3R – 325

2013 AGWMR

03 / 11 / 2014

COMPLIANCE / ENGINEERING / REMEDIATION

LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301
T 970.385.1096 / F 970.385.1873

March 11, 2014

Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Online Submission of 2013 Annual Groundwater Reports

Dear Mr. Von Gonten

LT Environmental (LTE), Inc., on behalf of Williams Field Services, LLC (Williams), is electronically submitting the attached 2013 annual groundwater monitoring reports for the following sites:

- Davis #1
- Dogie Compressor Station East Pit
- Florance #40
- Florance #47
- Ice Canyon Drip
- Jicarilla Contract #147-6
- Pritchard #2A.

If you have any questions regarding these reports please contact Ashley Ager with LTE at 970-385-1096 or aager@ltenv.com or Danny Ruetlinger with Williams at danny.reutlinger@williams.com.

Sincerely,

LT ENVIRONMENTAL, INC.

Ashley Ager
Senior Geologist/Office Manager

Brooke Herb
Staff Geologist

cc: Danny Ruetlinger
Attachments (7)

2013 ANNUAL GROUNDWATER REPORT

JICARILLA CONTRACT 147-6
ADMINISTRATIVE/ENVIRONMENTAL ORDER NUMBER 3RP-325-0

FEBRUARY 2014

Prepared for:

WILLIAMS FIELD SERVICES, LLC
Tulsa, Oklahoma

2013 ANNUAL GROUNDWATER REPORT

JICARILLA CONTRACT 147-6
ADMINISTRATIVE/ENVIRONMENTAL ORDER NUMBER
3RP-325-0

FEBRUARY 2014

Prepared for:

WILLIAMS FIELD SERVICES, LLC
PO Box 3483, MD 48-6
Tulsa, Oklahoma 74101

Prepared by:

LT ENVIRONMENTAL, INC.
2243 Main Avenue, Suite 3
Durango, Colorado 81301
(970) 385-1096

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EXECUTIVE SUMMARY

Groundwater at the Jicarilla Contract 147-6 natural gas production well (Administrative/Environmental Order Number 3RP-325-0) (Site) is impacted by petroleum hydrocarbons in excess of the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards for benzene, toluene, ethylbenzene, and total xylenes (BTEX) due to a release from a former dehydrator pit. During 2013, LT Environmental Inc., (LTE) was retained by Williams Field Services, LLC (Williams) to visit the Site and evaluate the status of groundwater monitoring wells, complete monitoring requirements, and install new groundwater monitoring wells.

Between January 2013 and December 2013, LTE conducted three groundwater monitoring events (March 2013, June 2013, and December 2013). The Site was not accessible during the fall of 2013 due to road damage as a result of flash flooding. LTE measured depth to water and used the data to construct groundwater contour maps, which indicate groundwater flow direction is to the north-northwest. LTE sampled groundwater from existing monitoring wells MW-1, MW-2, MW-3, MW-6, MW-8, MW-9, and MW-10 at least once during 2013. Monitoring wells MW-4, MW-5, and MW-7 no longer exist. LTE installed and sampled two new monitoring wells (MW-11 and MW-12) in October 2013 to further delineate groundwater impact at the Site and provide additional data for evaluating potential remediation options.

Concentrations of BTEX in groundwater from monitoring wells MW-1, MW-8, and MW-9 were compliant with the NMWQCC groundwater standards in 2013. Monitoring wells MW-2 and MW-10 appeared to contain 0.01 feet of phase-separated hydrocarbons (PSH) in March 2013; however, BTEX concentrations in samples collected from those wells during the remaining monitoring events did not contain detectable concentrations of BTEX. Similarly, no BTEX concentrations were detected in previous samples collected from monitoring wells MW-2 and MW-10. As a result of the small amount of PSH detected, historical analytical data, and visual observations of groundwater purged from the monitoring wells, it is likely the interface probe malfunctioned and no PSH was actually present in MW-2 and MW-10 in March 2013.

Groundwater monitoring wells MW-3 and MW-6 contained BTEX in excess of the NMWQCC groundwater standards during the 2013 monitoring events. New monitoring well MW-11 did not contain detectable BTEX concentrations; however, the benzene concentration in groundwater sampled from monitoring well MW-12 exceeded the NMWQCC standard.

Impacted groundwater is delineated by monitoring wells MW-3, MW-6, and MW-12 and exists near the wash adjacent to the Site, downgradient from the original source area. Williams will continue to monitor groundwater elevations and presence of PSH in the existing monitoring wells semi-annually during 2014. Williams will sample groundwater from monitoring wells containing elevated BTEX concentrations (MW-3, MW-6, and MW-12) semi-annually and evaluate potential remediation options.

1.0 INTRODUCTION

LT Environmental, Inc. (LTE), on behalf of Williams Field Services, LLC (Williams), has prepared this report detailing groundwater monitoring activities completed from January 2013 through December 2013 at the Jicarilla Contract 147-6 natural gas production well (Administrative/Environmental Order Number 3RP-325-0) (Site). The scope of work for this project was continued monitoring of petroleum hydrocarbon impacts to groundwater as a result of a release from a former dehydrator pit.

1.1 LOCATION

The Site is located at latitude 36.433803 and longitude -107.403562 in Unit C, Section 6, Township 25 North, Range 5 West (Figure 1). The Site is adjacent to a tributary to Tapacito Creek, which drains into Largo Wash, in the San Juan Basin of Rio Arriba County, New Mexico.

1.2 HISTORY

The source of groundwater impact is a former unlined dehydrator pit. In July 1998, over 12,000 cubic yards of impacted soil were excavated from the Site. A groundwater sample collected from the excavation at approximately 26 feet below ground surface (bgs) contained 1,400 micrograms per liter (µg/L) benzene, 4,500 µg/L toluene, 580 µg/L ethylbenzene, and 6,800 total xylenes. In January 1999, five groundwater monitoring wells were installed. At some time after that, additional five groundwater monitoring wells were installed. Between January 1999 and December 2012, Williams monitored groundwater at the Site. Records regarding these activities can be found in previous groundwater reports submitted to the New Mexico Oil Conservation Division (NMOCD).

2.0 METHODOLOGY

During 2013, LTE monitored groundwater in March 2013, June 2013, and December 2013; the access road was washed out by flash flooding in September 2013 making the Site inaccessible during the third quarter of 2013. Groundwater monitoring consisted of measuring groundwater elevations and sampling groundwater in monitoring wells MW-1, MW-2, MW-3, MW-6, MW-8, MW-9, and MW-10. Monitoring wells MW-4, MW-5, and MW-7 no longer exist. Additionally, LTE installed two new monitoring wells to further delineate impact to groundwater

2.1 WATER LEVEL MEASUREMENTS

LTE measured depth to groundwater in the monitoring wells with a Keck oil/water interface probe. The presence of phase-separated hydrocarbons (PSH) was investigated using the interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement. These data are summarized in Table 1.

2.2 GROUNDWATER SAMPLING

Prior to sampling groundwater, LTE measured depth to groundwater and total depth of monitoring wells with a Keck oil/water interface probe. Groundwater monitoring wells containing measurable PSH were not sampled. The volume of water in each monitoring well was calculated, and a minimum of three well casing volumes of water was purged from each well using a new disposable polyvinyl chloride (PVC) bailer. As water was removed from the monitoring well, pH, electric conductivity, and temperature were monitored. Wells were purged until these properties stabilized, indicating the purge water was representative of aquifer conditions, or until the well was purged dry. Stabilization was defined as three consecutive stable readings for each water property (±0.4 units for pH, ±10 percent for electric conductivity, and ±2^{o} Celsius for temperature). Purge water was containerized and disposed of at a facility designated by Williams. A copy of the 2013 field notes are presented in Appendix A.

Once each monitoring well was properly purged, groundwater samples were collected by filling three 40-milliliter (ml) glass vials. The laboratory-supplied vials were filled and capped with no air inside to prevent degradation of the sample. Samples were labeled with the date and time of collection, monitoring well designation, project name, collector's name, and parameters to be analyzed. They were immediately sealed, packed on ice, and transferred to Hall Environmental Analysis Laboratory (HEAL) under chain-of-custody (COC) procedures for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) using United States Environmental Protection Agency Method 8021. COC forms were completed documenting the date and time sampled, sample number, type of sample, sampler's name, preservative used (if any), analyses required, and sampler's signature. The COC forms are included in the laboratory analytical reports in Appendix B.

2.3 GROUNDWATER CONTOUR MAPS

LTE used existing top-of-casing (TOC) elevations and depth to water measured in monitoring wells during the March 2013 site visit to draft a groundwater contour map (Figure 2). In June 2013, the Site was resurveyed using an online positioning user service global positioning system (OPUS-GPS) with an accuracy of ±0.01 feet to establish a national geodetic survey (NGS) elevation at the monitoring wells. The June 2013 and December 2013 groundwater contour maps were constructed using the new survey data (Figures 3 and 4). Contours were inferred based on groundwater elevations obtained and observation of physical characteristics at the Site (topography, proximity to irrigation ditches, etc.).

2.4 GROUNDWATER MONITORING WELL INSTALLATION

LTE installed two groundwater monitoring wells (MW-11 and MW-12) on October 21, 2013, using a track-mounted GeoProbe® direct-push drilling rig operated by Earth Worx Environmental Services, LLC. Continuous soil samples were logged by an LTE geologist and described using the Unified Soil Classification System (USCS). The boring logs are included as Appendix C. The intervals from immediately beneath the ground surface and approximately every two feet thereafter were screened for volatile aromatic hydrocarbons as well as soil that was stained or had a hydrocarbon odor. Screening was conducted with a photo-ionization detector

(PID) equipped with a 10.6 electron volt lamp in accordance with the New Mexico Oil Conservation Division (NMOCD) *Guidelines for Remediation of Leaks, Spills and Releases*, August 13, 1993.

The new monitoring wells were constructed of schedule 40, 2-inch diameter polyvinyl chloride (PVC) and included 15 feet of 0.01-inch machine slotted flush-threaded PVC well screen. At least ten feet of screen was set beneath the water table and approximately five feet above to allow for seasonal fluctuations and a proper seal during well construction. A clean 10-20 grade silica sand gravel pack was placed from the bottom of the boring to two feet above the top of the screen. Natural 3/8-inch bentonite chips were set above the gravel pack to the surface. Locking protective steel casings were set in concrete surface completions. The monitoring well completion diagrams are included in Appendix C. The new groundwater monitoring wells were surveyed after construction. TOC elevations were determined to an accuracy of no less than ±0.01 feet.

Monitoring wells MW-11 and MW-12 were developed utilizing clean, disposable PVC bailers. LTE purged fluid until the pH, specific conductivity, and temperature were stabilized and turbidity was reduced to the greatest extent possible. Purge water was collected and properly disposed at the Dogie Compressor Station. The well development field forms are attached as Appendix D.

3.0 RESULTS

Groundwater elevations calculated with depth to water data presented on Table 1 indicate groundwater flow direction is to the north-northwest as depicted on Figures 2 through 4.

No concentrations of BTEX were detected in groundwater sampled from existing monitoring wells MW-1, MW-2, MW-8, MW-9, and MW-10 in 2013. Monitoring wells MW-2 and MW-10 appeared to contain 0.01 feet of PSH in March 2013; however, BTEX concentrations in samples collected from those wells during the remaining monitoring events did not contain detectable concentrations of BTEX. Similarly, no BTEX concentrations were detected in historical samples collected from those wells. As a result of the small amount of PSH detected, historical analytical data, and visual observations of groundwater purged from the wells, it is assumed the interface probe malfunctioned and no PSH was actually present in MW-2 and MW-10 in March 2013. Groundwater monitoring wells MW-3 and MW-6 contained BTEX in excess of the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards during the 2013 monitoring events. Monitoring well MW-11 did not contain detectable BTEX concentrations; however, the benzene concentration in MW-12 exceeded the NMWQCC standard. Table 2 summarizes the groundwater analytical results and copies of the laboratory reports can be found in Appendix B.

4.0 CONCLUSIONS

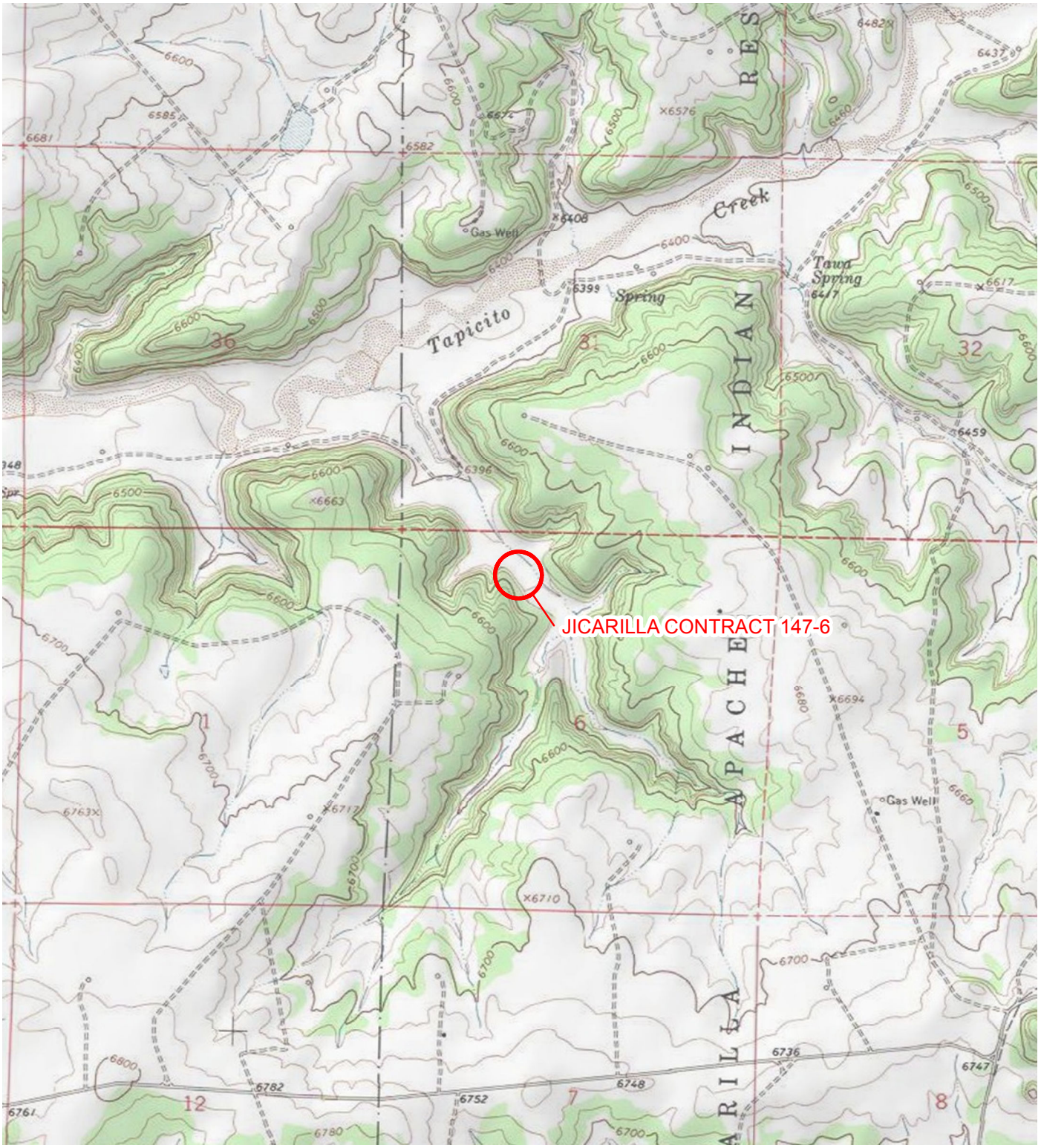
Groundwater sampled from upgradient monitoring wells MW-1 and MW-10 and downgradient monitoring well MW-9 has never been impacted. Groundwater originally impacted by the unlined production pit in monitoring wells MW-2 and MW-8 has naturally attenuated or

migrated downgradient. The remaining groundwater impact at the Site is located near the wash and delineated by groundwater monitoring wells MW-3, MW-6, and MW-12.

5.0 RECOMMENDATIONS

Williams will continue to monitor groundwater elevations in the existing monitoring wells semi-annually during 2014. Williams will sample groundwater from monitoring wells within the current BTEX plume (MW-3, MW-6, and MW-12) semi-annually. Since BTEX concentrations in groundwater samples from groundwater monitoring wells MW-1, MW-2, MW-8, MW-9, and MW-10 have been compliant with NMWQCC standards for two to 10 years or better, Williams will no longer sample those wells. Similarly, since the initial groundwater sample collected from MW-11 did not contain concentrations of BTEX exceeding NMWQCC standards and the well location is upgradient of the existing groundwater impact, the well will not be sampled during 2014. Based on data collected in 2014, Williams will evaluate potential remediation options at the Site.

FIGURES



LEGEND

SITE LOCATION

IMAGE COURTESY OF ESRI/BING MAPS

0 2,000 4,000

Feet

N

FIGURE 1
SITE LOCATION MAP
JICARILLA CONTRACT 147-6
RIO ARRIBA COUNTY, NEW MEXICO

WILLIAMS FIELD SERVICES, LLC

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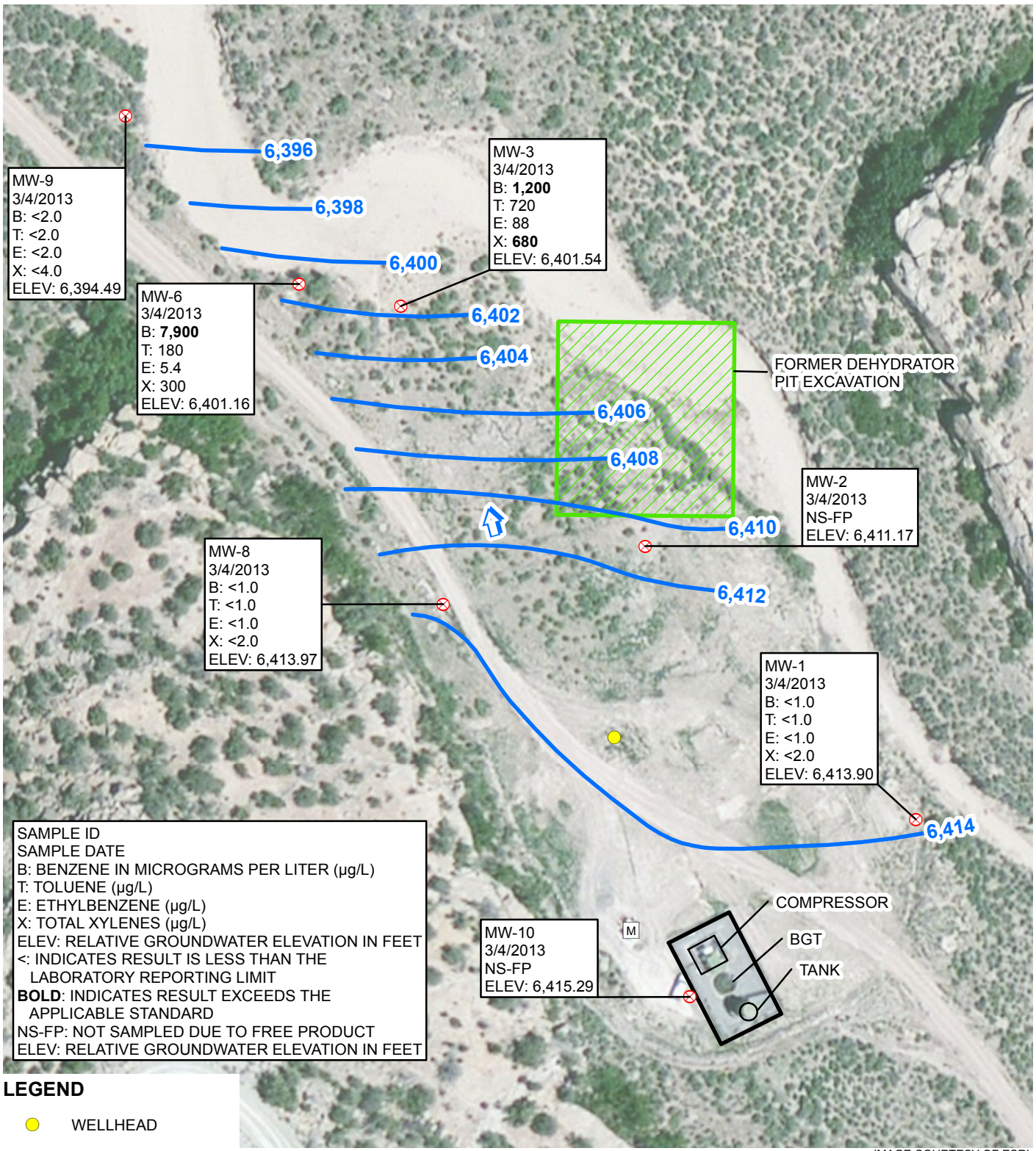

IMAGE COURTESY OF ESRI

LEGEND

- WELLHEAD
- MONITORING WELL
- M METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 2 FEET
- BERM

BGT: BELOW GRADE TANK

0 100 200
Feet

N

FIGURE 2
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (MARCH 2013)
JICARILLA CONTRACT 147-6
RIO ARRIBA COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

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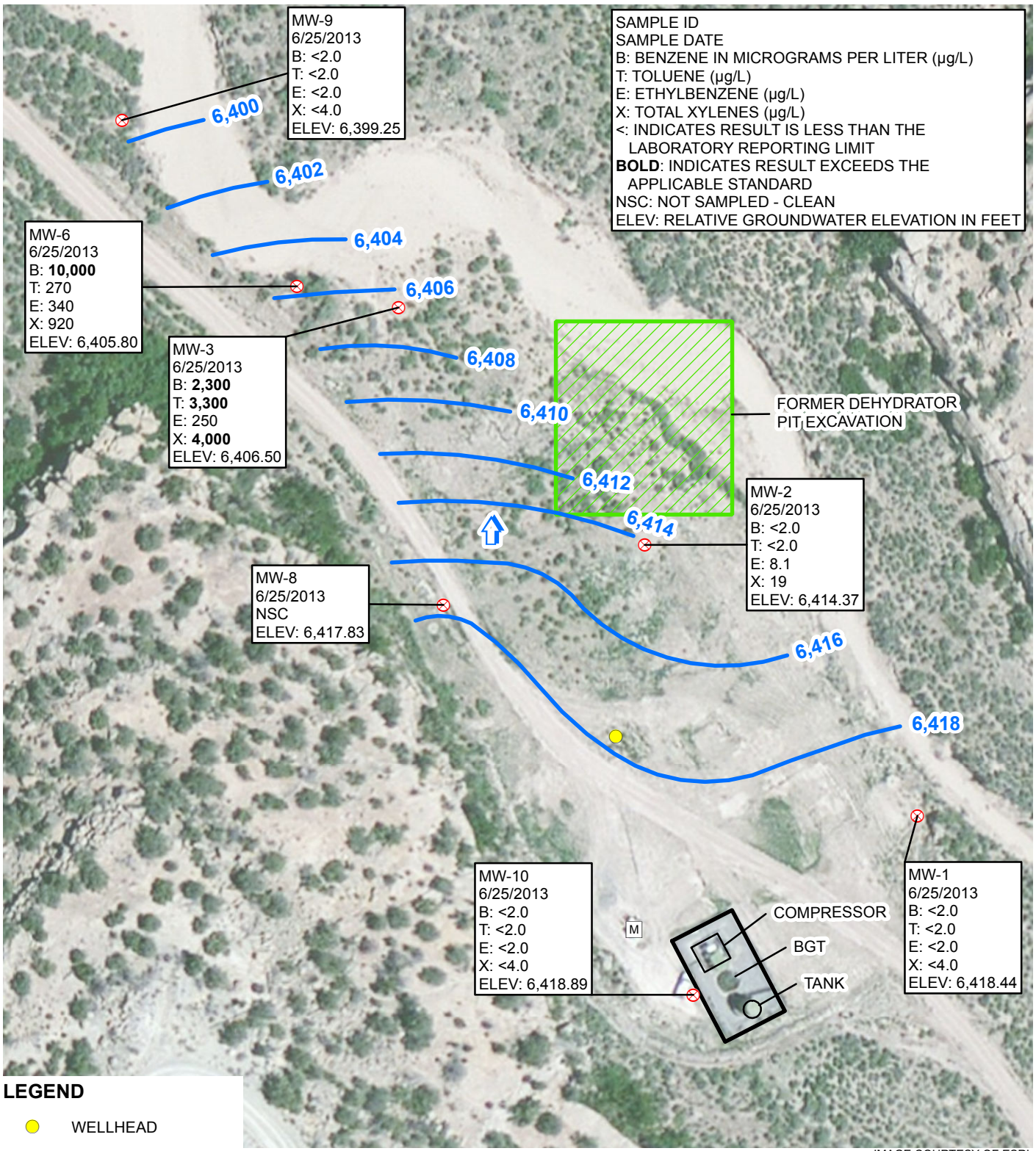

LEGEND

- WELLHEAD
- MONITORING WELL
- M METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 2 FEET
- BERM

BGT: BELOW GRADE TANK

IMAGE COURTESY OF ESRI

0 100 200
Feet

N

FIGURE 3
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (JUNE 2013)
JICARILLA CONTRACT 147-6
RIO ARRIBA COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

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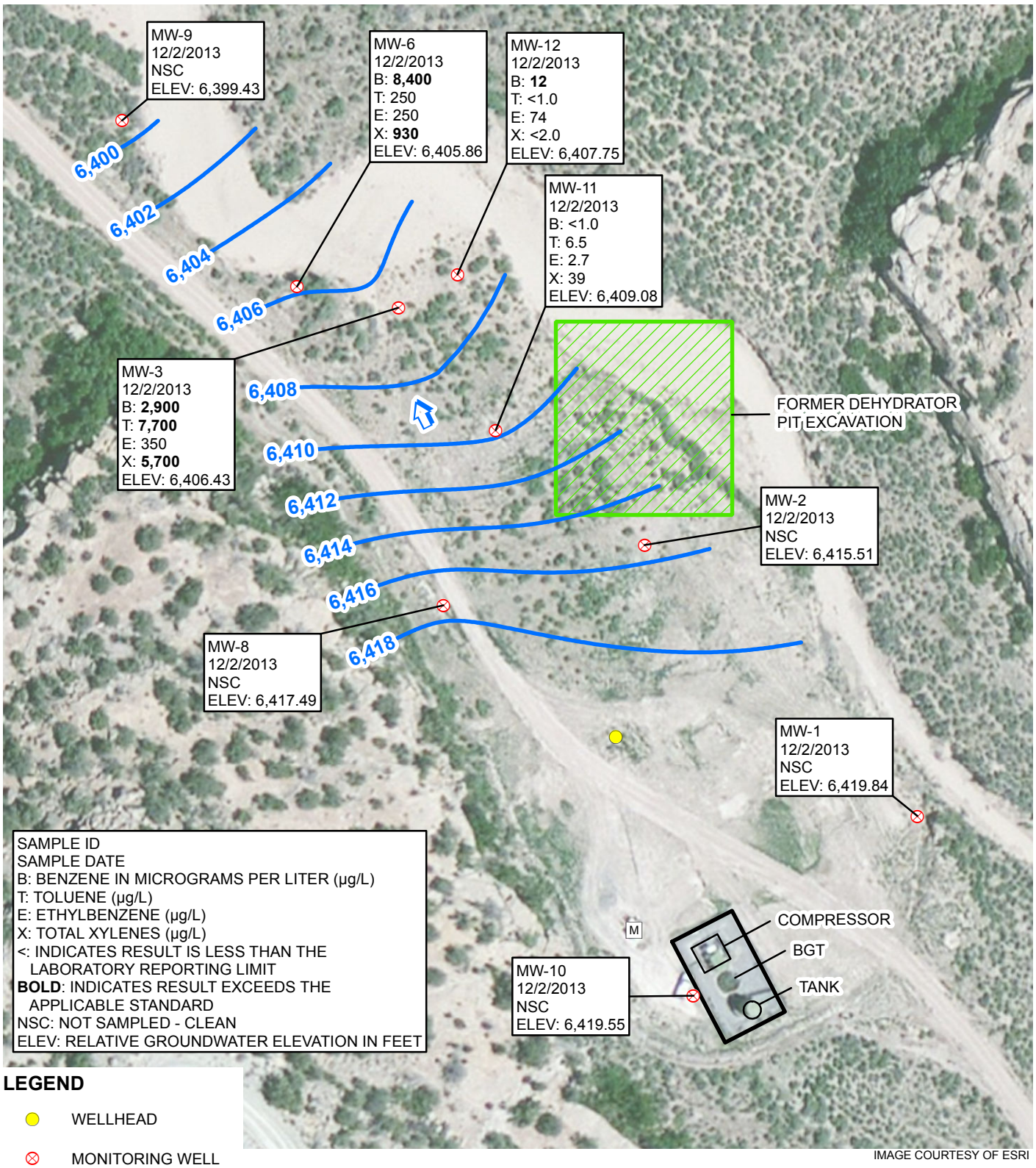

LEGEND

- WELLHEAD
- MONITORING WELL
- M — METER HOUSE
- ESTIMATED GROUNDWATER FLOW DIRECTION
- RELATIVE GROUNDWATER ELEVATION CONTOUR
  CONTOUR INTERVAL = 2 FEET
- BERM

BGT: BELOW GRADE TANK

IMAGE COURTESY OF ESRI

0 100 200
Feet

N

FIGURE 4
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (DECEMBER 2013)
JICARILLA CONTRACT 147-6
RIO ARRIBA COUNTY, NEW MEXICO
WILLIAMS FIELD SERVICES, LLC

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TABLES

TABLE 1

GROUNDWATER ELEVATIONS SUMMARY
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well ID	Date	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet BTOC)	Depth to Product (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet AMSL)
MW-1	3/4/2013	6,435.75	21.85	NP	NP	6,413.90
MW-1**	6/25/2013	6,440.95	22.51	NP	NP	6,418.44
MW-1	12/2/2013	6,440.95	21.11	NP	NP	6,419.84
MW-2*	3/4/2013	6,432.70	22.34	22.33	0.01	6,411.17
MW-2**	6/25/2013	6,437.27	22.90	NP	NP	6,414.37
MW-2	12/2/2013	6,437.27	21.76	NP	NP	6,415.51
MW-3	3/4/2013	6,422.80	21.26	NP	NP	6,401.54
MW-3**	6/25/2013	6,427.87	21.37	NP	NP	6,406.50
MW-3	12/2/2013	6,427.87	21.44	NP	NP	6,406.43
MW-4	3/4/2013	DEST	DEST	DEST	DEST	DEST
MW-5	3/4/2013	DEST	DEST	DEST	DEST	DEST
MW-6	3/4/2013	6,426.77	25.61	NP	NP	6,401.16
MW-6**	6/25/2013	6,431.94	26.14	NP	NP	6,405.80
MW-6	12/2/2013	6,431.94	26.08	NP	NP	6,405.86
MW-7	3/4/2013	DEST	DEST	DEST	DEST	DEST
MW-8	3/4/2013	6,430.33	16.36	NP	NP	6,413.97
MW-8**	6/25/2013	6,435.14	17.31	NP	NP	6,417.83
MW-8	12/2/2013	6,435.14	17.65	NP	NP	6,417.49
MW-9	3/4/2013	6,423.04	28.55	NP	NP	6,394.49
MW-9**	6/25/2013	6,428.08	28.83	NP	NP	6,399.25
MW-9	12/2/2013	6,428.08	28.65	NP	NP	6,399.43
MW-10*	3/4/2013	6,435.38	20.90	20.89	0.01	6,415.29
MW-10**	6/25/2013	6,440.48	21.59	NP	NP	6,418.89
MW-10	12/2/2013	6,440.48	20.93	NP	NP	6,419.55
MW-11	12/2/2013	6,433.46	24.38	NP	NP	6,409.08
MW-12	12/2/2013	6,429.62	21.87	NP	NP	6,407.75

Notes:
* - Interface probe appeared to be malfuntioning and presence of product is unlikely
** - Top of casing elevation was resurveyed on 6/19/13
AMSL - Above Mean Sea Level
BTOC - Below Top of Casing
DEST - well has been destroyed
NP - No Product

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-1	1/28/1999	<0.5	1.5	<0.5	2.6
MW-1	4/14/1999	<0.5	<0.5	<0.5	<1.5
MW-1	9/27/1999	<0.5	<0.5	<0.5	<1.5
MW-1	11/15/1999	<0.5	<0.5	<0.5	<1.5
MW-1	2/13/2001	<1	<1	<1	<1
MW-1	5/9/2001	<1	<1	<1	<1
MW-1	11/2/2001	<1.0	3.1	<2.0	<2.0
MW-1	3/20/2010	<1.0	<1.0	<1.0	<3.0
MW-1	6/22/2010	<1.0	<1.0	<1.0	<3.0
MW-1	9/16/2010	<1.0	<1.0	<1.0	<3.0
MW-1	12/8/2010	<1.0	<1.0	<1.0	<3.0
MW-1	3/10/2011	<1.0	<1.0	<1.0	<3.0
MW-1	6/15/2011	<1.0	<1.0	<1.0	<3.0
MW-1	9/13/2011	<1.0	<1.0	<1.0	<3.0
MW-1	1/6/2012	<1.0	<1.0	<1.0	<3.0
MW-1	4/6/2012	<1.0	<1.0	<1.0	<3.0
MW-1	6/12/2012	<1.0	<1.0	<1.0	<3.0
MW-1	9/27/2012	<1.0	<1.0	<1.0	<3.0
MW-1	12/7/2012	<1.0	<1.0	<1.0	<3.0
MW-1	3/4/2013	<1.0	<1.0	<1.0	<2.0
MW-1	6/25/2013	<2.0	<2.0	<2.0	<4.0
MW-1	12/2/2013	NSC	NSC	NSC	NSC
MW-2	1/28/1999*	**490**	38	<5	**1700**
MW-2	4/14/1999*	**230**	<5	<5	**671**
MW-2	10/14/1999	**55**	<0.5	2.6	**196.5**
MW-2	11/15/1999	**130**	<0.5	15	**272**
MW-2	3/20/2000	**140**	5.3	120	**440***
MW-2	6/6/2000	**52**	<0.5	48	46
MW-2	2/13/2001	**124**	14.8	72.3	**681**
MW-2	5/9/2001	**35.4**	15.1	27	23
MW-2	11/2/2001	**150**	3.4	120	**1200**
MW-2	9/24/2003	**2.8**	5.1	2.8	<5.0
MW-2	12/17/2003	**2.5**	5.9	<2.0	<5.0
MW-2	9/19/2004	<2.0	3.2	<2.0	<5.0
MW-2	12/4/2004	<2.0	2.4	<2.0	<5.0
MW-2	3/9/2005*	**23**	13	<10	<25
MW-2	9/17/2005	**<2.0**	<2.0	4.3	<5.0
MW-2	12/1/2005	<2.0	2.8	<2.0	<5.0
MW-2	3/20/2010	<1.0	<1.0	<1.0	<3.0
MW-2	6/22/2010	<1.0	<1.0	<1.0	<3.0

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-2	9/16/2010	<1.0	<1.0	<1.0	4.8
MW-2	12/8/2010	<1.0	<1.0	<1.0	<3.0
MW-2	3/10/2011	<1.0	<1.0	<1.0	<3.0
MW-2	6/15/2011	<1.0	<1.0	<1.0	<3.0
MW-2	9/13/2011	<1.0	<1.0	<1.0	17.8
MW-2	1/6/2012	<1.0	<1.0	<1.0	<3.0
MW-2	4/6/2012	<1.0	<1.0	<1.0	<3.0
MW-2	6/12/2012	<1.0	<1.0	<1.0	<3.0
MW-2	9/27/2012	<1.0	<1.0	<1.0	18.5
MW-2	12/7/2012	<1.0	<1.0	<1.0	<3.0
MW-2	3/4/2013	NSP	NSP	NSP	NSP
MW-2	6/25/2013	<2.0	<2.0	8.1	19
MW-2	12/2/2013	NSC	NSC	NSC	NSC
MW-3	1/28/1999	**7,100**	**5,900**	260	**4,130**
MW-3	4/14/1999	**6,700**	**3,100**	220	**3,360**
MW-3	9/27/1999*	**5,800**	**2,800**	260	**3,560**
MW-3	11/15/1999*	**5,200**	**1,800**	200	**2,970**
MW-3	3/20/2000*	**3,900**	**460**	230	**1,710**
MW-3	6/7/2000*	**4,400**	**64**	190	**1,232**
MW-3	2/13/2001	**7,250**	**1,660**	305	**5,800**
MW-3	5/9/2001	**7,810**	**1,860**	531	**7,610**
MW-3	11/2/2001	**6,700**	**7,400**	420	**7,900**
MW-3	9/24/2003*	**5,800**	**7,300**	320	**5,700**
MW-3	12/17/2003	**4,900**	**5,300**	280	**5,200**
MW-3	9/19/2004*	**5,400**	**9,500**	310	**6,500**
MW-3	12/4/2004*	**5,700**	**11,000**	330	**7,100**
MW-3	3/9/2005*	**4,700**	**7,900**	280	**5,600**
MW-3	6/16/2005*	**6,100**	**9,800**	380	**6,600**
MW-3	9/17/2005	**4,500**	**10,000**	260	**5,900**
MW-3	12/1/2005*	**5,570**	**9,970**	324	**6,760**
MW-3	3/20/2010	**3,590**	**1,990**	252	**2,310**
MW-3	6/22/2010	**2,710**	**1,080**	191	**1,170**
MW-3	9/16/2010	**3,240**	**3,630**	219	**2,210**
MW-3	12/8/2010	**2,950**	**3,380**	229	**1,900**

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-3	3/10/2011	**1,800**	729	122	**1,900**
MW-3	6/15/2011	**2,150**	**1,710**	124	**1,000**
MW-3	9/13/2011	**3,460**	**4,500**	330	**4,670**
MW-3	1/6/2012	**1,790**	**1,970**	144	**1,400**
MW-3	4/6/2012	**1,900**	127	**955**	**1,040**
MW-3	6/12/2012	**2,700**	203	**4,990**	**2,890**
MW-3	9/27/2012	**2,070**	194	**4,380**	**2,690**
MW-3	12/7/2012	**1,650**	145	**1,810**	**1,630**
MW-3	3/4/2013	**1,200**	720	88	**680**
MW-3	6/25/2013	**2,300**	**3,300**	250	**4,000**
MW-3	12/2/2013	**2,900**	**7,700**	350	**5,700**
MW-4	1/28/1999*	**1500**	**10,000**	**810**	**9,300**
MW-4	4/14/1999*	**280**	30	5.0	500
MW-4	9/27/1999	**56**	<0.5	3.6	22
MW-4	11/15/1999	**120**	<0.5	8.1	41.5
MW-4	3/20/2000	**250**	<0.5	45	47
MW-4	6/7/2000	**270**	1.6	5.6	10.2
MW-4	2/13/2001	**353**	3.85	69.5	59.8
MW-4	5/9/2001	**684**	6.10	110	97.2
MW-4	11/2/2001	**480**	7.9	84	34
MW-4	9/24/2003	**190**	45	57	60
MW-4	12/17/2003	**200**	2.9	58	<5.0
MW-4	12/4/2004	**170**	<2.0	49	<5.0
MW-4	9/19/2004	**55**	<2.0	14	<5.0
MW-4	3/9/2005	**68**	<2.0	22	18
MW-4	6/16/2005	**130**	<2.0	40	<5.0
MW-4	9/17/2005	**100**	<2.0	38	55
MW-4	12/6/2005	**100**	<2.0	36.6	<5.0
MW-4	4/6/2012	NS	NS	NS	NS
MW-4	6/12/2012	NS	NS	NS	NS
MW-4	9/27/2012	NS	NS	NS	NS
MW-4	12/7/2012	NS	NS	NS	NS
MW-4**	3/4/2013	<2.0	<2.0	<2.0	<4.0
MW-4**	6/25/2013	DEST	DEST	DEST	DEST
MW-5	1/28/1999*	**1,600**	**10,000**	**820**	**9,500**
MW-5	4/14/1999*	**310**	**26**	**3.6**	**479**

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-5	9/27/1999	<0.5	<0.5	1.5	2
MW-5	11/15/1999*	<2.5	6	39.0	<3.0
MW-5	3/20/2000	5.1	<0.5	210.0	8.0
MW-5	6/7/2000	1.5	<0.5	3.3	2.9
MW-5	2/13/2001	3.49	<1	222	31.5
MW-5	5/9/2001	4.68	20.8	244	28.7
MW-5	11/2/2001	2.8	<2.0	200	13
MW-5	3/4/2013	DEST	DEST	DEST	DEST
MW-6	9/27/1999*	**16,000**	460.0	280	**1,299**
MW-6	11/15/1999*	**20,000**	940	330	**1,640**
MW-6	3/20/2000*	**18,000**	630	380	**1,530**
MW-6	6/7/2000*	**19,000**	820	370	**1,960**
MW-6	2/13/2001	**22,300**	60	358	**1,560**
MW-6	5/9/2001	**33,900**	**2,310**	577	**3,820**
MW-6	11/2/2001	**31,000**	**2,200**	730	**4,500**
MW-6	9/24/2003*	**18,000**	**1,200**	370	**2,000**
MW-6	12/17/2003*	**21,000**	<400	500	**2,200**
MW-6	12/4/2004*	**16,000**	120	360	**1,800**
MW-6	9/19/2004*	**18,000**	**1,900**	380	**2,300**
MW-6	3/9/2005*	**19,000**	**810**	410	**2,100**
MW-6	6/16/2005*	**24,000**	<400	620	**2,500**
MW-6	9/17/2005	**15,000**	370	380	**1,400**
MW-6	12/1/2005*	**15,600**	**957**	460	**2,580**
MW-6	3/20/2010	**19,400**	**10,900**	570	**3,330**
MW-6	6/22/2010	**13,500**	<100	411	**16,740**
MW-6	9/16/2010	**10,200**	**2,190**	280	**1,410**
MW-6	12/8/2010	**10,000**	495	380	**1,510**
MW-6	3/10/2011	**13,000**	**4,260**	380	**1,740**
MW-6	6/15/2011	**14,400**	518	364	**1,450**
MW-6	9/13/2011	**12,300**	**2,570**	498	**2,730**
MW-6	1/6/2012	**11,600**	730	339	**1,660**
MW-6	4/6/2012	**13,800**	333	**3,070**	**1,590**
MW-6	6/12/2012	**13,000**	406	**1,010**	**1,560**
MW-6	9/27/2012	**10,300**	360	**3,430**	**2,070**
MW-6	12/7/2012	**10,200**	315	**1,540**	**1,760**
MW-6	3/4/2013	**7,900**	180	5.4	300
MW-6	6/25/2013	**10,000**	270	340	**920**

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-6	12/2/2013	**8,400**	250	250	**930**
MW-7	10/14/1999	**30**	120	8.9	165
MW-7	11/15/1999	0.5	1.3	0.5	4.6
MW-7	3/20/2000	5.5	0.8	0.9	4.7
MW-7	6/7/2000	<0.5	<0.5	<0.5	<1.5
MW-7	2/13/2001	<1	<1	<1	<1
MW-7	5/9/2001	4.00	<1	<1	<1
MW-7	11/2/2001	**16**	<2.0	<2.0	2
MW-7	4/6/2012	NS	NS	NS	NS
MW-7	6/12/2012	NS	NS	NS	NS
MW-7	9/27/2012	NS	NS	NS	NS
MW-7	12/7/2012	NS	NS	NS	NS
MW-7	3/4/2013	DEST	DEST	DEST	DEST
MW-8	3/20/2000*	**2,400**	**2,300**	55.0	540
MW-8	6/7/2000*	**1,100**	**130**	27.0	106.7
MW-8	2/13/2001	**613**	16.2	13.0	12.4
MW-8	5/9/2001	**182**	3.65	6.98	2.41
MW-8	11/2/2001	**370**	<2.0	8.9	2.0
MW-8	9/24/2003	**78**	2.2	4.2	<5.0
MW-8	12/17/2003	**55**	<2.0	3.2	<5.0
MW-8	12/4/2004	**19**	<2.0	<2.0	<5.0
MW-8	9/19/2004	**81**	<2.0	2.8	<5.0
MW-8	3/9/2005	**210***	4.6	5.2	8.6
MW-8	6/16/2005	**43**	<2.0	<2.0	<5.0
MW-8	9/17/2005	**38**	<2.0	<2.0	<5.0
MW-8	12/1/2005	**23**	<2.0	<2.0	<5.0
MW-8	3/20/2010	6.3	<1.0	<1.0	<3.0
MW-8	6/22/2010	3.0	<1.0	<1.0	<3.0
MW-8	9/16/2010	**22.9**	<1.0	<1.0	<3.0
MW-8	12/8/2010	<1.0	<1.0	<1.0	<3.0
MW-8	3/10/2011	2	<1.0	<1.0	<3.0
MW-8	6/15/2011	4.1	<1.0	<1.0	<3.0
MW-8	9/13/2011	1.9	<1.0	<1.0	<3.0
MW-8	1/6/2012	2.4	<1.0	<1.0	<3.0
MW-8	4/6/2012	<1.0	<1.0	<1.0	<3.0
MW-8	6/12/2012	2.5	<1.0	<1.0	<3.0

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-8	9/27/2012	<1.0	<1.0	<1.0	<3.0
MW-8	12/7/2012	<1.0	<1.0	<1.0	<3.0
MW-8	3/4/2013	<1.0	<1.0	<1.0	<2.0
MW-8	6/25/2013	NSC	NSC	NSC	NSC
MW-8	12/2/2013	NSC	NSC	NSC	NSC
MW-9	3/20/2000	<0.5	1.4	<0.5	1.5
MW-9	6/7/2000	<0.5	<0.5	<0.5	<1.5
MW-9	2/13/2001	<1	<1	<1	<1
MW-9	5/9/2001	<1	<1	<1	<1
MW-9	11/2/2001	150	<2.0	<2.0	<2.0
MW-9	9/24/2003	86	<2.0	<2.0	<5.0
MW-9	12/17/2003	69	<2.0	<2.0	<5.0
MW-9	12/4/2004	5.2	<2.0	<2.0	<5.0
MW-9	9/19/2004	45	<2.0	<2.0	<5.0
MW-9	3/9/2005	3.8	<2.0	<2.0	<5.0
MW-9	6/16/2005	<2.0	<2.0	<2.0	<5.0
MW-9	9/17/2005	<2.0	<2.0	<2.0	<5.0
MW-9	12/1/2005	<2.0	<2.0	<2.0	<5.0
MW-9	3/20/2010	<1.0	<1.0	<1.0	<3.0
MW-9	6/22/2010	<1.0	<1.0	<3.0	<3.0
MW-9	9/16/2010	8.6	<1.0	<1.0	<3.0
MW-9	12/8/2010	7.8	<1.0	<1.0	<3.0
MW-9	3/10/2011	<1.0	<1.0	<1.0	<3.0
MW-9	6/15/2011	<1.0	<1.0	<1.0	<3.0
MW-9	9/13/2011	<1.0	<1.0	<1.0	<3.0
MW-9	1/6/2012	<1.0	<1.0	<1.0	<3.0
MW-9	4/6/2012	<1.0	<1.0	<1.0	<3.0
MW-9	6/12/2012	<1.0	2.1	<1.0	<3.0
MW-9	9/27/2012	<1.0	<1.0	<1.0	<3.0
MW-9	12/7/2012	<1.0	<1.0	<1.0	<3.0
MW-9	3/4/2013	<2.0	<2.0	<2.0	<4.0
MW-9	6/25/2013	<2.0	<2.0	<2.0	<4.0
MW-9	12/2/2013	NSC	NSC	NSC	NSC
MW-10	3/20/2000	0.8	2.9	<0.5	1.5
MW-10	6/7/2000	<0.5	<0.5	<0.5	<1.5

TABLE 2

GROUNDWATER LABORATORY ANALYTICAL RESULTS
JICARILLA CONTRACT 147-6
WILLIAMS FIELD SERVICES, LLC

Well Name	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Standard (µg/L)		**10**	**750**	**750**	**620**
MW-10	2/13/2001	<1	<1	1.5	<1
MW-10	5/9/2001	<1	<1	<1	<1
MW-10	11/2/2001	<1.0	<2.0	<2.0	<2.0
MW-10	4/6/2012	NS	NS	NS	NS
MW-10	6/12/2012	NS	NS	NS	NS
MW-10	9/27/2012	NS	NS	NS	NS
MW-10	12/7/2012	<1.0	<1.0	<1.0	<3.0
MW-10	3/4/2013	NSP	NSP	NSP	NSP
MW-10	6/25/2013	<2.0	<2.0	<2.0	<4.0
MW-10	12/2/2013	NSC	NSC	NSC	NSC
MW-11	12/2/2013	<1.0	6.5	2.7	39
MW-12	12/2/2013	**12**	<1.0	74	<2.0

Notes:

< - indicates result is less than laboratory reporting detection limit

* - indicates sample was diluted

** Sample identified as MW-4 on laboratory reports was later determined to be an unknown well and MW-4 was determined to be destroyed

Bold - indicates sample exceeds NMWQCC standard

DEST - well has been destroyed

NMWQCC - New Mexico Water Quality Control Commission

NS - not sampled

NSC - not sampled due to eight quarters below NMWQCC standards

NSP - not sampled due to the presence of free phase hydrocarbons in the well

µg/L - micrograms per liter

APPENDIX A

2013 FIELD NOTES

Location Jicanilla Contract 147-6 Date 3/4/13

Project / Client Williams Historical GW

Follow Micha to Jicanilla Contract 147-6 (had to go through locked gate)
Arrive onsite @ 12:18
Windy overcast

MW-1 cut lock & replace
DTW = 21.85 TD = 27.00
5.15 x .16 = 0.824 x 3 = 2.47
(Gallons) (°C) (us)

Time	Vol	Tot Vol	pH	Temp	cond	comments
1240	.25	.25	7.17	12.0	1117	Light Brown minor silt
	.25	.50	7.74	12.1	1119	no change
	.25	.75	7.98	12.1	1097	"
	.25	1.00	8.14	12.0	1139	"
	.50	1.50	8.14	12.0	1113	"
	.25	1.75	8.18	11.7	1126	"
	.25	2.00	8.18	11.7	1137	"
	.25	2.25	8.19	11.7	1139	"
	.25	2.50	8.19	11.7	1126	"

Sample MW1 @ 1251 for BTEX

BA 3/4/13

Location JC 147-6 Date 3/4/13

Project / Client

MW-2 cut lock
PRS in well 100% saturated

DTP = 22.335 DTW = 22.34
Replace lock on lid. Cannot close metal casing due to PVC being higher than Metal. Return PRS sock
3 wells that are not on map. Just PVC stick up. NO metal casing.

Unknown Well #1
DTW = 22.30 from TOC
DTW = 18.30 from GS

Unknown well #2
DTW = 23.45 from TOC
DTW ≈ 19.35 from GS

MW-10
DTW = 20.90 TD =
DTP = 20.89

BA 3/4/13

28 Location JC 147-6 Date 3/4/13

Project / Client

MW-8

DTW = 16.36 TD = 26.44

10.08 * .16 = 1.61 x 3 = 4.84

Time	(Gallons) Vol	Tot Vol	pH	(°C) Temp	(µS) Cond	Comments
13:56	.25	.25	8.21	12.6	876	Clear no odor/sheen
	.25	.50	7.94	12.3	872	no change
	.25	.75	7.94	12.7	878	"
	.25	1.00	7.94	12.0	870	"
	1.00	2.00	7.95	12.1	885	silty lt. gray
	.50	2.50	7.89	11.7	910	silter, darker, Bailing down
	.75	3.25	7.91	11.7	897	no change
	.25	3.50	7.92	11.9	876	cloudy darker
	.50	4.00	7.91	11.7	873	no change
	.25	4.25	7.90	12.1	877	"
	.25	4.50	7.98	12.1	883	"
	.25	4.75	7.99	12.1	878	"
	.25	5.00	7.99	12.1	878	"

Sample MW-8 @ 1420 for BTEX 8021

BH 3/4/13

Location JC 147-6 Date 3/4/13 29

Project / Client

MW-3

Below Base of well eroded from wash

DTW = 21.26 TD = 23.60

2.35 x .16 = 0.38 x 3 = 1.14

Time	(Gallons) Vol	Tot Vol	pH	(°C) Temp	(MS) Cond	Comments
1455	.75	.25	7.83	13.1	3.32	Black, H Odor
	.25	.50	7.86	12.5	3.55	no sheen darker Black
	.10	.60	7.99	12.7	3.52	no change
			Bailed Dry			

Sample MW-3 for BTEX @ 1515

MW-4?

unsure of what well # Down in wash

1.75 x .16 = 0.28 x 3 = 0.84

unknown well - looks new 3/4/13 BH

just pvc stick up, not locked BH

~~Labeled as MW-4 in FHPS~~ Corrected

~~But dont think is correct~~

DTW = 16.00 from GS TD = 18.80 from TOC

17.05 from TOC

Location JC 147-6 Date 3/4/13
Project / Client Williams Historical GW

MW-4 cont.

(Gallons) Vol	Tot vol	pH	°C Temp	ms Cond	~~Dark~~ Comments BH 3/4/13
.20	.20	8.02	12.2	3.21	Dark Gray Black

BAILED DRY

Was ABLE TO fill 3 VOAS @ 1525

Was unable to find MW-5
MW-7 was destroyed in wash - saw evidence of it
* I think what I labled as MW-4 is a new well and MW-4 was destroyed by wash

MW-6
~~Incorrectly labeled as MW-7 in GPS - will correct.~~ Corrected BH 3/4/13
NO metal casing
PVC is duck taped near base
DTW = 25.61 TD = 31.50
5.89 x .16 = 0.94 x 3 = 2.82

BH 3/4/13

Location J Contract 147-6 Date 3/4/13
Project / Client

~~MW-6~~

Time	(Gallons) Vol	Tot Vol	pH	°C Temp	MS Cond	Comments
1530	.25	.25	8.77	12.8	5.79	Strong H ~~S~~ C odor ~~Black~~
	.25	.50	8.77	12.8	6.09	no change
	.25	.75	8.70	13.0	6.10	"
	.25	1.00	8.72	12.9	6.25	"
	1.00	2.00	8.75	12.7	6.42	"
	.25	2.25	8.75	12.6	6.43	"
	.25	2.50	8.76	12.6	6.42	Bailing down
	.25	2.75	8.76	12.7	6.37	no change
	.25	3.00	8.77	12.7	6.39	no change

Sampled MW-6 @ 1557

MW-9 (labled)
DTW = 28.55 TD = 32.05
3.5 x .16 = 0.56 x 3 = 1.68

Time	(Gallons) Vol	Tot vol	pH	°C Temp	ms Cond	Comments
1615	.25	.25	7.70	12.8	3.53	lt Brown Minor Silt
	.25	.50	7.73	12.7	3.55	Silty Brownish Blk
	.25	.75	7.76	12.7	3.69	"
	.25	1.00	7.77	12.6	3.59	"
	.25	1.25	7.80	12.6	3.62	"
	.25	1.50	7.80	12.6	3.62	
	.25	1.75	7.80	12.6	3.65	"

BH 3/4/13

32

Location Sicanilla Contract 147-6 Date 3/4/13

Project / Client Williams Historical GW

Sampled MW-9 @ 1630

Leave site 1645

Return office 1900

3/4/13

Water Sample Collection Form

Sample Location	Jicarilla Contract 147-C	Client	Williams
Sample Date	6/25/13	Project Name	Historical GW
Sample Time	9:06	Project #	
Sample ID	MW-1	Sampler	BH & DN
Analyses	BTEX 8021		
Matrix	Groundwater	Laboratory	Hall
Turn Around Time	Standard	Shipping Method	Christine/Fedex
Trip Blank	Yes	Other QA/QC	NA
Depth to Water	22.51	TD of Well	32.05
Time	8356	Depth to Product	NA

Vol. of H2O to purge: 9.54 x .1631 = 1.56 x 3 = 4.67 gal

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom Valve Bailer

Method of Sampling: Bottom Valve Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments
843	0.25	0.25	7.67	12.8	1337	Brown no H2Oder no sheen
	0.25	0.50	7.80	12.2	1297	Brown silty
	0.25	0.75	7.79	12.3	1224	More silt
	0.25	1.00	7.78	12.2	1252	Very silty Brown
	0.50	1.50	7.88	12.5	1253	no change
	0.50	2.00	7.90	12.4	1240	"
	0.50	2.50	7.97	12.2	1232	"
	0.50	3.00	7.98	12.5	1267	"
	0.50	3.50	7.97	12.3	1268	"
	0.25	3.75	7.98	12.5	1279	"
	0.25	4.00	7.98	12.3	1294	"
	0.25	4.25	7.99	12.4	1284	"
	0.25	4.50	7.98	12.4	1279	"
905	0.25	4.75	7.99	12.4	1282	"

Comments:

Describe Deviations from SOP:

Signature: [signature] **Date:** 6/25/13

LTE

Water Sample Collection Form

Sample Location: Jicarilla Contract 147-6 | Client: Williams
Sample Date: 6/25/13 | Project Name: Historical GW
Sample Time: 1075 | Project #:
Sample ID: MW-2 | Sampler: BH & DN
Analyses: BTEX 8021
Matrix: GW | Laboratory: Hall
Turn Around Time: Std | Shipping Method: Christine/Hall
Trip Blank: Yes | Other QA/QC: NA
Depth to Water: 22.90 | TD of Well: 32.82
Time: 945 | Depth to Product: NA
Vol. of H2O to purge: 9.92 x .1631 = 1.62 x 3 = 4.85
*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*
Method of Purging: Bottom Valve Bailer
Method of Sampling: " " "

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments
945	0.25	0.25	7.50	14.6	1915	Roots, Grayish Clear w/ BLK particles HC odor
	0.25	0.50	7.50	14.0	1952	Black lots of Roots
	0.25	0.75	7.51	13.9	1917	Silty Black
	0.25	1.00	7.53	13.4	1960	no change
	0.50	1.50	7.58	13.2	1919	"
	0.50	2.00	7.51	13.7	1873	"
	0.50	2.50	7.54	13.8	1885	Black silty NO Roots
	0.40	2.90	7.45	14.2	1875	odor stronger / Bailing down
	0.30	3.20	7.59	14.5	1944	no change
	0.30	3.50	7.63	14.3	1936	"
	0.30	3.80	7.64	14.3	1928	"
	0.30	4.10	7.66	14.5	1909	"
	0.25	4.35	7.67	14.4	1.92ms	"
	0.25	4.60	7.67	14.3	1.92ms	"
	0.25	4.85	7.66	14.3	1.92 ms	Jet BLK, HC odor Very silty

Comments:

Describe Deviations from SOP:

Signature: _____ **Date:** 6/25/13

Water Sample Collection Form

Sample Location	SC 147-6	Client	Williams
Sample Date	6/25/13	Project Name	Historical GW
Sample Time	1100	Project #	
Sample ID	MW-3	Sampler	DN & BH
Analyses	BTEX 8021		
Matrix	GW	Laboratory	HALL
Turn Around Time	Std	Shipping Method	Christine / Fedex
Trip Blank	Yes	Other QA/QC	NA
Depth to Water	21.37	TD of Well	23.64
Time	1045	Depth to Product	NA

Vol. of H2O to purge: 2.27 x .1631 = 0.37 x 3 = 1.11

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom Valve Bailer

Method of Sampling: " " "

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments
1045	0.10	0.10	7.64	16.1	3.70	Black HC odor Bugs
	0.12	0.22	7.83	13.6	3.73	Jet Black, very silty
1100						Bailed Dry

Bailing down

Comments: HCl reacted w/ H2O had to use Non-preserved VOA's (was able to fill 3)

Describe Deviations from SOP: Bailed dry before 3 casing volumes were removed

Signature: [signature] **Date:** 6/25/13

LTE

Water Sample Collection Form

Sample Location	JC-147-6	Client	Williams
Sample Date	6/25/13	Project Name	Historical groundwater
Sample Time	1130	Project #	
Sample ID	MW-6	Sampler	BH & DN
Analyses	BTEX 8021		
Matrix	Ground	Laboratory	Hall
Turn Around Time	Standard	Shipping Method	Christine / FedEX
Trip Blank	Yes	Other QA/QC	N/A
Depth to Water	26.14	TD of Well	31.50
Time	11.05	Depth to Product	NA

Vol. of H2O to purge: 5.36 x .1631 = 0.87 x 3 = 2.62

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom valve Bailer

Method of Sampling: Bottom Valve Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments
	0.25	0.25	8.49	14.6	7.46	Black, slight HC odor
	0.25	0.50	8.36	13.8	7.63	
	0.25	.75	8.46	13.0	7.43	
	0.25	1.00	8.52	13.2	7.40	
	0.25	1.25	8.5	12.6	7.59	
	0.25	1.50	8.54	13.0	7.59	
	0.25	1.75	8.59	12.8	7.46	
	0.25	2.00	8.62	12.8	7.53	Strong HC odor
	0.25	2.25	8.64	12.7	7.53	
	0.25	2.50	8.68	12.4	7.58	
	0.25	2.75	8.65	12.9	7.60	

Comments: HCl reacted w/sample, used non-preserved VOA's

Describe Deviations from SOP:

Signature: _____ **Date:** 6/25/13

LTE

Water Sample Collection Form

Sample Location	Jicarilla Contract 147-C	Client	Williams
Sample Date	6/25/13	Project Name	Historical GW
Sample Time	1200	Project #	
Sample ID	MW-9	Sampler	DN & BH
Analyses	BTEX 8021		
Matrix	GW	Laboratory	Hall
Turn Around Time	Std	Shipping Method	Christine / Fedex
Trip Blank	Yes	Other QA/QC	NA
Depth to Water	28.83	TD of Well	32.05
Time	1140	Depth to Product	NA
Vol. of H2O to purge	3.22 x .163 = 0.53 x 3 = 1.58		

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom Valve Bailer

Method of Sampling: " " "

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments
1140	0.25	0.25	7.53	15.7	3.91	Cloudy Brown Silty No odor
	0.25	0.50	7.47	14.6	3.71	no change
	0.25	0.75	7.57	13.8	3.84	"
	0.25	1.00	7.66	14.9	3.79	Very silty
	0.25	1.25	7.62	14.3	3.81	no change
	0.25	1.50	7.62	14.3	3.79	"
	0.25	1.75	7.63	14.3	3.81	"

Comments:

Describe Deviations from SOP:

Signature: **Date:**

Water Sample Collection Form

Sample Location	Jicarilla Contract 147-4	Client	Williams
Sample Date	6/25/13	Project Name	Historical GW
Sample Time	926	Project #	
Sample ID	MW-10	Sampler	BH & DN
Analyses	BTEX 8021		
Matrix	GW	Laboratory	Hall
Turn Around Time	Std	Shipping Method	Christine / Fed ex
Trip Blank	Yes	Other QA/QC	NA
Depth to Water	21.59	TD of Well	24.21
Time	907	Depth to Product	NA

Vol. of H2O to purge: 2.62 x .1631 = 0.42 x 3 = 1.28

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bottom Valve Bailer

Method of Sampling: " " "

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std units)	Temp. (C)	Conductivity (us or ms)	Comments
908	0.25	0.25	~~7.98~~ 8.49 BH	~~25.5~~ 14.7 BH	2.78	Clear No silt no odor no sheen
	0.20	0.45	7.99	12.8	2.81	Light Brown / more silt
	0.20	0.65	8.01	12.3	2.81	more silt
	0.20	0.85	8.00	13.2	2.75	no change
	0.20	1.05	8.02	12.8	2.85	"
	0.15	1.20	8.03	12.9	2.83	"
926	0.15	1.35	8.02	12.8	2.83	"

Comments:

Describe Deviations from SOP:

Signature: [signature] **Date:** 6/25/13

LTE

Water Sample Collection Form

Sample Location	Jicarilla Contract 147-6	Client	Williams
Sample Date	12/2/13	Project Name	Historical Ground Water
Sample Time	830	Project #	03401301O
Sample ID	MW-3	Sampler	DN
Analyses	BTEX		
Matrix	GW	Laboratory	Hall
Turn Around Time	Standard	Shipping Method	~~Standard~~ DN christine
Trip Blank	YES	Other QA/QC	Standard
Depth to Water	21.44	TD of Well	23.64
Time	12,46	Depth to Product	N/A

Vol. of H2O to purge: 23.64-21.44=2.2x0.1631=0.35882x3 1.07

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bailer

Method of Sampling: Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (c) DN F	Conductivity (us or ms)	Comments
1246	0,15	0,15	7.50	56.8	1.55ms	Black, NO ODOR, No sediment
	0,15	0.30	7.52	57.2	1785µS	Black, NO ODOR, No sediment
	0.20	0,50	7.58	57.4	1,54ms	"No Change
	0.15	0.65	7.60	56,7	1.52ms	NO change
1300	N/A	N/A	N/A	N/A	N/A	Bail Dry

PPt
0.77ppt
893ppm
0.77ppt
0.76ppt

Comments: Bail Dry Come Back to sample
Sampled @ 1330

Describe Deviations from SOP: Bailed Dry had to wait to recharge well

Signature: [signature] **Date:** 12/2/13

Water Sample Collection Form

Sample Location: Jicarilla Contract
Sample Date: 12/2/13
Sample Time: 1313
Sample ID: MW-6
Analyses: BTEX
Matrix: GW
Turn Around Time: Standard
Trip Blank: yes
Depth to Water: 26.08
Time: 1233

Client: Williams
Project Name: Historical Groundwater
Project #: CS140130010
Sampler: DH
Laboratory: Hall
Shipping Method: Christine
Other QA/QC: Standard
TD of Well: 31.58
Depth to Product: N/A

Vol. of H2O to purge: 2.7 gal
*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bailer
Method of Sampling: Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (F) ~~(C)~~	Conductivity (us or ~~ms~~)	Comments
1233	.25	.25	8.46	57.0	6.60	Clear yellow tint Strong HC odor
	.25	.50	8.48	57.2	6.62	Clear yellow tint strong HC odor
	.25	.75	8.49	55.9	6.81	Cloudy Black, strong HC odor sheen
	.25	1.00	8.45	56.3	6.74	"
	.25	1.25	8.45	56.3	6.82	"
	.25	1.50	8.46	55.9	6.87	Black cloudy strong HC odor sheen
	.25	1.75	8.48	55.9	6.73	"
	.25	2.00	8.50	56.1	6.85	"
	.25	2.25	8.50	56.1	6.80	"
	.25	2.50	8.51	55.9	6.70	"
	.25	2.75	8.50	55.9	6.81	"

Comments:

Describe Deviations from SOP:

Signature: _____ **Date:** 12/2/13

LTE

Water Sample Collection Form

Sample Location	J. Carrillo contact	Client	Williams
Sample Date	12/2/13	Project Name	Historical groundwater
Sample Time	1205	Project #	084013010
Sample ID	MW 11	Sampler	DH
Analyses	BTEX		
Matrix	GW	Laboratory	Hall
Turn Around Time	Standard	Shipping Method	Christine
Trip Blank	Yes	Other QA/QC	Standard
Depth to Water	24.38	TD of Well	35.16
Time	1059	Depth to Product	N/A
Vol. of H2O to purge	DH 5.27		

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bailer

Method of Sampling: Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	(F) Temp. (C)	Conductivity (us or ms)	Comments
1059	.25	.25	7.89	58.3	1225	Clear, Slight Hc odor
	.25	.50	7.79	57.9	1257	Dark clear, Hc odor
	.25	.75	7.80	58.1	1226	Dark Cloudy, Hc odor
	.25	1.00	7.81	57.6	1267	Dark Cloud, Hc odor slight sheen
	.25	1.25	7.82	57.6	1287	"
	.25	1.50	7.79	57.6	1290	Dark cloudy, Hc odor
	.25	1.75	7.81	57.4	1292	"
	.25	2.00	7.81	57.4	1280	"
	.25	2.25	7.83	56.7	1291	"
	.25	2.50	7.83	57.0	1299	"
	.50	3.00	7.86	56.8	1291	"
	.50	3.50	7.85	56.7	1297	"
	.50	4.00	7.86	56.8	1289	
	.50	4.50	7.86	56.7	1321	
	.50	5.00	7.89	56.8	1297	
	.50	5.50	7.86	57.0	1280	

Comments:

Describe Deviations from SOP:

Signature: _____ **Date:** 12/2/13

LTE

Water Sample Collection Form

Sample Location	Vicar, Un	Client	Williams
Sample Date	12/2/13	Project Name	Historical Groundwater
Sample Time	1410	Project #	03401B016
Sample ID	MW-12	Sampler	DH
Analyses	BTEX		
Matrix	GW	Laboratory	Hall
Turn Around Time	Standard	Shipping Method	Christine
Trip Blank	yes	Other QA/QC	Standard
Depth to Water	21.87	TD of Well	31.84
Time	1325	Depth to Product	NA
Vol. of H2O to purge	5 gal		

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bailer

Method of Sampling: Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	(F) Temp. (C)	Conductivity (us or ms)	Comments
1325	.25	.25	8.28	57.0	1814	Clear, No odor
	.25	.50	8.28	56.8	1843	Clear, slight odor
	.25	.75	8.31	56.3	1958	Darker cloudy, Hc odor
	.25	1.00	8.41	55.9	2.45	"
	.25	1.25	8.42	55.8	2.49	"
	.25	1.50	8.45	55.8	2.50	"
	.25	1.75	8.42	55.8	2.55	"
	.25	2.00	8.45	55.6	2.56	"
	.50	2.50	8.45	55.6	2.58	"
	.50	3.00	8.46	55.6	2.64	"
	.50	3.50	8.45	55.2	2.59	"
	.50	4.00	8.45	55.2	2.55	Becoming Clearer
	.50	4.50	8.43	55.4	2.46	Slightly Cloudy
	.50	5.00	8.45	55.2	2.51	Slightly Cloudy Slight Hc odor

Comments:

Describe Deviations from SOP:

Signature: _____ **Date:** 12/2/13

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 13, 2013

Julie Linn

LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 385-1096
FAX

RE: Jicarilla Contract 147-6 OrderNo.: 1303302

Dear Julie Linn:

Hall Environmental Analysis Laboratory received 6 sample(s) on 3/7/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1303302**
Date Reported: **3/13/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-1
Project: Jicarilla Contract 147-6
Collection Date: 3/4/2013 12:51:00 PM
Lab ID: 1303302-001
Matrix: AQUEOUS
Received Date: 3/7/2013 9:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	3/8/2013 2:59:31 AM
Toluene	ND	1.0		µg/L	1	3/8/2013 2:59:31 AM
Ethylbenzene	ND	1.0		µg/L	1	3/8/2013 2:59:31 AM
Xylenes, Total	ND	2.0		µg/L	1	3/8/2013 2:59:31 AM
Surr: 1,2-Dichloroethane-d4	100	70-130		%REC	1	3/8/2013 2:59:31 AM
Surr: 4-Bromofluorobenzene	92.5	69.5-130		%REC	1	3/8/2013 2:59:31 AM
Surr: Dibromofluoromethane	92.9	70-130		%REC	1	3/8/2013 2:59:31 AM
Surr: Toluene-d8	90.8	70-130		%REC	1	3/8/2013 2:59:31 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-8
Project: Jicarilla Contract 147-6
Collection Date: 3/4/2013 2:20:00 PM
Lab ID: 1303302-002
Matrix: AQUEOUS
Received Date: 3/7/2013 9:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	3/8/2013 4:04:11 AM
Toluene	ND	1.0		µg/L	1	3/8/2013 4:04:11 AM
Ethylbenzene	ND	1.0		µg/L	1	3/8/2013 4:04:11 AM
Xylenes, Total	ND	2.0		µg/L	1	3/8/2013 4:04:11 AM
Surr: 1,2-Dichloroethane-d4	101	70-130		%REC	1	3/8/2013 4:04:11 AM
Surr: 4-Bromofluorobenzene	96.8	69.5-130		%REC	1	3/8/2013 4:04:11 AM
Surr: Dibromofluoromethane	92.9	70-130		%REC	1	3/8/2013 4:04:11 AM
Surr: Toluene-d8	90.6	70-130		%REC	1	3/8/2013 4:04:11 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-3
Project: Jicarilla Contract 147-6
Collection Date: 3/4/2013 3:15:00 PM
Lab ID: 1303302-003
Matrix: AQUEOUS
Received Date: 3/7/2013 9:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	1200	20		µg/L	20	3/8/2013 11:34:00 AM
Toluene	720	20		µg/L	20	3/8/2013 11:34:00 AM
Ethylbenzene	88	2.0		µg/L	2	3/8/2013 5:08:52 AM
Xylenes, Total	680	40		µg/L	20	3/8/2013 11:34:00 AM
Surr: 1,2-Dichloroethane-d4	99.0	70-130		%REC	2	3/8/2013 5:08:52 AM
Surr: 4-Bromofluorobenzene	94.5	69.5-130		%REC	2	3/8/2013 5:08:52 AM
Surr: Dibromofluoromethane	94.1	70-130		%REC	2	3/8/2013 5:08:52 AM
Surr: Toluene-d8	86.5	70-130		%REC	2	3/8/2013 5:08:52 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-4
Project: Jicarilla Contract 147-6
Collection Date: 3/4/2013 3:25:00 PM
Lab ID: 1303302-004
Matrix: AQUEOUS
Received Date: 3/7/2013 9:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	2.0		µg/L	2	3/9/2013 6:58:24 AM
Toluene	ND	2.0		µg/L	2	3/9/2013 6:58:24 AM
Ethylbenzene	ND	2.0		µg/L	2	3/9/2013 6:58:24 AM
Xylenes, Total	ND	4.0		µg/L	2	3/9/2013 6:58:24 AM
Surr: 1,2-Dichloroethane-d4	114	70-130		%REC	2	3/9/2013 6:58:24 AM
Surr: 4-Bromofluorobenzene	97.7	69.5-130		%REC	2	3/9/2013 6:58:24 AM
Surr: Dibromofluoromethane	101	70-130		%REC	2	3/9/2013 6:58:24 AM
Surr: Toluene-d8	82.8	70-130		%REC	2	3/9/2013 6:58:24 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-6
Project: Jicarilla Contract 147-6
Collection Date: 3/4/2013 3:57:00 PM
Lab ID: 1303302-005
Matrix: AQUEOUS
Received Date: 3/7/2013 9:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	7900	500		µg/L	500	3/8/2013 12:38:53 PM
Toluene	180	2.0		µg/L	2	3/8/2013 6:13:36 AM
Ethylbenzene	5.4	2.0		µg/L	2	3/8/2013 6:13:36 AM
Xylenes, Total	300	4.0		µg/L	2	3/8/2013 6:13:36 AM
Surr: 1,2-Dichloroethane-d4	96.5	70-130		%REC	2	3/8/2013 6:13:36 AM
Surr: 4-Bromofluorobenzene	112	69.5-130		%REC	2	3/8/2013 6:13:36 AM
Surr: Dibromofluoromethane	98.3	70-130		%REC	2	3/8/2013 6:13:36 AM
Surr: Toluene-d8	97.5	70-130		%REC	2	3/8/2013 6:13:36 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-9
Project: Jicarilla Contract 147-6
Collection Date: 3/4/2013 4:30:00 PM
Lab ID: 1303302-006
Matrix: AQUEOUS
Received Date: 3/7/2013 9:56:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	2.0		µg/L	2	3/8/2013 1:11:10 PM
Toluene	ND	2.0		µg/L	2	3/8/2013 1:11:10 PM
Ethylbenzene	ND	2.0		µg/L	2	3/8/2013 1:11:10 PM
Xylenes, Total	ND	4.0		µg/L	2	3/8/2013 1:11:10 PM
Surr: 1,2-Dichloroethane-d4	99.9	70-130		%REC	2	3/8/2013 1:11:10 PM
Surr: 4-Bromofluorobenzene	88.2	69.5-130		%REC	2	3/8/2013 1:11:10 PM
Surr: Dibromofluoromethane	86.0	70-130		%REC	2	3/8/2013 1:11:10 PM
Surr: Toluene-d8	88.9	70-130		%REC	2	3/8/2013 1:11:10 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303302**

13-Mar-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R9048**	RunNo: **9048**
Prep Date:	Analysis Date: **3/7/2013**	SeqNo: **257989** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 1,2-Dichloroethane-d4	9.6		10.00		95.6	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.6	69.5	130			
Surr: Dibromofluoromethane	9.1		10.00		91.4	70	130			
Surr: Toluene-d8	9.4		10.00		94.3	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R9048**	RunNo: **9048**
Prep Date:	Analysis Date: **3/7/2013**	SeqNo: **257990** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.7	70	130			
Toluene	19	1.0	20.00	0	93.5	80	120			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.3	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	69.5	130			
Surr: Dibromofluoromethane	9.3		10.00		93.1	70	130			
Surr: Toluene-d8	8.6		10.00		86.1	70	130			

Sample ID **5ml rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R9082**	RunNo: **9082**
Prep Date:	Analysis Date: **3/8/2013**	SeqNo: **258668** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	8.5		10.00		85.0	69.5	130			
Surr: Dibromofluoromethane	9.4		10.00		94.0	70	130			
Surr: Toluene-d8	9.6		10.00		95.5	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R9082**	RunNo: **9082**
Prep Date:	Analysis Date: **3/8/2013**	SeqNo: **258669** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1303302**

13-Mar-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R9082**	RunNo: **9082**
Prep Date:	Analysis Date: **3/8/2013**	SeqNo: **258669** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	19	1.0	20.00	0	92.6	80	120			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	8.7		10.00		86.6	69.5	130			
Surr: Dibromofluoromethane	9.0		10.00		89.5	70	130			
Surr: Toluene-d8	8.7		10.00		87.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2	R	RPD outside accepted recovery limits
RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE — Work Order Number: 1303302

Received by/date: AG 03/07/13

Logged By: Lindsay Mangin 3/7/2013 9:56:00 AM

Completed By: Lindsay Mangin 3/7/2013 12:51:08 PM

Reviewed By: IO 03/07/2013

Chain of Custody

1. Were seals intact?	Yes	No	Not Present ✔	
2. Is Chain of Custody complete?	Yes ✔	No	Not Present	
3. How was the sample delivered?	~~Client~~ Courier AG 03/07/13			

Log In

4. Coolers are present? (see 19. for cooler specific information)	Yes ✔	No	NA
5. Was an attempt made to cool the samples?	Yes ✔	No	NA
6. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
7. Sample(s) in proper container(s)?	Yes ✔	No	
8. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
9. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
10. Was preservative added to bottles?	Yes	No ✔	NA
11. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
12. Were any sample containers received broken?	Yes	No ✔	
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	# of preserved bottles checked for pH:
14. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	(<2 or >12 unless noted)
15. Is it clear what analyses were requested?	Yes ✔	No	Adjusted?
16. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes No NA ✔

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

18. Additional remarks:

19. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

Chain-of-Custody Record

Client: LT Environmental

Mailing Address: 2243 Main Ave S.3
Durango CO 81301

Phone #: 970 385 1096

email or Fax#: jlinn@ltenv.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: Jicarilla Contract 147-6

Project #:

Project Manager: Julie Linn

Sampler: Brooke Herb

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1303302	BTEX + ~~MTBE~~ + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)				Air Bubbles (Y or N)
3/4/13	1251	GW	MW-1	VOA/3	Cool	-001	X														
3/4/13	1420	GW	MW-8	VOA/3	Cool	-002	X														
3/4/13	1515	GW	MW-3	VOA/3	Cool	-003	X														
3/4/13	1525	GW	MW-4	VOA/3	Cool	-004	X														
3/4/13	1557	GW	MW-6	VOA/3	Cool	-005	X														
3/4/13	1630	GW	MW-9	VOA/3	Cool	-006	X														

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/6/13	1705	[signature]	Christie Wade	3/6/13	1705
3/6/13	1757	Christie Wade	[signature]	03/07/13	0256

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

July 05, 2013

Ashley Ager
LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Jicarilla Contract 147-6 OrderNo.: 1306A99

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 7 sample(s) on 6/26/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1306A99**
Date Reported: **7/5/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-1
Project: Jicarilla Contract 147-6
Collection Date: 6/25/2013 9:06:00 AM
Lab ID: 1306A99-001
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	2.0		µg/L	2	6/26/2013 4:52:26 PM	R11588
Toluene	ND	2.0		µg/L	2	6/26/2013 4:52:26 PM	R11588
Ethylbenzene	ND	2.0		µg/L	2	6/26/2013 4:52:26 PM	R11588
Xylenes, Total	ND	4.0		µg/L	2	6/26/2013 4:52:26 PM	R11588
Surr: 4-Bromofluorobenzene	103	69.4-129		%REC	2	6/26/2013 4:52:26 PM	R11588

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-10
Project: Jicarilla Contract 147-6
Collection Date: 6/25/2013 9:26:00 AM
Lab ID: 1306A99-002
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	2.0		µg/L	2	6/26/2013 6:22:47 PM	R11588
Toluene	ND	2.0		µg/L	2	6/26/2013 6:22:47 PM	R11588
Ethylbenzene	ND	2.0		µg/L	2	6/26/2013 6:22:47 PM	R11588
Xylenes, Total	ND	4.0		µg/L	2	6/26/2013 6:22:47 PM	R11588
Surr: 4-Bromofluorobenzene	106	69.4-129		%REC	2	6/26/2013 6:22:47 PM	R11588

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-2
Project: Jicarilla Contract 147-6
Collection Date: 6/25/2013 10:25:00 AM
Lab ID: 1306A99-003
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	2.0		µg/L	2	6/27/2013 6:18:41 PM	R11626
Toluene	ND	2.0		µg/L	2	6/27/2013 6:18:41 PM	R11626
Ethylbenzene	8.1	2.0		µg/L	2	6/27/2013 6:18:41 PM	R11626
Xylenes, Total	19	4.0		µg/L	2	6/27/2013 6:18:41 PM	R11626
Surr: 4-Bromofluorobenzene	104	69.4-129		%REC	2	6/27/2013 6:18:41 PM	R11626

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-3
Project: Jicarilla Contract 147-6
Collection Date: 6/25/2013 11:00:00 AM
Lab ID: 1306A99-004
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	2300	50		µg/L	50	6/27/2013 6:47:28 PM	R11626
Toluene	3300	50		µg/L	50	6/27/2013 6:47:28 PM	R11626
Ethylbenzene	250	20		µg/L	20	6/26/2013 7:23:33 PM	R11588
Xylenes, Total	4000	40		µg/L	20	6/26/2013 7:23:33 PM	R11588
Surr: 4-Bromofluorobenzene	114	69.4-129		%REC	20	6/26/2013 7:23:33 PM	R11588

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-6
Project: Jicarilla Contract 147-6
Collection Date: 6/25/2013 11:30:00 AM
Lab ID: 1306A99-005
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	10000	200		µg/L	200	6/27/2013 7:16:12 PM	R11626
Toluene	270	10		µg/L	10	6/26/2013 8:24:03 PM	R11588
Ethylbenzene	340	10		µg/L	10	6/26/2013 8:24:03 PM	R11588
Xylenes, Total	920	20		µg/L	10	6/26/2013 8:24:03 PM	R11588
Surr: 4-Bromofluorobenzene	117	69.4-129		%REC	10	6/26/2013 8:24:03 PM	R11588

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-9
Project: Jicarilla Contract 147-6
Collection Date: 6/25/2013 12:00:00 PM
Lab ID: 1306A99-006
Matrix: AQUEOUS
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	2.0		µg/L	2	6/26/2013 11:25:12 PM	R11588
Toluene	ND	2.0		µg/L	2	6/26/2013 11:25:12 PM	R11588
Ethylbenzene	ND	2.0		µg/L	2	6/26/2013 11:25:12 PM	R11588
Xylenes, Total	ND	4.0		µg/L	2	6/26/2013 11:25:12 PM	R11588
Surr: 4-Bromofluorobenzene	106	69.4-129		%REC	2	6/26/2013 11:25:12 PM	R11588

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: Trip Blank
Project: Jicarilla Contract 147-6
Collection Date:
Lab ID: 1306A99-007
Matrix: TRIP BLANK
Received Date: 6/26/2013 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	6/26/2013 11:55:31 PM	R11588
Toluene	ND	1.0		µg/L	1	6/26/2013 11:55:31 PM	R11588
Ethylbenzene	ND	1.0		µg/L	1	6/26/2013 11:55:31 PM	R11588
Xylenes, Total	ND	2.0		µg/L	1	6/26/2013 11:55:31 PM	R11588
Surr: 4-Bromofluorobenzene	104	69.4-129		%REC	1	6/26/2013 11:55:31 PM	R11588

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1306A99**

05-Jul-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBW**	Batch ID:	**R11588**	RunNo:	**11588**					
Prep Date:		Analysis Date:	**6/26/2013**	SeqNo:	**328367**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	22		20.00		109	69.4	129			

Sample ID	**100NG BTEX LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSW**	Batch ID:	**R11588**	RunNo:	**11588**					
Prep Date:		Analysis Date:	**6/26/2013**	SeqNo:	**328368**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	80	120			
Toluene	21	1.0	20.00	0	103	80	120			
Ethylbenzene	21	1.0	20.00	0	104	80	120			
Xylenes, Total	63	2.0	60.00	0	105	80	120			
Surr: 4-Bromofluorobenzene	22		20.00		109	69.4	129			

Sample ID	**1306A99-001AMS**	SampType:	**MS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**MW-1**	Batch ID:	**R11588**	RunNo:	**11588**					
Prep Date:		Analysis Date:	**6/26/2013**	SeqNo:	**328370**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	40	2.0	40.00	0	101	80	120			
Toluene	40	2.0	40.00	0	99.5	80	120			
Ethylbenzene	40	2.0	40.00	0	100	80	120			
Xylenes, Total	120	4.0	120.0	0	101	80	120			
Surr: 4-Bromofluorobenzene	43		40.00		108	69.4	129			

Sample ID	**1306A99-001AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**MW-1**	Batch ID:	**R11588**	RunNo:	**11588**					
Prep Date:		Analysis Date:	**6/26/2013**	SeqNo:	**328371**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	40	2.0	40.00	0	101	80	120	0.139	20	
Toluene	40	2.0	40.00	0	99.0	80	120	0.534	20	
Ethylbenzene	40	2.0	40.00	0	99.4	80	120	1.04	20	
Xylenes, Total	120	4.0	120.0	0	101	80	120	0.527	20	
Surr: 4-Bromofluorobenzene	44		40.00		110	69.4	129	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1306A99**

05-Jul-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**
Client ID:	**PBW**	Batch ID:	**R11626**	RunNo:	**11626**
Prep Date:		Analysis Date:	**6/27/2013**	SeqNo:	**329768** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		95.7	69.4	129			

Sample ID	**100NG BTEX LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**
Client ID:	**LCSW**	Batch ID:	**R11626**	RunNo:	**11626**
Prep Date:		Analysis Date:	**6/27/2013**	SeqNo:	**329770** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	107	80	120			
Toluene	22	1.0	20.00	0	109	80	120			
Ethylbenzene	22	1.0	20.00	0	108	80	120			
Xylenes, Total	65	2.0	60.00	0	108	80	120			
Surr: 4-Bromofluorobenzene	20		20.00		101	69.4	129			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE | Work Order Number: 1306A99 | RcptNo: 1

Received by/date: 06/26/13

Logged By: Lindsay Mangin 6/26/2013 9:40:00 AM

Completed By: Lindsay Mangin 6/26/2013 10:42:31 AM

Reviewed By: 06/26/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes	No	Not Present ✔
2. Is Chain of Custody complete?	Yes ✔	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ✔	No	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
6. Sample(s) in proper container(s)?	Yes ✔	No	
7. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
8. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
9. Was preservative added to bottles?	Yes	No ✔	NA
10. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
11. Were any sample containers received broken?	Yes	No ✔	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	Adjusted?
14. Is it clear what analyses were requested?	Yes ✔	No	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA ✔

Person Notified: Date:

By Whom: Via: eMail Phone Fax In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.5	Good	Yes			

Chain-of-Custody Record

Client: LT Environmental

Mailing Address: 2243 MAIN AVE SUITE Durango Co 81301

Phone #: 970-385-1096

email or Fax#: aager@ltenv.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____
☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: JICARILLA Contract 147-6

Project #: ~~#~~ DN 034613001

Project Manager: Ashlee Ager

Sampler: BH / DN

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.5

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1306A99	BTEX + ~~MTBE + TMB's~~ (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
6/25	906	GW	MW-1	VOA 3	HCl	-001	X															
6/25	926	GW	MW-10	VOA 3	HCl	-002	X															
6/25	1025	GW	MW-2	VOA 3	HCl	-003	X															
~~6/25~~		~~GW~~	~~MW-8~~	VOA 3			X	DN														
6/25	1100	GW	MW-3	VOA 3	Cool	-004	X															
6/25	1130	GW	MW-6	VOA 3	Cool	-005	X															
6/25	1200	GW	MW-9	VOA 3	~~HCl~~ DN Cool	-006	X															
6/25	700	(	Trip Blank	VOA 2	HCl	-007	X															

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/25/13	1730			6/25/13	1730
Date:	Time:	Relinquished by:	Received by:	Date	Time
6/25/13	1800			06/26/13	0940

Remarks: MW-3, MW-6, MW-9 not Preserved w/ HCl only Cool

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

December 12, 2013

Ashley Ager
LTE
2243 Main Ave Suite 3
Durango, CO 81301
TEL: (970) 946-1093
FAX

RE: Jicarilla Contract 147-6 OrderNo.: 1312255

Dear Ashley Ager:

Hall Environmental Analysis Laboratory received 5 sample(s) on 12/5/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1312255**
Date Reported: **12/12/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-3
Project: Jicarilla Contract 147-6
Collection Date: 12/2/2013 1:30:00 PM
Lab ID: 1312255-001
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	2900	100		µg/L	100	12/9/2013 6:23:17 PM	R15367
Toluene	7700	100		µg/L	100	12/9/2013 6:23:17 PM	R15367
Ethylbenzene	350	20		µg/L	20	12/7/2013 1:16:36 AM	R15341
Xylenes, Total	5700	200		µg/L	100	12/9/2013 6:23:17 PM	R15367
Surr: 4-Bromofluorobenzene	103	85-136		%REC	100	12/9/2013 6:23:17 PM	R15367

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-6
Project: Jicarilla Contract 147-6
Collection Date: 12/2/2013 1:13:00 PM
Lab ID: 1312255-002
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	8400	100		µg/L	100	12/9/2013 10:54:50 PM	R15367
Toluene	250	100		µg/L	100	12/9/2013 10:54:50 PM	R15367
Ethylbenzene	250	100		µg/L	100	12/9/2013 10:54:50 PM	R15367
Xylenes, Total	930	200		µg/L	100	12/9/2013 10:54:50 PM	R15367
Surr: 4-Bromofluorobenzene	99.2	85-136		%REC	100	12/9/2013 10:54:50 PM	R15367

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-11
Project: Jicarilla Contract 147-6
Collection Date: 12/2/2013 12:05:00 PM
Lab ID: 1312255-003
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst:	**BCN**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	12/9/2013 6:30:53 PM	10667
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	12/9/2013 6:30:53 PM	10667
Surr: DNOP	108	70.1-140		%REC	1	12/9/2013 6:30:53 PM	10667
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	0.44	0.050		mg/L	1	12/7/2013 2:46:52 AM	R15341
Surr: BFB	92.3	80.4-118		%REC	1	12/7/2013 2:46:52 AM	R15341
EPA METHOD 8021B: VOLATILES						Analyst:	**NSB**
Benzene	ND	1.0		µg/L	1	12/7/2013 2:46:52 AM	R15341
Toluene	6.5	1.0		µg/L	1	12/7/2013 2:46:52 AM	R15341
Ethylbenzene	2.7	1.0		µg/L	1	12/7/2013 2:46:52 AM	R15341
Xylenes, Total	39	2.0		µg/L	1	12/7/2013 2:46:52 AM	R15341
Surr: 4-Bromofluorobenzene	90.7	85-136		%REC	1	12/7/2013 2:46:52 AM	R15341
EPA METHOD 300.0: ANIONS						Analyst:	**JRR**
Chloride	8.7	0.50		mg/L	1	12/6/2013 2:29:00 PM	R15322
Nitrogen, Nitrate (As N)	ND	0.10	H	mg/L	1	12/6/2013 2:29:00 PM	R15322
Sulfate	230	10		mg/L	20	12/6/2013 3:06:13 PM	R15322
SM2510B: SPECIFIC CONDUCTANCE						Analyst:	**JML**
Conductivity	1300	0.010		µmhos/cm	1	12/6/2013 6:31:34 PM	R15308
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst:	**KS**
Total Dissolved Solids	878	40.0	*	mg/L	1	12/11/2013 8:14:00 AM	10714

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: MW-12
Project: Jicarilla Contract 147-6
Collection Date: 12/2/2013 2:10:00 PM
Lab ID: 1312255-004
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst:	**BCN**
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	12/9/2013 6:52:21 PM	10667
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	12/9/2013 6:52:21 PM	10667
Surr: DNOP	104	70.1-140		%REC	1	12/9/2013 6:52:21 PM	10667
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	0.28	0.050		mg/L	1	12/7/2013 3:16:49 AM	R15341
Surr: BFB	139	80.4-118	S	%REC	1	12/7/2013 3:16:49 AM	R15341
EPA METHOD 8021B: VOLATILES						Analyst:	**NSB**
Benzene	12	1.0		µg/L	1	12/7/2013 3:16:49 AM	R15341
Toluene	ND	1.0		µg/L	1	12/7/2013 3:16:49 AM	R15341
Ethylbenzene	74	1.0		µg/L	1	12/7/2013 3:16:49 AM	R15341
Xylenes, Total	ND	2.0		µg/L	1	12/7/2013 3:16:49 AM	R15341
Surr: 4-Bromofluorobenzene	137	85-136	S	%REC	1	12/7/2013 3:16:49 AM	R15341
EPA METHOD 300.0: ANIONS						Analyst:	**JRR**
Chloride	6.6	0.50		mg/L	1	12/6/2013 3:18:38 PM	R15322
Nitrogen, Nitrate (As N)	ND	0.10	H	mg/L	1	12/6/2013 3:18:38 PM	R15322
Sulfate	140	10		mg/L	20	12/6/2013 3:31:03 PM	R15322
SM2510B: SPECIFIC CONDUCTANCE						Analyst:	**JML**
Conductivity	2100	0.010		µmhos/cm	1	12/6/2013 6:35:39 PM	R15308
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst:	**KS**
Total Dissolved Solids	1340	40.0	*	mg/L	1	12/11/2013 8:14:00 AM	10714

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: LTE
Client Sample ID: Trip Blank
Project: Jicarilla Contract 147-6
Collection Date:
Lab ID: 1312255-005
Matrix: AQUEOUS
Received Date: 12/5/2013 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	12/7/2013 3:46:56 AM	R15341
Surr: BFB	87.7	80.4-118		%REC	1	12/7/2013 3:46:56 AM	R15341
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	12/7/2013 3:46:56 AM	R15341
Toluene	ND	1.0		µg/L	1	12/7/2013 3:46:56 AM	R15341
Ethylbenzene	ND	1.0		µg/L	1	12/7/2013 3:46:56 AM	R15341
Xylenes, Total	ND	2.0		µg/L	1	12/7/2013 3:46:56 AM	R15341
Surr: 4-Bromofluorobenzene	103	85-136		%REC	1	12/7/2013 3:46:56 AM	R15341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**1312255-003BMS**	SampType:	**MS**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**MW-11**	Batch ID:	**R15322**		RunNo:	**15322**				
Prep Date:		Analysis Date:	**12/6/2013**		SeqNo:	**441493**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	0.50	5.000	8.746	104	89.9	119			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.9	93	113			H

Sample ID	**1312255-003BMSD**	SampType:	**MSD**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**MW-11**	Batch ID:	**R15322**		RunNo:	**15322**				
Prep Date:		Analysis Date:	**12/6/2013**		SeqNo:	**441494**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	0.50	5.000	8.746	104	89.9	119	0.0554	20	
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	99.3	93	113	0.456	20	H

Sample ID	**A5**	SampType:	**CCV_5**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**BatchQC**	Batch ID:	**R15322**		RunNo:	**15322**				
Prep Date:		Analysis Date:	**12/6/2013**		SeqNo:	**441502**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	8.1	0.50	8.000	0	101	90	110			
Nitrogen, Nitrate (As N)	5.0	0.10	4.800	0	104	90	110			
Sulfate	20	0.50	20.00	0	102	90	110			

Sample ID	**A6**	SampType:	**CCV_6**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**BatchQC**	Batch ID:	**R15322**		RunNo:	**15322**				
Prep Date:		Analysis Date:	**12/6/2013**		SeqNo:	**441514**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	12	0.50	12.00	0	103	90	110			
Nitrogen, Nitrate (As N)	7.8	0.10	7.200	0	108	90	110			
Sulfate	32	0.50	30.00	0	105	90	110			

Sample ID	**A4**	SampType:	**CCV_4**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**BatchQC**	Batch ID:	**R15322**		RunNo:	**15322**				
Prep Date:		Analysis Date:	**12/6/2013**		SeqNo:	**441526**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.3	90	110			
Nitrogen, Nitrate (As N)	2.9	0.10	3.000	0	97.2	90	110			
Sulfate	12	0.50	12.50	0	96.7	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R15322**	RunNo: **15322**
Prep Date:	Analysis Date: **12/6/2013**	SeqNo: **441530** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R15322**	RunNo: **15322**
Prep Date:	Analysis Date: **12/6/2013**	SeqNo: **441531** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	93.7	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.8	90	110			
Sulfate	9.7	0.50	10.00	0	96.8	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R15322**	RunNo: **15322**
Prep Date:	Analysis Date: **12/6/2013**	SeqNo: **441538** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	7.8	0.50	8.000	0	97.9	90	110			
Nitrogen, Nitrate (As N)	4.9	0.10	4.800	0	102	90	110			
Sulfate	20	0.50	20.00	0	101	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R15322**	RunNo: **15322**
Prep Date:	Analysis Date: **12/7/2013**	SeqNo: **441550** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	12	0.50	12.00	0	102	90	110			
Nitrogen, Nitrate (As N)	7.7	0.10	7.200	0	107	90	110			
Sulfate	32	0.50	30.00	0	105	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R15322**	RunNo: **15322**
Prep Date:	Analysis Date: **12/7/2013**	SeqNo: **441562** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.2	90	110			
Nitrogen, Nitrate (As N)	2.9	0.10	3.000	0	97.3	90	110			
Sulfate	12	0.50	12.50	0	97.4	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R15322**	RunNo: **15322**
Prep Date:	Analysis Date: **12/7/2013**	SeqNo: **441568** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	7.8	0.50	8.000	0	98.0	90	110			
Nitrogen, Nitrate (As N)	4.9	0.10	4.800	0	102	90	110			
Sulfate	20	0.50	20.00	0	101	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**MB-10667**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Diesel Range**					
Client ID:	**PBW**	Batch ID:	**10667**	RunNo:	**15333**					
Prep Date:	**12/5/2013**	Analysis Date:	**12/9/2013**	SeqNo:	**442400**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.1		1.000		112	70.1	140			

Sample ID	**LCS-10667**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Diesel Range**					
Client ID:	**LCSW**	Batch ID:	**10667**	RunNo:	**15333**					
Prep Date:	**12/5/2013**	Analysis Date:	**12/9/2013**	SeqNo:	**442401**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.7	1.0	5.000	0	134	73.3	145			
Surr: DNOP	0.60		0.5000		121	70.1	140			

Sample ID	**LCSD-10667**	SampType:	**LCSD**	TestCode:	**EPA Method 8015D: Diesel Range**					
Client ID:	**LCSS02**	Batch ID:	**10667**	RunNo:	**15333**					
Prep Date:	**12/5/2013**	Analysis Date:	**12/9/2013**	SeqNo:	**442402**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.3	1.0	5.000	0	127	73.3	145	19.8	20	
Surr: DNOP	0.59		0.5000		118	70.1	140	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBW**	Batch ID:	**R15341**	RunNo:	**15341**
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441946** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	16		20.00		82.2	80.4	118			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSW**	Batch ID:	**R15341**	RunNo:	**15341**
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441947** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.51	0.050	0.5000	0	103	80	120			
Surr: BFB	18		20.00		88.7	80.4	118			

Sample ID	**B16**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBW**	Batch ID:	**R15367**	RunNo:	**15367**
Prep Date:		Analysis Date:	**12/9/2013**	SeqNo:	**442669** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	17		20.00		84.4	80.4	118			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSW**	Batch ID:	**R15367**	RunNo:	**15367**
Prep Date:		Analysis Date:	**12/9/2013**	SeqNo:	**442670** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	18		20.00		91.4	80.4	118			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBW**	Batch ID:	**R15341**	RunNo:	**15341**					
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441968**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		92.7	85	136			

Sample ID	**100NG BTEX LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSW**	Batch ID:	**R15341**	RunNo:	**15341**					
Prep Date:		Analysis Date:	**12/6/2013**	SeqNo:	**441969**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	80	120			
Toluene	21	1.0	20.00	0	104	80	120			
Ethylbenzene	21	1.0	20.00	0	103	80	120			
Xylenes, Total	63	2.0	60.00	0	105	80	120			
Surr: 4-Bromofluorobenzene	19		20.00		97.0	85	136			

Sample ID	**B16**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBW**	Batch ID:	**R15367**	RunNo:	**15367**					
Prep Date:		Analysis Date:	**12/9/2013**	SeqNo:	**442688**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		94.4	85	136			

Sample ID	**100NG BTEX LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSW**	Batch ID:	**R15367**	RunNo:	**15367**					
Prep Date:		Analysis Date:	**12/9/2013**	SeqNo:	**442689**	Units:	**µg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	80	120			
Toluene	22	1.0	20.00	0	108	80	120			
Ethylbenzene	21	1.0	20.00	0	106	80	120			
Xylenes, Total	65	2.0	60.00	0	108	80	120			
Surr: 4-Bromofluorobenzene	21		20.00		104	85	136			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1312255**

12-Dec-13

Client: LTE

Project: Jicarilla Contract 147-6

Sample ID	**MB-10714**	SampType:	**MBLK**			TestCode:	**SM2540C MOD: Total Dissolved Solids**			
Client ID:	**PBW**	Batch ID:	**10714**			RunNo:	**15400**			
Prep Date:	**12/9/2013**	Analysis Date:	**12/11/2013**			SeqNo:	**443540**	Units:	**mg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	**LCS-10714**	SampType:	**LCS**			TestCode:	**SM2540C MOD: Total Dissolved Solids**			
Client ID:	**LCSW**	Batch ID:	**10714**			RunNo:	**15400**			
Prep Date:	**12/9/2013**	Analysis Date:	**12/11/2013**			SeqNo:	**443541**	Units:	**mg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1050	20.0	1000	0	105	80	120			

Sample ID	**1312255-004BMS**	SampType:	**MS**			TestCode:	**SM2540C MOD: Total Dissolved Solids**			
Client ID:	**MW-12**	Batch ID:	**10714**			RunNo:	**15400**			
Prep Date:	**12/9/2013**	Analysis Date:	**12/11/2013**			SeqNo:	**443560**	Units:	**mg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	3430	40.0	2000	1340	104	80	120			

Sample ID	**1312255-004BMSD**	SampType:	**MSD**			TestCode:	**SM2540C MOD: Total Dissolved Solids**			
Client ID:	**MW-12**	Batch ID:	**10714**			RunNo:	**15400**			
Prep Date:	**12/9/2013**	Analysis Date:	**12/11/2013**			SeqNo:	**443561**	Units:	**mg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	3440	40.0	2000	1340	105	80	120	0.407	5	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY
Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: LTE | Work Order Number: 1312255 | RcptNo: 1

Received by/date: MG 12/05/13

Logged By: Anne Thorne 12/5/2013 10:00:00 AM Anne Thorne

Completed By: Anne Thorne 12/6/2013 Anne Thorne

Reviewed By: KMS 12/6/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks: Client made trip Blank /A 12/06/13

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: LT Environmental

Mailing Address: 2243 Main Ave
Durango Co 81301

Phone #: 970-385-1096

email or Fax#: aager@ltenv.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name:
Jicarilla Contract 147-6

Project #:

Project Manager:
Ashley Ager

Sampler: Devin Hencmann

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1312255	BTEX + ~~MTBE + TMB's~~ (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	EC, TDS, TPH	Sulfate, Nitrate, Chlorides			Air Bubbles (Y or N)
12/2/13	1330	GW	MW-3	VOA/3	Cool	-001	X															
12/2/13	1313	GW	MW-6	VOA/3	Cool	-002	X															
12/2/13	1205	GW	MW-11	various/7	HCL/cool	-003	X		X									X	X			
12/2/13	1410	GW	MW-12	various/7	HCL/cool	-004	X		X									X	X			
			Trip Blank			-005	X															

Date:	Time:	Relinquished by:	Received by:	Date	Time
12/3/13	1845		Christine Walters	12/3/13	1845
12/4/13	1800	Christine Walters		12/05/13	1000

Remarks: per AG 8015 GRO DRO MRO/AT 12/06/13
Please Forward results to
aager@ltenv.com
Client made trip Blank AT 12/06/13

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

APPENDIX C

BOREHOLE LOGS AND MONITORING WELL COMPLETION DIAGRAMS

Compliance » Engineering » Remediation
LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301

Boring/Well Number: B1 / MW-11 | Date: 10/21/13
Project: Jicarilla Contract 147-6 | Project Number:
Logged By: B. Hero | Drilled By: Louis

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Lat/Long:	Elevation:	Detector: PID	Drilling Method: Geoprobe	Sampling Method: Continuous	Hole Diameter: 2" / Total Depth: 35' Below TOC
Casing Type: PVC	Casing Diameter: 2"	Casing Length: 30'	Slot Size: 0.01"	Slot Length: 15'	Depth to Water: 24.4 BTOC
Gravel Pack: 10-20 Silica Sand	Seal: Bentonite	Grout: Concrete	Comments: Stick up = 4'2" / Metal casing Surface Completion		

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
		0.0			0			0'-1' NO Recovery	
	Dry		NO		1				
Easy					2		SM	1-4' Silty Sand 10YR 6/3 Pale Brown 60% Fine grain Sand 40% Silt	
		0.0			3				
	Dry		NO		4				
		0.0	NO		5			4'-5' NO Recovery	
	Dry								
Easy		0.0			6		SM	5'-8' Same as above	
	Dry		NO		7				
					8				
		0.0	NO		9			8'-9.5' NO Recovery	
Easy	Dry						SM	9.5'-12' Silty sand w/ minor clay 10YR 6/3 Pale Brown 10% Clay 50% Fine 40% Silt	
		0.0			10				
			NO		11				

Compliance « Engineering « Remediation
LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: B-1 / MW-11	Date: 10/21/13		
Project: Jicarilla Contact 1476	Project Number:		
Logged By: Byers	Drilled By: Louis / Earthworx		
Sampling Method:	Hole Diameter:	Total Depth:	
Slot Length:	Depth to Water: 24.9 BTOC		
Lat/Long:	Elevation:	Detector: PID	Drilling Method: Geoprobe
Casing Type: PVC	Casing Diameter: 2"	Casing Length:	Slot Size:
Gravel Pack:	Seal:	Grout:	Comments:

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
		0.0			11				
					12			12' - 12.75' No Recovery	
easy	Dry	0.0	NO		13		ML	12.75' - 15' silty sand 10 YR 6/3 Pale Brown 60% Si l + 10% clay 30% Fine Sand	
					14				
	Dry	0.0	NO		15		SM	15' - 16' 10 YR 6/3 Pale Brown 40% silt 30% fine grain 30% med grain	
					16				
easy/ Med	Dry	3.5 ppm	NO		17			16' - 17.5' - No Recovery	
	Dry				18		SM	17.5' - 19.75' same as above ~~10YR~~ BH	
	Damp @ 19'	3H 2620 ppm	Hc odor Blk staining		19			19.75' - 20' Gley1 2.5/N Black Hc odor	
					20		SM	70% med grain 30% fine grain	
easy/ med	Wet	3254 ppm		Sample @ 20-20.5' @ 12:12	21			20'-21' same as above	
	Sat	3207 ppm	Blk/ Gray Hc odor		22		SM	21' - 21.5' Gley1 4/N Dark Gray Coarse grain 30% med grain 40% fine 30% Strong Hc odor	

BORELOG_custom.xls

Compliance « Engineering « Remediation
LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301

Boring/Well Number: B-1 / MW-11	Date: 10/21/13
Project: Jicarilla Contract 147-6	Project Number:
Logged By: BTH	Drilled By: Levi's
Sampling Method:	Hole Diameter: / Total Depth: 30'
Slot Length:	Depth to Water:

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Lat/Long:	Elevation:	Detector: PID	Drilling Method: Geoprobe	
Casing Type:	Casing Diameter:	Casing Length:	Slot Size:	
Gravel Pack:	Seal:	Grout:	Comments:	

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
		314			22			21.5-24 Med sand 60% Fine Sand 30% Silt/clay 10% Gley1 4/N Dark Gray	
easy/ med	Sat	4.3 ppm	Minor gray		23		SM		
					24				
					25		ML	24' - 27' 10 YR 5/1 gray Silt 70% Clay 10% Fine Sand 20%	
	Sat	0.6 ppm	Minor gray		26				
					27		SM	27' - 28' Med Sand 40% Coarse sand 30% Fine Sand 30%	
					28				
	Sat	0.0 ppm	Very Minor Gray		29		CL	28' - 29' CLAY 75% Clay 25% Silt Hard to Thumb print 10YR 5/1 Gray	
					30			29' - 30' 10 YR 5/1 Gray 75% Silt 5% Clay 20% Fine Sand	
					31		ML		
					32				
					33				

From TOC → DTW = 22.49 TD = 32.15 Stickup = 3' 9"

Compliance « Engineering « Remediation
LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301

Boring/Well Number: B-2/MW-2 | Date: 10/21/13
Project: Sican'ila Contract 147 | Project Number:
Logged By: BB | Drilled By: Louis
Hole Diameter: | Total Depth:

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Lat/Long:	Elevation:	Detector: PID	Drilling Method: Geoprobe	Sampling Method: Continuous	Depth to Water: ~20' ~~23~~
Casing Type: PVC	Casing Diameter: 2"	Casing Length: 30'	Slot Size: 0.01"	Slot Length: 15'	
Gravel Pack: 10-20 silica	Seal: Bentonite	Grout: concrete	Comments:		

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
					0			0-1 No Recovery	
					1		SM	1-2' 10YR 6/3 Pale Brown silty sand 60% fine sand 5% med 35% silt	
easy	DRY	0.0	NO		2		SP	2-3 Poorly sorted sand 10YR 6/3 Pale Brown 30% coarse 30% med 40% fine	
					3		SM	3-4' silty sand 60% fine 5% med 35% silt	
					4			4-5.25 No Recovery	
easy	Dry	0.0	NO		5		SP	5.25-6 Poorly sorted sand as above	
					6		SM	6-8 Fining upward Silty sand same as above 60% fine 5% med 35% silt	
					7				
					8			8-8.5 No Recovery	
					9		SW	8.5-10 same as above	
easy	Dry	0.0	NO		10		SP	10-12 Sand 30% coarse grain 30% med 40% fine 10YR 6/3 Pale Brown	
					11				

Page of

Compliance » Engineering » Remediation
LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: B-2 / MW-12
Date: 10/21/13
Project: Jicarilla Contract BH ~~MW~~-12
Project Number:
Logged By:
Drilled By:
Lat/Long:
Elevation:
Detector:
Drilling Method:
Sampling Method:
Hole Diameter:
Total Depth:
Depth to Water:
Casing Type:
Casing Diameter:
Casing Length:
Slot Size:
Slot Length:
Gravel Pack:
Seal:
Grout:
Comments:

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
		0.0			11			see page 1	
					12	X		12-13 NO Recovery	
Hard	Dry	0.0	NO		13		SP	13-15 same as above	
					14				
		0.0			15		SM	15-16 semi consolidated sandy silty ~~sand~~ 5% coarse 75% silt 10 % med 10% fine 10YR 6/3 Pale Brown	
		0.3			16	X		16-16.5 no Recovery	
	Dry				17		SM	16.5-17.5 same as above	
Med	Damp	Dai 2.4 ppm	NO		18		SP	17.5-18.5 10YR 6/3 Pale Brown 70 % med 5% coarse 25% fine sand	
	Damp				19			18.5-20 Poorly sorted sand same as above but very dark gray Gley 1 3/N	
	Wet	19.8 ppm	Yes Gray	Sample 19.5-20' @1100	20			20-21.5 same as above but Black	
	Wet	3.3 ppm	Yes BLK		21			21.5-23.5 same as above Gley 1 4/N dark Gray HC odor	
					22				

BORELOG_custom.xls

Compliance » Engineering » Remediation
LT Environmental, Inc.
2243 Main Avenue, Suite 3
Durango, Colorado 81301

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: B-2 / MW-12				Date: 10/21/13	
Project: Jicarilla Contract 147				Project Number:	
Logged By:				Drilled By: Louis	
Lat/Long:	Elevation:	Detector: PID	Drilling Method: Geoprobe	Sampling Method:	Hole Diameter: 2"	Total Depth:
Casing Type:	Casing Diameter:	Casing Length:	Slot Size:	Slot Length:	Depth to Water:	
Gravel Pack:	Seal:	Grout:	Comments:			

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Soil/Rock Type	Lithology/Remarks	Well Completion
		0.5 ppm	Minor Gray		22			Poorly sorted Sand	
med	Sat				23		SP	23.5-24 Gray/Tan Brown 10YR 5/2	
	Sat	2.2 ppm			24				
	Sat		NO		25		MC	24-27 clayey sand 25% clay 50% silt 25% fine 10YR 5/2	
med		0.0			26			27-28 silty sand 70% fines 25% silt 5% med	
	Sat		NO		27		SM		
		0.0			28				
	Sat		NO		29			28-28.5 NO Recovery 28.5-30 Silty Clay 25% silt 75% clay	
Hard		0.0			30		CL	Stiff Clay Hard to indent w/ thumb, impression stays 10YR 5/2	
	Sat				31				
		0.0			32				
					33				

APPENDIX D

MONITORING WELL DEVELOPMENT FIELD LOGS

Water Sample Collection Form

Sample Location	Jicarilla Contract	Client	Williams
Sample Date	10/30/13	Project Name	Well Development
Sample Time	N/A	Project #	03013010
Sample ID	MW-11	Sampler	Daniel Neuman
Analyses	N/A		
Matrix	N/A	Laboratory	N/A
Turn Around Time	N/A	Shipping Method	N/A
Trip Blank	N/A	Other QA/QC	N/A
Depth to Water	24.20	TD of Well	35.50
Time	1250	Depth to Product	N/A

Vol. of H2O to purge: 35.50 - 24.20 = 11.30 x 0.1631 = 1.84303 x 5 = 9.21515

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging: Bailer

Method of Sampling: Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments	PPM
1250	0.25	0.25	8.33	60.7	1.076	Brown Cloudy, slight odor	545
1252	0.25	0.50	8.27	61.0	1205	Brown/Gray Cloudy, slight odor	603
1253	0.25	0.75	8.30	60.5	1189	Dark Brown Cloudy, sediment, odor	531
1255	0.25	1.00	8.32	60.2	1069	Brown Cloudy, sediment	524
1340	0.25	1.25	8.40	60.1	1058	Brown Cloudy, Sediment	578
1342	0.25	1.50	8.35	59.8	1103	" "	611
1345	0.50	2.00	8.30	58.7	1109	" "	606
1348	1.00	3.00	8.29	57.2	1087	" "	600
1355	1.00	4.00	8.25	56.9	1101	" "	598
1403	1.00	5.00	8.26	57.1	1105	Lite Brown, little sediment	589
1410	1.00	6.00	8.25	57.0	1089	Cloudy "Clear"	592
1415	1.00	7.00	8.23	56.8	1095	Lite Brown,	598
1421	1.00	8.00	8.24	57.0	1101	Lite Brown	600
	0.25	8.25	8.21	57.1	1103	" "	610
	0.25	8.50	8.20	57.2	1109	" "	609
	0.25	8.75	8.21	57.1	1107	" "	608

Comments: left @ 1255 to check on MW-12, Finished bailing MW-12 down & came back to Finish MW-11

Describe Deviations from SOP:

Signature: _____ **Date:** 10/30/13

MW-11 Jicarilla Contract well Development

time	Vol Removed	total	pH	temp C°	Cond MS	Comments	PPM
1430	025	9.00	8.20	57.0	1101	Lite Brown	609
	025	9.25	8.21	57.1	1103	Lite Brown	610

DN
10/30/13

Water Sample Collection Form

Sample Location	Jicarilla Contract	Client	~~XTO~~ DW Williams
Sample Date	10/30/13	Project Name	Groundwater Remediation
Sample Time	N/A	Project #	03013016
Sample ID	~~MW-12~~ DW MW-12	Sampler	DW
Analyses	N/A		
Matrix	N/A	Laboratory	N/A
Turn Around Time	N/A	Shipping Method	N/A
Trip Blank	N/A	Other QA/QC	N/A
Depth to Water	2220	TD of Well	31.87
Time	1200	Depth to Product	
Vol. of H2O to purge	31.87 - 2220 = 9.67 X 0.1631 = 1.577177 x 5 = 7.885		

*(height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols*

Method of Purging Bailer
Method of Sampling Bailer

Time	Vol. Removed (gal.)	Total Vol H2O removed (gal.)	pH (std. units)	Temp. (C)	Conductivity (us or ms)	Comments	PPM
1200	.25	.25	8.29	56.8	1021	Gray/Black slight odor	512
	.25	.50	8.50	56.8	1093	Black, slight odor, Turbid	550
	.25	.75	8.55	56.7	1009	Black/Gray, Slight odor, Milky	503
	.25	1.00	8.56	56.7	980	B/G, slight odor, Turbid, sediment bottom bucket	489
	.25	1.25	8.54	56.7	1004	B/G, Slight odor, Turbid, Sediment on bottom of Bucket	501
	.25	1.50	8.51	56.5	822	" "	413
	.50	2.00	8.49	56.7	962	" "	483
	1.00	3.00	8.50	57.0	1762	" "	880
	1.00	4.00	8.55	56.5	897		448
1245	1.00	5.00	8.53	56.3	866	Light Brown, Bail Dry	443
1257	.25	5.25	8.49	56.3	1714	Clear, c	~~1711~~ DW 857
	.25	5.50	8.55	56.5	1847	Clear/slight gray, HC odor	921
	.25	5.75	8.58	57.2	1819	gray	910
	.25	6.00	8.56	57.0	1780	gray/Black	889
*	.25	6.25	8.56	56.7	786	gray/Black	418

Comments: *For the last reading on this page the meter was reset.

~~Continued~~ DW
well purged dry ~~Before~~ DW @ 1245 & recharged By 1257

Describe Deviations from SOP:

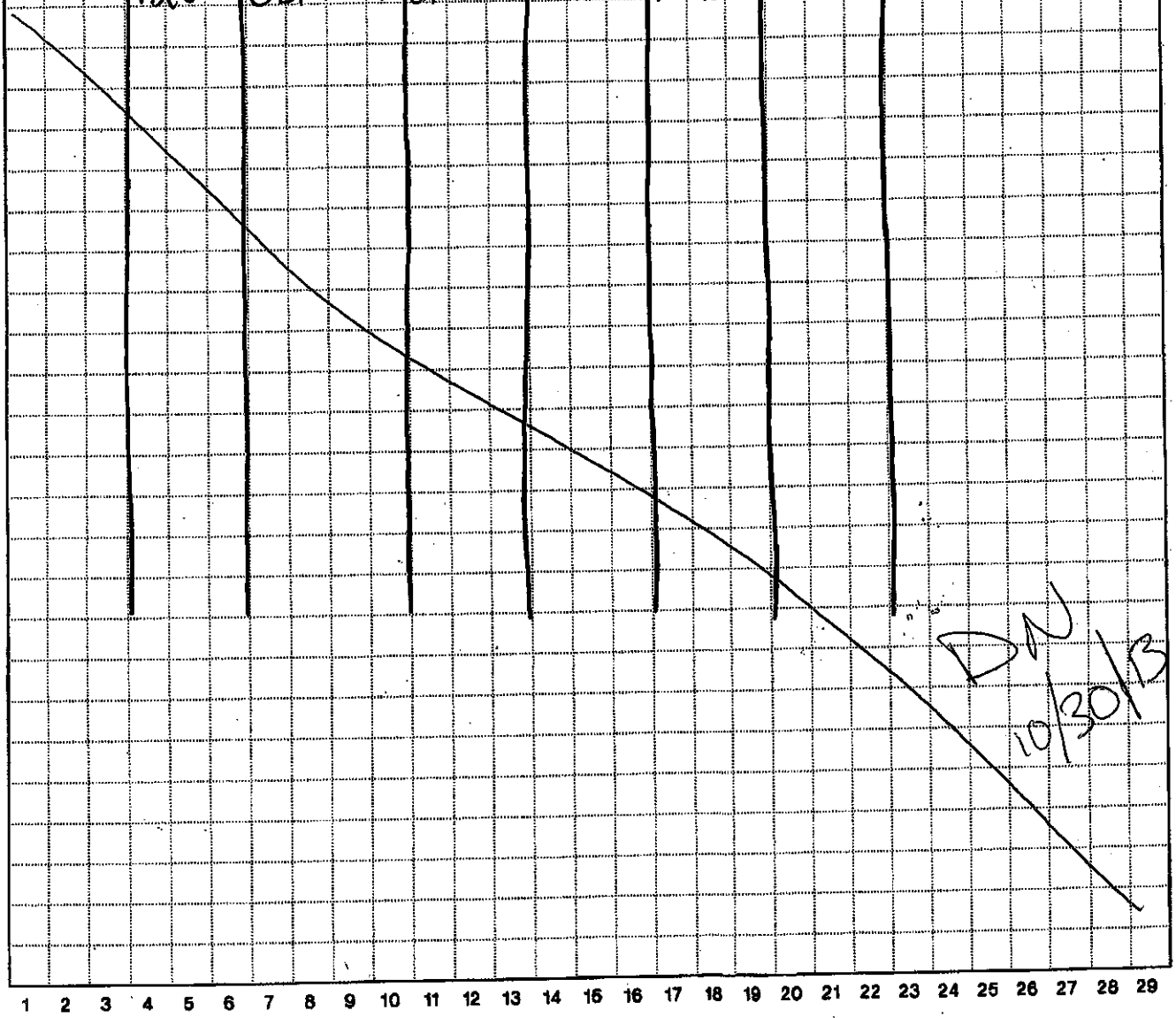
Signature: _____ **Date:** _____

MW-12

PROJECT Jicarilla Contract Well Development DATE 10/30/13
PROJECT MANAGER CONT. No.
JOB No. BY CHK'D
LOCATION SHEET No. OF

SSLT0028 10/1997

Time	Vol Removed	Total Vol Removed	pH	Temp °F	Cond mS	ppm	Comments
1320	.25	6.50	8.50	57.0	960	480	gray / turbid
	.25	6.75	8.52	57.0	1845	922	" "
	.25	7.00	8.52	57.0	1788	892	" "
	.25	7.25	8.50	56.8	1418	710	" "
	.25	7.50	8.50	56.8	1743	871	" "
	.25	7.75	8.49	57.0	1729	864	" "
	.25	8.00	8.49	56.8	1722	861	" "
	.25	8.25	8.50	56.8	1725	862	" "



DN 10/30/13

APPENDIX D

MONITORING WELL DEVELOPMENT FIELD LOGS