1R-395

Plains
Livingston Line-
Bob McCaslin

Annual Report
2013

PLAINS
ALL AMERICAN

March 18, 2014

Mr. Jim Griswold
New Mexico Oil Conservation Division
Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Plains All American – 2013 Annual Monitoring Reports
2 Sites in Lea County, New Mexico

Dear Mr. Griswold:

Plains All American is an operator of crude oil pipelines and terminal facilities in the state of New Mexico. Plains All American actively monitors certain historical release sites exhibiting groundwater impacts, consistent with assessments and work plans developed in consultation with the New Mexico Oil Conservation Division (NMOCD). In accordance with the rules and regulations of the NMOCD, Plains All American hereby submits our Annual Monitoring reports for the following sites:

Livingston Line-Bob McCasland	1R-0395	Section 3, T21S, R37E, Lea County
Livingston Ridge to Hugh-P. Sims	1R-0398	Section 3, T21S, R37E, Lea County

Terracon prepared these documents and has vouched for their accuracy and completeness, and on behalf of Plains All American, I have personally reviewed the documents and interviewed Terracon personnel in order to verify the accuracy and completeness of these documents. It is based upon these inquiries and reviews that Plains All American submits the enclosed Annual Monitoring Reports for the above facilities.

If you have any questions or require further information, please contact me at (575) 441-1099.

Sincerely,

Camille Bryant
Remediation Coordinator
Plains All American

CC: Geoff Leking, NMOCD, Hobbs, NM

Enclosures

2013 ANNUAL GROUNDWATER MONITORING REPORT

Livingston Line – Bob McCasland
NE ¼ of the SW ¼, Section 3, Township 21 South, Range 37 East
Plains Pipeline SRS Number 2001-11226
Lea County, New Mexico
NMOCD File Number 1R – 0395

Terracon Project Number A4147007 (Formerly A4077007)

March 21, 2014

Prepared for:

Plains Pipeline, L.P.
2530 State Highway 214
Denver City, Texas 79323

Prepared by:

Midland, Texas

Terracon

March 21, 2014

Plains Pipeline, L.P.
2530 State Highway 214
Denver City, Texas 79323
Attn: Mrs. Camille Bryant

Telephone: (806) 592-8305
Fax: (806) 592-7479

Re: 2013 Annual Groundwater Monitoring Report
Livingston Line - Bob McCasland
NE ¼ of the SW ¼, Section 3, T21S, R37E
Lea County, New Mexico
NMOCD File Number 1R - 0395
Plains Pipeline, L.P. SRS Number 2001-11226
Terracon Project Number A4147007 (Formerly A4077007)

Dear Mrs. Bryant:

Terracon is pleased to submit four copies of the 2013 Annual Groundwater Monitoring Report for the above referenced site.

We appreciate the opportunity to perform these services for Plains Pipeline, L.P. Please contact either of the undersigned at (432) 684-9600 if you have questions regarding the information provided in the report.

Sincerely,
Terracon

Prepared by:

Dale Moxley
Project Scientist I

Reviewed by:

STATE OF TEXAS
DENNIS MICHAEL HOWARD
94116
LICENSED
PROFESSIONAL ENGINEER

Dennis M. Howard 3/25/2014

Dennis M. Howard, P.E.
Environmental Engineer

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2013 Annual Groundwater Monitoring Report

Livingston Line - Bob McCasland Site
NE ¼ of the SW ¼ of Section 3, T21S, R37E
Plains SRS Number 2001-11226
Lea County, New Mexico
NMOCD File Number 1R – 0395
Terracon Project Number A4147007 (Formerly A4077007)

1.0 INTRODUCTION

1.1 Site Description

Site Name	Livingston Line – Bob McCasland
Site Location	Approximately 5 miles north-northeast of Eunice, Lea County, New Mexico on Loop 207.
General Site Description	Pipeline right-of-way surrounded by native pasture land, in close proximity of the abandoned Carbon Black Plant.

A topographic map is included as Figure 1 and a site plan is included as Figure 2 of Appendix A.

On July 13, 2001, a reported four barrels of crude oil were released from the Livingston four-inch steel pipeline. The release covered an area of approximately 1,600 square feet of pipeline right-of-way and caliche road.

Initial investigative activities were conducted from August 16, 2001 through August 22, 2001, and included advancing 17 soil borings. It was determined during this time that groundwater, situated approximately 30 feet below ground surface (bgs), had been impacted. Three groundwater monitor wells (MW-1, MW-2 and MW-3) were installed around the release area to evaluate the extent and magnitude of the release. Samples collected from the groundwater monitor wells indicated groundwater concentrations for benzene, toluene, ethylbenzene, and total xylenes (BTEX) were above New Mexico Water Quality Control Commission (NMWQCC) Groundwater Standards. Three additional groundwater monitor wells (MW-4, MW-5 and MW-6) were installed at the site. Phase separated hydrocarbon (PSH) was detected in groundwater monitor well MW-4 following its installation.

In December 2001, approximately 11,445 cubic yards of hydrocarbon impacted soil were excavated and stockpiled on-site. Earthen berms were constructed around the stockpiles to prevent runoff. Analytical results for soil samples collected from the excavation indicated BTEX concentrations above New Mexico Oil Conservation Division (NMOCD) remedial threshold limits.

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

1.2 Scope of Work

Terracon's scope of work included assuming oversight of remedial activities on February 1, 2007. Oversight activities included the preparation of 2006 through 2013 annual groundwater monitoring and soil closure status reports for submittal to the NMOCD. Four quarterly groundwater monitoring and sampling events were conducted during 2013 by Terracon. The events were performed on February 28, 2013, May 31, 2013, August 09, 2013, and November 14, 2013 at the Livingston Line - Bob McCasland site located in Lea County, New Mexico.

The objective of the quarterly sampling events was to gauge the eleven groundwater monitor wells (MW-1 through MW-11) and to collect samples of groundwater from each well not containing PSH for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX, quarterly)) and polycyclic aromatic hydrocarbons (PAHs, annually). Groundwater samples for PAH analysis were collected from all the monitoring wells except MW-1 because it was dry on September 5, 2013.

1.3 Standard of Care

Terracon was awarded this project on February 1, 2007. A previous consultant hired by Plains performed site activities prior to Terracon assuming oversight on this project. Terracon makes no assumptions or warranties regarding services being 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.

1.4 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 remediation activities. 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.

1.5 Reliance

This report has been prepared for the exclusive use of Plains Pipeline, L. P., 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 Pipeline, L.P. 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 this report, and Terracon's Terms and Conditions. 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.

2.0 FIELD ACTIVITIES

2.1 Groundwater Monitoring and Sampling

Quarterly monitoring and sampling events were performed on February 28, May 31, August 08, and November 14, 2013, by Terracon. Figure 1 presents the general boundaries and topography of the site on portions of the USGS topographic quadrangle map of Hobbs Southwest, New Mexico (Appendix A). Figure 2 is a site plan that indicates the approximate locations of the monitor wells in relation to the pertinent structures and general site boundaries (Appendix A).

During each sampling event, monitor wells were gauged to determine the depth to groundwater and to check for the presence of crude oil or PSH. Based on the gauging data, PSH was present as a heavy sheen in monitor wells MW-2 and MW-4 during the second quarter of 2013. No additional monitor wells at the site contained measurable PSH during 2013. Groundwater monitor well MW-1 was dry in November 2007 and has remained dry throughout 2013. As such, a water sample was not obtained from this well during 2013. Groundwater gradient maps for each quarter are included as Figures 3 through 6 (Appendix A). Gauging data is included in Appendix B as Table 1.

A groundwater sample was collected and analyzed from nine of the eleven groundwater monitor wells in accordance with the NMOCD. Prior to sample collection, each of these monitor wells was micro-purged until consistent values (i.e., less than 10% variance between consecutive readings) were obtained for dissolved oxygen, pH, temperature, oxygen reduction potential (ORP) and conductivity. Following purging, a groundwater sample was collected directly from polyethylene tubing attached to the downhole pump.

Groundwater samples were placed in laboratory-supplied containers appropriate to the analyses requested and placed on ice in a cooler. The sample coolers and completed chain-of-custody forms were delivered to Xenco Laboratories Company, in Odessa, Texas for standard turnaround for analysis of BTEX using EPA SW-846 Method 8021B in each of the four quarters, and PAHs using EPA SW-846 Method 8270C in September 2013.

3.0 DATA EVALUATION

3.1 Water Level Data

Water level measurement data collected during the respective quarterly sampling events were used to construct groundwater gradient maps that are included as Figures 3, 4, 5, and 6 (Appendix A). Groundwater elevation contours generated from the quarterly sampling events of 2013 indicated the groundwater gradient was generally consistent with previous sampling events. Previous gauging data at the site indicated that the groundwater gradient had been predominately to the south-southeast. Groundwater gradients during 2013 sampling and gauging events are summarized below:

- The gradient/direction during the February 2013 sampling event was 0.0058 ft/ft and toward the southeast.
- The gradient/direction during the May 2013 sampling event was 0.0092 ft/ft and toward the southeast.
- The gradient/direction during the August 2013 sampling event was 0.0053 ft/ft and toward the southeast.
- The gradient/direction during the November 2013 sampling event was 0.0074 ft/ft and toward the south-southeast.

Groundwater flow direction was relatively consistent during 2013. Water level measurement data is summarized in Table 1 in Appendix B.

Groundwater elevations in 2013 decreased an average of approximately 0.84 feet in site monitor wells. Monitor well MW-1 has been dry, containing no fluids, since November 2007.

3.2 Groundwater Analysis Data

Laboratory results from the analysis of groundwater samples collected from monitor wells MW-2 through MW-11 are summarized in Table 2 and Table 3 in Appendix B and presented on Figure 7 through Figure 10 in Appendix A. The executed chain-of-custody forms and laboratory data sheets are provided in Appendix C.

1st Quarter 2013

Groundwater samples were collected and analyzed for BTEX constituents during the first quarter on February 28, 2013. The first quarter results are summarized below:

- Groundwater was not collected from monitor well MW-1, as the well was dry.
- Groundwater was not collected from monitor well MW-4 due to PSH entering the well during the purging process.
- Benzene was not detected in the groundwater samples collected from monitor wells MW-2, MW-3, MW-6, MW-7, MW-8, MW-10 and MW-11 at concentrations which exceeded the NMWQCC groundwater standards;
- Groundwater samples collected from monitor wells MW-5 and MW-9 contained benzene concentrations of **0.0396** mg/l and **0.0106** mg/l, respectfully, which either met or exceeded the NMWQCC groundwater standard of **0.01** mg/l.
- Toluene, ethylbenzene and total xylene concentrations were not detected in any of the groundwater samples collected at the site that exceeded the respective NMWQCC groundwater standards.

2nd Quarter 2013

Groundwater samples were collected and analyzed for BTEX constituents during the second quarter on May 31, 2013. The second quarter results are summarized below:

- Groundwater was not collected from monitor well MW-1, as the well was dry.
- Groundwater was not collected from monitor well MW-2 due to PSH entering the well during the purging process.

- Benzene was not detected in the groundwater samples collected from monitor wells, MW-3, MW-6, MW-7, MW-8, MW-10 and MW-11 at concentrations which exceeded the NMWQCC groundwater standards.

- Groundwater samples collected from monitor wells MW-4, MW-5 and MW-9 contained benzene concentrations of **0.499** mg/l, **0.0342** mg/l, and **0.0289** mg/l respectfully, which either met or exceeded the NMWQCC groundwater standard of **0.01** mg/l.

- Toluene, ethylbenzene and total xylene concentrations were not detected in any of the groundwater samples collected at the site that exceeded the respective NMWQCC groundwater standards.

3rd Quarter 2013

Groundwater samples were collected and analyzed for BTEX constituents during the third quarter on August 9, 2013 and PAH constituents on September 5, 2013. The third quarter results are summarized below:

- Groundwater was not collected from monitor well MW-1, as the well was dry.

- Groundwater from all the monitor wells except MW-1 was collected and analyzed for PAH constituents.

- PAH constituents were only detected in the groundwater sample collected from monitor well MW-4 at concentrations which exceeded their respective NMWQCC groundwater standards (where established).

- The groundwater sample collected from monitor well MW-4 contained napthalene at a concentration of **0.0643** mg/l, which exceeded the NMWQCC groundwater standard of **0.03** mg/l.

- Benzene was not detected in the groundwater samples collected from monitor wells MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, MW-10 and MW-11 at concentrations which exceeded the NMWQCC groundwater standards.

- Groundwater samples collected from monitor wells MW-4 and MW-9 contained benzene concentrations of **0.4** mg/l and **0.0626** mg/l, respectfully, which either met or exceeded the NMWQCC groundwater standard of **0.01** mg/l.

- Toluene, ethylbenzene and total xylene concentrations were not detected in any of the groundwater samples collected at the site that exceeded the respective NMWQCC groundwater standards.

4th Quarter 2013

Groundwater samples were collected and analyzed for BTEX constituents during the fourth quarter on November 14, 2013. The fourth quarter results are summarized below:

- Groundwater was not collected from monitor well MW-1, as the well was dry.

- Benzene was not detected in the groundwater samples collected from monitor wells MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, MW-10 and MW-11 at concentrations which exceeded the NMWQCC groundwater standards.

- Groundwater samples collected from monitor wells MW-4 and MW-9 contained benzene concentrations of **0.281** mg/l and **0.0267** mg/l, respectfully, which either met or exceeded the NMWQCC groundwater standard of **0.01** mg/l.

- Toluene, ethylbenzene and total xylene concentrations were not detected in any of the groundwater samples collected at the site that exceeded the respective NMWQCC groundwater standards.

3.3 Historical Data Comparisons

Monitor wells MW-1, MW-3, MW-7 and MW-11 have historically not contained BTEX at concentrations exceeding the NMWQCC groundwater standards. Monitor well MW-1 has been dry since November 2007. Monitor well MW-1 was reportedly drilled to 40 feet bgs and it measures dry at approximately 32 feet bgs likely due to silting of sediments through the well screen. Minor thicknesses or a sheen of PSH have been detected in monitor well MW-4 since it was installed in January 2002. PSH has been detected periodically in monitor well MW-8; however, PSH has not been detected in monitor well MW-8 during 2013. With a few exceptions, groundwater samples from monitor wells MW-2, MW-4, MW-5, MW-8, and MW-9 have historically contained benzene at concentrations exceeding the NMWQCC groundwater standards. Monitoring wells MW-6 and MW-10 have not contained benzene at concentrations exceeding the NMWQCC groundwater standards since 2008. Toluene, ethylbenzene and total xylenes were not detected in the groundwater at concentrations exceeding the NMWQCC groundwater standards in any of the groundwater samples in 2013. With the exception of periodic concentrations of naphthalene detected in monitor wells MW-4 and MW-5, PAHs have not been detected at concentrations exceeding the NMWQCC groundwater standards since the

monitor wells were installed. Terracon has been purging large volumes of groundwater with dissolved phase constituents from monitor wells MW-4 and MW-8 during 2013 in an attempt to enhance remediation of the plume at the site.

4.0 FINDINGS AND RECOMMENDATIONS

4.1 Findings

The annual groundwater report presents the results of four groundwater monitoring and sampling events for the 2013 calendar year.

- Monitor well MW-1 contained no fluids during the 2013 sampling events.

- Measurable PSH has not been detected in the monitor wells at the site. PSH did, however, enter MW-4 during purging process in the 1st quarter in and MW-2 during the 2nd quarter of 2013. This occurrence interfered with the collection of a groundwater samples in the 1st and 2nd quarters, consequently the wells were not sampled during these quarters.

- With a few exceptions, groundwater samples collected from monitor wells MW-3, MW-7, MW-10, and MW-11 have not contained BTEX constituents above the NMWQCC groundwater standards since the monitor wells were installed in 2001 (MW-1 and MW-3) and 2004 (MW-7, MW-10 and MW-11).

- Groundwater samples collected from monitor wells, MW-4, MW-5, and MW-9 contained benzene at concentrations exceeding the NMWQCC groundwater standard during at least one of the four quarters they were sampled in 2013.

- Groundwater samples collected from monitor wells MW-2, MW-3, MW-6, MW-7, MW-8, MW-10, and MW-11 did not contain benzene at concentrations exceeding the NMWQCC groundwater standard during any of the four quarters of 2013.

- Groundwater samples collected in 2013 did not contain toluene, ethylbenzene and total xylenes at concentrations above their respective NMWQCC groundwater standards.

- PAH constituents were not detected in the groundwater samples collected from all the monitor wells with the exception of MW-4 at concentrations which exceeded their respective NMWQCC groundwater standards (where established). The groundwater sample collected from monitor well MW-4 contained napthalene at a concentration of **0.0643** mg/l, which exceeded the NMWQCC groundwater standard of **0.03** mg/l.

- The extents of the PSH plume and the dissolved phase plume exceeding the NMWQCC

groundwater standards have been defined. Detected concentrations of BTEX and PAHs have demonstrated a decreasing trend since groundwater sampling activities were initiated.

- A Soil Characterization Report and Remediation Plan report dated June 2006, by Environmental Plus, Inc. (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.

4.2 Recommendations

Based upon the results of this report, EPI's report, and correspondence from the NMOCD, Terracon recommends the following:

- Continue PSH recovery and purging groundwater with dissolved phase constituents from select wells at the site on a bi-monthly schedule to enhance recovery at the site.

- Continue quarterly groundwater sampling for BTEX for all monitor wells and PAH for select monitor wells during the 2014 calendar year, in accordance with the NMOCD standards.

- Submit an annual report to the NMOCD detailing the 2014 site activities.

DISTRIBUTION

Copy 1: Mr. Jim Griswold, Sr. Hydrologist
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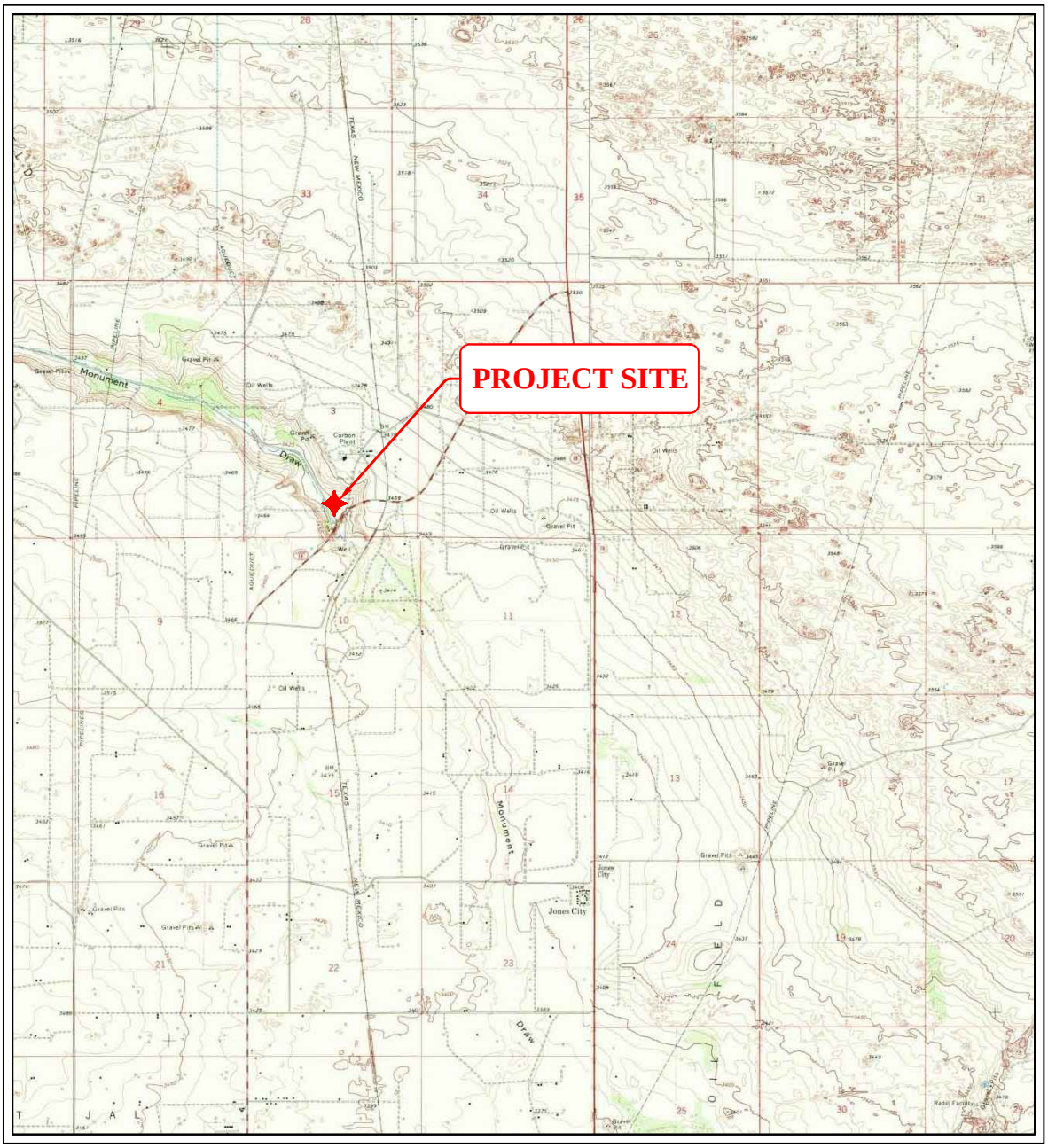
APPENDIX A

Appendix A: **Figure 1– Topographic Map**
Figure 2 – Site Plan
Figure 3 – Groundwater Gradient Map (02/28/13)
Figure 4 – Groundwater Gradient Map (05/23/13)
Figure 5 – Groundwater Gradient Map (08/09/13)
Figure 6 – Groundwater Gradient Map (11/14/13)
Figure 7 – Groundwater Contaminant Concentration Map (02/28/13)
Figure 8 – Groundwater Contaminant Concentration Map (05/31/13)
Figure 9 – Groundwater Contaminant Concentration Map (08/09/13)
Figure 10 – Groundwater Contaminant Concentration Map (11/14/13)

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



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CONTOUR INTERVAL FIVE FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

HOBBS SW, NM
PHOTOREVISED 1969
7.5 MINUTE SERIES (TOPOGRAPHIC)

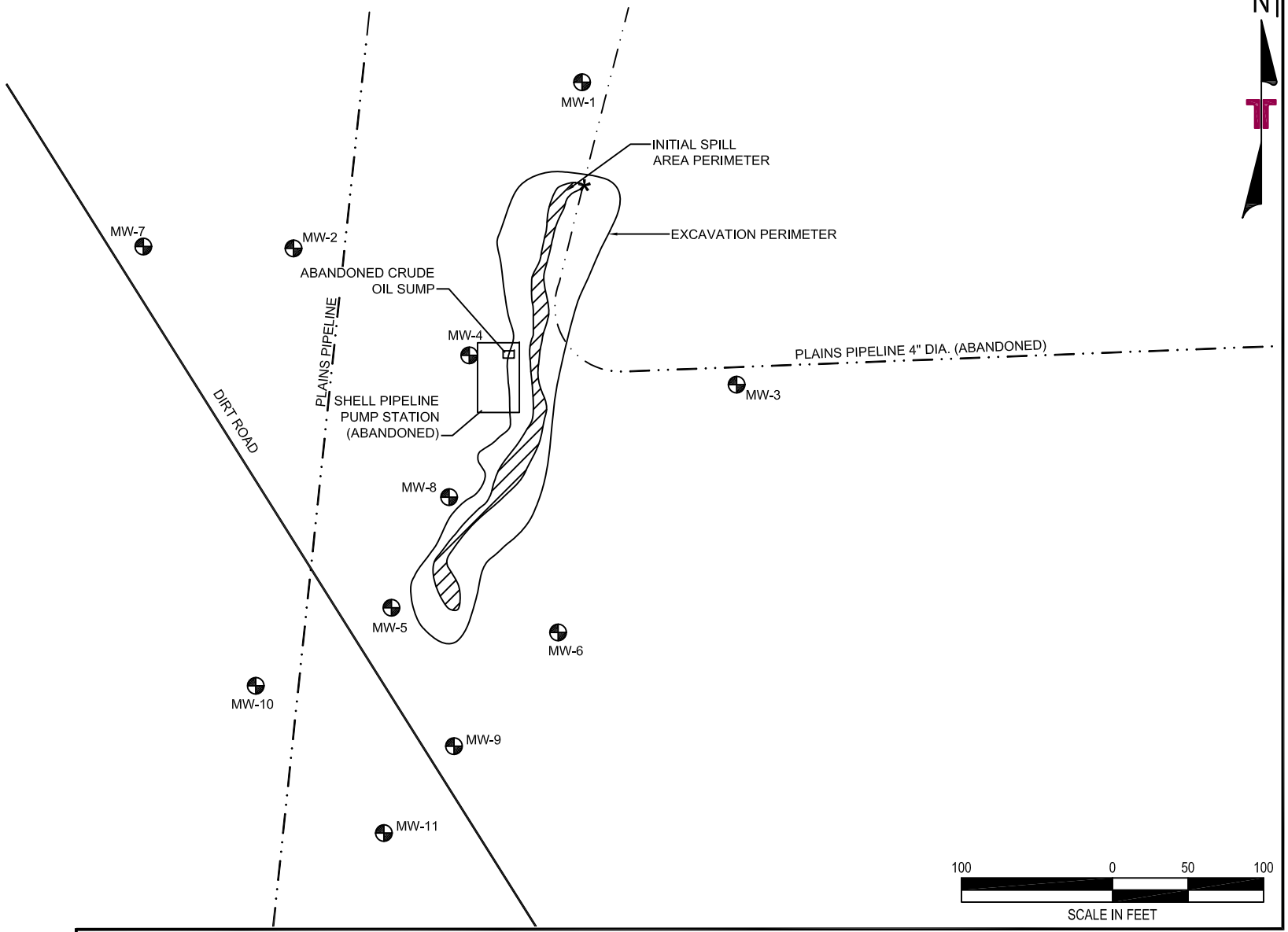
Project Mngr:	DM
Drawn By:	RF
Checked By:	DM
Approved By:	DM
Project No.	A4137007
Scale:	AS SHOWN
File No.	A4137007
Date:	12/26/2014

Terracon
Consulting Engineers & Scientists
1211 WEST FLORIDA MIDLAND, TEXAS
PH. (432) 684-9600 FAX. (432) 684-9608

TOPOGRAPHIC QUADRANGLE MAP

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

FIG. No. 1



LEGEND

MONITORING WELL LOCATIONS

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
Drawn by: RF	Scale: AS SHOWN
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Approved by: DM	Date: 12/26/2013

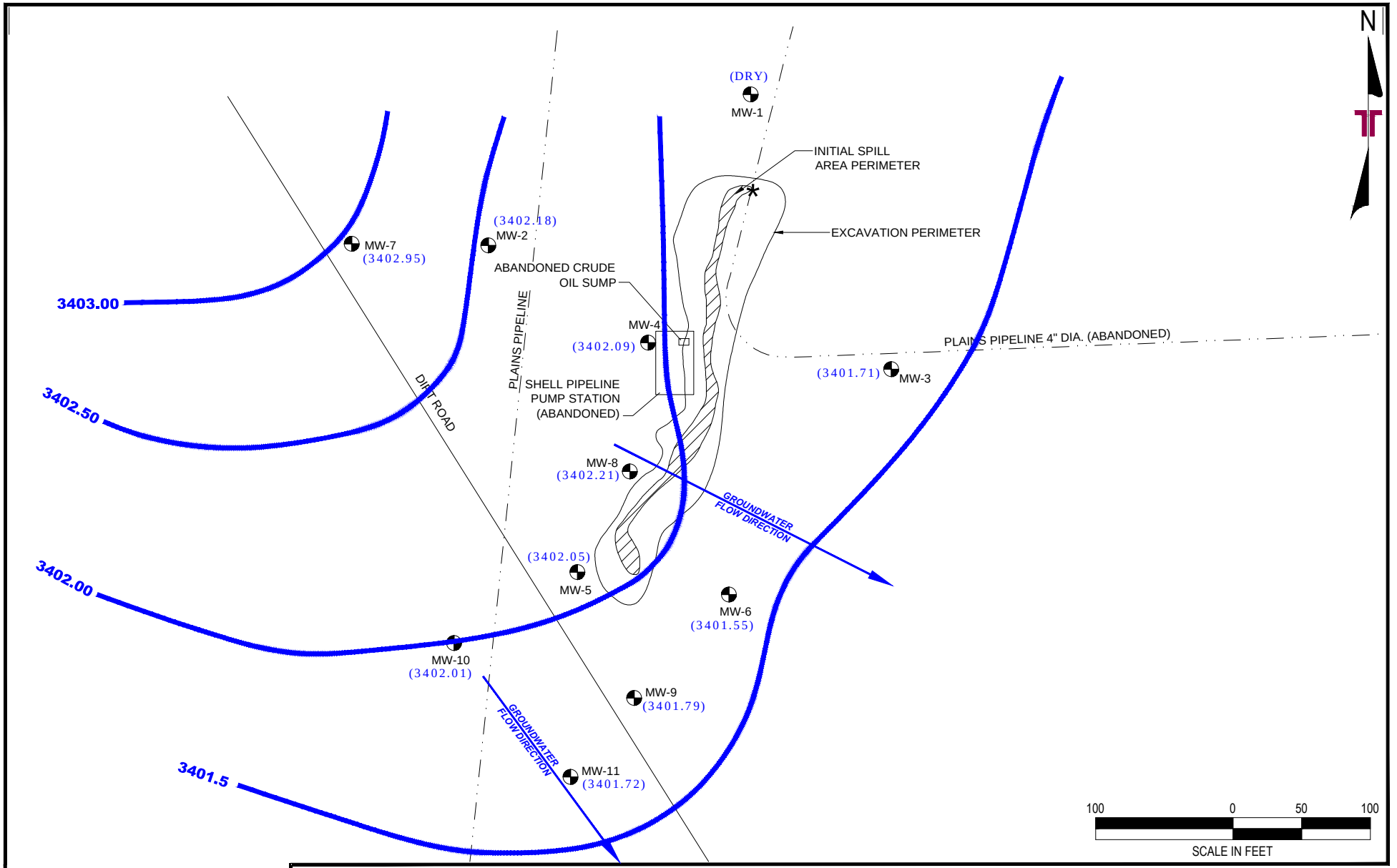
Terracon
Consulting Engineers & Scientists
1211 W Florida Street Midland, Texas 79701
PH. (432) 684 9600 FAX. (432) 684 9608

SITE DIAGRAM

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 2

DWG. No. A4137007 1st quarter site diagram



LEGEND

- MONITORING WELL LOCATIONS
- (3401.50) GROUNDWATER ELEVATION (FT)
- GROUNDWATER CONTOUR LINES
- RELEASE POINT

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
Drawn by: RF	Scale: AS SHOWN
Checked by: DM	File Name: A4137007
Approved by: DM	Date: 12/26/2013

Terracon
Consulting Engineers & Scientists
1211 W Florida Street Midland, Texas 79701
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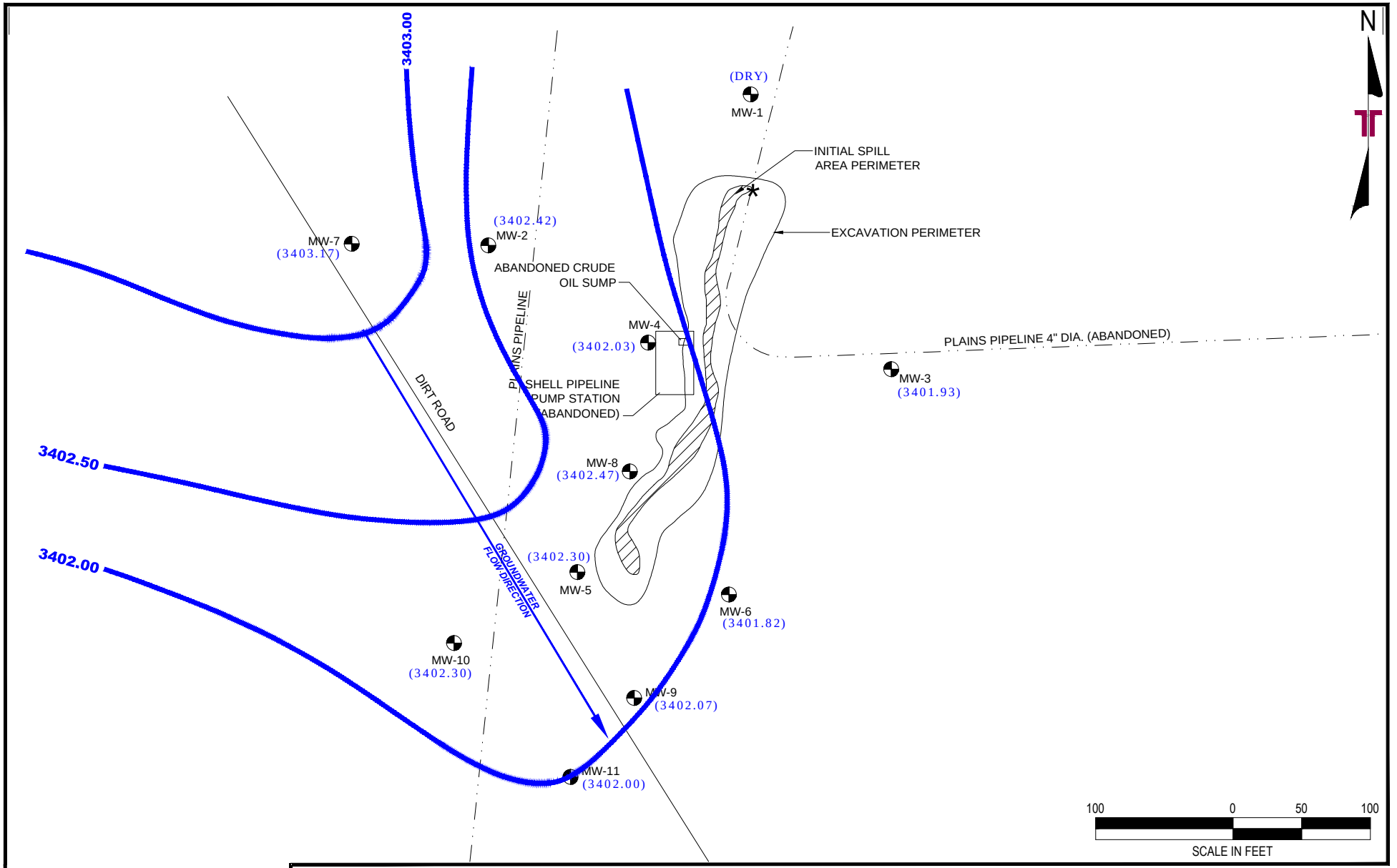
GROUNDWATER GRADIENT MAP (2/28/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 3



LEGEND

- MONITORING WELL LOCATIONS (3402.00) GROUNDWATER ELEVATION (FT)
- GROUNDWATER CONTOUR LINES * RELEASE POINT

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
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Checked by: DM	File Name: A4137007
Approved by: DM	Date: 12/26/2013

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Consulting Engineers & Scientists
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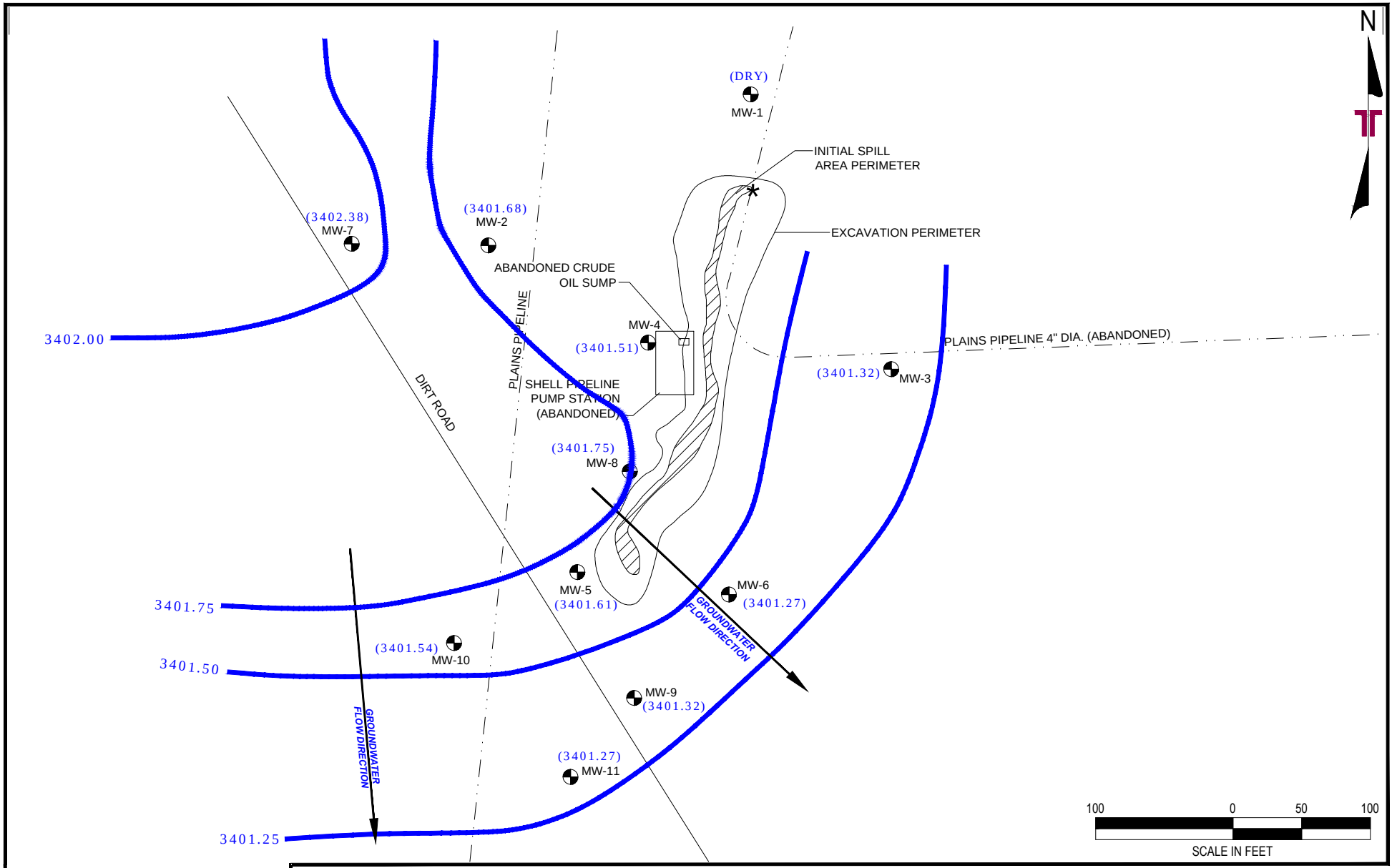
GROUNDWATER GRADIENT MAP (5/23/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 4



LEGEND

MONITORING WELL LOCATIONS (3401.22) GROUNDWATER ELEVATION (FT)

GROUNDWATER CONTOUR LINES

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
Drawn by: RF	Scale: AS SHOWN
Checked by: DM	File Name: A4137007
Approved by: DM	Date: 9/25/2013

Terracon
Consulting Engineers & Scientists
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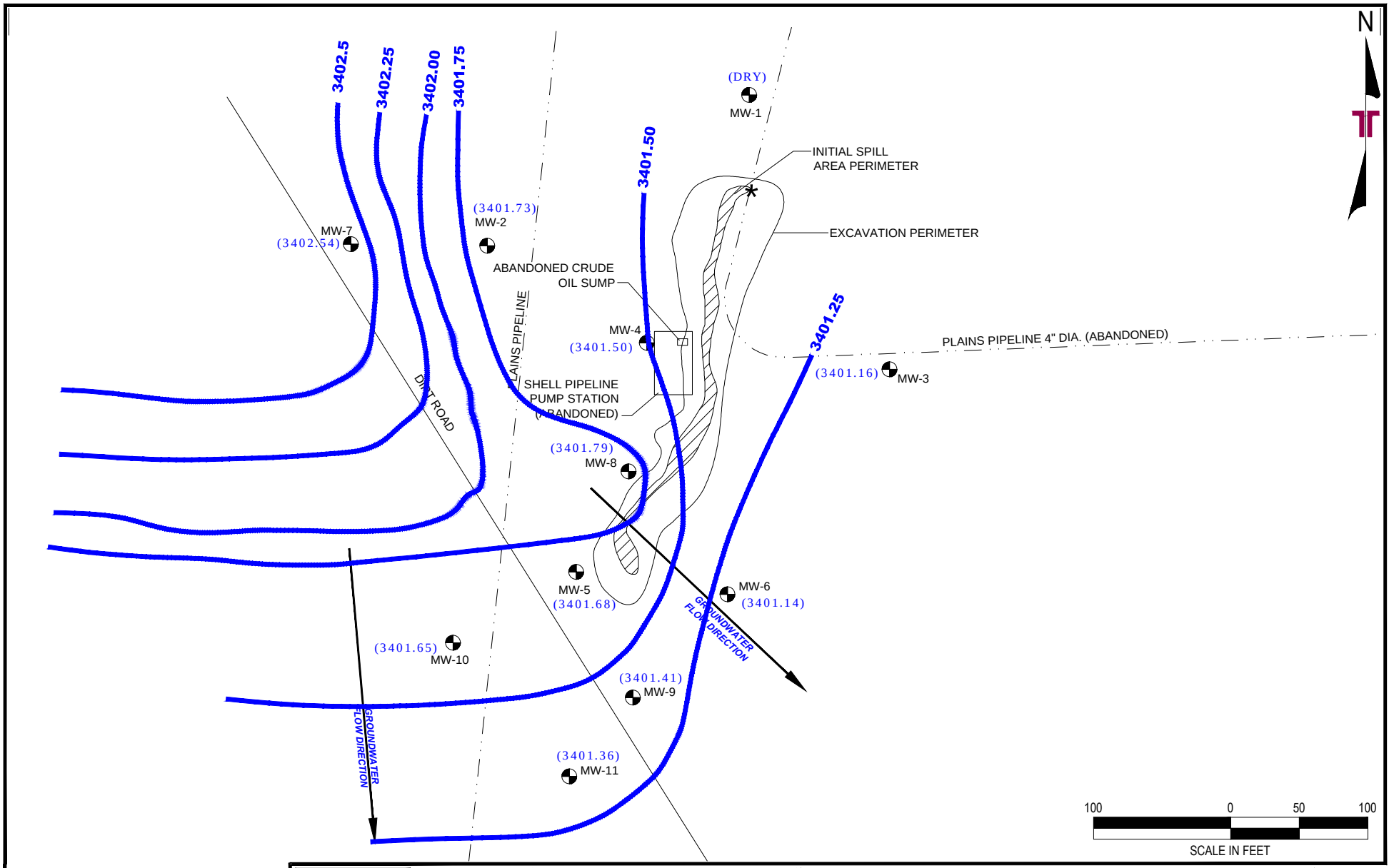
GROUNDWATER GRADIENT MAP (8/9/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 5



LEGEND

MONITORING WELL LOCATIONS (3401.16) GROUNDWATER ELEVATION (FT)

GROUNDWATER CONTOUR LINES

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
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Approved by: DM	Date: 12/26/2013

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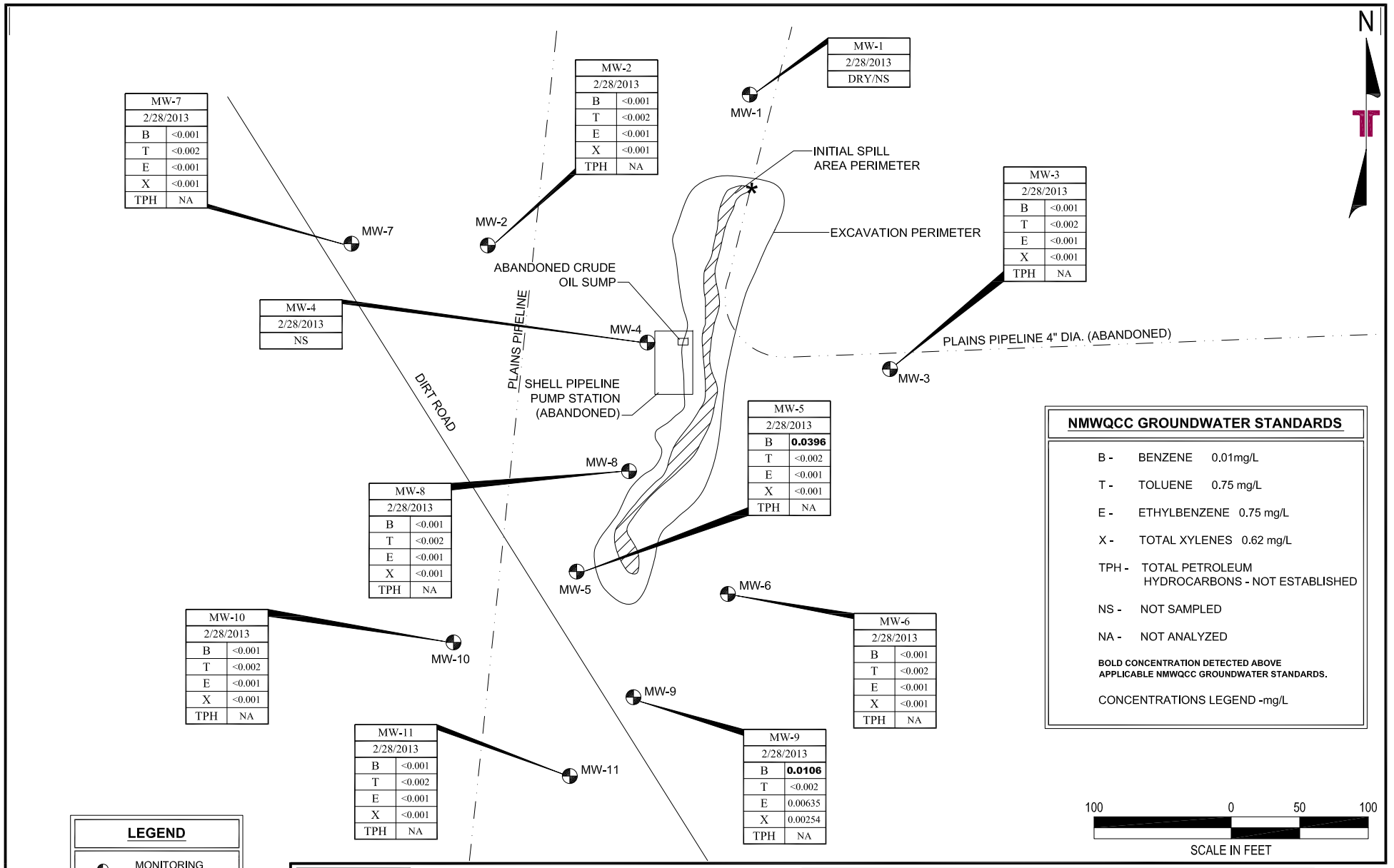
GROUNDWATER GRADIENT MAP (11/14/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 6



NMWQCC GROUNDWATER STANDARDS

B - BENZENE 0.01mg/L

T - TOLUENE 0.75 mg/L

E - ETHYLBENZENE 0.75 mg/L

X - TOTAL XYLENES 0.62 mg/L

TPH - TOTAL PETROLEUM HYDROCARBONS - NOT ESTABLISHED

NS - NOT SAMPLED

NA - NOT ANALYZED

BOLD CONCENTRATION DETECTED ABOVE APPLICABLE NMWQCC GROUNDWATER STANDARDS.

CONCENTRATIONS LEGEND -mg/L

LEGEND

- MONITORING WELL LOCATION
- OIL PIPELINE
- * RELEASE POINT

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
Drawn by: RF	Scale: AS SHOWN
Checked by: DM	File Name: A4137007
Approved by: DM	Date: 2/9/2014

Terracon
Consulting Engineers & Scientists
1211 W Florida Street Midland, Texas 79701
PH. (432) 684 9600 FAX. (432) 684 9608

GROUNDWATER CONTAMINANT CONCENTRATION MAP (2/28/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 7

DWG. No. A4137007 groundwater contaminant concentration map_annual report_fig 7

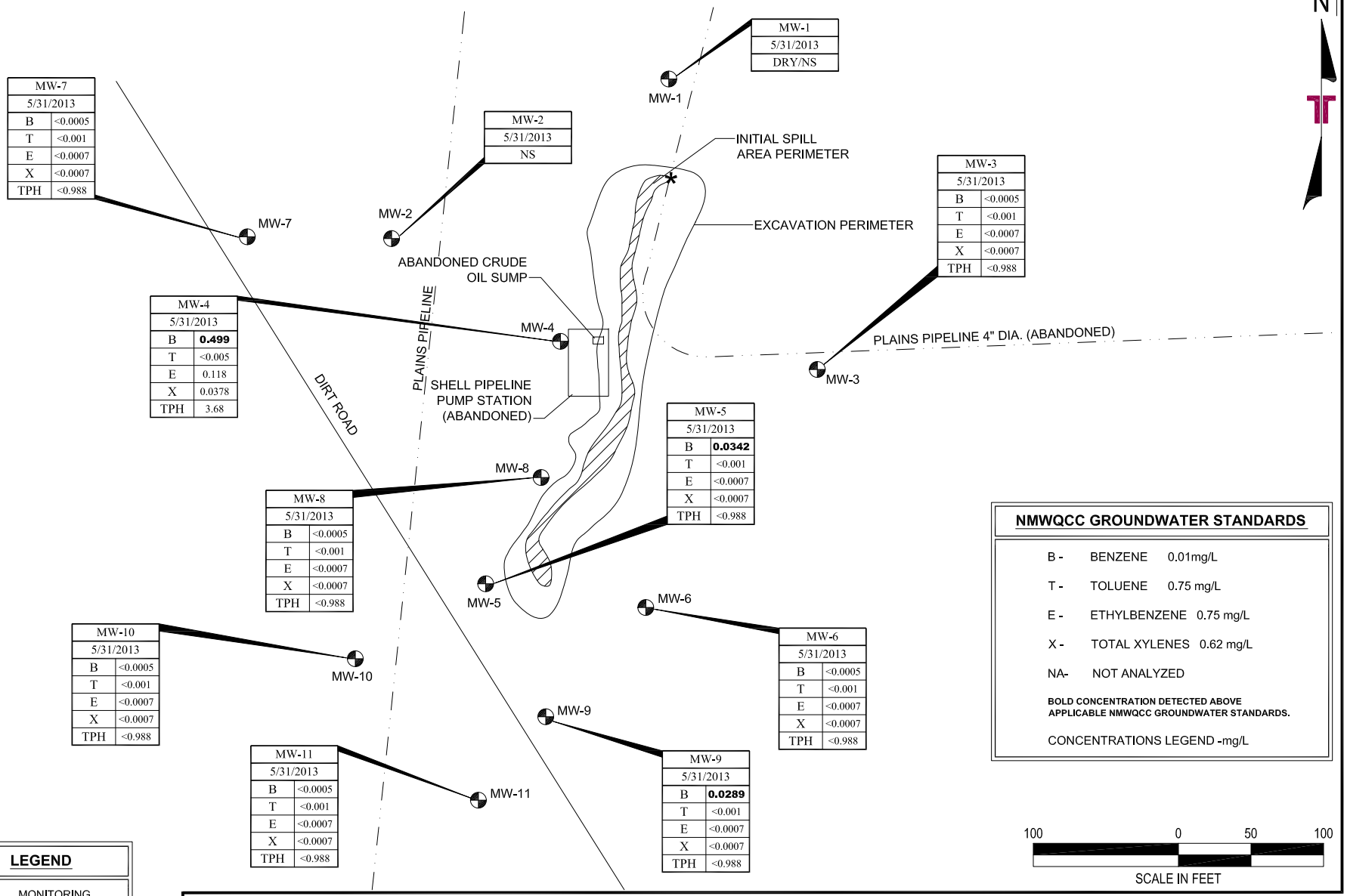


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
Drawn by: RF	Scale: AS SHOWN
Checked by: DM	File Name: A4137007
Approved by: DM	Date: 2/9/2014

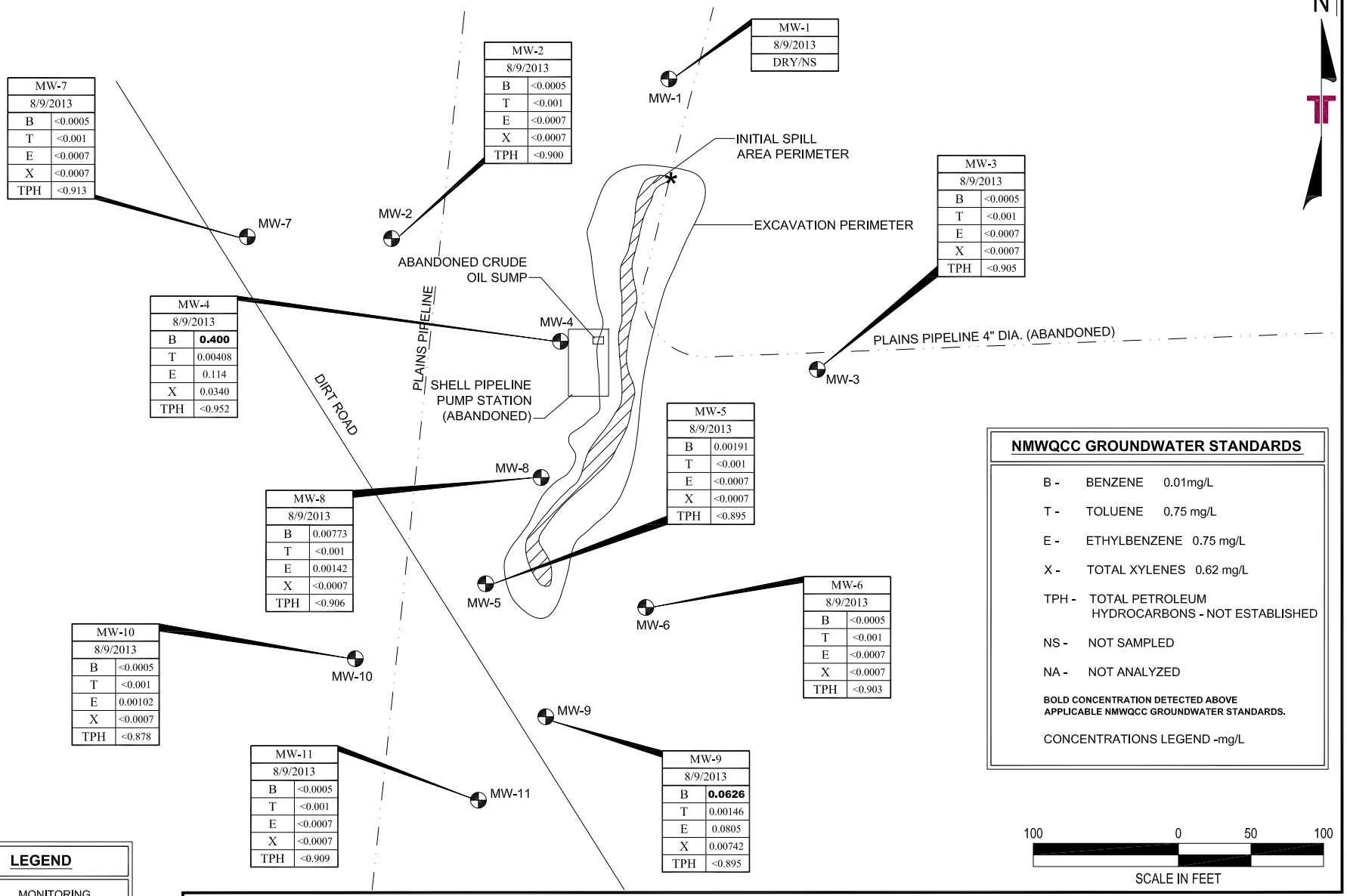
Terracon
Consulting Engineers & Scientists
1211 W Florida Street Midland, Texas 79701
PH. (432) 684 9600 FAX. (432) 684 9608

GROUNDWATER CONTAMINANT CONCENTRATION MAP (5/31/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 8

DWG. No. A4137007 groundwater contaminant concentration map_annual report_fig 8



NMWQCC GROUNDWATER STANDARDS

B -	BENZENE	0.01mg/L
T -	TOLUENE	0.75 mg/L
E -	ETHYLBENZENE	0.75 mg/L
X -	TOTAL XYLENES	0.62 mg/L
TPH -	TOTAL PETROLEUM HYDROCARBONS - NOT ESTABLISHED	
NS -	NOT SAMPLED	
NA -	NOT ANALYZED	

BOLD CONCENTRATION DETECTED ABOVE APPLICABLE NMWQCC GROUNDWATER STANDARDS.

CONCENTRATIONS LEGEND -mg/L

100 0 50 100

SCALE IN FEET

LEGEND

- MONITORING WELL LOCATION
- OIL PIPELINE
- * RELEASE POINT

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng:	DM
Drawn by:	RF
Checked by:	DM
Approved by:	DM
Project No.	A4137007
Scale:	AS SHOWN
File Name:	A4137007
Date:	9/25/2013

Terracon
Consulting Engineers & Scientists
1211 W Florida Street Midland, Texas 79701
PH. (432) 684 9600 FAX. (432) 684 9608

GROUNDWATER CONTAMINANT CONCENTRATION MAP (8/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 9

DWG. No. A4137007 groundwater contaminant concentration map_annual report_fig 9

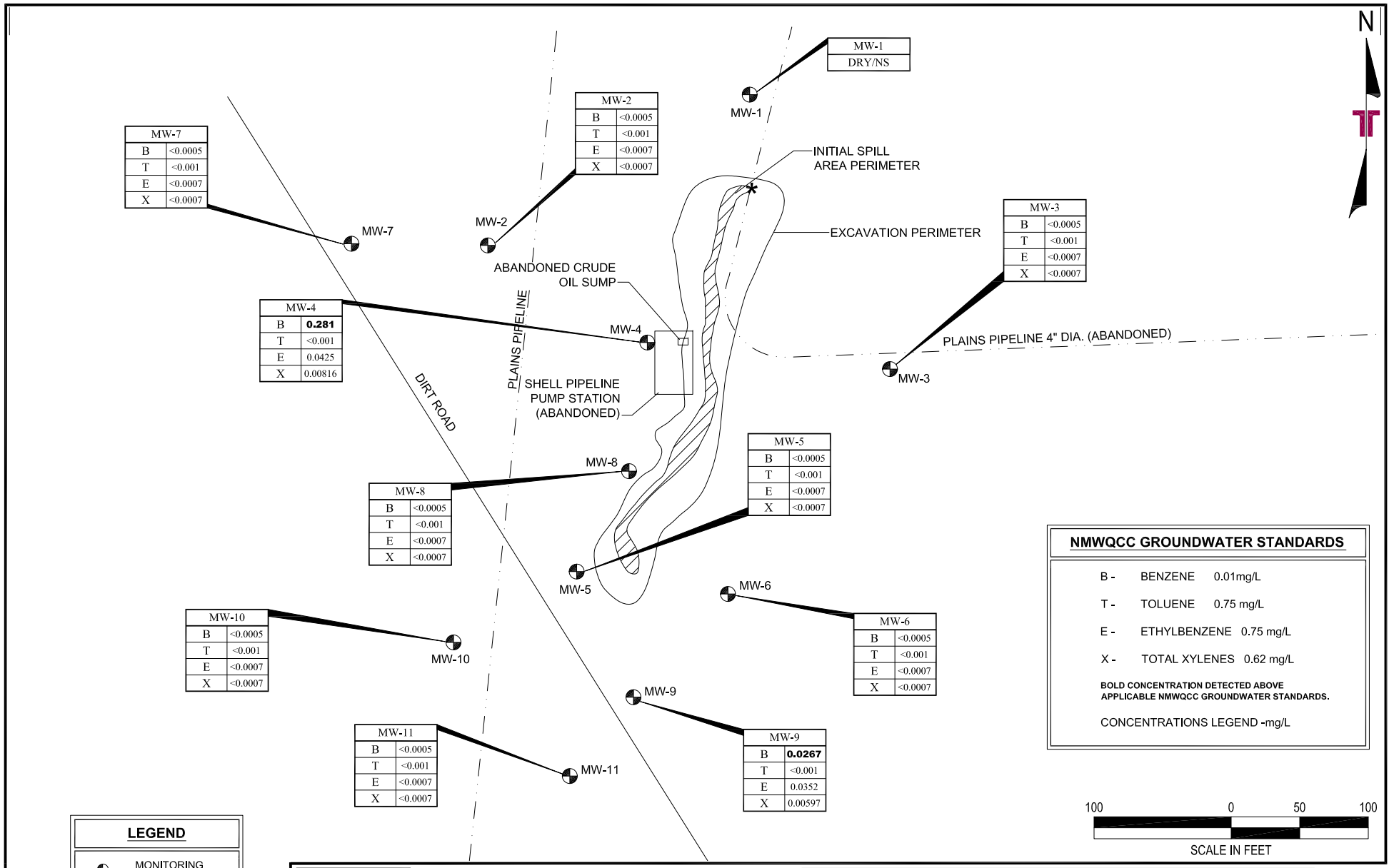


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mng: DM	Project No. A4137007
Drawn by: RF	Scale: AS SHOWN
Checked by: DM	File Name: A4137007
Approved by: DM	Date: 12/26/2013

Terracon
Consulting Engineers & Scientists
1211 W Florida Street Midland, Texas 79701
PH. (432) 684 9600 FAX. (432) 684 9608

GROUNDWATER CONTAMINANT CONCENTRATION MAP (11/14/2013)

PLAINS PIPELINE, L.P.
LIVINGSTON LINE-BOB MCCASLAND
LEA COUNTY, NEW MEXICO
SRS#2001-11226, NMOCD FILE# 1R-0395

Figure 10

DWG. No. A4137007 groundwater contaminant concentration map annual report fig_10

APPENDIX B

Tables

2013 Annual Report
Table 1
GROUNDWATER ELEVATION AND PSH[1] DATA

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
NMOCD File Number: 1R-0395
Plains Pipeline, L. P. SRS Number 2001-11226
Terracon Project Number A4137007

All measurements are in feet above mean sea level

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-1	07/10/02	3439.09	-[2]	38.10	-	3400.99		
	04/15/03		-	37.31	-	3401.78		
	07/14/03		-	38.13	-	3400.96		
	04/20/04		-	35.62	-	3403.47		
	05/07/04		-	35.55	-	3403.54		
	05/25/04		-	35.62	-	3403.47		
	06/10/04		-	35.77	-	3403.32		
	07/14/04		-	34.90	-	3404.19		
	07/21/04		-	34.69	-	3404.40		
	08/02/04		-	34.73	-	3404.36		
	09/10/04		-	34.24	-	3404.85		
	09/14/04		-	34.26	-	3404.83		
	10/05/04		-	32.64	-	3406.45		
	10/19/04		-	30.92	-	3408.17		
	11/02/04		-	31.01	-	3408.08		
	11/15/04		-	30.41	-	3408.68		
	12/06/04		-	30.30	-	3408.79		
	12/21/04		-	30.29	-	3408.80		
	01/03/05		-	30.45	-	3408.64		
	01/18/05		-	30.57	-	3408.52		
	02/01/05		-	30.65	-	3408.44		
	03/21/05		-	30.81	-	3408.28		
	04/21/05		-	31.03	-	3408.06		
	05/05/05		-	31.04	-	3408.05		
	05/17/05		-	31.11	-	3407.98		
	08/15/05		-	31.50	-	3407.59		
	10/05/05		-	31.24	-	3407.85		
	11/18/05		-	31.44	-	3407.65		
	01/12/06		-	31.56	-	3407.53		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-1	02/16/06	3439.09	-	31.68	-	3407.41		
	03/16/06		-	31.88	-	3407.21		
	04/10/06		-	31.83	-	3407.26		
	05/22/06		-	31.97	-	3407.12		
	07/20/06		-	32.44	-	3406.65		
	08/07/06		-	32.55	-	3406.54		
	09/11/06		-	31.87	-	3407.22		
	10/17/06		-	31.81	-	3407.28		
	11/21/06		-	31.91	-	3407.18		
	12/13/06		-	31.93	-	3407.16		
	01/09/07		-	32.07	-	3407.02		
	02/14/07		-	31.99	-	3407.10		
	02/22/07		-	32.01	-	3407.08		
	03/01/07		-	31.99	-	3407.10		
	03/13/07		-	32.03	-	3407.06		
	05/10/07		-	31.71	-	3407.38	0.1	6
	08/10/07		-	31.82	-	3407.27		
	08/20/07		-	31.94	-	3407.15		
	11/15/07		DRY					
	02/28/08		DRY					
	05/28/08		DRY					
	05/30/08		DRY					
	08/20/08		DRY					
	11/07/08		DRY					
	02/09/09		DRY					
	05/14/09		DRY					
	08/12/09		DRY					
	11/10/09		DRY					
	02/03/10		DRY					
	05/27/10		DRY					
	08/16/10		DRY					
	11/10/10		DRY					
	02/17/11		DRY					
	05/24/11		DRY					
	10/03/11		DRY					
	11/10/11		DRY					
	12/09/11		DRY					
	02/24/12		DRY					
	02/28/12		DRY					
	03/27/12		DRY					
	04/12/12		DRY					

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-1	05/05/12	3439.09	DRY					
	05/17/12		DRY					
	06/21/12		DRY					
	07/09/12		DRY					
	08/02/12		DRY					
	08/16/12		DRY					
	08/28/12		DRY					
	09/12/12		DRY					
	09/26/12		DRY					
	10/10/12		DRY					
	10/26/12		DRY					
	11/07/12		DRY					
	11/20/12		DRY					
	12/06/12		DRY					
	12/18/12		DRY					
	01/03/13		DRY					
	01/11/13		DRY					
	01/25/13		DRY					
	02/07/13		DRY					
	02/28/13		DRY					
	03/08/13		DRY					
	03/21/13		DRY					
	04/04/13		DRY					
	04/17/13		DRY					
	05/01/13		DRY					
	05/23/13		DRY					
	06/14/13		DRY					
	06/28/13		DRY					
	07/10/13		DRY					
	07/24/13		DRY					
	08/09/13		DRY					
	08/21/13		DRY					
	09/05/13		DRY					
	09/19/13		DRY					
	10/07/13		DRY					
	10/17/13		DRY					
	10/31/13		DRY					
	11/14/13		DRY					
	11/27/13		DRY					
	12/11/13		DRY					
	12/22/13		DRY					

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-2	07/10/02	3432.62	-	31.31	-	3401.31		
	04/15/03		-	30.68	-	3401.94		
	07/14/03		-	31.70	-	3400.92		
	04/20/04		-	28.20	-	3404.42		
	05/07/04		-	28.44	-	3404.18		
	05/25/04		-	28.72	-	3403.90		
	06/10/04		-	29.14	-	3403.48		
	07/14/04		-	27.73	-	3404.89		
	07/21/04		-	27.71	-	3404.91		
	08/02/04		-	27.96	-	3404.66		
	09/10/04		-	27.52	-	3405.10		
	09/14/04		-	27.51	-	3405.11		
	10/05/04		-	24.25	-	3408.37		
	10/19/04		-	23.12	-	3409.50		
	11/02/04		-	23.22	-	3409.40		
	11/15/04		-	23.50	-	3409.12		
	12/06/04		-	23.63	-	3408.99		
	12/21/04		-	23.63	-	3408.99		
	01/03/05		-	23.91	-	3408.71		
	01/18/05		-	24.05	-	3408.57		
	02/01/05		-	24.17	-	3408.45		
	03/21/05		-	24.44	-	3408.18		
	04/21/05		-	24.67	-	3407.95		
	05/05/05		-	24.63	-	3407.99		
	05/17/05		-	24.78	-	3407.84		
	08/15/05		-	25.18	-	3407.44		
	10/05/05		-	24.93	-	3407.69		
	11/18/05		-	25.07	-	3407.55		
	01/12/06		-	25.18	-	3407.44		
	02/16/06		-	25.36	-	3407.26		
	03/16/06		-	25.57	-	3407.05		
	04/10/06		-	25.48	-	3407.14		
	05/22/06		-	25.63	-	3406.99		
	07/20/06		-	26.15	-	3406.47		
	08/07/06		-	26.28	-	3406.34		
	09/11/06		-	25.30	-	3407.32		
	10/17/06		-	25.39	-	3407.23		
	11/21/06		-	25.46	-	3407.16		
	12/13/06		-	25.48	-	3407.14		
	01/09/07		-	25.61	-	3407.01		
	02/14/07		-	25.52	-	3407.10		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-2	02/22/07	3432.62	-	25.54	-	3407.08		
	03/01/07		-	25.47	-	3407.15		
	03/13/07		-	25.53	-	3407.09		
	05/10/07		-	25.12	-	3407.50		
	08/10/07		-	25.41	-	3407.21		
	08/20/07		-	25.57	-	3407.05		
	11/15/07		-	25.73	-	3406.89		
	02/28/08		-	25.69	-	3406.93		
	04/30/08		-	25.73	-	3406.89		
	05/28/08		-	26.04	-	3406.58		
	05/30/08		-	25.73	-	3406.89		
	07/07/08		-	26.45	-	3406.17		
	07/14/08		-	26.45	-	3406.17		
	07/22/08		-	26.54	-	3406.08		
	07/30/08		-	26.60	-	3406.02		
	08/05/08		-	26.62	-	3406.00		
	08/14/08		-	26.70	-	3405.92		
	08/20/08		-	26.70	-	3405.92		
	09/20/08		-	26.30	-	3406.32		
	09/29/08		-	26.26	-	3406.36		
	11/07/08		-	26.19	-	3406.43		
	11/15/08		-	26.32	-	3406.30		
	11/24/08		-	26.19	-	3406.43		
	11/26/08		-	26.21	-	3406.41		
	12/20/08		-	26.23	-	3406.39		
	01/16/09		-	26.25	-	3406.37		
	02/09/09		-	26.30	-	3406.32		
	04/08/09		-	26.35	-	3406.27		
	04/16/09		-	26.35	-	3406.27		
	04/23/09		-	26.41	-	3406.21		
	04/29/08		-	26.43	-	3406.19		
	05/06/09		-	26.45	-	3406.17		
	05/14/09		-	26.51	-	3406.11		
	07/08/09		-	26.93	-	3405.69		
	07/24/09		-	26.99	-	3405.63		
	08/04/09		-	26.93	-	3405.69		
	08/12/09		-	27.05	-	3405.57		
	08/19/09		-	27.18	-	3405.44		
	09/01/09		-	27.21	-	3405.41		
	09/22/09		-	27.30	-	3405.32		
	10/12/09		-	27.27	-	3405.35		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-2	10/30/09	3432.62	-	27.32	-	3405.30		
	11/10/09		-	27.27	-	3405.35		
	01/08/10		-	27.15	-	3405.47		
	01/22/10		-	27.01	-	3405.61		
	01/26/10		-	27.17	-	3405.45		
	02/03/10		-	27.07	-	3405.55		
	02/10/10		-	27.11	-	3405.51		
	02/22/10		-	27.06	-	3405.56		
	03/09/10		-	27.02	-	3405.60		
	03/24/10		-	27.03	-	3405.59		
	04/12/10		-	27.02	-	3405.60		
	04/27/10		-	27.05	-	3405.57		
	05/27/10		-	27.27	-	3405.35		
	06/21/10		-	27.53	-	3405.09		
	07/07/10		-	27.47	-	3405.15		
	07/20/10		-	27.31	-	3405.31		
	08/03/10		-	27.48	-	3405.14		
	08/16/10		-	27.65	-	3404.97		
	09/02/10		-	27.62	-	3405.00		
	09/17/10		-	27.72	-	3404.90		
	11/10/10		-	27.63	-	3404.99		
	02/17/11		-	27.57	-	3405.05		
	05/24/11		-	28.00	-	3404.62		
	08/19/11		-	29.00	-	3403.62		
	10/03/11		-	28.17	-	3404.45		
	11/10/11		-	28.14	-	3404.48		
	12/09/11		-	29.09	-	3403.53		
	02/24/12		-	29.00	-	3403.62		
	02/28/12		-	28.90	-	3403.72		
	03/27/12		-	29.05	-	3403.57		
	04/12/12		-	29.13	-	3403.49		
	05/05/12		-	29.41	-	3403.21		
	05/17/12		-	29.42	-	3403.20		
	06/21/12		-	29.71	-	3402.91		
	07/09/12		-	29.97	-	3402.65		
	08/02/12		-	29.90	-	3402.72		
	08/16/12		-	30.05	-	3402.57		
	08/28/12		-	30.13	-	3402.49		
	09/12/12		-	30.24	-	3402.38		
	09/26/12		-	30.61	-	3402.01		
	10/10/12		-	30.25	-	3402.37		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-2	10/26/12	3432.62	-	30.30	-	3402.32		
	11/07/12		-	30.23	-	3402.39		
	11/20/13		-	30.18	-	3402.44		
	12/06/12		-	30.10	-	3402.52		
	12/18/12		-	30.11	-	3402.51		
	01/03/13		-	30.15	-	3402.47		
	01/11/13		-	30.06	-	3402.56		
	01/25/13		-	30.09	-	3402.53		
	02/07/13		-	30.14	-	3402.48		
	02/28/13		-	30.44	-	3402.18		
	03/08/13		-	30.15	-	3402.47		
	03/21/13		-	30.29	-	3402.33		
	04/04/13		-	30.25	-	3402.37		
	04/17/13		-	30.10	-	3402.52		
	05/01/13		-	30.28	-	3402.34		
	05/23/13		-	30.20	-	3402.42		
	06/14/13		30.41	30.42	-	3402.20		
	06/28/13		30.56	30.57	-	3402.05		
	07/10/13		30.68	30.70	0.02	3401.92		
	07/24/13		-	30.78	-	3401.84		
	08/09/13		-	30.94	-	3401.68		
	08/22/13		-	31.70	-	3400.92		
	09/05/13		-	31.19	-	3401.43		
	09/19/13		-	31.27	-	3401.35		
	10/07/13		-	31.32	-	3401.30		
	10/17/13		-	31.21	-	3401.41		
	10/31/13		-	30.99	-	3401.63		
	11/14/13		-	30.89	-	3401.73		
	11/27/13		-	30.88	-	3401.74		
	12/11/13		-	30.87	-	3,401.75		
	12/22/13		-	30.80	-	3,401.82		
MW-3	07/10/02	3433.61	-	34.48	-	3399.13		
	04/15/03		-	32.14	-	3401.47		
	07/14/03		-	32.95	-	3400.66		
	04/20/04		-	29.17	-	3404.44		
	05/07/04		-	29.55	-	3404.06		
	05/25/04		-	29.80	-	3403.81		
	06/10/04		-	30.12	-	3403.49		
	07/14/04		-	28.33	-	3405.28		
	07/21/04		-	28.59	-	3405.02		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-3	08/02/04	3433.61	-	28.85	-	3404.76		
	09/10/04		-	28.35	-	3405.26		
	09/14/04		-	28.45	-	3405.16		
	10/05/04		-	25.00	-	3408.61		
	10/19/04		-	23.24	-	3410.37		
	11/02/04		-	23.29	-	3410.32		
	11/15/04		-	24.10	-	3409.51		
	12/06/04		-	24.33	-	3409.28		
	12/21/04		-	24.39	-	3409.22		
	01/03/05		-	24.73	-	3408.88		
	01/18/05		-	24.94	-	3408.67		
	02/01/05		-	25.08	-	3408.53		
	03/21/05		-	25.40	-	3408.21		
	04/21/05		-	25.66	-	3407.95		
	05/05/05		-	25.63	-	3407.98		
	05/17/05		-	25.82	-	3407.79		
	08/15/05		-	26.06	-	3407.55		
	10/05/05		-	25.98	-	3407.63		
	11/18/05		-	26.26	-	3407.35		
	01/12/06		-	26.37	-	3407.24		
	02/16/06		-	26.52	-	3407.09		
	03/16/06		-	26.71	-	3406.90		
	04/10/06		-	26.69	-	3406.92		
	05/22/06		-	26.84	-	3406.77		
	07/20/06		-	28.27	-	3405.34		
	08/07/06		-	27.39	-	3406.22		
	09/11/06		-	26.52	-	3407.09		
	10/17/06		-	22.62	-	3410.99		
	11/21/06		-	26.77	-	3406.84		
	12/13/06		-	26.80	-	3406.81		
	01/09/07		-	26.92	-	3406.69		
	02/14/07		-	26.84	-	3406.77		
	02/22/07		-	26.87	-	3406.74		
	03/01/07		-	26.84	-	3406.77		
	03/13/07		-	26.89	-	3406.72		
	05/10/07		-	26.48	-	3407.13		
	08/10/07		-	26.61	-	3407.00		
	08/20/07		-	26.70	-	3406.91		
	11/15/07		-	27.07	-	3406.54		
	02/28/08		-	26.99	-	3406.62		
	05/28/08		-	27.76	-	3405.85		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-3	08/20/08	3433.61	-	27.85	-	3405.76		
	11/07/08		-	27.47	-	3406.14		
	02/09/09		-	27.58	-	3406.03		
	05/14/09		-	27.44	-	3406.17		
	08/12/09		-	28.18	-	3405.43		
	11/10/09		-	28.48	-	3405.13		
	02/03/10		-	28.64	-	3404.97		
	05/27/10		-	28.49	-	3405.12		
	08/16/10		-	28.78	-	3404.83		
	11/10/10		-	28.86	-	3404.75		
	02/17/11		-	28.84	-	3404.77		
	05/24/11		-	29.18	-	3404.43		
	08/19/11		-	30.19	-	3403.42		
	10/03/11		-	30.30	-	3403.31		
	11/10/11		-	30.34	-	3403.27		
	12/09/11		-	30.36	-	3403.25		
	02/24/12		-	30.32	-	3403.29		
	02/28/12		-	30.37	-	3403.24		
	03/27/12		-	30.43	-	3403.18		
	04/12/12		-	30.53	-	3403.08		
	05/05/12		-	30.70	-	3402.91		
	05/17/12		-	30.76	-	3402.85		
	06/21/12		-	30.70	-	3402.91		
	07/09/12		-	31.22	-	3402.39		
	08/02/12		-	31.13	-	3402.48		
	08/16/12		-	31.27	-	3402.34		
	08/28/12		-	31.37	-	3402.24		
	09/12/12		-	31.48	-	3402.13		
	09/26/12		-	31.85	-	3401.76		
	10/10/12		-	31.56	-	3402.05		
	10/26/12		-	31.58	-	3402.03		
	11/07/12		-	31.59	-	3402.02		
	11/20/12		-	31.58	-	3402.03		
	12/06/12		-	31.52	-	3402.09		
	12/18/12		-	31.54	-	3402.07		
	01/03/13		-	31.57	-	3402.04		
	01/11/13		-	31.51	-	3402.10		
	01/25/13		-	31.57	-	3402.04		
	02/07/13		-	31.59	-	3402.02		
	02/28/13		-	31.90	-	3401.71		
	03/08/13		-	31.59	-	3402.02		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-3	03/21/13	3433.61	-	31.57	-	3402.04		
	04/04/13		-	31.71	-	3401.90		
	04/17/13		-	31.62	-	3401.99		
	05/01/13		-	31.73	-	3401.88		
	05/23/13		-	31.68	-	3401.93		
	06/14/13		-	31.83	-	3401.78		
	06/28/13		-	31.95	-	3401.66		
	07/10/13		-	32.07	-	3401.54		
	07/24/13		-	32.15	-	3401.46		
	08/09/13		-	32.29	-	3401.32		
	08/22/13		-	32.43	-	3401.18		
	09/05/13		-	32.53	-	3401.08		
	09/19/13		-	32.63	-	3400.98		
	10/07/13		-	32.70	-	3400.91		
	10/17/13		-	32.69	-	3400.92		
	10/31/13		-	32.52	-	3401.09		
	11/14/13		-	32.45	-	3401.16		
	11/27/13		-	32.45	-	3401.16		
	12/11/13		-	32.43	-	3,401.18		
	12/22/13		-	32.43	-	3,401.18		
MW-4	07/10/02	3432.35	30.7	30.95	0.25	3401.63		
	11/18/02		29.28	29.95	0.67	3403.00		
	12/13/02		29.75	30.99	1.24	3402.48		
	03/24/03		30.56	31.03	0.47	3401.74		
	04/15/03		30.55	31.05	0.50	3401.75		
	05/02/03		30.71	30.94	0.23	3401.62		
	06/16/03		31.09	31.18	0.09	3401.25		
	07/14/03		31.5	31.81	0.31	3400.82		
	07/31/03		31.49	31.80	0.31	3400.83		
	09/22/03		32.05	32.07	0.02	3400.30		
	10/23/03		32.03	33.07	1.04	3400.22		
	11/05/03		32.1	34.65	2.55	3400.00		
	01/02/04		31.82	35.30	3.48	3400.18		
	01/30/04		32.2	34.20	2.00	3399.95		
	03/03/04		32.19	34.21	2.02	3399.96		
	03/15/04		32.15	33.87	1.72	3400.03		
	03/25/04		32.14	33.87	1.73	3400.04		
	04/20/04		27.2	27.86	0.66	3405.08		
	05/07/04		27.89	28.63	0.74	3404.39		
	05/25/04		28.55	28.78	0.23	3403.78		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-4	06/10/04	3432.35	28.8	28.84	0.04	3403.55		
	07/14/04		-	26.88	-	3405.47		
	07/21/04		-	27.67	-	3404.68		
	08/02/04		-	27.28	-	3405.07		
	09/10/04		-	27.25	-	3405.10		
	09/14/04		-	27.15	-	3405.20		
	10/05/04		-	23.20	-	3409.15		
	10/19/04		-	22.00	-	3410.35		
	11/02/04		-	22.29	-	3410.06		
	11/15/04		-	22.95	-	3409.40		
	12/06/04		-	23.19	-	3409.16		
	12/21/04		-	23.21	-	3409.14		
	01/03/05		-	23.56	-	3408.79		
	01/18/05		-	23.75	-	3408.60		
	02/01/05		-	23.83	-	3408.52		
	03/21/05		-	24.11	-	3408.24		
	04/21/05		-	24.56	-	3407.79		
	05/05/05		-	24.54	-	3407.81		
	05/17/05		-	24.68	-	3407.67		
	08/15/05		-	24.98	-	3407.37		
	10/05/05		-	24.85	-	3407.50		
	11/18/05		-	25.04	-	3407.31		
	01/12/06		-	25.13	-	3407.22		
	02/16/06		-	25.31	-	3407.04		
	03/16/06		-	25.42	-	3406.93		
	04/10/06		-	25.42	-	3406.93		
	05/22/06		-	25.29	-	3407.06		
	07/20/06		-	26.02	-	3406.33		
	08/07/06		-	26.33	-	3406.02		
	09/11/06		-	25.02	-	3407.33		
	10/17/06		-	25.34	-	3407.01		
	11/21/06		-	25.37	-	3406.98		
	12/13/06		-	24.71	-	3407.64		
	01/09/07		-	25.81	-	3406.54		
	02/14/07		-	25.51	-	3406.84		
	02/22/07		-	25.47	-	3406.88		
	03/01/07		-	25.43	-	3406.92		
	03/13/07		-	25.46	-	3406.89		
	04/09/07		-	25.39	-	3406.96		
	05/10/07		-	25.05	-	3407.30		
	05/16/07		-	24.83	-	3407.52		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-4	05/29/07	3432.35	-	24.71	-	3407.64		
	06/06/07		-	22.12	-	3410.23		
	06/21/07		-	24.94	-	3407.41		
	07/12/07		-	25.10	-	3407.25		
	07/25/07		-	25.26	-	3407.09		
	08/08/07		-	25.38	-	3406.97		
	08/20/07		-	25.49	-	3406.86		
	09/07/07		-	26.66	-	3405.69		
	09/19/07		-	25.64	-	3406.71		
	10/01/07		-	24.03	-	3408.32		
	10/15/07		-	25.69	-	3406.66		
	11/02/07		-	25.71	-	3406.64		
	11/15/07		-	25.73	-	3406.62		
	11/29/07		-	25.75	-	3406.60		
	12/27/07		-	25.65	-	3406.70		
	01/18/08		-	25.66	-	3406.69		
	02/20/08		-	25.17	-	3407.18		
	02/28/08		-	25.65	-	3406.70		6.25
	04/30/08		-	25.71	-	3406.64		
	05/28/08		-	25.94	-	3406.41		
	05/30/08		-	25.71	-	3406.64		
	06/25/08		-	26.13	-	3406.22		
	07/02/08		-	26.20	-	3406.15		
	07/07/08		-	26.25	-	3406.10		10
	07/14/08		-	26.30	-	3406.05		25
	07/22/08		-	26.35	-	3406.00		
	07/30/08		-	26.40	-	3405.95		
	08/05/08		26.40	26.47	0.07	3405.94		
	08/14/08		-	26.52	-	3405.83		10
	08/20/08		-	26.49	-	3405.86		
	09/20/08		-	26.17	-	3406.18		15
	11/07/08		-	26.08	-	3406.27		
	11/15/08		-	23.24	-	3409.11		
	11/24/08		-	26.10	-	3406.25		
	11/26/08		-	26.19	-	3406.16		
	12/20/08		-	26.06	-	3406.29		
	01/16/09		-	26.19	-	3406.16		
	02/09/09		-	26.22	-	3406.13		
	04/08/09		-	26.51	-	3405.84		50
	04/16/09		-	26.40	-	3405.95		52
	04/23/09		-	26.45	-	3405.90		50

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-4	05/06/09	3432.35	-	26.59	-	3405.76		40
	05/14/09		-	26.62	-	3405.73		
	07/08/09		-	26.79	-	3405.56		50
	07/24/09		-	26.82	-	3405.53		
	08/04/09		-	26.84	-	3405.51		55
	08/12/09		-	26.90	-	3405.46		
	08/19/09		-	26.90	-	3405.45		47
	09/01/09		27.02	27.08	0.06	3405.32	3	43
	09/22/09		27.15	27.18	0.03	3405.20	0.25	5
	10/12/09		-	27.16	-	3405.20	0.5	12
	10/30/09		-	27.21	-	3405.14		
	11/10/09		27.15	27.17	0.02	3405.20	1	10
	01/08/10		-	27.06	-	3405.29		10
	01/22/10		-	26.93	-	3405.42		20
	01/26/10		-	27.08	-	3405.27		
	01/08/10		-	27.06	-	3405.29		
	01/22/10		-	26.93	-	3405.42		30
	01/26/10		-	27.08	-	3405.27		30
	02/03/10		-	26.98	-	3405.37		50
	02/10/10		-	27.06	-	3405.29		50
	02/22/10		-	26.98	-	3405.37		50
	03/09/10		-	26.94	-	3405.41		50
	03/24/10		-	26.96	-	3405.39		
	04/12/10		-	26.95	-	3405.40		
	04/27/10		-	26.97	-	3405.38		50
	05/27/10		27.16	27.21	0.05	3405.19		50
	06/21/10		27.39	27.45	0.06	3404.95		50
	07/07/10		-	27.33	-	3405.02		45
	07/20/10		-	27.17	-	3405.18		50
	08/03/10		-	27.35	-	3405.00		50
	08/16/10		27.5	27.53	0.03	3404.85		50
	09/02/10		-	27.51	-	3404.84		45
	09/17/10		-	27.60	-	3404.76		50
	10/05/10		27.59	27.61	0.02	3404.76		50
	11/10/10		27.51	27.57	0.06	3404.83		50
	12/29/10		-	27.36		3404.99		30
	02/17/11		27.46	27.58	0.12	3404.88		
	03/02/11		-	25.99	-	3406.36		30
	03/16/11		-	26.54	-	3405.81		20
	03/29/11		-	27.46	-	3404.89		25
	04/15/11		27.64	27.77	0.13	3404.70		30

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-4	04/18/11	3432.35	-	27.42	-	3404.93		20
	05/06/11		-	27.78	-	3404.57		25
	05/20/11		-	27.93	-	3404.42		25
	05/24/11		-	27.94	-	3404.41		
	06/01/11		-	28.00	-	3404.35		20
	06/14/11		-	28.11	-	3404.24		25
	06/30/11		-	28.31	-	3404.04		20
	07/30/11		-	28.64	-	3403.71		25
	09/20/11		-	28.93	-	3403.42		
	10/03/11		-	29.03	-	3403.32		
	11/10/11		-	29.02	-	3403.33		20
	12/09/11		-	29.00	-	3403.35		20
	02/24/12		-	29.21	-	3403.14		20
	02/28/12		-	29.30	-	3403.05		
	03/27/12		-	29.36	-	3402.99		20
	04/12/12		-	29.45	-	3402.90		20
	05/05/12		-	29.61	-	3402.74		20
	05/17/12		-	29.66	-	3402.69		
	06/21/12		-	29.61	-	3402.74		
	07/09/12		-	29.91	-	3402.44		25
	08/02/12		-	29.77	-	3402.58		25
	08/16/12		-	29.97	-	3402.38		
	08/28/12		-	30.02	-	3402.33		25
	09/12/12		-	30.12	-	3402.23		28
	09/26/12		-	30.50	-	3401.85		20
	10/10/12		-	30.18	-	3402.17		20
	10/26/12		-	30.22	-	3402.13		20
	11/07/12		-	30.18	-	3402.17		5
	11/20/12		-	30.29	-	3402.06		25
	12/06/12		-	30.31	-	3402.04		25
	12/18/12		-	30.26	-	3402.09		25
	01/03/13		-	30.30	-	3402.05		25
	01/11/13		-	30.17	-	3402.18		25
	01/25/13		-	30.24	-	3402.11		25
	02/07/13		-	30.32	-	3402.03		25
	02/28/13		-	30.26	-	3402.09		25
	03/08/13		-	30.32	-	3402.03		25
	03/21/13		-	30.24	-	3402.11	1	25
	04/04/13		-	33.34	-	3399.01	1	25
	04/17/13		-	30.90	-	3401.45	0.5	5
	05/01/13		-	30.34	-	3402.01	0.5	25

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-4	05/23/13	3432.35	-	30.32	-	3402.03	0.7	5
	06/14/13		-	30.52	-	3401.83	0.2	5
	06/28/13		-	30.64	-	3401.72	0.5	5
	07/10/13		-	30.74	-	3401.62		5
	07/24/13		-	31.00	-	3401.35		
	08/09/13		-	30.84	-	3401.51		
	08/22/13		-	30.98	-	3401.37		25
	09/05/13		-	31.10	-	3401.25		3.5
	09/19/13		-	31.19	-	3401.16		
	10/07/13		-	31.24	-	3401.11		1
	10/17/13		-	31.16	-	3401.19		0.75
	10/31/13		-	30.97	-	3401.39		4
	11/14/13		-	30.86	-	3401.50		
	11/27/13		-	30.87	-	3401.49		3
	12/11/13		-	30.86	-	3,401.49		3
	12/22/13		-	30.87	-	3,401.49		3
MW-5	07/10/02	3429.63	-	27.16	-	3402.47		
	04/15/03		-	27.79	-	3401.84		
	07/14/03		-	28.79	-	3400.84		
	04/20/04		-	23.73	-	3405.90		
	05/07/04		-	24.75	-	3404.88		
	05/25/04		-	25.32	-	3404.31		
	06/10/04		-	25.66	-	3403.97		
	07/14/04		-	23.33	-	3406.30		
	07/21/04		-	24.30	-	3405.33		
	08/02/04		-	23.88	-	3405.75		
	09/10/04		-	23.58	-	3406.05		
	09/14/04		-	23.88	-	3405.75		
	10/05/04		-	17.86	-	3411.77		
	10/19/04		-	17.50	-	3412.13		
	11/02/04		-	17.52	-	3412.11		
	11/15/04		-	19.54	-	3410.09		
	12/06/04		-	20.04	-	3409.59		
	12/21/04		-	20.17	-	3409.46		
	01/03/05		-	20.60	-	3409.03		
	01/18/05		-	20.86	-	3408.77		
	02/01/05		-	21.05	-	3408.58		
	03/21/05		-	21.41	-	3408.22		
	04/21/05		-	21.76	-	3407.87		
	05/05/05		-	21.76	-	3407.87		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-5	05/17/05	3429.63	-	21.87	-	3407.76		
	08/15/05		-	22.00	-	3407.63		
	10/05/05		-	22.01	-	3407.62		
	11/18/05		-	22.20	-	3407.43		
	01/12/06		-	22.32	-	3407.31		
	02/16/06		-	22.56	-	3407.07		
	03/16/06		-	22.71	-	3406.92		
	04/10/06		-	22.66	-	3406.97		
	05/22/06		-	22.83	-	3406.80		
	07/20/06		-	23.26	-	3406.37		
	08/07/06		-	23.27	-	3406.36		
	09/11/06		-	22.23	-	3407.40		
	10/17/06		-	22.67	-	3406.96		
	11/21/06		-	22.67	-	3406.96		
	12/13/06		-	22.71	-	3406.92		
	01/09/07		-	22.83	-	3406.80		
	02/14/07		-	22.67	-	3406.96		
	02/22/07		-	22.69	-	3406.94		
	03/01/07		-	22.64	-	3406.99		
	03/13/07		-	22.68	-	3406.95		
	05/10/07		-	21.88	-	3407.75		
	08/10/07		-	22.49	-	3407.14		
	08/20/07		-	22.60	-	3407.03		
	11/15/07		-	22.87	-	3406.76		
	02/28/08		-	22.84	-	3406.79		
	04/30/08		-	22.89	-	3406.74		
	05/28/08		-	23.14	-	3406.49		
	05/30/08		-	22.89	-	3406.74		10
	07/07/08		-	26.47	-	3403.16		10
	07/14/08		-	23.50	-	3406.13		25
	07/22/08		-	23.50	-	3406.13		10
	07/30/08		-	23.65	-	3405.98		20
	08/05/08		-	23.70	-	3405.93		20
	08/14/08		-	23.74	-	3405.89		12
	08/20/08		-	23.75	-	3405.88		
	09/20/08		-	23.33	-	3406.30		35
	09/29/08		-	23.39	-	3406.24		40
	11/07/08		-	24.59	-	3405.04		
	11/15/08		-	23.45	-	3406.18		50
	11/24/08		-	23.34	-	3406.29		25
	11/26/08		-	23.37	-	3406.26		25

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-5	12/20/08	3429.63	-	23.39	-	3406.24		50
	01/16/09		-	23.42	-	3406.21		
	02/09/09		-	23.44	-	3406.19		
	04/08/09		-	23.49	-	3406.14		50
	04/16/09		-	23.50	-	3406.13		50
	04/23/09		-	24.31	-	3405.32		50
	04/29/08		-	23.51	-	3406.12		50
	05/06/09		-	23.59	-	3406.04		50
	05/14/09		-	23.66	-	3405.97		
	07/08/09		-	24.01	-	3405.62		35
	07/24/09		-	24.07	-	3405.56		
	08/04/09		-	24.48	-	3405.15		55
	08/12/09		-	24.12	-	3405.51		
	08/19/09		-	24.16	-	3405.47		2
	09/01/09		-	24.02	-	3405.61		3
	09/22/09		-	24.38	-	3405.25		5
	10/12/09		-	24.38	-	3405.25		18
	10/30/09		-	24.41	-	3405.22		
	11/10/09		-	24.40	-	3405.23		20
	01/08/10		-	24.29	-	3405.34		10
	01/22/10		-	24.08	-	3405.55		10
	01/26/10		-	24.32	-	3405.31		
	02/03/10		-	24.26	-	3405.37		
	02/10/10		-	24.28	-	3405.35		30
	02/22/10		-	24.22	-	3405.41		30
	03/09/10		-	24.20	-	3405.43		
	03/24/10		-	24.21	-	3405.42		
	04/12/10		-	24.20	-	3405.43		
	04/27/10		-	24.23	-	3405.40		
	05/27/10		-	24.40	-	3405.23		
	06/21/10		-	24.63	-	3405.00		
	07/07/10		-	24.54	-	3405.09		
	07/20/10		-	24.42	-	3405.21		
	08/03/10		-	24.60	-	3405.03		
	08/16/10		-	24.77	-	3404.86		
	09/02/10		-	24.76	-	3404.87		
	09/17/10		-	24.84	-	3404.79		50
	10/05/10		-	24.83	-	3404.80		50
	11/10/10		-	24.77	-	3404.86		50
	02/17/11		-	24.73	-	3404.90		
	04/29/11		-	24.90	-	3404.73		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-5	05/06/11	3429.63	-	24.95	-	3404.68		
	05/20/11		-	25.12	-	3404.51		
	05/24/11		-	25.12	-	3404.51		
	08/19/11		-	26.11	-	3403.52		
	09/20/11		-	26.20	-	3403.43		
	10/03/11		-	26.28	-	3403.35		
	11/10/11		-	26.23	-	3403.40		
	12/09/11		-	26.19	-	3403.44		
	02/24/12		-	26.13	-	3403.50		
	02/28/12		-	26.13	-	3403.50		
	03/27/12		-	26.38	-	3403.25		
	04/12/12		-	26.28	-	3403.35		
	05/05/12		-	26.58	-	3403.05		
	05/17/12		-	26.58	-	3403.05		
	06/21/12		-	26.88	-	3402.75		
	07/09/12		-	27.13	-	3402.50		
	08/02/12		-	27.30	-	3402.33		
	08/16/12		-	27.18	-	3402.45		5
	08/28/12		-	27.25	-	3402.38		
	09/12/12		-	27.35	-	3402.28		
	09/26/12		-	27.75	-	3401.88		
	10/10/12		-	27.35	-	3402.28		
	10/26/12		-	27.40	-	3402.23		
	11/07/12		-	27.30	-	3402.33		5
	11/20/12		-	27.26	-	3402.37		
	12/06/12		-	27.29	-	3402.34		
	12/18/12		-	27.30	-	3402.33		
	01/03/13		-	27.33	-	3402.30		
	01/11/13		-	27.16	-	3402.47		
	01/25/13		-	27.20	-	3402.43		
	02/07/13		-	27.24	-	3402.39		
	02/28/13		-	27.58	-	3402.05		
	03/08/13		-	27.24	-	3402.39		
	03/21/13		-	27.20	-	3402.43		
	04/04/13		-	27.33	-	3402.30		
	04/17/13		-	27.23	-	3402.40		
	05/01/13		-	28.65	-	3400.98		
	05/23/13		-	27.33	-	3402.30		
	06/14/13		-	27.50	-	3402.13		
	06/28/13		-	27.66	-	3401.97		
	07/10/13		-	27.79	-	3401.84		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-5	07/24/13	3429.63	-	27.87	-	3401.76		
	08/09/13		-	28.02	-	3401.61		
	08/22/13		-	28.16	-	3401.47		
	09/05/13		-	28.27	-	3401.36		
	09/19/13		-	28.35	-	3401.28		
	10/07/13		-	28.39	-	3401.24		
	10/17/13		-	28.27	-	3401.36		
	10/31/13		-	28.06	-	3401.57		
	11/14/13		-	27.95	-	3401.68		
	11/27/13		-	27.97	-	3401.66		
	12/11/13		-	27.96	-	3,401.67		
	12/22/13		-	27.96	-	3,401.67		
MW-6	07/10/02	3429.3	-	27.16	-	3402.14		
	04/15/03		-	27.93	-	3401.37		
	07/14/03		-	28.90	-	3400.40		
	04/20/04		-	23.65	-	3405.65		
	05/07/04		-	24.72	-	3404.58		
	05/25/04		-	25.30	-	3404.00		
	06/10/04		-	25.75	-	3403.55		
	07/14/04		-	23.15	-	3406.15		
	07/21/04		-	24.41	-	3404.89		
	08/02/04		-	23.78	-	3405.52		
	09/10/04		-	23.86	-	3405.44		
	09/14/04		-	24.10	-	3405.20		
	10/05/04		-	16.96	-	3412.34		
	10/19/04		-	16.84	-	3412.46		
	11/02/04		-	16.86	-	3412.44		
	11/15/04		-	19.33	-	3409.97		
	12/06/04		-	19.77	-	3409.53		
	12/21/04		-	19.98	-	3409.32		
	01/03/05		-	20.42	-	3408.88		
	01/18/05		-	20.70	-	3408.60		
	02/01/05		-	20.90	-	3408.40		
	03/21/05		-	21.52	-	3407.78		
	04/21/05		-	21.64	-	3407.66		
	05/05/05		-	21.62	-	3407.68		
	05/17/05		-	21.77	-	3407.53		
	08/15/05		-	21.91	-	3407.39		
	10/05/05		-	21.98	-	3407.32		
	11/18/05		-	22.25	-	3407.05		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-6	01/12/06	3429.3	-	22.36	-	3406.94		
	02/16/06		-	22.51	-	3406.79		
	03/16/06		-	22.71	-	3406.59		
	04/10/06		-	22.65	-	3406.65		
	05/22/06		-	22.82	-	3406.48		
	07/20/06		-	23.26	-	3406.04		
	08/07/06		-	24.37	-	3404.93		
	09/11/06		-	22.28	-	3407.02		
	10/17/06		-	22.54	-	3406.76		
	11/21/06		-	22.66	-	3406.64		
	12/13/06		-	22.69	-	3406.61		
	01/09/07		-	22.83	-	3406.47		
	02/14/07		-	22.75	-	3406.55		
	02/22/07		-	22.78	-	3406.52		
	03/01/07		-	22.75	-	3406.55		
	03/13/07		-	22.78	-	3406.52		
	05/10/07		-	22.06	-	3407.24		
	08/10/07		-	22.56	-	3406.74		
	08/20/07		-	22.67	-	3406.63		
	11/15/07		-	22.46	-	3406.84		
	02/28/08		-	22.91	-	3406.39		
	05/28/08		-	23.19	-	3406.11		
	08/20/08		-	23.82	-	3405.48		
	11/07/08		-	23.41	-	3405.89		
	02/09/09		-	23.53	-	3405.77		
	05/14/09		-	23.77	-	3405.53		
	08/12/09		-	24.19	-	3405.11		
	11/10/09		-	24.46	-	3404.84		
	02/03/10		-	24.32	-	3404.98		
	05/27/10		-	24.50	-	3404.80		
	08/16/10		-	24.89	-	3404.41		
	11/10/10		-	24.98	-	3404.32		
	02/17/11		-	24.84	-	3404.46		
	05/24/11		-	25.20	-	3404.10		
	08/19/11		-	26.16	-	3403.14		
	10/03/11		-	26.36	-	3402.94		
	11/10/11		-	26.33	-	3402.97		
	12/09/11		-	26.31	-	3402.99		
	02/24/12		-	26.26	-	3403.04		
	02/28/12		-	26.26	-	3403.04		
	03/27/12		-	26.33	-	3402.97		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-6	04/12/12	3429.3	-	26.43	-	3402.87		
	05/05/12		-	26.70	-	3402.60		
	05/17/12		-	26.72	-	3402.58		
	06/21/12		-	26.65	-	3402.65		
	07/09/12		-	27.23	-	3402.07		
	08/02/12		-	27.12	-	3402.18		
	08/16/12		-	27.27	-	3402.03		
	08/28/12		-	27.35	-	3401.95		
	09/12/12		-	27.45	-	3401.85		
	09/26/12		-	28.86	-	3400.44		
	10/10/12		-	27.47	-	3401.83		
	10/26/12		-	27.52	-	3401.78		
	11/07/12		-	27.44	-	3401.86		
	11/20/12		-	27.43	-	3401.87		
	12/06/12		-	27.44	-	3401.86		
	12/18/12		-	27.46	-	3401.84		
	01/03/13		-	27.49	-	3401.81		
	01/11/13		-	27.31	-	3401.99		
	01/25/13		-	27.35	-	3401.95		
	02/07/13		-	27.39	-	3401.91		
	02/28/13		-	27.75	-	3401.55		
	03/08/13		-	27.24	-	3402.06		
	03/21/13		-	27.35	-	3401.95		
	04/04/13		-	27.48	-	3401.82		
	04/17/13		-	27.38	-	3401.92		
	05/01/13		-	27.75	-	3401.55		
	05/23/13		-	27.48	-	3401.82		
	06/14/13		-	27.67	-	3401.63		
	06/28/13		-	27.80	-	3401.50		
	07/10/13		-	27.95	-	3401.35		
	07/24/13		-	28.02	-	3401.28		
	08/09/13		-	28.03	-	3401.27		
	08/22/13		-	28.31	-	3400.99		
	09/05/13		-	28.43	-	3400.87		
	09/19/13		-	28.50	-	3400.80		
	10/07/13		-	28.54	-	3400.76		
	10/17/13		-	28.45	-	3400.85		
	10/31/13		-	28.24	-	3401.06		
	11/14/13		-	28.16	-	3401.14		
	11/27/13		-	28.16	-	3401.14		
	12/11/13		-	28.15	-	3,401.15		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-6	12/22/13	3429.3	-	28.15	-	3,401.15		
MW-7	06/10/04	3431.37	-	27.15	-	3404.22		
	07/14/04		-	25.69	-	3405.68		
	07/21/04		-	25.93	-	3405.44		
	08/02/04		-	26.10	-	3405.27		
	09/10/04		-	25.73	-	3405.64		
	09/14/04		-	25.75	-	3405.62		
	10/05/04		-	22.65	-	3408.72		
	10/19/04		-	21.55	-	3409.82		
	11/02/04		-	21.58	-	3409.79		
	11/15/04		-	21.68	-	3409.69		
	12/06/04		-	21.80	-	3409.57		
	12/21/04		-	21.43	-	3409.94		
	01/03/05		-	22.03	-	3409.34		
	01/18/05		-	22.18	-	3409.19		
	02/01/05		-	22.29	-	3409.08		
	03/21/05		-	22.49	-	3408.88		
	04/21/05		-	22.76	-	3408.61		
	05/05/05		-	22.74	-	3408.63		
	05/17/05		-	22.86	-	3408.51		
	08/15/05		-	23.30	-	3408.07		
	10/05/05		-	23.01	-	3408.36		
	11/18/05		-	23.18	-	3408.19		
	01/12/06		-	23.25	-	3408.12		
	02/16/06		-	23.41	-	3407.96		
	03/16/06		-	23.60	-	3407.77		
	04/10/06		-	23.52	-	3407.85		
	05/22/06		-	23.75	-	3407.62		
	07/20/06		-	24.24	-	3407.13		
	08/07/06		-	24.33	-	3407.04		
	09/11/06		-	23.41	-	3407.96		
	10/17/06		-	23.44	-	3407.93		
	11/21/06		-	23.49	-	3407.88		
	12/13/06		-	23.48	-	3407.89		
	01/09/07		-	23.61	-	3407.76		
	02/14/07		-	23.50	-	3407.87		
	02/22/07		-	23.54	-	3407.83		
	03/01/07		-	23.49	-	3407.88		
	03/13/07		-	23.54	-	3407.83		
	05/10/07		-	23.20	-	3408.17		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-7	08/10/07	3431.37	-	23.58	-	3407.79		
	08/20/07		-	23.66	-	3407.71		
	11/15/07		-	23.85	-	3407.52		
	02/28/08		-	23.73	-	3407.64		
	05/28/08		-	24.09	-	3407.28		
	08/20/08		-	24.76	-	3406.61		
	11/07/08		-	24.21	-	3407.16		
	02/09/09		-	24.32	-	3407.05		
	04/16/09		-	24.35	-	3407.02		
	05/14/09		-	24.56	-	3406.81		
	08/12/09		-	25.14	-	3406.23		
	11/10/09		-	25.31	-	3406.06		
	02/03/10		-	25.11	-	3406.26		
	05/27/10		-	25.32	-	3406.05		
	08/16/10		-	25.74	-	3405.63		
	11/10/10		-	25.67	-	3405.70		
	02/17/11		-	25.60	-	3405.77		
	05/24/11		-	26.08	-	3405.29		
	08/19/11		-	25.11	-	3406.26		
	10/03/11		-	27.25	-	3404.12		
	11/10/11		-	27.15	-	3404.22		
	12/09/11		-	27.09	-	3404.28		
	02/24/12		-	26.99	-	3404.38		
	02/28/12		-	26.89	-	3404.48		
	03/27/12		-	27.03	-	3404.34		
	04/12/12		-	27.12	-	3404.25		
	05/05/12		-	27.46	-	3403.91		
	05/17/12		-	27.43	-	3403.94		
	06/21/12		-	27.79	-	3403.58		
	07/09/12		-	28.05	-	3403.32		
	08/02/12		-	27.98	-	3403.39		
	08/16/12		-	28.11	-	3403.26		
	08/28/12		-	28.18	-	3403.19		
	09/12/12		-	28.28	-	3403.09		
	09/26/12		-	28.67	-	3402.70		
	10/10/12		-	28.23	-	3403.14		
	10/26/12		-	28.29	-	3403.08		
	11/07/12		-	28.22	-	3403.15		
	11/20/12		-	28.15	-	3403.22		
	12/06/12		-	28.18	-	3403.19		
	12/18/12		-	28.20	-	3403.17		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-7	01/03/13	3431.37	-	28.23	-	3403.14		
	01/11/13		-	28.02	-	3403.35		
	01/25/13		-	28.06	-	3403.31		
	02/07/13		-	28.76	-	3402.61		
	02/28/13		-	28.42	-	3402.95		
	03/08/13		-	28.76	-	3402.61		
	03/21/13		-	28.35	-	3403.02		
	04/04/13		-	28.17	-	3403.20		
	04/17/13		-	28.05	-	3403.32		
	05/01/13		-	28.15	-	3403.22		
	05/23/13		-	28.20	-	3403.17		
	06/14/13		-	28.43	-	3402.94		
	06/28/13		-	28.58	-	3402.79		
	07/10/13		-	28.73	-	3402.64		
	07/24/13		-	28.80	-	3402.57		
	08/09/13		-	28.99	-	3402.38		
	08/22/13		-	29.11	-	3402.26		
	09/05/13		-	29.22	-	3402.15		
	09/19/13		-	29.28	-	3402.09		
	10/07/13		-	29.32	-	3402.05		
	10/17/13		-	29.19	-	3402.18		
	10/31/13		-	28.94	-	3402.43		
	11/14/13		-	28.83	-	3402.54		
	11/27/13		-	28.81	-	3402.56		
	12/11/13		-	28.79	-	3,402.58		
	12/22/13		-	28.79	-	3,402.58		
MW-8	06/10/04	3431.07	-	27.52	-	3403.55		
	07/14/04		-	25.69	-	3405.38		
	07/21/04		-	25.46	-	3405.61		
	08/02/04		-	25.88	-	3405.19		
	09/10/04		-	25.35	-	3405.72		
	09/14/04		-	25.51	-	3405.56		
	10/05/04		-	20.30	-	3410.77		
	10/19/04		-	19.44	-	3411.63		
	11/02/04		-	19.46	-	3411.61		
	11/15/04		-	21.07	-	3410.00		
	12/06/04		-	21.48	-	3409.59		
	12/21/04		-	21.58	-	3409.49		
	01/03/05		-	21.98	-	3409.09		
	01/18/05		-	22.21	-	3408.86		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-8	02/01/05	3431.07	-	22.37	-	3408.70		
	03/21/05		-	22.72	-	3408.35		
	04/21/05		-	22.92	-	3408.15		
	05/05/05		-	22.90	-	3408.17		
	05/17/05		-	23.16	-	3407.91		
	08/15/05		-	23.41	-	3407.66		
	10/05/05		-	23.29	-	3407.78		
	11/18/05		-	23.55	-	3407.52		
	01/12/06		-	23.58	-	3407.49		
	02/16/06		-	23.80	-	3407.27		
	03/16/06		-	23.92	-	3407.15		
	04/10/06		-	24.09	-	3406.98		
	05/22/06		-	24.25	-	3406.82		
	07/20/06		-	24.57	-	3406.50		
	08/07/06		-	24.66	-	3406.41		
	09/11/06		-	23.65	-	3407.42		
	10/17/06		-	23.83	-	3407.24		
	11/21/06		-	24.18	-	3406.89		
	12/13/06		-	24.23	-	3406.84		
	01/09/07		-	24.36	-	3406.71		
	02/14/07		-	24.64	-	3406.43		
	02/22/07		-	23.95	-	3407.12		
	03/01/07		-	23.92	-	3407.15		
	03/13/07		-	23.95	-	3407.12		
	05/10/07		-	23.37	-	3407.70		
	08/10/07		-	23.78	-	3407.29		
	08/20/07		-	23.91	-	3407.16		
	09/07/07		-	24.09	-	3406.98		
	09/19/07		-	24.13	-	3406.94		
	10/01/07		-	25.68	-	3405.39		
	10/15/07		-	24.16	-	3406.91		
	11/02/07		-	24.22	-	3406.85		
	11/15/07		-	24.24	-	3406.83		
	11/28/07		-	24.23	-	3406.84		
	12/27/07		-	24.08	-	3406.99		
	01/18/08		-	24.20	-	3406.87		
	02/20/08		-	24.23	-	3406.84		
	02/28/08		-	24.17	-	3406.90		
	03/11/08		-	24.24	-	3406.83		
	04/30/08		-	24.30	-	3406.77		
	05/28/08		-	24.42	-	3406.65		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-8	05/30/08	3431.07	-	24.30	-	3406.77		
	06/25/08		-	24.74	-	3406.33		
	07/02/08		-	24.72	-	3406.35		30
	07/07/08		-	24.87	-	3406.20		
	07/14/08		-	24.90	-	3406.17		
	07/22/08		-	24.91	-	3406.16		10
	07/30/08		-	25.01	-	3406.06		20
	08/05/08		-	25.05	-	3406.02		20
	08/14/08		-	25.09	-	3405.98		21
	08/20/08		-	24.98	-	3406.09		
	09/20/08		-	24.64	-	3406.43		35
	09/29/08		-	24.86	-	3406.21		40
	11/07/08		-	24.59	-	3406.48		
	11/15/08		-	24.73	-	3406.34		50
	11/24/08		-	24.61	-	3406.46		25
	11/26/08		-	24.64	-	3406.43		25
	12/20/08		-	24.66	-	3406.41		50
	01/16/09		-	24.69	-	3406.38		
	02/09/09		-	24.72	-	3406.35		
	04/08/09		-	25.05	-	3406.02		50
	04/16/09		-	25.02	-	3406.05		50
	04/23/09		-	24.80	-	3406.27		50
	04/29/08		-	24.98	-	3406.09		40
	05/06/09		-	24.82	-	3406.25		50
	05/14/09		-	24.90	-	3406.17		
	07/08/09		-	25.29	-	3405.78		50
	07/24/09		-	25.34	-	3405.73		0
	08/04/09		-	25.32	-	3405.75		55
	08/12/09		-	25.41	-	3405.66		
	08/19/09		-	25.43	-	3405.64	0.1	40
	09/01/09		-	25.54	-	3405.53		44.5
	09/22/09		-	25.65	-	3405.42		5
	10/12/09		-	25.66	-	3405.41		19
	10/30/09		-	25.70	-	3405.37		
	11/10/09		-	25.68	-	3405.39		10
	01/08/10		-	25.56	-	3405.51		10
	01/22/10		-	25.44	-	3405.63		10
	01/26/10		-	25.58	-	3405.49		
	02/03/10		-	25.50	-	3405.57		
	02/10/10		-	25.54	-	3405.53		30
	03/09/10		-	25.45	-	3405.62		30

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-8	03/24/10	3431.07	-	25.46	-	3405.61		50
	04/12/10		-	25.45	-	3405.62		50
	04/27/10		-	25.48	-	3405.59		50
	05/27/10		-	25.67	-	3405.40		
	06/21/10		-	25.90	-	3405.17		55
	07/07/10		-	25.83	-	3405.24		50
	07/20/10		-	25.68	-	3405.39		55
	08/03/10		-	25.87	-	3405.20		50
	08/16/10		-	26.04	-	3405.03		45
	09/02/10		-	26.02	-	3405.05		45
	09/17/10		-	26.11	-	3404.96		
	11/10/10		-	26.03	-	3405.04		
	12/29/10		-	25.86	-	3405.21		20
	02/17/11		-	25.98	-	3405.09		
	03/02/11		-	25.99	-	3405.08		30
	03/16/11		-	26.06	-	3405.01		30
	03/29/11		-	25.95	-	3405.12		30
	04/15/11		-	26.15	-	3404.92		30
	04/18/11		-	26.08	-	3404.99		25
	05/06/11		-	26.20	-	3404.87		25
	05/20/11		-	26.39	-	3404.68		25
	05/24/11		-	26.39	-	3404.68		
	06/01/11		-	26.46	-	3404.61		20
	06/14/11		-	26.62	-	3404.45		25
	06/30/11		-	26.81	-	3404.26		25
	07/30/11		-	27.17	-	3403.90		25
	08/19/11		-	27.35	-	3403.72		
	09/20/11		-	27.45	-	3403.62		
	10/03/11		-	27.54	-	3403.53		
	11/10/11		-	27.51	-	3403.56		20
	12/09/11		-	27.47	-	3403.60		20
	02/24/12		-	27.42	-	3403.65		20
	02/28/12		-	27.40	-	3403.67		
	03/27/12		-	27.47	-	3403.60		20
	04/12/12		-	27.56	-	3403.51		20
	05/05/12		-	27.85	-	3403.22		20
	05/17/12		-	27.85	-	3403.22		
	06/21/12		-	28.15	-	3402.92		
	07/09/12		-	28.39	-	3402.68		25
	08/02/12		-	28.29	-	3402.78		25
	08/16/12		-	28.44	-	3402.63		5

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-8	08/28/12	3431.07	-	28.52	-	3402.55		
	09/12/12		-	28.63	-	3402.44		25
	09/26/12		-	29.02	-	3402.05		25
	10/10/12		-	28.65	-	3402.42		25
	10/26/12		-	28.69	-	3402.38		25
	11/07/12		-	28.61	-	3402.46		5
	11/20/12		-	28.57	-	3402.50		25
	12/06/12		-	28.59	-	3402.48		25
	12/18/12		-	28.62	-	3402.45		25
	01/03/13		-	28.65	-	3402.42		25
	01/11/13		-	28.46	-	3402.61		25
	01/25/13		-	28.50	-	3402.57		25
	02/07/13		-	28.56	-	3402.51		25
	02/28/13		-	28.86	-	3402.21		25
	03/08/13		-	28.56	-	3402.51		25
	03/21/13		-	28.50	-	3402.57		25
	04/04/13		-	28.90	-	3402.17	1	25
	04/17/13		-	28.50	-	3402.57	0.3	25
	05/01/13		-	28.65	-	3402.42	1	25
	05/23/13		-	28.60	-	3402.47	0.2	25
	06/14/13		-	28.80	-	3402.27	Trace	25
	06/28/13		-	28.95	-	3402.12	Trace	25
	07/10/13		-	29.08	-	3401.99		25
	07/24/13		-	29.17	-	3401.90		
	08/09/13		-	29.32	-	3401.75		
	08/22/13		-	29.46	-	3401.61		25
	09/05/13		-	29.58	-	3401.49		5
	09/19/13		-	29.66	-	3401.41		
	10/07/13		-	29.70	-	3401.37		25
	10/17/13		-	29.59	-	3401.48		25
	10/31/13		-	29.38	-	3401.69		25
	11/14/13		-	29.28	-	3401.79		25
	11/27/13		-	29.29	-	3401.78		25
	12/11/13		-	29.30	-	3,401.77		25
	12/22/13		-	29.30	-	3,401.77		25
MW-9	06/10/04	3429.79	Screen Filled With Mud					
	07/14/04		-	24.02	-	3405.77		
	07/21/04		-	23.84	-	3405.95		
	08/02/04		-	24.77	-	3405.02		
	09/10/04		-	24.21	-	3405.58		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-9	09/14/04	3429.79	-	24.27	-	3405.52		
	10/05/04		-	15.51	-	3414.28		
	10/19/04		-	16.54	-	3413.25		
	11/02/04		-	16.57	-	3413.22		
	11/15/04		-	19.53	-	3410.26		
	12/06/04		-	20.02	-	3409.77		
	12/21/04		-	20.36	-	3409.43		
	01/03/05		-	20.83	-	3408.96		
	01/18/05		-	21.10	-	3408.69		
	02/01/05		-	21.30	-	3408.49		
	03/21/05		-	21.69	-	3408.10		
	04/21/05		-	22.08	-	3407.71		
	05/05/05		-	22.06	-	3407.73		
	05/17/05		-	22.23	-	3407.56		
	08/15/05		-	22.30	-	3407.49		
	10/05/05		-	22.41	-	3407.38		
	11/18/05		-	22.68	-	3407.11		
	01/12/06		-	22.71	-	3407.08		
	02/16/06		-	22.93	-	3406.86		
	03/16/06		-	23.12	-	3406.67		
	04/10/06		-	23.10	-	3406.69		
	05/22/06		-	23.21	-	3406.58		
	07/20/06		-	23.69	-	3406.10		
	08/07/06		-	24.02	-	3405.77		
	09/11/06		-	22.61	-	3407.18		
	10/17/06		-	22.98	-	3406.81		
	11/21/06		-	23.06	-	3406.73		
	12/13/06		-	23.71	-	3406.08		
	01/09/07		-	23.24	-	3406.55		
	02/14/07		-	23.19	-	3406.60		
	02/22/07		-	23.09	-	3406.70		
	03/01/07		-	23.07	-	3406.72		
	03/13/07		-	23.10	-	3406.69		
	05/10/07		-	22.04	-	3407.75		
	05/29/07		-	22.08	-	3407.71		
	06/06/07		-	24.68	-	3405.11		
	06/21/07		-	22.35	-	3407.44		
	08/10/07		-	22.86	-	3406.93		
	08/20/07		-	22.99	-	3406.80		
	11/15/07		-	23.28	-	3406.51		
	02/28/08		-	23.24	-	3406.55		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-9	04/30/08	3429.79	-	23.30	-	3406.49		
	05/28/08		-	23.53	-	3406.26		
	05/30/08		-	23.30	-	3406.49		
	08/20/08		-	24.14	-	3405.65		
	09/20/08		-	23.71	-	3406.08		
	09/29/08		-	23.77	-	3406.02		
	11/07/08		-	23.74	-	3406.05		
	11/15/08		-	23.86	-	3405.93		
	11/24/08		-	23.76	-	3406.03		
	11/26/08		-	23.79	-	3406.00		
	12/20/08		-	23.82	-	3405.97		
	01/16/09		-	23.85	-	3405.94		
	02/09/09		-	23.78	-	3406.01		
	04/08/09		-	24.15	-	3405.64		
	04/16/09		-	24.23	-	3405.56		
	04/23/09		-	25.45	-	3404.34		
	04/29/08		-	23.95	-	3405.84		
	05/06/09		-	24.02	-	3405.77		
	05/14/09		-	24.10	-	3405.69		
	07/08/09		-	24.41	-	3405.38		
	07/24/09		-	24.48	-	3405.31		
	08/04/09		-	24.43	-	3405.36		
	08/12/09		-	24.52	-	3405.27		
	08/19/09		-	24.55	-	3405.24		
	09/01/09		-	24.68	-	3405.11		
	09/22/09		-	24.79	-	3405.00		
	10/12/09		-	24.78	-	3405.01		
	10/30/09		-	24.83	-	3404.96		
	11/10/09		-	24.80	-	3404.99		
	01/08/10		-	24.74	-	3405.05		
	01/22/10		-	24.62	-	3405.17		
	01/26/10		-	24.75	-	3405.04		
	02/03/10		-	24.69	-	3405.10		
	02/10/10		-	24.72	-	3405.07		
	03/09/10		-	24.62	-	3405.17		
	03/24/10		-	24.65	-	3405.14		
	04/12/10		-	24.64	-	3405.15		
	04/27/10		-	24.67	-	3405.12		
	05/27/10		-	24.85	-	3404.94		
	06/21/10		-	25.05	-	3404.74		
	07/07/10		-	24.93	-	3404.86		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-9	07/20/10	3429.79	-	24.88	-	3404.91		
	08/03/10		-	25.03	-	3404.76		
	08/16/10		-	25.19	-	3404.60		
	09/02/10		-	25.18	-	3404.61		
	09/17/10		-	25.27	-	3404.52		
	11/10/10		-	25.21	-	3404.58		
	02/17/11		-	25.19	-	3404.60		
	05/24/11		-	25.54	-	3404.25		
	08/19/11		-	26.50	-	3403.29		
	10/03/11		-	26.72	-	3403.07		
	11/10/11		-	26.68	-	3403.11		
	12/09/11		-	26.63	-	3403.16		
	02/24/12		-	26.55	-	3403.24		
	02/28/12		-	26.57	-	3403.22		
	03/27/12		-	26.64	-	3403.15		
	04/12/12		-	26.75	-	3403.04		
	05/05/12		-	27.02	-	3402.77		
	05/17/12		-	27.04	-	3402.75		
	06/21/12		-	26.95	-	3402.84		
	07/09/12		-	27.55	-	3402.24		
	08/02/12		-	27.44	-	3402.35		
	08/16/12		-	27.60	-	3402.19		1.5
	08/28/12		-	27.67	-	3402.12		
	09/12/12		-	27.77	-	3402.02		
	09/26/12		-	28.16	-	3401.63		
	10/10/12		-	27.75	-	3402.04		
	10/26/12		-	27.80	-	3401.99		
	11/07/12		-	27.72	-	3402.07		5
	11/20/12		-	27.68	-	3402.11		
	12/06/12		-	27.70	-	3402.09		
	12/18/12		-	27.72	-	3402.07		
	01/03/13		-	27.73	-	3402.06		
	01/11/13		-	27.57	-	3402.22		
	01/25/13		-	27.61	-	3402.18		
	02/07/13		-	27.63	-	3402.16		
	02/28/13		-	28.00	-	3401.79		
	03/08/13		-	27.63	-	3402.16		
	03/21/13		-	27.61	-	3402.18		
	04/03/13		-	27.73	-	3402.06		
	04/17/13		-	27.63	-	3402.16		
	05/01/13		-	27.79	-	3402.00		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-9	05/23/13	3429.79	-	27.72	-	3402.07		
	06/14/13		-	27.93	-	3401.86		
	06/28/13		-	28.10	-	3401.69		
	07/10/13		-	28.21	-	3401.58		
	07/24/13		-	28.30	-	3401.49		
	08/09/13		-	28.47	-	3401.32		
	08/22/13		-	28.58	-	3401.21		
	09/05/13		-	28.71	-	3401.08		
	09/19/13		-	28.77	-	3401.02		
	10/07/13		-	28.81	-	3400.98		
	10/17/13		-	28.70	-	3401.09		
	10/31/13		-	28.48	-	3401.31		
	11/14/13		-	28.38	-	3401.41		
	11/27/13		-	28.39	-	3401.40		
	12/11/13		-	28.37	-	3,401.42		
	12/22/13		-	28.37	-	3,401.42		
MW-10	11/15/04	3429.49	-	19.61	-	3409.88		
	12/06/04		-	19.95	-	3409.54		
	12/21/04		-	20.13	-	3409.36		
	01/03/05		-	20.56	-	3408.93		
	01/18/05		-	20.79	-	3408.70		
	02/01/05		-	20.98	-	3408.51		
	03/21/05		-	21.36	-	3408.13		
	04/21/05		-	21.64	-	3407.85		
	05/05/05		-	21.69	-	3407.80		
	05/17/05		-	21.81	-	3407.68		
	08/15/05		-	21.93	-	3407.56		
	10/05/05		-	21.98	-	3407.51		
	11/18/05		-	22.22	-	3407.27		
	01/12/06		-	22.33	-	3407.16		
	02/16/06		-	22.47	-	3407.02		
	03/16/06		-	22.77	-	3406.72		
	04/10/06		-	22.60	-	3406.89		
	05/22/06		-	22.78	-	3406.71		
	07/20/06		-	23.18	-	3406.31		
	08/07/06		-	23.25	-	3406.24		
	09/11/06		-	22.11	-	3407.38		
	10/17/06		-	22.46	-	3407.03		
	11/21/06		-	22.57	-	3406.92		
	12/13/06		-	22.61	-	3406.88		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-10	01/09/07	3429.49	-	22.71	-	3406.78		
	02/14/07		-	22.65	-	3406.84		
	02/22/07		-	22.64	-	3406.85		
	03/01/07		-	22.58	-	3406.91		
	03/13/07		-	22.64	-	3406.85		
	05/10/07		-	21.61	-	3407.88		
	08/10/07		-	22.48	-	3407.01		
	08/20/07		-	22.59	-	3406.90		
	11/15/07		-	22.87	-	3406.62		
	02/28/08		-	22.81	-	3406.68		
	05/28/08		-	23.09	-	3406.40		
	08/20/08		-	23.73	-	3405.76		
	11/07/08		-	23.38	-	3406.11		
	02/09/09		-	23.41	-	3406.08		
	04/16/09		-	23.51	-	3405.98		
	05/14/09		-	23.62	-	3405.87		
	08/12/09		-	24.11	-	3405.38		
	11/10/09		-	24.36	-	3405.13		
	02/03/10		-	24.20	-	3405.29		
	05/27/10		-	24.38	-	3405.11		
	08/16/10		-	24.74	-	3404.75		
	11/10/10		-	24.75	-	3404.74		
	02/17/11		-	24.72	-	3404.77		
	04/29/11		-	24.88	-	3404.61		
	05/06/11		-	24.92	-	3404.57		
	05/20/11		-	25.09	-	3404.40		
	05/24/11		-	25.09	-	3404.40		
	08/19/11		-	26.10	-	3403.39		
	09/20/11		-	26.20	-	3403.29		
	10/03/11		-	26.27	-	3403.22		
	11/10/11		-	26.39	-	3403.10		
	12/09/11		-	26.15	-	3403.34		
	02/24/12		-	26.06	-	3403.43		
	02/28/12		-	26.07	-	3403.42		
	03/27/12		-	26.12	-	3403.37		
	04/12/12		-	26.43	-	3403.06		
	05/05/12		-	26.54	-	3402.95		
	05/17/12		-	26.53	-	3402.96		
	06/21/12		-	26.50	-	3402.99		
	07/09/12		-	27.10	-	3402.39		
	08/02/12		-	26.08	-	3403.41		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-10	08/16/12	3429.49	-	27.14	-	3402.35		5
	08/28/12		-	27.20	-	3402.29		
	09/12/12		-	27.31	-	3402.18		
	09/26/12		-	27.70	-	3401.79		
	10/10/12		-	27.28	-	3402.21		
	10/26/12		-	27.32	-	3402.17		
	11/07/12		-	27.22	-	3402.27		5
	11/20/12		-	27.18	-	3402.31		
	12/06/12		-	27.21	-	3402.28		
	12/18/12		-	27.23	-	3402.26		
	01/03/13		-	27.29	-	3402.20		
	01/11/13		-	27.06	-	3402.43		
	01/25/13		-	27.10	-	3402.39		
	02/07/13		-	27.19	-	3402.30		
	02/28/13		-	27.48	-	3402.01		
	03/08/13		-	27.19	-	3402.30		
	03/21/13		-	27.10	-	3402.39		
	04/03/13		-	27.21	-	3402.28		
	04/17/13		-	27.10	-	3402.39		
	05/01/13		-	27.12	-	3402.37		
	05/23/13		-	27.19	-	3402.30		
	06/14/13		-	27.42	-	3402.07		
	06/28/13		-	27.58	-	3401.91		
	07/10/13		-	27.72	-	3401.77		
	07/24/13		-	27.80	-	3401.69		
	08/09/13		-	27.95	-	3401.54		
	08/22/13		-	28.08	-	3401.41		
	09/05/13		-	28.21	-	3401.28		
	09/19/13		-	28.27	-	3401.22		
	10/07/13		-	28.30	-	3401.19		
	10/17/13		-	28.16	-	3401.33		
	10/31/13		-	27.93	-	3401.56		
	11/14/13		-	27.84	-	3401.65		
	11/27/13		-	27.85	-	3401.64		
	12/11/13		-	27.86	-	3,401.63		
	12/22/13		-	27.85	-	3,401.64		
MW-11	11/15/04	3428.32	-	18.26	-	3410.06		
	12/06/04		-	18.67	-	3409.65		
	12/21/04		-	18.93	-	3409.39		
	01/03/05		-	19.40	-	3408.92		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-11	01/18/05	3428.32	-	19.68	-	3408.64		
	02/01/05		-	19.90	-	3408.42		
	03/21/05		-	20.34	-	3407.98		
	04/21/05		-	20.70	-	3407.62		
	05/05/05		-	20.71	-	3407.61		
	05/17/05		-	20.87	-	3407.45		
	08/15/05		-	20.95	-	3407.37		
	10/05/05		-	21.04	-	3407.28		
	11/18/05		-	21.31	-	3407.01		
	01/12/06		-	21.55	-	3406.77		
	02/16/06		-	21.58	-	3406.74		
	03/16/06		-	21.77	-	3406.55		
	04/10/06		-	21.75	-	3406.57		
	05/22/06		-	21.90	-	3406.42		
	08/07/06		-	22.32	-	3406.00		
	09/11/06		-	21.19	-	3407.13		
	10/17/06		-	21.49	-	3406.83		
	11/21/06		-	21.61	-	3406.71		
	12/13/06		-	21.64	-	3406.68		
	01/09/07		-	21.47	-	3406.85		
	02/14/07		-	21.70	-	3406.62		
	02/22/07		-	21.72	-	3406.60		
	03/01/07		-	21.69	-	3406.63		
	03/13/07		-	21.73	-	3406.59		
	05/10/07		-	20.04	-	3408.28		
	08/10/07		-	22.54	-	3405.78		
	08/20/07		-	21.63	-	3406.69		
	11/15/07		-	21.94	-	3406.38		
	02/28/08		-	21.89	-	3406.43		
	05/28/08		-	21.17	-	3407.15		
	08/20/08		-	22.77	-	3405.55		
	11/07/08		-	22.38	-	3405.94		
	02/09/09		-	22.51	-	3405.81		
	04/16/09		-	22.44	-	3405.88		
	05/14/09		-	22.73	-	3405.59		
	08/12/09		-	23.17	-	3405.15		
	11/10/09		-	23.42	-	3404.90		
	02/03/10		-	23.30	-	3405.02		
	05/27/10		-	23.46	-	3404.86		
	08/16/10		-	23.81	-	3404.51		
	11/10/10		-	23.85	-	3404.47		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-11	02/17/11	3428.32	-	23.81	-	3404.51		
	05/24/11		-	24.16	-	3404.16		
	08/19/11		-	25.19	-	3403.13		
	10/03/11		-	25.34	-	3402.98		
	11/10/11		-	25.28	-	3403.04		
	12/09/11		-	25.23	-	3403.09		
	02/24/12		-	25.14	-	3403.18		
	02/28/12		-	25.19	-	3403.13		
	03/27/12		-	25.21	-	3403.11		
	04/12/12		-	25.33	-	3402.99		
	05/05/12		-	25.65	-	3402.67		
	05/17/12		-	25.65	-	3402.67		
	06/21/12		-	25.60	-	3402.72		
	07/09/12		-	26.21	-	3402.11		
	08/02/12		-	26.08	-	3402.24		
	08/16/12		-	26.24	-	3402.08		5
	08/28/12		-	26.32	-	3402.00		
	09/12/12		-	26.40	-	3401.92		
	09/26/12		-	26.81	-	3401.51		
	10/10/12		-	26.36	-	3401.96		
	10/26/12		-	26.41	-	3401.91		
	11/07/12		-	26.33	-	3401.99		5
	11/20/12		-	26.29	-	3402.03		
	12/06/12		-	26.21	-	3402.11		
	12/18/12		-	26.24	-	3402.08		
	01/03/13		-	26.29	-	3402.03		
	01/11/13		-	26.18	-	3402.14		
	01/25/13		-	26.23	-	3402.09		
	02/07/13		-	26.20	-	3402.12		
	02/28/13		-	26.60	-	3401.72		
	03/08/13		-	26.20	-	3402.12		
	03/21/13		-	26.23	-	3402.09		
	04/04/13		-	23.35	-	3404.97		
	04/17/13		-	26.22	-	3402.10		
	05/01/13		-	26.25	-	3402.07		
	05/23/13		-	26.32	-	3402.00		
	06/14/13		-	26.53	-	3401.79		
	06/28/13		-	26.69	-	3401.63		
	07/10/13		-	26.83	-	3401.49		
	07/24/13		-	26.92	-	3401.40		
	08/09/13		-	27.05	-	3401.27		

1. PSH = Phase Separated Hydrocarbons

2. - = Measureable thickness of PSH not observed

Monitor Well	Date Gauged	Relative Top of Casing Elevation (TOC)*	Depth to PSH Below Top of Casing	Depth to Water Below Top of Casing	PSH Thickness	Corrected Relative Groundwater Elevation*	PSH Recovered	Volume Purged
MW-11	08/22/13	3428.32	-	27.19	-	3401.13		
	09/05/13		-	27.30	-	3401.02		
	09/19/13		-	27.37	-	3400.95		
	10/07/13		-	27.41	-	3400.91		
	10/17/13		-	27.28	-	3401.04		
	10/31/13		-	27.04	-	3401.28		
	11/14/13		-	26.96	-	3401.36		
	11/27/13		-	26.97	-	3401.35		
	12/11/13		-	26.94	-	3,401.38		
	12/22/13		-	26.94	-	3,401.38		

1. PSH = Phase Separated Hydrocarbons
2. - = Measureable thickness of PSH not observed

2013 Annual Report
Table 2
Groundwater Analytical Summary - BTEX and TPH

Plains All American Pipeline
Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
Plains All American Leak Number 2001-11226
Terracon Project Number A4137007

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

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-1	09/13/01	<0.003	<0.003	NA[2]	<0.006	0.002	0.003	<0.001	<0.001
	01/24/02	NA				<0.001	<0.001	<0.001	<0.001
	04/12/02	NA				<0.001	<0.001	<0.001	<0.001
	07/10/02	NA				0.00188	<0.001	0.00187	<0.001
	04/15/03	NA				<0.001	<0.001	<0.001	<0.001
	07/14/03	NA				<0.001	<0.001	<0.001	<0.001
	04/20/04	NA				<0.001	<0.001	<0.001	<0.001
	07/14/04	NA				<0.001	<0.001	<0.001	<0.001
	09/14/04	NA				<0.001	<0.001	<0.001	<0.001
	12/21/04	NA				<0.001	<0.001	<0.001	<0.001
	03/21/05	NA				<0.001	<0.001	<0.001	<0.001
	08/15/05	NA				<0.001	<0.001	<0.001	<0.001
	02/16/06	NA				<0.001	<0.001	<0.001	<0.001
	05/22/06	NA				<0.001	<0.001	<0.001	<0.001
	02/22/07	NA				<0.001	<0.001	<0.001	<0.002
	05/10/07	NA				<0.001	<0.001	<0.001	<0.001
	08/10/07	NA				<0.001	<0.001	<0.001	<0.001
	11/15/07	Dry - Not Sampled							
	02/28/08	Dry - Not Sampled							
	05/28/08	Dry - Not Sampled							
	08/20/08	Dry - Not Sampled							
	11/07/08	Dry - Not Sampled							
	02/09/09	Dry - Not Sampled							
	05/14/09	Dry - Not Sampled							
	08/12/09	Dry - Not Sampled							
	11/11/09	Dry - Not Sampled							
	02/05/10	Dry - Not Sampled							
	05/27/10	Dry - Not Sampled							
	08/19/10	Dry - Not Sampled							
	11/16/11	Dry - Not Sampled							
	02/29/12	Dry - Not Sampled							
	05/17/12	Dry - Not Sampled							
	08/16/12	Dry - Not Sampled							
	11/07/12	Dry - Not Sampled							
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

1. TPH = Total Petroleum Hydrocarbons

2. NA = Not Analyzed

3. PSH = Phase Separated Hydrocarbons

4. NMWQCC = New Mexico Water Quality Control Commission

5. NE = Not Established

Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-1	02/28/13	Dry - Not Sampled							
	05/31/13	Dry - Not Sampled							
	08/09/13	Dry - Not Sampled							
	11/14/13	Dry - Not Sampled							
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

1. TPH = Total Petroleum Hydrocarbons

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4. NMWQCC = New Mexico Water Quality Control Commission

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Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-2	01/24/02	NA				**0.368**	<0.001	0.0537	0.0125
	04/12/02	NA				**0.127**	<0.001	0.0254	0.00833
	07/10/02	NA				**0.0674**	0.00188	0.0176	0.00389
	04/15/03	NA				**0.229**	0.001	0.0588	0.0124
	07/14/03	NA				**0.185**	<0.001	0.0351	0.00823
	04/20/04	NA				**0.125**	<0.001	0.0341	0.0153
	07/14/04	NA				**0.209**	0.00616	0.047	0.0154
	09/14/04	NA				**0.125**	0.00276	0.0358	0.00701
	12/21/04	NA				**0.267**	0.00124	0.0357	0.00109
	03/21/05	NA				**0.186**	<0.001	0.0136	0.00199
	05/17/05	NA				**0.342**	0.001	0.0281	0.0147
	08/15/05	NA				**0.145**	0.00718	0.0187	0.00849
	11/18/05	NA				**0.413**	0.00207	0.114	0.0349
	02/16/06	NA				**0.433**	<0.001	0.146	0.00465
	05/22/06	NA				**0.694**	0.162	0.172	0.0182
	08/07/06	NA				**0.664**	0.00604	0.0496	0.00811
	11/21/06	NA				**0.461**	<0.005	0.0638	<0.005
	02/22/07	NA				**0.292**	<0.001	0.0437	0.0337
	05/10/07	NA				**0.19**	0.0049	0.0341	0.0233
	08/10/07	NA				**0.0881**	0.0012	0.0295	<0.001
	11/15/07	NA				**0.0615**	<0.002	0.0031	<0.001
	02/28/08	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/28/08	NA				**0.0949**	<0.002	0.006	<0.001
	08/20/08	NA				**0.1011**	<0.002	0.005	0.0021
	11/07/08	NA				**0.0462**	<0.002	0.0044	<0.001
	02/09/09	<1.5	<1.5	<1.5	<1.5	**0.0908**	<0.002	0.0019	<0.001
	05/14/09	NA				**0.7167**	<0.02	<0.01	<0.01
	11/11/09	NA				**0.0476**	<0.002	0.0068	<0.001
	02/05/10	NA				**0.0287**	<0.002	0.0046	0.0015
	05/27/10	NA				**0.0262**	<0.002	0.0082	<0.001
	08/16/10	NA				0.0095	<0.002	0.0041	<0.001
	11/19/10	NA				0.01	<0.002	0.0043	<0.001
	02/18/11	NA				**0.0101**	<0.002	0.00951	<0.001
	05/24/11	NA				0.00263	<0.002	0.00598	<0.001
	08/19/11	NA				**0.0163**	<0.002	0.00579	<0.001
	11/16/11	NA				0.00922	<0.002	0.00251	<0.001
	02/29/12	NA				0.00600	<0.0100	0.00500	<0.00500
	05/17/12	NA				0.00565	<0.001	<0.001	<0.001
	08/16/12	<5.0	NA		<5.0	**0.02930**	<0.001	<0.001	<0.001
	11/07/12	NA				<0.001	<0.001	<0.001	<0.001
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	Not Sampled Due To Presence Of PSH[3]							
	08/09/13	<0.900	<0.900	NA	<0.900	<0.0005	<0.0005	<0.001	<0.0007
	11/14/13	0.752	<0.954	NA	0.752	0.752	<0.0005	<0.001	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

1. TPH = Total Petroleum Hydrocarbons

2. NA = Not Analyzed

3. PSH = Phase Separated Hydrocarbons

4. NMWQCC = New Mexico Water Quality Control Commission

5. NE = Not Established

Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-3	09/13/01	<0.003	<0.003	NA	<0.006	<0.001	<0.001	<0.001	<0.001
	01/24/02	NA				<0.001	<0.001	<0.001	<0.001
	04/12/02	NA				<0.001	<0.001	<0.001	<0.001
	07/10/02	NA				<0.001	<0.001	<0.001	<0.001
	04/15/03	NA				<0.001	<0.001	<0.001	<0.001
	07/14/03	NA				<0.001	<0.001	<0.001	<0.001
	04/20/04	NA				<0.001	<0.001	<0.001	<0.001
	07/14/04	NA				<0.001	<0.001	<0.001	<0.001
	09/14/04	NA				<0.001	<0.001	<0.001	<0.001
	12/21/04	NA				<0.001	<0.001	<0.001	<0.001
	08/15/05	NA				<0.001	<0.001	<0.001	<0.001
	02/16/06	NA				<0.001	<0.001	<0.001	<0.001
	05/22/06	NA				<0.001	<0.001	<0.001	<0.001
	02/22/07	NA				<0.001	<0.001	<0.001	<0.002
	05/10/07	NA				<0.001	<0.001	<0.001	<0.001
	08/10/07	NA				<0.001	<0.001	<0.001	<0.001
	11/15/07	NA				<0.001	<0.002	<0.001	<0.001
	02/28/08	<1.5	<1.5	<1.5	<1.5	**0.0193**	<0.002	0.0032	<0.001
	05/28/08	NA				<0.001	<0.002	<0.001	<0.001
	08/20/08	NA				<0.001	<0.002	<0.001	<0.001
	11/07/08	NA				<0.001	<0.002	<0.001	<0.001
	08/12/09	NA				<0.001	<0.002	<0.001	<0.001
	11/11/09	NA				<0.001	<0.002	<0.001	<0.001
	02/05/10	NA				<0.001	<0.002	<0.001	<0.001
	05/27/10	NA				<0.001	<0.002	<0.001	<0.001
	08/16/10	NA				<0.001	<0.002	<0.001	<0.001
	11/19/10	NA				<0.001	<0.002	<0.001	<0.001
	02/18/11	NA				<0.001	<0.002	<0.001	<0.001
	08/19/11	NA				<0.001	<0.002	<0.001	<0.001
	11/16/11	NA				<0.001	<0.002	<0.001	<0.001
	02/29/12	NA				<0.001	<0.002	<0.001	<0.001
	05/17/12	NA				<0.001	<0.001	<0.001	<0.001
	08/16/12	<5.0	NA		<5.0	<0.001	<0.001	<0.001	<0.001
	11/07/12	NA				<0.001	<0.001	<0.001	<0.001
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	<0.0005	<0.001	<0.0007	<0.0007
	08/09/13	<0.905	<0.905	NA	<0.905	<0.0005	<0.001	<0.0007	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

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SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-4	01/24/02	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	04/12/02	NA	NA	NA	NA	**0.48**	0.361	0.199	0.216
	07/10/02	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	04/15/03	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	07/14/03	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	04/20/04	NA				**3.21**	**2.31**	**0.845**	1.03
	07/14/04	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	09/14/04	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	12/21/04	NA				**0.829**	0.0066	0.173	0.0595
	03/21/05	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	05/17/05	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	08/15/05	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	11/18/05	NA				**2.62**	<0.002	0.379	0.0365
	02/16/06	NA				**2.1**	<0.001	0.414	<0.001
	05/22/06	NA				**2.11**	<0.005	0.372	<0.005
	08/07/06	NA				**2.84**	0.00604	0.049	0.00811
	11/21/06	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	02/22/07	NA				**1.42**	<0.001	0.291	0.443
	05/10/07	NA				**1.21**	<0.001	0.267	0.382
	08/10/07	NA				**1.227**	0.0075	0.2418	<0.005
	11/15/07	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	02/28/08	<1.5	<1.5	<1.5	<1.5	0.0073	<0.002	0.0026	<0.001
	05/28/08	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	08/20/08	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	11/07/08	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	02/09/09	5.52	2.3	<1.5	7.82	**0.7677**	<0.002	0.059	0.0026
	05/14/09	NA				**0.492**	<0.001	0.0312	<0.005
	08/12/09	NA				**1.357**	<0.04	0.1026	<0.02
	11/11/09	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	02/05/10	NA				**2.019**	0.0551	0.088	<0.01
	05/27/10	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	08/19/10	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	11/16/11	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	02/29/12	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	05/17/12	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	08/16/12	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	09/12/12	NA				0.355	<0.0500	<0.0500	<0.0500
	11/07/12	NA				**1.43**	<0.0200	0.177	0.127
	02/28/13	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	05/31/13	2.0	1.68	NA	3.68	**0.499**	<0.005	0.118	0.0378
	08/09/13	<0.938	<0.938	NA	<0.938	**0.4**	0.00408	0.114	0.034
	11/14/13	1.45	<0.954	NA	1.45	**0.281**	<0.001	0.0425	0.00816
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

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SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-5	09/13/01	0.00634	0.00302	NA	0.00936	**0.535**	0.075	0.084	0.04
	01/24/02	NA				**0.28**	0.00319	0.107	0.00565
	04/12/02	NA				**0.303**	0.00948	0.129	0.0132
	04/15/03	NA				**0.129**	0.00354	0.0366	0.00238
	07/14/03	NA				**0.0814**	<0.001	0.0344	<0.001
	04/20/04	NA				**0.482**	0.00237	0.101	0.0313
	07/14/04	NA				**0.0708**	<0.001	0.0486	0.00207
	09/14/04	NA				**0.118**	0.00135	0.0588	0.00161
	12/21/04	NA				**0.204**	<0.001	0.0667	<0.001
	03/21/05	NA				**0.0308**	<0.001	0.0171	<0.001
	05/17/05	NA				**0.00966**	<0.001	<0.001	<0.001
	08/15/05	NA				**0.0138**	0.00173	0.00438	<0.001
	11/18/05	NA				**0.0107**	0.00115	<0.001	<0.001
	02/16/06	NA				0.00747	<0.001	0.00293	<0.001
	05/22/06	NA				0.00318	<0.001	<0.001	<0.001
	08/07/06	NA				**0.0964**	0.00763	0.0028	0.00133
	11/21/06	NA				**0.0883**	0.0241	0.00988	0.00727
	02/22/07	NA				**0.0443**	<0.001	0.0289	0.0123
	05/10/07	NA				**0.0462**	<0.001	0.0357	0.0159
	08/10/07	NA				**0.0266**	<0.005	0.0141	<0.005
	11/15/07	NA				**0.011**	<0.002	0.0036	<0.001
	02/28/08	4.55	3.33	<1.52	7.88	**0.5605**	0.0192	0.1301	0.007
	05/28/08	NA				**0.0112**	<0.002	0.0021	<0.001
	08/20/08	NA				0.0048	<0.002	0.0017	0.0013
	11/07/08	NA				**0.035**	<0.002	0.0081	<0.001
	02/09/09	<1.5	<1.5	<1.5	<1.5	**0.093**	<0.002	0.0045	0.0012
	05/14/09	NA				**0.1093**	<0.002	0.0043	<0.001
	08/12/09	NA				**0.057**	<0.002	0.0041	0.002
	11/11/09	NA				**0.1185**	<0.01	0.0248	<0.005
	02/05/10	NA				**0.0432**	<0.002	0.0072	<0.001
	05/27/10	NA				**0.0824**	<0.002	0.0174	<0.001
	08/18/10	NA				**0.2479**	<0.002	0.038	<0.001
	11/19/10	NA				**0.0133**	<0.002	0.0018	<0.001
	02/18/11	NA				**0.0638**	<0.002	0.0104	0.00106
	05/24/11	NA				**0.106**	<0.003	1.0104	<0.001
	08/19/11	NA				**0.163**	<0.040	<0.020	<0.020
	11/16/11	NA				**0.115**	<0.020	<0.010	<0.010
	02/29/12	NA				**0.0370**	<0.010	<0.005	<0.005
	05/17/12	NA				**0.0729**	<0.001	0.0011	<0.001
	08/16/12	<5.0	NA		<5.0	**<0.0200**	<0.0200	<0.0200	<0.030
	11/07/12	NA				**0.0621**	<0.001	<0.001	<0.001
	02/28/13	NA				**0.0396**	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	**0.0342**	<0.001	<0.0007	<0.0007
	08/09/13	<0.895	<0.895	NA	<0.895	0.00191	<0.001	<0.0007	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

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SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-6	01/24/02	NA				<0.001	<0.001	<0.001	<0.001
	04/12/02	NA				<0.001	<0.001	<0.001	<0.001
	07/10/02	NA				0.00153	<0.001	<0.001	<0.001
	04/15/03	NA				0.00274	<0.001	<0.001	<0.001
	07/14/03	NA				0.00254	<0.001	<0.001	<0.001
	04/20/04	NA				0.00106	<0.001	<0.001	<0.001
	07/14/04	NA				0.00195	<0.001	<0.001	<0.001
	09/14/04	NA				**0.01**	<0.001	<0.001	<0.001
	12/21/04	NA				<0.001	<0.001	<0.001	<0.001
	03/21/05	NA				<0.001	<0.001	<0.001	<0.001
	05/17/05	NA				<0.001	<0.001	<0.001	<0.001
	08/15/05	NA				<0.001	<0.001	<0.001	<0.001
	11/18/05	NA				<0.001	<0.001	<0.001	<0.001
	02/16/06	NA				<0.001	<0.001	<0.001	<0.001
	05/22/06	NA				<0.001	<0.001	<0.001	<0.001
	08/07/06	NA				<0.001	<0.001	<0.001	<0.001
	11/21/06	NA				<0.001	<0.001	<0.001	<0.001
	02/22/07	NA				<0.001	<0.001	<0.001	<0.002
	05/10/07	NA				**0.0238**	<0.001	0.014	0.0076
	08/10/07	NA				**0.0152**	<0.001	<0.001	<0.001
	11/15/07	NA				**0.0149**	<0.002	<0.001	<0.001
	02/28/08	1.72	<1.5	<1.5	1.72	**0.0444**	<0.002	0.0299	<0.001
	05/28/08	NA				0.0021	<0.002	<0.001	<0.001
	08/20/08	NA				**0.0121**	<0.002	<0.001	<0.001
	11/07/08	NA				0.0069	<0.002	<0.001	<0.001
	02/09/09	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/14/09	NA				<0.001	<0.002	<0.001	<0.001
	08/12/09	NA				0.008	<0.002	<0.001	<0.001
	11/11/09	NA				0.0072	<0.002	<0.001	<0.001
	02/05/10	NA				0.0051	<0.002	<0.001	<0.001
	05/27/10	NA				0.0078	<0.002	<0.001	<0.001
	08/16/10	NA				0.0088	<0.002	0.0011	<0.001
	11/19/10	NA				0.0024	<0.002	<0.001	<0.001
	02/18/11	NA				0.00307	<0.002	<0.001	<0.001
	05/24/11	NA				0.00383	<0.002	<0.001	<0.001
	08/19/11	NA				0.00271	<0.002	<0.001	<0.001
	11/16/11	NA				0.0026	<0.002	<0.001	<0.001
	02/29/12	NA				<0.001	<0.002	<0.001	<0.001
	05/17/12	NA				0.00188	<0.001	<0.001	<0.001
	08/16/12	<5.0	NA		<5.0	<0.001	<0.001	<0.001	<0.001
	11/07/12	NA				0.00188	<0.001	<0.001	<0.0018
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	<0.0005	<0.001	<0.0007	<0.0007
	08/09/13	<0.903	<0.903	NA	<0.903	<0.0005	<0.001	<0.0007	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

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Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-7	07/14/04	NA				<0.001	<0.001	<0.001	<0.001
	09/14/04	NA				<0.001	<0.001	<0.001	<0.001
	12/21/04	NA				<0.001	<0.001	<0.001	<0.001
	03/21/05	NA				<0.001	<0.001	<0.001	<0.001
	05/17/05	NA				<0.001	<0.001	<0.001	<0.001
	08/15/05	NA				<0.001	<0.001	<0.001	<0.001
	11/18/05	NA				<0.001	<0.001	<0.001	<0.001
	02/16/06	NA				<0.001	<0.001	<0.001	<0.001
	05/22/06	NA				<0.001	<0.001	<0.001	<0.001
	08/07/06	NA				<0.001	<0.001	<0.001	<0.001
	11/21/06	NA				<0.001	<0.001	<0.001	<0.001
	02/22/07	NA				<0.001	<0.001	<0.001	<0.002
	05/10/07	NA				<0.001	<0.001	<0.001	<0.001
	08/10/07	NA				<0.001	<0.001	<0.001	<0.001
	11/15/07	NA				<0.001	<0.002	<0.001	<0.001
	02/28/08	1.89	<1.5	<1.5	1.89	**0.0486**	<0.002	0.0599	0.0546
	05/28/08	NA				<0.001	<0.002	<0.001	<0.001
	08/20/08	NA				<0.001	<0.002	<0.001	<0.001
	11/07/08	NA				<0.001	<0.002	<0.001	<0.001
	02/09/09	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/14/09	NA				0.0013	<0.002	<0.001	<0.001
	08/12/09	NA				<0.001	<0.002	<0.001	<0.001
	11/11/09	NA				<0.001	<0.002	<0.001	<0.001
	02/05/10	NA				<0.001	<0.002	<0.001	<0.001
	05/27/10	NA				<0.001	<0.002	<0.001	<0.001
	08/16/10	NA				<0.001	<0.002	<0.001	<0.001
	11/19/10	NA				<0.001	<0.002	<0.001	<0.001
	02/18/11	NA				<0.001	<0.002	<0.001	<0.001
	05/24/11	NA				<0.001	<0.002	<0.001	<0.001
	08/19/11	NA				<0.001	<0.002	<0.001	<0.001
	11/16/11	NA				<0.001	<0.002	<0.001	<0.001
	02/29/12	NA				<0.001	<0.002	<0.001	<0.001
	05/17/12	NA				<0.001	<0.001	<0.001	<0.001
	08/16/12	<5.0	NA		<5.0	<0.001	<0.001	<0.001	<0.001
	11/07/12	NA				<0.001	<0.001	<0.001	<0.001
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	<0.0005	<0.001	<0.0007	<0.0007
	08/09/13	<0.913	<0.913	NA	<0.913	<0.0005	<0.001	<0.0007	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

1. TPH = Total Petroleum Hydrocarbons

2. NA = Not Analyzed

3. PSH = Phase Separated Hydrocarbons

4. NMWQCC = New Mexico Water Quality Control Commission

5. NE = Not Established

Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-8	07/14/04	NA				**0.575**	0.141	0.0884	0.0868
	09/14/04	NA				**0.482**	0.0356	0.106	0.0551
	12/21/04	NA				**4.22**	0.113	0.695	0.075
	03/21/05	NA				**3.41**	<0.01	0.452	0.0152
	05/17/05	NA				**2.29**	<0.001	0.115	0.00568
	08/15/05	NA				**1.21**	<0.001	0.0749	0.00149
	11/18/05	NA				**0.67**	<0.001	0.0299	<0.001
	02/16/06	NA				**0.243**	<0.001	0.0359	<0.001
	05/22/06	NA				**0.0974**	<0.001	0.0278	<0.001
	08/07/06	NA				**0.133**	<0.001	0.00758	<0.001
	02/22/07	NA				**0.118**	<0.001	0.0384	0.0429
	05/10/07	NA				**0.209**	<0.001	0.0473	0.0529
	08/10/07	NA				**0.05**	0.0012	0.0254	<0.001
	11/15/07	NA				**0.0186**	<0.002	0.0079	<0.001
	02/28/08	<1.5	<1.5	<1.5	<1.5	0.0056	<0.002	<0.001	<0.001
	05/28/08	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	08/20/08	Not Sampled due to the Presence of Phase Separated Hydrocarbons							
	11/07/08	NA				**0.012**	<0.002	0.0043	<0.001
	02/09/09	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/14/09	NA				**0.0121**	<0.002	0.0044	<0.001
	08/12/09	NA				**0.0138**	<0.002	0.0057	<0.001
	11/11/09	NA				0.0085	<0.002	0.0024	<0.001
	02/05/10	NA				0.001	<0.002	<0.001	<0.001
	05/27/10	NA				**0.0268**	<0.002	0.0126	<0.001
	08/16/10	NA				**0.0478**	<0.002	0.0088	<0.001
	11/19/10	NA				**0.0081**	<0.002	0.0023	<0.001
	02/18/11	NA				**0.01**	<0.002	0.00458	<0.001
	08/19/11	NA				<0.001	<0.002	0.00458	<0.001
	11/16/11	NA				**0.0241**	<0.002	0.00899	<0.001
	02/29/12	NA				**0.0200**	<0.002	<0.001	<0.001
	05/17/12	NA				0.00443	<0.001	0.00174	<0.001
	08/16/12	<5.0	NA		<5.0	<0.001	<0.001	<0.001	<0.001
	11/07/12	NA				<0.001	<0.001	<0.001	<0.001
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	<0.0005	<0.001	<0.0007	<0.0007
	08/09/13	<0.906	<0.906	NA	<0.906	0.00773	<0.001	0.00142	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

1. TPH = Total Petroleum Hydrocarbons

2. NA = Not Analyzed

3. PSH = Phase Separated Hydrocarbons

4. NMWQCC = New Mexico Water Quality Control Commission

5. NE = Not Established

Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-9	07/14/04	NA				**0.0275**	0.0109	0.487	0.319
	09/14/04	NA				**0.15**	0.00215	0.225	0.119
	12/21/04	NA				<0.001	<0.001	0.0335	0.0204
	03/21/05	NA				0.00925	<0.001	0.0151	0.0209
	05/17/05	NA				0.00498	<0.001	0.0148	0.0311
	08/15/05	NA				**0.0228**	<0.001	0.063	0.0357
	11/18/05	NA				0.00399	<0.001	0.0281	0.0607
	02/16/06	NA				0.00881	<0.001	0.0327	0.0727
	05/22/06	NA				0.00738	<0.001	0.0346	0.0743
	08/07/06	NA				0.00426	<0.001	0.0228	0.0423
	11/21/06	NA				0.00342	<0.001	0.0271	0.048
	02/22/07	NA				**0.0467**	<0.001	0.109	0.169
	05/10/07	NA				**0.0607**	<0.001	0.0815	0.0532
	08/10/07	NA				**<0.05**	<0.05	<0.05	<0.05
	11/15/07	NA				<0.001	0.0022	0.0012	0.054
	02/28/08	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/28/08	NA				**0.0581**	0.0023	0.0537	0.0427
	08/20/08	NA				**0.0512**	<0.002	0.07	0.0499
	11/07/08	NA				**0.0597**	<0.002	0.0353	0.0251
	02/09/09	1.57	<1.5	<1.5	1.57	**0.0509**	<0.002	0.0382	0.0472
	05/14/09	NA				**0.0336**	<0.002	0.0381	0.0305
	08/12/09	NA				**0.0452**	<0.04	0.0568	0.0288
	11/11/09	NA				**0.0363**	<0.002	0.0403	0.0089
	02/05/10	NA				0.0092	<0.002	0.0126	<0.001
	05/27/10	NA				**0.0279**	<0.002	0.0487	<0.01
	08/16/10	NA				**0.0373**	<0.002	0.0689	<0.01
	11/19/10	NA				**0.03445**	0.0019	0.0768	0.0029
	02/18/11	NA				**0.0328**	<0.002	0.0629	0.00409
	05/24/11	NA				**0.0374**	<0.002	0.0602	0.00596
	08/19/11	NA				**0.126**	<0.040	0.181	0.0214
	11/16/11	NA				**0.0371**	<0.002	0.0609	0.0038
	02/29/12	NA				**0.0198**	<0.0100	0.0322	<0.00500
	05/17/12	NA				**0.0523**	<0.001	0.0655	0.00193
	08/16/12	<5.0	NA		<5.0	<0.0100	<0.0100	<0.0100	<0.001
	11/07/12	NA				**0.0213**	<0.005	<0.005	<0.005
	02/28/13	NA				**0.0106**	<0.002	<0.00635	<0.00254
	05/31/13	<0.988	<0.988	NA	<0.988	**0.0289**	<0.001	0.0362	<0.0007
	08/09/13	<0.895	<0.895	NA	<0.895	**0.0626**	0.00146	0.0805	0.00742
	11/14/13	0.98	1.12	NA	2.1	**0.0267**	<0.001	0.0352	0.00597
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

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Bold text indicates a concentration exceeding the NMWQCC Delineation and Remediation Limits

SAMPLE LOCATION	SAMPLE DATE	Method SW 8015B				EPA 8021B			
		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-10	11/15/04	NA				**1.25**	0.0967	0.14	0.0108
	03/21/05	NA				**1.13**	0.0141	0.138	0.00484
	05/17/05	NA				**2.17**	0.0144	0.194	0.00755
	08/15/05	NA				**0.791**	<0.001	0.074	<0.001
	11/18/05	NA				**1.25**	<0.001	0.916	<0.001
	02/16/06	NA				**0.276**	<0.001	0.538	<0.001
	05/22/06	NA				**1.32**	<0.005	0.105	<0.005
	08/07/06	NA				**1.51**	<0.001	0.103	<0.001
	11/21/06	NA				**0.222**	<0.005	0.0215	<0.005
	02/22/07	NA				**0.0791**	<0.001	0.0061	<0.002
	05/10/07	NA				0.0023	<0.001	0.0072	<0.001
	08/10/07	NA				**0.0883**	0.0011	0.0047	<0.001
	11/15/07	NA				**0.0728**	0.0281	0.0279	0.094
	02/28/08	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/28/08	NA				**0.0193**	<0.002	0.0023	0.0024
	08/20/08	NA				**0.1847**	0.0031	0.271	0.1267
	11/07/08	NA				0.0012	<0.002	<0.001	0.0012
	02/09/09	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	0.001	<0.001
	05/14/09	NA				0.0028	<0.002	<0.001	0.0013
	08/12/09	NA				0.0014	<0.002	0.0021	0.0016
	11/11/09	NA				<0.001	<0.002	0.0022	0.0011
	02/05/10	NA				<0.001	<0.002	0.0011	<0.001
	05/27/10	NA				<0.001	<0.002	0.0026	<0.001
	08/16/10	NA				<0.001	<0.002	0.0033	<0.001
	11/19/10	NA				0.0007	<0.002	0.0014	<0.001
	02/18/11	NA				0.001	<0.002	0.0012	<0.001
	05/24/11	NA				<0.001	<0.002	<0.001	<0.001
	08/19/11	NA				0.00161	<0.002	0.00253	<0.001
	11/16/11	NA				<0.001	<0.002	0.00321	<0.001
	02/29/12	NA				<0.001	<0.002	0.00246	<0.001
	05/17/12	NA				<0.001	<0.001	0.00247	<0.001
	08/16/12	<5.0	NA		<5.0	<0.001	<0.001	<0.001	<0.001
	11/07/12	NA				<0.001	<0.001	<0.001	<0.001
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	<0.0005	<0.001	<0.0007	<0.0007
	08/09/13	<0.878	<0.878	NA	<0.878	<0.0005	<0.001	0.00102	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

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		TPH[1] C_6-C_{10}	TPH C_{10}-C_{28}	TPH C_{28}-C_{35}	TPH C_6-C_{35}	BENZENE	TOLUENE	ETHYL-BENZENE	TOTAL XYLENES
MW-11	11/15/04	NA				<0.001	<0.001	<0.001	<0.001
	03/21/05	NA				<0.001	<0.001	<0.001	<0.001
	05/17/05	NA				<0.001	<0.001	<0.001	<0.001
	08/15/05	NA				<0.001	<0.001	<0.001	<0.001
	11/18/05	NA				<0.001	<0.001	<0.001	<0.001
	02/16/06	NA				<0.001	<0.001	<0.001	<0.001
	05/22/06	NA				<0.001	<0.001	<0.001	<0.001
	08/07/06	NA				<0.001	<0.001	<0.001	<0.001
	11/21/06	NA				<0.001	<0.001	<0.001	<0.001
	02/22/07	NA				<0.001	<0.001	<0.001	<0.002
	05/10/07	NA				<0.001	<0.001	<0.001	<0.001
	08/10/07	NA				<0.001	<0.001	<0.001	<0.001
	11/15/07	NA				<0.001	<0.002	<0.001	<0.001
	02/28/08	<1.5	<1.5	<1.5	<1.5	0.005	<0.002	0.0019	0.0025
	05/28/08	NA				<0.001	<0.002	0.0012	<0.001
	08/20/08	NA				<0.001	<0.002	<0.001	<0.001
	11/07/08	<0.001	<0.002	<0.001	<0.002	<0.001	<0.002	<0.001	<0.001
	02/09/09	<1.5	<1.5	<1.5	<1.5	<0.001	<0.002	<0.001	<0.001
	05/14/09	NA				<0.001	<0.002	<0.001	<0.001
	08/12/09	NA				<0.001	<0.002	<0.001	<0.001
	11/11/09	NA				<0.001	<0.002	<0.001	<0.001
	02/05/10	NA				<0.001	<0.002	<0.001	<0.001
	05/27/10	NA				<0.001	<0.002	<0.001	<0.001
	08/16/10	NA				<0.001	<0.002	<0.001	<0.001
	11/19/10	NA				<0.001	<0.002	<0.001	<0.001
	02/18/11	NA				<0.001	<0.002	<0.001	<0.001
	05/24/11	NA				<0.001	<0.002	<0.001	<0.001
	08/19/11	NA				<0.001	<0.002	<0.001	<0.001
	11/16/11	NA				<0.001	<0.002	0.00149	<0.001
	02/29/12	NA				<0.001	<0.002	<0.001	<0.001
	05/17/12	NA				<0.001	<0.001	<0.001	<0.001
	08/16/12	<5.0	NA		<5.0	<0.001	<0.001	<0.001	<0.001
	11/07/12	NA				<0.001	<0.001	<0.001	<0.001
	02/28/13	NA				<0.001	<0.002	<0.001	<0.001
	05/31/13	<0.988	<0.988	NA	<0.988	<0.0005	<0.001	<0.0007	<0.0007
	08/09/13	<0.909	<0.909	NA	<0.909	<0.0005	<0.001	<0.0007	<0.0007
	11/14/13	<0.740	<0.954	NA	<0.740	<0.0005	<0.001	<0.0007	<0.0007
NMWQCC[4] Groundwater Standards		**NE[5]**				**0.01**	**0.75**	**0.75**	**0.62**

1. TPH = Total Petroleum Hydrocarbons

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2013 Annual Report
Table 3
CONCENTRATIONS OF PAH[1] IN GROUNDWATER

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
NMOCD File Number: 1R-0395
Plains Pipeline, L. P. SRS Number 2001-11226
Terracon Project Number A4077007

Concentrations are in mg/L [2]

Monitor Well Identification	Date	EPA SW846-8270C and 3510																		
		Naphthalene	Acenapthylene	Acenapthene	Flourene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)-anthracene	Chrysene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)-pyrene	Dibenzo(a,h)-anthracene	Benzo(g,h.i)-perylene	Dibenzo-furan	1-Methyl-naphthalene	2-Methyl-naphthalene
MW-1	09/13/01	<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	NA[3]	NA	NA
	07/14/04	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	NA	NA
	02/28/08	Dry - Well Not Sampled																		
	09/05/13	Dry - Well Not Sampled																		
MW-2	07/14/04	0.0133	<0.00005	<0.00005	0.000061	0.000497	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	0.00883	<0.00005	0.000054	0.000052	0.000325	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	0.0128	<0.00005	<0.00005	0.000103	0.000352	<0.00005	<0.00005	<0.00005	<0.00005	0.000066	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.00779	<0.0002	<0.0002	0.000229	<0.0002	0.00175	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	0.000442	NA	NA
	02/28/08	<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	<0.005	<0.005
	11/07/12	0.00946	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	**0.00422**	**0.00306**
	09/05/13	0.000902	<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	<0.0000508
MW-3	09/13/01	<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	NA	NA	NA
	07/14/04	CONTAINER BROKEN IN TRANSIT																		
	09/14/04	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	NA	NA
	02/28/08	<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	NA	<0.005	<0.005
	09/05/13	<0.000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562
MW-4	01/24/02	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	07/10/02	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	04/15/03	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	07/14/03	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	07/14/04	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	09/14/04	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	03/21/05	NOT SAMPLED DUE TO THE PRESENCE OF PHASE SEPARATED HYDROCARBONS																		
	02/16/06	**0.113**	<0.00005	<0.00005	0.000855	0.00916	<0.00005	<0.00005	<0.00005	<0.00005	0.00252	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	**0.0659**	<0.0002	<0.0002	0.000737	<0.0002	0.00596	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	0.00112	NA	NA
	02/28/08	<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	<0.005	<0.005
	12/30/11	**0.0366**	<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	0.0167	0.0126
	11/07/12	**0.101**	<0.0002	<0.0002	<0.0002	0.00494	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00154	0.0456	0.0440
	09/05/13	**0.0643**	0.000288	<0.0000667	0.000419	0.00328	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	0.00092	<0.0000667	<0.0000667
MW-5	09/13/01	**0.049**	<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	NA	NA	NA
	07/14/04	CONTAINER BROKE IN TRANSIT																		
	09/14/04	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	CONTAINER BROKE IN TRANSIT																		
	02/16/06	0.000415	<0.00005	0.000059	0.000147	0.000309	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.00218	<0.0002	<0.0002	0.000496	<0.0002	0.00075	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	0.00112	NA	NA
	02/28/08	**0.051**	<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	<0.005
	12/30/11	<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	<0.005	<0.005
	11/07/12	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	09/05/13	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	0.000311	<0.0000562	<0.0000562
MW-6	07/14/04	0.00122	<0.00005	<0.00005	<0.00005	0.000085	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	0.000089	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.00095	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	NA	NA
	02/28/08	0.009	<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	NA	0.006	<0.005
	09/05/13	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	<0.0000667	0.000305	<0.0000667	<0.0000667
MW-7	07/14/04	0.000261	<0.00005	<0.00005	<0.00005	0.000293	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	0.000448	<0.00005	<0.00005	<0.00005	0.000222	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	0.000057	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.000606	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	NA	NA
	02/28/08	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	NA	0.011	0.005
	12/30/11	<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	<0.005	<0.005
	09/05/13	<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	<0.0000508	<0.0000508
NMWQCC[4] Groundwater Standards		**0.03**	**NE[5]**											**0.0007**	**NE**					

1. PAH - Polycyclic Aromatic Hydrocarbons
2. mg/L - milligrams per liter
3. NA - Not Analyzed
4. NMWQCC - New Mexico Water Quality Control Commission

Values in **BOLD** equal or exceed NMWQCC Groundwater Standards

2013 Annual Report
Table 3
CONCENTRATIONS OF PAH[1] IN GROUNDWATER

Livingston Line - Bob McCasland Pipeline Leak
Lea County, New Mexico
NMOCD File Number: 1R-0395
Plains Pipeline, L. P. SRS Number 2001-11226
Terracon Project Number A4077007

Concentrations are in mg/L [2]

Monitor Well Identification	Date	EPA SW846-8270C and 3510																		
		Naphthalene	Acenapthylene	Acenapthene	Flourene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)-anthracene	Chrysene	Benzo(b)-fluoranthene	Benzo(k)-fluoranthene	Benzo(a)-pyrene	Indeno(1,2,3-cd)-pyrene	Dibenzo(a,h)-anthracene	Benzo(g,h.i)-perylene	Dibenzo-furan	1-Methyl-naphthalene	2-Methyl-naphthalene
MW-8	07/14/04	0.00494	0.000064	<0.00005	0.000127	0.00143	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	0.0057	<0.00005	<0.00005	<0.00005	0.00283	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	0.00529	0.00007	<0.00005	<0.00005	0.00282	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.0071	<0.0002	<0.0002	0.000229	<0.0002	0.00118	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	0.00047	NA	NA
	02/28/08	<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	<0.005	<0.005
	09/05/13	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	<0.0000562	0.000177	<0.0000562	<0.0000562
MW-9	07/14/04	0.00798	<0.00005	0.000089	0.000306	0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	03/21/05	0.00126	<0.00005	<0.00005	0.000076	0.000068	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	0.0107	<0.00005	<0.00005	0.000139	0.000125	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.00243	<0.0002	<0.0002	<0.0002	<0.0002	0.000222	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	0.00132	NA	NA
	02/28/08	<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	<0.005	<0.005
	09/05/13	0.00247	<0.0000588	<0.0000588	0.000262	0.000287	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	<0.0000588	0.000354	<0.0000588	<0.0000588
MW-10	03/21/05	0.00738	0.000051	0.000083	0.000292	0.000654	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	CONTAINER BROKE IN TRANSIT																		
	05/22/06	0.000174	<0.00005	<0.00005	0.00009	0.000202	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	0.000688	<0.0002	<0.0002	0.000388	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	0.00108	NA	NA
	02/28/08	<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	<0.005	<0.005
	09/05/13	0.000548	<0.0000508	<0.0000508	0.0000839	0.0000605	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	<0.0000508	0.000714	<0.0000508	<0.0000508
MW-11	03/21/05	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	02/16/06	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	NA	NA	NA
	05/10/07	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	NA	NA
	02/28/08	<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	NA	<0.005	<0.005
	09/05/13	<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	<0.0000524	<0.0000524
NMWQCC Groundwater Standards		**0.03**	**NE**											**0.0007**	**NE**					

1. PAH - Polycyclic Aromatic Hydrocarbons
2. mg/L - milligrams per liter
3. NA - Not Analyzed
4. NMWQCC - New Mexico Water Quality Control Commission

Values in **BOLD** equal or exceed NMWQCC Groundwater Standards

APPENDIX C

Laboratory Data Sheets

Analytical Report 458482

for

PLAINS ALL AMERICAN EH&S

Project Manager: Wesley Ty Burrow

Livingston Line

A4137007

06-MAR-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

06-MAR-13

Project Manager: **Wesley Ty Burrow**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **458482**
Livingston Line
Project Address: Texas

Wesley Ty Burrow:

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) 458482. 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. 458482 will be filed for 60 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,

Nicholas Straccione
Project Manager

Sample Cross Reference 458482

PLAINS ALL AMERICAN EH&S, Midland, TX

Livingston Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW 2	W	02-28-13 12:15	N/A	458482-001
MW 3	W	02-28-13 11:45	N/A	458482-002
MW 5	W	02-28-13 13:20	N/A	458482-003
MW 6	W	02-28-13 11:30	N/A	458482-004
MW 7	W	02-28-13 12:40	N/A	458482-005
MW 8	W	02-28-13 13:00	N/A	458482-006
MW 9	W	02-28-13 11:15	N/A	458482-007
MW 10	W	02-28-13 13:50	N/A	458482-008
MW 11	W	02-28-13 14:10	N/A	458482-009

Project ID:	*A4137007*	Report Date:	*06-MAR-13*
Work Order Number(s):	*458482*	Date Received:	*02/28/2013*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 458482

PLAINS ALL AMERICAN EH&S, Midland, TX

Project Name: Livingston Line

Project Id: A4137007
Contact: Wesley Ty Burrow
Project Location: Texas

Date Received in Lab: Thu Feb-28-13 04:11 pm
Report Date: 06-MAR-13
Project Manager: Nicholas Straccione

Analysis Requested													
	Lab Id:	458482-001		458482-002		458482-003		458482-004		458482-005		458482-006	
	Field Id:	MW 2		MW 3		MW 5		MW 6		MW 7		MW 8	
	Depth:	N/A		N/A		N/A		N/A		N/A		N/A	
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	Sampled:	Feb-28-13 12:15		Feb-28-13 11:45		Feb-28-13 13:20		Feb-28-13 11:30		Feb-28-13 12:40		Feb-28-13 13:00	
BTEX by EPA 8021B	***Extracted:***	Mar-05-13 10:45		Mar-05-13 10:45		Mar-05-13 10:45		Mar-05-13 10:45		Mar-05-13 10:45		Mar-05-13 10:45	
	Analyzed:	Mar-05-13 15:29		Mar-05-13 13:17		Mar-05-13 13:34		Mar-05-13 13:50		Mar-05-13 14:07		Mar-05-13 14:23	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Benzene		ND	0.00100	ND	0.00100	0.0396	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Toluene		ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
Ethylbenzene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
m_p-Xylenes		ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200	ND	0.00200
o-Xylene		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total Xylenes		ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100	ND	0.00100
Total BTEX		ND	0.00100	ND	0.00100	0.0396	0.00100	ND	0.00100	ND	0.00100	ND	0.00100

Certificate of Analysis Summary 458482

PLAINS ALL AMERICAN EH&S, Midland, TX

Project Name: Livingston Line

Project Id: A4137007
Contact: Wesley Ty Burrow
Project Location: Texas

Date Received in Lab: Thu Feb-28-13 04:11 pm
Report Date: 06-MAR-13
Project Manager: Nicholas Straccione

Analysis Requested											
	Lab Id:	458482-007		458482-008		458482-009					
	Field Id:	MW 9		MW 10		MW 11					
	Depth:	N/A		N/A		N/A					
	Matrix:	WATER		WATER		WATER					
	Sampled:	Feb-28-13 11:15		Feb-28-13 13:50		Feb-28-13 14:10					
BTEX by EPA 8021B	***Extracted:***	Mar-05-13 10:45		Mar-05-13 10:45		Mar-05-13 10:45					
	Analyzed:	Mar-05-13 18:13		Mar-05-13 18:29		Mar-05-13 15:13					
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL				
Benzene		0.0106	0.00100	ND	0.00100	ND	0.00100				
Toluene		ND	0.00200	ND	0.00200	ND	0.00200				
Ethylbenzene		0.00635	0.00100	ND	0.00100	ND	0.00100				
m_p-Xylenes		0.00254	0.00200	ND	0.00200	ND	0.00200				
o-Xylene		ND	0.00100	ND	0.00100	ND	0.00100				
Total Xylenes		0.00254	0.00100	ND	0.00100	ND	0.00100				
Total BTEX		0.0195	0.00100	ND	0.00100	ND	0.00100				

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 quantiation 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

+ NELAC certification not offered for this compound.

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

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5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
2505 North Falkenburg Rd, Tampa, FL 33619	(813) 620-2000	(813) 620-2033
12600 West I-20 East, Odessa, TX 79765	(432) 563-1800	(432) 563-1713
6017 Financial Drive, Norcross, GA 30071	(770) 449-8800	(770) 449-5477
3725 E. Atlanta Ave, Phoenix, AZ 85040	(602) 437-0330	

Form 2 - Surrogate Recoveries

Project Name: Livingston Line

Work Orders : 458482,

Project ID: A4137007

Lab Batch #: 908315 **Sample:** 458482-002 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 13:17

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	80-120	
4-Bromofluorobenzene	0.0270	0.0300	90	80-120	

Lab Batch #: 908315 **Sample:** 458482-003 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 13:34

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	80-120	
4-Bromofluorobenzene	0.0322	0.0300	107	80-120	

Lab Batch #: 908315 **Sample:** 458482-004 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 13:50

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0254	0.0300	85	80-120	
4-Bromofluorobenzene	0.0272	0.0300	91	80-120	

Lab Batch #: 908315 **Sample:** 458482-005 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 14:07

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

Lab Batch #: 908315 **Sample:** 458482-006 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 14:23

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	80-120	
4-Bromofluorobenzene	0.0294	0.0300	98	80-120	

* 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.

Version: 1.%

Form 2 - Surrogate Recoveries

Project Name: Livingston Line

Work Orders : 458482,

Project ID: A4137007

Lab Batch #: 908315 **Sample:** 458482-009 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 15:13

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0325	0.0300	108	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 908315 **Sample:** 458482-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 15:29

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

Lab Batch #: 908315 **Sample:** 458482-007 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 18:13

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 908315 **Sample:** 458482-008 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 18:29

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	80-120	
4-Bromofluorobenzene	0.0263	0.0300	88	80-120	

Lab Batch #: 908315 **Sample:** 634671-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 12:44

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0343	0.0300	114	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

* 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.

Version: 1.%

Form 2 - Surrogate Recoveries

Project Name: Livingston Line

Work Orders : 458482,

Project ID: A4137007

Lab Batch #: 908315 **Sample:** 634671-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 12:11

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0280	0.0300	93	80-120	

Lab Batch #: 908315 **Sample:** 634671-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 12:27

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	80-120	
4-Bromofluorobenzene	0.0244	0.0300	81	80-120	

Lab Batch #: 908315 **Sample:** 458482-002 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 17:40

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	80-120	
4-Bromofluorobenzene	0.0302	0.0300	101	80-120	

Lab Batch #: 908315 **Sample:** 458482-002 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 03/05/13 17:57

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0315	0.0300	105	80-120	
4-Bromofluorobenzene	0.0300	0.0300	100	80-120	

* 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.

Version: 1.%

BS / BSD Recoveries

Project Name: Livingston Line

Work Order #: 458482 **Project ID:** A4137007

Analyst: KEB **Date Prepared:** 03/05/2013 **Date Analyzed:** 03/05/2013

Lab Batch ID: 908315 **Sample:** 634671-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.00100	0.100	0.108	108	0.100	0.0926	93	15	70-125	25	
Toluene	<0.00200	0.100	0.105	105	0.100	0.0856	86	20	70-125	25	
Ethylbenzene	<0.00100	0.100	0.109	109	0.100	0.0880	88	21	71-129	25	
m_p-Xylenes	<0.00200	0.200	0.209	105	0.200	0.171	86	20	70-131	25	
o-Xylene	<0.00100	0.100	0.107	107	0.100	0.0857	86	22	71-133	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.%

Form 3 - MS / MSD Recoveries

Project Name: Livingston Line

Work Order # : 458482 **Project ID:** A4137007

Lab Batch ID: 908315 **QC- Sample ID:** 458482-002 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 03/05/2013 **Date Prepared:** 03/05/2013 **Analyst:** KEB

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	<0.00100	0.100	0.101	101	0.100	0.0922	92	9	70-125	25	
Toluene	<0.00200	0.100	0.0948	95	0.100	0.0912	91	4	70-125	25	
Ethylbenzene	<0.00100	0.100	0.0976	98	0.100	0.0910	91	7	71-129	25	
m_p-Xylenes	<0.00200	0.200	0.187	94	0.200	0.175	88	7	70-131	25	
o-Xylene	<0.00100	0.100	0.0937	94	0.100	0.0843	84	11	71-133	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 ApplicableN = See Narrative, EQL = Estimated Quantitation Limit

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location: Midland

Project Manager: Ty Burrow

Laboratory: Xenco

Address:

Contact:

Phone:

PO/SO #: 2001-11226

Sampler's Name: Michael O'Ferrall

Sampler's Signature: Michael O'Ferrall

Proj. No: A4137007

Project Name: Livingston Line

No/Type of Containers: 36

ANALYSIS REQUESTED: BTEX, TPH

Lab use only
Due Date:

Temp. of coolers when received (C°):
1 | 2 | 3 | 4 | 5

Page ____ of ____

458482
Lab Sample ID (Lab Use Only)

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O
W	2-28	12:15			MW-2			4			
		11:45			MW-3						
		1:20			MW-5						
		11:30			MW-6						
		12:40			MW-7						
		1:00			MW-8						
		11:15			MW-9						
		1:50			MW-10						
		2:10			MW-11						

Turn around time: [X] Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Michael O'Ferrall	2-28	4:11	Shawnee Smith	2/28/13	4:17
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:

NOTES:
Email results to
WTBurrow@Terracon.com

10.0

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

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11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 02/28/2013 04:11:00 PM

Work Order #: 458482

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	10
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**Yes**

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

Analyst:	PH Device/Lot#:

Checklist completed by: _____ Date: _____

Checklist reviewed by: _____ Date: _____

Analytical Report 463936

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

PAAPL Livingston Line

A4132007

05-JUN-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

05-JUN-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **463936**
PAAPL Livingston Line
Project Address: TX and NM

Dale Moxley:

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) 463936. 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. 463936 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW11	W	05-28-13 15:30		463936-001
MW6	W	05-28-13 17:45		463936-002
MW10	W	05-28-13 16:35		463936-003
MW9	W	05-28-13 19:05		463936-004

CASE NARRATIVE

Client Name: PLAINS ALL AMERICAN EH&S

Project Name: PAAPL Livingston Line

Project ID:	*A4132007*	Report Date:	*05-JUN-13*
Work Order Number(s):	*463936*	Date Received:	*05/29/2013*

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 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id: **MW11** | Matrix: Water | Sample Depth:

Lab Sample Id: **463936-001** | Date Collected: 05.28.13 15.30 | Date Received: 05.29.13 10.10

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.05.13 08:22	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.05.13 08:22	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.05.13 08:22	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	92	70 - 135	%		
o-Terphenyl	101	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915160 | Date Prep: 05.31.13 11.00

Prep seq: 639030

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	05.31.13 16:12	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	05.31.13 16:12	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	05.31.13 16:12	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	05.31.13 16:12	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	05.31.13 16:12	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	05.31.13 16:12	U	
Total BTEX		ND		0.000500	mg/L	05.31.13 16:12	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	84	80 - 120	%		
4-Bromofluorobenzene	98	80 - 120	%		

Certificate of Analytical Results 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id: **MW6** | Matrix: Water | Sample Depth:

Lab Sample Id: **463936-002** | Date Collected: 05.28.13 17.45 | Date Received: 05.29.13 10.10

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.05.13 00:28	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.05.13 00:28	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.05.13 00:28	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	93	70 - 135	%		
o-Terphenyl	100	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915160 | Date Prep: 05.31.13 11.00

Prep seq: 639030

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	05.31.13 19:51	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	05.31.13 19:51	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	05.31.13 19:51	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	05.31.13 19:51	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	05.31.13 19:51	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	05.31.13 19:51	U	
Total BTEX		ND		0.000500	mg/L	05.31.13 19:51	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	80	80 - 120	%		
4-Bromofluorobenzene	80	80 - 120	%		

Certificate of Analytical Results 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id: **MW10** | Matrix: Water | Sample Depth:

Lab Sample Id: **463936-003** | Date Collected: 05.28.13 16.35 | Date Received: 05.29.13 10.10

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.05.13 00:53	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.05.13 00:53	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.05.13 00:53	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	94	70 - 135	%		
o-Terphenyl	102	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915160 | Date Prep: 05.31.13 11.00

Prep seq: 639030

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	05.31.13 19:35	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	05.31.13 19:35	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	05.31.13 19:35	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	05.31.13 19:35	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	05.31.13 19:35	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	05.31.13 19:35	U	
Total BTEX		ND		0.000500	mg/L	05.31.13 19:35	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	114	80 - 120	%		
4-Bromofluorobenzene	120	80 - 120	%		

Certificate of Analytical Results 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id: **MW9** | Matrix: Water | Sample Depth:

Lab Sample Id: **463936-004** | Date Collected: 05.28.13 19.05 | Date Received: 05.29.13 10.10

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.05.13 08:48	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.05.13 08:48	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.05.13 08:48	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	93	70 - 135	%		
o-Terphenyl	102	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915358 | Date Prep: 06.04.13 11.30

Prep seq: 639146

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.0289**	0.00100	0.000500	mg/L	06.04.13 18:50		1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	06.04.13 18:50	U	1
Ethylbenzene	100-41-4	**0.0362**	0.00100	0.000700	mg/L	06.04.13 18:50		1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	06.04.13 18:50	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	06.04.13 18:50	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	06.04.13 18:50	U	
Total BTEX		**0.0651**		0.000500	mg/L	06.04.13 18:50		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	102	80 - 120	%		
4-Bromofluorobenzene	105	80 - 120	%		

Certificate of Analytical Results 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id: **639030-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: **639030-1-BLK** Date Collected: Date Received:

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

Analyst: DYV % Moist: Tech: DYV

Seq Number: 915160 Date Prep: 05.31.13 11.00

Prep seq: 639030

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	05.31.13 12:03	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	05.31.13 12:03	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	05.31.13 12:03	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	05.31.13 12:03	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	05.31.13 12:03	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	82	80 - 120	%		
4-Bromofluorobenzene	115	80 - 120	%		

Sample Id: **639146-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: **639146-1-BLK** Date Collected: Date Received:

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

Analyst: DYV % Moist: Tech: DYV

Seq Number: 915358 Date Prep: 06.04.13 11.30

Prep seq: 639146

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	06.04.13 13:01	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	06.04.13 13:01	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	06.04.13 13:01	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	06.04.13 13:01	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	06.04.13 13:01	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	80 - 120	%		
4-Bromofluorobenzene	93	80 - 120	%		

Certificate of Analytical Results 463936

PLAINS ALL AMERICAN EH&S, Midland, TX

PAAPL Livingston Line

Sample Id: **639179-1-BLK** | Matrix: Water | Sample Depth:

Lab Sample Id: **639179-1-BLK** | Date Collected: | Date Received:

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.04.13 21:01	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.04.13 21:01	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.04.13 21:01	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	99	70 - 135	%		
o-Terphenyl	109	70 - 135	%		

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 quantiation 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

\+ 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: PAAPL Livingston Line

Work Orders : 463936,

Project ID: A4132007

Lab Batch #: 915160 **Sample:** 639030-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 05/31/13 11:30

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0240	0.0300	80	80-120	
4-Bromofluorobenzene	0.0268	0.0300	89	80-120	

Lab Batch #: 915160 **Sample:** 639030-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 05/31/13 11:46

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0358	0.0300	119	80-120	
4-Bromofluorobenzene	0.0316	0.0300	105	80-120	

Lab Batch #: 915160 **Sample:** 639030-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 05/31/13 12:03

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0245	0.0300	82	80-120	
4-Bromofluorobenzene	0.0344	0.0300	115	80-120	

Lab Batch #: 915160 **Sample:** 464134-010 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 05/31/13 21:30

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	80-120	
4-Bromofluorobenzene	0.0285	0.0300	95	80-120	

Lab Batch #: 915160 **Sample:** 464134-010 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 05/31/13 21:46

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	80-120	
4-Bromofluorobenzene	0.0332	0.0300	111	80-120	

* 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: PAAPL Livingston Line

Work Orders : 463936,

Project ID: A4132007

Lab Batch #: 915358 **Sample:** 639146-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 12:29

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0307	0.0300	102	80-120	
4-Bromofluorobenzene	0.0273	0.0300	91	80-120	

Lab Batch #: 915358 **Sample:** 639146-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 12:45

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0329	0.0300	110	80-120	

Lab Batch #: 915358 **Sample:** 639146-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 13:01

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0278	0.0300	93	80-120	

Lab Batch #: 915358 **Sample:** 464200-004 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 14:56

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0296	0.0300	99	80-120	

Lab Batch #: 915358 **Sample:** 464200-004 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 15:12

BTEX by EPA 8021B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0246	0.0300	82	80-120	
4-Bromofluorobenzene	0.0347	0.0300	116	80-120	

* 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: PAAPL Livingston Line

Work Orders : 463936,

Project ID: A4132007

Lab Batch #: 915388 **Sample:** 639179-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 20:09

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.87	10.0	99	70-135	
o-Terphenyl	5.73	5.00	115	70-135	

Lab Batch #: 915388 **Sample:** 639179-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 20:35

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.83	10.0	98	70-135	
o-Terphenyl	6.39	5.00	128	70-135	

Lab Batch #: 915388 **Sample:** 639179-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 21:01

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.94	10.0	99	70-135	
o-Terphenyl	5.44	5.00	109	70-135	

Lab Batch #: 915388 **Sample:** 463936-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/05/13 05:32

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.58	10.0	96	70-135	
o-Terphenyl	5.55	5.00	111	70-135	

* 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: PAAPL Livingston Line

Work Order #: 463936 **Project ID:** A4132007

Analyst: DYV **Date Prepared:** 05/31/2013 **Date Analyzed:** 05/31/2013

Lab Batch ID: 915160 **Sample:** 639030-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.112	112	0.100	0.105	105	6	70-125	25	
Toluene	<0.00100	0.100	0.108	108	0.100	0.112	112	4	70-125	25	
Ethylbenzene	<0.000700	0.100	0.109	109	0.100	0.113	113	4	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.233	117	0.200	0.225	113	3	70-131	25	
o-Xylene	<0.000700	0.100	0.113	113	0.100	0.104	104	8	71-133	25	

Analyst: DYV **Date Prepared:** 06/04/2013 **Date Analyzed:** 06/04/2013

Lab Batch ID: 915358 **Sample:** 639146-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.107	107	0.100	0.106	106	1	70-125	25	
Toluene	<0.00100	0.100	0.106	106	0.100	0.111	111	5	70-125	25	
Ethylbenzene	<0.000700	0.100	0.118	118	0.100	0.118	118	0	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.215	108	0.200	0.220	110	2	70-131	25	
o-Xylene	<0.000700	0.100	0.107	107	0.100	0.106	106	1	71-133	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: PAAPL Livingston Line

Work Order #: 463936 **Project ID:** A4132007

Analyst: DYV **Date Prepared:** 06/04/2013 **Date Analyzed:** 06/04/2013

Lab Batch ID: 915388 **Sample:** 639179-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	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
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	105	105	100	106	106	1	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	114	114	100	116	116	2	70-135	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 Recoveries

Project Name: PAAPL Livingston Line

Work Order #: 463936
Lab Batch #: 915388
Project ID: A4132007
Date Analyzed: 06/05/2013
Date Prepared: 06/04/2013
Analyst: DYV
QC- Sample ID: 463936-001 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	103	103	70-135	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	109	109	70-135	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: PAAPL Livingston Line

Work Order # : 463936 **Project ID:** A4132007

Lab Batch ID: 915160 **QC- Sample ID:** 464134-010 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 05/31/2013 **Date Prepared:** 05/31/2013 **Analyst:** DYV

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	<0.000500	0.100	0.0834	83	0.100	0.0884	88	6	70-125	25	
Toluene	<0.00100	0.100	0.0821	82	0.100	0.0998	100	19	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0912	91	0.100	0.106	106	15	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.163	82	0.200	0.188	94	14	70-131	25	
o-Xylene	<0.000700	0.100	0.0814	81	0.100	0.0861	86	6	71-133	25	

Lab Batch ID: 915358 **QC- Sample ID:** 464200-004 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 06/04/2013 **Date Prepared:** 06/04/2013 **Analyst:** DYV

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	0.0201	0.100	0.117	97	0.100	0.118	98	1	70-125	25	
Toluene	<0.00100	0.100	0.105	105	0.100	0.109	109	4	70-125	25	
Ethylbenzene	<0.000700	0.100	0.112	112	0.100	0.114	114	2	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.211	106	0.200	0.226	113	7	70-131	25	
o-Xylene	<0.000700	0.100	0.103	103	0.100	0.113	113	9	71-133	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.

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location: MIDLAND

Project Manager: DALE MOXLEY

Laboratory:
Address:
Contact:
Phone:
PO/SO #:

Sampler's Name

Sampler's Signature

ANALYSIS REQUESTED

Lab use only
Due Date:

Temp. of coolers when received (C°): 1.0

1	2	3	4	5

Page ____ of ____

Proj. No.: SRS# 2001-1122C
A4132007

Project Name: PAAPL LIVINGSTON LINE

No/Type of Containers: 4

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	TPH - NM 8015B	BTEX	Lab Sample ID (Lab Use Only)
W	5/28/13	15:30		✓	MW 11			X				X	X	463936
W	5/28/13	17:45		✓	MW 6			X				X	X	
W	5/28/13	16:35		✓	MW 10			X				X	X	
W	5/28/13	19:05		✓	MW 9			X				X	X	

NFE

Turn around time: ☑ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/29/13	1610	Shawnee Smith	5-29-13	10:10
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:

NOTES: Standard

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 05/29/2013 10:10:00 AM

Work Order #: 463936

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	1
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**Yes**

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

Analyst:	PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 05/29/2013

Checklist reviewed by: Kelsey Brooks Date: 05/29/2013

Analytical Report 464267

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

A4137007

06-JUN-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

06-JUN-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **464267**
A4137007
Project Address: TX and NM

Dale Moxley:

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) 464267. 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. 464267 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 464267

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW5	W	05-31-13 10:30		464267-001
MW8	W	05-31-13 11:25		464267-002
MW4	W	05-31-13 12:20		464267-003

CASE NARRATIVE

Client Name: PLAINS ALL AMERICAN EH&S

Project Name: A4137007

Project ID:	*PLAINS-Terracon*	Report Date:	*06-JUN-13*
Work Order Number(s):	*464267*	Date Received:	*05/31/2013*

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 464267

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id: **MW5** | Matrix: Water | Sample Depth:

Lab Sample Id: **464267-001** | Date Collected: 05.31.13 10.30 | Date Received: 05.31.13 13.24

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.05.13 04:15	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.05.13 04:15	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.05.13 04:15	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	91	70 - 135	%		
o-Terphenyl	99	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915517 | Date Prep: 06.04.13 16.30

Prep seq: 639264

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.0342**	0.00100	0.000500	mg/L	06.05.13 13:28		1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	06.05.13 13:28	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	06.05.13 13:28	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	06.05.13 13:28	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	06.05.13 13:28	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	06.05.13 13:28	U	
Total BTEX		**0.0342**		0.000500	mg/L	06.05.13 13:28		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	116	80 - 120	%		
4-Bromofluorobenzene	86	80 - 120	%		

Sample Id: **MW8** | Matrix: Water | Sample Depth:

Lab Sample Id: **464267-002** | Date Collected: 05.31.13 11.25 | Date Received: 05.31.13 13.24

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.05.13 04:41	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.05.13 04:41	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.05.13 04:41	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	98	70 - 135	%		
o-Terphenyl	106	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915517 | Date Prep: 06.04.13 16.30

Prep seq: 639264

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	06.05.13 01:39	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	06.05.13 01:39	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	06.05.13 01:39	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	06.05.13 01:39	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	06.05.13 01:39	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	06.05.13 01:39	U	
Total BTEX		ND		0.000500	mg/L	06.05.13 01:39	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	104	80 - 120	%		
4-Bromofluorobenzene	118	80 - 120	%		

Certificate of Analytical Results 464267

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id: **MW4** | Matrix: Water | Sample Depth:

Lab Sample Id: **464267-003** | Date Collected: 05.31.13 12.20 | Date Received: 05.31.13 13.24

Analytical Method: **TPH by SW 8015B** | Prep Method: 1005

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915388 | Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	**2.00**	1.50	0.988	mg/L	06.05.13 05:07		1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	**1.68**	1.50	0.988	mg/L	06.05.13 05:07		1
Total TPH	PHC635	**3.68**		0.988	mg/L	06.05.13 05:07		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	93	70 - 135	%		
o-Terphenyl	101	70 - 135	%		

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

Analyst: DYV | % Moist: | Tech: DYV

Seq Number: 915517 | Date Prep: 06.04.13 16.30

Prep seq: 639264

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.499**	0.00500	0.00250	mg/L	06.05.13 15:39		5
Toluene	108-88-3	ND	0.0100	0.00500	mg/L	06.05.13 15:39	U	5
Ethylbenzene	100-41-4	**0.118**	0.00500	0.00350	mg/L	06.05.13 15:39		5
m,p-Xylenes	179601-23-1	**0.0378**	0.0100	0.00700	mg/L	06.05.13 15:39		5
o-Xylene	95-47-6	ND	0.00500	0.00350	mg/L	06.05.13 15:39	U	5
Total Xylenes	1330-20-7	**0.0378**		0.00350	mg/L	06.05.13 15:39		
Total BTEX		**0.655**		0.00250	mg/L	06.05.13 15:39		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	91	80 - 120	%		
4-Bromofluorobenzene	84	80 - 120	%		

Certificate of Analytical Results 464267

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id: **639179-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: **639179-1-BLK** Date Collected: Date Received:

Analytical Method: **TPH by SW 8015B** Prep Method: 1005

Analyst: DYV % Moist: Tech: DYV

Seq Number: 915388 Date Prep: 06.04.13 13.00

Prep seq: 639179

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	06.04.13 21:01	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	06.04.13 21:01	U	1
Total TPH	PHC635	ND		0.988	mg/L	06.04.13 21:01	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	99	70 - 135	%		
o-Terphenyl	109	70 - 135	%		

Sample Id: **639264-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: **639264-1-BLK** Date Collected: Date Received:

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

Analyst: DYV % Moist: Tech: DYV

Seq Number: 915517 Date Prep: 06.04.13 16.30

Prep seq: 639264

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	06.04.13 21:17	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	06.04.13 21:17	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	06.04.13 21:17	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	06.04.13 21:17	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	06.04.13 21:17	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	94	80 - 120	%		
4-Bromofluorobenzene	88	80 - 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 quantiation 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

\+ 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: A4137007

Work Orders : 464267,

Project ID: PLAINS-Terracon

Lab Batch #: 915517 **Sample:** 639264-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 20:45

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0249	0.0300	83	80-120	
4-Bromofluorobenzene	0.0262	0.0300	87	80-120	

Lab Batch #: 915517 **Sample:** 639264-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 21:01

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	80-120	
4-Bromofluorobenzene	0.0291	0.0300	97	80-120	

Lab Batch #: 915517 **Sample:** 639264-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 21:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene	0.0263	0.0300	88	80-120	

Lab Batch #: 915517 **Sample:** 464239-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/05/13 00:17

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0341	0.0300	114	80-120	

Lab Batch #: 915517 **Sample:** 464239-001 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/05/13 00:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	80-120	
4-Bromofluorobenzene	0.0290	0.0300	97	80-120	

* 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: A4137007

Work Orders : 464267,

Project ID: PLAINS-Terracon

Lab Batch #: 915388 **Sample:** 639179-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 20:09

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.87	10.0	99	70-135	
o-Terphenyl	5.73	5.00	115	70-135	

Lab Batch #: 915388 **Sample:** 639179-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 20:35

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.83	10.0	98	70-135	
o-Terphenyl	6.39	5.00	128	70-135	

Lab Batch #: 915388 **Sample:** 639179-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/04/13 21:01

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.94	10.0	99	70-135	
o-Terphenyl	5.44	5.00	109	70-135	

Lab Batch #: 915388 **Sample:** 463936-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 06/05/13 05:32

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.58	10.0	96	70-135	
o-Terphenyl	5.55	5.00	111	70-135	

* 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: A4137007

Work Order #: 464267 **Project ID:** PLAINS-Terracon

Analyst: DYV **Date Prepared:** 06/04/2013 **Date Analyzed:** 06/04/2013

Lab Batch ID: 915517 **Sample:** 639264-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.0837	84	0.100	0.100	100	18	70-125	25	
Toluene	<0.00100	0.100	0.0931	93	0.100	0.100	100	7	70-125	25	
Ethylbenzene	<0.000700	0.100	0.107	107	0.100	0.106	106	1	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.197	99	0.200	0.200	100	2	70-131	25	
o-Xylene	<0.000700	0.100	0.0961	96	0.100	0.0994	99	3	71-133	25	

Analyst: DYV **Date Prepared:** 06/04/2013 **Date Analyzed:** 06/04/2013

Lab Batch ID: 915388 **Sample:** 639179-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	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
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	105	105	100	106	106	1	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	114	114	100	116	116	2	70-135	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 Recoveries

Project Name: A4137007

Work Order #: 464267

Lab Batch #: 915388

Project ID: PLAINS-Terracon

Date Analyzed: 06/05/2013

Date Prepared: 06/04/2013

Analyst: DYV

QC- Sample ID: 463936-001 S

Batch #: 1

Matrix: Water

Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	103	103	70-135	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	109	109	70-135	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: A4137007

Work Order # : 464267 **Project ID:** PLAINS-Terracon

Lab Batch ID: 915517 **QC- Sample ID:** 464239-001 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 06/05/2013 **Date Prepared:** 06/04/2013 **Analyst:** DYV

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	<0.000500	0.100	0.105	105	0.100	0.105	105	0	70-125	25	
Toluene	<0.00100	0.100	0.105	105	0.100	0.104	104	1	70-125	25	
Ethylbenzene	<0.000700	0.100	0.114	114	0.100	0.110	110	4	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.212	106	0.200	0.214	107	1	70-131	25	
o-Xylene	<0.000700	0.100	0.117	117	0.100	0.108	108	8	71-133	25	

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

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

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

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.

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location: Midland

Project Manager: Dale Moxley

Laboratory: XenCo

Address: Odessa, TX

Contact: Dale Moxley

Phone: 432-684-9600

PO/SO #:

Sampler's Name: Hiram Loya

Sampler's Signature:

Proj. No.: A4137007 Plains/SRS 2001-11226

Project Name:

No/Type of Containers: VOAS

ANALYSIS REQUESTED: BTEX, TPH-NM 8015B

Lab use only
Due Date:

Temp. of coolers when received (C°): 3.0, 5.5

1	2	3	4	5

Page ____ of ____

464267
Lab Sample ID (Lab Use Only)

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O		
W	5/31/13	1030			MW5			4				X	X
W	5/31/13	1125			MW8			4				X	X
W	5/31/13	1220			MW4			4				X	X

Turn around time: ☑ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	5/31/13	1324	Stan Butler	5-31-13	1324
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
			Daniel Smith	6-3-13	10:00
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

NOTES:

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 05/31/2013 01:24:00 PM

Work Order #: 464267

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**Yes**

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

Analyst:	PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 06/04/2013

Checklist reviewed by: Kelsey Brooks Date: 06/04/2013

Analytical Report 466148

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

A4137007

PLAINS-Terracon

09-JUL-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

09-JUL-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **466148**
A4137007
Project Address: NM

Dale Moxley:

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) 466148. 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. 466148 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 466148

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW3	W	07-01-13 16:29		466148-001
MW7	W	07-01-13 15:53		466148-002

CASE NARRATIVE

Client Name: PLAINS ALL AMERICAN EH&S

Project Name: A4137007

Project ID: *PLAINS-Terracon*
Work Order Number(s): *466148*

Report Date: *09-JUL-13*
Date Received: *07/02/2013*

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 466148

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id: **MW3** Matrix: Water Sample Depth:

Lab Sample Id: 466148-001 Date Collected: 07.01.13 16.29 Date Received: 07.02.13 17.11

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917958 Date Prep: 07.08.13 11.30

Prep seq: 640757

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	07.08.13 17:36	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	07.08.13 17:36	U	1
Total TPH	PHC635	ND		0.988	mg/L	07.08.13 17:36	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	91	70 - 135	%		
o-Terphenyl	110	70 - 135	%		

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

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917965 Date Prep: 07.08.13 08.30

Prep seq: 640753

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	07.08.13 12:17	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	07.08.13 12:17	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	07.08.13 12:17	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	07.08.13 12:17	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	07.08.13 12:17	U	1
MTBE	1634-04-4	ND	0.00500	0.00200	mg/L	07.08.13 12:17	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	117	80 - 120	%		
4-Bromofluorobenzene	82	80 - 120	%		

Certificate of Analytical Results 466148

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id: **MW7** Matrix: Water Sample Depth:

Lab Sample Id: 466148-002 Date Collected: 07.01.13 15.53 Date Received: 07.02.13 17.11

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917958 Date Prep: 07.08.13 11.30

Prep seq: 640757

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	07.08.13 18:02	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	07.08.13 18:02	U	1
Total TPH	PHC635	ND		0.988	mg/L	07.08.13 18:02	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	89	70 - 135	%		
o-Terphenyl	104	70 - 135	%		

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

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917965 Date Prep: 07.08.13 08.30

Prep seq: 640753

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	07.08.13 12:33	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	07.08.13 12:33	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	07.08.13 12:33	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	07.08.13 12:33	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	07.08.13 12:33	U	1
MTBE	1634-04-4	ND	0.00500	0.00200	mg/L	07.08.13 12:33	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	115	80 - 120	%		
4-Bromofluorobenzene	87	80 - 120	%		

Certificate of Analytical Results 466148

PLAINS ALL AMERICAN EH&S, Midland, TX

A4137007

Sample Id: **640753-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 640753-1-BLK Date Collected: Date Received:

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

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917965 Date Prep: 07.08.13 08.30

Prep seq: 640753

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	07.08.13 11:29	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	07.08.13 11:29	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	07.08.13 11:29	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	07.08.13 11:29	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	07.08.13 11:29	U	1
MTBE	1634-04-4	ND	0.00500	0.00200	mg/L	07.08.13 11:29	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	117	80 - 120	%		
4-Bromofluorobenzene	85	80 - 120	%		

Sample Id: **640757-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 640757-1-BLK Date Collected: Date Received:

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: DYV % Moist: Tech: DYV

Seq Number: 917958 Date Prep: 07.08.13 11.30

Prep seq: 640757

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	07.08.13 15:23	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	07.08.13 15:23	U	1
Total TPH	PHC635	ND		0.988	mg/L	07.08.13 15:23	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	89	70 - 135	%		
o-Terphenyl	107	70 - 135	%		

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 quantiation 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

\+ 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: A4137007

Work Orders : 466148,

Project ID: PLAINS-Terracon

Lab Batch #: 917965 **Sample:** 640753-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 10:41

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0341	0.0300	114	80-120	
4-Bromofluorobenzene	0.0243	0.0300	81	80-120	

Lab Batch #: 917965 **Sample:** 640753-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 10:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0351	0.0300	117	80-120	
4-Bromofluorobenzene	0.0254	0.0300	85	80-120	

Lab Batch #: 917965 **Sample:** 640753-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 11:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0352	0.0300	117	80-120	
4-Bromofluorobenzene	0.0256	0.0300	85	80-120	

Lab Batch #: 917965 **Sample:** 466188-015 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 14:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0350	0.0300	117	80-120	
4-Bromofluorobenzene	0.0262	0.0300	87	80-120	

Lab Batch #: 917965 **Sample:** 466188-015 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 14:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0326	0.0300	109	80-120	
4-Bromofluorobenzene	0.0245	0.0300	82	80-120	

* 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: A4137007

Work Orders : 466148,

Project ID: PLAINS-Terracon

Lab Batch #: 917958 **Sample:** 640757-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 14:30

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.27	10.0	93	70-135	
o-Terphenyl	6.26	5.00	125	70-135	

Lab Batch #: 917958 **Sample:** 640757-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 14:56

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.29	10.0	93	70-135	
o-Terphenyl	6.19	5.00	124	70-135	

Lab Batch #: 917958 **Sample:** 640757-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 15:23

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	8.90	10.0	89	70-135	
o-Terphenyl	5.35	5.00	107	70-135	

Lab Batch #: 917958 **Sample:** 466148-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 07/08/13 18:28

TPH by SW 8015B Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.14	10.0	91	70-135	
o-Terphenyl	5.41	5.00	108	70-135	

* 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: A4137007

Work Order #: 466148 **Project ID:** PLAINS-Terracon

Analyst: DYV **Date Prepared:** 07/08/2013 **Date Analyzed:** 07/08/2013

Lab Batch ID: 917965 **Sample:** 640753-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.117	117	0.100	0.119	119	2	70-125	25	
Toluene	<0.00100	0.100	0.0916	92	0.100	0.0951	95	4	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0804	80	0.100	0.0847	85	5	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.160	80	0.200	0.170	85	6	70-131	25	
o-Xylene	<0.000700	0.100	0.0813	81	0.100	0.0864	86	6	71-133	25	
MTBE	<0.00200	0.500	0.480	96	0.500	0.508	102	6	71-133	25	

Analyst: DYV **Date Prepared:** 07/08/2013 **Date Analyzed:** 07/08/2013

Lab Batch ID: 917958 **Sample:** 640757-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	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
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	75.4	75	100	76.9	77	2	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	91.9	92	100	92.1	92	0	70-135	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 Recoveries

Project Name: A4137007

Work Order #: 466148
Lab Batch #: 917958
Project ID: PLAINS-Terracon
Date Analyzed: 07/08/2013
Date Prepared: 07/08/2013
Analyst: DYV
QC- Sample ID: 466148-001 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

TPH by SW 8015B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	76.4	76	70-135	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	90.9	91	70-135	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: A4137007

Work Order # : 466148 **Project ID:** PLAINS-Terracon

Lab Batch ID: 917965 **QC- Sample ID:** 466188-015 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 07/08/2013 **Date Prepared:** 07/08/2013 **Analyst:** DYV

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	<0.000500	0.100	0.119	119	0.100	0.111	111	7	70-125	25	
Toluene	<0.00100	0.100	0.0943	94	0.100	0.0899	90	5	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0865	87	0.100	0.0805	81	7	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.167	84	0.200	0.162	81	3	70-131	25	
o-Xylene	<0.000700	0.100	0.0869	87	0.100	0.0823	82	5	71-133	25	
MTBE	<0.00200	0.500	0.546	109	0.500	0.492	98	10	71-133	25	

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

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

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

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.

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location: Midland

Project Manager: Dale Moxley

Laboratory: XENCO
Address: 12600 W.I-20 EAST
ODESSA TX 79765
Contact:
Phone:
PO/SO #:

Sampler's Name: R. Reid

Sampler's Signature:

Lab use only
Due Date:

Temp. of coolers when received (C°): 3.0

1	2	3	4	5

Page ____ of ____

Proj. No.: A4137007

Project Name: PLAINS SRS # 2001-11226

No/Type of Containers: 8 / VOAS

466148

Lab Sample ID (Lab Use Only)

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	BETX	TPH NM 8015B
	~~6/28~~	~~7:1~~ 4:29p		X	MW3			4				X	X
	~~6/28~~	~~7:1~~ 3:53p		X	MW7			4				X	X

Turn around time: ☐ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	7.2.13	5:11p	Shannon Smith	7-2-13	17:11
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:

NOTES:
PLEASE EMAIL RESULTS TO:
JDMOXLEY@TERRACON.COM
Standard TAT

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 07/02/2013 05:11:00 PM

Work Order #: 466148

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**Yes**

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

Analyst:	PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 07/02/2013

Checklist reviewed by: Kelsey Brooks Date: 07/02/2013

Analytical Report 468306

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

SRS# 2001-11226 Livingston Line

A4137007

05-SEP-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-13-14-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

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05-SEP-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **468306**
SRS# 2001-11226 Livingston Line
Project Address: TX and NM

Dale Moxley:

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) 468306. 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. 468306 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 468306

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-11	W	08-09-13 07:58		468306-001
MW-9	W	08-09-13 08:39		468306-002
MW-6	W	08-09-13 09:17		468306-003
MW-10	W	08-09-13 09:57		468306-004
MW-5	W	08-09-13 10:35		468306-005
MW-2	W	08-09-13 11:15		468306-006
MW-7	W	08-09-13 11:54		468306-007
MW-3	W	08-09-13 12:36		468306-008
MW-8	W	08-09-13 13:18		468306-009
MW-4	W	08-09-13 14:02		468306-010
MW-12	W	08-08-13 11:42		Not Analyzed
MW-13	W	08-08-13 12:24		Not Analyzed
MW-14	W	08-08-13 13:13		Not Analyzed
MW-15	W	08-08-13 13:58		Not Analyzed
MW-1	W	08-08-13 17:02		Not Analyzed

CASE NARRATIVE

Client Name: PLAINS ALL AMERICAN EH&S

Project Name: SRS# 2001-11226 Livingston Line

Project ID: *A4137007*
Work Order Number(s): *468306*

Report Date: *05-SEP-13*
Date Received: *08/09/2013*

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 468306

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

Sample Id: **MW-11** Matrix: Water Sample Depth:

Lab Sample Id: 468306-001 Date Collected: 08.09.13 07.58 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 09.54

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.38	0.909	mg/L	08.14.13 18:50	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.38	0.909	mg/L	08.14.13 18:50	U	1
Total TPH	PHC635	ND		0.909	mg/L	08.14.13 18:50	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	93	70 - 135	%		
o-Terphenyl	102	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 13:17	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 13:17	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 13:17	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 13:17	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 13:17	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 13:17	U	
Total BTEX		ND		0.000500	mg/L	08.15.13 13:17	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	101	80 - 120	%		
4-Bromofluorobenzene	82	80 - 120	%		

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PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

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

Lab Sample Id: 468306-002 Date Collected: 08.09.13 08.39 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 09.57

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.36	0.895	mg/L	08.14.13 19:14	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.36	0.895	mg/L	08.14.13 19:14	U	1
Total TPH	PHC635	ND		0.895	mg/L	08.14.13 19:14	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	104	70 - 135	%		
o-Terphenyl	115	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.0626**	0.00100	0.000500	mg/L	08.15.13 13:33		1
Toluene	108-88-3	**0.00146**	0.00200	0.00100	mg/L	08.15.13 13:33	J	1
Ethylbenzene	100-41-4	**0.0805**	0.00100	0.000700	mg/L	08.15.13 13:33		1
m,p-Xylenes	179601-23-1	**0.00410**	0.00200	0.00140	mg/L	08.15.13 13:33		1
o-Xylene	95-47-6	**0.00332**	0.00100	0.000700	mg/L	08.15.13 13:33		1
Total Xylenes	1330-20-7	**0.00742**		0.000700	mg/L	08.15.13 13:33		
Total BTEX		**0.152**		0.000500	mg/L	08.15.13 13:33		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	120	80 - 120	%		
4-Bromofluorobenzene	98	80 - 120	%		

Certificate of Analytical Results 468306

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

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

Lab Sample Id: 468306-003 Date Collected: 08.09.13 09.17 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.00

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.37	0.903	mg/L	08.14.13 19:38	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.37	0.903	mg/L	08.14.13 19:38	U	1
Total TPH	PHC635	ND		0.903	mg/L	08.14.13 19:38	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	100	70 - 135	%		
o-Terphenyl	115	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 14:54	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 14:54	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 14:54	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 14:54	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 14:54	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 14:54	U	
Total BTEX		ND		0.000500	mg/L	08.15.13 14:54	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	90	80 - 120	%		
4-Bromofluorobenzene	82	80 - 120	%		

Certificate of Analytical Results 468306

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

Sample Id: **MW-10** Matrix: Water Sample Depth:

Lab Sample Id: 468306-004 Date Collected: 08.09.13 09.57 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.03

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.33	0.878	mg/L	08.14.13 20:01	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.33	0.878	mg/L	08.14.13 20:01	U	1
Total TPH	PHC635	ND		0.878	mg/L	08.14.13 20:01	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	101	70 - 135	%		
o-Terphenyl	118	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 15:58	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 15:58	U	1
Ethylbenzene	100-41-4	**0.00102**	0.00100	0.000700	mg/L	08.15.13 15:58		1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 15:58	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 15:58	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 15:58	U	
Total BTEX		**0.00102**		0.000500	mg/L	08.15.13 15:58		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	104	80 - 120	%		
4-Bromofluorobenzene	82	80 - 120	%		

Certificate of Analytical Results 468306

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

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

Lab Sample Id: 468306-005 Date Collected: 08.09.13 10.35 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.06

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.36	0.895	mg/L	08.14.13 20:25	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.36	0.895	mg/L	08.14.13 20:25	U	1
Total TPH	PHC635	ND		0.895	mg/L	08.14.13 20:25	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	110	70 - 135	%		
o-Terphenyl	121	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.00191**	0.00100	0.000500	mg/L	08.15.13 16:15		1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 16:15	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 16:15	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 16:15	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 16:15	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 16:15	U	
Total BTEX		**0.00191**		0.000500	mg/L	08.15.13 16:15		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	96	80 - 120	%		
4-Bromofluorobenzene	81	80 - 120	%		

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PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

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

Lab Sample Id: 468306-006 Date Collected: 08.09.13 11.15 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.09

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.37	0.900	mg/L	08.14.13 20:48	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.37	0.900	mg/L	08.14.13 20:48	U	1
Total TPH	PHC635	ND		0.900	mg/L	08.14.13 20:48	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	116	70 - 135	%		
o-Terphenyl	126	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 15:11	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 15:11	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 15:11	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 15:11	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 15:11	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 15:11	U	
Total BTEX		ND		0.000500	mg/L	08.15.13 15:11	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	99	80 - 120	%		
4-Bromofluorobenzene	82	80 - 120	%		

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PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

Sample Id: **MW-7** Matrix: Water Sample Depth:

Lab Sample Id: 468306-007 Date Collected: 08.09.13 11.54 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.12

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.39	0.913	mg/L	08.14.13 21:11	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.39	0.913	mg/L	08.14.13 21:11	U	1
Total TPH	PHC635	ND		0.913	mg/L	08.14.13 21:11	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	108	70 - 135	%		
o-Terphenyl	120	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 15:26	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 15:26	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 15:26	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 15:26	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 15:26	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 15:26	U	
Total BTEX		ND		0.000500	mg/L	08.15.13 15:26	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	113	80 - 120	%		
4-Bromofluorobenzene	85	80 - 120	%		

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PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

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

Lab Sample Id: 468306-008 Date Collected: 08.09.13 12.36 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.15

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.37	0.905	mg/L	08.14.13 21:34	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.37	0.905	mg/L	08.14.13 21:34	U	1
Total TPH	PHC635	ND		0.905	mg/L	08.14.13 21:34	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	111	70 - 135	%		
o-Terphenyl	121	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920801 Date Prep: 08.15.13 16.45

Prep seq: 642627

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 18:55	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 18:55	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 18:55	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 18:55	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 18:55	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 18:55	U	
Total BTEX		ND		0.000500	mg/L	08.15.13 18:55	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	103	80 - 120	%		
4-Bromofluorobenzene	84	80 - 120	%		

Certificate of Analytical Results 468306

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226 Livingston Line

Sample Id: **MW-8** Matrix: Water Sample Depth:

Lab Sample Id: 468306-009 Date Collected: 08.09.13 13.18 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.18

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.38	0.906	mg/L	08.14.13 21:56	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.38	0.906	mg/L	08.14.13 21:56	U	1
Total TPH	PHC635	ND		0.906	mg/L	08.14.13 21:56	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	115	70 - 135	%		
o-Terphenyl	125	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920801 Date Prep: 08.15.13 16.45

Prep seq: 642627

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.00773**	0.00100	0.000500	mg/L	08.15.13 19:11		1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 19:11	U	1
Ethylbenzene	100-41-4	**0.00142**	0.00100	0.000700	mg/L	08.15.13 19:11		1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 19:11	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 19:11	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	08.15.13 19:11	U	
Total BTEX		**0.00915**		0.000500	mg/L	08.15.13 19:11		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	104	80 - 120	%		
4-Bromofluorobenzene	81	80 - 120	%		

Sample Id: **MW-4** Matrix: Water Sample Depth:

Lab Sample Id: 468306-010 Date Collected: 08.09.13 14.02 Date Received: 08.09.13 16.07

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 10.21

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.42	0.938	mg/L	08.14.13 23:03	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.42	0.938	mg/L	08.14.13 23:03	U	1
Total TPH	PHC635	ND		0.938	mg/L	08.14.13 23:03	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	113	70 - 135	%		
o-Terphenyl	125	70 - 135	%		

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920801 Date Prep: 08.15.13 16.45

Prep seq: 642627

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.400**	0.00100	0.000500	mg/L	08.15.13 21:19		1
Toluene	108-88-3	**0.00408**	0.00200	0.00100	mg/L	08.15.13 21:19		1
Ethylbenzene	100-41-4	**0.114**	0.00100	0.000700	mg/L	08.15.13 21:19		1
m,p-Xylenes	179601-23-1	**0.0340**	0.00200	0.00140	mg/L	08.15.13 21:19		1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 21:19	U	1
Total Xylenes	1330-20-7	**0.0340**		0.000700	mg/L	08.15.13 21:19		
Total BTEX		**0.552**		0.000500	mg/L	08.15.13 21:19		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	112	80 - 120	%		
4-Bromofluorobenzene	87	80 - 120	%		

Sample Id: **642405-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 642405-1-BLK Date Collected: Date Received:

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920654 Date Prep: 08.13.13 09.45

Subcontractor: SUB: E871002 Prep seq: 642405

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	08.14.13 17:24	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	08.14.13 17:24	U	1
Total TPH	PHC635	ND		0.988	mg/L	08.14.13 17:24	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	101	70 - 135	%		
o-Terphenyl	113	70 - 135	%		

Sample Id: **642409-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 642409-1-BLK Date Collected: Date Received:

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: PKH % Moist: Tech: PKH

Seq Number: 920656 Date Prep: 08.13.13 11.15

Subcontractor: SUB: E871002 Prep seq: 642409

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.988	mg/L	08.14.13 13:58	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.988	mg/L	08.14.13 13:58	U	1
Total TPH	PHC635	ND		0.988	mg/L	08.14.13 13:58	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	114	70 - 135	%		
o-Terphenyl	137	70 - 135	%		**

Sample Id: **642580-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 642580-1-BLK Date Collected: Date Received:

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920715 Date Prep: 08.15.13 09.00

Prep seq: 642580

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 10:37	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 10:37	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 10:37	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 10:37	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 10:37	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	101	80 - 120	%		
4-Bromofluorobenzene	81	80 - 120	%		

Sample Id: **642627-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 642627-1-BLK Date Collected: Date Received:

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

Analyst: KEB % Moist: Tech: KEB

Seq Number: 920801 Date Prep: 08.15.13 16.45

Prep seq: 642627

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	08.15.13 18:39	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	08.15.13 18:39	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	08.15.13 18:39	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	08.15.13 18:39	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	08.15.13 18:39	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	101	80 - 120	%		
4-Bromofluorobenzene	81	80 - 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 quantiation 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

+ 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: SRS# 2001-11226 Livingston Line

Work Orders : 468306, **Project ID:** A4137007

Lab Batch #: 920715 **Sample:** 642580-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 09:48

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0347	0.0300	116	80-120	
4-Bromofluorobenzene	0.0255	0.0300	85	80-120	

Lab Batch #: 920715 **Sample:** 642580-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 10:04

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0348	0.0300	116	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 920715 **Sample:** 642580-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 10:37

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0304	0.0300	101	80-120	
4-Bromofluorobenzene	0.0243	0.0300	81	80-120	

Lab Batch #: 920715 **Sample:** 468194-003 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 16:54

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0356	0.0300	119	80-120	
4-Bromofluorobenzene	0.0255	0.0300	85	80-120	

Lab Batch #: 920801 **Sample:** 642627-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 17:50

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1,4-Difluorobenzene	0.0345	0.0300	115	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

* 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: SRS# 2001-11226 Livingston Line

Work Orders : 468306,

Project ID: A4137007

Lab Batch #: 920801 **Sample:** 642627-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 18:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0353	0.0300	118	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 920801 **Sample:** 642627-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 18:39

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	80-120	
4-Bromofluorobenzene	0.0244	0.0300	81	80-120	

Lab Batch #: 920801 **Sample:** 468306-008 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 21:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0351	0.0300	117	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

Lab Batch #: 920801 **Sample:** 468306-008 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/15/13 21:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0352	0.0300	117	80-120	
4-Bromofluorobenzene	0.0264	0.0300	88	80-120	

Lab Batch #: 920654 **Sample:** 642405-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/14/13 17:24

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	10.1	10.0	101	70-135	
o-Terphenyl	5.63	5.00	113	70-135	

* 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: SRS# 2001-11226 Livingston Line

Work Orders : 468306, **Project ID:** A4137007

Lab Batch #: 920654 **Sample:** 642405-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/14/13 18:00

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1-Chlorooctane	10.6	10.0	106	70-135	
o-Terphenyl	5.88	5.00	118	70-135	

Lab Batch #: 920654 **Sample:** 642405-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/14/13 18:25

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1-Chlorooctane	10.5	10.0	105	70-135	
o-Terphenyl	5.45	5.00	109	70-135	

Lab Batch #: 920656 **Sample:** 642409-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/14/13 13:58

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1-Chlorooctane	11.4	10.0	114	70-135	
o-Terphenyl	6.85	5.00	137	70-135	**

Lab Batch #: 920656 **Sample:** 642409-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/14/13 14:23

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1-Chlorooctane	11.2	10.0	112	70-135	
o-Terphenyl	6.33	5.00	127	70-135	

Lab Batch #: 920656 **Sample:** 642409-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 08/14/13 14:48

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	SURROGATE RECOVERY STUDY				
1-Chlorooctane	10.4	10.0	104	70-135	
o-Terphenyl	6.08	5.00	122	70-135	

* 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: SRS# 2001-11226 Livingston Line

Work Order #: 468306 **Project ID:** A4137007

Analyst: KEB **Date Prepared:** 08/15/2013 **Date Analyzed:** 08/15/2013

Lab Batch ID: 920715 **Sample:** 642580-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.102	102	0.100	0.103	103	1	70-125	25	
Toluene	<0.00100	0.100	0.0938	94	0.100	0.0950	95	1	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0910	91	0.100	0.0924	92	2	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.180	90	0.200	0.183	92	2	70-131	25	
o-Xylene	<0.000700	0.100	0.0898	90	0.100	0.0916	92	2	71-133	25	

Analyst: KEB **Date Prepared:** 08/15/2013 **Date Analyzed:** 08/15/2013

Lab Batch ID: 920801 **Sample:** 642627-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.105	105	0.100	0.113	113	7	70-125	25	
Toluene	<0.00100	0.100	0.0965	97	0.100	0.104	104	7	70-125	25	
Ethylbenzene	<0.000700	0.100	0.0952	95	0.100	0.102	102	7	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.189	95	0.200	0.202	101	7	70-131	25	
o-Xylene	<0.000700	0.100	0.0939	94	0.100	0.102	102	8	71-133	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: SRS# 2001-11226 Livingston Line

Work Order #: 468306 **Project ID:** A4137007

Analyst: PKH **Date Prepared:** 08/13/2013 **Date Analyzed:** 08/14/2013

Lab Batch ID: 920654 **Sample:** 642405-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	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
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	77.5	78	100	75.6	76	2	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	85.3	85	100	87.1	87	2	70-135	25	

Analyst: PKH **Date Prepared:** 08/13/2013 **Date Analyzed:** 08/14/2013

Lab Batch ID: 920656 **Sample:** 642409-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	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
C6-C10 Gasoline Range Hydrocarbons	<0.988	100	70.2	70	100	71.7	72	2	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.988	100	92.6	93	100	87.6	88	6	70-135	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 Recoveries

Project Name: SRS# 2001-11226 Livingston Line

Work Order #: 468306
Lab Batch #: 920715
Project ID: A4137007
Date Analyzed: 08/15/2013
Date Prepared: 08/15/2013
Analyst: KEB
QC- Sample ID: 468194-003 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

MATRIX / MATRIX SPIKE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Benzene	<0.000500	0.100	0.117	117	70-125	
Toluene	<0.00100	0.100	0.104	104	70-125	
Ethylbenzene	<0.000700	0.100	0.100	100	71-129	
m,p-Xylenes	<0.00140	0.200	0.198	99	70-131	
o-Xylene	<0.000700	0.100	0.0990	99	71-133	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: SRS# 2001-11226 Livingston Line

Work Order # : 468306 **Project ID:** A4137007

Lab Batch ID: 920801 **QC- Sample ID:** 468306-008 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 08/15/2013 **Date Prepared:** 08/15/2013 **Analyst:** KEB

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	<0.000500	0.100	0.113	113	0.100	0.115	115	2	70-125	25	
Toluene	<0.00100	0.100	0.104	104	0.100	0.106	106	2	70-125	25	
Ethylbenzene	<0.000700	0.100	0.101	101	0.100	0.103	103	2	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.199	100	0.200	0.203	102	2	70-131	25	
o-Xylene	<0.000700	0.100	0.0996	100	0.100	0.102	102	2	71-133	25	

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

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

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

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.

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location: MIDLAND, TX

Project Manager: J. DALE MOXLEY

Laboratory: XENCO LABS
Address: 12600 W. I-20 E
ODESSA, TX 79763
Contact: ALEX MONTOYA
Phone: 432 563 1800
PO/SO #:

Sampler's Name: KIMBLE THRASH

Sampler's Signature:

Proj. No.: A4137007

Project Name: LIVINGSTON LINE SRS# 2001-11226

No/Type of Containers: VOAs

ANALYSIS REQUESTED: BTEX 8021B, TX 1005

Lab use only
Due Date:

Temp. of coolers when received (C°): -0.5°

1 2 3 4 5

Page 1 of 1

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	BTEX 8021B	TX 1005	Lab Sample ID (Lab Use Only)
W	8/9/13	0758		✓	MW-11			✓				22		468306-001
		0839		✓	MW-9			✓				22		-002
		0917		✓	MW-6			✓				22		-003
		0957		✓	MW-10			✓				22		-004
		1035		✓	MW-5			✓				22		-005
		1115		✓	MW-2			✓				22		-006
		1154		✓	MW-7			✓				22		-007
		1236		✓	MW-3			✓				22		-008
		1318		✓	MW-8			✓				22		-009
		1402		✓	MW-4			✓				22		-010

Turn around time: ☑ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by (Signature)	8/9/13	1607		8-9-13	16:07
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:

NOTES:
E-MAIL RESULTS TO:
JDMOXLEY@TERRACON.COM

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 08/09/2013 04:07:00 PM

Work Order #: 468306

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**Yes**
#5 Custody Seals intact on sample bottles?	**Yes**
#6 *Custody Seals Signed and dated?	**Yes**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst:	PH Device/Lot#:

Checklist completed by: Kelsey Brooks Date: 08/14/2013

Checklist reviewed by: Kelsey Brooks Date: 08/14/2013

Analytical Report 474141

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

Livingston Line

A4137007

22-NOV-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-13-15-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

22-NOV-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **474141**
Livingston Line
Project Address: TX and NM

Dale Moxley:

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) 474141. 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. 474141 will be filed for 60 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,

Kelsey Brooks
Project Manager

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 - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America

Sample Cross Reference 474141

PLAINS ALL AMERICAN EH&S, Midland, TX

Livingston Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-7	W	11-14-13 08:34		474141-001
MW-2	W	11-14-13 09:22		474141-002
MW-3	W	11-14-13 10:11		474141-003
MW-6	W	11-14-13 10:55		474141-004
MW-9	W	11-14-13 11:40		474141-005
MW-11	W	11-14-13 12:33		474141-006
MW-10	W	11-14-13 13:21		474141-007
MW-5	W	11-14-13 14:08		474141-008
MW-8	W	11-14-13 14:56		474141-009
MW-4	W	11-14-13 15:51		474141-010

CASE NARRATIVE

Client Name: PLAINS ALL AMERICAN EH&S

Project Name: Livingston Line

Project ID: *A4137007*
Work Order Number(s): *474141*

Report Date: *22-NOV-13*
Date Received: *11/15/2013*

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
474141

PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

Sample Id: **MW-7** Matrix: Water Sample Depth:

Lab Sample Id: 474141-001 Date Collected: 11.14.13 08.34 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.19.13 23:55	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.19.13 23:55	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.19.13 23:55	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	96	70 - 135	%		
o-Terphenyl	90	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 20:56	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 20:56	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 20:56	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 20:56	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 20:56	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 20:56	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 20:56	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	94	80 - 120	%		
4-Bromofluorobenzene	98	80 - 120	%		

Certificate of Analytical Results
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PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

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

Lab Sample Id: 474141-002 Date Collected: 11.14.13 09.22 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	**0.752**	1.50	0.740	mg/L	11.20.13 01:10	J	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 01:10	U	1
Total TPH	PHC635	**0.752**		0.740	mg/L	11.20.13 01:10	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	105	70 - 135	%		
o-Terphenyl	101	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 21:13	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 21:13	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 21:13	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 21:13	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 21:13	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 21:13	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 21:13	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	89	80 - 120	%		
4-Bromofluorobenzene	99	80 - 120	%		

Certificate of Analytical Results
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PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

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

Lab Sample Id: 474141-003 Date Collected: 11.14.13 10.11 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.20.13 01:35	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 01:35	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.20.13 01:35	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	90	70 - 135	%		
o-Terphenyl	84	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 21:29	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 21:29	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 21:29	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 21:29	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 21:29	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 21:29	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 21:29	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	98	80 - 120	%		
4-Bromofluorobenzene	101	80 - 120	%		

Certificate of Analytical Results
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PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

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

Lab Sample Id: 474141-004 Date Collected: 11.14.13 10.55 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.20.13 02:00	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 02:00	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.20.13 02:00	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	97	70 - 135	%		
o-Terphenyl	92	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 21:46	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 21:46	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 21:46	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 21:46	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 21:46	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 21:46	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 21:46	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	93	80 - 120	%		
4-Bromofluorobenzene	95	80 - 120	%		

Certificate of Analytical Results
474141

PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

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

Lab Sample Id: 474141-005 Date Collected: 11.14.13 11.40 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	**0.980**	1.50	0.740	mg/L	11.20.13 02:25	J	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	**1.12**	1.50	0.954	mg/L	11.20.13 02:25	J	1
Total TPH	PHC635	**2.10**		0.740	mg/L	11.20.13 02:25		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	99	70 - 135	%		
o-Terphenyl	96	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.0267**	0.00100	0.000500	mg/L	11.19.13 22:02		1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 22:02	U	1
Ethylbenzene	100-41-4	**0.0352**	0.00100	0.000700	mg/L	11.19.13 22:02		1
m,p-Xylenes	179601-23-1	**0.00402**	0.00200	0.00140	mg/L	11.19.13 22:02		1
o-Xylene	95-47-6	**0.00195**	0.00100	0.000700	mg/L	11.19.13 22:02		1
Total Xylenes	1330-20-7	**0.00597**		0.000700	mg/L	11.19.13 22:02		
Total BTEX		**0.0679**		0.000500	mg/L	11.19.13 22:02		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	96	80 - 120	%		
4-Bromofluorobenzene	103	80 - 120	%		

Certificate of Analytical Results

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PLAINS ALL AMERICAN EH&S, Midland, TX

Livingston Line

Sample Id: **MW-11** Matrix: Water Sample Depth:

Lab Sample Id: 474141-006 Date Collected: 11.14.13 12.33 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.20.13 02:50	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 02:50	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.20.13 02:50	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	98	70 - 135	%		
o-Terphenyl	95	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 22:18	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 22:18	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 22:18	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 22:18	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 22:18	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 22:18	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 22:18	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	94	80 - 120	%		
4-Bromofluorobenzene	97	80 - 120	%		

Certificate of Analytical Results
474141

PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

Sample Id: **MW-10** Matrix: Water Sample Depth:

Lab Sample Id: 474141-007 Date Collected: 11.14.13 13.21 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.20.13 03:15	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 03:15	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.20.13 03:15	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	94	70 - 135	%		
o-Terphenyl	90	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 22:35	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 22:35	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 22:35	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 22:35	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 22:35	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 22:35	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 22:35	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	93	80 - 120	%		
4-Bromofluorobenzene	95	80 - 120	%		

Certificate of Analytical Results

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PLAINS ALL AMERICAN EH&S, Midland, TX

Livingston Line

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

Lab Sample Id: 474141-008 Date Collected: 11.14.13 14.08 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.20.13 03:40	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 03:40	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.20.13 03:40	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	90	70 - 135	%		
o-Terphenyl	88	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 22:51	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 22:51	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 22:51	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 22:51	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 22:51	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 22:51	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 22:51	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	92	80 - 120	%		
4-Bromofluorobenzene	96	80 - 120	%		

Certificate of Analytical Results
474141

PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

Sample Id: **MW-8** Matrix: Water Sample Depth:

Lab Sample Id: 474141-009 Date Collected: 11.14.13 14.56 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.20.13 04:04	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 04:04	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.20.13 04:04	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	102	70 - 135	%		
o-Terphenyl	100	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 23:07	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 23:07	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 23:07	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 23:07	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 23:07	U	1
Total Xylenes	1330-20-7	ND		0.000700	mg/L	11.19.13 23:07	U	
Total BTEX		ND		0.000500	mg/L	11.19.13 23:07	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	99	80 - 120	%		
4-Bromofluorobenzene	99	80 - 120	%		

Certificate of Analytical Results
474141

PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

Sample Id: **MW-4** Matrix: Water Sample Depth:

Lab Sample Id: 474141-010 Date Collected: 11.14.13 15.51 Date Received: 11.15.13 15.21

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	**1.45**	1.50	0.740	mg/L	11.20.13 04:29	J	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.20.13 04:29	U	1
Total TPH	PHC635	**1.45**		0.740	mg/L	11.20.13 04:29	J	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	99	70 - 135	%		
o-Terphenyl	97	70 - 135	%		

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	**0.281**	0.00100	0.000500	mg/L	11.19.13 23:24		1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 23:24	U	1
Ethylbenzene	100-41-4	**0.0425**	0.00100	0.000700	mg/L	11.19.13 23:24		1
m,p-Xylenes	179601-23-1	**0.00816**	0.00200	0.00140	mg/L	11.19.13 23:24		1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 23:24	U	1
Total Xylenes	1330-20-7	**0.00816**		0.000700	mg/L	11.19.13 23:24		
Total BTEX		**0.332**		0.000500	mg/L	11.19.13 23:24		

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	106	80 - 120	%		
4-Bromofluorobenzene	88	80 - 120	%		

Certificate of Analytical Results
474141

PLAINS ALL AMERICAN EH&S, Midland, TX
Livingston Line

Sample Id: **647201-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 647201-1-BLK Date Collected: Date Received:

Analytical Method: TPH by SW 8015B Prep Method: 1005

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928062 Date Prep: 11.19.13 17.00

Prep seq: 647201

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
C6-C10 Gasoline Range Hydrocarbons	C6C10GRO	ND	1.50	0.740	mg/L	11.19.13 23:29	U	1
C10-C28 Diesel Range Hydrocarbons	C10C28DRO	ND	1.50	0.954	mg/L	11.19.13 23:29	U	1
Total TPH	PHC635	ND		0.740	mg/L	11.19.13 23:29	U	

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1-Chlorooctane	95	70 - 135	%		
o-Terphenyl	89	70 - 135	%		

Sample Id: **647276-1-BLK** Matrix: Water Sample Depth:

Lab Sample Id: 647276-1-BLK Date Collected: Date Received:

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

Analyst: ARM % Moist: Tech: ARM

Seq Number: 928160 Date Prep: 11.19.13 13.00

Prep seq: 647276

Parameter	CAS Number	Result	MQL	SDL	Units	Analysis Date	Flag	Dil Factor
Benzene	71-43-2	ND	0.00100	0.000500	mg/L	11.19.13 20:40	U	1
Toluene	108-88-3	ND	0.00200	0.00100	mg/L	11.19.13 20:40	U	1
Ethylbenzene	100-41-4	ND	0.00100	0.000700	mg/L	11.19.13 20:40	U	1
m,p-Xylenes	179601-23-1	ND	0.00200	0.00140	mg/L	11.19.13 20:40	U	1
o-Xylene	95-47-6	ND	0.00100	0.000700	mg/L	11.19.13 20:40	U	1

Surrogate	% Recovery	Limits	Units	Analysis Date	Flag
1,4-Difluorobenzene	97	80 - 120	%		
4-Bromofluorobenzene	102	80 - 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

+ 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

Work Orders : 474141,

Project ID: A4137007

Lab Batch #: 928160 **Sample:** 647276-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 19:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0299	0.0300	100	80-120	
4-Bromofluorobenzene	0.0323	0.0300	108	80-120	

Lab Batch #: 928160 **Sample:** 647276-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 19:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	80-120	
4-Bromofluorobenzene	0.0318	0.0300	106	80-120	

Lab Batch #: 928160 **Sample:** 474141-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 19:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0319	0.0300	106	80-120	

Lab Batch #: 928160 **Sample:** 474141-001 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 20:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0319	0.0300	106	80-120	
4-Bromofluorobenzene	0.0323	0.0300	108	80-120	

Lab Batch #: 928160 **Sample:** 647276-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 20:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	80-120	
4-Bromofluorobenzene	0.0305	0.0300	102	80-120	

* 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

Work Orders : 474141, **Project ID:** A4137007

Lab Batch #: 928062 **Sample:** 647201-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 22:39

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.00	10.0	90	70-135	
o-Terphenyl	5.17	5.00	103	70-135	

Lab Batch #: 928062 **Sample:** 647201-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 23:04

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.29	10.0	93	70-135	
o-Terphenyl	5.34	5.00	107	70-135	

Lab Batch #: 928062 **Sample:** 647201-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/19/13 23:29

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.45	10.0	95	70-135	
o-Terphenyl	4.43	5.00	89	70-135	

Lab Batch #: 928062 **Sample:** 474141-001 S / MS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/20/13 00:20

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	9.08	10.0	91	70-135	
o-Terphenyl	4.94	5.00	99	70-135	

Lab Batch #: 928062 **Sample:** 474141-001 SD / MSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 11/20/13 00:45

SURROGATE RECOVERY STUDY

TPH by SW 8015B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	10.1	10.0	101	70-135	
o-Terphenyl	5.36	5.00	107	70-135	

* 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

Work Order #: 474141 **Project ID:** A4137007

Analyst: ARM **Date Prepared:** 11/19/2013 **Date Analyzed:** 11/19/2013

Lab Batch ID: 928160 **Sample:** 647276-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.000500	0.100	0.110	110	0.100	0.105	105	5	70-125	25	
Toluene	<0.00100	0.100	0.110	110	0.100	0.105	105	5	70-125	25	
Ethylbenzene	<0.000700	0.100	0.108	108	0.100	0.101	101	7	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.239	120	0.200	0.226	113	6	70-131	25	
o-Xylene	<0.000700	0.100	0.111	111	0.100	0.107	107	4	71-133	25	

Analyst: ARM **Date Prepared:** 11/19/2013 **Date Analyzed:** 11/19/2013

Lab Batch ID: 928062 **Sample:** 647201-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B Analytes	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
C6-C10 Gasoline Range Hydrocarbons	<0.740	100	86.0	86	100	94.4	94	9	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.954	100	89.5	90	100	95.4	95	6	70-135	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

Work Order # : 474141 **Project ID:** A4137007

Lab Batch ID: 928160 **QC- Sample ID:** 474141-001 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 11/19/2013 **Date Prepared:** 11/19/2013 **Analyst:** ARM

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	<0.000500	0.100	0.107	107	0.100	0.110	110	3	70-125	25	
Toluene	<0.00100	0.100	0.107	107	0.100	0.110	110	3	70-125	25	
Ethylbenzene	<0.000700	0.100	0.102	102	0.100	0.103	103	1	71-129	25	
m,p-Xylenes	<0.00140	0.200	0.229	115	0.200	0.232	116	1	70-131	25	
o-Xylene	<0.000700	0.100	0.108	108	0.100	0.111	111	3	71-133	25	

Lab Batch ID: 928062 **QC- Sample ID:** 474141-001 S **Batch #:** 1 **Matrix:** Water

Date Analyzed: 11/20/2013 **Date Prepared:** 11/19/2013 **Analyst:** ARM

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW 8015B 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
C6-C10 Gasoline Range Hydrocarbons	<0.740	100	89.0	89	100	92.2	92	4	70-135	25	
C10-C28 Diesel Range Hydrocarbons	<0.954	100	87.0	87	100	90.0	90	3	70-135	25	

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

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

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

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.

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location MIDLAND, TX

Project Manager J. DALE MOXLEY

Laboratory: XENCO LABS
Address: 12600 W. I-20 E.
ODESSA, TX 79765
Contact: ALEX MONTOYA
Phone: 432 563 1800
PO/SO #:

ANALYSIS REQUESTED

Lab use only
Due Date:

Temp. of coolers when received (C°): -1 (-0°C)

1 | 2 | 3 | 4 | 5

Page 1 of 1

474141

Sampler's Name: KIMBLE THRASH

Sampler's Signature:

SRS #2001-11226

Proj. No.: A4137007

Project Name: LIVINGSTON LINE

No/Type of Containers: 40 VOAs

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	TPH SW8015B	BTEX EPA 8021B	Lab Sample ID (Lab Use Only)
W	11-14-13	0834		✓	MW-7			✓				2	2	
↓	↓	0922		↓	MW-2			↓				2	2	
		1011			MW-3							2	2	
		1055			MW-6							2	2	
		1140			MW-9							2	2	
		1233			MW-11							2	2	
		1321			MW-10							2	2	
		1408			MW-5							2	2	
		1456			MW-8							2	2	
↓	↓	1551		↓	MW-4			↓				2	2	

Turn around time ☒ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	11/15/13	16:30		11-15-13	15:21
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:

NOTES:
E-MAIL RESULTS TO:
JDMOXLEY@TERRACON.COM
Camille Bryant

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 11/15/2013 03:21:00 PM

Work Order #: 474141

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	0
#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 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**No**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**Yes**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**Yes**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst:	PH Device/Lot#:

Checklist completed by: Candace James Date: 11/15/2013
Candace James

Checklist reviewed by: Kelsey Brooks Date: 11/15/2013
Kelsey Brooks

Analytical Report 469826

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

SRS# 2001-11226

A4137007

12-SEP-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-13-14-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

12-SEP-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **469826**
SRS# 2001-11226
Project Address: Livingston Line

Dale Moxley:

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) 469826. 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. 469826 will be filed for 60 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,

Kelsey Brooks
Project Manager

Sample Cross Reference 469826

PLAINS ALL AMERICAN EH&S, Midland, TX

SRS# 2001-11226

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-2	W	09-05-13 08:03		469826-001
MW-3	W	09-05-13 08:27		469826-002
MW-4	W	09-05-13 10:15		469826-003
MW-5	W	09-05-13 09:46		469826-004
MW-6	W	09-05-13 08:44		469826-005
MW-7	W	09-05-13 07:42		469826-006
MW-8	W	09-05-13 10:04		469826-007
MW-9	W	09-05-13 09:00		469826-008
MW-11	W	09-05-13 09:21		469826-009

CASE NARRATIVE

Client Name: PLAINS ALL AMERICAN EH&S

Project Name: SRS# 2001-11226

Project ID: *A4137007*
Work Order Number(s): *469826*

Report Date: *12-SEP-13*
Date Received: *09/05/2013*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-922543 PAHs by GCMS SIM
SIM

Batch 922543, 2-Fluorobiphenyl recovered below QC limits . Matrix interferences is suspected; data confirmed by re-analysis
Samples affected are: 469826-004.
Nitrobenzene-d5 recovered above QC limits . Matrix interferences is suspected; data confirmed by re-analysis
Samples affected are: 469826-003.

SIM

Batch 922543, Benzo(k)fluoranthene, Fluoranthene recovered below QC limits in the laboratory control sample.
Samples affected are: 469826-002, -006, -008, -003, -001, -005, -004, -007, -009.

Certificate of Analysis Summary 469826

PLAINS ALL AMERICAN EH&S, Midland, TX

Project Name: SRS# 2001-11226

Project Id: A4137007
Contact: Dale Moxley
Project Location: Livingston Line

Date Received in Lab: Thu Sep-05-13 03:51 pm
Report Date: 12-SEP-13
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	469826-001	469826-002	469826-003	469826-004	469826-005	469826-006
	Field Id:	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
	Depth:						
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	Sampled:	Sep-05-13 08:03	Sep-05-13 08:27	Sep-05-13 10:15	Sep-05-13 09:46	Sep-05-13 08:44	Sep-05-13 07:42
PAHs by GCMS SIM SUB: TX104704215	***Extracted:***	Sep-10-13 16:39	Sep-10-13 16:42	Sep-10-13 16:45	Sep-10-13 16:48	Sep-10-13 16:51	Sep-10-13 16:54
	Analyzed:	Sep-11-13 14:07	Sep-11-13 14:21	Sep-11-13 14:35	Sep-11-13 14:50	Sep-11-13 15:04	Sep-11-13 15:18
	Units/RL:	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL	mg/L RL
Acenaphthene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Acenaphthylene		ND 0.0000508	ND 0.0000562	0.000288 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Anthracene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Benzo(a)anthracene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Benzo(a)pyrene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Benzo(b)fluoranthene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Benzo(g,h,i)perylene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Benzo(k)fluoranthene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Chrysene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Dibenz(a,h)anthracene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Dibenzofuran		ND 0.0000508	ND 0.0000562	0.000920 0.0000667	0.000311 0.0000562	0.000305 0.0000667	ND 0.0000508
Fluoranthene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Fluorene		ND 0.0000508	ND 0.0000562	0.000419 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Indeno(1,2,3-c,d)Pyrene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Naphthalene		0.000902 0.000508	ND 0.000562	0.0643 D 0.00667	ND 0.000562	ND 0.000667	ND 0.000508
Phenanthrene		ND 0.0000508	ND 0.0000562	0.00328 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508
Pyrene		ND 0.0000508	ND 0.0000562	ND 0.0000667	ND 0.0000562	ND 0.0000667	ND 0.0000508

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 469826

PLAINS ALL AMERICAN EH&S, Midland, TX

Project Name: SRS# 2001-11226

Project Id: A4137007
Contact: Dale Moxley
Project Location: Livingston Line

Date Received in Lab: Thu Sep-05-13 03:51 pm
Report Date: 12-SEP-13
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	469826-007	469826-008	469826-009			
	Field Id:	MW-8	MW-9	MW-11			
	Depth:						
	Matrix:	WATER	WATER	WATER			
	Sampled:	Sep-05-13 10:04	Sep-05-13 09:00	Sep-05-13 09:21			
PAHs by GCMS SIM SUB: TX104704215	***Extracted:***	Sep-10-13 16:57	Sep-10-13 17:00	Sep-10-13 17:03			
	Analyzed:	Sep-11-13 15:33	Sep-11-13 15:47	Sep-11-13 16:01			
	Units/RL:	mg/L RL	mg/L RL	mg/L RL			
Acenaphthene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Acenaphthylene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Anthracene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Benzo(a)anthracene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Benzo(a)pyrene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Benzo(b)fluoranthene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Benzo(g,h,i)perylene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Benzo(k)fluoranthene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Chrysene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Dibenz(a,h)anthracene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Dibenzofuran		0.000177 0.0000562	0.000354 0.0000588	ND 0.0000524			
Fluoranthene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Fluorene		ND 0.0000562	0.000262 0.0000588	ND 0.0000524			
Indeno(1,2,3-c,d)Pyrene		ND 0.0000562	ND 0.0000588	ND 0.0000524			
Naphthalene		ND 0.000562	0.00247 0.000588	ND 0.000524			
Phenanthrene		ND 0.0000562	0.000287 0.0000588	ND 0.0000524			
Pyrene		ND 0.0000562	ND 0.0000588	ND 0.0000524			

Kelsey Brooks
Project Manager

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 quantiation 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

\+ 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: SRS# 2001-11226

Work Orders : 469826,

Project ID: A4137007

Lab Batch #: 922543 **Sample:** 469826-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 14:07

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.589	1.00	59	35-114	
2-Fluorobiphenyl	0.589	1.00	59	43-116	
Terphenyl-D14	0.659	1.00	66	33-141	

Lab Batch #: 922543 **Sample:** 469826-002 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 14:21

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.532	1.00	53	35-114	
2-Fluorobiphenyl	0.522	1.00	52	43-116	
Terphenyl-D14	0.631	1.00	63	33-141	

Lab Batch #: 922543 **Sample:** 469826-003 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 14:35

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.532	1.00	53	35-114	
2-Fluorobiphenyl	0.667	1.00	67	43-116	
Terphenyl-D14	0.754	1.00	75	33-141	

Lab Batch #: 922543 **Sample:** 469826-004 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 14:50

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.412	1.00	41	35-114	
2-Fluorobiphenyl	0.369	1.00	37	43-116	**
Terphenyl-D14	0.365	1.00	37	33-141	

* 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: SRS# 2001-11226

Work Orders : 469826,

Project ID: A4137007

Lab Batch #: 922543 **Sample:** 469826-005 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 15:04

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.567	1.00	57	35-114	
2-Fluorobiphenyl	0.511	1.00	51	43-116	
Terphenyl-D14	0.684	1.00	68	33-141	

Lab Batch #: 922543 **Sample:** 469826-006 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 15:18

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.495	1.00	50	35-114	
2-Fluorobiphenyl	0.488	1.00	49	43-116	
Terphenyl-D14	0.684	1.00	68	33-141	

Lab Batch #: 922543 **Sample:** 469826-007 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 15:33

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.485	1.00	49	35-114	
2-Fluorobiphenyl	0.457	1.00	46	43-116	
Terphenyl-D14	0.600	1.00	60	33-141	

Lab Batch #: 922543 **Sample:** 469826-008 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 15:47

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.949	1.00	95	35-114	
2-Fluorobiphenyl	0.557	1.00	56	43-116	
Terphenyl-D14	0.591	1.00	59	33-141	

* 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: SRS# 2001-11226

Work Orders : 469826, **Project ID:** A4137007

Lab Batch #: 922543 **Sample:** 469826-009 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 16:01

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.456	1.00	46	35-114	
2-Fluorobiphenyl	0.443	1.00	44	43-116	
Terphenyl-D14	0.598	1.00	60	33-141	

Lab Batch #: 922543 **Sample:** 469826-003 / DL **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 17:27

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.130	0.100	130	35-114	**
2-Fluorobiphenyl	0.0551	0.100	55	43-116	
Terphenyl-D14	0.0671	0.100	67	33-141	

Lab Batch #: 922543 **Sample:** 643599-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 13:24

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.686	1.00	69	35-114	
2-Fluorobiphenyl	0.667	1.00	67	43-116	
Terphenyl-D14	0.775	1.00	78	33-141	

Lab Batch #: 922543 **Sample:** 643599-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 13:38

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.516	1.00	52	35-114	
2-Fluorobiphenyl	0.614	1.00	61	43-116	
Terphenyl-D14	0.644	1.00	64	33-141	

* 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: SRS# 2001-11226

Work Orders : 469826,

Project ID: A4137007

Lab Batch #: 922543 **Sample:** 643599-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/11/13 13:52

SURROGATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.584	1.00	58	35-114	
2-Fluorobiphenyl	0.687	1.00	69	43-116	
Terphenyl-D14	0.793	1.00	79	33-141	

* 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: SRS# 2001-11226

Work Order #: 469826 **Project ID:** A4137007

Analyst: PKH **Date Prepared:** 09/10/2013 **Date Analyzed:** 09/11/2013

Lab Batch ID: 922543 **Sample:** 643599-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	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
Acenaphthene	<0.0000500	0.00100	0.000625	63	0.00100	0.000699	70	11	57-90	25	
Acenaphthylene	<0.0000500	0.00100	0.000599	60	0.00100	0.000676	68	12	47-95	25	
Anthracene	<0.0000500	0.00100	0.000595	60	0.00100	0.000690	69	15	56-90	25	
Benzo(a)anthracene	<0.0000500	0.00100	0.000507	51	0.00100	0.000623	62	21	51-100	25	
Benzo(a)pyrene	<0.0000500	0.00100	0.000520	52	0.00100	0.000626	63	18	49-97	25	
Benzo(b)fluoranthene	<0.0000500	0.00100	0.000519	52	0.00100	0.000610	61	16	41-114	25	
Benzo(g,h,i)perylene	<0.0000500	0.00100	0.000542	54	0.00100	0.000641	64	17	51-105	25	
Benzo(k)fluoranthene	<0.0000500	0.00100	0.000515	52	0.00100	0.000645	65	22	54-103	25	L
Chrysene	<0.0000500	0.00100	0.000701	70	0.00100	0.000800	80	13	60-101	25	
Dibenz(a,h)anthracene	<0.0000500	0.00100	0.000513	51	0.00100	0.000625	63	20	50-109	25	
Dibenzofuran	<0.0000500	0.00100	0.000632	63	0.00100	0.000710	71	12	55-91	25	
Fluoranthene	<0.0000500	0.00100	0.000538	54	0.00100	0.000638	64	17	58-93	25	L
Fluorene	<0.0000500	0.00100	0.000587	59	0.00100	0.000654	65	11	58-93	25	
Indeno(1,2,3-c,d)Pyrene	<0.0000500	0.00100	0.000554	55	0.00100	0.000624	62	12	52-108	25	
Naphthalene	<0.000500	0.00100	0.000647	65	0.00100	0.000708	71	9	51-100	25	
Phenanthrene	<0.0000500	0.00100	0.000581	58	0.00100	0.000666	67	14	43-97	25	
Pyrene	<0.0000500	0.00100	0.000601	60	0.00100	0.000718	72	18	51-95	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

ENVIRONMENTAL, GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location MIDLAND, TX

Project Manager J. DALE MOXLEY

Laboratory: XENCO LABS
Address: 12600 W I-20 E
ODESSA, TX 79763
Contact: ALEX MONTOYA
Phone: 432 563 1800
PO/SO #:

Sampler's Name: KIMBLE THRASH
Sampler's Signature:

Proj. No.: A4137007
Project Name: SRS #2001-11246 LIVINGSTON LINE
No/Type of Containers: 9 1LAMB

ANALYSIS REQUESTED

PAHs

Lab use only
Due Date:

Temp. of coolers when received (C°): 1.5°

1 2 3 4 5

Page 1 of 1

469826

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	Lab Sample ID (Lab Use Only)
W	9-5-13	0803		✓	MW-2				✓			
↓	↓	0827		↓	MW-3				↓			
		1015			MW-4							
		0946			MW-5							
		0844			MW-6							
		0742			MW-7							
		1004			MW-8							
		0900			MW-9							
↓	↓	0921		↓	MW-11				↓			

Turn around time: ☑ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	9/5/13	1551	Candace Jones 9513	1551	
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:

NOTES:
E-MAIL RESULTS TO:
JDMOXLEY@TERRACON.COM

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
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Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

Analytical Report 470646

for

PLAINS ALL AMERICAN EH&S

Project Manager: Dale Moxley

Livingston Line

A4137007

24-SEP-13

Collected By: Client

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-13-14-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102), DoD (L11-54)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Kentucky (85), DoD (L10-135)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Lakeland: Florida (E84098)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

24-SEP-13

Project Manager: **Dale Moxley**
PLAINS ALL AMERICAN EH&S
1301 S. COUNTY ROAD 1150
Midland, TX 79706

Reference: XENCO Report No(s): **470646**
Livingston Line
Project Address: TX

Dale Moxley:

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) 470646. 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. 470646 will be filed for 60 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,

Kelsey Brooks
Project Manager

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 - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America

Sample Cross Reference 470646

PLAINS ALL AMERICAN EH&S, Midland, TX

Livingston Line

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-10	W	09-19-13 09:40		470646-001

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 470646

PLAINS ALL AMERICAN EH&S, Midland, TX

Project Name: Livingston Line

Project Id: A4137007
Contact: Dale Moxley
Project Location: TX

Date Received in Lab: Thu Sep-19-13 04:05 pm
Report Date: 24-SEP-13
Project Manager: Kelsey Brooks

Analysis Requested							
	Lab Id:	470646-001					
	Field Id:	MW-10					
	Depth:						
	Matrix:	WATER					
	Sampled:	Sep-19-13 09:40					
PAHs by GCMS SIM SUB: E871002	***Extracted:***	Sep-21-13 16:36					
	Analyzed:	Sep-23-13 15:07					
	Units/RL:	mg/L RL					
Acenaphthene		ND 0.0000508					
Acenaphthylene		ND 0.0000508					
Anthracene		ND 0.0000508					
Benzo(a)anthracene		ND 0.0000508					
Benzo(a)pyrene		ND 0.0000508					
Benzo(b)fluoranthene		ND 0.0000508					
Benzo(g,h,i)perylene		ND 0.0000508					
Benzo(k)fluoranthene		ND 0.0000508					
Chrysene		ND 0.0000508					
Dibenz(a,h)anthracene		ND 0.0000508					
Dibenzofuran		0.000714 0.0000508					
Fluoranthene		ND 0.0000508					
Fluorene		0.0000839 0.0000508					
Indeno(1,2,3-c,d)Pyrene		ND 0.0000508					
Naphthalene		0.000548 0.000508					
Phenanthrene		0.0000605 0.0000508					
Pyrene		ND 0.0000508					

Kelsey Brooks
Project Manager

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 quantiation 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

\+ 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

Work Orders : 470646,

Project ID: A4137007

Lab Batch #: 923322 **Sample:** 470646-001 / SMP **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/23/13 15:07

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.544	1.00	54	35-114	
2-Fluorobiphenyl	0.600	1.00	60	43-116	
Terphenyl-D14	0.818	1.00	82	33-141	

Lab Batch #: 923322 **Sample:** 644138-1-BLK / BLK **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/23/13 12:01

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.660	1.00	66	35-114	
2-Fluorobiphenyl	0.804	1.00	80	43-116	
Terphenyl-D14	0.831	1.00	83	33-141	

Lab Batch #: 923322 **Sample:** 644138-1-BKS / BKS **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/23/13 12:15

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.573	1.00	57	35-114	
2-Fluorobiphenyl	0.778	1.00	78	43-116	
Terphenyl-D14	0.804	1.00	80	33-141	

Lab Batch #: 923322 **Sample:** 644138-1-BSD / BSD **Batch:** 1 **Matrix:** Water

Units: mg/L **Date Analyzed:** 09/23/13 12:29

PAHs by GCMS SIM Analytes	SURROGATE RECOVERY STUDY Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Nitrobenzene-d5	0.555	1.00	56	35-114	
2-Fluorobiphenyl	0.717	1.00	72	43-116	
Terphenyl-D14	0.781	1.00	78	33-141	

* 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

Work Order #: 470646 **Project ID:** A4137007

Analyst: CYE **Date Prepared:** 09/21/2013 **Date Analyzed:** 09/23/2013

Lab Batch ID: 923322 **Sample:** 644138-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

PAHs by GCMS SIM Analytes	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
Acenaphthene	<0.0000500	0.00100	0.000817	82	0.00100	0.000757	76	8	57-90	25	
Acenaphthylene	<0.0000500	0.00100	0.000681	68	0.00100	0.000646	65	5	47-95	25	
Anthracene	<0.0000500	0.00100	0.000871	87	0.00100	0.000845	85	3	56-90	25	
Benzo(a)anthracene	<0.0000500	0.00100	0.000761	76	0.00100	0.000739	74	3	51-100	25	
Benzo(a)pyrene	<0.0000500	0.00100	0.000719	72	0.00100	0.000706	71	2	49-97	25	
Benzo(b)fluoranthene	<0.0000500	0.00100	0.000702	70	0.00100	0.000684	68	3	41-114	25	
Benzo(g,h,i)perylene	<0.0000500	0.00100	0.000745	75	0.00100	0.000713	71	4	51-105	25	
Benzo(k)fluoranthene	<0.0000500	0.00100	0.000749	75	0.00100	0.000722	72	4	54-103	25	
Chrysene	<0.0000500	0.00100	0.000853	85	0.00100	0.000827	83	3	60-101	25	
Dibenz(a,h)anthracene	<0.0000500	0.00100	0.000736	74	0.00100	0.000726	73	1	50-109	25	
Dibenzofuran	<0.0000500	0.00100	0.000814	81	0.00100	0.000770	77	6	55-91	25	
Fluoranthene	<0.0000500	0.00100	0.000747	75	0.00100	0.000725	73	3	58-93	25	
Fluorene	<0.0000500	0.00100	0.000833	83	0.00100	0.000778	78	7	58-93	25	
Indeno(1,2,3-c,d)Pyrene	<0.0000500	0.00100	0.000754	75	0.00100	0.000740	74	2	52-108	25	
Naphthalene	<0.000500	0.00100	0.000838	84	0.00100	0.000806	81	4	51-100	25	
Phenanthrene	<0.0000500	0.00100	0.000781	78	0.00100	0.000752	75	4	43-97	25	
Pyrene	<0.0000500	0.00100	0.000886	89	0.00100	0.000867	87	2	51-95	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

ENVIRONMENTAL. GEOTECHNICAL AND CONSTRUCTION MATERIALS SERVICES

CHAIN OF CUSTODY RECORD

Terracon
Consulting Engineers & Scientists

Office Location MIDLAND, TX

Project Manager J. DALE MOXLEY

Laboratory: XENCO LABS
Address: 12600 WI-20E
ODESSA, TX 79763
Contact: ALEX MONTOYA
Phone: 432 563 1800
PO/SO #:

Sampler's Name: KIMBLE THRASH

Sampler's Signature:

Proj. No. A4137007

Project Name SAS # 2001-11256 LIVINGSTON LINE

No/Type of Containers 1 1 LAMB

ANALYSIS REQUESTED

Lab use only
Due Date:

Temp. of coolers when received (C°): 0.5

1 | 2 | 3 | 4 | 5

Page 1 of 1

470646

Matrix	Date	Time	Comp	Grab	Identifying Marks of Sample(s)	Start Depth	End Depth	VOA	A/G 1 Lt.	250 ml	P/O	PAHs	Lab Sample ID (Lab Use Only)
W	9-19-18	0940		✓	MW-10				✓			1	

Turn around time ☑ Normal ☐ 25% Rush ☐ 50% Rush ☐ 100% Rush

Relinquished by (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	9/19/18	1605		9-19-18	1605
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:

NOTES:
E-MAIL RESULTS TO:
JDMOXLEY@TERRACON.COM

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

Houston Office
11555 Clay Road, Suite 100
Houston, Texas 77043
(713) 690-8989 Fax (713) 690-8787

Dallas Office
8901 Carpenter Freeway, Suite 100
Dallas, Texas 75247
(214) 630-1010 Fax (214) 630-7070

Fort Worth Office
2601 Gravel Drive
Fort Worth, Texas 76118
(817) 268-8600 Fax (817) 268-8602

Austin Office
5307 Industrial Oaks Blvd. # 160
Austin, Texas 78735
(512) 442-1122 Fax (512) 442-1181

Midland Office
24 Smith Rd., # 261
Midland, Texas 79705
(432) 684-9600 Fax (432) 684-9608

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: PLAINS ALL AMERICAN EH&S

Date/ Time Received: 09/19/2013 04:05:00 PM

Work Order #: 470646

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	.5
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6 *Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Sample instructions complete on Chain of Custody?	**Yes**
#9 Any missing/extra samples?	**No**
#10 Chain of Custody signed when relinquished/ received?	**Yes**
#11 Chain of Custody agrees with sample label(s)?	**Yes**
#12 Container label(s) legible and intact?	**Yes**
#13 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#14 Samples in proper container/ bottle?	**Yes**
#15 Samples properly preserved?	**Yes**
#16 Sample container(s) intact?	**Yes**
#17 Sufficient sample amount for indicated test(s)?	**Yes**
#18 All samples received within hold time?	**Yes**
#19 Subcontract of sample(s)?	**Yes**
#20 VOC samples have zero headspace (less than 1/4 inch bubble)?	**N/A**
#21 <2 for all samples preserved with HNO3,HCL, H2SO4?	**N/A**
#22 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst:	PH Device/Lot#:

Checklist completed by: Candace James
Candace James
Date: 09/19/2013

Checklist reviewed by:
Date: 09/19/2013

APPENDIX D

CD of the 2013 Annual Groundwater Monitoring Report