

April 5, 2017

Randy Bayliss
New Mexico Oil Conservation Division
1220 South Street Francis Drive
Santa Fe, New Mexico 87505

RE: Online Submission of 2016 Annual Groundwater Reports

Dear Mr. Randy Bayliss:

LT Environmental (LTE), Inc., on behalf of XTO Energy, Inc. (XTO), 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:

- Sullivan Gas Com D #1E (3RP-1035);
- Bruington Gas Com #1 (3RP-106);
- Federal Gas Com H #1 (3RP-110);
- McCoy Gas Com D #1E (3RP-414);
- OH Randel #007 (3RP-386); and
- Valdez A #1E (3RP-134).

If you have any questions regarding these reports please contact Ashley Ager with LTE at (970) 385-1096 or aager@ltenv.com or James McDaniel with XTO at (505) 333-3701 or James_McDaniel@xtoenergy.com.

Sincerely,



James McDaniel, CHMM #15676
XTO Energy Inc., a subsidiary of ExxonMobil
EH&S Supervisor

cc: Attachments (6)



2016 ANNUAL GROUNDWATER REPORT

Valdez A #1E

3RP-134

***SWNE, Section 24, Township 29N, Range 11W
San Juan County, New Mexico***

PREPARED FOR:

***New Mexico Oil Conservation Division
1220 South St. Francis Street
Santa Fe, New Mexico 87505
(505) 476-3488***

April 2017

2016 XTO GROUNDWATER REPORT

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VALDEZ A #1E 3RP-134

SITE DETAILS

LEGALS – TWN: 29N	RNG: 11W	SEC: 24	UNIT: SWNE
OCD HAZARD RANKING: 40		LAND TYPE: FEE	
LATITUDE: 36.711867		LONGITUDE: -107.942700	

INTRODUCTION

Tenneco Oil Company (Tenneco) was the original owner/operator of this well site. XTO Energy Inc. (XTO) acquired the Valdez A #1E natural gas production well from Amoco Production Company (Amoco) in January 1998. This is an active gas producing well in the Dakota Sandstone Formation and Otero Chacra Formation. The San Juan River flows in a general west/southwest direction approximately 1,000 feet from the location. A topographic map is presented as *Figure 1*.

HISTORY

In September 1987, the New Mexico Oil Conservation Division (NMOCD) augered four exploratory borings between 10½ feet and 18 feet deep at the site. The borings identified impact to groundwater in the vicinity of a produced water tank and separator. A letter documenting the NMOCD findings is included as *Attachment 1*. Tenneco was required by NMOCD to install a series of monitoring wells to delineate the vertical and lateral extent of groundwater impact and to monitor concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX).

In June 1988, Tenneco installed monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. Completion diagrams and borehole logs are presented as *Attachment 2*. The monitoring wells were sampled in July 1988 with the exception of monitoring well MW-4, which was damaged. Groundwater from monitoring well MW-6 contained BTEX concentrations exceeding the New Mexico Water Quality Control Commission (NMWQCC) standards. Monitoring well MW-4 was repaired in August 1988 and all monitoring wells were sampled. Laboratory analytical results indicated elevated BTEX concentrations existed in groundwater from monitoring wells MW-4 and MW-6. Tenneco submitted a groundwater report to the NMOCD in September 1988 documenting activities and laboratory results.

In January 1989, the site was acquired by Amoco. In 1992, based on historical analytical data, it is assumed that additional monitoring wells MW-7, MW-8, MW-9, and MW-10 were installed during the first quarter. In January 1996, Amoco submitted a written request to the NMOCD to discontinue groundwater monitoring at the site. Based on data collected since 1988, Amoco argued that the groundwater plume was stable and not a risk to human health and the environment and therefore continued groundwater monitoring appears to be unnecessary. In March 1996, as NMWQCC standards had not been met within the defined groundwater plume, the request was denied by the NMOCD. Amoco's closure request and the subsequent response by NMOCD are included as *Attachment 3*.

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The *1998 Annual Groundwater Report* was submitted to the NMOCD following XTO's acquisition of the site. The report presented data collected from 1996 through 1998. Monitoring well MW-2 was dry from 1996 through 1998. No BTEX concentrations in groundwater sampled from monitoring wells MW-1, MW-3, and MW-9 exceeded NMWQCC standards. Elevated concentrations of BTEX were documented during one sampling event between 1996 and 1998 at monitoring wells MW-4, MW-5, and MW-10, but BTEX concentrations were compliant with the NMWQCC standards thereafter. BTEX concentrations consistently exceeded the NMWQCC standards in groundwater sampled from monitoring wells MW-6, MW-7, and MW-8; however, a significant decrease in BTEX concentrations was observed in monitoring wells MW-6, MW-7, and MW-8 between 1996 and 1998. In June 1998, 0.88 feet of phase-separated hydrocarbons (PSH) was measured in monitoring well MW-7. Monitoring well MW-8 was damaged during the last quarter 1998.

From 1999 to 2005, XTO sampled groundwater from monitoring wells MW-6, MW-7, MW-9, and MW-10 to monitor natural degradation and confirm PSH was not migrating. According a former annual report, BTEX concentrations were not detected or were compliant with NMWQCC standards in groundwater sampled from monitoring wells MW-9 and MW-10 for four consecutive quarters and sampling was discontinued.

In April 2002, monitoring wells MW-2, MW-3, and MW-5 were plugged and abandoned per the surface owner's (FEE) request and NMOCD approval. In 2005, monitoring wells MW-9 and MW-10 were removed by the property owner. From 2006 through 2007, XTO conducted annual or semi-annual sampling of groundwater monitoring wells MW-6 and MW-7 to monitor natural degradation of BTEX constituents.

The *2008 Annual Groundwater Report* was submitted to the NMOCD proposing the addition of chemical oxygenate to monitoring wells MW-6 and MW-7 with a change in frequency from semi-annual sampling to quarterly sampling. No response was provided by NMOCD; therefore XTO did not proceed with the activities and continued semi-annual sampling through 2009.

In 2010, XTO implemented quarterly sampling of monitoring wells MW-6 and MW-7 and added chemical oxygenate to monitoring well MW-7 via Oxygen Release Compound[®] (ORC) socks. In the *2010 Annual Groundwater Report* submitted to the NMOCD, XTO proposed cessation of sampling of monitoring well MW-6 after the NMWQCC standards for BTEX concentrations were met for four consecutive quarters. Sampling of monitoring well MW-6 was discontinued in 2011. XTO continued to apply chemical oxygenate to groundwater in monitoring well MW-7 and sampled the monitoring well quarterly through 2015. A summary of groundwater elevation data and laboratory results from historical and current groundwater monitoring is presented in *Table 1* and *Table 2* respectively.

METHODOLOGY

XTO utilized ORC socks in monitoring well MW-7 throughout 2016 and groundwater samples were collected in June, September, and December and submitted to Environmental Science Corporation (ESC) of Mount Juliet, Tennessee, or Hall Environmental Analysis Laboratory (HEAL) of

2016 XTO GROUNDWATER REPORT

Albuquerque, New Mexico, for laboratory analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021B. The ORC socks were removed from monitoring well MW-7 at least seven days prior to sampling to allow groundwater to equilibrate; after sampling, the ORC socks were replaced. Depth to groundwater was measured quarterly at monitoring wells MW-1, MW-3, and MW-7 during 2016. Monitoring well MW-6 was removed following the second quarter monitoring event at the request of the property owner.

Water Level Measurements

Static groundwater level monitoring included measuring depth to groundwater with a Keck oil/water interface probe. Presence of PSH was also investigated using the interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement.

Groundwater Sampling

The volume of water in the monitoring well was calculated and a minimum of three well casing volumes of water were purged (unless the monitoring well was purged dry) from the monitoring well using a new disposable polyvinyl chloride (PVC) bailer or a dedicated PVC bailer. All purge water was disposed of into on-site tanks.

Once the monitoring well was purged, groundwater samples were collected by filling a minimum of two 40-milliliter (mL) glass vials. The laboratory-supplied vials were filled and capped with zero headspace to prevent degradation of the sample. Samples were labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. The samples were immediately sealed, packed on ice, and shipped via Fed-Ex priority overnight delivery for laboratory analysis. Proper chain-of-custody (COC) procedures were followed documenting the date and time sampled, sample number, type of sample, sample collector's name, preservative used, analyses required, and sample collector's signature. Laboratory reports are included as *Attachment 4* and field notes from the quarterly monitoring events are included as *Attachment 5*.

Groundwater Contour Maps

Groundwater elevations obtained from monitoring wells during site visits were used to draft groundwater contour maps. Contours were inferred based on depth to groundwater measurements and physical characteristics at the site (topography, proximity to irrigation ditches, etc.).

RESULTS

Laboratory analytical results indicated the benzene concentration in monitoring well MW-7 exceeded the NMWQCC standard at 35.8 micrograms per liter ($\mu\text{g/L}$) during the second quarter monitoring event. The total xylenes concentration exceeded the NMWQCC standard during the second and third quarter monitoring events with a concentration of 824 $\mu\text{g/L}$ and 830 $\mu\text{g/L}$, respectively. Toluene and ethylbenzene concentrations were in compliance with the NMWQCC standards in monitoring well MW-7 throughout 2016. The benzene concentration decreased and were compliant with the NMWQCC standard for the third and fourth quarter monitoring events. Laboratory analytical results are summarized in *Table 2*, laboratory reports from 2016 are included

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as *Attachment 4*, and copies of the field notes are provided as *Attachment 5*.

Field data collected during site monitoring activities indicated the groundwater continues to flow to the southwest, toward the San Juan River, which is consistent with historical observations. *Figures 2, 3, 4, and 5* illustrate the estimated groundwater potentiometric surface for 2016. Depth to groundwater and groundwater elevation data are summarized in *Table 1*.

CONCLUSIONS

Laboratory analytical results from groundwater monitoring in 2016 indicated benzene and total xylene concentrations in groundwater monitoring well MW-7 exceeded the NMWQCC standards. Toluene and ethylbenzene concentrations were in compliance with the NMWQCC standards in monitoring well MW-7 throughout 2016. While the total xylenes concentration remains stable, the benzene concentration was below the NMWQCC standard for the third and fourth quarter monitoring events. Monitoring well MW-7 was in compliance for all BTEX concentrations during the fourth quarter monitoring event.

RECOMMENDATIONS

XTO proposes to continue using ORC socks in monitoring well MW-7 to enhance biodegradation of the petroleum hydrocarbons in groundwater. The ORC socks will be replaced annually. XTO will continue quarterly sampling of groundwater from monitoring well MW-7 for BTEX concentrations until NMWQCC standards have been met for four consecutive quarters, at which time groundwater sampling from monitoring well MW-7 will cease.

FIGURE 1
SITE LOCATION MAP

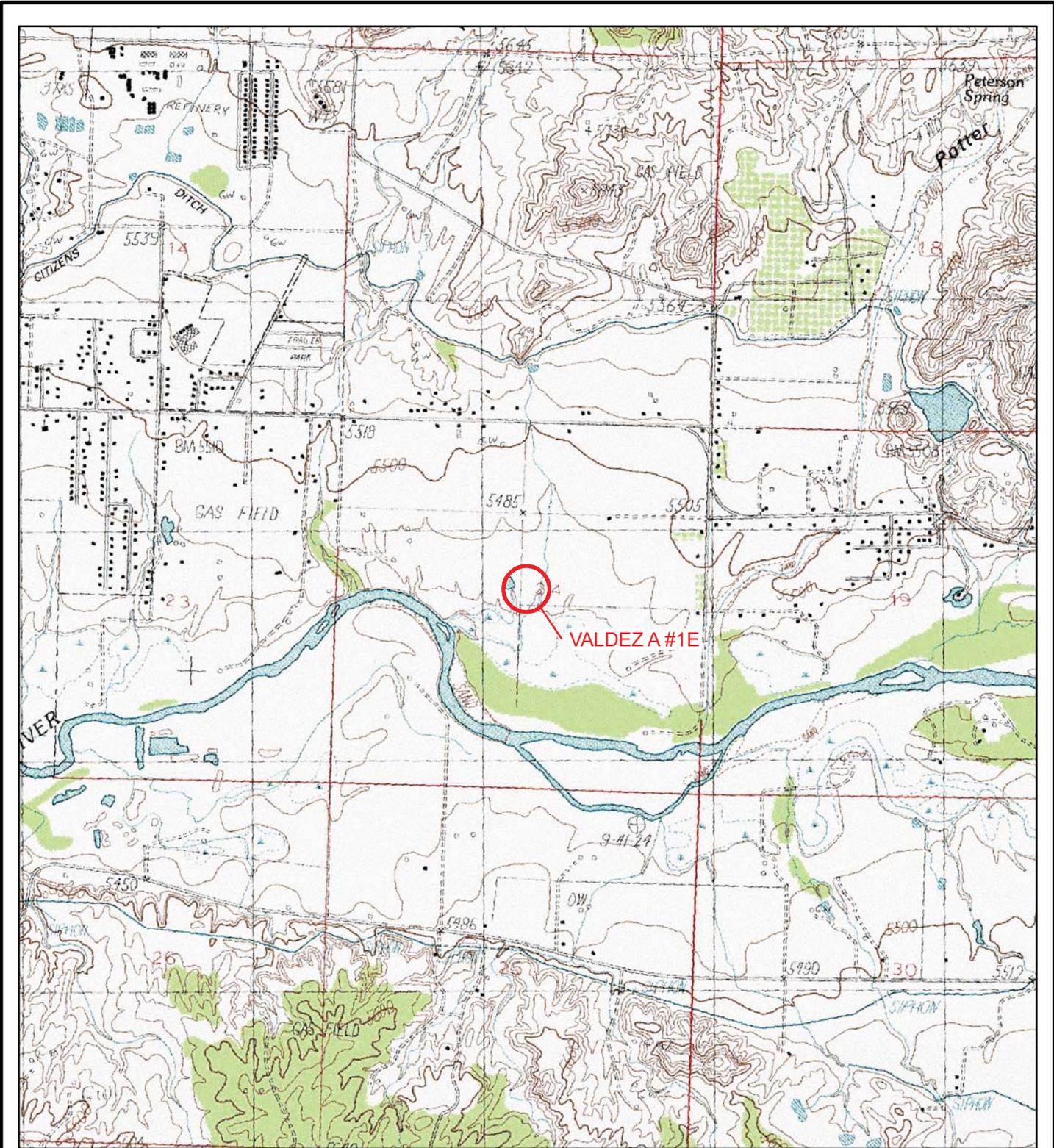


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES

LEGEND

 SITE LOCATION

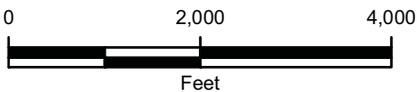


FIGURE 1
SITE LOCATION MAP
VALDEZ A #1E
SWNE SEC 24 T29N R11W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.



FIGURE 2
GROUNDWATER ELEVATIONS
(MARCH 2016)

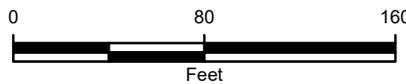


LEGEND

- ⊗ MONITORING WELL
- ⊗ REMOVED MONITORING WELL
- WELLHEAD
- ↑ ESTIMATED GROUNDWATER FLOW DIRECTION
- x — x FENCE
- - - INFERRED RELATIVE GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL = 0.5 FEET
- ▭ BERM

SAMPLE ID
 SAMPLE DATE
 DTW: DEPTH TO GROUNDWATER MEASURED
 IN FEET BELOW TOP OF CASING
 ELEV: RELATIVE GROUNDWATER ELEVATION
 MEASURED IN FEET
 NS: NOT SAMPLED

IMAGE COURTESY OF GOOGLE EARTH 2015



NOTE: MONITORING WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

FIGURE 2
 GROUNDWATER ELEVATION AND ANALYTICAL RESULTS (MARCH 2016)
 VALDEZ A #1E
 SWNE SEC 24 T29N R11W
 SAN JUAN COUNTY, NEW MEXICO
 XTO ENERGY, INC.



FIGURE 3
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS
(JUNE 2016)



MW-1
6/20/2016
NS
DTW: 12.62
ELEV: 89.94

MW-3
6/20/2016
NS
DTW: 12.90
ELEV: 88.16

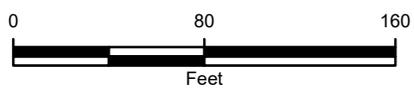
MW-7
6/20/2016
B: **35.8**
T: <50.0
E: 94.5
X: **824**
DTW: 12.03
ELEV: 87.56

MW-6
6/20/2016
NS
DTW: 9.12
ELEV: 87.97

LEGEND

- ⊗ MONITORING WELL
- ⊘ REMOVED MONITORING WELL
- WELLHEAD
- ↑ ESTIMATED GROUNDWATER FLOW DIRECTION
- x — x FENCE
- - - INFERRED RELATIVE GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL = 0.5 FEET
- ▭ BERM

SAMPLE ID
SAMPLE DATE
B: BENZENE IN MICROGRAMS PER LITER (µg/L)
T: TOLUENE (µg/L)
E: ETHYLBENZENE (µg/L)
X: TOTAL XYLENES (µg/L)
ELEV: RELATIVE GROUNDWATER ELEVATION MEASURED IN FEET
<: LESS THAN LABORATORY METHOD DETECTION LIMIT
BOLD INDICATES RESULT EXCEEDS THE NEW MEXICO WATER QUALITY CONTROL COMMISSION STANDARD
NS: NOT SAMPLED



NOTE: MONITORING WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

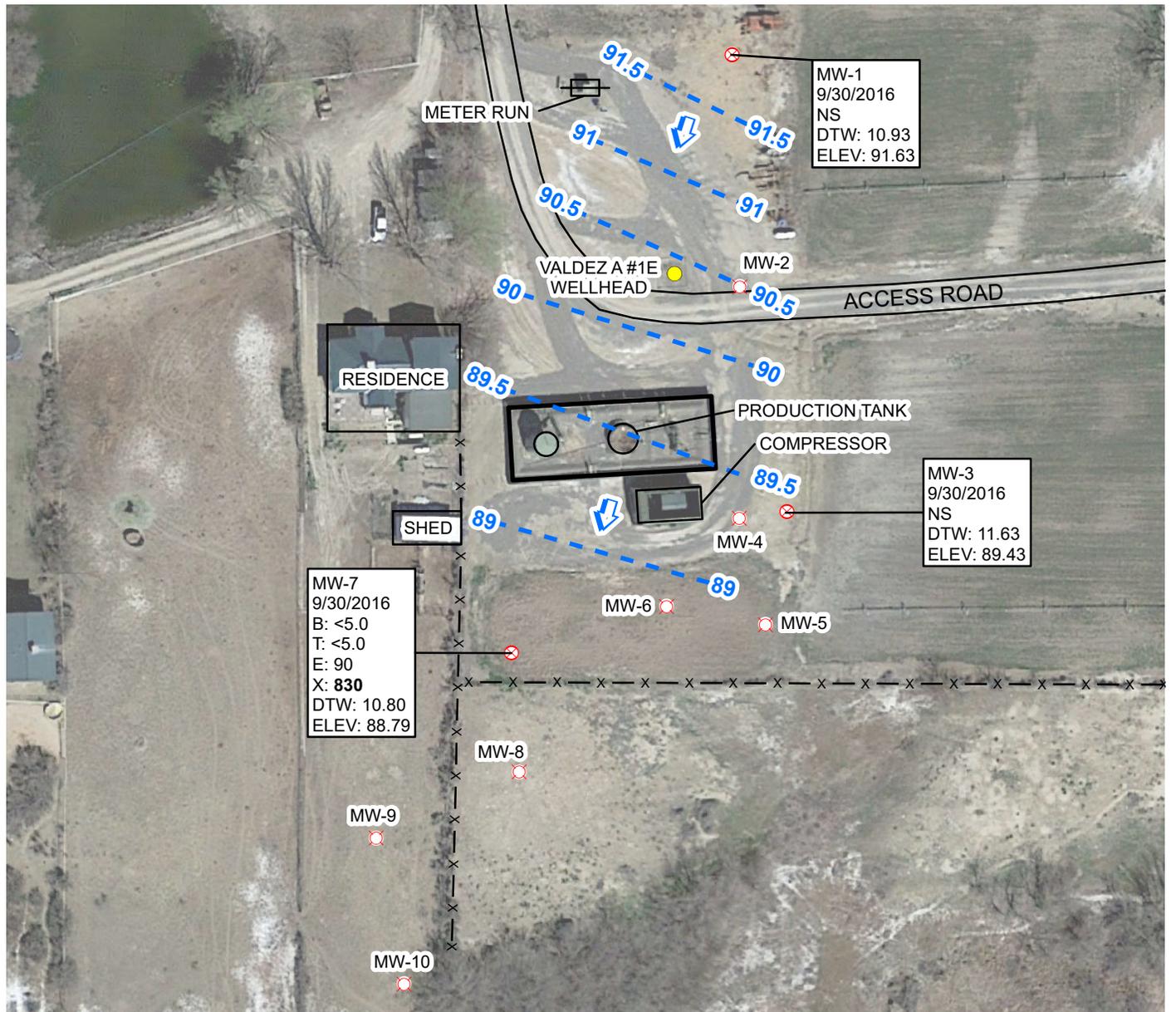
FIGURE 3
GROUNDWATER ELEVATION AND ANALYTICAL RESULTS (JUNE 2016)
VALDEZ A #1E
SWNE SEC 24 T29N R11W
SAN JUAN COUNTY, NEW MEXICO
XTO ENERGY, INC.



FIGURE 4

GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS

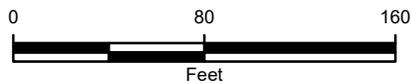
(SEPTEMBER 2016)



LEGEND

- MONITORING WELL
- REMOVED MONITORING WELL
- WELLHEAD
- ESTIMATED GROUNDWATER FLOW DIRECTION
- x — x FENCE
- INFERRED RELATIVE GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL = 0.5 FEET
- BERM

SAMPLE ID
 SAMPLE DATE
 B: BENZENE IN MICROGRAMS PER LITER (µg/L)
 T: TOLUENE (µg/L)
 E: ETHYLBENZENE (µg/L)
 X: TOTAL XYLENES (µg/L)
 ELEV: RELATIVE GROUNDWATER ELEVATION MEASURED IN FEET
 <: LESS THAN LABORATORY METHOD DETECTION LIMIT
 NS: NOT SAMPLED
BOLD INDICATES RESULT EXCEEDS THE NEW MEXICO WATER QUALITY CONTROL COMMISSION STANDARD



NOTE: MONITORING WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

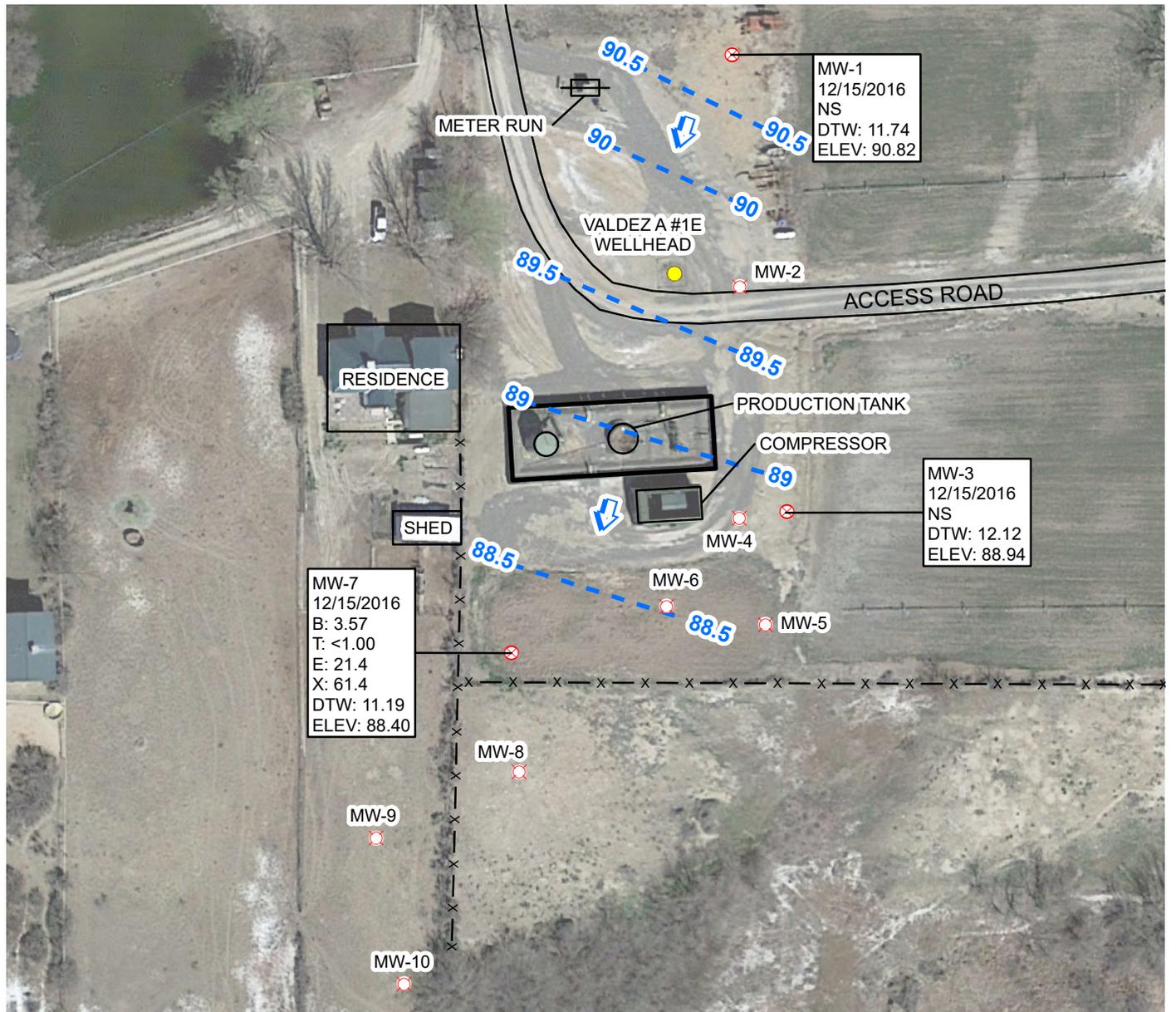
FIGURE 4
GROUNDWATER ELEVATION AND ANALYTICAL RESULTS (SEPTEMBER 2016)
 VALDEZ A #1E
 SWNE SEC 24 T29N R11W
 SAN JUAN COUNTY, NEW MEXICO
 XTO ENERGY, INC.



FIGURE 5

GROUNDWATER ELEVATION AND ANALYTICAL RESULTS

(DECEMBER 2016)



LEGEND

- ⊗ MONITORING WELL
- ⊗ REMOVED MONITORING WELL
- WELLHEAD
- ↑ ESTIMATED GROUNDWATER FLOW DIRECTION
- x — x FENCE
- - - INFERRED RELATIVE GROUNDWATER ELEVATION CONTOUR
CONTOUR INTERVAL = 0.5 FEET
- ▭ BERM

SAMPLE ID
 SAMPLE DATE
 B: BENZENE IN MICROGRAMS PER LITER (µg/L)
 T: TOLUENE (µg/L)
 E: ETHYLBENZENE (µg/L)
 X: TOTAL XYLENES (µg/L)
 DTW: DEPTH TO GROUNDWATER MEASURED
 IN FEET BELOW TOP OF CASING
 ELEV: RELATIVE GROUNDWATER ELEVATION
 MEASURED IN FEET
 <: LESS THAN LABORATORY METHOD DETECTION LIMIT
 NS: NOT SAMPLED

NOTE: MONITORING WELL LOCATIONS ARE ONLY AS ACCURATE AS THE INSTRUMENTS USED IN OBTAINING THE FOOTAGE AND BEARING FROM THE WELL HEAD (BRUNTON COMPASS AND LASER RANGE FINDER). ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND MAY NOT BE TO SCALE.

FIGURE 5
 GROUNDWATER ELEVATION AND ANALYTICAL RESULTS (DECEMBER 2016)
 VALDEZ A #1E
 SWNE SEC 24 T29N R11W
 SAN JUAN COUNTY, NEW MEXICO
 XTO ENERGY, INC.



TABLE 1

GROUNDWATER ELEVATION SUMMARY

TABLE 1
GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-1	7/1/1988	NM	NM
MW-1	8/31/1988	NM	NM
MW-1	3/5/1992	NM	NM
MW-1	2/23/1993	13.59	88.97
MW-1	6/7/1993	12.92	89.64
MW-1	9/8/1993	12.06	90.50
MW-1	3/9/1994	14.20	88.36
MW-1	6/24/1994	12.39	90.17
MW-1	9/23/1994	11.35	91.21
MW-1	12/9/1994	12.35	90.21
MW-1	3/13/1995	13.71	88.85
MW-1	6/3/2008	12.95	89.61
MW-1	12/7/2009	12.37	90.19
MW-1	6/21/2010	13.23	89.33
MW-1	9/15/2010	12.14	90.42
MW-1	12/13/2010	12.89	89.67
MW-1	3/10/2011	14.29	88.27
MW-1	6/16/2011	13.10	89.46
MW-1	9/13/2011	11.66	90.90
MW-1	12/14/2011	12.41	90.15
MW-1	3/8/2012	13.90	88.66
MW-1	6/14/2012	12.63	89.93
MW-1	9/12/2012	11.12	91.44
MW-1	12/21/2012	12.25	90.31
MW-1	3/14/2013	13.69	88.87
MW-1	6/17/2013	12.58	89.98
MW-1	9/11/2013	11.16	91.40
MW-1	12/16/2013	12.29	90.27
MW-1	3/12/2014	13.69	88.87
MW-1	6/11/2014	12.85	89.71
MW-1	9/22/2014	11.00	91.56
MW-1	12/9/2014	11.67	90.89
MW-1	3/12/2015	13.34	89.22
MW-1	6/11/2015	12.49	90.07
MW-1	9/21/2015	11.02	91.54



TABLE 1

**GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-1	10/1/2015	10.99	91.57
MW-1	12/21/2015	12.08	90.48
MW-1	3/24/2016	13.68	88.88
MW-1	6/20/2016	12.62	89.94
MW-1	9/30/2016	10.93	91.63
MW-1	12/15/2016	11.74	90.82

MW-3	7/1/1988	NM	NM
MW-3	8/31/1988	NM	NM
MW-3	3/5/1992	NM	NM
MW-3	2/23/1993	14.02	87.04
MW-3	6/7/1993	13.66	87.40
MW-3	9/8/1993	13.16	87.90
MW-3	3/9/1994	14.54	86.52
MW-3	6/24/1994	12.95	88.11
MW-3	9/23/1994	12.24	88.82
MW-3	12/9/1994	12.94	88.12
MW-3	3/13/1995	13.88	87.18
MW-3	6/3/2008	13.21	87.85
MW-3	12/7/2009	12.78	88.28
MW-3	6/21/2010	13.47	87.59
MW-3	9/15/2010	12.54	88.52
MW-3	12/13/2010	13.16	87.90
MW-3	3/10/2011	14.23	86.83
MW-3	6/16/2011	13.32	87.74
MW-3	9/13/2011	12.20	88.86
MW-3	12/14/2011	12.76	88.30
MW-3	3/8/2012	13.94	87.12
MW-3	6/14/2012	12.97	88.09
MW-3	9/12/2012	11.78	89.28
MW-3	12/21/2012	12.64	88.42
MW-3	3/14/2013	13.77	87.29
MW-3	6/17/2013	12.91	88.15
MW-3	9/11/2013	11.79	89.27
MW-3	12/16/2013	12.60	88.46



TABLE 1

**GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-3	3/12/2014	13.69	87.37
MW-3	6/11/2014	13.05	88.01
MW-3	9/22/2014	11.59	89.47
MW-3	12/9/2014	12.12	88.94
MW-3	3/12/2015	13.42	87.64
MW-3	6/11/15	12.79	88.27
MW-3	9/21/2015	11.63	89.43
MW-3	10/1/15	11.61	89.45
MW-3	12/21/15	12.37	88.69
MW-3	3/24/2016	13.67	87.39
MW-3	6/20/2016	12.90	88.16
MW-3	9/30/16	11.63	89.43
MW-3	12/15/16	12.12	88.94

MW-6	7/1/1988	NM	NM
MW-6	8/31/1988	NM	NM
MW-6	3/5/1992	NM	NM
MW-6	2/23/1993	15.06	82.03
MW-6	6/7/1993	14.72	82.37
MW-6	9/8/1993	14.27	82.82
MW-6	12/2/1993	14.69	82.40
MW-6	3/9/1994	15.49	81.60
MW-6	6/24/1994	14.05	83.04
MW-6	9/23/1994	13.40	83.69
MW-6	12/9/1994	14.02	83.07
MW-6	1/10/1995	14.28	82.81
MW-6	2/9/1995	14.58	82.51
MW-6	3/13/1995	14.85	82.24
MW-6	4/10/1995	15.00	82.09
MW-6	6/19/1995	14.48	82.61
MW-6	8/7/1995	14.08	83.01
MW-6	9/12/1995	13.89	83.20
MW-6	10/10/1995	13.74	83.35
MW-6	11/15/1995	13.98	83.11
MW-6	12/7/1995	14.12	82.97



TABLE 1
GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-6	3/7/1996	15.07	82.02
MW-6	6/18/1996	14.40	82.69
MW-6	6/17/1997	14.97	82.12
MW-6	6/12/1998	14.92	82.17
MW-6	9/25/1998	14.36	82.73
MW-6	5/26/1999	15.12	81.97
MW-6	6/26/2000	14.53	82.56
MW-6	5/15/2001	14.91	82.18
MW-6	6/25/2002	13.72	83.37
MW-6	5/20/2003	14.47	82.62
MW-6	6/19/2004	14.07	83.02
MW-6	9/27/2004	8.27	88.82
MW-6	6/29/2005	9.13	87.96
MW-6	6/28/2006	8.78	88.31
MW-6	6/15/2007	9.76	87.33
MW-6	12/20/2007	9.16	87.93
MW-6	6/3/2008	9.58	87.51
MW-6	12/4/2008	9.85	87.24
MW-6	6/10/2009	9.75	87.34
MW-6	12/7/2009	9.15	87.94
MW-6	6/21/2010	9.77	87.32
MW-6	9/15/2010	9.01	88.08
MW-6	12/13/2010	9.50	87.59
MW-6	3/10/2011	10.45	86.64
MW-6	6/16/2011	9.66	87.43
MW-6	9/13/2011	8.79	88.30
MW-6	12/14/2011	9.17	87.92
MW-6	3/8/2012	10.18	86.91
MW-6	6/14/2012	Dry	Dry
MW-6	9/12/2012	8.27	88.82
MW-6	12/21/2012	9.02	88.07
MW-6	3/14/2013	10.01	87.08
MW-6	6/17/2013	9.31	87.78
MW-6	9/11/2013	8.34	88.75
MW-6	12/16/2013	9.18	87.91



TABLE 1

**GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-6	3/12/2014	9.50	87.59
MW-6	6/11/2014	9.32	87.77
MW-6	9/22/2014	9.52	87.57
MW-6	12/9/2014	8.43	88.66
MW-6	3/12/2015	9.51	87.58
MW-6	6/11/2015	8.97	88.12
MW-6	9/21/2015	8.25	88.84
MW-6	10/1/2015	8.26	88.83
MW-6	12/21/2015	8.70	88.39
MW-6	3/24/2016	9.82	87.27
MW-6	6/20/2016	9.12	87.97
MW-6*	9/30/2016	NM	NM
MW-6*	12/15/2016	NM	NM

MW-7	3/5/1992	NM	NM
MW-7	2/23/1993	13.37	86.22
MW-7	6/7/1993	14.54	85.05
MW-7	9/8/1993	14.15	85.44
MW-7	12/2/1993	14.56	85.03
MW-7	3/9/1994	15.30	84.29
MW-7	6/24/1994	14.04	85.55
MW-7	9/23/1994	13.51	86.08
MW-7	12/9/1994	13.94	85.65
MW-7	1/10/1995	14.23	85.36
MW-7	2/9/1995	14.50	85.09
MW-7	3/13/1995	14.73	84.86
MW-7	4/10/1995	14.87	84.72
MW-7	6/19/1995	14.39	85.20
MW-7	8/7/1995	14.04	85.55
MW-7	9/12/1995	13.85	85.74
MW-7	10/10/1995	13.73	85.86
MW-7	11/15/1995	13.94	85.65
MW-7	12/7/1995	14.05	85.54
MW-7	3/7/1996	14.94	84.65
MW-7	6/18/1996	14.34	85.25



TABLE 1
GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-7	6/17/1997	14.83	84.76
MW-7	6/12/1998	14.83	84.76
MW-7	9/25/1998	NM	NM
MW-7	5/26/1999	NM	NM
MW-7	8/25/1999	NM	NM
MW-7	11/30/1999	NM	NM
MW-7	6/26/2000	14.46	85.13
MW-7	5/15/2001	14.87	84.72
MW-7	6/25/2002	13.72	85.87
MW-7	5/20/2003	14.43	85.16
MW-7	6/19/2004	13.97	85.62
MW-7	6/29/2005	13.81	85.78
MW-7	6/28/2006	13.37	86.22
MW-7	6/15/2007	15.00	84.59
MW-7	12/20/2007	13.65	85.94
MW-7	6/3/2008	14.03	85.56
MW-7	12/4/2008	13.46	86.13
MW-7	6/10/2009	14.20	85.39
MW-7	12/7/2009	13.61	85.98
MW-7	6/21/2010	14.19	85.40
MW-7	9/15/2010	13.76	85.83
MW-7	12/13/2010	13.98	85.61
MW-7	3/10/2011	14.81	84.78
MW-7	6/16/2011	14.10	85.49
MW-7	9/13/2011	13.21	86.38
MW-7	12/14/2011	13.68	85.91
MW-7	3/8/2012	14.62	84.97
MW-7	6/14/2012	13.88	85.71
MW-7	9/12/2012	12.89	86.70
MW-7	12/21/2012	13.59	86.00
MW-7	3/14/2013	14.49	85.10
MW-7	6/17/2013	13.83	85.76
MW-7	9/11/2013	12.93	86.66
MW-7	12/16/2013	13.56	86.03
MW-7	3/12/2014	14.54	85.05



TABLE 1

**GROUNDWATER ELEVATION SUMMARY
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Depth to Water (feet BTOC)	Groundwater Elevation (feet relative to site)
MW-7	6/11/2014	13.92	85.67
MW-7	9/22/2014	12.75	86.84
MW-7	12/9/2014	13.18	86.41
MW-7	3/12/2015	14.22	85.37
MW-7	6/11/2015	11.75	87.84
MW-7	9/21/2015	10.83	88.76
MW-7	10/1/2015	10.81	88.78
MW-7	12/21/2015	11.43	88.16
MW-7	3/24/2016	12.45	87.14
MW-7	6/20/2016	12.03	87.56
MW-7	9/30/2016	10.80	88.79
MW-7	12/15/2016	11.19	88.40

Notes:

- *monitor well removed by XTO between sampling events
- BTOC - below top of casing
- NM - not measured



TABLE 2

GROUNDWATER ANALYTICAL RESULTS

TABLE 2

**GROUNDWATER ANALYTICAL RESULTS
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		10	750	750	620
MW-1	7/1/1988	ND	ND	ND	ND
MW-1	8/31/1988	ND	ND	ND	ND
MW-1	3/5/1992	ND	ND	ND	ND
MW-1	2/23/1993	ND	ND	ND	ND
MW-1	6/7/1993	ND	0.5	ND	1
MW-1	9/8/1993	ND	ND	ND	ND
MW-1	3/9/1994	ND	ND	ND	ND
MW-1	6/24/1994	ND	ND	ND	ND
MW-1	9/23/1994	0.9	0.2	ND	3.8
MW-1	12/9/1994	0.8	ND	ND	ND
MW-1	3/13/1995	ND	ND	ND	ND

MW-3	7/1/1988	ND	ND	ND	ND
MW-3	8/31/1988	ND	ND	ND	ND
MW-3	3/5/1992	3	6.9	0.3	7.8
MW-3	2/23/1993	ND	ND	ND	ND
MW-3	6/7/1993	ND	ND	ND	0.6
MW-3	9/8/1993	ND	0.6	ND	11.7
MW-3	3/9/1994	ND	ND	ND	ND
MW-3	6/24/1994	ND	ND	ND	ND
MW-3	9/23/1994	ND	ND	ND	ND
MW-3	12/9/1994	ND	ND	ND	ND
MW-3	3/13/1995	ND	ND	ND	ND

MW-6	7/1/1988	1,500	3,300	550	4,560
MW-6	8/31/1988	1,700	1,600	340	1,300
MW-6	3/5/1992	65	44.1	20.3	82.7
MW-6	2/23/1993	2,090	7,800	578	4,080
MW-6	6/7/1993	1,300	444	293	840
MW-6	9/8/1993	770	980	174	783
MW-6	12/2/1993	540	1,140	144	867
MW-6	3/9/1994	580	1,520	130	888
MW-6	6/24/1994	542	1,923	164	1,172
MW-6	9/23/1994	484	1,696	170	1,300
MW-6	12/9/1994	593	2,242	183	1,707
MW-6	1/10/1995	450	1,380	153	1,248



TABLE 2

**GROUNDWATER ANALYTICAL RESULTS
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		10	750	750	620
MW-6	2/9/1995	710	2,160	271	2,297
MW-6	3/13/1995	19.8	2,471	289	2,460
MW-6	4/10/1995	525	1,840	222	1,502
MW-6	6/19/1995	299.3	998.8	114.5	1,045.4
MW-6	8/7/1995	593	1,650	247	2,111
MW-6	9/12/1995	412	1,390	259	1,549
MW-6	10/10/1995	176	970	191	1,552
MW-6	11/15/1995	598	1,370	339	2,819
MW-6	12/7/1995	599	1,310	304	2,322
MW-6	3/7/1996	426	467	234	1,876
MW-6	6/18/1996	462	773	305	2,540
MW-6	6/17/1997	110	19.6	37.6	288.9
MW-6	6/12/1998	55.6	25.2	45.9	296.1
MW-6	9/25/1998	42.7	17.7	68.3	469
MW-6	5/26/1999	78.9	22	51.6	273.9
MW-6	6/26/2000	26	2.5	100	670
MW-6	5/15/2001	13	0.5	74	490
MW-6	6/25/2002	20	ND	200	1,740
MW-6	5/20/2003	14	1.1	190	1,400
MW-6	6/19/2004	7.5	ND	79	530
MW-6	9/27/2004	8.4	ND	140	1,100
MW-6	6/29/2005	6.9	ND	150	1,100
MW-6	6/28/2006	6.7	ND	190	790
MW-6	6/15/2007	2.1	ND	76	470
MW-6	12/20/2007	2.9	ND	130	750
MW-6	6/3/2008	1.5	ND	88	680
MW-6	12/4/2008	1.6	3.6	98	640
MW-6	6/10/2009	1.6	1.4	140	810
MW-6	12/7/2009	< 1.0	< 1.0	7.2	29
MW-6	6/21/2010	< 1.0	< 1.0	1.5	3.7
MW-6	9/15/2010	< 0.5	< 5.0	< 0.5	1.6
MW-6	12/13/2010	0.6	< 5.0	1.1	3.1
MW-7	3/5/1992	1,160	1,110	302	1,972
MW-7	2/23/1993	ND	1	ND	2
MW-7	6/7/1993	640	2,270	330	2,430
MW-7	9/8/1993	820	1,660	306	1,780



TABLE 2

**GROUNDWATER ANALYTICAL RESULTS
VALDEZ A #1E
XTO ENERGY, INC.**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		10	750	750	620
MW-7	12/2/1993	319	366	35.1	242
MW-7	3/9/1994	103	88	10.3	74
MW-7	6/24/1994	569	2,090	288	3,094
MW-7	9/23/1994	627	1,805	189	1,755
MW-7	12/9/1994	707	1,220	161	1,342
MW-7	1/10/1995	298	394	54.8	365.4
MW-7	2/9/1995	465	624	92	582
MW-7	3/13/1995	997.8	813.2	168.4	1,015.9
MW-7	4/10/1995	648	456	104	623
MW-7	6/19/1995	366.7	414.7	66.1	602.2
MW-7	8/7/1995	869	1,000	171	1,431
MW-7	9/12/1995	1725	846	141	1,035
MW-7	10/10/1995	143	689	93.6	925
MW-7	11/15/1995	710	1,000	178	1,642
MW-7	12/7/1995	1,050	606	167	996
MW-7	3/7/1996	101	10.3	8.69	42.27
MW-7	6/18/1996	128	65.5	11.5	175.3
MW-7	6/17/1997	360	16.3	16.5	127.5
MW-7	6/26/2000	220	63	94	4,080
MW-7	5/15/2001	190	ND	76	880
MW-7	6/25/2002	92	14	32	264
MW-7	5/20/2003	99	ND	40	230
MW-7	6/19/2004	170	4.1	120	780
MW-7	6/29/2005	100	14	68	470
MW-7	6/28/2006	48	14	69	580
MW-7	6/15/2007	86	ND	67	97
MW-7	12/20/2007	310	ND	220	1,300
MW-7	6/3/2008	34	ND	63	490
MW-7	12/4/2008	100	31	430	3,600
MW-7	6/10/2009	43	25	160	1,100
MW-7	12/7/2009	62	33	320	2,400
MW-7	6/21/2010	8.2	5.6	30	180
MW-7	9/15/2010	36	< 100	78	660
MW-7	12/13/2010	22	<5.0	60	420
MW-7	3/10/2011	7	<50	72	260
MW-7	6/16/2011	4.7	<5.0	11	78
MW-7	9/13/2011	13	<25	67	890



TABLE 2

GROUNDWATER ANALYTICAL RESULTS
VALDEZ A #1E
XTO ENERGY, INC.

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		10	750	750	620
MW-7	12/14/2011	39	<50	350	1,900
MW-7	3/8/2012	0.91	5.4	2.7	19
MW-7	6/14/2012	2.3	<5	8.8	70
MW-7	9/12/2012	10	<50	28	260
MW-7	12/21/2012	7.3	5.3	27	250
MW-7	3/14/2013	7.4	<5.0	<0.5	1.9
MW-7	6/17/2013	2.7	<5.0	<0.5	3.3
MW-7	9/11/2013	70	<100	310	2,800
MW-7	12/16/2013	<5.0	<50	77	570
MW-7	3/12/2014	3.7	<5.0	30	190
MW-7	6/11/2014	1.8	<5.0	16	120
MW-7	9/22/2014	17	56	57	300
MW-7	12/9/2014	5.4	<5.0	58	260
MW-7	3/12/2015	6.8	<50	37	110
MW-7	6/11/2015	3.7	<5.0	21	93
MW-7	9/21/2015	123	<250	391	3,950
MW-7	10/1/2015	25.6	<25	110	961
MW-7	12/21/2015	31	<125	124	1,010
MW-7	6/20/2016	35.8	<50.0	94.5	824
MW-7	9/30/2016	<5.0	<5.0	90	830
MW-7	12/15/2016	3.57	<1.00	21.4	61.1

Notes:

< - indicates the result was less than the laboratory detection limit

BOLD values exceed the NMWQCC Standard

µg/L - micrograms per liter

ND - not detected

NMWQCC - New Mexico Water Quality Control Commission



ATTACHMENT 1

NMOCD LETTER TO TENNECO OIL COMPANY (1988)



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

June 6, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Martin W. Buys
Tenneco Oil Company
P. O. Box 3249
Englewood, Colorado 80155

RE: Ground Water Contamination Sites: Tenneco Valdez A1E
Tenneco Riddle F LS 3A

Dear Mr. Buys:

On September 17, 1987, the Oil Conservation Division (OCD) personnel augered four 10½'-18' holes at the Valdez A1E well site and discovered ground water contamination in the vicinity of the produced water tank and the separator. You have been sent laboratory analyses and a field map of the well site.

On October 27, 1987, the OCD augered five 13'-16' holes at the Riddle F LS #3A well site and discovered ground water contamination in the vicinity of the dehydrator and tank drain pit. Copies of the laboratory analysis of fluids found in Auger Hole #2 and a field map locating the auger holes in relation to the well site are enclosed.

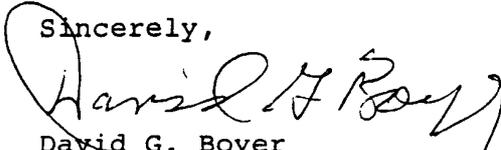
Because ground water contamination has been found at these well sites, Tenneco is required to install a series of monitor wells at the sites to define the contamination plume and to monitor contaminant concentration levels. At this time remedial action is not being required. The need for such action will be reevaluated after review of information and data collected at these sites.

OCD staff will be available the week of June 27 to supervise installation of the monitor wells and to split samples of fluids found in the wells. Monitor well installation requirements have been discussed with you by phone.

Mr. Martin W. B...
June 6, 1988
Page -2-

If you have any questions, please contact me at (505) 827-5812 or
Jami Bailey at (505) 827-5884.

Sincerely,



David G. Boyer
Environmental Bureau Chief

DGB:JB:sl

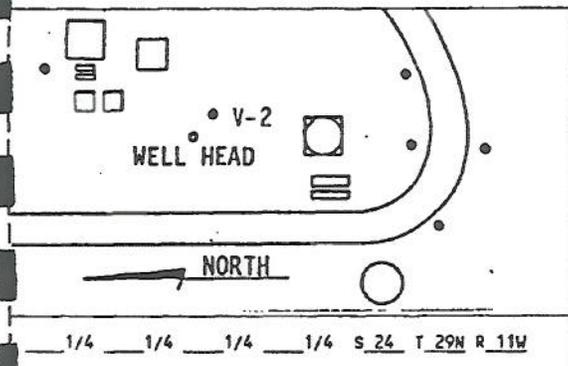
Enclosure

cc: OCD - Aztec

ATTACHMENT 2

COMPLETION DIAGRAMS AND BOREHOLE LOGS

BOREHOLE LOG (SOIL)



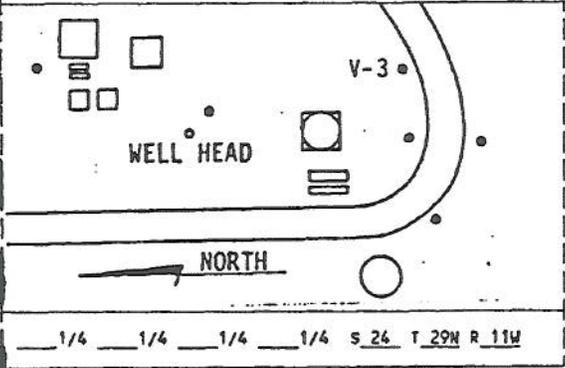
SITE ID: Valdez LOCATION ID: V-2
 SITE COORDINATES (ft.): 2390 FNL, 2500 FEL
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: HSA
 DRILLING CONTR.: Western Technologies
 DATE STARTED: 7/01/88 DATE COMPLETED: 7/01/88
 FIELD REP.: W.S. DUBYK, P. LINLEY
 COMMENTS: Cored.

LOCATION DESCRIPTION:

DEPTH	LITH.	R E C	S A M	RUN		SAMPLE		USCS	VISUAL CLASSIFICATION
				#	FROM TO	REC.	TYPE		
0				1	0' 3'	100%		CH	0'-3' <u>Clay</u> - silty, damp, pale brown 5 YR 5/2 plastic, no odor, fill material.
5				2	3' 8'	60%		SC	3'-8' <u>Sand and Silt</u> - clayey, poorly sorted, moderately rounded, very fine to coarse, yellowish gray damp, probably fill. Grayish Orange Pink 5 Y 7/2.
10				3	8' 13.5'	100%		CH	8'-13.5' <u>Clay</u> - slightly silty, plastic damp, no odor, caliche streaks in frags. Dark yellowish brown 10 YR 4/2.
15				4	13.5' 18.5'	75%		CH	13.5'-18.5' <u>Clay</u> - as above. Gravel at 18.4', to 2" diameter, slightly rounded, in clay and sand matrix. No coring after 18.5'.
20				5	18.5' 21.5'	0%		GC	18.5'-21.5' <u>Gravel</u> - no recovery, very slow drilling.
25									
30									

T.D. 21.5'

BOREHOLE LOG (SOIL)



SITE ID: Valdez LOCATION ID: V-3
 SITE COORDINATES (ft.): 2390 FNL, 2500 FEL
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: HSA
 DRILLING CONTR.: Western Technologies
 DATE STARTED: 6/30/88 DATE COMPLETED: 6/30/88
 FIELD REP.: W.S. DUBYK, P. LINLEY
 COMMENTS: _____

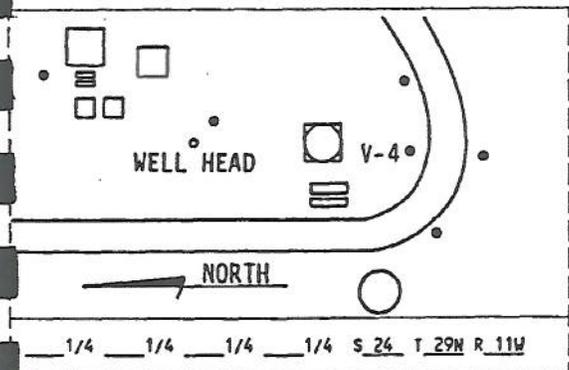
LOCATION DESCRIPTION:

DEPTH	LITH.	R E C	S A N	RUN		SAMPLE		USCS	VISUAL CLASSIFICATION
				#	FROM TO	REC.	TYPE		
0	[Hatched pattern]							ML	0'-8' <u>Fill</u> - very fine grained silty clay, no odor, light brown 5 YR 6/4.
5								CH	8'-18' <u>Clay</u> - silty, minor rounded quartz grains; plastic, cohesive, carbonate, damp, no odor caliche in frags. Water at 18' medium brown, 5 YR 4/4.
10									
15	[Dotted pattern]							GC	18'-23' <u>Gravel</u> - no sample return difficult drilling.
20									
25									
30									

TO
22.94'

BOREHOLE LOG (SOIL)

Page 1 of 1



SITE ID: Valdez LOCATION ID: V-4
 SITE COORDINATES (ft.): 2390 FNL, 2500 FEL
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: New Mexico COUNTY: San Juan
 DRILLING METHOD: HSA
 DRILLING CONTR.: Western Technologies
 DATE STARTED: 7/1/88 DATE COMPLETED: 7/1/88
 FIELD REP.: W.S. DUBYK, P. LINLEY
 COMMENTS: Cored with continuous sampler

LOCATION DESCRIPTION: _____

DEPTH	LITH.	R E C	S A M	RUN		SAMPLE		USCS	VISUAL CLASSIFICATION
				#	FROM TO	REC.	TYPE		
0				1	2' 7'	100%		0'-7' <u>Fill</u> - Clayey sand, no odor.	
5				2	7' 12'	100%	CH	7'-13' <u>Clay</u> - Dusky, yellowish brown 10 YR 2/2, laminated, damp, plastic. Hydrocarbon string at 11', odor noted.	
10				3	12' 14'	50%	CH	13'-17.5' <u>Clay</u> - as above, grades downward into sandy clay, medium yellowish brown, 10 YR 5/4.	
15				4	14' 18'	100%	GC	17.5'-18' <u>Sand</u> - with minor gravel moderately yellowish brown 10 YR 5/4 moderately sorted, fine to coarse grained. Core to 18'.	
18							GC	18' <u>Gravel</u> - no sample, difficult drilling.	
20									
23	T.D. 23'								

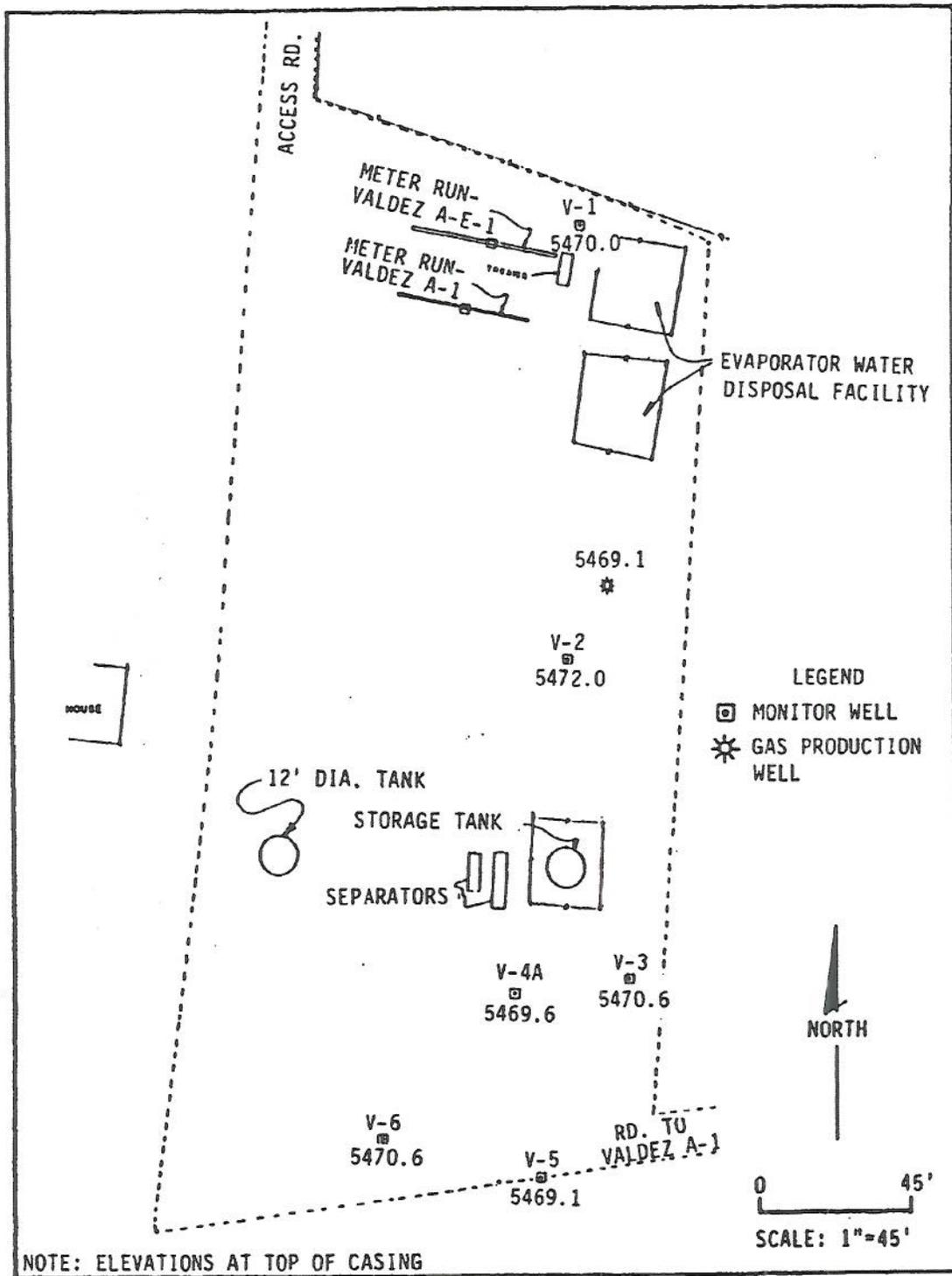


FIGURE 4-1
SITE MAP OF MONITOR WELL LOCATIONS AT VALDEZ A-1-E WELL SITE

ATTACHMENT 3

AMOCO REQUEST FOR CLOSURE (1996)



NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

March 12, 1996

CERTIFIED MAIL
RETURN RECEIPT NO. Z-765-962-549

Mr. B.D. Shaw
Amoco Production Company
200 Amoco Court
Farmington, New Mexico 87401

**RE: GROUND WATER CONTAMINATION
VALDEZ A#1E**

Dear Mr. Shaw:

The New Mexico Oil Conservation Division (OCD) has completed a review of Amoco Production Company's (Amoco) JANUARY 8, 1996 "REDUCTION OF GROUNDWATER MONITORING REQUIREMENTS FOR AMOCO WELL SITE VALDEZ A-1-E". This document contains Amoco's request to cease ground water monitoring related to contamination from a former unlined production pit at the Valdez A#1E well site.

According to New Mexico Water Quality Control Commission (WQCC) regulations, a responsible party is required to remediate and monitor contaminated ground water until WQCC standards have been achieved. While the data shows that the contaminated ground water plume has decreased in size, ground water within the plume is still approximately 65 times WQCC ground water standards. Since WQCC standards have not been met, the OCD cannot approve a proposal to cease remedial actions and ground water monitoring. Therefore, the above referenced request is denied.

The OCD would like to point out to Amoco that according to WQCC regulation 4103.F. and 4106 Amoco can voluntarily submit an "Abatement Plan" which could petition for approval of alternate abatement standards. The WQCC regulations are enclosed for your reference.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

cc: OCD Aztec District Office



NEW MEXICO OIL CONSERVATION DIVISION
JAN 10 1996 10 52

Southern

Rockies

Business

Unit

January 8, 1996

San Juan Operations Center

Mr. William Olsen
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504

RE: REDUCTION OF GROUNDWATER MONITORING REQUIREMENTS FOR
AMOCO WELL SITE VALDEZ A-1-E

Dear Bill:

I have asked Geoscience Consultants, Ltd. (GCL) to evaluate the groundwater chemistry of the above-referenced site. The data, which have been collected from 1988 to 1996, are presented in the attached table, figure, and graphs. Amoco believes the data support our request to cease routine groundwater monitoring at this site. The justification and contingency plan presented below demonstrate that the plume is stable, natural biodegradation is occurring at this site, threats to human health and the environment do not exist, and installation of a remedy at this site would best be accomplished after plugging and abandonment of the on-site natural gas production well.

Trends in BTEX Concentrations

The attached concentration/time plots demonstrate the benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations outside the center of mass of the plume have remained low and below Water Quality Control Commission (WQCC) standards since 1992. Concentrations in wells inside the center of mass of the plume (MW-6, MW-7, MW-8, and MW-10) are remaining fairly constant or, in the case of well MW-10, have decreased (if the initial 1988 analysis is valid). Some "spikes" in BTEX concentrations may be due to sampling or analytical error.

No Plume Migration

The attached plume map clearly shows the plume has not migrated over time and, in fact, the plume has actually retracted slightly towards the center of mass. It is our understanding that no new water supply wells have been installed near the site and therefore the plume should not migrate from its present position. It appears to be essentially in a steady state, if not slowly retracting.

A solute transport model simulation conducted by RESPEC in 1992 is superimposed on the plume map. This model predicted the extent of contamination if retardation factors, such as bioremediation, did not occur. Clearly, plume conditions predicted by the model were never borne out by groundwater quality analyses conducted since 1992. Natural bioremediation of BTEX constituents is a well-documented process in the literature and is probably responsible for the static

Mr. William Olsen
January 8, 1996
Page 2

plume observed at this site. Irrigation return water provides nutrients and oxygen to the system, and the petroleum hydrocarbons sorbed to the subsurface soils and dissolved in groundwater provide a carbon source. The rate of petroleum hydrocarbon transport from the source soils is completely offset by the metabolism of these hydrocarbons by indigenous microbes. Amoco strongly believes this process is operating effectively at this site, based upon the eight years of groundwater data.

Human Health and Environment Adequately Protected

The land use in the area is agricultural/pastureland, and we believe it will likely remain so for the lifetime of the gas production well. Provided current conditions do not change, the plume will remain stable or slowly degrade, and not impact a human or ecological receptor. If conditions change, Amoco will implement the contingency plan outlined below.

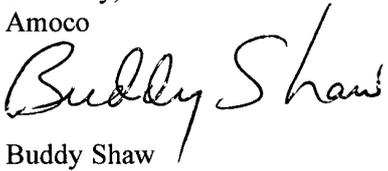
- If a domestic water well is installed within 200 feet (the length of the plume) of the edge of the plume, or if an irrigation well is installed within 400 feet of the edge of the plume, Amoco will commence semi-annual monitoring of MW-10 and any other monitoring well that lies between the plume's center of mass and the production well.
- If a spill of natural gas liquids occurs, Amoco will commence quarterly monitoring of MW-10 and the monitoring well nearest the spill location.
- If groundwater pumping or spillage causes plume migration, as demonstrated by monitoring, Amoco will commence active remediation of groundwater through a soil venting program and, if required, an air sparging program to arrest the plume and prevent more extensive degradation of groundwater quality.
- One year prior to plugging and abandonment of the natural gas production well, Amoco will collect one year of quarterly monitoring data from all monitoring wells. If contamination remains to the extent that WQCC standards would be exceeded at a place of reasonably foreseeable future use, as determined by the NMOCD, Amoco will install an appropriate groundwater remedy or institutional controls to ensure that all regulatory requirements are met.

Based upon the stability of the plume and the lack of risk it poses to human health and the environment, Amoco believes that continuation of groundwater monitoring is unnecessary. Amoco will commit to remediation of the plume or institutional controls to fully protect usable groundwater (1) if and when site conditions change, (2) the well is plugged, or (3) Amoco or any subsequent operator loses control of the site. Based on the above information, we urge you to approve this request to cease groundwater monitoring at this site.

Mr. William Olsen
January 8, 1996
Page 3

If you have any questions on the information I have provided you, please feel free to give me a call.

Sincerely,
Amoco

A handwritten signature in cursive script that reads "Buddy Shaw". The signature is written in black ink and is positioned above the printed name "Buddy Shaw".

Buddy Shaw

J:\AMOCO.LTR

cc: Roger Anderson, NMOCD
Randall Hicks, GCL

ATTACHMENT 4
2016 LABORATORY REPORTS

XTO Energy - San Juan Division

Sample Delivery Group: L842710
Samples Received: 06/21/2016
Project Number: 30-045-24445
Description: Valdez A#1E

Report To: James McDaniel
382 County Road 3100
Aztec, NM 87410

Entire Report Reviewed By:



Daphne Richards
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



¹Cp: Cover Page	1	¹Cp
²Tc: Table of Contents	2	²Tc
³Ss: Sample Summary	3	³Ss
⁴Cn: Case Narrative	4	⁴Cn
⁵Sr: Sample Results	5	⁵Sr
FARAC-062016-0945 L842710-01	5	
⁶Qc: Quality Control Summary	6	⁶Qc
Volatile Organic Compounds (GC) by Method 8021B	6	
⁷Gl: Glossary of Terms	7	⁷Gl
⁸Al: Accreditations & Locations	8	⁸Al
⁹Sc: Chain of Custody	9	⁹Sc

SAMPLE SUMMARY



FARAC-062016-0945 L842710-01 GW

Collected by
A. Crooks

Collected date/time
06/20/16 09:45

Received date/time
06/21/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B	WG883317	10	06/25/16 01:58	06/25/16 01:58	JAH

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne Richards
Technical Service Representative

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.0358		0.00500	10	06/25/2016 01:58	WG883317
Toluene	ND		0.0500	10	06/25/2016 01:58	WG883317
Ethylbenzene	0.0945		0.00500	10	06/25/2016 01:58	WG883317
Total Xylene	0.824		0.0150	10	06/25/2016 01:58	WG883317
(S) a,a,a-Trifluorotoluene(PID)	100		55.0-122		06/25/2016 01:58	WG883317

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3145978-3 06/24/16 20:50

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000190	0.000500
Toluene	U		0.000180	0.00500
Ethylbenzene	U		0.000160	0.000500
Total Xylene	U		0.000510	0.00150
<i>(S) a,a,a-Trifluorotoluene(PID) 101</i>			55.0-122	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3145978-1 06/24/16 19:42 • (LCSD) R3145978-2 06/24/16 20:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0470	0.0483	94.0	96.6	70.0-130			2.72	20
Toluene	0.0500	0.0478	0.0481	95.6	96.2	70.0-130			0.590	20
Ethylbenzene	0.0500	0.0498	0.0499	99.5	99.8	70.0-130			0.240	20
Total Xylene	0.150	0.151	0.149	101	99.6	70.0-130			1.33	20
<i>(S) a,a,a-Trifluorotoluene(PID)</i>				100	100	55.0-122				

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L842799-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L842799-01 06/24/16 22:58 • (MS) R3145978-4 06/24/16 21:28 • (MSD) R3145978-5 06/24/16 21:51

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	U	0.0326	0.0515	65.1	103	1	57.2-131		J3	45.1	20
Toluene	0.0500	U	0.0325	0.0508	65.0	102	1	63.7-134		J3	44.0	20
Ethylbenzene	0.0500	U	0.0333	0.0530	66.6	106	1	67.5-135	J6	J3	45.7	20
Total Xylene	0.150	U	0.103	0.159	68.6	106	1	65.9-138	J6	J3	42.7	20
<i>(S) a,a,a-Trifluorotoluene(PID)</i>					100	101		55.0-122				



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.
 * Not all certifications held by the laboratory are applicable to the results reported in the attached report.



State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

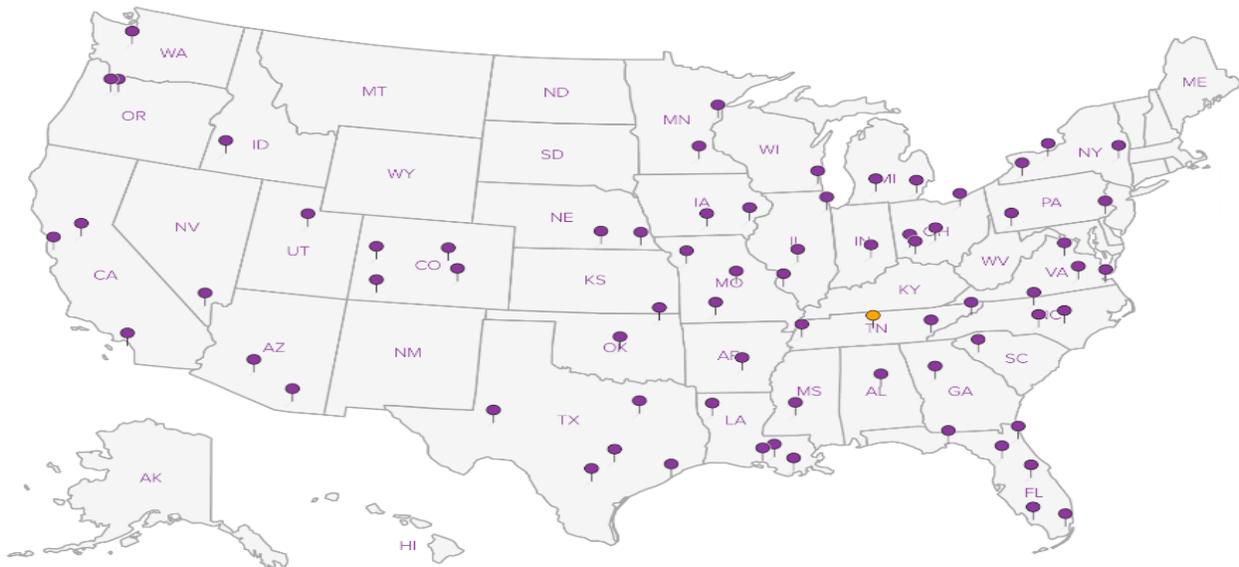
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**





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

October 06, 2016

Danny Burns
XTO Energy
382 County Road 3100
Aztec, NM 87410
TEL: (505) 787-0519
FAX (505) 333-3280

RE: Valdez A #1E

OrderNo.: 1610016

Dear Danny Burns:

Hall Environmental Analysis Laboratory received 1 sample(s) on 10/1/2016 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 light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1610016

Date Reported: 10/6/2016

CLIENT: XTO Energy

Client Sample ID: MW-7

Project: Valdez A #1E

Collection Date: 9/30/2016 9:30:00 AM

Lab ID: 1610016-001

Matrix: GROUNDWA

Received Date: 10/1/2016 11:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	5.0	P	µg/L	5	10/4/2016 1:59:49 PM
Toluene	ND	5.0	P	µg/L	5	10/4/2016 1:59:49 PM
Ethylbenzene	90	5.0	P	µg/L	5	10/4/2016 1:59:49 PM
Xylenes, Total	830	10	P	µg/L	5	10/4/2016 1:59:49 PM
Surr: 4-Bromofluorobenzene	122	87.9-146	P	%Rec	5	10/4/2016 1:59:49 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#: 1610016

06-Oct-16

Client: XTO Energy
Project: Valdez A #1E

Sample ID RB	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBW	Batch ID: B37669		RunNo: 37669							
Prep Date:	Analysis Date: 10/4/2016		SeqNo: 1173402		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	24		20.00		119	87.9	146			

Sample ID 100NG BTEX LCS	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSW	Batch ID: B37669		RunNo: 37669							
Prep Date:	Analysis Date: 10/4/2016		SeqNo: 1173406		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	80	120			
Toluene	20	1.0	20.00	0	98.4	80	120			
Ethylbenzene	19	1.0	20.00	0	96.8	80	120			
Xylenes, Total	61	2.0	60.00	0	101	80	120			
Surr: 4-Bromofluorobenzene	24		20.00		118	87.9	146			

Sample ID 1610016-001AMS	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: MW-7	Batch ID: B37669		RunNo: 37669							
Prep Date:	Analysis Date: 10/4/2016		SeqNo: 1173412		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	76	5.0	100.0	2.560	73.5	78	119			S
Toluene	80	5.0	100.0	0	79.8	80	120			S
Ethylbenzene	190	5.0	100.0	90.08	101	80	120			
Xylenes, Total	1200	10	300.0	832.4	114	75.3	120			
Surr: 4-Bromofluorobenzene	130		100.0		127	87.9	146			

Sample ID 1610016-001AMSD	SampType: MSD		TestCode: EPA Method 8021B: Volatiles							
Client ID: MW-7	Batch ID: B37669		RunNo: 37669							
Prep Date:	Analysis Date: 10/4/2016		SeqNo: 1173413		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	78	5.0	100.0	2.560	75.6	78	119	2.68	20	S
Toluene	82	5.0	100.0	0	82.1	80	120	2.84	20	
Ethylbenzene	190	5.0	100.0	90.08	105	80	120	1.93	20	
Xylenes, Total	1200	10	300.0	832.4	119	75.3	120	1.35	20	
Surr: 4-Bromofluorobenzene	130		100.0		131	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: XTO Energy

Work Order Number: 1610016

RcptNo: 1

Received by/date: AT 10/01/16

Logged By: **Anne Thorne** 10/1/2016 11:45:00 AM *Anne Thorne*

Completed By: **Anne Thorne** 10/3/2016 *Anne Thorne*

Reviewed By: TO 10/03/16

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:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.1	Good	Yes			

XTO Energy - San Juan Division

Sample Delivery Group: L879649
Samples Received: 12/17/2016
Project Number: 30-045-24446
Description: Valdez A#1E

Report To: James McDaniel
382 County Road 3100
Aztec, NM 87410

Entire Report Reviewed By:



Nancy McLain
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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FARES-121516-1030 L879649-01	5	
⁶Qc: Quality Control Summary	6	⁶Qc
Volatile Organic Compounds (GC) by Method 8021B	6	
⁷Gl: Glossary of Terms	7	⁷Gl
⁸Al: Accreditations & Locations	8	⁸Al
⁹Sc: Chain of Custody	9	⁹Sc

SAMPLE SUMMARY



FARES-121516-1030 L879649-01 GW

Collected by
Emilee Skyles

Collected date/time
12/15/16 10:30

Received date/time
12/17/16 10:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B	WG936565	1	12/23/16 01:21	12/23/16 01:21	CMJ

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Nancy McLain
Technical Service Representative

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Volatile Organic Compounds (GC) by Method 8021B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.00357		0.000500	1	12/23/2016 01:21	WG936565
Toluene	ND		0.00100	1	12/23/2016 01:21	WG936565
Ethylbenzene	0.0214		0.000500	1	12/23/2016 01:21	WG936565
Total Xylene	0.0611		0.00150	1	12/23/2016 01:21	WG936565
(S) a,a,a-Trifluorotoluene(PID)	98.9		55.0-122		12/23/2016 01:21	WG936565

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3186998-3 12/22/16 16:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000190	0.000500
Toluene	U		0.000412	0.00100
Ethylbenzene	U		0.000160	0.000500
Total Xylene	U		0.000510	0.00150
<i>(S) a,a,a-Trifluorotoluene(PID) 100</i>				55.0-122

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3186998-1 12/22/16 15:12 • (LCSD) R3186998-2 12/22/16 15:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0494	0.0503	98.8	101	70.0-130			1.79	20
Toluene	0.0500	0.0485	0.0490	97.0	98.0	70.0-130			1.08	20
Ethylbenzene	0.0500	0.0492	0.0498	98.4	99.6	70.0-130			1.16	20
Total Xylene	0.150	0.147	0.148	97.9	98.8	70.0-130			0.970	20
<i>(S) a,a,a-Trifluorotoluene(PID)</i>				99.0	98.9	55.0-122				

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L879340-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L879340-11 12/22/16 16:53 • (MS) R3186998-4 12/22/16 17:16 • (MSD) R3186998-5 12/22/16 18:03

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	ND	0.0497	0.0517	99.4	103	1	57.2-131			3.87	20
Toluene	0.0500	ND	0.0485	0.0505	97.0	101	1	63.7-134			3.97	20
Ethylbenzene	0.0500	ND	0.0497	0.0516	99.4	103	1	67.5-135			3.70	20
Total Xylene	0.150	ND	0.148	0.154	98.5	103	1	65.9-138			4.03	20
<i>(S) a,a,a-Trifluorotoluene(PID)</i>					98.9	99.1		55.0-122				



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.
 * Not all certifications held by the laboratory are applicable to the results reported in the attached report.



State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

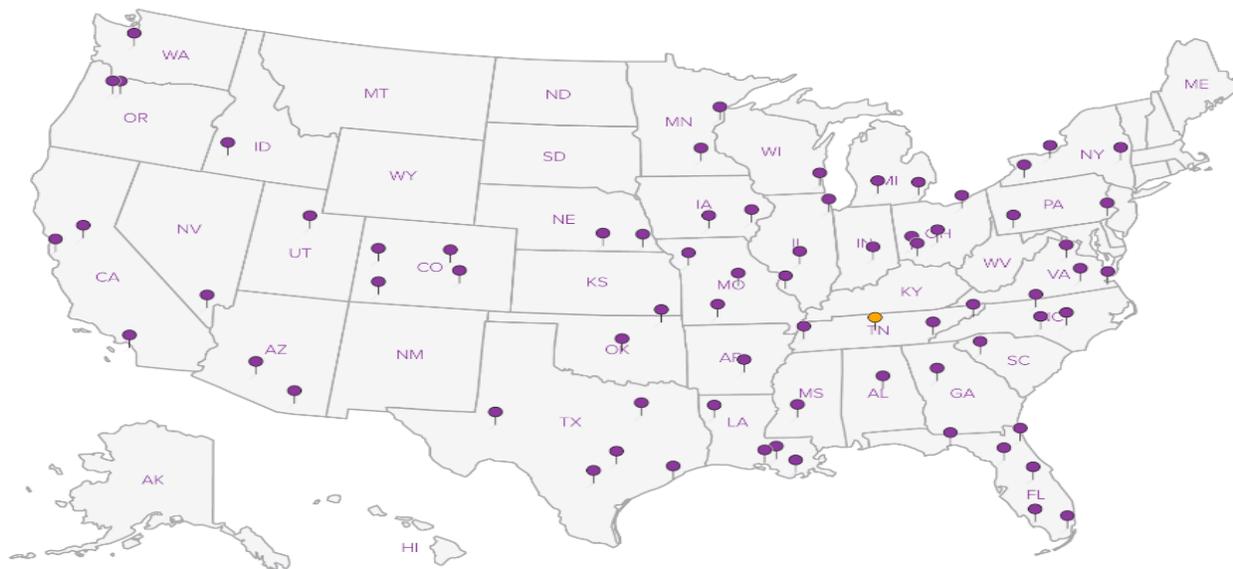
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**





Cooler Receipt Form			
Client:	XT6SM7	SDG#	879649
Cooler Received/Opened On:	12/ 17 /16	Temperature Upon Receipt:	1.9 °c
Received By: Michael Witherspoon			
Signature: <i>MW</i>			
Receipt Check List			
	Yes	No	N/A
Were custody seals on outside of cooler and intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were custody papers properly filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did all bottles arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were correct bottles used for the analyses requested?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was sufficient amount of sample sent in each bottle?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If applicable, was an observable VOA headspace present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Non Conformance Generated. (If yes see attached NCF)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Andy Vann

ESC Lab Sciences
Non-Conformance Form

Login #L879649	Client: XTOSMT	Date:12/17	Evaluated by:Michael
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Non-Conformance (check applicable items)

Sample Integrity	Chain of Custody Clarification	If Broken Container:
Parameter(s) past holding time <input checked="" type="checkbox"/>	Login Clarification Needed	Insufficient packing material around container
Improper temperature	Chain of custody is incomplete	Insufficient packing material inside cooler
Improper container type	Please specify Metals requested.	
Improper preservation	Please specify TCLP requested.	Improper handling by carrier (FedEx / UPS / Court Sample was frozen)
Insufficient sample volume.	Received additional samples not listed on coc.	Container lid not intact
Sample is biphasic.	Sample ids on containers do not match ids on coc	If no Chain of Custody:
Vials received with headspace.	Trip Blank not received.	Received by:
Broken container	Client did not "X" analysis.	Date/Time:
Broken container:	Chain of Custody is missing	Temp./Cont. Rec./pH:
Sufficient sample remains		Carrier:
		Tracking#

Login Comments: time doesn't match. COC 1030 and bottle 1040/ Logged per COC

Client informed by:	Call	Email	Voice Mail	Date:	Time:
TSR Initials:	Client Contact:				

Login Instructions:

Go by coc

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ATTACHMENT 5

2016 FIELD NOTES



Water Sample Collection Form

Project Name XTO Groundwater Monitoring

Project Number 12911007

Site Name Valdez

Sampler AUX CROSS

Sample Date 3/30/14

Matrix Groundwater

Analyses 8021 BTEX

Laboratory ESC

Turn Around Time Standard

Shipping FedEx

Trip Blank No

Method of Purging Dedicated bailer

Method of Sampling Purge 3 volumes or bail dry

Sample ID	Depth to Water (ft)	Total Depth (ft)	Vol to Purge (gal)*	Actual Vol Purged (gal)	Sample Time	Comments
FAAC-33016-920	19.20	12.57	3.24	3.25	0920	MW-7

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

Comments
12.57 - 19.20 = 6.63 x .1631 = 1.08 x 3 = 3.24

Signature: Alex Cross

Date: 3/30/14



Water Sample Collection Form

Project Name XTO Groundwater Monitoring
Project Number 12911007

Site Name Valdez
Sampler JA

Sample Date 9-30-2014

Matrix Groundwater
Laboratory ESC Hall

Analyses 8021 (BTEX) only

Turn Around Time Standard

Shipping FedEx none

Trip Blank No

Method of Purging Dedicated bailer

Method of Sampling Purge 3 volumes or bail dry

Sample ID	Depth to Water (ft)	Total Depth (ft)	Vol to Purge (gal)*	Actual Vol Purged (gal)	Dissolved Oxygen (mg/L)	Sample Time	Comments
MW-7	10.80	17.23	3.15	2.5	7.58	0930	

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

Comments
- sampled after purging 25 gallons due to draw down
- water reached w/ H₂O so used unpreserved WQA's

Signature: _____ Date: _____

