

September 15,
2023

nRM1926352539 / 1RP-5677
2023 3rd Quarter (July-September) Groundwater Monitoring
North Monument G/SA Unit #2102
Lea County, New Mexico

REVIEWED

By Mike Buchanan at 10:54 am, Sep 03, 2024

Review of the 2023, 3Q Groundwater Monitoring Report for N. Monument G/SA #2102: content satisfactory

1. May transition sampling wells to semi-annual until those analyses convey results below the WQCC human health standard, then transition back to sampling quarterly in preparation of closing the incident.
2. Continue to collect samples as prescribed and take DTW for all wells in operation.
3. Submit the 2024 annual report to OCD by April 1, 2025.

Prepared for:



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LAI Project No: 19-0112-51

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Table of Contents

1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	3
2.1 Background	3
2.2 Physical Setting	4
3.0 GROUNDWATER MONITORING.....	4
3.1 Depth to Groundwater and Groundwater Potentiometric Elevation.....	4
3.2 Groundwater Samples and Laboratory Analysis.....	5
3.2.1 Organic Analysis	5
3.2.2 Inorganic Analysis	5
4.0 CONCLUSIONS.....	6
5.0 RECOMMENDATIONS	6

List of Tables

Table 1	Monitor Well Completion and Gauging Summary
Table 2	Groundwater Analytical Data Summary

List of Figures

Figure 1	Topographic Map
Figure 2	Aerial Map
Figure 3	Site Map
Figure 4	Groundwater Potentiometric Map, September 5, 2023
Figure 5	Benzene Concentration in Groundwater, September 5, 2023
Figure 6	Chloride Concentration in Groundwater, September 5, 2023
Figure 7	Chloride Concentration Control Chart

List of Appendices

Appendix A	Initial C-141
Appendix B	Boring Logs
Appendix C	Karst Potential Map
Appendix D	NMOCD Communications
Appendix E	Laboratory Reports

nRM1926352539/1RP-5677

2023 Third Quarter (July – September) Groundwater Monitoring Report
North Monument G/SA Unit #2102, Lea County, New Mexico
September 14, 2023

1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this 2023 third (3rd) quarter (July – September) groundwater monitoring report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) in Santa Fe and Hobbs, New Mexico. This report presents the 2023 third (3rd) quarter laboratory analysis of groundwater samples collected from three (3) monitoring wells (MW-2, TMW-1, and TMW-2) at the North Monument Grayburg San Andres Unit (NM G/SAU) #2102 (Site) located in Unit O (SW/4, SE/4), Section 32, Township 19 South, Range 37 East, in Lea County, New Mexico. The geodetic position is North 32.61233° and West -103.27262°.

The following activities occurred on September 5, 2023:

- Gauged three (3) monitoring wells (MW-2, TMW-1, and TMW-2) for light nonaqueous phase liquid (LNAPL) and depth to groundwater.
- Purged and sampled groundwater from three (3) monitor wells (MW-2, TMW-1, and TMW-2), and a duplicate sample from MW-2 (DUP-1/MW-2) for quality assurance and quality control (QA/QC).
- Analyzed groundwater samples for benzene, toluene, ethylbenzene, xylenes (BTEX) and chloride.

The following observations are documented in this report for September 5, 2023:

- September 5, 2023, depth to groundwater was 11.14 feet below ground surface (bgs) at MW-2, 22.71 feet bgs (TMW-1), and 24.07 feet bgs (TMW-2).
- The groundwater elevation ranged from 3,555.50 feet above mean sea level (MSL) at MW-2 (upgradient) to 3,537.36 feet above MSL at TMW-1 (downgradient).
- The groundwater flow direction was from northwest (MW-2) to southeast (TMW-2) at a gradient of about 0.03 feet per foot.
- BTEX concentrations were below the analytical method reporting limits (RL) and NMWQCC human health standards in all samples on September 5, 2023.
- The chloride concentration in the sample from well MW-2 (232 mg/L) located hydraulically up-gradient and representative of background conditions was below the New Mexico Water Quality Control Commission (NMWQCC) domestic water quality standard of 250 milligrams per liter (mg/L).
- Chloride in groundwater samples from TMW-1 (350 mg/L) and TMW-2 (360 mg/L) exceeded the NMWQCC domestic water quality standard of 250 mg/L.
- No significant changes in depth to groundwater, groundwater flow conditions and analyte concentrations were observed during the third 2023 quarterly monitoring events on September 5, 2023.

Recommendations:

- Apache will continue to notify NMOCD at seven (7) working in days in advance of each quarterly groundwater monitoring event and immediately for any significant changes in analyte

nRM1926352539/1RP-5677

2023 Third Quarter (July – September) Groundwater Monitoring Report

North Monument G/SA Unit #2102, Lea County, New Mexico

September 15, 2023

concentrations in groundwater samples. Apache requests approval to reduce groundwater monitoring frequency from quarterly (4 time per year) to semi-annual (2 times per year) and submit reports to NMOCD after each semi-annual monitoring event.

nRM1926352539/1RP-5677

2023 Third Quarter (July – September) Groundwater Monitoring Report
North Monument G/SA Unit #2102, Lea County, New Mexico
September 15, 2023

2.0 INTRODUCTION

Larson & Associates, Inc. (LAI) has prepared this 2023 third (3rd) quarter (July – September) groundwater monitoring report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) in Santa Fe and Hobbs, New Mexico. This report presents the September 5, 2023, third (3rd) quarter laboratory analysis of groundwater samples from three (3) monitoring wells (MW-2, TMW-1, and TMW-2) at the North Monument Grayburg San Andres Unit (NMS/SAU Well #2102 (Site) located in Unit O (SW/4, SE/4), Section 32, Township 19 South, Range 37 East, in Lea County, New Mexico. The geodetic position is North 32.61233° and West -103.27262°. Figure 1 presents a topographic map.

2.1 Background

A crude oil and produced water release occurred on August 16, 2019, due to corrosion and failure of a buried 3-inch steel flowline. The failure allowed for an unknown volume of crude oil and produced water to be released. Approximately 2.5 barrels (bbls) of crude oil and produced water were recovered. The fluid pooled in the pasture south of the well pad and west of the lease road. Immediate notice was given to Mr. Dylan Rose-Cross (NMOCD) by Mr. Jeffery Broom (Apache Environmental Tech) via email on August 16, 2019. The surface ownership is private. The initial C-141 was submitted on August 29, 2019, and assigned remediation permit number of 1RP-5677. Appendix A presents the initial C-141.

An Apache contractor remediated the spill area. On October 10, 2019, Apache applied for a variance to backfill the excavation due to TPH and chloride concentrations remaining above the NMOCD limits in soil below the excavation at approximately 12 feet bgs and with groundwater between approximately 21 to 23 feet bgs. The request stated that Apache would backfill the excavation with clean caliche to about 6 feet bgs, install a 20-mil polyethylene synthetic liner, and complete backfilling with clean topsoil containing chloride less than 600 mg/Kg.

On October 16, 2019, NMOCD conditionally approved the variance request with the condition that Apache install two (2) monitor wells, with TMW-1 installed as close as possible to the source of the release and TMW-2 installed hydraulically down gradient approximately 150 feet southeast of the excavation. NMOCD requested one (1) monitor well be installed hydraulically upgradient to monitor background groundwater quality. Apache proposed to use an existing monitoring well (NMGSAU #1631, MW-2) located approximately 375 feet northwest for the up-gradient monitoring well.

On November 14, 2019, Apache backfilled the excavation with clean caliche to about 6 feet bgs prior to installing the 20-mil polyethylene synthetic liner and completed backfilling above the liner with clean topsoil to the surface. The backfilled area measures approximately 16,024 square feet and was seeded with BLM Mix #2.

On March 11, 2020, Scarborough Drilling, Inc. (SDI) under supervision from LAI installed the monitoring wells (TMW-1 and TMW-2) utilizing an air rotary rig. The wells were drilled to depths of approximately 30 feet bgs and were completed with 2-inch schedule 40 threaded PVC casing. Approximately twenty (20)

nRM1926352539/1RP-5677

2023 Third Quarter (July – September) Groundwater Monitoring Report
North Monument G/SA Unit #2102, Lea County, New Mexico
September 15, 2023

feet of 0.010-inch factory slotted screen was installed above and below the groundwater observed at the time of drilling. The well screen is surrounded with graded silica sand to about 2 feet above the well screen. The annular space above the sand was filled with bentonite chips to about 1-foot bgs. The wells were secured with locking steel protectors anchored in concrete. West Company, a State of New Mexico licensed professional land surveyor (License Number 23263), surveyed the monitoring wells for position and elevation including top of casing and natural ground surface. Drill cuttings were logged for lithology according to the Unified Soil Classification System (ASTM D 2487-06). The wells were installed at the locations presented in Figure 3.

On December 21, 2020, LAI issued a report titled “1RP-5677 Closure Report North Monument G/SA Unit #2102 Produced Water and Crude Oil Release” documenting the excavation closure and monitoring well installations. The report was submitted to the NMOCD in Santa Fe and Hobbs, New Mexico. No response has been received from the NMOCD regarding this closure report and the incident remains open on the NMOCD web portal. Appendix B presents the well logs and completion records.

2.2 Physical Setting

The physical setting is as follows:

- The surface elevation is approximately 3,564 feet above msl.
- The topography slopes gently towards the southeast.
- There are no surface water features within 1,000 feet of the Site.
- Karst data provided by the USGS describes this site as “Low Risk Potential”.
- The soils are designated Berino-Cacique fine sandy loams association, 0 to 3 percent slopes, consisting of 8 inches of fine sandy loam and 52 inches of sandy clay loam in descending order.
- The surface geology consists of eolian and piedmont deposits (Holocene to middle Pleistocene) interlayered eolian sands and piedmont-slop deposits.
- Groundwater occurs in the Ogallala Formation between about 21 to 23 feet bgs based on depth to groundwater measurements from two (2) monitoring wells (TMW-1 and TMW-2) installed near the excavation.

Appendix C presents the Karst Potential Map

3.0 GROUNDWATER MONITORING

3.1 Depth to Groundwater and Groundwater Potentiometric Elevation

On September 5, 2023, LAI personnel gauged monitor wells MW-2, TMW-1, and TMW-2 for light nonaqueous phase liquid (LNAPL) and depth to groundwater. LNAPL was not detected in the monitoring wells. Groundwater was gauged at 14.02 (MW-2), 25.61 (TMW-1), and 27.11 (TMW-2) feet below top of casing (TOC) or about 11.14 (MW-2), 22.71 (TMW-1) and 24.07 (TMW-2) feet bgs. The groundwater potentiometric surface elevation ranged from 3,555.50 feet above MSL at well MW-2 (up gradient) to

nRM1926352539/1RP-5677

2023 Third Quarter (July – September) Groundwater Monitoring Report
North Monument G/SA Unit #2102, Lea County, New Mexico
September 15, 2023

3,537.36 feet above MSL at well TMW-2 (down gradient). Groundwater flow was from northwest to southeast at a gradient of about 0.0308 feet/foot. No significant changes in groundwater flow direction or gradient were observed on September 5, 2023, compared to the previous monitoring event on June 6, 2023. Figure 4 presents the groundwater potentiometric surface map for September 5, 2023.

3.2 Groundwater Samples and Laboratory Analysis

On September 5, 2023, LAI personnel collected groundwater samples from monitoring wells MW-2, TMW-1, and TMW-2 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. Notification of the groundwater sampling event was submitted to the NMOCD on August 22, 2023.

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 of potable water and laboratory grade detergent (Alconox®) and rinsed with distilled water. Quality assurance and quality control (duplicate) samples were collected from MW-2 (DUP-1). The samples were carefully transferred to laboratory containers that were labeled, packed in an ice filled chest affixed with custody seals, and delivered under chain of custody control to Xenco-Eurofins Laboratories (Xenco-Eurofins), a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory, located in Midland, Texas. Xenco-Eurofins analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8021B and chloride by EPA Method 300, respectively. Table 2 presents the laboratory analytical data summary. Appendix D presents the NMOCD communications. Appendix E presents the laboratory report.

3.2.1 Organic Analysis

Xenco reported BTEX concentrations below the laboratory analytical reporting limit (RL) and New Mexico Water Quality Control Commission (WQCC) human health standards in groundwater samples collected from MW-2, TMW-1, TMW-2, and DUP-1/(TMW-1). No data quality exceptions were noted in the Xenco case narratives. The results are consistent with the results from all previous groundwater monitoring events. Figure 5 presents the benzene concentrations in groundwater map.

3.2.2 Inorganic Analysis

The chloride concentrations were 232 mg/L in MW-2, 350 mg/L (TMW-1) and 360 mg/L (TMW-2). Chloride concentrations in groundwater samples from wells TMW-1 and TMW-2 exceeded the WQCC domestic water quality standard (250 mg/L). The chloride concentration in the groundwater sample from MW-2 (upgradient) was below the WQCC domestic water quality standard and appears representative of background conditions. The duplicate (QA/QC) sample (Dup-1) collected from MW-2 (241 mg/L) is 3.87 percent of the original chloride value (232 mg/L) for MW-2. The chloride concentrations in samples collected on September 5, 2023, are consistent with the chloride concentrations reported in samples collected on June 6, 2023. No data quality exceptions were noted in the Eurofins-Xenco case narratives.

nRM1926352539/1RP-5677
2023 Third Quarter (July – September) Groundwater Monitoring Report
North Monument G/SA Unit #2102, Lea County, New Mexico
September 15, 2023

Figure 6 presents the groundwater chloride concentration map. Figure 7 presents the chloride concentration control chart.

4.0 CONCLUSIONS

The following observations are documented in this report:

- Monitoring well MW-2 remains hydraulically up gradient and representative of background chloride in groundwater.
- BTEX was reported below the analytical method RL and NMWQCC human health standards in wells MW-2, TMW-1, and TMW-2.
- Chloride concentrations in groundwater samples from TMW-1 (350 mg/L) and TMW-2 (360 mg/L) exceeded the NMWQCC domestic water quality standard of 250 mg/L.
- Chloride concentrations in groundwater samples from MW-2 (232 mg/L) are reported below the WQCC domestic water quality standard.

5.0 RECOMMENDATIONS

Apache proposes the following modifications to the groundwater monitoring program:

- Reduce frequency of groundwater monitoring from quarterly (4 times per year) to semi-annually (2 times per year).
- Collect depth to groundwater and groundwater samples from all monitoring wells during each semi-annual event.
- Report the laboratory results to NMOCD in semi-annual reports, unless significant changes in analyte concentrations are detected, at which time Apache will immediately report the results to NMOCD.

Apache will provide notice to the NMOCD in Hobbs and Santa Fe, New Mexico, at least 7 working days prior to each monitoring event.

Tables

Table 1
Monitor Well Completion and Gauging Summary
Apache Corporation, NMGSAU 2102
Lea 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-2	Unknown	62.91	60.03	2	3566.64	Unknown	2.88	3,569.52	03/12/2020	13.59	10.71	49.32	3,555.93
									07/20/2020	13.75	10.87	49.16	3,555.77
									10/01/2020	13.90	11.02	49.01	3,555.62
									12/08/2020	13.81	10.93	49.10	3,555.71
									03/10/2021	13.80	10.92	49.11	3,555.72
									06/11/2021	13.80	10.92	49.11	3,555.72
									10/12/2021	13.81	10.93	49.10	3,555.71
									12/21/2021	13.76	10.88	49.15	3,555.76
									08/15/2022	13.95	11.07	48.96	3,555.57
									12/12/2022	13.81	10.93	49.10	3,555.71
									03/09/2023	13.80	10.92	49.11	3,555.72
									06/06/2023	13.85	10.97	49.06	3,555.67
									09/05/2023	14.02	11.14	48.89	3,555.50
TMW-1	3/11/2020	36.23	33.33	2	3561.92	9.83 - 29.49	2.90	3,564.82	03/12/2020	24.37	21.47	11.86	3,540.45
									07/20/2020	24.95	22.05	11.28	3,539.87
									10/01/2020	24.90	22.00	11.33	3,539.92
									12/08/2020	24.65	21.75	11.58	3,540.17
									03/10/2021	24.60	21.70	11.63	3,540.22
									06/11/2021	24.80	21.9	11.43	3,540.02
									10/12/2021	24.96	22.06	11.27	3,539.86
									12/21/2021	24.64	21.74	11.59	3,540.18
									08/15/2022	25.45	22.55	10.78	3,539.37
									12/12/2022	24.64	21.74	11.59	3,540.18
									03/09/2023	24.56	21.66	11.67	3,540.26
									06/06/2023	24.66	21.76	11.57	3,540.16
									09/05/2023	25.61	22.71	10.62	3,539.21
TWM-2	3/11/2020	37.07	34.03	2	3561.43	10.05 - 29.30	3.04	3,564.47	03/12/2020	26.38	23.34	10.69	3,538.09
									07/20/2020	26.70	23.66	10.37	3,537.77

Table 1
Monitor Well Completion and Gauging Summary
Apache Corporation, NMGSAU 2102
Lea 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)
									10/01/2020	26.70	23.66	10.37	3,537.77
									12/08/2020	26.51	23.47	10.56	3,537.96
									03/10/2021	26.40	23.36	10.67	3,538.07
									06/11/2021	26.57	23.53	10.50	3,537.90
									10/12/2021	26.72	23.68	10.35	3,537.75
									12/21/2021	26.49	23.45	10.58	3,537.98
									08/15/2022	27.01	23.97	10.06	3,537.46
									12/12/2022	26.53	23.49	10.54	3,537.94
									03/09/2023	26.43	23.39	10.64	3,538.04
									06/06/2023	26.51	23.47	10.56	3,537.96
									09/05/2023	27.11	24.07	9.96	3,537.36

Notes:

Monitoring wells TMW-1 and TMW-2 installed by Scarborough Drilling, Inc. (SDI), with 2-inch schedule 40 PVC casing and screen.

bgs: below ground surface

TOC: top of casing

AMSL: above mean sea level

Groundwater Sample Analytical Data Summary

Apache Corporation, NMGSAU 2102

Lea County, New Mexico

Sample	Collection Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
WQCC Standard:		*0.005	* 1	*0.7	*0.62	**250
MW-2	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	230
	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	231
	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	241
	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	227
	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	235
	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	212
	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	207
	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	222
	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	232
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	223
	03/09/2023	<0.00200	<0.00200	<0.00200	<0.00400	254
	06/06/2023	<0.00200	<0.00200	<0.00200	<0.00400	236
	09/05/2023	<0.00200	<0.00200	<0.00200	<0.00200	232
TMW-1	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	360
	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	432
	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	452
	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	449
	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	418
	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	361
	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	291
	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	406
	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	306
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	358
	03/09/2023	<0.00200	<0.00200	<0.00200	<0.00400	378
	06/06/2023	<0.00200	<0.00200	<0.00200	<0.00400	355
	09/05/2023	<0.00200	<0.00200	<0.00200	<0.00400	350
TMW-2	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	423
	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	664
	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	591
	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	473
	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	428
	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	402

Groundwater Sample Analytical Data Summary

Apache Corporation, NMGSAU 2102

Lea County, New Mexico

	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	325
	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	388
	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	362
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	338
	03/09/2023	<0.00200	<0.00200	<0.00200	<0.00400	401
	06/06/2023	<0.00200	<0.00200	<0.00200	<0.00400	393
	09/05/2023	<0.00200	<0.00200	<0.00200	<0.00400	360
QA/QC (Duplicate) Samples						
DUP-1 (MW-2)	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	223
DUP-1 (MW-2)	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	242
DUP-1 (MW-2)	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	245
DUP-1 (MW-2)	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	226
DUP-1 (MW-2)	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	237
DUP-1 (MW-2)	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	213
DUP-1 (MW-2)	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	305
DUP-1 (MW-2)	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	226
DUP-1 (MW-2)	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	254
DUP-1 (MW-2)	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	221
DUP-1 (TMW-2)	03/09/2023	<0.00200	<0.00200	<0.00200	<0.00400	412
DUP-1 (TMW-2)	06/06/2023	<0.00200	<0.00200	<0.00200	<0.00400	241
DUP-1 (MW-2)	09/05/2023	<0.00200	<0.00200	<0.00200	<0.00400	241

Notes:

analysis performed by Xenco Laboratories, Midland, Texas by EPA SW-846 Method 8021B (BTEX)
and Method 300 (chloride)

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

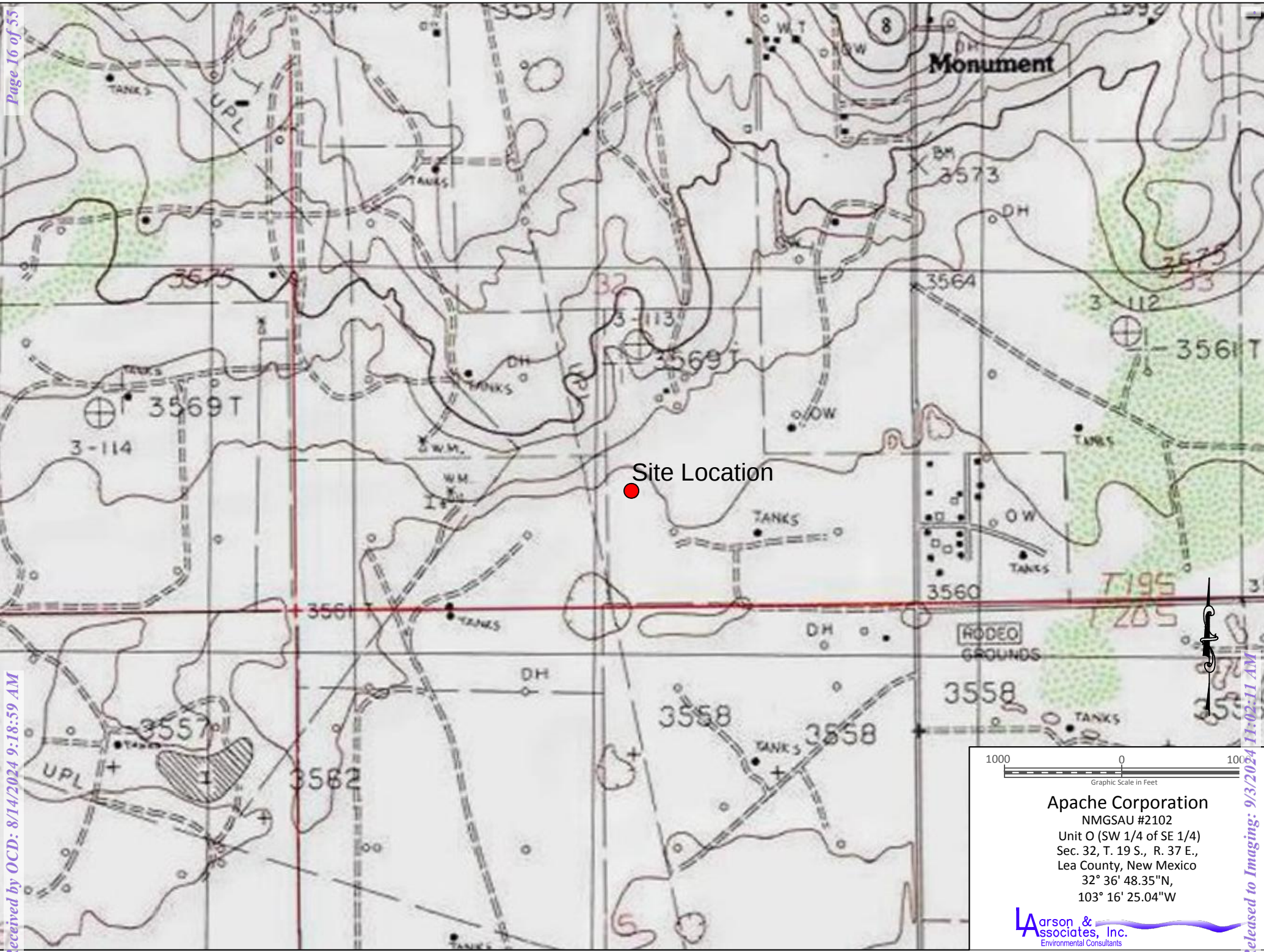
< values - denotes concentration is less than method reporting limit (RL).

* - NMWQCC human health standard

** - NMWQCC domestic water quality standard

BGS - below ground surface

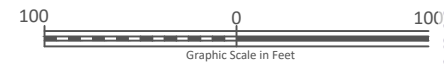
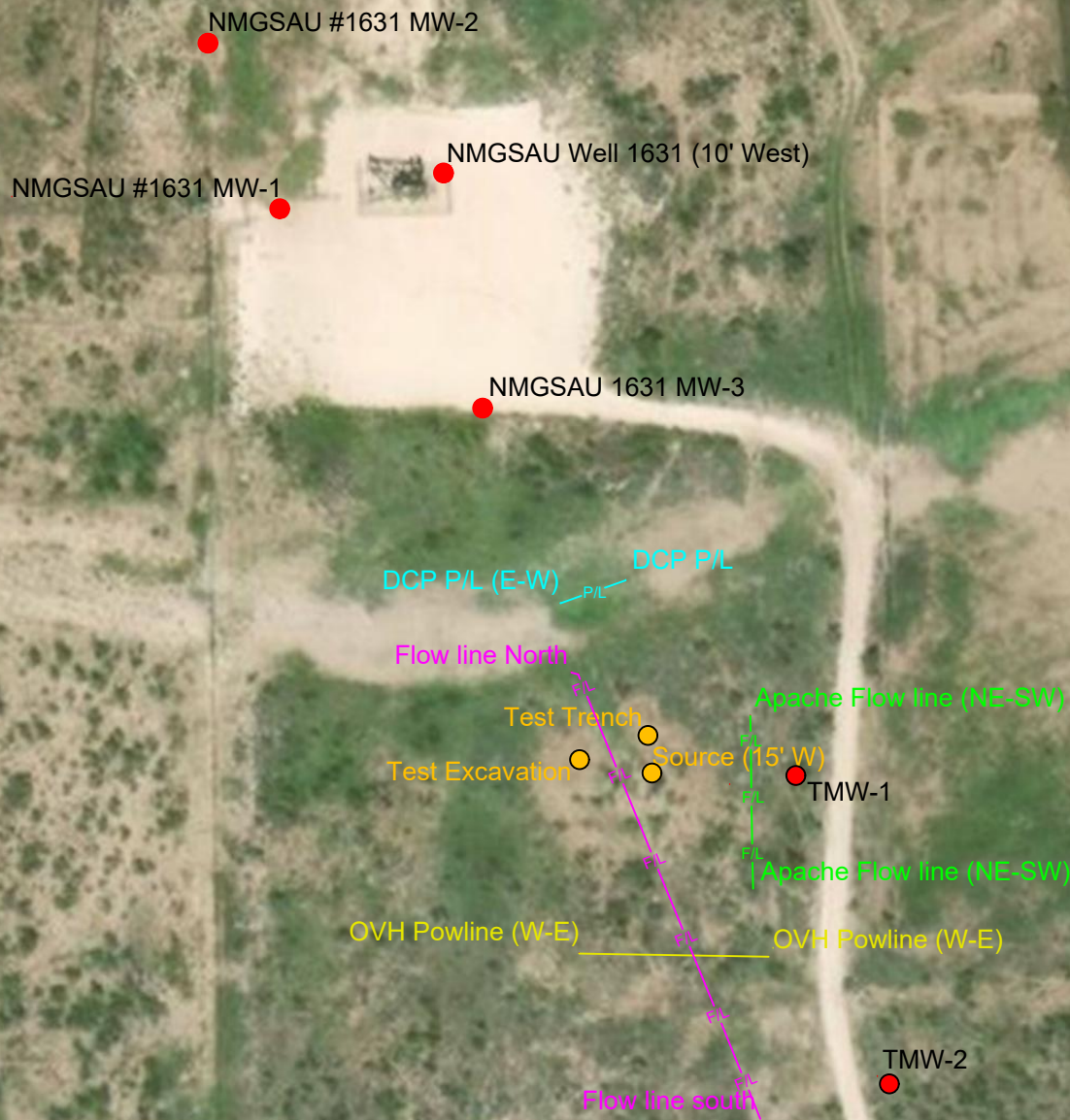
Figures



Apache Corporation
NMGSAU #2102
Unit O (SW 1/4 of SE 1/4)
Sec. 32, T. 19 S., R. 37 E.,
Lea County, New Mexico
32° 36' 48.35"N,
103° 16' 25.04"W

Larson &
Associates, Inc.
Environmental Consultants

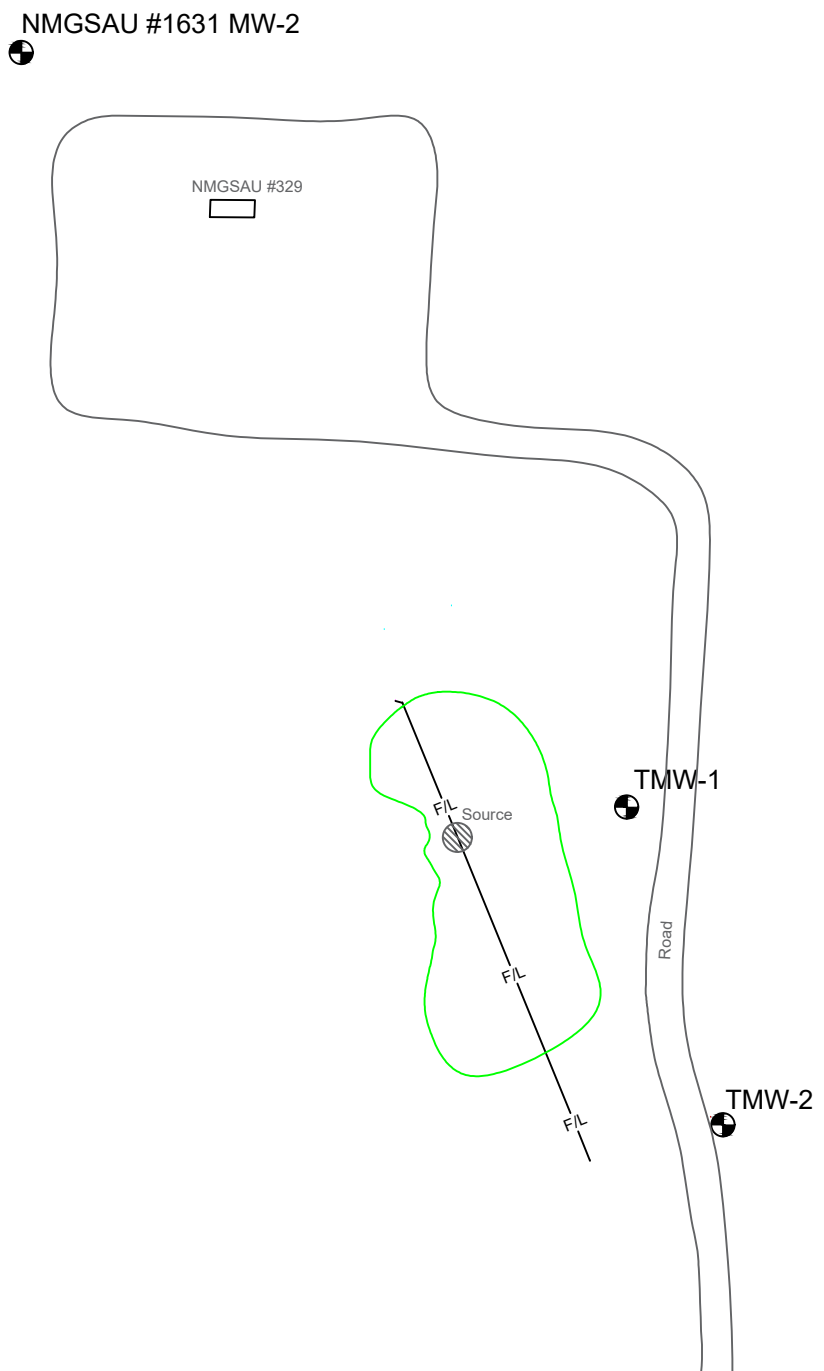
Figure 1 - Topographic Map



Apache Corporation
NMGSAU #2102
Unit O (SW 1/4 of SE 1/4)
Sec. 32, T. 19 S., R. 37 E.,
Lea County, New Mexico
32° 36' 48.35"N,
103° 16' 25.04"W



Figure 2 - Aerial Map



100 0 100
Graphic Scale in Feet

Apache Corporation
NMGSAU #2102
Unit O (SW 1/4 of SE 1/4)
Sec. 32, T. 19 S., R. 37 E.,
Lea County, New Mexico
32° 36' 48.35"N,
103° 16' 25.04"W

Larson & Associates, Inc.
Environmental Consultants



Figure 3 - Base Map

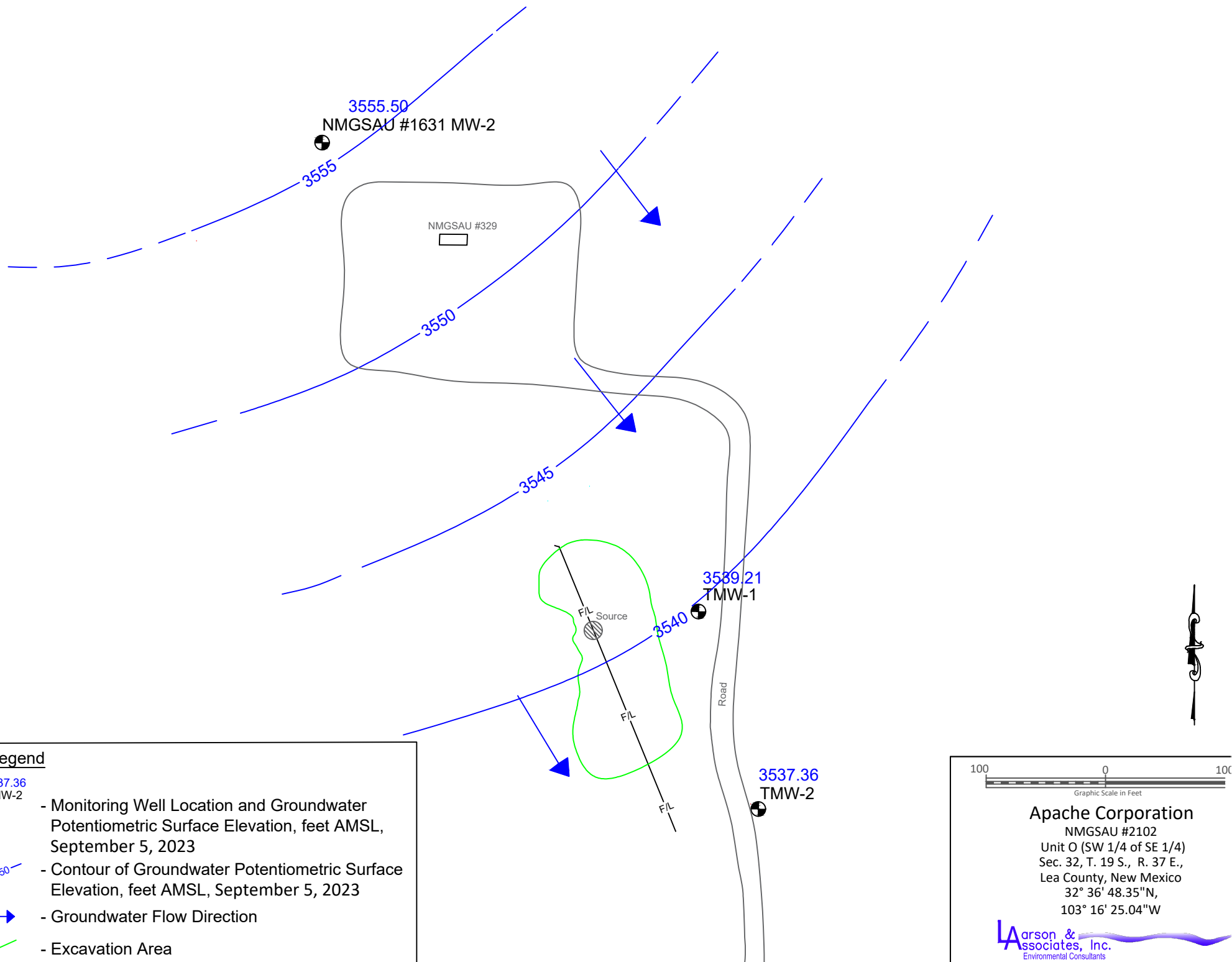


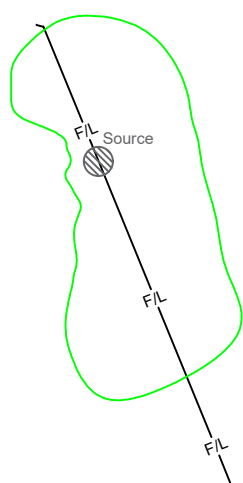
Figure 4 - Groundwater Potentiometric Surface Map, September 5, 2023

NMGS AU #1631 MW-2
● <0.0020

NMGS AU #329
□

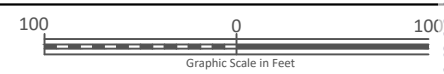
<0.0020
TMW-1
●

<0.0020
TMW-2
●



Legend

- <0.0020
TMW-2 - Monitoring Well Location and Benzene Concentration in Groundwater, mg/L, September 5, 2023
- Concentration Below Analytical Method Reporting Limit
- 0.01 mg/L: NWQCC Human WOH Quality Standard



Apache Corporation
NMGS AU #2102
Unit O (SW 1/4 of SE 1/4)
Sec. 32, T. 19 S., R. 37 E.,
Lea County, New Mexico
32° 36' 48.35"N,
103° 16' 25.04"W

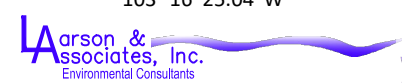
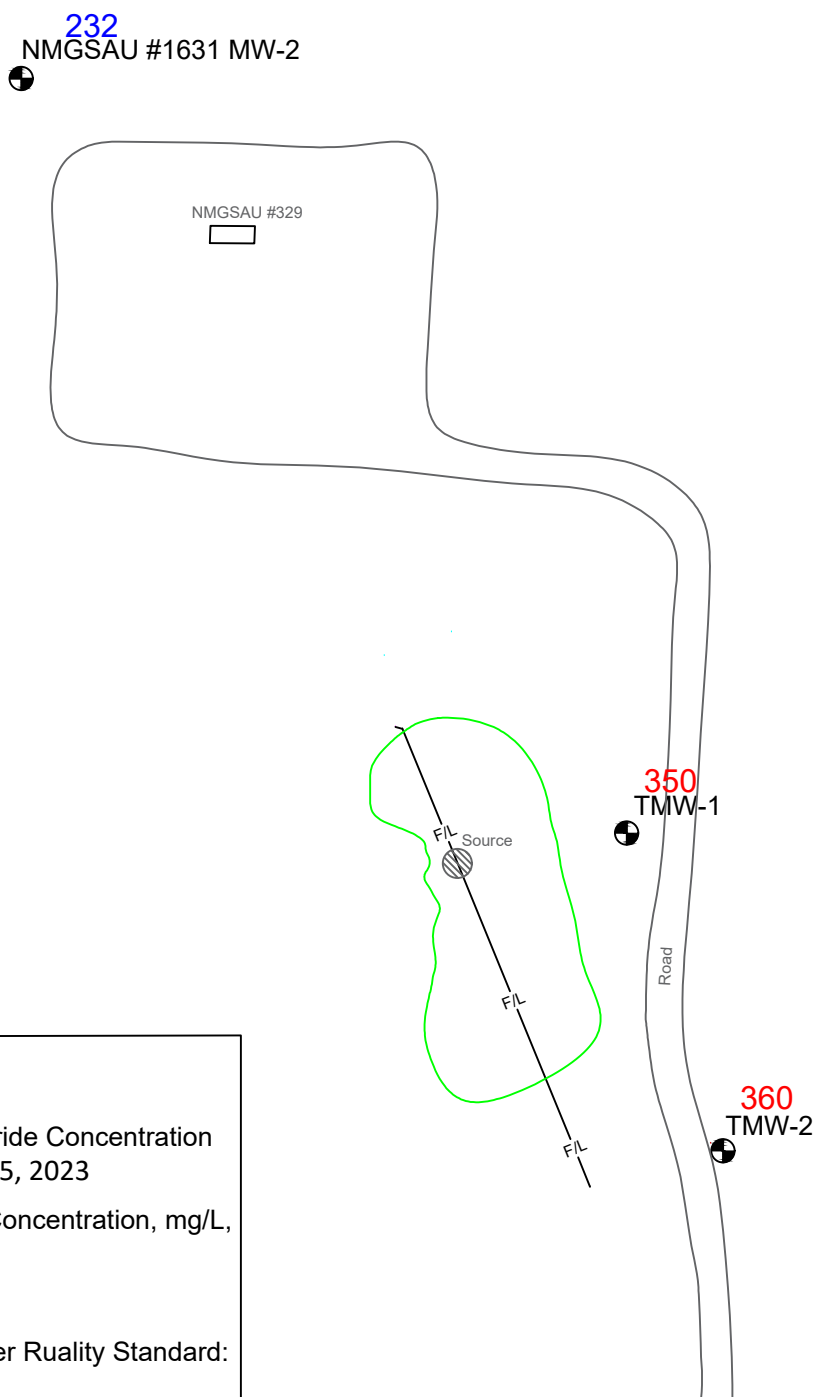
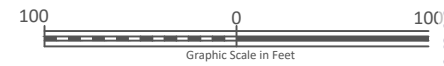


Figure 5 - Benzene Concentration in Groundwater Map, September 5, 2023



Legend

- 360 TMW-2 - Monitoring Well Location and Chloride Concentration in Groundwater, mg/L, September 5, 2023
- 350 - Contour of Groundwater Chloride Concentration, mg/L, September 5, 2023
- Excavation Area
- Exceeds NMWQCC Domestic Water Ruality Standard: 250 mg/L



Apache Corporation
NMGSAU #2102
Unit O (SW 1/4 of SE 1/4)
Sec. 32, T. 19 S., R. 37 E.,
Lea County, New Mexico
32° 36' 48.35"N,
103° 16' 25.04"W

Larson & Associates, Inc.
Environmental Consultants

Figure 6 - Chloride Concentration in Groundwater Map, September 5, 2023

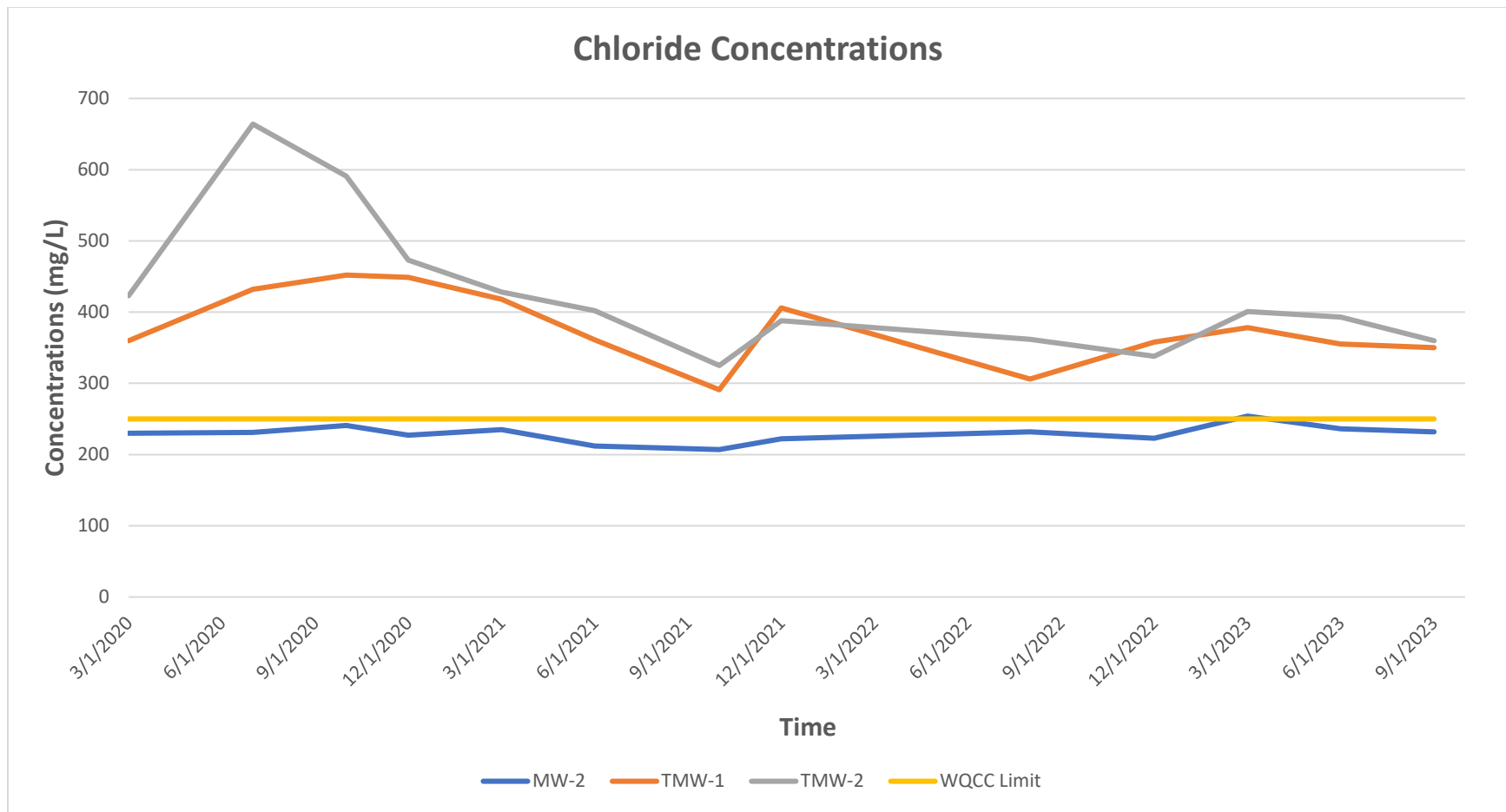


Figure 7 – Chloride Concentration Control Chart

Appendix A

Initial C-141

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	<u>16</u> (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☐ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas not on an exploration, development, production, or storage site?	☒ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: *Each of the following items must be included in the report.*

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☐ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within 1/2-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table I of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141

Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Bruce BAKER

Title: Environmental Tech. SR.

Signature: Bruce Baker

Date: 10-14-19

email: larry.baker@apachecorp.com

Telephone: 432-631-6982

OCD Only

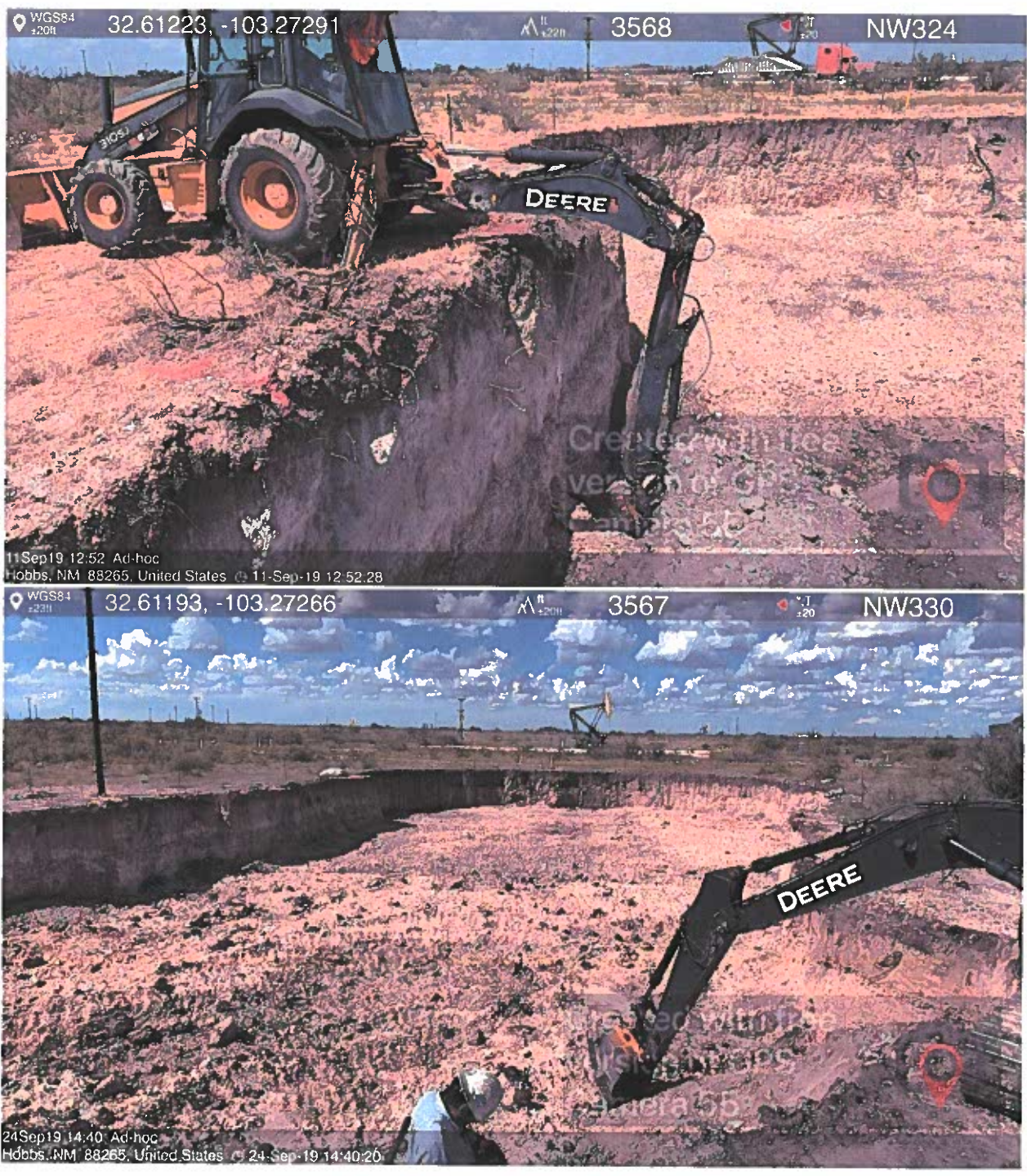
Received by: _____

Date: _____

Appendix E

Photographs





Appendix B
Soil Boring Logs

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 10:29 Finish: 11:45 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	Surface Elevation: TOC Elevation:		NUMBER	RECOVERY	DEPTH	REMARKS
										BACKGROUND PID READING
	0	Sand, 7.5YR, 6/5 to 6/4, Well Sorted, Very Fine Grained Quartz Sand, Light Brown	ML							SOIL : _____ PPM SOIL : _____ PPM
	5	Caliche, 7.5YR, 8/3, Pink, 2-10mm Subangular Clast Inclusions, Fine Grained	Caliche							
	10	Silty Sand, 7.5YR, 8/4, Pink, Moderately Sorted with Subangular 1-6mm Clast Inclusions								
	15	7.5YR, 8/6, Reddish Yellow, Moderately Sorted with Subangular 2-6mm Clast Inclusions	ML							
	20									
	25									
	30	TD: 30'								

☐ ONE CONTINUOUS AUGER SAMPLER

☐ STANDARD PENETRATION TEST

☐ UNDISTURBED SAMPLE

☐ WATER TABLE (24 HRS)

☐ WATER TABLE (TIME OF BORING)

☐ LABORATORY TEST LOCATION

☐ PENETROMETER (TONS/ SQ. FT)

☐ NO RECOVERY

JOB NUMBER : 19-0112-51 / Apache Corp.

HOLE DIAMETER : 2"

LOCATION : NMGSAU 2102

LAI GEOLOGIST : R. Nelson

DRILLING CONTRACTOR : SDI

DRILLING METHOD : Air Rotary

BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 12:36 Finish: 1:09 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	Surface Elevation: TOC Elevation:		NUMBER	RECOVERY	DEPTH	REMARKS
										BACKGROUND PID READING
	0	Sand, 7.5YR, 6/5 to 6/4, Well Sorted, Very Fine Quartz Grained Sand, Light Brown	ML							SOIL: _____ PPM SOIL: _____ PPM
	5	Caliche, 7.5YR, 8/3, Pink, 2-10mm Subangular Clast Inclusions, Fine Grained	Caliche							
	10	Silty Sand, 7.5YR, 8/4, Pink, Moderately Sorted with Subangular 1-6mm Clast Inclusions								
	15	7.5YR, 8/6, Reddish Yellow, Moderately Sorted with Subangular 2-6mm Clast Inclusions	ML							
	20									
	25									
	30	TD: 30'								

☐ ONE CONTINUOUS AUGER SAMPLER

☐ STANDARD PENETRATION TEST

☐ UNDISTURBED SAMPLE

☐ WATER TABLE (24 HRS)

☐ WATER TABLE (TIME OF BORING)

☐ LABORATORY TEST LOCATION

☐ PENETROMETER (TONS/ SQ. FT)

☐ NR NO RECOVERY

JOB NUMBER : 19-0112-51 / Apache Corp.

HOLE DIAMETER : 2"

LOCATION : NMGSAU 2102

LAI GEOLOGIST : R. Nelson

DRILLING CONTRACTOR : SDI

DRILLING METHOD : Air Rotary

Appendix C
Karst Risk Potential



Browser

★ Favorites

▶ Spatial Bookmarks

▶ Project Home

▶ Home

▶ C:\

▶ D:\

▶ L:\

▶ Z:\

▶ GeoPackage

▶ SpatiaLite

▶ PostgreSQL

▶ MSSQL

▶ Oracle

▶ DB2

▶ WMS/WMTS

▶ XYZ Tiles

▶ WCS

▶ WFS / OGC API - Features

▶ OWS

▶ ArcGisMapServer

▶ ArcGisFeatureServer

▶ GeoNode

Layers

✓ Added geom info

✓ carlsbad_west

▼ Karst_or_No_Karst

✓ High

✓ Low

✓ Medium

✓

▼ Bing Satellite



Appendix D
NMOCD Communications

Daniel St. Germain

From: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Sent: Tuesday, August 22, 2023 9:21 AM
To: Robert Nelson
Cc: 'Larry.Baker@apachecorp.com'; Mark Larson; Daniel St. Germain; Bratcher, Michael, EMNRD
Subject: Re: [EXTERNAL] Apache Corp. NMGSAU 2102 (1RP-5677 / nRM1926352539) and NEDU #527 (1RP-1113 / nPAC0631334833) Groundwater Notice

Good morning Robert,

Thank you for the notice. If an OCD representative is not on-site on the date &/or time given, please proceed with your sampling. For whatever reason, the sample collection timeframe is altered, please notify the OCD as soon as possible so we may adjust our schedule(s). Failure to notify the OCD of the rescheduling may result in the sample(s) not being accepted.

Please keep a copy of this communication for inclusion within the appropriate reporting documentation.

The OCD requires a copy of all correspondence related to remedial activities be included in all proposals, weekly/monthly/quarterly/semi-annual/annual, or final closure reports. Correspondence reporting requirements may include, but not limited to, notifications for sampling or drilling event(s), and request for time extension(s) or variance(s).

If you have any questions, please contact me via email at your convenience.

Thanks again

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Robert Nelson <rnelson@laenvironmental.com>
Sent: Tuesday, August 22, 2023 8:16 AM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>; Bratcher, Michael, EMNRD <mike.bratcher@emnrd.nm.gov>
Cc: 'Larry.Baker@apachecorp.com' <Larry.Baker@apachecorp.com>; Mark Larson <Mark@laenvironmental.com>;

Daniel St. Germain <dstgermain@laenvironmental.com>

Subject: [EXTERNAL] Apache Corp. NMGSAU 2102 (1RP-5677 / nRM1926352539) and NEDU #527 (1RP-1113 / nPAC0631334833) Groundwater Notice

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Hello Mr. Velez and Mr. Bratcher,

This message is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of Apache Corporation to provide notice that personnel from Larson & Associates, Inc. (LAI) will be at the NMGSAU 2102 (1RP-5677 / nRM1926352539) and NEDU #527 (1RP-1113 / nPAC0631334833) on September 5, 2023, at approximately 10:00 mst and 13:00 mst, respectively, for the purpose of collecting groundwater samples from monitoring wells per the OCD approved plans. Please feel free to contact Bruce Baker with Apache at (432) 631-6982 or Larry.Baker@apache.com, Mark Larson at (432) 687-0901 or mark@laenvironmental.com or me if you have any questions.

Thank you,

Robert Nelson
Sr. Geologist
Office – 432-687-0901
Cell – 432-664-4804
rnelson@laenvironmental.com



Appendix E
Laboratory Reports



Environment Testing

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

ANALYTICAL REPORT

PREPARED FOR

Attn: Mr. Mark J Larson
Larson & Associates, Inc.
507 N Marienfeld
Suite 202
Midland, Texas 79701

Generated 9/7/2023 11:49:13 AM

JOB DESCRIPTION

NMGSAU 2102
SDG NUMBER 19-0112-51

JOB NUMBER

880-32886-1

Eurofins Midland
1211 W. Florida Ave
Midland TX 79701

Eurofins Midland

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



Generated
9/7/2023 11:49:13 AM

Authorized for release by
Holly Taylor, Project Manager
Holly.Taylor@et.eurofinsus.com
(806)794-1296

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Laboratory Job ID: 880-32886-1
SDG: 19-0112-51

Table of Contents

Cover Page	1
Table of Contents	3
Definitions/Glossary	4
Case Narrative	5
Client Sample Results	6
Surrogate Summary	8
QC Sample Results	9
QC Association Summary	11
Lab Chronicle	12
Certification Summary	13
Method Summary	14
Sample Summary	15
Chain of Custody	16
Receipt Checklists	17

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Definitions/Glossary

Client: Larson & Associates, Inc.
Project/Site: NMGS AU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Qualifiers

GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Case Narrative

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Job ID: 880-32886-1

Laboratory: Eurofins Midland

Narrative
Job Narrative 880-32886-1

Receipt

The samples were received on 9/6/2023 10:57 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 6.0°C

GC VOA

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

HPLC/IC

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

1
2
3
4
5
6
7
8
9
10
11
12
13
14

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Client Sample ID: MW-2

Lab Sample ID: 880-32886-1

Date Collected: 09/05/23 11:20

Matrix: Water

Date Received: 09/06/23 10:57

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L			09/07/23 01:06	1
Toluene	<2.00	U	2.00	ug/L			09/07/23 01:06	1
Ethylbenzene	<2.00	U	2.00	ug/L			09/07/23 01:06	1
m,p-Xylenes	<4.00	U	4.00	ug/L			09/07/23 01:06	1
o-Xylene	<2.00	U	2.00	ug/L			09/07/23 01:06	1
Xylenes, Total	<4.00	U	4.00	ug/L			09/07/23 01:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		70 - 130		09/07/23 01:06	1
1,4-Difluorobenzene (Surr)	113		70 - 130		09/07/23 01:06	1

Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			09/07/23 10:57	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	232		2.50	mg/L			09/06/23 21:35	5

Client Sample ID: TMW-1

Lab Sample ID: 880-32886-2

Date Collected: 09/05/23 12:00

Matrix: Water

Date Received: 09/06/23 10:57

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L			09/07/23 01:27	1
Toluene	<2.00	U	2.00	ug/L			09/07/23 01:27	1
Ethylbenzene	<2.00	U	2.00	ug/L			09/07/23 01:27	1
m,p-Xylenes	<4.00	U	4.00	ug/L			09/07/23 01:27	1
o-Xylene	<2.00	U	2.00	ug/L			09/07/23 01:27	1
Xylenes, Total	<4.00	U	4.00	ug/L			09/07/23 01:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		70 - 130		09/07/23 01:27	1
1,4-Difluorobenzene (Surr)	115		70 - 130		09/07/23 01:27	1

Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			09/07/23 10:57	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	350		5.00	mg/L			09/06/23 22:07	10

Client Sample ID: TMW-2

Lab Sample ID: 880-32886-3

Date Collected: 09/05/23 12:39

Matrix: Water

Date Received: 09/06/23 10:57

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L			09/07/23 01:47	1
Toluene	<2.00	U	2.00	ug/L			09/07/23 01:47	1

Eurofins Midland

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NMGS AU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Client Sample ID: TMW-2

Lab Sample ID: 880-32886-3

Date Collected: 09/05/23 12:39

Matrix: Water

Date Received: 09/06/23 10:57

Method: SW846 8021B - Volatile Organic Compounds (GC) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	<2.00	U	2.00	ug/L			09/07/23 01:47	1
m,p-Xylenes	<4.00	U	4.00	ug/L			09/07/23 01:47	1
o-Xylene	<2.00	U	2.00	ug/L			09/07/23 01:47	1
Xylenes, Total	<4.00	U	4.00	ug/L			09/07/23 01:47	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		70 - 130				09/07/23 01:47	1
1,4-Difluorobenzene (Surr)	112		70 - 130				09/07/23 01:47	1

Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			09/07/23 10:57	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	360		5.00	mg/L			09/06/23 22:14	10

Client Sample ID: DUP-1

Lab Sample ID: 880-32886-4

Date Collected: 09/05/23 00:00

Matrix: Water

Date Received: 09/06/23 10:57

Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L			09/07/23 02:08	1
Toluene	<2.00	U	2.00	ug/L			09/07/23 02:08	1
Ethylbenzene	<2.00	U	2.00	ug/L			09/07/23 02:08	1
m,p-Xylenes	<4.00	U	4.00	ug/L			09/07/23 02:08	1
o-Xylene	<2.00	U	2.00	ug/L			09/07/23 02:08	1
Xylenes, Total	<4.00	U	4.00	ug/L			09/07/23 02:08	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		70 - 130				09/07/23 02:08	1
1,4-Difluorobenzene (Surr)	107		70 - 130				09/07/23 02:08	1

Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			09/07/23 10:57	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	241		2.50	mg/L			09/06/23 22:20	5

Eurofins Midland

Surrogate Summary

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Method: 8021B - Volatile Organic Compounds (GC)
Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	BFB1 (70-130)	DFBZ1 (70-130)
880-32886-1	MW-2	95	113
880-32886-2	TMW-1	95	115
880-32886-3	TMW-2	92	112
880-32886-4	DUP-1	95	107
LCS 880-61898/34	Lab Control Sample	97	105
LCSD 880-61898/35	Lab Control Sample Dup	94	103
MB 880-61898/39	Method Blank	75	90
MB 880-61899/5-A	Method Blank	78	92
Surrogate Legend			
BFB = 4-Bromofluorobenzene (Surr)			
DFBZ = 1,4-Difluorobenzene (Surr)			

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NMGS AU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 880-61898/39

Matrix: Water

Analysis Batch: 61898

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L			09/06/23 23:42	1
Toluene	<2.00	U	2.00	ug/L			09/06/23 23:42	1
Ethylbenzene	<2.00	U	2.00	ug/L			09/06/23 23:42	1
m,p-Xylenes	<4.00	U	4.00	ug/L			09/06/23 23:42	1
o-Xylene	<2.00	U	2.00	ug/L			09/06/23 23:42	1
Xylenes, Total	<4.00	U	4.00	ug/L			09/06/23 23:42	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	75		70 - 130		09/06/23 23:42	1
1,4-Difluorobenzene (Surr)	90		70 - 130		09/06/23 23:42	1

Lab Sample ID: LCS 880-61898/34

Matrix: Water

Analysis Batch: 61898

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	100	101.9		ug/L		102	70 - 130
Toluene	100	98.08		ug/L		98	70 - 130
Ethylbenzene	100	96.21		ug/L		96	70 - 130
m,p-Xylenes	200	193.1		ug/L		97	70 - 130
o-Xylene	100	93.78		ug/L		94	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	97		70 - 130
1,4-Difluorobenzene (Surr)	105		70 - 130

Lab Sample ID: LCSD 880-61898/35

Matrix: Water

Analysis Batch: 61898

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	100	93.58		ug/L		94	70 - 130	9	20
Toluene	100	91.30		ug/L		91	70 - 130	7	20
Ethylbenzene	100	90.29		ug/L		90	70 - 130	6	20
m,p-Xylenes	200	182.1		ug/L		91	70 - 130	6	20
o-Xylene	100	88.69		ug/L		89	70 - 130	6	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		70 - 130
1,4-Difluorobenzene (Surr)	103		70 - 130

Lab Sample ID: MB 880-61899/5-A

Matrix: Water

Analysis Batch: 61898

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 61899

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L		09/06/23 08:31	09/06/23 11:21	1
Toluene	<2.00	U	2.00	ug/L		09/06/23 08:31	09/06/23 11:21	1

Eurofins Midland

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: MB 880-61899/5-A						Client Sample ID: Method Blank		
Matrix: Water						Prep Type: Total/NA		
Analysis Batch: 61898						Prep Batch: 61899		
Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	<2.00	U	2.00	ug/L		09/06/23 08:31	09/06/23 11:21	1
m,p-Xylenes	<4.00	U	4.00	ug/L		09/06/23 08:31	09/06/23 11:21	1
o-Xylene	<2.00	U	2.00	ug/L		09/06/23 08:31	09/06/23 11:21	1
Xylenes, Total	<4.00	U	4.00	ug/L		09/06/23 08:31	09/06/23 11:21	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	78		70 - 130			09/06/23 08:31	09/06/23 11:21	1
1,4-Difluorobenzene (Surr)	92		70 - 130			09/06/23 08:31	09/06/23 11:21	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 880-61941/3						Client Sample ID: Method Blank		
Matrix: Water						Prep Type: Total/NA		
Analysis Batch: 61941								
Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.500	U	0.500	mg/L			09/06/23 18:12	1
Lab Sample ID: LCS 880-61941/4						Client Sample ID: Lab Control Sample		
Matrix: Water						Prep Type: Total/NA		
Analysis Batch: 61941								
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
Chloride	25.0	25.32		mg/L		101	90 - 110	
Lab Sample ID: LCSD 880-61941/5						Client Sample ID: Lab Control Sample Dup		
Matrix: Water						Prep Type: Total/NA		
Analysis Batch: 61941								
Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD Limit
Chloride	25.0	25.36		mg/L		101	90 - 110	0 20

QC Association Summary

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

GC VOA

Analysis Batch: 61898

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-32886-1	MW-2	Total/NA	Water	8021B	61899
880-32886-2	TMW-1	Total/NA	Water	8021B	
880-32886-3	TMW-2	Total/NA	Water	8021B	
880-32886-4	DUP-1	Total/NA	Water	8021B	
MB 880-61898/39	Method Blank	Total/NA	Water	8021B	
MB 880-61899/5-A	Method Blank	Total/NA	Water	8021B	
LCS 880-61898/34	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-61898/35	Lab Control Sample Dup	Total/NA	Water	8021B	

Prep Batch: 61899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 880-61899/5-A	Method Blank	Total/NA	Water	5035	

Analysis Batch: 61984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-32886-1	MW-2	Total/NA	Water	Total BTEX	
880-32886-2	TMW-1	Total/NA	Water	Total BTEX	
880-32886-3	TMW-2	Total/NA	Water	Total BTEX	
880-32886-4	DUP-1	Total/NA	Water	Total BTEX	

HPLC/IC

Analysis Batch: 61941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-32886-1	MW-2	Total/NA	Water	300.0	
880-32886-2	TMW-1	Total/NA	Water	300.0	
880-32886-3	TMW-2	Total/NA	Water	300.0	
880-32886-4	DUP-1	Total/NA	Water	300.0	
MB 880-61941/3	Method Blank	Total/NA	Water	300.0	
LCS 880-61941/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 880-61941/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Client Sample ID: MW-2
Date Collected: 09/05/23 11:20
Date Received: 09/06/23 10:57

Lab Sample ID: 880-32886-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	61898	09/07/23 01:06	MNR	EET MID
Total/NA	Analysis	Total BTEX		1			61984	09/07/23 10:57	SM	EET MID
Total/NA	Analysis	300.0		5			61941	09/06/23 21:35	CH	EET MID

Client Sample ID: TMW-1
Date Collected: 09/05/23 12:00
Date Received: 09/06/23 10:57

Lab Sample ID: 880-32886-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	61898	09/07/23 01:27	MNR	EET MID
Total/NA	Analysis	Total BTEX		1			61984	09/07/23 10:57	SM	EET MID
Total/NA	Analysis	300.0		10			61941	09/06/23 22:07	CH	EET MID

Client Sample ID: TMW-2
Date Collected: 09/05/23 12:39
Date Received: 09/06/23 10:57

Lab Sample ID: 880-32886-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	61898	09/07/23 01:47	MNR	EET MID
Total/NA	Analysis	Total BTEX		1			61984	09/07/23 10:57	SM	EET MID
Total/NA	Analysis	300.0		10			61941	09/06/23 22:14	CH	EET MID

Client Sample ID: DUP-1
Date Collected: 09/05/23 00:00
Date Received: 09/06/23 10:57

Lab Sample ID: 880-32886-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	61898	09/07/23 02:08	MNR	EET MID
Total/NA	Analysis	Total BTEX		1			61984	09/07/23 10:57	SM	EET MID
Total/NA	Analysis	300.0		5			61941	09/06/23 22:20	CH	EET MID

Laboratory References:
EET MID = Eurofins Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Accreditation/Certification Summary

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Laboratory: Eurofins Midland

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

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704400-23-26	06-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
300.0		Water	Chloride
Total BTEX		Water	Total BTEX

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Method Summary

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	EET MID
Total BTEX	Total BTEX Calculation	TAL SOP	EET MID
300.0	Anions, Ion Chromatography	EPA	EET MID
5030B	Purge and Trap	SW846	EET MID

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

EET MID = Eurofins Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Sample Summary

Client: Larson & Associates, Inc.
Project/Site: NMGSAU 2102

Job ID: 880-32886-1
SDG: 19-0112-51

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
880-32886-1	MW-2	Water	09/05/23 11:20	09/06/23 10:57
880-32886-2	TMW-1	Water	09/05/23 12:00	09/06/23 10:57
880-32886-3	TMW-2	Water	09/05/23 12:39	09/06/23 10:57
880-32886-4	DUP-1	Water	09/05/23 00:00	09/06/23 10:57

- 1
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No. 3115

Login Sample Receipt Checklist

Client: Larson & Associates, Inc.

Job Number: 880-32886-1

SDG Number: 19-0112-51

Login Number: 32886

List Number: 1

Creator: Teel, Brianna

List Source: Eurofins Midland

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

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 373738

CONDITIONS

Operator: APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID:
	873
	Action Number:
	373738
Action Type:	
[UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)	

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the 2023, 3Q Groundwater Monitoring Report for N. Monument G/SA #2102: content satisfactory 1. May transition sampling wells to semi-annual until those analyses convey results below the WQCC human health standard, then transition back to sampling quarterly in preparation of closing the incident. 2. Continue to collect samples as prescribed and take DTW for all wells in operation. 3. Submit the 2024 annual report to OCD by April 1, 2025.	9/3/2024