



February 14, 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

San Juan 29-7 Unit 37
Rio Arriba, New Mexico
Hilcorp Energy Company
NMOCD Incident Number: NCS1904241144
NMOCD Administrative Order: 3RP-425

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) to document groundwater monitoring activities conducted at the San Juan 29-7 Unit 37 natural gas production well (Site) during 2024. The Site is located on private land within Unit Letter N, Section 12 within Township 29 North and Range 7 West, in Rio Arriba County, New Mexico (Figure 1).

SITE BACKGROUND

A leaking inspection plate gasket on the aboveground condensate tank was discovered by ConocoPhillips (previous well owner) on August 26, 2010. Approximately 23 barrels of condensate were released and fully contained within the berm; however, no liquids were recovered. The release was reported by ConocoPhillips on September 16, 2010, to the NMOCD on a Form C-141 *Release Notification and Corrective Action* form.

After the discovery, delineation activities were conducted at the Site in 2010 and 2011 to characterize soil and groundwater impacted by the release. Site characterization indicated petroleum hydrocarbon impacts from the release exceeded NMOCD Table I Closure Criteria for soils (Title 19, Chapter 15, Part 29, Section 12 [19.15.29.12] of the New Mexico Administrative Code [NMAC]) and New Mexico Water Quality Control Commission (NMWQCC) standards for groundwater. Based on the nature of the release, the original contaminants of concern (COCs) at the Site included benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) in vadose zone soil and benzene, toluene, total xylenes, dissolved manganese, selenium, sulfate, and total dissolved solids (TDS) in groundwater.

Between September 24, 2010 and January 3, 2011, approximately 5,100 cubic yards of impacted soil were excavated from the release area and transported off-Site for disposal. The excavation measured approximately 70 feet by 120 feet by 30 feet deep. Previous reports stated more than

3,000 cubic feet of impacted soil were excavated; however, review of the *Subsurface Characterization Work Plan*, dated August 31, 2011, confirmed that M&M Trucking removed 5,100 cubic yards of impacted soil. Impacted groundwater was present in the immediate area of the release and extended approximately 60 feet downgradient. Eight groundwater monitoring wells (MW-1 through MW-8) were installed to monitor groundwater conditions at the Site. Residual soil and groundwater impacts were additionally treated from December 2011 through February 2012 with the injection of the chemical oxidant CoolOx® in attempts to remediate residual impacts by chemical oxidation and enhanced bioremediation. Cool-Ox™ Technology is a patented in-situ process that uses a solution of calcium peroxide that generates hydrogen peroxide slowly and facilitates the oxidation of petroleum hydrocarbons.

Hilcorp acquired the Site from ConocoPhillips in April 2017 and has continued to monitor groundwater conditions at the Site. GHD Services Inc. (GHD) prepared the *2018 Annual Groundwater Monitoring Report* (dated January 2019) on behalf of Hilcorp. Based on that report, the NMOCD concurred with the conclusions that sulfate and TDS were attributed to naturally occurring background concentrations at the Site and these constituents could be removed as COCs. In addition, NMOCD agreed BTEX constituents could be removed as COCs for all onsite wells with at least eight consecutive quarters with concentrations below NMWQCC standards (which included all wells except replacement well MW-8R). At that time, well MW-8R had achieved seven quarters with results below NMWQCC standards.

During sampling events in 2019, BTEX concentrations remained below NMWQCC standards in groundwater collected from MW-8R, therefore BTEX as a COC for groundwater in all wells at the Site was removed. Based on WSP's *2020 Annual Groundwater Monitoring Report*, dated March 8, 2021, the NMOCD approved the elimination of selenium as a COC from all wells at the Site. Additionally, based on historical sampling data, dissolved manganese had been below NMWQCC standards for eight or more consecutive quarters in wells MW-2, MW-4, MW-5, MW-6, and MW-7. Therefore, the NMOCD approved the discontinuation of sampling these monitoring wells for all future sampling events (NMOCD approval email dated December 28, 2021). Although sampling at these wells was discontinued, they will continue to be gauged for the development of potentiometric surface maps.

Based on historical sampling results and prior agreements with NMOCD, dissolved manganese is considered the only COC for groundwater in wells MW-1, MW-3, and MW-8R at the Site (as presented below). Following a review of the *2022 Annual Groundwater Monitoring Report*, the NMOCD approved reducing sampling frequency to an annual basis in 2024. Well locations and Site features are shown on Figure 2.

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 NMAC. The following NMWQCC standard is presented for the COC at the Site in milligrams per liter (mg/L).

- Dissolved Manganese: 0.2 mg/L

GROUNDWATER SAMPLING ACTIVITIES AND RESULTS

Annual groundwater sampling was conducted at the Site in March 2024. Prior to collection of groundwater samples in selected monitoring wells, depth to groundwater was measured 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 March 2024 sampling event are presented in Table 1 and were used to create a groundwater potentiometric surface map (Figure 3). The inferred groundwater flow direction is to the south.

GROUNDWATER SAMPLING

Groundwater sampling was conducted at monitoring wells MW-1, MW-3, and MW-8R in March 2024. The wells were purged and sampled using disposable bailers. Stagnant groundwater was removed during purging to verify the collected samples accurately represented aquifer conditions. Field measurements of groundwater quality parameters, including temperature, pH, TDS, and electrical conductivity, were collected during purging and are summarized in Table 2.

Following well purging, groundwater samples were collected and placed directly into laboratory-provided bottles and labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. Sample bottles were immediately sealed, packed on ice, and submitted to Eurofins Environmental Testing Laboratory (Eurofins) for analysis of dissolved manganese following United States Environmental Protection Agency (EPA) Method 200.7. 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

During the March 2024 groundwater sampling event, dissolved manganese concentrations exceeded the NMWQCC standard in wells MW-1, MW-3, and MW-8R. Dissolved manganese concentrations ranged from 0.65 mg/L in well MW-8R to 2.3 mg/L in well MW-1. A summary of manganese analytical results for actively sampled wells is presented in Table 3 and depicted on Figure 4, with complete laboratory reports attached as Appendix A.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater samples collected from wells MW-1, MW-3, and MW-8R continue to contain dissolved manganese concentrations exceeding the NMWQCC groundwater quality standard. Elevated dissolved manganese concentrations appear to be a result of low-oxygen and reducing groundwater conditions in these wells. Average dissolved oxygen concentrations in wells MW-1, MW-3, and MW-8R (from data collected between 2015 and 2021) range from 1.68 mg/L to 2.02 mg/L, whereas average dissolved oxygen concentrations in all other on-Site wells range from 2.97 mg/L to 6.06 mg/L. Additionally, the oxidation-reduction potential (ORP) in wells MW-1, MW-3, and MW-8R range from -17.3 millivolts (mV) to -84.3 mV, suggesting continued reducing groundwater conditions in these wells leading to the dissolution of manganese and increased dissolved manganese concentrations. Conversely, the remaining wells at the Site have ORP values ranging from 18.0 mV to 35.8 mV, suggesting oxidizing conditions conducive to the precipitation of manganese, resulting in lower dissolved manganese concentrations.

As groundwater conditions at the Site continue to equilibrate and dissolved oxygen increases, groundwater conditions will become increasingly aerobic. As this happens, dissolved manganese has the ability to precipitate out of solution leading to decreased concentrations in groundwater. Because there are no potential receptors downgradient of the Site (closest water well SJ-03390, is located 1,900 feet southeast and cross gradient from the Site and is screened in a hydrogeologically separate water-bearing zone), Ensolum and Hilcorp recommend continuing annual sampling of wells MW-1, MW-3, and MW-8R until dissolved manganese concentrations

achieve the NMWQCC standard. At that time, Hilcorp will begin quarterly sampling until eight consecutive quarters indicate that manganese concentrations are below NMWQCC standards.

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

Sincerely,

Ensolum, LLC



Wes Weichert, PG
Project Geologist
(816) 266-8732
wweichert@ensolum.com



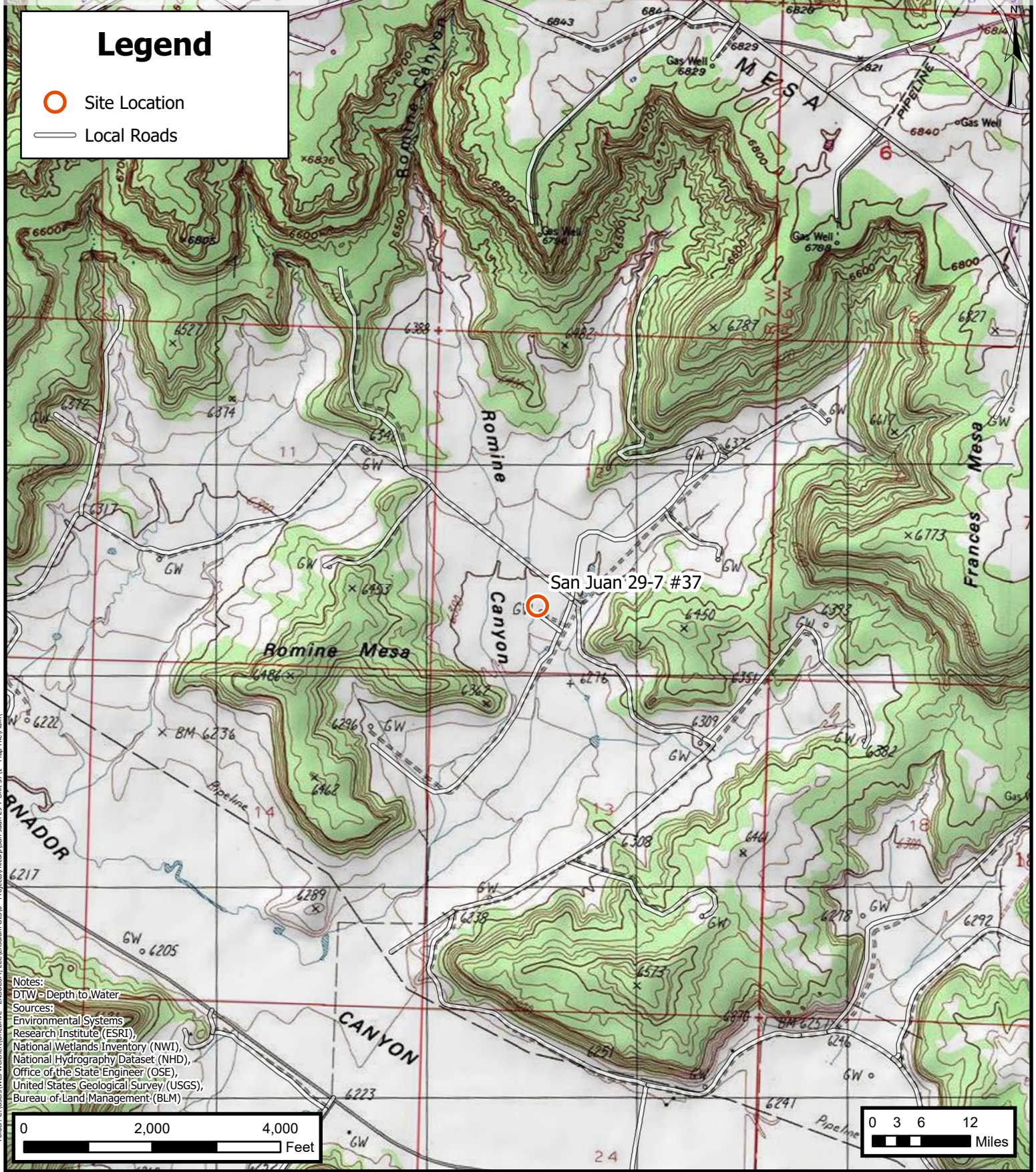
Stuart Hyde, PG
Senior Geologist
(970) 903-1607
shyde@ensolum.com

Attachments:

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3	March 2024 Groundwater Elevation Map
Figure 4	2024 Groundwater Analytical Results
Table 1	Groundwater Elevations
Table 2	Groundwater Quality Measurements
Table 3	Groundwater Analytical Results
Appendix A	Laboratory Analytical Reports



FIGURES







Site Location Map

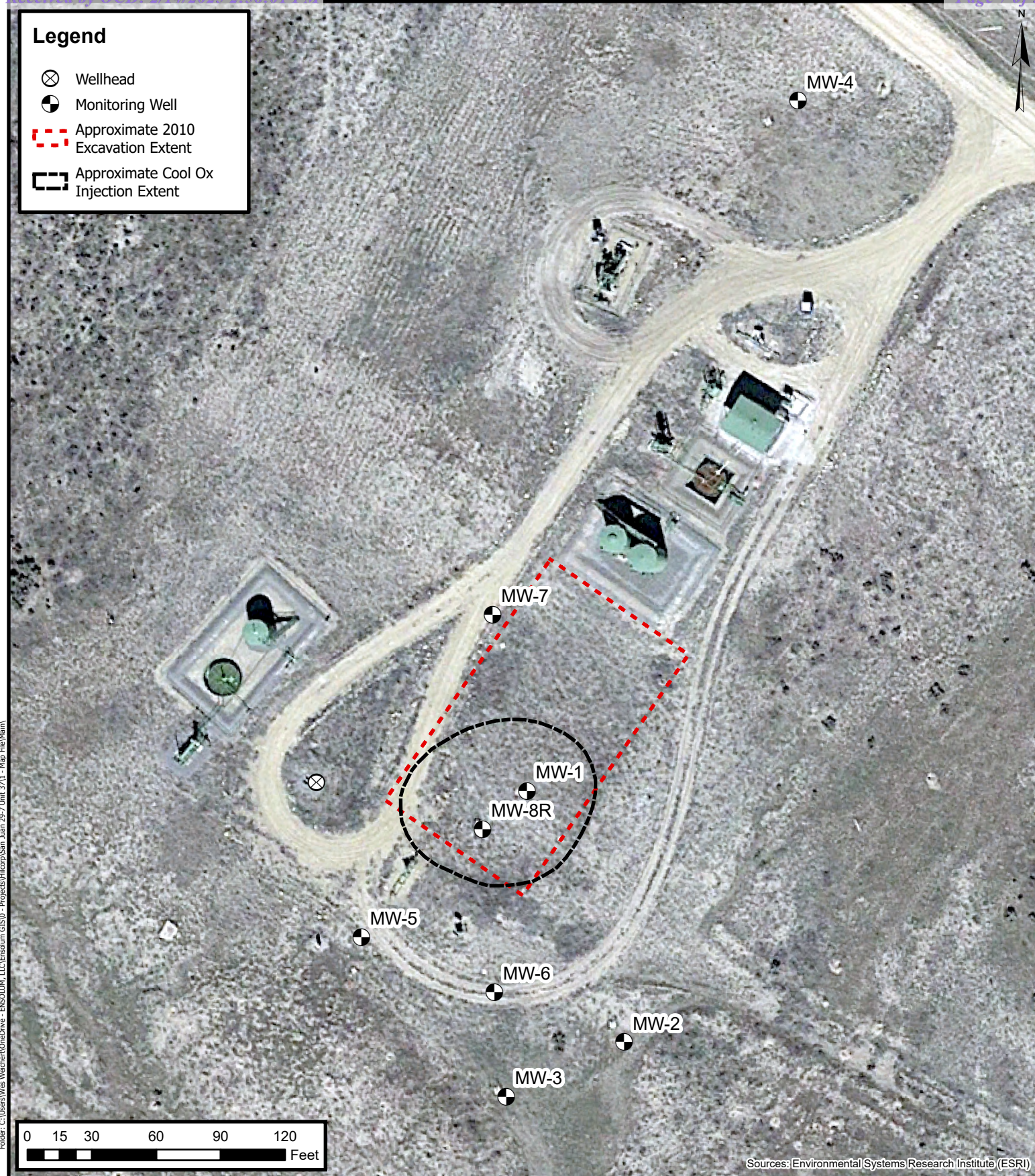
Hilcorp Energy Company
San Juan 29-7 #37
36.73580, -107.52562
Rio Arriba County, New Mexico

FIGURE
1



Legend

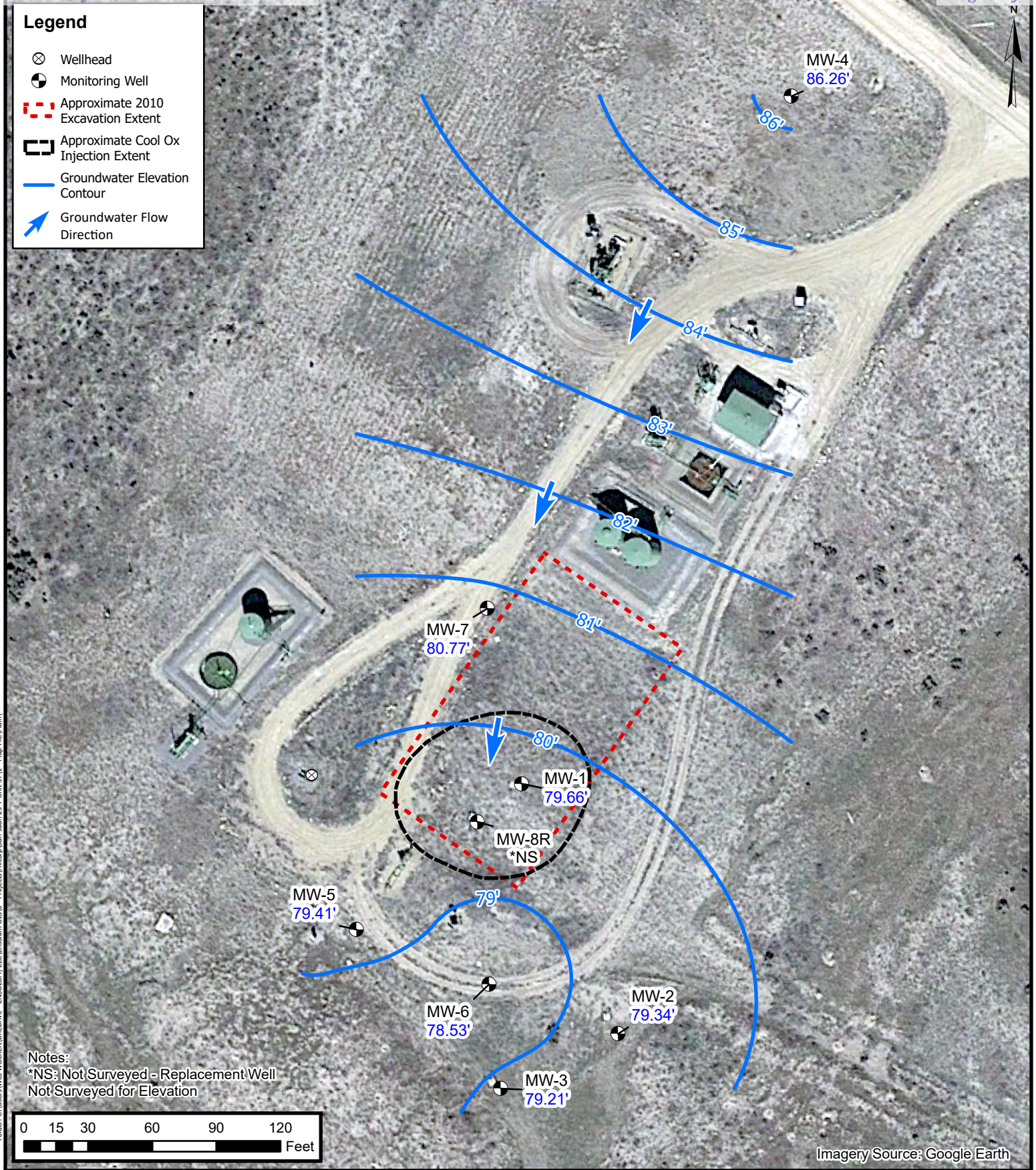
-  Wellhead
-  Monitoring Well
-  Approximate 2010 Excavation Extent
-  Approximate Cool Ox Injection Extent



Sources: Environmental Systems Research Institute (ESRI)

Site Map

Hilcorp Energy Company
San Juan 29-7 #37
36.73580, -107.52562
Rio Arriba County, New Mexico



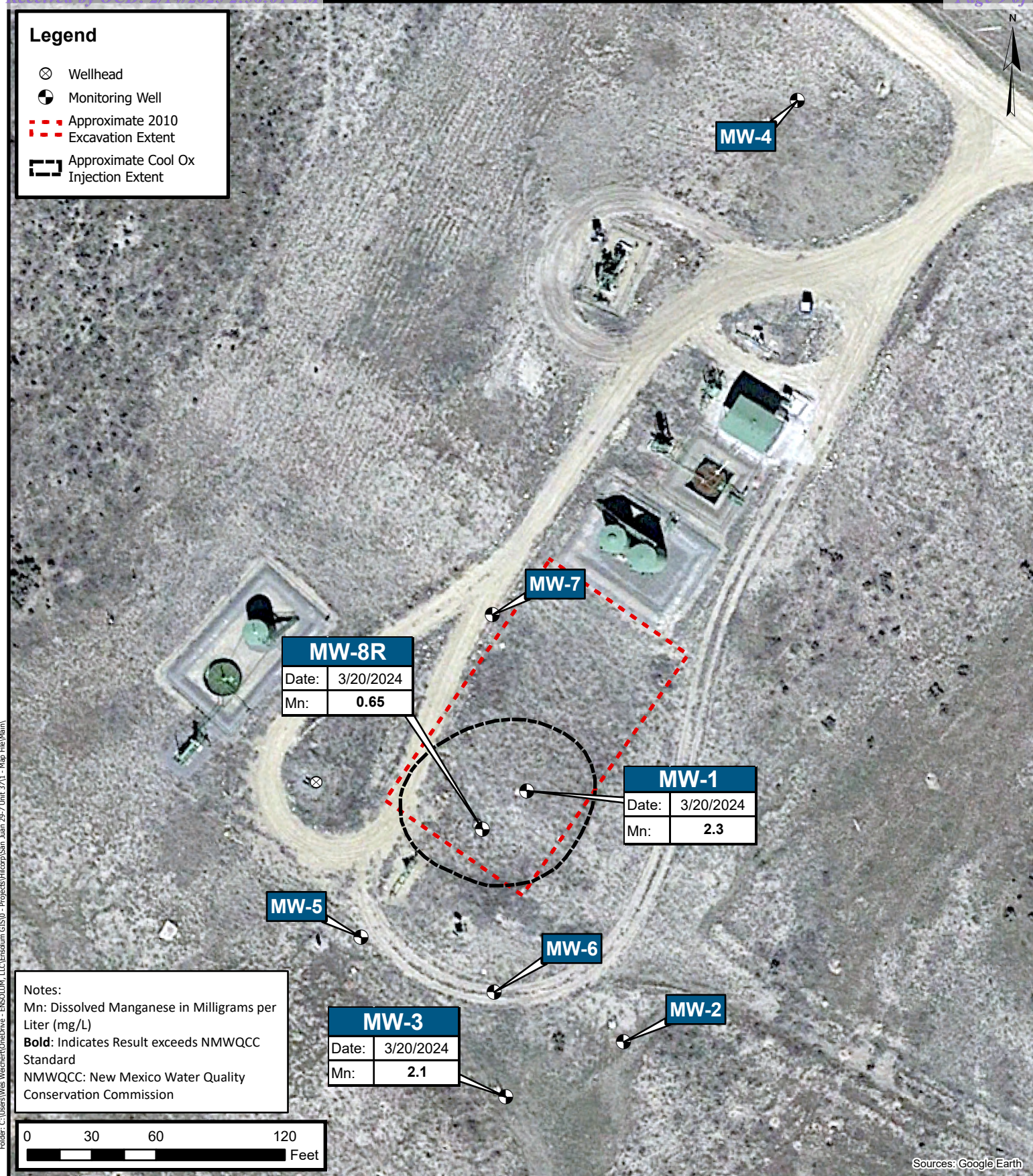
Groundwater Elevation Contour Map March 2024

Hilcorp Energy Company
San Juan 29-7 #37
36.73580, -107.52562
Rio Arriba County, New Mexico

**FIGURE
3**

Legend

- ⊗ Wellhead
- Monitoring Well
- - - Approximate 2010 Excavation Extent
- - - Approximate Cool Ox Injection Extent



2024 Groundwater Analytical Results

Hilcorp Energy Company
San Juan 29-7 #37
36.73580, -107.52562
Rio Arriba County, New Mexico

FIGURE
4



TABLES



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-1	189.24	3/17/2011	108.91	80.33
		8/17/2011	108.81	80.43
		10/18/2011	108.87	80.37
		2/23/2012	108.74	80.50
		6/5/2012	108.75	80.49
		9/18/2012	108.68	80.56
		1/8/2013	108.62	80.62
		3/26/2013	108.69	80.55
		6/11/2013	108.81	80.43
		9/10/2013	109.04	80.20
		1/7/2014	109.26	79.98
		3/18/2014	109.10	80.14
		6/16/2014	109.31	79.93
		9/25/2014	109.54	79.70
		12/16/2014	109.59	79.65
		3/17/2015	109.61	79.63
		6/16/2015	109.68	79.56
		9/15/2015	109.62	79.62
		12/1/2015	109.78	79.46
		3/29/2016	109.61	79.63
		6/21/2016	109.89	79.35
		9/7/2016	109.87	79.37
		11/30/2016	109.89	79.35
		3/7/2017	109.92	79.32
		6/13/2017	110.06	79.18
		9/26/2017	110.00	79.24
		12/19/2017	109.99	79.25
		3/14/2018	109.93	79.31
		6/26/2018	110.02	79.22
		9/5/2018	110.06	79.18
		12/14/2018	110.04	79.20
		3/29/2019	109.95	79.29
		6/24/2019	110.44	78.80
		9/13/2019	110.12	79.12
		11/6/2019	110.05	79.19
		3/5/2020	110.16	79.08



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-1	189.24	5/6/2020	110.13	79.11
		8/20/2020	110.04	79.20
		10/21/2020	110.01	79.23
		3/2/2021	110.16	79.08
		9/24/2021	110.50	78.74
		3/3/2022	110.16	79.08
		9/20/2022	110.19	79.05
		3/2/2023	110.04	79.20
		10/3/2023	110.08	79.16
		3/20/2024	109.58	79.66
MW-2	189.60	3/17/2011	109.20	80.40
		8/17/2011	109.10	80.50
		10/18/2011	109.13	80.47
		2/23/2012	109.05	80.55
		6/5/2012	109.10	80.50
		9/18/2012	109.28	80.32
		1/8/2013	109.07	80.53
		3/26/2013	109.12	80.48
		6/11/2013	109.32	80.28
		9/10/2013	109.32	80.28
		1/7/2014	109.71	79.89
		3/18/2014	109.71	79.89
		6/16/2014	109.83	79.77
		9/16/2014	109.94	79.66
		12/16/2014	110.04	79.56
		3/17/2015	110.09	79.51
		6/16/2015	110.17	79.43
		9/15/2015	110.14	79.46
		12/1/2015	110.23	79.37
		3/29/2016	110.26	79.34
		6/21/2016	110.31	79.29
		9/7/2016	110.33	79.27
		11/30/2016	110.39	79.21
		3/7/2017	110.37	79.23
		6/13/2017	110.35	79.25



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-2	189.60	9/26/2017	110.54	79.06
		12/19/2017	110.50	79.10
		3/14/2018	110.54	79.06
		6/26/2018	110.55	79.05
		9/5/2018	110.60	79.00
		12/14/2018	110.51	79.09
		3/27/2019	110.57	79.03
		6/18/2019	110.55	79.05
		9/11/2019	110.57	79.03
		11/5/2019	110.56	79.04
		3/4/2020	110.61	78.99
		5/6/2020	110.63	78.97
		8/21/2020	110.60	79.00
		10/22/2020	110.62	78.98
		3/1/2021	110.63	78.97
		9/24/2021	111.10	78.50
		3/3/2022	110.71	78.89
		9/20/2022	--	--
		3/2/2023	110.83	78.77
		10/3/2023	110.58	79.02
		3/20/2024	110.26	79.34
MW-3	189.13	3/17/2011	109.42	79.71
		8/17/2011	109.35	79.78
		10/18/2011	109.37	79.76
		2/23/2012	109.26	79.87
		6/5/2012	109.28	79.85
		9/18/2012	109.30	79.83
		1/8/2013	109.28	79.85
		3/26/2013	109.33	79.80
		6/11/2013	109.41	79.72
		9/10/2013	109.58	79.55
		1/7/2014	109.70	79.43
		3/18/2014	109.68	79.45
		6/16/2014	109.84	79.29
		9/16/2014	109.97	79.16
		12/16/2014	110.08	79.05



TABLE 1 GROUNDWATER ELEVATIONS San Juan 29-7 Unit 37 Hilcorp Energy Company Rio Arriba County, New Mexico				
Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-3	189.13	3/17/2015	110.03	79.10
		6/16/2015	110.08	79.05
		9/15/2015	110.08	79.05
		12/1/2015	110.24	78.89
		3/29/2016	110.04	79.09
		6/21/2016	110.15	78.98
		9/7/2016	110.27	78.86
		11/30/2016	110.26	78.87
		3/7/2017	110.25	78.88
		6/13/2017	110.36	78.77
		9/26/2017	110.48	78.65
		12/19/2017	110.39	78.74
		3/14/2018	110.35	78.78
		6/26/2018	110.40	78.73
		9/5/2018	110.55	78.58
		12/14/2018	110.30	78.83
		3/26/2019	110.35	78.78
		6/17/2019	110.31	78.82
		9/10/2019	110.37	78.76
		11/4/2019	110.38	78.75
		3/3/2020	110.32	78.81
		5/4/2020	110.43	78.70
		8/19/2020	110.41	78.72
		10/21/2020	110.46	78.67
		3/1/2021	110.59	78.54
		9/24/2021	110.70	78.43
		3/3/2022	110.53	78.60
		9/20/2022	110.54	78.59
		3/2/2023	110.38	78.75
		10/3/2023	110.28	78.85
		3/20/2024	109.92	79.21
MW-4	197.60	3/17/2011	111.11	86.49
		8/17/2011	111.10	86.50
		10/18/2011	111.16	86.44
		2/23/2012	111.14	86.46



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-4	197.60	6/5/2012	111.20	86.40
		9/18/2012	111.12	86.48
		1/8/2013	111.14	86.46
		3/26/2013	111.23	86.37
		6/11/2013	111.41	86.19
		9/10/2013	111.47	86.13
		1/7/2014	111.66	85.94
		3/18/2014	111.60	86.00
		6/16/2014	111.68	85.92
		9/25/2014	111.77	85.83
		12/16/2014	111.80	85.80
		3/17/2015	111.77	85.83
		6/16/2015	111.78	85.82
		9/15/2015	111.76	85.84
		12/1/2015	111.89	85.71
		3/29/2016	111.92	85.68
		6/21/2016	111.95	85.65
		9/7/2016	111.33	86.27
		11/30/2016	112.03	85.57
		3/7/2017	111.90	85.70
		6/13/2017	111.92	85.68
		9/26/2017	112.01	85.59
		12/19/2017	112.05	85.55
		3/15/2018	112.02	85.58
		6/26/2018	112.02	85.58
		9/5/2018	112.05	85.55
		12/14/2018	112.02	85.58
		3/25/2019	112.04	85.56
		6/14/2019	112.03	85.57
		9/9/2019	110.57	87.03
		11/1/2019	112.07	85.53
		3/2/2020	112.05	85.55
		5/1/2020	112.05	85.55
		8/18/2020	112.01	85.59
		10/19/2020	112.02	85.58
		3/1/2021	112.08	85.52



TABLE 1 GROUNDWATER ELEVATIONS San Juan 29-7 Unit 37 Hilcorp Energy Company Rio Arriba County, New Mexico				
Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-4	197.60	9/24/2021	112.70	84.90
		3/3/2022	112.06	85.54
		9/20/2022	--	--
		3/2/2023	112.14	85.46
		10/3/2023	111.79	85.81
		3/20/2024	111.34	86.26
MW-5	188.70	10/18/2011	108.05	80.65
		2/23/2012	108.44	80.26
		6/5/2012	108.38	80.32
		9/18/2012	108.11	80.59
		1/8/2013	108.36	80.34
		3/26/2013	108.72	79.98
		6/11/2013	108.56	80.14
		9/10/2013	108.77	79.93
		1/7/2014	108.91	79.79
		3/18/2014	108.91	79.79
		6/16/2014	109.01	79.69
		9/16/2014	109.20	79.50
		12/16/2014	109.22	79.48
		3/17/2015	109.25	79.45
		6/16/2015	109.33	79.37
		9/15/2015	109.37	79.33
		12/1/2015	109.37	79.33
		3/29/2016	109.38	79.32
		6/21/2016	109.63	79.07
		9/7/2016	109.58	79.12
		11/30/2016	109.54	79.16
		3/7/2017	109.63	79.07
		6/13/2017	109.65	79.05
		9/26/2017	109.72	78.98
		12/19/2017	110.64	78.06
		3/14/2018	109.72	78.98
		6/26/2018	109.73	78.97
		9/5/2018	109.74	78.96
		12/14/2018	109.72	78.98



TABLE 1 GROUNDWATER ELEVATIONS San Juan 29-7 Unit 37 Hilcorp Energy Company Rio Arriba County, New Mexico				
Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-5	188.70	3/26/2019	109.65	79.05
		6/14/2019	109.80	78.90
		9/10/2019	109.75	78.95
		11/4/2019	109.88	78.82
		3/3/2020	109.73	78.97
		5/4/2020	109.82	78.88
		8/19/2020	109.93	78.77
		10/20/2020	109.84	78.86
		3/1/2021	109.89	78.81
		9/24/2021	109.40	79.30
		3/3/2022	109.93	78.77
		9/20/2022	--	--
		3/2/2023	--	--
		10/3/2023	109.87	78.83
		3/20/2024	109.29	79.41
MW-6	188.03	10/18/2011	109.55	78.48
		2/23/2012	108.01	80.02
		6/5/2012	108.05	79.98
		9/18/2012	108.06	79.97
		1/8/2013	108.07	79.96
		3/26/2013	108.09	79.94
		6/11/2013	108.25	79.78
		9/10/2013	108.43	79.60
		1/7/2014	108.70	79.33
		3/18/2014	108.70	79.33
		6/16/2014	108.85	79.18
		9/16/2014	108.99	79.04
		12/16/2014	109.10	78.93
		3/17/2015	109.14	78.89
		6/16/2015	109.23	78.80
		9/15/2015	109.20	78.83
		12/1/2015	109.30	78.73
		3/29/2016	109.34	78.69
		6/21/2016	108.58	79.45
		9/7/2016	109.47	78.56
		11/30/2016	109.51	78.52



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-6	188.03	3/7/2017	109.47	78.56
		6/13/2017	109.48	78.55
		9/26/2017	109.64	78.39
		12/19/2017	109.64	78.39
		3/15/2018	109.66	78.37
		6/26/2018	109.99	78.04
		9/5/2018	109.75	78.28
		12/14/2018	109.64	78.39
		3/26/2019	109.65	78.38
		6/18/2019	109.73	78.30
		9/11/2019	109.75	78.28
		11/5/2019	109.76	78.27
		3/4/2020	109.81	78.22
		5/6/2020	109.53	78.50
		8/20/2020	109.82	78.21
		10/20/2020	109.83	78.20
		3/1/2021	109.87	78.16
		9/27/2021	110.40	77.63
		3/3/2022	109.94	78.09
		9/20/2022	--	--
		3/2/2023	110.07	77.96
		10/3/2023	109.86	78.17
		3/20/2024	109.50	78.53
		12/30/2024	109.59	78.44
MW-7	189.93	10/18/2011	109.70	80.23
		2/23/2012	106.58	83.35
		6/5/2012	107.95	81.98
		9/18/2012	108.10	81.83
		1/8/2013	108.13	81.80
		3/26/2013	108.24	81.69
		6/11/2013	108.45	81.48
		9/10/2013	108.64	81.29
		1/7/2014	108.80	81.13
		3/18/2014	108.83	81.10
		6/16/2014	108.96	80.97
		9/25/2014	109.10	80.83



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-7	189.93	12/16/2014	109.13	80.80
		3/17/2015	109.12	80.81
		6/16/2015	109.14	80.79
		9/15/2015	109.07	80.86
		12/1/2015	109.15	80.78
		3/29/2016	109.23	80.70
		6/21/2016	109.39	80.54
		9/7/2016	109.42	80.51
		11/30/2016	109.51	80.42
		3/7/2017	109.44	80.49
		6/13/2017	109.38	80.55
		9/26/2017	109.52	80.41
		12/19/2017	109.52	80.41
		3/14/2018	109.49	80.44
		6/26/2018	109.57	80.36
		9/5/2018	109.55	80.38
		12/14/2018	109.50	80.43
		3/25/2019	109.48	80.45
		6/14/2019	109.50	80.43
		9/9/2019	109.48	80.45
		11/1/2019	109.53	80.40
		3/2/2020	109.53	80.40
		5/1/2020	109.53	80.40
		8/18/2020	109.52	80.41
		10/19/2020	109.51	80.42
		3/1/2021	109.60	80.33
		9/24/2021	109.90	80.03
		3/3/2022	109.63	80.30
		9/20/2022	--	--
		3/2/2023	109.68	80.25
		10/3/2023	109.52	80.41
		3/20/2024	109.16	80.77



TABLE 1
GROUNDWATER ELEVATIONS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Top of Casing Elevation (feet**)	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet**)
MW-8	189.86	10/19/2011	--	--
		2/23/2012	108.71	81.15
		6/5/2012	108.65	81.21
		9/20/2012	108.64	81.22
		1/8/2013	108.56	81.30
		3/26/2013	108.63	81.23
		6/11/2013	108.85	81.01
		7/13/2013	Plugged and Abandoned	
MW-8R	Replacement Well Not Surveyed for Elevation	9/10/2013	108.39	--
		1/7/2014	108.65	--
		3/18/2014	108.62	--
		6/16/2014	108.77	--
		9/25/2014	108.91	--
		12/16/2014	108.95	--
		3/17/2015	109.00	--
		6/16/2015	109.12	--
		9/15/2015	109.01	--
		12/1/2015	109.18	--
		3/29/2016	109.12	--
		6/21/2016	109.32	--
		9/7/2016	109.31	--
		11/30/2016	109.26	--
		3/7/2017	109.31	--
		6/13/2017	109.27	--
		9/26/2017	109.40	--
		12/19/2017	109.39	--
		3/14/2018	109.34	--
		6/26/2018	109.42	--
		9/5/2018	109.48	--
		12/14/2018	109.37	--
		3/28/2019	109.38	--
		6/24/2019	109.38	--
		9/13/2019	109.91	--
		11/6/2019	109.86	--
		3/5/2020	109.52	--



TABLE 1 GROUNDWATER ELEVATIONS San Juan 29-7 Unit 37 Hilcorp Energy Company Rio Arriba County, New Mexico				
Well Identification	Top of Casing Elevation (feet ^{**})	Date	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet ^{**})
MW-8R	Replacement Well Not Surveyed for Elevation	5/7/2020	109.62	--
		8/21/2020	109.63	--
		10/22/2020	109.43	--
		3/2/2021	109.63	--
		9/24/2021	110.00	--
		3/3/2022	109.71	--
		9/20/2022	109.59	--
		3/2/2023	109.48	--
		10/3/2023	109.73	--
		3/20/2024	109.13	--

Notes:

^{**}: elevations based on an arbitrary datum of 200 feet

BTOC: below top of casing

--: indicates no GWEL measured



TABLE 2
GROUNDWATER QUALITY MEASUREMENTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (µS/cm)	DO (mg/L)	ORP (mV)
MW-1	3/17/2015	18.10	7.28	2,200	3,380	--	53.0
	6/16/2015	17.70	7.30	1,970	3,030	1.39	-12.4
	9/15/2015	16.12	7.13	2,212	3,403	1.09	50.2
	12/1/2015	16.63	7.72	2,361	3,632	1.08	-100.5
	3/29/2016	16.64	7.22	3,100	3,350	4.20	126.0
	6/21/2016	17.10	7.44	--	3,320	0.46	6.5
	9/7/2016	16.31	7.34	2,139	3,290	0.56	-66.0
	12/1/2016	12.71	7.55	--	2,989	5.29	23.5
	3/7/2017	15.36	7.55	2,377	3,657	1.25	-108.8
	6/13/2017	18.42	7.38	2,109	3,245	1.67	-103.7
	9/26/2017	21.00	7.05	--	2,844	--	--
	12/19/2017	13.89	7.37	--	3,232	--	--
	3/14/2018	17.90	7.41	--	3,141	0.28	3.5
	6/26/2018	21.15	7.37	--	3,101	0.29	23.1
	9/5/2018	20.93	7.64	--	2,913	0.03	44.9
	3/29/2019	12.10	7.75	1,520	3,040	--	-34.7
	6/24/2019	20.40	7.28	1,580	3,130	26.60*	-38.0
	9/13/2019	17.80	6.28	1,550	3,100	25.30*	-45.5
	11/6/2019	15.50	6.90	1,540	3,090	100.60*	-45.6
	3/5/2020	14.90	6.73	1,530	3,060	5.99	-37.5
	5/6/2020	19.80	6.63	1,560	3,130	2.33	-30.4
	8/20/2020	21.30	6.95	1,520	3,030	1.21	-31.6
	10/21/2020	17.90	6.75	1,380	2,770	2.59	-30.3
	3/2/2021	16.60	6.94	1,400	2,810	0.58	-27.4
	9/24/2021	19.40	7.06	--	7,480*	--	--
	3/3/2022	16.90	6.96	--	2,590	--	--
	9/20/2022	18.00	7.06	1,230	2,460	--	--
	3/2/2023	14.00	7.39	1,150	2,370	--	--
	10/3/2023	17.88	7.74	2,290	3,523	1.80	113.1
	3/20/2024	21.31	8.08	2.25	3,460.8	2.05	251.1
MW-2	3/17/2015	14.80	7.30	2,200	3,430	--	165.0
	6/16/2015	14.90	6.91	1,925	2,961	6.23	25.2
	9/15/2015	14.62	6.99	2,162	3,327	6.27	75.5
	12/1/2015	13.50	7.61	2,277	3,504	5.27	80.8
	3/29/2016	--	--	--	--	--	--
	6/21/2016	15.40	7.38	--	2,850	0.56	-121.6
	9/7/2016	13.96	6.98	2,064	3,175	6.37	60.7
	12/1/2016	13.33	7.92	--	2,932	7.31	29.7
	3/7/2017	12.71	7.30	2,320	3,570	3.81	-84.5
	6/13/2017	15.03	7.24	2,075	3,191	5.55	-12.2
	9/26/2017	15.67	6.83	--	2,795	--	--
	12/19/2017	11.60	7.05	--	3,176	--	--
	3/14/2018	14.81	7.14	--	3,135	4.53	70.3
	6/26/2018	17.31	7.08	--	3,010	3.47	54.9
	9/5/2018	17.39	7.39	--	2,890	3.86	67.4
	3/27/2019	16.60	7.02	1,550	3,010	--	7.5
	6/18/2019	18.00	7.02	1,560	3,130	26.60*	55.4
	9/11/2019	17.60	6.21	1,550	3,100	42.80*	-23.2
	11/5/2019	15.20	6.39	1,560	3,120	46.00*	-19.0



TABLE 2
GROUNDWATER QUALITY MEASUREMENTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (µS/cm)	DO (mg/L)	ORP (mV)
MW-2	3/4/2020	15.60	6.41	1,580	3,140	6.95	-17.4
	5/7/2020	16.10	6.46	1,550	3,080	3.28	-19.9
	8/21/2020	18.10	6.87	1,540	3,090	2.50	-18.0
	10/22/2020	15.50	6.47	1,370	2,750	4.05	-17.2
MW-3	3/17/2015	15.10	7.45	1,900	3,040	--	-94.0
	6/16/2015	15.09	7.31	1,717	2,641	1.23	-123.5
	9/15/2015	15.03	7.30	1,912	2,941	1.39	-125.0
	12/1/2015	13.73	7.78	2,044	3,144	1.48	-164.2
	3/29/2016	15.82	7.34	1,900	2,940	5.66	-103.0
	6/21/2016	14.70	7.00	--	3,230	4.62	56.2
	9/7/2016	14.55	7.10	1,816	2,794	1.50	-102.7
	12/1/2016	14.91	7.74	--	2,556	1.97	-116.2
	3/7/2017	12.81	7.63	2,044	3,144	0.39	-192.6
	6/13/2017	14.77	7.58	1,819	2,801	0.42	-123.9
	9/26/2017	15.05	7.25	--	2,425	--	--
	12/19/2017	12.36	7.48	--	2,776	--	--
	3/14/2018	15.72	7.63	--	2,208	0.00	-139.6
	6/26/2018	18.48	7.63	--	2,589	0.22	-146.3
	9/5/2018	17.28	7.87	--	2,500	-0.07*	-124.3
	3/26/2019	15.80	7.35	1,320	2,640	0.00	-32.6
	6/17/2019	18.70	7.35	1,350	2,740	17.00*	-48.3
	9/10/2019	19.50	6.31	1,350	2,700	15.20*	-57.6
	11/4/2019	15.90	6.70	1,340	2,660	54.20*	-44.6
	3/3/2020	16.30	6.61	1,360	2,710	6.66	-33.6
	5/4/2020	18.30	6.72	1,330	2,620	1.92	-38.6
	8/19/2020	20.30	6.82	1,330	2,700	0.88	-34.4
	10/21/2020	15.80	6.73	1,170	2,340	3.47	-31.8
	3/1/2021	15.00	6.95	1,190	2,390	0.56	-33.6
	9/24/2021	19.30	6.85	--	6,570	--	--
	3/3/2022	17.10	6.70	--	2,250	--	--
	9/20/2022	18.20	6.59	1,050	2,290	--	--
	3/2/2023	11.90	7.52	1,040	2,080	--	--
	10/3/2023	27.96	8.09	1,980	3,050	1.63	-83.4
	3/20/2024	21.58	8.21	0.36	569.55	2.26	-112.3
MW-4	3/17/2015	16.30	7.43	2,000	3,120	--	125.0
	6/16/2015	14.68	7.38	1,760	2,707	6.38	13.6
	9/15/2015	14.75	6.99	1,980	3,047	7.23	48.3
	12/1/2015	14.57	7.89	1,451	2,231	5.92	-12.2
	3/29/2016	16.94	7.33	1,900	3,030	7.71	110.0
	6/21/2016	15.30	7.62	--	2,980	4.10	58.9
	9/7/2016	14.52	7.50	1,919	2,953	6.36	65.1
	12/2/2016	12.48	7.81	--	2,688	9.18	76.9
	3/7/2017	--	--	--	--	--	--
	9/26/2017	12.75	7.25	--	2,537	--	--
	12/19/2017	12.22	7.49	--	2,914	--	--
	3/14/2018	14.13	7.57	--	28	5.95	55.1
	6/26/2018	15.95	7.64	--	2,682	4.63	33.8
	9/5/2018	14.99	7.84	--	2,625	6.35	51.2
	3/25/2019	15.60	7.77	1,400	2,570	--	-33.4



TABLE 2
GROUNDWATER QUALITY MEASUREMENTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (μS/cm)	DO (mg/L)	ORP (mV)
MW-4	6/14/2019	15.70	7.35	1,410	2,790	60.10*	61.6
	9/9/2019	18.40	7.30	1,420	2,830	51.10*	-56.7
	11/1/2019	12.50	7.03	1,380	2,770	49.10*	-51.8
	3/2/2020	13.90	6.78	1,430	2,940	9.11	-42.6
	5/1/2020	18.40	6.47	1,410	2,790	5.62	-39.9
	8/18/2020	19.80	6.63	1,450	2,990	2.52	-40.0
	10/19/2020	16.40	6.46	1,220	2,430	2.97	-32.2
MW-5	3/17/2015	18.00	6.80	2,400	3,790	--	87.0
	6/16/2015	17.17	6.49	2,174	3,345	2.36	63.2
	9/15/2015	16.10	6.64	2,468	3,796	1.97	64.7
	12/1/2015	15.73	7.10	2,603	4,004	2.66	168.2
	3/29/2016	19.44	6.87	2,400	3,750	3.01	66.0
	6/21/2016	18.00	6.68	--	3,660	0.92	91.1
	9/7/2016	15.71	6.89	2,331	3,586	3.99	55.4
	12/1/2016	16.15	7.40	--	3,266	3.55	22.4
	3/7/2017	13.27	7.64	2,617	4,026	3.10	-64.7
	9/26/2017	14.09	6.85	--	3,030	--	--
	12/19/2017	12.49	6.85	--	3,513	--	--
	3/14/2018	15.02	6.92	--	3,476	1.37	70.5
	6/26/2018	16.65	7.05	--	3,124	1.64	47.6
	9/5/2018	16.10	7.47	--	3,186	3.88	63.6
	3/26/2019	12.80	7.29	1,490	2,780	--	-3.3
	6/17/2019	17.20	7.25	1,740	3,460	31.60*	-26.0
	9/10/2019	17.90	6.27	1,710	3,430	30.80*	-27.7
	11/4/2019	15.10	6.77	1,710	3,370	26.40*	103.1
	3/3/2020	16.20	6.36	1,690	3,360	9.83	-16.7
	5/4/2020	16.20	6.69	1,670	3,340	2.66	-23.2
	8/19/2020	19.20	6.58	1,660	3,370	1.86	-13.4
	10/20/2020	17.10	6.51	1,480	3,030	1.78	-11.8
MW-6	3/17/2015	17.30	6.90	1,800	2,800	--	103.0
	6/16/2015	17.77	6.73	1,584	2,437	2.12	1.9
	9/15/2015	15.96	6.57	1,784	2,745	2.87	84.3
	12/1/2015	16.18	7.32	1,867	2,873	2.93	82.9
	3/29/2016	16.64	6.77	1,700	2,630	4.89	103.0
	6/21/2016	17.00	7.11	--	27	3.86	59.8
	9/7/2016	16.48	7.00	1,676	2,578	1.87	8.7
	12/2/2016	12.07	7.29	--	2,409	4.10	50.8
	3/7/2017	14.16	7.10	1,936	2,979	2.01	-63.8
	6/13/2017	16.86	7.00	1,716	2,640	2.29	-36.8
	9/26/2017	16.61	6.51	--	2,287	--	--
	12/19/2017	13.49	6.85	--	2,640	--	--
	3/14/2018	16.20	6.94	--	2,581	2.36	68.9
	6/26/2018	22.89	6.91	--	2,494	2.20	52.8
	9/5/2018	20.66	7.18	--	2,381	2.13	65.0
	3/26/2019	16.40	6.95	1,270	2,540	--	-0.6
	6/18/2020	17.20	7.19	1,280	2,570	38.70*	-16.1
	9/11/2019	18.50	6.20	1,280	2,560	38.80*	-13.4
	11/5/2019	16.90	6.31	1,300	2,620	94.90*	-14.5
	3/4/2020	15.10	6.54	1,290	2,580	5.92	-8.7



TABLE 2
GROUNDWATER QUALITY MEASUREMENTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (µS/cm)	DO (mg/L)	ORP (mV)
MW-6	5/6/2020	17.40	6.39	1,280	2,570	3.26	-5.6
	8/20/2020	18.50	6.67	1,240	2,600	2.35	-11.6
	10/20/2020	18.10	6.39	1,150	2,270	3.52	-6.3
MW-7	3/17/2015	17.40	7.64	2,600	4,100	--	118.0
	6/16/2015	17.05	8.28	2,366	3,639	3.73	-48.2
	9/15/2015	16.47	7.66	2,663	4,096	6.44	85.4
	12/1/2015	16.03	7.90	2,853	4,389	2.00	-65.0
	3/29/2016	18.42	7.45	2,600	4,050	7.12	108.0
	6/21/2016	16.40	7.50	--	3,990	5.73	58.1
	9/7/2016	16.04	7.54	2,571	3,970	6.15	59.2
	12/2/2016	14.19	7.57	--	3,604	5.91	47.7
	3/7/2017	13.80	7.59	2,853	4,390	8.58	-29.4
	6/13/2017	17.73	7.47	2,510	3,863	9.30	-2.2
	9/26/2017	16.71	7.07	--	3,337	--	--
	12/19/2017	13.35	7.33	--	3,799	--	--
	3/14/2018	16.21	7.26	--	3,674	8.57	71.9
	6/26/2018	18.13	7.20	--	3,596	8.44	56.5
	9/5/2018	21.46	7.59	--	3,438	6.08	65.5
	3/25/2019	16.20	7.37	1,770	3,560	--	-30.6
	6/14/2019	18.20	7.03	1,820	3,650	46.20*	-22.5
	9/9/2019	18.10	7.23	1,810	3,620	35.60*	-50.5
	11/1/2019	13.50	6.61	1,750	3,410	139.50*	-32.2
	3/2/2020	14.50	6.61	1,760	3,500	8.71	-32.1
	5/1/2020	18.80	6.60	1,780	3,580	3.88	-25.3
MW-8R	8/18/2020	20.30	6.99	1,800	3,510	2.35	-27.8
	10/19/2020	16.70	6.42	1,580	3,130	3.98	-22.5
	3/17/2015	19.30	6.96	2,100	3,310	--	30.0
	6/16/2015	17.82	7.07	1,970	3,033	0.48	-50.3
	9/15/2015	18.30	6.91	2,222	3,431	1.20	-10.7
	12/1/2015	16.75	7.41	2,341	3,595	1.08	-91.3
	3/29/2016	15.86	7.24	2,100	3,340	4.49	-56.0
	6/21/2016	18.20	7.15	--	3,230	0.18	-104.8
	9/7/2016	17.21	7.07	2,128	3,274	0.53	-81.1
	12/1/2016	13.01	7.10	--	2,930	2.36	39.6
	3/7/2017	14.89	7.40	2,368	3,644	2.40	-144.1
	6/13/2017	17.30	7.13	2,061	3,171	0.49	-103.0
	9/26/2017	19.77	6.97	--	2,860	--	--
	12/19/2017	14.97	7.11	--	3,176	--	--
	3/14/2018	19.03	7.09	--	3,127	0.04	-3.6
	6/26/2018	21.51	7.04	--	3,015	0.26	-13.9
	9/5/2018	21.78	7.32	--	2,872	0.05	8.3
	3/28/2019	17.00	7.32	1,560	3,070	--	-11.4
	6/24/2019	17.60	7.25	1,580	3,160	23.60*	-22.5
	9/13/2019	20.10	6.09	1,570	3,140	30.10*	-27.2
	11/6/2019	15.90	6.37	1,540	3,120	118.20*	-9.8
	3/5/2020	16.00	6.76	1,530	3,060	6.71	-32.1
	5/7/2020	20.04	6.51	1,610	3,240	--	-24.1
	8/21/2020	24.20	6.76	1,500	2,970	1.78	-14.3
	10/22/2020	15.90	6.76	1,430	2,840	4.04	-19.0



TABLE 2
GROUNDWATER QUALITY MEASUREMENTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (µS/cm)	DO (mg/L)	ORP (mV)
MW-8R	3/2/2021	15.80	6.96	1,420	2,840	0.72	-13.3
	9/24/2021	18.40	7.12	--	7,760*	--	--
	3/2/2022	17.30	6.85	--	2,690	--	--
	9/20/2022	23.50	6.80	1,200	2,400	--	--
	3/2/2023	13.00	7.44	1,210	2,430	--	--
	10/3/2023	26.41	7.88	2,090	3,217	1.63	127.2
	3/20/2024	21.12	7.75	1.68	2,594.6	1.63	-17.2

Notes:

°C: degrees Celcius

DO: dissolved oxygen

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

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-1	3/17/2011	2.77
	8/17/2011	0.318
	10/18/2011	--
	2/23/2012	6.40
	6/5/2012	5.15
	9/18/2012	2.60
	1/8/2013	1.10
	3/26/2013	0.486
	6/11/2013	0.520
	9/10/2013	0.164
	1/7/2014	0.132
	3/18/2014	0.643
	6/16/2014	1.20
	9/25/2014	1.57
	12/16/2014	1.49
	3/17/2015	1.60
	6/16/2015	1.36
	9/15/2015	1.52
	12/1/2015	1.76
	3/29/2016	1.86
	6/21/2016	1.72
	9/7/2016	1.38
	12/2/2016	--
	3/7/2017	1.90
	6/13/2017	1.76
	9/26/2017	2.04
	12/19/2017	1.75
	3/14/2018	1.94
	6/26/2018	1.83
	9/5/2018	1.83
	12/14/2018	1.8
	3/29/2019	0.056
	6/24/2019	2.00
	9/13/2019	1.800
	11/6/2019	0.608
	3/5/2020	1.28



TABLE 3 GROUNDWATER ANALYTICAL RESULTS San Juan 29-7 Unit 37 Hilcorp Energy Company Rio Arriba County, New Mexico		
Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-1	5/6/2020	1.11
	8/20/2020	1.57
	10/21/2020	0.625
	3/2/2021	1.02
	9/24/2021	1.5
	3/3/2022	1.8
	9/20/2022	2.0
	3/2/2023	1.7
	10/3/2023	0.24
	3/20/2024	2.3
MW-2	3/17/2011	0.334
	8/17/2011	0.179
	10/18/2011	--
	2/23/2012	0.0360
	6/5/2012	0.0078
	9/18/2012	0.0194
	1/8/2013	0.0057
	3/26/2013	0.0188
	6/11/2013	0.0086
	9/10/2013	< 0.0050
	1/7/2014	0.0069
	3/18/2014	0.281
	6/16/2014	0.09
	9/16/2014	0.783
	12/16/2014	0.746
	3/17/2015	0.0195
	6/16/2015	0.0703
	9/15/2015	< 0.005
	12/1/2015	0.0144
	3/29/2016	< 0.005
	6/21/2016	0.0099
	9/7/2016	0.0104
	12/2/2016	< 0.005
	3/7/2017	< 0.005



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-2	6/13/2017	< 0.005
	9/26/2017	< 0.005
	12/19/2017	< 0.005
	3/14/2018	< 0.005
	6/26/2018	--
	9/5/2018	< 0.005
	12/14/2016	< 0.01
	3/29/2019	< 0.01
	6/18/2019	< 0.01
	9/11/2019	< 0.01
	11/5/2019	< 0.01
	3/4/2020	<0.005
	5/7/2020	<0.005
	8/21/2020	<0.005
	10/22/2020	<0.005
MW-3	3/17/2011	1.79
	8/17/2011	1.42
	10/18/2011	--
	2/23/2012	1.60
	6/5/2012	1.43
	9/18/2012	1.24
	1/8/2013	1.62
	3/26/2013	1.83
	6/11/2013	1.75
	9/10/2013	1.7
	1/7/2014	1.77
	3/18/2014	1.81
	6/16/2014	2
	9/16/2014	2.29
	12/16/2014	2.06
	3/17/2015	2.06
	6/16/2015	1.88
	9/15/2015	2.1
	12/1/2015	2.17
	3/29/2016	2.14
	6/21/2016	1.92



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-3	9/7/2016	1.88
	12/2/2016	1.98
	3/7/2017	2.22
	6/13/2017	1.87
	9/26/2017	1.82
	12/19/2017	1.82
	3/14/2018	1.97
	6/26/2018	1.94
	9/5/2018	1.88
	12/14/2018	1.76
	3/29/2019	1.75
	6/17/2019	1.74
	9/10/2019	1.74
	11/4/2019	1.74
	3/3/2020	1.84
	5/4/2020	1.64
	8/19/2020	1.72
	10/21/2020	1.69
	3/1/2021	1.64
	9/24/2021	1.9
	3/2/2022	1.7
	9/20/2022	1.6
	3/2/2023	1.8
	10/3/2023	1.7
	3/20/2024	2.1
MW-4	3/17/2011	0.022
	8/17/2011	0.0062
	10/18/2011	--
	2/23/2012	0.0170
	6/5/2012	0.0814
	9/18/2012	0.1030
	1/8/2013	0.0289
	3/26/2013	0.0605
	6/11/2013	0.0484
	9/10/2013	0.0303
	1/7/2014	0.0265



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMQCC Standards		0.2
MW-4	3/18/2014	0.0227
	6/16/2014	0.0080
	9/25/2014	0.0160
	12/16/2014	0.0155
	3/17/2015	0.0156
	6/16/2015	0.0226
	9/15/2015	0.0088
	12/1/2015	0.0118
	3/29/2016	0.0134
	6/21/2016	0.0713
	9/7/2016	0.0138
	12/2/2016	--
	3/7/2017	--
	6/13/2017	--
	9/26/2017	0.0538
	12/19/2017	0.1280
	3/14/2018	<0.005
	6/26/2018	--
	9/5/2018	0.0217
	12/14/2018	<0.010
	3/29/2019	<0.010
	6/14/2019	<0.010
	9/9/2019	<0.010
	11/4/2019	<0.010
	3/2/2020	<0.005
	5/1/2020	<0.005
	8/18/2020	<0.005
	10/19/2020	<0.005
MW-5	10/18/2011	--
	2/23/2012	1.10
	6/5/2012	0.868
	9/18/2012	0.791
	1/8/2013	0.58
	3/26/2013	0.356
	6/11/2013	0.609
	9/10/2013	0.368



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-5	1/7/2014	0.396
	3/18/2014	0.606
	6/16/2014	0.93
	9/16/2014	0.433
	12/16/2014	0.0706
	3/17/2015	0.0433
	6/16/2015	0.0331
	9/15/2015	0.0215
	12/1/2015	0.0163
	3/29/2016	0.128
	6/21/2016	0.0109
	9/7/2016	0.235
	12/2/2016	0.214
	3/7/2017	0.0405
	6/13/2017	--
	9/26/2017	1.54
	12/19/2017	0.182
	3/14/2018	0.192
	6/26/2018	0.0054
	9/5/2018	0.02
	12/14/2018	<0.010
	3/29/2019	<0.010
	6/17/2019	<0.010
	9/10/2019	<0.010
	11/4/2019	<0.010
	3/3/2020	<0.005
	5/4/2020	<0.005
	8/19/2020	0.00942
	10/20/2020	0.0866
MW-6	10/18/2011	--
	2/23/2012	<0.005
	6/5/2012	1.600
	9/18/2012	1.110
	1/8/2013	0.158
	3/26/2013	0.282
	6/11/2013	0.328



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-6	9/10/2013	0.299
	1/7/2014	0.268
	3/18/2014	0.246
	6/16/2014	0.140
	9/16/2014	0.115
	12/16/2014	0.147
	3/17/2015	0.114
	6/16/2015	0.0917
	9/15/2015	0.0456
	12/1/2015	0.0396
	3/29/2016	0.0338
	6/21/2016	0.0819
	9/7/2016	0.1070
	12/2/2016	--
	3/7/2017	0.1290
	6/13/2017	0.0734
	9/26/2017	0.0787
	12/19/2017	0.0481
	3/14/2018	0.0459
	6/26/2018	--
	9/5/2018	0.024
	12/14/2018	<0.010
	3/29/2019	<0.010
	6/18/2019	<0.010
	9/11/2019	<0.010
	11/5/2019	<0.010
	3/4/2020	<0.005
	5/6/2020	<0.005
	8/20/2020	<0.005
	10/20/2020	<0.005
MW-7	10/18/2011	--
	2/23/2012	< 0.005
	6/5/2012	0.019
	9/18/2012	0.012
	1/8/2013	0.0093
	3/26/2013	<0.005
	6/11/2013	0.0082



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-7	9/10/2013	0.168
	1/7/2014	0.452
	3/18/2014	0.438
	6/16/2014	0.49
	9/25/2014	0.231
	12/16/2014	0.435
	3/17/2015	0.321
	6/16/2015	0.256
	9/15/2015	0.227
	12/1/2015	0.108
	3/29/2016	0.102
	6/21/2016	0.0552
	9/7/2016	0.0387
	12/2/2016	--
	3/7/2017	0.0077
	6/13/2017	<0.005
	9/26/2017	0.2620
	12/19/2017	<0 .0050
	3/14/2018	0.0056
	6/26/2018	<0 .0050
	9/5/2018	<0 .0050
	12/14/2018	<0 .010
	3/29/2019	<0 .010
	6/14/2019	<0 .010
	9/9/2019	<0 .010
	11/1/2019	<0 .010
	3/2/2020	<0.005
	5/1/2020	<0.005
	8/18/2020	<0.005
	10/19/2020	<0.005



TABLE 3
GROUNDWATER ANALYTICAL RESULTS

San Juan 29-7 Unit 37
Hilcorp Energy Company
Rio Arriba County, New Mexico

Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-8	10/19/2011	--
	2/23/2012	<0.005
	6/5/2012	0.022
	9/20/2012	--
	1/8/2013	--
	3/26/2013	
	6/11/2013	
	7/13/2013	
MW-8R	9/10/2013	0.395
	1/7/2014	0.255
	3/18/2014	0.106
	6/16/2014	1.5
	9/25/2014	1.38
	12/16/2014	1.01
	3/17/2015	0.323
	6/16/2015	0.707
	9/15/2015	0.7
	12/1/2015	0.84
	3/29/2016	1.16
	6/21/2016	0.431
	9/7/2016	0.758
	12/2/2016	0.488
	3/7/2017	0.437
	6/13/2017	0.396
	9/26/2017	0.0218
	12/19/2017	0.432
	3/14/2018	0.364
	6/26/2018	0.434
	9/5/2018	0.442
	12/14/2018	0.238
	3/29/2019	0.172
	6/24/2019	0.427
	9/13/2019	0.357
	11/6/2019	0.0153
	3/5/2020	1.98
	5/7/2020	0.775
	8/21/2020	0.0524



TABLE 3 GROUNDWATER ANALYTICAL RESULTS San Juan 29-7 Unit 37 Hilcorp Energy Company Rio Arriba County, New Mexico		
Well Identification	Sample Date	Dissolved Manganese (mg/L)
NMWQCC Standards		0.2
MW-8R	10/22/2020	0.710
	3/2/2021	0.622
	9/24/2021	0.89
	3/2/2022	0.31
	9/20/2022	0.60
	3/2/2023	0.52
	10/3/2023	0.43
	3/20/2024	0.65

Notes:

mg/L: milligrams per liter

NMWQCC: New Mexico Water Quality Control Commission

--: not analyzed

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

Cells shaded in gray indicate groundwater samples collected prior to CoolOx™ treatment

Concentrations in **bold** and shaded exceed the New Mexico Water Quality Control Commission Standards, 20.6.2 of the New Mexico Administrative Code



APPENDIX A

Laboratory Analytical Reports



Environment Testing

1

2

3

4

5

6

7

8

9

10

11

12

ANALYTICAL REPORT

PREPARED FOR

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

Generated 3/27/2024 4:46:25 PM

JOB DESCRIPTION

San Juan 29-7 unit 37
San Juan 29-7 unit 37

JOB NUMBER

885-1623-1

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



Generated
3/27/2024 4:46:25 PM

Authorized for release by
Andy Freeman, Business Unit Manager
andy.freeman@et.eurofinsus.com
(505)345-3975

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Laboratory Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Client Sample Results	6
QC Sample Results	7
QC Association Summary	8
Lab Chronicle	9
Certification Summary	10
Method Summary	11
Chain of Custody	12
Receipt Checklists	13

1
2
3
4
5
6
7
8
9
10
11
12

Definitions/Glossary

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

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: San Juan 29-7 unit 37

Job ID: 885-1623-1

Job ID: 885-1623-1Eurofins Albuquerque

Job Narrative
885-1623-1

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 3/22/2024 7:05 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 3.7°C.

Metals

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: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

Client Sample ID: MW-1**Lab Sample ID: 885-1623-1**

Date Collected: 03/20/24 13:10

Matrix: Water

Date Received: 03/22/24 07:05

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.3		0.010	mg/L			03/26/24 08:26	5

Client Sample ID: MW-3**Lab Sample ID: 885-1623-2**

Date Collected: 03/20/24 15:20

Matrix: Water

Date Received: 03/22/24 07:05

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.1		0.010	mg/L			03/26/24 08:33	5

Client Sample ID: MW-8R**Lab Sample ID: 885-1623-3**

Date Collected: 03/20/24 14:25

Matrix: Water

Date Received: 03/22/24 07:05

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.65		0.0020	mg/L			03/26/24 08:36	1

QC Sample Results

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: MB 885-2306/17

Matrix: Water

Analysis Batch: 2306

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			03/26/24 08:15	1

Lab Sample ID: LCS 885-2306/19

Matrix: Water

Analysis Batch: 2306

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	0.565		mg/L		113	85 - 115

Lab Sample ID: LLCS 885-2306/18

Matrix: Water

Analysis Batch: 2306

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	0.00194	J	mg/L		97	50 - 150

QC Association Summary

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

Metals

Filtration Batch: 2170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1623-1	MW-1	Dissolved	Water	Filtration	
885-1623-2	MW-3	Dissolved	Water	Filtration	
885-1623-3	MW-8R	Dissolved	Water	Filtration	

Analysis Batch: 2306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
885-1623-1	MW-1	Dissolved	Water	200.7 Rev 4.4	2170
885-1623-2	MW-3	Dissolved	Water	200.7 Rev 4.4	2170
885-1623-3	MW-8R	Dissolved	Water	200.7 Rev 4.4	2170
MB 885-2306/17	Method Blank	Total/NA	Water	200.7 Rev 4.4	
LCS 885-2306/19	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	
LLCS 885-2306/18	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	

Lab Chronicle

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

Client Sample ID: MW-1
Date Collected: 03/20/24 13:10
Date Received: 03/22/24 07:05

Lab Sample ID: 885-1623-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Filtration	Filtration			2170	TC	EET ALB	03/22/24 12:43
Dissolved	Analysis	200.7 Rev 4.4		5	2306	VP	EET ALB	03/26/24 08:26

Client Sample ID: MW-3
Date Collected: 03/20/24 15:20
Date Received: 03/22/24 07:05

Lab Sample ID: 885-1623-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Filtration	Filtration			2170	TC	EET ALB	03/22/24 12:43
Dissolved	Analysis	200.7 Rev 4.4		5	2306	VP	EET ALB	03/26/24 08:33

Client Sample ID: MW-8R
Date Collected: 03/20/24 14:25
Date Received: 03/22/24 07:05

Lab Sample ID: 885-1623-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Filtration	Filtration			2170	TC	EET ALB	03/22/24 12:43
Dissolved	Analysis	200.7 Rev 4.4		1	2306	VP	EET ALB	03/26/24 08:36

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

Accreditation/Certification Summary

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

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	Manganese
Oregon	NELAP	NM100001	02-26-25

Method Summary

Client: Hilcorp Energy
Project/Site: San Juan 29-7 unit 37

Job ID: 885-1623-1
SDG: San Juan 29-7 unit 37

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	EET ALB
Filtration	Sample Filtration	None	EET ALB

Protocol References:

EPA = US Environmental Protection Agency
None = None

Laboratory References:

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

1
2
3
4
5
6
7
8
9
10
11
12

Login Sample Receipt Checklist

Client: Hilcorp Energy

Job Number: 885-1623-1

SDG Number: San Juan 29-7 unit 37

Login Number: 1623**List Number: 1****Creator: Casarrubias, Tracy****List Source: Eurofins Albuquerque**

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	Refer to Job Narrative for details.
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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	Sample splitting required.
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/oed/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 432365

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 432365
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
amaxwell	Report accepted for record.	8/12/2025
amaxwell	Submit a C-141N for all future sampling and monitoring activities.	8/12/2025