



P.O. Box 3483, MD 48-6
Tulsa, OK 74101

April 14, 2016

Randolph Bayliss
Hydrologist, Districts III and IV
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Online Submission of 2016 Annual Groundwater Reports

Dear Mr. Bayliss,

LT Environmental (LTE), Inc., on behalf of Williams Four Corners LLC (Williams), is electronically submitting the attached 2016 annual groundwater monitoring reports covering the period from January 1, 2016 to December 31, 2016 for the following sites:

- Davis #1 (3RP-311-0);
- Dogie East Pit (3RP-312-0);
- Florance #40 (3RP-315-0);
- Florance #47X (3RP-317-0);
- Jicarilla Contract #147-6 (3RP-325-0); and
- Pritchard #2A (3RP-339-0).

If you have any questions regarding these reports please contact Brooke Herb with LTE at 970-385-1096 or BHerb@LTEnv.com or Aaron Galer with Williams at 801-584-6746 or Aaron.Galer@Williams.com.

Sincerely,

A handwritten signature in black ink that reads "Aaron Galer". The signature is written in a cursive, slightly slanted style.

Aaron Galer
Environmental Specialist IV
Williams Companies

cc:

Attachments (6)

2016 ANNUAL GROUNDWATER REPORT

FLORANCE #47X

ADMINISTRATIVE/ENVIRONMENTAL

ORDER NUMBER 3RP-317-0

APRIL 2017

Prepared for:

**WILLIAMS FOUR CORNERS LLC
Salt Lake City, Utah**



2016 ANNUAL GROUNDWATER REPORT

**FLORANCE #47X
ADMINISTRATIVE/ENVIRONMENTAL
ORDER NUMBER 3RP-317-0**

APRIL 2017

Prepared for:

**WILLIAMS FOUR CORNERS LLC
295 Chipeta Way
Salt Lake City, Utah 84108**

Prepared by:

**LT ENVIRONMENTAL, INC.
848 East Second Avenue
Durango, Colorado 81301
(970) 385-1096**



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EXECUTIVE SUMMARY

Groundwater at the Florance #47X (Site), Administrative/Environmental Order Number 3RP-317-0, is impacted by petroleum hydrocarbons due to a release from a former earthen dehydrator pit. LT Environmental, Inc. (LTE) on behalf of Williams Four Corners LLC (Williams) conducted groundwater sampling and monitoring activities for the last three quarters of 2016 at the Site. These activities included measuring depth to groundwater and investigating for the presence of phase-separated hydrocarbons (PSH) in monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5.

Groundwater samples were collected from MW-5 for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX). Monitoring wells MW-1 and MW-4 were not sampled in 2016 as concentrations of BTEX have been compliant with the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards since 2000 and 2003, respectively, and were removed from the sampling program. Monitoring well MW-2 was not sampled in 2016 due to an obstruction in the well preventing recovery of water. Monitoring well MW-3 was not sampled in 2016 due to the presence of PSH.

Depth to groundwater data collected during the April, August, and October 2016 monitoring events indicated groundwater flow direction is to the southeast. Concentrations of benzene exceeded the NMWQCC groundwater standards in the sample collected from monitoring well MW-5 during April 2016. Measurable PSH was observed in monitoring well MW-3 during all three 2016 monitoring events. LTE recovered PSH from monitoring well MW-3 during 2016 using oil absorbent socks and by manual recovery.

Williams will monitor groundwater elevations and the presence of PSH in monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5, quarterly. Williams will manually recover PSH from monitoring well MW-3 and install oil absorbent socks for passive PSH recovery between quarterly site visits. Additionally, Williams will collect annual groundwater samples from monitoring wells MW-2 and MW-5 as well as MW-3 if no free product is detected.

1.0 INTRODUCTION

LT Environmental, Inc. (LTE) has prepared this report on behalf of Williams Four Corners LLC (Williams) detailing annual groundwater monitoring activities completed in 2016 at the Florance #47X (Site), Administrative/Environmental Order Number 3RP-317-0. The scope of work for this project includes monitoring of petroleum hydrocarbon impacts to groundwater including groundwater sampling and recovery of phase-separated hydrocarbons (PSH) resulting from operations of a former earthen dehydrator pit.

1.1 LOCATION

The Site is located at latitude 36.843316 and longitude -108.800667 in Unit G, Section 5, Township 30 North, Range 9 West as depicted on Figure 1. The Site is in Crow Canyon, a tributary of Pump Canyon, in the San Juan Basin in San Juan County, New Mexico.

1.2 HISTORY

In June 1996, approximately 399 cubic yards of petroleum hydrocarbon-impacted soil were excavated from what was believed to be the former earthen dehydrator pit. Field notes indicated the dimensions of the pit were 27 feet long by 21 feet wide by 19 feet deep. A composite soil sample from the pit excavation contained 97 milligrams per kilogram (mg/kg) of benzene, toluene, ethylbenzene, and total xylenes (BTEX) and 277 mg/kg of total petroleum hydrocarbons (TPH)-diesel range organics (DRO). A test hole was drilled in the location of the excavation to a depth of 115 feet below ground surface (bgs); groundwater was encountered at 96.95 feet. A soil sample from this test hole at 56 feet bgs contained 6,318 mg/kg of TPH-gasoline range organics (GRO) and 88.2 mg/kg of TPH-DRO. A groundwater sample from this test hole, which was completed as monitoring well MW-2, contained 18,650 micrograms per liter ($\mu\text{g/L}$) of BTEX.

Between September 1997 and December 2015, Williams monitored groundwater at the Site. Monitoring wells MW-2, MW-3, and MW-5 contained PSH at some time between 1999 and 2013. Records regarding these activities can be found in previous groundwater reports submitted to the New Mexico Oil Conservation Division (NMOCD).

Laboratory analytical results for groundwater samples collected from monitoring wells MW-1 and MW-4 indicated BTEX concentrations were compliant with the New Mexico Water Quality Control Commission (NMWQCC) standards for more than eight consecutive quarters; therefore, sampling of these wells was discontinued after the March 2013 monitoring event.

On September 12, 2013, LTE collected a sample of PSH from monitoring well MW-3 for paraffins, isoparaffins, aromatics, naphthenes, and olefins (PIANO) analysis to determine the chemical composition of the PSH and identify the potential source at the Site. The PIANO analysis from MW-3 indicated a natural gas condensate source.

2.0 METHODOLOGY

2.1 SCOPE OF WORK

LTE conducted groundwater sampling monitoring activities for the last three quarters of 2016 at the Site. These activities included measuring depth to groundwater and investigating for the presence of PSH in monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5. A groundwater sample was collected from MW-5 in April 2016. Monitoring wells MW-1 and MW-4 were not sampled in 2016 as concentrations of BTEX have been compliant with the NMWQCC groundwater standards since 2000 and 2003, respectively, and were removed from the monitoring program. Monitoring well MW-2 was not sampled in 2016 due to an obstruction in the well preventing recovery of water. Monitoring well MW-3 was not sampled in 2016 due to the presence of PSH.

2.2 WATER AND PRODUCT LEVEL MEASUREMENTS

Monitoring activities included measuring depth to PSH (where present) and depth to groundwater with a Keck oil/water interface probe. The presence of 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.

2.3 GROUNDWATER SAMPLING

Prior to sampling groundwater, depth to groundwater and total depth of monitoring wells were measured with a Keck oil/water interface probe. Monitoring wells containing measurable PSH were not sampled. The volume of water in each monitoring well sampled was calculated, and a minimum of three well casing volumes of water was purged from each well using a dedicated polyvinyl chloride (PVC) bailer. As water was removed from the monitoring well, pH, electrical conductivity, and temperature were monitored. Monitoring well MW-5 was purged until these parameters stabilized, indicating the purge water was representative of ambient aquifer conditions, or until the well was purged dry. Stabilization was defined as three consecutive stable readings for each water quality parameter (plus or minus (\pm) 0.4 units for pH, ± 10 percent for electrical conductivity, and ± 2 degrees ($^{\circ}$) Celsius for temperature). All purge water was contained and disposed of at a designated Williams facility. A copy of the 2016 field notes are presented in Appendix A.

After monitoring well MW-5 was properly purged, a groundwater sample was collected by filling three 40-milliliter (ml) glass vials directly from the bailer. 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 constituents to be analyzed. Samples were immediately sealed, packed on ice, and transferred to Hall Environmental Analysis Laboratory (HEAL) for analysis. HEAL analyzed the samples for BTEX using United States Environmental Protection Agency Method 8021.



2.4 GROUNDWATER CONTOUR MAPS

The April, August, and October 2016 groundwater elevations in the monitoring wells were determined relative to the top-of-casing elevations measured during the June 2013 survey. Figures 2 through 4 present contoured groundwater elevation maps derived from these data indicating the groundwater flow direction. The contours were inferred based on groundwater elevations obtained and observations of physical characteristics at the Site, such as topography.

2.5 PSH RECOVERY

Oil absorbent socks were used to passively recover PSH in monitoring well MW-3. The oil absorbent socks were removed from the monitoring well at least seven days prior to the monitoring event to allow groundwater to equilibrate. After measuring the PSH and groundwater levels, new oil absorbent socks were installed. LTE estimated the volume of recovered PSH based on percent saturation observed in the socks. Once the oil absorbent socks were removed, LTE manually bailed as much PSH from the monitoring well as possible.

3.0 RESULTS

Depth to groundwater data collected during the April, August, and October 2016 monitoring events are summarized in Table 1. The groundwater flow direction was determined to be to the southeast (Figure 2 through 4).

During the 2016 annual sampling event, laboratory analytical results indicated concentrations of benzene exceeded the NMWQCC groundwater standards in monitoring well MW-5 at 270 µg/L. Laboratory analytical results for groundwater are summarized in Table 2. Copies of the laboratory analytical results are presented in Appendix B.

Monitoring well MW-2 was not sampled during 2016 due to an obstruction in the well casing preventing the recovery of water. Groundwater was not sampled from MW-3 during 2016 due to the presence of PSH. Monitoring well MW-3 contained 1.65 feet of measurable PSH on April 21, 2016; 1.55 feet of measurable PSH on July, 25, 2016; and 1.51 feet of measurable PSH on October 10, 2016. A total of approximately 536 ounces or 4.19 gallons of PSH were removed from MW-3 during 2016 through passive product recovery socks and manual bailing.

4.0 CONCLUSIONS

In 2016, concentrations of benzene exceeding the NMWQCC standards were detected in the groundwater sample from monitoring well MW-5 located within and downgradient of the source area. Monitoring well MW-2 has been damaged, restricting data gathering and remediation options in monitoring well MW-2. PSH was measured in monitoring well MW-3 downgradient of the original source area.

5.0 MONITORING PLAN

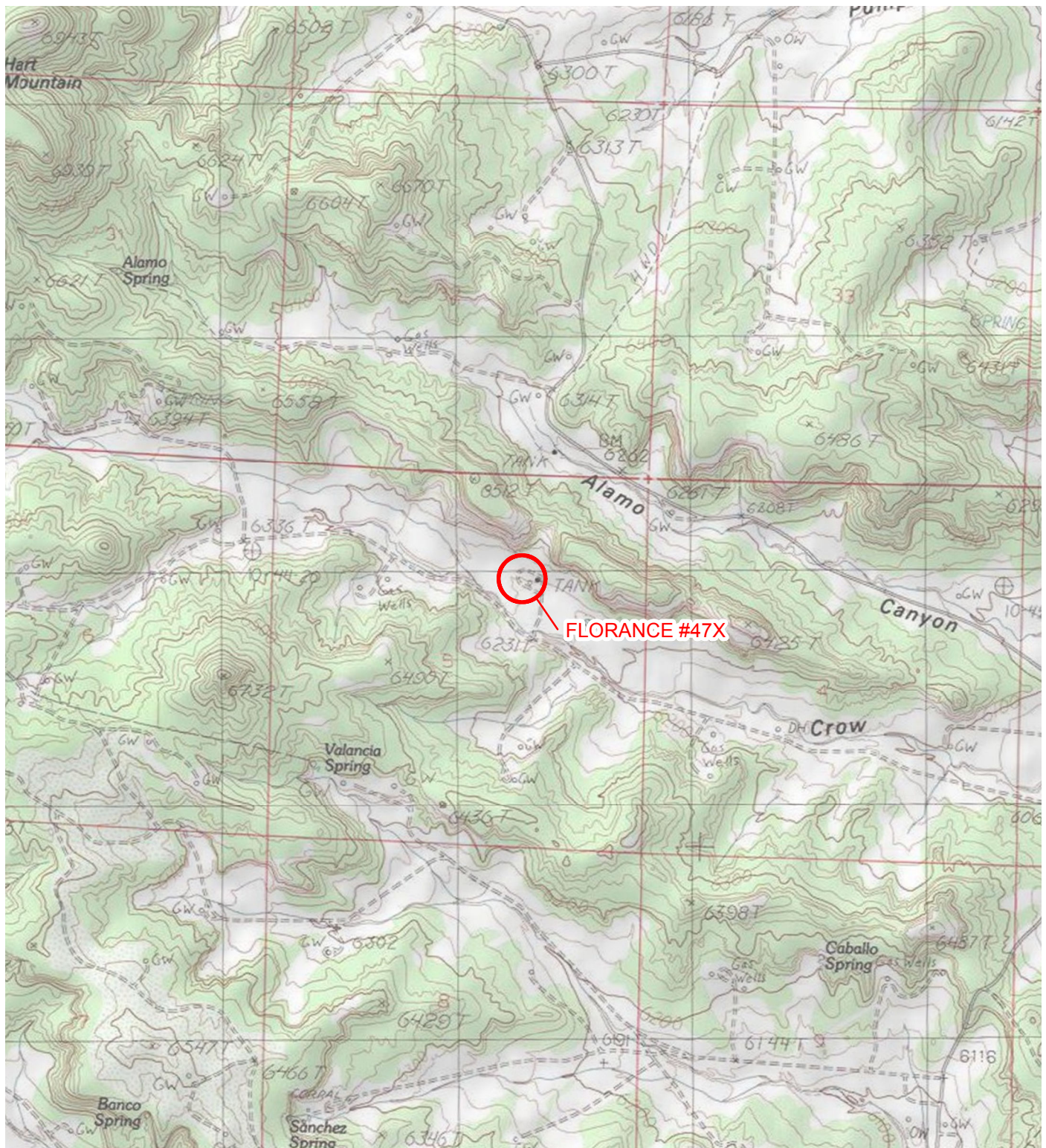
Williams will monitor groundwater elevations and the presence of PSH in monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5, quarterly. Williams will manually recover PSH from monitoring well MW-3 and install oil absorbent socks for passive PSH recovery between



quarterly site visits. Additionally, Williams will collect annual groundwater samples from monitoring wells MW-2 and MW-5, if possible.



FIGURES



LEGEND

○ SITE LOCATION

IMAGE COURTESY OF ESRI/BING MAPS

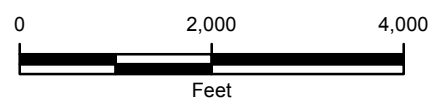


FIGURE 1
SITE LOCATION MAP
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO

WILLIAMS FOUR CORNERS LLC



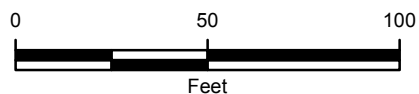
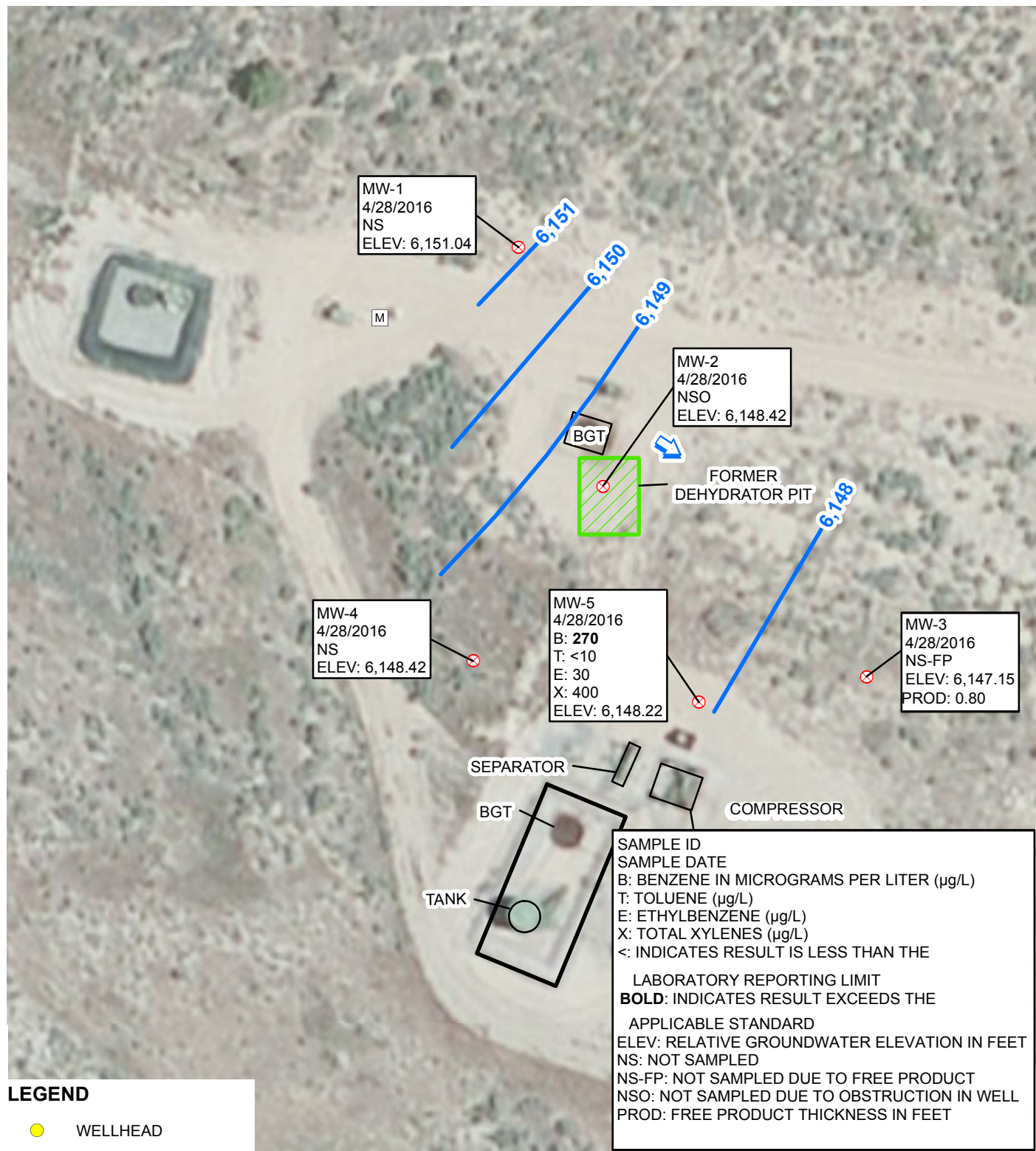


FIGURE 2
GROUNDWATER ELEVATION & ANALYTICAL RESULTS (APRIL 2016)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS LLC



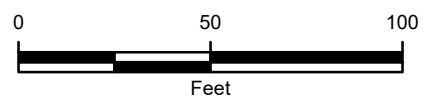
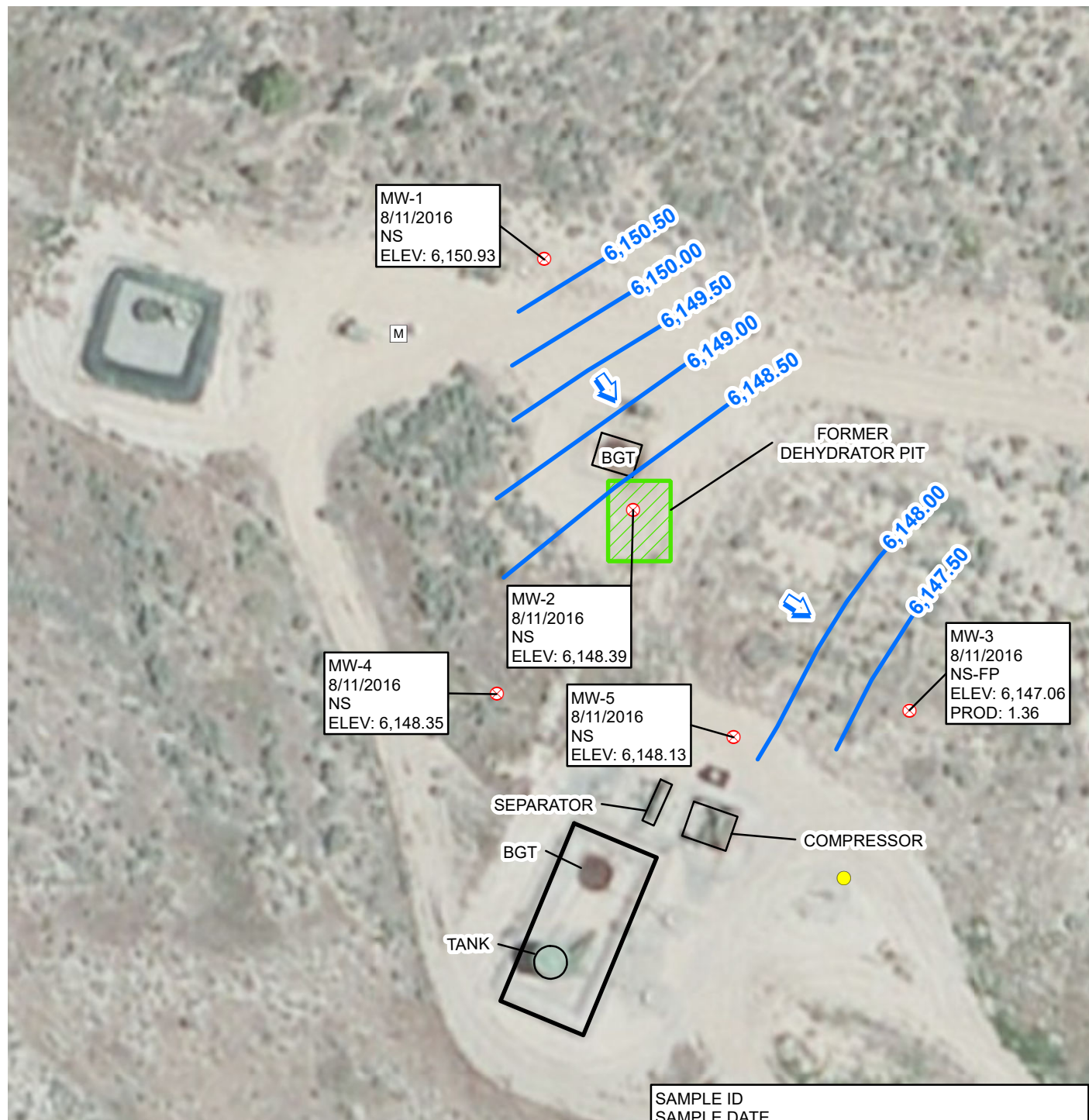


FIGURE 3
GROUNDWATER ELEVATIONS
(AUGUST 2016)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS LLC



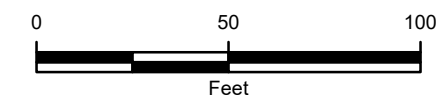
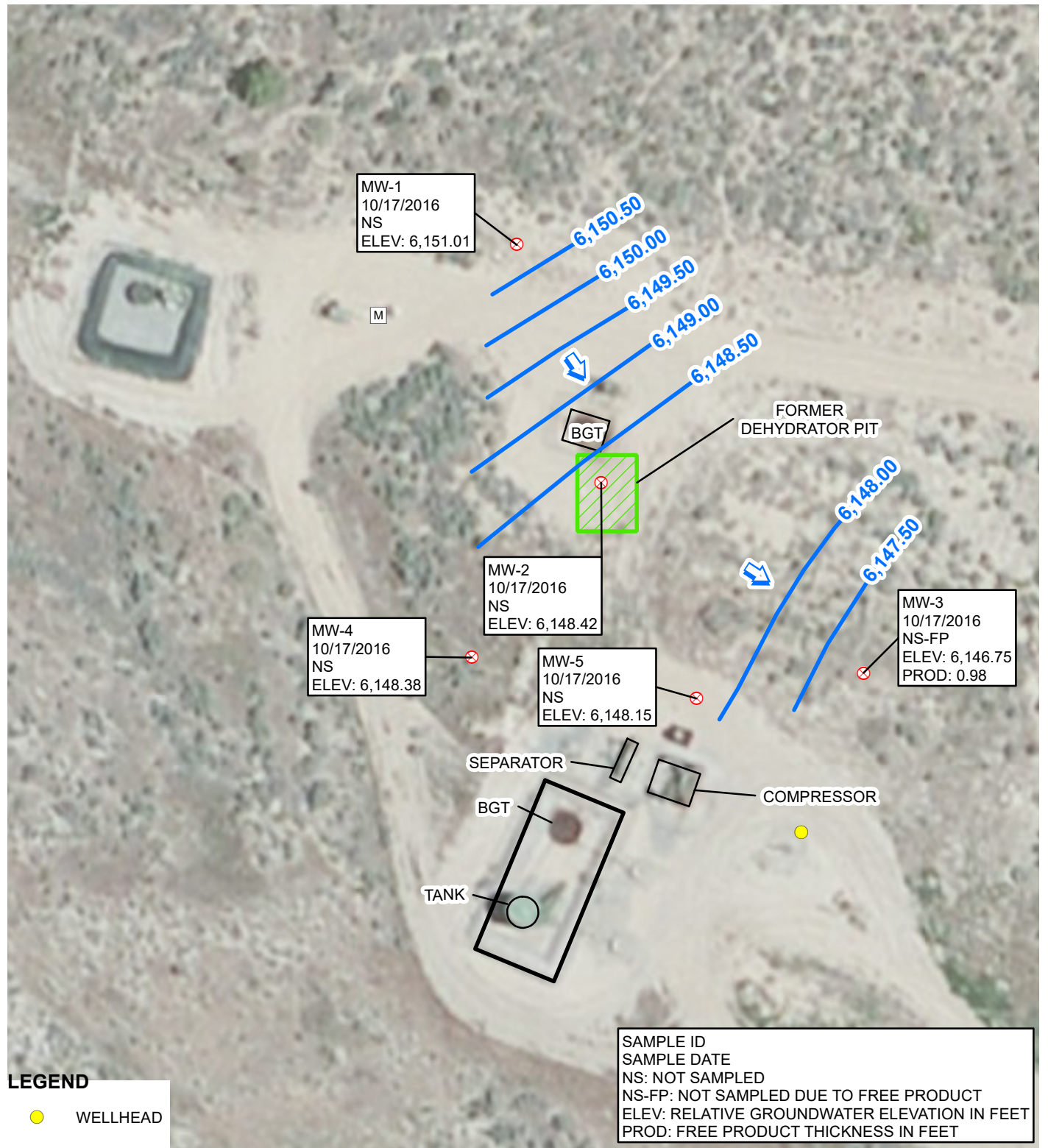


FIGURE 4
GROUNDWATER ELEVATIONS
(OCTOBER 2016)
FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS LLC



TABLES

TABLE 1
GROUNDWATER ELEVATIONS SUMMARY

FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS LLC

Well Name	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	4/2/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	6/13/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	10/2/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	12/6/2012	6,229.61	UNK	UNK	UNK	UNK
MW-1	3/1/2013	6,229.61	99.52	NP	NP	6,130.09
MW-1	6/24/2013**	6,250.21	99.41	NP	NP	6,150.80
MW-1	9/12/2013	6,250.21	98.90	NP	NP	6,151.31
MW-1	12/4/2013	6,250.21	98.79	NP	NP	6,151.42
MW-1	3/19/2014	6,250.21	99.08	NP	NP	6,151.13
MW-1	6/13/2014	6,250.21	99.02	NP	NP	6,151.19
MW-1	9/11/2014	6,250.21	99.01	NP	NP	6,151.20
MW-1	12/4/2014	6,250.21	99.18	NP	NP	6,151.03
MW-1	3/17/2015	6,250.21	99.14	NP	NP	6,151.07
MW-1	4/28/2016	6,250.21	99.17	NP	NP	6,151.04
MW-1	8/11/2016	6,250.21	99.28	NP	NP	6,150.93
MW-1	10/17/2016	6,250.21	99.20	NP	NP	6,151.01
MW-2	4/2/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	6/13/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	10/2/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	12/6/2012	6,226.30	UNK	UNK	UNK	UNK
MW-2	3/1/2013	6,226.30	98.47	NP	NP	6,127.83
MW-2	6/24/2013**	6,247.15	98.45	NP	NP	6,148.70
MW-2	9/12/2013	6,247.15	98.60	NP	NP	6,148.55
MW-2	12/4/2013	6,247.15	98.41	NP	NP	6,148.74
MW-2	3/19/2014	6,247.15	98.54	NP	NP	6,148.61
MW-2	6/13/2014	6,247.15	98.53	NP	NP	6,148.62
MW-2	9/11/2014	6,247.15	98.60	NP	NP	6,148.55
MW-2	12/4/2014	6,247.15	98.56	NP	NP	6,148.59
MW-2	3/17/2015	6,247.15	98.63	NP	NP	6,148.52
MW-2	4/28/2016	6,247.15	98.73	NP	NP	6,148.42
MW-2	8/11/2016	6,247.15	98.76	NP	NP	6,148.39
MW-2	10/17/2016	6,247.15	98.73	NP	NP	6,148.42
MW-3	4/2/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3	6/13/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3	10/2/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3	12/6/2012	6,217.53	UNK	UNK	UNK	UNK
MW-3*	3/1/2013	6,217.53	92.48	91.51	0.97	6,125.83
MW-3*	6/24/2013**	6,238.51	91.71	90.86	0.85	6,147.48
MW-3	9/12/2013	6,238.51	91.69	90.89	0.80	6,147.46
MW-3	12/4/2013	6,238.51	91.23	90.83	0.40	6,147.60
MW-3	3/19/2014	6,238.51	91.59	91.03	0.56	6,147.37
MW-3	6/13/2014	6,238.51	91.38	91.08	0.30	6,147.37
MW-3	9/11/2014	6,238.51	91.47	91.20	0.27	6,147.26
MW-3	12/4/2014	6,238.51	91.15	91.15†	<0.01	6,147.36
MW-3	3/17/2015	6,238.51	91.53	91.22	0.31	6,147.23
MW-3	4/28/2016	6,238.51	92.00	91.20	0.80	6,147.15
MW-3	8/11/2016	6,238.51	92.54	91.18	1.36	6,147.06
MW-3	10/17/2016	6,238.51	92.54	91.56	0.98	6,146.75



**TABLE 1
GROUNDWATER ELEVATIONS SUMMARY**

**FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS LLC**

Well Name	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-4	4/2/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	6/13/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	10/2/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	12/6/2012	6,219.93	UNK	UNK	UNK	UNK
MW-4	3/1/2013	6,219.93	92.02	NP	NP	6,127.91
MW-4	6/24/2013**	6,240.67	91.98	NP	NP	6,148.69
MW-4	9/12/2013	6,240.67	92.00	NP	NP	6,148.67
MW-4	12/4/2013	6,240.67	91.96	NP	NP	6,148.71
MW-4	3/19/2014	6,240.67	92.09	NP	NP	6,148.58
MW-4	6/13/2014	6,240.67	92.06	NP	NP	6,148.61
MW-4	9/11/2014	6,240.67	92.13	NP	NP	6,148.54
MW-4	12/4/2014	6,240.67	92.10	NP	NP	6,148.57
MW-4	3/17/2015	6,240.67	92.17	NP	NP	6,148.50
MW-4	4/28/2016	6,240.67	92.25	NP	NP	6,148.42
MW-4	8/11/2016	6,240.67	92.32	NP	NP	6,148.35
MW-4	10/17/2016	6,240.67	92.29	NP	NP	6,148.38
MW-5	4/2/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	6/13/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	10/2/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	12/6/2012	6,216.97	UNK	UNK	UNK	UNK
MW-5	3/1/2013	6,216.97	90.48	90.46	0.02	6,126.51
MW-5	6/24/2013**	6,238.33	89.78	NP	NP	6,148.55
MW-5	9/12/2013	6,238.33	89.98	NP	NP	6,148.35
MW-5	12/4/2013	6,238.33	89.86	NP	NP	6,148.47
MW-5	3/19/2014	6,238.33	89.91	NP	NP	6,148.42
MW-5	6/13/2014	6,238.33	89.95	NP	NP	6,148.38
MW-5	9/11/2014	6,238.33	90.02	NP	NP	6,148.31
MW-5	12/4/2014	6,238.33	90.02	NP	NP	6,148.31
MW-5	3/17/2015	6,238.33	89.98	NP	NP	6,148.35
MW-5	4/28/2016	6,238.33	90.11	NP	NP	6,148.22
MW-5	8/11/2016	6,238.33	90.20	NP	NP	6,148.13
MW-5	10/17/2016	6,238.33	90.18	NP	NP	6,148.15

Notes:

< - less than laboratory detection limit

* Due to presence of product recovery device, this is not a static water level

** Top of casing elevation was resurveyed on 6/20/13

†Oil-water interface probe did not detect phase separated hydrocarbons. LTE visually observed phase separated hydrocarbons using a bailer.

Groundwater elevation calculation in wells with product: (Top of Casing Elevation - Depth to Water) + (Product Thickness * 0.8)

AMSL - above mean sea level

BTOC - below top of casing

NP - no free phase hydrocarbons are present the well

UNK - data is not known



TABLE 2
GROUNDWATER LABORATORY ANALYTICAL RESULTS

FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS 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	1/8/1997	3,380	7,150	917	7,200
MW-1	7/13/1997	367	241	35	191
MW-1	10/1/1997	171	54	27	65
MW-1	1/6/1998	147	70	20	73.6
MW-1	3/9/1998	140	1.4	17	36
MW-1	6/11/1998	94	19	11	16.3
MW-1	8/12/1998	49	4.7	8.8	5.7
MW-1	12/15/1998	46	11	5.8	4.7
MW-1	2/9/1999	33	6.6	5.6	4.7
MW-1	4/21/1999	40	15	6.4	10.4
MW-1	7/28/1999	34	7.8	3	3.0
MW-1	11/3/1999	2.9	<0.5	<0.5	<1.5
MW-1	3/23/2000	10	1.1	<0.5	<1.5
MW-1	6/14/2000	4.1	1.4	0.6	<1.5
MW-1	11/17/2000	4.64	<1.0	<1.0	<1.0
MW-1	1/31/2001	3.67	1.44	<1.0	<1.0
MW-1	4/30/2001	5.44	1.90	<1.0	1.78
MW-1	10/10/2001	1.1	<2.0	<2.0	<2.0
MW-1	12/2/2003	<2.0	<2.0	<2.0	<5.0
MW-1	9/20/2004	3.4	<2.0	<2.0	<5.0
MW-1	12/3/2004	<2.0	<2.0	<2.0	<5.0
MW-1	3/10/2005	<2.0	<2.0	<2.0	<5.0
MW-1	6/18/2005	<2.0	<2.0	<2.0	<5.0
MW-1	7/13/2006	2.2	<1.0	<1.0	<3.0
MW-1	9/21/2006	4.9	<1.0	<1.0	<3.0
MW-1	3/29/2010	<1.0	<1.0	<1.0	<3.0
MW-1	6/18/2010	<1.0	<1.0	<1.0	<3.0
MW-1	9/10/2010	1.2	<1.0	<1.0	<3.0
MW-1	12/4/2010	<1.0	<1.0	<1.0	<3.0
MW-1	3/2/2011	<1.0	<1.0	<1.0	<3.0
MW-1	6/14/2011	3.6	<1.0	<1.0	<3.0
MW-1	9/12/2011	<1.0	<1.0	<1.0	<3.0
MW-1	1/3/2012	<1.0	<1.0	<1.0	<3.0
MW-1	4/2/2012	<1.0	<1.0	<1.0	<3.0
MW-1	6/13/2012	<1.0	<1.0	<1.0	<3.0
MW-1	10/2/2012	1.1	<1.0	<1.0	<3.0
MW-1	12/6/2012	<1.0	<1.0	<1.0	<3.0
MW-1	3/1/2013	<1.0	<1.0	<1.0	<2.0
MW-2	8/12/1998	9,800	14,000	920	9,200
MW-2	12/15/1998	12,000	17,000	870	8,700
MW-2	2/9/1999	11,000	16,000	720	7,300
MW-2	4/21/1999	14,000	20,000	850	8,500
MW-2	7/28/1999	11,000	15,000	740	6,800
MW-2	11/3/1999	11,000	14,000	770	8,100

TABLE 2
GROUNDWATER LABORATORY ANALYTICAL RESULTS

FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS 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	3/23/2000	12,000	15,000	810	8,200
MW-2	6/14/2000	6,400	7,000	570	5,800
MW-2	11/17/2000	5,980	3,240	600	4,780
MW-2	1/31/2001	6,300	2,790	458	5,490
MW-2	4/30/2001	7,160	2,200	404	7,060
MW-2	10/10/2001	4,500	1,000	390	3,800
MW-2	12/2/2003	11,000	<100	540	6,400
MW-2	9/20/2004	11,000	<200	600	5,800
MW-2	12/3/2004	11,000	<200	630	6,300
MW-2	3/10/2005	10,000	38	490	5,700
MW-2	6/18/2005	9,700	<100	640	6,000
MW-2	9/16/2005	8,900	31	370	4,800
MW-2	11/30/2005	<2.0	2.9	<2.0	12.2
MW-2	7/18/2006	16,900	<10.0	753	4,370
MW-2	3/29/2010	9,460	67	521	6,210
MW-2	6/18/2010	3,270	<1.0	260	3,530
MW-2	12/4/2010	1,470	26.3	599	2,720
MW-2	3/2/2011	2,530	1.4	764	3,700
MW-2	6/14/2011	8,500	<20.0	537	4,490
MW-2	1/3/2012	9,400	<50.0	710	6,340
MW-2	4/2/2012	10,000	710	<100	6,390
MW-2	6/13/2012	11,200	716	<50.0	6,790
MW-2	10/2/2012	10,200	765	<100	7,260
MW-2	12/6/2012	8,280	722	<50.0	5,610
MW-2	3/4/2013	8,600	<10	<10	6,500
MW-2	6/24/2013	6,300	<10	600	5,800
MW-2	9/12/2013	NSO	NSO	NSO	NSO
MW-2	12/4/2013	39	72	<5.0	150
MW-2	3/19/2014	9,700	<10	760	7,000
MW-2	6/13/2014	8,600	<10	290	5,800
MW-2	9/11/2014	9,700	<10	490	7,200
MW-2	12/8/2014	9,400	<10	360	6,900
MW-2	3/17/2015	5,000	<20	340	3,000
MW-2	4/28/2016	NSO	NSO	NSO	NSO

MW-3	4/2/2012	NS	NS	NS	NS
MW-3	6/13/2012	NS	NS	NS	NS
MW-3	10/2/2012	NS	NS	NS	NS
MW-3	12/6/2012	NS	NS	NS	NS
MW-3	3/1/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	6/24/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	9/12/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	12/4/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	3/19/2014	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	6/13/2014	NS-FP	NS-FP	NS-FP	NS-FP

TABLE 2
GROUNDWATER LABORATORY ANALYTICAL RESULTS

FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS 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	9/11/2014	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	12/4/2014	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	3/17/2015	NS-FP	NS-FP	NS-FP	NS-FP
MW-3	4/28/2016	NS-FP	NS-FP	NS-FP	NS-FP

MW-4	12/15/1998	44	11	5.8	4.8
MW-4	2/9/1999	11,000	16,000	730	7,300
MW-4	4/21/1999	68	25	9.3	13
MW-4	7/2/1999	11,000	14,000	700	6,700
MW-4	3/23/2000	11,000	13,000	770	7,800
MW-4	6/14/2000	28	42	7	135
MW-4	11/17/2000	59.9	104	2.94	98.3
MW-4	1/31/2001	30.3	81.0	5.20	156
MW-4	4/30/2001	36.1	56.1	1.32	73
MW-4	10/10/2001	24	28	<2.0	47
MW-4	12/2/2003	2.3	2.7	<2.0	6.5
MW-4	9/20/2004	3.6	3.2	<2.0	9.8
MW-4	12/3/2004	2.5	2.3	<2.0	8
MW-4	3/10/2005	3.0	3.5	<2.0	11
MW-4	6/18/2005	<2.0	3	<2.0	8.6
MW-4	9/16/2005	<2.0	2.3	<2.0	9.4
MW-4	11/30/2005	<2.0	<2.0	<2.0	10.4
MW-4	7/13/2006	2.9	<1.0	1.0	9.9
MW-4	9/21/2006	1.2	<1.0	<1.0	9.6
MW-4	3/29/2010	1.3	<1.0	<1.0	8.7
MW-4	6/18/2010	<1.0	<1.0	<1.0	6.8
MW-4	9/10/2010	<1.0	<1.0	<1.0	3.9
MW-4	12/4/2010	<1.0	<1.0	<1.0	5.6
MW-4	3/2/2011	<1.0	<1.0	<1.0	3
MW-4	6/14/2011	<1.0	<1.0	<1.0	6
MW-4	9/12/2011	<1.0	<1.0	<1.0	4.7
MW-4	1/3/2012	<1.0	<1.0	<1.0	5.4
MW-4	4/2/2012	<1.0	<1.0	<1.0	6.1
MW-4	6/13/2012	<1.0	<1.0	<1.0	3.7
MW-4	10/2/2012	<1.0	<1.0	<1.0	4.5
MW-4	12/6/2012	<1.0	<1.0	<1.0	6
MW-4	3/1/2013	<1.0	<1.0	<1.0	<2.0

MW-5	6/14/2000	1,100	710	100	1,100
MW-5	6/14/2000	890	570	80	900
MW-5	11/17/2000	161	110	8.09	60.8
MW-5	4/30/2001	15.7	21.6	2.01	17.9
MW-5	10/10/2001	380	120	19	220
MW-5	12/2/2003	41	7.9	3.1	10
MW-5	9/20/2004	17	3.7	<2.0	9.9

TABLE 2
GROUNDWATER LABORATORY ANALYTICAL RESULTS

FLORANCE #47X
SAN JUAN COUNTY, NEW MEXICO
WILLIAMS FOUR CORNERS 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	12/9/2004	13	3.3	<2.0	14
MW-5	3/10/2005	5.5	<2.0	<2.0	6.3
MW-5	7/13/2006	920	74	34.7	1,980
MW-5	9/21/2006	135	19.2	17.0	409
MW-5	4/2/2012	NS	NS	NS	NS
MW-5	6/13/2012	NS	NS	NS	NS
MW-5	10/2/2012	NS	NS	NS	NS
MW-5	12/6/2012	NS	NS	NS	NS
MW-5	3/1/2013	NS-FP	NS-FP	NS-FP	NS-FP
MW-5	6/24/2013	930	<50	98	1,100
MW-5	9/12/2013	2,400	40	250	3,800
MW-5	12/4/2013	410	46	51	1,000
MW-5	3/19/2014	920	3.1	100	660
MW-5	6/13/2014	4,000	<20	480	1,700
MW-5	9/11/2014	3,000	33	370	2,800
MW-5	12/4/2014	3,000	14	390	2,900
MW-5	3/17/2015	570	<10	52	660
MW-5	4/28/2016	270	<10	30	400

Notes:

Bold - indicates sample exceeds NMWQCC standard

< - indicates result is less than laboratory reporting detection limit

µg/L - micrograms per liter

NMWQCC - New Mexico Water Quality Control Commission

NS - not sampled

NSC - not sampled due to eight quarters below NMWQCC standards

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

NSO - not sampled due to obstruction

APPENDIX A
2016 FIELD NOTES



1030 → JA onsite, lock was broke on well

1045 → removed sock from MW-3
→ yellow on top, black on bottom, 100% saturated

WL : 92.97

DTP : 91.32

bailed 0.75 gallons of product; installed new sock

1145 → JA offsite

~~John Adams~~

4-21-2016

Location

Florence 47x

Date

4-28-16³³

Project / Client

1100 → JA onsite for quarterly sampling

#	DTW	DTP	TD	Sam. time	Purg volume
MW-1	99.17	ND	-	NS	-
MW-2	98.73	ND	101.81	NS	-
MW-3	92.00	41.20	100.11	NS	-
MW-4	92.25	ND	101.81	NS	-
MW-5	98.11	ND	99.79	1530	0.8 gal

~~1100~~ - could not sample MW-2
broken bailer in well sitting
@ 95-100 ft. bgs.

1545 → JA offsite to drop samples
and dispose of H₂O @ Prichard

1730 → JA onsite to attempt to
recover broken bailer
- could not recover bailer

1915 → JA offsite

Joh Adams
4-28-16

Sunny / Hot / JSA / HASP / T80

1447 AC onsite

- Removed Socie from MW-3
- yellow & brown, 100% Saturated

NL: 92.90

DTP: 91.35

Bailed ~ 86z of product

1600 AC offsite

AC 7/25/16

1000 → JA onsite, review JSA, HSAP,
+ Job Plan

DTP = 91.16

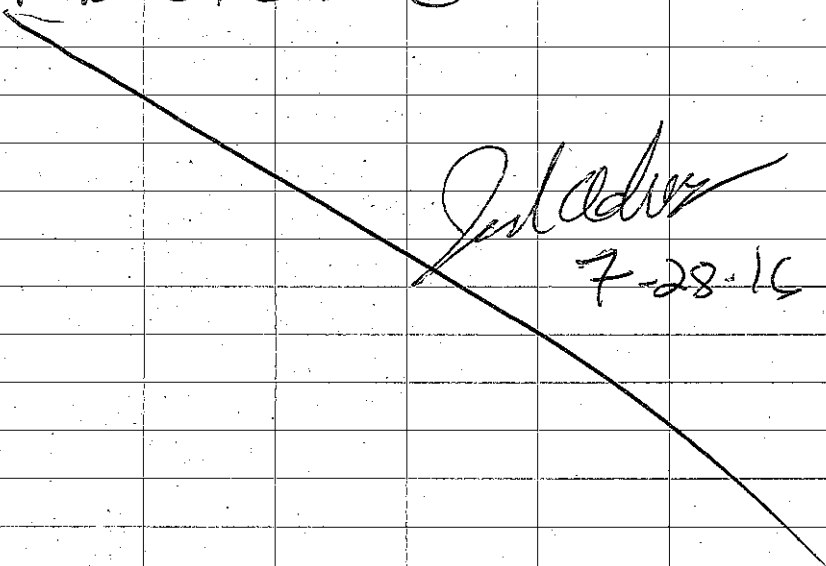
DTW = 92.63

97

Product Thickness = 1.47'

~~JP~~ hauled 21.5 gallons of product
- reinstalled PRS

1045 - JA offsite


J. L. L. L.

7-28-16

Location Florance 47x Date 8/11/16
 Project / Client Williams Field Services
MAW, T59, IFP

1208, Onsite to gauge water levels, review
 SSA/MASP

Well	DTW	DTP
MW-1	99.28	ND
MW-2	98.76	ND
MW-3	91.18	91.18
MW-4	92.32	ND
MW-5	90.20	ND

DTW⁽³⁾

92.54

MW-3, removed ~ 104oz / 0.815 gal
 of dark brown product

1306, Offsite, Installed PRC sock in MW-3

Location Florance 47x Date 10/10/16

Project / Client _____

T68, IFP, Bailer - D. Burne

1520- Onsite to pull product recovery socks,
measure DTW/DTP in MW-3
Bail product. Review HASP, job plan.

	DTP	DTW	Thickness
MW-3	91.07	92.58	1.51

- Bailed 4 gallons of PSH/H₂O ~ 1 gallon of product

- sock was not stained & dry

DB
10-10-16

Location Florance 47x Date 10/17/16 ⁴⁹Project / Client Quarterly WL

0905 AC onsite

- Begin taking water levels

	DTW	DTP	
MW-1	97.20	NM	
MW-2	98.73	NM	
* MW-3	92.54	91.56	0.98 Thickness
MW-4	92.29	NM	
MW-5	90.18	NM	

NM = not measured

MW-3 - purged 8oz of product
Added absorbent sock to well

1015 AC offsite

AC
10/17/16

APPENDIX B
LABORATORY ANALYTICAL REPORT





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

May 04, 2016

Brooke Herb
LT Environmental
10 42nd St E #1301
Williston, ND 58801
TEL: (701) 609-5436
FAX

RE: Florance #47x

OrderNo.: 1604C79

Dear Brooke Herb:

Hall Environmental Analysis Laboratory received 2 sample(s) on 4/29/2016 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 qualifiers 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1604C79**

Date Reported: **5/4/2016**

CLIENT: LT Environmental

Client Sample ID: MW5-01

Project: Florance #47x

Collection Date: 4/28/2016 3:30:00 PM

Lab ID: 1604C79-001

Matrix: AQUEOUS

Received Date: 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	270	10		µg/L	10	5/2/2016 11:41:08 AM
Toluene	ND	10		µg/L	10	5/2/2016 11:41:08 AM
Ethylbenzene	30	10		µg/L	10	5/2/2016 11:41:08 AM
Xylenes, Total	400	20		µg/L	10	5/2/2016 11:41:08 AM
Surr: 4-Bromofluorobenzene	117	87.9-146		%Rec	10	5/2/2016 11:41:08 AM

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
	D	Sample Diluted Due to Matrix	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 Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1604C79**

Date Reported: **5/4/2016**

CLIENT: LT Environmental

Client Sample ID: Trip Blank

Project: Florance #47x

Collection Date:

Lab ID: 1604C79-002

Matrix: TRIP BLANK

Received Date: 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	5/2/2016 4:19:23 PM
Toluene	ND	1.0		µg/L	1	5/2/2016 4:19:23 PM
Ethylbenzene	ND	1.0		µg/L	1	5/2/2016 4:19:23 PM
Xylenes, Total	ND	2.0		µg/L	1	5/2/2016 4:19:23 PM
Surr: 4-Bromofluorobenzene	107	87.9-146		%Rec	1	5/2/2016 4:19:23 PM

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
	D	Sample Diluted Due to Matrix	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 Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1604C79

04-May-16

Client: LT Environmental

Project: Florance #47x

Sample ID	5ML RB	SampType:	MBLK	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	PBW	Batch ID:	A33934	RunNo:	33934					
Prep Date:		Analysis Date:	5/2/2016	SeqNo:	1045478	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	87.9	146			

Sample ID	100NG BTEX LCS	SampType:	LCS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	LCSW	Batch ID:	A33934	RunNo:	33934					
Prep Date:		Analysis Date:	5/2/2016	SeqNo:	1045479	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	94.3	80	120			
Toluene	20	1.0	20.00	0	98.8	80	120			
Ethylbenzene	20	1.0	20.00	0	99.2	80	120			
Xylenes, Total	60	2.0	60.00	0	101	80	120			
Surr: 4-Bromofluorobenzene	24		20.00		119	87.9	146			

Sample ID	1604C79-001AMS	SampType:	MS	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	MW5-01	Batch ID:	A33934	RunNo:	33934					
Prep Date:		Analysis Date:	5/2/2016	SeqNo:	1045482	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	510	10	200.0	270.0	119	78	119			
Toluene	200	10	200.0	0	99.8	80	120			
Ethylbenzene	250	10	200.0	29.92	108	80	120			
Xylenes, Total	1100	20	600.0	404.2	113	75.3	120			
Surr: 4-Bromofluorobenzene	250		200.0		123	87.9	146			

Sample ID	1604C79-001AMSD	SampType:	MSD	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	MW5-01	Batch ID:	A33934	RunNo:	33934					
Prep Date:		Analysis Date:	5/2/2016	SeqNo:	1045483	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	500	10	200.0	270.0	115	78	119	1.62	20	
Toluene	200	10	200.0	0	99.5	80	120	0.351	20	
Ethylbenzene	240	10	200.0	29.92	106	80	120	1.79	20	
Xylenes, Total	1100	20	600.0	404.2	112	75.3	120	0.660	20	
Surr: 4-Bromofluorobenzene	250		200.0		125	87.9	146	0	0	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Detection Limit
W Sample container temperature is out of limit as specified



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 ENVIRONMENTAL**

Work Order Number: **1604C79**

RcptNo: 1

Received by/date:

Logged By: **Lindsay Mangin**

4/29/2016
4/29/2016 7:00:00 AM

Completed By: **Lindsay Mangin**

4/29/2016 9:15:12 AM

Reviewed By:

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 $>0^{\circ}\text{C}$ 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 $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.0	Good	Yes			

