

September 22,
2020

**Quarterly (3rd) Groundwater Monitoring Report (July–September)
3 Bear Energy Services, LLC, Cottonwood Facility (2RF-128)
Eddy County, New Mexico**

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A handwritten signature in black ink, appearing to be "Mark J. Larson", written over a horizontal line.A handwritten signature in black ink, appearing to be "Robert Nelson", written over a horizontal line.

Robert Nelson
Sr. Geologist

LAI Project No: 18-0167-01

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1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) on behalf of 3 Bear Energy Services, LLC (3 Bear) to report the results of 2020 third (3rd) quarter (July – September) groundwater monitoring at the Cottonwood Facility (Site). The Site is in Unit N (SE/4, SW/4), Section 20, Township 20 South, and Range 26 East in Eddy County, New Mexico. The geodetic position is North 32.0210483° and West -104.31879°. The surface and mineral owner is the U.S. Government administered by the Bureau of Land Management (BLM).

The following activities occurred on August 13, 2020:

- Gauge four (4) monitoring wells MW-1 through MW-4) for light non-aqueous phase liquid (LNAPL) and depth to groundwater.
- Purge and sample groundwater from four (4) wells (MW-1 through MW-4) utilizing the low stress (low flow) method.
- Analyze samples for benzene, toluene, ethylbenzene, xylenes (BTEX), total petroleum hydrocarbons (TPH) and chloride.

The following observations are documented in this report:

- Depth to groundwater ranged from 29.06 feet below ground surface (bgs) at MW-1 to 67.12 feet bgs at MW-4.
- Depth to groundwater decreased (rising) in wells MW-3 and MW-4 at 0.04 and 2.10 feet, respectively, compared to the previous monitoring period (May 7, 2020).
- Depth to groundwater increased (lowering) in wells MW-1 and MW-2 at 0.1 and .239 feet, respectively, compared to the previous monitoring period (May 7, 2020).
- The groundwater potentiometric surface elevation ranged from 3,431.23 feet above mean sea level (MSL) at well MW-1 (up gradient) to 3,388.94 feet above MSL at MW-4 (down gradient).
- An apparent groundwater divide occurs in the area between monitoring well MW-1 causes groundwater to flow to the northeast towards wells MW-2 and MW-3 and southeast towards well MW-4 at gradients between 0.04 and 0.18 feet per foot.
- No significant change in the groundwater flow direction or gradient was observed on August 13, 2020.
- BTEX was less than the analytical method reporting limit (RL) in all samples.
- TPH was reported above the RL in samples from wells MW-1 (0.107 mg/L) and MW-4 (0.137 mg/L).
- The Site does not appear to be the source for the TPH reported in samples from wells MW-1 and MW-4.
- Chloride was reported below the WQCC domestic water quality standard (250 mg/L) in samples from monitoring wells MW-1 (228 mg/L), MW-2 (124 mg/L), and MW-3 (125 mg/L) on August 13, 2020.
- Chloride exceeded the WQCC domestic water quality standard (250 mg/L) in the sample from MW-4 (19,800 mg/L), which is consistent with previous monitoring periods.

Conclusions

Chloride in the sample from well MW-3 was confirmed by laboratory analysis to be the result of cross contamination during well gauging and/or sample collection. LAI modified its sampling and

decontamination procedures to gauge and sample the monitoring wells in the following order: MW-2, MW-3, MW-1, and MW-4.

3 Bear will continue monitor the leak detection system and immediately report any changes to the OCD. 3 Bear will also continue monitoring groundwater on a quarterly (4 times per year) schedule. Notification will be provided to the OCD at least 7 working days prior to each monitoring event, and as soon as possible upon any significant change in analyte concentrations.

2.0 INTRODUCTION

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) on behalf of 3 Bear Energy Services LLC (3 Bear) to present quarterly (4 times per year) groundwater monitoring results from four (4) monitoring wells (MW-1, MW-2, MW-3 and MW-4) at the Cottonwood Facility (Site) in Eddy County, New Mexico. This report is for groundwater samples collected for the third (3rd) quarter on August 13, 2020. The Site is in Unit N (SE 1/4, SW 1/4), Section 20, Township 26 South, and Range 26 East, in Eddy County, New Mexico. The surface and mineral owner is the U.S. Government administered by the Bureau of Land Management (BLM). The geodetic position is North 32.02104833° and West -104.318793°. Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

3.0 GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION

On August 13, 2020, LAI personnel gauged monitoring wells MW-1 through MW-4 for light non-aqueous phase liquid (LNAPL) and depth to groundwater. LNAPL was not present in the monitoring wells. Groundwater was gauged in wells MW-1, MW-2, MW-3, and MW-4 at 31.82, 51.69, 45.64 and 70.10 feet below top of casing (TOC), respectively. Depth to groundwater decreased (rising) in wells MW-3 and MW-4 at 0.04 and 2.10 feet, respectively, compared to the previous monitoring period (May 7, 2020). Depth to groundwater increased (lowering) in wells MW-1 and MW-2 at 0.1 and .239 feet, respectively, compared to the previous monitoring period (May 7, 2020).

The groundwater potentiometric surface elevation ranged from 3,431.23 feet above mean sea level (MSL) at well MW-1 (up gradient) to 3,388.94 feet above MSL at MW-4 (down gradient). An apparent groundwater divide occurs in the area between monitoring well MW-1 that causes groundwater to flow to the northeast towards wells MW-2 and MW-3 and southeast towards well MW-4 at gradients between 0.04 and 0.18 feet per foot. No significant change in the groundwater flow direction or gradient was observed on August 13, 2020. Table 1 presents the groundwater gauging summary. Figure 3 presents the groundwater potentiometric map for August 13, 2020.

4.0 GROUNDWATER SAMPLES AND ANALYSIS

On August 13, 2020, LAI personnel collected groundwater samples from wells MW-1 through MW-4 using the low stress or low flow method, according to EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017) where an environmental pump is submerged near the middle of the water column and the well is pumped at a low rate until environmental parameters stabilize. Groundwater samples were collected from the discharge of the dedicated disposable Tygon tubing. The tubing was discarded after each use and the pump was thoroughly cleaned with a solution potable water and laboratory grade detergent (Alconox®) and rinsed with distilled water. The samples were carefully transferred to laboratory containers that were labeled, sealed with custody labels, packed in an ice filled chest and delivered under chain of custody control to DHL Analytical, Inc. (DHL), a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory, located in Round Rock, Texas. A duplicate sample was collected from well MW-1 for laboratory quality assurance and quality control (QA/QC). DHL analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8021B and total petroleum hydrocarbons (TPH) according to EPA SW-846 Method 8015M including gasoline range organics (C6 to C10), diesel range organics (>C10 to C28) and oil range organics (>C28 to C35) and chloride by EPA Method 300. Table 2 presents the laboratory analytical data summary. Appendix A presents the laboratory report.

4.1 Organic Analysis

BTEX was not detected at concentrations above the analytical method reporting limits (RL) in the groundwater samples. TPH was reported above the analytical method reporting limit in samples from monitoring wells MW-1 at 0.107 milligrams per liter (mg/L) and MW-4 at 0.137 mg/L. The Site does not appear to be the source for the TPH. No data quality exceptions were noted in the DHL case narratives.

4.2 Inorganic Analysis

On May 7, 2020, the laboratory reported chloride above the New Mexico Water Quality Control Commission (WQCC) domestic water quality standard of 250 mg/L, in the sample from well MW-3 (305 mg/L). LAI reviewed its sampling and decontamination procedures and found that it was possible the chloride could have been carried over from well MW-4 which was sampled prior to sampling well MW-3. On August 13, 2020, monitoring well MW-4 was last to be gauged and sample to eliminate the potential for sample cross contamination in the other monitoring wells. On August 13, 2020, chloride was below the WQCC domestic water quality standard (250 mg/L) in samples from monitoring wells MW-1 (228 mg/L), MW-2 (124 mg/L) and MW-3 (125 mg/L). Chloride remained above the WQCC domestic water quality standard in well MW-4 (19,800 mg/L) on August 13, 2020. The Site does not appear to be the source for chloride in well MW-4. The duplicate (QA/QC) sample from monitoring well MW-1 was consistent with the original sample confirming no laboratory QA/QC issues. Figure 4 presents a map showing chloride concentrations in groundwater on August 13, 2020.

On January 29, 2019 and May 15, 2019, the laboratory analyzed a layer of naturally occurring salts that formed as a precipitate in samples from monitoring well MW-4. The laboratory reported chloride in the precipitate at 87,700 mg/L and 25,900 mg/L, on January 29, 2019 and May 15, 2019, respectively. The precipitate is considered as naturally occurring and contributes to the elevated chloride reported in the groundwater samples. No data quality exceptions were noted in the DHL case narratives for chloride.

5.0 CONCLUSIONS

The following observations are documented in this report:

- A hydrologic divide in the vicinity of monitoring well MW-1 causes groundwater to flow to the northeast to southeast at gradients between 0.04 and 0.18 feet per foot.
- No significant changes in the groundwater flow direction and gradient were observed on August 13, 2020.
- BTEX was below the RL in all samples on August 13, 2020.
- TPH was reported above the RL in samples from monitoring wells MW-1 (0.107 mg/L) and MW-4 (0.137 mg/L) on August 13, 2020.
- The Site does not appear to be the source for the TPH.
- The laboratory confirmed that chloride (305 mg/L) previously reported in the sample from well MW-3 (May 7, 2020) was most likely due to cross contamination during sampling since chloride was 125 mg/L and below the WQCC domestic water quality standard (250 mg/L) on August 13, 2020.
- Chloride was below the WQCC domestic water quality standard in samples from wells MW-1 (228 mg/L), MW-2 (124 mg/L), and MW-3 (125 mg/L) on August 13, 2020.
- Chloride in well MW-4 (19,800 mg/L) is considered naturally occurring and unrelated to 3 Bear operations.

6.0 RECOMMENDATIONS

3 Bear will continue quarterly (4 times per year) groundwater monitoring. LAI will conduct quarterly gauging and sampling wells in the following order: MW-2, MW-3, MW-1, and MW-4. Notification will be provided to the OCD at least 7 working days prior to each monitoring event, and as soon as possible upon any significant change in analyte concentrations.

Tables

Table 1
Monitoring Well Completion and Gauging Summary
3 Bear Energy, LLC, Eddy County, New Mexico

Well Information									Groundwater Data				
Well No.	Date Drilled	Well Depth (Feet TOC)	Drilled Depth (Feet BGS)	Well Diameter (inches)	Surface Elevation (Feet AMSL)	Screen Interval (Feet BGS)	Casing Stickup (Feet)	TOC Elevation (Feet AMSL)	Date Gauged	Depth to Water (feet TOC)	Depth to Water (feet BGS)	Water Column Height (feet)	Groundwater Elevation (feet AMSL)
MW-1	8/15/2018	92.40	89.40	2	3,460.29	74.40 - 89.40	2.76	3,463.05	9/25/2018	31.85	29.09	60.55	3,431.20
									11/13/2018	31.81	29.05	60.59	3,431.24
									12/12/2018	31.69	28.93	60.71	3,431.36
									01/29/2019	32.62	29.86	59.78	3,430.43
									5/15/2019	32.50	29.74	59.90	3,430.55
									9/12/2019	31.51	28.75	60.89	3,431.54
									9/20/2019	32.40	29.64	60.00	3,430.65
									12/4/2019	31.73	28.97	60.67	3,431.32
									2/18/2020	31.50	28.74	60.90	3,431.55
									5/7/2020	31.72	28.96	60.68	3,431.33
									8/13/2020	31.82	29.06	60.58	3,431.23
MW-2	08/16/2018	58.70	61.70	2	3,455.22	40.70 - 55.70	3.04	3,458.26	09/25/2018	Dry			
									11/13/2018				
									12/12/2018	42.52	39.48	16.18	3,415.74
									01/29/2019	42.07	39.03	16.63	3,416.19
									5/15/2019	42.70	39.66	16.00	3,415.56
									9/12/2019	43.98	40.94	14.72	3,414.28
									9/20/2019	44.78	41.74	13.92	3,413.48
									12/4/2019	45.01	41.97	13.69	3,413.25
									2/18/2020	45.10	42.06	13.60	3,413.16
									5/7/2020	49.30	46.26	9.40	3,408.96
									8/13/2020	51.69	48.65	7.01	3,406.57
MW-3	08/16/2018	52.90	49.90	2	3,455.52	34.90 - 49.90	3.00	3,458.33	09/25/2018	43.55	40.55	9.35	3,414.78
									11/13/2018	42.65	39.65	10.25	3,415.68
									12/12/2018	42.16	39.16	10.74	3,416.17
									01/29/2019	41.85	38.85	11.05	3,416.48
									5/15/2019	42.61	39.61	10.29	3,415.72
									9/12/2019	44.30	41.30	8.60	3,414.03
									9/20/2019	44.10	41.10	8.80	3,412.23
									12/4/2019	44.83	41.83	8.07	3,413.50
									2/18/2020	45.60	42.60	7.30	3,412.73
									5/7/2020	45.68	42.68	7.22	3,412.65
									8/13/2020	45.64	42.64	7.26	3,412.69

Table 1
Monitoring Well Completion and Gauging Summary
3 Bear Energy, LLC, Eddy County, New Mexico

Well Information									Groundwater Data				
Well No.	Date Drilled	Well Depth (Feet TOC)	Drilled Depth (Feet BGS)	Well Diameter (inches)	Surface Elevation (Feet AMSL)	Screen Interval (Feet BGS)	Casing Stickup (Feet)	TOC Elevation (Feet AMSL)	Date Gauged	Depth to Water (feet TOC)	Depth to Water (feet BGS)	Water Column Height (feet)	Groundwater Elevation (feet AMSL)
MW-4	08/14/2018	78.10	75.10	2	3,456.06	60.10 - 75.00	2.98	3,459.04	09/25/2018	Dry Dry			
									11/13/2018				
									12/12/2018				
										74.36	71.38	3.74	3,384.68
									01/29/2019	71.34	68.36	6.76	3,387.70
									5/15/2019	71.50	68.52	6.60	3,387.54
									9/12/2019	67.38	64.40	10.72	3,391.66
									9/20/2019	71.41	68.43	6.69	3,387.63
									12/4/2019	66.31	63.33	11.79	3,392.73
									2/18/2020	71.80	68.82	6.30	3,387.24
									5/7/2020	72.20	69.22	5.90	3,386.84
									8/13/2020	70.10	67.12	8.00	3,388.94

Notes: monitoring wells installed by Environ-Drill, Albuquerque, New Mexico with 2 inch schedule 40 PVC casing and screen

bgs - below ground surface

TOC - top of casing

AMSL: denotes elevation in feet above mean sea level

Table 2
Groundwater Sample Organic and Inorganic Analytical Data Summary
3Bears Cottonwood Facility
Eddy County, New Mexico

Well No.	Collection Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	C6 -C10 (mg/L)	>C10-C28 (mg/L)	>C28-C35 (mg/L)	C6-C35 (mg/L)	Chloride (mg/L)
WQCC Standard:		*0.01	*0.75	*0.75	*0.62	--	--	--	--	**250
MW-1	9/25/2018	<0.000800	<0.00200	<0.00200	<0.00200	<0.556	<0.556	<0.556	<0.556	210
	11/13/2018	0.00124	<0.00200	<0.00200	<0.00200	<0.527	<0.527	<0.527	<0.527	1,220
	12/12/2018	0.00130	<0.00200	<0.00200	<0.00200	<0.537	<0.537	<0.537	<0.537	677
	1/29/2019	0.00489	<0.00400	<0.00400	<0.00400	<0.0600	<0.0789	<0.0789	<0.2178	1,750
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0749	<0.0749	<0.7498	214
	9/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0730	<0.0730	<0.206	248
	12/4/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0739	<0.0739	<0.2078	224
	2/18/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0772	<0.0772	<0.2144	214
	5/7/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0787	<0.0787	<0.2174	246
	8/13/2020	<0.0008.00	<0.00200	<0.00200	<0.00200	<0.0600	0.107	<0.0758	0.107	228
MW-2	9/25/2018	Dry								
	11/13/2018									
	1/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0767	<0.0767	<0.0767	136
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0744	<0.0744	<0.2088	106
	9/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0748	<0.0748	<0.2096	117
	12/4/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0751	<0.0751	<0.2102	105
	2/18/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0766	<0.0766	<0.2132	120
	5/7/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0823	<0.0823	<0.2246	121
	8/13/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0841	<0.0841	<0.2282	124
MW-3	9/25/2018	<0.000800	<0.00200	<0.00200	<0.00200	<0.554	<0.554	<0.554	<0.554	101
	11/13/2018	<0.000800	<0.00200	<0.00200	<0.00200	<0.574	<0.574	<0.574	<0.574	103
	1/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0780	<0.0780	<0.0780	140
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0758	<0.0758	<0.2116	121
	9/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0737	<0.0737	<0.2074	130
	12/4/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0752	<0.0752	<0.2104	111

Table 2
Groundwater Sample Organic and Inorganic Analytical Data Summary
3Bears Cottonwood Facility
Eddy County, New Mexico

Well No.	Collection Date	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Xylenes (mg/L)	C6 -C10 (mg/L)	>C10-C28 (mg/L)	>C28-C35 (mg/L)	C6-C35 (mg/L)	Chloride (mg/L)
WQCC Standard:		*0.01	*0.75	*0.75	*0.62	--	--	--	--	**250
	2/18/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0794	<0.0794	<0.2188	120
	5/7/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0997	<0.0997	<0.2594	305
	8/13/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0822	<0.0822	<0.2244	125
MW-4	9/25/2018	Dry								
	11/13/2018									
	1/29/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	0.216	<0.110	0.216	22,300
	5/15/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.762	<0.762	<0.2114	22,900
	9/20/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.741	<0.741	<0.082	26,000
	12/4/2019	<0.000800	<0.00200	<0.00200	<0.00200	<0.600	<0.752	<0.752	<2.104	24,400
	2/18/2020	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	<0.577	<0.577	<1.754	25,800
	5/7/2020	<0.00800	<0.0200	<0.0200	<0.0200	<0.600	<0.110	<0.110	<0.820	25,400
	8/13/2020	<0.00800	<0.00200	<0.00200	<0.00200	<0.600	0.137	<0.0566	0.137	19,800
QA/QC (Duplicate) Samples										
Dup - 1 (MW-1)	2/18/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0802	<0.0802	<0.2204	210
	5/7/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0800	<0.0800	<0.2200	221
Dup - 1 (MW-1)	8/13/2020	<0.000800	<0.00200	<0.00200	<0.00200	<0.0600	<0.0747	<0.0747	<0.2094	213
Precipitate										
Well No.	Collection Date	Barium (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Strontium (mg/L)		
MW-4	1/29/2019	<0.463	347	46.9	20,500	894	87,700	8.87		
	5/15/2019	--	333	--	50,500	2,370	25,900	--		
Alkalinity										
Well No.	Collection Date	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L	Total mg/L					
MW-4	1/29/2019	--	--	--	--					
	5/15/2019	5140	<	<	5140					
MW-2	5/15/2019	116	<	<	116					

Table 2
Groundwater Sample Organic and Inorganic Analytical Data Summary
3Bears Cottonwood Facility
Eddy County, New Mexico

Notes: Analysis performed by DHL Analytical, Round Rock, Texas, by EPA SW-846 Method 8021B (BTEX), Method 8015M (TPH) and Method 300 (chloride)

All values reported in milligrams per liter (mg/L) equivalent to parts per million (ppm)

-- No data available

< values - denotes concentration is less than method reporting limit (RL).

* - Human health standard

** - Domestic water quality standard

Figures

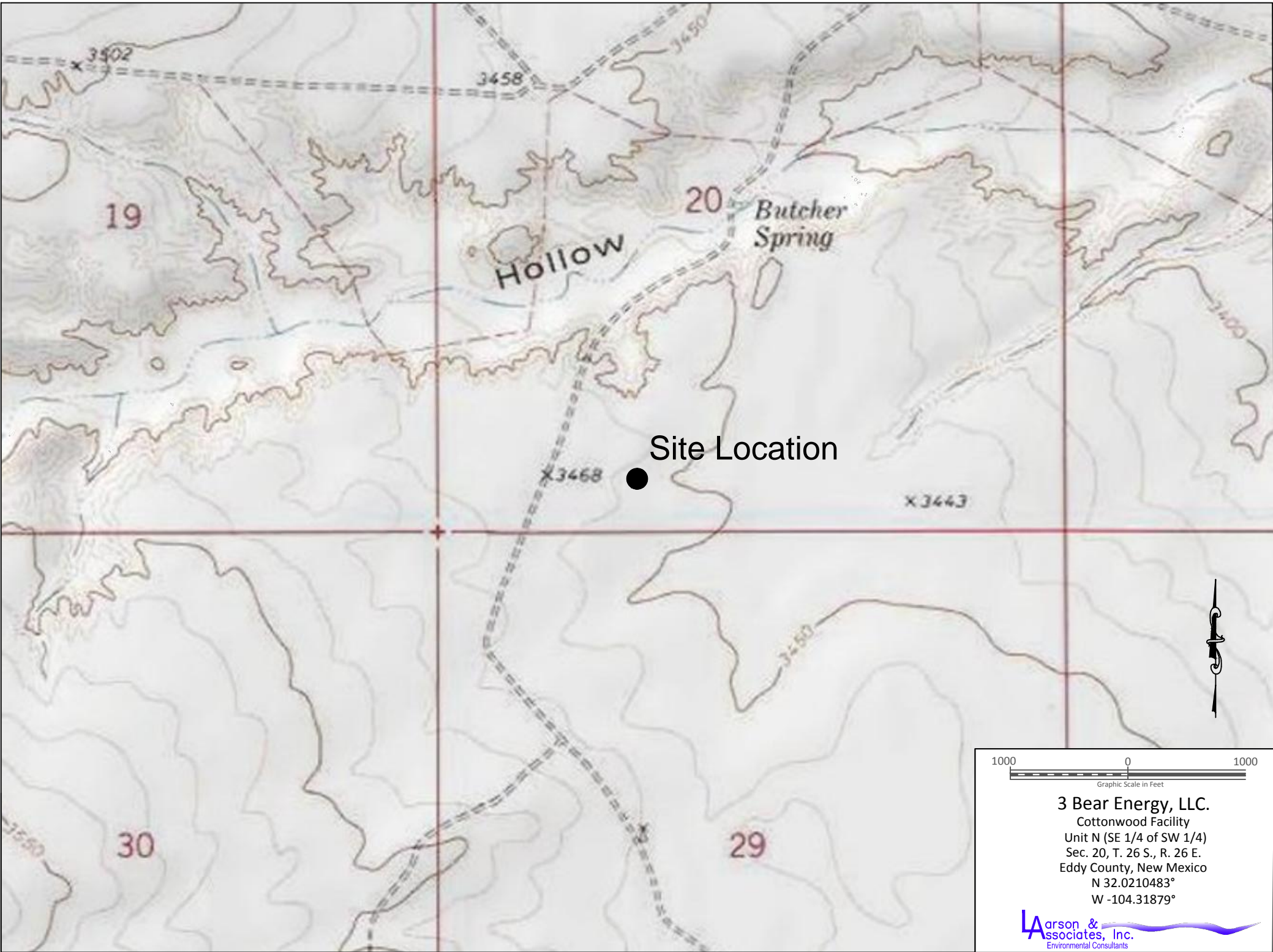
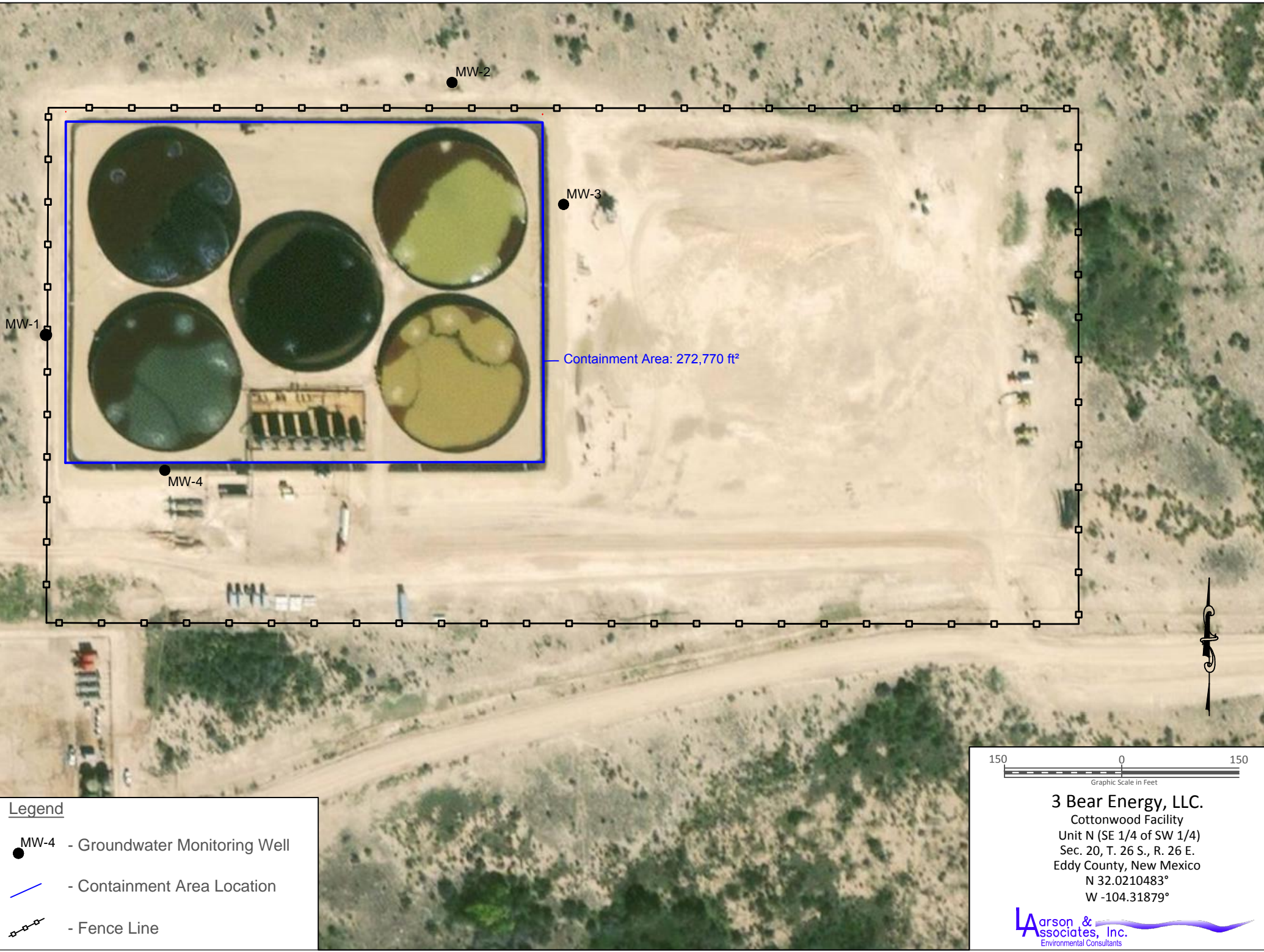


Figure 1 - Topographic Map



Legend

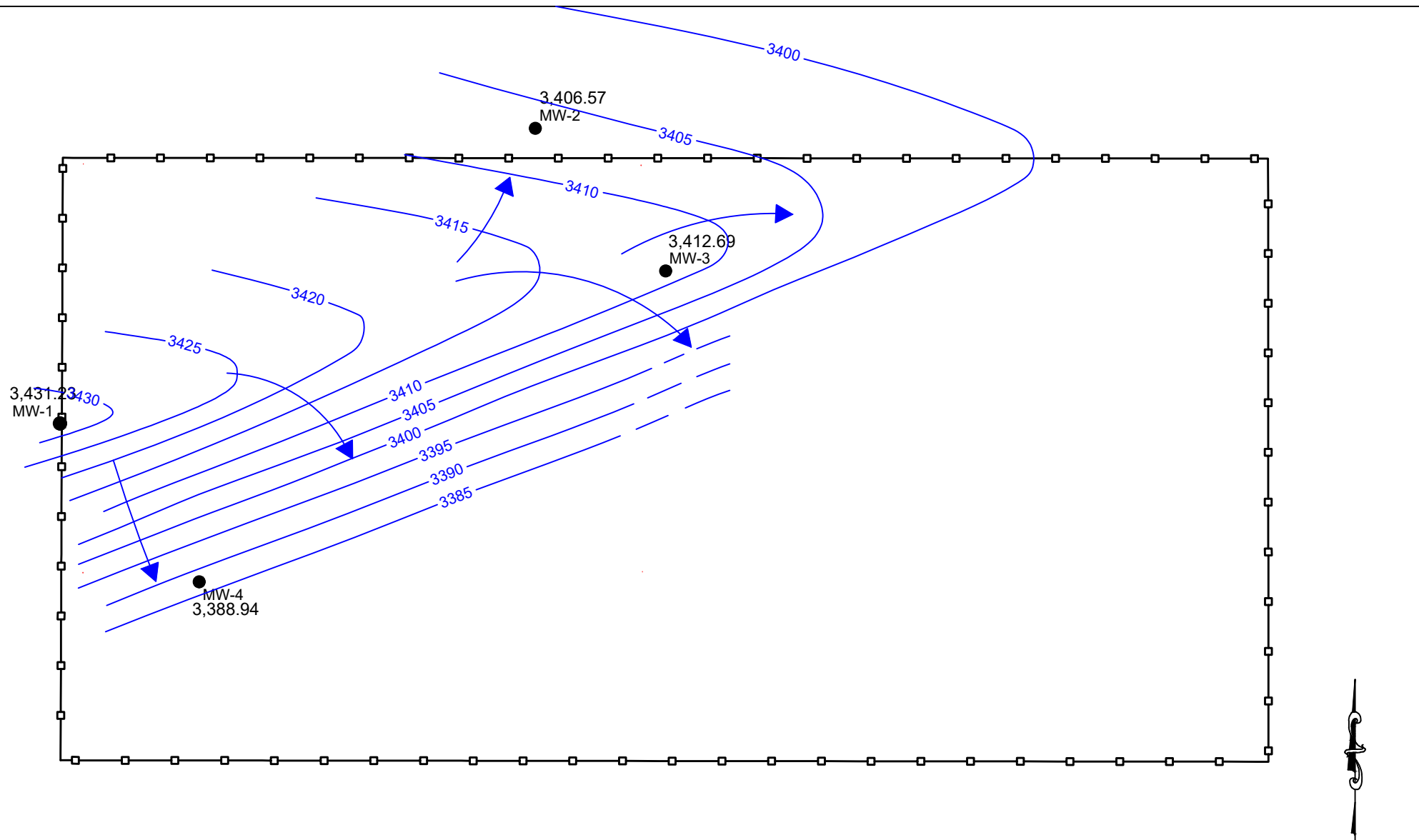
- MW-4 - Groundwater Monitoring Well
- Containment Area Location
- Fence Line

150 0 150
Graphic Scale in Feet

3 Bear Energy, LLC.
Cottonwood Facility
Unit N (SE 1/4 of SW 1/4)
Sec. 20, T. 26 S., R. 26 E.
Eddy County, New Mexico
N 32.0210483°
W -104.31879°

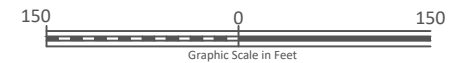
Larson & Associates, Inc.
Environmental Consultants

Figure 2 - Aerial Map



Legend

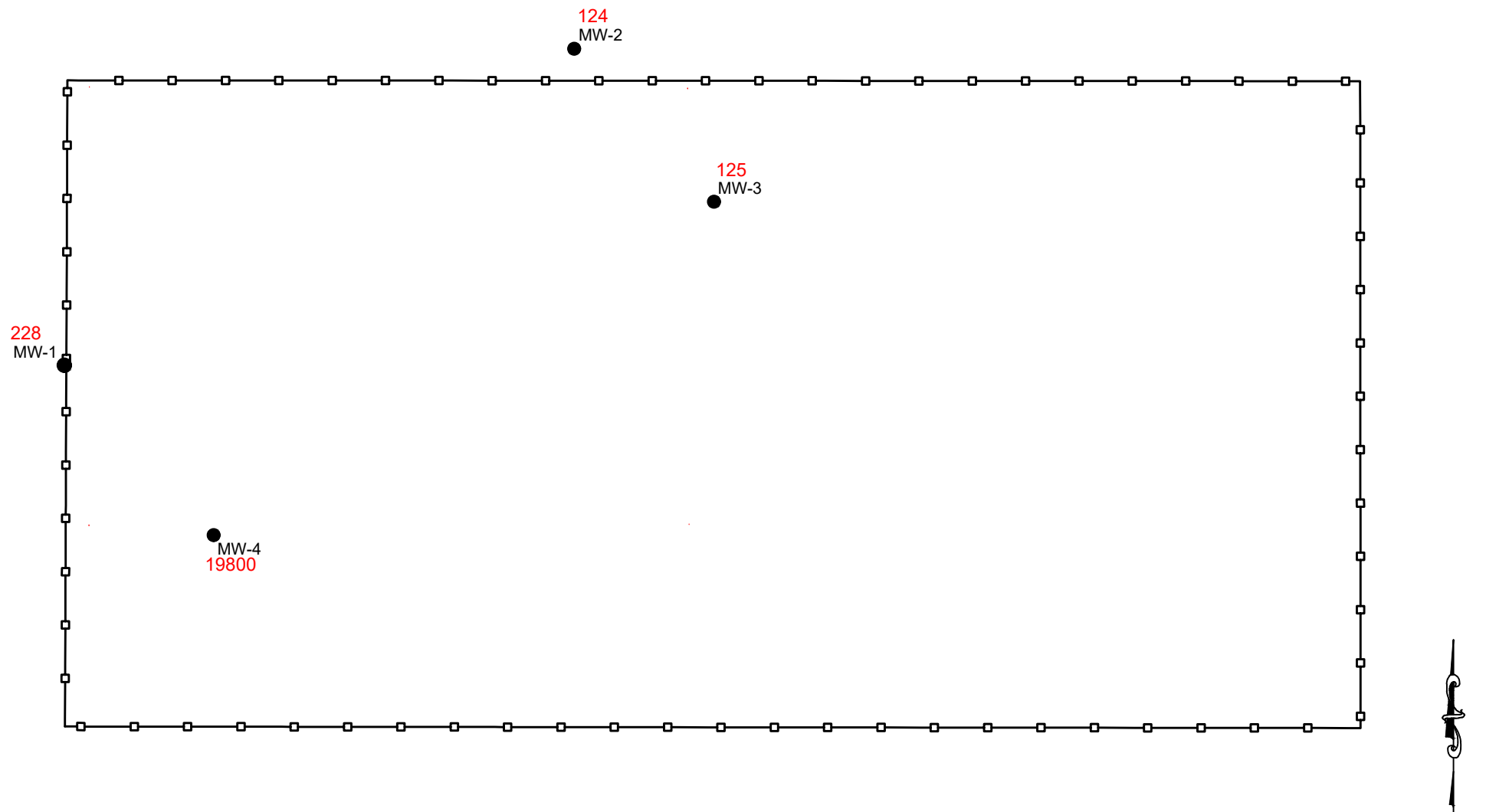
- MW-4 - Monitoring Well Location and Groundwater Potentiometric Surface Elevation, Feet AMSL, August 13, 2020
- 3425 - Contour of Groundwater Potentiometric Surface Elevation, Feet AMSL, August 13, 2020
- Groundwater Flow Direction
- Fence





3 Bear Energy LLC.,
 Cottonwood Facility
 Unit N (SE 1/4 of SW 1/4)
 Sec. 20, T. 26 S., R. 26 E.
 Eddy County, New Mexico
 N 32.0210483°
 W -104.31879°

Larson & Associates, Inc.
 Environmental Consultants

Figure 3 - Groundwater Potentiometric Map, August 13, 2020



Legend

- 
19800
MW-4 - Monitoring Well Location and Chloride Concentration in Groundwater, mg/L, August 8, 2020
-  - Fence

150 0 150
Graphic Scale in Feet

3 Bear Energy LLC.,
 Cottonwood Facility
 Unit N (SE 1/4 of SW 1/4)
 Sec. 20, T. 26 S., R. 26 E.
 Eddy County, New Mexico
 N 32.0210483°
 W -104.31879°

Larson & Associates, Inc.
 Environmental Consultants

Figure 4 - Chloride Concentration in Groundwater Map, August 13, 2020

Appendix A
Laboratory Reports



August 25, 2020

Mark Larson
Larson & Associates
507 N. Marienfeld #205
Midland, TX 79701
TEL: (432) 687-0901
FAX: (432) 687-0456
RE: 3 Bear - Cottonwood

Order No.: 2008152

Dear Mark Larson:

DHL Analytical, Inc. received 5 sample(s) on 8/18/2020 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAP except where noted in the Case Narrative. All non-NELAP methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in red ink, appearing to read "John DuPont".

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification
Number: T104704211-20-25



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AnalyticalDatesReport 2008152	9
Analytical Report 2008152	10
AnalyticalQCSummaryReport 2008152	15

507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 8/17/2020 PAGE 1 OF 1

PO#: LAB WORK ORDER#: 2008152

PROJECT LOCATION OR NAME: 3 Bear - Cottonwood

LAI PROJECT #: 18-0176-01 COLLECTOR: AS

[illegible]

WWW.LSO.COM
Questions? Call 800-800-8984

bill No. LSO0BYGT

1. To:
Company Name: LSO
Street Address (No P.O. Box): 1000 N. 10th St.
City: Grand Rapids State: MI Zip: 49503

2. From:
Company Name: ASSOCIATES
Street Address: 1000 N. 10th St.
City: Grand Rapids State: MI Zip: 49503

3. Service:
☐ LSO Priority Overnight® By 10:30 a.m. to most cities
☐ LSO Early Overnight® By 8:30 a.m. to most cities
☐ LSO Economy Next Day By 9 a.m. to most cities
☐ LSO 2nd Day
☐ Deliver Without Signature
 See Limits of Liability

4. Package:
 Ship Date: (mm/dd/yy) _____
 Your Company's Billing Reference Info: _____

5. Payment:
 Signature: _____
 Title: _____
 Phone: _____

FOR DRIVER USE ONLY
 Driver Number: _____
 Check here if LSO Supplies are used with LSO Ground Service.
 Pick-up Location: _____
 Date: 8-17-20
 Time: 2:46
 City Code: _____

DELIVERY: We are not responsible for claims in excess of the actual value of the contents. We will not pay any claim in excess of the actual value of the contents. Liability for claims resulting from our service. Signature Required. Packaging provided by LSO is for EXPRESS USE ONLY - NEVER REUSE. Service Guide for further details.

1.1) Declare a greater value than the actual value of the contents. If so, declare the value online at LSO.com. OVSERIES RATES MAY APPLY.

CUSTODY:
 DATE: 8/17/20
 SIGNATURE: [Signature]

DHL ANALYTICAL


Sample Receipt Checklist

Client Name **Larson & Associates**

Date Received: **8/18/2020**

Work Order Number **2008152**

Received by: **RA**

Checklist completed by:  8/18/2020
Signature Date

Reviewed by:  8/18/2020
Initials Date

Carrier name: LoneStar

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	5.6 °C
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH<2 acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/> LOT #
	Adjusted? _____	Checked by _____	
Water - pH>9 (S) or pH>10 (CN) acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/> LOT #
	Adjusted? _____	Checked by _____	

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted: _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action: _____

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Lab Order: 2008152

CASE NARRATIVE

Sample was analyzed using the methods outlined in the following references:

Method M8015V - GRO Analysis
Method M8015D - DRO Analysis
Method SW8260D - Volatile Aromatics Analysis
Method E300 - Anions Analysis

LOG IN

The samples were received and log-in performed on 8/18/2020. A total of 5 samples were received and analyzed. The samples arrived in good condition and were properly packaged. The samples were collected in Mountain Standard time-zone.

DRO ANALYSIS

For DRO Analysis, the recovery of surrogate Isopropylbenzene for Sample MW-4 was below the method control limits. This is flagged accordingly in the Analytical Data Report. The remaining surrogate for this sample was within method control limits. No further corrective action was taken.

ANIONS ANALYSIS

For Anions Analysis, the recovery of Chloride for the Matrix Spike (2008152-01 MS) was below the method control limits. This is flagged accordingly in the QC Summary Report. This anion was within method control limits in the associated LCS/MSD. No further corrective action was taken.

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Lab Order: 2008152**Work Order Sample Summary**

Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recved
2008152-01	MW-1		08/13/20 02:00 PM	8/18/2020
2008152-02	MW-2		08/13/20 11:40 AM	8/18/2020
2008152-03	MW-3		08/13/20 01:00 PM	8/18/2020
2008152-04	MW-4		08/13/20 03:00 PM	8/18/2020
2008152-05	Dup-1		08/13/20 01:30 PM	8/18/2020

Lab Order: 2008152
Client: Larson & Associates
Project: 3 Bear - Cottonwood

PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
2008152-01A	MW-1	08/13/20 02:00 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	08/19/20 10:15 AM	97658
2008152-01B	MW-1	08/13/20 02:00 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	08/20/20 08:10 AM	97664
2008152-01C	MW-1	08/13/20 02:00 PM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
2008152-01D	MW-1	08/13/20 02:00 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	08/19/20 11:07 AM	97660
2008152-02A	MW-2	08/13/20 11:40 AM	Aqueous	SW5030C	Purge and Trap Water GC/MS	08/19/20 10:15 AM	97658
2008152-02B	MW-2	08/13/20 11:40 AM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	08/20/20 08:10 AM	97664
2008152-02C	MW-2	08/13/20 11:40 AM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
2008152-02D	MW-2	08/13/20 11:40 AM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	08/19/20 11:07 AM	97660
2008152-03A	MW-3	08/13/20 01:00 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	08/19/20 10:15 AM	97658
2008152-03B	MW-3	08/13/20 01:00 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	08/20/20 08:10 AM	97664
2008152-03C	MW-3	08/13/20 01:00 PM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
2008152-03D	MW-3	08/13/20 01:00 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	08/19/20 11:07 AM	97660
2008152-04A	MW-4	08/13/20 03:00 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	08/19/20 10:15 AM	97658
2008152-04B	MW-4	08/13/20 03:00 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	08/20/20 08:10 AM	97664
2008152-04C	MW-4	08/13/20 03:00 PM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
	MW-4	08/13/20 03:00 PM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
2008152-04D	MW-4	08/13/20 03:00 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	08/19/20 11:07 AM	97660
2008152-05A	Dup-1	08/13/20 01:30 PM	Aqueous	SW5030C	Purge and Trap Water GC/MS	08/19/20 10:15 AM	97658
2008152-05B	Dup-1	08/13/20 01:30 PM	Aqueous	SW5030C	Purge and Trap Water GC-Gas	08/20/20 08:10 AM	97664
2008152-05C	Dup-1	08/13/20 01:30 PM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
	Dup-1	08/13/20 01:30 PM	Aqueous	E300	Anion Preparation	08/19/20 10:04 AM	97657
2008152-05D	Dup-1	08/13/20 01:30 PM	Aqueous	SW3510C	Aq Prep Sep Funnel: DRO	08/19/20 11:07 AM	97660

Lab Order: 2008152
Client: Larson & Associates
Project: 3 Bear - Cottonwood

ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
2008152-01A	MW-1	Aqueous	SW8260D	Volatile Aromatics by GC/MS	97658	1	08/19/20 12:28 PM	GCMS3_200819A
2008152-01B	MW-1	Aqueous	M8015V	TPH Purgeable by GC - Water	97664	1	08/20/20 12:14 PM	GC4_200820A
2008152-01C	MW-1	Aqueous	E300	Anions by IC method - Water	97657	100	08/19/20 02:41 PM	IC2_200819A
2008152-01D	MW-1	Aqueous	M8015D	TPH Extractable by GC - Water	97660	1	08/20/20 09:39 AM	GC15_200820A
2008152-02A	MW-2	Aqueous	SW8260D	Volatile Aromatics by GC/MS	97658	1	08/19/20 12:53 PM	GCMS3_200819A
2008152-02B	MW-2	Aqueous	M8015V	TPH Purgeable by GC - Water	97664	1	08/20/20 12:38 PM	GC4_200820A
2008152-02C	MW-2	Aqueous	E300	Anions by IC method - Water	97657	10	08/19/20 05:03 PM	IC2_200819A
2008152-02D	MW-2	Aqueous	M8015D	TPH Extractable by GC - Water	97660	1	08/20/20 09:48 AM	GC15_200820A
2008152-03A	MW-3	Aqueous	SW8260D	Volatile Aromatics by GC/MS	97658	1	08/19/20 01:17 PM	GCMS3_200819A
2008152-03B	MW-3	Aqueous	M8015V	TPH Purgeable by GC - Water	97664	1	08/20/20 01:01 PM	GC4_200820A
2008152-03C	MW-3	Aqueous	E300	Anions by IC method - Water	97657	10	08/19/20 05:19 PM	IC2_200819A
2008152-03D	MW-3	Aqueous	M8015D	TPH Extractable by GC - Water	97660	1	08/20/20 09:57 AM	GC15_200820A
2008152-04A	MW-4	Aqueous	SW8260D	Volatile Aromatics by GC/MS	97658	10	08/19/20 01:42 PM	GCMS3_200819A
2008152-04B	MW-4	Aqueous	M8015V	TPH Purgeable by GC - Water	97664	10	08/20/20 01:27 PM	GC4_200820A
2008152-04C	MW-4	Aqueous	E300	Anions by IC method - Water	97657	1000	08/19/20 02:25 PM	IC2_200819A
	MW-4	Aqueous	E300	Anions by IC method - Water	97657	1000	08/19/20 04:15 PM	IC2_200819A
2008152-04D	MW-4	Aqueous	M8015D	TPH Extractable by GC - Water	97660	1	08/20/20 10:06 AM	GC15_200820A
2008152-05A	Dup-1	Aqueous	SW8260D	Volatile Aromatics by GC/MS	97658	1	08/19/20 02:07 PM	GCMS3_200819A
2008152-05B	Dup-1	Aqueous	M8015V	TPH Purgeable by GC - Water	97664	1	08/20/20 01:51 PM	GC4_200820A
2008152-05C	Dup-1	Aqueous	E300	Anions by IC method - Water	97657	100	08/19/20 03:29 PM	IC2_200819A
	Dup-1	Aqueous	E300	Anions by IC method - Water	97657	10	08/19/20 05:35 PM	IC2_200819A
2008152-05D	Dup-1	Aqueous	M8015D	TPH Extractable by GC - Water	97660	1	08/20/20 10:15 AM	GC15_200820A

DHL Analytical, Inc.

Date: 25-Aug-20

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Project No: 18-0176-01
Lab Order: 2008152

Client Sample ID: MW-1
Lab ID: 2008152-01
Collection Date: 08/13/20 02:00 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		M8015D		Analyst: BTJ			
TPH-DRO C10-C28	0.107	0.0758	0.0947		mg/L	1	08/20/20 09:39 AM
TPH-ORO >C28-C35	<0.0758	0.0758	0.0947		mg/L	1	08/20/20 09:39 AM
Surr: Isopropylbenzene	63.9	0	47-142		%REC	1	08/20/20 09:39 AM
Surr: Octacosane	90.3	0	51-124		%REC	1	08/20/20 09:39 AM
VOLATILE AROMATICS BY GC/MS		SW8260D		Analyst: SNM			
Benzene	<0.000800	0.000800	0.00200		mg/L	1	08/19/20 12:28 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 12:28 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 12:28 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 12:28 PM
Surr: 1,2-Dichloroethane-d4	104	0	72-119		%REC	1	08/19/20 12:28 PM
Surr: 4-Bromofluorobenzene	98.8	0	76-119		%REC	1	08/19/20 12:28 PM
Surr: Dibromofluoromethane	109	0	85-115		%REC	1	08/19/20 12:28 PM
Surr: Toluene-d8	106	0	81-120		%REC	1	08/19/20 12:28 PM
TPH PURGEABLE BY GC - WATER		M8015V		Analyst: BTJ			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	08/20/20 12:14 PM
Surr: Tetrachlorethene	126	0	74-138		%REC	1	08/20/20 12:14 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	228	30.0	100		mg/L	100	08/19/20 02:41 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 25-Aug-20

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Project No: 18-0176-01
Lab Order: 2008152

Client Sample ID: MW-2
Lab ID: 2008152-02
Collection Date: 08/13/20 11:40 AM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		M8015D		Analyst: BTJ			
TPH-DRO C10-C28	<0.0841	0.0841	0.105		mg/L	1	08/20/20 09:48 AM
TPH-ORO >C28-C35	<0.0841	0.0841	0.105		mg/L	1	08/20/20 09:48 AM
Surr: Isopropylbenzene	56.6	0	47-142		%REC	1	08/20/20 09:48 AM
Surr: Octacosane	89.6	0	51-124		%REC	1	08/20/20 09:48 AM
VOLATILE AROMATICS BY GC/MS		SW8260D		Analyst: SNM			
Benzene	<0.000800	0.000800	0.00200		mg/L	1	08/19/20 12:53 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 12:53 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 12:53 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 12:53 PM
Surr: 1,2-Dichloroethane-d4	104	0	72-119		%REC	1	08/19/20 12:53 PM
Surr: 4-Bromofluorobenzene	99.5	0	76-119		%REC	1	08/19/20 12:53 PM
Surr: Dibromofluoromethane	109	0	85-115		%REC	1	08/19/20 12:53 PM
Surr: Toluene-d8	107	0	81-120		%REC	1	08/19/20 12:53 PM
TPH PURGEABLE BY GC - WATER		M8015V		Analyst: BTJ			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	08/20/20 12:38 PM
Surr: Tetrachlorethene	113	0	74-138		%REC	1	08/20/20 12:38 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	124	3.00	10.0		mg/L	10	08/19/20 05:03 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 25-Aug-20

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Project No: 18-0176-01
Lab Order: 2008152

Client Sample ID: MW-3
Lab ID: 2008152-03
Collection Date: 08/13/20 01:00 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		M8015D		Analyst: BTJ			
TPH-DRO C10-C28	<0.0822	0.0822	0.103		mg/L	1	08/20/20 09:57 AM
TPH-ORO >C28-C35	<0.0822	0.0822	0.103		mg/L	1	08/20/20 09:57 AM
Surr: Isopropylbenzene	63.5	0	47-142		%REC	1	08/20/20 09:57 AM
Surr: Octacosane	90.6	0	51-124		%REC	1	08/20/20 09:57 AM
VOLATILE AROMATICS BY GC/MS		SW8260D		Analyst: SNM			
Benzene	<0.000800	0.000800	0.00200		mg/L	1	08/19/20 01:17 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 01:17 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 01:17 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 01:17 PM
Surr: 1,2-Dichloroethane-d4	104	0	72-119		%REC	1	08/19/20 01:17 PM
Surr: 4-Bromofluorobenzene	100	0	76-119		%REC	1	08/19/20 01:17 PM
Surr: Dibromofluoromethane	109	0	85-115		%REC	1	08/19/20 01:17 PM
Surr: Toluene-d8	106	0	81-120		%REC	1	08/19/20 01:17 PM
TPH PURGEABLE BY GC - WATER		M8015V		Analyst: BTJ			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	08/20/20 01:01 PM
Surr: Tetrachlorethene	114	0	74-138		%REC	1	08/20/20 01:01 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	125	3.00	10.0		mg/L	10	08/19/20 05:19 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.**Date:** 25-Aug-20

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Project No: 18-0176-01
Lab Order: 2008152

Client Sample ID: MW-4
Lab ID: 2008152-04
Collection Date: 08/13/20 03:00 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		M8015D		Analyst: BTJ			
TPH-DRO C10-C28	0.137	0.0566	0.0708		mg/L	1	08/20/20 10:06 AM
TPH-ORO >C28-C35	<0.0566	0.0566	0.0708		mg/L	1	08/20/20 10:06 AM
Surr: Isopropylbenzene	39.6	0	47-142	S	%REC	1	08/20/20 10:06 AM
Surr: Octacosane	102	0	51-124		%REC	1	08/20/20 10:06 AM
VOLATILE AROMATICS BY GC/MS		SW8260D		Analyst: SNM			
Benzene	<0.00800	0.00800	0.0200		mg/L	10	08/19/20 01:42 PM
Ethylbenzene	<0.0200	0.0200	0.0600		mg/L	10	08/19/20 01:42 PM
Toluene	<0.0200	0.0200	0.0600		mg/L	10	08/19/20 01:42 PM
Total Xylenes	<0.0200	0.0200	0.0600		mg/L	10	08/19/20 01:42 PM
Surr: 1,2-Dichloroethane-d4	107	0	72-119		%REC	10	08/19/20 01:42 PM
Surr: 4-Bromofluorobenzene	100	0	76-119		%REC	10	08/19/20 01:42 PM
Surr: Dibromofluoromethane	109	0	85-115		%REC	10	08/19/20 01:42 PM
Surr: Toluene-d8	106	0	81-120		%REC	10	08/19/20 01:42 PM
TPH PURGEABLE BY GC - WATER		M8015V		Analyst: BTJ			
TPH-GRO (C6-C10)	<0.600	0.600	1.00		mg/L	10	08/20/20 01:27 PM
Surr: Tetrachlorethene	125	0	74-138		%REC	10	08/20/20 01:27 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	19800	300	1000		mg/L	1000	08/19/20 04:15 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: 25-Aug-20

CLIENT: Larson & Associates
Project: 3 Bear - Cottonwood
Project No: 18-0176-01
Lab Order: 2008152

Client Sample ID: Dup-1
Lab ID: 2008152-05
Collection Date: 08/13/20 01:30 PM
Matrix: AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
TPH EXTRACTABLE BY GC - WATER		M8015D		Analyst: BTJ			
TPH-DRO C10-C28	<0.0747	0.0747	0.0934		mg/L	1	08/20/20 10:15 AM
TPH-ORO >C28-C35	<0.0747	0.0747	0.0934		mg/L	1	08/20/20 10:15 AM
Surr: Isopropylbenzene	65.3	0	47-142		%REC	1	08/20/20 10:15 AM
Surr: Octacosane	92.7	0	51-124		%REC	1	08/20/20 10:15 AM
VOLATILE AROMATICS BY GC/MS		SW8260D		Analyst: SNM			
Benzene	<0.000800	0.000800	0.00200		mg/L	1	08/19/20 02:07 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 02:07 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 02:07 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	08/19/20 02:07 PM
Surr: 1,2-Dichloroethane-d4	105	0	72-119		%REC	1	08/19/20 02:07 PM
Surr: 4-Bromofluorobenzene	101	0	76-119		%REC	1	08/19/20 02:07 PM
Surr: Dibromofluoromethane	108	0	85-115		%REC	1	08/19/20 02:07 PM
Surr: Toluene-d8	106	0	81-120		%REC	1	08/19/20 02:07 PM
TPH PURGEABLE BY GC - WATER		M8015V		Analyst: BTJ			
TPH-GRO (C6-C10)	<0.0600	0.0600	0.100		mg/L	1	08/20/20 01:51 PM
Surr: Tetrachlorethene	121	0	74-138		%REC	1	08/20/20 01:51 PM
ANIONS BY IC METHOD - WATER		E300		Analyst: SNM			
Chloride	213	3.00	10.0		mg/L	10	08/19/20 05:35 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

CLIENT: Larson & Associates

Work Order: 2008152

Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GC15_200820A

The QC data in batch 97660 applies to the following samples: 2008152-01D, 2008152-02D, 2008152-03D, 2008152-04D, 2008152-05D

Sample ID: MB-97660	Batch ID: 97660	TestNo: M8015D	Units: mg/L							
SampType: MBLK	Run ID: GC15_200820A	Analysis Date: 8/20/2020 9:11:52 AM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-DRO C10-C28 <0.0800 0.100

TPH-ORO >C28-C35 <0.0800 0.100

Surr: Isopropylbenzene 0.0650 0.1000 65.0 47 142

Surr: Octacosane 0.0855 0.1000 85.5 51 124

Sample ID: LCS-97660	Batch ID: 97660	TestNo: M8015D	Units: mg/L							
SampType: LCS	Run ID: GC15_200820A	Analysis Date: 8/20/2020 9:20:55 AM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-DRO C10-C28 1.33 0.100 1.250 0 107 50 114

Surr: Isopropylbenzene 0.0892 0.1000 89.2 47 142

Surr: Octacosane 0.0902 0.1000 90.2 51 124

Sample ID: LCSD-97660	Batch ID: 97660	TestNo: M8015D	Units: mg/L							
SampType: LCSD	Run ID: GC15_200820A	Analysis Date: 8/20/2020 9:29:59 AM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-DRO C10-C28 1.25 0.100 1.250 0 99.7 50 114 6.70 30

Surr: Isopropylbenzene 0.0796 0.1000 79.6 47 142 0 0

Surr: Octacosane 0.0920 0.1000 92.0 51 124 0 0

Qualifiers:

B Analyte detected in the associated Method Blank

J Analyte detected between MDL and RL

ND Not Detected at the Method Detection Limit

RL Reporting Limit

J Analyte detected between SDL and RL

DF Dilution Factor

MDL Method Detection Limit

R RPD outside accepted control limits

S Spike Recovery outside control limits

N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GC15_200820A

Sample ID: ICV-200820	Batch ID: R112021	TestNo: M8015D	Units: mg/L							
SampType: ICV	Run ID: GC15_200820A	Analysis Date: 8/20/2020 8:57:36 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	445	0.100	500.0	0	89.0	80	120			
TPH-ORO >C28-C35	0.484	0.100	0							
Surr: Isopropylbenzene	24.5		25.00		98.2	80	120			
Surr: Octacosane	20.6		25.00		82.5	80	120			

Sample ID: CCV1-200820	Batch ID: R112021	TestNo: M8015D	Units: mg/L							
SampType: CCV	Run ID: GC15_200820A	Analysis Date: 8/20/2020 10:34:31 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-DRO C10-C28	237	0.100	250.0	0	94.8	80	120			
TPH-ORO >C28-C35	0.116	0.100	0							
Surr: Isopropylbenzene	14.2		12.50		113	80	120			
Surr: Octacosane	10.7		12.50		85.5	80	120			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GC4_200820A

The QC data in batch 97664 applies to the following samples: 2008152-01B, 2008152-02B, 2008152-03B, 2008152-04B, 2008152-05B

Sample ID: LCS-97664	Batch ID: 97664	TestNo: M8015V	Units: mg/L							
SampType: LCS	Run ID: GC4_200820A	Analysis Date: 8/20/2020 9:47:55 AM	Prep Date: 8/20/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.42	0.100	2.500	0	96.8	67	136			
Surr: Tetrachlorethene	0.334		0.4000		83.4	74	138			

Sample ID: LCSD-97664	Batch ID: 97664	TestNo: M8015V	Units: mg/L							
SampType: LCSD	Run ID: GC4_200820A	Analysis Date: 8/20/2020 10:11:28 AM	Prep Date: 8/20/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.75	0.100	2.500	0	110	67	136	12.7	30	
Surr: Tetrachlorethene	0.386		0.4000		96.4	74	138	0	0	

Sample ID: MB-97664	Batch ID: 97664	TestNo: M8015V	Units: mg/L							
SampType: MBLK	Run ID: GC4_200820A	Analysis Date: 8/20/2020 11:24:27 AM	Prep Date: 8/20/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	<0.0600	0.100								
Surr: Tetrachlorethene	0.489		0.4000		122	74	138			

Sample ID: 2008152-01BMS	Batch ID: 97664	TestNo: M8015V	Units: mg/L							
SampType: MS	Run ID: GC4_200820A	Analysis Date: 8/20/2020 2:15:09 PM	Prep Date: 8/20/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.75	0.100	2.500	0	110	67	136			
Surr: Tetrachlorethene	0.430		0.4000		107	74	138			

Sample ID: 2008152-01BMSD	Batch ID: 97664	TestNo: M8015V	Units: mg/L							
SampType: MSD	Run ID: GC4_200820A	Analysis Date: 8/20/2020 2:38:26 PM	Prep Date: 8/20/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

TPH-GRO (C6-C10)	2.85	0.100	2.500	0	114	67	136	3.38	30	
Surr: Tetrachlorethene	0.444		0.4000		111	74	138	0	0	

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GC4_200820A

Sample ID: ICV-200820	Batch ID: R112016	TestNo: M8015V	Units: mg/L							
SampType: ICV	Run ID: GC4_200820A	Analysis Date: 8/20/2020 9:22:35 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	5.16	0.100	5.000	0	103	80	120			
Surr: Tetrachlorethene	0.361		0.4000		90.3	74	138			

Sample ID: CCV1-200820	Batch ID: R112016	TestNo: M8015V	Units: mg/L							
SampType: CCV	Run ID: GC4_200820A	Analysis Date: 8/20/2020 3:29:38 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TPH-GRO (C6-C10)	2.77	0.100	2.500	0	111	80	120			
Surr: Tetrachlorethene	0.431		0.4000		108	74	138			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_200819A

The QC data in batch 97658 applies to the following samples: 2008152-01A, 2008152-02A, 2008152-03A, 2008152-04A, 2008152-05A

Sample ID: LCS-97658	Batch ID: 97658	TestNo: SW8260D	Units: mg/L							
SampType: LCS	Run ID: GCMS3_200819A	Analysis Date: 8/19/2020 11:37:00 AM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	0.0447	0.00200	0.0464	0	96.4	81	122			
Ethylbenzene	0.0421	0.00600	0.0464	0	90.8	73	127			
Toluene	0.0465	0.00600	0.0464	0	100	77	122			
Total Xylenes	0.125	0.00600	0.139	0	90.2	80	121			
Surr: 1,2-Dichloroethane-d4	52.4		50.00		105	72	119			
Surr: 4-Bromofluorobenzene	50.0		50.00		100	76	119			
Surr: Dibromofluoromethane	54.7		50.00		109	85	115			
Surr: Toluene-d8	53.0		50.00		106	81	120			

Sample ID: MB-97658	Batch ID: 97658	TestNo: SW8260D	Units: mg/L							
SampType: MBLK	Run ID: GCMS3_200819A	Analysis Date: 8/19/2020 12:04:00 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	<0.000800	0.00200								
Ethylbenzene	<0.00200	0.00600								
Toluene	<0.00200	0.00600								
Total Xylenes	<0.00200	0.00600								
Surr: 1,2-Dichloroethane-d4	51.6		50.00		103	72	119			
Surr: 4-Bromofluorobenzene	50.7		50.00		101	76	119			
Surr: Dibromofluoromethane	54.0		50.00		108	85	115			
Surr: Toluene-d8	52.6		50.00		105	81	120			

Sample ID: 2008152-01AMS	Batch ID: 97658	TestNo: SW8260D	Units: mg/L							
SampType: MS	Run ID: GCMS3_200819A	Analysis Date: 8/19/2020 4:36:00 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	0.0486	0.00200	0.0464	0	105	81	122			
Ethylbenzene	0.0449	0.00600	0.0464	0	96.8	73	127			
Toluene	0.0505	0.00600	0.0464	0	109	77	122			
Total Xylenes	0.133	0.00600	0.139	0	95.9	80	121			
Surr: 1,2-Dichloroethane-d4	51.9		50.00		104	72	119			
Surr: 4-Bromofluorobenzene	49.8		50.00		99.7	76	119			
Surr: Dibromofluoromethane	53.8		50.00		108	85	115			
Surr: Toluene-d8	52.8		50.00		106	81	120			

Sample ID: 2008152-01AMSD	Batch ID: 97658	TestNo: SW8260D	Units: mg/L							
SampType: MSD	Run ID: GCMS3_200819A	Analysis Date: 8/19/2020 5:02:00 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Benzene	0.0492	0.00200	0.0464	0	106	81	122	1.27	20	
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Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_200819A

Sample ID: 2008152-01AMSD	Batch ID: 97658	TestNo: SW8260D				Units: mg/L				
SampType: MSD	Run ID: GCMS3_200819A	Analysis Date: 8/19/2020 5:02:00 PM				Prep Date: 8/19/2020				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	0.0454	0.00600	0.0464	0	97.9	73	127	1.14	20	
Toluene	0.0508	0.00600	0.0464	0	109	77	122	0.513	20	
Total Xylenes	0.132	0.00600	0.139	0	95.3	80	121	0.681	20	
Surr: 1,2-Dichloroethane-d4	52.0		50.00		104	72	119	0	0	
Surr: 4-Bromofluorobenzene	49.6		50.00		99.1	76	119	0	0	
Surr: Dibromofluoromethane	54.2		50.00		108	85	115	0	0	
Surr: Toluene-d8	52.9		50.00		106	81	120	0	0	

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_200819A

Sample ID: ICV-200819	Batch ID: R112002	TestNo: SW8260D	Units: mg/L							
SampType: ICV	Run ID: GCMS3_200819A	Analysis Date: 8/19/2020 11:13:00 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0861	0.00200	0.0928	0	92.8	70	130			
Ethylbenzene	0.0818	0.00600	0.0928	0	88.1	70	130			
Toluene	0.0893	0.00600	0.0928	0	96.2	70	130			
Total Xylenes	0.243	0.00600	0.278	0	87.5	70	130			
Surr: 1,2-Dichloroethane-d4	52.4		50.00		105	72	119			
Surr: 4-Bromofluorobenzene	50.2		50.00		100	76	119			
Surr: Dibromofluoromethane	54.2		50.00		108	85	115			
Surr: Toluene-d8	52.6		50.00		105	81	120			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200819A

The QC data in batch 97657 applies to the following samples: 2008152-01C, 2008152-02C, 2008152-03C, 2008152-04C, 2008152-05C

Sample ID: MB-97657	Batch ID: 97657	TestNo: E300	Units: mg/L							
SampType: MBLK	Run ID: IC2_200819A	Analysis Date: 8/19/2020 12:06:15 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	<0.300	1.00								
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Sample ID: LCS-97657	Batch ID: 97657	TestNo: E300	Units: mg/L							
SampType: LCS	Run ID: IC2_200819A	Analysis Date: 8/19/2020 12:22:15 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	9.97	1.00	10.00	0	99.7	90	110			
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Sample ID: LCSD-97657	Batch ID: 97657	TestNo: E300	Units: mg/L							
SampType: LCSD	Run ID: IC2_200819A	Analysis Date: 8/19/2020 12:38:14 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	9.95	1.00	10.00	0	99.5	90	110	0.123	20	
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Sample ID: 2008152-01CMS	Batch ID: 97657	TestNo: E300	Units: mg/L							
SampType: MS	Run ID: IC2_200819A	Analysis Date: 8/19/2020 2:57:19 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	1940	100	2000	227.7	85.8	90	110			S
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Sample ID: 2008152-01CMSD	Batch ID: 97657	TestNo: E300	Units: mg/L							
SampType: MSD	Run ID: IC2_200819A	Analysis Date: 8/19/2020 3:13:19 PM	Prep Date: 8/19/2020							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Chloride	2190	100	2000	227.7	98.1	90	110	11.9	20	
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Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 2008152
Project: 3 Bear - Cottonwood

ANALYTICAL QC SUMMARY REPORT

RunID: IC2_200819A

Sample ID: ICV-200819	Batch ID: R112005	TestNo: E300	Units: mg/L							
SampType: ICV	Run ID: IC2_200819A	Analysis Date: 8/19/2020 11:34:14 AM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	24.8	1.00	25.00	0	99.2	90	110			

Sample ID: CCV1-200819	Batch ID: R112005	TestNo: E300	Units: mg/L							
SampType: CCV	Run ID: IC2_200819A	Analysis Date: 8/19/2020 6:55:58 PM	Prep Date:							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110			

Qualifiers:

- B Analyte detected in the associated Method Blank
- J Analyte detected between MDL and RL
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- J Analyte detected between SDL and RL

- DF Dilution Factor
- MDL Method Detection Limit
- R RPD outside accepted control limits
- S Spike Recovery outside control limits
- N Parameter not NELAP certified