



March 25, 2025

New Mexico Oil Conservation Division

New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: 2024 Annual Groundwater Monitoring Report

Mangum #1
San Juan County, New Mexico
NMOCD Incident Number: NCS1602631162
NMOCD Administrative Order: 3RP-1038

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *2024 Annual Groundwater Monitoring Report* to the New Mexico Oil Conservation Division (NMOCD). This report documents quarterly groundwater monitoring activities conducted at the Mangum #1 natural gas production well (Site) in 2024. The Site is located approximately 1-mile south of the City of Bloomfield, New Mexico and is situated on surface managed by the Bureau of Land Management (BLM) within Unit L, Section 27, Township 29 North and Range 11 West, San Juan County, New Mexico (Figure 1).

SITE BACKGROUND

In April of 2015, ConocoPhillips Company (COP, well owner/operator at that time) conducted a Site assessment as part of internal due diligence activities. Seven potholes were advanced to depths of approximately 7.5 feet to 8 feet below ground surface (bgs) using a backhoe. Following the Site assessment, COP excavated impacted soil in February 2016. The final excavation measured approximately 100 feet by 38 feet laterally by 9 feet to 17 feet vertically. Approximately 1,400 cubic yards of impacted soil were transported for off-site disposal at Industrial Ecosystems, Inc in Aztec, New Mexico. Groundwater was encountered in the bottom of the excavation at a depth of 16 feet bgs. A total of 1 foot of groundwater-saturated soil was removed from the excavation in the deepest extents. Approximately 275 barrels (bbls) of impacted groundwater was then removed from the bottom of the excavation and transported for off-site disposal to Industrial Ecosystems, Inc. Five-point composite soil samples were collected from the sidewalls and shallow floor area (area excavated to 9 feet bgs). In total, five sidewall samples and one floor sample were collected to confirm the removal of impacted soil. All soil analytical results were below the Site closure standards for total petroleum hydrocarbons (TPH), chloride, and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The NMOCD approved backfill of the excavation via email communications on February 22, 2016.

Four groundwater monitoring wells (MW-1 through MW-4) were subsequently installed in May 2016 to assess and monitor groundwater conditions at the Site (Figure 2). Based on initial

analysis, the following contaminants of concern (COCs) were identified for groundwater at the Site: benzene, xylenes, dissolved iron, dissolved manganese, sulfate, and total dissolved solids (TDS). Quarterly sampling has been performed since June 2016 from wells MW-1 through MW-4.

GHD Services, Inc. (GHD) prepared the *2018 Annual Groundwater Monitoring Report* (dated January 2019) summarizing groundwater sampling activities performed in 2018. Based on their review of the report, the NMOCD required Hilcorp to “fully delineate the groundwater plume” at the Site. In response, Hilcorp/GHD installed three new groundwater monitoring wells (MW-5, MW-6, and MW-7) in locations downgradient of the release in June 2019 (Figure 2). The installation of one additional well (MW-8) was attempted in an upgradient location (Figure 2) but encountered shallow refusal in two separate locations and was finally abandoned. The newly installed wells were incorporated into the quarterly sampling program starting in the third quarter of 2019. Historical quarterly sampling results indicated BTEX constituents, dissolved manganese, sulfate, and/or TDS were present in the Site groundwater at concentrations above New Mexico Water Quality Control Commission (NMWQCC) standards. In addition, dissolved iron concentrations were sporadically detected at concentrations exceeding the NMWQCC standard during past events and has been historically included in quarterly sampling events.

Lastly, Hilcorp has managed the groundwater monitoring project at Mangum #1 (API 30-045-07835, NMOCD Incident ID NCS1602631162) since 2017, when Hilcorp acquired certain other San Juan assets from Burlington Resources Oil & Gas Company LP (“Burlington”) and COP. A recent review revealed that the Mangum #1 wellsite is not owned or operated by Hilcorp and Hilcorp is not liable for the remediation obligations at this Site. Effective October 1, 2016 (and prior to Hilcorp’s San Juan acquisition), Burlington assigned the Mangum #1 well to LCS Company, Inc. (LCS) and resigned as the operator of such well. Holcomb Oil & Gas, Inc (Holcomb), an affiliate of LCS, became the operator of the Mangum #1 following Burlington’s resignation. Additionally, Holcomb is the operator of record noted on the NMOCD website. During that same period, Burlington and COP agreed to remain responsible for the remediation obligations related to the Mangum #1.

Although Hilcorp did not take assignment of, and assumed no liabilities related to, the Mangum #1 well, Hilcorp has elected to continue quarterly sampling until a resolution is achieved with Holcomb and the NMOCD.

SITE GROUNDWATER CLEANUP STANDARDS

The NMOCD requires groundwater-quality standards be met as presented by the NMWQCC and listed in Title 20, Chapter 6, Part 2, Section 3103 (20.6.2.3103) of the New Mexico Administrative Code (NMAC). The following standards are presented for the COCs at the Site in milligrams per liter (mg/L).

- Benzene: 0.005 mg/L
- Toluene: 1.0 mg/L
- Ethylbenzene: 0.70 mg/L
- Total Xylenes: 0.62 mg/L
- Dissolved Manganese: 0.20 mg/L
- Sulfate: 600 mg/L
- Total Dissolved Solids: 1,000 mg/L

As approved by the NMOCD in their May 31, 2024, review of the *2023 Annual Groundwater Monitoring Report*, iron is no longer considered a COC.

GROUNDWATER SAMPLING ACTIVITIES AND RESULTS

Groundwater level measurements and samples were collected in March, June, September, and December 2024 from wells MW-1 through MW-7. Static groundwater level monitoring included recording depth-to-groundwater measurements of each monitoring well using a Keck oil/water interface probe. The interface probe was decontaminated with Alconox® soap and rinsed with distilled water prior to each measurement to prevent cross-contamination. Groundwater elevations measured in monitoring wells during the 2024 sampling events are presented in Table 1 and were used to develop groundwater potentiometric surface maps (Figures 3 through 6). The inferred groundwater flow direction is to the north.

GROUNDWATER SAMPLING

Groundwater from each monitoring well was purged and sampled using a disposable bailer. Purging was accomplished by removing stagnant groundwater from the monitoring well prior to collecting a sample. Field measurements of groundwater quality parameters, including temperature, pH, TDS, electrical conductivity, dissolved oxygen, and oxidation-reduction potential, were collected during the purging process, and are presented in Table 2.

Following well purging, groundwater samples were placed directly into laboratory-provided containers and labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. Samples were immediately sealed with zero headspace and packed on ice to preserve samples. Samples were submitted to Eurofins Environment Testing (Eurofins) in Albuquerque, New Mexico, for analysis of BTEX following United States Environmental Protection Agency (EPA) Method 8260B, dissolved manganese following EPA Method 200.7, sulfate following EPA Method 300.0, and TDS following Method SM2540C MOD. Proper chain-of-custody 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.

GROUNDWATER ANALYTICAL RESULTS

In general, data collected in 2024 were consistent with historical Site results. Benzene was detected in groundwater during one or more quarters at concentrations above the NMWQCC standard in wells MW-2, MW-3, and MW-6. Ethylbenzene, toluene, and total xylenes were not detected above the NMWQCC standards in any of the wells during 2024 sampling events.

Dissolved manganese and TDS were detected at concentrations above the NMWQCC standards in all wells during one or more quarterly sampling events in 2024. Sulfate was detected at concentrations above the NMWQCC standard during one or more quarterly sampling events in wells MW-1, MW-3, MW-4, MW-5, and MW-7. A summary of analytical results is presented in Table 3 and depicted on Figure 7, with complete laboratory analytical reports attached as Appendix A.

CONCLUSIONS AND RECOMMENDATIONS

Based on the groundwater analytical data collected since 2016, overall groundwater conditions have improved over time, with BTEX concentrations decreasing in all wells between 2016 and 2024. Natural attenuation through biodegradation processes appears to be occurring in all wells based on historical data and active remediation is not currently recommended at the Site. Dissolved manganese, sulfate, and TDS concentrations have largely remained consistent since they were first analyzed in 2016. Dissolved manganese and TDS concentrations have also consistently exceeded the NMWQCC standards since initial sampling efforts began in 2016. Although concentrations of manganese, sulfate, and TDS could be elevated as a byproduct of

petroleum degradation, these constituents are often naturally occurring at elevated concentrations in areas with shallow, perched groundwater.

Based on current and historical data gathered at the Site, Ensolum/Hilcorp recommend the following actions:

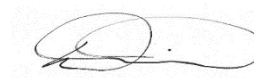
- Continue quarterly monitoring of all Site wells for BTEX constituents, dissolved manganese, sulfate, and TDS. Quarterly monitoring will continue until a resolution is achieved with Holcomb and the NMOCD.
- Previous annual reports recommended the installation of an upgradient groundwater monitoring well in the location previously attempted in 2019 (location MW-8). However, it appears COP and/or Holcomb are responsible for environmental liabilities at the Site and as such, Hilcorp does not plan to install any additional wells at this time.

Ensolum appreciates the opportunity to provide these environmental services to Hilcorp. Please contact either of the undersigned with any questions.

Sincerely,
Ensolum, LLC



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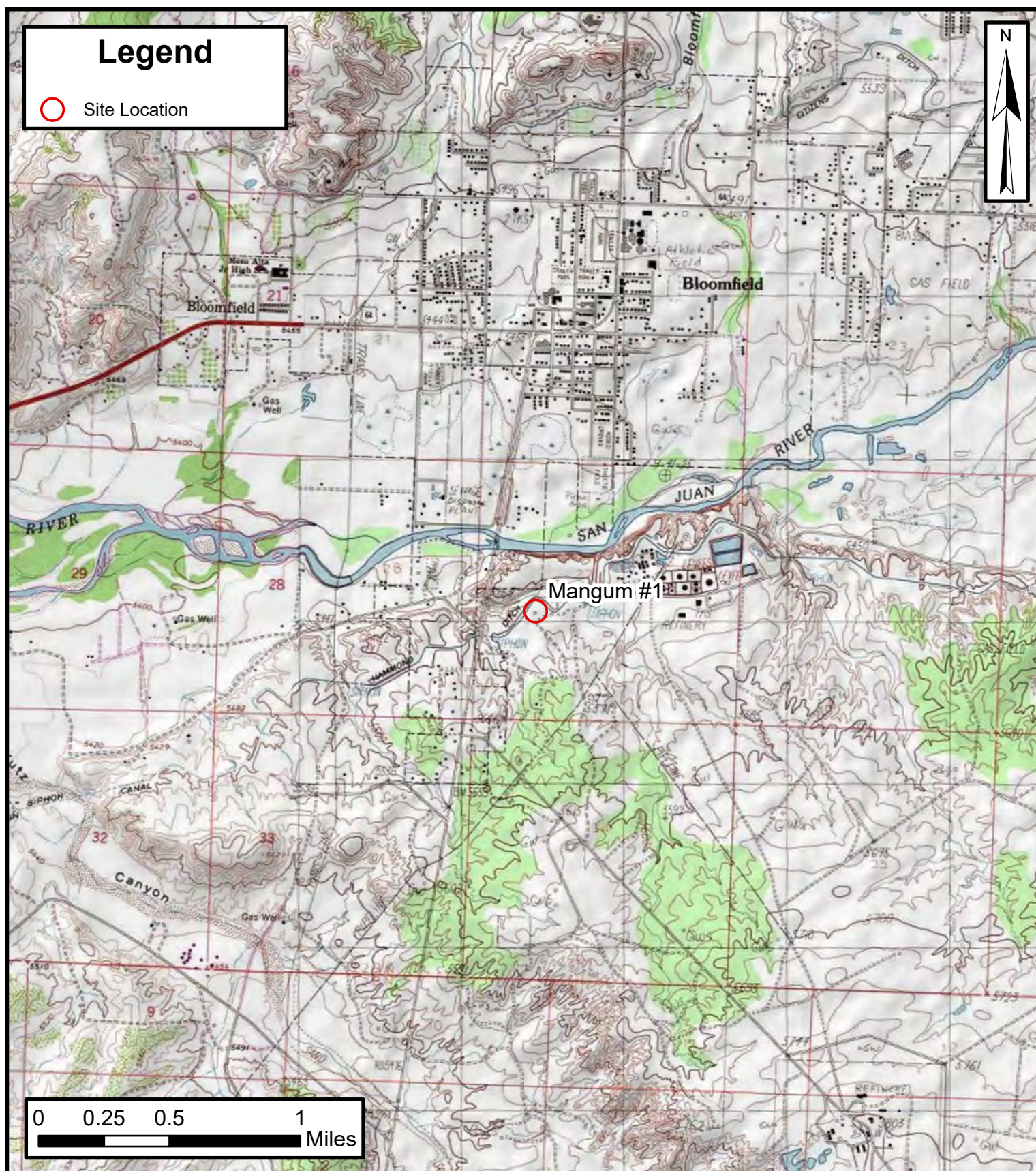
Daniel R. Moir
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Attachments:

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3	Q1 Groundwater Elevation Map
Figure 4	Q2 Groundwater Elevation Map
Figure 5	Q3 Groundwater Elevation Map
Figure 6	Q4 Groundwater Elevation Map
Figure 7	Groundwater Analytical Results
Table 1	Groundwater Elevations
Table 2	Groundwater Quality Measurements
Table 3	Groundwater Analytical Results
Appendix A	Laboratory Analytical Reports



FIGURES

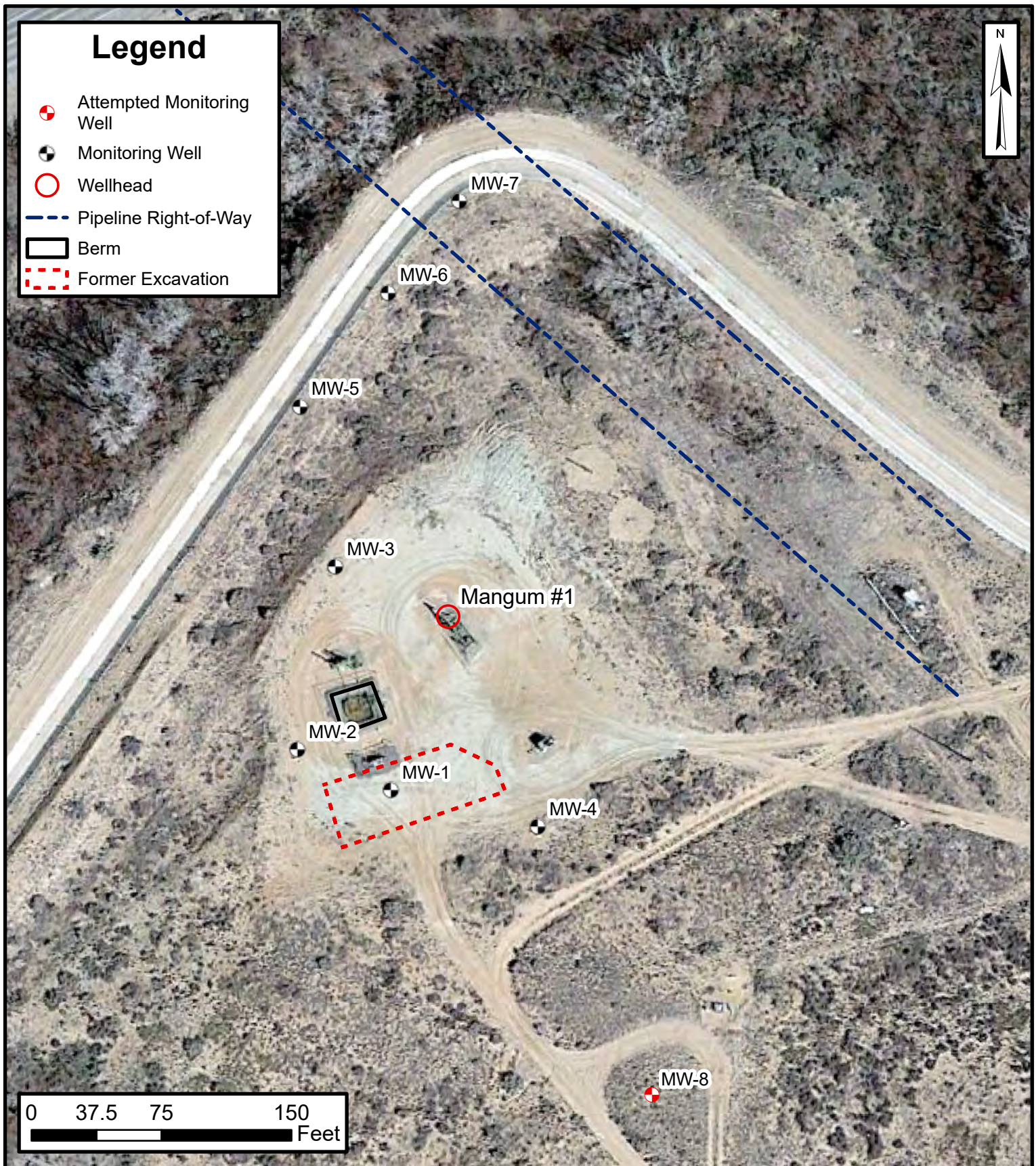


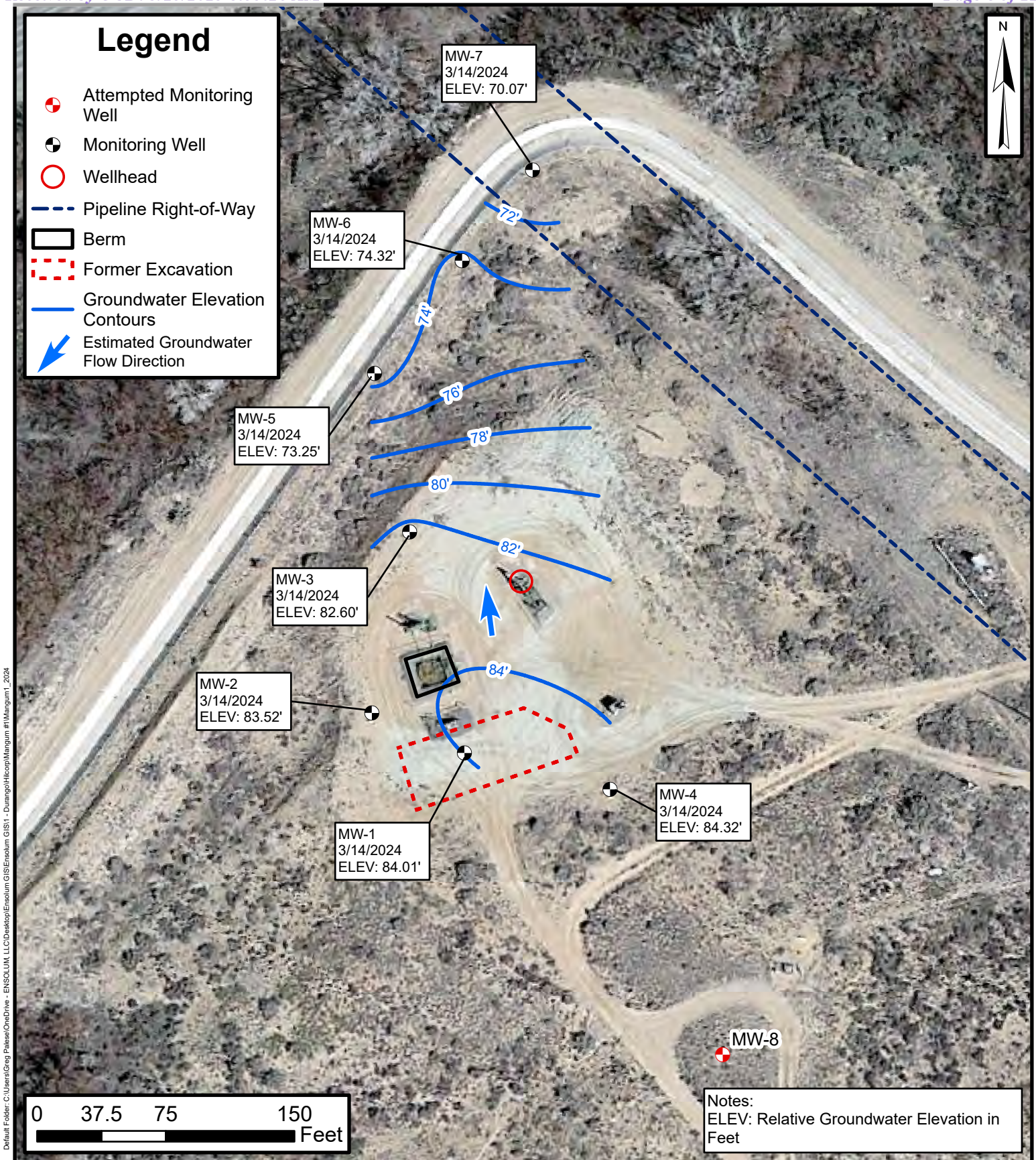
ENSOLUM
Environmental, Engineering and
Hydrogeologic Consultants

Site Location Map

Mangum #1
Hilcorp Energy Company
36.69579, -107.98402
San Juan County, New Mexico

FIGURE
1

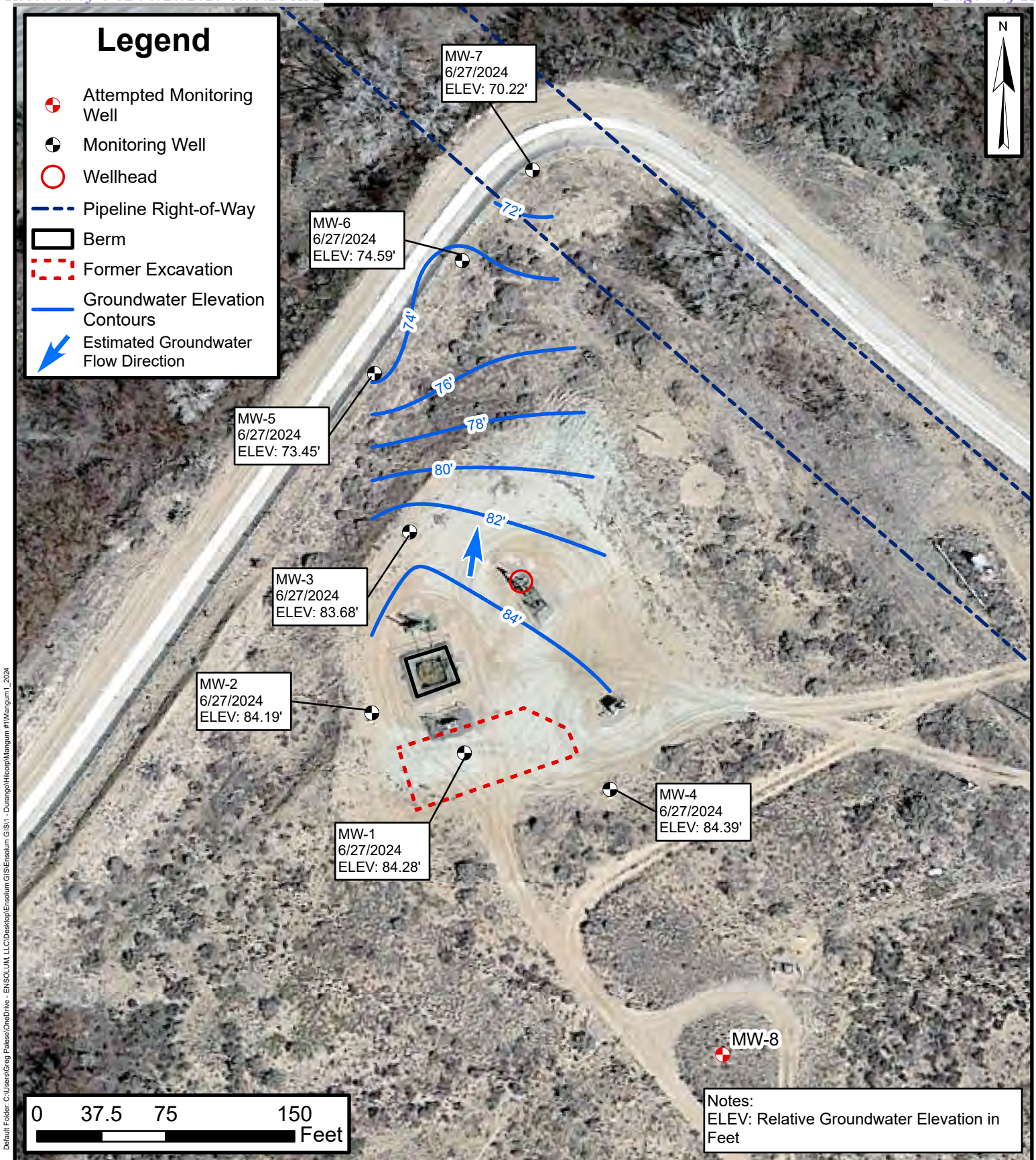




Q1 Groundwater Elevation Map

Mangum #1
Hilcorp Energy Company
36.69579, -107.98402
San Juan County, New Mexico

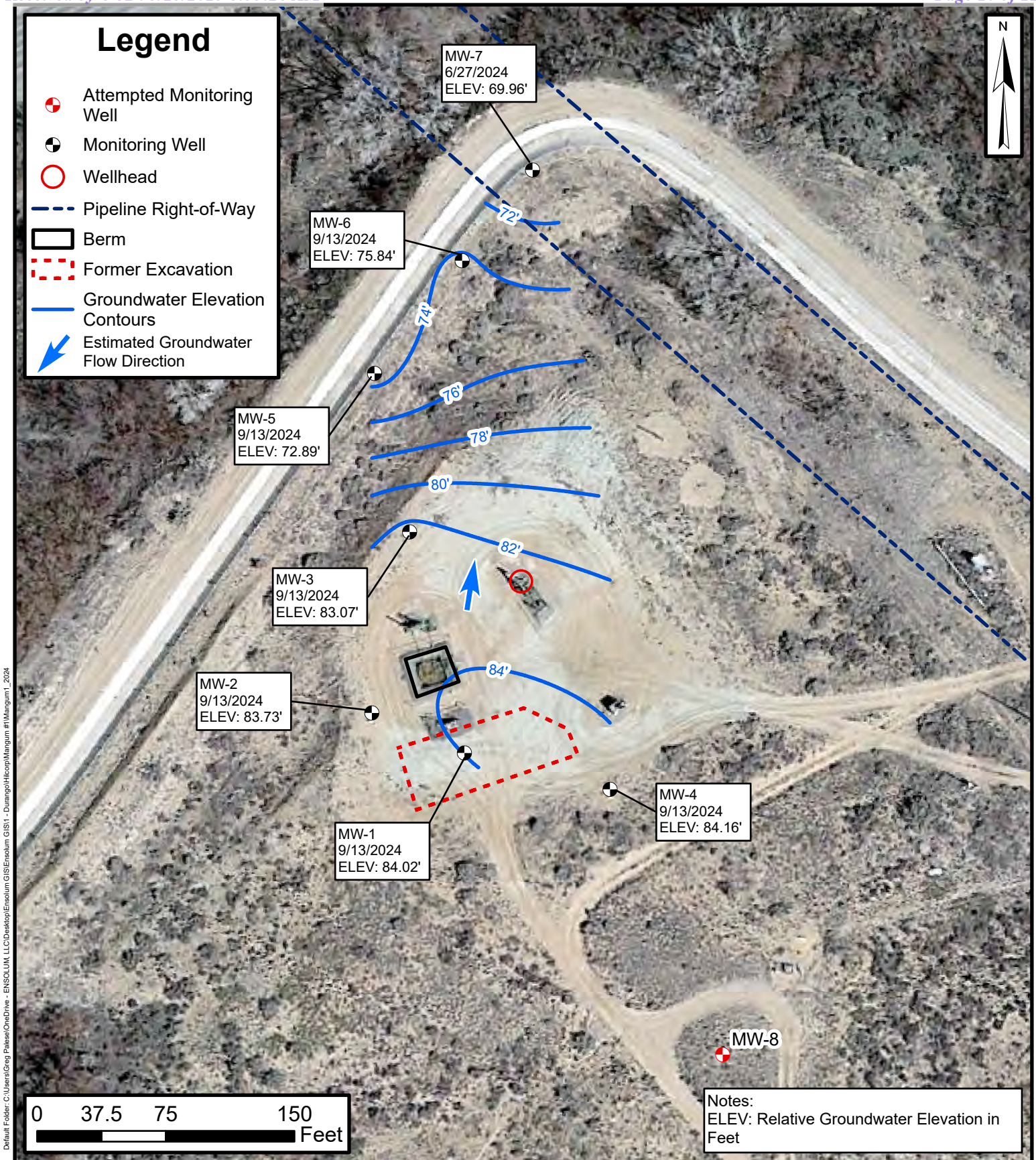
FIGURE
3



Q2 Groundwater Elevation Map

Mangum #1
Hilcorp Energy Company
36.69579, -107.98402
San Juan County, New Mexico

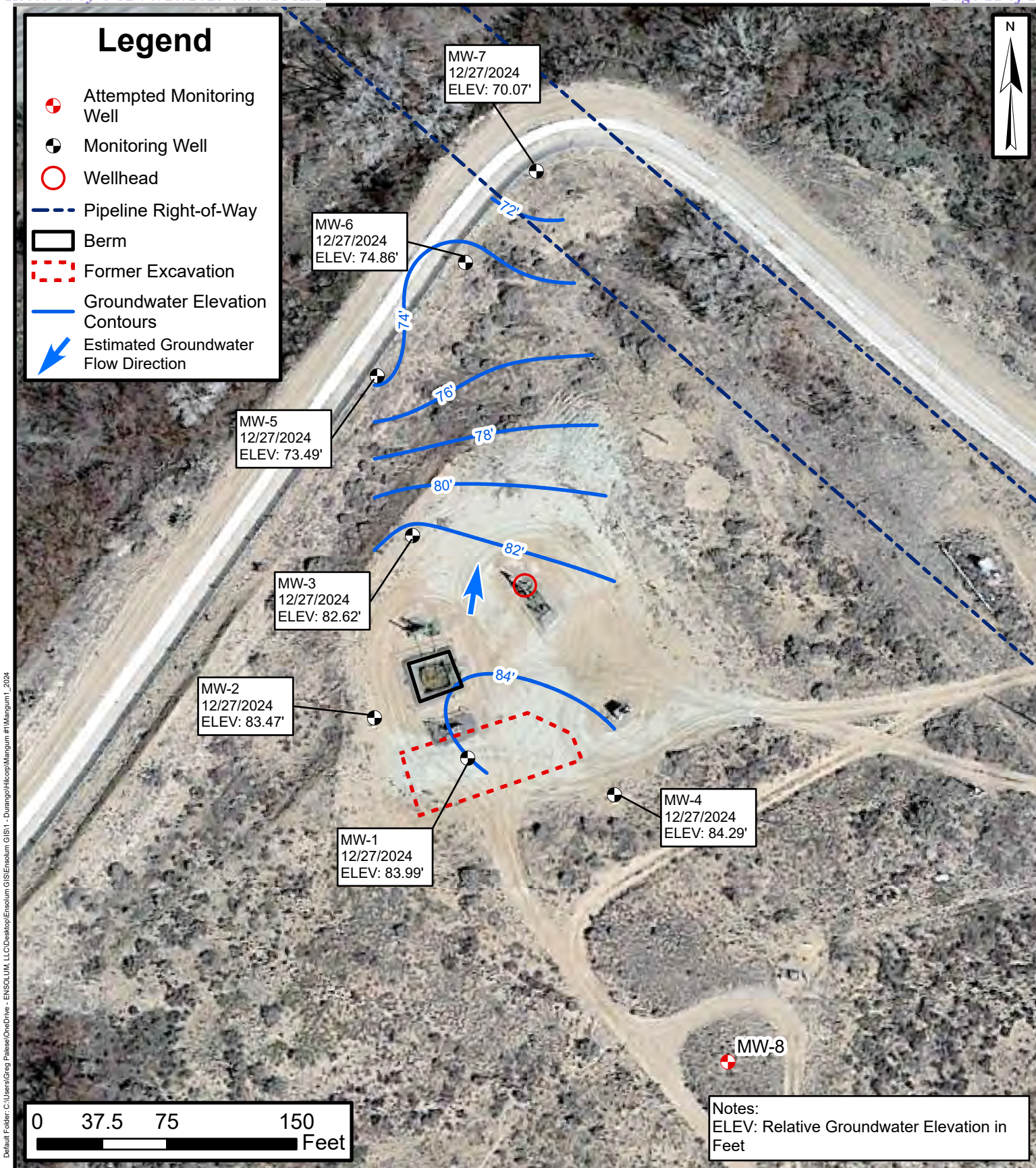
FIGURE
4



Q3 Groundwater Elevation Map

Mangum #1
Hilcorp Energy Company
36.69579, -107.98402
San Juan County, New Mexico

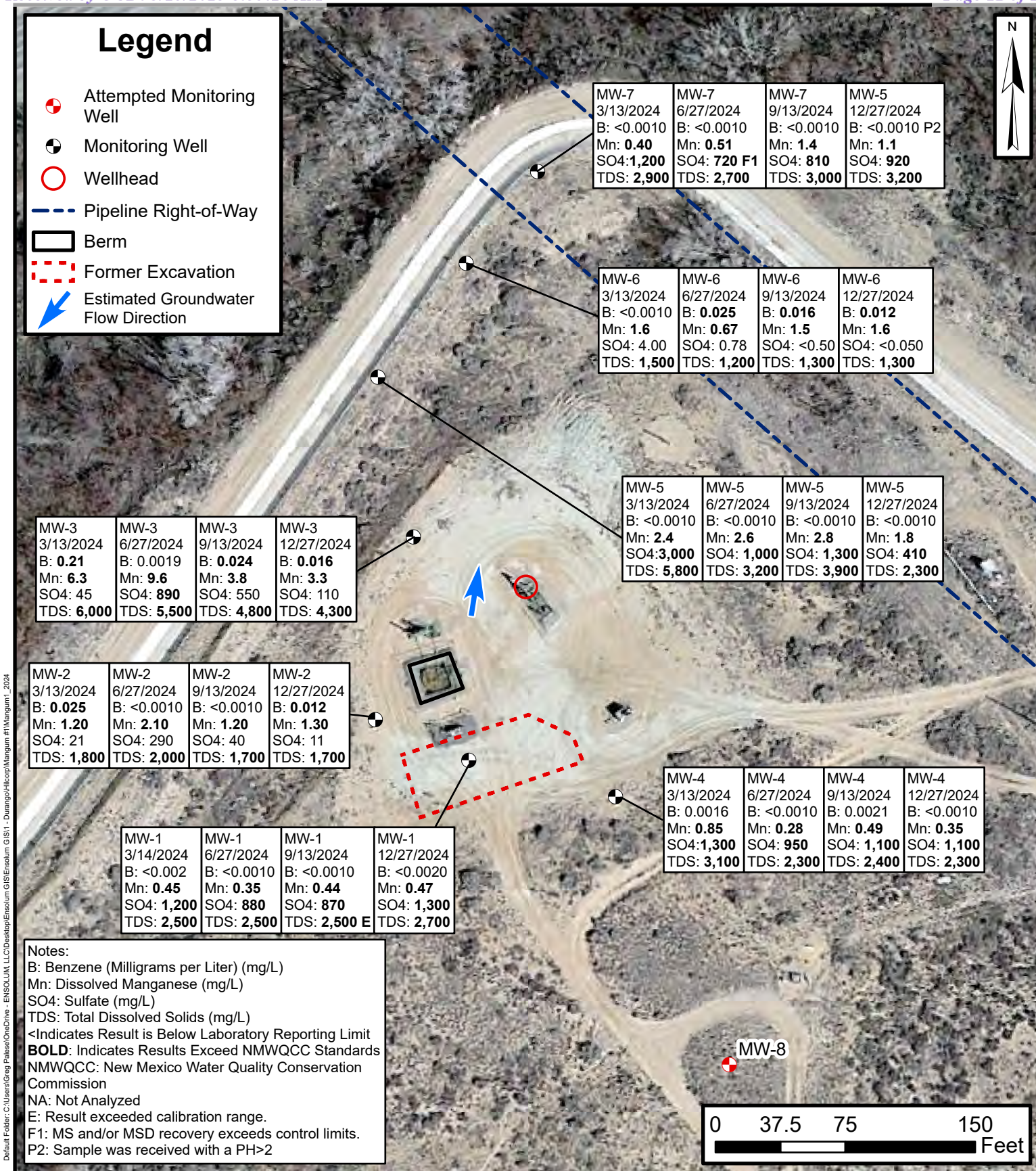
FIGURE
5



Q4 Groundwater Elevation Map

Mangum #1
Hilcorp Energy Company
36.69579, -107.98402
San Juan County, New Mexico

FIGURE
6



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Groundwater Analytical Results

Mangum #1
 Hilcorp Energy Company
 36.69579, -107.98402
 San Juan County, New Mexico

FIGURE
7



TABLES



TABLE 1 GROUNDWATER ELEVATIONS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico				
Well Identification	Top of Casing Elevation (1)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (1)
MW-1	98.97	6/8/2016	15.12	83.85
		9/12/2016	14.75	84.22
		11/29/2016	15.06	83.91
		3/6/2017	14.91	84.06
		6/12/2017	14.96	84.01
		10/26/2017	15.00	83.97
		12/4/2017	15.08	83.89
		3/13/2018	15.22	83.75
		6/25/2018	15.23	83.74
		9/4/2018	15.39	83.58
		12/10/2018	15.12	83.85
		3/12/2019	15.04	83.93
		5/22/2019	14.93	84.04
		8/22/2019	15.19	83.78
		12/2/2019	15.21	83.76
		2/3/2020	15.19	83.78
		4/24/2020	15.22	83.75
		7/24/2020	15.00	83.97
		10/8/2020	15.21	83.76
		1/11/2021	15.29	83.68
		4/12/2021	15.26	83.71
		8/2/2021	14.88	84.09
		10/7/2021	15.09	83.88
		1/10/2022	15.19	83.78
		6/23/2022	14.96	84.01
		9/28/2022	15.23	83.74
		12/29/2022	15.18	83.79
		3/28/2023	15.10	83.87
		6/26/2023	15.03	83.94
		9/13/2023	15.28	83.69
		12/28/2023	14.88	84.09
		3/14/2024	14.96	84.01
		6/27/2024	14.69	84.28
		9/13/2024	14.95	84.02
		12/27/2024	14.98	83.99
MW-2	101.05	6/8/2016	17.49	83.56
		9/12/2016	17.28	83.77
		11/29/2016	17.62	83.43
		3/6/2017	17.49	83.56



TABLE 1 GROUNDWATER ELEVATIONS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico				
Well Identification	Top of Casing Elevation (1)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (1)
MW-2	101.05	6/12/2017	17.40	83.65
		10/26/2017	17.49	83.56
		12/4/2017	17.57	83.48
		3/13/2018	17.74	83.31
		6/25/2018	17.32	83.73
		9/5/2018	17.64	83.41
		12/10/2018	17.58	83.47
		3/12/2019	17.56	83.49
		5/22/2019	17.18	83.87
		8/22/2019	17.30	83.75
		12/2/2019	17.65	83.40
		2/3/2020	18.74	82.31
		4/24/2020	17.71	83.34
		7/24/2020	17.08	83.97
		10/8/2020	17.22	83.83
		1/11/2021	17.80	83.25
		4/12/2021	17.80	83.25
		8/2/2021	16.64	84.41
		10/7/2021	17.23	83.82
		1/10/2022	17.73	83.32
		6/23/2022	16.91	84.14
		9/28/2022	17.53	83.52
		12/29/2022	17.78	83.27
		3/28/2023	17.60	83.45
		6/26/2023	17.38	83.67
		9/13/2023	17.55	83.50
		12/28/2023	17.59	83.46
		3/14/2024	17.53	83.52
		6/27/2024	16.86	84.19
		9/13/2024	17.32	83.73
		12/27/2024	17.58	83.47
MW-3	101.35	6/8/2016	18.47	82.88
		9/12/2016	18.41	82.94
		11/29/2016	18.84	82.51
		3/6/2017	19.01	82.34
		6/12/2017	18.32	83.03
		10/26/2017	18.50	82.85
		12/4/2017	18.87	82.48
		3/13/2018	19.13	82.22
		6/25/2018	18.14	83.21
		9/5/2018	18.54	82.81



TABLE 1 GROUNDWATER ELEVATIONS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico				
Well Identification	Top of Casing Elevation (1)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (1)
MW-3	101.35	12/10/2018	18.71	82.64
		3/11/2019	18.69	82.66
		5/22/2019	18.19	83.16
		8/22/2019	18.28	83.07
		12/22/2019	18.62	82.73
		2/3/2020	18.84	82.51
		4/24/2020	18.84	82.51
		7/23/2020	18.05	83.30
		10/5/2020	18.12	83.23
		1/8/2021	18.87	82.48
		4/12/2021	18.94	82.41
		8/2/2021	17.62	83.73
		10/6/2021	18.08	83.27
		1/10/2022	18.84	82.51
		6/23/2022	17.83	83.52
		9/28/2022	18.44	82.91
		12/29/2022	18.87	82.48
		3/28/2023	18.92	82.43
		6/26/2023	18.32	83.03
		9/13/2023	18.38	82.97
		12/28/2023	18.78	82.57
		3/14/2024	18.75	82.60
		6/27/2024	17.67	83.68
		9/13/2024	18.28	83.07
		12/27/2024	18.73	82.62
MW-4	103.76	6/8/2016	19.72	84.04
		9/12/2016	19.43	84.33
		11/29/2016	19.62	84.14
		3/6/2017	19.50	84.26
		6/21/2017	19.76	84.00
		10/26/2017	19.59	84.17
		12/4/2017	19.62	84.14
		3/13/2018	19.76	84.00
		6/25/2018	19.89	83.87
		9/4/2018	19.03	84.73
		12/10/2018	19.69	84.07
		3/12/2019	19.63	84.13
		5/22/2019	19.57	84.19
		8/22/2019	19.92	83.84
		12/2/2019	19.81	83.95
		2/3/2020	19.79	83.97



TABLE 1 GROUNDWATER ELEVATIONS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico				
Well Identification	Top of Casing Elevation (1)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (1)
MW-4	103.76	4/24/2020	19.78	83.98
		7/23/2020	19.66	84.10
		10/8/2020	19.94	83.82
		1/11/2021	19.88	83.88
		4/12/2021	19.84	83.92
		8/2/2021	19.88	83.88
		10/6/2021	19.78	83.98
		1/11/2022	19.78	83.98
		6/23/2022	19.69	84.07
		9/28/2022	19.92	83.84
		12/29/2022	19.73	84.03
		3/28/2023	19.51	84.25
		6/26/2023	19.70	84.06
		9/13/2023	19.96	83.80
		12/28/2023	19.26	84.50
		3/14/2024	19.44	84.32
		6/27/2024	19.37	84.39
		9/13/2024	19.60	84.16
		12/27/2024	19.47	84.29
MW-5	95.77	8/23/2019	23.32	72.45
		9/19/2019	23.13	72.64
		12/4/2019	22.51	73.26
		2/4/2020	22.42	73.35
		4/27/2020	22.63	73.14
		7/24/2020	23.05	72.72
		10/5/2020	22.85	72.92
		1/8/2021	22.58	73.19
		4/13/2021	22.61	73.16
		8/2/2021	22.86	72.91
		10/8/2021	22.44	73.33
		1/11/2022	22.65	73.12
		6/23/2022	22.92	72.85
		9/28/2022	23.29	72.48
		12/29/2022	22.72	73.05
		3/28/2023	22.94	72.83
		6/26/2023	23.22	72.55
		9/13/2023	23.60	72.17
		12/28/2023	22.69	73.08
		3/14/2024	22.52	73.25
		6/27/2024	22.32	73.45
		9/13/2024	22.88	72.89
		12/27/2024	22.28	73.49



TABLE 1 GROUNDWATER ELEVATIONS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico				
Well Identification	Top of Casing Elevation (1)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (1)
MW-6	94.70	8/23/2019	19.98	74.72
		9/19/2019	18.63	76.07
		12/4/2019	19.09	75.61
		2/4/2020	20.22	74.48
		4/27/2020	20.53	74.17
		7/24/2020	17.53	77.17
		10/5/2020	18.82	75.88
		1/8/2021	20.59	74.11
		4/13/2021	21.19	73.51
		8/2/2021	19.24	75.46
		10/8/2021	19.02	75.68
		1/11/2022	20.95	73.75
		6/23/2022	19.81	74.89
		9/28/2022	20.22	74.48
		12/29/2022	21.53	73.17
		3/28/2023	21.67	73.03
		6/26/2023	19.96	74.74
		9/13/2023	20.23	74.47
		12/28/2023	20.65	74.05
		3/14/2024	20.38	74.32
		6/27/2024	20.11	74.59
		9/13/2024	18.86	75.84
		12/27/2024	19.84	74.86
MW-7	94.49	8/23/2019	24.04	70.45
		9/19/2019	23.66	70.83
		12/4/2019	23.69	70.80
		2/4/2020	23.62	70.87
		4/27/2020	23.24	71.25
		7/24/2020	24.01	70.48
		10/5/2020	24.35	70.14
		1/11/2021	24.34	70.15
		4/13/2021	24.54	69.95
		8/2/2021	24.94	69.55
		10/7/2021	24.62	69.87
		1/11/2022	24.82	69.67
		6/23/2022	24.79	69.70
		9/28/2022	25.29	69.20
		12/29/2022	24.93	69.56
		3/28/2023	24.99	69.50
		6/26/2023	25.02	69.47
		9/13/2023	27.79	66.70
		12/28/2023	24.64	69.85
		3/14/2024	24.42	70.07
		6/27/2024	24.27	70.22
		9/13/2024	24.53	69.96
		12/27/2024	24.42	70.07

Notes:
(1): surface elevation based on an arbitrary datum of 100 feet
BTOC: below top of casing



TABLE 2 GROUNDWATER QUALITY MEASUREMENTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico							
Well Identification	Date	Temperature (°C)	pH	TDS (g/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)
MW-1	11/29/2016	16.54	7.42	--	2,607.0	1.52	-155.3
	3/6/2017	13.37	7.37	1.99	3,057.0	1.48	-262.6
	6/12/2017	14.35	7.14	1.82	2,800.0	0.89	-197.6
	10/26/2017	18.00	7.19	--	2,600.0	1.85	-156
	12/4/2017	15.47	7.07	1.79	2,748.0	1.30	-209.9
	3/13/2018	19.94	7.31	--	2,502.0	--	-203.6
	6/25/2018	15.81	7.22	--	2,109.5	0.51	-198.3
	3/12/2019	13.10	7.57	1.37	2,720.0	--	-24.9
	5/22/2019	16.80	7.29	1.45	2,920.0	0.00	-27.5
	8/22/2019	21.10	7.20	2.01	4,030.0	--	-16.1
	12/2/2019	13.60	6.80	1.53	3,050.0	--	-26.5
	2/3/2020	15.30	6.81	1.51	3,020.0	7.30*	-28.5
	4/24/2020	16.00	6.98	1.36	2,710.0	3.47	-34.5
	7/24/2020	19.10	7.04	1.41	2,810.0	2.15	-32.7
	10/8/2020	18.30	6.99	1.63	3,260.0	3.57	-20.4
	1/11/2021	12.50	7.16	1.29	2,570.0	1.80	-24.7
	4/12/2021	17.00	7.26	1.25	2,490.0	8.89*	-22.7
	8/2/2021	17.30	8.36	--	2,330.0	--	--
	10/7/2021	16.50	7.06	--	2,740.0	--	--
	1/10/2022	12.40	7.1	--	2,350.0	--	--
	6/23/2022	18.20	7.22	1.14	2,260.0	--	--
	9/28/2022	19.30	7.12	1.26	2,520.0	--	--
	12/29/2022	11.20	7.44	1.20	2,460.0	--	--
	3/28/2023	12.90	7.59	1.16	2,330.0	--	--
	6/26/2023	28.31*	7.68	2.39	3,941.0	3.57	-132.9
	9/13/2023	30.99*	7.74	3.08	4,732.2	2.24	-202.1
	12/28/2023	22.82	8.18	1.78	2,749.2	2.04	-173.4
	3/14/2024	17.18	8.30	0.88	1,347.7	1.88	-295.9
	6/27/2024	58.32*	8.34	2.43	3,744.4	8.35*	-258.5
	9/13/2024	28.23*	8.34	1.42	2,182.6	1.74	-201.7
	12/27/2024	14.18	8.59	0.22	334.89*	2.77	-298.8
MW-2	11/29/2016	16.04	7.20	--	2,299.0	2.21	-109.3
	3/6/2017	12.74	7.15	1.74	2,683.0	2.05	-171.7
	6/12/2017	13.50	6.95	1.56	2,396.0	1.61	-155.8
	10/26/2017	18.70	7.01	--	2,264.0	1.74	-92.8
	12/4/2017	15.41	7.00	1.52	2,333.0	1.11	-178.0
	3/13/2018	14.67	7.21	--	2,334.0	--	-180.7
	6/25/2018	17.63	6.62	--	1,905.0	0.94	-187.2
	3/12/2019	13.70	7.57	9.50	1,886.0	NA	7.3
	5/22/2019	13.70	6.67	9.54	1,907.0	--	5.0
	8/22/2019	23.00	6.49	8.63	1,727.0	--	10.0
	12/2/2019	16.20	5.84	10.00	2,000.0	--	9.2
	2/3/2020	12.80	5.93	9.71	18,320.0	6.22*	-0.1
	4/24/2020	16.50	6.25	5.81	11,630.0	2.28	0.9
	7/24/2020	21.40	6.55	2.79	5,580.0	1.73	-8.6
	10/8/2020	21.00	6.61	2.81	5,600.0	2.69	6.0
	1/11/2021	14.10	6.77	3.30	6,620.0	1.56	0.9
	4/12/2021	18.40	6.95	2.09	4,250.0	6.48*	-11.2
	8/2/2021	17.35	7.25	--	4,808.0	--	--
	10/7/2021	20.10	6.38	--	3,100.0	--	--
	1/10/2022	14.00	6.94	--	3,080.0	--	--
	6/23/2022	19.30	6.74	1.16	2,330.0	--	--
	9/28/2022	19.80	6.83	1.15	2,300.0	--	--
	12/29/2022	13.30	7.2	1.04	2,090.0	--	--
	3/28/2023	13.90	7.18	0.99	1,990.0	--	--
	6/26/2023	29.66*	7.48	1.73	2,750.0	2.41	-205.3
	9/13/2023	29.45*	7.61	1.81	2,780.8	1.91	-141.4
	12/28/2023	22.36	7.93	0.05	74*	11.25*	-9.0*
	3/14/2024	17.64	8.53	1.45	2,233.6	1.45	-287.6
	6/27/2024	59.77*	8.71	1.78	2,736.1	2.15	-247.3
	9/13/2024	27.13*	8.14	1.87	2,876.5	1.55	-200.6
	12/27/2024	15.88	8.81	0.00*	0.07*	2.25	-265.8



TABLE 2 GROUNDWATER QUALITY MEASUREMENTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico							
Well Identification	Date	Temperature (°C)	pH	TDS (g/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)
MW-3	11/29/2016	15.01	7.09	--	3,091.0	2.52	-91
	3/6/2017	12.74	7.05	2.19	3,376.0	4.17	-151.6
	6/12/2017	15.40	7.18	2.19	3,360.0	6.70*	-136.0
	10/26/2017	17.71	7.06	--	2,653.0	1.80	-177.4
	12/4/2017	14.19	7.04	1.84	2,835.0	3.05	-153.5
	3/13/2018	14.84	7.18	--	2,641.0	0.17	-167.0
	6/25/2018	Sample volume insufficient to analyze field parameters					
	3/11/2019	14.30	7.24	1.41	2,830.0	--	-31.5
	5/22/2019	13.30	7.11	1.36	2,730.0	5.80*	-35.6
	8/22/2019	20.80	7.19	1.43	2,860.0	--	-25.2
	12/2/2019	15.20	6.55	1.49	2,960.0	--	-25.4
	2/3/2020	13.30	6.44	1.42	2,930.0	--	-16.5
	4/24/2020	19.60	6.71	1.44	2,890.0	2.80	-27.0
	7/23/2020	24.00	6.36	2.57	5,090.0	1.26	-12.5
	10/5/2020	16.50	6.49	3.03	6,070.0	3.76	-2.9
	1/8/2021	12.60	6.80	2.75	5,510.0	1.59	-3.1
	4/12/2021	14.50	6.55	4.00	8,030.0	9.65*	-17.7
	8/2/2021	17.10	7.96	--	7,920.0	--	--
	10/6/2021	18.80	6.43	--	6,400.0	--	--
	1/10/2022	16.60	5.60	--	9,470.0	--	--
	6/23/2022	19.10	6.20	4.28	8,540.0	--	--
	9/28/2022	18.60	6.49	3.05	6,110.0	--	--
	12/29/2022	11.70	6.58	3.96	7,910.0	--	--
	3/28/2023	14.10	6.51	4.39	8,810.0	--	--
	6/26/2023	26.35*	6.74	8.00	11,397.0	2.85	-86.3
	9/13/2023	26.64*	7.02	7.99	12,284.0	1.97	-72.5
	12/28/2023	19.67	7.29	2.72	4,182.9	2.38	-65.1
	3/14/2024	15.99	7.94	3.64	5,654.1	1.51	-246.7
	6/27/2024	54.14*	7.91	4.09	6,292.6	1.74	-137.9
	9/13/2024	29.67*	7.80	2.62	4,039.4	1.55	-256.3
	12/27/2024	15.50	7.95	0.90*	1,383.4*	2.33	-215.6
MW-4	6/23/2016	15.10	7.29	--	2,950.0	1.04	-148.5
	11/29/2016	16.01	7.40	--	2,396.0	1.59	-127.5
	3/6/2017	13.01	7.39	2.34	3,608.0	2.01	-237.2
	6/21/2017	14.49	7.08	1.92	2,955.0	1.36	-188.7
	10/26/2017	17.37	7.29	--	2,830.0	1.74	-193.2
	12/4/2017	15.26	3.33	2.06	3,161.0	0.66	-244.2
	3/13/2018	15.08	7.41	--	3,437.0	--	-214.9
	6/25/2018	15.85	7.33	--	2,580.0	0.97	-224.9
	3/12/2019	14.10	7.49	1.48	2,960.0	--	-31.5
	5/22/2019	15.40	7.35	1.67	3,300.0	1.44	-33.6
	8/22/2019	19.50	7.35	1.55	3,090.0	6.90*	-22.4
	12/2/2019	15.30	6.65	1.69	3,310.0	--	-32.7
	2/3/2020	15.00	6.81	1.57	3,140.0	6.51	-37.4
	4/24/2020	13.90	6.84	1.64	3,270.0	1.59	-47.4
	7/23/2020	24.50	6.67	1.47	2,910.0	0.87	-33.4
	10/8/2020	15.90	7.00	1.32	2,630.0	3.78	-43.2
	1/11/2021	8.40	7.50	1.23	2,420.0	2.73	-60.1
	4/12/2021	16.40	7.06	1.35	2,710.0	7.11*	-43.3
	8/2/2021	16.91	7.41	--	3,845.0	1.84	-312.6
	10/6/2021	20.20	6.67	--	2,510.0	--	--
	1/10/2022	11.30	7.19	--	2,540.0	--	--
	6/23/2022	19.40	7.12	1.32	2,630.0	--	--
	9/28/2022	18.80	7.19	1.25	2,500.0	--	--
	12/29/2022	9.40	7.45	1.25	2,490.0	--	--
	3/28/2023	12.50	7.56	1.24	2,480.0	--	--
	6/26/2023	21.42	7.79	2.19	3,138.0	2.61	-288.7
	9/13/2023	26.91*	7.87	2.36	3,637.1	1.55	-198.4
	12/28/2023	23.45*	8.19	1.38	2,153.4	0.94	-179.1
	3/14/2024	15.41	8.27	0.01	17.14*	1.62	-296.4
	6/27/2024	50.05*	8.28	2.16	3,349.5	2.67	-290.2
	9/13/2024	29.26 *	8.48	1.61	2,486.5	0.48	-330.2
	12/27/2024	10.38	8.72	0.27	303.64*	2.24	-347.5



TABLE 2 GROUNDWATER QUALITY MEASUREMENTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico							
Well Identification	Date	Temperature (°C)	pH	TDS (g/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)
MW-5	8/23/2019	18.20	6.79	3.54	7,100.0	--	6.6
	12/4/2019	12.60	6.11	3.28	6,540.0	--	-1.1
	2/4/2020	8.50	6.25	3.24	6,520.0	--	-5.1
	4/27/2020	21.20	6.01	3.25	6,550.0	3.81	8.0
	7/24/2020	20.20	6.15	3.02	5,980.0	1.78	6.2
	10/5/2020	20.30	6.35	2.91	5,810.0	2.36	12.4
	1/8/2021	12.90	6.67	2.78	5,570.0	2.39	1.7
	4/13/2021	14.60	6.62	2.64	5,280.0	0.47	8.7
	8/2/2021	14.50	7.38	--	8,082.0	--	--
	10/8/2021	16.70	6.27	--	5,300.0	--	--
	1/11/2022	11.50	6.80	--	5,020.0	--	--
	6/23/2022	20.50	6.34	2.43	4,870.0	--	--
	9/28/2022	18.20	6.36	1.98	3,940.0	--	--
	12/29/2022	9.40	6.90	2.22	4,440.0	--	--
	3/28/2023	14.10	6.90	2.07	4,130.0	--	--
	6/26/2023	29.72*	7.13	4.76	7,046.0	2.14	0.9
	9/13/2023	26.66*	7.35	4.92	7,568.6	1.72	-48.5
	12/28/2023	21.41	7.50	4.09	6,294.5	1.98	-71.3
	3/14/2024	18.12	8.33	2.42	3,730.6	2.30	-229.6
	6/27/2024	45.52*	7.76	3.16	4,865.3	8.04*	-95.7
	9/13/2024	32.55*	7.75	0.90	1,388.9*	1.41	-147.2
	12/27/2024	15.99	7.91	1.03	1,563.1*	1.54	-196.5
MW-6	8/23/2019	21.10	6.96	1.29	2,590.0	--	0.7
	12/4/2019	12.70	6.29	1.21	2,430.0	--	-5.0
	2/4/2020	8.50	6.52	1.27	2,540.0	--	-3.1
	4/27/2020	18.30	6.04	1.36	2,700.0	3.85	7.3
	7/24/2020	20.00	6.47	1.15	2,290.0	1.54	4.2
	10/5/2020	20.20	6.30	1.07	2,140.0	2.80	10.1
	1/8/2021	13.60	6.36	1.04	2,070.0	1.30	11.6
	4/13/2021	13.90	6.57	1.12	2,230.0	0.68	10.0
	8/2/2021	15.50	7.90	--	1,780.0	--	--
	10/8/2021	16.20	5.81	--	1,960.0	--	--
	1/11/2022	13.50	6.22	--	2,030.0	--	--
	6/23/2022	18.60	6.10	0.94	1,880.0	--	--
	9/28/2022	17.00	6.39	0.89	1,790.0	--	--
	12/29/2022	8.40	6.92	0.95	1,900.0	--	--
	3/28/2023	16.20	6.76	0.95	1,940.0	--	--
	6/26/2023	20.92	7.20	1.66	2,377.0	2.23	-82.6
	9/13/2023	27.47*	7.24	1.75	2,690.5	1.78	-99.7
	12/28/2023	21.68*	7.45	0.39	593.11*	2.46	-117.6
	3/14/2024	15.30	7.50	1.05	1,617.3	2.02	-219.2
	6/27/2024	33.58*	7.72	1.50	2,312.4	5.00*	-109.3
	9/13/2024	34.99*	7.75	1.56	2,405.8	1.36	-153.7
	12/27/2024	15.56	8.62	1.03	12.45*	1.94	-189.7



TABLE 2 GROUNDWATER QUALITY MEASUREMENTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico							
Well Identification	Date	Temperature (°C)	pH	TDS (g/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)
MW-7	8/23/2019	21.80	6.95	2.63	5,240.0	--	-12.2
	12/4/2019	12.80	6.11	2.40	4,800.0	--	-8.0
	2/4/2020	11.00	6.39	2.26	4,390.0	--	-17.5
	4/27/2020	17.20	6.34	1.96	3,950.0	4.56	-11.7
	7/24/2020	20.70	6.43	1.37	2,760.0	2.94	-8.9
	10/5/2020	18.50	6.55	1.26	2,530.0	4.23	-6.1
	1/11/2021	13.50	6.85	1.28	2,550.0	1.44	-0.7
	4/13/2021	16.50	6.62	1.53	3,060.0	9.22*	-1.7
	8/2/2021	14.96	7.33	--	4,259.0	--	--
	10/7/2021	18.60	6.23	--	2,910.0	--	--
	1/11/2022	12.98	6.56	--	2,910.0	--	--
	6/23/2022	17.00	6.25	1.13	1,720.0	--	--
	9/28/2022	17.20	6.42	1.34	2,670.0	--	--
	12/29/2022	10.20	6.63	1.44	2,890.0	--	--
	3/28/2023	15.80	6.55	1.51	3,040.0	--	--
	6/26/2023	20.93	7.14	2.98	4,222.0	3.31	-51.7
	9/13/2023	--	--	--	--	--	--
	12/28/2023	15.79	7.48	2.02	3,102.3	4.35	-33.1
	3/14/2024	15.44	7.62	0.01	18.9	3.49	-214.3
	6/27/2024	31.26*	8.34	2.37	3,646.7	2.49	-29.3
	9/13/2024	39.25*	7.74	2.90	4,468.6	7.74*	-89.7
	12/27/2024	15.83	8.32	0.00	0.2	2.80	-88.6

Notes:

°C: degrees Celcius

DO: dissolved oxygen

g/L: grams per liter

uS/cm: microsiemens per centimeter

mg/L: milligrams per liter

mV: millivolts

ORP: oxidation-reduction potential

TDS: total dissolved solids

--: data not collected

*: anomalous data



TABLE 3 GROUNDWATER ANALYTICAL RESULTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico									
Well Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
NMWQCC Standards		0.005	1.00	0.70	0.62	1.0	0.20	600	1,000
MW-1	6/8/2016	0.0388	<0.020	0.358	4.01	--	1.69	1,170	2,590
	9/12/2016	0.0111	< 0.001	0.0946	0.382	--	0.925	577	--
	11/29/2016	0.0132	< 0.001	0.119	0.445	--	0.99	240	--
	3/6/2017	0.0041	< 0.001	0.0481	0.167	--	0.876	387	1,920
	6/12/2017	0.002	< 0.001	0.0265	0.12	--	0.80	312	1,830
	10/26/2017	< 0.001	< 0.001	0.0081	0.0307	0.256	0.71	424	1,940
	12/4/2017	<0.005	< 0.005	0.021	0.0814	--	0.674	321	1,710
	3/13/2018	< 0.001	< 0.001	0.008	0.0353	--	0.68	319	1,410
	6/25/2018	< 0.001	< 0.001	0.0067	0.0229	--	0.705	349	1,820
	9/4/2018	<0.005	<0.005	0.0154	0.0499	--	0.694	481	2,000
	12/10/2018	<0.001	<0.001	<0.001	<0.003	<0.10	0.712	343	1,980
	3/12/2019	<0.001	<0.001	<0.001	<.300	0.143	0.89	578	2,040
	5/22/2019	<0.001	<0.001	0.00619	0.0119	<0.100	0.732	598	2,210
	8/22/2019	<0.001	<0.001	0.0053	0.0095	<0.100	1.59	1,260	3,010
	12/2/2019	<0.001	<0.001	0.0029	0.0045	<0.100	0.940	697	1,930
	2/3/2020	<0.001	<0.001	0.00714	0.0107	0.119	0.824	735	1,820
	4/24/2020	<0.001	<0.001	0.00337	0.00599	<0.100	0.623	568	1,910
	7/24/2020	<0.001	<0.001	<0.001	<0.003	<0.100	0.613	570	2,230
	10/8/2020	<0.001	<0.001	<0.001	<0.003	<0.100	1.06	1,060	2,960
	1/11/2021	<0.001	<0.001	0.00325	0.00452	<0.100	0.712	642	2,190
	4/12/2021	<0.001	<0.001	0.0021	0.0025	<0.020	0.59	450	1,990
	8/2/2021	0.0046	<0.001	<0.001	<0.0015	0.20	0.52	160	2,040
	10/7/2021	0.0078	<0.001	<0.001	<0.0015	<0.020	0.70	490	2,400
	1/10/2022	<0.001	<0.001	0.0018	<0.0015	--	0.54	480	2,040
	6/23/2022	<0.001	<0.001	<0.001	<0.0015	<0.020	0.42	540	2,070
	9/28/2022	<0.001	<0.001	<0.001	<0.0015	--	0.74	800	2,660
	12/29/2022	<0.001	<0.001	<0.001	<0.0015	--	0.44	810	2,420
	3/28/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	0.40	920	2,390
	6/26/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	0.54	990	5,080
	9/13/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	1.40	1,300	3,130
	12/28/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	0.56	1,300	2,710
	3/14/2024	<0.002	<0.002	<0.002	<0.003	--	0.45	1,200	2,500
	6/27/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	0.35	880	2,500
	9/13/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	0.44	870	2,500 E
	12/27/2024	<0.0020	<0.0020	<0.0020	<0.0030	<0.020	0.47	1,300	2,700
MW-2	6/8/2016	0.103	< 0.001	0.0072	0.0448	--	1.06	3.00	1,580
	9/12/2016	0.0647	< 0.001	0.0021	0.00320	--	1.73	2.80	--
	11/29/2016	0.0257	< 0.001	0.0021	< 0.003	--	1.41	2.60	--
	3/6/2017	0.0347	< 0.001	0.0022	< 0.003	--	1.45	7.90	1,510
	6/12/2017	0.009	< 0.001	0.0011	< 0.003	--	1.39	3.10	1,550
	10/26/2017	0.0013	< 0.001	< 0.001	< 0.003	5.1	1.26	4.50	1,560
	12/4/2017	0.0039	< 0.001	0.0011	< 0.003	--	1.23	14.3	1,470
	3/13/2018	0.0036	< 0.001	0.0011	< 0.003	--	1.25	154	1,450
	6/25/2018	0.0079	< 0.001	< 0.001	< 0.003	--	1.37	31.3	1,600
	9/4/2018	< 0.001	< 0.001	< 0.001	< 0.003	--	1.13	87.0	1,730
	12/10/2018	0.0543	< 0.001	0.0015	< 0.003	<0.10	1.15	27.7	1,470
	3/12/2019	0.779	< 0.001	0.0317	0.0519	1.59	11.4	64.7	15,300
	5/22/2019	0.435	< 0.005	0.0245	0.0533	4.30	7.77	29.6	15,300
	8/22/2019	0.170	< 0.001	0.0265	0.0153	0.426	7.27	8.01	12,700
	12/2/2019	0.130	< 0.001	0.0304	0.00870	<0.100	10.2	<5.00	15,700
	2/3/2020	0.147	<0.001	0.0312	0.00841	0.174	8.19	<5.00	14,400
	4/24/2020	0.054	<0.001	0.0106	<0.003	<0.100	3.63	6.08	7,800
	7/24/2020	<0.001	<0.001	0.00902	<0.003	<0.100	2.21	10.7	3,680
	10/8/2020	<0.001	<0.001	0.00646	<0.003	0.195	2.31	<5.00	4,290
	1/11/2021	0.014	<0.001	0.00183	<0.003	<0.100	2.55	<5.00	5,150
	4/12/2021	0.019	<0.001	0.0015	<0.0015	0.073	0.92	120	3,060
	8/2/2021	<0.001	<0.001	<0.001	<0.0015	0.91	4.1	570	2,790
	10/7/2021	<0.001	<0.001	<0.001	<0.0015	0.085	2.0	200	2,280
	1/10/2022	0.0074	<0.001	<0.001	<0.0015	0.32	0.98	43	2,510



TABLE 3 GROUNDWATER ANALYTICAL RESULTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico									
Well Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
NMWQCC Standards		0.005	1.00	0.70	0.62	1.0	0.20	600	1,000
MW-2	6/23/2022	0.0021	<0.002	<0.002	<0.003	0.19	1.5	170	2,000
	9/28/2022	<0.002	<0.002	<0.002	<0.003	--	0.99	29	1,970
	12/29/2022	0.0054	<0.001	<0.001	<0.0015	--	0.64	76	1,800
	3/28/2023	0.040	<0.0010	0.0025	<0.0015	--	0.97	35	1,770
	6/26/2023	0.0067	<0.0010	<0.0010	<0.0015	--	0.89	22	1,480
	9/13/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	0.99	9.8	1,600
	12/28/2023	0.015	<0.0010	0.0034	<0.0015	--	0.96	33	1,680
	3/14/2024	0.025	0.0023	<0.0010	<0.0015	--	1.20	21	1,800
	6/27/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	2.10	290	2,000
	9/13/2024	<0.0010	<0.0010	<0.0010	<0.0015	<0.020	1.20	40	1,700
	12/27/2024	0.012	<0.0050	<0.0050	<0.0075	<0.020	1.30	11	1,700
MW-3	6/8/2016	2.95	< 0.020	0.813	7.78	--	2.65	110	2,190
	9/12/2016	2.27	< 0.001	0.44	2.49	--	3.62	112	--
	11/29/2016	2.97	< 0.001	0.845	5.44	--	3.12	22.5	--
	3/6/2017	1.89	< 0.02	0.259	3.06	--	2.52	14.7	1,880
	6/12/2017	1.68	< 0.02	0.329	1.93	--	3.09	372	2,280
	10/26/2017	1.88	< 0.001	0.417	2.91	3.58	2.15	65.6	2,000
	12/4/2017	2.00	< 0.025	0.346	2.43	--	2.36	35.5	1,750
	3/13/2018	1.43	< 0.025	0.107	1.93	--	2.34	24.6	1,530
	6/26/2018	2.02	< 0.025	0.287	2.69	--	3.52	606	2,560
	9/5/2018	1.82	<0.005	0.160	1.40	--	2.08	241	2,300
	12/10/2018	1.49	<0.10	0.133	0.639	0.142	1.94	170	2,050
	3/11/2019	1.45	<0.001	0.015	0.655	<0.100	2.01	95.6	1,940
	5/22/2019	1.84	<0.001	0.120	1.17	0.278	1.03	23.7	2,540
	8/22/2019	0.623	<0.001	0.0193	0.387	<0.100	1.62	119	1,860
	12/2/2019	0.114	<0.001	0.006	0.184	<0.100	1.55	129	1,800
	2/3/2020	1.24	<0.010	0.0224	1.05	<0.100	1.94	36.1	1,590
	4/24/2020	1.08	<0.010	<0.010	<0.010	0.610	1.93	21.3	1,610
	7/23/2020	0.00663	<0.001	0.00191	0.0147	0.118	5.19	1,400	4,280
	10/5/2020	0.0112	<0.001	0.00204	0.00608	<0.100	6.49	1,140	4,520
	1/8/2021	0.455	<0.001	0.0618	0.300	0.656	3.5	162	4,120
	4/12/2021	0.72	<0.01	0.035	0.260	0.16	11	37	7,190
	8/2/2021	0.0034	<0.001	<0.001	<0.0015	10*	23	2,100	7,940
	10/6/2021	0.0030	<0.001	0.0012	0.0035	0.054	15	2,200	6,620
	1/10/2022	0.0250	<0.001	0.0036	0.0024	--	17	570	10,100
	6/23/2022	0.0052	<0.001	0.092	0.056	5.2*	17	1,300	8,920
	9/28/2022	0.0056	<0.001	0.0029	0.12	--	9.6	1,300	6,940
	12/29/2022	0.042	<0.001	0.022	0.0018	--	16	190	10,300
	3/28/2023	0.380	<0.0010	0.250	0.190	--	19	30	9,840
	6/26/2023	0.160	<0.0020	0.250	0.190	--	2.7	550	7,520
	9/13/2023	0.053	<0.0020	0.085	0.0072	--	8.0	430	8,370
	12/28/2023	<0.0020	<0.0020	<0.0020	<0.0030	--	7.5	280	7,860
	3/14/2024	0.21	<0.001	0.250	0.61	--	6.3	45	6,000
	6/27/2024	0.0019	<0.001	0.022	0.0017	--	9.6	890	5,500
	9/13/2024	0.024	<0.001	0.028	0.0075	--	3.8	550	4,800
	12/27/2024	0.016	<0.010	0.012	<0.015	<0.020	3.3	110	4,300



TABLE 3 GROUNDWATER ANALYTICAL RESULTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico									
Well Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
NMWQCC Standards		0.005	1.00	0.70	0.62	1.0	0.20	600	1,000
MW-4	6/23/2016	0.118	< 0.001	0.186	1.06	--	0.983	838	--
	9/12/2016	0.0742	< 0.001	0.114	0.803	--	1.32	735	--
	11/29/2016	0.0853	< 0.001	0.0929	0.967	--	1.26	382	--
	3/6/2017	0.0886	< 0.02	0.0804	1.23	--	1.22	814	2,260
	6/12/2017	0.100	< 0.005	0.0747	1.44	--	1.01	738	2,140
	10/26/2017	0.0462	< 0.001	0.0226	0.849	0.507	0.73	1,120	2,370
	12/4/2017	0.0632	<0.020	0.0386	1.45	--	0.893	993	2,150
	12/4/2017	0.064	<0.020	0.0421	1.7	--	--	--	--
	3/13/2018	0.0467	<0.10	0.0292	1.33	--	0.827	1,370	2,350
	6/25/2018	0.0561	<0.020	<0.020	1.74	--	0.888	1,230	2,540
	9/4/2018	0.0257	< 0.005	< 0.005	0.848	--	0.889	1,450	2,410
	12/10/2018	0.108	<0.020	0.0484	2.93	0.209	0.801	439	1,900
	3/12/2019	0.0488	<0.0100	0.0265	1.85	<0.100	0.843	1,240	2,390
	5/22/2019	0.0496	<0.0100	0.0309	1.84	<0.100	0.867	1,090	2,700
	8/22/2019	0.0336	0.0013	0.0113	1.05	<0.100	0.737	1,270	2,290
	12/2/2019	0.0172	<0.0100	<0.0100	0.937	<0.100	0.752	1,390	2,480
	2/3/2020	0.0249	<0.0100	0.0224	1.66	<0.100	0.756	1,300	2,180
	4/24/2020	0.0170	<0.0100	0.0120	0.694	<0.100	0.744	1,330	2,640
	7/23/2020	0.0150	<0.0100	0.0132	0.975	<0.100	0.549	1,180	2,620
	10/8/2020	0.0137	<0.0100	<0.0100	0.657	<0.100	0.569	843	2,340
	1/11/2021	0.0148	<0.001	0.0156	0.717	<0.100	0.523	1,190	2,560
	4/12/2021	0.012	<0.005	0.015	0.600	0.022	0.53	1,000	2,530
	8/2/2021	0.0022	<0.001	<0.001	0.071	0.19	0.79	1,600	3,010
	10/6/2021	0.0058	<0.001	0.0026	0.370	<0.020	0.62	1,100	2,470
	1/10/2022	0.0089	<0.002	0.0072	0.570	--	0.55	1,100	2,600
	6/23/2022	0.0026	<0.002	0.0024	0.110	0.067	0.40	850	2,530
	9/28/2022	0.0018	<0.002	<0.002	0.086	--	0.46	900	2,390
	12/29/2022	0.0022	<0.001	0.0017	0.094	--	0.41	1,000	2,560
	3/28/2023	0.0046	<0.0010	0.014	0.340	--	0.46	970	2,380
	6/26/2023	0.0054	<0.0010	0.013	0.370	--	0.53	1,100	2,620
	9/13/2023	0.0015	<0.0010	0.0012	0.061	--	0.45	1,100	2,560
	12/28/2023	0.0019	<0.0010	0.0044	0.087	--	0.56	1,300	2,740
	3/14/2024	0.0016	<0.0010	0.0015	0.018	--	0.85	1,300	3,100
	6/27/2024	<0.0010	<0.0010	<0.0010	0.0075	--	0.28	950	2,300
	9/13/2024	0.0021	<0.0010	<0.0010	0.100	--	0.49	1,100	2,400
	12/27/2024	<0.0010	<0.0010	<0.0010	0.020	<0.020	0.35	1,100	2,300
MW-5	8/23/2019	<0.001	<0.001	<0.001	0.0067	<0.100	3.33	3,660	6,620
	12/2/2019	<0.001	<0.001	<0.0010	<0.0030	0.185	3.26	3,730	6,350
	2/4/2020	<0.001	<0.001	<0.0010	<0.0030	<0.100	3.45	3,660	5,940
	4/24/2020	<0.001	<0.001	<0.0010	<0.0030	<0.100	3.39	3,440	6,450
	7/24/2020	<0.001	<0.001	<0.0010	<0.0030	<0.100	3.13	2,410	5,260
	10/5/2020	<0.001	<0.001	<0.0010	<0.0030	<0.100	3.33	3,430	4,010
	1/8/2021	<0.001	<0.001	<0.001	<0.003	<0.100	3.37	3,530	6,150
	4/13/2021	<0.001	<0.001	<0.001	<0.0015	0.063	3.3	3,500	6,500
	8/2/2021	<0.001	<0.001	<0.001	<0.0015	0.33	3.1	3,300	5,920
	10/8/2021	<0.001	<0.001	<0.001	<0.0015	0.023	3.4	3,400	6,120
	1/11/2022	<0.001	<0.001	<0.001	<0.0015	--	2.5	2,800	5,520
	6/23/2022	<0.001	<0.001	<0.001	<0.0015	0.068	2.7	2,600	5,280
	9/28/2022	<0.001	<0.001	<0.001	<0.0015	--	2.3	1,800	4,870
	12/29/2022	<0.001	<0.001	<0.001	<0.0015	--	2.6	2,400	5,460
	3/28/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	1.3	1,700	4,200
	6/26/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	2.8	2,400	5,530
	9/13/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	3.2	3,100	5,920
	12/28/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	3.3	3,300	5,920
	3/14/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	2.4	3,000	5,800
	6/27/2024	<0.0010	<0.0010	0.036	0.38	--	2.6	1,000	3,200
	9/13/2024	<0.0010	<0.0010	0.015	0.0097	--	2.8	1,300	3,900
	12/27/2024	<0.0010	<0.0010	0.0045	0.0025	0.19	1.8	410	2,300



TABLE 3 GROUNDWATER ANALYTICAL RESULTS Mangum #1 Hilcorp Energy Company San Juan County, New Mexico									
Well Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
NMWQCC Standards		0.005	1.00	0.70	0.62	1.0	0.20	600	1,000
MW-6	8/23/2019	0.213	<0.001	0.145	0.806	<0.100	2.51	168	1,750
	12/2/2019	0.0741	<0.001	0.168	0.170	<0.100	3.11	86.1	1,630
	2/4/2020	0.0284	<0.001	0.0184	0.0720	<0.100	5.05	150	1,570
	4/24/2020	0.00348	<0.001	<0.0010	<0.0030	<0.100	4.59	121	1,550
	7/24/2020	0.0977	<0.001	0.0705	0.510	<0.100	2.54	47.0	1,650
	10/5/2020	0.0787	<0.0100	0.114	0.025	<0.100	3.33	24.7	1,550
	1/8/2021	0.00794	<0.001	0.00891	0.0368	<0.100	3.85	30.4	1,580
	4/13/2021	<0.001	<0.001	<0.001	<0.0015	0.22	3.3	71	1,450
	8/2/2021	0.016	<0.001	0.013	0.072	7.0*	2.6	25	1,500
	10/8/2021	0.0035	<0.001	0.0018	0.0097	0.052	2.9	18	1,310
	1/11/2022	0.0021	<0.001	0.0013	0.0058	--	2.9	32	1,550
	6/23/2022	0.013	<0.001	0.020	0.170	4.4*	2.0	<5.0	1,510
	9/28/2022	0.013	<0.001	0.017	0.170	--	1.7	<5.0	1,390
	12/29/2022	<0.001	<0.001	<0.001	<0.0015	--	1.7	12	1,500
	3/28/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	1.7	13	1,310
	6/26/2023	0.0051	<0.0010	0.0082	0.077	--	1.6	8.8	1,480
	9/13/2023	0.0092	<0.0010	0.014	0.110	--	1.8	1.3	1,510
	12/28/2023	0.0067	<0.0010	0.0048	0.032	--	1.6	<5.0	1,420
	3/14/2024	<0.0010	<0.0010	<0.0010	0.0037	--	1.6	4.00	1,500
	6/27/2024	0.025	<0.0010	0.035	0.530	--	0.67	0.78	1,200
	9/13/2024	0.016	<0.0010	0.0061	0.320	--	1.5	<0.50	1,300
	12/27/2024	0.012	<0.0010	0.0022	0.410	0.15	1.6	<0.050	1,300
MW-7	8/23/2019	<0.001	<0.001	<0.001	0.004	<0.100	1.75	2,950	4,930
	12/2/2019	<0.001	<0.001	<0.001	<0.003	<0.100	1.98	2,830	3,990
	2/4/2020	<0.001	<0.001	<0.001	<0.003	<0.100	2.01	2,580	3,860
	4/24/2020	<0.001	<0.001	<0.001	<0.003	<0.100	2.00	1,550	4,400
	7/24/2020	<0.001	<0.001	<0.001	<0.003	<0.100	1.04	808	2,300
	10/5/2020	<0.001	<0.001	<0.001	<0.003	<0.100	1.06	887	2,100
	1/11/2021	<0.001	<0.001	<0.001	<0.003	<0.100	1.03	873	2,280
	4/13/2021	<0.001	<0.001	<0.001	<0.0015	0.14	1.3	910	2,710
	8/2/2021	<0.001	<0.001	<0.001	<0.0015	0.28	1.4	870	517
	10/7/2021	<0.001	<0.001	<0.001	<0.0015	<0.020	1.1	880	2,110
	1/11/2022	<0.001	<0.001	<0.001	<0.0015	--	1.1	810	2,560
	6/23/2022	<0.001	<0.001	<0.001	<0.0015	<0.020	1.1	880	2,890
	9/28/2022	<0.001	<0.001	<0.001	<0.0015	--	1.1	820	2,880
	12/29/2022	<0.001	<0.001	<0.001	<0.0015	--	1.2	1,000	3,020
	3/28/2023	<0.0020	<0.0020	<0.0020	<0.0030	--	1.2	1,200	3,650
	6/26/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	1.2	1,100	3,330
	9/13/2023	Not Sampled - PSH Present*							
	12/28/2023	<0.0010	<0.0010	<0.0010	<0.0015	--	0.99	1,100	3,310
	3/14/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	0.40	1,200	2,900
	6/27/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	0.51	720 F1	2,700
	9/13/2024	<0.0010	<0.0010	<0.0010	<0.0015	--	1.4	810	3,000
	12/27/2024	<0.0010 P2	<0.0010 P2	<0.0010 P2	<0.0015 P2	<0.020	1.1	920	3,200

Notes:

mg/L: milligrams per liter

ND: not detected, practical quantitation limit unknown

NMWQCC: New Mexico Water Quality Control Commission

PSH: phase separated hydrocarbons

E: Result exceeded calibration range.

F1: MS and/or MSD recovery exceeds control limits.

P2: Sample was received with a PH>2

--: not analyzed

*: anomalous data

<: indicates result less than the stated laboratory reporting limit (RL)

Concentrations in **bold** and shaded exceed the New Mexico Water Quality Control Commission Standards, 20.6.2.3103 of the New Mexico Administrative Code.



APPENDIX A

Laboratory Analytical Reports



Environment Testing

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ANALYTICAL REPORT

PREPARED FOR

Attn: Mitch Killough
Hilcorp Energy
PO BOX 4700
Farmington, New Mexico 87499
Generated 4/10/2024 10:35:41 PM

JOB DESCRIPTION

Mangum 1

JOB NUMBER

885-1281-1



Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



Authorized for release by
Andy Freeman, Business Unit Manager
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(505)345-3975

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4/10/2024 10:35:41 PM

Client: Hilcorp Energy
Project/Site: Mangum 1

Laboratory Job ID: 885-1281-1

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Definitions/Glossary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Hilcorp Energy
Project: Mangum 1

Job ID: 885-1281-1

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Job Narrative
885-1281-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 3/15/2024 7:20 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.9°C.

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

Method 300_OF_28D_PREC: The method blank for analytical batch 885-2863 contained SO4 above the method detection limit (MDL). Associated samples were not re-analyzed because the method blank results were less than the reporting limit (RL) OR practical quantitation limit (PQL).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-1

Lab Sample ID: 885-1281-1

Date Collected: 03/14/24 12:55

Matrix: Water

Date Received: 03/15/24 07:20

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0	ug/L			03/25/24 14:59	2
Ethylbenzene	ND		2.0	ug/L			03/25/24 14:59	2
Toluene	ND		2.0	ug/L			03/25/24 14:59	2
Xylenes, Total	ND		3.0	ug/L			03/25/24 14:59	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		70 - 130		03/25/24 14:59	2
4-Bromofluorobenzene (Surr)	105		70 - 130		03/25/24 14:59	2
Dibromofluoromethane (Surr)	113		70 - 130		03/25/24 14:59	2
Toluene-d8 (Surr)	101		70 - 130		03/25/24 14:59	2

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1200		25	mg/L			04/05/24 14:00	50

Method: SW846 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.45		0.0020	mg/L			03/18/24 16:17	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	2500		250	mg/L			03/20/24 10:16	1

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-2

Lab Sample ID: 885-1281-2

Date Collected: 03/14/24 13:40

Matrix: Water

Date Received: 03/15/24 07:20

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Benzene	25		1.0	ug/L			03/25/24 16:49	1	
Ethylbenzene	2.3		1.0	ug/L			03/25/24 16:49	1	
Toluene	ND		1.0	ug/L			03/25/24 16:49	1	
Xylenes, Total	ND		1.5	ug/L			03/25/24 16:49	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil	Fac
1,2-Dichloroethane-d4 (Surr)	112		70 - 130				03/25/24 16:49	1	
4-Bromofluorobenzene (Surr)	117		70 - 130				03/25/24 16:49	1	
Dibromofluoromethane (Surr)	113		70 - 130				03/25/24 16:49	1	
Toluene-d8 (Surr)	103		70 - 130				03/25/24 16:49	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Sulfate	21		2.5	mg/L			03/15/24 18:04	5	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Manganese	1.2		0.010	mg/L			03/18/24 16:26	5	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Total Dissolved Solids (SM 2540C)	1800		250	mg/L			03/20/24 10:16	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-3

Lab Sample ID: 885-1281-3

Date Collected: 03/14/24 14:00

Matrix: Water

Date Received: 03/15/24 07:20

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	210		10	ug/L			03/26/24 18:33	10
Ethylbenzene	250		10	ug/L			03/26/24 18:33	10
Toluene	ND		1.0	ug/L			03/25/24 17:16	1
Xylenes, Total	610		15	ug/L			03/26/24 18:33	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		70 - 130		03/25/24 17:16	1
1,2-Dichloroethane-d4 (Surr)	101		70 - 130		03/26/24 18:33	10
4-Bromofluorobenzene (Surr)	113		70 - 130		03/25/24 17:16	1
4-Bromofluorobenzene (Surr)	93		70 - 130		03/26/24 18:33	10
Dibromofluoromethane (Surr)	95		70 - 130		03/25/24 17:16	1
Dibromofluoromethane (Surr)	113		70 - 130		03/26/24 18:33	10
Toluene-d8 (Surr)	103		70 - 130		03/25/24 17:16	1
Toluene-d8 (Surr)	94		70 - 130		03/26/24 18:33	10

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	45		2.5	mg/L			03/15/24 18:30	5

Method: SW846 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	6.3		0.020	mg/L			03/19/24 07:26	10

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	6000		500	mg/L			03/20/24 10:16	1

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Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-4

Lab Sample ID: 885-1281-4

Date Collected: 03/14/24 12:30

Matrix: Water

Date Received: 03/15/24 07:20

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.6		1.0	ug/L			03/26/24 19:00	1
Ethylbenzene	1.5		1.0	ug/L			03/26/24 19:00	1
Toluene	ND		1.0	ug/L			03/26/24 19:00	1
Xylenes, Total	18		1.5	ug/L			03/26/24 19:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		70 - 130		03/26/24 19:00	1
4-Bromofluorobenzene (Surr)	99		70 - 130		03/26/24 19:00	1
Dibromofluoromethane (Surr)	101		70 - 130		03/26/24 19:00	1
Toluene-d8 (Surr)	95		70 - 130		03/26/24 19:00	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1300		25	mg/L			04/05/24 14:15	50

Method: SW846 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.85		0.0020	mg/L			03/18/24 16:44	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	3100		500	mg/L			03/20/24 10:16	1

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-5

Lab Sample ID: 885-1281-5

Date Collected: 03/14/24 14:45

Matrix: Water

Date Received: 03/15/24 07:20

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			03/25/24 18:11	1
Ethylbenzene	ND		1.0	ug/L			03/25/24 18:11	1
Toluene	ND		1.0	ug/L			03/25/24 18:11	1
Xylenes, Total	ND		1.5	ug/L			03/25/24 18:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		70 - 130		03/25/24 18:11	1
4-Bromofluorobenzene (Surr)	101		70 - 130		03/25/24 18:11	1
Dibromofluoromethane (Surr)	118		70 - 130		03/25/24 18:11	1
Toluene-d8 (Surr)	101		70 - 130		03/25/24 18:11	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	3000		50	mg/L			04/05/24 14:30	100

Method: SW846 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.4		0.010	mg/L			03/18/24 16:55	5

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	5800		500	mg/L			03/20/24 10:16	1

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-6

Lab Sample ID: 885-1281-6

Date Collected: 03/14/24 15:20

Matrix: Water

Date Received: 03/15/24 07:20

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			03/25/24 18:39	1
Ethylbenzene	ND		1.0	ug/L			03/25/24 18:39	1
Toluene	ND		1.0	ug/L			03/25/24 18:39	1
Xylenes, Total	3.7		1.5	ug/L			03/25/24 18:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		70 - 130		03/25/24 18:39	1
4-Bromofluorobenzene (Surr)	102		70 - 130		03/25/24 18:39	1
Dibromofluoromethane (Surr)	112		70 - 130		03/25/24 18:39	1
Toluene-d8 (Surr)	97		70 - 130		03/25/24 18:39	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	4.0		2.5	mg/L			03/15/24 20:13	5

Method: SW846 6010B - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	1.6		0.010	mg/L			03/18/24 17:00	5

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1500		250	mg/L			03/20/24 10:16	1

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Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-7
Date Collected: 03/14/24 15:45
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-7
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			03/25/24 19:06	1	
Ethylbenzene	ND		1.0	ug/L			03/25/24 19:06	1	
Toluene	ND		1.0	ug/L			03/25/24 19:06	1	
Xylenes, Total	ND		1.5	ug/L			03/25/24 19:06	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	114		70 - 130				03/25/24 19:06	1	
4-Bromofluorobenzene (Surr)	93		70 - 130				03/25/24 19:06	1	
Dibromofluoromethane (Surr)	120		70 - 130				03/25/24 19:06	1	
Toluene-d8 (Surr)	98		70 - 130				03/25/24 19:06	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	1200		25	mg/L			04/05/24 19:48	50	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.40		0.0020	mg/L			03/18/24 17:03	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2900		500	mg/L			03/20/24 10:16	1	

QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 885-2290/18

Matrix: Water

Analysis Batch: 2290

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			03/25/24 09:57	1
Ethylbenzene	ND		1.0	ug/L			03/25/24 09:57	1
Toluene	ND		1.0	ug/L			03/25/24 09:57	1
Xylenes, Total	ND		1.5	ug/L			03/25/24 09:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		70 - 130		03/25/24 09:57	1
4-Bromofluorobenzene (Surr)	102		70 - 130		03/25/24 09:57	1
Dibromofluoromethane (Surr)	108		70 - 130		03/25/24 09:57	1
Toluene-d8 (Surr)	100		70 - 130		03/25/24 09:57	1

Lab Sample ID: LCS 885-2290/17

Matrix: Water

Analysis Batch: 2290

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.1	21.4		ug/L		107	70 - 130
Toluene	20.2	19.1		ug/L		95	70 - 130
Trichloroethene (TCE)	20.2	18.5		ug/L		92	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	113		70 - 130
4-Bromofluorobenzene (Surr)	98		70 - 130
Dibromofluoromethane (Surr)	115		70 - 130
Toluene-d8 (Surr)	97		70 - 130

Lab Sample ID: 885-1281-1 MS

Matrix: Water

Analysis Batch: 2290

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	ND		40.2	37.1		ug/L		92	70 - 130
Toluene	ND		40.3	38.7		ug/L		96	70 - 130
Trichloroethene (TCE)	ND		40.3	35.4		ug/L		88	70 - 130

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	110		70 - 130
4-Bromofluorobenzene (Surr)	106		70 - 130
Dibromofluoromethane (Surr)	111		70 - 130
Toluene-d8 (Surr)	96		70 - 130

Lab Sample ID: 885-1281-1 MSD

Matrix: Water

Analysis Batch: 2290

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	ND		40.2	35.7		ug/L		89	70 - 130	4	20
Toluene	ND		40.3	37.4		ug/L		93	70 - 130	3	20

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 885-1281-1 MSD

Matrix: Water

Analysis Batch: 2290

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Trichloroethene (TCE)	ND		40.3	35.2		ug/L		87	70 - 130	1	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	111		70 - 130
4-Bromofluorobenzene (Surr)	106		70 - 130
Dibromofluoromethane (Surr)	114		70 - 130
Toluene-d8 (Surr)	100		70 - 130

Lab Sample ID: MB 885-2388/11

Matrix: Water

Analysis Batch: 2388

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			03/26/24 12:07	1
Ethylbenzene	ND		1.0	ug/L			03/26/24 12:07	1
Toluene	ND		1.0	ug/L			03/26/24 12:07	1
Xylenes, Total	ND		1.5	ug/L			03/26/24 12:07	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		70 - 130		03/26/24 12:07	1
4-Bromofluorobenzene (Surr)	90		70 - 130		03/26/24 12:07	1
Dibromofluoromethane (Surr)	119		70 - 130		03/26/24 12:07	1
Toluene-d8 (Surr)	101		70 - 130		03/26/24 12:07	1

Lab Sample ID: LCS 885-2388/10

Matrix: Water

Analysis Batch: 2388

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.0	21.0		ug/L		105	70 - 130
Ethylbenzene	20.0	20.1		ug/L		101	70 - 130
Toluene	20.0	20.4		ug/L		102	70 - 130
Trichloroethene (TCE)	20.0	19.4		ug/L		97	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	109		70 - 130
4-Bromofluorobenzene (Surr)	96		70 - 130
Dibromofluoromethane (Surr)	116		70 - 130
Toluene-d8 (Surr)	101		70 - 130

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-1818/4

Matrix: Water

Analysis Batch: 1818

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			03/15/24 10:57	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 885-1818/5

Matrix: Water

Analysis Batch: 1818

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.83		mg/L		98	90 - 110

Lab Sample ID: MRL 885-1818/3

Matrix: Water

Analysis Batch: 1818

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.528		mg/L		106	50 - 150

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 885-1890/14

Matrix: Water

Analysis Batch: 1890

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.0020	mg/L			03/19/24 07:20	1

Lab Sample ID: LCS 885-1890/16

Matrix: Water

Analysis Batch: 1890

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.500	0.493		mg/L		99	80 - 120

Lab Sample ID: LCSD 885-1890/17

Matrix: Water

Analysis Batch: 1890

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	0.500	0.504		mg/L		101	80 - 120	2	20

Lab Sample ID: LLCS 885-1890/15

Matrix: Water

Analysis Batch: 1890

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00200	0.00192	J	mg/L		96	

Lab Sample ID: MB 885-1903/16

Matrix: Water

Analysis Batch: 1903

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.0020	mg/L			03/18/24 16:06	1

Eurofins Albuquerque

QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 885-1903/18

Matrix: Water

Analysis Batch: 1903

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.500	0.547		mg/L		109	80 - 120

Lab Sample ID: LCSD 885-1903/19

Matrix: Water

Analysis Batch: 1903

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	0.500	0.515		mg/L		103	80 - 120	6	20

Lab Sample ID: LLCS 885-1903/17

Matrix: Water

Analysis Batch: 1903

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00200	0.00197	J	mg/L		99	

Method: 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 885-1995/1

Matrix: Water

Analysis Batch: 1995

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		50	mg/L			03/20/24 10:16	1

Lab Sample ID: LCS 885-1995/2

Matrix: Water

Analysis Batch: 1995

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	989		mg/L		99	80 - 120

Eurofins Albuquerque

QC Association Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

GC/MS VOA

Analysis Batch: 2290

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-1	MW-1	Total/NA	Water	8260B	
885-1281-2	MW-2	Total/NA	Water	8260B	
885-1281-3	MW-3	Total/NA	Water	8260B	
885-1281-5	MW-5	Total/NA	Water	8260B	
885-1281-6	MW-6	Total/NA	Water	8260B	
885-1281-7	MW-7	Total/NA	Water	8260B	
MB 885-2290/18	Method Blank	Total/NA	Water	8260B	
LCS 885-2290/17	Lab Control Sample	Total/NA	Water	8260B	
885-1281-1 MS	MW-1	Total/NA	Water	8260B	
885-1281-1 MSD	MW-1	Total/NA	Water	8260B	

Analysis Batch: 2388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-3	MW-3	Total/NA	Water	8260B	
885-1281-4	MW-4	Total/NA	Water	8260B	
MB 885-2388/11	Method Blank	Total/NA	Water	8260B	
LCS 885-2388/10	Lab Control Sample	Total/NA	Water	8260B	

HPLC/IC

Analysis Batch: 1818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-2	MW-2	Total/NA	Water	300.0	
885-1281-3	MW-3	Total/NA	Water	300.0	
885-1281-6	MW-6	Total/NA	Water	300.0	
MB 885-1818/4	Method Blank	Total/NA	Water	300.0	
LCS 885-1818/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-1818/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 2863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-1	MW-1	Total/NA	Water	300.0	
885-1281-4	MW-4	Total/NA	Water	300.0	
885-1281-5	MW-5	Total/NA	Water	300.0	
885-1281-7	MW-7	Total/NA	Water	300.0	

Metals

Filtration Batch: 1776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-1	MW-1	Dissolved	Water	Filtration	
885-1281-2	MW-2	Dissolved	Water	Filtration	
885-1281-3	MW-3	Dissolved	Water	Filtration	
885-1281-4	MW-4	Dissolved	Water	Filtration	
885-1281-5	MW-5	Dissolved	Water	Filtration	
885-1281-6	MW-6	Dissolved	Water	Filtration	
885-1281-7	MW-7	Dissolved	Water	Filtration	

Analysis Batch: 1890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-3	MW-3	Dissolved	Water	6010B	1776
MB 885-1890/14	Method Blank	Total/NA	Water	6010B	

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QC Association Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Metals (Continued)

Analysis Batch: 1890 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 885-1890/16	Lab Control Sample	Total/NA	Water	6010B	
LCSD 885-1890/17	Lab Control Sample Dup	Total/NA	Water	6010B	
LLCS 885-1890/15	Lab Control Sample	Total/NA	Water	6010B	

Analysis Batch: 1903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-1	MW-1	Dissolved	Water	6010B	1776
885-1281-2	MW-2	Dissolved	Water	6010B	1776
885-1281-4	MW-4	Dissolved	Water	6010B	1776
885-1281-5	MW-5	Dissolved	Water	6010B	1776
885-1281-6	MW-6	Dissolved	Water	6010B	1776
885-1281-7	MW-7	Dissolved	Water	6010B	1776
MB 885-1903/16	Method Blank	Total/NA	Water	6010B	
LCS 885-1903/18	Lab Control Sample	Total/NA	Water	6010B	
LCSD 885-1903/19	Lab Control Sample Dup	Total/NA	Water	6010B	
LLCS 885-1903/17	Lab Control Sample	Total/NA	Water	6010B	

General Chemistry

Analysis Batch: 1995

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1281-1	MW-1	Total/NA	Water	2540C	
885-1281-2	MW-2	Total/NA	Water	2540C	
885-1281-3	MW-3	Total/NA	Water	2540C	
885-1281-4	MW-4	Total/NA	Water	2540C	
885-1281-5	MW-5	Total/NA	Water	2540C	
885-1281-6	MW-6	Total/NA	Water	2540C	
885-1281-7	MW-7	Total/NA	Water	2540C	
MB 885-1995/1	Method Blank	Total/NA	Water	2540C	
LCS 885-1995/2	Lab Control Sample	Total/NA	Water	2540C	

Eurofins Albuquerque

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-1
Date Collected: 03/14/24 12:55
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		2	2290	JR	EET ALB	03/25/24 14:59
Total/NA	Analysis	300.0		50	2863	SS	EET ALB	04/05/24 14:00
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		1	1903	VP	EET ALB	03/18/24 16:17
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Client Sample ID: MW-2
Date Collected: 03/14/24 13:40
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	2290	JR	EET ALB	03/25/24 16:49
Total/NA	Analysis	300.0		5	1818	SS	EET ALB	03/15/24 18:04
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		5	1903	VP	EET ALB	03/18/24 16:26
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Client Sample ID: MW-3
Date Collected: 03/14/24 14:00
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	2290	JR	EET ALB	03/25/24 17:16
Total/NA	Analysis	8260B		10	2388	JR	EET ALB	03/26/24 18:33
Total/NA	Analysis	300.0		5	1818	SS	EET ALB	03/15/24 18:30
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		10	1890	VP	EET ALB	03/19/24 07:26
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Client Sample ID: MW-4
Date Collected: 03/14/24 12:30
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	2388	JR	EET ALB	03/26/24 19:00
Total/NA	Analysis	300.0		50	2863	SS	EET ALB	04/05/24 14:15
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		1	1903	VP	EET ALB	03/18/24 16:44
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Client Sample ID: MW-5
Date Collected: 03/14/24 14:45
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	2290	JR	EET ALB	03/25/24 18:11
Total/NA	Analysis	300.0		100	2863	SS	EET ALB	04/05/24 14:30
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		5	1903	VP	EET ALB	03/18/24 16:55
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Client Sample ID: MW-6
Date Collected: 03/14/24 15:20
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	2290	JR	EET ALB	03/25/24 18:39
Total/NA	Analysis	300.0		5	1818	SS	EET ALB	03/15/24 20:13
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		5	1903	VP	EET ALB	03/18/24 17:00
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Client Sample ID: MW-7
Date Collected: 03/14/24 15:45
Date Received: 03/15/24 07:20

Lab Sample ID: 885-1281-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	2290	JR	EET ALB	03/25/24 19:06
Total/NA	Analysis	300.0		50	2863	SS	EET ALB	04/05/24 19:48
Dissolved	Filtration	Filtration			1776	TC	EET ALB	03/15/24 11:20
Dissolved	Analysis	6010B		1	1903	VP	EET ALB	03/18/24 17:03
Total/NA	Analysis	2540C		1	1995	KB	EET ALB	03/20/24 10:16

Laboratory References:
EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-1281-1

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
2540C		Water	Total Dissolved Solids
300.0		Water	Sulfate
6010B		Water	Manganese
8260B		Water	Benzene
8260B		Water	Ethylbenzene
8260B		Water	Toluene
8260B		Water	Xylenes, Total
Oregon	NELAP	NM100001	02-26-25

Login Sample Receipt Checklist

Client: Hilcorp Energy

Job Number: 885-1281-1

Login Number: 1281

List Source: Eurofins Albuquerque

List Number: 1

Creator: Casarrubias, Tracy

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Did not receive all required containers.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting required
Residual Chlorine Checked.	True	



Environment Testing

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ANALYTICAL REPORT

PREPARED FOR

Attn: Kate Kaufman
Hilcorp Energy
PO BOX 4700
Farmington, New Mexico 87499

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JOB DESCRIPTION

Mangum 1

JOB NUMBER

885-7157-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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Authorized for release by
Michelle Garcia, Project Manager
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(505)345-3975

Client: Hilcorp Energy
Project/Site: Mangum 1

Laboratory Job ID: 885-7157-1

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Definitions/Glossary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Hilcorp Energy
Project: Mangum 1

Job ID: 885-7157-1

Job ID: 885-7157-1

Eurofins Albuquerque

Job Narrative 885-7157-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 6/29/2024 6:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.7°C.

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-1
Date Collected: 06/27/24 12:55
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-1
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			07/10/24 14:15	1	
Ethylbenzene	ND		1.0	ug/L			07/10/24 14:15	1	
Toluene	ND		1.0	ug/L			07/10/24 14:15	1	
Xylenes, Total	ND		1.5	ug/L			07/10/24 14:15	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	97		70 - 130				07/10/24 14:15	1	
4-Bromofluorobenzene (Surr)	114		70 - 130				07/10/24 14:15	1	
Dibromofluoromethane (Surr)	94		70 - 130				07/10/24 14:15	1	
Toluene-d8 (Surr)	100		70 - 130				07/10/24 14:15	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	880		50	mg/L			07/01/24 22:59	100	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.35		0.010	mg/L			07/08/24 06:47	5	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2500		100	mg/L			07/03/24 12:52	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-2
Date Collected: 06/27/24 13:30
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-2
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			07/11/24 02:29	1	
Ethylbenzene	ND		1.0	ug/L			07/11/24 02:29	1	
Toluene	ND		1.0	ug/L			07/11/24 02:29	1	
Xylenes, Total	ND		1.5	ug/L			07/11/24 02:29	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	88		70 - 130				07/11/24 02:29	1	
4-Bromofluorobenzene (Surr)	128		70 - 130				07/11/24 02:29	1	
Dibromofluoromethane (Surr)	86		70 - 130				07/11/24 02:29	1	
Toluene-d8 (Surr)	106		70 - 130				07/11/24 02:29	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	290		50	mg/L			07/01/24 23:48	100	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	2.1		0.010	mg/L			07/02/24 12:50	5	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2000		250	mg/L			07/03/24 12:52	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-3
Date Collected: 06/27/24 14:00
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	1.9		1.0	ug/L			07/11/24 02:53	1	
Ethylbenzene	22		1.0	ug/L			07/11/24 02:53	1	
Toluene	ND		1.0	ug/L			07/11/24 02:53	1	
Xylenes, Total	1.7		1.5	ug/L			07/11/24 02:53	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	86		70 - 130				07/11/24 02:53	1	
4-Bromofluorobenzene (Surr)	111		70 - 130				07/11/24 02:53	1	
Dibromofluoromethane (Surr)	90		70 - 130				07/11/24 02:53	1	
Toluene-d8 (Surr)	105		70 - 130				07/11/24 02:53	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	890		50	mg/L			07/02/24 00:13	100	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	9.6		0.020	mg/L			07/08/24 08:08	10	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	5500		250	mg/L			07/03/24 12:52	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-4
Date Collected: 06/27/24 12:30
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-4
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			07/10/24 16:17	1	
Ethylbenzene	ND		1.0	ug/L			07/10/24 16:17	1	
Toluene	ND		1.0	ug/L			07/10/24 16:17	1	
Xylenes, Total	7.5		1.5	ug/L			07/10/24 16:17	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	94		70 - 130				07/10/24 16:17	1	
4-Bromofluorobenzene (Surr)	120		70 - 130				07/10/24 16:17	1	
Dibromofluoromethane (Surr)	90		70 - 130				07/10/24 16:17	1	
Toluene-d8 (Surr)	109		70 - 130				07/10/24 16:17	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	950		50	mg/L			07/02/24 00:38	100	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.28		0.0020	mg/L			07/02/24 12:23	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2300		250	mg/L			07/03/24 12:52	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-5
Date Collected: 06/27/24 14:45
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-5
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			07/10/24 16:42	1	
Ethylbenzene	36		1.0	ug/L			07/10/24 16:42	1	
Toluene	ND		1.0	ug/L			07/10/24 16:42	1	
Xylenes, Total	380		15	ug/L			07/11/24 15:49	10	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	87		70 - 130				07/10/24 16:42	1	
4-Bromofluorobenzene (Surr)	113		70 - 130				07/10/24 16:42	1	
Dibromofluoromethane (Surr)	87		70 - 130				07/10/24 16:42	1	
Toluene-d8 (Surr)	113		70 - 130				07/10/24 16:42	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	1000		50	mg/L			07/02/24 01:02	100	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	2.6		0.020	mg/L			07/02/24 12:59	10	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	3200		250	mg/L			07/03/24 12:52	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-6
Date Collected: 06/27/24 15:30
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-6
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	25		1.0	ug/L			07/10/24 17:06	1	
Ethylbenzene	35		1.0	ug/L			07/10/24 17:06	1	
Toluene	ND		1.0	ug/L			07/10/24 17:06	1	
Xylenes, Total	530		15	ug/L			07/11/24 16:13	10	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	89		70 - 130				07/10/24 17:06	1	
4-Bromofluorobenzene (Surr)	117		70 - 130				07/10/24 17:06	1	
Dibromofluoromethane (Surr)	87		70 - 130				07/10/24 17:06	1	
Toluene-d8 (Surr)	118		70 - 130				07/10/24 17:06	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	0.78		0.50	mg/L			07/03/24 13:05	1	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.67		0.010	mg/L			07/02/24 13:01	5	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	1200		250	mg/L			07/03/24 12:52	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-7
Date Collected: 06/27/24 17:00
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-7
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			07/10/24 17:31	1	
Ethylbenzene	ND		1.0	ug/L			07/10/24 17:31	1	
Toluene	ND		1.0	ug/L			07/10/24 17:31	1	
Xylenes, Total	ND		1.5	ug/L			07/10/24 17:31	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	92		70 - 130				07/10/24 17:31	1	
4-Bromofluorobenzene (Surr)	109		70 - 130				07/10/24 17:31	1	
Dibromofluoromethane (Surr)	92		70 - 130				07/10/24 17:31	1	
Toluene-d8 (Surr)	104		70 - 130				07/10/24 17:31	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	720	F1	50	mg/L			07/02/24 02:41	100	
Method: SW846 6010B - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.51		0.0020	mg/L			07/02/24 12:32	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2700		250	mg/L			07/03/24 12:52	1	

QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 885-8161/34

Matrix: Water

Analysis Batch: 8161

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			07/11/24 00:27	1
Ethylbenzene	ND		1.0	ug/L			07/11/24 00:27	1
Toluene	ND		1.0	ug/L			07/11/24 00:27	1
Xylenes, Total	ND		1.5	ug/L			07/11/24 00:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	94		70 - 130		07/11/24 00:27	1
4-Bromofluorobenzene (Surr)	103		70 - 130		07/11/24 00:27	1
Dibromofluoromethane (Surr)	89		70 - 130		07/11/24 00:27	1
Toluene-d8 (Surr)	101		70 - 130		07/11/24 00:27	1

Lab Sample ID: MB 885-8161/5

Matrix: Water

Analysis Batch: 8161

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			07/10/24 12:37	1
Ethylbenzene	ND		1.0	ug/L			07/10/24 12:37	1
Toluene	ND		1.0	ug/L			07/10/24 12:37	1
Xylenes, Total	ND		1.5	ug/L			07/10/24 12:37	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		07/10/24 12:37	1
4-Bromofluorobenzene (Surr)	101		70 - 130		07/10/24 12:37	1
Dibromofluoromethane (Surr)	93		70 - 130		07/10/24 12:37	1
Toluene-d8 (Surr)	100		70 - 130		07/10/24 12:37	1

Lab Sample ID: STOBLK 885-8161/29

Matrix: Water

Analysis Batch: 8161

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	STOBLK Result	STOBLK Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			07/10/24 22:25	1
Ethylbenzene	ND		1.0	ug/L			07/10/24 22:25	1
Toluene	ND		1.0	ug/L			07/10/24 22:25	1
Xylenes, Total	ND		1.5	ug/L			07/10/24 22:25	1

Surrogate	STOBLK %Recovery	STOBLK Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		70 - 130		07/10/24 22:25	1
4-Bromofluorobenzene (Surr)	105		70 - 130		07/10/24 22:25	1
Dibromofluoromethane (Surr)	94		70 - 130		07/10/24 22:25	1
Toluene-d8 (Surr)	101		70 - 130		07/10/24 22:25	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 885-8161/33

Matrix: Water

Analysis Batch: 8161

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.1	19.8		ug/L		99	70 - 130
Toluene	20.2	23.0		ug/L		114	70 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	91		70 - 130				
4-Bromofluorobenzene (Surr)	106		70 - 130				
Dibromofluoromethane (Surr)	90		70 - 130				
Toluene-d8 (Surr)	103		70 - 130				

Lab Sample ID: LCS 885-8161/4

Matrix: Water

Analysis Batch: 8161

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.1	21.0		ug/L		104	70 - 130
Toluene	20.2	23.7		ug/L		118	70 - 130
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	97		70 - 130				
4-Bromofluorobenzene (Surr)	106		70 - 130				
Dibromofluoromethane (Surr)	92		70 - 130				
Toluene-d8 (Surr)	104		70 - 130				

Lab Sample ID: 885-7157-1 MS

Matrix: Water

Analysis Batch: 8161

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	ND		20.1	19.4		ug/L		97	70 - 130
Toluene	ND		20.2	21.1		ug/L		105	70 - 130
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	92		70 - 130						
4-Bromofluorobenzene (Surr)	113		70 - 130						
Dibromofluoromethane (Surr)	92		70 - 130						
Toluene-d8 (Surr)	101		70 - 130						

Lab Sample ID: 885-7157-1 MSD

Matrix: Water

Analysis Batch: 8161

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Benzene	ND		20.1	19.5		ug/L		97	70 - 130	0	20
Toluene	ND		20.2	21.4		ug/L		106	70 - 130	2	20
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	95		70 - 130								

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 885-7157-1 MSD

Matrix: Water

Analysis Batch: 8161

Client Sample ID: MW-1

Prep Type: Total/NA

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene (Surr)	115		70 - 130
Dibromofluoromethane (Surr)	91		70 - 130
Toluene-d8 (Surr)	102		70 - 130

Lab Sample ID: MB 885-8229/5

Matrix: Water

Analysis Batch: 8229

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB							
	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			07/11/24 12:32	1	
Ethylbenzene	ND		1.0	ug/L			07/11/24 12:32	1	
Toluene	ND		1.0	ug/L			07/11/24 12:32	1	
Xylenes, Total	ND		1.5	ug/L			07/11/24 12:32	1	

Surrogate	MB	MB							
	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
1,2-Dichloroethane-d4 (Surr)	93		70 - 130		07/11/24 12:32	1			
4-Bromofluorobenzene (Surr)	104		70 - 130		07/11/24 12:32	1			
Dibromofluoromethane (Surr)	92		70 - 130		07/11/24 12:32	1			
Toluene-d8 (Surr)	103		70 - 130		07/11/24 12:32	1			

Lab Sample ID: LCS 885-8229/4

Matrix: Water

Analysis Batch: 8229

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike	LCS	LCS						%Rec
	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Benzene	20.1	19.9		ug/L		99	70 - 130		
Toluene	20.2	22.6		ug/L		112	70 - 130		

Surrogate	LCS	LCS							
	%Recovery	Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	91		70 - 130						
4-Bromofluorobenzene (Surr)	107		70 - 130						
Dibromofluoromethane (Surr)	92		70 - 130						
Toluene-d8 (Surr)	103		70 - 130						

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-7735/4

Matrix: Water

Analysis Batch: 7735

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB							
	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	ND		0.50	mg/L			07/01/24 16:24	1	

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 885-7735/5

Matrix: Water

Analysis Batch: 7735

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.72		mg/L		97	90 - 110

Lab Sample ID: MRL 885-7735/3

Matrix: Water

Analysis Batch: 7735

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.509		mg/L		102	50 - 150

Lab Sample ID: MB 885-7923/4

Matrix: Water

Analysis Batch: 7923

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			07/03/24 10:35	1

Lab Sample ID: LCS 885-7923/5

Matrix: Water

Analysis Batch: 7923

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.87		mg/L		99	90 - 110

Lab Sample ID: MRL 885-7923/3

Matrix: Water

Analysis Batch: 7923

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.531		mg/L		106	50 - 150

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 885-7818/83

Matrix: Water

Analysis Batch: 7818

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.0020	mg/L			07/02/24 10:49	1

Lab Sample ID: LCS 885-7818/85

Matrix: Water

Analysis Batch: 7818

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.500	0.476		mg/L		95	80 - 120

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MRL 885-7818/13

Matrix: Water

Analysis Batch: 7818

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00200	0.00204	J	mg/L		102	50 - 150

Lab Sample ID: MB 885-8029/28

Matrix: Water

Analysis Batch: 8029

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.0020	mg/L			07/08/24 06:40	1

Lab Sample ID: LCS 885-8029/30

Matrix: Water

Analysis Batch: 8029

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.500	0.528		mg/L		106	80 - 120

Lab Sample ID: LLCS 885-8029/29

Matrix: Water

Analysis Batch: 8029

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00200	0.00196	J	mg/L		98	50 - 150

Lab Sample ID: MRL 885-8029/22

Matrix: Water

Analysis Batch: 8029

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00200	0.00201	J	mg/L		101	50 - 150

Lab Sample ID: 885-7157-2 MS

Matrix: Water

Analysis Batch: 7818

Client Sample ID: MW-2

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	2.1		2.50	4.26		mg/L		87	75 - 125

Lab Sample ID: 885-7157-2 MSD

Matrix: Water

Analysis Batch: 7818

Client Sample ID: MW-2

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Manganese	2.1		2.50	4.20		mg/L		84	75 - 125	2	20

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Method: 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 885-7881/1

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 7881

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		50	mg/L			07/03/24 12:52	1

Lab Sample ID: LCS 885-7881/2

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 7881

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	999		mg/L		100	80 - 120

QC Association Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

GC/MS VOA

Analysis Batch: 8161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-1	MW-1	Total/NA	Water	8260B	
885-7157-2	MW-2	Total/NA	Water	8260B	
885-7157-3	MW-3	Total/NA	Water	8260B	
885-7157-4	MW-4	Total/NA	Water	8260B	
885-7157-5	MW-5	Total/NA	Water	8260B	
885-7157-6	MW-6	Total/NA	Water	8260B	
885-7157-7	MW-7	Total/NA	Water	8260B	
MB 885-8161/34	Method Blank	Total/NA	Water	8260B	
MB 885-8161/5	Method Blank	Total/NA	Water	8260B	
STOBLK 885-8161/29	Method Blank	Total/NA	Water	8260B	
LCS 885-8161/33	Lab Control Sample	Total/NA	Water	8260B	
LCS 885-8161/4	Lab Control Sample	Total/NA	Water	8260B	
885-7157-1 MS	MW-1	Total/NA	Water	8260B	
885-7157-1 MSD	MW-1	Total/NA	Water	8260B	

Analysis Batch: 8229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-5	MW-5	Total/NA	Water	8260B	
885-7157-6	MW-6	Total/NA	Water	8260B	
MB 885-8229/5	Method Blank	Total/NA	Water	8260B	
LCS 885-8229/4	Lab Control Sample	Total/NA	Water	8260B	

HPLC/IC

Analysis Batch: 7735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-1	MW-1	Total/NA	Water	300.0	
885-7157-2	MW-2	Total/NA	Water	300.0	
885-7157-3	MW-3	Total/NA	Water	300.0	
885-7157-4	MW-4	Total/NA	Water	300.0	
885-7157-5	MW-5	Total/NA	Water	300.0	
885-7157-7	MW-7	Total/NA	Water	300.0	
MB 885-7735/4	Method Blank	Total/NA	Water	300.0	
LCS 885-7735/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-7735/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 7923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-6	MW-6	Total/NA	Water	300.0	
MB 885-7923/4	Method Blank	Total/NA	Water	300.0	
LCS 885-7923/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-7923/3	Lab Control Sample	Total/NA	Water	300.0	

Metals

Analysis Batch: 7818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-2	MW-2	Dissolved	Water	6010B	
885-7157-4	MW-4	Dissolved	Water	6010B	
885-7157-5	MW-5	Dissolved	Water	6010B	
885-7157-6	MW-6	Dissolved	Water	6010B	
885-7157-7	MW-7	Dissolved	Water	6010B	

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QC Association Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Metals (Continued)

Analysis Batch: 7818 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 885-7818/83	Method Blank	Total/NA	Water	6010B	
LCS 885-7818/85	Lab Control Sample	Total/NA	Water	6010B	
MRL 885-7818/13	Lab Control Sample	Total/NA	Water	6010B	
885-7157-2 MS	MW-2	Dissolved	Water	6010B	
885-7157-2 MSD	MW-2	Dissolved	Water	6010B	

Analysis Batch: 8029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-1	MW-1	Dissolved	Water	6010B	
885-7157-3	MW-3	Dissolved	Water	6010B	
MB 885-8029/28	Method Blank	Total/NA	Water	6010B	
LCS 885-8029/30	Lab Control Sample	Total/NA	Water	6010B	
LLCS 885-8029/29	Lab Control Sample	Total/NA	Water	6010B	
MRL 885-8029/22	Lab Control Sample	Total/NA	Water	6010B	

General Chemistry

Analysis Batch: 7881

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-7157-1	MW-1	Total/NA	Water	2540C	
885-7157-2	MW-2	Total/NA	Water	2540C	
885-7157-3	MW-3	Total/NA	Water	2540C	
885-7157-4	MW-4	Total/NA	Water	2540C	
885-7157-5	MW-5	Total/NA	Water	2540C	
885-7157-6	MW-6	Total/NA	Water	2540C	
885-7157-7	MW-7	Total/NA	Water	2540C	
MB 885-7881/1	Method Blank	Total/NA	Water	2540C	
LCS 885-7881/2	Lab Control Sample	Total/NA	Water	2540C	

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-1
Date Collected: 06/27/24 12:55
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/10/24 14:15
Total/NA	Analysis	300.0		100	7735	JT	EET ALB	07/01/24 22:59
Dissolved	Analysis	6010B		5	8029	VP	EET ALB	07/08/24 06:47
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Client Sample ID: MW-2
Date Collected: 06/27/24 13:30
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/11/24 02:29
Total/NA	Analysis	300.0		100	7735	JT	EET ALB	07/01/24 23:48
Dissolved	Analysis	6010B		5	7818	VP	EET ALB	07/02/24 12:50
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Client Sample ID: MW-3
Date Collected: 06/27/24 14:00
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/11/24 02:53
Total/NA	Analysis	300.0		100	7735	JT	EET ALB	07/02/24 00:13
Dissolved	Analysis	6010B		10	8029	VP	EET ALB	07/08/24 08:08
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Client Sample ID: MW-4
Date Collected: 06/27/24 12:30
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/10/24 16:17
Total/NA	Analysis	300.0		100	7735	JT	EET ALB	07/02/24 00:38
Dissolved	Analysis	6010B		1	7818	VP	EET ALB	07/02/24 12:23
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Client Sample ID: MW-5
Date Collected: 06/27/24 14:45
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/10/24 16:42
Total/NA	Analysis	8260B		10	8229	RA	EET ALB	07/11/24 15:49
Total/NA	Analysis	300.0		100	7735	JT	EET ALB	07/02/24 01:02
Dissolved	Analysis	6010B		10	7818	VP	EET ALB	07/02/24 12:59

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Lab Chronicle

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Client Sample ID: MW-5
Date Collected: 06/27/24 14:45
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Client Sample ID: MW-6
Date Collected: 06/27/24 15:30
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/10/24 17:06
Total/NA	Analysis	8260B		10	8229	RA	EET ALB	07/11/24 16:13
Total/NA	Analysis	300.0		1	7923	JT	EET ALB	07/03/24 13:05
Dissolved	Analysis	6010B		5	7818	VP	EET ALB	07/02/24 13:01
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Client Sample ID: MW-7
Date Collected: 06/27/24 17:00
Date Received: 06/29/24 06:15

Lab Sample ID: 885-7157-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	8161	RA	EET ALB	07/10/24 17:31
Total/NA	Analysis	300.0		100	7735	JT	EET ALB	07/02/24 02:41
Dissolved	Analysis	6010B		1	7818	VP	EET ALB	07/02/24 12:32
Total/NA	Analysis	2540C		1	7881	KS	EET ALB	07/03/24 12:52

Laboratory References:
EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-7157-1

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
2540C		Water	Total Dissolved Solids
300.0		Water	Sulfate
6010B		Water	Manganese
8260B		Water	Benzene
8260B		Water	Ethylbenzene
8260B		Water	Toluene
8260B		Water	Xylenes, Total
Oregon	NELAP	NM100001	02-26-25

Login Sample Receipt Checklist

Client: Hilcorp Energy

Job Number: 885-7157-1

Login Number: 7157

List Source: Eurofins Albuquerque

List Number: 1

Creator: Casarrubias, Tracy

Question	Answer	Comment
Radioactivity wasn't checked or is <= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Pour off/filtering needed for diss metals analysis.
Residual Chlorine Checked.	N/A	



Environment Testing

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ANALYTICAL REPORT

PREPARED FOR

Attn: Samantha Grabert
Hilcorp Energy
PO BOX 4700
Farmington, New Mexico 87499

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JOB DESCRIPTION

Mangum 1

JOB NUMBER

885-11916-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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Authorized for release by
Michelle Garcia, Project Manager
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(505)345-3975

Client: Hilcorp Energy
Project/Site: Mangum 1

Laboratory Job ID: 885-11916-1

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Definitions/Glossary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Hilcorp Energy
Project: Mangum 1

Job ID: 885-11916-1

Job ID: 885-11916-1

Eurofins Albuquerque

Job Narrative 885-11916-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 9/17/2024 7:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.1°C.

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

Method 2540C_SingleDry: The analysis volume selected for the following sample produced a base result greater than 200mg before calculation of the final result: MW-1 (885-11916-1). Reanalysis could not be performed due to holding time exceedance. Visual inspection by analyst shows no signs of trapped moisture, report as is. The reference method specifies that no more than 200mg of weight be recovered for a chosen sample analysis volume in order to produce the best data precision. As such, these data have been qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-1
Date Collected: 09/13/24 12:40
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-1
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			09/25/24 01:45	1	
Ethylbenzene	ND		1.0	ug/L			09/25/24 01:45	1	
Toluene	ND		1.0	ug/L			09/25/24 01:45	1	
Xylenes, Total	ND		1.5	ug/L			09/25/24 01:45	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	93		70 - 130				09/25/24 01:45	1	
4-Bromofluorobenzene (Surr)	99		70 - 130				09/25/24 01:45	1	
Dibromofluoromethane (Surr)	97		70 - 130				09/25/24 01:45	1	
Toluene-d8 (Surr)	99		70 - 130				09/25/24 01:45	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	870		50	mg/L			09/17/24 16:37	100	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.44		0.0020	mg/L			09/20/24 12:21	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2500	E	50	mg/L			09/20/24 11:16	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-2
Date Collected: 09/13/24 12:15
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-2
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			09/25/24 02:58	1	
Ethylbenzene	ND		1.0	ug/L			09/25/24 02:58	1	
Toluene	ND		1.0	ug/L			09/25/24 02:58	1	
Xylenes, Total	ND		1.5	ug/L			09/25/24 02:58	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	91		70 - 130				09/25/24 02:58	1	
4-Bromofluorobenzene (Surr)	115		70 - 130				09/25/24 02:58	1	
Dibromofluoromethane (Surr)	95		70 - 130				09/25/24 02:58	1	
Toluene-d8 (Surr)	101		70 - 130				09/25/24 02:58	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	40		5.0	mg/L			09/17/24 16:49	10	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	1.2		0.020	mg/L			09/20/24 12:36	10	
Iron	ND		0.020	mg/L			09/20/24 12:29	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	1700		250	mg/L			09/20/24 11:16	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-3
Date Collected: 09/13/24 13:45
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	24		1.0	ug/L			09/25/24 03:22	1	
Ethylbenzene	28		1.0	ug/L			09/25/24 03:22	1	
Toluene	ND		1.0	ug/L			09/25/24 03:22	1	
Xylenes, Total	7.5		1.5	ug/L			09/25/24 03:22	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	93		70 - 130				09/25/24 03:22	1	
4-Bromofluorobenzene (Surr)	102		70 - 130				09/25/24 03:22	1	
Dibromofluoromethane (Surr)	96		70 - 130				09/25/24 03:22	1	
Toluene-d8 (Surr)	100		70 - 130				09/25/24 03:22	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	550		50	mg/L			09/17/24 17:26	100	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	3.8		0.020	mg/L			09/20/24 12:40	10	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	4800		250	mg/L			09/20/24 11:16	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-4
Date Collected: 09/13/24 13:10
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-4
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	2.1		1.0	ug/L			09/25/24 03:46	1	
Ethylbenzene	ND		1.0	ug/L			09/25/24 03:46	1	
Toluene	ND		1.0	ug/L			09/25/24 03:46	1	
Xylenes, Total	100		1.5	ug/L			09/25/24 03:46	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	91		70 - 130				09/25/24 03:46	1	
4-Bromofluorobenzene (Surr)	109		70 - 130				09/25/24 03:46	1	
Dibromofluoromethane (Surr)	96		70 - 130				09/25/24 03:46	1	
Toluene-d8 (Surr)	130		70 - 130				09/25/24 03:46	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	1100		50	mg/L			09/17/24 17:51	100	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.49		0.0020	mg/L			09/20/24 12:47	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2400		100	mg/L			09/20/24 11:16	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-5
Date Collected: 09/13/24 14:25
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-5
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Benzene	ND		1.0	ug/L			09/25/24 04:11	1	
Ethylbenzene	15		1.0	ug/L			09/25/24 04:11	1	
Toluene	ND		1.0	ug/L			09/25/24 04:11	1	
Xylenes, Total	9.7		1.5	ug/L			09/25/24 04:11	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil	Fac
1,2-Dichloroethane-d4 (Surr)	88		70 - 130				09/25/24 04:11	1	
4-Bromofluorobenzene (Surr)	101		70 - 130				09/25/24 04:11	1	
Dibromofluoromethane (Surr)	95		70 - 130				09/25/24 04:11	1	
Toluene-d8 (Surr)	111		70 - 130				09/25/24 04:11	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Sulfate	1300		50	mg/L			09/17/24 18:15	100	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Manganese	2.8		0.020	mg/L			09/20/24 12:54	10	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil	Fac
Total Dissolved Solids (SM 2540C)	3900		250	mg/L			09/20/24 11:16	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-6

Lab Sample ID: 885-11916-6

Date Collected: 09/13/24 15:10

Matrix: Water

Date Received: 09/17/24 07:15

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	16		1.0	ug/L			09/25/24 04:35	1
Ethylbenzene	6.1		1.0	ug/L			09/25/24 04:35	1
Toluene	ND		1.0	ug/L			09/25/24 04:35	1
Xylenes, Total	320		15	ug/L			09/25/24 13:11	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		70 - 130		09/25/24 04:35	1
1,2-Dichloroethane-d4 (Surr)	92		70 - 130		09/25/24 13:11	10
4-Bromofluorobenzene (Surr)	101		70 - 130		09/25/24 04:35	1
4-Bromofluorobenzene (Surr)	98		70 - 130		09/25/24 13:11	10
Dibromofluoromethane (Surr)	92		70 - 130		09/25/24 04:35	1
Dibromofluoromethane (Surr)	98		70 - 130		09/25/24 13:11	10
Toluene-d8 (Surr)	121		70 - 130		09/25/24 04:35	1
Toluene-d8 (Surr)	106		70 - 130		09/25/24 13:11	10

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			10/02/24 21:36	1

Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	1.5		0.020	mg/L			09/20/24 12:58	10

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1300		250	mg/L			09/20/24 11:16	1

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Client Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-7
Date Collected: 09/13/24 16:00
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-7
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			09/25/24 04:59	1	
Ethylbenzene	ND		1.0	ug/L			09/25/24 04:59	1	
Toluene	ND		1.0	ug/L			09/25/24 04:59	1	
Xylenes, Total	ND		1.5	ug/L			09/25/24 04:59	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	90		70 - 130				09/25/24 04:59	1	
4-Bromofluorobenzene (Surr)	99		70 - 130				09/25/24 04:59	1	
Dibromofluoromethane (Surr)	95		70 - 130				09/25/24 04:59	1	
Toluene-d8 (Surr)	102		70 - 130				09/25/24 04:59	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	810		50	mg/L			09/17/24 19:42	100	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	1.4		0.020	mg/L			09/20/24 13:02	10	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	3000		250	mg/L			09/20/24 11:16	1	

QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 885-12855/1005

Matrix: Water

Analysis Batch: 12855

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			09/24/24 11:55	1
Ethylbenzene	ND		1.0	ug/L			09/24/24 11:55	1
Toluene	ND		1.0	ug/L			09/24/24 11:55	1
Xylenes, Total	ND		1.5	ug/L			09/24/24 11:55	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		09/24/24 11:55	1
4-Bromofluorobenzene (Surr)	91		70 - 130		09/24/24 11:55	1
Dibromofluoromethane (Surr)	102		70 - 130		09/24/24 11:55	1
Toluene-d8 (Surr)	98		70 - 130		09/24/24 11:55	1

Lab Sample ID: MB 885-12855/35

Matrix: Water

Analysis Batch: 12855

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			09/25/24 00:07	1
Ethylbenzene	ND		1.0	ug/L			09/25/24 00:07	1
Toluene	ND		1.0	ug/L			09/25/24 00:07	1
Xylenes, Total	ND		1.5	ug/L			09/25/24 00:07	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		70 - 130		09/25/24 00:07	1
4-Bromofluorobenzene (Surr)	90		70 - 130		09/25/24 00:07	1
Dibromofluoromethane (Surr)	102		70 - 130		09/25/24 00:07	1
Toluene-d8 (Surr)	98		70 - 130		09/25/24 00:07	1

Lab Sample ID: MB 885-12855/5

Matrix: Water

Analysis Batch: 12855

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			09/24/24 11:55	1
Ethylbenzene	ND		1.0	ug/L			09/24/24 11:55	1
Toluene	ND		1.0	ug/L			09/24/24 11:55	1
Xylenes, Total	ND		1.5	ug/L			09/24/24 11:55	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		09/24/24 11:55	1
4-Bromofluorobenzene (Surr)	91		70 - 130		09/24/24 11:55	1
Dibromofluoromethane (Surr)	102		70 - 130		09/24/24 11:55	1
Toluene-d8 (Surr)	98		70 - 130		09/24/24 11:55	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 885-12855/34

Matrix: Water

Analysis Batch: 12855

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			20.1	23.3		ug/L		116	70 - 130		
Toluene			20.2	21.1		ug/L		105	70 - 130		
		LCS	LCS								
Surrogate		%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)		97		70 - 130							
4-Bromofluorobenzene (Surr)		91		70 - 130							
Dibromofluoromethane (Surr)		100		70 - 130							
Toluene-d8 (Surr)		98		70 - 130							

Lab Sample ID: LCS 885-12855/4

Matrix: Water

Analysis Batch: 12855

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			20.1	23.2		ug/L		115	70 - 130		
Toluene			20.2	20.8		ug/L		103	70 - 130		
		LCS	LCS								
Surrogate		%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)		99		70 - 130							
4-Bromofluorobenzene (Surr)		92		70 - 130							
Dibromofluoromethane (Surr)		103		70 - 130							
Toluene-d8 (Surr)		99		70 - 130							

Lab Sample ID: 885-11916-1 MS

Matrix: Water

Analysis Batch: 12855

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene	ND		20.1	22.9		ug/L		114	70 - 130		
Toluene	ND		20.2	20.7		ug/L		102	70 - 130		
		MS	MS								
Surrogate		%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)		94		70 - 130							
4-Bromofluorobenzene (Surr)		98		70 - 130							
Dibromofluoromethane (Surr)		97		70 - 130							
Toluene-d8 (Surr)		98		70 - 130							

Lab Sample ID: 885-11916-1 MSD

Matrix: Water

Analysis Batch: 12855

Client Sample ID: MW-1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Benzene	ND		20.1	22.1		ug/L		110	70 - 130	3	20
Toluene	ND		20.2	20.2		ug/L		100	70 - 130	2	20
		MSD	MSD								
Surrogate		%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)		94		70 - 130							

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 885-11916-1 MSD

Matrix: Water

Analysis Batch: 12855

Client Sample ID: MW-1

Prep Type: Total/NA

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene (Surr)	99		70 - 130
Dibromofluoromethane (Surr)	97		70 - 130
Toluene-d8 (Surr)	100		70 - 130

Lab Sample ID: MB 885-12987/1005

Matrix: Water

Analysis Batch: 12987

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB						
	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			09/25/24 12:46	1
Ethylbenzene	ND		1.0	ug/L			09/25/24 12:46	1
Toluene	ND		1.0	ug/L			09/25/24 12:46	1
Xylenes, Total	ND		1.5	ug/L			09/25/24 12:46	1

Surrogate	MB	MB						
	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac		
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		09/25/24 12:46	1		
4-Bromofluorobenzene (Surr)	94		70 - 130		09/25/24 12:46	1		
Dibromofluoromethane (Surr)	103		70 - 130		09/25/24 12:46	1		
Toluene-d8 (Surr)	101		70 - 130		09/25/24 12:46	1		

Lab Sample ID: MB 885-12987/5

Matrix: Water

Analysis Batch: 12987

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB						
	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	ug/L			09/25/24 12:46	1
Ethylbenzene	ND		1.0	ug/L			09/25/24 12:46	1
Toluene	ND		1.0	ug/L			09/25/24 12:46	1
Xylenes, Total	ND		1.5	ug/L			09/25/24 12:46	1

Surrogate	MB	MB						
	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac		
1,2-Dichloroethane-d4 (Surr)	100		70 - 130		09/25/24 12:46	1		
4-Bromofluorobenzene (Surr)	94		70 - 130		09/25/24 12:46	1		
Dibromofluoromethane (Surr)	103		70 - 130		09/25/24 12:46	1		
Toluene-d8 (Surr)	101		70 - 130		09/25/24 12:46	1		

Lab Sample ID: LCS 885-12987/4

Matrix: Water

Analysis Batch: 12987

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike	LCS	LCS						%Rec
	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Benzene	20.1	22.2		ug/L		110	70 - 130		
Toluene	20.2	20.5		ug/L		102	70 - 130		

Surrogate	LCS	LCS						
	%Recovery	Qualifier	Limits					
1,2-Dichloroethane-d4 (Surr)	95		70 - 130					
4-Bromofluorobenzene (Surr)	94		70 - 130					

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 885-12987/4

Matrix: Water

Analysis Batch: 12987

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Dibromofluoromethane (Surr)	98		70 - 130
Toluene-d8 (Surr)	99		70 - 130

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-12443/4

Matrix: Water

Analysis Batch: 12443

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			09/17/24 09:24	1

Lab Sample ID: MB 885-12443/51

Matrix: Water

Analysis Batch: 12443

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			09/17/24 19:17	1

Lab Sample ID: LCS 885-12443/5

Matrix: Water

Analysis Batch: 12443

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.02		mg/L		90	90 - 110

Lab Sample ID: LCS 885-12443/52

Matrix: Water

Analysis Batch: 12443

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.23		mg/L		92	90 - 110

Lab Sample ID: MRL 885-12443/3

Matrix: Water

Analysis Batch: 12443

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.497	J	mg/L		99	50 - 150

Lab Sample ID: MB 885-13575/4

Matrix: Water

Analysis Batch: 13575

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			10/02/24 08:30	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 885-13575/56					Client Sample ID: Method Blank				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 13575									
Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	ND		0.50	mg/L			10/02/24 20:19	1	

Lab Sample ID: LCS 885-13575/57					Client Sample ID: Lab Control Sample				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 13575									
Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate			10.0	9.40		mg/L		94	90 - 110

Lab Sample ID: MRL 885-13575/3					Client Sample ID: Lab Control Sample				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 13575									
Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate			0.500	0.483	J	mg/L		97	50 - 150

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 885-12656/44					Client Sample ID: Method Blank				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 12656									
Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	ND		0.0020	mg/L			09/20/24 11:05	1	
Iron	ND		0.020	mg/L			09/20/24 11:05	1	

Lab Sample ID: LCS 885-12656/46					Client Sample ID: Lab Control Sample				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 12656									
Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese			0.500	0.528		mg/L		106	85 - 115
Iron			0.500	0.549		mg/L		110	85 - 115

Lab Sample ID: LLCS 885-12656/53					Client Sample ID: Lab Control Sample				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 12656									
Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese			0.00200	0.00214		mg/L		107	50 - 150
Iron			0.0200	0.0231		mg/L		116	50 - 150

Lab Sample ID: MRL 885-12656/40					Client Sample ID: Lab Control Sample				
Matrix: Water					Prep Type: Total/NA				
Analysis Batch: 12656									
Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Manganese			0.00200	0.00198	J	mg/L		99	50 - 150
Iron			0.0200	0.0200	J	mg/L		100	50 - 150

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 885-11916-1 MS Matrix: Water Analysis Batch: 12656											Client Sample ID: MW-1 Prep Type: Dissolved		
Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits				
Manganese	0.44		0.500	0.949		mg/L		102	70 - 130				

Lab Sample ID: 885-11916-1 MSD Matrix: Water Analysis Batch: 12656											Client Sample ID: MW-1 Prep Type: Dissolved		
Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit		
Manganese	0.44		0.500	0.926		mg/L		97	70 - 130	2	20		

Lab Sample ID: 885-11916-2 MS Matrix: Water Analysis Batch: 12656											Client Sample ID: MW-2 Prep Type: Dissolved		
Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits				
Iron	ND		0.500	0.531		mg/L		103	70 - 130				
Iron	ND		0.500	0.531		mg/L		103	70 - 130				

Lab Sample ID: 885-11916-2 MSD Matrix: Water Analysis Batch: 12656											Client Sample ID: MW-2 Prep Type: Dissolved		
Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit		
Iron	ND		0.500	0.542		mg/L		105	70 - 130	2	20		
Iron	ND		0.500	0.542		mg/L		105	70 - 130	2	20		

Method: 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 885-12629/1 Matrix: Water Analysis Batch: 12629											Client Sample ID: Method Blank Prep Type: Total/NA		
Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed		Dil Fac			
Total Dissolved Solids	ND		50		mg/L			09/20/24 11:16		1			

Lab Sample ID: LCS 885-12629/2 Matrix: Water Analysis Batch: 12629											Client Sample ID: Lab Control Sample Prep Type: Total/NA		
Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits				
Total Dissolved Solids			1000	1010		mg/L		101	80 - 120				

QC Association Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

GC/MS VOA

Analysis Batch: 12855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-1	MW-1	Total/NA	Water	8260B	
885-11916-2	MW-2	Total/NA	Water	8260B	
885-11916-3	MW-3	Total/NA	Water	8260B	
885-11916-4	MW-4	Total/NA	Water	8260B	
885-11916-5	MW-5	Total/NA	Water	8260B	
885-11916-6	MW-6	Total/NA	Water	8260B	
885-11916-7	MW-7	Total/NA	Water	8260B	
MB 885-12855/1005	Method Blank	Total/NA	Water	8260B	
MB 885-12855/35	Method Blank	Total/NA	Water	8260B	
MB 885-12855/5	Method Blank	Total/NA	Water	8260B	
LCS 885-12855/34	Lab Control Sample	Total/NA	Water	8260B	
LCS 885-12855/4	Lab Control Sample	Total/NA	Water	8260B	
885-11916-1 MS	MW-1	Total/NA	Water	8260B	
885-11916-1 MSD	MW-1	Total/NA	Water	8260B	

Analysis Batch: 12987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-6	MW-6	Total/NA	Water	8260B	
MB 885-12987/1005	Method Blank	Total/NA	Water	8260B	
MB 885-12987/5	Method Blank	Total/NA	Water	8260B	
LCS 885-12987/4	Lab Control Sample	Total/NA	Water	8260B	

HPLC/IC

Analysis Batch: 12443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-1	MW-1	Total/NA	Water	300.0	
885-11916-2	MW-2	Total/NA	Water	300.0	
885-11916-3	MW-3	Total/NA	Water	300.0	
885-11916-4	MW-4	Total/NA	Water	300.0	
885-11916-5	MW-5	Total/NA	Water	300.0	
885-11916-7	MW-7	Total/NA	Water	300.0	
MB 885-12443/4	Method Blank	Total/NA	Water	300.0	
MB 885-12443/51	Method Blank	Total/NA	Water	300.0	
LCS 885-12443/5	Lab Control Sample	Total/NA	Water	300.0	
LCS 885-12443/52	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-12443/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 13575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-6	MW-6	Total/NA	Water	300.0	
MB 885-13575/4	Method Blank	Total/NA	Water	300.0	
MB 885-13575/56	Method Blank	Total/NA	Water	300.0	
LCS 885-13575/57	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-13575/3	Lab Control Sample	Total/NA	Water	300.0	

Metals

Filtration Batch: 12392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-1	MW-1	Dissolved	Water	Filtration	
885-11916-2	MW-2	Dissolved	Water	Filtration	

Eurofins Albuquerque

QC Association Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Metals (Continued)

Filtration Batch: 12392 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-3	MW-3	Dissolved	Water	Filtration	
885-11916-4	MW-4	Dissolved	Water	Filtration	
885-11916-5	MW-5	Dissolved	Water	Filtration	
885-11916-6	MW-6	Dissolved	Water	Filtration	
885-11916-7	MW-7	Dissolved	Water	Filtration	
885-11916-1 MS	MW-1	Dissolved	Water	Filtration	
885-11916-1 MSD	MW-1	Dissolved	Water	Filtration	
885-11916-2 MS	MW-2	Dissolved	Water	Filtration	
885-11916-2 MSD	MW-2	Dissolved	Water	Filtration	

Analysis Batch: 12656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-1	MW-1	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-2	MW-2	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-2	MW-2	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-3	MW-3	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-4	MW-4	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-5	MW-5	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-6	MW-6	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-7	MW-7	Dissolved	Water	200.7 Rev 4.4	12392
MB 885-12656/44	Method Blank	Total/NA	Water	200.7 Rev 4.4	
LCS 885-12656/46	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	
LLCS 885-12656/53	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	
MRL 885-12656/40	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	
885-11916-1 MS	MW-1	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-1 MSD	MW-1	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-2 MS	MW-2	Dissolved	Water	200.7 Rev 4.4	12392
885-11916-2 MSD	MW-2	Dissolved	Water	200.7 Rev 4.4	12392

General Chemistry

Analysis Batch: 12629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-11916-1	MW-1	Total/NA	Water	2540C	
885-11916-2	MW-2	Total/NA	Water	2540C	
885-11916-3	MW-3	Total/NA	Water	2540C	
885-11916-4	MW-4	Total/NA	Water	2540C	
885-11916-5	MW-5	Total/NA	Water	2540C	
885-11916-6	MW-6	Total/NA	Water	2540C	
885-11916-7	MW-7	Total/NA	Water	2540C	
MB 885-12629/1	Method Blank	Total/NA	Water	2540C	
LCS 885-12629/2	Lab Control Sample	Total/NA	Water	2540C	

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-1
Date Collected: 09/13/24 12:40
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 01:45
Total/NA	Analysis	300.0		100	12443	JT	EET ALB	09/17/24 16:37
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		1	12656	VP	EET ALB	09/20/24 12:21
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Client Sample ID: MW-2
Date Collected: 09/13/24 12:15
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 02:58
Total/NA	Analysis	300.0		10	12443	JT	EET ALB	09/17/24 16:49
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		1	12656	VP	EET ALB	09/20/24 12:29
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		10	12656	VP	EET ALB	09/20/24 12:36
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Client Sample ID: MW-3
Date Collected: 09/13/24 13:45
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 03:22
Total/NA	Analysis	300.0		100	12443	JT	EET ALB	09/17/24 17:26
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		10	12656	VP	EET ALB	09/20/24 12:40
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Client Sample ID: MW-4
Date Collected: 09/13/24 13:10
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 03:46
Total/NA	Analysis	300.0		100	12443	JT	EET ALB	09/17/24 17:51
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		1	12656	VP	EET ALB	09/20/24 12:47
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Client Sample ID: MW-5
Date Collected: 09/13/24 14:25
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 04:11
Total/NA	Analysis	300.0		100	12443	JT	EET ALB	09/17/24 18:15
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		10	12656	VP	EET ALB	09/20/24 12:54
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Client Sample ID: MW-6
Date Collected: 09/13/24 15:10
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 04:35
Total/NA	Analysis	8260B		10	12987	CM	EET ALB	09/25/24 13:11
Total/NA	Analysis	300.0		1	13575	JT	EET ALB	10/02/24 21:36
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		10	12656	VP	EET ALB	09/20/24 12:58
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Client Sample ID: MW-7
Date Collected: 09/13/24 16:00
Date Received: 09/17/24 07:15

Lab Sample ID: 885-11916-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	12855	CM	EET ALB	09/25/24 04:59
Total/NA	Analysis	300.0		100	12443	JT	EET ALB	09/17/24 19:42
Dissolved	Filtration	Filtration			12392	TC	EET ALB	09/17/24 11:22
Dissolved	Analysis	200.7 Rev 4.4		10	12656	VP	EET ALB	09/20/24 13:02
Total/NA	Analysis	2540C		1	12629	KS	EET ALB	09/20/24 11:16

Laboratory References:
EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Hilcorp Energy
Project/Site: Mangum 1

Job ID: 885-11916-1

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4		Water	Iron
200.7 Rev 4.4		Water	Manganese
2540C		Water	Total Dissolved Solids
300.0		Water	Sulfate
8260B		Water	Benzene
8260B		Water	Ethylbenzene
8260B		Water	Toluene
8260B		Water	Xylenes, Total
Oregon	NELAP	NM100001	02-26-25

Chain-of-Custody Record

Client: Hilcorp Farmington NM

Mailing Address: 382 Road 3100 Aztec, NM 87410

Billing Address: PO Box 61529 Houston, TX 77208

Phone #: 505-486-9543

email or Fax#: Brandon.Sinclair@hilcorp.com

QA/QC Package:

☐ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Mangum 1

Project #:

Project Manager:

Samantha Grabert

Sampler: Brandon Sinclair

On Ice: ☒ Yes ☐ No

of Coolers:

Cooler Temp (including CF): 0-20-0.1

Date Time Matrix Sample Name

9-13 1240 Water MW-1

1215 Water MW-2

1345 Water MW-3

1310 Water MW-4

1425 Water MW-5

1510 Water MW-6

1600 Water MW-7

Date Time Relinquished by:

9/16/24 1600 yz Sinclair

Date Time Relinquished by:

9/16/24 1728 CW Watson

Received by: Via: Date Time

Seth West 9/16/24 1600

Received by: Via: Date Time

Brandon Sinclair 9/17/24 7:15

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

HALL ENVIRONMENTAL
ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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



885-11916 COC

Analysis Request

Container Type and #	Preservative Type	HEAL No.	Dissolved Mn	BTEX 8260	Sulfate / TDS
(3) 40ml VOA (1) Liter Plastic Cool	HCl	1	X	X	X
(3) 40ml VOA (1) Liter Plastic Cool	HCl	2	X	X	X
(3) 40ml VOA (1) Liter Plastic Cool	HCl	3	X	X	X
(3) 40ml VOA (1) Liter Plastic Cool	HCl	4	X	X	X
(3) 40ml VOA (1) Liter Plastic Cool	HCl	5	X	X	X
(3) 40ml VOA (1) Liter Plastic Cool	HCl	6	X	X	X
(3) 40ml VOA (1) Liter Plastic Cool	HCl	7	X	X	X

Remarks: *Dissolved Mn is to be filtered and preserved in the lab. Special pricing see Andy.

* MW-7 : no preservative in vial

Login Sample Receipt Checklist

Client: Hilcorp Energy

Job Number: 885-11916-1

Login Number: 11916

List Source: Eurofins Albuquerque

List Number: 1

Creator: Casarrubias, Tracy

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	Did not receive all required containers.
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting requested.
Residual Chlorine Checked.	N/A	



Environment Testing

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ANALYTICAL REPORT

PREPARED FOR

Attn: Mitch Killough
Hilcorp Energy
PO BOX 4700
Farmington, New Mexico 87499

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JOB DESCRIPTION

Magnum 1

JOB NUMBER

885-17747-1

Eurofins Albuquerque
4901 Hawkins NE
Albuquerque NM 87109

Eurofins Albuquerque

Job Notes

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing South Central, LLC Project Manager.

Authorization



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Authorized for release by
Michelle Garcia, Project Manager
michelle.garcia@et.eurofinsus.com
(505)345-3975

Client: Hilcorp Energy
Project/Site: Magnum 1

Laboratory Job ID: 885-17747-1

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Definitions/Glossary

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
P2	The sample was received with pH>2

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Hilcorp Energy
Project: Magnum 1

Job ID: 885-17747-1

Job ID: 885-17747-1

Eurofins Albuquerque

Job Narrative 885-17747-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 12/31/2024 7:35 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.0°C.

GC/MS VOA

Method 8260B: The following samples was diluted due to the nature of the sample matrix: MW-1 (885-17747-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-1

Lab Sample ID: 885-17747-1

Date Collected: 12/27/24 12:30

Matrix: Water

Date Received: 12/31/24 07:35

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0	ug/L			01/04/25 02:56	2
Ethylbenzene	ND		2.0	ug/L			01/04/25 02:56	2
Methyl-tert-butyl Ether (MTBE)	ND		2.0	ug/L			01/04/25 02:56	2
Tetrachloroethene (PCE)	ND		2.0	ug/L			01/04/25 02:56	2
Toluene	ND		2.0	ug/L			01/04/25 02:56	2
Trichloroethene (TCE)	ND		2.0	ug/L			01/04/25 02:56	2
Xylenes, Total	ND		3.0	ug/L			01/04/25 02:56	2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 130		01/04/25 02:56	2
4-Bromofluorobenzene (Surr)	101		70 - 130		01/04/25 02:56	2
Dibromofluoromethane (Surr)	104		70 - 130		01/04/25 02:56	2
Toluene-d8 (Surr)	97		70 - 130		01/04/25 02:56	2

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1300		25	mg/L			01/03/25 17:46	50

Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.47		0.0020	mg/L			01/02/25 12:04	1
Iron	ND		0.020	mg/L			01/02/25 12:04	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	2700		250	mg/L			01/02/25 10:41	1

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-2

Lab Sample ID: 885-17747-2

Date Collected: 12/27/24 13:00

Matrix: Water

Date Received: 12/31/24 07:35

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	12		5.0	ug/L			01/04/25 03:21	5
Ethylbenzene	ND		5.0	ug/L			01/04/25 03:21	5
Methyl-tert-butyl Ether (MTBE)	ND		5.0	ug/L			01/04/25 03:21	5
Tetrachloroethene (PCE)	ND		5.0	ug/L			01/04/25 03:21	5
Toluene	ND		5.0	ug/L			01/04/25 03:21	5
Trichloroethene (TCE)	ND		5.0	ug/L			01/04/25 03:21	5
Xylenes, Total	ND		7.5	ug/L			01/04/25 03:21	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	96		70 - 130		01/04/25 03:21	5
4-Bromofluorobenzene (Surr)	105		70 - 130		01/04/25 03:21	5
Dibromofluoromethane (Surr)	100		70 - 130		01/04/25 03:21	5
Toluene-d8 (Surr)	97		70 - 130		01/04/25 03:21	5

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	11		0.50	mg/L			01/01/25 02:31	1

Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	1.3		0.020	mg/L			01/02/25 12:07	10
Iron	ND		0.020	mg/L			01/02/25 12:14	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1700		250	mg/L			01/02/25 10:41	1

Eurofins Albuquerque

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-3
Date Collected: 12/27/24 13:45
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-3
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	16		10	ug/L			01/04/25 03:46	10	
Ethylbenzene	12		10	ug/L			01/04/25 03:46	10	
Methyl-tert-butyl Ether (MTBE)	ND		10	ug/L			01/04/25 03:46	10	
Tetrachloroethene (PCE)	ND		10	ug/L			01/04/25 03:46	10	
Toluene	ND		10	ug/L			01/04/25 03:46	10	
Trichloroethene (TCE)	ND		10	ug/L			01/04/25 03:46	10	
Xylenes, Total	ND		15	ug/L			01/04/25 03:46	10	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	97		70 - 130				01/04/25 03:46	10	
4-Bromofluorobenzene (Surr)	100		70 - 130				01/04/25 03:46	10	
Dibromofluoromethane (Surr)	105		70 - 130				01/04/25 03:46	10	
Toluene-d8 (Surr)	97		70 - 130				01/04/25 03:46	10	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	110		5.0	mg/L			01/02/25 13:17	10	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	3.3		0.020	mg/L			01/02/25 12:18	10	
Iron	ND		0.020	mg/L			01/02/25 12:16	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	4300		250	mg/L			01/02/25 10:41	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-4
Date Collected: 12/27/24 12:00
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-4
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			01/04/25 04:10	1	
Ethylbenzene	ND		1.0	ug/L			01/04/25 04:10	1	
Methyl-tert-butyl Ether (MTBE)	ND		1.0	ug/L			01/04/25 04:10	1	
Tetrachloroethene (PCE)	ND		1.0	ug/L			01/04/25 04:10	1	
Toluene	ND		1.0	ug/L			01/04/25 04:10	1	
Trichloroethene (TCE)	ND		1.0	ug/L			01/04/25 04:10	1	
Xylenes, Total	20		1.5	ug/L			01/04/25 04:10	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	99		70 - 130				01/04/25 04:10	1	
4-Bromofluorobenzene (Surr)	107		70 - 130				01/04/25 04:10	1	
Dibromofluoromethane (Surr)	103		70 - 130				01/04/25 04:10	1	
Toluene-d8 (Surr)	104		70 - 130				01/04/25 04:10	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	1100		50	mg/L			01/02/25 14:25	100	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	0.35		0.0020	mg/L			01/02/25 12:20	1	
Iron	ND		0.020	mg/L			01/02/25 12:20	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2300		250	mg/L			01/02/25 10:41	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-5
Date Collected: 12/27/24 14:30
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-5
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	ND		1.0	ug/L			01/04/25 04:35	1	
Ethylbenzene	4.5		1.0	ug/L			01/04/25 04:35	1	
Methyl-tert-butyl Ether (MTBE)	ND		1.0	ug/L			01/04/25 04:35	1	
Tetrachloroethene (PCE)	ND		1.0	ug/L			01/04/25 04:35	1	
Toluene	ND		1.0	ug/L			01/04/25 04:35	1	
Trichloroethene (TCE)	ND		1.0	ug/L			01/04/25 04:35	1	
Xylenes, Total	2.5		1.5	ug/L			01/04/25 04:35	1	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	96		70 - 130				01/04/25 04:35	1	
4-Bromofluorobenzene (Surr)	115		70 - 130				01/04/25 04:35	1	
Dibromofluoromethane (Surr)	100		70 - 130				01/04/25 04:35	1	
Toluene-d8 (Surr)	121		70 - 130				01/04/25 04:35	1	
Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	410		5.0	mg/L			01/02/25 14:39	10	
Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	1.8		0.020	mg/L			01/02/25 12:26	10	
Iron	0.19		0.020	mg/L			01/02/25 12:24	1	
General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	2300		250	mg/L			01/02/25 10:41	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-6
Date Collected: 12/27/24 15:20
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-6
Matrix: Water

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Benzene	12		1.0	ug/L			01/04/25 04:59	1	
Ethylbenzene	2.2		1.0	ug/L			01/04/25 04:59	1	
Methyl-tert-butyl Ether (MTBE)	ND		1.0	ug/L			01/04/25 04:59	1	
Tetrachloroethene (PCE)	ND		1.0	ug/L			01/04/25 04:59	1	
Toluene	ND		1.0	ug/L			01/04/25 04:59	1	
Trichloroethene (TCE)	ND		1.0	ug/L			01/04/25 04:59	1	
Xylenes, Total	410		15	ug/L			01/06/25 12:03	10	
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	93		70 - 130				01/04/25 04:59	1	
1,2-Dichloroethane-d4 (Surr)	96		70 - 130				01/06/25 12:03	10	
4-Bromofluorobenzene (Surr)	103		70 - 130				01/04/25 04:59	1	
4-Bromofluorobenzene (Surr)	101		70 - 130				01/06/25 12:03	10	
Dibromofluoromethane (Surr)	97		70 - 130				01/04/25 04:59	1	
Dibromofluoromethane (Surr)	99		70 - 130				01/06/25 12:03	10	
Toluene-d8 (Surr)	118		70 - 130				01/04/25 04:59	1	
Toluene-d8 (Surr)	101		70 - 130				01/06/25 12:03	10	

Method: EPA 300.0 - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Sulfate	ND		0.50	mg/L			01/03/25 17:05	1	

Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Manganese	1.6		0.010	mg/L			01/02/25 12:28	5	
Iron	0.15		0.10	mg/L			01/02/25 12:28	5	

General Chemistry									
Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	1300		250	mg/L			01/02/25 10:41	1	

Client Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-7

Lab Sample ID: 885-17747-7

Date Collected: 12/27/24 16:10

Matrix: Water

Date Received: 12/31/24 07:35

Method: SW846 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND	P2	1.0	ug/L			01/04/25 05:24	1
Ethylbenzene	ND	P2	1.0	ug/L			01/04/25 05:24	1
Methyl-tert-butyl Ether (MTBE)	ND	P2	1.0	ug/L			01/04/25 05:24	1
Tetrachloroethene (PCE)	ND	P2	1.0	ug/L			01/04/25 05:24	1
Toluene	ND	P2	1.0	ug/L			01/04/25 05:24	1
Trichloroethene (TCE)	ND	P2	1.0	ug/L			01/04/25 05:24	1
Xylenes, Total	ND	P2	1.5	ug/L			01/04/25 05:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98	P2	70 - 130		01/04/25 05:24	1
4-Bromofluorobenzene (Surr)	99	P2	70 - 130		01/04/25 05:24	1
Dibromofluoromethane (Surr)	99	P2	70 - 130		01/04/25 05:24	1
Toluene-d8 (Surr)	96	P2	70 - 130		01/04/25 05:24	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	920		50	mg/L			01/02/25 15:47	100

Method: EPA 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	1.1		0.010	mg/L			01/02/25 12:51	5
Iron	ND		0.020	mg/L			01/02/25 12:46	1

General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	3200		250	mg/L			01/02/25 10:41	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 885-18817/34

Matrix: Water

Analysis Batch: 18817

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Benzene	ND		1.0	ug/L			01/03/25 23:40	1
Ethylbenzene	ND		1.0	ug/L			01/03/25 23:40	1
Methyl-tert-butyl Ether (MTBE)	ND		1.0	ug/L			01/03/25 23:40	1
Tetrachloroethene (PCE)	ND		1.0	ug/L			01/03/25 23:40	1
Toluene	ND		1.0	ug/L			01/03/25 23:40	1
Trichloroethene (TCE)	ND		1.0	ug/L			01/03/25 23:40	1
Xylenes, Total	ND		1.5	ug/L			01/03/25 23:40	1
Surrogate	MB	MB	Limits			Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier						
1,2-Dichloroethane-d4 (Surr)	98		70 - 130				01/03/25 23:40	1
4-Bromofluorobenzene (Surr)	98		70 - 130				01/03/25 23:40	1
Dibromofluoromethane (Surr)	104		70 - 130				01/03/25 23:40	1
Toluene-d8 (Surr)	97		70 - 130				01/03/25 23:40	1

Lab Sample ID: LCS 885-18817/33

Matrix: Water

Analysis Batch: 18817

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	20.1	20.8		ug/L		104	70 - 130
Toluene	20.2	21.3		ug/L		105	70 - 130
Trichloroethene (TCE)	20.2	19.9		ug/L		99	70 - 130
Surrogate	LCS	LCS	Limits				
	%Recovery	Qualifier					
1,2-Dichloroethane-d4 (Surr)	100		70 - 130				
4-Bromofluorobenzene (Surr)	100		70 - 130				
Dibromofluoromethane (Surr)	106		70 - 130				
Toluene-d8 (Surr)	98		70 - 130				

Lab Sample ID: MB 885-18828/5

Matrix: Water

Analysis Batch: 18828

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Benzene	ND		1.0	ug/L			01/06/25 11:13	1
Ethylbenzene	ND		1.0	ug/L			01/06/25 11:13	1
Methyl-tert-butyl Ether (MTBE)	ND		1.0	ug/L			01/06/25 11:13	1
Tetrachloroethene (PCE)	ND		1.0	ug/L			01/06/25 11:13	1
Toluene	ND		1.0	ug/L			01/06/25 11:13	1
Trichloroethene (TCE)	ND		1.0	ug/L			01/06/25 11:13	1
Xylenes, Total	ND		1.5	ug/L			01/06/25 11:13	1
Surrogate	MB	MB	Limits			Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier						
1,2-Dichloroethane-d4 (Surr)	95		70 - 130				01/06/25 11:13	1
4-Bromofluorobenzene (Surr)	100		70 - 130				01/06/25 11:13	1
Dibromofluoromethane (Surr)	99		70 - 130				01/06/25 11:13	1
Toluene-d8 (Surr)	99		70 - 130				01/06/25 11:13	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 885-18828/4

Matrix: Water

Analysis Batch: 18828

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.1	19.8		ug/L		98	70 - 130
Toluene	20.2	20.9		ug/L		104	70 - 130
Trichloroethene (TCE)	20.2	19.2		ug/L		95	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		70 - 130
4-Bromofluorobenzene (Surr)	99		70 - 130
Dibromofluoromethane (Surr)	102		70 - 130
Toluene-d8 (Surr)	98		70 - 130

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 885-18615/39

Matrix: Water

Analysis Batch: 18615

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			12/31/24 18:06	1

Lab Sample ID: LCS 885-18615/40

Matrix: Water

Analysis Batch: 18615

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.77		mg/L		98	90 - 110

Lab Sample ID: MRL 885-18615/3

Matrix: Water

Analysis Batch: 18615

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.533		mg/L		107	50 - 150

Lab Sample ID: MB 885-18684/4

Matrix: Water

Analysis Batch: 18684

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			01/02/25 09:22	1

Lab Sample ID: MB 885-18684/43

Matrix: Water

Analysis Batch: 18684

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			01/02/25 18:17	1

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 885-18684/44

Matrix: Water

Analysis Batch: 18684

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.73		mg/L		97	90 - 110

Lab Sample ID: LCS 885-18684/5

Matrix: Water

Analysis Batch: 18684

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.66		mg/L		97	90 - 110

Lab Sample ID: MRL 885-18684/3

Matrix: Water

Analysis Batch: 18684

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.534		mg/L		107	50 - 150

Lab Sample ID: MB 885-18766/4

Matrix: Water

Analysis Batch: 18766

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			01/03/25 09:17	1

Lab Sample ID: LCS 885-18766/5

Matrix: Water

Analysis Batch: 18766

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.61		mg/L		96	90 - 110

Lab Sample ID: MRL 885-18766/3

Matrix: Water

Analysis Batch: 18766

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.524		mg/L		105	50 - 150

Lab Sample ID: MB 885-18786/4

Matrix: Water

Analysis Batch: 18786

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		0.50	mg/L			01/03/25 12:12	1

Lab Sample ID: LCS 885-18786/5

Matrix: Water

Analysis Batch: 18786

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	10.0	9.71		mg/L		97	90 - 110

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MRL 885-18786/3

Matrix: Water

Analysis Batch: 18786

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	0.500	0.536		mg/L		107	50 - 150

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MRL 885-18735/65

Matrix: Water

Analysis Batch: 18735

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00200	0.00216		mg/L		108	50 - 150
Iron	0.0200	0.0178	J	mg/L		89	50 - 150

Lab Sample ID: 885-17747-6 MS

Matrix: Water

Analysis Batch: 18735

Client Sample ID: MW-6

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	1.6		2.50	3.84		mg/L		92	70 - 130
Iron	0.15		2.50	2.53		mg/L		95	70 - 130

Lab Sample ID: 885-17747-6 MSD

Matrix: Water

Analysis Batch: 18735

Client Sample ID: MW-6

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	1.6		2.50	3.85		mg/L		92	70 - 130	0	20
Iron	0.15		2.50	2.55		mg/L		96	70 - 130	1	20

Lab Sample ID: 885-17747-7 MS

Matrix: Water

Analysis Batch: 18735

Client Sample ID: MW-7

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	ND		0.500	0.504		mg/L		101	70 - 130

Lab Sample ID: 885-17747-7 MS

Matrix: Water

Analysis Batch: 18735

Client Sample ID: MW-7

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	1.1		2.50	3.39		mg/L		93	70 - 130

Lab Sample ID: 885-17747-7 MSD

Matrix: Water

Analysis Batch: 18735

Client Sample ID: MW-7

Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	ND		0.500	0.519		mg/L		104	70 - 130	3	20

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QC Sample Results

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: 885-17747-7 MSD
Matrix: Water
Analysis Batch: 18735

Client Sample ID: MW-7
Prep Type: Dissolved

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	1.1		2.50	3.46		mg/L		96	70 - 130	2	20

Method: 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 885-18712/1
Matrix: Water
Analysis Batch: 18712

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		50	mg/L			01/02/25 10:41	1

Lab Sample ID: LCS 885-18712/2
Matrix: Water
Analysis Batch: 18712

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	982		mg/L		98	80 - 120

QC Association Summary

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

GC/MS VOA

Analysis Batch: 18817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-1	MW-1	Total/NA	Water	8260B	
885-17747-2	MW-2	Total/NA	Water	8260B	
885-17747-3	MW-3	Total/NA	Water	8260B	
885-17747-4	MW-4	Total/NA	Water	8260B	
885-17747-5	MW-5	Total/NA	Water	8260B	
885-17747-6	MW-6	Total/NA	Water	8260B	
885-17747-7	MW-7	Total/NA	Water	8260B	
MB 885-18817/34	Method Blank	Total/NA	Water	8260B	
LCS 885-18817/33	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 18828

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-6	MW-6	Total/NA	Water	8260B	
MB 885-18828/5	Method Blank	Total/NA	Water	8260B	
LCS 885-18828/4	Lab Control Sample	Total/NA	Water	8260B	

HPLC/IC

Analysis Batch: 18615

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-2	MW-2	Total/NA	Water	300.0	
MB 885-18615/39	Method Blank	Total/NA	Water	300.0	
LCS 885-18615/40	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-18615/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 18684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-3	MW-3	Total/NA	Water	300.0	
885-17747-4	MW-4	Total/NA	Water	300.0	
885-17747-5	MW-5	Total/NA	Water	300.0	
885-17747-7	MW-7	Total/NA	Water	300.0	
MB 885-18684/4	Method Blank	Total/NA	Water	300.0	
MB 885-18684/43	Method Blank	Total/NA	Water	300.0	
LCS 885-18684/44	Lab Control Sample	Total/NA	Water	300.0	
LCS 885-18684/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-18684/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 18766

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-6	MW-6	Total/NA	Water	300.0	
MB 885-18766/4	Method Blank	Total/NA	Water	300.0	
LCS 885-18766/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-18766/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 18786

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-1	MW-1	Total/NA	Water	300.0	
MB 885-18786/4	Method Blank	Total/NA	Water	300.0	
LCS 885-18786/5	Lab Control Sample	Total/NA	Water	300.0	
MRL 885-18786/3	Lab Control Sample	Total/NA	Water	300.0	

QC Association Summary

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Metals

Filtration Batch: 18654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-1	MW-1	Dissolved	Water	Filtration	
885-17747-2	MW-2	Dissolved	Water	Filtration	
885-17747-3	MW-3	Dissolved	Water	Filtration	
885-17747-4	MW-4	Dissolved	Water	Filtration	
885-17747-5	MW-5	Dissolved	Water	Filtration	
885-17747-6	MW-6	Dissolved	Water	Filtration	
885-17747-7	MW-7	Dissolved	Water	Filtration	
885-17747-6 MS	MW-6	Dissolved	Water	Filtration	
885-17747-6 MSD	MW-6	Dissolved	Water	Filtration	
885-17747-7 MS	MW-7	Dissolved	Water	Filtration	
885-17747-7 MSD	MW-7	Dissolved	Water	Filtration	

Analysis Batch: 18735

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-1	MW-1	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-2	MW-2	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-2	MW-2	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-3	MW-3	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-3	MW-3	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-4	MW-4	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-5	MW-5	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-5	MW-5	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-6	MW-6	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-7	MW-7	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-7	MW-7	Dissolved	Water	200.7 Rev 4.4	18654
MRL 885-18735/65	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	
885-17747-6 MS	MW-6	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-6 MSD	MW-6	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-7 MS	MW-7	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-7 MS	MW-7	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-7 MSD	MW-7	Dissolved	Water	200.7 Rev 4.4	18654
885-17747-7 MSD	MW-7	Dissolved	Water	200.7 Rev 4.4	18654

General Chemistry

Analysis Batch: 18712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-17747-1	MW-1	Total/NA	Water	2540C	
885-17747-2	MW-2	Total/NA	Water	2540C	
885-17747-3	MW-3	Total/NA	Water	2540C	
885-17747-4	MW-4	Total/NA	Water	2540C	
885-17747-5	MW-5	Total/NA	Water	2540C	
885-17747-6	MW-6	Total/NA	Water	2540C	
885-17747-7	MW-7	Total/NA	Water	2540C	
MB 885-18712/1	Method Blank	Total/NA	Water	2540C	
LCS 885-18712/2	Lab Control Sample	Total/NA	Water	2540C	

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-1
Date Collected: 12/27/24 12:30
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		2	18817	CM	EET ALB	01/04/25 02:56
Total/NA	Analysis	300.0		50	18786	EH	EET ALB	01/03/25 17:46
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		1	18735	VP	EET ALB	01/02/25 12:04
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Client Sample ID: MW-2
Date Collected: 12/27/24 13:00
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		5	18817	CM	EET ALB	01/04/25 03:21
Total/NA	Analysis	300.0		1	18615	RC	EET ALB	01/01/25 02:31
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		10	18735	VP	EET ALB	01/02/25 12:07
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		1	18735	VP	EET ALB	01/02/25 12:14
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Client Sample ID: MW-3
Date Collected: 12/27/24 13:45
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		10	18817	CM	EET ALB	01/04/25 03:46
Total/NA	Analysis	300.0		10	18684	ES	EET ALB	01/02/25 13:17
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		1	18735	VP	EET ALB	01/02/25 12:16
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		10	18735	VP	EET ALB	01/02/25 12:18
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Client Sample ID: MW-4
Date Collected: 12/27/24 12:00
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	18817	CM	EET ALB	01/04/25 04:10
Total/NA	Analysis	300.0		100	18684	ES	EET ALB	01/02/25 14:25
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		1	18735	VP	EET ALB	01/02/25 12:20
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Lab Chronicle

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Client Sample ID: MW-5
Date Collected: 12/27/24 14:30
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	18817	CM	EET ALB	01/04/25 04:35
Total/NA	Analysis	300.0		10	18684	ES	EET ALB	01/02/25 14:39
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		1	18735	VP	EET ALB	01/02/25 12:24
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		10	18735	VP	EET ALB	01/02/25 12:26
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Client Sample ID: MW-6
Date Collected: 12/27/24 15:20
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	18817	CM	EET ALB	01/04/25 04:59
Total/NA	Analysis	8260B		10	18828	CM	EET ALB	01/06/25 12:03
Total/NA	Analysis	300.0		1	18766	ES	EET ALB	01/03/25 17:05
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		5	18735	VP	EET ALB	01/02/25 12:28
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Client Sample ID: MW-7
Date Collected: 12/27/24 16:10
Date Received: 12/31/24 07:35

Lab Sample ID: 885-17747-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260B		1	18817	CM	EET ALB	01/04/25 05:24
Total/NA	Analysis	300.0		100	18684	ES	EET ALB	01/02/25 15:47
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		1	18735	VP	EET ALB	01/02/25 12:46
Dissolved	Filtration	Filtration			18654	SM	EET ALB	12/31/24 14:11
Dissolved	Analysis	200.7 Rev 4.4		5	18735	VP	EET ALB	01/02/25 12:51
Total/NA	Analysis	2540C		1	18712	ES	EET ALB	01/02/25 10:41

Laboratory References:
EET ALB = Eurofins Albuquerque, 4901 Hawkins NE, Albuquerque, NM 87109, TEL (505)345-3975

Accreditation/Certification Summary

Client: Hilcorp Energy
Project/Site: Magnum 1

Job ID: 885-17747-1

Laboratory: Eurofins Albuquerque

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New Mexico	State	NM9425, NM0901	02-26-25
The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.			
Analysis Method	Prep Method	Matrix	Analyte
200.7 Rev 4.4		Water	Iron
200.7 Rev 4.4		Water	Manganese
2540C		Water	Total Dissolved Solids
300.0		Water	Sulfate
8260B		Water	Benzene
8260B		Water	Ethylbenzene
8260B		Water	Methyl-tert-butyl Ether (MTBE)
8260B		Water	Tetrachloroethene (PCE)
8260B		Water	Toluene
8260B		Water	Trichloroethene (TCE)
8260B		Water	Xylenes, Total
Oregon	NELAP	NM100001	02-25-25

Login Sample Receipt Checklist

Client: Hilcorp Energy

Job Number: 885-17747-1

Login Number: 17747

List Source: Eurofins Albuquerque

List Number: 1

Creator: McQuiston, Steven

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

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

CONDITIONS

Action 444890

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 444890
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	Report accepted for record.	10/2/2025
amaxwell	Submit annual report by April 1, 2026.	10/2/2025