June 29,

2022

nRM2031146817
2022 Second Quarter Groundwater Monitoring Report
Northeast Drinkard Unit (NEDU) #829, #830, #922, #928, and #929
Lea County, New Mexico

Prepared for:

Apache

303 Veterans Airpark Lane
Midland, TX 79701

Prepared by:

LAI Larson & Associates, Inc. Environmental Consultants

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(432) 687-0901

Mark J. Larson

Mark J. Larson
Certified Professional Geologist #10490

Daniel St. Germain

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Staff Geologist

LAI Project No: 19-0112-38

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1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this report on behalf of the Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) District I in Hobbs and Santa Fe, New Mexico. This report presents 2022 second (2nd) quarter (April-June) groundwater monitoring results for the Northeast Drinkard Unit (NEDU) #829, 830, 922, 928, and 929 (Sites). The Sites are located in Section 22, Township 21 South, Range 37 East, in Lea County, New Mexico. The geodetic position is North 32.46294° and West -103.15153°.

The following activities occurred on May 24, 2022:

- Gauged and collected groundwater samples from monitoring wells MW-1 through MW-4.
- Analyzed groundwater samples for benzene, toluene, ethylbenzene, and xylenes (BTEX), chloride, and total dissolved solids (TDS).

The following observations are documented in this report:

- Depth to groundwater ranged from 54.32 feet below ground surface (bgs) in monitoring well MW-1 to 40.42 feet bgs in monitoring well MW-4.
- The groundwater elevation ranged between at 3,371.52 and 3,355.44 feet above mean sea level (MSL) in monitoring wells MW-4 (upgradient) and MW-3 (downgradient), respectively, on May 24, 2022.
- Apparent groundwater flow direction is northwest to southeast at a gradient of about 0.012 feet per foot (ft/ft).
- BTEX compounds were below the analytical method reporting limit (RL) and New Mexico Water Quality Control Commission (NMWQCC) human health standards in groundwater samples from monitoring wells MW-1 through MW-4.
- Chloride concentrations in the groundwater samples were below the NMWQCC domestic water quality standard of 250 milligrams per liter (mg/L), except in the groundwater sample from monitoring well MW-1 (912 mg/L).
- TDS concentrations were below the NMWQCC domestic water quality standard of 1,000 mg/L, except in groundwater samples collected from monitoring wells MW-1 (2,500) and MW-2 (1,100).

Apache proposes the following:

- Apache will continue groundwater monitoring on a quarterly (4 times per year) schedule.
- Gauge all monitoring wells for depth to groundwater and collect groundwater samples from monitoring wells with sufficient groundwater during each quarterly event.
- Analyze samples for BTEX, chloride and TDS.
- Report the laboratory results to NMOCD in quarterly 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.

2.0 INTRODUCTON

Larson & Associates, Inc. (LAI) has prepared this report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) District I in and Santa Fe, New Mexico. This report presents 2022 quarterly groundwater monitoring results for the second (2nd) quarter on May 24, 2022. During the quarterly event groundwater samples were collected from four (4) monitor wells (MW-1 through MW-4) at the Northeast Drinkard Unit (NEDU) #829, 830, 922, 928, and 929 (Sites) located in Lea County, New Mexico. The legal description is Section 22, Township 21 South, Range 37 East. The geodetic coordinates are as follows:

Site	North (°)	West (°)
NEDU #829	32.462947	-103.151539
NEDU #830	32.463967	-103.155761
NEDU #922	32.457803	-103.151181
NEDU #928	32.458019	-103.155831
NEDU #929	32.458022	-103.151450

The NMOCD was notified prior to the groundwater monitoring event. Figure 1 presents a topographic map. Figure 2 presents an aerial map. Figure 3 presents a site map. Appendix A presents the NMOCD communications.

2.1 Background

On April 6, 2001, the landowner reported to the NMOCD that an Apache contractor was closing drilling pits at the Sites by disposing pit fluid in open trenches adjacent to the drilling pits. Apache was notified and submitted the initial C-141 on April 23, 2001. NMOCD assigned the trenches remediation permit 1RP-313.

On April 23, 2001, Apache submitted a work plan for the remediating the trenches. NMOCD approved the work plan on May 8, 2001. The work plan stated that the trenches at wells #829, #830 and #929 would be excavated to approximately 19 feet BGS and to approximately 13 feet BGS at #928. There is no evidence that the trench was excavated at #922. An Apache contractor collected bottom and composite samples from the excavations and found chloride above the remediation closure limits in all excavations. Total petroleum hydrocarbons (TPH) were reported above the NMOCD closure limits in the excavation at #928. No documentation is available in NMOCD files to confirm the remediation.

On October 31, 2019, Apache submitted an administrative summary and path forward for remediating and closing the trenches. The plan requested approval from the NMOCD for a variance to excavate soil to a depth of approximately four (4) feet below ground surface (BGS) at each trench and install a 20-mil polyethylene liner in the bottom of the excavations. Additionally, Apache committed to installing monitoring wells hydraulically down gradient (east - southeast) approximately 50 feet from the trench.

On May 19, 2021, NMOCD approved the administrative summary and path forward for remediation but stated that "preapproval for monitor well locations on map before installation" was required. On July14, 2021, NMOCD approved the monitor well locations. Appendix A presents the NMOCD communications.

3.0 GROUNDWATER INVESTIGATION

3.1 Monitoring Well Installation

On July 19 and 20, 2021, Scarborough Drilling, Inc. (SDI) under the supervision of LAI, installed monitoring wells MW-1, MW-2, MW-3, and MW-4 at locations specified in the permits utilizing an air rotary drill rig. The wells were completed in 5-inch diameter borings advanced to 65 to 76 feet BGS. Monitoring wells MW-1, MW-2, MW-3, and MW-4 were completed to depths of approximately 74.08, 74.86, 65.35 and 76.01 feet below ground surface (bgs, respectively. The monitoring wells are completed with 2-inch schedule 40 threaded PVC casing and 20 feet of 0.010-inch factory slotted screen installed above and below the groundwater level observed during drilling. Graded silica sand is positioned around the well screens to a depth about 2 feet above the screen. Sodium bentonite chips extend around the PVC riser and above the sand to about 1-foot BGS. The wells are secured with locking steel sleeves anchored in concrete. West Company, a State of New Mexico licensed Professional Land Surveyor (License Number 23263) surveyed the monitoring wells for location and elevation including top of casing and natural ground surface. Figure 3 presents Site drawing showing the monitoring well locations. Table 1 presents the monitoring well completion and gauging summary. Appendix B presents the monitoring well boring logs and well completion records.

On July 27-30, 2021, the wells were developed by pumping with an electric submersible pump to remove sediment disturbed drilling and well installation. Approximately 40 gallons of water were removed from each well and disposed in 55-gallon drums.

4.0 GROUNDWATER MONITORING

4.1 Depth to Groundwater and Groundwater Potentiometric Surface Elevation

On May 24, 2022, LAI personnel gauged monitoring wells MW-1 through MW-4 for depth to groundwater. Groundwater was gauged in monitoring well MW-1, MW-2, MW-3, and MW-4 at 57.32, 54.91, 53.88, and 43.50 feet below top of casing (TOC), respectively. The groundwater potentiometric surface elevation was recorded at 3,371.52 above mean sea level (MSL) at MW-4 (upgradient) to 3,355.44 feet above MSL at MW-3 (downgradient). The apparent groundwater flow direction is from northwest to southeast at a gradient of 0.012 ft/ft. Figure 4 presents the groundwater potentiometric surface map for May 24, 2022.

4.2 Groundwater Samples and Analysis

On May 24, 2022, LAI personnel used the low stress or low flow method following EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017) to collect groundwater samples from monitoring wells MW-1, through MW-4. An environmental pump was lowered into the wells to near the middle of the water column and the well was pumped at a low flow rate until environmental parameters stabilized. Groundwater samples were collected from discharge through dedicated disposable Tygon® tubing after chemical parameters stabilized. The Tygon® 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. The samples were transferred to labeled laboratory containers, packed in an ice chest filled with ice, and delivered under chain of custody control to Eurofins-Xenco Laboratory (Xenco), a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory, in Midland, Texas. A duplicate sample (Dup-1) was collected from monitoring well MW-2 for laboratory quality assurance and quality control (QA/QC). The groundwater samples were analyzed for BTEX according to EPA SW-846 Method SW-8260D, chloride by EPA Method 300, and TDS by EPA Method SM 2540C. Table 2 presents the laboratory analytical summary. Appendix C presents the laboratory report.

4.2.1 Organic Analysis

Total BTEX concentrations were below the laboratory analytical RL and NMWQCC human health standards in all groundwater samples collected from monitoring wells, MW-1 through MW-4. The results are consistent with results from previous groundwater monitoring events.

4.2.2 Inorganic Analysis

Chloride concentrations were reported below the NMWQCC domestic water quality standard of 250 milligrams per liter (mg/L) in monitoring wells MW-2 (200 mg/L), MW-3 (114 mg/L), and MW-4 (171 mg/L). The chloride concentration in the groundwater sample collected from monitoring well MW-1 (912 mg/L) was above the NMWQCC domestic water quality standard. The chloride concentration in the QA/QC sample (Dup-1) collected from monitoring well MW-2 was 189 mg/L and within 5.5 percent of the original chloride value for MW-2 (200 mg/L). No data exceptions were noted in the laboratory report case narratives. Figure 5 presents the chloride isopleth map for May 24, 2022.

TDS concentrations in groundwater samples collected from monitoring wells MW-1 (2,500 mg/L) and MW-2 (1,100 mg/L) were above the NMWQCC domestic water quality standard of 1,000 mg/L. TDS concentrations were below the NMWQCC domestic water quality standard in groundwater samples collected from MW-3 (647 mg/L) and MW-4 (827 mg/L). The TDS concentration in the QA/QC sample (Dup-1) was 1,100 mg/L was identical to the original TDS value for MW-2 (1,100 mg/L). No data exceptions were noted in the laboratory case narratives. Figure 6 presents the TDS isopleth map for May 24, 2022.

5.0 CONCLUSIONS

The following observations are documented in this report:

- Apparent groundwater flow direction is from northwest to southeast at a gradient of approximately 0.012 ft/ft.
- BTEX concentrations were below the analytical method RL and NMWQCC human health standards in all groundwater samples from monitoring wells MW-1 through MW-4.
- The chloride concentration in the groundwater sample collected from monitoring well MW-1 (912 mg/L) above the NMWQCC domestic water quality standard of 250 mg/L.
- Chloride concentrations in groundwater samples from monitoring wells MW-2 (200 mg/L), MW-3 (114 mg/L), and MW-4 (171 mg/L) were below the NMWQCC domestic water quality standard of 250 mg/L.
- TDS concentrations were below the NMWQCC domestic water quality standard of 1,000 mg/L in groundwater samples collected from monitoring wells MW-3 (647 mg/L) and MW-4 (827 mg/L).
- TDS concentrations in the groundwater samples collected from wells MW-1 (2,500 mg/L) and MW-2 (1,100 mg/L) were above the NMWQCC domestic water quality standard of 1,000 mg/L.

6.0 RECOMMENDATIONS

Apache proposes the following:

- Continue groundwater monitoring on a quarterly (4 times per year).
- Gauge each well (MW-1 through MW-4) for depth to groundwater and collect groundwater samples from monitoring wells with sufficient groundwater during each quarterly event.
- Report the laboratory results to NMOCD in quarterly 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
1RP-313
Monitoring Well Completion and Gauging Summary
Apache Corportaion, NEDU Drill Pits
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-1	07/19/2021	74.08	71.08	2	3417.34	70.85-50.85	3.00	3,417.34	07/29/2021	57.40	54.40	16.68	3,359.94
									11/08/2021	57.40	54.40	16.68	3,359.94
									03/02/2022	57.36	54.36	16.72	3,359.98
									05/24/2022	57.32	54.32	16.76	3,360.02
MW-2	07/19/2021	74.86	71.86	2	3408.43	71.68-51.68	3.00	3,411.66	07/29/2021	54.81	51.81	20.05	3,356.85
									11/08/2021	54.85	51.85	20.01	3,356.81
									03/02/2022	54.91	51.91	19.95	3,356.75
									05/24/2022	54.91	51.91	19.95	3,356.75
MW-3	07/20/2021	65.35	62.75	2	3406.01	65.15-45.15	2.60	3,409.32	07/29/2021	53.55	50.95	11.80	3,355.77
									11/08/2021	53.67	51.07	9.68	3,355.65
									03/02/2022	53.83	51.23	11.52	3,355.49
									05/24/2022	53.88	51.28	11.47	3,355.44
MW-4	07/20/2021	76.01	72.93	2	3412.51	75.81-55.81	3.08	3,415.02	07/30/2021	44.38	41.30	31.63	3,370.64
									11/08/2021	43.44	40.36	32.57	3,371.58
									03/02/2022	43.44	40.36	32.57	3,371.58
									05/24/2022	43.50	40.42	32.51	3,371.52

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 Analytical Data Summary
Apache Corporation, NEDU #830, 922, 928, and 929
Lea County, New Mexico

Sample	Collection Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)	TDS (mg/L)
NMWQCC Standard:		**0.005*	** 1*	**0.7*	**0.62*	***250*	***1,000*
MW-1 (NEDU #830)	07/29/2021	<0.00200	<0.00200	<0.00200	<0.00400	446	2,510
	11/08/2021	<0.00200	<0.00200	<0.00200	<0.00400	1,270	2,490
	03/02/2022	<0.00200	<0.00200	<0.00200	<0.00400	1,250	2,500
	05/24/2022	<0.00200	<0.00200	<0.00200	<0.00400	912	2,500
MW-2 (NEDU #922)	07/29/2021	0.0391	<0.00200	<0.00219	<0.00400	268	1,170
	11/08/2021	<0.00200	<0.00200	<0.00200	<0.00400	279	1,100
	03/02/2022	<0.00200	<0.00200	<0.00200	<0.00400	253	1,110
	05/24/2022	<0.00200	<0.00200	<0.00200	<0.00400	200	1,100
MW-3 (NEDU #929)	07/29/2021	0.00407	<0.00200	<0.00200	<0.00400	128	663
	11/08/2021	<0.00200	<0.00200	<0.00200	<0.00400	122	644
	03/02/2022	<0.00200	<0.00200	<0.00200	<0.00400	114	664
	05/24/2022	<0.00200	<0.00200	<0.00200	<0.00400	114	647
MW-4 (NEDU #928)	07/30/2021	<0.00200	<0.00200	<0.00200	<0.00400	559	1,030
	11/08/2021	<0.00200	<0.00200	<0.00200	<0.00400	203	832
	03/02/2022	<0.00200	<0.00200	<0.00200	<0.00400	182	836
	05/24/2022	<0.00200	<0.00200	<0.00200	<0.00400	171	827
Dup-1 (MW-2)	07/29/2021	<0.00200	<0.00200	<0.00200	<0.00400	244	1,160
Dup-2 (MW-4)	07/30/2021	<0.00200	<0.00200	<0.00200	<0.00400	235	1,030
Dup-1 (MW-2)	11/08/2021	<0.00200	<0.00200	<0.00200	<0.00400	270	1,100
Dup-1 (MW-2)	03/02/2022	<0.00200	<0.00200	<0.00200	<0.00400	268	1,090
Dup-1 (MW-2)	05/24/2022	<0.00200	<0.00200	<0.00200	<0.00400	189	1,100

Notes:
analysis performed by Xenco-Eurofins Laboratories, Midland, Texas by EPA SW-846 Method 8021B (BTEX), Method 300 (chloride), Method 2540C
All values reported in milligrams per liter (mg/L); equivalent to parts per million (ppm)
< - concentration is less than method reporting limit (RL).
* - NMWQCC human health standard
** - NMWQCC domestic water quality standard
bgs - below ground surface

Figures

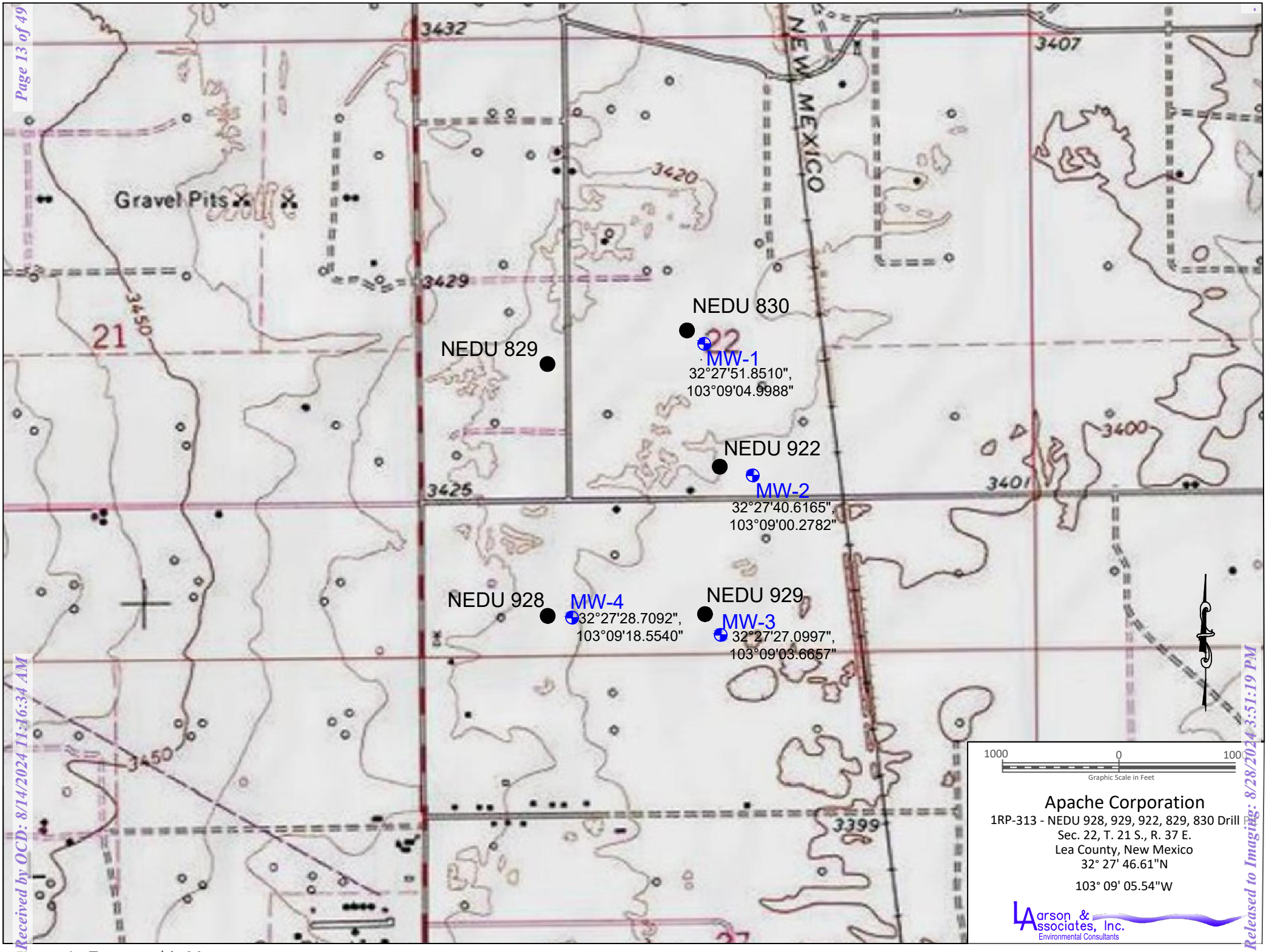


Figure 1 - Topographic Map

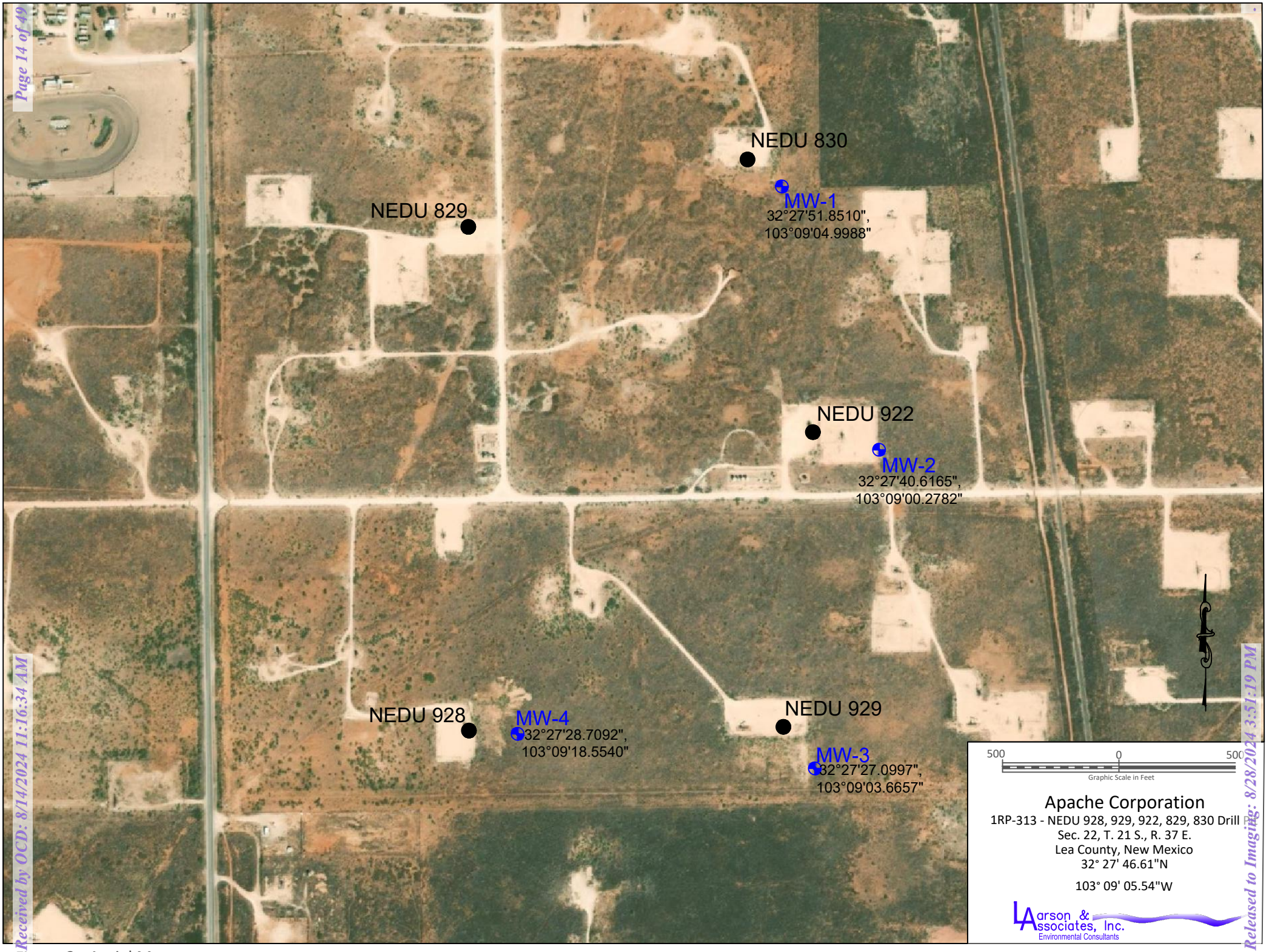


Figure 2 - Aerial Map

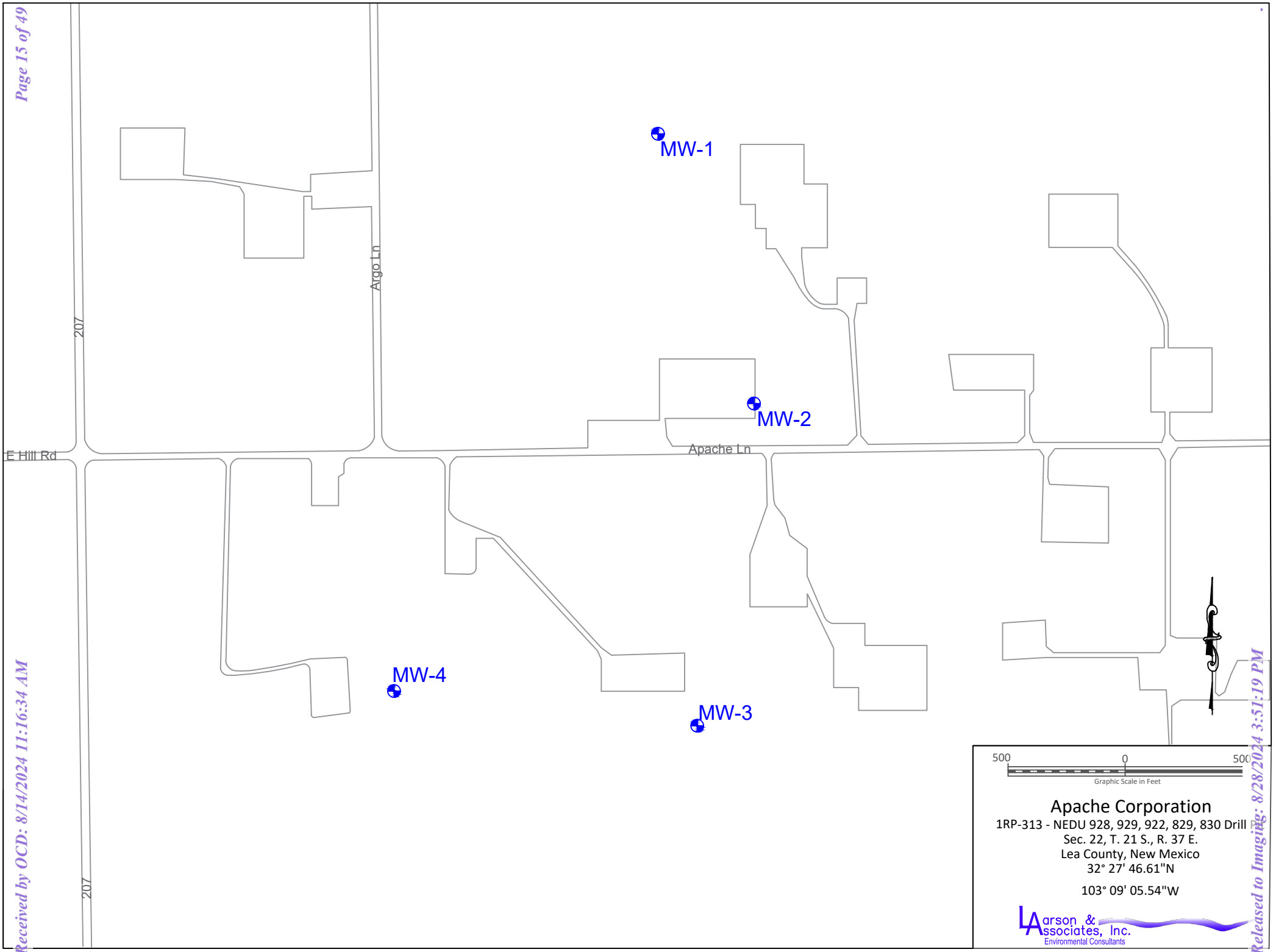


Figure 3 - Site Map

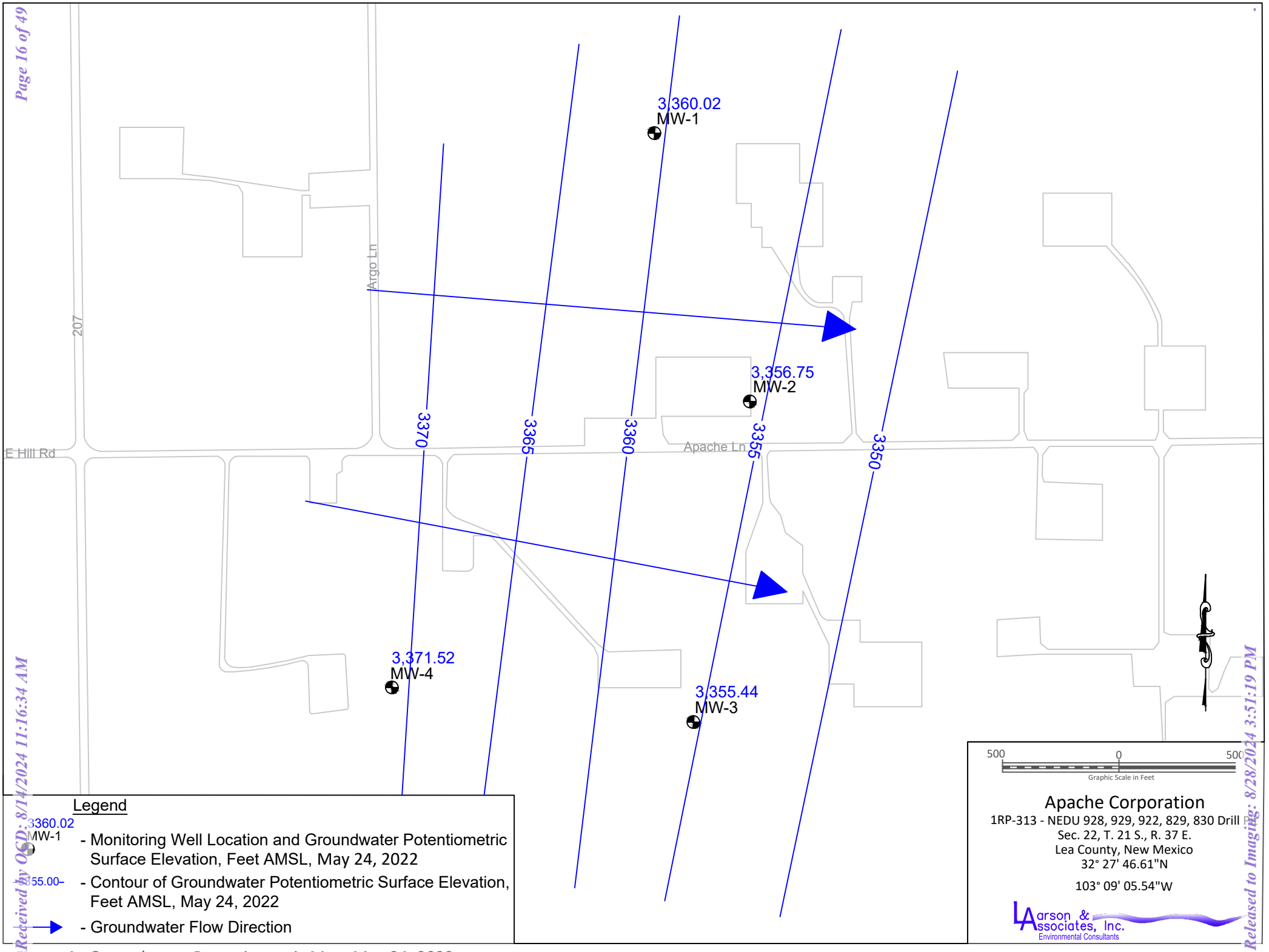


Figure 4 - Groundwater Potentiometric Map, May 24, 2022

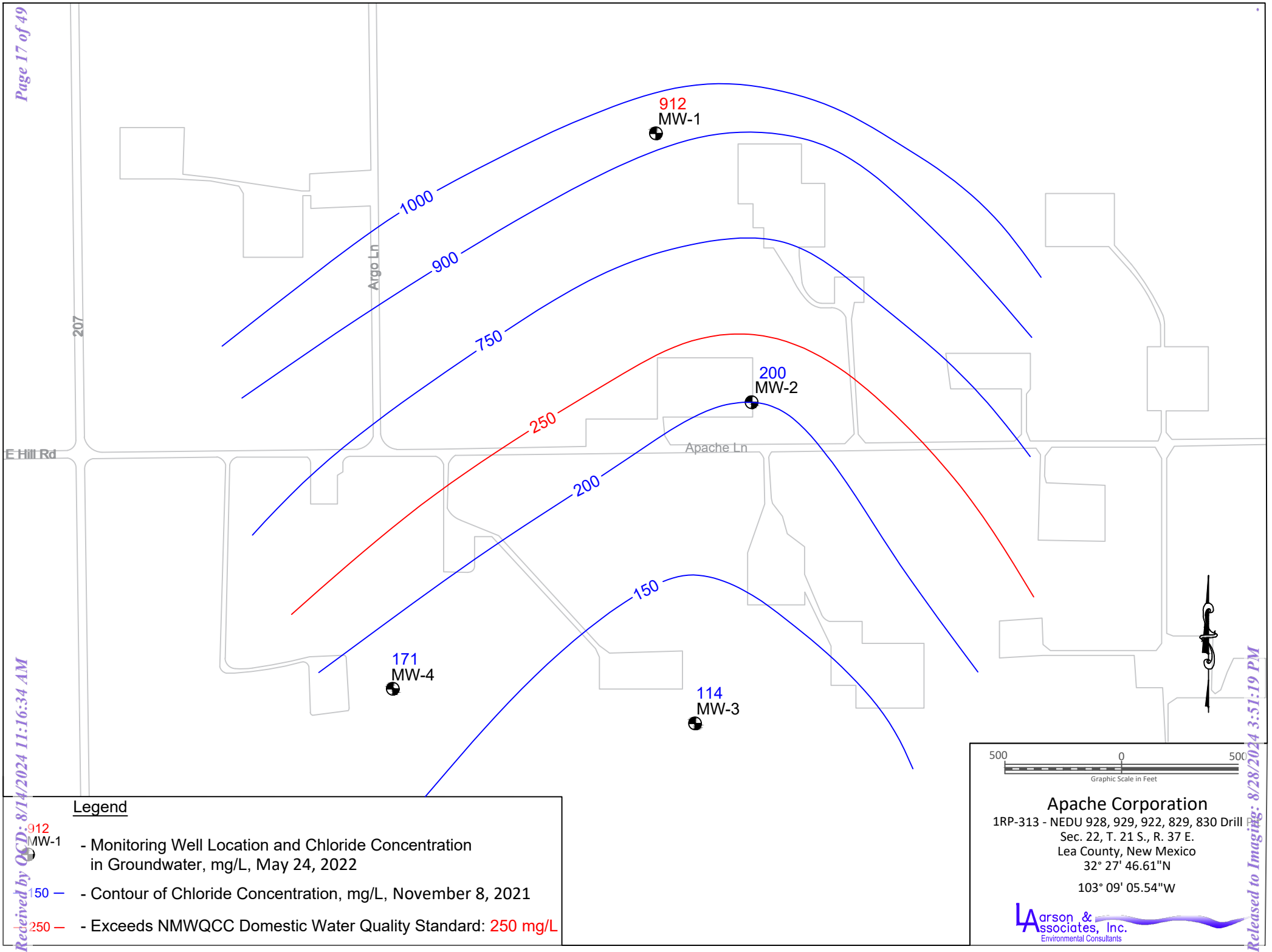


Figure 5 - Chloride Concentration in Groundwater, May 24, 2022

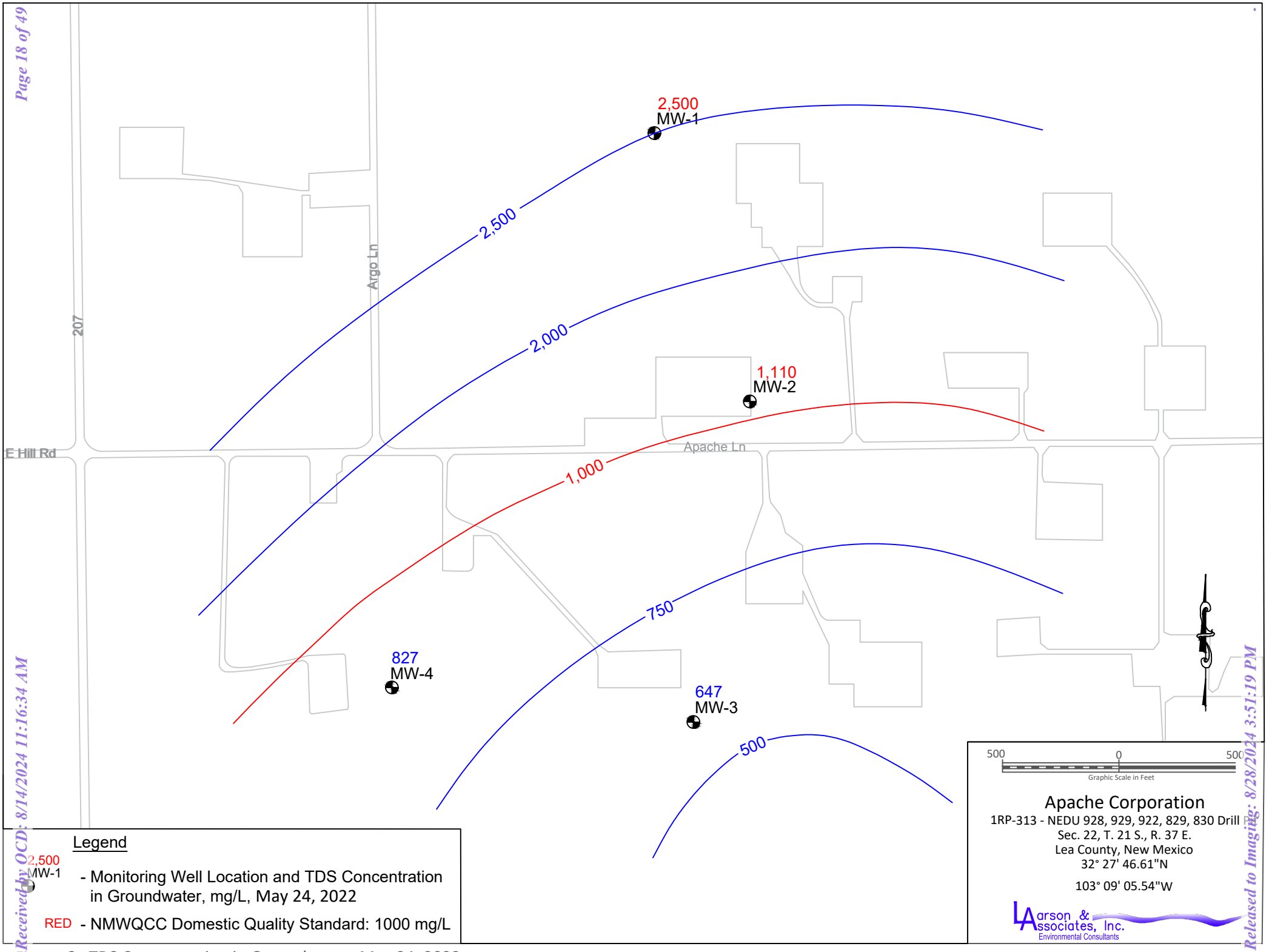


Figure 6 - TDS Concentration in Groundwater, May 24, 2022

Appendix A

NMOCD Communications

Robert Nelson

From: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Sent: Wednesday, May 18, 2022 4:20 PM
To: Robert Nelson; Bratcher, Mike, EMNRD
Cc: 'Larry.Baker@apachecorp.com'; Bole, Barrett; Mark Larson
Subject: RE: [EXTERNAL] Apache Corp. NEDU 829, 830, 922, 928, &929 (1RP-0313/nRM2031146817) Groundwater Sampling Notice

Hello,

Thank you for the notification. Please include this communication in associated report(s).

Bradford Billings
EMNRD/OCD

From: Robert Nelson <rnelson@laenvironmental.com>
Sent: Wednesday, May 18, 2022 3:03 PM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>; Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>
Cc: 'Larry.Baker@apachecorp.com' <Larry.Baker@apachecorp.com>; Bole, Barrett <Barrett.Bole@apachecorp.com>; Mark Larson <Mark@laenvironmental.com>
Subject: [EXTERNAL] Apache Corp. NEDU 829, 830, 922, 928, &929 (1RP-0313/nRM2031146817) Groundwater Sampling Notice

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

Hello Mr. Billings 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 Northeast Drinkard Unit (NEDU) Wells 829, 830, 922, 928, & 929 (1RP-0313/nRM2031146817), on May 24, 2022, at approximately 13:00 mst 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) 215-2284 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
Larson & Associates, Inc.
Environmental Consultants

From: Baker, Larry
To: Robert Nelson
Subject: FW: [EXTERNAL] The Oil Conservation Division (OCD) has approved the application, Application ID: 10932
Date: Tuesday, July 13, 2021 3:24:03 PM

From: OCDOnline@state.nm.us [mailto:OCDOnline@state.nm.us]
Sent: Thursday, May 13, 2021 3:00 PM
To: Baker, Larry <Larry.Baker@apachecorp.com>
Subject: [EXTERNAL] The Oil Conservation Division (OCD) has approved the application, Application ID: 10932

To whom it may concern (c/o Larry Baker for APACHE CORPORATION),

The OCD has approved the submitted *Application for administrative approval of a release notification and corrective action* (C-141), for incident ID (n#) nRM2031146817, with the following conditions:

- **Using new Rule make sure sidewall data and bottom data are correct. Requested variances for excavation and liner are approved. Get pre-approval for Monitor Well locations on map before installations.**

The signed C-141 can be found in the OCD Online: Imaging under the incident ID (n#).

If you have any questions regarding this application, please contact me.

Thank you,
Bradford Billings
Hydrologist/E.Spec.A
505-670-6549
bradford.billings@state.nm.us

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

From: Billings, Bradford, EMNRD
To: Robert Nelson
Cc: Mark Larson; Baker, Larry
Subject: RE: Apache Corp. (1RP-0313/nRM2031146817) Monitor Well Location Approval
Date: Wednesday, July 14, 2021 12:13:08 PM
Attachments: image001.png

07/14/2021

Hello,

Locations as indicated in attached PDF's are APPROVED. Question, one might consider some soil samples for same analytes, at least in the vicinity of anticipated/encountered groundwater.
Thank you for your efforts.

Sincerely,

Bradford Billings
EMNRD/OCD

From: Robert Nelson <rnelson@laenvironmental.com>
Sent: Wednesday, July 14, 2021 7:12 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Mark Larson <Mark@laenvironmental.com>; Baker, Larry <Larry.Baker@apachecorp.com>
Subject: Apache Corp. (1RP-0313/nRM2031146817) Monitor Well Location Approval

Hello Bradford,

On October 31, 2019, Larson & Associates, Inc. (LAI) submitted a summary of work and path forward for remediation and closure of trenches associated with drillings pits at the Northeast Drinkard Unit (NEDU) Wells 829, 830, 922, 928, & 929 (1RP-0313). The trenches were discovered on April 6, 2001 when a landowner reported the drilling pits were being closed by disposing pit fluid in trenches adjacent to the drilling pits. Apache was notified and submitted the initial C-141 on April 23, 2001. OCD assigned the wells (trenches) remediation permit 1RP-313. On May 13, 2021, Apache received notification from OCD with approval for the submitted application for administrative approval of a release notification and corrective action (C-141), for incident ID (n#) nRM2031146817. OCD stated " **Using new Rule make sure sidewall data and bottom data are correct. Requested variance for excavation and liner are approved. Get pre- approval for Monitor Well locations on map before installations**".

The summary of work and path forward stated that monitor wells be installed approximately 50 feet hydraulically down gradient (east-southeast) from the trenches and complete with 15 feet of 2-inch schedule 40 screen to gauge depth to groundwater and collect groundwater samples for laboratory analysis (BTEX, chloride and total dissolved solids (TDS)). Please find attached the topographic map and proposed monitor well locations. The drilling rig is currently scheduled to complete the

installation of these monitor wells on Tuesday – Thursday (July 20th through July 22nd, 2021). Your approval of these monitor well locations is requested and greatly appreciated. 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 B

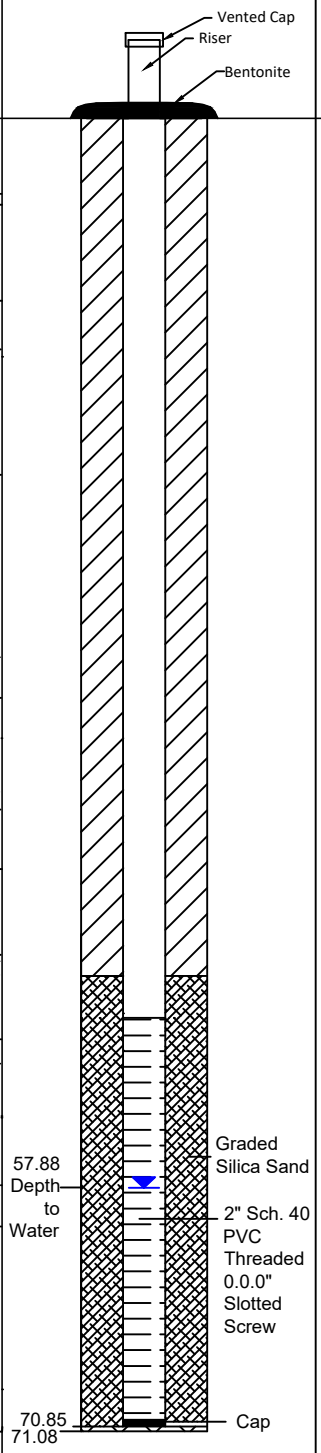
Monitoring Well Completion Records

BORING RECORD

Start: 10:49 MST
Finish: 12:37

Surface Elevation:
TOC Elecation:

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS
	0	Sand, 10YR 5/6, Yellowish Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SW
	5	Silty Sand, 10YR 5/6, Yellowish Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SM
	10	Sand, 7.5YR 7/6, Reddish Yellow, Fine Grained Quartz Sand, Dry, Poorly Sorted	SW
	20		
	25	Sand, 7.5YR 7/6, Reddish Brown, Fine Grained Quartz Sand, Dry, 4.75mm Clasts, Poorly Sorted	
	30		
	35		
	40	Silty Sand, 7.5YR 8/6, Pink, Well Sorted, Fine Grained Quartz Sand, Dry	SM
	45	10 YR 7/6, Yellowish Brown, Fine Grained Quartz Sand, Well Sorted Dry	
	50	10 YR 7/6, Yellowish Brown, Moderately Sorted, 2mm Quartz Clasts, Dry	
57.88 Depth to Water	55	Water Injected at 55'	
	60		
	65		
	70		
		TD: 71.08'	
	75		



NUMBER	RECOVERY	DEPTH	REMARKS
			BACKGROUND PID READING SOIL : _____ PPM SOIL : _____ PPM

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 : 19-0112-22/ Apache
HOLE DIAMETER : 5'
LOCATION : NEDU #830
LAI GEOLOGIST : R. Nelson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 07/19/2021

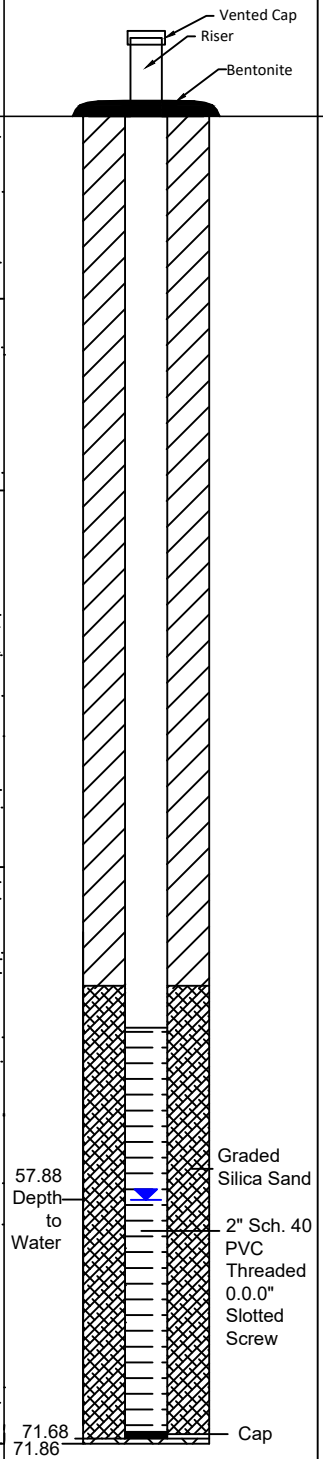
BORING NUMBER : MW-1

BORING RECORD

Start: 13:17 MST
Finish: 14:40

Surface Elevation:
TOC Elecation:

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS
	0	Sand, 7.5YR 4/6, Strong Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SW
	10	Silty Sand, 7.5YR 7/4, Pink, Fine Grained Quartz Sand, Moderately Sorted, Dry, Quartz Clasts 2mm	SM
	20	7.5YR 6/6, Reddish Yellow, Fine Grained Quartz Sand, Moderately Sorted, Dry, Fine to Medium Quartz Clasts	
	25	Sand, 7.5YR 7/6, Reddish Yellow, Fine Grained Quartz Sand, Dry	SW
	30	7.5YR 7/6, Reddish Yellow, Fine Grained Quartz Sand, Quartz Clasts	
	40	Silty Sand, 7.5YR 5/6, Strong Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SM
	50	7.5YR 5/6, Strong Brown, Fine Grained Quartz Sand, Well Sorted, Dry, Quartz Clasts Medium to Coarse Grained	
57.88 Depth to Water	55	Water Injected at 55'	
	70	TD: 71.86'	
	75		



NUMBER | RECOVERY | DEPTH

REMARKS
BACKGROUND PID READING
SOIL : PPM
SOIL : PPM

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 : 19-0112-22/ Apache
HOLE DIAMETER : 5'
LOCATION : NEDU #922
LAI GEOLOGIST : R. Nelson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 07/19/2021

BORING NUMBER : MW-2

BORING RECORD

Start: 13:45
Finish: 14:50

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING PPM X	SAMPLE NUMBER	SAMPLE PID READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS BACKGROUND PID READING
	0	2.5YR 4/6, Red, Fine Grained Quartz Rich Sand, Very Well Sorted, Well Rounded, Unconsolidated								
	5					1			5	13:50
	10	Increase in Depth Lithology Remains Same Color Changes to 2.5YR 7/3 to 7/4 Light Reddish Brown at 13'	SM			2			10	13:54
	15					3			15	13:58
	20					4			20	14:03
	25	5YR 7/4, Pink, Fine to Medium Grained Quartz Rich Sand, Moderately Sorted, Rounded to Sub Rounded	SM			5			25	14:10
	30					6			30	14:13
	35					7			35	14:20
	40	7.5YR 9/2, Pale Yellowish Pink, Very Fine to Fine Grained Quartz Grained Sand, Well Sorted, Well Rounded to Sub Rounded				8			40	14:22
	45					9			45	14:25
Depth to Water: 53.71	50	7.5YR 6/8, Reddish Yellow, Very Fine to Fine Grained Quartz Sand, Well Sorted, Well Rounded	SM			10			50	14:30
	55					11			55	14:42
	60					12			60	14:44
	65	TD: 65.35'				13			65	14:50

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 : Apache/19-0112-22
HOLE DIAMETER : 5"
LOCATION : NEDU 929
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 7/20/2021

BORING NUMBER : MW- 3

BORING RECORD

Start: 9:35
Finish: 12:10

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING (PPM X)	SAMPLE NUMBER	SAMPLE PID READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS BACKGROUND PID READING
	0	Sand, 2.5YR 4/6, Red, Fine Grained Quart Sand, Very Well Sorted, Well Rounded, Unconsolidated, Quartz Rich Sand	SM							SOIL : PPM SOIL : PPM
	5					1			5	9:38
	10					2			10	9:40
	15	Sand, 2.5YR 7/4, Light Reddish Brown, Very Fine to Fine Grained Quartz Sand, Moderately Sorted, Sub Angular to Sub Rounded, with Depth Decrease in Grain Size and Becomes Well Sorted, Quartz Rich Sand				3			15	9:40
	20					4			20	9:42
	25					5			25	9:45
	30	7.5YR 8/3, Pink, Fine to Medium Grained Quartz Sand, Sub Rounded to Sub Angular, Moderately Sorted, Quartz Rich Sand	SM			6			30	10:30
	35					7			35	10:35
Depth to Water: 41.05	40	7.5YR 6/4, Light Brown, Fine Grained Quartz Sand, Well Sorted, Rounded to Sub Rounded, with Depth Increase in Consolidation and Cementation, Quartz Rich Sand				8			40	10:38
	45					9			45	11:14
	50	7.5YR 7/4, Light Reddish Brown, Poorly Sorted, Fine to Coarse Grained Quartz Sand, Rounded to Angular, Very Consolidated with Red Sandstone Fragments in Cuttings, Quartz Rich Sand								
	55									
	60									
		Introduced Water with Drilling	SM							
	65									
	70									
	75									
		TD: 76.01								

ONE CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HRS)
WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/ SQ. FT)
NR NO RECOVERY

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 7/20/2021

BORING NUMBER : MW-4

JOB NUMBER : Apache/ 19-0112-22
HOLE DIAMETER : 5"
LOCATION : NEDU 928
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Appendix C

Laboratory Report

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Midland
1211 W. Florida Ave
Midland, TX 79701
Tel: (432)704-5440

Laboratory Job ID: 880-15148-1
Laboratory Sample Delivery Group: 19-0112-22
Client Project/Site: NEDU Pits

For:
Larson & Associates, Inc.
507 N Marienfeld
Suite 202
Midland, Texas 79701

Attn: Mr. Mark J Larson

Authorized for release by:
6/1/2022 5:56:39 PM
Dean Joiner, Project Manager II
(346)320-6096
Dean.Joiner@et.eurofinsus.com

Designee for

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

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Laboratory Job ID: 880-15148-1
SDG: 19-0112-22

Table of Contents

Definitions/Glossary

Client: Larson & Associates, Inc. Job ID: 880-15148-1
Project/Site: NEDU Pits SDG: 19-0112-22

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.

General Chemistry

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: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Job ID: 880-15148-1

Laboratory: Eurofins Midland

Narrative

Job Narrative
880-15148-1

Receipt
The samples were received on 5/25/2022 8:30 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 5.7°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.

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

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Client Sample ID: MW-1

Date Collected: 05/24/22 12:30
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-1
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			05/27/22 21:17	1
Toluene	<0.00200	U	0.00200		mg/L			05/27/22 21:17	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			05/27/22 21:17	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			05/27/22 21:17	1
o-Xylene	<0.00200	U	0.00200		mg/L			05/27/22 21:17	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			05/27/22 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*05/27/22 21:17*	*1*
1,4-Difluorobenzene (Surr)	*102*		*70 - 130*		*05/27/22 21:17*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			05/31/22 09:13	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**912**		10.0		mg/L			05/26/22 21:09	20

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2500**		200		mg/L			05/26/22 10:50	1

Client Sample ID: MW-2

Date Collected: 05/24/22 11:50
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-2
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			05/27/22 21:38	1
Toluene	<0.00200	U	0.00200		mg/L			05/27/22 21:38	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			05/27/22 21:38	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			05/27/22 21:38	1
o-Xylene	<0.00200	U	0.00200		mg/L			05/27/22 21:38	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			05/27/22 21:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*05/27/22 21:38*	*1*
1,4-Difluorobenzene (Surr)	*100*		*70 - 130*		*05/27/22 21:38*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			05/31/22 09:13	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**		5.00		mg/L			05/26/22 21:17	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		50.0		mg/L			05/26/22 10:50	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Client Sample ID: MW-3

Date Collected: 05/24/22 10:30
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-3
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			05/27/22 21:58	1
Toluene	<0.00200	U	0.00200		mg/L			05/27/22 21:58	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			05/27/22 21:58	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			05/27/22 21:58	1
o-Xylene	<0.00200	U	0.00200		mg/L			05/27/22 21:58	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			05/27/22 21:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*		*05/27/22 21:58*	*1*
1,4-Difluorobenzene (Surr)	*102*		*70 - 130*		*05/27/22 21:58*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			05/31/22 09:13	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**114**		2.50		mg/L			05/26/22 21:25	5

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**647**		50.0		mg/L			05/26/22 10:50	1

Client Sample ID: MW-4

Date Collected: 05/24/22 11:30
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-4
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			05/28/22 00:09	1
Toluene	<0.00200	U	0.00200		mg/L			05/28/22 00:09	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			05/28/22 00:09	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			05/28/22 00:09	1
o-Xylene	<0.00200	U	0.00200		mg/L			05/28/22 00:09	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			05/28/22 00:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*05/28/22 00:09*	*1*
1,4-Difluorobenzene (Surr)	*102*		*70 - 130*		*05/28/22 00:09*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			05/31/22 09:13	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**171**		2.50		mg/L			05/26/22 21:33	5

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**827**		50.0		mg/L			05/26/22 10:50	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Client Sample ID: Dup-1

Date Collected: 05/24/22 00:00
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-5

Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			05/28/22 00:29	1
Toluene	<0.00200	U	0.00200		mg/L			05/28/22 00:29	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			05/28/22 00:29	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			05/28/22 00:29	1
o-Xylene	<0.00200	U	0.00200		mg/L			05/28/22 00:29	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			05/28/22 00:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*05/28/22 00:29*	*1*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*		*05/28/22 00:29*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			05/31/22 09:13	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**189**		5.00		mg/L			05/26/22 21:57	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		50.0		mg/L			05/26/22 10:50	1

Surrogate Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)											
		BFB1	DFBZ1										
Lab Sample ID	Client Sample ID	(70-130)	(70-130)										
880-15148-1	MW-1	102	102										
880-15148-2	MW-2	101	100										
880-15148-3	MW-3	105	102										
880-15148-4	MW-4	104	102										
880-15148-5	Dup-1	104	101										
LCS 880-26468/3	Lab Control Sample	103	100										
LCSD 880-26468/4	Lab Control Sample Dup	100	98										
MB 880-26468/8	Method Blank	97	99										

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DFBZ = 1,4-Difluorobenzene (Surr)

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 880-26468/8
Matrix: Water
Analysis Batch: 26468

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			05/27/22 18:45	1
Toluene	<0.00200	U	0.00200		mg/L			05/27/22 18:45	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			05/27/22 18:45	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			05/27/22 18:45	1
o-Xylene	<0.00200	U	0.00200		mg/L			05/27/22 18:45	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			05/27/22 18:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*		*05/27/22 18:45*	*1*
1,4-Difluorobenzene (Surr)	*99*		*70 - 130*		*05/27/22 18:45*	*1*

Lab Sample ID: LCS 880-26468/3
Matrix: Water
Analysis Batch: 26468

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Benzene			0.100	0.09706		mg/L		97	70 - 130		
Toluene			0.100	0.1048		mg/L		105	70 - 130		
Ethylbenzene			0.100	0.09811		mg/L		98	70 - 130		
m,p-Xylenes			0.200	0.2271		mg/L		114	70 - 130		
o-Xylene			0.100	0.1101		mg/L		110	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*
1,4-Difluorobenzene (Surr)	*100*		*70 - 130*

Lab Sample ID: LCSD 880-26468/4
Matrix: Water
Analysis Batch: 26468

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			0.100	0.09215		mg/L		92	70 - 130	5	20
Toluene			0.100	0.1003		mg/L		100	70 - 130	4	20
Ethylbenzene			0.100	0.09443		mg/L		94	70 - 130	4	20
m,p-Xylenes			0.200	0.2188		mg/L		109	70 - 130	4	20
o-Xylene			0.100	0.1059		mg/L		106	70 - 130	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*
1,4-Difluorobenzene (Surr)	*98*		*70 - 130*

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 880-26380/3
Matrix: Water
Analysis Batch: 26380

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.500	U	0.500		mg/L			05/26/22 18:07	1

Lab Sample ID: LCS 880-26380/4
Matrix: Water
Analysis Batch: 26380

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			25.0	25.33		mg/L		101	90 - 110		

Lab Sample ID: LCSD 880-26380/5
Matrix: Water
Analysis Batch: 26380

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
Chloride			25.0	25.31		mg/L		101	90 - 110	0	20

Lab Sample ID: 880-15148-4 MS
Matrix: Water
Analysis Batch: 26380

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	171		125	302.1		mg/L		105	90 - 110		

Lab Sample ID: 880-15148-4 MSD
Matrix: Water
Analysis Batch: 26380

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	171		125	301.9		mg/L		105	90 - 110	0	20

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

Lab Sample ID: MB 880-26341/1
Matrix: Water
Analysis Batch: 26341

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<25.0	U	25.0		mg/L			05/26/22 10:50	1

Lab Sample ID: LCS 880-26341/2
Matrix: Water
Analysis Batch: 26341

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	1011		mg/L		101	80 - 120		

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

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

Lab Sample ID: LCSD 880-26341/3
Matrix: Water
Analysis Batch: 26341

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
Total Dissolved Solids			1000	1026		mg/L		103	80 - 120	1	10

Lab Sample ID: 880-15148-1 DU
Matrix: Water
Analysis Batch: 26341

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	2500			2444		mg/L				2	10

QC Association Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

GC VOA

Analysis Batch: 26468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-15148-1	MW-1	Total/NA	Water	8021B	
880-15148-2	MW-2	Total/NA	Water	8021B	
880-15148-3	MW-3	Total/NA	Water	8021B	
880-15148-4	MW-4	Total/NA	Water	8021B	
880-15148-5	Dup-1	Total/NA	Water	8021B	
MB 880-26468/8	Method Blank	Total/NA	Water	8021B	
LCS 880-26468/3	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-26468/4	Lab Control Sample Dup	Total/NA	Water	8021B	

Analysis Batch: 26547

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-15148-1	MW-1	Total/NA	Water	Total BTEX	
880-15148-2	MW-2	Total/NA	Water	Total BTEX	
880-15148-3	MW-3	Total/NA	Water	Total BTEX	
880-15148-4	MW-4	Total/NA	Water	Total BTEX	
880-15148-5	Dup-1	Total/NA	Water	Total BTEX	

HPLC/IC

Analysis Batch: 26380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-15148-1	MW-1	Total/NA	Water	300.0	
880-15148-2	MW-2	Total/NA	Water	300.0	
880-15148-3	MW-3	Total/NA	Water	300.0	
880-15148-4	MW-4	Total/NA	Water	300.0	
880-15148-5	Dup-1	Total/NA	Water	300.0	
MB 880-26380/3	Method Blank	Total/NA	Water	300.0	
LCS 880-26380/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 880-26380/5	Lab Control Sample Dup	Total/NA	Water	300.0	
880-15148-4 MS	MW-4	Total/NA	Water	300.0	
880-15148-4 MSD	MW-4	Total/NA	Water	300.0	

General Chemistry

Analysis Batch: 26341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-15148-1	MW-1	Total/NA	Water	SM 2540C	
880-15148-2	MW-2	Total/NA	Water	SM 2540C	
880-15148-3	MW-3	Total/NA	Water	SM 2540C	
880-15148-4	MW-4	Total/NA	Water	SM 2540C	
880-15148-5	Dup-1	Total/NA	Water	SM 2540C	
MB 880-26341/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 880-26341/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 880-26341/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
880-15148-1 DU	MW-1	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Client Sample ID: MW-1
Date Collected: 05/24/22 12:30
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-1
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	26468	05/27/22 21:17	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			26547	05/31/22 09:13	SM	XEN MID
Total/NA	Analysis	300.0		20			26380	05/26/22 21:09	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	25 mL	200 mL	26341	05/26/22 10:50	SC	XEN MID

Client Sample ID: MW-2
Date Collected: 05/24/22 11:50
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-2
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	26468	05/27/22 21:38	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			26547	05/31/22 09:13	SM	XEN MID
Total/NA	Analysis	300.0		10			26380	05/26/22 21:17	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	26341	05/26/22 10:50	SC	XEN MID

Client Sample ID: MW-3
Date Collected: 05/24/22 10:30
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-3
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	26468	05/27/22 21:58	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			26547	05/31/22 09:13	SM	XEN MID
Total/NA	Analysis	300.0		5			26380	05/26/22 21:25	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	26341	05/26/22 10:50	SC	XEN MID

Client Sample ID: MW-4
Date Collected: 05/24/22 11:30
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-4
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	26468	05/28/22 00:09	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			26547	05/31/22 09:13	SM	XEN MID
Total/NA	Analysis	300.0		5			26380	05/26/22 21:33	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	26341	05/26/22 10:50	SC	XEN MID

Client Sample ID: Dup-1
Date Collected: 05/24/22 00:00
Date Received: 05/25/22 08:30

Lab Sample ID: 880-15148-5
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	26468	05/28/22 00:29	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			26547	05/31/22 09:13	SM	XEN MID
Total/NA	Analysis	300.0		10			26380	05/26/22 21:57	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	26341	05/26/22 10:50	SC	XEN MID

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Laboratory References:

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

Accreditation/Certification Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

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	T104704400-21-22	06-30-22

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
Total BTEX		Water	Total BTEX

Method Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	XEN MID
Total BTEX	Total BTEX Calculation	TAL SOP	XEN MID
300.0	Anions, Ion Chromatography	MCAWW	XEN MID
SM 2540C	Solids, Total Dissolved (TDS)	SM	XEN MID
5030B	Purge and Trap	SW846	XEN MID

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

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:

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

Sample Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU Pits

Job ID: 880-15148-1
SDG: 19-0112-22

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
880-15148-1	MW-1	Water	05/24/22 12:30	05/25/22 08:30
880-15148-2	MW-2	Water	05/24/22 11:50	05/25/22 08:30
880-15148-3	MW-3	Water	05/24/22 10:30	05/25/22 08:30
880-15148-4	MW-4	Water	05/24/22 11:30	05/25/22 08:30
880-15148-5	Dup-1	Water	05/24/22 00:00	05/25/22 08:30

No. 2241

15148 CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants

507 N Marienfeld Ste 202
Midland TX 79701
432 687 0901

Data Reported to

DATE 5-24-22 PAGE 1 OF 1

PO# LAB WORK ORDER#

PROJECT LOCATION OR NAME NEDU Drill Pit

LAI PROJECT # 19-0112-22 COLLECTOR TP + RN

TRRP report? ☐ Yes ☒ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR OT=OTHER

TIME ZONE
Time zone/State
MST/NM

Field Sample I D	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl 3x	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE 2x	UNPRESSERVED	ANALYSES: BTEX ☐ MTBE ☐ TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ GASOLINE MOD 8015 ☐ DIESEL - MOD 8015 ☐ OIL - MOD 8015 ☐ VOC 8260 ☐ SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ 8082 PCBS ☐ TCLP - METALS (RCRA) ☐ TCLP VOC ☐ TCLP - PEST ☐ HERB ☐ Semi-VOC ☐ TOTAL METALS (RCRA) ☐ OTHER LIST ☐ LEAD TOTAL ☐ D W 200.8 ☐ TCLP ☐ RCI ☐ TOX ☐ FLASHPOINT ☐ TDS TSS ☐ % MOISTURE ☐ CYANIDE ☐ pH ☐ HEXAVALENT CHROMIUM ☐ EXPLOSIVES ☐ PECHLORATE ☐ CHLORIDE ANIONS ☐ ALKALINITY ☐	FIELD NOTES
MW-1		5/24/22	1230	W	5	X			X		X	Bill Direct to Apache, Send Report to LAI
MW-2		"	1150	"	"	"			"		"	
MW-3		"	1030	"	"	"			"		"	
MW-4		"	1130	"	"	"			"		"	
Dup-1		"		"	"	"			"		"	

TOTAL 5

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
	5/25/22 0838	
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)

LABORATORY Xenco

TURN AROUND TIME
NORMAL X
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY
RECEIVING TEMP 5.9/5.7 THERM# -2 IR8
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☐ HAND DELIVERED

880-15148 Chain of Custody

Login Sample Receipt Checklist

Client: Larson & Associates, Inc.

Job Number: 880-15148-1
SDG Number: 19-0112-22

Login Number: 15148
List Number: 1
Creator: Rodriguez, Leticia

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 373808

CONDITIONS

Operator: APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID: 873
	Action Number: 373808
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Apache Second Quarter (Apr-Jun) Groundwater Monitoring Report NEDU Pits, June 30, 2022 accepted by OCD for the record on 08/14/2024. App ID: 373808	8/28/2024