sec 3, T21S, R37E GPS: 32.504135, -103.151345

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.
- Groundwater gradient: 0.006 ft/ft

0 50 100 Feet
Fractional Scale: 1:20,799

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

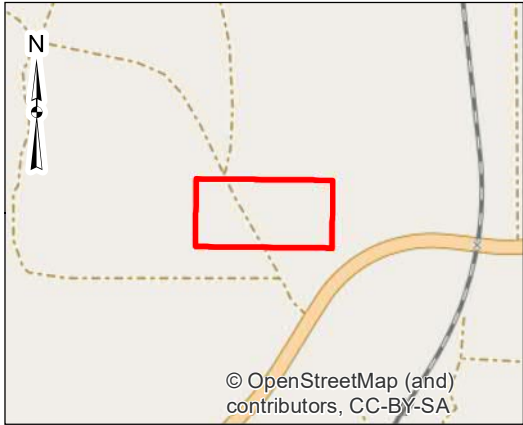
Project No.:	AR207011
Date:	May 2020
Drawn By:	KK
Reviewed By:	ELL

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1Q20 Groundwater Gradient Map (01/27/20)
Livingston Line – Bob McCasland Pipeline Leak Plains SRS # 2001-11226 NMOCD Ref. # 1R-0395 Plains Pipeline, LP NE 1/4 of the SW 1/4, Section 3, T21S, R37E Lea County, New Mexico GPS: 32.504135°, -103.151345°

Exhibit
3

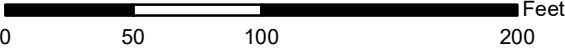
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Groundwater Monitoring Site

- 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: 0.003 ft/ft



1:900

DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

Project No.:	AR207011
Date:	Jul 2020
Drawn By:	KAK
Reviewed By:	ELL

5847 50th St.

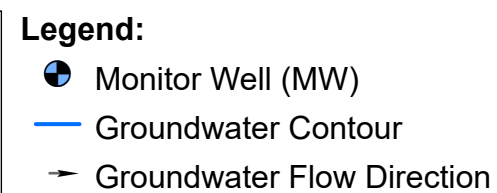
Lubbock, TX 79424

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2Q20 Groundwater Gradient Map
Livingston Line – Bob McCasland Pipeline Leak Plains SRS # 2001-11226 NMOC Ref. # 1R-0395 Plains Pipeline, LP NE 1/4 of the SW 1/4, Section 3, T21S, R37E Lea County, New Mexico GPS: 32.504135°, -103.151345°

Exhibit
4



Notes:

- All groundwater elevations are measured in feet above mean sea level.
- Groundwater contours were interpolated with ArcGIS's kriging algorithm.
- Groundwater contour interval: 0.15 ft.
- Groundwater gradient: 0.0034 ft./ft.



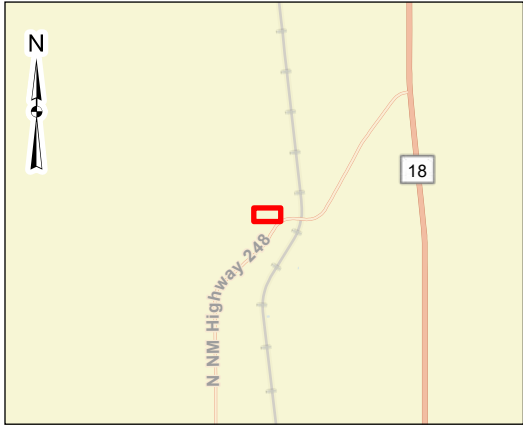
DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

Project No.: AR207011	 5847 50th Street Lubbock, Texas 79424 PH. (806) 300-0140 terracon.com
Date: Oct 2020	
Drawn By: BAD	
Reviewed By: ELL	

3Q20 Groundwater Gradient Map Livingston Line - Bob McCasland Pipeline Release Plains SRS # 2001-11226 NMOCD Ref. # 1RP-0395 NE 1/4 of the SW 1/4, Sec. 3, T21S, R37E Lea County, New Mexico GPS: 32.504135, -103.151345	Exhibit 5
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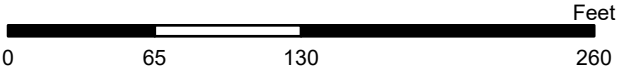
C:\Users\badennis\OneDrive - Terracon Consultants Inc\Desktop\Active Projects\Plains GIS\Livingston Line - Bob McCasland\Maps\Maps.aprx



- Legend:**
- Monitor Well (MW)
 - 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: 0.0037 ft./ft.



DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

Project No.:	AR207011
Date:	Jan 2021
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Reviewed By:	ELL

5847 50th Street

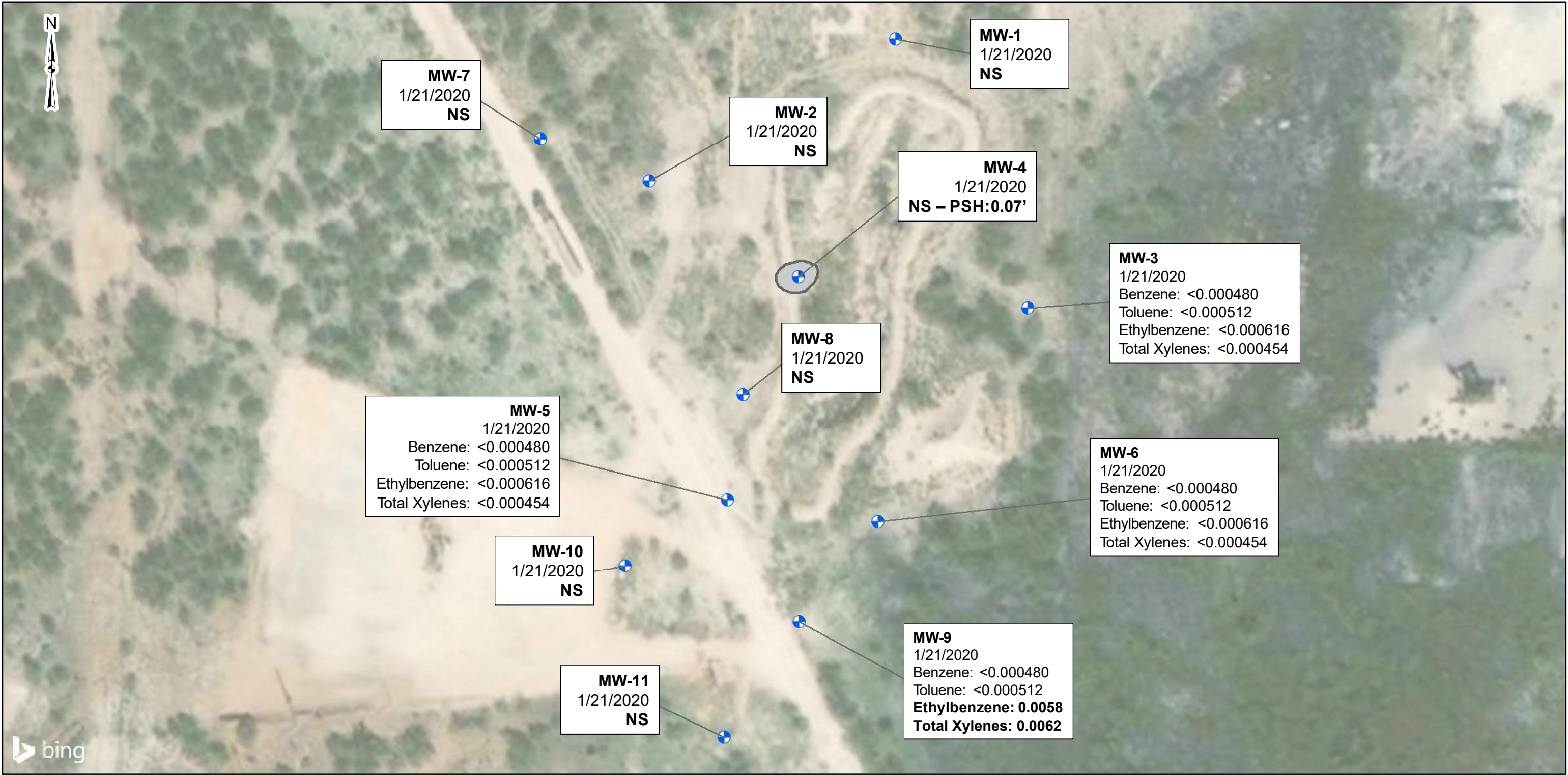
Lubbock, Texas 79424

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4Q20 Groundwater Gradient Map
Livingston Line - Bob McCasland Pipeline Release Plains SRS # 2001-11226 NMOCD Ref. # 1RP-0395 NE 1/4 of the SW 1/4, Sec 3, T21S, R37E GPS: 32.504135, -103.151345

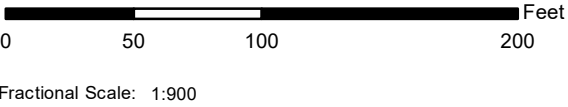
Exhibit
6



Groundwater Monitoring Site

- Monitoring Well (MW)
- Free Phase Plume

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.
Bold concentrations indicate a concentration above the laboratory sample detection limit (SDL).
Highlighted concentrations indicate a concentration exceeding the NMOCD Delineation and Remediation Limits. PSH thicknesses are measured in tenths of feet.



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

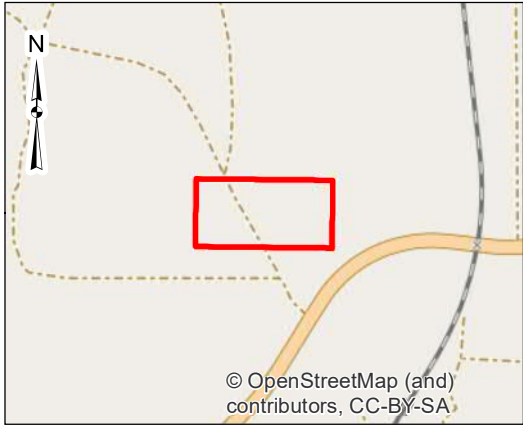
Project No.:	AR207011
Date:	May 2020
Drawn By:	KK
Reviewed By:	ELL

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1Q20 Groundwater Contaminant Concentration Map
Livingston Line – Bob McCasland Pipeline Leak Plains SRS # 2001-11226 NMOCD Ref. # 1R-0395 Plains Pipeline, LP NE 1/4 of the SW 1/4, Section 3, T21S, R37E Lea County, New Mexico GPS: 32.504135°, -103.151345°

Exhibit
7

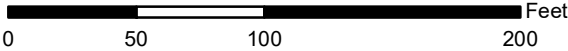
N:\GIS\Projects\AR207011\Maps\AR207011_LL_GWCCM_1Q20.mxd



Groundwater Monitoring Site

- Monitoring Well (MW)
- Free Phase Plume

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.
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.



1:900

DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

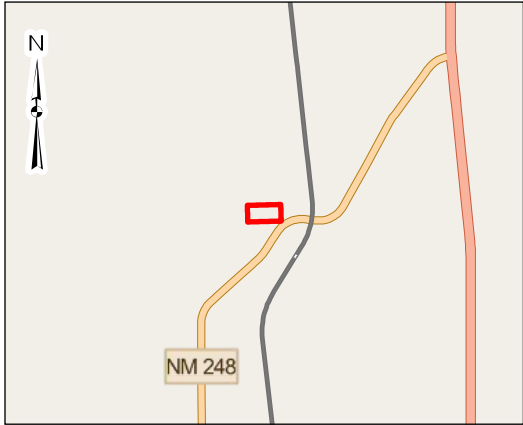
Project No.:	AR207011
Date:	Aug 2020
Drawn By:	KAK
Reviewed By:	ELL

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PH. (806) 300-0104 terracon.com

2Q20 Groundwater Contaminant Concentration Map
Livingston Line – Bob McCasland Pipeline Leak Plains SRS # 2001-11226 NMOCD Ref. # 1R-0395 Plains Pipeline, LP NE 1/4 of the SW 1/4, Section 3, T21S, R37E Lea County, New Mexico GPS: 32.504135°, -103.151345°

Exhibit
8

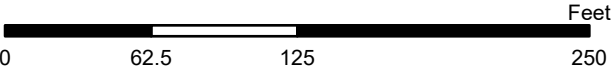
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Legend:

- Monitor Well (MW)
- Free Phase Plume

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
- NS: Monitoring well was not sampled
- **Bold** concentrations indicates a concentration above laboratory sample detection limit (SDL).
- **Highlighted** text indicates concentrations exceeding applicable NMOCD criteria
- All concentrations are reported in milligrams per liter (mg/L)
- PSH thickness is measured in tenths of feet.



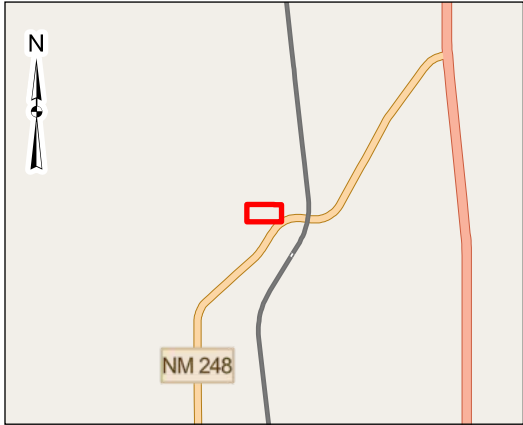
DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

Project No.:	AR207011
Date:	Oct 2020
Drawn By:	BAD
Reviewed By:	ELL

5847 50th Street
Lubbock, Texas 79424
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3Q20 Groundwater Concentration Map
Livingston Line - Bob McCasland Pipeline Release Plains SRS # 2001-11226 NMOCD Ref. # 1RP-0395 NE 1/4 of the SW 1/4, Sec. 3, T21S, R37E Lea County, New Mexico GPS: 32.504135, -103.151345

Exhibit
9



Legend:
● Monitor Well (MW)
■ Free Phase Plume

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
- NS: Monitoring well was not sampled
- **Bold** concentrations indicates a concentration above laboratory sample detection limit (SDL).
- **Highlighted** indicates concentrations exceeding applicable NMOCD criteria
- All concentrations are reported in milligrams per liter (mg/L)
- PSH thickness is measured in tenths of feet.



DATA SOURCES:
ESRI WMS - World Aerial Imagery, OpenStreetMap

Project No.:	AR207011
Date:	Jan 2021
Drawn By:	BAD
Reviewed By:	ELL

5847 50th Street
Lubbock, Texas 79424
PH. (806) 300-0140
terracon.com

4Q20 Groundwater Concentration Map
Livingston Line - Bob McCasland Pipeline Release Plains SRS # 2001-11226 NMOCD Ref. # 1RP-0395 NE 1/4 of the SW 1/4, Sec 3, T21S, R37E GPS: 32.504135, -103.151345

Exhibit
10

APPENDIX B

Table 1 – Groundwater Elevation and PSH Thickness Summary

Table 2 – Groundwater BTEX Concentration Analytical Summary

Table 3a – MW-4 PSH/BTEX Impacted Groundwater Recovery Summary

Table 3b – MW-5 BTEX Impacted Groundwater Recovery Summary

Table 4 – Concentrations of PAH in Groundwater Summary

Table 1
Groundwater Elevation & PSH¹ Thickness Summary

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2001-11226
Terracon Project #: AR207011
NMOCD² Reference #: 1R-0395

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")	01/22/16	2,439.09				DRY
	04/27/16					
	07/14/16					
	10/05/16					
	02/07/17					
	04/27/17					
	07/16/17					
	11/10/17					
	06/26/18					
	08/27/18					
	11/20/18					
	02/25/19					
	05/21/19					
	08/30/19					
	11/12/19					
	01/21/20					
	06/08/20					
	09/16/20					
	12/14/20					
MW-2 (2")	01/22/16	3,432.62	-	30.07	-	3,402.55
	04/27/16		-	30.00	-	3,402.62
	07/14/16		-	30.85	-	3,401.77
	10/05/16		28.72	28.73	0.01	3,403.90
	02/07/17		-	28.27	-	3,404.35
	04/27/17		-	28.75	-	3,403.87
	07/16/17		-	29.51	-	3,403.11
	11/10/17		-	29.45	-	3,403.17
	06/26/18		-	29.28	-	3,403.34
	08/27/18		-	30.80	-	3,401.82
	11/20/18		-	29.43	-	3,403.19
	02/25/19		-	30.47	-	3,402.15
	05/21/19		-	30.71	-	3,401.91
	08/30/19		-	31.76	-	3,400.86
	11/12/19		-	31.58	-	3,401.04
	01/21/20		-	31.29	-	3,401.33
	06/08/20		-	31.92	-	3,400.70
	09/16/20		-	32.60	-	3,400.02
	12/14/20		-	32.37	-	3,400.25
MW-3 (2")	01/22/16	3,433.61	-	31.72	-	3,401.89
	04/27/16		-	31.64	-	3,401.97
	07/14/16		-	32.35	-	3,401.26
	10/05/16		-	30.28	-	3,403.33
	02/07/17		-	30.14	-	3,403.47
	04/27/17		-	30.27	-	3,403.34
	07/16/17		-	31.09	-	3,402.52
	11/10/17		-	31.07	-	3,402.54
	06/26/17		-	31.58	-	3,402.03
	08/27/18		-	32.28	-	3,401.33
	11/20/18		-	32.25	-	3,401.36
	02/25/19		-	32.13	-	3,401.48
	05/21/19		-	32.36	-	3,401.25
	08/30/19		-	33.25	-	3,400.36
	11/12/19		-	33.25	-	3,400.36
	01/21/20		-	33.99	-	3,399.62
	06/08/20		-	33.45	-	3,400.16
	09/16/20		-	34.16	-	3,399.45
	12/14/20		-	34.04	-	3,399.57
MW-4 (2")	01/22/16	3,432.25	30.07	30.08	0.01	3,402.18
	04/27/16		29.98	29.99	0.01	3,402.27
	07/14/16		30.79	30.80	0.01	3,401.46
	10/05/16		28.54	28.55	0.01	3,403.71
	02/08/17		-	28.55	-	3,403.70
	04/27/17		-	28.64	-	3,403.61
	07/16/17		-	29.44	-	3,402.81
	11/10/17		-	29.52	-	3,402.73
	06/26/18		-	30.25	-	3,402.00
	08/27/18		30.79	30.82	0.03	3,401.46
	11/20/18		-	30.64	-	3,401.61
	02/25/19		30.48	30.51	0.03	3,401.77
	05/21/19		30.70	30.78	0.08	3,401.54
	08/30/19		SHEEN	31.71	-	-31.71
	11/12/19		-	31.60	-	-31.60
	01/21/20		31.33	31.40	0.07	3,400.91
	06/08/20		31.74	31.89	0.15	3,400.49
	09/16/20		32.52	32.94	0.42	3,399.67
	09/16/20		32.09	34.15	2.06	3,399.85

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 1
Groundwater Elevation & PSH¹ Thickness Summary

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2001-11226
Terracon Project #: AR207011
NMOCD² Reference #: 1R-0395

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-5 (2")	01/22/16	3,429.63	-	27.20	-	3,402.43
	04/27/16		-	27.09	-	3,402.54
	07/14/16		-	27.92	-	3,401.71
	10/06/16		25.08	25.20	0.12	3,404.53
	02/08/17		-	25.60	-	3,404.03
	04/27/17		-	25.76	-	3,403.87
	07/16/17		-	26.62	-	3,403.01
	11/09/17		-	26.55	-	3,403.08
	06/26/18		-	27.17	-	3,402.46
	08/27/18		-	27.92	-	3,401.71
	11/20/18		-	27.71	-	3,401.92
	02/25/19		-	27.60	-	3,402.03
	08/30/19		-	28.86	-	3,400.77
	05/21/19		-	27.84	-	3,401.79
	11/12/19		-	28.68	-	3,400.95
	01/21/20		-	28.42	-	3,401.21
MW-6 (2")	06/08/20	3,429.30	-	29.13	-	3,400.50
	09/16/20		-	29.65	-	3,399.98
	12/14/20		-	29.47	-	3,400.16
	01/22/16		-	27.40	-	3,401.90
	04/27/16		-	27.29	-	3,402.01
	07/14/16		-	28.10	-	3,401.20
	10/05/16		-	25.28	-	3,404.02
	02/07/17		-	25.69	-	3,403.61
	04/27/17		-	25.95	-	3,403.35
	07/16/17		-	26.80	-	3,402.50
	11/10/17		-	26.70	-	3,402.60
	06/26/18		-	27.35	-	3,401.95
	08/27/18		-	28.05	-	3,401.25
	11/20/18		-	27.89	-	3,401.41
	02/25/19		-	27.80	-	3,401.50
	05/21/19		-	28.05	-	3,401.25
MW-7 (2")	08/30/19	3,431.37	-	29.03	-	3,400.27
	11/12/19		-	28.88	-	3,400.42
	01/21/20		-	28.63	-	3,400.67
	06/08/20		-	29.20	-	3,400.10
	09/16/20		-	29.84	-	3,399.46
	12/14/20		-	29.70	-	3,399.60
	01/22/16		-	28.03	-	3,403.34
	04/27/16		-	27.91	-	3,403.46
	07/14/16		-	28.88	-	3,402.49
	10/05/16		-	26.65	-	3,404.72
	02/08/17		-	26.42	-	3,404.95
	04/27/17		-	26.49	-	3,404.88
	07/16/17		-	27.48	-	3,403.89
	11/10/17		-	27.37	-	3,404.00
	06/26/18		-	28.03	-	3,403.34
	08/27/18		-	28.76	-	3,402.61
MW-8 (4")	11/20/18	3,431.07	-	28.53	-	3,402.84
	02/25/19		-	28.37	-	3,403.00
	05/21/19		-	28.66	-	3,402.71
	08/30/19		-	29.73	-	3,401.64
	11/12/19		-	29.49	-	3,401.88
	01/21/20		-	29.24	-	3,402.13
	06/08/20		-	29.95	-	3,401.42
	09/16/20		-	30.55	-	3,400.82
	12/14/20		-	30.29	-	3,401.08
	01/22/16		-	28.52	-	3,402.55
	04/27/16		-	28.41	-	3,402.66
	07/14/16		-	29.24	-	3,401.83
	10/05/16		-	26.71	-	3,404.36
	02/08/17		-	26.89	-	3,404.18
	04/26/17		-	27.02	-	3,404.05
	07/16/17		-	27.95	-	3,403.12
MW-9 (2")	11/10/17	3,431.07	-	27.89	-	3,403.18
	06/26/18		-	28.45	-	3,402.62
	08/27/18		-	29.22	-	3,401.85
	11/20/18		-	28.98	-	3,402.09
	02/25/19		-	28.97	-	3,402.10
	05/21/19		-	29.16	-	3,401.91
	08/30/19		-	30.18	-	3,400.89
	11/12/19		-	30.07	-	3,401.00
	01/21/20		-	29.31	-	3,401.76
	06/08/20		-	30.35	-	3,400.72
	09/16/20		-	31.01	-	3,400.06
	12/14/20		-	30.83	-	3,400.24

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 1
Groundwater Elevation & PSH¹ Thickness Summary

Livingston Line - Bob McCasland Pipeline Leak
 Lea County, New Mexico
 Plains Pipeline, L.P. SRS #: 2001-11226
 Terracon Project #: AR207011
 NMOCD² Reference #: 1R-0395

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-9 (2")	01/22/16	3,429.79	-	27.62	-	3,402.17
	04/27/16		-	27.51	-	3,402.28
	07/14/16		-	28.34	-	3,401.45
	10/05/16		-	25.29	-	3,404.50
	02/08/17		-	25.93	-	3,403.86
	04/27/17		-	26.12	-	3,403.67
	07/16/17		-	27.02	-	3,402.77
	11/10/17		-	26.99	-	3,402.80
	06/26/18		-	27.56	-	3,402.23
	08/27/18		-	28.28	-	3,401.51
	11/20/18		-	28.10	-	3,401.69
	02/25/19		-	28.00	-	3,401.79
	05/21/19		-	28.84	-	3,400.95
	08/30/19		-	29.36	-	3,400.43
	11/12/19		-	29.10	-	3,400.69
	01/21/20		-	28.85	-	3,400.94
MW-10 (2")	06/08/20	3,429.49	-	29.43	-	3,400.36
	09/16/20		-	30.07	-	3,399.72
	12/14/20		-	29.91	-	3,399.88
	01/21/16		-	27.06	-	3,402.43
	04/27/16		-	26.99	-	3,402.50
	07/14/16		-	27.81	-	3,401.68
	10/05/16		-	24.92	-	3,404.57
	02/08/17		-	25.46	-	3,404.03
	04/27/17		-	25.64	-	3,403.85
	07/16/17		-	26.47	-	3,403.02
	11/09/17		-	26.40	-	3,403.09
	06/26/18		-	27.03	-	3,402.46
	08/27/18		-	27.73	-	3,401.76
	11/20/18		-	27.55	-	3,401.94
	02/25/19		-	27.48	-	3,402.01
	05/21/19		-	27.70	-	3,401.79
MW-11 (2")	08/30/19	3,428.32	-	28.70	-	3,400.79
	11/12/19		-	28.52	-	3,400.97
	01/21/20		-	28.28	-	3,401.21
	06/08/20		-	29.15	-	3,400.34
	09/16/20		-	29.57	-	3,399.92
	12/14/20		-	29.30	-	3,400.19
	01/21/16		-	26.18	-	3,402.14
	04/27/16		-	26.10	-	3,402.22
	07/14/16		-	26.93	-	3,401.39
	10/05/16		-	23.80	-	3,404.52
	02/08/17		-	24.60	-	3,403.72
	04/27/17		-	25.47	-	3,402.85
	07/16/17		-	25.63	-	3,402.69
	11/09/17		-	25.54	-	3,402.78
	06/26/18		-	26.16	-	3,402.16
	08/27/18		-	26.89	-	3,401.43
	11/20/18		-	26.70	-	3,401.62
	02/25/19		-	26.61	-	3,401.71
	05/21/19		-	26.85	-	3,401.47
	08/30/19		-	27.85	-	3,400.47
	11/12/19		-	27.65	-	3,400.67
	01/21/20		-	27.41	-	3,400.91
	06/08/20		-	28.02	-	3,400.30
	09/16/20		-	28.64	-	3,399.68
	12/14/20		-	28.45	-	3,399.87

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 Concentration Analytical Summary

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2001-11226
Terracon Project #: AR207011
NMOCD² Reference #: 1R-0395

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

EPA SW846-8021B								
Monitoring Well	Date Sampled	Benzene	Toluene	Ethylbenzene	M.P.-Xylenes	O-Xylenes	Total Xylenes	Total BTEX
NMOCD RRAL CRITERIA ³		0.01	0.75	0.75	TOTAL XYLENES 0.62			NET ⁴
MW-1	01/22/2016							
	04/27/2016							
	07/14/2016							
	10/05/2016							
	02/07/2017							
	04/27/2017							
	07/16/2017							
	11/09/2017							
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019							
	05/21/2019							
	08/30/2019							
11/14/2019								
MW-2	01/21/2020							
	06/09/2020							
	09/17/2020							
	12/14/2020							
	01/22/2016							
	04/27/2016							
	07/14/2016							
	10/05/2016							
	02/07/2017							
	04/27/2017							
	07/16/2017							
	11/10/2017							
	06/26/2018							
	08/22/2018							
MW-3	11/20/2018							
	02/25/2019							
	05/21/2019							
	08/30/2019							
	11/14/2019							
	01/21/2020							
	06/09/2020							
	09/17/2020							
	12/14/2020							
	01/22/2016							
	04/27/2016							
	07/14/2016							
	10/05/2016							
	02/07/2017							
MW-4	04/27/2017							
	07/16/2017							
	11/10/2017							
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019							
	05/21/2019							
	08/30/2019							
	11/14/2019							
	DUP-2							
	01/21/2020							
	06/09/2020							
	09/17/2020							
12/14/2020								
MW-5	01/22/2016							
	04/27/2016							
	07/14/2016							
	10/05/2016							
	02/08/2017							
	04/27/2017							
	07/16/2017							
	11/09/2017							
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019							
	05/21/2019							
	DUP-1							
MW-6	08/30/2019							
	11/14/2019							
	DUP-1							
	01/21/2020							
	DUP-1							
	06/09/2020							
	DUP-1							
	09/17/2020							
	12/14/2020							
	DUP-1							
	01/22/2016							
	04/27/2016							
	07/14/2016							
	10/05/2016							
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
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02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								
07/16/2017								
11/10/2017								
06/26/2018								
08/22/2018								
11/20/2018								
02/25/2019								
05/21/2019								
08/30/2019								
11/14/2019								
01/21/2020								
06/09/2020								
09/17/2020								
12/14/2020								
DUP-1								
01/22/2016								
04/27/2016								
07/14/2016								
10/05/2016								
02/08/2017								
04/27/2017								

Table 2
Groundwater BTEX¹ Concentration Analytical Summary

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2001-11226
Terracon Project #: AR207011
NMOCD² Reference #: 1R-0395

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

Monitoring Well	Date Sampled	EPA SW846-8021B						
		Benzene	Toluene	Ethylbenzene	M.P.-Xylenes	O-Xylenes	Total Xylenes	Total BTEX
		NMOC	RRAL CRITERIA ³	0.01	0.75	0.75	TOTAL XYLENES 0.62	NE ⁴
MW-7	01/22/2016	<0.00060	<0.00120	<0.00060	<0.00120	<0.00070	<0.00070	<0.00070
	04/27/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/14/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	10/05/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	02/09/2017	<0.000500	<0.000500	<0.000750	<0.00100	<0.000500	<0.000500	<0.000500
	04/27/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/16/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	11/10/2017	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00100	<0.00100
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270
	05/21/2019							
	08/30/2019							
	11/14/2019							
	01/21/2020							
MW-8	01/22/2016	<0.00060	<0.00120	<0.00060	<0.00120	<0.00070	<0.00070	<0.00070
	04/27/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/14/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	10/05/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	02/09/2017	<0.000500	<0.000500	<0.000750	<0.00100	<0.000500	<0.000500	<0.000500
	04/27/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/16/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	11/10/2017	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00100	<0.00100
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270
	05/21/2019							
	08/30/2019							
	11/14/2019							
	01/21/2020							
MW-9	01/22/2016	<0.00060	<0.00120	0.00398	<0.00120	<0.00070	<0.00070	<0.00070
	04/27/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/14/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	10/05/2016	0.000990 J	0.000380 J	0.000740 J	<0.000630	<0.000642	<0.000630	0.00211
	02/09/2017	<0.000500	<0.000500	<0.000750	<0.00100	<0.000500	<0.000500	<0.000500
	04/27/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/16/2017	<0.00040	<0.000367	0.00325	<0.000630	<0.000642	<0.000630	0.00325
	11/10/2017	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00100	<0.00100
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019	<0.000480	<0.000512	0.000900 J	0.000900 J	<0.000270	0.000900 J	0.00180 J
	05/21/2019	<0.000480	0.000490 J	0.000720 J	<0.000630	<0.000642	<0.000630	0.00121 J
	08/30/2019	<0.000480	<0.000512	0.00130	0.00180	<0.000270	0.00180	0.00310
	11/14/2019	0.000410 J	<0.000500	0.00102	<0.000330	<0.000192	<0.000192	0.00143
	01/21/2020	<0.000480	<0.000512	0.0098	0.0044	0.0018	0.0062	0.012
MW-10	01/21/2016	<0.00060	<0.00120	<0.00060	<0.00120	<0.00070	<0.00070	<0.00070
	04/27/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/14/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	10/05/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	02/09/2017	<0.000500	<0.000500	<0.000750	<0.00100	<0.000500	<0.000500	<0.000500
	04/27/2017	<0.00040	0.00199	<0.000657	<0.000630	<0.000642	<0.000630	0.00199
	07/16/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	11/09/2017	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00100	<0.00100
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270
	05/21/2019							
	08/30/2019							
	11/14/2019							
	01/21/2020							
MW-11	01/21/2016	<0.00060	<0.00120	<0.00060	<0.00120	<0.00070	<0.00070	<0.00070
	04/27/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/14/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	10/05/2016	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	02/09/2017	<0.000500	<0.000500	<0.000750	<0.00100	<0.000500	<0.000500	<0.000500
	04/27/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	07/16/2017	<0.00040	<0.000367	<0.000657	<0.000630	<0.000642	<0.000630	<0.000367
	11/09/2017	<0.00100	<0.00100	<0.00100	<0.00200	<0.00100	<0.00100	<0.00100
	06/26/2018							
	08/22/2018							
	11/20/2018							
	02/25/2019	<0.000480	<0.000512	<0.000616	<0.000454	<0.000270	<0.000270	<0.000270
	05/21/2019							
	08/30/2019							
	11/14/2019							
	01/21/2020							

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
3. 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
MW-4 PSH/BTEX² Impacted Groundwater Recovery Summary
Manual Abatement (Bailer)

Livingston Line to Bob McCasland Pipeline Release

Lea County, New Mexico

Plains Pipeline, L.P. SRS #: 2001-11226

NMOCD³ Reference #: 1R-0395

Terracon Project Number: AR207011

All elevations are measured in feet above mean sea level

Monitoring Well	Date	Depth to PSH ¹ Below Top of Casing	Depth to Water Below	PSH Thickness	Total Fluid Recovery (gallons)	PSH Recovered (gallons)
MW-4	07/03/2018	30.20	30.33	0.13	-	0.021
	07/11/2018	30.28	30.43	0.15	-	0.024
	07/19/2018	30.40	30.45	0.05	10.0	0.008
	07/30/2018	30.55	30.57	0.02	5.0	0.003
	08/27/2018	30.79	30.82	0.03	-	0.005
	09/13/2018	30.83	30.89	0.06	5.0	0.010
	10/18/2018	30.87	30.90	0.03	10.0	0.005
	11/16/2018	-	30.70	-	5.0	-
	02/25/2019	30.48	30.51	0.03	-	0.005
	05/08/2019	-	30.55	-	3.5	-
	05/17/2019	30.63	30.66	0.03	-	0.005
	06/13/2019	-	29.98	-	3.0	-
	06/18/2019	31.02	31.04	0.02	3.0	0.003
	06/25/2019	31.09	31.10	0.01	4.0	0.002
	07/01/2019	31.10	31.12	0.02	3.0	0.003
	07/08/2019	32.12	32.22	0.10	3.0	0.016
	07/30/2019	32.18	32.29	0.11	2.5	0.018
	08/07/2019	-	31.53	-	2.0	-
	08/13/2019	-	31.58	-	2.5	-
	08/21/2019	-	31.65	-	2.0	-
	09/04/2019	-	31.77	-	2.5	-
	09/09/2019	-	31.79	-	2.5	-
	09/19/2019	-	31.83	-	3.0	-
	10/02/2019	-	31.78	-	2.0	-
	10/07/2019	-	-	-	2.5	-
	10/15/2019	-	31.62	-	2.0	-
	10/23/2019	-	31.60	-	2.5	-
	10/31/2019	-	31.58	-	3.0	-
	11/05/2019	-	-	-	2.5	-
	11/12/2019	-	-	-	2.5	-
	11/19/2019	-	-	-	3.0	-
	12/09/2019	-	31.43	-	3.0	-
	12/17/2019	-	31.44	-	3.0	-
	12/23/2019	-	31.37	-	3.0	-
	12/31/2019	-	31.88	-	3.0	-
	01/09/2020	31.33	31.39	0.06	3.0	0.010
	01/20/2020	31.35	31.40	0.05	3.0	0.008
	01/31/2020	31.37	34.42	3.05	3.0	0.497
	02/14/2020	31.23	31.33	0.10	3.0	0.016
	02/19/2020	31.31	31.37	0.06	3.5	0.010
	02/27/2020	31.33	31.37	0.04	3.0	0.007
	03/05/2020	31.26	31.27	0.01	3.0	0.002
	03/17/2020	31.33	31.38	0.05	3.0	0.008
	05/26/2020	31.60	31.89	0.29	2.0	0.047
	06/29/2020	32.16	32.25	0.09	3.0	0.015
	07/28/2020	32.35	32.45	0.10	2.0	0.016
	08/18/2020	32.16	32.25	0.09	2.0	0.015
	10/14/2020	32.54	33.48	0.94	2.0	0.153
	11/12/2020	-	-	-	3.0	-
	12/29/2020	32.12	34.16	2.04	3.0	0.333
Average PSH Thickness: 0.50'				2020 Total Recovered	41.5	1.136

Notes:

1. PSH: Phase Separated Hydrocarbons
 2. BTEX: Benzene, Toluene, Ethylbenzene, and Total Xylenes
 3. NMOCD: New Mexico Oil Conservation Division
 4. GW: Groundwater
- = Data not recorded

Table 3b
MW-5 BTEX¹ Impacted Groundwater Recovery Summary
Manual Abatement (Bailer)

Livingston Line to Bob McCasland Pipeline Release
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2001-11226
NMOCD² Reference #: 1R-0395
Terracon Project Number: AR207011

All elevations are measured in feet above mean sea level

Monitoring Well	Date	Groundwater Recovered (gallons)
MW-5	05/03/2019	4.0
	05/08/2019	5.0
	05/17/2019	5.0
	06/13/2019	4.0
	06/18/2019	3.0
	06/25/2019	3.0
	07/01/2019	3.0
	07/08/2019	3.0
	07/30/2019	4.5
	08/07/2019	3.0
	08/13/2019	3.0
	08/21/2019	3.0
	09/04/2019	3.0
	09/09/2019	3.0
	09/19/2019	3.0
	10/02/2019	3.0
	10/07/2019	3.0
	10/15/2019	3.0
	10/23/2019	3.0
	10/31/2019	3.0
	11/05/2019	4.5
	11/12/2019	3.5
	11/19/2019	3.0
	12/09/2019	3.0
	12/17/2019	3.0
	12/23/2019	3.0
	12/31/2019	3.0
	01/09/2020	3.0
	01/20/2020	5.0
	01/31/2020	3.0
	02/14/2020	5.0
	02/19/2020	5.0
	02/27/2020	4.0
	03/05/2020	5.0
	03/17/2020	5.0
	05/26/2020	5.0
	06/29/2020	5.0
	07/28/2020	4.5
	08/18/2020	5.0
	10/14/2020	3.0
	11/12/2020	5.0
	12/29/2020	3.0
2020 Total GW³ Recovered		65.5

Notes:

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

2 NMOCD: New Mexico Oil Conservation Division

3. GW: Groundwater

- = Data not recorded

Table 4
Concentrations of PAH¹ in Groundwater Summary

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
Plains Pipeline, L.P. SRS #: 2001-11226
Terracon Project #: AR207011
NMOC2 Reference#: 1R-0395

All concentrations are in milligrams per liter (mg/L)³

All concentrations are in milligrams per liter (mg/L)																			
Monitoring Well	Date Sampled	EPA SW846-8270C, 3510																	
		Naphthalene	Benzo(a)pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)Pyrene	Phenanthrene	Pyrene		
NMWQCC Groundwater Criteria ⁴		0.03	0.0007							NE ⁵									
MW-7	7/14/2004	0.000261	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	0.000293	<0.00005	
	3/21/2005	0.000448	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	0.000222	<0.00005	
	2/16/2006	0.000057	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
	5/10/2007	0.000606	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	
	2/28/2008	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	N/A	<0.005	<0.005	<0.005	<0.005	<0.005	
	12/30/2011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	9/5/2013	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	
	10/5/2014																		
	10/15/2015																		
	12/14/2020																		
Not Sampled Due to Sample Reduction																			
MW-8	7/14/2004	0.000261	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	0.000293	<0.00005	
	3/21/2005	0.000448	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	0.000222	<0.00005	
	2/16/2006	0.000057	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
	5/10/2007	0.000606	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	
	2/28/2008	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	12/30/2011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	9/5/2013	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	
	10/5/2014																		
	10/15/2015																		
	12/14/2020																		
Not Sampled Due to Sample Reduction																			
MW-9	7/14/2004	0.00798	<0.00005	0.000089	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	0.000306	<0.00005	0.00008	<0.00005	
	3/21/2005	0.00126	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	0.000076	<0.00005	0.000068	<0.00005	
	2/16/2006	0.0107	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	0.000139	<0.00005	0.000125	<0.00005	
	5/10/2007	0.00243	<0.0002	<0.0002	<0.0002	0.000222	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	0.00132	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	
	2/28/2008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	12/30/2011	0.00247	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	0.000354	<0.0000508	0.000262	<0.0000508	0.000287	<0.0000508	
	9/5/2013																		
	10/5/2014																		
	10/15/2015																		
	12/14/2020	<0.0000969	<0.0000569	<0.0000996	<0.0000839	<0.0000863	<0.000134	<0.0000708	<0.000113	<0.000116	<0.000156	<0.0000757	N/A	<0.000157	<0.000100	<0.0000910	<0.0000848	<0.000138	
MW-10	3/21/2005	0.00738	<0.00005	0.000083	0.000051	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	0.000292	<0.00005	0.000654	<0.00005
	2/16/2006																		
	5/22/2006	0.000174	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	0.00009	<0.00005	0.000202	<0.00005	
	5/10/2007	0.000688	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	0.00108	<0.0002	0.000388	<0.0004	<0.0002	<0.0002	
	2/28/2008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	9/5/2013	0.000548	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	0.000714	<0.0000508	0.0000839	<0.0000508	0.0000605	<0.0000508	
	10/5/2014																		
	10/15/2015																		
	12/14/2020																		
	Not Sampled Due to Sample Reduction																		
MW-11	3/21/2005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
	2/16/2006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/A	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
	5/10/2007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	
	2/28/2008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	9/5/2013	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	<0.0000524	
	10/5/2014																		
	10/15/2015																		
	12/14/2020																		
	Not Sampled Due to Sample Reduction																		

Notes:

1. PAH: Polycyclic Aromatic Hydrocarbons
 2. NMOC2: New Mexico Oil Conservation Division
 3. mg/L: milligrams per liter
 4. NMWQCC: Groundwater Criteria: Recommended Remediation Action Level Criteria
 5. NE: Not Established
3. 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 NMOC2 RRAL Criteria

APPENDIX C

Certified Laboratory Analytical Reports:

1Q20 Groundwater Report 649986

2Q20 Groundwater Report 664259

3Q20 Groundwater Report 672977

4Q20 Groundwater Report 681578

Analytical Report 649986

for Terracon-Lubbock

Project Manager: Paige Gaona

Livingston Line - Bob McCasland

AR207011

04-FEB-20

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)



04-FEB-20

Project Manager: **Paige Gaona**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: XENCO Report No(s): **649986**

Livingston Line - Bob McCasland

Project Address: SRS #2001-11226

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) 649986. 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. 649986 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,

A handwritten signature in black ink that reads 'Jessica Kramer'.

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 649986****Terracon-Lubbock, Lubbock, TX**

Livingston Line - Bob McCasland

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-6	W	01-21-20 11:43		649986-001
MW-9	W	01-21-20 12:28		649986-002
MW-3	W	01-21-20 13:55		649986-003
MW-5	W	01-21-20 15:10		649986-004
DUP-1	W	01-21-20 15:15		649986-005

**CASE NARRATIVE****Client Name: Terracon-Lubbock****Project Name: Livingston Line - Bob McCasland**Project ID: AR207011
Work Order Number(s): 649986Report Date: 04-FEB-20
Date Received: 01/23/2020

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:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3114899 BTEX-MTBE by EPA 8021B

Surrogate 4-Bromofluorobenzene, Surrogate a,a,a-Trifluorotoluene recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 650194-002 SD.



Certificate of Analytical Results

649986

Terracon-Lubbock, Lubbock, TX

Livingston Line - Bob McCasland

Sample Id: **MW-6** Matrix: Ground Water Sample Depth:

Lab Sample Id: 649986-001 Date Collected: 01.21.20 11.43 Date Received: 01.23.20 09.53

Analytical Method: BTEX by EPA 8021 Prep Method: 5030B

Analyst: MIT % Moist: Tech: MIT

Seq Number: 3114899 Date Prep: 01.29.20 15.00

Prep seq: 7695479

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.29.20 21:23	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.29.20 21:23	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	01.29.20 21:23	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	01.29.20 21:23	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	01.29.20 21:23	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	01.29.20 21:23	U	
Total BTEX		<0.000270		0.000270	mg/L	01.29.20 21:23	U	

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

Sample Id: **MW-9** Matrix: Ground Water Sample Depth:

Lab Sample Id: 649986-002 Date Collected: 01.21.20 12.28 Date Received: 01.23.20 09.53

Analytical Method: BTEX by EPA 8021 Prep Method: 5030B

Analyst: MIT % Moist: Tech: MIT

Seq Number: 3115322 Date Prep: 01.30.20 16.00

Prep seq: 7695804

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.31.20 08:09	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.31.20 08:09	U	1
Ethylbenzene	100-41-4	0.00580	0.00100	0.000616	mg/L	01.31.20 08:09		1
m_p-Xylenes	179601-23-1	0.00440	0.00200	0.000454	mg/L	01.31.20 08:09		1
o-Xylene	95-47-6	0.00180	0.00100	0.000270	mg/L	01.31.20 08:09		1
Xylenes, Total	1330-20-7	0.00620		0.000270	mg/L	01.31.20 08:09		
Total BTEX		0.0120		0.000270	mg/L	01.31.20 08:09		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	115	66 - 120	%		
4-Bromofluorobenzene	102	67 - 120	%		



Certificate of Analytical Results

649986



Terracon-Lubbock, Lubbock, TX

Livingston Line - Bob McCasland

Sample Id: **MW-3** Matrix: Ground Water Sample Depth:

Lab Sample Id: 649986-003 Date Collected: 01.21.20 13.55 Date Received: 01.23.20 09.53

Analytical Method: BTEX by EPA 8021 Prep Method: 5030B

Analyst: MIT % Moist: Tech: MIT

Seq Number: 3114899 Date Prep: 01.29.20 15.00

Prep seq: 7695479

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.29.20 22:17	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.29.20 22:17	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	01.29.20 22:17	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	01.29.20 22:17	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	01.29.20 22:17	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	01.29.20 22:17	U	
Total BTEX		<0.000270		0.000270	mg/L	01.29.20 22:17	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	96	66 - 120	%		
4-Bromofluorobenzene	91	67 - 120	%		

Sample Id: **MW-5** Matrix: Ground Water Sample Depth:

Lab Sample Id: 649986-004 Date Collected: 01.21.20 15.10 Date Received: 01.23.20 09.53

Analytical Method: BTEX by EPA 8021 Prep Method: 5030B

Analyst: MIT % Moist: Tech: MIT

Seq Number: 3115322 Date Prep: 01.30.20 16.00

Prep seq: 7695804

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.31.20 08:34	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.31.20 08:34	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	01.31.20 08:34	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	01.31.20 08:34	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	01.31.20 08:34	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	01.31.20 08:34	U	
Total BTEX		<0.000270		0.000270	mg/L	01.31.20 08:34	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	104	66 - 120	%		
4-Bromofluorobenzene	93	67 - 120	%		



Certificate of Analytical Results

649986



Terracon-Lubbock, Lubbock, TX
Livingston Line - Bob McCasland

Sample Id: **DUP-1**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 649986-005

Date Collected: 01.21.20 15.15

Date Received: 01.23.20 09.53

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3115322

Date Prep: 01.30.20 16.00

Prep seq: 7695804

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.31.20 08:58	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.31.20 08:58	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	01.31.20 08:58	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	01.31.20 08:58	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	01.31.20 08:58	U	1
Xylenes, Total	1330-20-7	<0.000270		0.000270	mg/L	01.31.20 08:58	U	
Total BTEX		<0.000270		0.000270	mg/L	01.31.20 08:58	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	103	66 - 120	%		
4-Bromofluorobenzene	87	67 - 120	%		



Certificate of Analytical Results

649986

Terracon-Lubbock, Lubbock, TX

Livingston Line - Bob McCasland

Sample Id: **7695479-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 7695479-1-BLK Date Collected: Date Received:

Analytical Method: BTEX by EPA 8021 Prep Method: 5030B

Analyst: MIT % Moist: Tech: MIT

Seq Number: 3114899 Date Prep: 01.29.20 15.00

Prep seq: 7695479

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.29.20 18:42	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.29.20 18:42	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	01.29.20 18:42	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	01.29.20 18:42	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	01.29.20 18:42	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	94	66 - 120	%		
4-Bromofluorobenzene	93	67 - 120	%		

Sample Id: **7695804-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 7695804-1-BLK Date Collected: Date Received:

Analytical Method: BTEX by EPA 8021 Prep Method: 5030B

Analyst: MIT % Moist: Tech: MIT

Seq Number: 3115322 Date Prep: 01.30.20 16.00

Prep seq: 7695804

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	01.31.20 04:32	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	01.31.20 04:32	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	01.31.20 04:32	U	1
m_p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	01.31.20 04:32	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	01.31.20 04:32	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	106	66 - 120	%		
4-Bromofluorobenzene	90	67 - 120	%		



Flagging Criteria



- 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: Livingston Line - Bob McCasland

Work Orders : 649986,

Project ID: AR207011

Lab Batch #: 3114899

Sample: 7695479-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 01/29/20 16:54	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0852	0.100	85	66-120	
4-Bromofluorobenzene	0.0826	0.100	83	67-120	

Lab Batch #: 3114899

Sample: 7695479-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 01/29/20 17:21	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0854	0.100	85	66-120	
4-Bromofluorobenzene	0.0855	0.100	86	67-120	

Lab Batch #: 3114899

Sample: 7695479-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 01/29/20 18:42	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0939	0.100	94	66-120	
4-Bromofluorobenzene	0.0932	0.100	93	67-120	

Lab Batch #: 3114899

Sample: 650194-002 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 01/29/20 19:35	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0832	0.100	83	66-120	
4-Bromofluorobenzene	0.0859	0.100	86	67-120	

Lab Batch #: 3114899

Sample: 650194-002 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 01/29/20 20:03	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0619	0.100	62	66-120	**
4-Bromofluorobenzene	0.0586	0.100	59	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: Livingston Line - Bob McCasland

Work Orders : 649986,

Project ID: AR207011

Lab Batch #: 3115322

Sample: 7695804-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 01/31/20 02:55	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0899	0.100	90	66-120
4-Bromofluorobenzene		0.0783	0.100	78	67-120

Lab Batch #: 3115322

Sample: 7695804-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 01/31/20 03:20	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.0933	0.100	93	66-120
4-Bromofluorobenzene		0.0805	0.100	81	67-120

Lab Batch #: 3115322

Sample: 7695804-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L	Date Analyzed: 01/31/20 04:32	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.106	0.100	106	66-120
4-Bromofluorobenzene		0.0904	0.100	90	67-120

Lab Batch #: 3115322

Sample: 649980-009 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 01/31/20 05:20	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.525	0.500	105	66-120
4-Bromofluorobenzene		0.0936	0.100	94	67-120

Lab Batch #: 3115322

Sample: 649980-009 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L	Date Analyzed: 01/31/20 05:45	SURROGATE RECOVERY STUDY			
BTEX by EPA 8021		Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R
Analytes					
a,a,a-Trifluorotoluene		0.477	0.500	95	66-120
4-Bromofluorobenzene		0.0851	0.100	85	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: Livingston Line - Bob McCasland

Work Order #: 649986

Project ID: AR207011

Analyst: MIT

Date Prepared: 01/29/2020

Date Analyzed: 01/29/2020

Lab Batch ID: 3114899

Sample: 7695479-1-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	0.0952	95	0.100	0.100	100	5	74-120	20	
Toluene	<0.000512	0.100	0.0951	95	0.100	0.0974	97	2	74-120	20	
Ethylbenzene	<0.000616	0.100	0.0907	91	0.100	0.0931	93	3	74-120	20	
m_p-Xylenes	<0.000454	0.200	0.178	89	0.200	0.183	92	3	73-120	25	
o-Xylene	<0.000270	0.100	0.0879	88	0.100	0.0903	90	3	73-120	25	

Analyst: MIT

Date Prepared: 01/30/2020

Date Analyzed: 01/31/2020

Lab Batch ID: 3115322

Sample: 7695804-1-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	0.0994	99	0.100	0.0995	100	0	74-120	20	
Toluene	<0.000512	0.100	0.104	104	0.100	0.0981	98	6	74-120	20	
Ethylbenzene	<0.000616	0.100	0.107	107	0.100	0.101	101	6	74-120	20	
m_p-Xylenes	<0.000454	0.200	0.212	106	0.200	0.200	100	6	73-120	25	
o-Xylene	<0.000270	0.100	0.106	106	0.100	0.102	102	4	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

Version: 1.0%



Form 3 - MS / MSD Recoveries



Project Name: Livingston Line - Bob McCasland

Work Order #: 649986

Project ID: AR207011

Lab Batch ID: 3114899

QC- Sample ID: 650194-002 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 01/29/2020

Date Prepared: 01/29/2020

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	0.0959	96	0.100	0.0705	71	31	15-147	25	F
Toluene	<0.000512	0.100	0.0958	96	0.100	0.0678	68	34	11-147	25	F
Ethylbenzene	<0.000616	0.100	0.0900	90	0.100	0.0634	63	35	10-149	25	F
m_p-Xylenes	<0.000454	0.200	0.176	88	0.200	0.116	58	41	62-124	25	XF
o-Xylene	<0.000270	0.100	0.0875	88	0.100	0.0609	61	36	62-124	25	XF

Lab Batch ID: 3115322

QC- Sample ID: 649980-009 S

Batch #: 1 Matrix: Ground Water

Date Analyzed: 01/31/2020

Date Prepared: 01/30/2020

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	<0.00240	0.500	0.499	100	0.500	0.509	102	2	15-147	25	
Toluene	0.242	0.500	0.721	96	0.500	0.757	103	5	11-147	25	
Ethylbenzene	0.688	0.500	1.18	98	0.500	1.23	108	4	10-149	25	
m_p-Xylenes	0.994	1.00	1.97	98	1.00	2.05	106	4	62-124	25	
o-Xylene	0.665	0.500	1.17	101	0.500	1.21	109	3	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.

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Terracon-Lubbock

Date/ Time Received: 01.23.2020 09.53.00 AM

Work Order #: 649986

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)?	5.1
#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: 01.23.2020

Checklist reviewed by:

Jessica Kramer
Jessica Kramer

Date: 01.27.2020



Analytical Report 664259

for

Terracon-Lubbock

Project Manager: Paige Gaona

Livingston Line - Bob McCasland

AR207011

06.16.2020

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-32), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (TX104704295-19-23), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-17)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-22)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-19)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-7)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tampa: Florida (E87429), North Carolina (483)



06.16.2020

Project Manager: **Paige Gaona**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: XENCO Report No(s): **664259**

Livingston Line - Bob McCasland

Project Address: SRS# 2001-11226

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) 664259. 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. 664259 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,

A handwritten signature in black ink that reads 'Jessica Kramer'. The signature is written in a cursive, flowing style.

Jessica Kramer

Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico



Sample Cross Reference 664259

Terracon-Lubbock, Lubbock, TX

Livingston Line - Bob McCasland

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-9	W	06.09.2020 10:20		664259-001
MW-6	W	06.09.2020 12:15		664259-002
MW-3	W	06.09.2020 13:23		664259-003
MW-5	W	06.09.2020 12:53		664259-004
DUP-1	W	06.09.2020 12:58		664259-005



CASE NARRATIVE

Client Name: Terracon-Lubbock

Project Name: Livingston Line - Bob McCasland

Project ID: AR207011
Work Order Number(s): 664259

Report Date: 06.16.2020
Date Received: 06.11.2020

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:

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results

664259

Terracon-Lubbock, Lubbock, TX
Livingston Line - Bob McCasland

Sample Id: **MW-9**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 664259-001

Date Collected: 06.09.2020 10:20

Date Received: 06.11.2020 13:50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3128991

Date Prep: 06.12.2020 16:38

Prep seq: 7705471

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	06.13.2020 05:23	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	06.13.2020 05:23	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	06.13.2020 05:23	U	1
m,p-Xylenes	179601-23-1	0.00100	0.00200	0.000454	mg/L	06.13.2020 05:23	J	1
o-Xylene	95-47-6	0.000700	0.00100	0.000270	mg/L	06.13.2020 05:23	J	1
Total Xylenes	1330-20-7	0.00170		0.000270	mg/L	06.13.2020 05:23		
Total BTEX		0.00170		0.000270	mg/L	06.13.2020 05:23		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	93	66 - 120	%		
4-Bromofluorobenzene	94	67 - 120	%		

Sample Id: **MW-6**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 664259-002

Date Collected: 06.09.2020 12:15

Date Received: 06.11.2020 13:50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3128991

Date Prep: 06.12.2020 16:38

Prep seq: 7705471

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	06.13.2020 05:47	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	06.13.2020 05:47	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	06.13.2020 05:47	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	06.13.2020 05:47	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	06.13.2020 05:47	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	06.13.2020 05:47	U	
Total BTEX		<0.000270		0.000270	mg/L	06.13.2020 05:47	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	88	66 - 120	%		
4-Bromofluorobenzene	90	67 - 120	%		



Certificate of Analytical Results

664259

Terracon-Lubbock, Lubbock, TX
Livingston Line - Bob McCasland

Sample Id: **MW-3**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 664259-003

Date Collected: 06.09.2020 13:23

Date Received: 06.11.2020 13:50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3128991

Date Prep: 06.12.2020 16:38

Prep seq: 7705471

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	06.13.2020 06:12	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	06.13.2020 06:12	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	06.13.2020 06:12	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	06.13.2020 06:12	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	06.13.2020 06:12	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	06.13.2020 06:12	U	
Total BTEX		<0.000270		0.000270	mg/L	06.13.2020 06:12	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	91	66 - 120	%		
4-Bromofluorobenzene	93	67 - 120	%		

Sample Id: **MW-5**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 664259-004

Date Collected: 06.09.2020 12:53

Date Received: 06.11.2020 13:50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3128991

Date Prep: 06.12.2020 16:38

Prep seq: 7705471

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	06.13.2020 06:36	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	06.13.2020 06:36	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	06.13.2020 06:36	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	06.13.2020 06:36	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	06.13.2020 06:36	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	06.13.2020 06:36	U	
Total BTEX		<0.000270		0.000270	mg/L	06.13.2020 06:36	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	91	66 - 120	%		
4-Bromofluorobenzene	92	67 - 120	%		



Certificate of Analytical Results

664259

Terracon-Lubbock, Lubbock, TX
Livingston Line - Bob McCasland

Sample Id: **DUP-1**

Matrix: Ground Water

Sample Depth:

Lab Sample Id: 664259-005

Date Collected: 06.09.2020 12:58

Date Received: 06.11.2020 13:50

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3128991

Date Prep: 06.12.2020 16:38

Prep seq: 7705471

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	06.13.2020 07:00	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	06.13.2020 07:00	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	06.13.2020 07:00	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	06.13.2020 07:00	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	06.13.2020 07:00	U	1
Total Xylenes	1330-20-7	<0.000270		0.000270	mg/L	06.13.2020 07:00	U	
Total BTEX		<0.000270		0.000270	mg/L	06.13.2020 07:00	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	89	66 - 120	%		
4-Bromofluorobenzene	92	67 - 120	%		



Certificate of Analytical Results

664259

Terracon-Lubbock, Lubbock, TX
Livingston Line - Bob McCasland

Sample Id: 7705471-1-BLK

Matrix: Water

Sample Depth:

Lab Sample Id: 7705471-1-BLK

Date Collected:

Date Received:

Analytical Method: BTEX by EPA 8021B

Prep Method: 5030B

Analyst: MIT

% Moist:

Tech: MIT

Seq Number: 3128991

Date Prep: 06.12.2020 16:38

Prep seq: 7705471

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000480	0.00100	0.000480	mg/L	06.12.2020 20:32	U	1
Toluene	108-88-3	<0.000512	0.00100	0.000512	mg/L	06.12.2020 20:32	U	1
Ethylbenzene	100-41-4	<0.000616	0.00100	0.000616	mg/L	06.12.2020 20:32	U	1
m,p-Xylenes	179601-23-1	<0.000454	0.00200	0.000454	mg/L	06.12.2020 20:32	U	1
o-Xylene	95-47-6	<0.000270	0.00100	0.000270	mg/L	06.12.2020 20:32	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
a,a,a-Trifluorotoluene	93	66 - 120	%		
4-Bromofluorobenzene	94	67 - 120	%		



Flagging Criteria

- 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. **ND** Not Detected.

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: Livingston Line - Bob McCasland

Work Orders : 664259

Project ID: AR207011

Lab Batch #: 3128991

Sample: 7705471-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 06.12.2020 18:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0960	0.100	96	66-120	
4-Bromofluorobenzene	0.0983	0.100	98	67-120	

Lab Batch #: 3128991

Sample: 7705471-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 06.12.2020 19:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0973	0.100	97	66-120	
4-Bromofluorobenzene	0.0981	0.100	98	67-120	

Lab Batch #: 3128991

Sample: 7705471-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 06.12.2020 20:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0925	0.100	93	66-120	
4-Bromofluorobenzene	0.0939	0.100	94	67-120	

Lab Batch #: 3128991

Sample: 664316-005 S / MS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 06.12.2020 22:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0941	0.100	94	66-120	
4-Bromofluorobenzene	0.0992	0.100	99	67-120	

Lab Batch #: 3128991

Sample: 664316-005 SD / MSD

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 06.12.2020 22:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
a,a,a-Trifluorotoluene	0.0894	0.100	89	66-120	
4-Bromofluorobenzene	0.0929	0.100	93	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: Livingston Line - Bob McCasland

Work Order #: 664259

Project ID: AR207011

Analyst: MIT

Date Prepared: 06.12.2020

Date Analyzed: 06.12.2020

Lab Batch ID: 3128991

Sample: 7705471-1-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	0.0975	98	0.100	0.0975	98	0	74-120	20	
Toluene	<0.000512	0.100	0.0977	98	0.100	0.0976	98	0	74-120	20	
Ethylbenzene	<0.000616	0.100	0.0947	95	0.100	0.0941	94	1	74-120	20	
m,p-Xylenes	<0.000454	0.200	0.189	95	0.200	0.188	94	1	73-120	25	
o-Xylene	<0.000270	0.100	0.0952	95	0.100	0.0948	95	0	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: Livingston Line - Bob McCasland

Work Order #: 664259

Project ID: AR207011

Lab Batch ID: 3128991

QC- Sample ID: 664316-005 S

Batch #: 1 Matrix: Water

Date Analyzed: 06.12.2020

Date Prepared: 06.12.2020

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	0.0595	60	0.100	0.0103	10	141	15-147	25	XF
Toluene	<0.000512	0.100	0.0579	58	0.100	0.00980	10	142	11-147	25	XF
Ethylbenzene	<0.000616	0.100	0.0542	54	0.100	0.00980	10	139	10-149	25	F
m,p-Xylenes	<0.000454	0.200	0.108	54	0.200	0.0197	10	138	62-124	25	XF
o-Xylene	<0.000270	0.100	0.0541	54	0.100	0.0101	10	137	62-124	25	XF

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

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

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.

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Terracon-Lubbock

Date/ Time Received: 06.11.2020 01.50.00 PM

Work Order #: 664259

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)?	4.8
#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)?	Yes Test sent to Stafford
#18 Water VOC samples have zero headspace?	N/A

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

Analyst: ASD

PH Device/Lot#: 207519

Checklist completed by:

Brenda Ward
Brenda Ward

Date: 06.15.2020

Checklist reviewed by:

Jessica Kramer
Jessica Kramer

Date: 06.15.2020

Certificate of Analysis Summary 672977

Terracon-Lubbock, Lubbock, TX

Project Name: Livingston Line-Bob McCasland (SRS #2001-11226)

Project Id: AR207011
 Contact: Camille Bryant
 Project Location:

Date Received in Lab: Fri 09.18.2020 11:16
 Report Date: 09.23.2020 14:14
 Project Manager: Jessica Kramer

Analysis Requested	Lab Id:	672977-001	672977-002	672977-003	672977-004	672977-005	
	Field Id:	MW-2	MW-3	MW-9	MW-6	MW-5	
	Depth:						
	Matrix:	WATER	WATER	WATER	WATER	WATER	
	Sampled:	09.17.2020 14:17	09.17.2020 14:50	09.17.2020 15:37	09.17.2020 16:10	09.17.2020 16:47	
BTEX by EPA 8021B SUB: T104704400-20-21	Extracted:	09.20.2020 09:00	09.22.2020 09:30	09.20.2020 09:00	09.20.2020 09:00	09.20.2020 09:00	
	Analyzed:	09.20.2020 13:05	09.22.2020 12:22	09.20.2020 13:26	09.20.2020 13:47	09.20.2020 14:08	
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL	
Benzene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	
Toluene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	
Ethylbenzene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	
m,p-Xylenes		<0.00400 0.00400	<0.00400 0.00400	<0.00400 0.00400	<0.00400 0.00400	<0.00400 0.00400	
o-Xylene		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	
Total Xylenes		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	
Total BTEX		<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	<0.00200 0.00200	

BRL - Below Reporting Limit

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico



Analytical Report 672977

for

Terracon-Lubbock

Project Manager: Camille Bryant

Livingston Line-Bob McCasland (SRS #2001-11226)

AR207011

09.23.2020

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-38), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2020-014), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-20-26), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-18)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-23)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-21)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-8)
Xenco-Tampa: Florida (E87429), North Carolina (483)



09.23.2020

Project Manager: **Camille Bryant**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: Eurofins Xenco, LLC Report No(s): **672977**

Livingston Line-Bob McCasland (SRS #2001-11226)

Project Address:

Camille Bryant:

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 Eurofins Xenco, LLC Report Number(s) 672977. 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 Eurofins Xenco, LLC. 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. 672977 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 Eurofins Xenco, LLC to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads "Jessica Kramer".

Jessica Kramer

Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

**Sample Cross Reference 672977****Terracon-Lubbock, Lubbock, TX**

Livingston Line-Bob McCasland (SRS #2001-11226)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-2	W	09.17.2020 14:17		672977-001
MW-3	W	09.17.2020 14:50		672977-002
MW-9	W	09.17.2020 15:37		672977-003
MW-6	W	09.17.2020 16:10		672977-004
MW-5	W	09.17.2020 16:47		672977-005



CASE NARRATIVE

Client Name: Terracon-Lubbock

Project Name: Livingston Line-Bob McCasland (SRS #2001-11226)

Project ID: AR207011
Work Order Number(s): 672977

Report Date: 09.23.2020
Date Received: 09.18.2020

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results 672977

Terracon-Lubbock, Lubbock, TX Livingston Line-Bob McCasland (SRS #2001-11226)

Sample Id: **MW-2**
Lab Sample Id: 672977-001

Matrix: Water
Date Collected: 09.17.2020 14:17

Date Received: 09.18.2020 11:16

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: AMF

% Moisture:

Analyst: AMF

Date Prep: 09.20.2020 09:00

Seq Number: 3137598

SUB: T104704400-20-21

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	09.20.2020 13:05	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	09.20.2020 13:05	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	09.20.2020 13:05	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	09.20.2020 13:05	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	09.20.2020 13:05	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	09.20.2020 13:05	U	1
Total BTEX		<0.00200	0.00200	mg/L	09.20.2020 13:05	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	89	%	70-130	09.20.2020 13:05		
4-Bromofluorobenzene	460-00-4	112	%	70-130	09.20.2020 13:05		



Certificate of Analytical Results 672977

Terracon-Lubbock, Lubbock, TX Livingston Line-Bob McCasland (SRS #2001-11226)

Sample Id: **MW-3**
Lab Sample Id: 672977-002

Matrix: Water
Date Collected: 09.17.2020 14:50

Date Received: 09.18.2020 11:16

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: AMF

% Moisture:

Analyst: AMF

Date Prep: 09.22.2020 09:30

Seq Number: 3137773

SUB: T104704400-20-21

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	09.22.2020 12:22	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	09.22.2020 12:22	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	09.22.2020 12:22	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	09.22.2020 12:22	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	09.22.2020 12:22	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	09.22.2020 12:22	U	1
Total BTEX		<0.00200	0.00200	mg/L	09.22.2020 12:22	U	1
Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag	
1,4-Difluorobenzene	540-36-3	86	%	70-130	09.22.2020 12:22		
4-Bromofluorobenzene	460-00-4	118	%	70-130	09.22.2020 12:22		



Certificate of Analytical Results 672977

Terracon-Lubbock, Lubbock, TX Livingston Line-Bob McCasland (SRS #2001-11226)

Sample Id: **MW-9**
Lab Sample Id: 672977-003

Matrix: Water
Date Collected: 09.17.2020 15:37

Date Received: 09.18.2020 11:16

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: AMF

% Moisture:

Analyst: AMF

Date Prep: 09.20.2020 09:00

Seq Number: 3137598

SUB: T104704400-20-21

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	09.20.2020 13:26	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	09.20.2020 13:26	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	09.20.2020 13:26	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	09.20.2020 13:26	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	09.20.2020 13:26	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	09.20.2020 13:26	U	1
Total BTEX		<0.00200	0.00200	mg/L	09.20.2020 13:26	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	98	%	70-130	09.20.2020 13:26	
4-Bromofluorobenzene	460-00-4	111	%	70-130	09.20.2020 13:26	



Certificate of Analytical Results 672977

Terracon-Lubbock, Lubbock, TX Livingston Line-Bob McCasland (SRS #2001-11226)

Sample Id: **MW-6**
Lab Sample Id: 672977-004

Matrix: Water
Date Collected: 09.17.2020 16:10

Date Received: 09.18.2020 11:16

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: AMF

% Moisture:

Analyst: AMF

Date Prep: 09.20.2020 09:00

Seq Number: 3137598

SUB: T104704400-20-21

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	09.20.2020 13:47	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	09.20.2020 13:47	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	09.20.2020 13:47	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	09.20.2020 13:47	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	09.20.2020 13:47	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	09.20.2020 13:47	U	1
Total BTEX		<0.00200	0.00200	mg/L	09.20.2020 13:47	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	95	%	70-130	09.20.2020 13:47	
4-Bromofluorobenzene	460-00-4	100	%	70-130	09.20.2020 13:47	



Certificate of Analytical Results 672977

Terracon-Lubbock, Lubbock, TX Livingston Line-Bob McCasland (SRS #2001-11226)

Sample Id: **MW-5**
Lab Sample Id: 672977-005

Matrix: Water
Date Collected: 09.17.2020 16:47

Date Received: 09.18.2020 11:16

Analytical Method: BTEX by EPA 8021B

Prep Method: SW5030B

Tech: AMF

% Moisture:

Analyst: AMF

Date Prep: 09.20.2020 09:00

Seq Number: 3137598

SUB: T104704400-20-21

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	09.20.2020 14:08	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	09.20.2020 14:08	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	09.20.2020 14:08	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	09.20.2020 14:08	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	09.20.2020 14:08	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	09.20.2020 14:08	U	1
Total BTEX		<0.00200	0.00200	mg/L	09.20.2020 14:08	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	93	%	70-130	09.20.2020 14:08	
4-Bromofluorobenzene	460-00-4	112	%	70-130	09.20.2020 14:08	

Flagging Criteria

- 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. **ND** Not Detected.

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



Terracon-Lubbock
Livingston Line-Bob McCasland (SRS #2001-11226)

Analytical Method: BTEX by EPA 8021B

Seq Number: 3137598

Matrix: Water

Prep Method: SW5030B

Date Prep: 09.20.2020

MB Sample Id: 7711695-1-BLK

LCS Sample Id: 7711695-1-BKS

LCSD Sample Id: 7711695-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.107	107	0.103	103	70-130	4	25	mg/L	09.20.2020 10:32	
Toluene	<0.00200	0.100	0.111	111	0.107	107	70-130	4	25	mg/L	09.20.2020 10:32	
Ethylbenzene	<0.00200	0.100	0.109	109	0.105	105	70-130	4	25	mg/L	09.20.2020 10:32	
m,p-Xylenes	<0.00400	0.200	0.230	115	0.225	113	70-130	2	25	mg/L	09.20.2020 10:32	
o-Xylene	<0.00200	0.100	0.116	116	0.113	113	70-130	3	25	mg/L	09.20.2020 10:32	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	84		98		97		70-130	%	09.20.2020 10:32
4-Bromofluorobenzene	97		116		113		70-130	%	09.20.2020 10:32

Analytical Method: BTEX by EPA 8021B

Seq Number: 3137773

Matrix: Water

Prep Method: SW5030B

Date Prep: 09.22.2020

MB Sample Id: 7711829-1-BLK

LCS Sample Id: 7711829-1-BKS

LCSD Sample Id: 7711829-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.109	109	0.116	116	70-130	6	25	mg/L	09.22.2020 09:49	
Toluene	<0.00200	0.100	0.112	112	0.118	118	70-130	5	25	mg/L	09.22.2020 09:49	
Ethylbenzene	<0.00200	0.100	0.109	109	0.115	115	70-130	5	25	mg/L	09.22.2020 09:49	
m,p-Xylenes	<0.00400	0.200	0.231	116	0.245	123	70-130	6	25	mg/L	09.22.2020 09:49	
o-Xylene	<0.00200	0.100	0.112	112	0.120	120	70-130	7	25	mg/L	09.22.2020 09:49	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	81		98		95		70-130	%	09.22.2020 09:49
4-Bromofluorobenzene	108		116		117		70-130	%	09.22.2020 09:49

Analytical Method: BTEX by EPA 8021B

Seq Number: 3137598

Matrix: Water

Prep Method: SW5030B

Date Prep: 09.20.2020

Parent Sample Id: 672977-001

MS Sample Id: 672977-001 S

MSD Sample Id: 672977-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.101	101	0.105	105	70-130	4	25	mg/L	09.20.2020 11:14	
Toluene	<0.00200	0.100	0.103	103	0.108	108	70-130	5	25	mg/L	09.20.2020 11:14	
Ethylbenzene	<0.00200	0.100	0.103	103	0.107	107	70-130	4	25	mg/L	09.20.2020 11:14	
m,p-Xylenes	<0.00400	0.200	0.218	109	0.228	114	70-130	4	25	mg/L	09.20.2020 11:14	
o-Xylene	<0.00200	0.100	0.111	111	0.114	114	70-130	3	25	mg/L	09.20.2020 11:14	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	100		101		70-130	%	09.20.2020 11:14
4-Bromofluorobenzene	118		122		70-130	%	09.20.2020 11:14

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Terracon-Lubbock
Livingston Line-Bob McCasland (SRS #2001-11226)

Analytical Method: BTEX by EPA 8021B

Seq Number: 3137773

Parent Sample Id: 672977-002

Matrix: Water

MS Sample Id: 672977-002 S

Prep Method: SW5030B

Date Prep: 09.22.2020

MSD Sample Id: 672977-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.113	113	0.113	113	70-130	0	25	mg/L	09.22.2020 10:31	
Toluene	<0.00200	0.100	0.115	115	0.117	117	70-130	2	25	mg/L	09.22.2020 10:31	
Ethylbenzene	<0.00200	0.100	0.112	112	0.112	112	70-130	0	25	mg/L	09.22.2020 10:31	
m,p-Xylenes	<0.00400	0.200	0.239	120	0.240	120	70-130	0	25	mg/L	09.22.2020 10:31	
o-Xylene	<0.00200	0.100	0.116	116	0.119	119	70-130	3	25	mg/L	09.22.2020 10:31	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	93		101		70-130	%	09.22.2020 10:31
4-Bromofluorobenzene	111		126		70-130	%	09.22.2020 10:31

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec

672977

CHAIN OF CUSTODY RECORD

Terracon				Laboratory: Xenco Address: 6701 Aberdeen Lubbock, Texas 79424		ANALYSIS REQUESTED		LAB USE ONLY DUE DATE: TEMP OF COOLER WHEN RECEIVED (°C)	
Office Location Lubbock		Phone: Contact: SRS #: 2001-11226		Sampler's Signature <i>[Signature]</i>		Page 1 of 1			
Project Manager Brett Dennis		Sampler's Name Aaron Adams		Project Name Livingston Line - Bob McCasland		Project Number AR207011 AR187006-02			
Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	No. Type of Containers 40 ml VOA	Lab Sample ID
GW	9/17/2020	14:17	X	X	MW-2			3	672977-001
GW	9/17/2020	14:50	X	X	MW-3			3	-002
GW	9/17/2020	15:37	X	X	MW-9			3	-003
GW	9/17/2020	16:10	X	X	MW-6			3	-004
GW	9/17/2020	16:47	X	X	MW-5			3	-005
NFE									
[Large curved line across the table]									
TURNAROUND TIME									
Relinquished by (Signature)		Date: 9-18-2020		Time: 11:16		Received by (Signature)		Date: 9/18/2020 Time: 11:16	
Relinquished by (Signature)		Date:		Time:		Received by (Signature)		Date: Time:	
Relinquished by (Signature)		Date:		Time:		Received by (Signature)		Date: Time:	
Relinquished by (Signature)		Date:		Time:		Received by (Signature)		Date: Time:	

e-mail results to:

1. CIBRYANT@PAALP.COM
2. ALGROVES@PAALP.COM
3. BRETT.DENNIS@TERRACON.COM
4. ERIN.LLOYD@TERRACON.COM
5. AARON.ADAMS@TERRACON.COM

Matrix Container: WW-Wastewater VOA-40 ml vial

W - Water A/G- Amber Glass 1L

S - Soil 250 ml - Glass wide mouth

L - Liquid P/O - Plastic or other

A - Air Bag C - Charcoal tube SL - Sludge

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

Responsive ■ Resourceful ■ Reliable

Inter-Office Shipment

IOS Number : **70704**

Date/Time: 09.18.2020

Created by: Michael J Turner

Please send report to: Jessica Kramer

Lab# From: **Lubbock**

Delivery Priority:

Address: 6701 Aberdeen, Suite 9 Lubbock, TX 79424

Lab# To: **Midland**

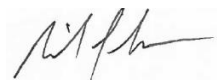
Air Bill No.: 771571819557

E-Mail: jessica.kramer@xenco.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
672977-001	W	MW-2	09.17.2020 14:17	SW8021B	BTEX by EPA 8021B	09.24.2020	10.01.2020	JKR	BR4FBZ BZ BZME EBZ	
672977-002	W	MW-3	09.17.2020 14:50	SW8021B	BTEX by EPA 8021B	09.24.2020	10.01.2020	JKR	BR4FBZ BZ BZME EBZ	
672977-003	W	MW-9	09.17.2020 15:37	SW8021B	BTEX by EPA 8021B	09.24.2020	10.01.2020	JKR	BR4FBZ BZ BZME EBZ	
672977-004	W	MW-6	09.17.2020 16:10	SW8021B	BTEX by EPA 8021B	09.24.2020	10.01.2020	JKR	BR4FBZ BZ BZME EBZ	
672977-005	W	MW-5	09.17.2020 16:47	SW8021B	BTEX by EPA 8021B	09.24.2020	10.01.2020	JKR	BR4FBZ BZ BZME EBZ	

Inter Office Shipment or Sample Comments:

Relinquished By:



Michael J Turner

Date Relinquished: 09.18.2020

Received By:



Katie Lowe

Date Received: 09.19.2020

Cooler Temperature: 1.8



Inter Office Report- Sample Receipt Checklist

Sent To: Midland

IOS #: 70704

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-8

Sent By: Michael J Turner

Date Sent: 09.18.2020 03.52 PM

Received By: Katie Lowe

Date Received: 09.19.2020 10.45 AM

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	1.8
#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	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:

Katie Lowe

Date: 09.19.2020

Eurofins Xenco, LLC

Prelogin/Nonconformance Report- Sample Log-In

Client: Terracon-Lubbock

Date/ Time Received: 09.18.2020 11.16.00 AM

Work Order #: 672977

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)?	4.2
#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 Xenco Midland.
#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:



Michael J Turner

Date: 09.18.2020

Checklist reviewed by:



Jessica Kramer

Date: 09.23.2020

Analytical Report 681578

for

Terracon-Lubbock

Project Manager: Brett Dennis

Livingston Line-Bob McCasland

AR107011

01.05.2021

Collected By: Client



6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-38), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2020-014), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-20-26), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-18)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-23)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-21)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-8)
Xenco-Tampa: Florida (E87429), North Carolina (483)



01.05.2021

Project Manager: **Brett Dennis**

Terracon-Lubbock

5827 50th st, Suite 1

Lubbock, TX 79424

Reference: Eurofins Xenco, LLC Report No(s): **681578**

Livingston Line-Bob McCasland

Project Address:

Brett Dennis:

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 Eurofins Xenco, LLC Report Number(s) 681578. 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 Eurofins Xenco, LLC. 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. 681578 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 Eurofins Xenco, LLC to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

A handwritten signature in black ink that reads "Jessica Kramer".

Jessica Kramer

Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

**Sample Cross Reference 681578****Terracon-Lubbock, Lubbock, TX**

Livingston Line-Bob McCasland

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-2	W	12.14.2020 16:45		681578-001
MW-3	W	12.14.2020 16:00		681578-002
MW-5	W	12.14.2020 17:33		681578-003
MW-6	W	12.14.2020 15:06		681578-004
MW-9	W	12.14.2020 14:07		681578-005
DUP-1	W	12.14.2020 00:00		681578-006

**CASE NARRATIVE****Client Name: Terracon-Lubbock****Project Name: Livingston Line-Bob McCasland**Project ID: AR107011
Work Order Number(s): 681578Report Date: 01.05.2021
Date Received: 12.17.2020

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:**Sample receipt non conformances and comments per sample:**

None

Analytical non conformances and comments:

Batch: LBA-3145857 PAHs by SW846 8270D SIM

Surrogate Terphenyl-D14 recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 681578-005.



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **MW-2**Matrix: **Water**

Sample Depth:

Lab Sample Id: 681578-001

Date Collected: 12.14.2020 16:45

Date Received: 12.17.2020 11:19

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: **DNE**

% Moist:

Seq Number: 3145857

Date Prep: 12.21.2020 14:09

Tech: **DNE**

Subcontractor: SUB: T104704215-20-38

Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.000100	0.000182	0.000100	mg/L	12.30.2020 17:05	U	1
Acenaphthylene	208-96-8	<0.0000845	0.000182	0.0000845	mg/L	12.30.2020 17:05	U	1
Anthracene	120-12-7	<0.0000869	0.000182	0.0000869	mg/L	12.30.2020 17:05	U	1
Benzo(a)anthracene	56-55-3	<0.000135	0.000182	0.000135	mg/L	12.30.2020 17:05	U	1
Benzo(a)pyrene	50-32-8	<0.0000573	0.000182	0.0000573	mg/L	12.30.2020 17:05	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000714	0.000182	0.0000714	mg/L	12.30.2020 17:05	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000114	0.000182	0.000114	mg/L	12.30.2020 17:05	U	1
Benzo(k)fluoranthene	207-08-9	<0.000117	0.000182	0.000117	mg/L	12.30.2020 17:05	U	1
Chrysene	218-01-9	<0.000157	0.000182	0.000157	mg/L	12.30.2020 17:05	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000763	0.000182	0.0000763	mg/L	12.30.2020 17:05	U	1
Fluoranthene	206-44-0	<0.000158	0.000182	0.000158	mg/L	12.30.2020 17:05	U	1
Fluorene	86-73-7	<0.000101	0.000182	0.000101	mg/L	12.30.2020 17:05	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000916	0.000182	0.0000916	mg/L	12.30.2020 17:05	U	1
Naphthalene	91-20-3	<0.0000976	0.000365	0.0000976	mg/L	12.30.2020 17:05	U	1
Phenanthrene	85-01-8	<0.0000854	0.000182	0.0000854	mg/L	12.30.2020 17:05	U	1
Pyrene	129-00-0	<0.000131	0.000182	0.000131	mg/L	12.30.2020 17:05	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	131	54 - 146	%		
Nitrobenzene-d5	123	46 - 151	%		
Terphenyl-D14	137	51 - 139	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: MW-2	Matrix: Water	Sample Depth:
Lab Sample Id: 681578-001	Date Collected: 12.14.2020 16:45	Date Received: 12.17.2020 11:19
Analytical Method: BTEX by EPA 8021		Prep Method: 5030B
Analyst: KTL	% Moist:	
Seq Number: 3145478	Date Prep: 12.18.2020 16:00	Tech: KTL
Subcontractor: SUB: T104704400-20-21	Prep seq: 7717526	

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	12.20.2020 00:59	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.20.2020 00:59	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.20.2020 00:59	U	1
m_p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	12.20.2020 00:59	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.20.2020 00:59	U	1
Xylenes, Total	1330-20-7	<0.000630		0.000630	mg/L	12.20.2020 00:59	U	
Total BTEX		<0.000367		0.000367	mg/L	12.20.2020 00:59	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	94	70 - 130	%		
4-Bromofluorobenzene	119	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **MW-3**Matrix: **Water**

Sample Depth:

Lab Sample Id: 681578-002

Date Collected: 12.14.2020 16:00

Date Received: 12.17.2020 11:19

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: **DNE**

% Moist:

Seq Number: 3145857

Date Prep: 12.21.2020 14:12

Tech: **DNE**

Subcontractor: SUB: T104704215-20-38

Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.000107	0.000195	0.000107	mg/L	12.30.2020 17:23	U	1
Acenaphthylene	208-96-8	<0.0000904	0.000195	0.0000904	mg/L	12.30.2020 17:23	U	1
Anthracene	120-12-7	<0.0000930	0.000195	0.0000930	mg/L	12.30.2020 17:23	U	1
Benzo(a)anthracene	56-55-3	<0.000144	0.000195	0.000144	mg/L	12.30.2020 17:23	U	1
Benzo(a)pyrene	50-32-8	<0.0000613	0.000195	0.0000613	mg/L	12.30.2020 17:23	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000763	0.000195	0.0000763	mg/L	12.30.2020 17:23	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000122	0.000195	0.000122	mg/L	12.30.2020 17:23	U	1
Benzo(k)fluoranthene	207-08-9	<0.000125	0.000195	0.000125	mg/L	12.30.2020 17:23	U	1
Chrysene	218-01-9	<0.000168	0.000195	0.000168	mg/L	12.30.2020 17:23	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000816	0.000195	0.0000816	mg/L	12.30.2020 17:23	U	1
Fluoranthene	206-44-0	<0.000169	0.000195	0.000169	mg/L	12.30.2020 17:23	U	1
Fluorene	86-73-7	<0.000108	0.000195	0.000108	mg/L	12.30.2020 17:23	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000980	0.000195	0.0000980	mg/L	12.30.2020 17:23	U	1
Naphthalene	91-20-3	<0.000104	0.000390	0.000104	mg/L	12.30.2020 17:23	U	1
Phenanthrene	85-01-8	<0.0000913	0.000195	0.0000913	mg/L	12.30.2020 17:23	U	1
Pyrene	129-00-0	<0.000140	0.000195	0.000140	mg/L	12.30.2020 17:23	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	122	54 - 146	%		
Nitrobenzene-d5	111	46 - 151	%		
Terphenyl-D14	123	51 - 139	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: MW-3	Matrix: Water	Sample Depth:
Lab Sample Id: 681578-002	Date Collected: 12.14.2020 16:00	Date Received: 12.17.2020 11:19
Analytical Method: BTEX by EPA 8021		Prep Method: 5030B
Analyst: KTL	% Moist:	
Seq Number: 3145478	Date Prep: 12.18.2020 16:00	Tech: KTL
Subcontractor: SUB: T104704400-20-21	Prep seq: 7717526	

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	12.20.2020 01:25	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.20.2020 01:25	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.20.2020 01:25	U	1
m_p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	12.20.2020 01:25	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.20.2020 01:25	U	1
Xylenes, Total	1330-20-7	<0.000630		0.000630	mg/L	12.20.2020 01:25	U	
Total BTEX		<0.000367		0.000367	mg/L	12.20.2020 01:25	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	70 - 130	%		
4-Bromofluorobenzene	116	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **MW-5**Matrix: **Water**

Sample Depth:

Lab Sample Id: 681578-003

Date Collected: 12.14.2020 17:33

Date Received: 12.17.2020 11:19

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: **DNE**

% Moist:

Seq Number: 3145857

Date Prep: 12.21.2020 14:15

Tech: **DNE**

Subcontractor: SUB: T104704215-20-38

Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.000104	0.000190	0.000104	mg/L	12.30.2020 17:59	U	1
Acenaphthylene	208-96-8	<0.0000878	0.000190	0.0000878	mg/L	12.30.2020 17:59	U	1
Anthracene	120-12-7	<0.0000904	0.000190	0.0000904	mg/L	12.30.2020 17:59	U	1
Benzo(a)anthracene	56-55-3	<0.000140	0.000190	0.000140	mg/L	12.30.2020 17:59	U	1
Benzo(a)pyrene	50-32-8	<0.0000595	0.000190	0.0000595	mg/L	12.30.2020 17:59	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000742	0.000190	0.0000742	mg/L	12.30.2020 17:59	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000118	0.000190	0.000118	mg/L	12.30.2020 17:59	U	1
Benzo(k)fluoranthene	207-08-9	<0.000121	0.000190	0.000121	mg/L	12.30.2020 17:59	U	1
Chrysene	218-01-9	<0.000163	0.000190	0.000163	mg/L	12.30.2020 17:59	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000793	0.000190	0.0000793	mg/L	12.30.2020 17:59	U	1
Fluoranthene	206-44-0	<0.000164	0.000190	0.000164	mg/L	12.30.2020 17:59	U	1
Fluorene	86-73-7	<0.000105	0.000190	0.000105	mg/L	12.30.2020 17:59	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000953	0.000190	0.0000953	mg/L	12.30.2020 17:59	U	1
Naphthalene	91-20-3	<0.000101	0.000379	0.000101	mg/L	12.30.2020 17:59	U	1
Phenanthrene	85-01-8	<0.0000887	0.000190	0.0000887	mg/L	12.30.2020 17:59	U	1
Pyrene	129-00-0	<0.000136	0.000190	0.000136	mg/L	12.30.2020 17:59	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	109	54 - 146	%		
Nitrobenzene-d5	102	46 - 151	%		
Terphenyl-D14	110	51 - 139	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: MW-5	Matrix: Water	Sample Depth:
Lab Sample Id: 681578-003	Date Collected: 12.14.2020 17:33	Date Received: 12.17.2020 11:19
Analytical Method: BTEX by EPA 8021		Prep Method: 5030B
Analyst: KTL	% Moist:	
Seq Number: 3145479	Date Prep: 12.18.2020 17:00	Tech: KTL
Subcontractor: SUB: T104704400-20-21	Prep seq: 7717527	

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000780	0.00200	0.000408	mg/L	12.20.2020 05:40	J	1
Toluene	108-88-3	0.000500	0.00200	0.000367	mg/L	12.20.2020 05:40	J	1
Ethylbenzene	100-41-4	0.000820	0.00200	0.000657	mg/L	12.20.2020 05:40	J	1
m_p-Xylenes	179601-23-1	0.000840	0.00400	0.000630	mg/L	12.20.2020 05:40	J	1
o-Xylene	95-47-6	0.00102	0.00200	0.000642	mg/L	12.20.2020 05:40	J	1
Xylenes, Total	1330-20-7	0.00186		0.000630	mg/L	12.20.2020 05:40	J	
Total BTEX		0.00396		0.000367	mg/L	12.20.2020 05:40		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	86	70 - 130	%		
4-Bromofluorobenzene	114	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **MW-6**

Matrix: Water

Sample Depth:

Lab Sample Id: 681578-004

Date Collected: 12.14.2020 15:06

Date Received: 12.17.2020 11:19

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: DNE

% Moist:

Seq Number: 3145857

Date Prep: 12.21.2020 14:18

Tech: DNE

Subcontractor: SUB: T104704215-20-38

Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.000100	0.000183	0.000100	mg/L	12.30.2020 18:17	U	1
Acenaphthylene	208-96-8	<0.0000846	0.000183	0.0000846	mg/L	12.30.2020 18:17	U	1
Anthracene	120-12-7	<0.0000870	0.000183	0.0000870	mg/L	12.30.2020 18:17	U	1
Benzo(a)anthracene	56-55-3	<0.000135	0.000183	0.000135	mg/L	12.30.2020 18:17	U	1
Benzo(a)pyrene	50-32-8	<0.0000573	0.000183	0.0000573	mg/L	12.30.2020 18:17	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000714	0.000183	0.0000714	mg/L	12.30.2020 18:17	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000114	0.000183	0.000114	mg/L	12.30.2020 18:17	U	1
Benzo(k)fluoranthene	207-08-9	<0.000117	0.000183	0.000117	mg/L	12.30.2020 18:17	U	1
Chrysene	218-01-9	<0.000157	0.000183	0.000157	mg/L	12.30.2020 18:17	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000764	0.000183	0.0000764	mg/L	12.30.2020 18:17	U	1
Fluoranthene	206-44-0	<0.000158	0.000183	0.000158	mg/L	12.30.2020 18:17	U	1
Fluorene	86-73-7	<0.000101	0.000183	0.000101	mg/L	12.30.2020 18:17	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000917	0.000183	0.0000917	mg/L	12.30.2020 18:17	U	1
Naphthalene	91-20-3	<0.0000977	0.000365	0.0000977	mg/L	12.30.2020 18:17	U	1
Phenanthrene	85-01-8	<0.0000854	0.000183	0.0000854	mg/L	12.30.2020 18:17	U	1
Pyrene	129-00-0	<0.000131	0.000183	0.000131	mg/L	12.30.2020 18:17	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	131	54 - 146	%		
Nitrobenzene-d5	117	46 - 151	%		
Terphenyl-D14	120	51 - 139	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: MW-6	Matrix: Water	Sample Depth:
Lab Sample Id: 681578-004	Date Collected: 12.14.2020 15:06	Date Received: 12.17.2020 11:19
Analytical Method: BTEX by EPA 8021		Prep Method: 5030B
Analyst: KTL	% Moist:	
Seq Number: 3145479	Date Prep: 12.18.2020 17:00	Tech: KTL
Subcontractor: SUB: T104704400-20-21	Prep seq: 7717527	

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	12.20.2020 06:06	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.20.2020 06:06	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.20.2020 06:06	U	1
m_p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	12.20.2020 06:06	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.20.2020 06:06	U	1
Xylenes, Total	1330-20-7	<0.000630		0.000630	mg/L	12.20.2020 06:06	U	
Total BTEX		<0.000367		0.000367	mg/L	12.20.2020 06:06	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	84	70 - 130	%		
4-Bromofluorobenzene	95	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **MW-9**

Matrix: Water

Sample Depth:

Lab Sample Id: 681578-005

Date Collected: 12.14.2020 14:07

Date Received: 12.17.2020 11:19

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: DNE

% Moist:

Seq Number: 3145857

Date Prep: 12.21.2020 14:21

Tech: DNE

Subcontractor: SUB: T104704215-20-38

Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.0000996	0.000181	0.0000996	mg/L	12.30.2020 18:53	U	1
Acenaphthylene	208-96-8	<0.0000839	0.000181	0.0000839	mg/L	12.30.2020 18:53	U	1
Anthracene	120-12-7	<0.0000863	0.000181	0.0000863	mg/L	12.30.2020 18:53	U	1
Benzo(a)anthracene	56-55-3	<0.000134	0.000181	0.000134	mg/L	12.30.2020 18:53	U	1
Benzo(a)pyrene	50-32-8	<0.0000569	0.000181	0.0000569	mg/L	12.30.2020 18:53	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000708	0.000181	0.0000708	mg/L	12.30.2020 18:53	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000113	0.000181	0.000113	mg/L	12.30.2020 18:53	U	1
Benzo(k)fluoranthene	207-08-9	<0.000116	0.000181	0.000116	mg/L	12.30.2020 18:53	U	1
Chrysene	218-01-9	<0.000156	0.000181	0.000156	mg/L	12.30.2020 18:53	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000757	0.000181	0.0000757	mg/L	12.30.2020 18:53	U	1
Fluoranthene	206-44-0	<0.000157	0.000181	0.000157	mg/L	12.30.2020 18:53	U	1
Fluorene	86-73-7	<0.000100	0.000181	0.000100	mg/L	12.30.2020 18:53	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000910	0.000181	0.0000910	mg/L	12.30.2020 18:53	U	1
Naphthalene	91-20-3	<0.0000969	0.000362	0.0000969	mg/L	12.30.2020 18:53	U	1
Phenanthrene	85-01-8	<0.0000848	0.000181	0.0000848	mg/L	12.30.2020 18:53	U	1
Pyrene	129-00-0	<0.000130	0.000181	0.000130	mg/L	12.30.2020 18:53	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	84	54 - 146	%		
Nitrobenzene-d5	79	46 - 151	%		
Terphenyl-D14	38	51 - 139	%		**



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: MW-9	Matrix: Water	Sample Depth:
Lab Sample Id: 681578-005	Date Collected: 12.14.2020 14:07	Date Received: 12.17.2020 11:19
Analytical Method: BTEX by EPA 8021		Prep Method: 5030B
Analyst: KTL	% Moist:	
Seq Number: 3145479	Date Prep: 12.18.2020 17:00	Tech: KTL
Subcontractor: SUB: T104704400-20-21	Prep seq: 7717527	

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	12.20.2020 06:30	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.20.2020 06:30	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.20.2020 06:30	U	1
m_p-Xylenes	179601-23-1	0.000720	0.00400	0.000630	mg/L	12.20.2020 06:30	J	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.20.2020 06:30	U	1
Xylenes, Total	1330-20-7	0.000720		0.000630	mg/L	12.20.2020 06:30	J	
Total BTEX		0.000720		0.000367	mg/L	12.20.2020 06:30	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	70 - 130	%		
4-Bromofluorobenzene	105	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **DUP-1**

Matrix: Water

Sample Depth:

Lab Sample Id: 681578-006

Date Collected: 12.14.2020 00:00

Date Received: 12.17.2020 11:19

Analytical Method: PAHs by SW846 8270D SIM

Prep Method: SW3511

Analyst: DNE

% Moist:

Seq Number: 3145857

Date Prep: 12.21.2020 14:24

Tech: DNE

Subcontractor: SUB: T104704215-20-38

Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.000105	0.000192	0.000105	mg/L	12.30.2020 19:11	U	1
Acenaphthylene	208-96-8	<0.0000887	0.000192	0.0000887	mg/L	12.30.2020 19:11	U	1
Anthracene	120-12-7	<0.0000913	0.000192	0.0000913	mg/L	12.30.2020 19:11	U	1
Benzo(a)anthracene	56-55-3	<0.000142	0.000192	0.000142	mg/L	12.30.2020 19:11	U	1
Benzo(a)pyrene	50-32-8	<0.0000601	0.000192	0.0000601	mg/L	12.30.2020 19:11	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000749	0.000192	0.0000749	mg/L	12.30.2020 19:11	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000119	0.000192	0.000119	mg/L	12.30.2020 19:11	U	1
Benzo(k)fluoranthene	207-08-9	<0.000122	0.000192	0.000122	mg/L	12.30.2020 19:11	U	1
Chrysene	218-01-9	<0.000165	0.000192	0.000165	mg/L	12.30.2020 19:11	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000801	0.000192	0.0000801	mg/L	12.30.2020 19:11	U	1
Fluoranthene	206-44-0	<0.000166	0.000192	0.000166	mg/L	12.30.2020 19:11	U	1
Fluorene	86-73-7	<0.000106	0.000192	0.000106	mg/L	12.30.2020 19:11	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000962	0.000192	0.0000962	mg/L	12.30.2020 19:11	U	1
Naphthalene	91-20-3	0.000121	0.000383	0.000102	mg/L	12.30.2020 19:11	J	1
Phenanthrene	85-01-8	<0.0000896	0.000192	0.0000896	mg/L	12.30.2020 19:11	U	1
Pyrene	129-00-0	<0.000137	0.000192	0.000137	mg/L	12.30.2020 19:11	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	98	54 - 146	%		
Nitrobenzene-d5	89	46 - 151	%		
Terphenyl-D14	101	51 - 139	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **DUP-1**

Matrix: Water

Sample Depth:

Lab Sample Id: 681578-006

Date Collected: 12.14.2020 00:00

Date Received: 12.17.2020 11:19

Analytical Method: BTEX by EPA 8021

Prep Method: 5030B

Analyst: KTL

% Moist:

Seq Number: 3145479

Date Prep: 12.18.2020 17:00

Tech: KTL

Subcontractor: SUB: T104704400-20-21

Prep seq: 7717527

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	0.000480	0.00200	0.000408	mg/L	12.20.2020 06:56	J	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.20.2020 06:56	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.20.2020 06:56	U	1
m_p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	12.20.2020 06:56	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.20.2020 06:56	U	1
Xylenes, Total	1330-20-7	<0.000630		0.000630	mg/L	12.20.2020 06:56	U	
Total BTEX		0.000480		0.000367	mg/L	12.20.2020 06:56	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	70 - 130	%		
4-Bromofluorobenzene	112	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **7717526-1-BLK** Matrix: Water Sample Depth:
Lab Sample Id: 7717526-1-BLK Date Collected: Date Received:
Analytical Method: BTEX by EPA 8021 Prep Method: 5030B
Analyst: KTL % Moist:
Seq Number: 3145478 Date Prep: 12.18.2020 16:00 Tech: KTL
Subcontractor: SUB: T104704400-20-21 Prep seq: 7717526

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	12.19.2020 15:20	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.19.2020 15:20	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.19.2020 15:20	U	1
m_p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	12.19.2020 15:20	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.19.2020 15:20	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	88	70 - 130	%		
4-Bromofluorobenzene	71	70 - 130	%		

Sample Id: **7717527-1-BLK** Matrix: Water Sample Depth:
Lab Sample Id: 7717527-1-BLK Date Collected: Date Received:
Analytical Method: BTEX by EPA 8021 Prep Method: 5030B
Analyst: KTL % Moist:
Seq Number: 3145479 Date Prep: 12.18.2020 17:00 Tech: KTL
Subcontractor: SUB: T104704400-20-21 Prep seq: 7717527

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	<0.000408	0.00200	0.000408	mg/L	12.20.2020 05:14	U	1
Toluene	108-88-3	<0.000367	0.00200	0.000367	mg/L	12.20.2020 05:14	U	1
Ethylbenzene	100-41-4	<0.000657	0.00200	0.000657	mg/L	12.20.2020 05:14	U	1
m_p-Xylenes	179601-23-1	<0.000630	0.00400	0.000630	mg/L	12.20.2020 05:14	U	1
o-Xylene	95-47-6	<0.000642	0.00200	0.000642	mg/L	12.20.2020 05:14	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	84	70 - 130	%		
4-Bromofluorobenzene	73	70 - 130	%		



Certificate of Analytical Results

681578

Terracon-Lubbock, Lubbock, TX
Livingston Line-Bob McCasland

Sample Id: **7717623-1-BLK** Matrix: Water Sample Depth:
 Lab Sample Id: 7717623-1-BLK Date Collected: Date Received:
 Analytical Method: PAHs by SW846 8270D SIM Prep Method: SW3511
 Analyst: DNE % Moist:
 Seq Number: 3145857 Date Prep: 12.21.2020 14:00 Tech: DNE
 Subcontractor: SUB: T104704215-20-38 Prep seq: 7717623

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Acenaphthene	83-32-9	<0.000100	0.000182	0.0001000	mg/L	12.22.2020 17:53	U	1
Acenaphthylene	208-96-8	<0.0000842	0.000182	0.0000842	mg/L	12.22.2020 17:53	U	1
Anthracene	120-12-7	<0.0000866	0.000182	0.0000866	mg/L	12.22.2020 17:53	U	1
Benzo(a)anthracene	56-55-3	<0.000134	0.000182	0.000134	mg/L	12.22.2020 17:53	U	1
Benzo(a)pyrene	50-32-8	<0.0000571	0.000182	0.0000571	mg/L	12.22.2020 17:53	U	1
Benzo(b)fluoranthene	205-99-2	<0.0000711	0.000182	0.0000711	mg/L	12.22.2020 17:53	U	1
Benzo(g,h,i)perylene	191-24-2	<0.000113	0.000182	0.000113	mg/L	12.22.2020 17:53	U	1
Benzo(k)fluoranthene	207-08-9	<0.000116	0.000182	0.000116	mg/L	12.22.2020 17:53	U	1
Chrysene	218-01-9	<0.000156	0.000182	0.000156	mg/L	12.22.2020 17:53	U	1
Dibenz(a,h)anthracene	53-70-3	<0.0000760	0.000182	0.0000760	mg/L	12.22.2020 17:53	U	1
Fluoranthene	206-44-0	<0.000157	0.000182	0.000157	mg/L	12.22.2020 17:53	U	1
Fluorene	86-73-7	<0.000101	0.000182	0.000101	mg/L	12.22.2020 17:53	U	1
Indeno(1,2,3-c,d)Pyrene	193-39-5	<0.0000913	0.000182	0.0000913	mg/L	12.22.2020 17:53	U	1
Naphthalene	91-20-3	<0.0000972	0.000364	0.0000972	mg/L	12.22.2020 17:53	U	1
Phenanthrene	85-01-8	<0.0000850	0.000182	0.0000850	mg/L	12.22.2020 17:53	U	1
Pyrene	129-00-0	<0.000130	0.000182	0.000130	mg/L	12.22.2020 17:53	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
2-Fluorobiphenyl	107	54 - 146	%		
Nitrobenzene-d5	103	46 - 151	%		
Terphenyl-D14	119	51 - 139	%		

Flagging Criteria

- 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. **ND** Not Detected.

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: Livingston Line-Bob McCasland

Report Date: 01052021

Project ID: AR107011

Work Orders : 681578

Lab Batch #: 3145478

Sample: 7717526-1-BKS / BKS

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12.19.2020 05:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0299	0.0300	100	70-130	
4-Bromofluorobenzene	0.0273	0.0300	91	70-130	

Lab Batch #: 3145478

Sample: 7717526-1-BSD / BSD

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12.19.2020 06:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0292	0.0300	97	70-130	
4-Bromofluorobenzene	0.0299	0.0300	100	70-130	

Lab Batch #: 3145478

Sample: 680972-001 S / MS

Batch: 1 Matrix: Ground Water

Units: mg/L

Date Analyzed: 12.19.2020 13:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0283	0.0300	94	70-130	
4-Bromofluorobenzene	0.0302	0.0300	101	70-130	

Lab Batch #: 3145478

Sample: 680972-001 SD / MSD

Batch: 1 Matrix: Ground Water

Units: mg/L

Date Analyzed: 12.19.2020 14:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0291	0.0300	97	70-130	
4-Bromofluorobenzene	0.0277	0.0300	92	70-130	

Lab Batch #: 3145478

Sample: 7717526-1-BLK / BLK

Batch: 1 Matrix: Water

Units: mg/L

Date Analyzed: 12.19.2020 15:20

SURROGATE RECOVERY STUDY

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0264	0.0300	88	70-130	
4-Bromofluorobenzene	0.0213	0.0300	71	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.

Form 2 - Surrogate Recoveries**Project Name: Livingston Line-Bob McCasland****Report Date: 01052021****Project ID: AR107011****Work Orders : 681578****Lab Batch #: 3145479****Sample: 7717527-1-BKS / BKS****Batch: 1 Matrix: Water****Units: mg/L****Date Analyzed: 12.20.2020 02:43****SURROGATE RECOVERY STUDY**

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0284	0.0300	95	70-130	
4-Bromofluorobenzene	0.0320	0.0300	107	70-130	

Lab Batch #: 3145479**Sample: 7717527-1-BSD / BSD****Batch: 1 Matrix: Water****Units: mg/L****Date Analyzed: 12.20.2020 03:08****SURROGATE RECOVERY STUDY**

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0287	0.0300	96	70-130	
4-Bromofluorobenzene	0.0309	0.0300	103	70-130	

Lab Batch #: 3145479**Sample: 681578-003 S / MS****Batch: 1 Matrix: Water****Units: mg/L****Date Analyzed: 12.20.2020 03:33****SURROGATE RECOVERY STUDY**

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0290	0.0300	97	70-130	
4-Bromofluorobenzene	0.0317	0.0300	106	70-130	

Lab Batch #: 3145479**Sample: 681578-003 SD / MSD****Batch: 1 Matrix: Water****Units: mg/L****Date Analyzed: 12.20.2020 03:58****SURROGATE RECOVERY STUDY**

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0299	0.0300	100	70-130	
4-Bromofluorobenzene	0.0314	0.0300	105	70-130	

Lab Batch #: 3145479**Sample: 7717527-1-BLK / BLK****Batch: 1 Matrix: Water****Units: mg/L****Date Analyzed: 12.20.2020 05:14****SURROGATE RECOVERY STUDY**

BTEX by EPA 8021	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0251	0.0300	84	70-130	
4-Bromofluorobenzene	0.0220	0.0300	73	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.

Form 2 - Surrogate Recoveries**Project Name: Livingston Line-Bob McCasland****Report Date:** 01052021**Project ID:** AR107011**Work Orders :** 681578**Lab Batch #:** 3145857**Sample:** 7717623-1-BLK / BLK**Batch:** 1 **Matrix:** Water**Units:** mg/L**Date Analyzed:** 12.22.2020 17:53**SURROGATE RECOVERY STUDY**

PAHs by SW846 8270D SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
2-Fluorobiphenyl	0.536	0.500	107	54-146	
Nitrobenzene-d5	0.515	0.500	103	46-151	
Terphenyl-D14	0.595	0.500	119	51-139	

Lab Batch #: 3145857**Sample:** 7717623-1-BKS / BKS**Batch:** 1 **Matrix:** Water**Units:** mg/L**Date Analyzed:** 12.22.2020 18:11**SURROGATE RECOVERY STUDY**

PAHs by SW846 8270D SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
2-Fluorobiphenyl	0.604	0.500	121	54-146	
Nitrobenzene-d5	0.636	0.500	127	46-151	
Terphenyl-D14	0.661	0.500	132	51-139	

Lab Batch #: 3145857**Sample:** 7717623-1-BSD / BSD**Batch:** 1 **Matrix:** Water**Units:** mg/L**Date Analyzed:** 12.22.2020 18:29**SURROGATE RECOVERY STUDY**

PAHs by SW846 8270D SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
2-Fluorobiphenyl	0.612	0.500	122	54-146	
Nitrobenzene-d5	0.650	0.500	130	46-151	
Terphenyl-D14	0.648	0.500	130	51-139	

* 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: Livingston Line-Bob McCasland

Work Order #: 681578

Project ID: AR107011

Analyst: KTL

Date Prepared: 12.18.2020

Date Analyzed: 12.19.2020

Lab Batch ID: 3145478

Sample: 7717526-1-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	<0.000408	0.100	0.0919	92	0.100	0.0936	94	2	70-130	25	
Toluene	<0.000367	0.100	0.0978	98	0.100	0.0987	99	1	70-130	25	
Ethylbenzene	<0.000657	0.100	0.0945	95	0.100	0.0938	94	1	70-130	25	
m_p-Xylenes	<0.000630	0.200	0.191	96	0.200	0.190	95	1	70-130	25	
o-Xylene	<0.000642	0.100	0.0950	95	0.100	0.0966	97	2	70-130	25	

Analyst: KTL

Date Prepared: 12.18.2020

Date Analyzed: 12.20.2020

Lab Batch ID: 3145479

Sample: 7717527-1-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	<0.000408	0.100	0.0834	83	0.100	0.0866	87	4	70-130	25	
Toluene	<0.000367	0.100	0.0882	88	0.100	0.0793	79	11	70-130	25	
Ethylbenzene	<0.000657	0.100	0.0849	85	0.100	0.0871	87	3	70-130	25	
m_p-Xylenes	<0.000630	0.200	0.170	85	0.200	0.175	88	3	70-130	25	
o-Xylene	<0.000642	0.100	0.0884	88	0.100	0.0911	91	3	70-130	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: Livingston Line-Bob McCasland

Work Order #: 681578

Project ID: AR107011

Analyst: DNE

Date Prepared: 12.21.2020

Date Analyzed: 12.22.2020

Lab Batch ID: 3145857

Sample: 7717623-1-BKS

Batch #: 1

Matrix: Water

Units: mg/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	<0.000100	0.0182	0.0204	112	0.0182	0.0211	116	3	75-127	30	
Acenaphthylene	<0.0000842	0.0182	0.0223	123	0.0182	0.0231	127	4	78-133	30	
Anthracene	<0.0000866	0.0182	0.0228	125	0.0182	0.0234	129	3	73-145	30	
Benzo(a)anthracene	<0.000134	0.0182	0.0224	123	0.0182	0.0221	121	1	77-131	30	
Benzo(a)pyrene	<0.0000571	0.0182	0.0213	117	0.0182	0.0205	113	4	56-163	30	
Benzo(b)fluoranthene	<0.0000711	0.0182	0.0200	110	0.0182	0.0195	107	3	74-138	30	
Benzo(g,h,i)perylene	<0.000113	0.0182	0.0188	103	0.0182	0.0182	100	3	77-127	30	
Benzo(k)fluoranthene	<0.000116	0.0182	0.0219	120	0.0182	0.0214	118	2	67-142	30	
Chrysene	<0.000156	0.0182	0.0209	115	0.0182	0.0208	114	0	66-126	30	
Dibenz(a,h)anthracene	<0.0000760	0.0182	0.0199	109	0.0182	0.0193	106	3	71-142	30	
Fluoranthene	<0.000157	0.0182	0.0224	123	0.0182	0.0229	126	2	78-138	30	
Fluorene	<0.000101	0.0182	0.0211	116	0.0182	0.0218	120	3	79-128	30	
Indeno(1,2,3-c,d)Pyrene	<0.0000913	0.0182	0.0198	109	0.0182	0.0190	104	4	76-140	30	
Naphthalene	<0.0000972	0.0182	0.0197	108	0.0182	0.0205	113	4	72-122	30	
Phenanthrene	<0.0000850	0.0182	0.0208	114	0.0182	0.0214	118	3	76-129	30	
Pyrene	<0.000130	0.0182	0.0228	125	0.0182	0.0234	129	3	74-138	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 / MSD Recoveries

Project Name: Livingston Line-Bob McCasland

Work Order #: 681578

Lab Batch ID: 3145478

Date Analyzed: 12.19.2020

Reporting Units: mg/L

QC- Sample ID: 680972-001 S

Date Prepared: 12.18.2020

Batch #: 1

Analyst: KTL

Report Date: 01052021

Project ID: AR107011

Matrix: Ground Water

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	8.68	0.100	0.112	0	0.100	0.103	0	8	70-130	25	X
Toluene	0.0108	0.100	0.101	90	0.100	0.0939	83	7	70-130	25	
Ethylbenzene	0.0991	0.100	0.0981	0	0.100	0.0913	0	7	70-130	25	X
m_p-Xylenes	0.116	0.200	0.195	40	0.200	0.184	34	6	70-130	25	X
o-Xylene	0.00222	0.100	0.104	102	0.100	0.0887	86	16	70-130	25	

Lab Batch ID: 3145479

QC- Sample ID: 681578-003 S

Batch #: 1 Matrix: Water

Date Analyzed: 12.20.2020

Date Prepared: 12.18.2020

Analyst: KTL

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	0.000780	0.100	0.0908	90	0.100	0.0794	79	13	70-130	25	
Toluene	0.000500	0.100	0.0938	93	0.100	0.0828	82	12	70-130	25	
Ethylbenzene	0.000820	0.100	0.0917	91	0.100	0.0810	80	12	70-130	25	
m_p-Xylenes	0.000840	0.200	0.187	93	0.200	0.166	83	12	70-130	25	
o-Xylene	0.00102	0.100	0.0967	96	0.100	0.0865	85	11	70-130	25	

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

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

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.

681578

CHAIN OF CUSTODY RECORD

Terracon				Laboratory: Xenco Address: 6701 Aberdeen Lubbock, Texas 79424		ANALYSIS REQUESTED		LAB USE ONLY	
Office Location Lubbock				Phone: _____ Contact: _____ SRS #: 2001-11226		PAHs (EPA Method 8270 SIM)		DUE DATE:	
Project Manager Brett Dennis				Sampler's Signature		BTEX (EPA Method 8021)		TEMP OF COOLER WHEN RECEIVED (°C)	
Sampler's Name Aaron Adams				Project Name Livingston Line - Bob McCasland		No. Type of Containers		Page 1 of 1	
Project Number AR207011				Identifying Marks of Sample(s)		40 ml VOA		Lab Sample ID	
Matrix	Date	Time	Comp	Grab	Start Depth	End Depth	3	2	
GW	12/14/2020	16:45	X				3	2	681578-001
GW	12/14/2020	16:00	X				3	2	-002
GW	12/14/2020	17:33	X				3	2	-003
GW	12/14/2020	15:06	X				3	2	-004
GW	12/14/2020	14:07	X				3	2	-005
GW	12/14/2020	-	X				3	2	-006
NFE									
TURNAROUND TIME									
Relinquished by (Signature)				Date: 12-17-20		Time: 11:18		24-Hour Rush	
Relinquished by (Signature)				Date:		Time:		48-Hour Rush	
Relinquished by (Signature)				Date:		Time:		Normal	
Relinquished by (Signature)				Date:		Time:		TBRP Laboratory Review Checklist	
Relinquished by (Signature)				Date:		Time:		YES	
Relinquished by (Signature)				Date:		Time:		NO	
Relinquished by (Signature)				Date:		Time:		Bill directly to Plains Pipeline	
Relinquished by (Signature)				Date:		Time:		e-mail results to:	
Relinquished by (Signature)				Date:		Time:		brett.dennis@terracon.com	
Relinquished by (Signature)				Date:		Time:		erin.loyd@terracon.com	

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

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

Responsive ■ Resourceful ■ Reliable

Inter-Office Shipment

IOS Number : **75134**

Date/Time: 12.17.2020

Created by: Michael J Turner

Please send report to: Jessica Kramer

Lab# From: **Lubbock**

Delivery Priority:

Address: 6701 Aberdeen, Suite 9 Lubbock, TX 79424

Lab# To: **Midland**

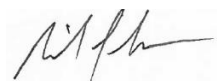
Air Bill No.:

E-Mail: jessica.kramer@eurofinset.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
681578-001	W	MW-2	12.14.2020 16:45	SW8021B	BTEX by EPA 8021	12.23.2020	12.28.2020	JKR	BR4FBZ BZ BZME EBZ	
681578-002	W	MW-3	12.14.2020 16:00	SW8021B	BTEX by EPA 8021	12.23.2020	12.28.2020	JKR	BR4FBZ BZ BZME EBZ	
681578-003	W	MW-5	12.14.2020 17:33	SW8021B	BTEX by EPA 8021	12.23.2020	12.28.2020	JKR	BR4FBZ BZ BZME EBZ	
681578-004	W	MW-6	12.14.2020 15:06	SW8021B	BTEX by EPA 8021	12.23.2020	12.28.2020	JKR	BR4FBZ BZ BZME EBZ	
681578-005	W	MW-9	12.14.2020 14:07	SW8021B	BTEX by EPA 8021	12.23.2020	12.28.2020	JKR	BR4FBZ BZ BZME EBZ	
681578-006	W	DUP-1	12.14.2020 00:00	SW8021B	BTEX by EPA 8021	12.23.2020	12.28.2020	JKR	BR4FBZ BZ BZME EBZ	

Inter Office Shipment or Sample Comments:

Relinquished By:



Michael J Turner

Date Relinquished: 12.17.2020

Received By:



Jessica Kramer

Date Received: 12.18.2020

Cooler Temperature: 5.9

Inter-Office Shipment

IOS Number : **75135**

Date/Time: 12.17.2020

Created by: Michael J Turner

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.: 772411350672

E-Mail: jessica.kramer@eurofinset.com

Sample Id	Matrix	Client Sample Id	Sample Collection	Method	Method Name	Lab Due	HT Due	PM	Analytes	Sign
681578-001	W	MW-2	12.14.2020 16:45	SIM_PAH_D	PAHs by 8270D SIM	12.23.2020	12.21.2020 16:45	JKR	ACNP ACNPY ANTH Bz	
681578-002	W	MW-3	12.14.2020 16:00	SIM_PAH_D	PAHs by 8270D SIM	12.23.2020	12.21.2020 16:00	JKR	ACNP ACNPY ANTH Bz	
681578-003	W	MW-5	12.14.2020 17:33	SIM_PAH_D	PAHs by 8270D SIM	12.23.2020	12.21.2020 17:33	JKR	ACNP ACNPY ANTH Bz	
681578-004	W	MW-6	12.14.2020 15:06	SIM_PAH_D	PAHs by 8270D SIM	12.23.2020	12.21.2020 15:06	JKR	ACNP ACNPY ANTH Bz	
681578-005	W	MW-9	12.14.2020 14:07	SIM_PAH_D	PAHs by 8270D SIM	12.23.2020	12.21.2020 14:07	JKR	ACNP ACNPY ANTH Bz	
681578-006	W	DUP-1	12.14.2020 00:00	SIM_PAH_D	PAHs by 8270D SIM	12.23.2020	12.21.2020 00:00	JKR	ACNP ACNPY ANTH Bz	

Inter Office Shipment or Sample Comments:

Relinquished By:



Michael J Turner

Date Relinquished: 12.17.2020

Received By:



Hypatia Keys

Date Received: 12.17.2020

Cooler Temperature: 2.5



Inter Office Report- Sample Receipt Checklist

Sent To: Midland

IOS #: 75134

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sent By: Michael J Turner

Date Sent: 12.17.2020 11.50 AM

Received By: Jessica Kramer

Date Received: 12.18.2020 12.38 PM

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	5.9
#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:

Jessica Kramer

Date: 12.18.2020



Inter Office Report- Sample Receipt Checklist

Sent To: Houston

IOS #: 75135

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : hou-188

Sent By: Michael J Turner

Date Sent: 12.17.2020 11.50 AM

Received By: Hypatia Keys

Date Received: 12.17.2020 09.30 AM

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	2.5
#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:

Hypatia Keys

Date: 12.17.2020

APPENDIX D

Terracon Standard of Care, Limitation, and Reliance

Standard of Care

Terracon's services will be performed in a manner consistent with generally-accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Terracon makes no warranties, either express or implied, regarding the findings, conclusions or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed with you, our client, as set forth in our proposal and were not intended to be in strict conformance with ASTM E1903-11.

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

This report has been prepared for the exclusive use of Plains All American Pipeline LP; and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the Site) is prohibited without the express written authorization of Plains All American Pipeline LP and Terracon. Any unauthorized distribution or reuse is at the client's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions and limitations stated in the Master Services Agreement (026450-04810-PMLP.2.17), dated August 3, 2011, between Terracon and Plains All American Pipeline LP. The limitation of liability defined in the Terms and Conditions is the aggregate limit of Terracon's liability to the client and all relying parties unless otherwise agreed in writing.

District I

1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720

District II

811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 23568

CONDITIONS

Operator: PLAINS MARKETING L.P. 333 Clay St, Ste 1600 Houston, TX 77002	OGRID:
	34053
	Action Number: 23568
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Review of 2020 ANNUAL GROUNDWATER MONITORING REPORT: Content satisfactory Contractor anticipated actions approved by OCD and are as follows; 1. Complete quarterly monitoring well gauging for all site wells 2. Continue quarterly groundwater purging and sampling on monitoring wells MW-2, MW-3, MW-4 (if PSH is not present), MW-5, MW-6, and MW-9 3. Sample monitoring wells MW-7, MW-8, MW-10, and MW-11 during the 1st quarter of 2021 and continue to be sampled annually per NMOCD approval of the 2019 annual groundwater monitoring report 4. Complete monthly manual recovery of PSH hydrocarbon impacted groundwater from monitoring well MW-4 and MW-5, if present 5. Submit annual report to OCD no later than March 31,2022.	1/11/2022