



Review of 2021 ANNUAL GROUNDWATER MONITORING REPORT: **Content satisfactory**

OCD condition of approval are as follows;

1. 1. Following receipt of this report from OCD, operator will be required to install a minimum of four (4) groundwater monitor wells in the general areas displayed within Figure 5 of the report. Locations in general are in up/side gradient area, side gradient areas (2), and in down gradient direction (southeast) by February 20, 2024.
2. Continue groundwater monitoring and sampling on a semi-annual basis for chloride.
3. Submit the Annual Groundwater Monitoring Report to the OCD no later than April 1, 2024.

2021 Annual Groundwater Monitoring Report

**MF-16 Pipeline Release
Lea County, New Mexico
1RP-2073**

Energy Transfer

June 14, 2022

→ **The Power of Commitment**

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1. Introduction

The MF-16 pipeline release (Site) is located about 2.5 miles north of Eunice, New Mexico on NM Hwy 18 and approximately 0.3 mile east of NM Hwy 18 off of Jones City Road, in Unit letter N, Section 15, Township 21 South, Range 37 East in Lea County, New Mexico (**Figure 1**). Site coordinates are 32.472050N, 103.153517W. Site details are shown on **Figure 2**. The property at the pipeline release location is owned by the Millard Deck Estate. The Site is regulated by the New Mexico Oil Conservation Division (NMOCD) under remediation permit 1RP-2073.

1.1 Background

On January 28, 2009 Southern Union Gas Services, Ltd. discovered that a release had occurred on the MF-16 Pipeline. As indicated on the submitted NMOCD Release Notification and Corrective Action Form (C-141), approximately 25 barrels (bbls) of crude oil and 60 million cubic feet of natural gas were released. During initial response to the release an estimated 5 bbls of free-standing fluids were recovered via vacuum truck.

Initial remedial efforts were performed between February 16 and March 20, 2009 with the excavation and disposal of approximately 1,164 cubic yards of impacted soil. The dimensions of the excavation were approximately 200 feet (ft) long by 115 ft wide by 19 ft deep in some areas. During the time of the excavation, only benzene, toluene, ethylbenzene, total xylenes (BTEX), and total petroleum hydrocarbons (TPH) were included in soil analyses. Chloride had not been considered during the cleanup efforts. As of March 10, 2009, laboratory analytical results for soil samples collected from the excavation indicated that BTEX and TPH concentrations were below NMOCD Recommended Remedial Action Limits (RRALs) and the excavation was backfilled with clean fill.

On June 22, 2012, consulting duties were turned over to Basin Environmental Service Technologies (Basin). Between February 2013 and February 2014, four groundwater monitoring wells (MW), MW-1 through MW-4, were installed to depths ranging from 40-45 ft below ground surface (bgs). Laboratory analyses of soil samples collected during installation of the groundwater monitoring wells indicated chloride concentrations exceeded NMOCD RRALs from the MW-1 and MW-3 boreholes.

Basin performed three groundwater monitoring events on May 9, 2013, September 3, 2013, and February 28, 2014. The results of the groundwater monitoring events indicated that chloride concentrations in groundwater exceeded the New Mexico Water Quality Control Commission (NMWQCC) groundwater quality standard in MW-1, MW-3, and MW-4 during one or more sampling events.

Site consulting duties were turned over to Apex beginning in July 2014. Groundwater monitoring events were conducted on July 15, 2014, October 30, 2014, January 20, 2015, and April 16, 2015. An additional monitoring well, MW-5, was installed on November 11, 2014, and was incorporated into groundwater sampling events in 2015. Groundwater samples collected from Site monitoring wells during the noted sampling events were analyzed for BTEX and chloride concentrations. Results from the Apex groundwater monitoring indicated that chloride concentrations exceeded the NMWQCC standard in samples collected from MW-1, MW-3, MW-4, and MW-5 during one or more of the sampling events.

Consulting duties were transferred from Apex to GHD during August 2015. GHD performed two rounds of groundwater sampling May 31 through June 1, and December 8, 2016. The sampling frequency was reduced from quarterly to semiannually since there was at least 2 years of monitoring data and the chloride concentrations had been consistent over time. GHD also performed a pumping test on August 30, 2016 and again September 16 and 17, 2019 to gain knowledge of aquifer characteristics.

A groundwater pumping event was conducted in September of 2019 pumping 1680 gallons from. of groundwater from two site wells to determine if a decrease in chloride concentrations was observable following the removal of a larger quantity of impacted groundwater. Groundwater samples collected after the event indicated no noticeable changes in chloride concentrations were observed in Site wells following the pumping event Semiannual groundwater monitoring

has continued throughout 2021. Details and results from the 2021 groundwater monitoring events are discussed further in this report.

2. Groundwater Monitoring Summary, Methodology, and Analytical Results

2.1 Groundwater Monitoring Summary, Methodology, and Analytical Results

Groundwater monitoring was conducted at the Site on May 5 and 6, 2021 and November 23, 2021. During the groundwater monitoring events, depth to groundwater measurements were taken and recorded from Site monitoring wells. An oil/water interface probe was used to measure depth to groundwater and check for the presence of light non-aqueous phase liquids, if any. Before and after each use, the oil/water interface probe was cleaned with an Alconox®/deionized water solution and rinsed with deionized water. Groundwater elevations were calculated from the depth to water measurements and are presented in Table 1.

The groundwater gradient calculated from the 2021 semiannual monitoring events was approximately 0.011 feet per foot towards the southeast in May and 0.011 feet per foot towards the southeast in November, both consistent with historical data. Groundwater gradient maps have been prepared for the April and November 2021 groundwater monitoring events and are included as Figures 3 and 4, respectively.

2.2 Groundwater Monitoring Methodology

During the 2021 semiannual groundwater monitoring events, monitoring wells were purged of at least 3 well casing volumes of water or until dry using a dedicated, polyethylene bailer prior to sampling. Groundwater quality parameters including pH, temperature, oxidation reduction potential, and conductivity were collected using a calibrated multi-parameter groundwater quality meter. A summary of field parameters is presented as Table 2.

Groundwater samples were placed in laboratory-prepared bottles, packed on ice and shipped under chain-of-custody documentation to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico. Groundwater samples were analyzed for chloride by EPA Method 300.0.

2.3 Groundwater Monitoring Methodology

Groundwater samples collected from MW-1, MW-4, MW-5, MW-6, and MW-7 have consistently exceeded the NMWQCC standard for chloride of 250 mg/L. During the most recent semiannual sampling event in November 2021, chloride concentrations in Site wells ranged between 170 mg/L (MW-3) to 1,500 mg/L (MW-5).

During the 2021 monitoring events, concentrations of chloride in samples collected from all Site wells were over the NMWQCC standard, except for the samples collected from MW-2 and MW-3. Chloride impacted groundwater at the Site is not laterally delineated to the south, west, or east.

A chloride concentration map depicting concentrations for 2021 is included as Figure 5. A summary of the historical groundwater laboratory analytical results is presented in Table 3. Groundwater laboratory analytical reports for 2021 monitoring events are included as Appendix A.

2.4 Groundwater Chemistry and Stiff Diagrams

During the November 2021 monitoring event samples from Site monitoring wells were analyzed for anions: calcium, magnesium, and sodium as well as cations: calcium carbonate, chloride, and sulfate. The anion and cation analytical

results were used to populate stiff diagrams for each of the wells. Stiff diagrams compare cations as positive values to anions as negative values to give a representative number for sodium and chloride, calcium and calcium carbonate, and magnesium and sulfate. These three numbers are plotted to give a visual representation of the chemistry of the analyzed groundwater sample. From the stiff diagrams populated, shown in Appendix B, the following conclusions can be made:

- Wells MW-1, MW-2 and MW-3 are dominated by sodium as the cation and carbonate as the anion
- Well MW-4 is dominated by sodium and chloride
- In well MW-5, sodium and calcium are present in equivalent concentrations and carbonate is the dominant anion
- Wells MW-6 and MW-7 are dominated by calcium and carbonate

The data from the Stiff diagrams suggest that wells MW-1, MW-2 and MW-3 have similar groundwater chemistry and wells MW-6 and MW-7 have similar groundwater chemistry. Wells MW-4 and MW-5 are different from the other wells and also different from each other.

3. Conclusions and 2022 Recommendations

3.1 Conclusions

Based on the above-referenced information, GHD makes the following conclusions:

- Groundwater samples collected from MW-1, and MW-4 through MW-7 continue to exceed the NMWQCC standard for chlorides.
- Chloride impacted groundwater at the Site appears to not be delineated to the south, east, or west with the current monitoring well network.
- The data from the Stiff diagrams suggest that wells MW-1, MW-2 and MW-3 have similar groundwater chemistry and wells MW-6 and MW-7 have similar groundwater chemistry while wells MW-4 and MW-5 are different from the other wells and also different from each other

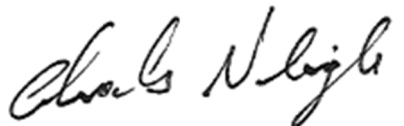
3.2 2022 Recommendations

GHD recommends the following for 2022:

- Continuation of semiannual groundwater monitoring for chloride.

All of Which is Respectfully Submitted,

GHD

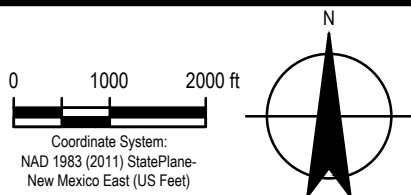
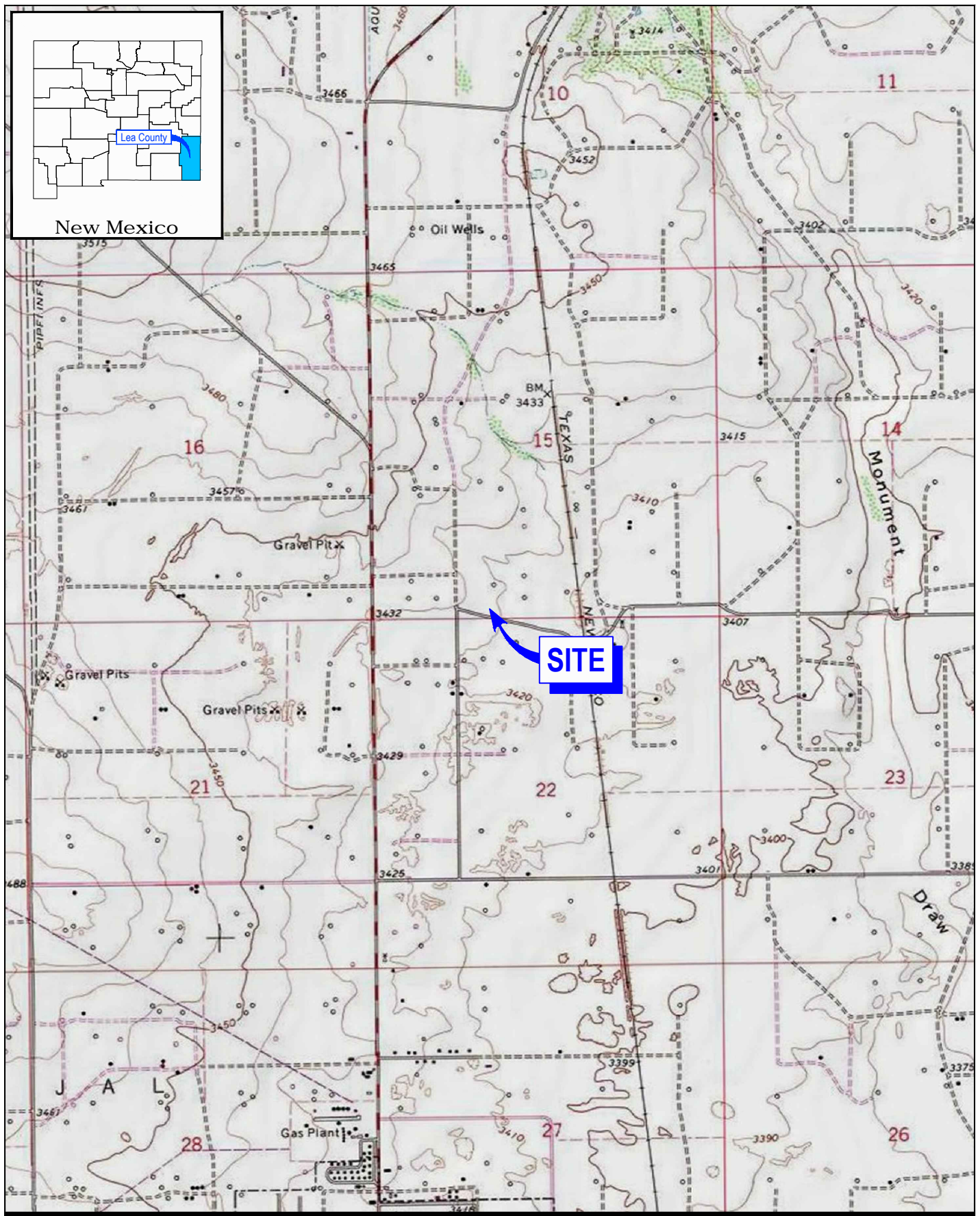


Charles Neligh
Project Scientist



Christine Mathews
Project Manager

Figures



ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
MF-16 INCH PIPELINE RELEASE

Project No. 12574708
Date February 2022

SITE LOCATION MAP

FIGURE 1

Filename: \\ghdnet\ghd\US\Albuquerque\Projects\62\12574708\Digital_Design\ACAD\Figures\IPT006\12574708-GHD-0000-RPT-EN-0101_DL-006.dwg

Data Source: USGS 7.5 Minute Quad "Eunice and Eunice NE, New Mexico"
Lat/Long: 32.47205° North, 103.153517° West



LEGEND

Monitoring Well Location

Release Point

Subsurface Pipeline

Excavation Limits

03060 ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

N

ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
MF-16 INCH PIPELINE RELEASE

Project No. 12574708
Date February 2022

FIGURE 2

SITE PLAN



LEGEND

Monitoring Well Location

Release Point

Subsurface Pipeline

Excavation Limits

Groundwater Elevation Contour
(Interval = 0.2 ft)

Elevation of Groundwater (ft)

Direction of Groundwater Flow

03060 ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

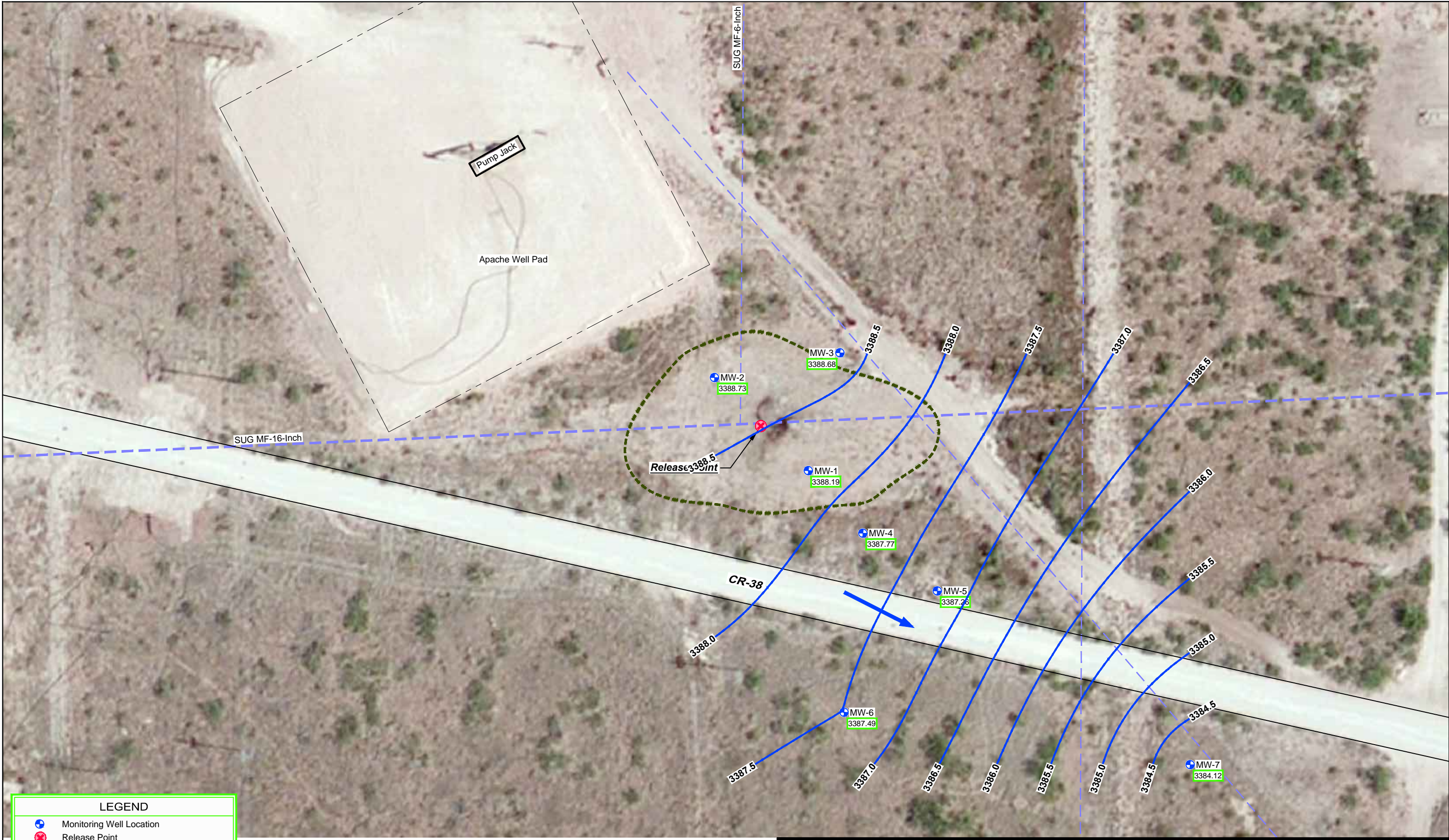


ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
MF-16 INCH PIPELINE RELEASE

**GROUNDWATER GRADIENT MAP -
MAY 5, 2021**

Project No. 12574708
Date May 2022

FIGURE 3



LEGEND

Monitoring Well Location

Release Point

Subsurface Pipeline

Excavation Limits

Groundwater Elevation Contour
(Interval = 0.5 ft)

Elevation of Groundwater (ft)

Direction of Groundwater Flow

0

30

60 ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

N



ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
MF-16 INCH PIPELINE RELEASE

**GROUNDWATER GRADIENT MAP -
NOVEMBER 23, 2021**

Project No. 12574708
Date May 2022

FIGURE 4



Tables

Table 1
Monitoring Well Specifications and Groundwater Elevations
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Page 1 of 2

Monitor Well ID	Top of Casing (TOC) Elevation (ft)	Total Depth (ft BGS)	Date Measured	Depth to LNAPL (ft below TOC)	Depth to Water (ft below TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft AMSL)
MW-1	3,425.53	48	2/28/2013	-	37.32	-	3,388.21
			5/9/2013	-	37.21	-	3,388.32
			9/3/2013	-	37.30	-	3,388.23
			7/15/2014	-	37.30	-	3,388.23
			10/30/2014	-	37.31	-	3,388.22
	1/20/2015		-	37.21	-	3,388.19	
	4/16/2015		-	37.12	-	3,388.28	
	12/18/2015		-	37.05	-	3,388.35	
	5/31/2016		-	36.97	-	3,388.43	
	12/8/2016		-	36.86	-	3,388.54	
	5/8/2017		-	36.70	-	3,388.70	
	11/14/2017		-	36.62	-	3,388.78	
	5/9/2018		-	36.55	-	3,388.85	
	11/7/2018		-	36.63	-	3,388.77	
	3/27/2019		-	36.63	-	3,388.77	
	9/18/2019		-	36.81	-	3,388.59	
	4/22/2020		-	36.79	-	3,388.61	
11/18/2020	-	37.02	-	3,388.38			
5/5/2021	-	37.07	-	3,388.33			
11/23/2021	-	37.21	-	3,388.19			
MW-2	3,426.07	43	5/9/2013	-	37.27	-	3,388.80
			9/3/2013	-	37.38	-	3,388.69
			7/15/2014	-	37.36	-	3,388.71
			10/30/2014	-	37.35	-	3,388.72
			1/20/2015	-	37.24	-	3,388.74
	4/16/2015		-	37.15	-	3,388.83	
	12/18/2015		-	37.14	-	3,388.84	
	5/31/2016		-	36.98	-	3,389.00	
	12/8/2016		-	36.89	-	3,389.09	
	5/8/2017		-	36.72	-	3,389.26	
	11/14/2017		-	36.65	-	3,389.33	
	5/9/2018		-	36.65	-	3,389.33	
	11/7/2018		-	36.69	-	3,389.29	
	3/27/2019		-	36.64	-	3,389.34	
	9/18/2019		-	36.79	-	3,389.19	
	4/22/2020		-	36.83	-	3,389.15	
	11/18/2020		-	37.05	-	3,388.93	
5/5/2021	-	37.10	-	3,388.88			
11/23/2021	-	37.25	-	3,388.73			
MW-3	3,425.16	44	5/9/2013	-	36.70	-	3,388.46
			9/3/2013	-	36.77	-	3,388.39
			7/15/2014	-	36.78	-	3,388.38
			10/30/2014	-	36.18	-	3,388.98
			1/20/2015	-	36.65	-	3,388.41
	4/16/2015		-	36.56	-	3,388.50	
	12/18/2015		-	36.49	-	3,388.57	
	5/31/2016		-	36.38	-	3,388.68	
	12/8/2016		-	36.30	-	3,388.76	
	5/8/2017		-	36.12	-	3,388.94	
	11/14/2017		-	36.04	-	3,389.02	
	5/9/2018		-	36.01	-	3,389.05	
	11/7/2018		-	36.09	-	3,388.97	
	3/27/2019		-	36.05	-	3,389.01	
	9/18/2019		-	36.22	-	3,388.84	
	4/22/2020		-	36.23	-	3,388.83	
	11/18/2020		-	36.48	-	3,388.58	
5/5/2021	-	36.54	-	3,388.52			
11/23/2021	-	36.38	-	3,388.68			

Table 1
Monitoring Well Specifications and Groundwater Elevations
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Page 2 of 2

Monitor Well ID	Top of Casing (TOC) Elevation (ft)	Total Depth (ft BGS)	Date Measured	Depth to LNAPL (ft below TOC)	Depth to Water (ft below TOC)	LNAPL Thickness (ft)	Groundwater Elevation (ft AMSL)
MW-4	3,424.91	49	5/9/2013	-	37.02	-	3,387.89
			9/3/2013	-	37.10	-	3,387.81
			7/15/2014	-	37.08	-	3,387.83
			10/30/2014	-	37.16	-	3,387.75
	3,424.81		1/20/2015	-	36.99	-	3,387.82
			4/16/2015	-	36.91	-	3,387.90
			12/18/2015	-	36.88	-	3,387.93
			5/31/2016	-	36.78	-	3,388.03
			12/8/2018	-	36.70	-	3,388.11
			5/8/2017	-	36.54	-	3,388.27
			11/14/2017	-	36.47	-	3,388.34
			5/9/2018	-	36.42	-	3,388.39
			11/7/2018	-	36.49	-	3,388.32
			3/27/2019	-	36.45	-	3,388.36
			9/18/2019	-	36.67	-	3,388.14
			12/6/2019	-	36.66	-	3,388.15
			4/22/2020	-	36.61	-	3,388.20
			11/18/2020	-	36.84	-	3,387.97
5/5/2021	-	36.89	-	3,387.92			
11/23/2021	-	37.04	-	3,387.77			
MW-5	3,423.44	49	1/20/2015	-	36.12	-	3,387.32
			4/16/2015	-	36.06	-	3,387.38
			12/18/2015	-	36.03	-	3,387.41
			5/31/2016	-	35.92	-	3,387.52
			12/8/2016	-	35.83	-	3,387.61
			5/8/2017	-	35.69	-	3,387.75
			11/14/2017	-	35.64	-	3,387.80
			5/9/2018	-	35.56	-	3,387.88
			11/7/2018	-	35.63	-	3,387.81
			3/27/2019	-	35.62	-	3,387.82
			9/18/2019	-	35.88	-	3,387.56
			12/6/2019	-	35.80	-	3,387.64
			4/22/2020	-	35.77	-	3,387.67
			11/18/2020	-	35.98	-	3,387.46
5/5/2021	-	36.03	-	3,387.41			
11/23/2021	-	36.18	-	3,387.26			
MW-6	3,423.78	43	12/18/2015	-	36.14	-	3,387.64
			5/31/2016	-	36.06	-	3,387.72
			12/8/2016	-	35.99	-	3,387.79
			5/8/2017	-	35.87	-	3,387.91
			11/14/2017	-	35.81	-	3,387.97
			5/9/2018	-	35.74	-	3,388.04
			11/7/2018	-	35.78	-	3,388.00
			3/27/2019	-	35.74	-	3,388.04
			9/18/2019	-	35.89	-	3,387.89
			12/6/2019	-	35.91	-	3,387.87
			4/22/2020	-	36.83	-	3,386.95
			11/18/2020	-	36.06	-	3,387.72
			5/5/2021	-	36.10	-	3,387.68
			11/23/2021	-	36.29	-	3,387.49
MW-7	3,421.42	38	12/18/2015	-	37.10	-	3,384.32
			5/31/2016	-	37.01	-	3,384.41
			12/8/2016	-	36.95	-	3,384.47
			5/8/2017	-	36.26	-	3,385.16
			11/14/2017	-	36.74	-	3,384.68
			5/9/2018	-	36.64	-	3,384.78
			11/7/2018	-	36.78	-	3,384.64
			3/27/2019	-	36.67	-	3,384.75
			9/18/2019	-	36.89	-	3,384.53
			4/22/2020	-	36.78	-	3,384.64
			11/18/2020	-	38.07	-	3,383.35
			5/5/2021	-	37.08	-	3,384.34
			11/23/2021	-	37.30	-	3,384.12

Note:

- 1.) LNAPL = Light non-aqueous phase liquid
 2.) AMSL = Above mean sea level

- 3.) BGS = below ground surface
 4.) ft = feet

Table 2
Field Parameters Summary
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Page 1 of 3

Sample ID	Date	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (mS/cm)
MW-1	7/15/2014	27.10	6.90	0.85	32.70	1,700
	10/30/2014	22.20	7.10	6.40	69.30	1,615
	1/20/2015	15.30	7.56	25.80	143.90	1,636
	4/16/2015	22.50	6.99	2.70	91.00	1,821
	12/18/2015	19.95	6.85	4.20	-13.10	3,385
	5/31/2016	20.90	6.99	2.14	-69.80	3,760
	12/8/2016	19.51	6.84	6.82	-222.90	3,146
	5/8/2017	20.27	7.45	1.60	-151.00	3,833
	11/14/2017	18.90	7.45	1.35	-51.80	3,567
	5/9/2018	19.92	6.95	--	-147.10	2,721
	11/7/2018	18.28	7.29	--	-120.40	2,692
	3/27/2019	18.88	6.88	2.80	-82.70	5,907
	9/18/2019	18.71	6.55	--	-129.30	--
	4/22/2020	20.90	7.67	2.03	-66.90	2,160
	11/18/2020	21.50	7.22	1.70	-19.50	2,324
	5/5/2021	21.83	7.37	0.58	-41.20	123,259
	11/23/2021	21.02	7.13	0.96	-36.40	2,620
MW-2	7/15/2014	22.60	7.04	6.61	27.80	1,356
	10/30/2014	21.80	7.84	75.60	75.50	1,510
	1/20/2015	14.90	7.73	24.30	162.30	1,437
	4/16/2015	22.00	7.30	16.30	112.20	1,435
	12/18/2015	19.49	7.47	2.11	-150.00	1,543
	5/31/2016	20.50	7.14	1.70	60.50	1,290
	12/8/2016	19.04	7.19	2.67	-114.70	1,301
	5/8/2017	19.82	6.85	1.07	-68.40	1,345
	11/14/2017	18.57	7.45	1.07	-2.50	1,682
	5/9/2018	19.50	6.92	--	-62.00	1,475
	11/7/2018	17.96	7.14	--	-45.90	1,523
	3/27/2019	18.92	6.78	2.61	-11.20	2,878
	9/18/2019	18.23	6.45	--	-130.20	--
	4/22/2020	20.20	7.56	0.54	-36.30	1,440
	11/18/2020	20.88	7.21	1.20	59.90	1,475
	5/5/2021	21.30	7.45	0.98	30.20	65,185
	11/23/2021	20.30	7.28	1.63	9.10	1,303
MW-3	7/15/2014	22.60	7.02	3.58	25.80	1,832
	10/30/2014	22.50	7.25	20.30	65.30	1,600
	1/20/2015	16.80	7.54	18.60	150.50	1,823
	4/16/2015	23.50	7.15	10.00	119.30	1,714
	12/18/2015	19.59	7.43	2.90	-101.60	2,266
	5/31/2016	20.70	6.84	1.80	60.50	1,840
	12/8/2016	19.03	7.21	1.78	-115.20	1,734
	5/8/2017	19.49	6.19	1.58	-26.70	1,695
	11/14/2017	18.12	7.57	1.63	18.40	2,102
	5/9/2018	18.99	7.11	--	-52.00	1,675
	11/7/2018	17.80	7.37	--	-45.10	1,703
	3/27/2019	18.13	7.01	2.91	-4.30	3,098
	9/18/2019	17.92	6.70	--	-127.20	--
	4/22/2020	19.80	7.66	3.50	68.80	1,570
	11/18/2020	20.44	7.30	1.83	93.00	1,567
	5/6/2021	20.65	7.62	1.41	58.80	68,198
	11/23/2021	20.44	7.41	1.31	11.90	1,397

Table 2
Field Parameters Summary
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Sample ID	Date	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (mS/cm)
MW-4	7/15/2014	22.80	6.93	3.70	65.20	7,308
	10/30/2014	22.40	6.94	2.80	76.10	3,010
	1/20/2015	19.10	7.34	14.70	160.30	8,275
	4/16/2015	21.70	6.92	3.30	98.10	3,080
	12/18/2015	19.79	7.06	2.31	-123.20	6,557
	5/31/2016	20.60	6.93	1.58	-50.30	5,590
	12/8/2016	19.07	7.10	2.80	-209.30	5,923
	5/8/2017	19.68	6.75	0.86	-139.30	7,987
	11/14/2017	18.59	7.36	1.71	0.10	6,485
	5/9/2018	19.31	6.98	--	-100.91	4,500
	11/7/2018	18.13	7.04	--	-66.70	7,469
	3/27/2019	18.72	6.69	2.56	-32.90	12,210
	9/18/2019	18.41	6.55	--	-121.60	--
	12/6/2019	20.21	7.19	2.68	-312.20	4,386
	4/22/2020	20.40	7.54	0.42	2.30	4,620
	11/18/2020	21.21	7.07	1.01	89.00	4,360
	5/6/2021	21.26	7.32	0.34	31.00	203,720
	11/23/2021	21.06	7.01	1.04	15.70	4,853
MW-5	1/20/2015	20.10	7.31	10.00	148.90	6,888
	4/16/2015	21.40	6.98	5.70	90.50	6,405
	12/18/2015	19.06	7.10	3.37	-134.10	6,631
	5/31/2016	19.90	6.94	1.88	76.70	5,760
	12/8/2016	18.78	7.13	1.96	-79.40	5,690
	5/8/2017	19.05	6.70	1.41	-86.70	6,303
	11/14/2017	17.82	7.20	2.04	37.90	7,041
	5/9/2018	17.99	6.85	--	-100.20	4,629
	11/7/2018	17.10	7.08	--	-55.60	6,934
	3/27/2019	17.98	6.75	3.69	-16.00	11,522
	9/18/2019	17.62	6.46	--	-120.10	--
	12/6/2019	19.23	7.11	1.88	-331.40	5,638
	4/22/2020	19.90	7.54	0.91	89.40	5,610
	11/18/2020	20.30	7.00	0.80	116.00	5,450
	5/6/2021	20.89	7.22	0.20	43.00	229,595
	11/23/2021	20.41	6.98	1.37	28.80	4,709
MW-6	12/18/2015	18.79	7.18	6.64	-112.20	4,958
	6/1/2016	20.50	6.84	1.51	93.80	4,750
	12/8/2016	19.05	7.20	6.02	-64.30	4,620
	5/8/2017	19.44	7.10	1.90	-142.30	4,658
	11/14/2017	18.19	6.98	1.37	28.70	5,574
	5/9/2018	19.72	7.12	--	-64.80	4,622
	11/7/2018	17.09	7.01	--	-47.40	4,979
	3/27/2019	18.51	6.74	3.02	-10.80	8,556
	9/18/2019	18.09	6.45	--	-124.30	--
	12/6/2019	19.51	7.10	2.08	-308.70	4,784
	4/22/2020	20.30	7.67	0.91	115.00	4,750
	11/18/2020	20.77	7.05	0.80	55.00	5,375
	5/6/2021	21.11	7.26	0.20	50.90	240,842
	11/23/2021	20.57	6.98	1.36	31.00	5,025

Table 2
Field Parameters Summary
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Sample ID	Date	Temperature (°C)	pH	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (mS/cm)
MW-7	12/18/2015	Insufficient volume to collect parameters				
	6/1/2016	Insufficient volume to collect parameters				
	12/8/2016	14.51	7.61	6.13	-5.80	2,659
	5/8/2017	19.93	7.27	--	-56.90	2,758
	11/14/2017	Insufficient volume to collect parameters				
	5/9/2018	19.35	7.30	--	-40.21	3,021
	11/7/2018	14.92	7.48	--	-26.10	107
	3/27/2019	18.23	7.14	8.12	52.60	5,957
	9/18/2019	18.08	7.62	--	-86.30	--
	4/22/2020	20.30	8.29	6.85	157.70	3,410
	11/18/2020	Insufficient volume to collect parameters				
	5/6/2021	Insufficient volume to collect parameters				
	11/23/2021	Insufficient volume to collect parameters				

Notes:

- 1.) °C = degrees Celsius
- 2.) mg/L = milligrams per liter
- 3.) mV = millivolts
- 4.) mS/cm = microsiemens per centimeter

Table 3
Groundwater Analytical Results Summary
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Page 1 of 3

Well ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC Groundwater Quality		0.005	1	0.7	0.62	250
MW-1	2/28/2013	<0.00100	<0.00200	<0.00100	<0.00200	1,600
	5/9/2013	<0.00100	<0.00200	<0.00100	<0.00200	746
	9/3/2013	<0.00100	<0.00200	<0.00100	<0.00200	220
	2/28/2014	<0.00100	<0.00200	<0.00100	<0.00100	1,350
	7/15/2014	<0.00100	<0.00200	<0.00100	<0.00100	272
	10/30/2014	<0.00100	<0.00100	<0.00100	<0.00100	261
	1/20/2015	<0.00100	<0.00100	<0.00100	<0.00100	475
	4/16/2015	<0.00100	<0.00100	<0.00100	<0.00100	2,720
	12/18/2015	<0.0010	<0.0010	<0.0010	<0.0015	3,100
	5/31/2016	--	--	--	--	840
	12/8/2016	--	--	--	--	1,200
	5/8/2017	--	--	--	--	710
	11/14/2017	--	--	--	--	1,400
	5/9/2018	--	--	--	--	410
	11/7/2018	--	--	--	--	830
	11/7/18 (DUP)	--	--	--	--	520
	3/27/2019	--	--	--	--	590
	9/18/2019	--	--	--	--	670
	4/22/2020	<0.0010	<0.0010	<0.0010	<0.0015	630
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	660
	5/5/2021	--	--	--	--	870
	11/23/2021	--	--	--	--	390
MW-2	5/9/2013	<0.00100	<0.00200	<0.00100	<0.00200	199
	9/3/2013	<0.00100	<0.00200	<0.00100	<0.00200	211
	2/28/2014	<0.00100	<0.00200	<0.00100	<0.00100	190
	7/15/2014	<0.00100	<0.00200	<0.00100	<0.00100	165
	10/30/2014	<0.00100	<0.00100	<0.00100	<0.00100	215
	1/20/2015	<0.00100	<0.00100	<0.00100	<0.00100	152
	4/16/2015	<0.00100	<0.00100	<0.00100	<0.00100	155
	12/18/2015	<0.0010	<0.0010	<0.0010	<0.0015	180
	5/31/2016	--	--	--	--	150
	12/8/2016	--	--	--	--	190
	5/8/2017	--	--	--	--	170
	11/14/2017	--	--	--	--	170
	5/9/2018	--	--	--	--	190
	5/9/2018 (DUP)	--	--	--	--	190
	11/7/2018	--	--	--	--	200
	3/27/2019	--	--	--	--	180
	9/18/2019	--	--	--	--	170
	4/22/2020	0.0021	<0.0010	<0.0010	<0.0015	190
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	180
	5/5/2021	--	--	--	--	190
	11/23/2021	--	--	--	--	170

Table 3
Groundwater Analytical Results Summary
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Page 2 of 3

Well ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC Groundwater Quality		0.005	1	0.7	0.62	250
MW-3	5/9/2013	<0.00100	<0.00200	<0.00100	<0.00200	392
	9/3/2013	<0.00100	<0.00200	<0.00100	<0.00200	191
	2/28/2014	<0.00100	<0.00200	<0.00100	<0.00100	424
	7/15/2014	<0.00100	<0.00200	<0.00100	<0.00100	434
	10/30/2014	<0.00100	<0.00100	<0.00100	<0.00100	212
	1/20/2015	<0.00100	<0.00100	<0.00100	<0.00100	488
	4/16/2015	<0.00100	<0.00100	<0.00100	<0.00100	248
	12/18/2015	<0.0010	<0.0010	<0.0010	<0.0015	400
	5/31/2016	--	--	--	--	390
	12/8/2016	--	--	--	--	340
	5/8/2017	--	--	--	--	310
	11/14/2017	--	--	--	--	210
	5/9/2018	--	--	--	--	260
	11/7/2018	--	--	--	--	210
	3/27/2019	--	--	--	--	220
	3/27/2019 (DUP)	--	--	--	--	200
	9/18/2019	--	--	--	--	170
	4/22/2020	<0.0010	<0.0010	<0.0010	<0.0015	220
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	210
	5/6/2021	--	--	--	--	200
	11/23/2021	--	--	--	--	200
MW-4	5/9/2013	<0.00100	<0.00200	<0.00100	<0.00200	2,710
	9/3/2013	<0.00100	<0.00200	<0.00100	<0.00200	610
	2/28/2014	<0.00100	<0.00200	<0.00100	<0.00100	2,220
	7/15/2014	<0.00100	<0.00200	<0.00100	<0.00100	2,100
	10/30/2014	<0.00100	<0.00100	<0.00100	<0.00100	1,430
	1/20/2015	<0.00100	<0.00100	<0.00100	<0.00100	2,390
	4/16/2015	<0.00100	<0.00100	<0.00100	<0.00100	1,450
	12/18/2015	<0.0010	<0.0010	<0.0010	<0.0015	3,500
	12/15/2015 (DUP)	<0.0010	<0.0010	<0.0010	<0.0015	3,500
	5/31/2016	--	--	--	--	1,700
	12/8/2016	--	--	--	--	1,100
	5/8/2017	--	--	--	--	2,500
	11/14/2017	--	--	--	--	1,400
	5/9/2018	--	--	--	--	2,600
	11/7/2018	--	--	--	--	1,600
	3/27/2019	--	--	--	--	1,000
	9/18/2019	--	--	--	--	1,300
	9/18/2019 (DUP)	--	--	--	--	1,400
	12/6/2019	--	--	--	--	1,200
	4/22/2020	0.0010	<0.0010	<0.0010	<0.0015	2,100
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	1,500
	5/6/2021	--	--	--	--	1,500
	11/23/2021	--	--	--	--	960

Table 3
Groundwater Analytical Results Summary
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

Page 3 of 3

Well ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
NMWQCC Groundwater Quality		0.005	1	0.7	0.62	250
MW-5	1/20/2015	<0.00100	<0.00100	<0.00100	<0.00100	1,700
	4/16/2015	<0.00100	<0.00100	<0.00100	<0.00100	1,750
	12/18/2015	<0.0010	<0.0010	<0.0010	<0.0015	1,800
	5/31/2016	--	--	--	--	2,000
	5/31/2016 (DUP)	--	--	--	--	2,200
	12/8/2016	--	--	--	--	2,000
	12/8/16 (DUP)	--	--	--	--	1,800
	5/8/2017	--	--	--	--	1,900
	11/14/2017	--	--	--	--	2,000
	5/9/2018	--	--	--	--	2,300
	11/7/2018	--	--	--	--	1,900
	3/27/2019	--	--	--	--	1,500
	9/18/2019	--	--	--	--	1,900
	12/6/2019	--	--	--	--	1,400
	12/6/2019 (DUP)	--	--	--	--	1,300
	4/22/2020	<0.0010	<0.0010	<0.0010	<0.0015	2,100
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	2,000
	5/6/2021	--	--	--	--	1,700
	11/23/2021	--	--	--	--	1,500
MW-6	1/20/2015	<0.00100	<0.00100	<0.00100	<0.00100	1,300
	6/1/2016	--	--	--	--	1,400
	12/8/2016	--	--	--	--	1,700
	5/8/2017	--	--	--	--	1,500
	11/17/2017	--	--	--	--	1,100
	5/9/2018	--	--	--	--	1,300
	11/7/2018	--	--	--	--	1,100
	3/27/2019	--	--	--	--	1,000
	9/18/2019	--	--	--	--	1,300
	12/6/2019	--	--	--	--	1,400
	4/22/2020	<0.0010	<0.0010	<0.0010	<0.0015	1,400
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	1,500
	5/6/2021	--	--	--	--	1,300
	11/23/2021	--	--	--	--	1,400
MW-7	12/18/2015	<0.0010	<0.0010	<0.0010	<0.0015	580
	6/1/2016	--	--	--	--	740
	12/8/2016	--	--	--	--	830
	5/8/2017	--	--	--	--	810
	11/14/2017	--	--	--	--	670
	5/9/2018	--	--	--	--	820
	11/7/2018	--	--	--	--	870
	3/27/2019	--	--	--	--	870
	9/18/2019	--	--	--	--	920
	4/22/2020	<0.0010	<0.0010	<0.0010	<0.0015	900
	11/18/2020	<0.0010	<0.0010	<0.0010	<0.0015	920
	5/6/2021	--	--	--	--	870
	11/23/2021	--	--	--	--	870

Notes:

- 1.) NMWQCC = New Mexico Water Quality Control Commission
- 1.) Concentrations that are **bold** exceed the NMWQCC Groundwater Quality Standards
- 2.) mg/L- milligrams per Liter

Appendices

Appendix A

Groundwater Laboratory Analytical Report



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

May 17, 2021

Christine Mathews

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX:

RE: MF-16

OrderNo.: 2105323

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 6 sample(s) on 5/7/2021 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 #NM0901

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

Analytical Report

Lab Order: 2105323

Date Reported: 5/17/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: MF-16

Lab Order: 2105323

Lab ID: 2105323-001

Collection Date: 5/5/2021 2:00:00 PM

Client Sample ID: GW-11209054-050521-CN-MW-1

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: JMT
Sulfate	130	5.0		mg/L	10	5/10/2021 10:32:16 AM	R77283
SM2320B: ALKALINITY							Analyst: CAS
Bicarbonate (As CaCO ₃)	295.0	20.00		mg/L Ca	1	5/13/2021 12:50:01 PM	R77386
Carbonate (As CaCO ₃)	ND	2.000		mg/L Ca	1	5/13/2021 12:50:01 PM	R77386
Total Alkalinity (as CaCO ₃)	295.0	20.00		mg/L Ca	1	5/13/2021 12:50:01 PM	R77386
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Calcium	140	5.0		mg/L	5	5/10/2021 3:26:51 PM	B77278
Magnesium	82	1.0		mg/L	1	5/10/2021 3:25:17 PM	B77278
Sodium	370	5.0		mg/L	5	5/10/2021 3:26:51 PM	B77278

Lab ID: 2105323-002

Collection Date: 5/5/2021 4:00:00 PM

Client Sample ID: GW-11209054-050521-CN-MW-2

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: JMT
Sulfate	140	5.0		mg/L	10	5/10/2021 10:57:05 AM	R77283
SM2320B: ALKALINITY							Analyst: CAS
Bicarbonate (As CaCO ₃)	286.2	20.00		mg/L Ca	1	5/13/2021 1:05:04 PM	R77386
Carbonate (As CaCO ₃)	ND	2.000		mg/L Ca	1	5/13/2021 1:05:04 PM	R77386
Total Alkalinity (as CaCO ₃)	286.2	20.00		mg/L Ca	1	5/13/2021 1:05:04 PM	R77386
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Calcium	68	1.0		mg/L	1	5/10/2021 3:28:27 PM	B77278
Magnesium	37	1.0		mg/L	1	5/10/2021 3:28:27 PM	B77278
Sodium	180	5.0		mg/L	5	5/10/2021 3:30:01 PM	B77278

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Analytical Report

Lab Order: 2105323

Date Reported: 5/17/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: MF-16

Lab Order: 2105323

Lab ID: 2105323-003

Collection Date: 5/6/2021 8:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-3

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: JMT
Sulfate	110	5.0		mg/L	10	5/10/2021 11:21:54 AM	R77283
SM2320B: ALKALINITY							Analyst: CAS
Bicarbonate (As CaCO ₃)	326.6	20.00		mg/L Ca	1	5/13/2021 1:18:57 PM	R77386
Carbonate (As CaCO ₃)	ND	2.000		mg/L Ca	1	5/13/2021 1:18:57 PM	R77386
Total Alkalinity (as CaCO ₃)	326.6	20.00		mg/L Ca	1	5/13/2021 1:18:57 PM	R77386
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Calcium	54	1.0		mg/L	1	5/10/2021 3:36:22 PM	B77278
Magnesium	32	1.0		mg/L	1	5/10/2021 3:36:22 PM	B77278
Sodium	220	5.0		mg/L	5	5/10/2021 3:37:57 PM	B77278

Lab ID: 2105323-004

Collection Date: 5/6/2021 9:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-4

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: JMT
Sulfate	140	5.0		mg/L	10	5/10/2021 12:11:32 PM	R77283
SM2320B: ALKALINITY							Analyst: CAS
Bicarbonate (As CaCO ₃)	267.4	20.00		mg/L Ca	1	5/13/2021 1:33:49 PM	R77386
Carbonate (As CaCO ₃)	ND	2.000		mg/L Ca	1	5/13/2021 1:33:49 PM	R77386
Total Alkalinity (as CaCO ₃)	267.4	20.00		mg/L Ca	1	5/13/2021 1:33:49 PM	R77386
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Calcium	230	5.0		mg/L	5	5/10/2021 3:41:07 PM	B77278
Magnesium	130	5.0		mg/L	5	5/10/2021 3:41:07 PM	B77278
Sodium	440	5.0		mg/L	5	5/10/2021 3:41:07 PM	B77278

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 2 of 6

Analytical Report

Lab Order: 2105323

Date Reported: 5/17/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: MF-16

Lab Order: 2105323

Lab ID: 2105323-005

Collection Date: 5/6/2021 10:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-5

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: JMT
Sulfate	140	5.0		mg/L	10	5/10/2021 12:36:21 PM	R77283
SM2320B: ALKALINITY							Analyst: CAS
Bicarbonate (As CaCO ₃)	298.9	20.00		mg/L Ca	1	5/13/2021 1:47:30 PM	R77386
Carbonate (As CaCO ₃)	ND	2.000		mg/L Ca	1	5/13/2021 1:47:30 PM	R77386
Total Alkalinity (as CaCO ₃)	298.9	20.00		mg/L Ca	1	5/13/2021 1:47:30 PM	R77386
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Calcium	320	5.0		mg/L	5	5/10/2021 3:44:15 PM	B77278
Magnesium	190	5.0		mg/L	5	5/10/2021 3:44:15 PM	B77278
Sodium	400	5.0		mg/L	5	5/10/2021 3:44:15 PM	B77278

Lab ID: 2105323-006

Collection Date: 5/6/2021 11:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-6

Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: JMT
Sulfate	130	5.0		mg/L	10	5/10/2021 1:01:10 PM	R77283
SM2320B: ALKALINITY							Analyst: CAS
Bicarbonate (As CaCO ₃)	216.0	20.00		mg/L Ca	1	5/13/2021 2:02:12 PM	R77386
Carbonate (As CaCO ₃)	ND	2.000		mg/L Ca	1	5/13/2021 2:02:12 PM	R77386
Total Alkalinity (as CaCO ₃)	216.0	20.00		mg/L Ca	1	5/13/2021 2:02:12 PM	R77386
EPA METHOD 200.7: DISSOLVED METALS							Analyst: ELS
Calcium	340	5.0		mg/L	5	5/10/2021 3:47:24 PM	B77278
Magnesium	200	5.0		mg/L	5	5/10/2021 3:47:24 PM	B77278
Sodium	340	5.0		mg/L	5	5/10/2021 3:47:24 PM	B77278

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 3 of 6

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2105323

17-May-21

Client: GHD
Project: MF-16

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: PBW	Batch ID: B77278	RunNo: 77278								
Prep Date:	Analysis Date: 5/10/2021	SeqNo: 2741017 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Sodium	ND	1.0								

Sample ID: LL LCS	SampType: LCSLL	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: BatchQC	Batch ID: B77278	RunNo: 77278								
Prep Date:	Analysis Date: 5/10/2021	SeqNo: 2741108 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0	0.5000	0	101	50	150			
Magnesium	ND	1.0	0.5000	0	97.8	50	150			
Sodium	ND	1.0	0.5000	0	91.4	50	150			

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: LCSW	Batch ID: B77278	RunNo: 77278								
Prep Date:	Analysis Date: 5/10/2021	SeqNo: 2741110 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	48	1.0	50.00	0	95.6	85	115			
Magnesium	50	1.0	50.00	0	99.6	85	115			
Sodium	50	1.0	50.00	0	99.3	85	115			

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
PQL Practical Quantitative Limit
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 Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2105323

17-May-21

Client: GHD
Project: MF-16

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R77283	RunNo: 77283								
Prep Date:	Analysis Date: 5/10/2021	SeqNo: 2741244	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R77283	RunNo: 77283								
Prep Date:	Analysis Date: 5/10/2021	SeqNo: 2741245	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.8	0.50	10.00	0	98.4	90	110			

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
PQL Practical Quantitative Limit
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 Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2105323

17-May-21

Client: GHD
Project: MF-16

Sample ID: mb-1 alk	SampType: mblk	TestCode: SM2320B: Alkalinity								
Client ID: PBW	Batch ID: R77386	RunNo: 77386								
Prep Date:	Analysis Date: 5/13/2021	SeqNo: 2746154	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: lcs-1 alk	SampType: lcs	TestCode: SM2320B: Alkalinity								
Client ID: LCSW	Batch ID: R77386	RunNo: 77386								
Prep Date:	Analysis Date: 5/13/2021	SeqNo: 2746155	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	76.00	20.00	80.00	0	95.0	90	110			

Sample ID: lcs-2 alk	SampType: lcs	TestCode: SM2320B: Alkalinity								
Client ID: LCSW	Batch ID: R77386	RunNo: 77386								
Prep Date:	Analysis Date: 5/13/2021	SeqNo: 2746178	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	75.60	20.00	80.00	0	94.5	90	110			

Sample ID: mb-2 alk	SampType: mblk	TestCode: SM2320B: Alkalinity								
Client ID: PBW	Batch ID: R77386	RunNo: 77386								
Prep Date:	Analysis Date: 5/13/2021	SeqNo: 2746179	Units: mg/L CaCO3							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

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
PQL Practical Quantitative Limit
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 Limit

Page 6 of 6



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

Sample Log-In Check List

Client Name: GHD

Work Order Number: 2105323

RcptNo: 1

Received By: Juan Rojas

5/7/2021 7:25:00 AM

Juan Rojas

Completed By: Cheyenne Cason

5/7/2021 7:57:09 AM

*Cason*Reviewed By: *SGR* 5/7/21Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4$ " for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: 6
or >12 unless noted
Adjusted? YES
Checked by: JO 5/7/21

Special Handling (if applicable)

15. 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: _____

16. Additional remarks:

Poured off and filtered ~125ml from 001A-006A for 001B-006B, added ~0.4 ml HNO₃ to 001B-006B for metals analysis -- JO

17. Cooler Information

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

5/7/21



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

May 14, 2021

Christine Mathews

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX

RE: MF-16

OrderNo.: 2105327

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 7 sample(s) on 5/7/2021 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 #NM0901

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

Analytical Report

Lab Order: 2105327

Date Reported: 5/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: MF-16

Lab Order: 2105327

Lab ID: 2105327-001 Collection Date: 5/5/2021 2:00:00 PM

Client Sample ID: GW-11209054-050521-CN-MW-1 Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS Analyst: CAS							
Chloride	870	50	*	mg/L	100	5/7/2021 4:47:37 PM	R77261

Lab ID: 2105327-002 Collection Date: 5/5/2021 4:00:00 PM

Client Sample ID: GW-11209054-050521-CN-MW-2 Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS Analyst: CAS							
Chloride	190	5.0		mg/L	10	5/7/2021 5:00:29 PM	R77261

Lab ID: 2105327-003 Collection Date: 5/6/2021 8:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-3 Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS Analyst: CAS							
Chloride	200	50		mg/L	100	5/7/2021 5:39:08 PM	R77261

Lab ID: 2105327-004 Collection Date: 5/6/2021 9:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-4 Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS Analyst: CAS							
Chloride	1500	50	*	mg/L	100	5/7/2021 6:04:55 PM	R77261

Lab ID: 2105327-005 Collection Date: 5/6/2021 10:30:00 AM

Client Sample ID: GW-11209054-050621-CN-MW-5 Matrix: AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS Analyst: CAS							
Chloride	1700	100	*	mg/L	200	5/11/2021 5:04:53 PM	R77320

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 1 of 3

Analytical Report

Lab Order: 2105327

Date Reported: 5/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: MF-16

Lab Order: 2105327**Lab ID:** 2105327-006**Collection Date:** 5/6/2021 11:30:00 AM**Client Sample ID:** GW-11209054-050621-CN-MW-6**Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							
Chloride	1300	50	*	mg/L	100	5/7/2021 7:22:09 PM	R77261

Analyst: CAS

Lab ID: 2105327-007**Collection Date:** 5/6/2021 12:30:00 AM**Client Sample ID:** GW-11209054-050621-CN-MW-7**Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							
Chloride	870	50	*	mg/L	100	5/7/2021 7:47:56 PM	R77261

Analyst: CAS

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 2 of 3

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2105327

14-May-21

Client: GHD
Project: MF-16

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R77261	RunNo: 77261								
Prep Date:	Analysis Date: 5/7/2021	SeqNo: 2740384 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R77261	RunNo: 77261								
Prep Date:	Analysis Date: 5/7/2021	SeqNo: 2740385 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	97.3	90	110			

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R77320	RunNo: 77320								
Prep Date:	Analysis Date: 5/11/2021	SeqNo: 2743455 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

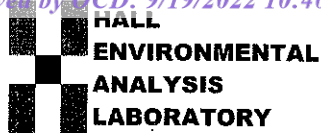
Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R77320	RunNo: 77320								
Prep Date:	Analysis Date: 5/11/2021	SeqNo: 2743456 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	97.2	90	110			

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
PQL Practical Quantitative Limit
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 Limit

Page 3 of 3



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

Sample Log-In Check List

Client Name: **GHD**Work Order Number: **2105327**

RcptNo: 1

Received By: **Juan Rojas** 5/7/2021 7:25:00 AMCompleted By: **Cheyenne Cason** 5/7/2021 8:18:25 AMReviewed By: **SGC 5/7/21**

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4$ " for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

TO
5/7/21
of preserved bottles checked for pH: 10
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

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

16. Additional remarks:

17. Cooler Information

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



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

December 09, 2021

Christine Mathews

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX:

RE: MF 16

OrderNo.: 2111C07

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 8 sample(s) on 11/24/2021 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 #NM0901

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

Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 9:00:00 AM

Lab ID: 2111C07-001

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	570	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	390	25	*	mg/L	50	12/1/2021 3:15:58 AM	A83173
Sulfate	150	2.5		mg/L	5	11/24/2021 12:21:24 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	120	5.0		mg/L	5	11/30/2021 9:54:29 AM	64187
Magnesium	66	5.0		mg/L	5	11/30/2021 9:54:29 AM	64187
Potassium	6.0	1.0		mg/L	1	11/30/2021 9:48:15 AM	64187
Sodium	260	5.0		mg/L	5	11/30/2021 9:54:29 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 10:00:00 AM

Lab ID: 2111C07-002

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	410	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: LRN
Chloride	170	10		mg/L	20	11/24/2021 1:23:27 PM	R83131
Sulfate	150	2.5		mg/L	5	11/24/2021 1:11:02 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	98	1.0		mg/L	1	12/1/2021 7:31:01 AM	64187
Magnesium	40	1.0		mg/L	1	12/1/2021 7:31:01 AM	64187
Potassium	7.5	1.0		mg/L	1	12/1/2021 7:31:01 AM	64187
Sodium	170	5.0		mg/L	5	12/1/2021 7:33:05 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 11:00:00 AM

Lab ID: 2111C07-003

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	330	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: LRN
Chloride	200	10		mg/L	20	11/24/2021 2:13:04 PM	R83131
Sulfate	110	2.5		mg/L	5	11/24/2021 2:00:40 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	76	1.0		mg/L	1	12/1/2021 7:41:59 AM	64187
Magnesium	35	1.0		mg/L	1	12/1/2021 7:41:59 AM	64187
Potassium	6.3	1.0		mg/L	1	12/1/2021 7:41:59 AM	64187
Sodium	200	5.0		mg/L	5	12/1/2021 7:44:04 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 12:00:00 PM

Lab ID: 2111C07-004

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	870	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	960	50	*	mg/L	100	12/1/2021 3:28:19 AM	A83173
Sulfate	140	2.5		mg/L	5	11/24/2021 2:25:28 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	180	5.0		mg/L	5	12/1/2021 7:48:06 AM	64187
Magnesium	100	5.0		mg/L	5	12/1/2021 7:48:06 AM	64187
Potassium	10	1.0		mg/L	1	12/1/2021 7:46:00 AM	64187
Sodium	310	5.0		mg/L	5	12/1/2021 7:48:06 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 1:00:00 PM

Lab ID: 2111C07-005

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	2000	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	1500	50	*	mg/L	100	12/1/2021 3:40:40 AM	A83173
Sulfate	150	2.5		mg/L	5	11/24/2021 2:50:17 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	410	5.0		mg/L	5	12/1/2021 7:51:52 AM	64187
Magnesium	240	5.0		mg/L	5	12/1/2021 7:51:52 AM	64187
Potassium	13	1.0		mg/L	1	12/1/2021 7:49:54 AM	64187
Sodium	420	5.0		mg/L	5	12/1/2021 7:51:52 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 2:00:00 PM

Lab ID: 2111C07-006

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	1700	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	1400	50	*	mg/L	100	12/1/2021 3:53:00 AM	A83173
Sulfate	140	2.5		mg/L	5	11/24/2021 3:15:06 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	360	5.0		mg/L	5	12/1/2021 7:55:52 AM	64187
Magnesium	210	5.0		mg/L	5	12/1/2021 7:55:52 AM	64187
Potassium	12	1.0		mg/L	1	12/1/2021 7:53:55 AM	64187
Sodium	320	5.0		mg/L	5	12/1/2021 7:55:52 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-MW

Project: MF 16

Collection Date: 11/23/2021 2:30:00 PM

Lab ID: 2111C07-007

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	1400	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	870	50	*	mg/L	100	12/1/2021 4:05:20 AM	A83173
Sulfate	110	2.5		mg/L	5	11/24/2021 3:39:55 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	330	5.0		mg/L	5	12/1/2021 7:59:36 AM	64187
Magnesium	130	5.0		mg/L	5	12/1/2021 7:59:36 AM	64187
Potassium	10	1.0		mg/L	1	12/1/2021 7:57:43 AM	64187
Sodium	240	5.0		mg/L	5	12/1/2021 7:59:36 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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Analytical Report

Lab Order 2111C07

Date Reported: 12/9/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD

Client Sample ID: GW-11209054-112321-CN-DUP

Project: MF 16

Collection Date: 11/23/2021

Lab ID: 2111C07-008

Matrix: AQUEOUS

Received Date: 11/24/2021 7:43:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2340B: HARDNESS							Analyst: ELS
Hardness as CaCO ₃	590	6.6		mg/L	1	12/1/2021 6:42:00 AM	R83200
EPA METHOD 300.0: ANIONS							Analyst: JMT
Chloride	550	25	*	mg/L	50	12/1/2021 4:17:42 AM	A83173
Sulfate	150	2.5		mg/L	5	11/24/2021 4:29:33 PM	R83131
EPA METHOD 200.7: METALS							Analyst: ELS
Calcium	120	5.0		mg/L	5	12/1/2021 8:09:54 AM	64187
Magnesium	69	1.0		mg/L	1	12/1/2021 8:07:48 AM	64187
Potassium	7.1	1.0		mg/L	1	12/1/2021 8:07:48 AM	64187
Sodium	290	5.0		mg/L	5	12/1/2021 8:09:54 AM	64187

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
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2111C07

09-Dec-21

Client: GHD
Project: MF 16

Sample ID: MB-64187	SampType: MBLK	TestCode: EPA Method 200.7: Metals								
Client ID: PBW	Batch ID: 64187	RunNo: 83176								
Prep Date: 11/29/2021	Analysis Date: 11/30/2021	SeqNo: 2954898	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID: LLCS-64187	SampType: LCSLL	TestCode: EPA Method 200.7: Metals								
Client ID: BatchQC	Batch ID: 64187	RunNo: 83176								
Prep Date: 11/29/2021	Analysis Date: 11/30/2021	SeqNo: 2954902	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0	0.5000	0	103	50	150			
Magnesium	ND	1.0	0.5000	0	104	50	150			
Potassium	ND	1.0	0.5000	0	83.6	50	150			
Sodium	ND	1.0	0.5000	0	108	50	150			

Sample ID: LCS-64187	SampType: LCS	TestCode: EPA Method 200.7: Metals								
Client ID: LCSW	Batch ID: 64187	RunNo: 83176								
Prep Date: 11/29/2021	Analysis Date: 11/30/2021	SeqNo: 2954904	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	99.0	85	115			
Magnesium	49	1.0	50.00	0	98.4	85	115			
Potassium	48	1.0	50.00	0	95.9	85	115			
Sodium	48	1.0	50.00	0	95.1	85	115			

Sample ID: 2111C07-001BMS	SampType: MS	TestCode: EPA Method 200.7: Metals								
Client ID: GW-11209054-11232	Batch ID: 64187	RunNo: 83176								
Prep Date: 11/29/2021	Analysis Date: 11/30/2021	SeqNo: 2954938	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	53	1.0	50.00	5.963	93.8	70	130			

Sample ID: 2111C07-001BMSD	SampType: MSD	TestCode: EPA Method 200.7: Metals								
Client ID: GW-11209054-11232	Batch ID: 64187	RunNo: 83176								
Prep Date: 11/29/2021	Analysis Date: 11/30/2021	SeqNo: 2954939	Units: mg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	53	1.0	50.00	5.963	94.2	70	130	0.416	20	

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
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix interference	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2111C07

09-Dec-21

Client: GHD

Project: MF 16

Sample ID: 2111C07-001BMS		SampType: MS		TestCode: EPA Method 200.7: Metals						
Client ID: GW-11209054-11232		Batch ID: 64187		RunNo: 83176						
Prep Date: 11/29/2021		Analysis Date: 11/30/2021		SeqNo: 2954941		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	160	5.0	50.00	119.4	75.1	70	130			
Magnesium	110	5.0	50.00	65.59	81.4	70	130			
Sodium	280	5.0	50.00	256.9	43.1	70	130			S

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

PQL Practical Quantitative Limit

S % Recovery outside of range due to dilution or matrix interference
- 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 Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2111C07

09-Dec-21

Client: GHD
Project: MF 16

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R83131	RunNo: 83131								
Prep Date:	Analysis Date: 11/24/2021	SeqNo: 2953130 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: R83131	RunNo: 83131								
Prep Date:	Analysis Date: 11/24/2021	SeqNo: 2953131 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.9	90	110			
Sulfate	9.4	0.50	10.00	0	94.4	90	110			

Sample ID: 2111C07-001AMS	SampType: ms	TestCode: EPA Method 300.0: Anions								
Client ID: GW-11209054-11232	Batch ID: R83131	RunNo: 83131								
Prep Date:	Analysis Date: 11/24/2021	SeqNo: 2953145 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	200	2.5	50.00	150.7	92.8	90.5	112			

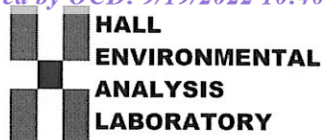
Sample ID: 2111C07-001AMSD	SampType: msd	TestCode: EPA Method 300.0: Anions								
Client ID: GW-11209054-11232	Batch ID: R83131	RunNo: 83131								
Prep Date:	Analysis Date: 11/24/2021	SeqNo: 2953146 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	200	2.5	50.00	150.7	99.2	90.5	112	1.60	20	

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: A83173	RunNo: 83173								
Prep Date:	Analysis Date: 12/1/2021	SeqNo: 2956260 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: LCS	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSW	Batch ID: A83173	RunNo: 83173								
Prep Date:	Analysis Date: 12/1/2021	SeqNo: 2956261 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	91.9	90	110			

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
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of range due to dilution or matrix interference	



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

Sample Log-In Check List

Client Name: GHD

Work Order Number: 2111C07

RcptNo: 1

Received By: Cheyenne Cason 11/24/2021 7:43:00 AM

Completed By: Sean Livingston 11/24/2021 8:25:57 AM

Reviewed By: TMC 11/24/21

Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☐ No ☒ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4"$ for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: 8
(<2 or >12 unless noted)

Adjusted? noChecked by: Cue 11/24/21Special Handling (if applicable)

15. 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: _____

16. Additional remarks:

17. Cooler Information

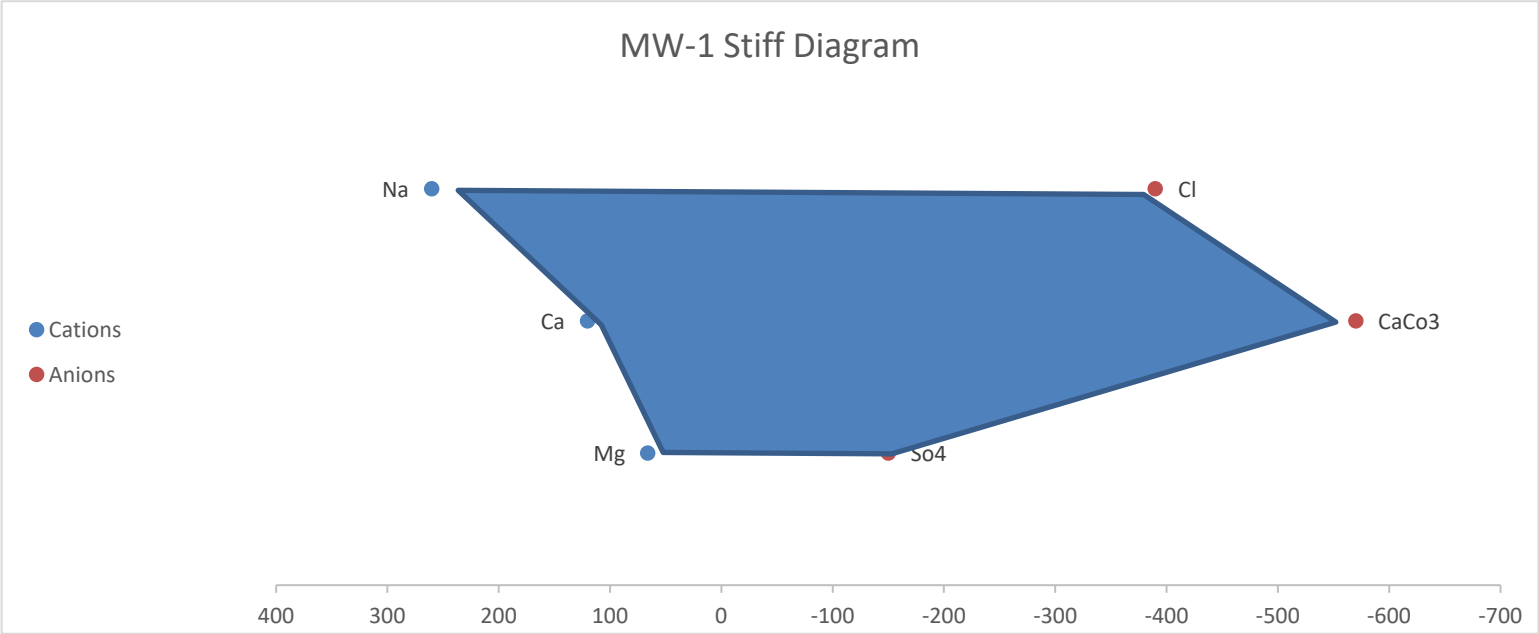
Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	-1.1	Good				

Appendix B

Stiff Diagrams

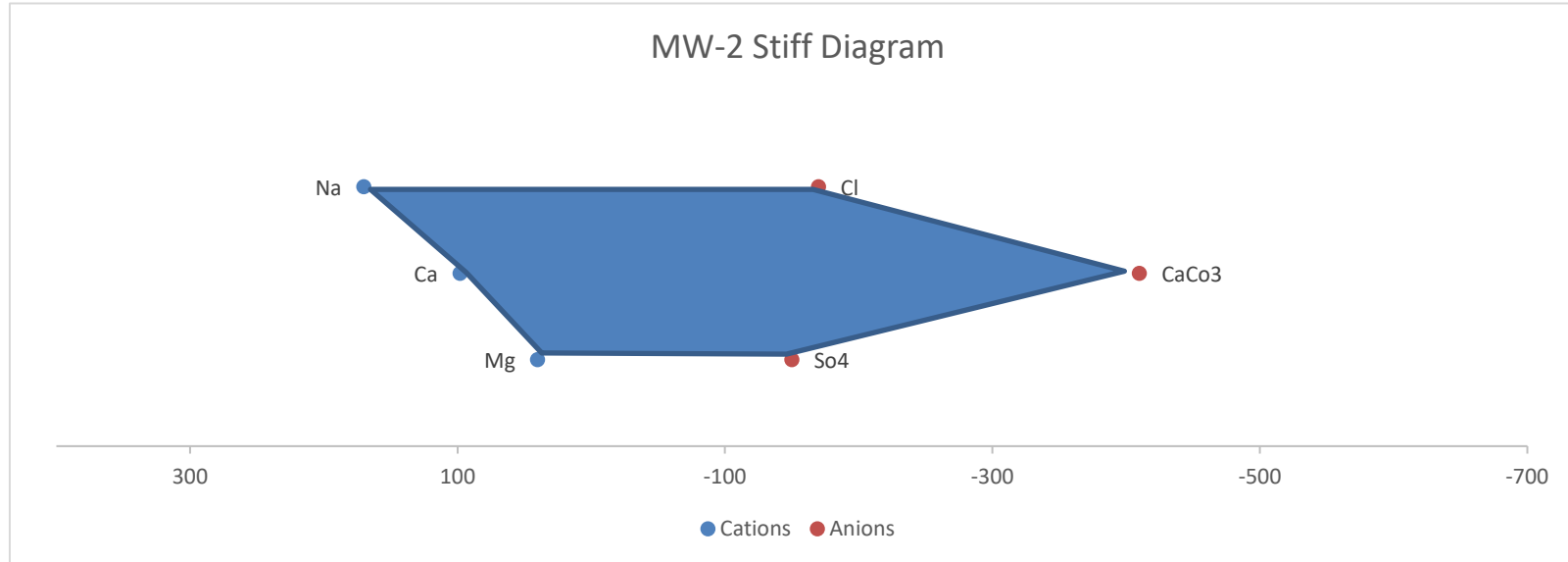
Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-1							
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2
1	Mg	66	So4	-150	Values of Cations	66	120
2	Ca	120	CaCo3	-570	Values Of Anions	-150	-570
3	Na	260	Cl	-390			-390



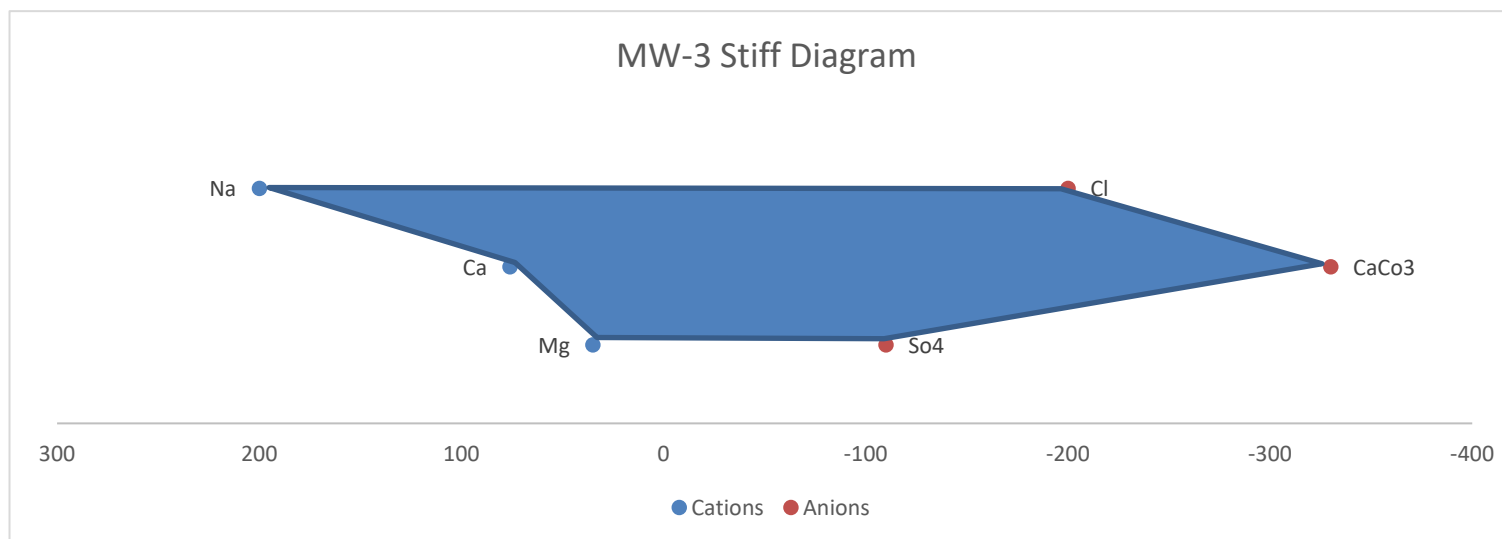
Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-2								
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2	3
1	Mg	40	So4	-150	Values of Cations	40	98	170
2	Ca	98	CaCo3	-410	Values Of Anions	-150	-410	-170
3	Na	170	Cl	-170				



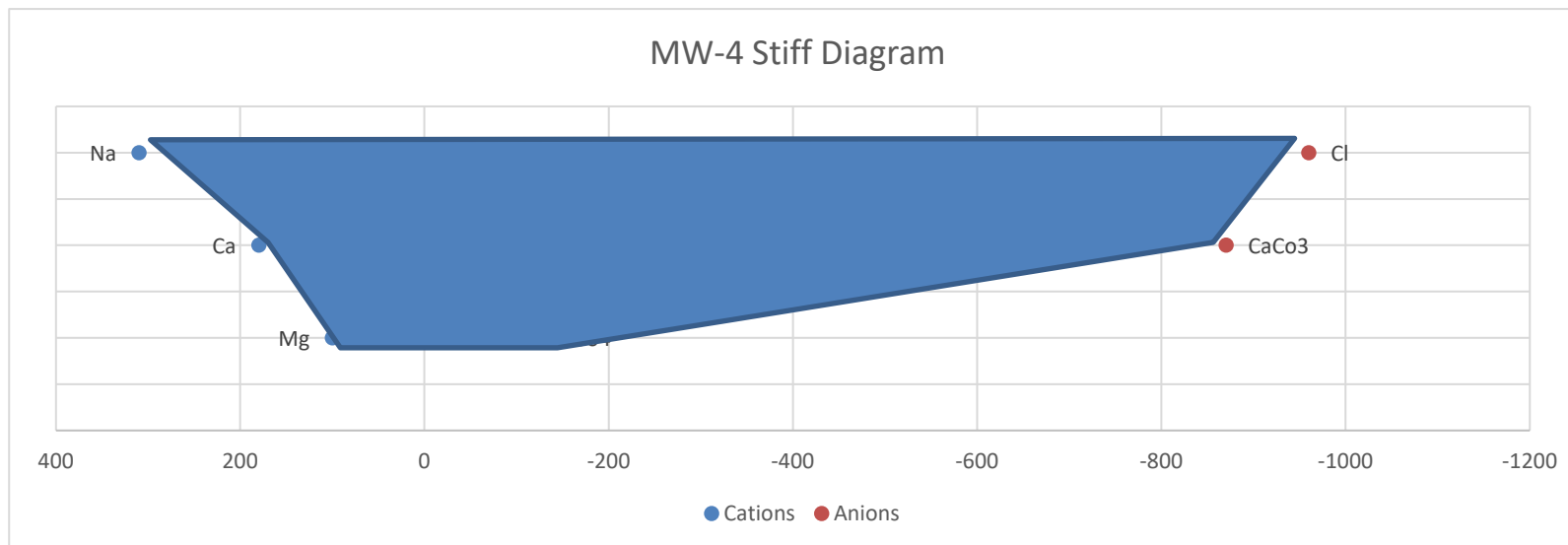
Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-3								
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2	3
1	Mg		35 So4	-110	Values of Cations	35	76	200
2	Ca		76 CaCo3	-330	Values Of Anions	-110	-330	-200
3	Na		200 Cl	-200				



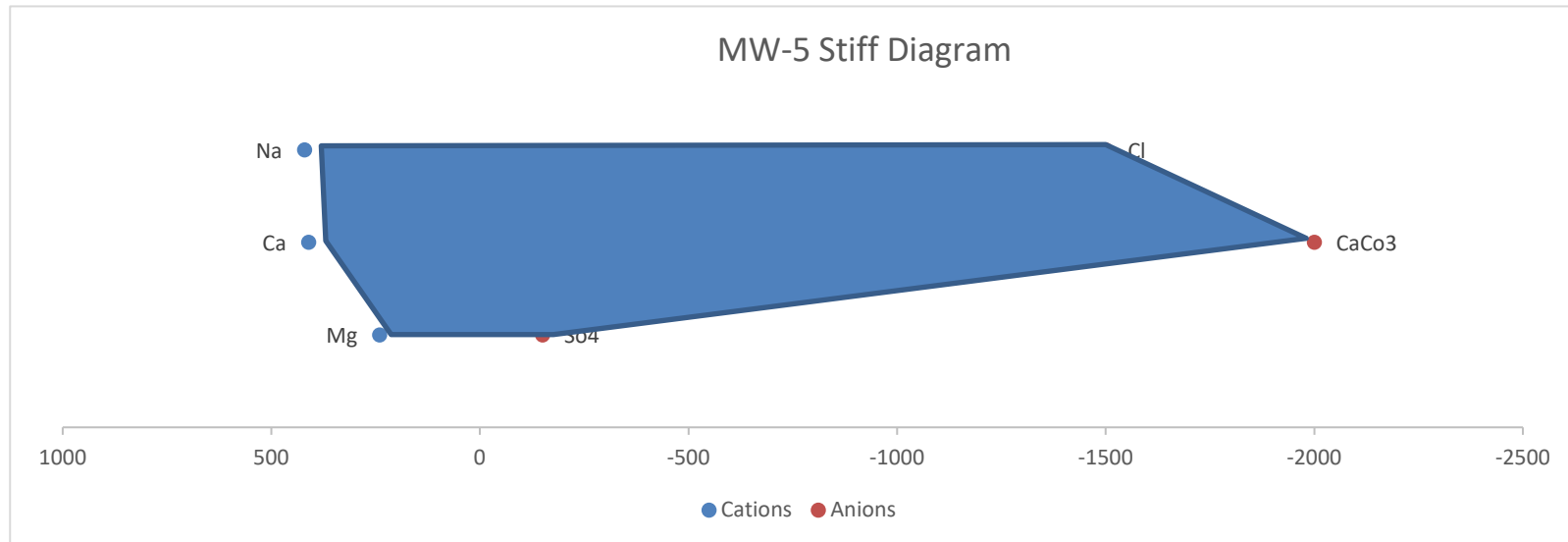
Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-4								
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2	3
1	Mg	100	So4	-140	Values of Cations	100	180	310
2	Ca	180	CaCo3	-870	Values Of Anions	-140	-870	-960
3	Na	310	Cl	-960				



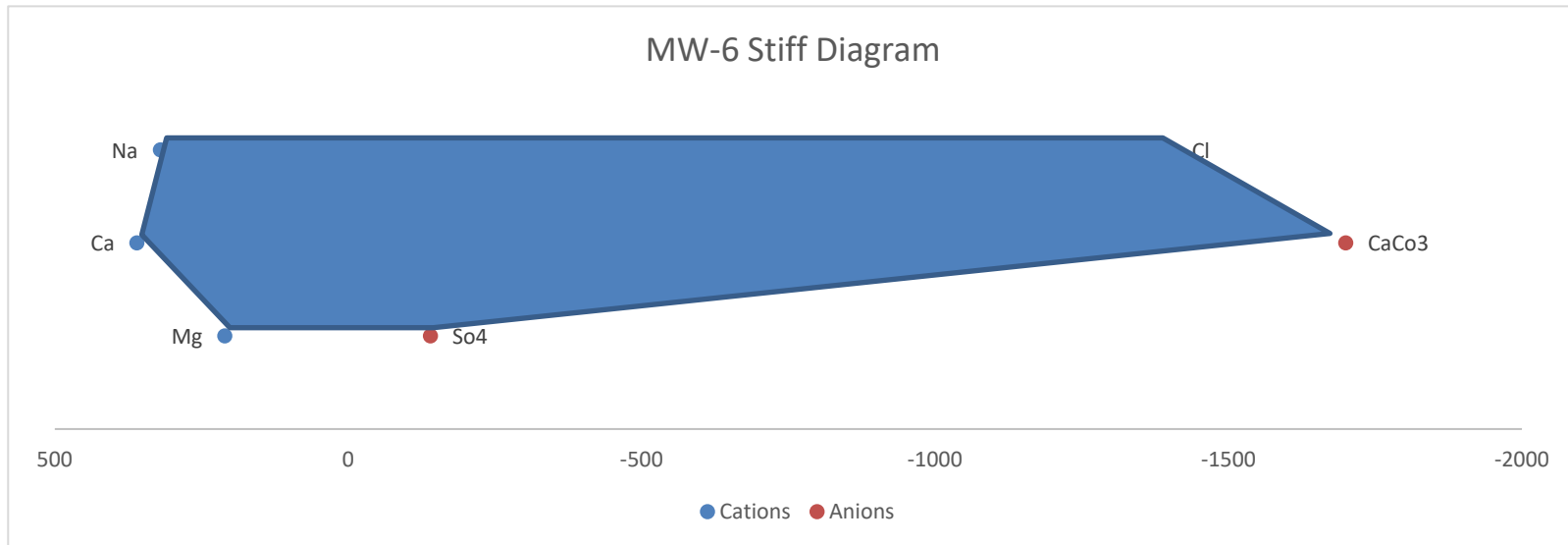
Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-5								
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2	3
1	Mg	240	So4	-150	Values of Cations	240	410	420
2	Ca	410	CaCo3	-2000	Values Of Anions	-150	-2000	-1500
3	Na	420	Cl	-1500				



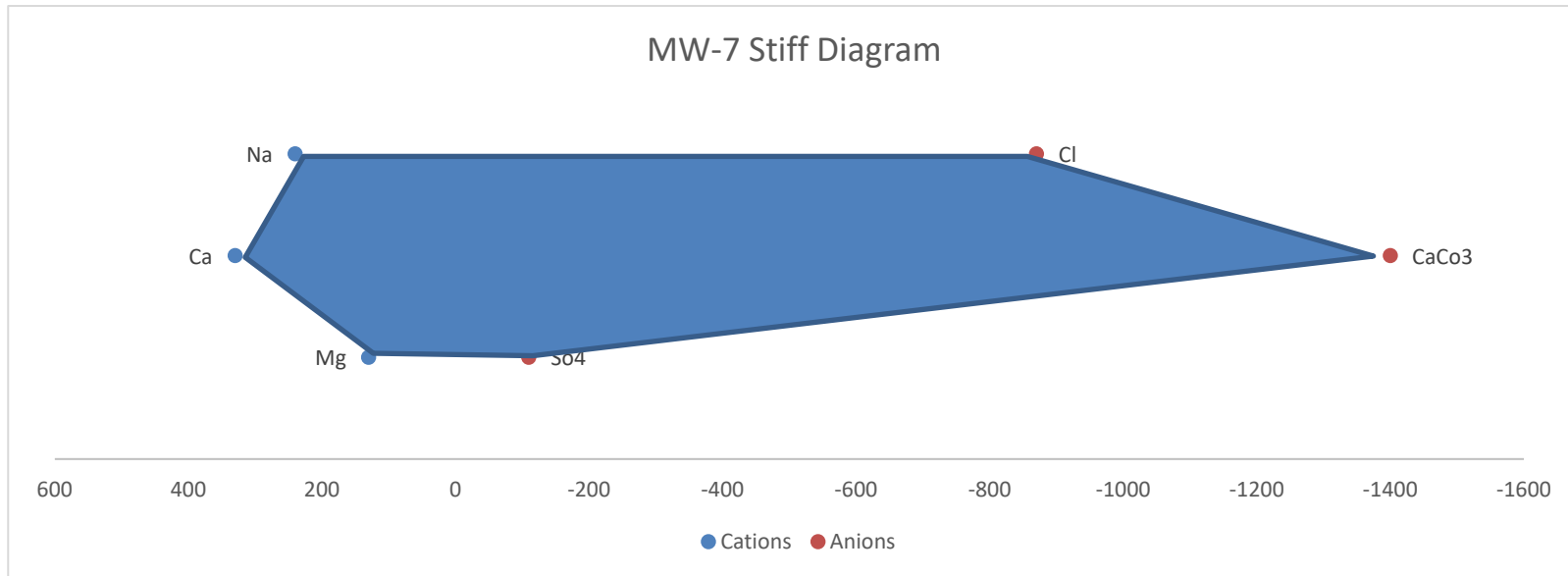
Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-6								
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2	3
1	Mg	210	So4	-140	Values of Cations	210	360	320
2	Ca	360	CaCo3	-1700	Values Of Anions	-140	-1700	-1400
3	Na	320	Cl	-1400				



Appendix B
Stiff Diagrams
MF 16-Inch Pipeline Release
ETC Texas Pipeline, Ltd.
Lea County, New Mexico

MW-7								
No.	Cation	Values of Cations	Anion	Values Of Anions	No.	1	2	3
1	Mg	130	So4	-110	Values of Cations	130	330	240
2	Ca	330	CaCo3	-1400	Values Of Anions	-110	-1400	-870
3	Na	240	Cl	-870				





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

CONDITIONS

Action 144729

CONDITIONS

Operator: ETC Texas Pipeline Ltd., Limited Partnership 8111 Westchester Drive Dallas, TX 75225	OGRID:
	328923
	Action Number:
	144729
Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)	

CONDITIONS

Created By	Condition	Condition Date
nvelez	Review of 2021 ANNUAL GROUNDWATER MONITORING REPORT: Content satisfactory OCD condition of approval are as follows; 1. 1. Following receipt of this report from OCD, operator will be required to install a minimum of four (4) groundwater monitor wells in the general areas displayed within Figure 5 of the report. Locations in general are in up/side gradient area, side gradient areas (2), and in down gradient direction (southeast) by February 20, 2024. 2. Continue groundwater monitoring and sampling on a semi-annual basis for chloride. 3. Submit the Annual Groundwater Monitoring Report to the OCD no later than April 1, 2024.	5/24/2023