



| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

## Rule 34 Registration

May 2026

### Lost Tanks East

Section 30 Township 22S Range 33E, Lea County

#### Volume 2

- C-147
- Closure Cost
- Stamped Design Drawings
- Avian Deterrent System Demonstration
- Fence Design Demonstration
- Liner Equivalency Demonstration
- Design and Construction Plan
- Operation and Maintenance Plan
- Closure Plan



*View of mesquite and grasses in the AOI that make up the predominant vegetation in the darker areas seen on satellite imagery.*

#### Prepared for:

DEVON ENERGY PRODUCTION COMPANY, LP  
Oklahoma City, Oklahoma

#### Prepared by:

Cascade Services LLC  
Midland, Texas

State of New Mexico
Energy Minerals and Natural Resources
Department Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505
https://www.emnrd.nm.gov/ocd/ocd-e-permitting/

Recycling Facility and/or Recycling Containment

Type of Facility: [X] Recycling Facility [X] Recycling Containment\*
Type of action: [ ] Permit [X] Registration
[ ] Modification [ ] Extension
[ ] Closure [ ] Other (explain)

\* At the time C-147 is submitted to the division for a Recycling Containment, a copy shall be provided to the surface owner.

Be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1. Operator: DEVON ENERGY PRODUCTION COMPANY, LP (For multiple operators attach page with information) OGRID #: 6137
Address: 333 West Sheridan Ave., Oklahoma City, OK 73102
Facility or well name (include API# if associated with a well): Lost Tanks East
OCD Permit Number: FVV2614937814 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr Gov. Lot 2, F Section 30 Township 22S Range 33E County: Lea
Surface Owner: [X] Federal [ ] State [ ] Private [ ] Tribal Trust or Indian Allotment

2. [X] Recycling Facility:
Location of recycling facility (if applicable): Latitude 32.54557 Longitude -103.70714 NAD83
Proposed Use: [X] Drilling\* [X] Completion\* [X] Production\* [X] Plugging \*
\*The re-use of produced water may NOT be used until fresh water zones are cased and cemented
[ ] Other, requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.
[X] Fluid Storage
[X] Above ground tanks [X] Recycling containment [ ] Activity permitted under 19.15.17 NMAC explain type
[ ] Activity permitted under 19.15.36 NMAC explain type: [ ] Other explain
[ ] For multiple or additional recycling containments, attach design and location information of each containment
[ ] Closure Report (required within 60 days of closure completion): [ ] Recycling Facility Closure Completion Date:

3. [X] Recycling Containment:
[ ] Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)
Center of Recycling Containment (if applicable): Latitude 32.54557 Longitude -103.70714 NAD83
[ ] For multiple or additional recycling containments, attach design and location information of each containment
[X] Lined [X] Liner type: Thickness 60p 40s mil [ ] LLDPE [X] HDPE [ ] PVC [ ] Other
[ ] String-Reinforced
Liner Seams: [X] Welded [ ] Factory [ ] Other Volume: 607,935 bbl Dimensions: L x W x D
[ ] Recycling Containment Closure Completion Date: See Attached Engineered Drawings

4.

**Bonding:**

Covered under bonding pursuant to 19.15.8 NMAC per 19.15.34.15(A)(2) NMAC (These containments are limited to only the wells owned or operated by the owners of the containment.)

Bonding in accordance with 19.15.34.15(A)(1). Amount of bond \$ 339,725.60 (work on these facilities cannot commence until bonding amounts are approved)

Attach closure cost estimate and documentation on how the closure cost was calculated.

5.

**Fencing:**

Four foot height, four strands of barbed wire evenly spaced between one and four feet

Alternate. Please specify Game Fence

6.

**Signs:**

12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers

Signed in compliance with 19.15.16.8 NMAC

7.

**Variances:**

Justifications and/or demonstrations that the proposed variance will afford reasonable protection against contamination of fresh water, human health, and the environment.

**Check the below box only if a variance is requested:**

Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. If a Variance is requested, include the variance information on a separate page and attach it to the C-147 as part of the application.

**If a Variance is requested, it must be approved prior to implementation.**

8.

**Siting Criteria for Recycling Containment**

*Instructions: The applicant must provide attachments that demonstrate compliance for each siting criteria below as part of the application. Potential examples of the siting attachment source material are provided below under each criteria.*

<b>General siting</b>	
<b>Ground water is less than 50 feet below the bottom of the Recycling Containment.</b> NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. - Written confirmation or verification from the municipality; written approval obtained from the municipality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain. FEMA map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; aerial photo; satellite image	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

9.

**Recycling Facility and/or Containment Checklist:**

*Instructions: Each of the following items must be attached to the application. Indicate, by a check mark in the box, that the documents are attached.*

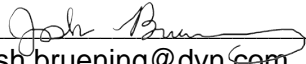
- Design Plan - based upon the appropriate requirements.
- Operating and Maintenance Plan - based upon the appropriate requirements.
- Closure Plan - based upon the appropriate requirements.
- Site Specific Groundwater Data -
- Siting Criteria Compliance Demonstrations -
- Certify that notice of the C-147 (only) has been sent to the surface owner(s)

10.

**Operator Application Certification:**

I hereby certify that the information and attachments submitted with this application are true, accurate and complete to the best of my knowledge and belief.

Name (Print): Josh Bruening Title: Supervisor

Signature:  Date: 5/6/2026

e-mail address: josh.bruening@dvn.com Telephone: 405-552-7882

11.

OCD Representative Signature: Victoria Venegas Approval Date: 05/29/2026

Title: Senior Environmental Scientist OCD Permit Number: FVV2614937814

OCD Conditions \_\_\_\_\_

Additional OCD Conditions on Attachment



| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

## Closure Cost



Corporate Headquarters | 952 Echo Lane, Ste 130 | Houston, TX 77024  
Midland Headquarters | 3403-B E. County Road 44 | Midland, TX 79705

**Lost Tanks East In-Ground Containment Financial Assurance Cost Estimate**

Attached is the cost estimate for reclamation of the Lost Tanks East Recycling In-Ground containment.

**Lost Tanks East In-Ground Containment**

The contractor’s detailed estimate for closure of the in-ground containment immediately follows this outline of closure costs.

The attached cost sheet shows closure sampling and analysis cost is estimated at \$1,725 (sampling) plus \$2,700 (laboratory cost) to “test the soils beneath the containment for contamination with a five-point composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I” of Rule 34. Total closure sampling costs including project management and preparation of the Closure Report for the site are estimated at \$7,500. The cost estimates are presented below.

All work elements required by Rule 34:	\$332,225.60
Preparation of sampling results and closure report:	\$7,500.00
<b>Total Closure Cost:</b>	<b>\$339,725.60</b>

**Cascade Services, LLC**

952 Echo Ln Ste 130  
Houston, TX 77024-2762  
www.cascadeservicesllc.com



**Estimate**

ADDRESS	SHIP TO	ESTIMATE	2383
Devon Energy Production Company, L.P.	Devon Energy Production Company, L.P.	DATE	05/11/2026
333 West Sheridan Ave	333 West Sheridan Ave		
Oklahoma City, OK 731025015	Oklahoma City, OK 731025015		
CUSTOMER PROJECT NAME	PROJECT LOCATION COORDINATES		
Lost Tank East Closure	32.5456900013, -103.709949999		

DESCRIPTION	QTY	UNIT	RATE	AMOUNT
This is pricing a package to reclaim the single 600,444bbl produced water pond. (East Pit) Mobilize equipment to site. Dirt reclaim of pond consist of- Bury all material (Caliche, Gypsum, Sand, ect.) below ground level, backfill pond area with uncontaminated soil from pond walls. Pond area will be reclaimed to natural elevations and water flow patterns. All stockpiled strippings will be put down last to ensure ground has been completely returned to native design.	56,330		2.00	112,660.00
Environmental soil sampling This will include digging 6 sample locations for each containment. One composite sample from 0-4 feet below surface and one discrete sample from each location at 4.25 feet Cost include trip, labor, materials, and laboratory testing	1		1,725.00	1,725.00
Environmental Soil testing Before earthwork can begin the soil must be tested for contamination in case of liner leakage. Cost include trip, labor, materials, and laboratory testing of 18 tests.	1		2,700.00	2,700.00
Broadcast seeding of pond area Seed will be a native mix for Lea County NM Includes purchase of seed mix and placement	1		3,000.00	3,000.00

Fence removal and disposal Fence estimated at 4,315 ft This includes removal of all posts, braces, wire, fabric, gates, and hardware.	4,315	4.00	17,260.00
Remove and dispose of all four layers. Textile, 40 mil, net, and 60 mil	1,299,204	0.15	194,880.60

Preferred payment method: ACH/Wire  
Email AR@cascadeservicesllc.com for ACH/Wire details.

Remit Checks To:  
Cascade Services LLC  
PO Box 200954  
Dallas, TX 75320-0954

\*\*THIS ESTIMATE IS SUBJECT TO THE TERMS & CONDITIONS ATTACHED.

\*\*If pumping is needed due to weather conditions, a \$350 daily fee will be charged on final invoice.

\*\*Materials will be invoiced upon receipt of customer purchase order or job approval.

\*\*This estimate may not include tax and may be added on invoice unless customer provides a valid tax exemption document.

Questions? Email AR@Cascadeservicesllc.com

SUBTOTAL	332,225.60
TAX	0.00
<b>TOTAL</b>	<b>\$332,225.60</b>

Accepted By

Accepted Date



| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

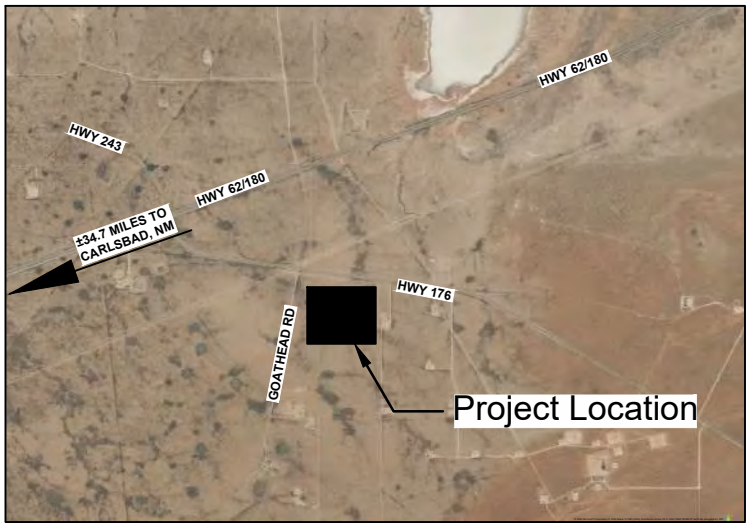
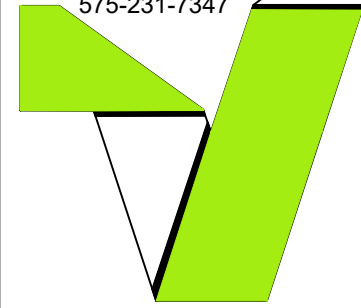
## Recycling Containment Design Drawings

# CIVIL PLANS

## DEVON

# LOST TANKS - EAST RECYCLE CONTAINMENT

SECTION 30, TOWNSHIP 20 SOUTH, RANGE 33 EAST  
N.M.P.M., LEA COUNTY, NEW MEXICO  
N032° 32' 44.23", W103° 42' 26.07"



VICINITY MAP  
N.T.S.

INDEX OF SHEETS		
SHEET	NAME	DESCRIPTION
1	C-100	COVER SHEET
2	SU-101	TOPOGRAPHIC MAP
3	C-101	GENERAL NOTES
4	CS-101	EXISTING SITE FEATURES
5	CS-102	CIVIL SITE PLAN
6	CS-103	MASTER LAYOUT
7	CS-104	CIVIL GRADING PLAN
8	CS-105	FENCE LAYOUT
9	CS-106	CONTAINMENT WEST TO EAST P&P
10	CS-107	CONTAINMENT NORTH TO SOUTH P&P
11	CS-108	VOLUME QUANTITIES
12	CS-501	LEAK DETECTION DETAILS
13	CS-502	LINER DETAILS
14	CS-503	FENCE DETAILS



(505)-254-7310

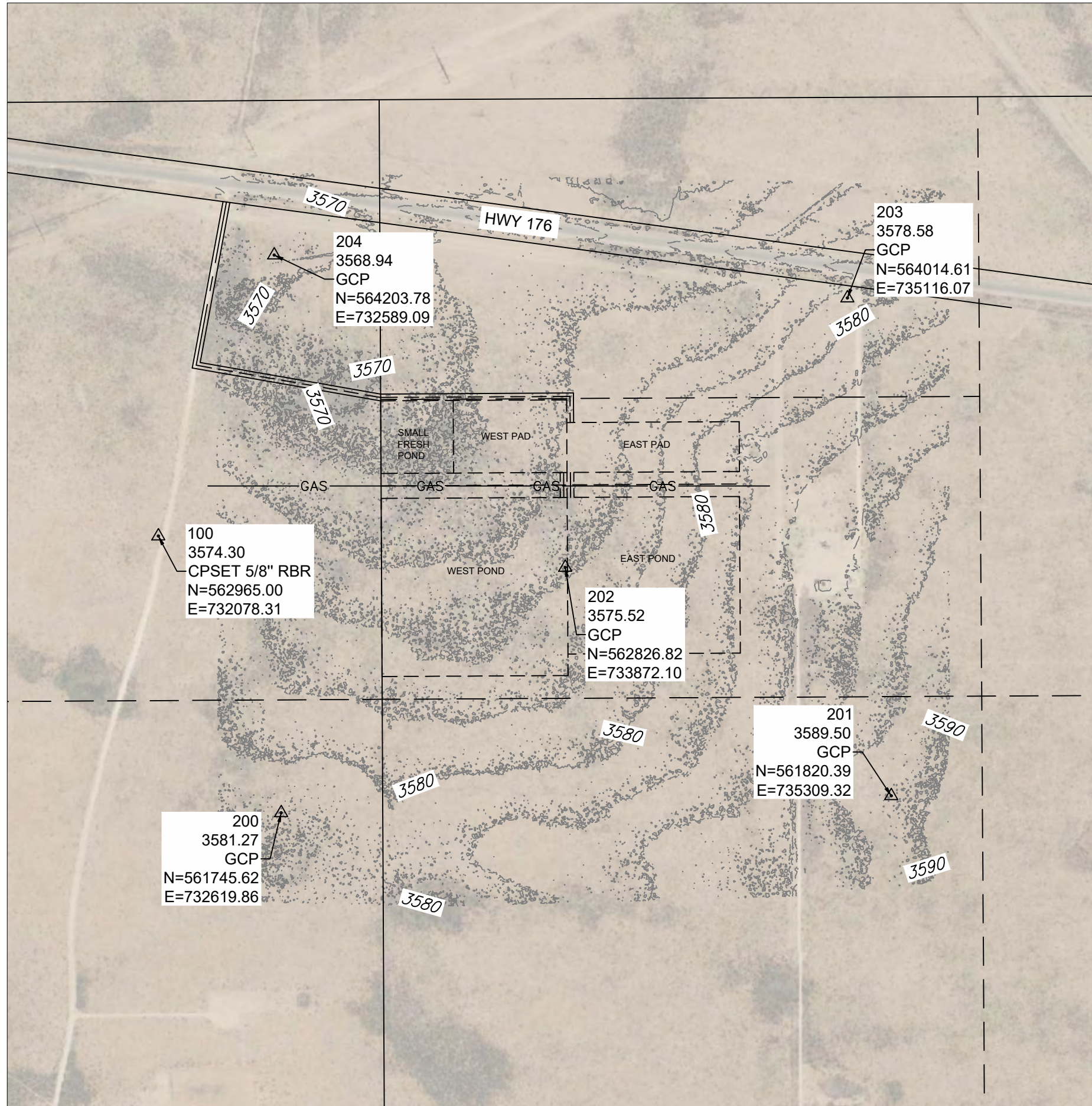
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.



# TOPOGRAPHIC SURVEY

## of DEVON LOST TANKS

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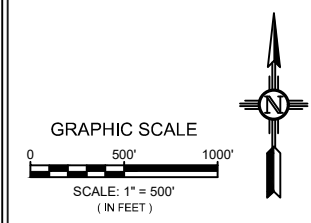


7921 N World Dr.  
 Hobbs, NM 88242-9032  
 Squarerootservices.net  
 575-231-7347

TYPE OF SURVEY:  
**TOPOGRAPHIC SURVEY**  
 OF  
 PROJECT NAME:  
**RECYCLE CONTAINMENT - LOST TANKS**  
 FOR  
 CLIENT:  
**DEVON**

PROJECT NUMBER:  
**26054**

PROJECT SURVEYOR:  
 Jeremy Baker, PS  
 DRAWN BY:  
 C. Jimenez



LEGEND	
	CONTROL POINT AS NOTED
	PARCEL BOUNDARY
	SECTION BOUNDARY
	EDGE OF ROAD
	UNDERGROUND GAS
	CONTOUR LABEL WITH ELEVATION AS NOTED
	MAJOR CONTOUR (10FT)
	MINOR CONTOUR (2FT)

**UTILITY NOTE**  
 UTILITIES DEPICTED WERE OBTAINED THROUGH EVIDENCE: FROM FIELD OBSERVATIONS, PLANS AND/OR REPORTS PROVIDED BY THE CLIENT, AND MARKINGS COORDINATED BY THE NEW MEXICO 811. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURE CANNOT BE ACCURATELY, COMPLETELY, AND RELIABLY DEPICTED. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY.

**TOPOGRAPHIC NOTE**  
 THE TOPOGRAPHY SHOWN HEREIN IS A COMBINATION OF UAV DATA AND CONVENTIONAL/GPS DATA. THE UAV DATA WAS GENERATED USING INDUSTRY STANDARD QUALITY CHECKS AND IS WITHIN THE INDUSTRY RECOGNIZED GROUND SAMPLING DISTANCE (GSD) STANDARD OF BELOW 2.5 CM (1 IN / 0.08 FT). THE ABSOLUTE ACCURACY LEVEL IN STANDARD UAV DATA IS EQUAL TO 3 X GSD (3 X 0.08 FT = 0.24 FT). UAV DATA WAS USED FOR MEASUREMENTS ON NATURAL GROUND AND SUPPLEMENTAL FEATURES.

**BASIS OF BEARING**  
 BEARINGS SHOWN HEREON ARE FROM GPS/GNSS OBSERVATIONS AND CONFORM TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM OF 1983. TRUE NORTH CAN BE OBTAINED BY APPLYING A CONVERGENCE ANGLE OF 00°19'58.9" AT CONTROL POINT #100. DISTANCES SHOWN HEREON ARE IN GROUND AND WERE OBTAINED BY APPLYING A COMBINED GRID TO GROUND SCALE FACTOR OF 1.00021662083956 AT THE PREVIOUSLY NOTED POINT LOCATED AT N 562965.001, E 732078.312 THE VERTICAL DATUM IS BASED ON GEOID18 AND IT PROVIDES ORTHOMETRIC HEIGHTS CONSISTENT WITH THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

I, JEREMY BAKER, NEW MEXICO PROFESSIONAL SURVEYOR NO. 25773, DO HEREBY CERTIFY THAT THIS TOPOGRAPHIC SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT AND THAT THIS INSTRUMENT IS A TOPOGRAPHIC SURVEY PLAT OF AN EXISTING TRACT OR TRACTS.

*Jeremy Baker*  
 Jeremy Baker, N.M. P.S. 25773

05/04/2026  
 Date



SHEET:  
 2 of 14  
**SU - 101**

Released to Imaging: 5/29/2026 1:22:03 PM

Received by OCD: 5/16/2026 12:25:40 PM

GENERAL NOTES

- NEW MEXICO ADMINISTRATIVE CODE TITLE 19, CHAPTER 15, PART 34, DESIGN CRITERIA FOR RECYCLING CONTAINMENTS SHALL APPLY TO THIS PROJECT.
- ALL BOUNDARY, TOPOGRAPHIC AND UTILITY INFORMATION SHOWN ARE BASED ON SURVEY INFORMATION FURNISHED BY TOPOGRAPHIC.
- THE CONTRACTOR SHALL IDENTIFY AND LOCATE UTILITY LINES, MONITORING WELLS, SURVEY MONUMENTS, AND OTHER NEARBY STRUCTURES PRIOR TO PERFORMING WORK.
- COORDINATE INFORMATION IS BASED ON STATE PLANE COORDINATES, NEW MEXICO EAST, NAD 83.
- THE CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES PRIOR TO PROCEEDING WITH CONSTRUCTION AND CONTACT THE ENGINEER IN WRITING.
- THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN BEST MANAGEMENT PRACTICES (BMPS) TO MINIMIZE EROSION AND CONTROL SEDIMENT TO PROTECT SURFACE WATER QUALITY DURING STORM EVENTS.

EARTHWORK NOTES

- THE CONTRACTOR SHALL USE WATER FOR COMPACTION AT ALL TIMES. THE CONTRACTOR SHALL ENSURE THEIR BID INCLUDES CONSTRUCTION WATER. NO EARTHWORK OPERATIONS SHALL TAKE PLACE IF CONSTRUCTION WATER IS NOT AVAILABLE ONSITE.
- THE CONTRACTOR SHALL BUILD THE LEVEES USING COMPACTED LAYERS. UNCONTROLLED AND INCONSISTENT PUSHING AND PILING OF MATERIAL FOR LEVEE CONSTRUCTION IS NOT ACCEPTABLE. THE CONTRACTOR SHALL DEVELOP A SUCCESSFUL COMPACTION PATTERN EARLY IN THE PROCESS, VERIFIED THROUGH NUCLEAR DENSITY OR SAND CONE TESTING, AND SHALL MAINTAIN CONSISTENCY IN THE COMPACTION EFFORT AS LONG AS THE MATERIALS ENCOUNTERED REMAINS CONSISTENT. IF ONSITE SOILS ENCOUNTERED CHANGE, THE CONTRACTOR SHALL DEVELOP A NEW COMPACTION PATTERN.
- FILL FOR LEVEES SHALL BE PLACED AND COMPACTED IN HORIZONTAL LIFTS WITH MAXIMUM LOOSE LIFT THICKNESS OF 10 INCHES, OR AS DIRECTED BY ENGINEER. CONSTRUCT EACH LAYER CONTINUOUSLY AND APPROXIMATELY HORIZONTAL FOR THE WIDTH AND LENGTH OF THE LEVEE. FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DRY DENSITY DETERMINED BY THE ASTM D698 AND AT MOISTURE CONTENT WITHIN +2% TO -2% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY A STANDARD PROCTOR SOILS TEST ON SAMPLES FROM THE SOURCE AREA.
- FILL SHALL NOT BE PLACED AND COMPACTED WHEN THE MATERIALS ARE TOO WET TO PROPERLY COMPACT. MATERIAL WHICH IS TOO WET SHALL BE SPREAD ON THE FILL AREA AND PERMITTED TO DRY, ASSISTED BY HARROWING IF NECESSARY, UNTIL THE MOISTURE CONTENT IS REDUCED TO ALLOWABLE LIMITS. IF THE ENGINEER DETERMINED THAT ADDED MOISTURE IS REQUIRED, WATER SHALL BE APPLIED UNIFORMLY OVER THE AREA TO BE TREATED, AND GIVE COMPLETE AND ACCURATE CONTROL OF THE AMOUNT OF WATER TO BE USED. IF TOO MUCH WATER IS ADDED, THAT AREA SHALL BE PERMITTED TO DRY BEFORE COMPACTION IS CONTINUED.
- PERFORM ONE NUCLEAR DENSITY GAGE TEST PER 2500 CY MINIMUM OR AS DIRECTED BY THE ENGINEER.
- EARTHWORK CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF THE FINISHED COMPACTED POND BOTTOM AND SIDE SLOPES BEFORE HDPE LINER INSTALLATION, REMOVING ALL DEBRIS, SHARP OBJECTS AND GRAVEL LARGER THAN 3/4 INCH.
- EARTHWORK CONTRACTOR SHALL ROLL SURFACE WITH A SMOOTH ROLLER TO ELIMINATE RUTS.

LINER NOTES

- LINER CONTRACTOR SHALL INSPECT GRADED SURFACE FOR DEBRIS, ROCKS OR OTHER MATERIAL THAT MAY DAMAGE THE LINER AND COORDINATE WITH OWNER IF ADDITIONAL SUBGRADE RESURFACING IS NEEDED PRIOR TO PERFORMING WORK.
- LINER CONTRACTOR TO PROVIDE SUBMITTAL OF LINER PANEL LAYOUT.
- LINER CONTRACTOR TO SIGN SUBGRADE ACCEPTANCE FORM (PROVIDED BY OWNER REPRESENTATIVE) DAILY PRIOR TO INSTALLATION.
- LINER TO BE INSTALLED PER GRI SPECIFICATIONS, GUIDES AND PRACTICES.
- CONTRACTOR SHALL PLACE SANDBAGS ON LINER DURING INSTALLATION AS REQUIRED TO PREVENT WIND UPLIFT UNTIL POND IS FILLED TO A DEPTH OF 3 FEET.
- CONTRACTOR SHALL USE BLACK 60 MIL HDPE SMOOTH GEOMEMBRANE AS THE PRIMARY LINER AND BLACK 40 MIL HDPE SMOOTH GEOMEMBRANE AS THE SECONDARY LINER.
- A 3' DIAMETER MINIMUM PIECE OF 40MIL LINER SHALL BE EXTRUDED WELDED WHERE THE PIE SHAPED CORNER SECTIONS MEET FOR SEAM REINFORCEMENT.
- INSTALL A FULL DOUBLE WIDTH SECTION OF BLACK OR WHITE 60 MIL TEXTURED HDPE GEOMEMBRANE RUB SHEET. EXTRUDE WELD TO LINER. WELDS SHALL BE 2" LONG AND SPACED EVERY 12" ALONG BOTH SIDES OF THE SHEET. DO NOT WELD END EDGES. SECTION SHALL EXTEND FROM SUMP AND INSTALLED INTO LINER ANCHOR TRENCH AS SHOWN.
- LINER SHALL BE PROTECTED WITH A 8 OZ. NONWOVEN GEOTEXTILE IF ROCK OR OTHER ANGULAR MATERIALS WITH A DIMENSION GREATER THAN 3/4 INCH ARE PRESENT.
- SUMPS SHALL BE BACKFILLED WITH NON-ANGULAR MAXIMUM 3/8 INCH SIZED PEA GRAVEL.
- ALL SEAMS MUST BE WELDED WITH A 6" MINIMUM OVERLAP.
- CONTRACTOR SHALL NON-DESTRUCTIVELY TEST ALL SEAMS THEIR FULL LENGTH USING AN AIR PRESSURE OR VACUUM TEST, THE PURPOSE OF THIS TEST IS TO CHECK THE CONTINUITY OF THE SEAM.
- FOR AIR PRESSURE TESTING (ASTM 5820), THE FOLLOWING PROCEDURES ARE APPLICABLE TO THE SEAMS WELD WITH DOUBLE SEAM FUSION WELDER.
  - THE EQUIPMENT USED SHALL CONSIST OF AN AIR TANK OR PUMP CAPABLE OF PRODUCING A MINIMUM 35 PSI AND A SHARP NEEDLE WITH A PRESSURE GAUGE ATTACHED TO INSERT INTO THE AIR CHANNEL.
  - SEAL BOTH ENDS OF THE SEAM BY HEATING AND SQUEEZING THEM TOGETHER. INSERT THE NEEDLE WITH THE GAUGE INTO THE AIR CHANNEL. PRESSURIZE THE AIR CHANNEL TO A MINIMUM OF 35 PSI. NOTE TIME STARTS AND WAIT A MINIMUM OF 5 MINUTES TO CHECK. IF PRESSURE AFTER 5 MINUTES HAD DROPPED LESS THAN 2 PSI THE TEST IS SUCCESSFUL (THICKNESS OF MATERIAL MAY CAUSE VARIANCE).
  - CUT OPPOSITE SEAM END AND LISTEN FOR PRESSURE RELEASE TO VERIFY FULL SEAM HAS BEEN TESTED.
  - IF THE TEST FAILS, FOLLOW THESE PROCEDURES.
    - WHILE CHANNEL IS UNDER PRESSURE WALK THE LENGTH OF THE SEAM LISTENING FOR A LEAK.
    - WHILE CHANNEL IS UNDER PRESSURE APPLY A SOAPY SOLUTION TO THE SEAM EDGE AND LOOK FOR BUBBLES FORMED BY AIR ESCAPING.
    - RE-TEST THE SEAM IN SMALLER INCREMENTS UNTIL THE LEAK IS FOUND.
  - ONCE LEAK IS FOUND USING ONE OF THE PROCEDURES ABOVE, CUT OUT THE AREA AND RETEST THE PORTIONS OF THE PORTIONS OF THE SEAMS BETWEEN THE LEAK AREAS PER 6A AND 6B ABOVE. CONTINUE THIS PROCEDURE UNTIL ALL SECTIONS OF THE SEAM PASS THE PRESSURE TEST.
  - REPAIR THE LEAK WITH A PATCH AND VACUUM TEST.
- ALL NON-DESTRUCTIVE TESTS WILL BE NOTED IN THE NON-DESTRUCTIVE LOGS.
- LINER GAS VENTS SHALL BE SPACED ALONG THE INSIDE SLOPE AT APPROXIMATELY 100 FEET ON CENTER OR MINIMUM 2 VENTS PER SIDE.
- WHEN ANY PIPING EQUIPMENT, INLET, OR OUTLET IS IN DIRECT CONTACT WITH THE LINER, AN APRON CONSISTING OF 60 MIL HDPE MATERIAL SHALL BE INSTALLED BENEATH THE EQUIPMENT OR STRUCTURE TO PROTECT THE PRIMARY LINER.
- LAY BOTH LINERS IN ANCHOR TRENCH. BACKFILL ANCHOR TRENCH IN 2 LIFTS AND COMPACT.

SUGGESTED CONSTRUCTION SEQUENCE

- CLEAR EXISTING VEGETATION.
- STRIP AND STOCKPILE TOPSOIL AT THE LOCATION DESIGNATED ON THESE PLANS.
- PERFORM EARTHWORK OPERATIONS:
  - CONSTRUCT STORMWATER DIVERSION CHANNEL.
  - PERFORM RIPPING/EXCAVATING OPERATIONS.
  - REPLACE EXCAVATED MATERIAL IN COMPACTED LAYERS ON THE LEVEE/PAD IN ACCORDANCE WITH THE DETAILS AND SPECIFICATIONS.
  - FINISH SLOPES USING A SMOOTH ROLLER.
  - DIG ANCHOR TRENCH.
- INSTALL NEW GAME FENCE AND GATES.
- INSTALL GEOMEMBRANES:
  - INSTALL GEOTEXTILE AS NEEDED, SECONDARY LINER, GEONET, LEAK DETECTION SYSTEM AND PRIMARY LINER.
  - INSTALL RUB SHEETS AND WATER LEVEL GAGE/LADDER.
  - BACKFILL AND COMPACT ANCHOR TRENCH.



7921 N. World Dr.  
Hobbs, NM 88242  
Squarerootservices.net  
575-231-7347

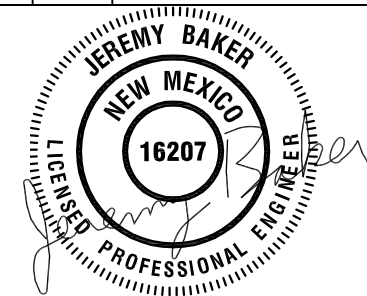
ENGINEERING SHEET:

GENERAL NOTES  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ

REVISIONS	
No.	DATE DESCRIPTION

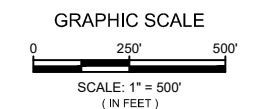


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SHEET:  
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C-101

ENGINEERING  
SHEET:  
EXISTING SITE  
FEATURES  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

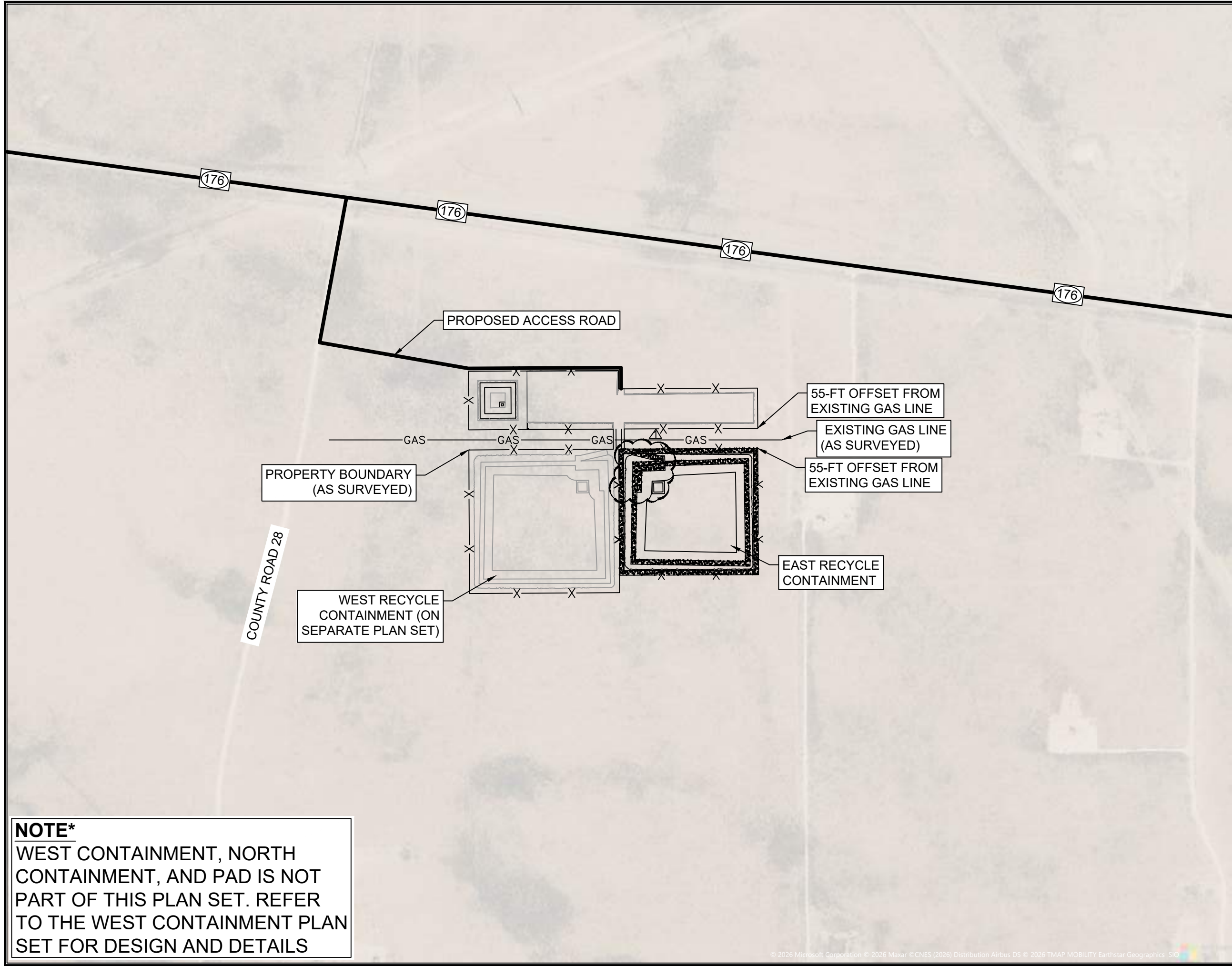
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ



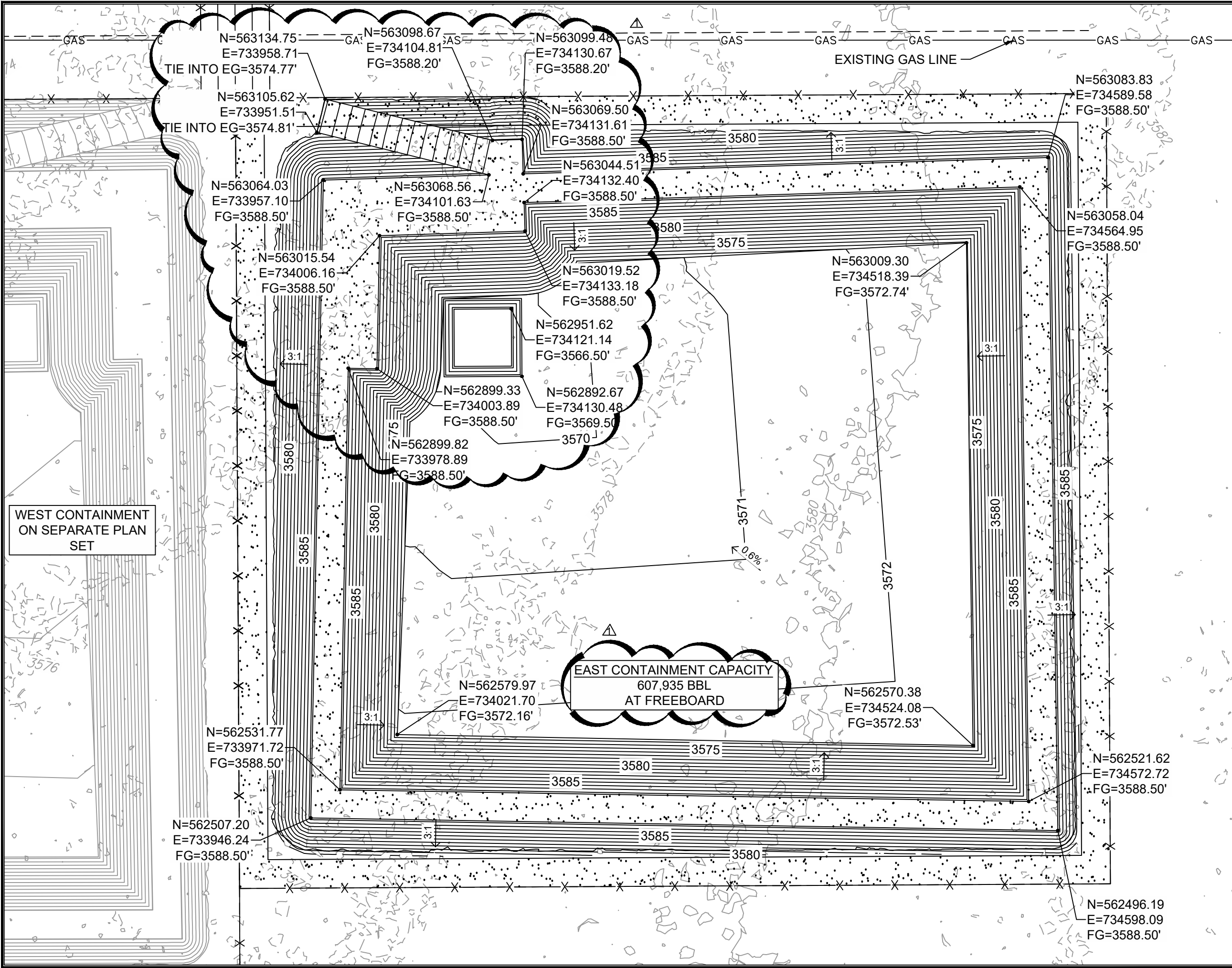
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No.	DATE	DESCRIPTION
1	5/14/26	RAMPS ADDED



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SHEET:  
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CS-101



**NOTE\***  
WEST CONTAINMENT, NORTH  
CONTAINMENT, AND PAD IS NOT  
PART OF THIS PLAN SET. REFER  
TO THE WEST CONTAINMENT PLAN  
SET FOR DESIGN AND DETAILS

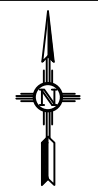
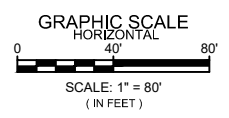


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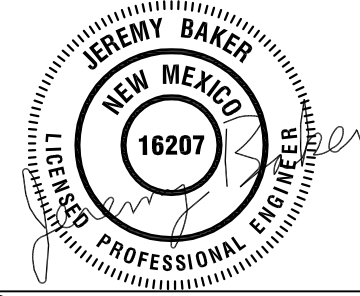
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**CIVIL GRADING PLAN**  
OF  
PROJECT NAME:  
LOST TANKS - EAST RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ



REVISIONS		
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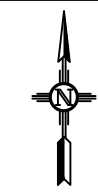
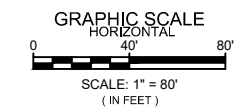


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CS-104

ENGINEERING SHEET:  
MASTER LAYOUT  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

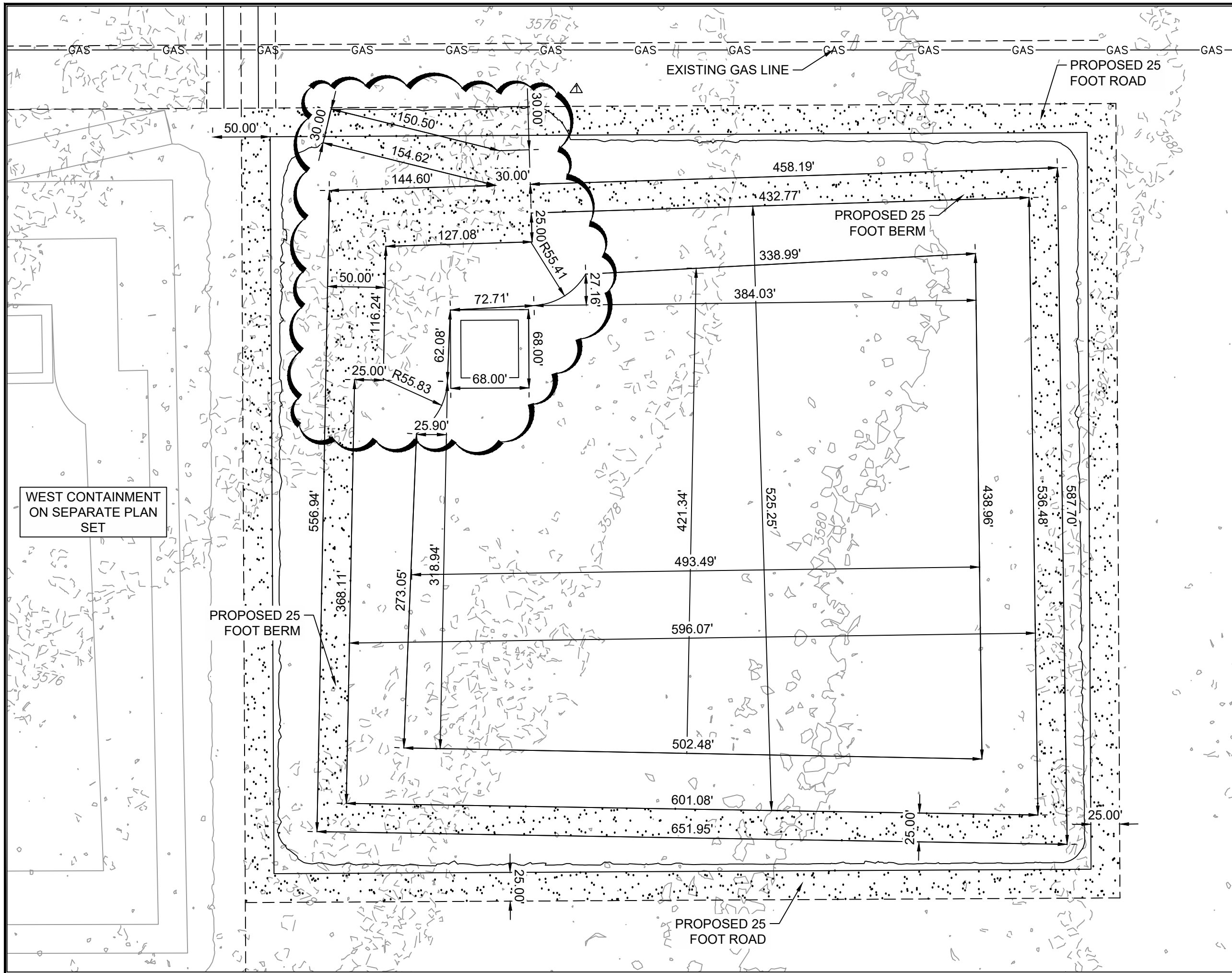
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JEREMY BAKER, PE  
DRAWN BY:  
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REVISIONS		
No.	DATE	DESCRIPTION
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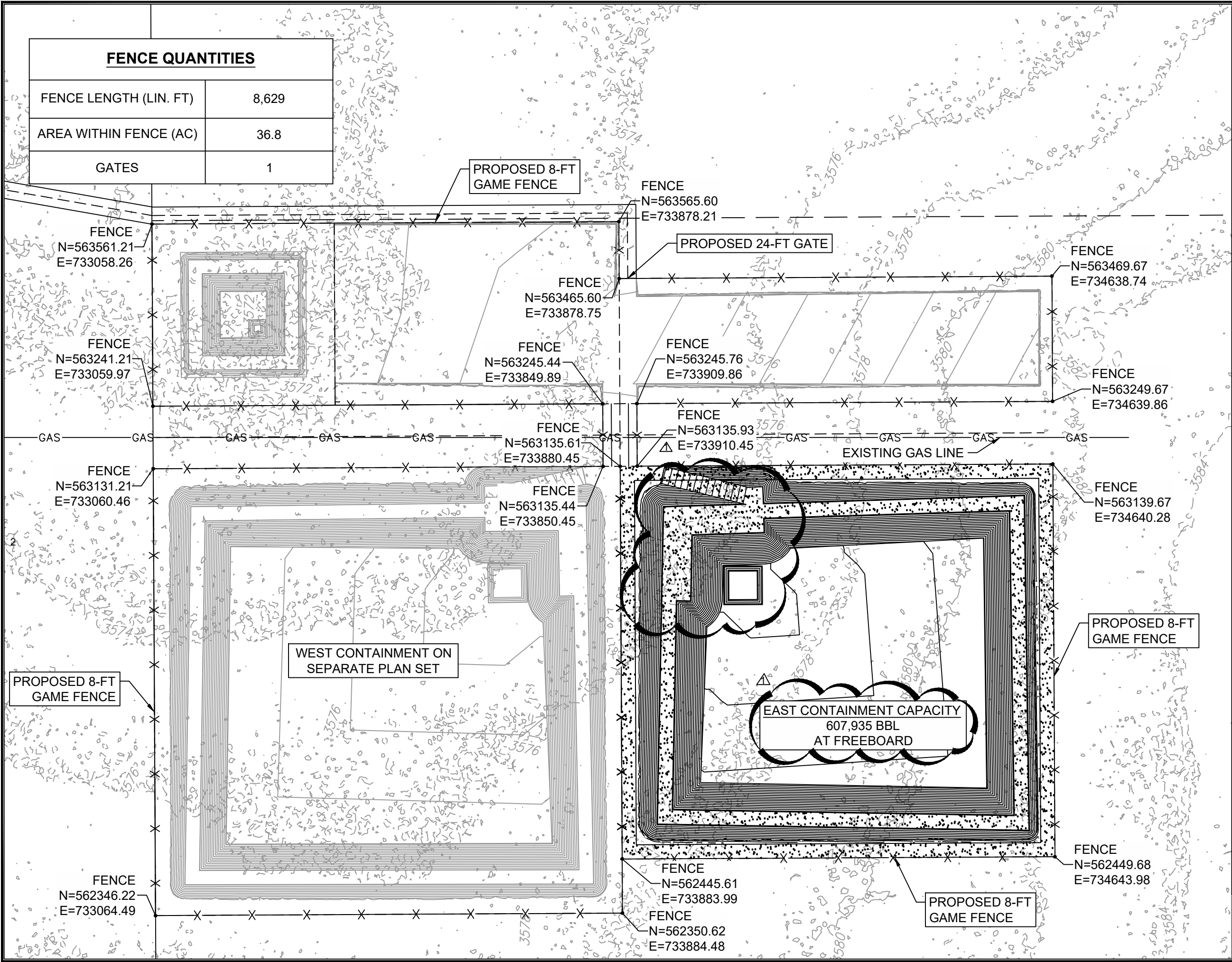


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SHEET:  
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CS-103





FENCE QUANTITIES	
FENCE LENGTH (LIN. FT)	8,629
AREA WITHIN FENCE (AC)	36.8
GATES	1

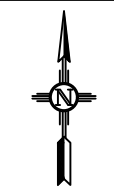
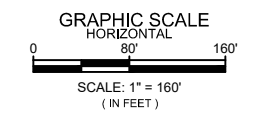


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ENGINEERING SHEET:  
**FENCE LAYOUT**  
 OF  
**PROJECT NAME: LOST TANKS - EAST RECYCLE CONTAINMENT**  
 FOR  
**CLIENT: DEVON**

PROJECT NUMBER:  
 26054

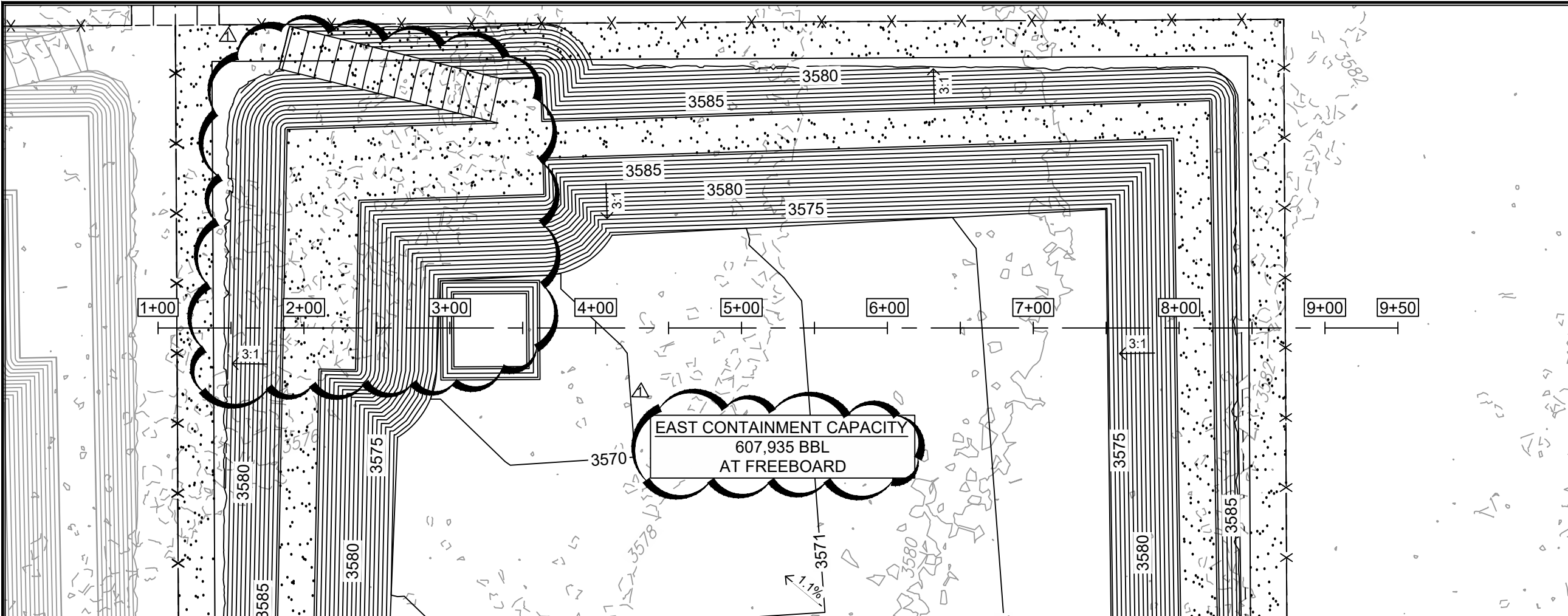
PROJECT ENGINEER:  
 JEREMY BAKER, PE  
 DRAWN BY:  
 C. JIMENEZ



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No.	DATE	DESCRIPTION
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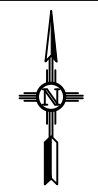
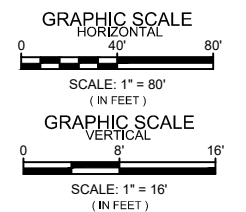


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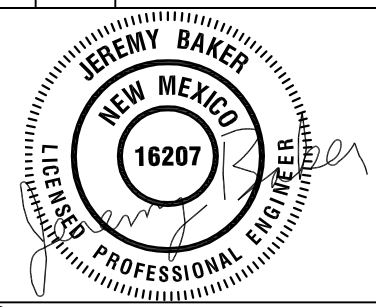
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SHEET:  
CONTAINMENT WEST TO  
EAST P&P  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

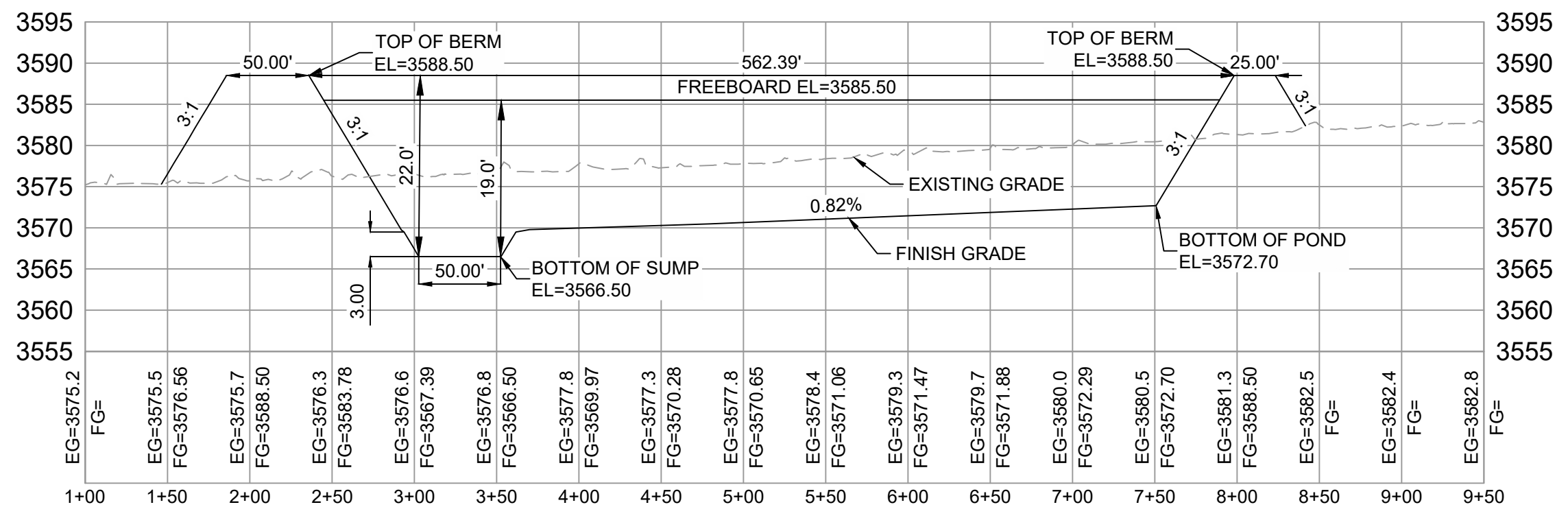
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ

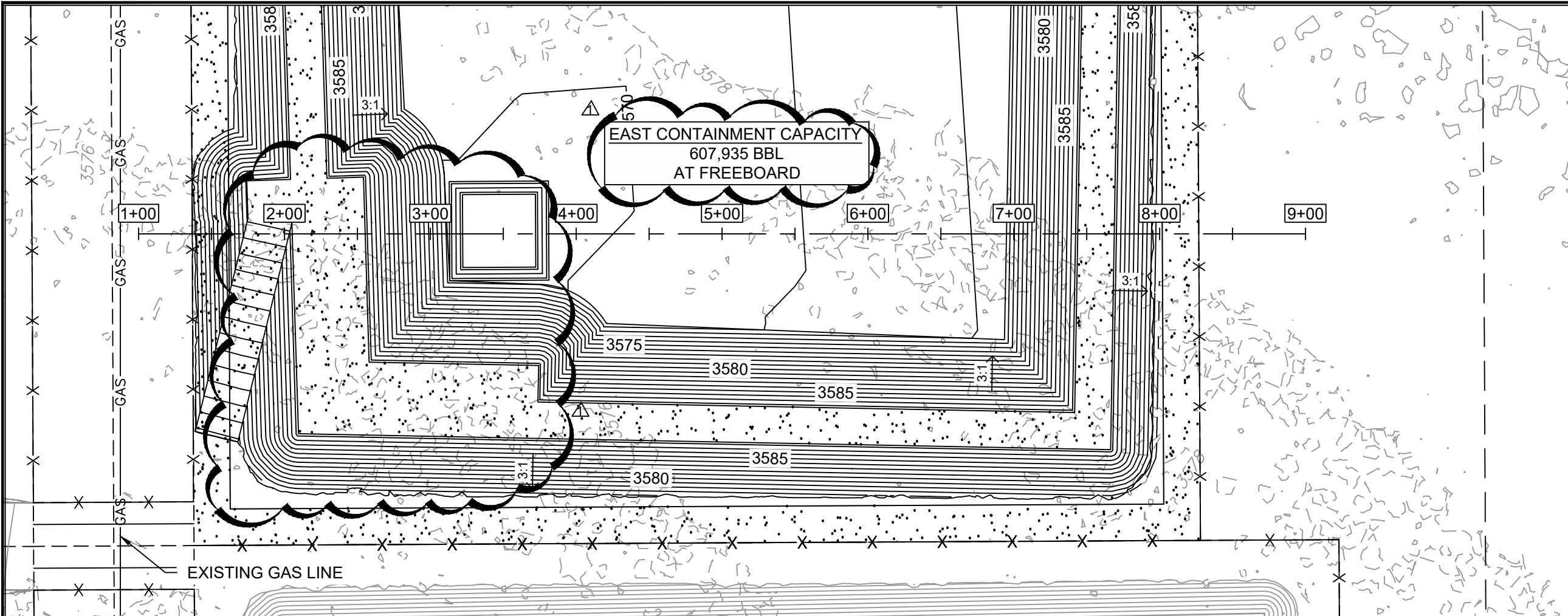


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No.	DATE	DESCRIPTION
1	5/14/26	RAMPS ADDED



05/14/2026  
SHEET:  
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CS-106



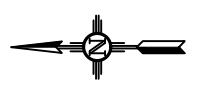
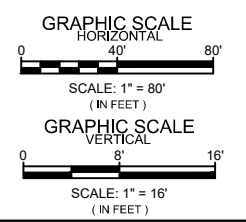


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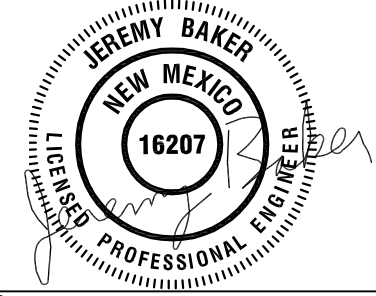
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SHEET:  
CONTAINMENT NORTH TO  
SOUTH P&P  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

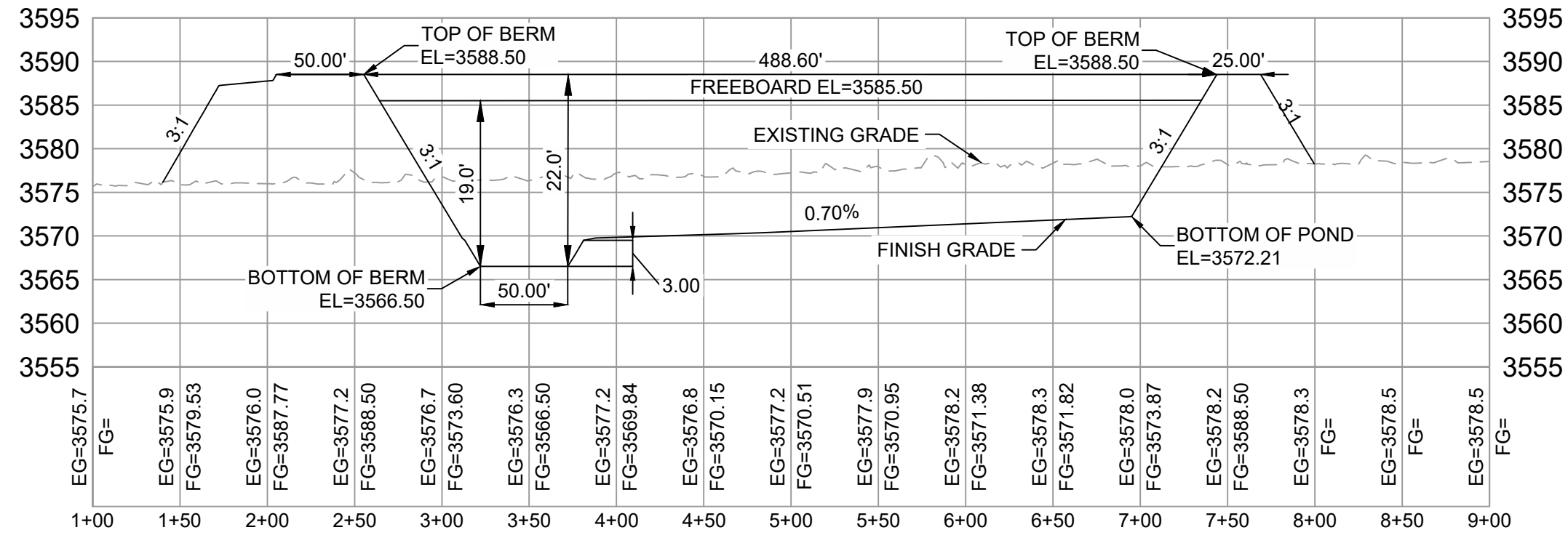
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ



REVISIONS		
No.	DATE	DESCRIPTION
1	5/14/26	RAMPS ADDED



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ENGINEERING SHEET:  
VOLUME QUANTITIES  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ

REVISIONS		
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CONTAINMENT VOLUME

ELEVATION (FT)	CONTAINMENT DEPTH (FT)	REMAINING STORAGE (FT)	REMAINING STORAGE VOL (FT3)	REMAINING STORAGE VOL (GAL)	REMAINING STORAGE VOL (BBL)	PERCENT OF TOTAL VOL (%)	VOL IN CONTAINMENT (FT3)	VOL IN CONTAINMENT (GAL)	VOL IN CONTAINMENT (BBL)	VOL IN CONTAINMENT (AC-FT)	PERCENT OF TOTAL VOL (%)	
3,588.80	0	22	0	-	-	0%	4,291,548	32,105,070	764,301	98.52	100%	
3,587.80	1	21	299,234	2,238,571	53,292	7%	3,992,314	29,866,499	711,009	91.65	93%	FREEBOARD
3,586.80	2	20	591,874	4,427,808	105,409	14%	3,699,674	27,677,263	658,891	84.93	86%	
3,585.80	3	19	877,995	6,568,282	156,366	20%	3,413,553	25,536,788	607,935	78.36	80%	MAX VOLUME
3,584.80	4	18	1,157,675	8,660,564	206,175	27%	3,133,873	23,444,506	558,125	71.94	73%	
3,583.80	5	17	1,430,989	10,705,228	254,851	33%	2,860,559	21,399,842	509,450	65.67	67%	
3,582.80	6	16	1,698,015	12,702,847	302,407	40%	2,593,533	19,402,223	461,894	59.54	60%	
3,581.80	7	15	1,958,828	14,653,991	348,856	46%	2,332,720	17,451,079	415,444	53.55	54%	
3,580.80	8	14	2,213,505	16,559,234	394,213	52%	2,078,043	15,545,837	370,088	47.71	48%	
3,579.80	9	13	2,462,124	18,419,148	438,490	57%	1,829,424	13,685,922	325,810	42.00	43%	STORAGE
3,578.80	10	12	2,704,760	20,234,306	481,703	63%	1,586,788	11,870,764	282,598	36.43	37%	VOLUME
3,577.80	11	11	2,941,489	22,005,278	523,863	69%	1,350,059	10,099,792	240,438	30.99	31%	
3,576.80	12	10	3,172,389	23,732,640	564,985	74%	1,119,159	8,372,430	199,316	25.69	26%	
3,575.80	13	9	3,397,535	25,416,961	605,082	79%	894,013	6,688,109	159,219	20.52	21%	
3,574.80	14	8	3,617,005	27,058,815	644,168	84%	674,543	5,046,255	120,132	15.49	16%	
3,573.80	15	7	3,830,875	28,658,774	682,257	89%	460,673	3,446,296	82,043	10.58	11%	
3,572.80	16	6	4,038,651	30,213,147	719,261	94%	252,897	1,891,923	45,040	5.81	6%	
3,571.80	17	5	4,193,383	31,370,696	746,818	98%	98,165	734,374	17,483	2.25	2%	FLOOR
3,570.80	18	4	4,264,319	31,901,372	759,451	99%	27,229	203,698	4,849	0.63	1%	VOLUME
3,569.80	19	3	4,281,024	32,026,344	762,426	100%	10,524	78,726	1,874	0.24	0%	
3,568.80	20	2	4,285,252	32,057,971	763,179	100%	6,296	47,099	1,121	0.14	0%	
3,567.80	21	1	4,288,736	32,084,033	763,800	100%	2,812	21,037	501	0.06	0%	SUMP
3,566.80	22	0	4,291,548	32,105,070	764,301	100%	0	0	0	0.00	0%	VOLUME



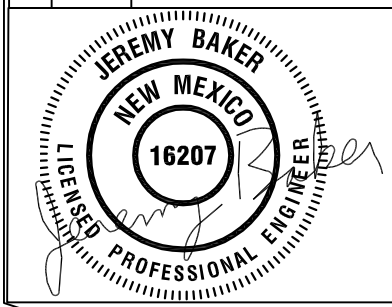
7921 N. World Dr.  
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Squarerootservices.net  
575-231-7347

ENGINEERING SHEET:  
**LEAK DETECTION DETAILS**  
OF  
PROJECT NAME:  
LOST TANKS - EAST RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

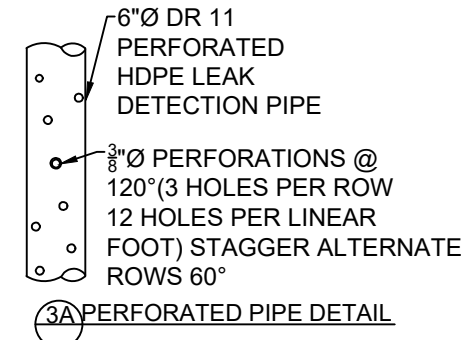
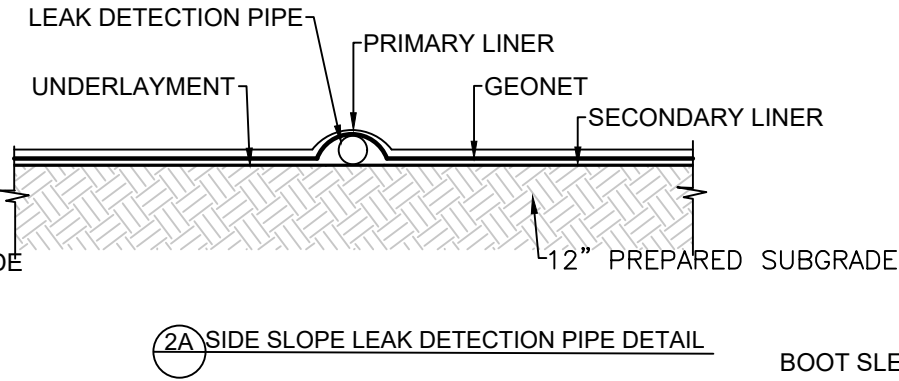
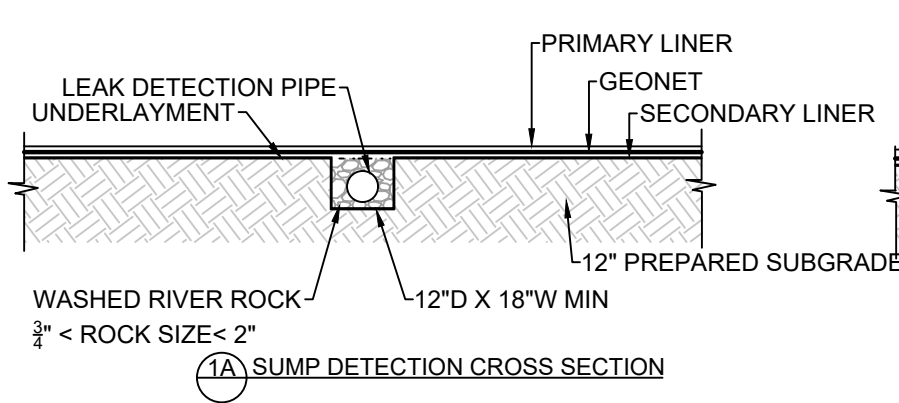
PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ

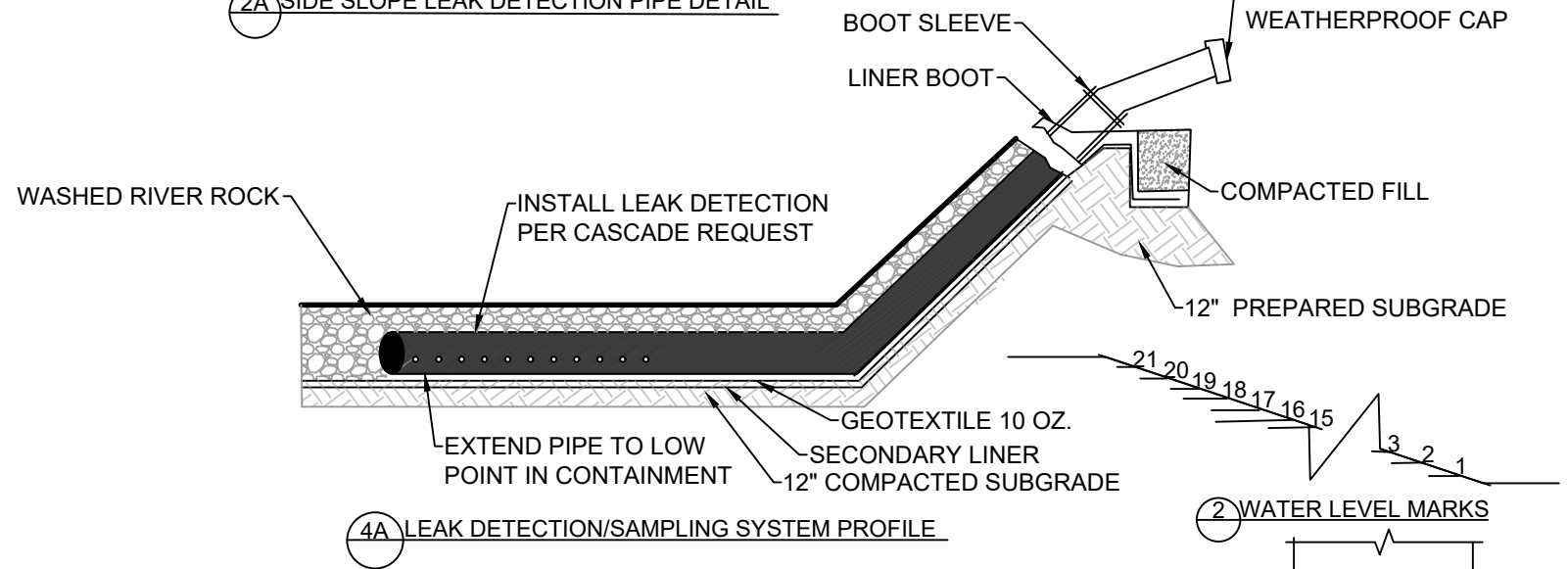
REVISIONS		
No.	DATE	DESCRIPTION
1	5/12/26	RAMPS ADDED



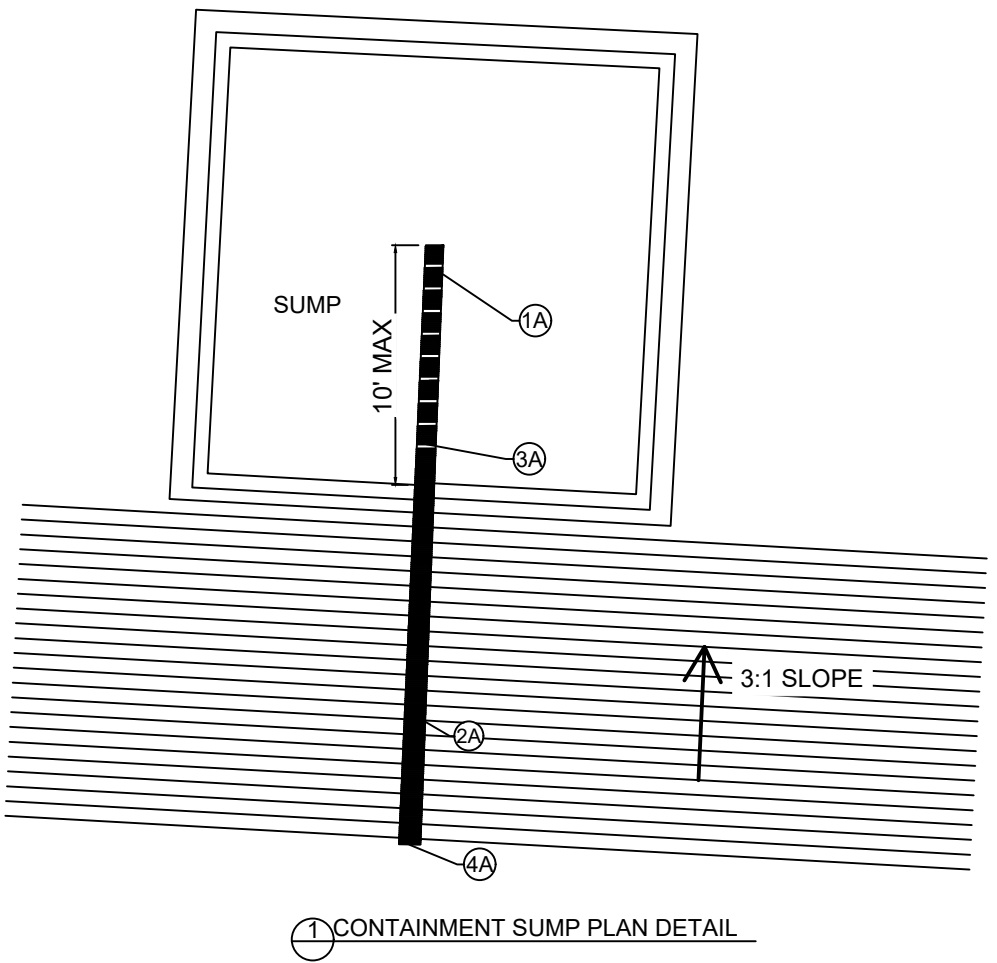
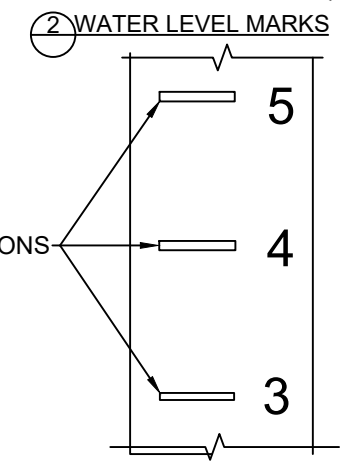
05/14/2026  
SHEET:  
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CS-501



- NOTES:
1. LEAK DETECTION SYSTEM TO BE INSTALLED BY OWNER.
  2. PERFORATED PIPE TO BE ALONG THE BOTTOM OF THE CONTAINMENT. SOLID PIPE ON THE SIDE SLOPE.
  3. CONSTRUCT COMPACTED SUBGRADE TO 95% STANDARD PROCTOR AS PER ASTM D-698
  4. EXTEND 60 MIL RUB SHEET 1.0-FT PAST TOP OF SHOULDER OF SUMP.
  5. WASHED RIVER ROCK SHALL BE 3/4" MIN @ 2" MAX.



- NOTE:
1. LEVEL MARKS TO BE LOCATED BY SURVEYOR
  2. MARKS TO BE MADE BY AN EXTRUSION WELDER USING BLACK FILAMENT (OR WHITE FILAMENT ON BLACK LINER)
  3. MARKS WILL BE DETERMINE ON THE FIELD BY THE OWNER AND CONTINUE TO THE TOP OF THE BERM.
  4. REFERENCE PIT CAPACITY TABLES FOR ACCURATE ELEVATIONS.



PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60 MIL HDPE LINER
LEAK DETECTION	200 MIL GEONET
SECONDARY LINER	40 MIL HDPE LINER
UNDERLAYMENT	COMPACTED SUBGRADE/10 OZ GEOTEXTILE
EAST CONTAINMENT	
BOTTOM OF POND	3,566.50'
BERM (ROAD CREST)	3,588.50'
LEAK DETECTION PIPING	6-IN DR11 X PERFORATED HDPE PIPE LEAK DETECTION PIPE

ENGINEERING SHEET:  
**LINER DETAILS**  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

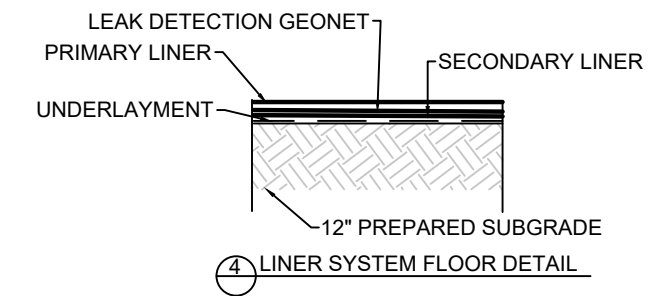
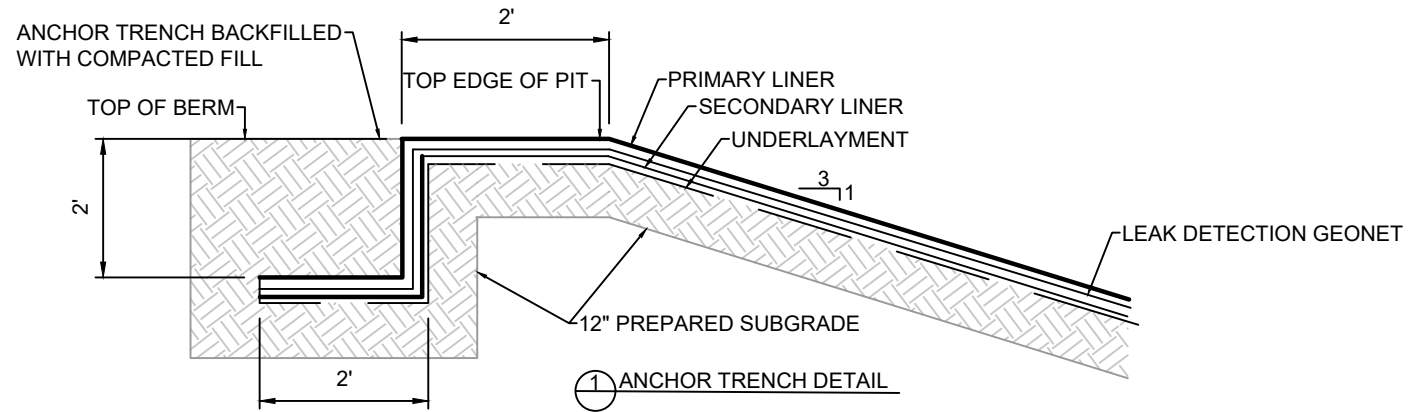
PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ

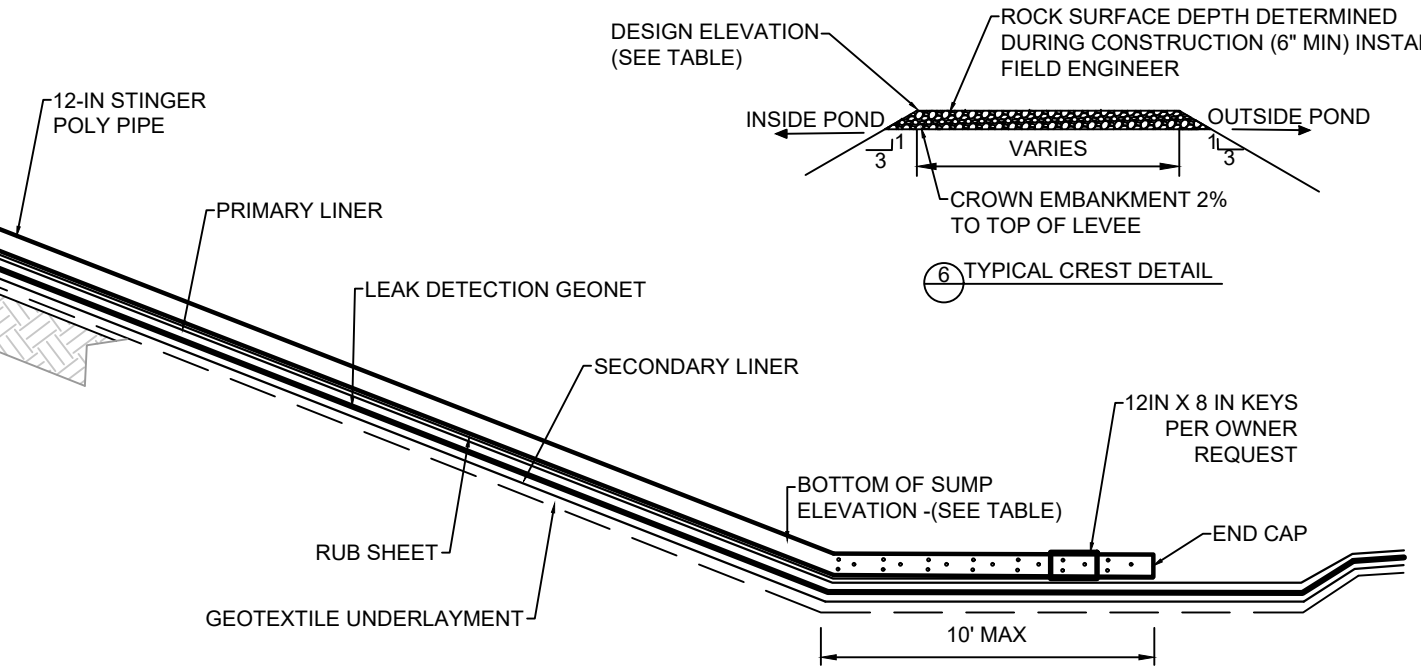
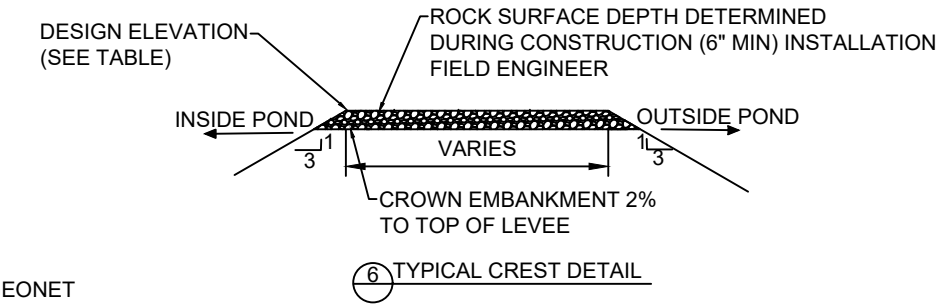
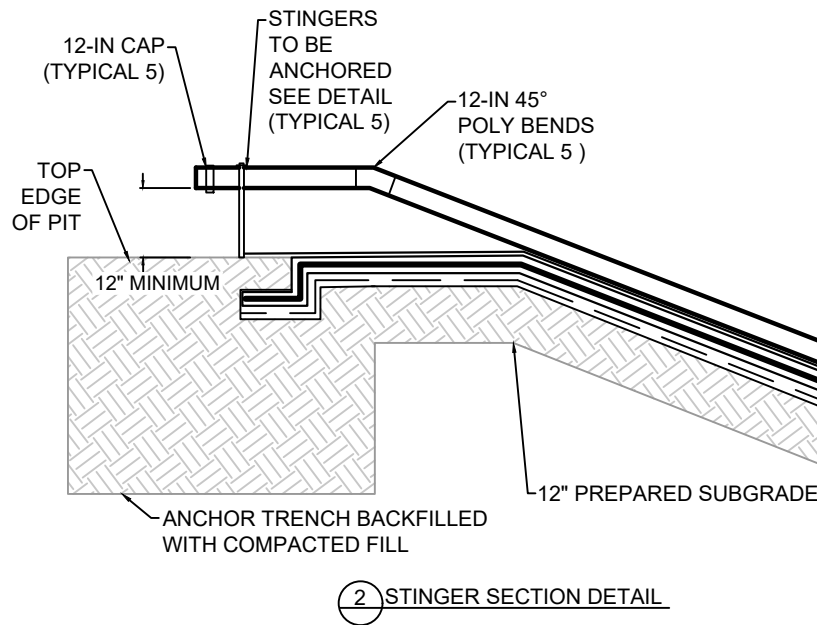
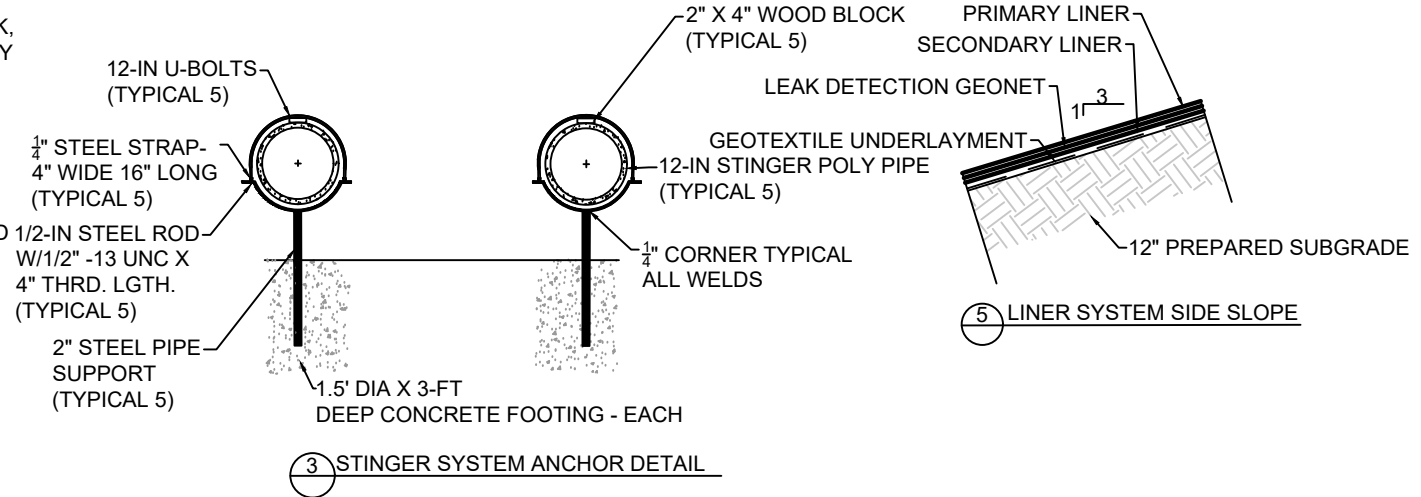
REVISIONS		
No.	DATE	DESCRIPTION



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SHEET:  
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CS-502



- GENERAL NOTES:
1. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCK, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MAY PUNCTURE THE HDPE LINER, A MINIMUM COMPACTED DEPTH OF 12".
  2. ALL INTERIOR SLOPES AND TOP OF BERMS TO BE SMOOTH DRUM ROLLED
  3. ALL EMBANKMENT SLOPES SHALL HAVE A SLOPE (H:V RATIO) OF 3:1.
  4. AT LEAST 3 FEET OF NATURAL OR PROCESSED CLAY AND OTHER SOILS, PLACED IN SIX-INCH LIFTS AND COMPACTED TO 95% STANDARD PROCTOR; ASTM D-698
  5. PERFORM GEOTECHNICAL ANALYSIS ON EXISTING SOIL TO CONFIRM SOIL IS SUITABLE FOR USE IN THE LEVEE.
  6. LINER SPECIFICATIONS PROVIDED ON SHEET CS - 501



ENGINEERING SHEET:  
FENCE DETAILS  
OF  
PROJECT NAME:  
LOST TANKS - EAST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

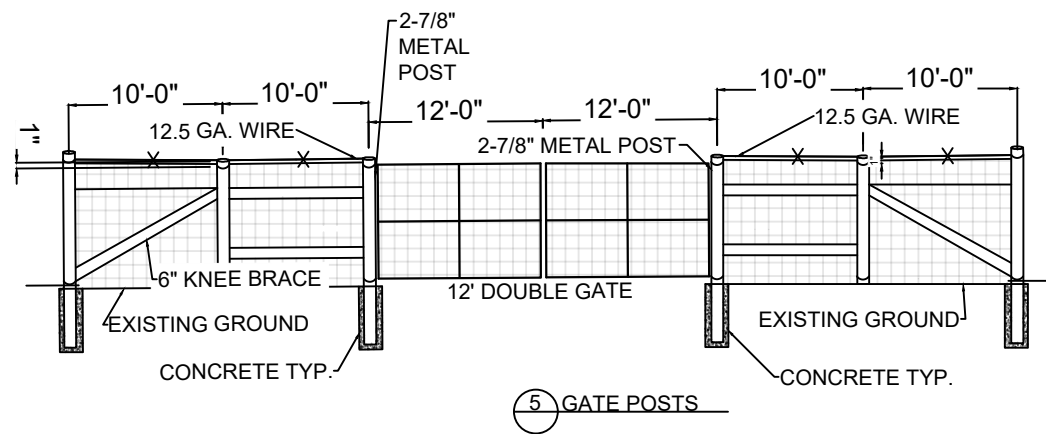
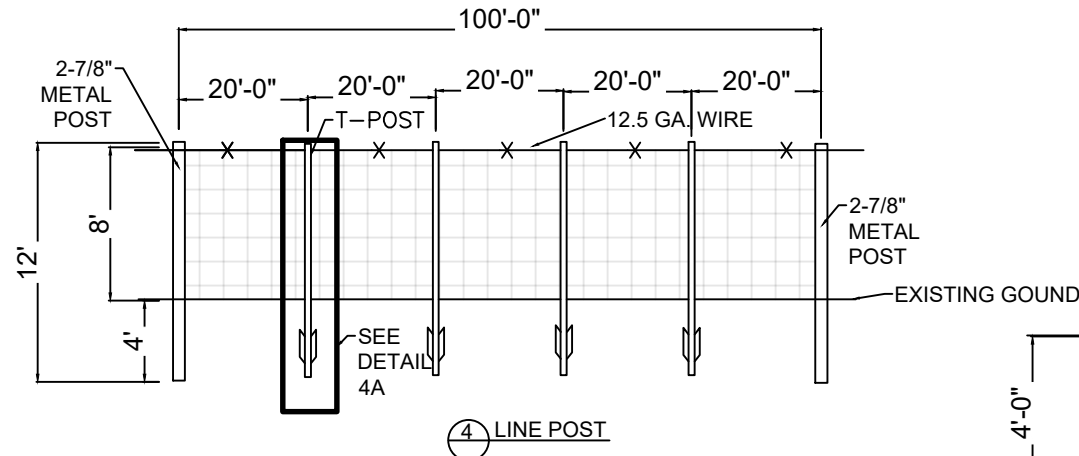
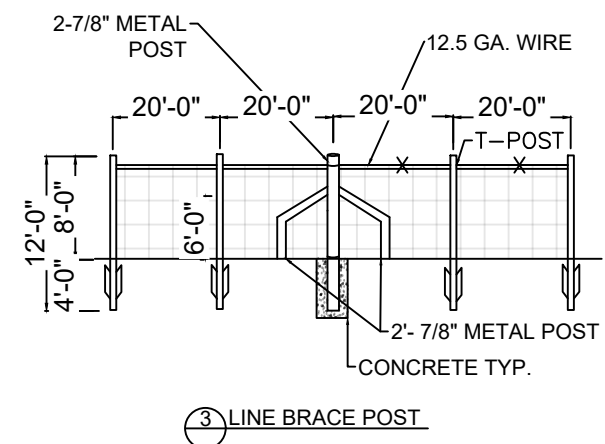
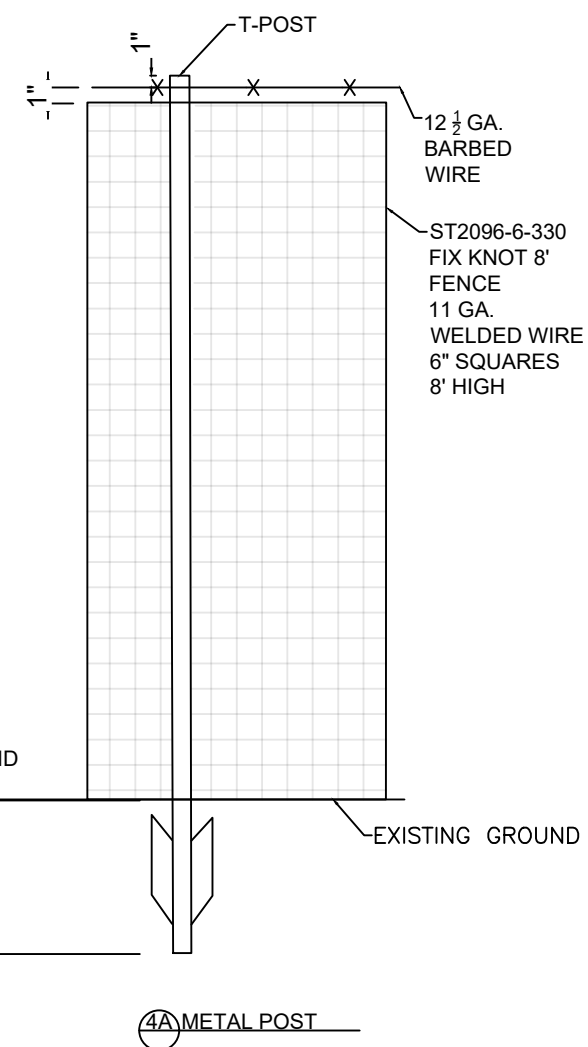
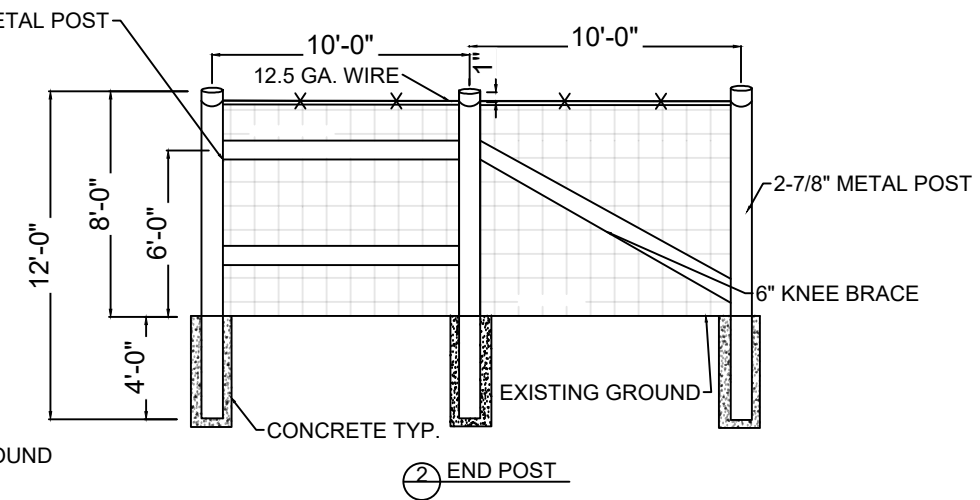
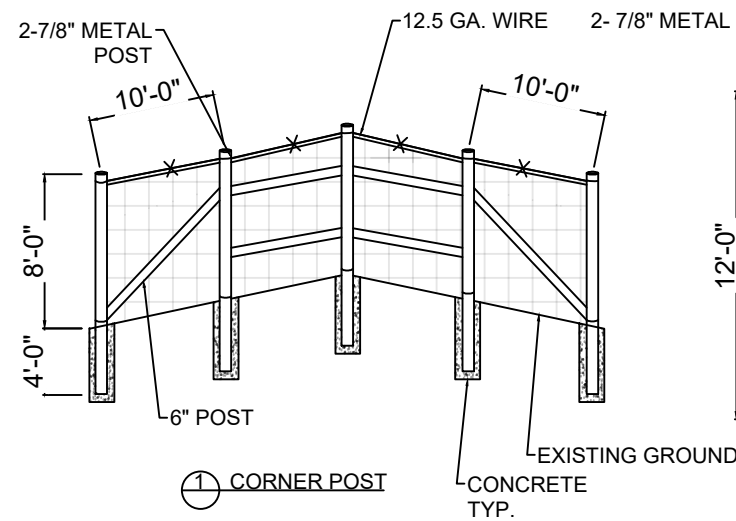
PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ

REVISIONS		
No.	DATE	DESCRIPTION



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SHEET:  
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CS-503





| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

## Avian Deterrent System Demonstration

## Avian Deterrence Equivalency Demonstration

The prescriptive mandates of the Rule that are the subject of this variance request are presented below (emphasis added):

### NMAC 19.15.34.12 E.

Netting.

“The operator shall ensure that a recycling containment is screened, netted *or otherwise protective of wildlife*, including migratory birds.”

**As previously approved by the OCD, use of the proposed Bird-X Mega Blaster Pro in lieu of netting does not constitute a variance.** Section 19.15.34.12 E of the Rule specifically allows for other systems to be used in lieu of screens or nets. The Bird-X Mega Blaster Pro configured with sound patterns appropriate to the Permian Basin region in conjunction with the proposed game fence is fully “protective of wildlife, including migratory birds.”

As described in the Design and Construction Plan section, personnel may also discharge blank cartridges from a handgun, starter pistol, or shotgun to reinforce deterrence as needed. Raptor decoys may also be placed as needed on fencing or other suitable elevated locations.

# **MEGA BLASTER PRO**



## User's Manual

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Bird Control Management Guidelines	3
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Control Unit	5
Solar Panel	5
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Building a Mounting Pole or Mast	7
Installation	8
20-Speaker Tower	8
Solar Panel	8
Control Box	9
Solar Panel Connections	9
Settings	10
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# Overview

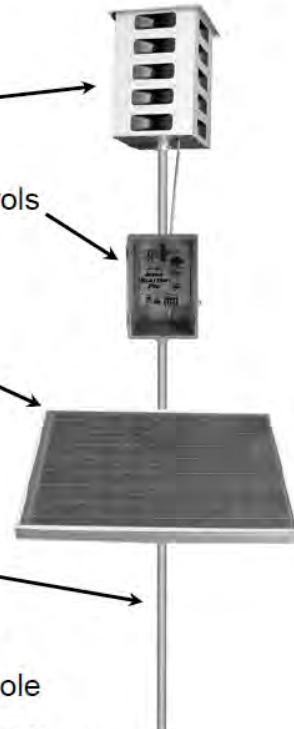
The Bird-X Mega Blaster Pro utilizes the innate power of the natural survival instincts of birds to effectively repel them. Digital recordings of distressed and alarmed birds, along with the sounds made by their natural predators are broadcast through high fidelity weather-resistant speakers over the top of areas. This action triggers a primal fear and flee response. Pest birds soon relocate to where they can feed without feeling threatened.

Your Bird-X Mega Blaster Pro system consists of:

**20-Speaker Tower** broadcasts the bird sounds

**Control Unit** produces the bird sounds and contains all operational controls

**Solar Panel** recharges the 12-volt deep cycle battery



Items needed but not included:

- (1) **Mounting Pole or Mast** tall enough to raise the 20-Speaker Tower at least 5 feet above the top of the areas, trees or other obstructions
- (1) **12-volt Deep Cycle Battery** (RV/Marine) Group 27 or larger wet cell
- (1) **T-Post** or similar (Optional) may be needed to support the mounting pole
- (1) **Bailing Wire or zip-tie** (Optional) to secure the Mounting Pole to the T-Post

**CAUTION: THE MEGA BLASTER PRO IS CAPABLE OF PRODUCING SOUNDS UP TO 125 DECIBELS. PROPER HEARING PROTECTION MUST BE WORN ANYTIME THE UNIT IS TURNED ON.**



# Bird Control Management Guidelines

**An active bird control management program is a key to successfully repelling pest birds. Bird feeding patterns may take several days or weeks to break. Follow all suggestions for maximum effectiveness. Read all instructions prior to installation.**

## **For best results:**

- **It is extremely important to fully protect your entire area from birds.** Any areas not fully protected will allow birds to begin feeding at the fringes of the sound coverage. They will soon become bolder and learn the sounds are nothing to fear. This will cause the effectiveness to diminish. Complete Bird-X product coverage forces birds to leave the area entirely.
- Install the Mega Blaster Pro unit at least two weeks before birds are attracted to your area. It is much easier to keep birds away before they have found a food source than it is to repel them once they have developed a feeding pattern.
- Most birds begin feeding from the perimeter of an area. Place Mega Blaster Pro units so the sound protection covers past the edges of the area.
- Birds will often use tall trees for roosting and observation. If birds are in bordering trees it is necessary to position the units so the sound protection covers the trees as well.
- Mount the 20-Speaker Tower at least five feet above trees, areas and structures for maximum coverage. The higher the better. Sound will disperse or reflect off structures or foliage. Mount control unit out of direct sun, if possible.
- When first installed, run Mega Blaster Pro units at FULL volume and on SHORT time off periods. This ensures maximum "bird stress" and creates a hostile environment.
- Watch for changes in bird activity and adjust the location of your Mega Blaster Pro unit if needed.
- **Check the battery and unit settings often to insure continuous bird control. Be certain that the system is not turned down or has a dead battery. Field hands or harvesters may turn down the volume.**
- Changing settings and switches often helps to prevent bird habituation. Periodically change the switch settings of the eight sounds (turning them ON or OFF). NEVER turn OFF the distress calls of the target birds you are trying to repel and always keep at least one predator bird sound turned ON.
- If different bird species enter the protected area and begin causing damage contact us immediately for an updated Sound Recording Card designed to repel the new invading birds.
- Remember that the Mega Blaster Pro system is a management tool, and should be used as part of your overall bird control strategy, sometimes in conjunction with other bird control techniques and devices.

**Be aware that under extreme drought or other adverse conditions, birds will disregard all deterrents and risks in order to survive**



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## Fence Design Demonstration

## Fencing

The prescriptive mandates of the Rule that are the subject of this variance request are presented below (emphasis added):

### NMAC 19.15.17.13 D.

#### FENCING

- 1) The operator shall fence or enclose a recycling containment in a manner that *deters unauthorized wildlife and human access* and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.
- 2) Recycling containments shall be fenced with a four foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.

**As previously approved by the OCD, use of the proposed deer (game) fencing in lieu of a four-strand barbed wire fence does not constitute a variance.** Section

19.15.34.12(D)(1) of the Rule requires fencing adequate to prevent entry by wildlife. Feral pigs, javelina, and deer are known to be present in the area; therefore, a tall game fence is necessary to meet this requirement.

The fencing specification in Section 19.15.34.12(D)(2) conflicts with the performance standard in Section (D)(1). Specifically, feral pigs are capable of passing beneath the lower strand of a four-foot-high barbed wire fence, and deer are capable of jumping over such fencing. As a result, strict compliance with Section (D)(2) would fail to achieve the wildlife-exclusion requirement of Section (D)(1).

Accordingly, compliance with Section 19.15.34.12(D)(1) represents the critical requirement of the Rule. Operators implementing fencing consistent with best management practices to effectively exclude wildlife should not be required to seek a variance solely because the prescriptive example in Section (D)(2) is not utilized.

Notwithstanding this position, four strands of barbed wire can be affixed to the game fence if specifically required by the OCD.

See the attached design drawings for game fence details.



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## Liner Equivalency Demonstration

## Secondary Liner Equivalency Demonstration

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections (emphasis added):

### NMAC 19.15.34.12 A.

#### DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT:

5. All primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 30-mil flexible PVC, 45-mil LLDPE string reinforced or 60-mil HDPE liners. Secondary liners shall be 30-mil LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than  $1 \times 10^{-9}$  cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

**The following equivalency demonstration for the proposed 40-mil HDPE secondary liner has been previously approved by the OCD and is not the subject of a variance.**

The language of the rule clearly allows for secondary liners of any type that are “equivalent” to 30-mil LLDPE string reinforced liners. 40-mil HDPE equivalency to 30-mil LLDPE string reinforced liners is demonstrated by qualified experts below.

**R.K. FROBEL & ASSOCIATES**  
*Consulting Engineers*

**Technical Memorandum: 40-mil HDPE as Alternative Secondary Liner System for In Ground Recycling Containment Facilities**  
**NMAC 19.15.34.12 A**

I have investigated the suitability of application for 40 mil HDPE geomembrane as an equivalent secondary liner to 30 mil scrim reinforced LLDPE (LLDPEr) in the application for In Ground Recycling Containment facilities. *In summary, it is my professional opinion that the specified 40 mil HDPE geomembrane will provide a secondary liner system that is equal to or better than 30 mil scrim reinforced LLDPEr and will provide the requisite protection of fresh water, public health and the environment for many years when engineering design provides requisite site/soil/slope preparation and when used in concert with requisite primary liners and drainage layers.*

It is understood that the lining system under discussion is composed of a 60 mil HDPE Primary liner, geonet drainage layer and a 40 mil HDPE Secondary liner. *In consideration of the secondary lining system application, size of impoundment and depth, design details as well as the chemical nature of typical processed water, it is my professional opinion that the 40 mil HDPE geomembrane will provide the requisite barrier against processed water loss and will function effectively as a secondary liner.*

The following are discussion points that hopefully will exhibit the equivalency of a 40 mil HDPE secondary liner to that of a 30 mil LLDPEr.

The nature and formulation of the 40 mil HDPE resin is the same as the Primary 60 mil HDPE. The major difference is that the 40 mil HDPE is lower in thickness (more flexible and less puncture resistant). However, in covered conditions, HDPE will resist aging and degradation and remain intact for many decades. In fact, a secondary liner of 40 mil HDPE will outlast an exposed 60 mil HDPE liner. According to the Geosynthetic Research Institute (GRI) study on lifetime prediction (GRI Paper No. 6), the half life of HDPE (GRI GM 13) exposed is > 36 years and the half-life of HDPE covered or buried is greater than 100 years. It is understood that in order to ensure compliance of materials, the primary 60 mil HDPE to be used must meet or exceed GRI GM 13 Standards. Likewise, the secondary liner that is not exposed to the same environmental and chemical conditions must meet or exceed GRI GM 13 for non-reinforced HDPE. Adhering to the minimum requirements of the GRI Specifications, 40 mil HDPE when used as a secondary liner will be equally as protective as the primary 60 mil HDPE liner (reference: [www.geosynthetic-institute.org/grispecs](http://www.geosynthetic-institute.org/grispecs)) and equally as protective as a 30 mil scrim reinforced LLDPEr liner.

Durability of Geomembranes is directly affected by exposure conditions. Buried or covered geomembranes are not affected by the same degradation mechanisms (UV, Ozone, Chemical, Stress, Temperature, etc) as are fully exposed geomembranes. In this regard, the secondary liner material and thickness can be much less robust than the fully exposed primary liner which in this case is 60 mil HDPE. This is also the case for

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landfill lining systems where the secondary geomembrane in a bottom landfill cell may be 40 mil HDPE.

Thermal Fusion Seaming Requirements. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Dual wedge thermal fusion welding is commonly used on HDPE and QC testing by air channel (ASTM D 5820) is fully acceptable and recognized as an industry standard. In this regard, there should be no exception requirement for seaming and QC testing as both the Primary and Secondary geomembranes are HDPE. This is fully covered in comprehensive specifications for both the Primary and Secondary geomembranes (Reference: [www.ASTM.org/Standards](http://www.ASTM.org/Standards)).

Potential for Leakage through the Primary and Secondary Liners. Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The geonet drainage media provides immediate drainage to a low point or sump and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the secondary liner. In this regard, secondary geomembrane materials can be (and usually are) much less in thickness and also polymer type. Hydraulic Conductivity through the 40 mil HDPE liner material is extremely low due to the polymer type, structure and crystallinity and exceeds requirements of EPA SW-846 Method 9090A.

Chemical Attack. Chemical attack to polymeric geomembranes is directly a function of type of chemical, temperature and exposure time. Again, the HDPE Primary provides the chemically resistant liner and is QC tested to reduce potential defects or holes. If there is a small hole, the geonet drain takes any leakage water immediately to the sump for extraction. Thus, exposure time is very limited on a secondary liner in addition to low temperature, little volume and virtually no head pressure. In this regard, a chemically resistant geomembrane material such as 40 mil HDPE can be specified for the secondary and is a fully acceptable alternate to 30 mil scrim reinforced LLDPEr.

Mechanical Properties Characteristics. Geomembranes of different polymer and/or structure (i.e., reinforced vs non-reinforced) cannot be readily compared using such characteristics as tensile stress/strain, tear, puncture and polymer requirements. For a 40 mil HDPE liner material to function as a Secondary liner it should meet or exceed the manufacturers minimum requirements for Density, Tensile Properties, Tear, Puncture as well as other properties such as UV resistance. The sheet material must also meet or exceed GRI GM 13 minimum requirements. *In this regard, a 40 mil HDPE will be equivalent to a 30 mil LLDPEr as a secondary liner for the conditions listed below:*

- *The subgrade or compacted earth foundation will be smooth, free of debris or loose rocks, dry, unyielding and will support the lining system.*
- *The side slopes for the containment shall be equal to or less than 3H:1V.*
- *The physical properties and condition of the subgrade or liner foundation*

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(i.e., density, slope, moisture) will be inspected and certified by a Professional Engineer that it meets or exceeds specification requirements.

- Immediately prior to installation, the installation contractor shall inspect and sign off on the subgrade conditions that they meet or exceed the HDPE manufacturer and installers requirements.
- A protective geotextile will be placed on the finished and accepted subgrade between subgrade and the 40 mil HDPE Secondary liner
- A 200 mil geonet will be placed over the 40 mil HDPE Secondary Liner.
- A 60 mil HDPE Primary liner will be placed over the 200 mil geonet drainage layer.

If you have any questions on the above technical memorandum or require further information, give me a call at 720-289-0300 or email [geosynthetics@msn.com](mailto:geosynthetics@msn.com)

Sincerely Yours,

*RK Frobel*

Ronald K. Frobel, MSCE, PE



References:

NMAC 19.15.34.12 A DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

Geosynthetic Research Institute (GRI) Published Standards and Papers 2017  
[www.geosynthetic-institute.org](http://www.geosynthetic-institute.org)

ASTM Geosynthetics Standards 2017  
[www.ASTM.org/Standards](http://www.ASTM.org/Standards)



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## Design and Construction Plan

## Design and Construction Plan

This volume provides the stamped engineered drawings, liner equivalency, fencing plans, and avian deterrent plans for the containment that demonstrate the following design/construction specifications:

### Earth Work

**Purpose:** Must confine produced water, prevent releases, avert overtopping from wave action or rainfall, and avoid run-on of surface water.

#### Foundation & Slopes:

- Containment floor sloped towards the sump in the corner(s).
- Firm, smooth base free of rocks/debris to protect liner.
- Inside levee slope:  $\geq 2H:1V$ ; outside slope:  $\geq 3H:1V$ .
- Top wide enough for anchor trench and maintenance.
- Geotextile under liner as needed to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.

#### Run-on Prevention:

- Surround containment with berm, ditch, or diversion.

### Liners & Leak Detection

#### Liner Requirements:

- Minimum: **Primary (upper) liner, Secondary (lower) liner, and leak detection system.**
- Anchor trench:  **$\geq 18$  inches** deep.

#### Liner Specs:

- Primary: **60-mil HDPE**
- Secondary: **40-mil HDPE** (as previously approved and demonstrated in the Liner Equivalency section)
- Meets or exceeds EPA SW-846 Method 9090A compatibility.

#### 19.15.34.12 A

(1) The operator shall design and construct a recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall.

(7) [...] The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection.

(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity. The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot (3H:1V). The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance.

(8) The operator of a recycling containment shall design the containment to prevent run-on of surface water. The containment shall be surrounded by a berm, ditch or other diversion to prevent run-on of surface water.

(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

(4) All primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 30-mil flexible PVC, 45-mil LLDPE string reinforced or 60-mil HDPE liners. Secondary liners shall be 30-mil LLDPE string reinforced or equivalent with a hydraulic conductivity no greater than  $1 \times 10^{-9}$  cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

## Design and Construction Plan

### Seams:

- Minimize seams; orient vertically (up/down slope).
- Factory weld preferred; field seams thermally welded.
- Overlap: 4–6 inches; no horizontal seams within 5 ft of slope toe.
- Qualified personnel required for welding/testing.

### Leak Detection System:

- Between liners: **200-mil geonet**
- Include drainage, collection, and removal system sloped for early detection.
- Piping will withstand chemical attack from any seepage, structural loading from stresses and disturbances from overlying water, cover materials, equipment operation or expansion or contraction.

### Discharge/Suction Protection:

All points of discharge into the lined earthen containment are configured to protect the liner from excessive hydrostatic force or mechanical damage during filling. The design ensures that, at any location where fluids are introduced or withdrawn, the liner remains safeguarded against potential impacts or abrasion. External discharge or suction lines do not penetrate the liner.

For hydraulic fracturing operations, fluid withdrawal is typically managed by stimulation contractors. Typically, lines are permanently installed within the containment and equipped with floats to prevent direct contact and abrasion of the liner system. If needed, the containment may include a permanent HDPE stinger, supported by a sacrificial liner or geotextile, to facilitate fluid withdrawal during operations.

- Protect liner from hydrostatic/mechanical damage.
- No external lines penetrating liner.

### Topsoil Stockpiling

- Strip and stockpile topsoil for closure cover.

(5) The operator of a recycling containment shall minimize liner seams and orient them up and down, not across, a slope of the levee. Factory welded seams shall be used where possible. The operator shall ensure field seams in geosynthetic material are thermally seamed. Prior to field seaming, the operator shall overlap liners four to six inches. The operator shall minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the slope's toe. Qualified personnel shall perform field welding and testing.

(7) The operator of a recycling containment shall place a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet or two feet of compacted soil with a saturated hydraulic conductivity of  $1 \times 10^{-5}$  cm/sec or greater to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection.

(6) At a point of discharge into or suction from the recycling containment, the operator shall insure that the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines shall not penetrate the liner.

#### 19.15.34.12 B: Stockpiling of topsoil

Prior to constructing containment, the operator shall strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

## Design and Construction Plan

### Signage

- Upright sign:  $\geq 12'' \times 24''$ , letters  $\geq 2''$  high, posted on fence.
- Must include: **operator name, site location (quarter-quarter or unit letter, section, township, range), and emergency phone numbers.**

### Fencing

In the spirit and letter of rule 19.15.34.12 D (1), the operator will install and maintain a chain-link / game fence rather than a barbed wire fence. This will more effectively deter unauthorized humans, feral pigs, deer, etc. from accessing the containment than “a four-foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level”. If required specifically by the OCD, barbed wire can be attached to the game fence as specified in rule 19.15.34.12 D (2).

- Fence to deter wildlife/human access; maintain in good repair.
- Gates locked when unattended.

### Wildlife Protection

The chain-link / game fence provides effective protection from stock and most terrestrial wildlife. However, if requested by the surface owner, the fence can include a one-foot-tall fine mesh at the base of the fence to exclude smaller animals (e.g. dune sagebrush lizard).

The Bird-X Mega Blaster Pro, configured with sound patterns appropriate for the Permian Basin environment, is the primary avian deterrent system. Containment areas will be routinely inspected for the presence of birds and personnel may discharge blank cartridges from a handgun, starter pistol, or shotgun to reinforce deterrence. Raptor decoys may also be placed on fencing or other suitable elevated locations.

- Avian deterrence system
- Monthly inspections; report dead wildlife within **30 days** to wildlife agency and division office.

#### 19.15.34.12 C: Signs

The operator shall post an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers.

#### 19.15.34.12 D: Fencing

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

(2) Recycling containments shall be fenced with a four foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.

#### 19.15.34.12 E: Netting

The operator shall ensure that a recycling containment is screened, netted or otherwise protective of wildlife, including migratory birds. The operator shall on a **monthly** basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.



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## Operation and Maintenance Plan

## Operation and Maintenance Plan

### Summary:

The operator will use the earthen containment to contain liquids and incidental solids (blow sand and minimal precipitates from the produced water). The operator will maintain the integrity of the liner system to prevent contamination of fresh water and protect public health and the environment.

The purpose of the lined earthen containment is to facilitate recycling, reuse, and reclamation of produced water sourced from oil and gas wells. While water for oil and gas operations is not needed, produced water will be discharged into wastewater injection wells or transferred to other recycling facilities via pipeline. The containment will not be used to dispose of produced water or other oilfield waste.

### Operation Plan

- A. Produced water from oil and gas wells will be received in a recycling facility as indicated on the C-147 form.
- B. Unless specified otherwise, after treatment in the recycling facility, the water will then be transferred to the recycling containment.
- C. Recycled water is then removed from the containment for use in oil and gas operations including drilling below the freshwater zones (beneath surface casing), hydraulic fracturing of the reservoir, and other oil and gas related uses as approved by the OCD.
- D. When the maximum capacity of the containment is reached, no additional water will be transferred into the containment until compensatory space is first created via fluid removal, maintaining at least a 3 foot freeboard.
- E. Accurate records will be maintained monthly and weekly in accordance with the OCD rules. The sources and disposition of all recycled water as well as weekly leak detection systems shall be made available for review by the division upon request.
- F. Reports will be sent monthly to the OCD using the C-148 form to record the total volumes of produced and fresh

#### **19.15.34.10 D**

Recycling containments may not be used for the disposal of produced water or other oilfield wastes.

#### **19.15.34.13 B (2)**

(See Operational Standards below)

#### **19.15-34-12 E**

(See Operational Standards below)

#### **19.15.34.12 E**

#### **19.15.34.9 E**

#### **19.15.34.9 F**

(See Monitoring, Inspection and Reporting Plan below)

## Operation and Maintenance Plan

water (recorded separately) received and the total volume of water leaving the facility.

- G. The containment will be considered to have ceased operations if less than 20% of the total fluid capacity is used every six months. The operator will report the cessation of operations to the division, and either request an extension (no longer than six months) or prepare for closure.

### Operational Standards:

The containment will adhere to the following mandates:

1. **Remove any visible oil layer** from the containment surface.
2. **Maintain minimum three feet of freeboard.**
3. **Use headers/diverters or other hardware** to prevent liner damage during fluid injection or withdrawal.
4. **If the primary liner is damaged above fluid level, repair or replace within 48 hours** or request an extension.
5. **If damage to the primary liner below fluid level** is confirmed through the leak detection system (see “Leak Detection, Fluid Removal, and Leak Reporting Plan” section below): begin and maintain fluid removal from the leak detection / pump-back system, Notify the district office within 48 hours, identify the location of the leak, and repair or if needed, replace the containment liner.
6. **Prevent surface water run-on** into containment.
7. **Keep an oil absorbent boom** or similar device on site for emergency containment.
8. **Report fluid releases** in a manner consistent with NMAC 19.15.29.
9. **Do not discharge or store hazardous waste** (as defined by 40 CFR 261 and NMAC 19.15.2.7.H.3) in the containment.
10. **Ensure all gates are closed and locked** when personnel are not onsite.
11. **Maintain the fences** in good repair.

#### 19.15.34.13 C

A recycling containment shall be deemed to have ceased operations if less than twenty percent of the total fluid capacity is used every six months following the first withdrawal of produced water for use. The operator must report cessation of operations to the division. The division may grant an extension to this determination of cessation of operations not to exceed six months.

#### 19.15.34.13 B

(1) The operator shall remove any visible layer of oil from the surface of the recycling containment.

(2) The operator shall maintain at least three feet of freeboard at each containment.

(3) The injection or withdrawal of fluids from the containment shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.

(4) If the containment’s primary liner is compromised **above** the fluid’s surface, the operator shall repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.

(5) If the primary liner is compromised below the fluid’s surface, the operator shall remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.

(6) The containment shall be operated to prevent the collection of surface water run-on.

(7) The operator shall install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release.

#### 19.15.34.8 A

(6) All releases from the recycling and re-use of produced water within the jurisdiction of the division shall be handled in accordance with 19.15.29 NMAC. If the release is detrimental to ground or surface waters, the responsible party must send a copy of the form C-141 to the New Mexico environment department, as applicable, in accordance with 19.15.29 NMAC.

#### 19.15.34.10 B

[...] may not include any hazardous waste.

#### 19.15.34.12 D

(1) The operator shall fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

## Operation and Maintenance Plan

### Monitoring, Inspection and Reporting Plan:

Operators must inspect recycling containments and leak detection systems **weekly** while fluids are present and **maintain a log** available for division review.

Weekly inspections include:

- Recording the **fluid height**
- Recording evidence of **visible oil**
- Visually **inspecting** the containment's **exposed liners**
- **Inspecting berms** and other diversion means around the containment **for erosion and collection of surface water run-on**
- **Inspecting the leak detection system** integrity and **monitor for leakage**

Monthly inspections include:

- **Inspect** the containment **for dead migratory birds or other wildlife** and report any findings to the appropriate wildlife agency and to the division district office to facilitate further assessment and implementation of measures to prevent incidents from reoccurring.
- **Record and report** to the division the **total volumes of produced and fresh water (recorded separately) received and the total volume of water leaving the facility** using the C-148 form.
- **Record sources and disposition** of all recycled water.

#### 19.15.34.13 A

The operator shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the log available for review by the division upon request.

#### 19.15.34.12 E

[...] The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

#### 19.15.34.9 E

The operator of a recycling facility shall keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.

#### 19.15.34.9 F

The operator of a recycling facility shall maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

## Operation and Maintenance Plan

### Leak Detection, Fluid Removal, and Leak Reporting Plan

The leak detection system includes a monitoring riser pipe connected to the collection sump. All leak-detection piping and appurtenances shall be chemically compatible with produced-water constituents and designed to withstand structural loads, equipment operations, and thermal expansion/contraction without loss of integrity. Any fluid released from the primary liner flows to this sump, where fluid levels can be monitored.

#### Monitoring Water Levels Procedure

- Use a portable electronic water level meter to check for fluid in the monitoring riser pipe.
- If the containment base is sloped, obtaining accurate readings may require additional steps:
  - Push the probe to the bottom of the port using an electrician's wire snake.
  - Attach a small bailer or similar device to confirm water presence.
- The operator may use any effective method to obtain accurate readings.

#### Actions When Seepage Is Suspected

If seepage from the containment into the leak detection system is suspected by a positive fluid level measurement, the operator will:

1. **Re-measure fluid levels daily for one week** to confirm discovery of seepage.
2. **Simultaneously collect a water sample** from the monitoring riser pipe to verify seepage using electrical conductivity and chloride measurements.
3. **Notify NM OCD** of a confirmed positive detection within 48 hours (initial notification).
4. **Install a pump** in the monitoring riser pipe sump to remove fluids from the leak detection system until the liner is repaired or replaced.

#### **19.15.34.13 A**

(5) If the primary liner is compromised below the fluid's surface, the operator shall remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.

## Operation and Maintenance Plan

5. **Remove all fluid above the damage or leak.**
6. **Dispatch a liner professional** to inspect the suspected leakage area during a “low water” monitoring event.
7. **Provide NM OCD a second report** describing inspection and/or repair within 20 days of the initial notification.

### Repair and Inspection

- If the point of release is obvious during inspection, the liner professional will repair the loss of integrity.
- If the point of release cannot be determined, the liner professional will develop a plan to identify the leak location.
- Submit the inspection plan and schedule to NM OCD with the second report.
- Implement the plan upon OCD approval.



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## Closure Plan

## Closure Plan

### Closure and Site Reclamation Requirements for Recycling Containments

#### Overview and Timeline

- After ceasing operations:
  - **Remove all fluids within 60 days.**
  - **Close the containment within 6 months** of ceasing operations.
  - Extensions:
    - Up to **2 months** for fluid removal.
    - Up to **6 months** for closure.
- Any alternative use of the containment must be approved by the division.
- Closure design must conform to site needs; variances require division approval.

#### Excavation and Removal Closure Plan

1. **Fluid Removal**
  - Remove all fluids from the containment.
  - Dispose of liquids at a division-approved facility or reuse if permitted.
2. **Containment Cleanout**
  - Remove all solids, contents, and synthetic liners.
  - Transfer these materials to a division-approved facility.
3. **Soil Testing**
  - Collect a **minimum five-point composite sample** from soils beneath the containment, including stained or wet areas.
  - Analyze sample for contaminants listed in **Table I of 19.15.34.14.**
4. **Laboratory Results**
  - If **contaminant levels exceed Table I:**
    - Additional delineation may be required.
    - Operator must obtain division approval before proceeding.
  - If **contaminant levels are within limits:**
    - Backfill with clean, uncontaminated earthen material.

#### 19.15.34.14

**A.** Once the operator has ceased operations, the operator shall remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use. The division district office may grant an extension for the removal of all fluids not to exceed two months. The division district office may grant an extension to close the containment not to exceed six months. If the operator wants to use the containment for a purpose other than recycling then the operator must have that use approved or permitted by the division in accordance with the appropriate rules.

**B.** The operator shall close a recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.

**C.** The operator shall test the soils beneath the containment for contamination with a five-point composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I below.

(1) If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.

(2) If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator can proceed to backfill with non-waste containing, uncontaminated, earthen material.

## Closure Plan

- OR submit a variance request for an alternative closure process.

### Closure Documentation

- Within **60 days of closure completion**, submit **Form C-147** with:
  - Sampling results.
  - Details of backfilling, capping, or covering.
  - Certification that all information is correct and closure complies with division rules.

### Reclamation and Re-vegetation

- Restore the site to:
  - A **safe and stable condition** blending with surrounding undisturbed area.
  - Or comply with federal, state trust, or tribal land requirements if they provide equal or better protection.
- Specific actions:
  - Replace topsoil and subsoil to original relative positions.
  - Contour for erosion control, long-term stability, and preservation of surface water flow patterns.
  - Reseed during the first favorable growing season after closure.
- Reclamation is complete when:
  - All ground-disturbing activities are finished.
  - Vegetative cover achieves:
    - **±50% of pre-disturbance life-form ratio.**
    - **≥70% total plant cover**, excluding noxious weeds.

### Final Notification

- Notify the division when reclamation and re-vegetation are complete.

**D.** Within 60 days of closure completion, the operator shall submit a closure report on form C-147, including required attachments, to document all closure activities including sampling results and the details on any backfilling, capping or covering, where applicable. The closure report shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in division rules or directives.

**E.** Once the operator has closed the recycling containment, the operator shall reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area. Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment. The operator shall substantially restore the impacted surface area to the condition that existed prior to the construction of the recycling containment.

**F.** Reclamation of all disturbed areas no longer in use shall be considered complete when all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent of pre-disturbance levels and a total percent plant cover of at least seventy percent of pre-disturbance levels, excluding noxious weeds.

**G.** The re-vegetation and reclamation obligations imposed by federal, state trust land or tribal agencies on lands managed by those agencies shall supersede these provisions and govern the obligations of any operator subject to those provisions, provided that the other requirements provide equal or better protection of fresh water, human health and the environment.

**H.** The operator shall notify the division when reclamation and re-vegetation are complete.



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## Rule 34 Registration

May 2026

### Lost Tanks East

Section 30 Township 22S Range 33E, Lea County

#### Volume 1

- Transmittal Letter
- Siting Criteria and Demonstration Plates
- Relevant NMOSE Well Reports
- Cave and Karst Survey Report



*View looking east illustrating typical terrain and vegetation in the AOI. Mesquite, small bushes, and grasses dominate the local vegetation while piedmont and alluvial processes dominate deposition. The area is very flat with no eolian dunes.*

#### Prepared for:

DEVON ENERGY PRODUCTION COMPANY, LP  
Oklahoma City, Oklahoma

#### Prepared by:

Cascade Services LLC  
Midland, Texas



| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

May 2026

Ms. Leigh Barr  
EMNRD – Oil Conservation Division  
1220 S. St. Francis Drive  
Santa Fe, NM 87505  
Via E-Mail

Ms. Victoria Venegas  
NMOCD – District 2  
811 S. First St.  
Artesia, NM 88210  
Via E-Mail

RE: DEVON ENERGY PRODUCTION COMPANY, LP, Lost Tanks East In-ground  
Containment Registration  
Section 30 Township 22S Range 33E, Lea County

Dear Ms. Barr and Ms. Venegas:

We are pleased to submit a C-147 registration for the above-referenced project. This is a sister project to, but separate from, the DEVON ENERGY PRODUCTION COMPANY, LP, Lost Tanks West In-ground Containment. These ponds are going to be built directly adjacent to each other, but will be completely separate from a BLM and OCD permitting perspective.

Volume 1 contains:

- Transmittal Letter
- Siting Criteria Demonstration
- Relevant NMOSE Well Log Reports
- Cave and Karst Survey Report

Volume 2 contains:

- C-147
- Closure Cost
- Stamped Design Drawings
- Avian Deterrent System Demonstration
- Fence Design Demonstration
- Liner Equivalency Demonstration
- Design and Construction Plan
- Operation and Maintenance Plan
- Closure Plan



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This submission addresses elements that prior OCD reviewers have, in some cases, treated as variances for in-ground containments:

1. An equivalency demonstration prepared by qualified experts for the proposed 40-mil HDPE secondary liner has been previously approved by the OCD. The applicable Rule language is clear, and a variance is not required for use of the proposed liner.
2. The proposed Avian Protection Plan (Bird-X Mega Blaster Pro) has been approved by the OCD for other containments. The plan satisfies the Rule requirement that facilities be “otherwise protective of wildlife, including migratory birds,” and therefore does not require a variance.
3. Use of the proposed game fencing in lieu of a four-strand barbed wire fence does not constitute a variance. Feral pigs, javelina, and deer are present in the area, necessitating a tall game fence to comply with Section 19.15.34.12(D)(1) of the Rule. The fencing specification in Section 19.15.34.12(D)(2) conflicts with this requirement because pigs can pass beneath the lower strand of a four-foot barbed wire fence and deer can jump over it. As a result, strict compliance with Section (D)(2) would fail to meet the wildlife-exclusion requirement of Section (D)(1). Compliance with Section (D)(1) is therefore the controlling requirement of the Rule. Nevertheless, four strands of barbed wire can be added to the game fence if required by the OCD.

This package will be submitted to the OCD via the Online Portal. In compliance with 19.15-34-10 of the Rule, a copy of this package has been provided to the surface owner’s representative by the operator. If you have any questions or need additional information, please feel free to contact me. Thank you for your consideration.

Sincerely,  
Cascade Services LLC

A handwritten signature in black ink that reads "George Jennings". The signature is written in a cursive style with a large, stylized "G" and "J".

George R. Jennings III  
Senior Geologist  
[gjennings@cascadeservicesllc.com](mailto:gjennings@cascadeservicesllc.com)  
575-618-2103



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## Siting Requirements Demonstration



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## Groundwater

*As shown on Plates 1a, 1b, 1c, & 1d, and demonstrated in the discussion below, groundwater in the area of interest (AOI) is located deeper than 56.8 feet and is likely >360 feet below the base of the proposed containment. No groundwater wells are located within 500 feet of the AOI.*

Plate 1a shows the location of the AOI relative to the nearest wells identified from the NMOSE and USGS databases set over a USGS Topo map. Text around each well identifies the source, data date, and the recorded depth to ground water (or the total depth of the boring if no ground water was encountered). Red circles around each water wellbore indicate 500-foot buffers. All six wells shown on the map are part of two different Geo-Technical projects drilled to determine ground water in this area. The 5 borings to the south are part of the CP-02074 project and the one boring to the north is part of the CP-02070 project. None of the borings shown on the map are water wells (and thus do not have 500-foot buffers drawn around them), and all 6 wells have been plugged. No water wells are within 500-feet of the AOI.

Geo-Technical project CP-02074, consisting of five borings drilled to the southwest of the AOI, encountered no water in any of the borings. Four of the borings were drilled to 25 feet and were not drilled to a sufficient depth to be helpful proving the bottom of the proposed containment is >50 feet from ground water. The central boring was drilled to 75 feet, however, and is useful for establishing the fact that the depth to ground water in the AOI is >50 feet from the bottom of the sump of the proposed pond.

Geo-Technical project CP-02070 consists of one boring drilled to the northwest of the project. It was drilled to a depth of 75 feet and is useful for determining that any ground water in the AOI is >50 feet below the sump of the proposed pond.

Plate 1b shows the location of the AOI relative to the nearest borings identified from the NMOSE and USGS databases set over the Geologic Map of the area with the USGS Topo Map in the background. Text around each well identifies the source, data date, and the recorded depth to ground water. Red circles around each water wellbore indicate 500-foot buffers. The AOI is located in modern Piedmont Alluvial Deposits. The Upper Chinle Group is exposed ~4,200 feet to the north.

As shown in Plates 1 & 2 and detailed in the table below, two borings of sufficient depth are present within one mile of the AOI. Both borings were drilled to a depth of 75 feet, and



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neither boring encountered ground water as shown in the attached well plugging reports. This means that the calculations presented in the table below are MINIMUM depths to ground water assuming that ground water is present at immediately below 75 feet. It is likely that ground water is present much deeper than 75 feet as shown on Plate 1d.

Plate 1c is a modified partial reproduction of Plate 1 in Ground Water Report 6 (Nicholson and Clebsch, 1961), a classic and accurate report of the geology of southern Lea County. Plate 1c demonstrates the elevation of Red Beds as mapped by Nicholson and Clebsch with solid red lines. The dashed red lines represent interpolation of elevation data from surface exposures of the Chinle Group and fills in the area around the AOI. This data fits perfectly with the mapped data presented by Nicholson and Clebsch. Chinle Group Outcrops from the geologic map overly Nicholson and Clebsch's original map for context.

Based on the data mapped by Nicholson and Clebsch and elevation data obtained from Chinle exposures in the area it is expected to encounter Red Beds at ~3560 feet above sea level in the AOI. The proposed AOI has an undisturbed surface elevation of 3,575 feet. This indicates ~15 feet of alluvial cover over the top of the red beds in the AOI. Unfortunately, no logs are present for the six Geo-Technical wells drilled around the AOI on the NMOSE website. However, all six wells were drilled to a depth of at least 25 feet and would have drilled down to the top of the Red Beds. No water was found in any of the borings, indicating that no ground water is perched above the Red Beds. This solidifies Nicholson and Clebsch ground water depth interpretation as presented in Plate 1d. Ground water is expected to be at ~360 feet below the ground surface in the AOI as shown on Plate 1d.

Plate 1d is a partial reproduction of Plate 2 in Ground Water Report 6 (Nicholson and Clebsch, 1961). This Plate maps "Water-table or piezometric contour on water body in Triassic aquifers." As shown in Plate 1d, Nicholson and Clebsch mapped the water table in the red-beds at <3,200 feet above sea level. Because the undisturbed surface elevation of the AOI is 3,575 feet above sea level, this indicates a ground water depth of >363 feet. This aligns well with the Geo-Technical wells drilled in the area and exceeds the >50 foot to ground water requirement.

Using the direct measurements from the borings in the area and assuming a 75' ground water depth at the northern CP-02070-POD1 boring, a maximum ground water elevation of <3,490.9 feet above sea level is calculated. Assuming a 75' ground water depth at the northern CP-02074-POD2 boring, a maximum ground water elevation of <3,509.3 feet above sea level is calculated. Using an Inverse Distance Weighted Average (IDW) that gives more weight to the borings closer to the AOI, an elevation of 3,506.0 feet above sea level is



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calculated as the maximum elevation that ground water could be at. Using a projected sump elevation of 3,567.0 feet above sea level, a depth of 61.0 feet from the lowest point of the pond to the highest possible ground water elevation is calculated. The NMOSE source data for all borings are included in the Appendix.

Well Elevation Details (ft)						
Well ID	Source	Distance From AOI to Well (ft)	Surface Elevation	Depth to GW	Calculated GW Elevation	Sump to GW
CP-02070-POD1	NMOSE	3,700.0	3,565.9	>75	<3490.9	>76.1
CP-02074-POD2	NMOSE	1,725.0	3,584.3	>75	<3509.3	>57.7
Inverse Distance Weighted Average (power=2)					<b>3,506.0</b>	<b>61.0</b>

Pond Elevation Details (ft)				
Undisturbed Surface Elevation at Sump	Undisturbed Surface to Top of Berm	Top of Berm to Sump	Undisturbed Surface to Sump	Calculated Sump Elevation
3,575.0	14.0	22.0	8.0	3,567.0

As discussed above, 61.0 feet is the *minimum* distance to groundwater based on the immediate borings. Nicholson and Clebsch mapped groundwater in the Triassic Red Beds at >360 feet in this area. Both interpretations are consistent, and no matter what data is used, ground water is greater than 50 feet from the lowest point of the containment.

### Nearby Municipal Water Supplies

*The AOI is not within incorporated municipal boundaries or within a defined municipal fresh water well field covered by a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978, as amended.*

Plate 2 illustrates all New Mexican Public Water Systems and Incorporated Places set over a basemap (Map data © OpenStreetMap contributors) and demonstrates that the AOI is not located within any incorporated municipal boundaries or within a defined municipal fresh water well field. The closest municipality is Monument, located about 24 miles to the east. Carlsbad municipality is located about 25 miles to the west.

### Nearby Subsurface Mines

*The AOI is not within an area overlying a subsurface mine.*

Plate 3 contains a USGS Topo basemap EMNRD mines and ½ mile buffers around potash mine workings. There are no EMNRD mapped mines in the AOI. The AOI is located in the



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Potash District. However, the closest ½ mile mineworking buffer is located ~4,335 feet to the southwest. James Rutley at the BLM provided the shapefiles via email for the mineworking buffers on 2026-04-02. Several gravel pits are located in the area but are over ~2,500 feet to the southwest and southeast of the AOI.

## Nearby Unstable Areas

*The AOI is not located in an unstable area.*

Plate 4 shows a USGS Topo Map with the Bureau of Land Management's Carlsbad Field Office designated Karst Potential Areas. The AOI is located in "Medium" karst potential. Plate 1a displays the USGS Topo and Plate 1b shows the geologic map of the area with nothing on either map indicating the presence of unstable ground.

Because the AOI is located in "Medium" karst potential, the OCD requires an aerial karst survey to be completed. On March 16<sup>th</sup>, 2026, BLM certified karst specialist Richard Bridges and George Jennings completed an aerial karst survey. Additionally, George Jennings visited the field on March 20<sup>th</sup>, 2026 to investigate all potential karst features identified in the aerial survey and perform a general site inspection. Please see the attached Cave and Karst Survey Report for additional information.

NO Surface Karst Features (i.e. sinkholes, swallets, or cave entrances) were found within 200 meters of the AOI. No attempt was made to investigate the subsurface.

## Nearby 100 year Floodplains

*The AOI is not located within a FEMA mapped 100-year floodplain.*

Plate 5 maps the AOI relative to FEMA mapped 100-year floodplains overlying a basemap (Map data © OpenStreetMap contributors). The closest floodplain is ~12 miles to the southwest.

## Nearby Significant Watercourses

*The AOI is not within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole or playa lake (measured from the ordinary high-water mark).*

Plate 6 demonstrates the AOI's position relative to 3DHP significant waterbodies and watercourses. The USGS topo in the background corroborates the 3DHP dataset. A 200-



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foot buffer is shaded with blue dots. Additionally, a 300-foot buffer is drawn over that in a light blue. No significant watercourses or their respective buffers intersect the AOI.

## Nearby Permanent Residences or Structures

*There are no permanent residences, schools, hospitals, institutions, or churches within 1000 ft of the AOI.*

Plate 7 shows a recent Google Satellite photo of the area as well as a modified OpenStreetMap view of all buildings in the area (© OpenStreetMap contributors). The only structures in the area are related to oil field operations, and are not residences, schools, hospitals, institutions, or churches, and none are within the 1000-foot buffer.

## Nearby Springs and Freshwater Wells

*The AOI exceeds the 500 ft setback requirement for nearby springs and freshwater wells.*

Plate 1a is a USGS topographic map with all wells, borings, springs, and other hydro locations. The borings indicated on the map were all drilled as Geo-Technical wells, and do not produce any water. All six wells shown on the map were immediately plugged as shown in the Well Log Appendix. No springs are within 500 feet of the proposed pond.

## Nearby Wetlands

*No wetlands are present within 500 feet of the AOI.*

Plate 8 displays all USFWS Wetland and Riparian designated locations. A green 500-foot buffer is also mapped around all USFWS mapped wetlands.

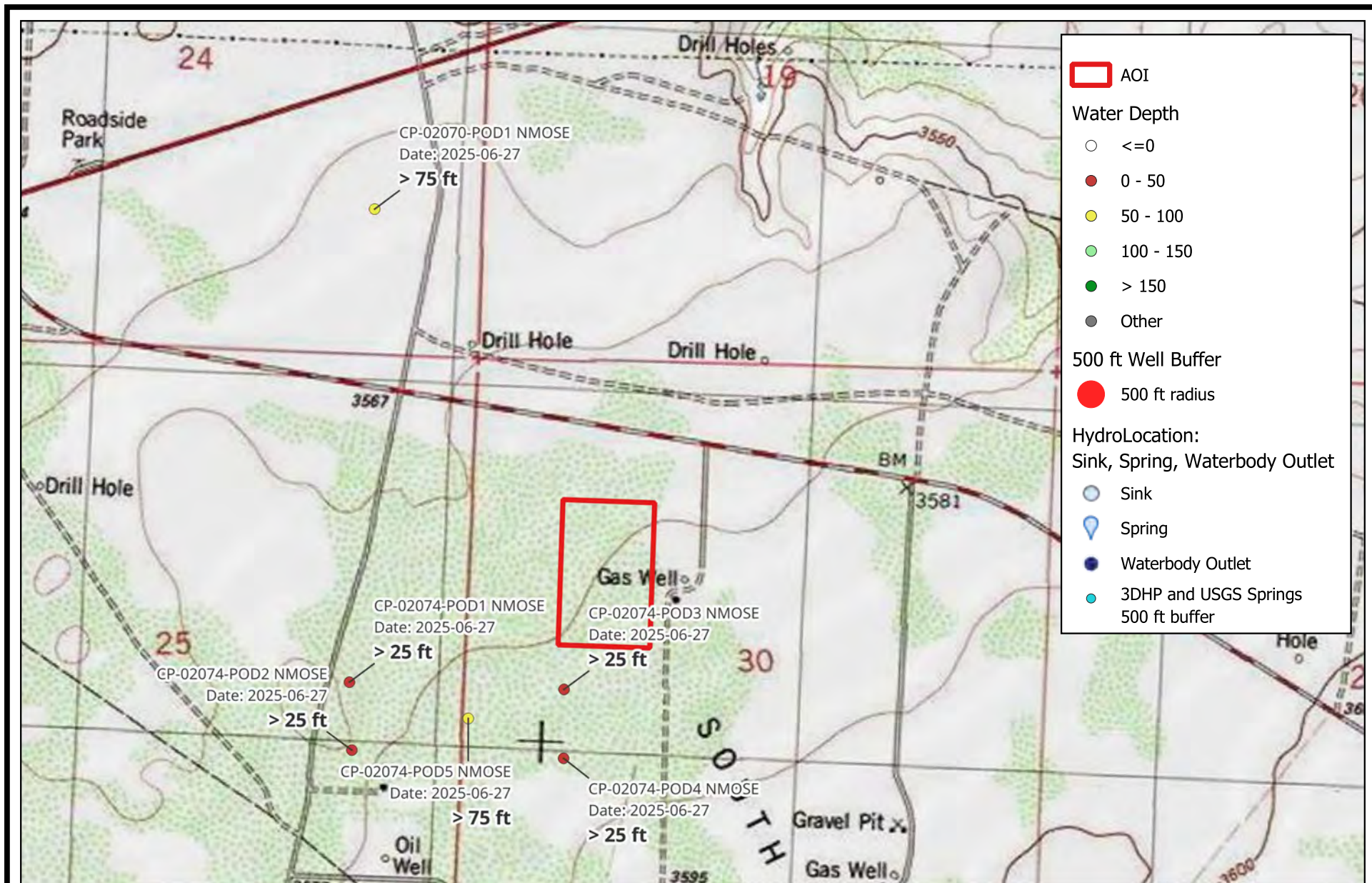
The USFWS maps these wetlands remotely, and while they provide a guide for the location of possible wetlands, they often miss-identify wetlands as defined by the State of New Mexico. In New Mexico TITLE 20: Environmental Protection Chapter 6: Water Quality Part 4: Standards for Interstate and Intrastate Surface Waters, wetlands are defined as “*areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions in New Mexico.*”

No wetlands are mapped by the USFWS within 500 feet of the AOI. No evidence of saturated soil or vegetation typically adapted for life in saturated soil were observed during field visits.



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## Siting Requirements Demonstration Plates



1,000 2,000 ft



Scale 1:15,000



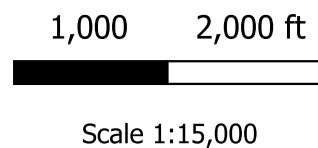
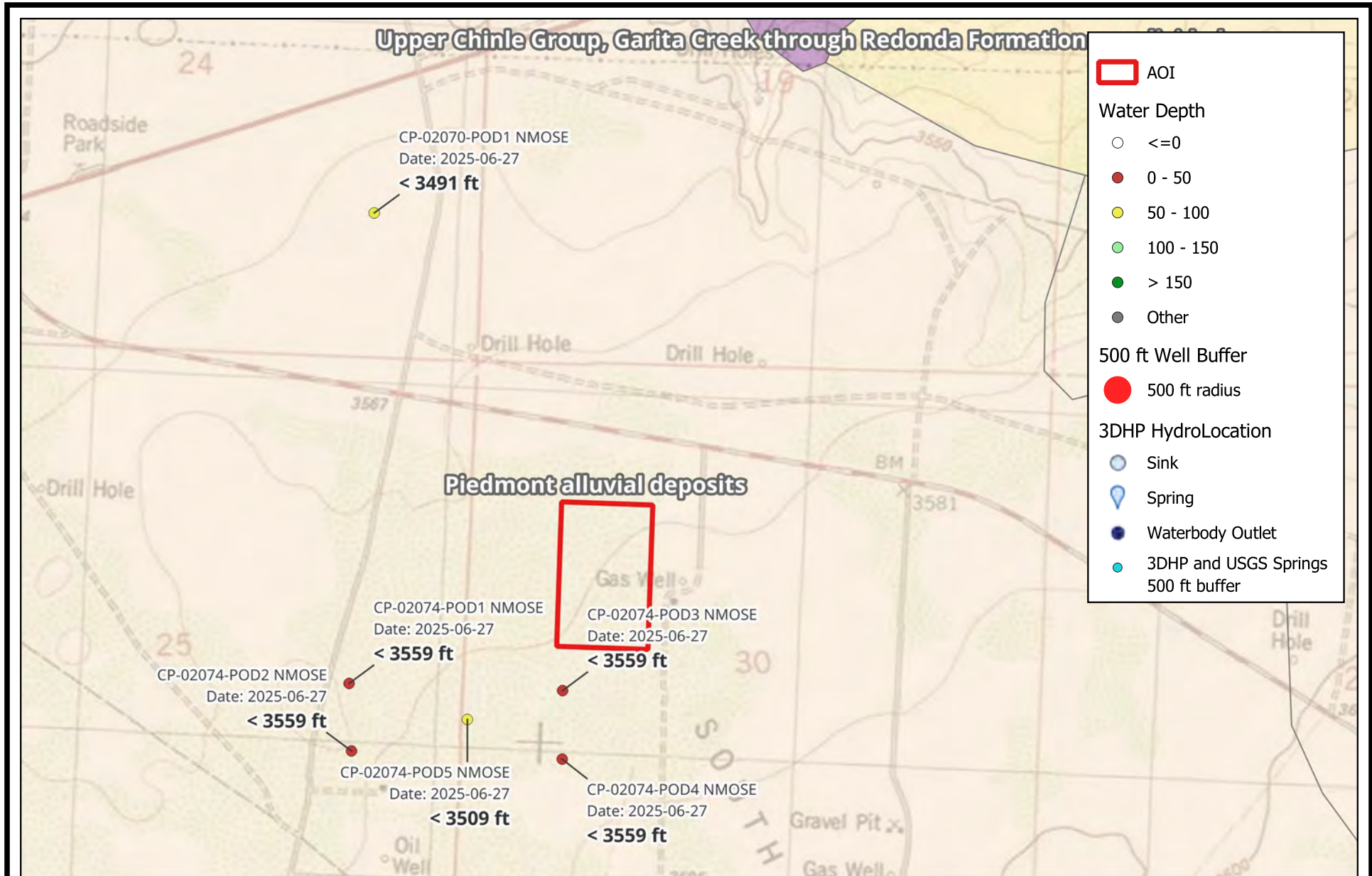
952 Echo Lane, Suite 130  
Houston, Texas 77024

Nearby Springs, Wells, and Borings with Ground Water Depth

Plate 1a

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Lost Tanks East

May 2026



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Houston, Texas 77024

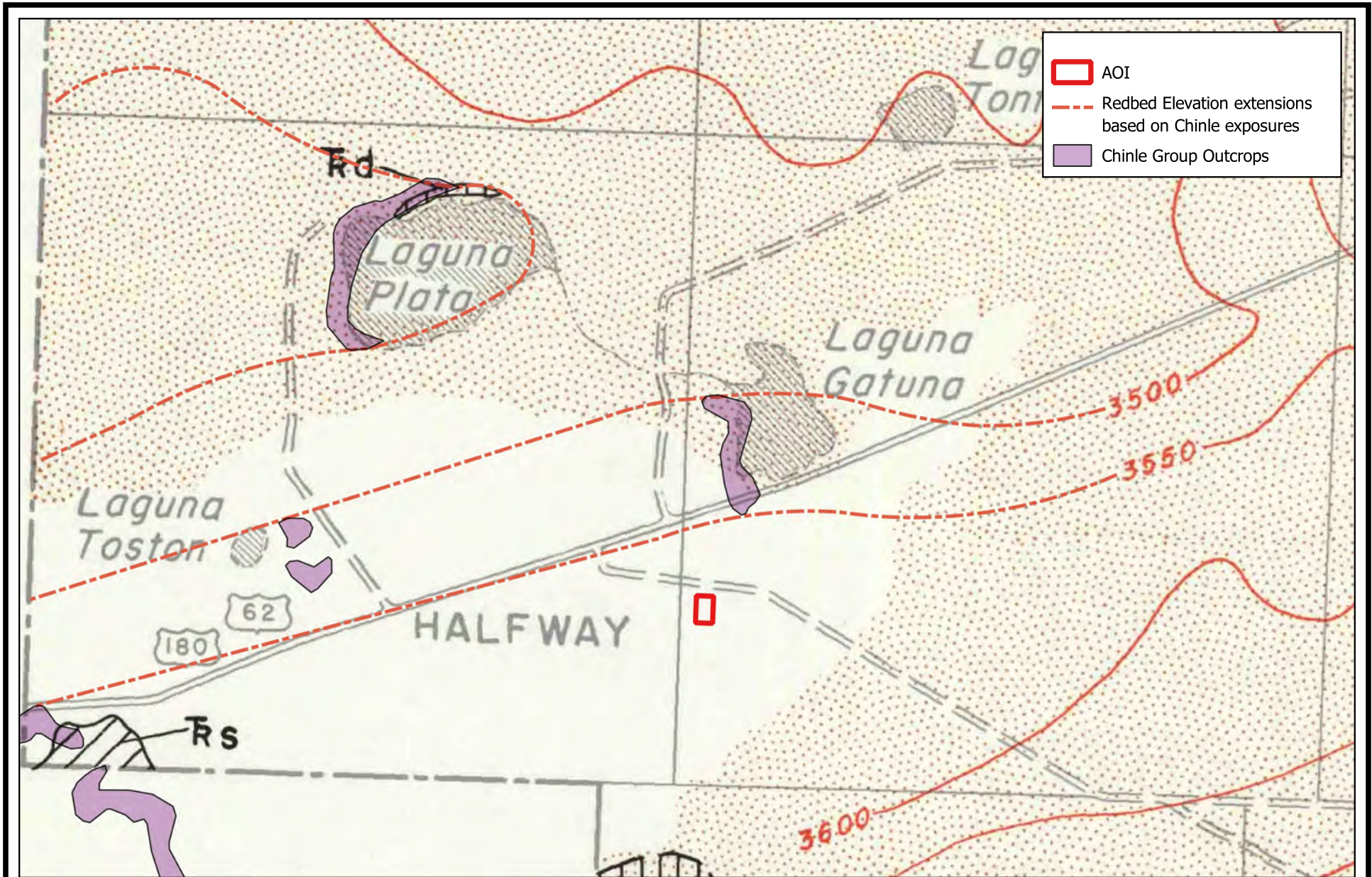
Nearby Springs, Wells and Borings with Ground Water  
Elevation Relative to Surface Geology




DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks East

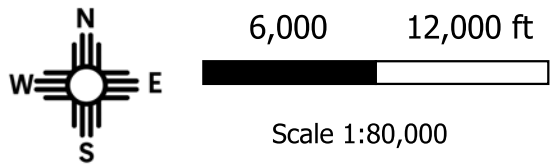
Plate 1b

May 2026

Basemap: USGS Scanned Topo & USGS State Geologic Map Compilation (SGMC)



	AOI
	Redbed Elevation extensions based on Chinle exposures
	Chinle Group Outcrops



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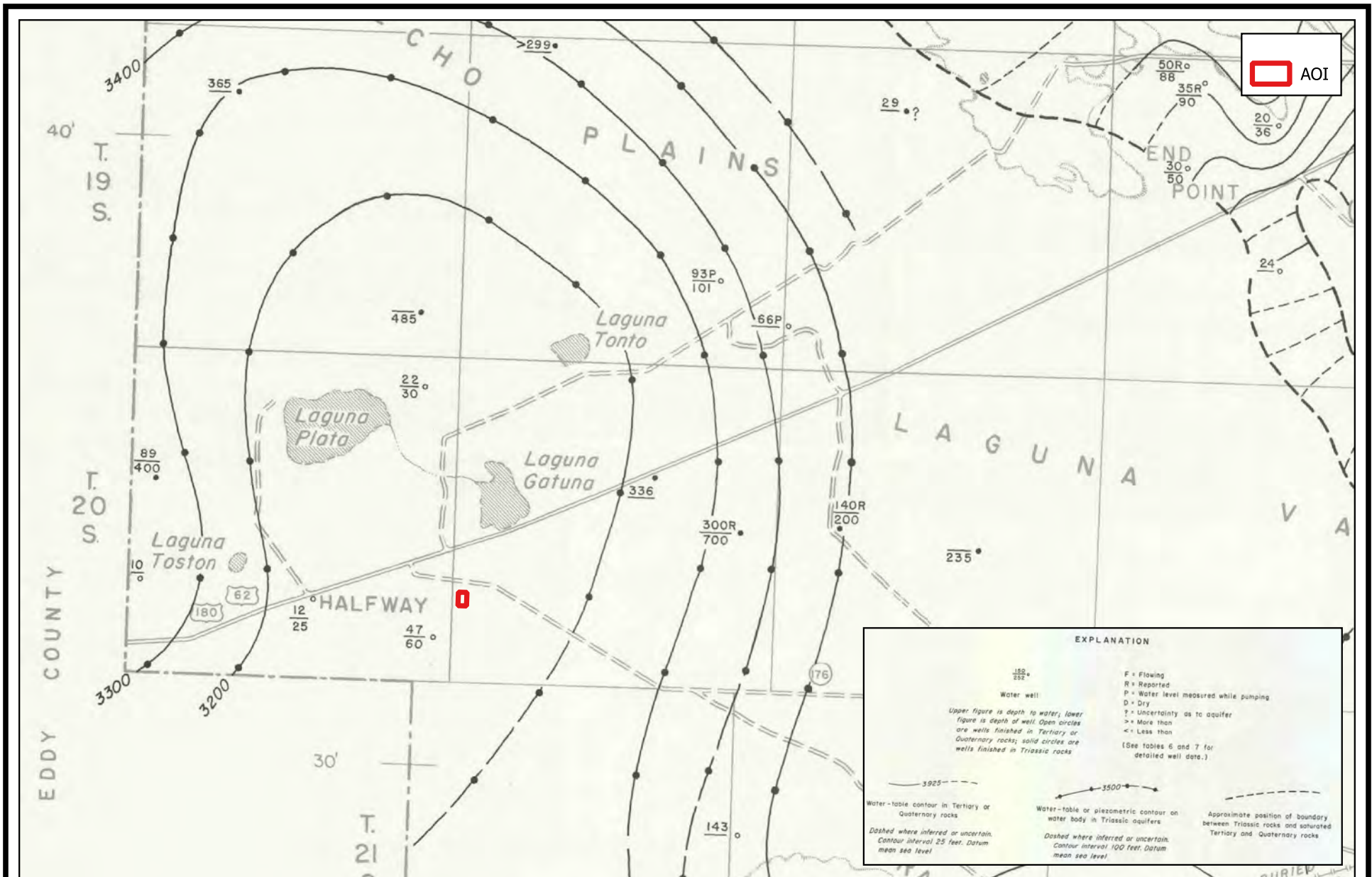
952 Echo Lane, Suite 130  
Houston, Texas 77024

Partial reproduction of Plate 1 in Ground Water Report 6 (Nicholson and Clebsch, 1961). Redbed elevations extended based on surface elevation of Chinle Group outcrops.

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Lost Tanks East

Plate 1c

May 2026



10,000 20,000 ft



Scale 1:160,000



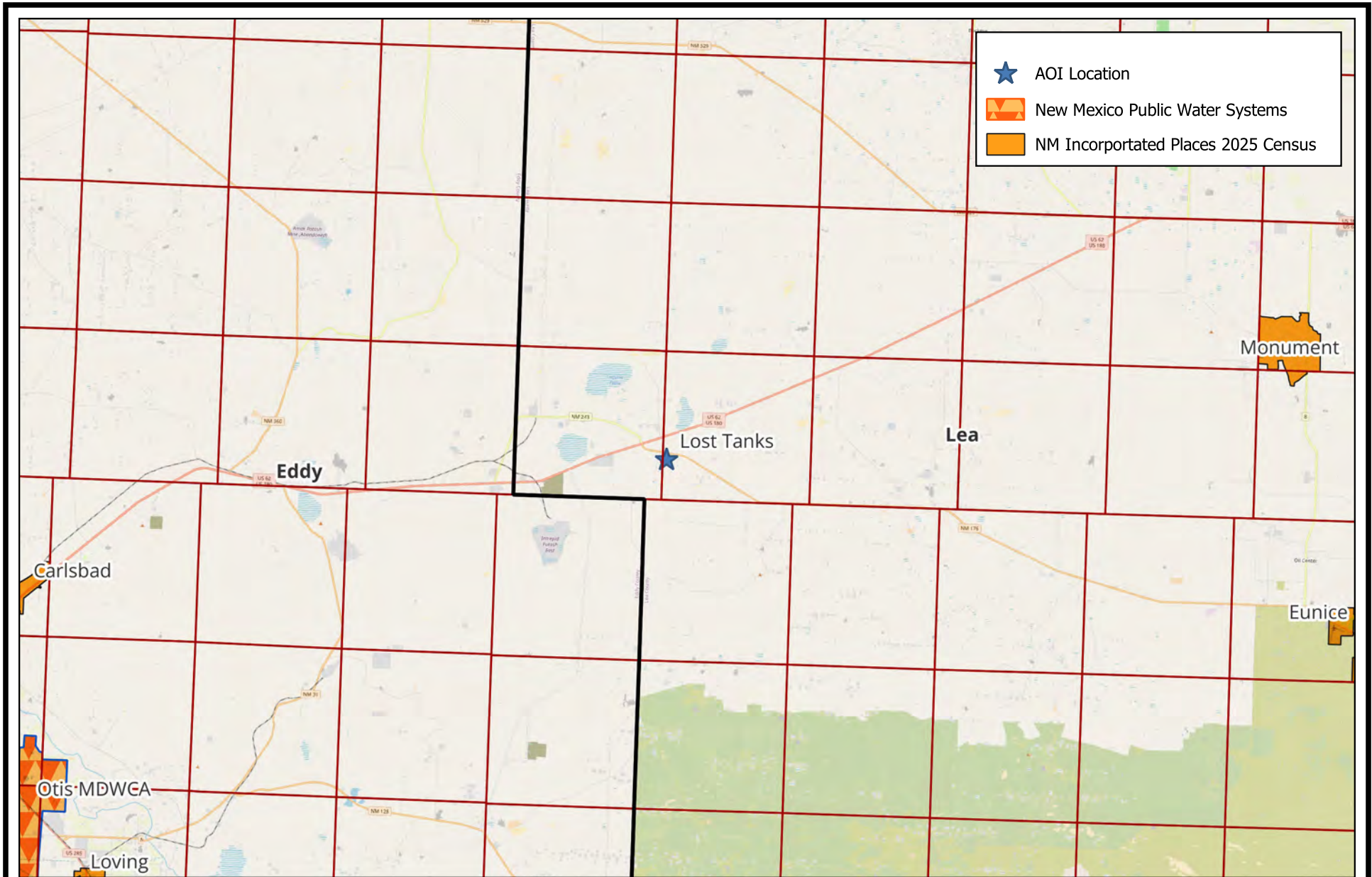
952 Echo Lane, Suite 130  
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Partial reproduction of Plate 2 in Ground Water Report 6  
(Nicholson and Clebsch, 1961). Water-table is predicted to be  
confined to Red Beds at an elevation <3200 feet.



DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks East

Plate 1d

May 2026



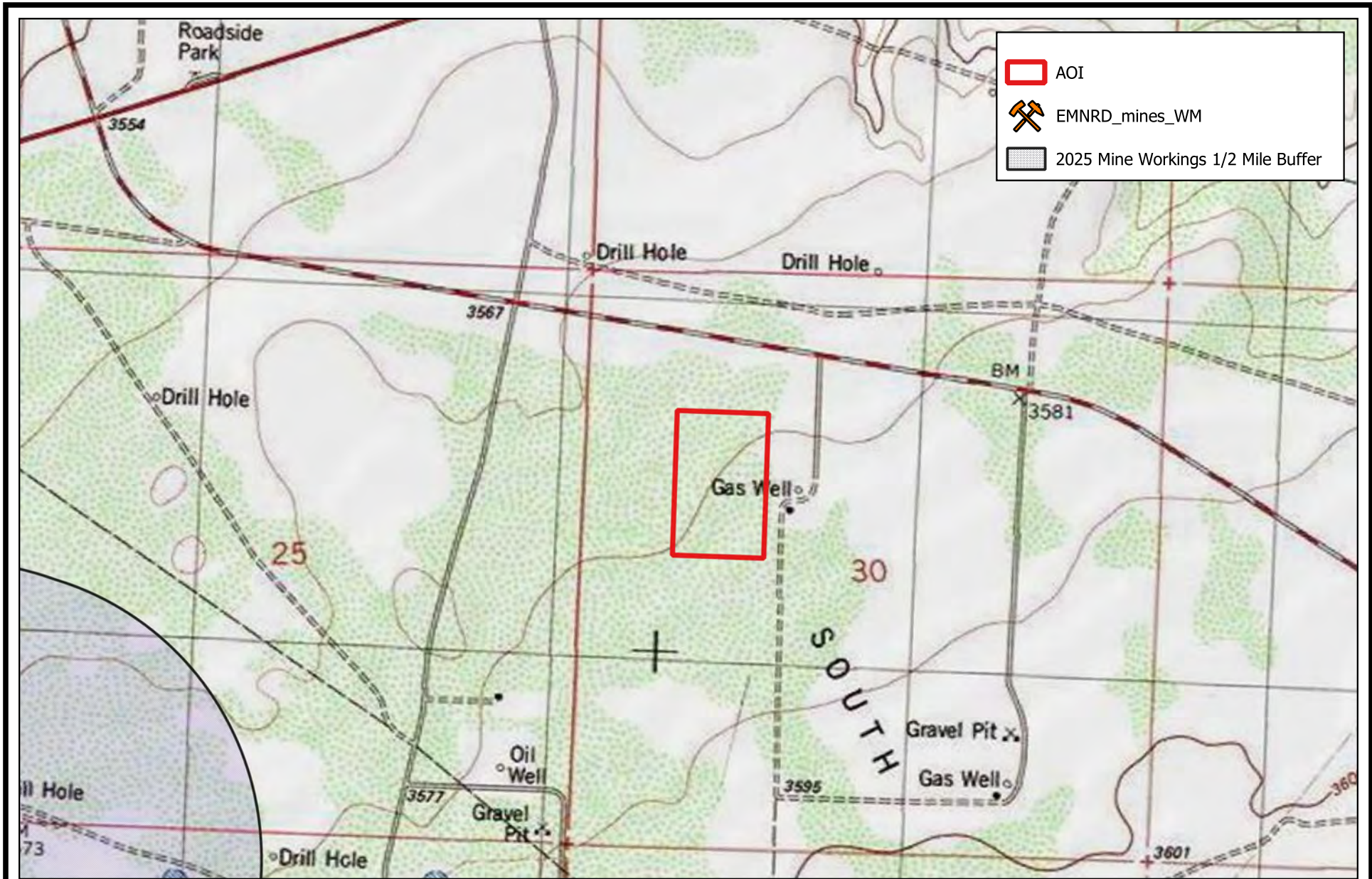
-  AOI Location
-  New Mexico Public Water Systems
-  NM Incorporated Places 2025 Census





20,000 40,000 ft  
  
 Scale 1:350,000

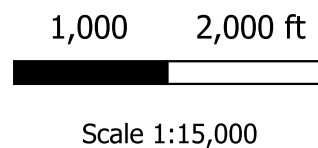
  
 952 Echo Lane, Suite 130  
 Houston, Texas 77024

Incorporated Places and Municipal Water Supplies.
DEVON ENERGY PRODUCTION COMPANY, LP Lost Tanks East

Plate 2
May 2026

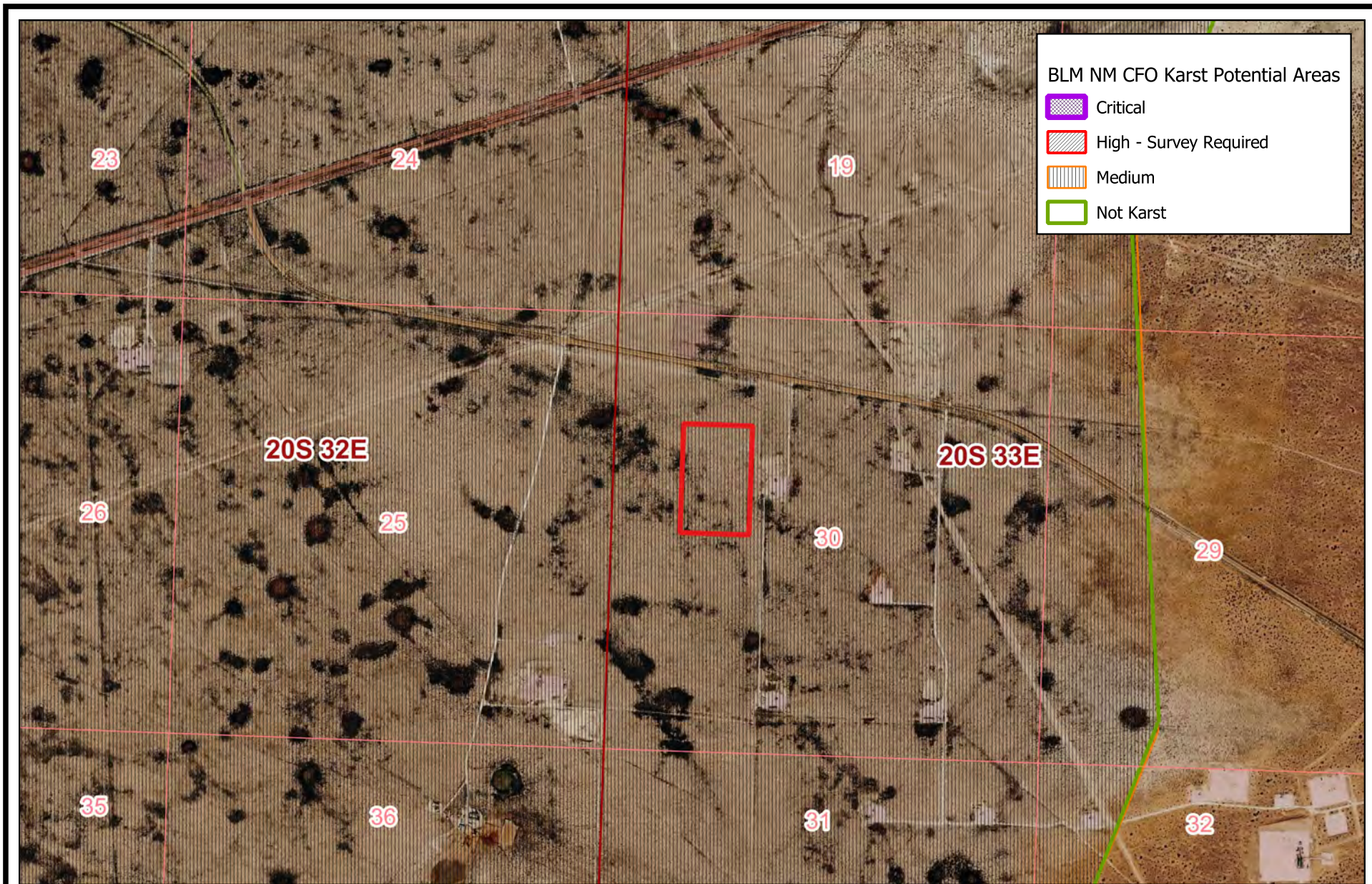


-  AOI
-  EMNRD\_mines\_WM
-  2025 Mine Workings 1/2 Mile Buffer



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Nearby Mines	Plate 3
DEVON ENERGY PRODUCTION COMPANY, LP Lost Tanks East	May 2026



1,000 2,000 ft



Scale 1:20,000



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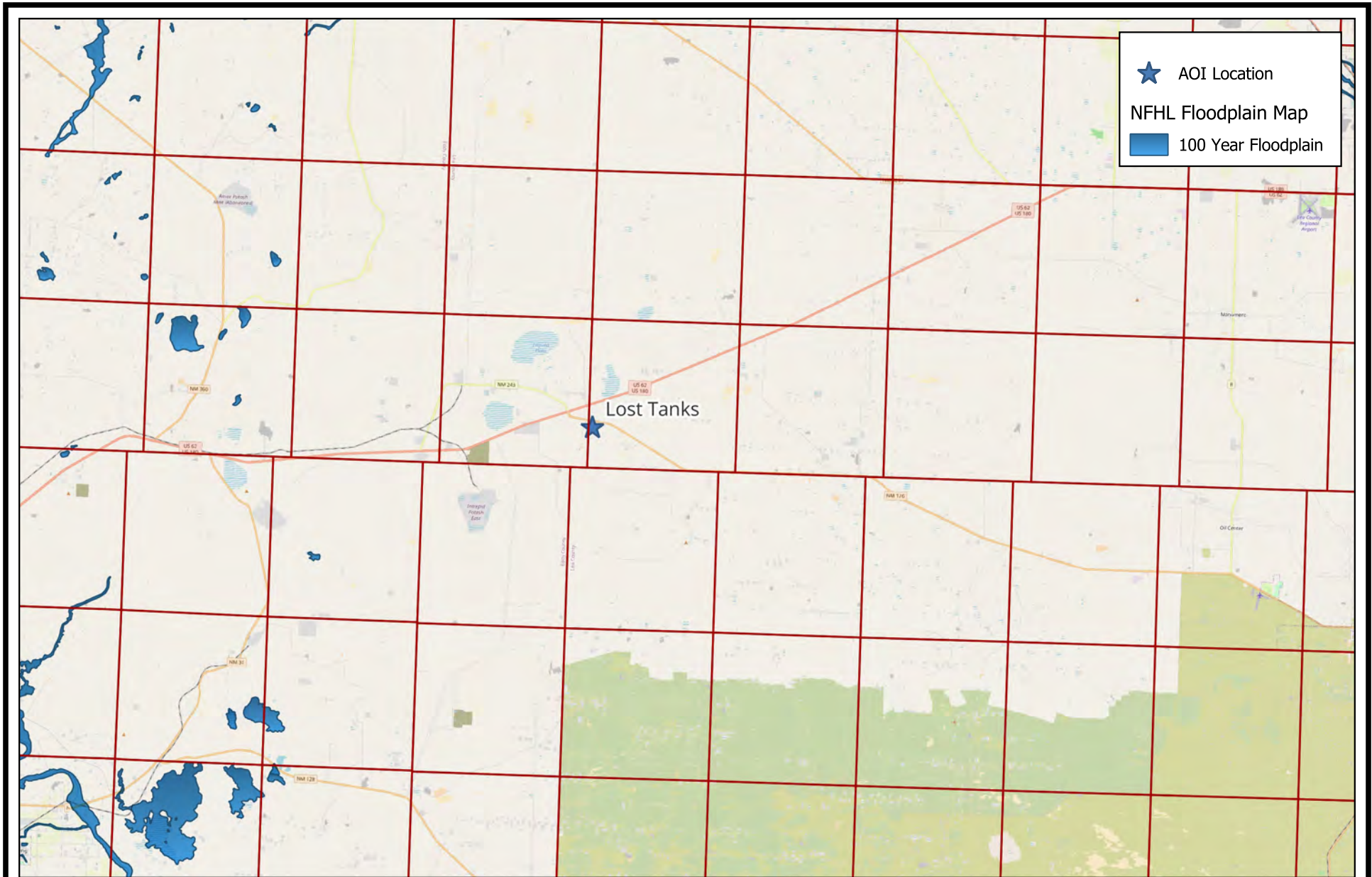
Karst Potential

Plate 4

DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks East

May 2026

Basemap: Google Satellite Imagery



20,000 40,000 ft



Scale 1:350,000



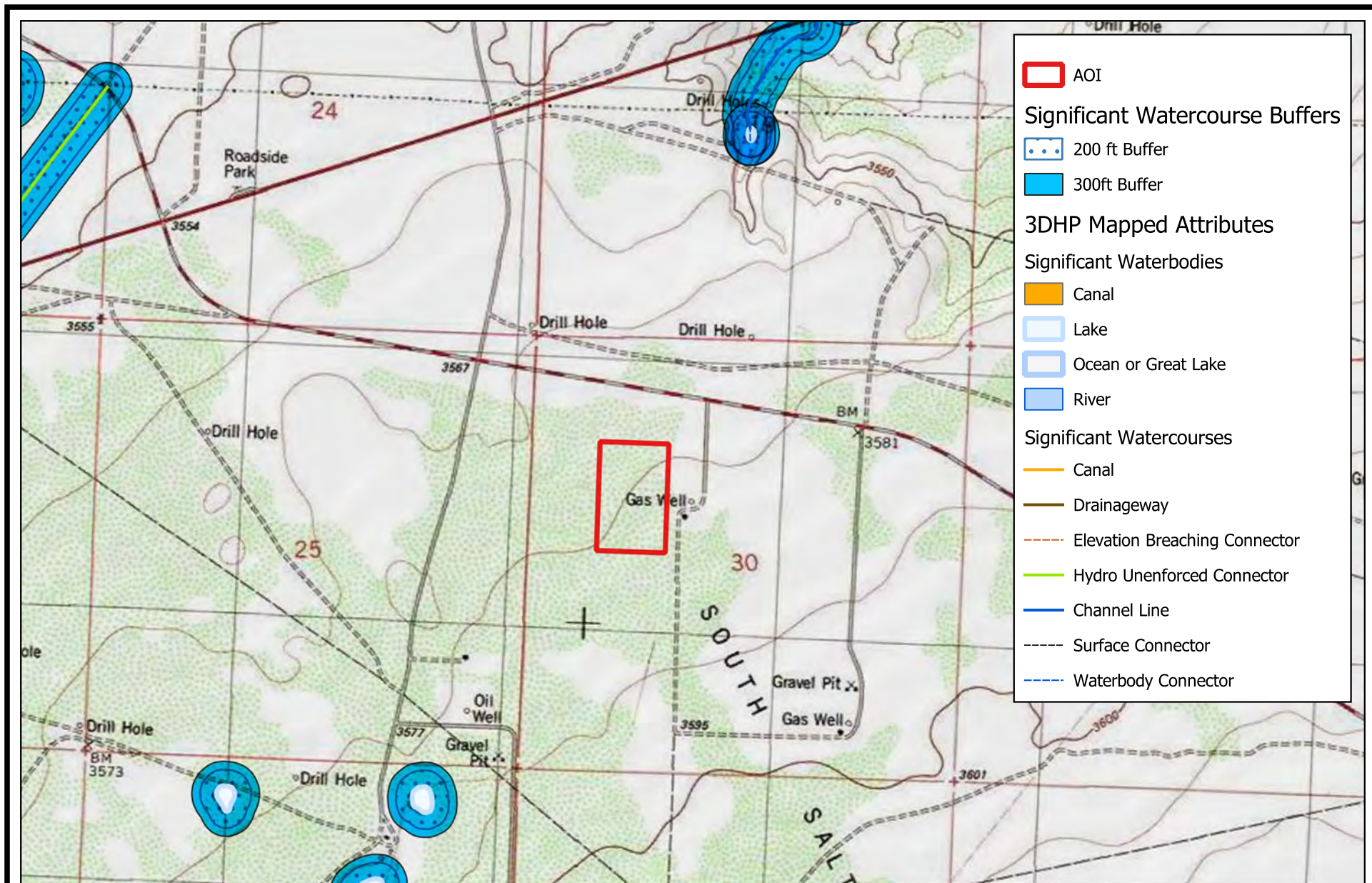
952 Echo Lane, Suite 130  
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100 Year Floodplain

Plate 5

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Lost Tanks East

May 2026



1,000 2,000 ft



Scale 1:20,000



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Significant Watercourses and Setbacks

Plate 6

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Lost Tanks East

May 2026



Scale 1:7,500



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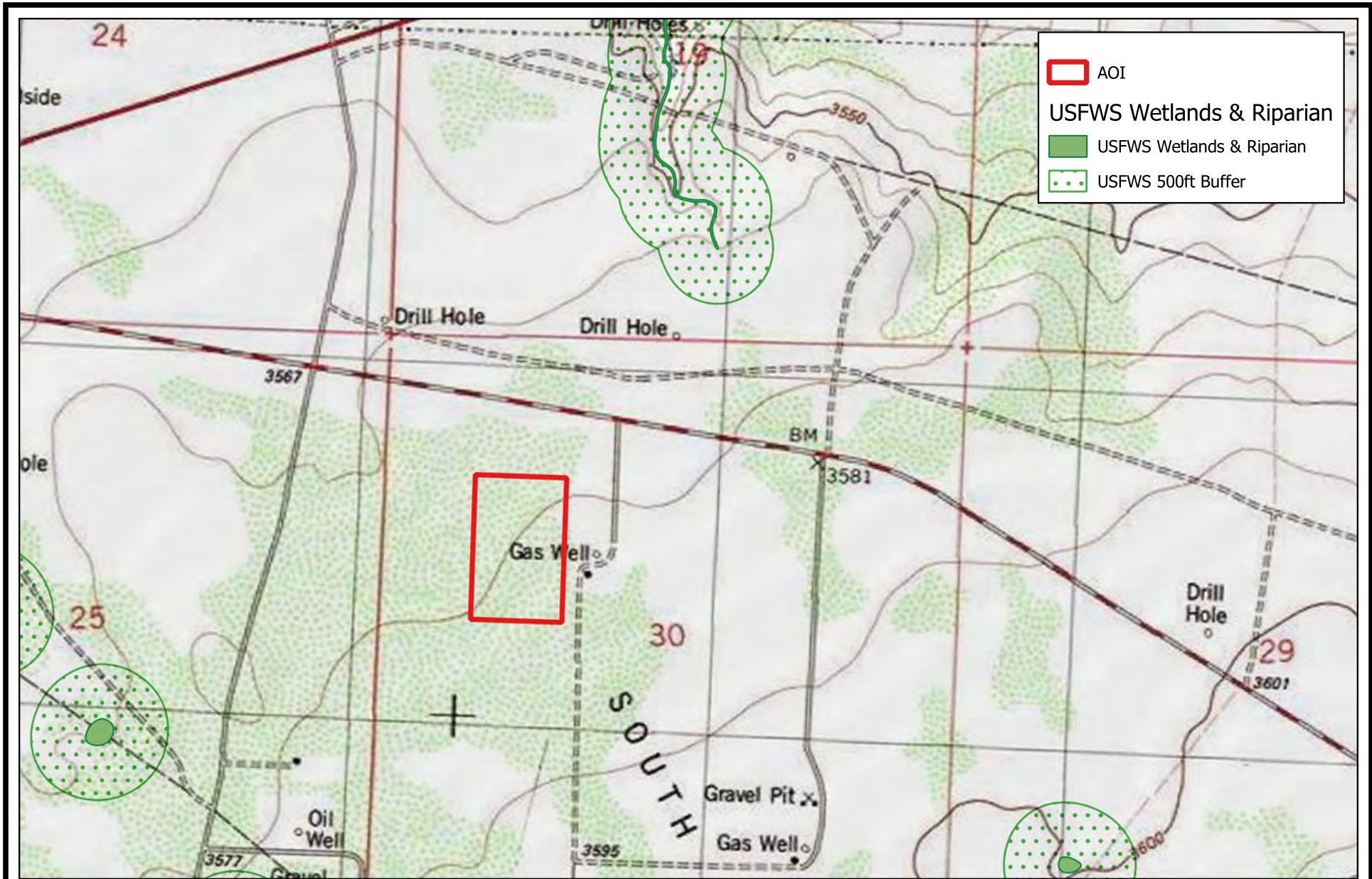
Buildings and 1000' setbacks

Plate 7

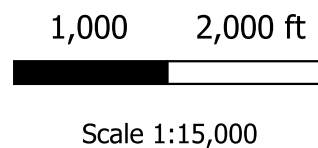
DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks East

May 2026

Basemap: Google Satellite Imagery; Buildings buffers modified from © OpenStreetMap contributors



	AOI
	USFWS Wetlands & Riparian
	USFWS 500ft Buffer



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Wetlands and Setbacks  
DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks East

Plate 8  
May 2026

Basemap: USGS Scanned Topo



| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

## Well Logs & USGS Data



# WELL PLUGGING PLAN OF OPERATIONS



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology [geoinfo.nmt.edu/resources/water/cgmm/](http://geoinfo.nmt.edu/resources/water/cgmm/) if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email [nmbg-waterlevels@nmt.edu](mailto:nmbg-waterlevels@nmt.edu), prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

**I. FILING FEE:** There is no filing fee for this form.

**II. GENERAL / WELL OWNERSHIP:**  Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged.. CP-2076-POD1 to POD5  
Name of well owner: Kenneth Smith Ranch  
Mailing address: 267 Smith Ranch Road County: \_\_\_\_\_  
City: Hobbs State: NM Zip code: 88240  
Phone number: 575-942-3832 E-mail: jaydeelogan87@yahoo.com

**III. WELL DRILLER INFORMATION:**

Well Driller contracted to provide plugging services: Enviro Drill Inc.  
New Mexico Well Driller License No.: 1848 Expiration Date: \_\_\_\_\_

**IV. WELL INFORMATION:**  Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1) GPS Well Location: Latitude: 32 deg, 32 min, 31.9 sec  
Longitude: 103 deg, 42 min, 39.8 sec, NAD 83

2) Reason(s) for plugging well(s):

Plan relates to proposed geotechnical bores. Holes will be drilled, soils analyzed and holes backfilled immediately with cuttings and bentonite chips.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? UNKN If yes, provide additional detail, including analytical results and/or laboratory report(s): \_\_\_\_\_

5) Static water level: UNKN feet below land surface / feet above land surface (circle one)

6) Depth of the well: 75 feet

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- 7) Inside diameter of innermost casing:  N/A  inches.
- 8) Casing material:  No casing
- 9) The well was constructed with:
  - an open-hole production interval, state the open interval:  N/A
  - a well screen or perforated pipe, state the screened interval(s): \_\_\_\_\_
- 10) What annular interval surrounding the artesian casing of this well is cement-grouted?  N/A
- 11) Was the well built with surface casing?  No  If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? \_\_\_\_\_ If yes, please describe:
- 12) Has all pumping equipment and associated piping been removed from the well?  Not installed  If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

**V. DESCRIPTION OF PLANNED WELL PLUGGING:**  If plugging method differs between multiple wells on same site, a separate form must be completed for each method.

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

- 1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well:  

Bore hole will be immediately backfilled with cuttings and betonite chips
- 2) Will well head be cut-off below land surface after plugging?  No well head

**VI. PLUGGING AND SEALING MATERIALS:**

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.
- 3) Theoretical volume of grout required to plug the well to land surface:  N/A
- 4) Type of Cement proposed:  N/A
- 5) Proposed cement grout mix:  N/A  gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be:  -  batch-mixed and delivered to the site  
 -  mixed on site

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27 JUN '25 PM1:44

7) Grout additives requested, and percent by dry weight relative to cement:

None

8) Additional notes and calculations:

None

**VII. ADDITIONAL INFORMATION:** List additional information below, or on separate sheet(s):

Plan relates to proposed geotechnical bores. Holes will be drilled, cuttings analyzed and holes backfilled immediately.

**VIII. SIGNATURE:**

I, Braden Harris, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

[Signature]  
Signature of Applicant

06-26-2025  
Date

**IX. ACTION OF THE STATE ENGINEER:**

This Well Plugging Plan of Operations is:

- Approved subject to the attached conditions.
- Not approved for the reasons provided on the attached letter.

OSE DII ROSWELL NM  
27 JUN '25 PM 1:44

Witness my hand and official seal this 14<sup>th</sup> day of July, 2025

Elizabeth K. Anderson P.E.

New Mexico State Engineer



By: K. Parekh  
Kashyap Parekh

Water Resources Manager I

WD-08 Well Plugging Plan  
Version: March 07, 2022  
Page 3 of 5

**TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.**

	<b>Interval 1 – deepest</b>	<b>Interval 2</b>	<b>Interval 3 – most shallow</b>
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			
Bottom of proposed interval of grout placement (ft bgl)			
Theoretical volume of grout required per interval (gallons)			
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			
Mixed on-site or batch-mixed and delivered?			
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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27 JUN '25 PM1:44

**TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.**

	<b>Interval 1 – deepest</b>	<b>Interval 2</b>	<b>Interval 3 – most shallow</b>
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			
Bottom of proposed sealant or grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

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# NEW MEXICO OFFICE OF THE STATE ENGINEER



## ATTACHMENT to WD-08 Plan of Plugging MULTIPLE MONITORING WELL DESCRIPTIONS

This Attachment is to be completed if more than one (1) monitoring well is to be plugged using the same method.

Location (Required):									
<input type="checkbox"/> NM State Plane (NAD83) (Feet) <input type="checkbox"/> NM West Zone <input type="checkbox"/> NM Central Zone <input type="checkbox"/> NM East Zone		<input type="checkbox"/> UTM (NAD83) (Meters) <input type="checkbox"/> Zone 13N <input type="checkbox"/> Zone 12N		<input checked="" type="checkbox"/> Lat/Long (WGS84) (1/10 <sup>th</sup> of second)		OTHER (allowable only for move-from descriptions - see application form for format) <input type="checkbox"/> PLSS (quarters, section, township, range) <input type="checkbox"/> Hydrographic Survey, Map & Tract <input type="checkbox"/> Lot, Block & Subdivision <input type="checkbox"/> Grant			
OSE POD Number:	Other Well ID:	X or Longitude (ddmmss):	Y or Latitude (ddmmss):	Other Location Info (PLSS):	Casing ID- (inches):	Depth to Water- (ft bgs):	Total well Depth- (ft bgs):	Grout Volume:	Surface Casing (Y or N):
		323234.8	1034252.6		None	UNKN	25	N/A	N
		323228.7	1034252.1		None	UNKN	25	N/A	N
		323234.8	1034229.7		None	UNKN	25	N/A	N
		323228.6	1034229.5		None	UNKN	25	N/A	N
		323231.9	1034239.8		None	UNKN	75	N/A	N

FOR OSE INTERNAL USE Multiple Monitoring POD Descriptions, Form wr-08m (Rev 7/31/19)

File Number:	Trn Number:
Trans Description (optional):	

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27 JUN '25 PM 1:45



**STATE OF NEW MEXICO  
OFFICE OF THE STATE ENGINEER  
DISTRICT II  
TELEPHONE: (575) 622-6521 FAX: (575) 623-8559**

**ELIZABETH K. ANDERSON, P.E.  
STATE ENGINEER**

**1900 West Second Street  
Roswell, New Mexico 88201**

July 14, 2025

Kenneth Smith Ranch  
267 Smith Ranch Road  
Hobbs, NM 88240

RE: Well Plugging Plan of Operations for well No. CP-2074-POD1 to POD5

Greetings:

Enclosed is your copy of the Well Plugging Plan of Operations for the above referenced well subject to the attached Conditions of Approval. The proposed method of operation is found to be acceptable and in accordance with the Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells 19.27.4 NMAC adopted June 30, 2017 by the State Engineer. subject to the attached Conditions of Approval.

Within 30 days after the well is plugged, the well driller is required to file a complete plugging record with the OSE and the permit holder.

Sincerely,

A handwritten signature in black ink that reads "K. Parekh".

Kashyap Parekh  
Water Resources Manager I



**STATE OF NEW MEXICO**  
**OFFICE OF THE STATE ENGINEER**  
**ROSWELL**  
 1900 West Second St.  
 Roswell, New Mexico 88201  
 Phone: (575) 622-6521  
 Fax: (575) 623- 8559

Applicant has identified wells, listed below, to be plugged. Enviro Drill Inc. (WD-1848) will perform the plugging.

Permittee: Kenneth Smith Ranch  
 NMOSE Permit Number: CP-2074-POD1 to POD5

NMOSE File	Casing diameter (inches)	Well depth (feet bgl)	Approximate static water level (feet bgl)	Latitude	Longitude
CP-2074-POD1	8.0 (Soil Boring)	25.0	Unknown	32° 32' 34.8"	103° 42' 52.6"
CP-2074-POD2	8.0 (Soil Boring)	25.0	Unknown	32° 32' 28.7"	103° 42' 52.1"
CP-2074-POD3	8.0 (Soil Boring)	25.0	Unknown	32° 32' 34.8"	103° 42' 29.7"
CP-2074-POD4	8.0 (Soil Boring)	25.0	Unknown	32° 32' 28.6"	103° 42' 29.5"
CP-2074-POD5	8.0 (Soil Boring)	75.0	Unknown	32° 32' 31.9"	103° 42' 39.8"

**Specific Plugging Conditions of Approval for Well located in Lea County, New Mexico.**

1. Water well drilling and well drilling activities, including well plugging, are regulated under 19.27.4 NMAC, which requires any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the New Mexico Office of the State Engineer (NMOSE). Therefore, the firm of a New Mexico licensed Well Driller shall perform the well plugging.
2. **Dry Hole:** The total Theoretical volume of sealant required for abandonment of soil boring well is approximately 26.10 gallons. Total minimum volume of necessary sealant shall be calculated upon sounding the actual pluggable depth of well, which is estimated at 10 feet.
3. **Dry Hole:** (a) Drill cuttings up to ten feet of land surface. (b) 10 feet to 0 feet – Bentonite Pellets. The bentonite shall be hydrated separately with its required increments of water prior to being mixed into the cement slurry.

4. Placement of the sealant within the wells shall be by tremie pipe extending to near well bottom and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column. The tremie shall be incrementally removed to retain the tremie bottom a limited distance above the top of the rising column of pellets throughout the plugging process.
5. Any open annulus encountered surrounding the casing shall also be sealed by the placement of the approved sealant. When plugging shallow wells with no construction or environmental concerns, and if the well record on a well to be plugged shows a proper 20-foot annular seal, a plugging plan can propose the use of clean fill material to a nominal 30 feet bgs, then placing an OSE approved sealant to surface. Lacking that information, we would require an excavation of at least 2-feet which shall then be filled in its entirety with sealant to surface.
6. Should the NMED, or another regulatory agency sharing jurisdiction of the project authorize, or by regulation require a more stringent well plugging procedure than herein acknowledged, the more-stringent procedure should be followed. This, in part, includes provisions regarding pre-authorization to proceed, contaminant remediation, inspection, pulling/perforating of casing, or prohibition of free discharge of any fluid from the borehole during or related to the plugging process.
7. NMOSE witnessing of the plugging of the soil boring will not be required.
8. Any deviation from this plan must obtain an approved variance from this office prior to implementation.
9. A Well Plugging Record itemizing actual abandonment process and materials used shall be filed with the State Engineer within 30 days after completion of well plugging. For the plugging record, please resurvey coordinate location for well and note coordinate system for GPS unit. Please attach a copy of these plugging conditions.

The NMOSE Well Plugging Plan of Operations is hereby approved with the aforesaid conditions applied.

Witness my hand and seal this 14<sup>th</sup> day of July 2025

Elizabeth K. Anderson, P.E. State Engineer



By: K. Parekh

Kashyap Parekh  
Water Resources Manager I



# WELL PLUGGING PLAN OF OPERATIONS



NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology [geoinfo.nmt.edu/resources/water/cgmn/](http://geoinfo.nmt.edu/resources/water/cgmn/) if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email [nmbg-waterlevels@nmt.edu](mailto:nmbg-waterlevels@nmt.edu), prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

**I. FILING FEE:** There is no filing fee for this form.

**II. GENERAL / WELL OWNERSHIP:**  Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged CP-2070-POD1  
Name of well owner: Kenneth Smith Ranch  
Mailing address: 267 Smith Ranch Road County: \_\_\_\_\_  
City: Hobbs State: NM Zip code: 88240  
Phone number: 575-942-3832 E-mail: jaydeelogan87@yahoo.com

**III. WELL DRILLER INFORMATION:**

Well Driller contracted to provide plugging services: Enviro Drill  
New Mexico Well Driller License No.: 1848 Expiration Date: \_\_\_\_\_

**IV. WELL INFORMATION:**  Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1) GPS Well Location: Latitude: 32 deg, 33 min, 17.4 sec  
Longitude: 103 deg, 42 min, 51.6 sec, NAD 83

2) Reason(s) for plugging well(s):

Plan relates to proposed geotechnical bores. Holes will be drilled, soils analyzed and holes backfilled immediately with cuttings and bentonite chips.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? UNKN If yes, provide additional detail, including analytical results and/or laboratory report(s): \_\_\_\_\_

5) Static water level: UNKN feet below land surface / feet above land surface (circle one)

6) Depth of the well: 75 feet

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27 JUN '25 PM 1:41



7) Grout additives requested, and percent by dry weight relative to cement:

None

8) Additional notes and calculations:

None

**VII. ADDITIONAL INFORMATION:** List additional information below, or on separate sheet(s):

Plan relates to proposed geotechnical bores. Holes will be drilled, cuttings analyzed and holes backfilled immediately.

**VIII. SIGNATURE:**

I, Braden Harris, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

[Signature]  
Signature of Applicant

06-26-2025  
Date

**IX. ACTION OF THE STATE ENGINEER:**

This Well Plugging Plan of Operations is:

- Approved subject to the attached conditions.
- Not approved for the reasons provided on the attached letter.

OSE DII ROSWELL NM  
27 JUN '25 PM1:41

Witness my hand and official seal this 1st day of July, 2025

Elizabeth K. Anderson P.E.  
\_\_\_\_\_, New Mexico State Engineer



By: K. Parekh  
Kashyap Parekh

Water Resources Manager I  
WD-08 Well Plugging Plan  
Version: March 07, 2022  
Page 3 of 5

**TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.**

	<b>Interval 1 – deepest</b>	<b>Interval 2</b>	<b>Interval 3 – most shallow</b>
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			
Bottom of proposed interval of grout placement (ft bgl)			
Theoretical volume of grout required per interval (gallons)			
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			
Mixed on-site or batch-mixed and delivered?			
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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**TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.**

	<b>Interval 1 – deepest</b>	<b>Interval 2</b>	<b>Interval 3 – most shallow</b>
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

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27 JUN '25 PM1:41



**STATE OF NEW MEXICO**  
**OFFICE OF THE STATE ENGINEER**  
**ROSWELL**

**Elizabeth K. Anderson, P.E.**  
State Engineer

**DISTRICT II**  
1900 West Second St.  
Roswell, New Mexico 88201  
Phone: (575) 622-6521  
Fax: (575) 623-8559

July 1, 2025

Kenneth Simth Ranch  
267 Smith Ranch Road  
Hobbs, NM 88240

RE: Well Plugging Plan of Operations for well no. CP-2070-POD1

Greetings:

Enclosed is your copy of the Well Plugging Plan of Operations for the above referenced well subject to the attached Conditions of Approval. The proposed method of operation is found to be acceptable and in accordance with the Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells 19.27.4 NMAC adopted June 30, 2017 by the State Engineer. subject to the attached Conditions of Approval.

Within 30 days after the well is plugged, the well driller is required to file a complete plugging record with the OSE and the permit holder.

Sincerely,

A handwritten signature in black ink that reads "K. Parekh".

Kashyap Parekh  
Water Resources Manager I



**STATE OF NEW MEXICO**  
**OFFICE OF THE STATE ENGINEER**  
**ROSWELL**

1900 West Second St.  
 Roswell, New Mexico 88201  
 Phone: (575) 622-6521  
 Fax: (575) 623- 8559

Applicant has identified wells, listed below, to be plugged. Enviro Drill (WD-1848) will perform the plugging.

Permittee: Kenneth Smith Ranch  
 NMOSE Permit Number: CP-2070-POD1

NMOSE File	Casing diameter (inches)	Well depth (feet bgl)	Approximate static water level (feet bgl)	Latitude	Longitude
CP-2070-POD1	2.0 inch (Soil Boring)	75.0	Unknown	32° 33' 17.4"	103° 42' 51.6"

**Specific Plugging Conditions of Approval for Well located in Lea County, New Mexico.**

1. Water well drilling and well drilling activities, including well plugging, are regulated under 19.27.4 NMAC, which requires any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the New Mexico Office of the State Engineer (NMOSE). Therefore, the firm of a New Mexico licensed Well Driller shall perform the well plugging.
2. Theoretical volume of sealant required for abandonment of the 2.0 inch borehole is approximately 12.23 gallons. Total minimum volume of necessary sealant shall be calculated upon sounding the actual pluggable depth of well, which is estimated at 75.0 feet below ground surface (b.g.s.).
3. Native Fill is the approved sealant from 75 feet b.g.s. to 10 feet b.g.s. Bentonite chips (Baroid Quick Grout/Baroid Hole Plug) is the approved sealant from 10 b.g.s. to ground level. When bentonite chips are added above static water level, a minimum of 5-gallons of fresh water shall be added to the borehole per 50-lb of bentonite chips.
4. Placement of the sealant within the wells shall be by tremie pipe extending to near well bottom and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column. The tremie shall be incrementally removed to retain the tremie bottom a limited distance above the top of the rising column of chips throughout the plugging process.

5. Any open annulus encountered surrounding the casing shall also be sealed by the placement of the approved sealant. When plugging shallow wells with no construction or environmental concerns, and if the well record on a well to be plugged shows a proper 20-foot annular seal, a plugging plan can propose the use of clean fill material to a nominal 30 feet bgs, then placing an OSE approved sealant to surface. Lacking that information, we would require an excavation of at least 2-feet which shall then be filled in its entirety with sealant to surface.
6. Should the NMED, or another regulatory agency sharing jurisdiction of the project authorize, or by regulation require a more stringent well plugging procedure than herein acknowledged, the more-stringent procedure should be followed. This, in part, includes provisions regarding pre-authorization to proceed, contaminant remediation, inspection, pulling/perforating of casing, or prohibition of free discharge of any fluid from the borehole during or related to the plugging process.
7. NMOSE witnessing of the plugging of the non-artesian well will not be required.
8. Any deviation from this plan must obtain an approved variance from this office prior to implementation.
9. A Well Plugging Record itemizing actual abandonment process and materials used shall be filed with the State Engineer within 30 days after completion of well plugging. For the plugging record, please resurvey coordinate location for well and note coordinate system for GPS unit. Please attach a copy of these plugging conditions.

The NMOSE Well Plugging Plan of Operations is hereby approved with the aforesaid conditions applied.

Witness my hand and seal this 1<sup>st</sup> day of July 2025

Elizabeth K. Anderson, P.E. State Engineer

By: K. Parekh

Kashyap Parekh  
Water Resources Manager I



| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

## Cave & Karst Survey Report Medium Karst



Corporate Headquarters | 952 Echo Lane, Ste 130 | Houston, TX 77024  
Midland Headquarters | 3403-B E. County Road 44 | Midland, TX 79705

## Cave and Karst Survey Report

**Project:** Devon Energy, Lost Tanks West & Lost Tanks East  
Section 30, Township 20S, Range 33E, S1/2 NW Quarter  
32.54578, -103.70853  
Lea County, NM

**To:** Bobbi Jo Crain  
Cascade Services  
3403-B E. County Road 44  
Midland, TX 79705  
Phone: 210-632-8670 (Mobile)  
Email: [bobbijo@cascadeservicesllc.com](mailto:bobbijo@cascadeservicesllc.com)

**Prepared by:** Richard A. Bridges                      George R. Jennings III  
subTerra Consulting                      Cascade Services, LLC  
[caver1\\_2001@yahoo.com](mailto:caver1_2001@yahoo.com)                      [gjennings@cascadeservicesllc.com](mailto:gjennings@cascadeservicesllc.com)  
C: 575-361-1272                      C: 575-618-2103

**Date:** March 30<sup>th</sup>, 2026

### Cave and Karst Survey Method:

The area of interest (AOI) for the Aerial Cave and Karst Survey (CKS) for this report is the proposed Devon Energy, Lost Tanks West and Lost Tanks East project located in the South Half of the Northwest Corner of Section 30, Township 20S, Range 33E in Lea County, New Mexico. The area to be checked includes a 200 meter buffer around the project and was furnished by George Jennings of Cascade Services, LLC as a KMZ file on March 10<sup>th</sup>, 2026. The approximate center of the project is located at 32.54578, -103.70853.

The Lost Tanks project consists of two adjacent ponds, the Lost Tanks West (BLUE outline), and Lost Tanks East (GREEN outline) and their associated pads. The general location relative to the CFO Karst Potential Zones is found on Plate 1. The proposed layout of the ponds and pads can be seen on Plate 2.

Both ponds are located in the BLM Carlsbad Filed Office designated “Medium Karst Potential” area. The BLM does not require CKS’s in “Medium Karst Potential” areas. The

subTerra Consulting  
1055 N, 750 W  
Monroe, UT 84754

[caver1\\_2001@yahoo.com](mailto:caver1_2001@yahoo.com)  
C: 575-361-1272  
P: 575-361-8636



Corporate Headquarters | 952 Echo Lane, Ste 130 | Houston, TX 77024  
Midland Headquarters | 3403-B E. County Road 44 | Midland, TX 79705

OCD's updated guidelines found in the *Karst Potential Occurrence Zones* notice effective December 1, 2024 requires a CKS to be submitted with all C-147's located in "Medium", "High", or "Critical" BLM mapped Karst Potential areas. In "Medium Karst Potential" areas, the CKS is required to begin with an aerial survey. In "Critical" and "High" karst potential occurrence zones, geophysical surveys must be submitted to the OCD to verify the presence or absence of hypogene karst features.

A drone aerial survey (including photography) was conducted by Square Root Services who employed licensed FAA pilots and licensed surveyors to conduct the survey. Resolution on the resulting orthomosaic photo is around 1-2 inches. Gopher and prairie dog burrows are easily observable.

Following guidance from the "Carlsbad Field Office Survey Standard Protocol for Karst Resources" issued on December 1<sup>st</sup>, 2025, for pedestrian surveys in "High" and "Critical" karst potential areas, an area of 200 meters around the AOI was surveyed aurally (RED outline on Plate 2). 25 meter corridors were mapped across the project to aid in systematically examining the aerial orthomosaic (Plate 2). The total area investigated via aerial survey is 147 acres, over six times the ~24 acre surface disturbance of the ponds and pads. The aerial CKS was conducted by Mr. Bridges and Mr. Jennings via Microsoft Teams meeting on March 16<sup>th</sup>, 2026. Surface expressions of cave and karst features (sinkholes, swallets and cave entrances) were searched for, but in no way was anything analyzed in the sub-surface.

Additionally, on March 20<sup>th</sup>, 2026 a field investigation was undertaken by Mr. Jennings to ensure that the field conditions matched the observations and interpretations from the aerial survey. Field routes were recorded using GPS and are recorded as cyan colored dashed lines (Plate 2). Over 3.4 miles of survey tracks were recorded during the field QC of the aerial survey. Geotagged photos were taken as indicated by the camera icons on the maps. Only selected relevant field photos are included in this report. Surface expressions of cave and karst features (sinkholes, swallets and cave entrances) were searched for, but in no way was anything analyzed in the sub-surface.



Corporate Headquarters | 952 Echo Lane, Ste 130 | Houston, TX 77024  
 Midland Headquarters | 3403-B E. County Road 44 | Midland, TX 79705

## Location of the Cerberus LLC, Vast Pond Re-permitting Project – Karst Survey Area:

The RED 200m buffer, DARK BLUE 25m corridors, facility locations, and the following survey coordinates in NO WAY should be interpreted as having been derived from a civil survey of the premises nor to represent exact locations. They are for estimating the general location of the proposed facilities, geographic locations, and area covered in this CKS.

### Survey Coordinates:

Devon Energy, Lost Tanks West and Lost Tanks East, Section 30, Township 20S, Range 33E, S1/2 NW Quarter, Lea County, NM

Company	Project	Description	Latitude	Longitude
Devon Energy	Lost Tanks	CKS Area: Center of North Side	32.54922	-103.70853
Devon Energy	Lost Tanks	CKS Area: Center of East Side	32.54576	-103.70392
Devon Energy	Lost Tanks	CKS Area: Center of South Side	32.54258	-103.70846
Devon Energy	Lost Tanks	CKS Area: Center of West Side	32.54578	-103.71333

### Findings:

After extensive searching and careful observation, **NO Surface Karst Features** (i.e. sinkholes, swallets or cave entrances) were found within the limits of the AOI in either the Aerial Survey conducted on March 16<sup>th</sup>, 2026 or in the field investigation conducted on March 20<sup>th</sup>, 2026.

Plate 3 shows the location of an abandoned well with an associated abandoned pit that was identified during the aerial survey, and subsequently confirmed with a field visit. The typical terrain within the area covered by this CKS is shown in Plates 4-6.

subTerra Consulting  
 1055 N, 750 W  
 Monroe, UT 84754

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 C: 575-361-1272  
 P: 575-361-8636



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Midland Headquarters | 3403-B E. County Road 44 | Midland, TX 79705

## Conclusions and Recommendations:

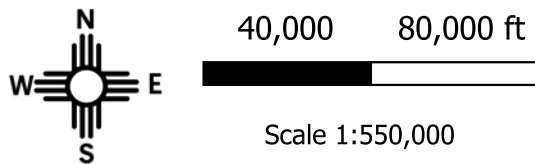
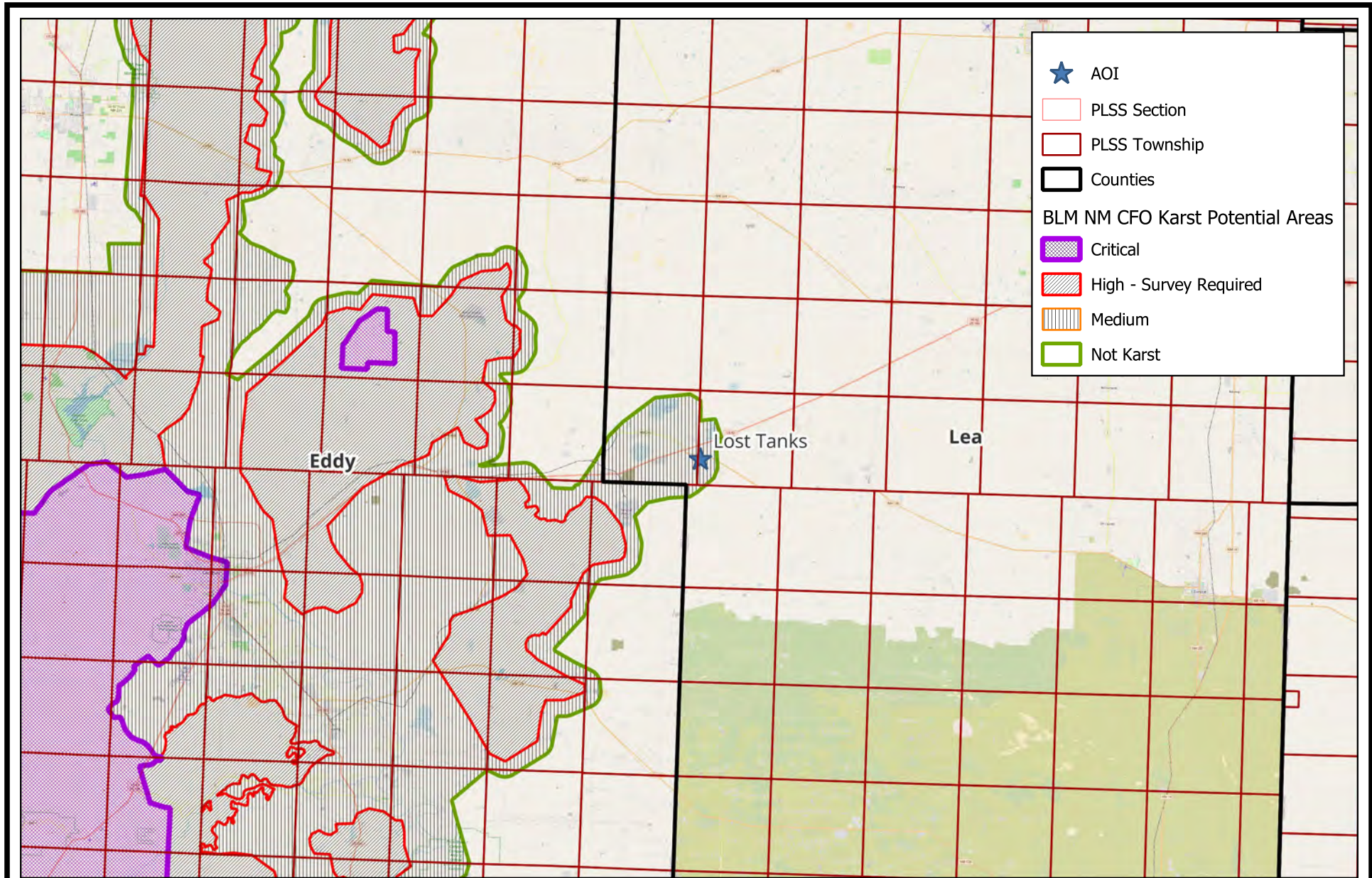
The following recommendations are needed for this CKS area:

Karst features exist in the general area of this CKS, as the BLM High Karst Area is approximately 6.3 miles SW from the Project area (Plate 1). Since karst features are within the vicinity of this project, caution and due diligence should be exercised when working in the area.

**This CKS in NO way has investigated anything in the subsurface. Karst features exist in the general area of this CKS and we cannot predict what may lie below the surface.**

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Monroe, UT 84754

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**CASCADE**  
SERVICES

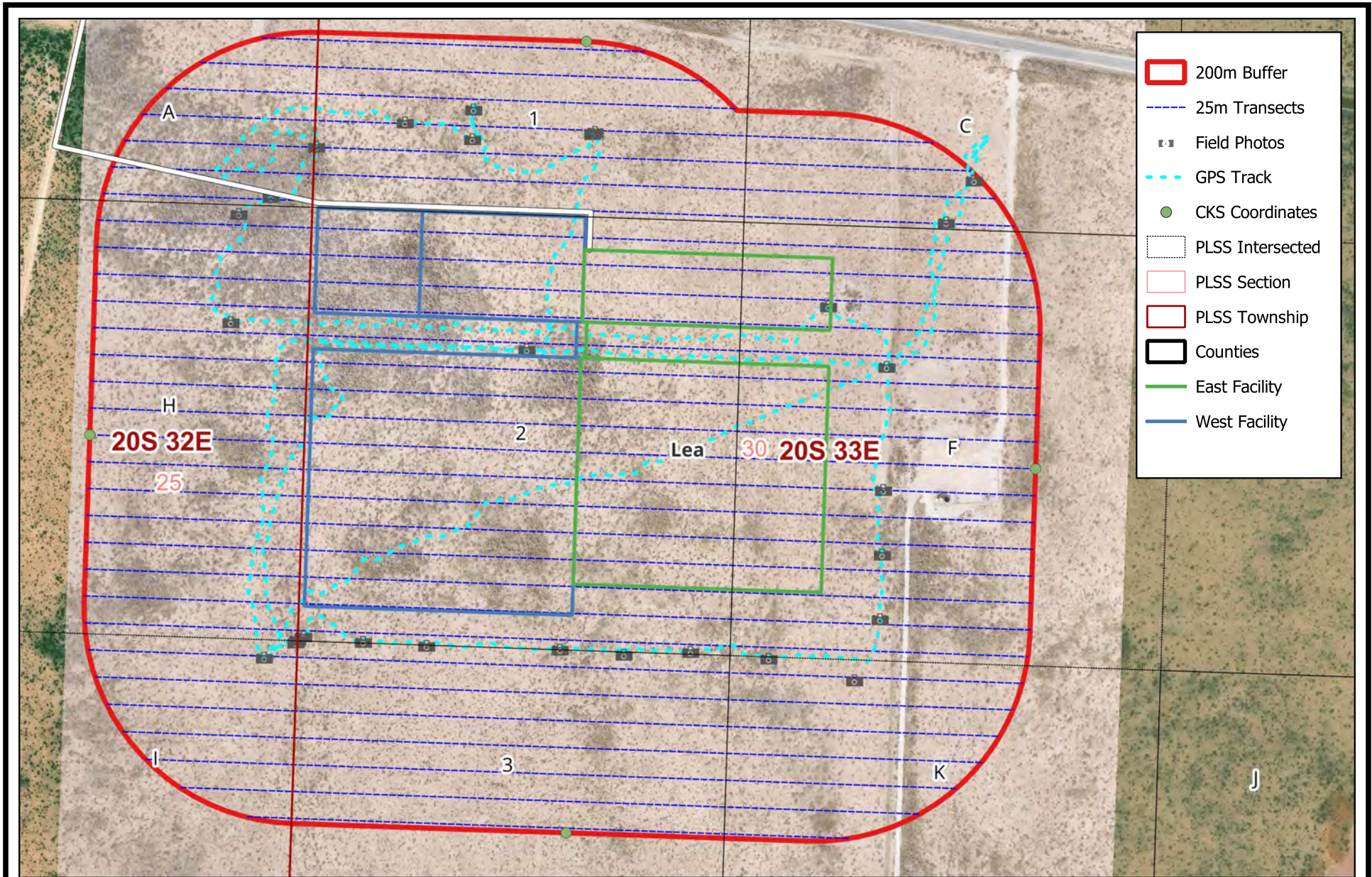
**subTerra Consulting**

Location Map

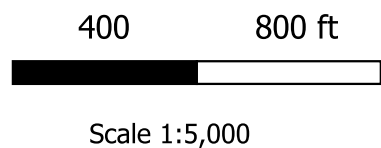
Devon Energy  
Lost Tanks West and Lost Tanks East

Plate 1

April 2026



- 200m Buffer
- 25m Transects
- Field Photos
- GPS Track
- CKS Coordinates
- PLSS Intersected
- PLSS Section
- PLSS Township
- Counties
- East Facility
- West Facility



**CASCADE**  
SERVICES

**subTerra Consulting**

Cave and Karst Survey (CKS) AOI

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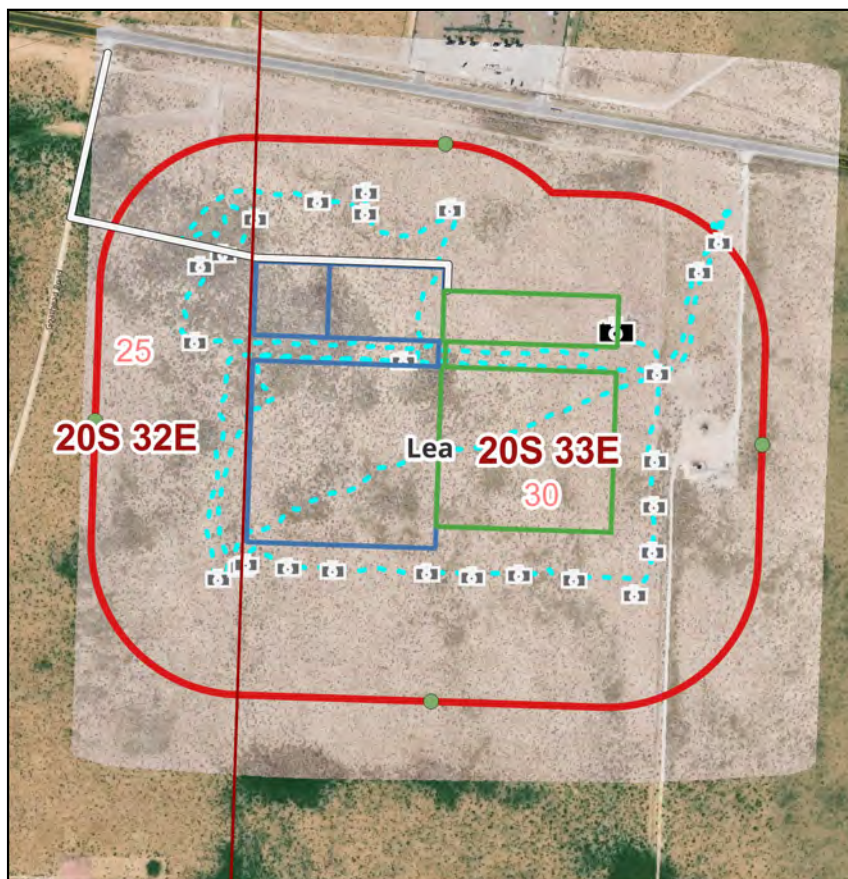
Devon Energy  
Lost Tanks West and Lost Tanks East

Plate 2

---

April 2026

Basemap: © OpenStreetMap contributors  
Satellite Photos: ESRI Satellite



- 200m Buffer
- PLSS Intersected
- East Facility
- Photo Location
- PLSS Section
- West Facility
- GPS Track
- PLSS Township
- CKS Coordinates
- Counties



Scale 1:10,000



**subTerra Consulting**

Looking east at an abandoned well next to an old mud pit with raised berm in background. This pit is NOT a karst feature.

Plate 3

Devon Energy  
Lost Tanks West and Lost Tanks East


April 2026

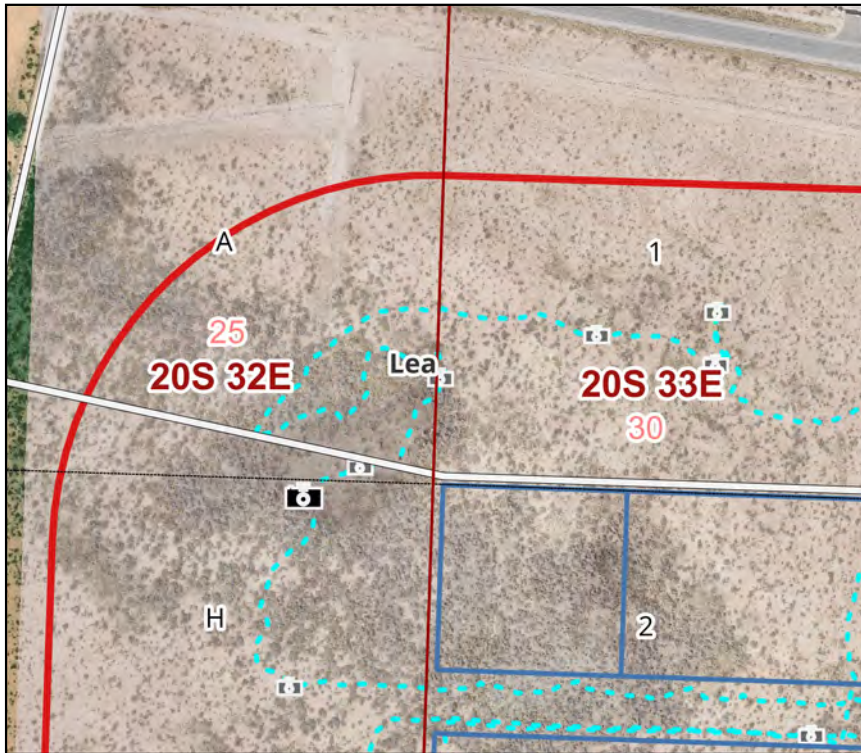


- 200m Buffer
- GPS Track
- Counties
- Field Photos
- CKS Coordinates
- East Facility
- 📷 Photo Location
- PLSS Intersected
- West Facility
- 📷 Other Photos
- PLSS Section
- PLSS Township



Scale 1:75


 <b>subTerra Consulting</b>	Burrows observed in high resolution orthomosaic aerial survey.	Plate 4
	Devon Energy Lost Tanks West and Lost Tanks East	April 2026

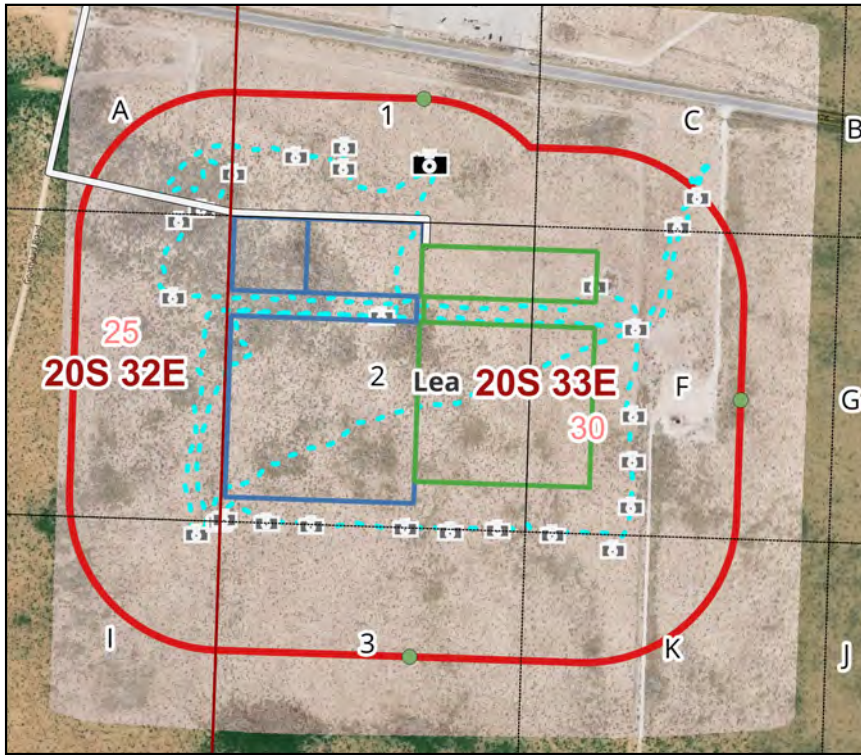


- 200m Buffer
- PLSS Intersected
- East Facility
- Photo Location
- PLSS Section
- West Facility
- GPS Track
- PLSS Township
- CKS Coordinates
- Counties



Scale 1:4,000

 <b>subTerra Consulting</b>	Grassy area typical of the darker, more vegetated areas on the satellite photos. No associated depression.	Plate 5
	Devon Energy Lost Tanks West and Lost Tanks East	April 2026



- 200m Buffer
- PLSS Intersected
- East Facility
- Photo Location
- PLSS Section
- West Facility
- GPS Track
- PLSS Township
- Counties
- CKS Coordinates



Scale 1:10,000



**subTerra Consulting**

Typical terrain of the AOI

Plate 6

Devon Energy  
Lost Tanks West and Lost Tanks East

April 2026

**Venegas, Victoria, EMNRD**

---

**From:** Venegas, Victoria, EMNRD  
**Sent:** Friday, May 29, 2026 1:17 PM  
**To:** Bruening, Josh; Bobbi Jo Crain; gjennings@CascadeServicesLLC.com  
**Subject:** FVV2614937814 LOST TANKS EAST  
**Attachments:** C-147 FVV2614937814 LOST TANKS EAST 05.29.2026.pdf

**FVV2614937814 LOST TANKS EAST**

Good afternoon Mr. Bruening.

The NMOCD has reviewed the recycling containment permit application and related documents, submitted by [6137] DEVON ENERGY PRODUCTION COMPANY, LP on 05/16/2026, Application ID **585729**, for FVV2614937814 LOST TANKS EAST in L-30-20S-33E, Lea County, New Mexico.

The form C-147 and related documents for FVV2614937814 LOST TANKS EAST are approved with the following conditions of approval:

- The purpose of this permit is for oil and gas activities regulated under the NMAC 19.15.34.3 STATUTORY AUTHORITY: 19.15.34 NMAC is adopted pursuant to the Oil and Gas Act, Paragraph (15) of Section 70-2-12(B) NMSA 1978, which authorizes the division to regulate the disposition of water produced or used in connection with the drilling for or producing of oil and gas or both and Paragraph (21) of Section 70-2-12(B) NMSA 1978 which authorizes the regulation of the disposition of nondomestic wastes from the exploration, development, production or storage of crude oil or natural gas.
- FVV2614937814 LOST TANKS EAST is approved for five years of operation from the date of permit application of 05/16/2026. FVV2614937814 LOST TANKS EAST permit expires on 05/16/2031. If [6137] DEVON ENERGY PRODUCTION COMPANY, LP wishes to extend operations past five years, an annual extension request must be submitted using Form C-147 Long through OCD Permitting by 04/16/2031.
- FVV2614937814 LOST TANKS EAST consists of one (1) earthen containment with a capacity of 607,935 barrels. The total closure cost estimated of permit FVV2614937814 LOST TANKS EAST in the amount of \$339,725.60, meets the requirements of NMAC 19.15.34.15.A. The financial assurance should be mailed to: EMNRD - Oil Conservation Division, Administration & Compliance Bureau Attn: Bond Administrator 1220 S. St. Francis Drive| Santa Fe, NM 87505.
- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall construct, operate, maintain, close, and reclaim FVV2614937814 LOST TANKS EAST in compliance with NMAC 19.15.34.
- **KARST Best Practices:**
  - ❖ No surface karst features are located within the survey area. [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall have a BLM-CFO approved karst monitor on site to assess any karst features encountered during brush clearing and grading or during the construction of the FVV2614937814 LOST TANKS EAST. If voids are encountered during excavation, the operator must contact the Bureau of Land Management's Karst Division at (575) 234-5972 or a BLM-CFO-approved karst contractor and request an on-site investigation by a karst expert. The operator must also notify NMOCD through OCD Permitting.
- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall notify OCD, through OCD Permitting, when construction of FVV2614937814 LOST TANKS EAST commences.

- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall notify NMOCD through OCD Permitting when recycling operations commence and cease at FVV2614937814 LOST TANKS EAST.
- A minimum of 3-feet freeboard must be maintained at FVV2614937814 LOST TANKS EAST at all times during operations.
- If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdrawal, operations of the FVV2614937814 LOST TANKS EAST are considered ceased and a notification of cessation of operations should be sent electronically to OCD Permitting. A request to extend the cessation of operations, not to exceed six months, may be submitted using a C-147 form to OCD Permitting. If after that 6-month extension period, the FVV2614937814 LOST TANKS EAST is not utilized at a minimum of 20% fluid capacity, no additional extensions would be granted, and the operator would be directed to remove all fluids and proceed with the closure requirements.
- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall submit monthly reports of recycling and reuse of produced water, drilling fluids, and liquid oil field waste via OCD Permitting even if there is zero activity.
- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the logs available for review by the division upon request according to 19.15.34.13.A.
- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field waste at FVV2614937814 LOST TANKS EAST.

Please reference number FVV2614937814 LOST TANKS EAST in all future communications.

Best regards,

**Victoria Venegas** • Senior Environmental Scientist  
EMNRD - Oil Conservation Division  
506 W. Texas Ave. Artesia, NM 88210  
575.909.0269 | [Victoria.Venegas@emnrd.nm.gov](mailto:Victoria.Venegas@emnrd.nm.gov)

Sante Fe Main Office  
Phone: (505) 476-3441

General Information  
Phone: (505) 629-6116

Online Phone Directory  
<https://www.emnrd.nm.gov/ocd/contact-us>

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

CONDITIONS

Action 585729

**CONDITIONS**

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 585729
	Action Type: [C-147] Water Recycle Long (C-147L)

**CONDITIONS**

Created By	Condition	Condition Date
vvenegas	FVV2614937814 LOST TANKS EAST permit expires on 05/16/2031. If [6137] DEVON ENERGY PRODUCTION COMPANY, LP wishes to extend operations past five years, an annual extension request must be submitted using Form C-147 Long through OCD Permitting by 04/16/2031. • [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall construct, operate, maintain, close, and reclaim FVV2614937814 LOST TANKS EAST in compliance with NMAC 19.15.34. • [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field waste at FVV2614937814 LOST TANKS EAST.	5/29/2026