

State of New Mexico
Energy, Minerals and Natural Resources Department

Michele Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Cabinet Secretary

Dylan Fuge
Acting Director
Oil Conservation Division



May 5, 2023

Apache Corporation OGRID: 873
Bruce Baker
303 Veterans Airpark Ln
Midland TX 79705

**Re: Incident NDHR1922141227 (IRP-5636) - Scope of Work for Additional Monitoring Wells
Apache Corp., EBDU #37, Lea County, New Mexico**

Mr. Baker:

The New Mexico Oil Conservation Division (OCD) has requested that Apache complete a groundwater investigation to determine if groundwater has been impacted (and if so, the extent of contamination) from incident **NDHR1922141227**. The OCD has reviewed the proposed scope of work received, via email, on April 27, 2023. OCD appreciates Apache's willingness to continue investigation activities. It should be noted chlorides in the area of Apache's operations exceed WQCC regulations and therefore must be investigated to identify any potential sources. OCD may require additional monitoring wells, if deemed necessary, for continued investigation of the elevated chlorides. NMOCD approves the scope of work with the attached conditions:

- Drilling must be performed within 30 days or an extension for cause shall be provided to the OCD for review and approval.
- The reported findings must be supplied to the OCD within 30 days of the sampling activities or within 14 days of the receipt of the sampling results from the laboratory, whichever is greater.
- Apache shall provide OCD the drilling schedule no later than 3 business days prior to starting.

If you have any questions, please contact Mike Bratcher at (505) 626-0857 or by email at mike.bratcher@emnrd.nm.gov.

Respectfully,

Rosa M. Romero

Rosa Romero
Environmental Bureau Chief – NMOCD
CC: MB/NV



April 5, 2023

VIA EMAIL: nelson.velez@emnrd.nm.gov
mike.batcher@emnrd.nm.gov

Mr. Nelson Velez, Environmental Specialist
State of New Mexico – Oil Conservation Division
1000 Rio Brazos Road
Aztec, New Mexico 87410

**Re: Incident NDHR1922141227 (1RP-5636) - Scope of Work for Additional Monitoring Wells
Apache Corp., EBDU #37, Lea County, New Mexico**

Dear Mr. Velez,

Larson & Associates, Inc. (LAI), on behalf of Apache Corp. (Apache) has prepared this scope of work (SOW) for New Mexico Oil Conservation Division (NMOCD) approval to install four (4) additional monitoring wells (TMW-7 through TMW-10) at the East Blinebry Drinkard Unit (EBDU) #37 (Site) located in Unit E (SW/NW), Section 13, Township 21 South, Range 37 East, Lea County, New Mexico. Apache believes that the remediation work it performed in 2019, which was approved by NMOCD, was extensive and successfully remediated any adverse impact to the area. In the spirit of cooperation and to ensure a thorough remediation, however, Apache agrees to install the additional wells that NMOCD has requested. The geodetic position is North 32.479569° and West -103.122061°. Figure 1 presents a topographic map.

Purpose and Background

The purpose for the additional groundwater monitoring wells is to assess the source and extent of chloride reported in soil and groundwater samples from a produced water release that occurred on July 14, 2019. The release originated from a flowline at a pipeline junction located about 720 feet east from Well #37. Produced fluids (oil and water) flowed west about 350 feet west from the release origin, and south about 450 feet before terminating in low-lying area. The volume of the release and recovered fluid are unknown.

On October 29, 2019, Apache submitted to the NMOCD a remediation plan titled, "1RP-5636 REMEDIATION PLAN, East Blinebry Drinkard Unit #37 Produced water Spill, Lea County, New Mexico, October 29, 2019". On December 23, 2019, NMOCD approved an addendum to the remediation plan based on a telephone call on December 20, 2019 (Bradford Billings) with the following conditions:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered.
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs.
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient.
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019.

507 North Marienfeld, Suite 202 ♦ Midland, Texas 79701 ♦ Ph. (432) 687-0901 ♦ Fax (432) 687-0456

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- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20-mil thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil.
- Seed Area 1 and Area 2 following remediation according to landowner requirement.
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Apache performed the remediation, installed four (4) monitoring wells (TMW-1 through TMW-4), and performed quarterly (4 times per year) groundwater monitoring from monitoring wells and a water well (windmill). In all, Apache has spent over \$750,000 to ensure the remediation was thorough and properly done in accordance with the approved plan.

Between November 28 and 30, 2022, at NMOCD request, Apache installed two (2) additional monitoring wells (TMW-5 and TMW-6) east of the playa where the release terminated. Soil samples were collected from seven (7) borings (BH-1 and BH-3 from BH-8) installed in the playa (BH-1 and BH-3 to BH-5) and the release corridor north of the playa (BH-6, BH-7 and BH-8).

On April 4, 2023, during a conference call. NMOCD, then requested Apache to install four (4) additional monitoring wells (TMW-7 through TMW-11). In the spirit of cooperation and to ensure all potential impacts are addressed, Apache agreed. Figure 2 presents an aerial map showing the proposed monitoring well locations.

Scope of Work

LAI, on behalf of Apache, will prepare and submit permit applications to the State of New Mexico Office of the State Engineering (NMOSE) for approval to install four (4) additional monitoring wells at locations shown on Figure 2. Monitoring well TMW-7 will be installed at the source for the release located about 475 feet northeast from the playa. Monitoring well TMW-8 will be installed within about five (5) feet north or south of BH-7. Wells TM-9 and TMW-10 will be installed about one hundred (100) feet west and east, respectively, from monitoring well TMW-1 located south of the playa. The wells will be installed about twenty (20) feet into the uppermost groundwater unit estimated to occur at about fifty-six (56), fifty-five (55), and forty-seven (47) feet below ground surface (bgs) near TMW-7, TMW-8 and TMW-9/TMW-10, respectively. A nominal five (5) diameter bore will be drilled at each location with an air rotary rig. The lithologies will be described and logs prepared according to the Unified Soil Classification System (USCS) in ASTM D-2487 (*Standard Practice for Classification of Soils for Engineering Purposes*). The monitoring wells will be constructed in accordance with ASTM D5092-04 (Reapproved 2010) in *Standard Practice for Design and Installation of Groundwater Monitoring Wells* using 2-inch diameter schedule 40 threaded screw-threaded PVC riser and approximately twenty (20) feet of 0.01-inch factory slotted screen. A filter pack of appropriately sized silica sand will be placed around the borehole by evenly pouring around the PVC riser. The sand will extend from the bottom of the borings to about two (2) feet above the screen. Sodium bentonite chips will be placed around the riser from the top of the filter sand to about 1-foot bgs at wells TMW-7 and TMW-9 and hydrated with potable water. A slurry of portland cement and bentonite will be used to TMW-8 to seal the bore above the sand to about 1-foot bgs. The purpose of the cement and bentonite slurry at TMW-8 is to prevent surface water intrusion below a 20-mil thickness polyethylene liner positioned at about 4-feet bgs. The wells will be secured with locking steel covers anchored into a concrete apron measuring about 3 by 3 feet and about 4-inches thick. A State of New Mexico Licensed Professional Land Surveyor (PLS) will survey the wells for position and elevation including natural ground and top of casing (TOC). LAI personnel will develop the wells by pumping with a Waterra mechanical pump to remove

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sediment disturbed during drilling and well installation. The pump will be fitted with new polyethene discharge tubing that will be discarded between wells. The Waterra foot valve will be thoroughly cleaned between wells with a solution of laboratory-grade detergent (Alconox®) and rinsed distilled water. Purged water and sediment will be captured in 55-gallon drums for disposal in a NMOCD permitted Class II commercial salt-water disposal (SWD) well. Drill cuttings will be placed on the ground adjacent to the wells. The proposed well and screen depths are so follows:

Well Number	Est. Water Level, Feet bgs	Est. Well Depth, Feet bgs	Est. Screen Interval, Feet bgs
TMW-7	60	80	60 – 80
TMW-8	55	75	55 – 75
TMW-9	48	68	48 – 68
TMW-10	48	68	48 – 68

The wells will be allowed to recover to near the pre-development depth to groundwater level before collecting groundwater samples. Depth to groundwater will be gauged at TOC with an electronic water level meter. Groundwater samples will be collected from each monitoring well using the low stress or low flow method according to EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017) where an environmental pump is submerged near the middle of the water column and the well is pumped at a low rate until environmental parameters stabilize. Groundwater samples were collected from discharge through dedicated disposable Tygon® tubing. The tubing was discarded after each use and the pump was thoroughly cleaned with a solution of potable water and Alconox® and rinsed with distilled water. The samples will be transferred to labeled laboratory containers, packed in an ice chest filled with ice, and delivered under chain of custody control to EUROFINs Xenco Laboratories (Xenco), a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory, located in Midland, Texas. A groundwater sample will be collected from the discharge at the windmill. A duplicate sample will be collected for laboratory quality assurance and quality control (QA/QC). Xenco will analyze the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8260D, total dissolved solids (TDS) by Method SM 2540C, and chloride by EPA Method 300. BTEX according to EPA SW-846 Method SW-8260D, cations (calcium, magnesium, potassium, and sodium) by Method SW-6020B, anions (chloride and sulfate) by EPA Method 300, alkalinity by EPA Method M-2320B, and total dissolved solids (TDS) by EPA Method M-2540C.

Report

Apache will prepare a report after receipt of the laboratory report that will include the following:

- Description of well installation and groundwater sample collection procedures and conclusions.
- Groundwater potentiometric and contaminant concentration maps.
- Laboratory analytical reports and chain of custody documentation.
- Lithologic logs and well completion diagrams.
- Photographs.

Your approval of this SOW for additional groundwater monitoring wells is requested. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.aBaker@apachecorp.com, Robert Nelson at (432) 687-0901 or nelson@laenvironmental.com or me to discuss any questions you may have.

Respectively,

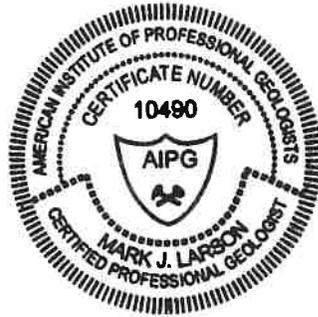
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Nelson Velez
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Larson & Associates, Inc.

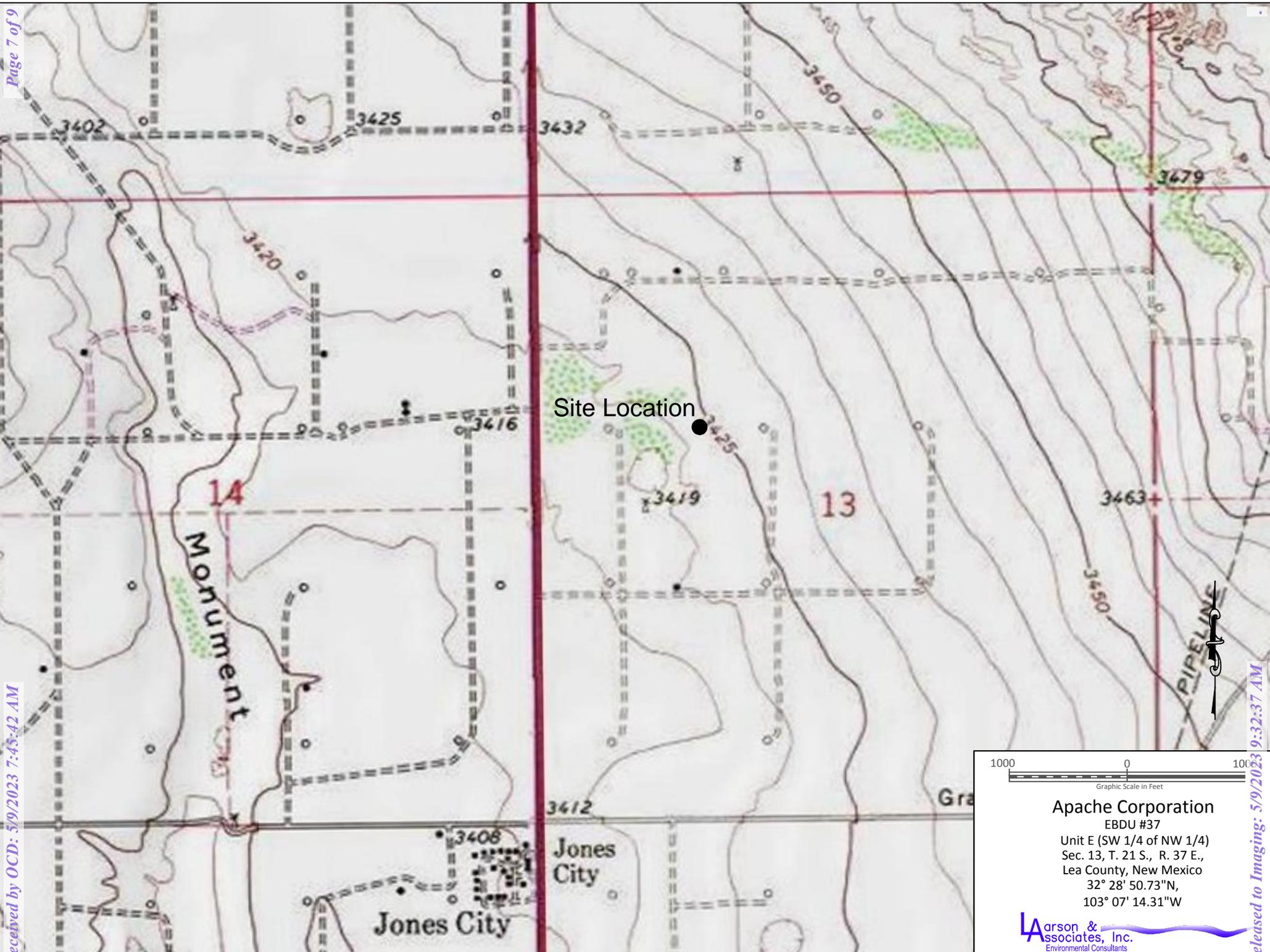


Mark J. Larson, P.G.
President/Sr. Hydrogeologist
Certified Professional Geologist #10490



Encl.

Figures

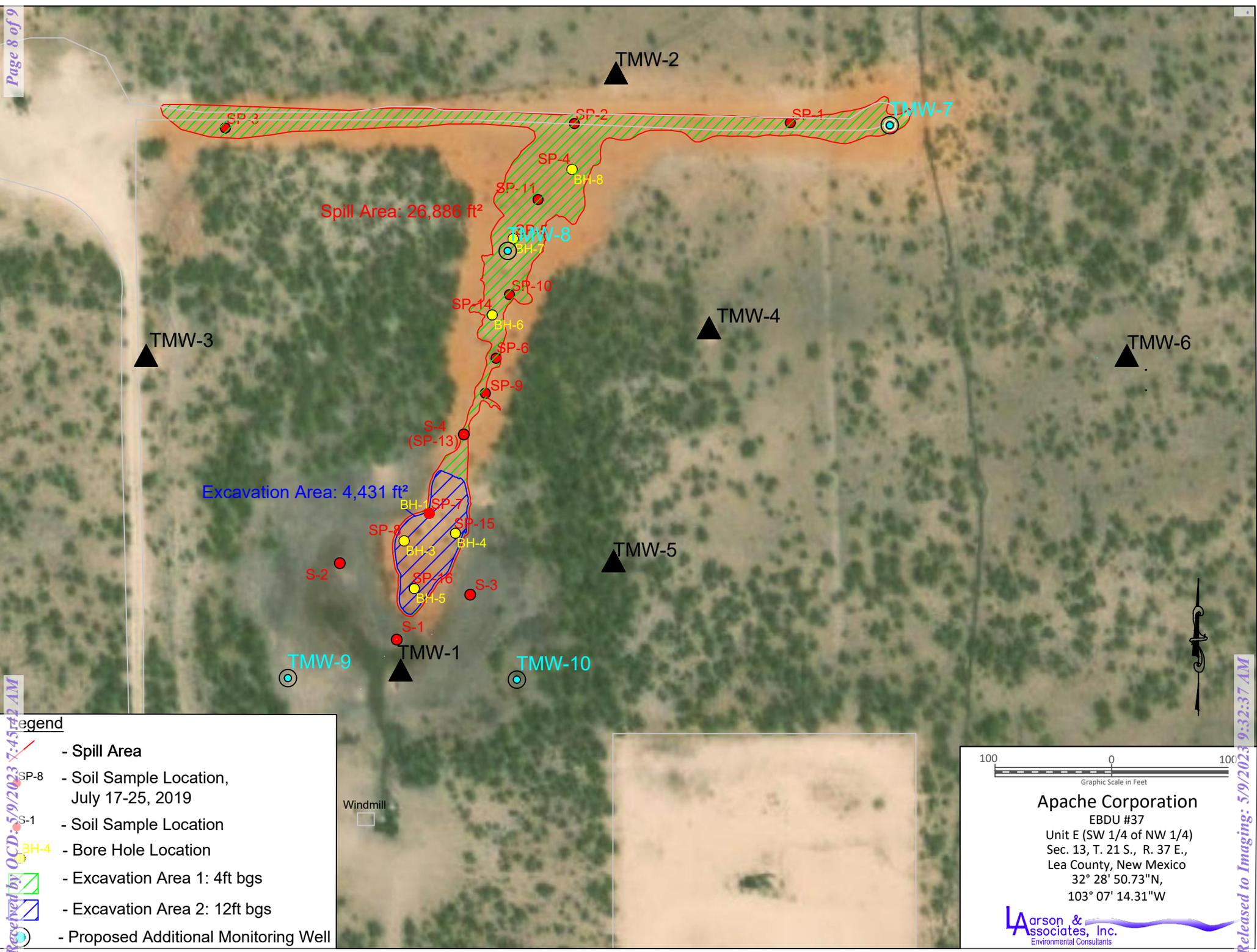


1000 0 1000
Graphic Scale in Feet

Apache Corporation
EBDU #37
Unit E (SW 1/4 of NW 1/4)
Sec. 13, T. 21 S., R. 37 E.,
Lea County, New Mexico
32° 28' 50.73"N,
103° 07' 14.31"W

Larson &
Associates, Inc.
Environmental Consultants

Figure 1 - Topographic Map



Legend

- ▬ - Spill Area
- SP-8 - Soil Sample Location, July 17-25, 2019
- S-1 - Soil Sample Location
- BH-4 - Bore Hole Location
- Excavation Area 1: 4ft bgs
- Excavation Area 2: 12ft bgs
- Proposed Additional Monitoring Well

100 0 100
Graphic Scale in Feet

Apache Corporation
 EBDU #37
 Unit E (SW 1/4 of NW 1/4)
 Sec. 13, T. 21 S., R. 37 E.,
 Lea County, New Mexico
 32° 28' 50.73"N,
 103° 07' 14.31"W

Larson & Associates, Inc.
 Environmental Consultants

Figure 2 - Aerial Map Showing Excavation Area and Proposed Additional Monitoring Well Locations

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 214931

CONDITIONS

Operator: APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID: 873
	Action Number: 214931
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	NMOCD approves the scope of work with the attached conditions: • Drilling must be performed within 30 days or an extension for cause shall be provided to the OCD for review and approval. • The reported findings must be supplied to the OCD within 30 days of the sampling activities or within 14 days of the receipt of the sampling results from the laboratory, whichever is greater. • Apache shall provide OCD the drilling schedule no later than 3 business days prior to starting.	5/9/2023