REVIEWED
By Nelson Velez at 3:10 pm, Feb 06, 2023

Review of 2021 Annual Groundwater Report: **Content satisfactory**

1. Discontinue sulfate analysis from all site monitor wells.
2. Discontinue BTEX analysis MW-2 & MW-3.
3. Continue sampling for Manganese from MW-1, MW-3, MW-4.
4. Submit next Annual Monitoring Report to the OCD no later than March 31, 2023.

March 4, 2022

New Mexico Energy, Minerals and Natural Resources Department
New Mexico Oil Conservation Division
1000 Rio Brazos
Aztec, New Mexico 87410

Subject: **2021 Annual Groundwater Monitoring Report**
Johnston Federal #4
San Juan County, New Mexico
NMOCD Incident Number: NAUTOFAB000306
NMOCD Administrative Order: 3RP-71

To Whom it May Concern:

WSP USA Inc. (WSP), on behalf of Hilcorp Energy Company (Hilcorp), presents this 2021 Annual Groundwater Monitoring Report to the New Mexico Oil Conservation Division (NMOCD) to document groundwater monitoring activities conducted at the Johnston Federal #4 metering station (Site) during 2021. The Site is located on Bureau of Land Management (BLM) land within Unit M, Section 27, Township 31 North and Range 9 West, San Juan County, New Mexico (Figure 1).

SITE BACKGROUND

Initial investigations were performed by Burlington Resources (Burlington, a previous operator of the Site) in August 1998 to assess two historical production pits (shown on Figure 2). Soil samples were collected from each pit and analyzed for total petroleum hydrocarbons (TPH). TPH concentrations from samples collected at Production Pit #1 was compliant with NMOCD standards and this pit was subsequently granted closure by NMOCD. Soil analyzed from Production Pit #2 was analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and TPH, with results indicating exceedances of NMOCD standards. Based on sampling results, Burlington excavated approximately 3,055 cubic yards of hydrocarbon-impacted soil in December 1998. The NMOCD subsequently granted closure of the release based on the excavation results.

In May 1999, monitoring well MW-1 was installed at the Site to a depth of 50 feet below ground surface (bgs). ConocoPhillips Company acquired Burlington in March 2006 and installed three additional monitoring wells (MW-2, MW-3, and MW-4) in 2008 to further assess groundwater impacts related to the former Production Pit #2. To remediate dissolved phase hydrocarbons from groundwater, four mobile dual phase extraction (MDPE) events were conducted in well MW-1 in August 2013, November 2014, April 2015, and November 2017. Recovered liquids were discharged to the on-Site evaporation tank. Vapors recovered during the events were used as fuel and burned in the MDPE internal combustion engine. A total of approximately 298 gallons equivalent of hydrocarbons (liquid and vapor) were removed from MW-1 during these events.

Hilcorp acquired ConocoPhillips Company in April 2017 and assumed groundwater monitoring responsibilities. Additionally, El Paso CGP Company (El Paso) is a co-producer on the Site well pad and owns additional Site monitoring wells, from which non-aqueous phase liquid (LNAPL), otherwise known as free product or phase separated hydrocarbons (PSH), is being recovered. El Paso groundwater impacts are down gradient from the ConocoPhillips-installed monitoring wells.

SITE GROUNDWATER CLEANUP STANDARDS

NMOCD requires groundwater-quality standards presented by the New Mexico Water Quality Control Commission (NMWQCC) in 20.6.2.3103 of the New Mexico Administrative Code (NMAC) be met. The following standards are presented for the constituents of concern at the Site in milligrams per liter (mg/L).

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ANALYTE	LIMIT
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

In addition, NMWQCC standards state that LNAPLs or PSH (as referenced in this report) shall not be present floating on the groundwater.

GROUNDWATER SAMPLING ACTIVITIES AND RESULTS

Groundwater monitoring at the Site includes annual gauging and sampling for laboratory analysis. Groundwater-level measurements and samples were collected on September 23, 2021 from wells MW-1 through MW-4; however, a sample was not collected for laboratory analysis from MW-1 due to the presence of PSH. The following sections summarize the sampling procedures and results gathered during these events.

GROUNDWATER-LEVEL MEASUREMENTS

Static groundwater-level monitoring included recording depth-to-groundwater and depth-to-PSH 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 2021 sampling event are presented in Table 1 and were used to develop a groundwater potentiometric surface map (Figure 3). The inferred groundwater flow direction is to the east.

GROUNDWATER SAMPLING

Groundwater 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, and electrical conductivity, were collected during the purging process, and are presented in Table 2. Following well purging, groundwater samples were placed directly into laboratory-provided jars and labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. They were immediately sealed, packed on ice, and submitted to Hall Environmental Analysis Laboratory (Hall) for analysis of BTEX by Environmental Protection Agency (EPA) Method 8021B, dissolved manganese by EPA Method 200.7, and sulfate by EPA Method 300.0. Proper chain-of-custody (COC) procedures were followed documenting the date and time sampled, sample number, type of sample, sample collector's name, preservative used, analyses required, and sample collector's signature. Analytical laboratory reports from the sampling events are included as Enclosure A.

GROUNDWATER ANALYTICAL RESULTS

During the annual groundwater-sampling event, PSH was present in well MW-1 at a thickness of 0.10 feet. Benzene was detected in well MW-4 at a concentration of 0.027 mg/L, exceeding the NMWQCC standard. Dissolved manganese was detected at concentrations above the NMWQCC standard in wells MW-3 and MW-4 and sulfate was detected wells MW-2 and MW-4 above the NMWQCC standard. No other constituents of concern were detected above NMWQCC standards in any of the wells sampled during the September sampling event. A summary of analytical results are presented in Table 3 and on Figure 4.

CONCLUSIONS

Elevated concentrations of BTEX have been continually present in wells MW-1 and MW-4 since groundwater was first monitored at the Site in 1999. PSH has also been present in well MW-1 during sampling events conducted in 2016, 2019, 2020, and 2021. Overall concentrations of BTEX have decreased over time at the Site and downgradient wells MW-3 and MW-4 indicate PSH has not migrated downgradient from well MW-1 since it was first measured in 2016. Additionally, BTEX concentrations have not been detected above NMWQCC standards in wells MW-2 or MW-3 in over 10 years.

Dissolved manganese has also been present at concentrations exceeding NMWQCC standards in wells MW-1, MW-3, and MW-4. Elevated manganese concentrations in these wells appear to be a result of generally low-oxygen and reducing groundwater conditions in these wells, which is a common biproduct of petroleum hydrocarbon degradation in groundwater systems. This is further evidenced by the low concentrations of manganese in the hydrogeologically upgradient well MW-2 which is outside and upgradient of the original petroleum-hydrocarbon plume. 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.

Conversely, elevated sulfate concentrations above NMWQCC standards are present in the upgradient well MW-2. Based on data gathered between 2008 and 2021, sulfate concentrations in groundwater from well MW-2 have averaged 1,238 mg/L, above the NMWQCC standard of 600 mg/L. Average sulfate concentrations in all other Site wells are also significantly less than in well MW-2. Based on the elevated concentrations present in upgradient well MW-2, sulfate concentrations are expected to be present throughout the Site at varying levels associated with background concentrations and not due to the historical release.

RECOMMENDATIONS

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

- Eliminate sulfate as a constituent of concern at the Site. Naturally occurring sulfate concentrations exceeding the NMWQCC standard are present in upgradient well MW-2 and indicate elevated concentrations in other wells at the Site are also naturally occurring.
- Continue annual sampling to assess BTEX and dissolved manganese concentrations in all wells at the Site.

WSP appreciates the opportunity to provide these environmental services to Hilcorp. Please contact either of the undersigned with any questions at (970) 385-1096.

Kind regards,

Stuart Hyde, L.G.
Senior Geologist

Daniel Moir, P.G.
Sr. Lead Consultant, Geologist

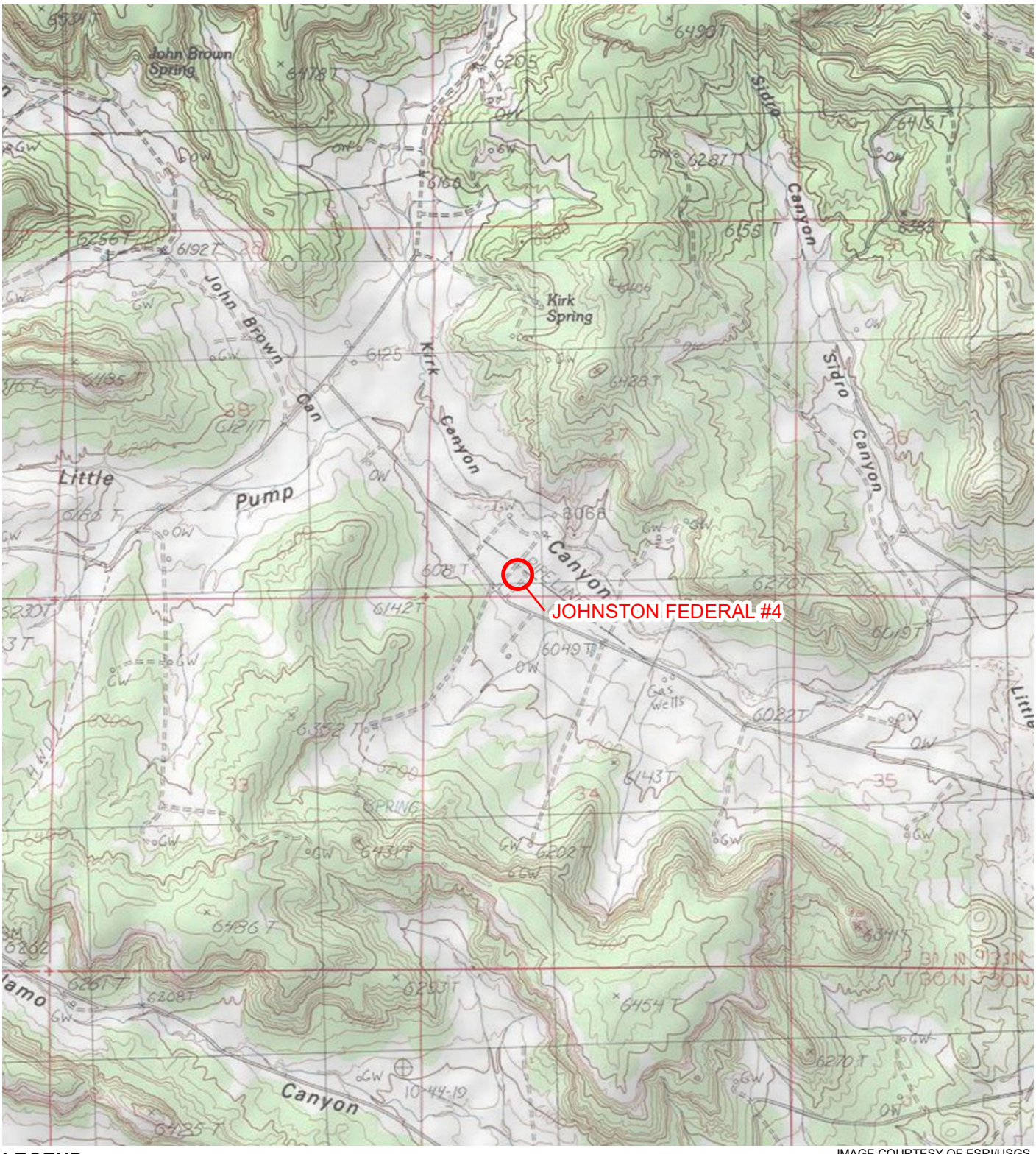
Enclosed:

Figure 1: Site Location Map
Figure 2: Site Map
Figure 3: Groundwater Elevation Map
Figure 4: Groundwater Analytical Results

Table 1: Well Construction Information and Groundwater Elevations
Table 2: Field Parameter Results
Table 3: Petroleum Hydrocarbon Groundwater Analytical Results

Enclosure A: Analytical Laboratory Reports

FIGURES



LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

NEW MEXICO

FIGURE 1
SITE LOCATION MAP
JOHNSTON FEDERAL #4
SWSW & SESW SEC 27 T31N R09W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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FIGURE 2
SITE MAP
JOHNSTON FEDERAL #4
SWSW & SESW SEC 27 T31N R09W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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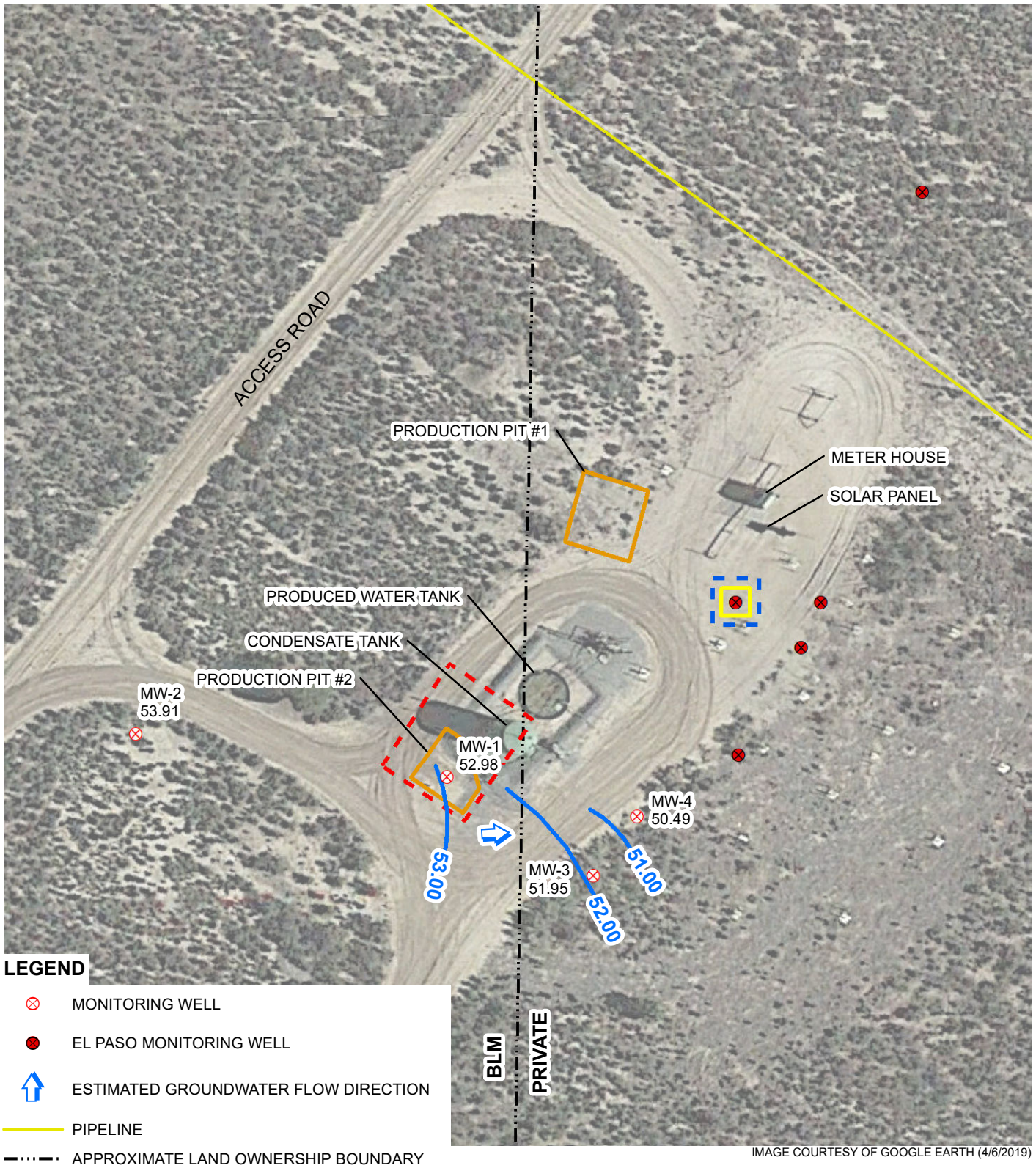

LEGEND

- MONITORING WELL
- EL PASO MONITORING WELL
- ESTIMATED GROUNDWATER FLOW DIRECTION
- PIPELINE
- APPROXIMATE LAND OWNERSHIP BOUNDARY
- RELATIVE GROUNDWATER ELEVATION CONTOUR
- CONTOUR INTERVAL = 1.00 FOOT
- EXCAVATION EXTENT
- APPROXIMATE EL PASO EXCAVATION EXTENT
- FORMER DEHDRATOR PIT
- FORMER PRODUCTION PIT

GROUNDWATER ELEVATIONS WERE MEASURED ON SEPTEMBER 23, 2021.

FIGURE 3
GROUNDWATER ELEVATION MAP
JOHNSTON FEDERAL #4
SWSW & SESW SEC 27 T31N R09W SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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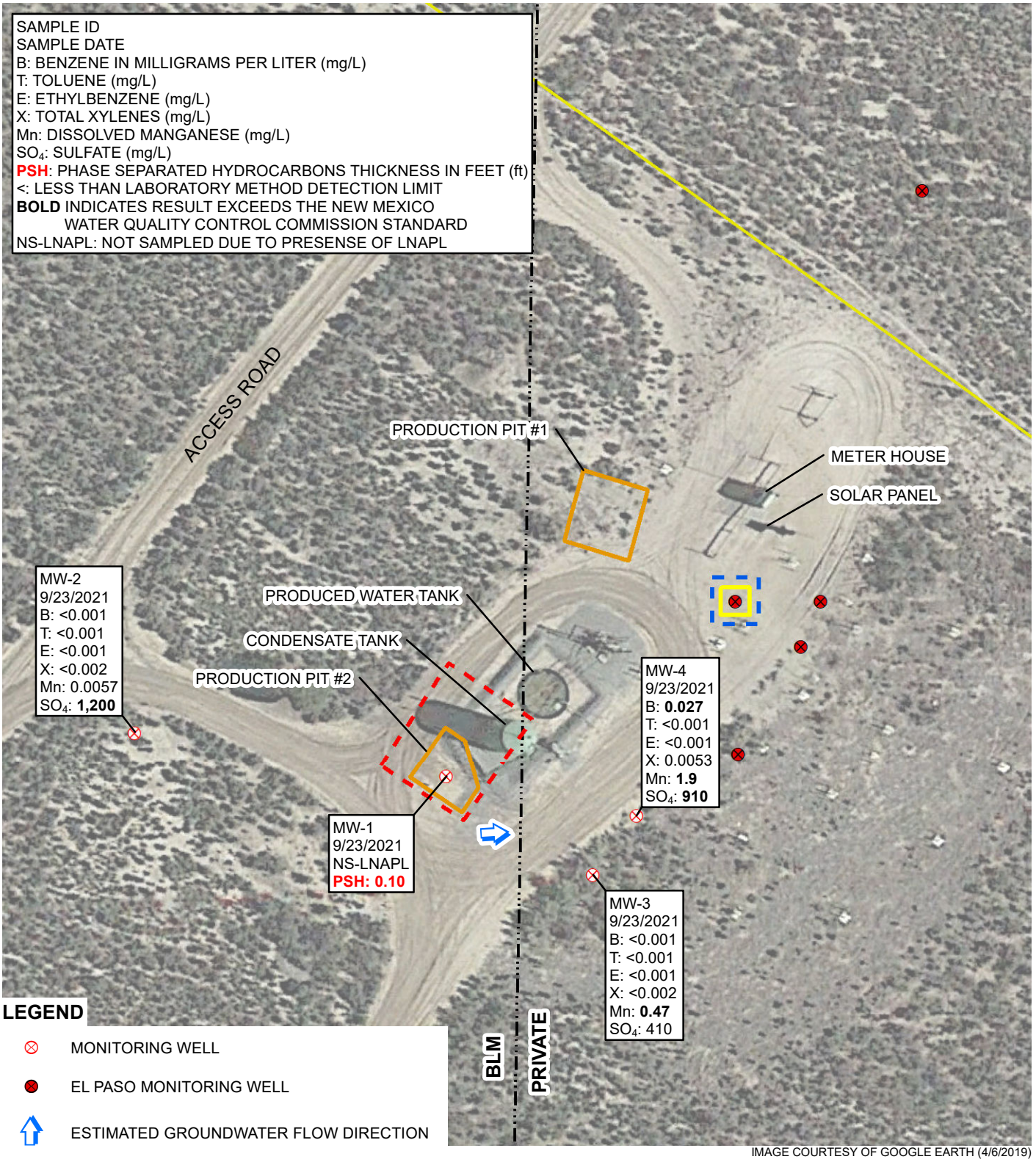

FIGURE 4
GROUNDWATER ANALYTICAL RESULTS
JOHNSTON FEDERAL #4
SWSW & SESW SEC 27 T31N R09W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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TABLES

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Top of Casing Elevation (1)	Screened Interval (ft bgs)	Sample Date	Depth to PSH (ft BTOC)	Depth to Groundwater (ft BTOC)	PSH Thickness (ft)	Adjusted Groundwater Elevation (2)
MW-1	51.79	100	35 - 50	5/25/1999	--	NM	--	NM
				9/1/1999	--	47.02	--	52.98
				12/1/1999	--	46.96	--	53.04
				1/18/2000	--	44.05	--	55.95
				5/17/2000	--	46.90	--	53.10
				9/8/2000	--	46.91	--	53.09
				12/20/2000	--	46.88	--	53.12
				3/27/2001	--	NM	--	NM
				6/27/2001	--	47.05	--	52.95
				9/17/2001	--	46.93	--	53.07
				12/19/2001	--	46.97	--	53.03
				3/25/2002	--	46.99	--	53.01
				6/25/2002	--	47.01	--	52.99
				9/24/2002	--	46.98	--	53.02
				12/30/2002	--	47.40	--	52.60
				3/27/2003	--	NM	--	NM
				6/27/2003	--	NM	--	NM
				10/10/2003	--	NM	--	NM
				12/10/2003	--	NM	--	NM
				3/16/2004	--	47.28	--	52.72
				6/22/2004	--	47.06	--	52.94
				9/30/2004	--	47.24	--	52.76
				12/13/2004	--	47.14	--	52.86
				3/23/2005	--	46.91	--	53.09
				6/22/2005	--	46.93	--	53.07
				10/28/2005	--	46.87	--	53.13
				12/14/2005	--	46.72	--	53.28
				3/20/2006	--	46.75	--	53.25
				6/21/2006	--	46.84	--	53.16
				10/20/2006	--	46.89	--	53.11
				12/13/2006	--	46.92	--	53.08
				11/9/2007	--	NM	--	NM
				1/15/2008	--	NM	--	NM
				4/30/2008	--	46.45	--	53.55
				7/23/2008	--	46.63	--	53.37
				10/24/2008	--	46.60	--	53.40
				1/29/2009	--	46.57	--	53.43
				4/23/2009	--	46.40	--	53.60
				9/25/2009	--	46.52	--	53.48
				9/22/2010	--	46.60	--	53.40
				9/28/2011	--	46.65	--	53.35
				9/26/2012	--	46.80	--	53.20
				9/17/2013	--	46.88	--	53.12
				9/23/2014	--	46.94	--	53.06
				12/17/2014	--	46.94	--	53.06
				1/8/2015	--	46.92	--	53.08
				6/18/2015	--	46.94	--	53.06

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Top of Casing Elevation (1)	Screened Interval (ft bgs)	Sample Date	Depth to PSH (ft BTOC)	Depth to Groundwater (ft BTOC)	PSH Thickness (ft)	Adjusted Groundwater Elevation (2)
MW-1	51.79	100	35 - 50	9/22/2015	--	46.91	--	53.09
				9/14/2016	46.70	46.71	0.01	53.30
				9/27/2017	--	46.78	--	53.22
				9/6/2018	--	46.79	--	53.21
				8/12/2019	46.77	46.87	0.10	53.21
				8/12/2020	46.81	47.00	0.19	53.15
				9/21/2021	47.00	47.10	0.10	52.98
MW-2	65.5	97.71	41.5 - 61.5	10/24/2008	--	42.85	--	54.86
				1/29/2009	--	42.83	--	54.88
				4/23/2009	--	42.75	--	54.96
				9/25/2009	--	42.82	--	54.89
				9/22/2010	--	43.01	--	54.70
				9/28/2011	--	43.14	--	54.57
				9/26/2012	--	43.33	--	54.38
				9/17/2013	--	43.51	--	54.20
				9/23/2014	--	43.56	--	54.15
				12/17/2014	--	43.59	--	54.12
				6/18/2015	--	43.57	--	54.14
				9/22/2015	--	43.58	--	54.13
				9/14/2016	--	43.51	--	54.20
				9/27/2017	--	43.56	--	54.15
				9/6/2018	--	43.50	--	54.21
				8/15/2019	--	43.56	--	54.15
				8/12/2020	--	43.62	--	54.09
				9/23/2021	--	43.80	--	53.91
MW-3	59	94.65	35 - 55	10/24/2008	--	43.91	--	50.74
				1/29/2009	--	41.97	--	52.68
				4/23/2009	--	41.87	--	52.78
				9/25/2009	--	42.04	--	52.61
				9/22/2010	--	42.17	--	52.48
				9/28/2011	--	42.22	--	52.43
				9/26/2012	--	42.36	--	52.29
				9/17/2013	--	42.47	--	52.18
				9/23/2014	--	42.70	--	51.95
				12/17/2014	--	42.62	--	52.03
				6/18/2015	--	43.67	--	50.98
				9/22/2015	--	42.65	--	52.00
				9/14/2016	--	42.47	--	52.18
				9/27/2017	--	42.54	--	52.11
				9/6/2018	--	42.45	--	52.20
				8/12/2019	--	42.48	--	52.17
				8/12/2020	--	42.53	--	52.12
				9/23/2021	--	42.70	--	51.95
MW-4	61	94.79	37 - 57	10/24/2008	--	43.11	--	51.68
				1/29/2009	--	43.11	--	51.68
				4/23/2009	--	43.06	--	51.73

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Top of Casing Elevation (1)	Screened Interval (ft bgs)	Sample Date	Depth to PSH (ft BTOC)	Depth to Groundwater (ft BTOC)	PSH Thickness (ft)	Adjusted Groundwater Elevation (2)
MW-4	61	94.79	37 - 57	9/25/2009	--	43.20	--	51.59
				9/22/2010	--	43.39	--	51.40
				9/28/2011	--	43.45	--	51.34
				9/26/2012	--	43.57	--	51.22
				9/17/2013	--	43.65	--	51.14
				9/23/2014	--	44.81	--	49.98
				12/17/2014	--	44.80	--	49.99
				6/18/2015	--	45.85	--	48.94
				9/22/2015	--	44.73	--	50.06
				9/14/2016	--	44.16	--	50.63
				9/27/2017	--	44.15	--	50.64
				9/6/2018	--	44.00	--	50.79
				8/16/2019	--	44.27	--	50.52
				8/13/2020	--	44.36	--	50.43
				9/23/2021	--	44.30	--	50.49

Notes:

(1) - surface elevation based on an arbitrary datum of 100 feet based on top of casing of MW-1
(2) - when PSH is present, groundwater elevation is adjusted using a PSH density correction factor of 0.8
bgs - below ground surface
BTOC - below top of casing
ft = feet
NM = Not measured
PSH - phase separated hydrocarbons

TABLE 2
FIELD PARAMETER RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Volume (gallons)
MW-1		**No parameters collected due to LNAPL sheen.**						
	6/18/2015	**No parameters collected due to LNAPL sheen.**						
	9//22/2015	**No parameters collected due to LNAPL sheen.**						
	9/14/2016	**No parameters collected due to LNAPL sheen.**						
	9/27/2017	14.06	6.55	--	1,662	--	--	0.80
	9/6/2018	16.45	7.32	--	1,797	0.80	-349.5	2.50
	8/12/2019	20.00	7.40	0.99	--	4.80	-11.3	
	8/12/2020	24.90	7.01	1.02	2,160	0.13	-18.9	0.19
	9/21/2021	**No parameters collected due to LNAPL sheen.**						
MW-2	9/23/2014	15.00	7.22	1.50	2,310	11.30	57.0	9.50
	9/23/2014	14.80	7.18	1.50	2,360	10.89	63.0	10.00
	9/23/2014	14.80	7.17	1.50	2,360	10.70	67.0	10.50
	9/22/2015	13.95	7.62	0.80	1,235	12.50	59.2	9.00
	9/22/2015	13.69	6.98	1.48	2,276	5.62	82.6	9.50
	9/22/2015	13.55	6.64	1.48	2,273	5.05	93.0	10.00
	9/14/2016	13.53	7.26	1.53	2,368	5.10	6.9	10.00
	9/27/2016	12.52	7.13	--	1,884	--	--	3.32
	9/6/2018	--	--	--	--	--	--	9.50
	8/15/2019	19.80	7.35	1.05	--	--	-45.8	
	8/12/2020	18.90	6.45	1.02	2,060	2.72	-24.2	
	9/23/2021	17.40	7.24	--	5,320	--	--	7.00
MW-3	9/23/2014	15.70	7.01	1.20	1,820	10.13	-104.0	6.25
	9/23/2014	15.70	7.01	1.20	1,840	9.12	-127.0	6.75
	9/23/2014	15.70	7.01	1.20	1,850	8.48	-137.0	7.25
	12/17/2014	14.76	7.48	1.38	2,123	2.40	-149.1	5.75
	12/17/2014	14.72	7.48	1.40	2,158	2.66	-159.7	6.25
	12/17/2014	14.78	7.49	1.44	2,218	2.39	-164.0	6.75
	9/22/2015	15.11	7.71	0.74	1,130	9.05	5.7	6.25
	9/22/2015	15.07	7.50	1.32	2,032	4.70	-53.7	6.75
	9/22/2015	15.07	7.32	1.31	2,021	2.34	-79.2	7.25
	9/14/2016	14.91	7.21	1.21	1,856	2.01	-158.8	7.00
	9/27/2017	13.91	6.79	--	1,534	--	--	2.40
	9/6/2018	17.17	7.36	--	1,637	1.15	-68.7	7.50
	8/12/2019	20.10	7.24	0.38	--	--	7.2	
	8/12/2020	22.20	6.47	0.50	1,020	1.66	2.6	
	9/23/2021	19.20	7.06	--	2,870	--	--	7.14
MW-4	9/23/2014	16.40	6.65	1.40	2,130	10.81	-124.0	3.50
	9/23/2014	16.00	6.72	1.40	2,110	9.17	-136.0	4.00
	9/23/2014	15.80	6.77	1.30	2,110	8.42	-142.0	4.50
	9/23/2014	15.90	6.81	1.30	2,110	8.10	-150.0	5.00
	12/17/2014	14.79	7.22	1.51	2,320	4.74	-145.4	6.25
	12/17/2014	14.91	7.35	1.51	2,324	3.70	-158.7	6.75
	12/17/2014	14.98	7.37	1.51	2,323	2.94	-166.6	7.25
	6/18/2015	15.65	6.67	1.42	2,186	2.52	-133.8	6.00
	6/18/2015	15.49	6.68	1.42	2,184	2.44	-130.2	6.25
	6/18/2015	15.38	6.71	1.42	2,183	2.20	-129.3	6.50
	6/18/2015	15.38	6.72	1.42	2,182	2.21	-146.6	6.75
	6/18/2015	15.37	6.73	1.42	2,184	2.05	-140.1	7.00
	9/22/2015	15.17	7.15	1.33	2,042	2.45	-105.6	6.50

TABLE 2
FIELD PARAMETER RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Volume (gallons)
MW-4	9/22/2015	15.14	6.89	1.33	2,043	2.07	-12.5	7.00
	9/22/2015	15.13	6.82	1.33	2,041	2.04	-126.5	7.50
	9/14/2016	14.92	7.23	1.36	2,096	7.69	-205.4	5.00
	9/27/2017	14.01	6.95	--	1,671	--	--	2.52
	9/6/2018	--	--	--	--	--	--	3.25
	8/16/2019	18.10	7.21	0.90	--	--	-22.5	
	8/13/2020	20.80	6.72	0.89	1,770	1.66	2.6	
	9/23/2021	18.80	7.15	--	4,270	--	--	7.50

Notes:

mg/L - milligrams per liter

uS/cm - microsiemens per centimeter

mg/L - milligrams per liter

°C - degrees Celcius

DO - dissolved oxygen

mV - millivolts

ORP - oxidation-reduction potential

TDS - total dissolved solids

-- - data not collected

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				**0.005**	**1.00**	**0.70**	**0.62**	**0.20**	**600**
MW-1	MW-1	5/25/1999	(orig)	**8.7**	**2.9**	**2.8**	**2.9**	--	--
	MW-1	12/1/1999	(orig)	**4.7**	**1.3**	**0.9**	**10**	--	--
	MW-1	1/18/2000	(orig)	**3.6**	0.82	**0.84**	**7.5**	--	--
	MW-1	5/17/2000	(orig)	**6.9**	**1.1**	**1.5**	**17**	--	--
	MW-1	9/8/2000	(orig)	**4.6**	0.62	**0.93**	**10**	--	--
	MW-1	12/20/2000	(orig)	< 0.0002	0.0005	0.034	0.061	--	--
	MW-1	3/27/2001	(orig)	**5.43**	0.641	**0.991**	**9.83**	--	--
	MW-1	6/27/2001	(orig)	**5.87**	0.9	**0.99**	**10.4**	--	--
	MW-1	9/17/2001	(orig)	**5.91**	0.75	**0.98**	**10.7**	--	--
	MW-1	12/19/2001	(orig)	**7.2**	0.65	**1.02**	**11.3**	--	--
	MW-1	3/25/2002	(orig)	**5.52**	**0.83**	**1.19**	**10.5**	--	--
	MW-1	6/26/2002	(orig)	**0.516**	0.0662	0.0787	**0.863**	--	--
	MW-1	9/24/2002	(orig)	**5.31**	**8**	**0.88**	**13.96**	--	--
	MW-1	12/30/2002	(orig)	**7.66**	**10.2**	**0.76**	**14.14**	--	--
	MW-1	6/22/2004	(orig)	**6.16**	**8.1**	0.47	**15.84**	--	--
	MW-1	3/20/2006	(orig)	**3.17**	**3.74**	**1.06**	**30.13**	--	--
	MW-1	6/21/2006	(orig)	**4.9**	**3.28**	0.448	**2.39**	--	--
	MW-1	12/13/2006	(orig)	**5.3**	**7.2**	**0.87**	**15.45**	--	--
	MW-1	3/27/2007	(orig)	**6.87**	**5.72**	0.21	**12.16**	--	--
	MW-1	6/25/2007	(orig)	**5.68**	**1.83**	0.4	**9.48**	--	--
	MW-1	4/30/2008	(orig)	**6.3**	**1.8**	0.28 J	**8.6**	--	--
	MW-1	7/23/2008	(orig)	**7.1**	**2.2**	0.45	**10.6**	--	--
	MW-1	10/24/2008	(orig)	**6**	**2.1**	0.4	**9.0**	--	--
	MW-1	1/29/2009	(orig)	**6.7**	**2.2**	0.63	**14.5**	--	315
	MW-1	9/25/2009	(orig)	**3.9**	**1.5**	0.68	**9.8**	**1.11**	429
	MW-1	9/22/2010	(orig)	**3.5**	0.98	0.63	**7.5**	**0.752**	190
	GW-074925-092811-CM-004	9/28/2011	(orig)	**3.36**	**1.05**	0.667	**6.81**	**0.774**	202
	GW-074925-092811-CM-005	9/28/2011	(Duplicate)	**3.43**	**1.12**	**0.779**	**8.29**	--	--
	GW-074925-092612-CM-MW-1	9/26/2012	(orig)	**3.07**	0.599	0.577	**5.16**	**0.67**	113
	August 2013 Mobile Dual Phase Extraction Event								
	GW-074925-091713-CM-MW-1	9/17/2013	(orig)	**4.69**	**7.55**	**1.17**	**9.0**	**0.89**	371
	GW-074925-091713-CM-DUP	9/17/2013	(Duplicate)	**4.7**	**7.21**	**1.04**	**9.97**	--	--
	GW-074925-092314-SP-MW-1	9/23/2014	(orig)	**2.97**	**4.25**	**0.778**	**6.89**	**0.85**	155
	GW-074925-092314-SP-DUP	9/23/2014	(Duplicate)	**2.82**	**3.88**	**0.754**	**6.69**	--	--
	November 2014 Mobile Dual Phase Extraction Event								

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				**0.005**	**1.00**	**0.70**	**0.62**	**0.20**	**600**
MW-1	GW-074925-010815-JW-MW-1	1/8/2015	(orig)	**4.35**	**6.15**	**1.07**	**10.0**	--	--
	GW-074925-061815-CB-MW-1	6/18/2015	(orig)	**4.05**	**6.26**	**1.04**	**10.8**	--	--
	GW-074925-061815-CB-DUP	6/18/2015	(Duplicate)	**4.34**	**6.46**	**0.933**	**11.1**	--	--
	April 2015 Mobile Dual Phase Extraction Event								
	GW-074925-092215-CB-MW-1	9/22/2015	(orig)	**3.36**	**4.57**	**0.741**	**8.62**	**0.72**	44.2
	GW-074925-092215-CB-DUP	9/22/2015	(Duplicate)	**3.37**	**4.28**	**0.724**	**7.98**	--	--
	---	9/14/2016	**Not sampled due to presense of LNAPL**						
	GW-11145957-092717-SP-MW-1	9/27/2017	(orig)	**2.34**	**2.86**	**0.949**	**9.5**	**0.739**	10
	November 2017 Mobile Dual Phase Extraction Event								
	GW-11145957-090618-CN-MW-1	9/6/2018	(orig)	**2.86**	**2.65**	**0.747**	**7.59**	**0.802**	14.4
	MW-1	8/12/2019	(orig)	**2.19**	**1.61**	**0.944**	**7.0**	**0.395**	184
	MW-1	8/12/2020	(orig)	**2.13**	**1.25**	**0.815**	**5.9**	**0.297**	237
	---	9/21/2021	**Not sampled due to presense of LNAPL**						
MW-2	MW-2	10/24/2008	(orig)	< 0.0005	< 0.0005	< 0.0005	< 0.0005	--	**974**
	MW-2	1/29/2009	(orig)	< 0.0005	< 0.0005	< 0.0005	< 0.0005	--	--
	MW-2	9/25/2009	(orig)	< 0.001	< 0.001	< 0.001	< 0.002	0.04	**1,260**
	MW-2	9/22/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	0.0074	**1,350**
	GW-074925-092811-CM-002	9/28/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	0.0956	**1,290**
	GW-074925-092612-CM-MW-2	9/26/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,210**
	GW-074925-091713-CM-MW-2	9/17/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,230**
	GW-074925-092314-SP-MW-2	9/23/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,190**
	GW-074925-092215-CB-MW-2	9/22/2015	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,210**
	GW-074925-091516-CM-MW-2	9/14/2016	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,270**
	GW-11145957-092717-SP-MW-2	9/27/2017	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,150**
	GW-11145957-090618-CN-MW-2	9/6/2018	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.005	**1,430**
	MW-2	8/15/2019	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	0.0344	**1,250**
	MW-2	8/12/2020	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.010	**1,330**
	MW-2	9/23/2021	(orig)	< 0.001	< 0.001	< 0.001	< 0.002	0.0057	**1,200**
MW-3	MW-3	10/24/2008	(orig)	**0.02**	< 0.0005	< 0.0005	0.024	--	**714**
	MW-3	1/29/2009	(orig)	**0.012**	< 0.0005	< 0.0005	0.005	--	--
	MW-3	9/25/2009	(orig)	0.0021	< 0.001	< 0.001	< 0.002	**1.24**	**1,070**
	MW-3	9/22/2010	(orig)	0.0042	< 0.001	< 0.001	< 0.001	**1.11**	**1,060**

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				**0.005**	**1.00**	**0.70**	**0.62**	**0.20**	**600**
MW-3	GW-074925-092811-CM-003	9/28/2011	(orig)	0.0038	< 0.001	< 0.001	< 0.003	**0.704**	**809**
	GW-074925-092612-CM-MW-3	9/26/2012	(orig)	0.0016	< 0.001	< 0.001	< 0.003	**0.67**	**892**
	GW-074925-091713-CM-MW-3	9/17/2013	(orig)	0.0012	< 0.001	< 0.001	< 0.003	**0.67**	**808**
	GW-074925-092314-SP-MW-3	9/23/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	**0.65**	598
	GW-074925-121714-CM-MW-3	12/17/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--
	GW-074925-092215-CB-MW-3	9/22/2015	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	**0.79**	**943**
	GW-074925-091516-CM-MW-3	09/14/2016	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	**0.48**	**671**
	GW-11145957-092717-SP-MW-3	9/27/2017	(orig)	0.0031	< 0.001	< 0.001	< 0.003	**0.471**	**680**
	GW-11145957-090618-CN-MW-3	9/6/2018	(orig)	0.001	< 0.001	< 0.001	< 0.003	**0.477**	**976**
	MW-3	8/12/2019	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	**0.496**	73.9
	MW-3	8/12/2020	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	**0.55**	138
	MW-3	9/23/2021	(orig)	< 0.001	< 0.001	< 0.001	< 0.002	**0.47**	410
MW-4	MW-4	10/24/2008	(orig)	**0.024**	< 0.0005	0.006	0.01	--	**678**
	MW-4	1/29/2009	(orig)	**0.11**	0.006	0.009	0.147	--	--
	MW-4	9/25/2009	(orig)	**0.0088**	< 0.001	0.0057	0.002	**1.24**	**968**
	MW-4	9/22/2010	(orig)	**0.019**	0.005	0.0069	0.0057	**1.27**	**1040**
	GW-074925-092811-CM-001	9/28/2011	(orig)	**0.0256**	0.0078	0.0017	0.0106	**1.82**	**960**
	GW-074925-092612-CM-MW-4	9/26/2012	(orig)	**0.0124**	0.0023	< 0.001	< 0.003	**1.5**	**949**
	GW-074925-092612-CM-DUP	9/26/2012	(Duplicate)	**0.013**	0.0022	< 0.001	0.0031	--	--
	August 2013 Mobile Dual Phase Extraction Event								
	GW-074925-091713-CM-MW-4	9/17/2013	(orig)	**0.0065**	< 0.001	< 0.001	< 0.003	**1.6**	**925**
	GW-074925-092314-SP-MW-4	9/23/2014	(orig)	**0.0068**	< 0.001	0.0011	< 0.003	**2.2**	**905**
	November 2014 Mobile Dual Phase Extraction Event								
	GW-074925-121714-CM-MW-4	12/17/2014	(orig)	0.003	< 0.001	< 0.001	< 0.003	--	--
	GW-074925-092314-CM-DUP	12/17/2014	(Duplicate)	0.0039	< 0.001	< 0.001	< 0.003	--	--
	April 2015 Mobile Dual Phase Extraction Event								
	GW074925-061815-CB-MW-4	6/18/2015	(orig)	0.0039	< 0.001	< 0.001	< 0.003	--	--
	GW-074925-092215-CB-MW-4	9/22/2015	(orig)	0.0018	< 0.001	< 0.001	< 0.003	**1.9**	**911**
	GW-074925-091516-CM-MW-4	9/14/2016	(orig)	0.0047	< 0.001	< 0.001	< 0.003	**2.0**	**943**
	GW-11145957-092717-SP-MW-4	9/27/2017	(orig)	**0.0266**	< 0.001	< 0.001	0.004	**2.46**	**948**
	November 2017 Mobile Dual Phase Extraction Event								
	GW-11145957-090618-CN-MW-4	9-6-2018	(orig)	**0.132**	<0.001	<0.001	0.0165	**1.74**	**1,000**

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				**0.005**	**1.00**	**0.70**	**0.62**	**0.20**	**600**
MW-4	MW-4	8/16/2019	(orig)	**0.0087**	< 0.001	< 0.001	< 0.003	**1.57**	**858**
	MW-4	8/13/2020	(orig)	**0.0184**	< 0.001	< 0.001	< 0.003	**1.65**	**960**
	MW-4	9/23/2021	(orig)	**0.027**	< 0.001	< 0.001	0.0053	**1.9**	**910**

Notes:

mg/L - milligrams per liter

J - laboratory flag for estimated concentration

ND - not detected, practical quantitation limit unknown

NE - not established

NMWQCC - New Mexico Water Quality Control Commission

<0.037 - indicates result less than the stated laboratory reporting limit (PQL)

BOLD - indicates concentration exceeds the NNEPA standard

-- - not analyzed

ENCLOSURE A – ANALYTICAL LABORATORY REPORT

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 01, 2021

Mitch Killough
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX:

RE: Johnson Fed 4 OrderNo.: 2109D94

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 3 sample(s) on 9/24/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2109D94**
Date Reported: **10/1/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW2
Project: Johnson Fed 4 **Collection Date:** 9/23/2021 3:15:00 PM
Lab ID: 2109D94-001 **Matrix:** AQUEOUS **Received Date:** 9/24/2021 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/27/2021 5:41:15 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 5:41:15 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 5:41:15 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 5:41:15 PM
Surr: 4-Bromofluorobenzene	89.7	70-130		%Rec	1	9/27/2021 5:41:15 PM
EPA METHOD 300.0: ANIONS						Analyst: **LRN**
Sulfate	1200	50	*	mg/L	100	9/24/2021 2:33:40 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **ELS**
Manganese	0.0057	0.0020		mg/L	1	9/29/2021 9:38:48 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix

Analytical Report
Lab Order **2109D94**
Date Reported: **10/1/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW3
Project: Johnson Fed 4 **Collection Date:** 9/23/2021 1:05:00 PM
Lab ID: 2109D94-002 **Matrix:** AQUEOUS **Received Date:** 9/24/2021 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	1.0		µg/L	1	9/27/2021 6:04:49 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 6:04:49 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 6:04:49 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 6:04:49 PM
Surr: 4-Bromofluorobenzene	90.2	70-130		%Rec	1	9/27/2021 6:04:49 PM
EPA METHOD 300.0: ANIONS						Analyst: **LRN**
Sulfate	410	5.0	*	mg/L	10	9/24/2021 2:46:02 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **ELS**
Manganese	0.47	0.0020	*	mg/L	1	9/29/2021 9:43:45 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix

Analytical Report
Lab Order **2109D94**
Date Reported: **10/1/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW4
Project: Johnson Fed 4 **Collection Date:** 9/23/2021 1:50:00 PM
Lab ID: 2109D94-003 **Matrix:** AQUEOUS **Received Date:** 9/24/2021 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	27	1.0		µg/L	1	9/27/2021 6:28:21 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 6:28:21 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 6:28:21 PM
Xylenes, Total	5.3	2.0		µg/L	1	9/27/2021 6:28:21 PM
Surr: 4-Bromofluorobenzene	89.4	70-130		%Rec	1	9/27/2021 6:28:21 PM
EPA METHOD 300.0: ANIONS						Analyst: **LRN**
Sulfate	910	50	*	mg/L	100	9/24/2021 3:23:06 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **ELS**
Manganese	1.9	0.010	*	mg/L	5	9/29/2021 10:05:46 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2109D94**

01-Oct-21

Client: HILCORP ENERGY

Project: Johnson Fed 4

Sample ID: **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **A81654**	RunNo: **81654**
Prep Date:	Analysis Date: **9/29/2021**	SeqNo: **2886240** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.49	0.0020	0.5000	0	98.7	85	115			

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **A81654**	RunNo: **81654**
Prep Date:	Analysis Date: **9/29/2021**	SeqNo: **2886258** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	ND	0.0020								

Sample ID: **LLLCS**	SampType: **LCSLL**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **A81654**	RunNo: **81654**
Prep Date:	Analysis Date: **9/29/2021**	SeqNo: **2886260** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	ND	0.0020	0.002000	0	95.1	50	150			

Sample ID: **2109D94-001CMS**	SampType: **MS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **MW2**	Batch ID: **A81654**	RunNo: **81654**
Prep Date:	Analysis Date: **9/29/2021**	SeqNo: **2886294** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.49	0.0020	0.5000	0.005735	96.2	70	130			

Sample ID: **2109D94-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **MW2**	Batch ID: **A81654**	RunNo: **81654**
Prep Date:	Analysis Date: **9/29/2021**	SeqNo: **2886295** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.51	0.0020	0.5000	0.005735	101	70	130	5.32	20	

Sample ID: **2109D94-002CMS**	SampType: **MS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **MW3**	Batch ID: **A81654**	RunNo: **81654**
Prep Date:	Analysis Date: **9/29/2021**	SeqNo: **2886297** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.96	0.0020	0.5000	0.4652	98.5	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2109D94**
01-Oct-21

Client: HILCORP ENERGY
Project: Johnson Fed 4

Sample ID: **2109D94-002CMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **MW3** Batch ID: **A81654** RunNo: **81654**
Prep Date: Analysis Date: **9/29/2021** SeqNo: **2886298** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	0.95	0.0020	0.5000	0.4652	96.4	70	130	1.11	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2109D94**
01-Oct-21

Client: HILCORP ENERGY
Project: Johnson Fed 4

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R81573**	RunNo: **81573**
Prep Date:	Analysis Date: **9/24/2021**	SeqNo: **2882749** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R81573**	RunNo: **81573**
Prep Date:	Analysis Date: **9/24/2021**	SeqNo: **2882750** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.8	0.50	10.00	0	98.0	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2109D94**
01-Oct-21

Client: HILCORP ENERGY
Project: Johnson Fed 4

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **B81596**	RunNo: **81596**
Prep Date:	Analysis Date: **9/27/2021**	SeqNo: **2883416** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	17		20.00		87.5	70	130			

Sample ID: **100ng btex lcs**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **B81596**	RunNo: **81596**
Prep Date:	Analysis Date: **9/27/2021**	SeqNo: **2883417** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.4	80	120			
Toluene	19	1.0	20.00	0	97.0	80	120			
Ethylbenzene	19	1.0	20.00	0	96.6	80	120			
Xylenes, Total	57	2.0	60.00	0	94.7	80	120			
Surr: 4-Bromofluorobenzene	19		20.00		93.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **2109D94** RcptNo: **1**

Received By: **Cheyenne Cason** **9/24/2021 7:30:00 AM** Chk

Completed By: **Sean Livingston** **9/24/2021 8:38:55 AM** S Livingston

Reviewed By: KPG 9/24/21

Chain of Custody

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

Log In

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

# of preserved bottles checked for pH: 3 (<2 or >12 unless noted)

Adjusted? NO

Checked by: JR 9/24/21

Special Handling (if applicable)

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

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.7	Good				
2	3.9	Good				

Chain-of-Custody Record

Client: MITCH KILLOUGH
Hilcorp
Mailing Address:
Phone #:
email or Fax#: MKILLOUGH@HILLCORP.COM
QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: JOHNSON FED #4
Project #:
Project Manager: STUART HYDE
Sampler: PAYTON BENNER
On Ice: ☒ Yes ☐ No
# of Coolers: 2 5.6+0.1=5.7
Cooler Temp(including CF): 3.8+0.1=3.9 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2109D94	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	dissolved Mn	sulfates
9/23/21	15:15	W	MW2	3)40mL VOAs 1)125mL	HCL HNO_3	001	X										X	X
↓	13:05	↓	MW3	1)500mL		002	↓										↓	↓
↓	13:50	↓	MW4	↓	↓	003	↓										↓	↓

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9/23/21	16:20	pbenner	Christ Waele		9/23/21	1620
9/23/21	1826	Christine Waeles		Courier	9/24/21	0730

Remarks:

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.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 87501

CONDITIONS

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 87501
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Review of 2021 Annual Groundwater Report: Content satisfactory 1. Discontinue sulfate analysis from all site monitor wells. 2. Discontinue BTEX analysis MW-2 & MW-3. 3. Continue sampling for Manganese from MW-1, MW-3, MW-4. 4. Submit next Annual Monitoring Report to the OCD no later than March 31, 2023.	2/6/2023