



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

## Rule 34 Registration

May 2026

## Lost Tanks West & Lost Tanks West AST

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: [X] 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 West & Lost Tanks West AST
OCD Permit Number: FVV2614849880 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr Gov. Lot 2 Section 30 Township 20S 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 32.54721 Longitude -103.70892 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 32.54544 Longitude -103.70988 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 AST: 40mil LLDPE (p), 30mill LLDPE (s)
[ ] String-Reinforced AST: 40k bbls (no freeboard)
Liner Seams: [X] Welded [ ] Factory [ ] Other Volume: 806,956 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 \$ 462,821.60 (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.**

See Volume 3 for variance requests previously approved by OCD regarding ASTs

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><u>General siting</u></b>	
<b><u>Ground water is less than 50 feet below the bottom of the Recycling Containment.</u></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.*

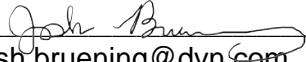
- Design Plan - based upon the appropriate requirements.
- Operating and Maintenance Plan - based upon the appropriate requirements.
- Closure Plan - based upon the appropriate requirements.
- Site Specific Groundwater Data -
- Siting Criteria Compliance Demonstrations -
- Certify that notice of the 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: 05/28/2026

Title: Senior Environmental Scientist OCD Permit Number: FVV2614849880

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 West In-Ground Containment & Lost Tanks West AST Financial Assurance Cost Estimate**

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

**Lost Tanks West In-Ground Containment & Lost Tanks West AST**

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. Additional sampling for the AST location is estimated to be \$2,500. The cost estimates are presented below.

In-ground Containment Closure Costs as Required by Rule 34	\$436,821.60
In-ground Containment Preparation of Sampling Results and Closure Report	\$7,500.00
AST Closure Costs Removal of Liner and Disposal	\$16,000.00
AST Closure Sampling	2,500.00
<b>Total Closure Cost:</b>	<b>\$462,821.60</b>

**Cascade Services, LLC**

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



**Estimate**

ADDRESS  
Devon Energy Production Company, L.P.  
333 West Sheridan Ave  
Oklahoma City, OK 731025015

SHIP TO  
Devon Energy Production Company, L.P.  
333 West Sheridan Ave  
Oklahoma City, OK 731025015

ESTIMATE 2383  
DATE 05/11/2026

CUSTOMER PROJECT NAME  
Lost Tank West Closure

PROJECT LOCATION COORDINATES  
32.5456900013, -103.709949999

DESCRIPTION	QTY	UNIT	RATE	AMOUNT
This is pricing a package to reclaim the single 805,272bbl produced water pond. (West 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.	77,200		2.00	154,400.00
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	1,718,244	0.15	257,736.60

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

SUBTOTAL	436,821.60
TAX	0.00

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

TOTAL	<b>\$436,821.60</b>
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\*\*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

Accepted By

Accepted Date



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

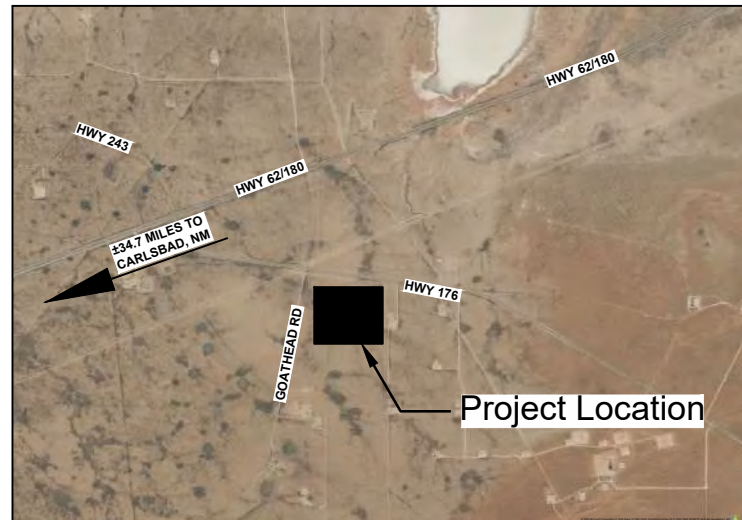
## Recycling Containment Design Drawings

# CIVIL PLANS

## DEVON

# LOST TANKS - WEST RECYCLE CONTAINMENT

SECTION 30, TOWNSHIP 20 SOUTH, RANGE 33 EAST  
N.M.P.M., LEA COUNTY, NEW MEXICO  
N032° 32' 43.74", W103° 42' 36.30"



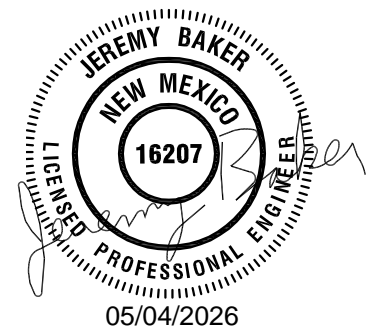
VICINITY MAP  
N.T.S.

INDEX OF SHEETS		
SHEET	NAME	DESCRIPTION
1	C-100	COVER SHEET
2	CS-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	WEST POND GRADING PLAN
8	CG-105	EAST AND PAD GRADING PLAN
9	CS-106	FENCE LAYOUT
10	CS-107	WEST CONTAINMENT WEST TO EAST P&P
11	CS-108	WEST CONTAINMENT NORTH TO SOUTH P&P
12	CS-109	NORTH CONTAINMENT WEST TO EAST P&P
13	CS-110	NORTH CONTAINMENT NORTH TO SOUTH P&P
14	CS-111	VOLUME QUANTITIES
15	CS-501	LEAK DETECTION DETAILS
16	CS-502	LINER DETAILS
17	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.

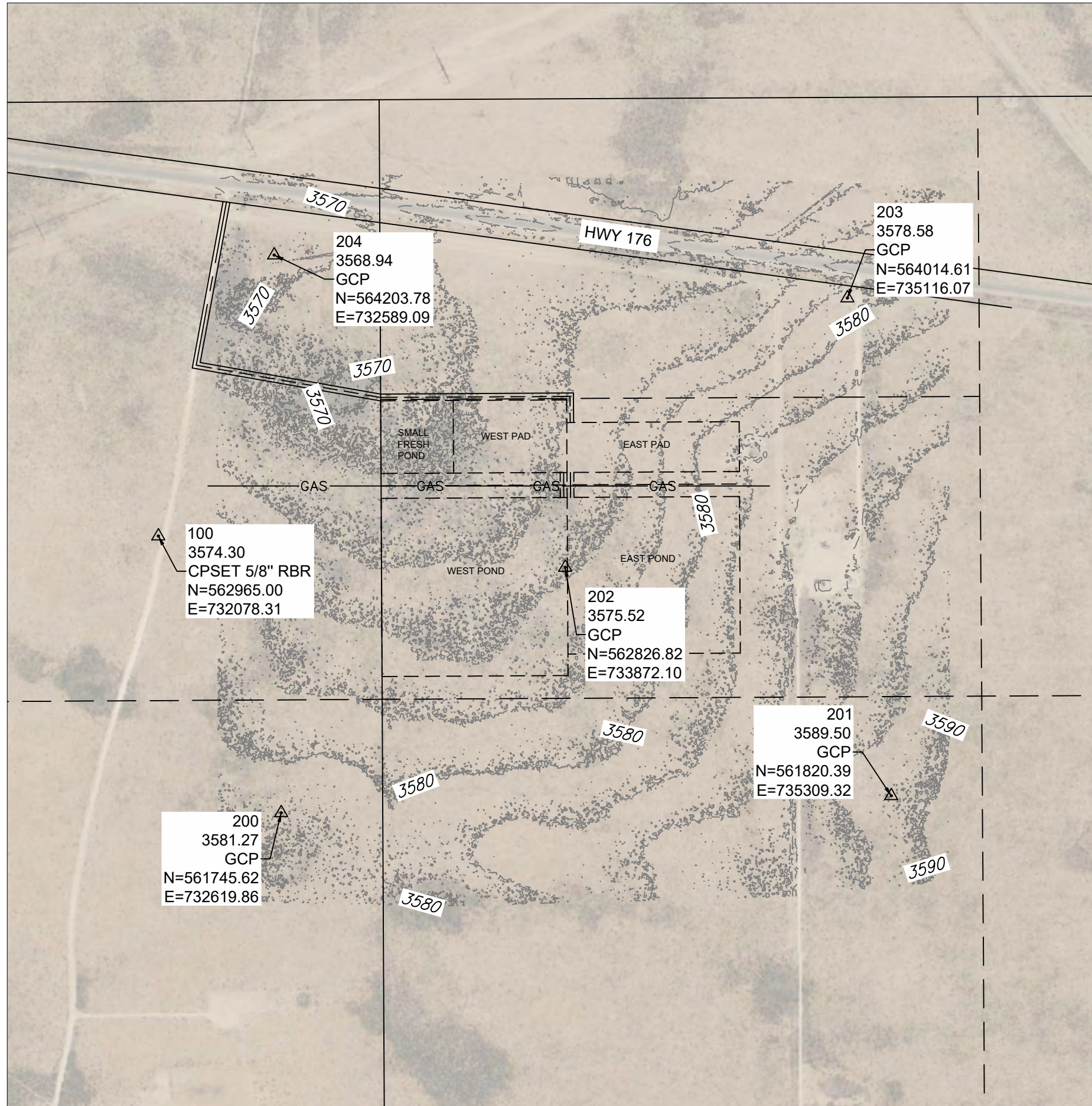


05/04/2026

# 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**

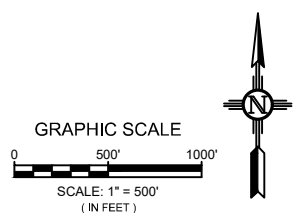
FOR

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 17  
**SU - 101**

Received by OCD: 5/16/2026 12:22:04 PM

Released to Imaging: 5/28/2026 4:17:14 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.



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ENGINEERING SHEET:

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

PROJECT NUMBER:  
26054

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

REVISIONS	
No.	DESCRIPTION

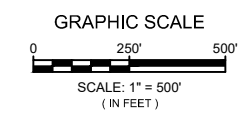


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SHEET:  
3 of 17  
C-101

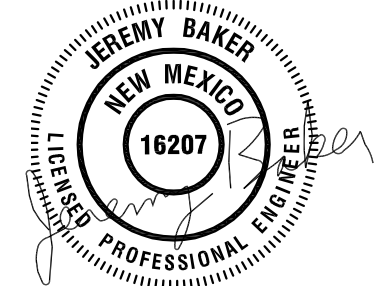
ENGINEERING  
SHEET:  
**EXISTING SITE  
FEATURES  
OF**  
PROJECT NAME:  
**LOST TANKS - WEST  
RECYCLE CONTAINMENT**  
FOR  
CLIENT:  
**DEVON**

PROJECT NUMBER:  
**26054**

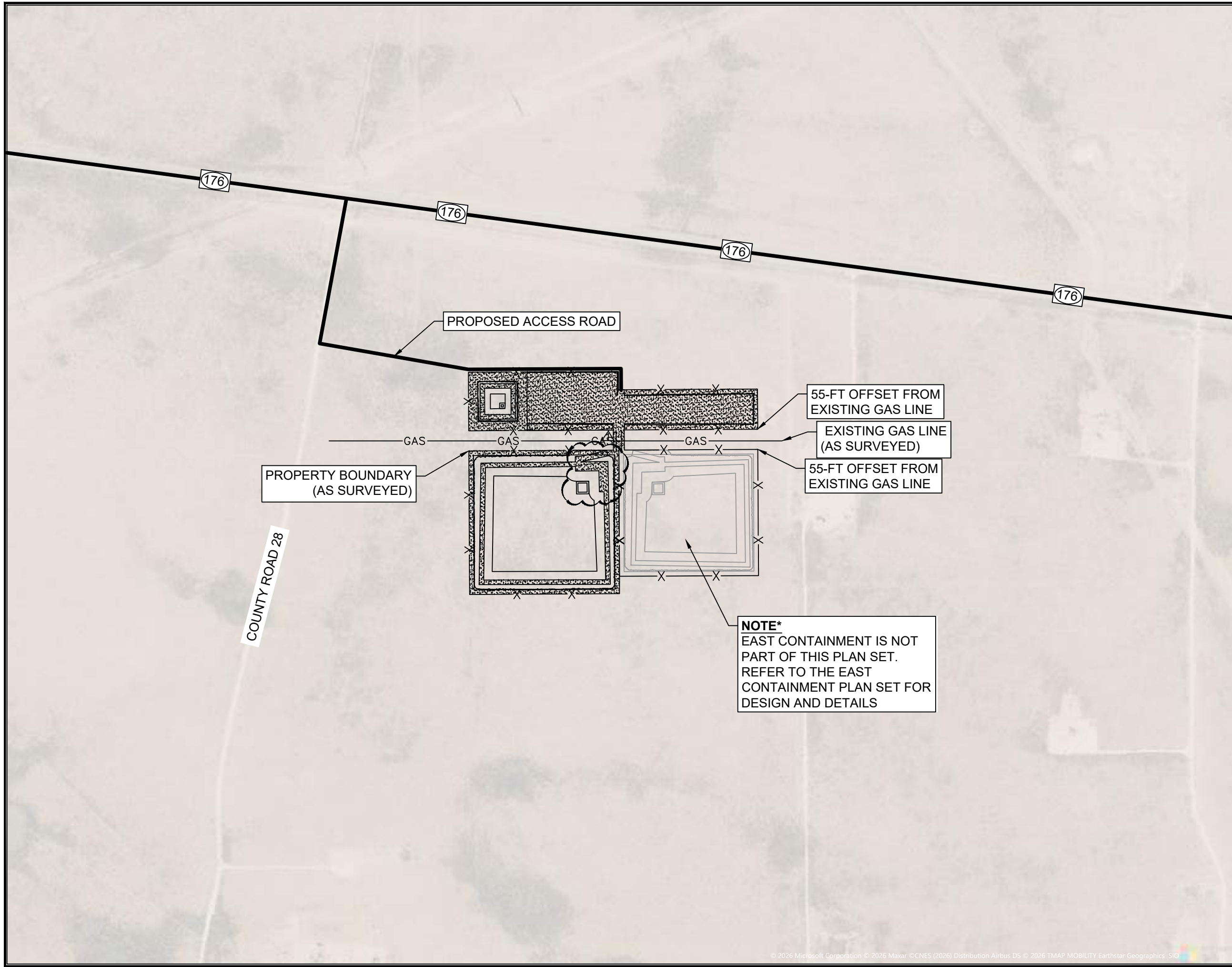
PROJECT ENGINEER:  
**JEREMY BAKER, PE**  
DRAWN BY:  
**C. JIMENEZ**



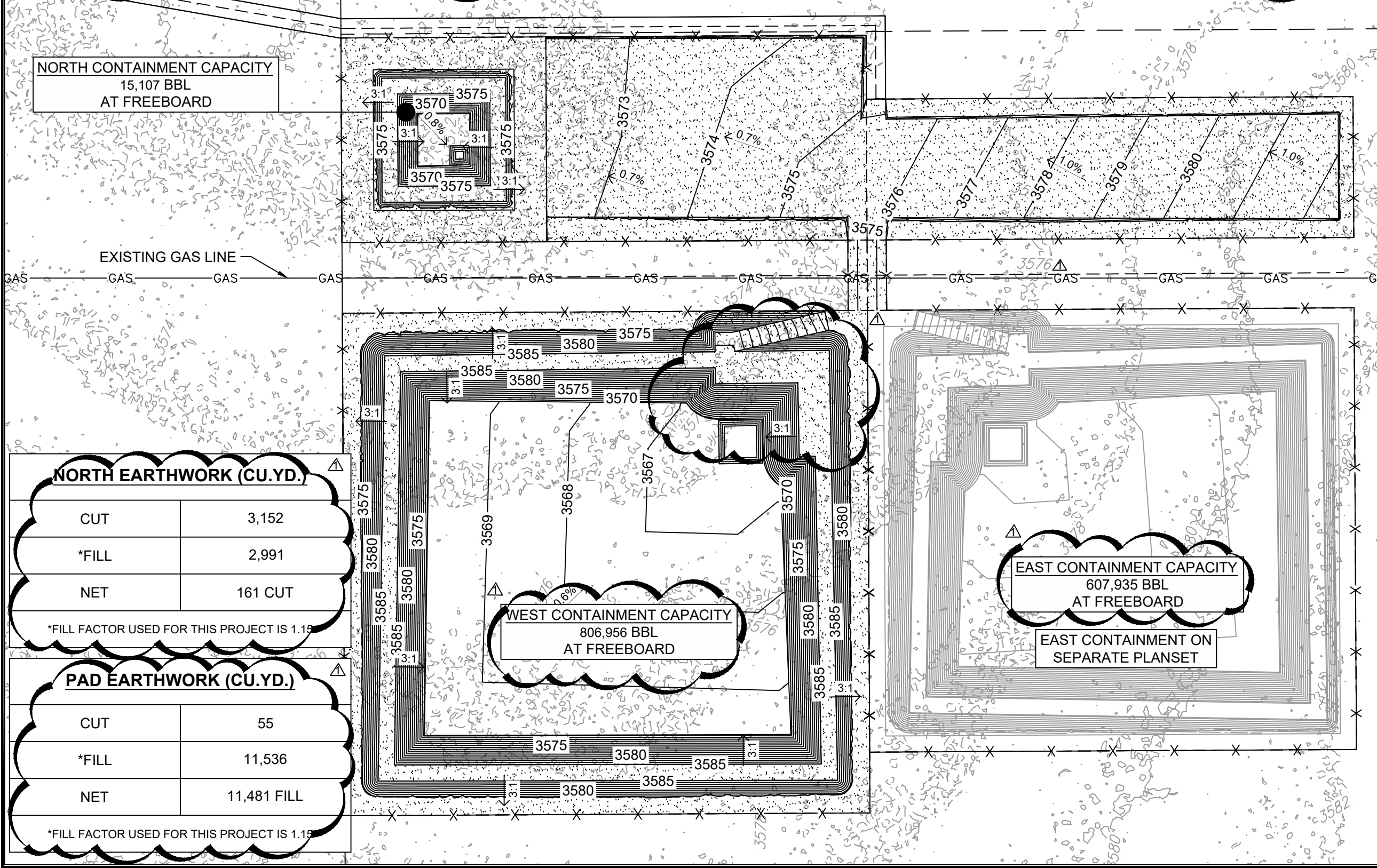
REVISIONS		
No.	DATE	DESCRIPTION
1	5/14/26	RAMPS ADDED



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SHEET:  
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CS-101



OVERALL EARTHWORK (CU.YD.)		WEST EARTHWORK (CU.YD.)		OVERALL VOLUME QUANTITIES (BBL.)		OVERALL LINER QUANTITIES (SQFT)	
CUT	139,146	CUT	76,458	NORTH	15,107	NORTH	25,779
*FILL	138,716	*FILL	66,564	WEST	806,956	WEST	422,863
NET	430 CUT	NET	9,894 CUT	EAST	607,935	EAST	323,995
*FILL FACTOR USED FOR THIS PROJECT IS 1.1		*FILL FACTOR USED FOR THIS PROJECT IS 1.15		TOTAL	1,429,998	TOTAL	772,637

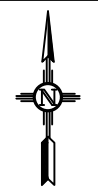
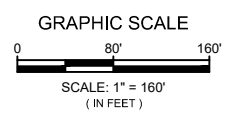


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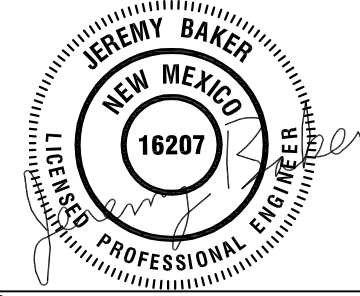
ENGINEERING SHEET:  
CIVIL SITE PLAN  
OF  
PROJECT NAME:  
LOST TANKS - WEST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

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



REVISIONS		
No.	DATE	DESCRIPTION
1	05/14/26	RAMPS ADDED



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CS-102



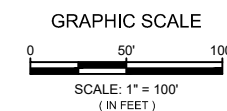


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ENGINEERING SHEET:  
**WEST POND GRADING PLAN OF LOST TANKS - WEST RECYCLE CONTAINMENT FOR DEVON**

PROJECT NUMBER:  
26054

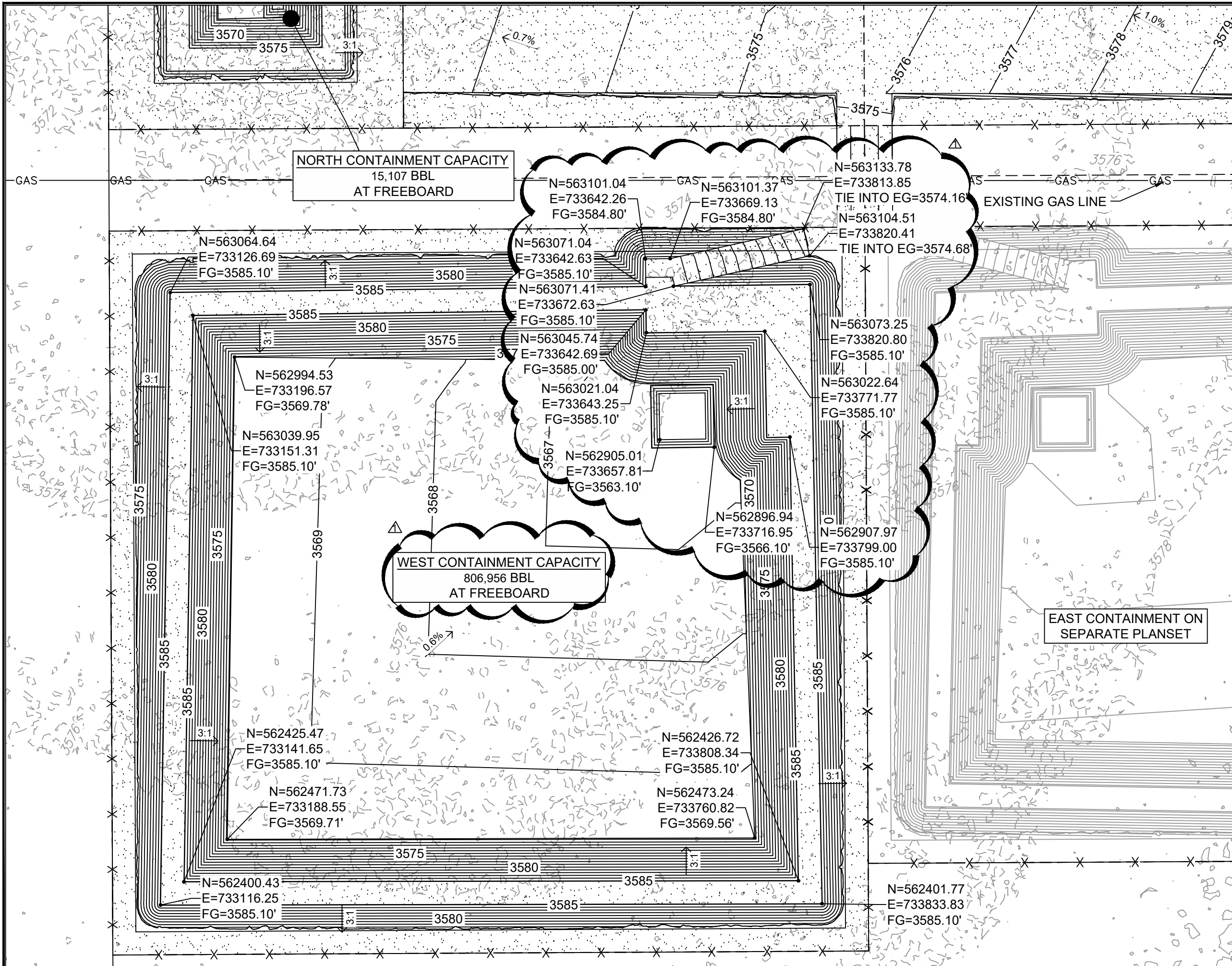
PROJECT ENGINEER:  
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DRAWN BY:  
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REVISIONS		
No.	DATE	DESCRIPTION
1	05/14/26	RAMPS ADDED



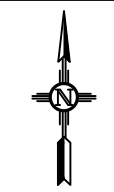
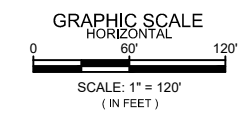
05/14/2026  
SHEET:  
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CS-104



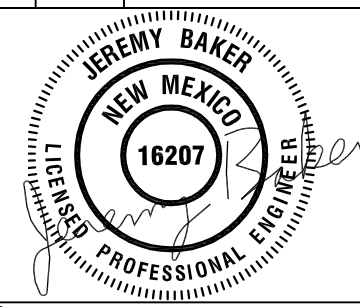
ENGINEERING  
SHEET:  
NORTH CONTAINMENT  
AND PAD GRADING PLAN  
OF  
PROJECT NAME:  
LOST TANKS - WEST  
RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

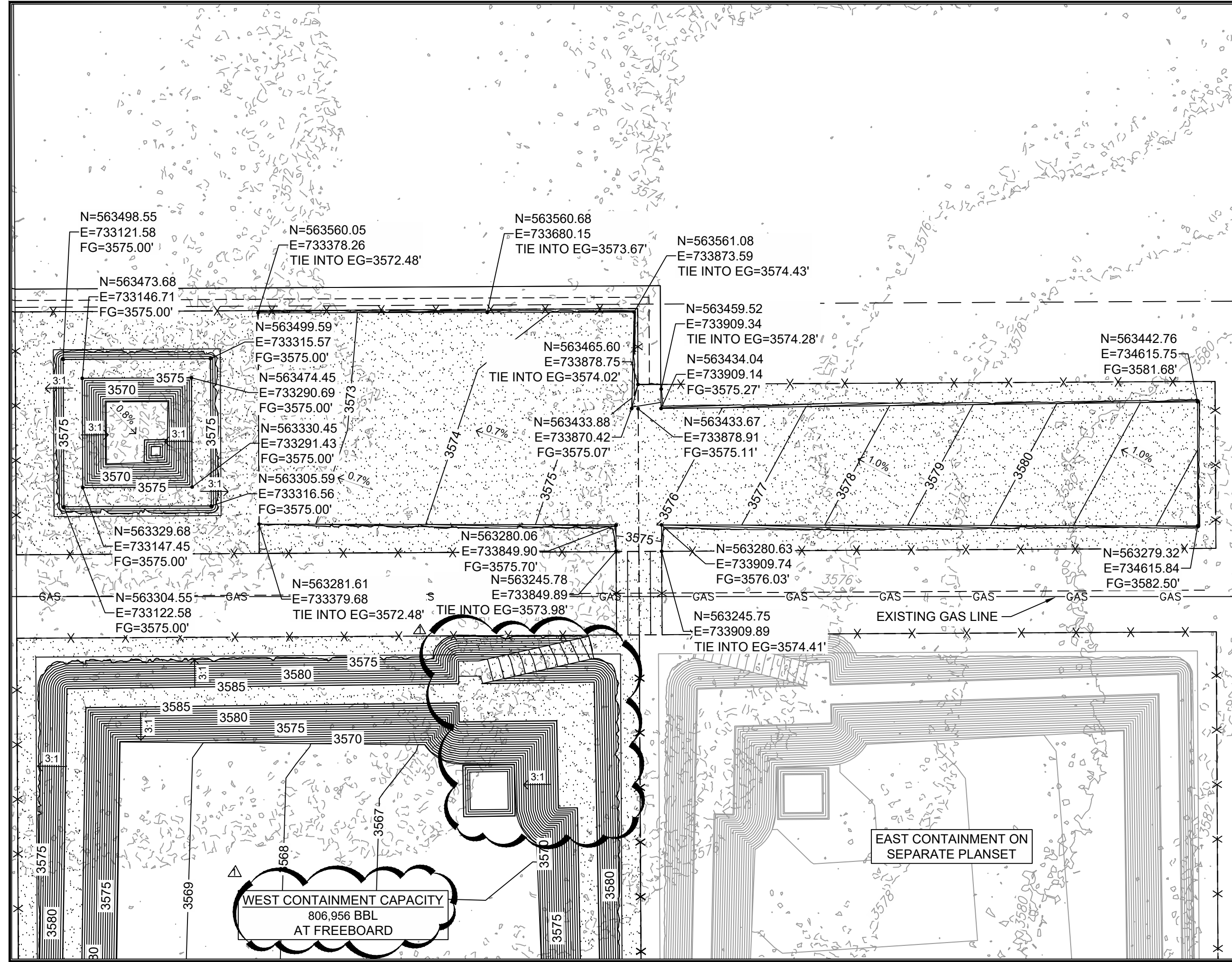
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
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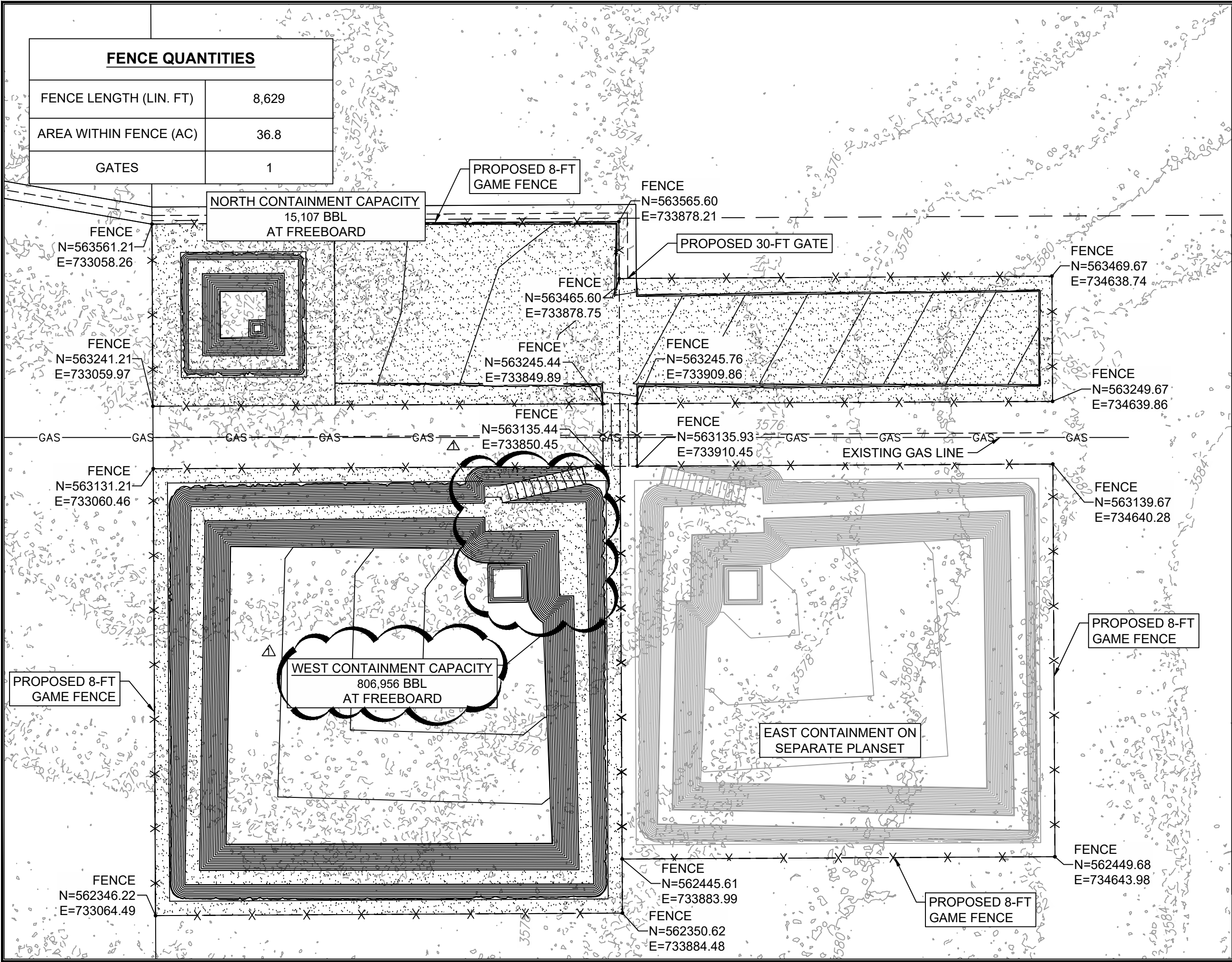
REVISIONS		
No.	DATE	DESCRIPTION
1	05/14/26	RAMPS ADDED



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SHEET:  
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CG-105



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

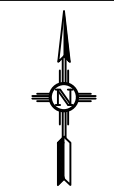
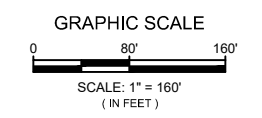


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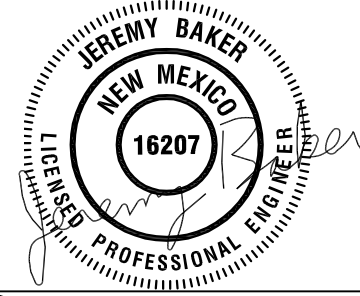
ENGINEERING SHEET:  
**FENCE LAYOUT**  
OF  
PROJECT NAME: **LOST TANKS - WEST RECYCLE CONTAINMENT**  
FOR  
CLIENT: **DEVON**

PROJECT NUMBER:  
26054

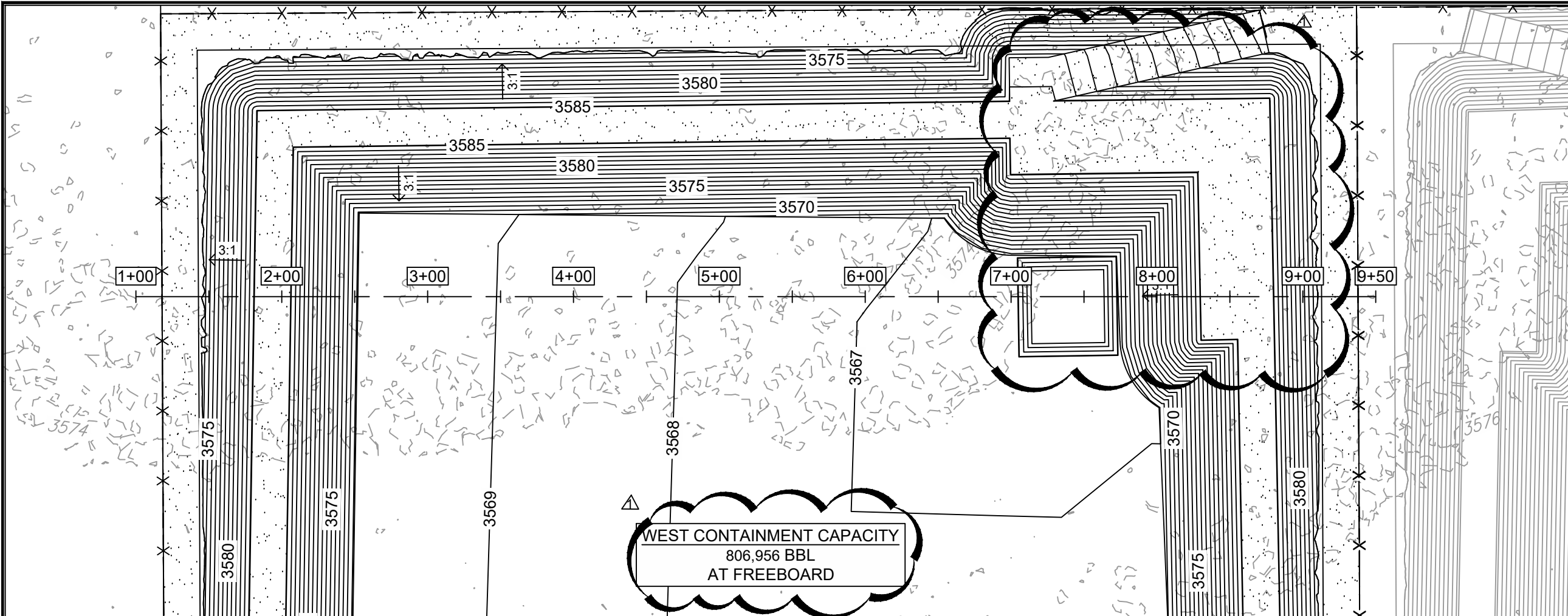
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
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REVISIONS		
No.	DATE	DESCRIPTION
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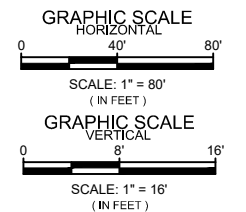


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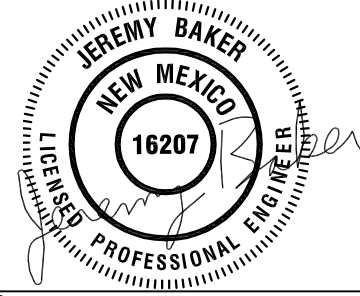
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SHEET:  
WEST CONTAINMENT  
WEST TO EAST P&P  
OF  
PROJECT NAME:  
LOST TANKS - WEST RECYCLE  
CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

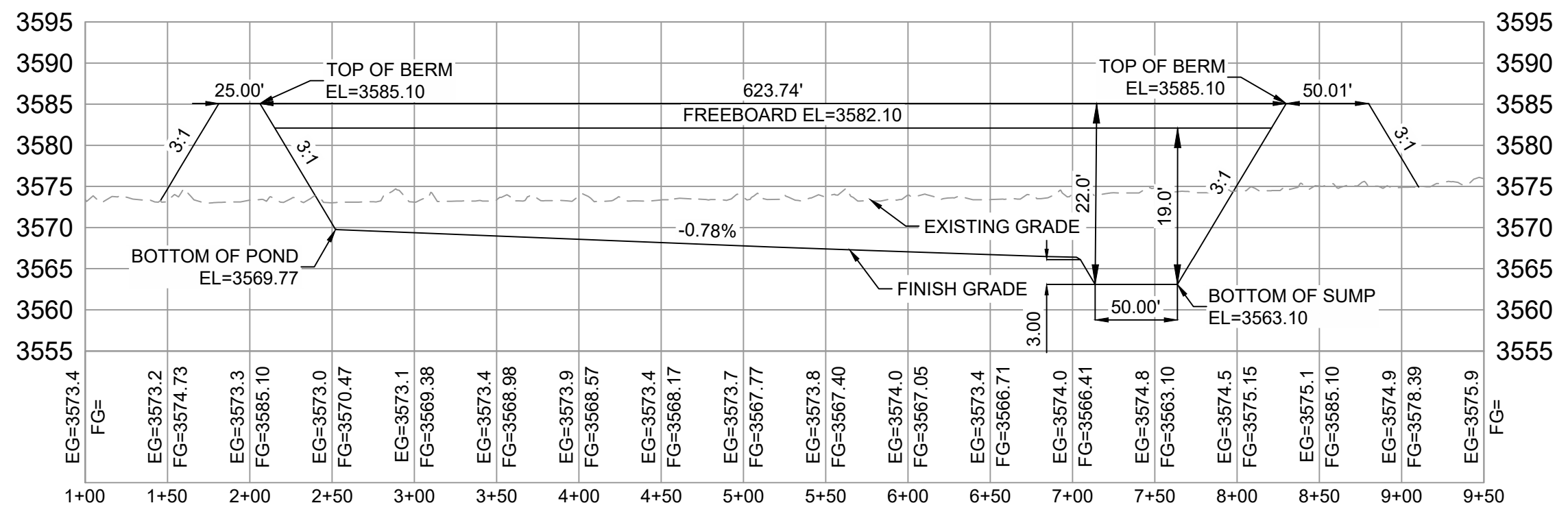
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
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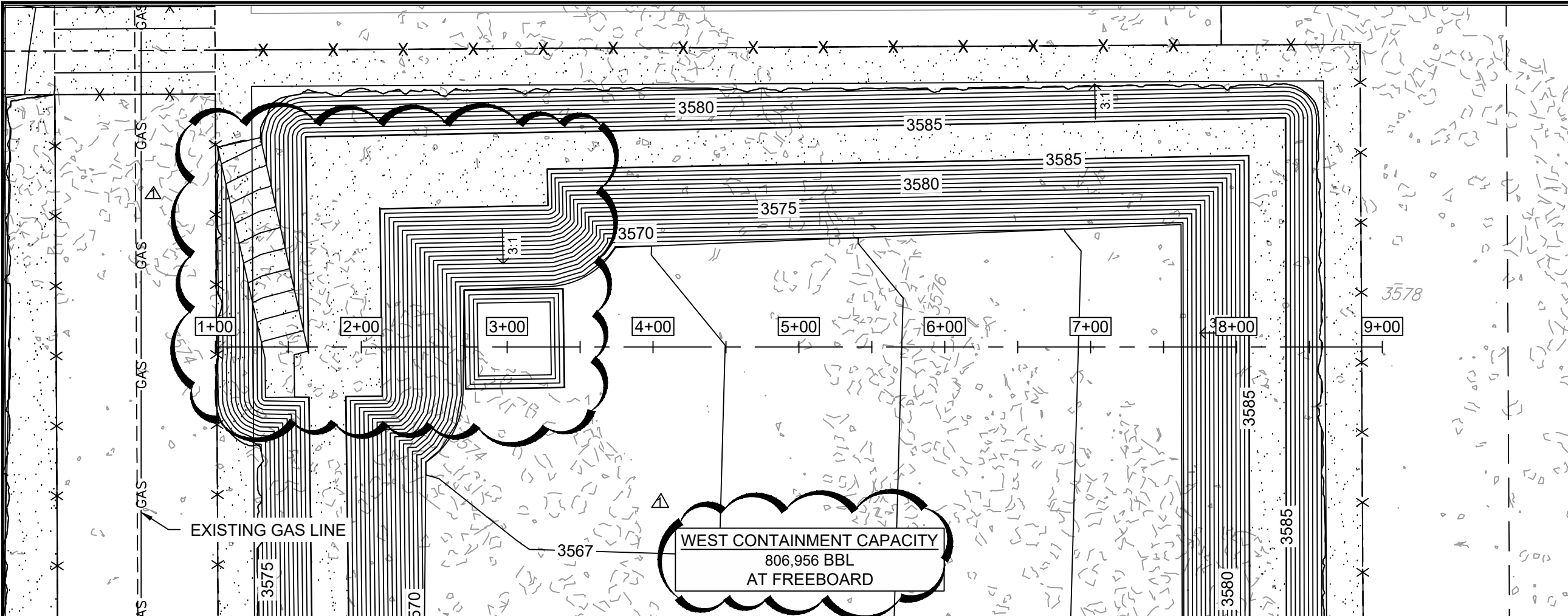


REVISIONS		
No.	DATE	DESCRIPTION
1	05/14/26	RAMPS ADDED



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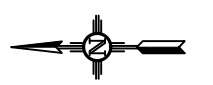
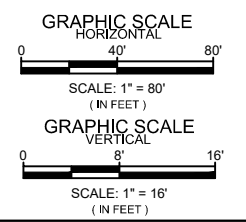


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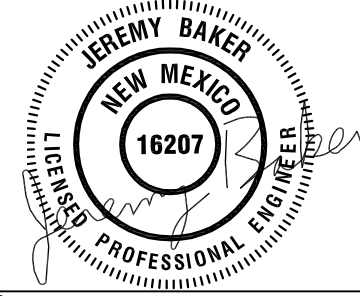
ENGINEERING  
SHEET:  
WEST CONTAINMENT  
NORTH TO SOUTH P&P  
OF  
PROJECT NAME:  
LOST TANKS - WEST RECYCLE  
CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

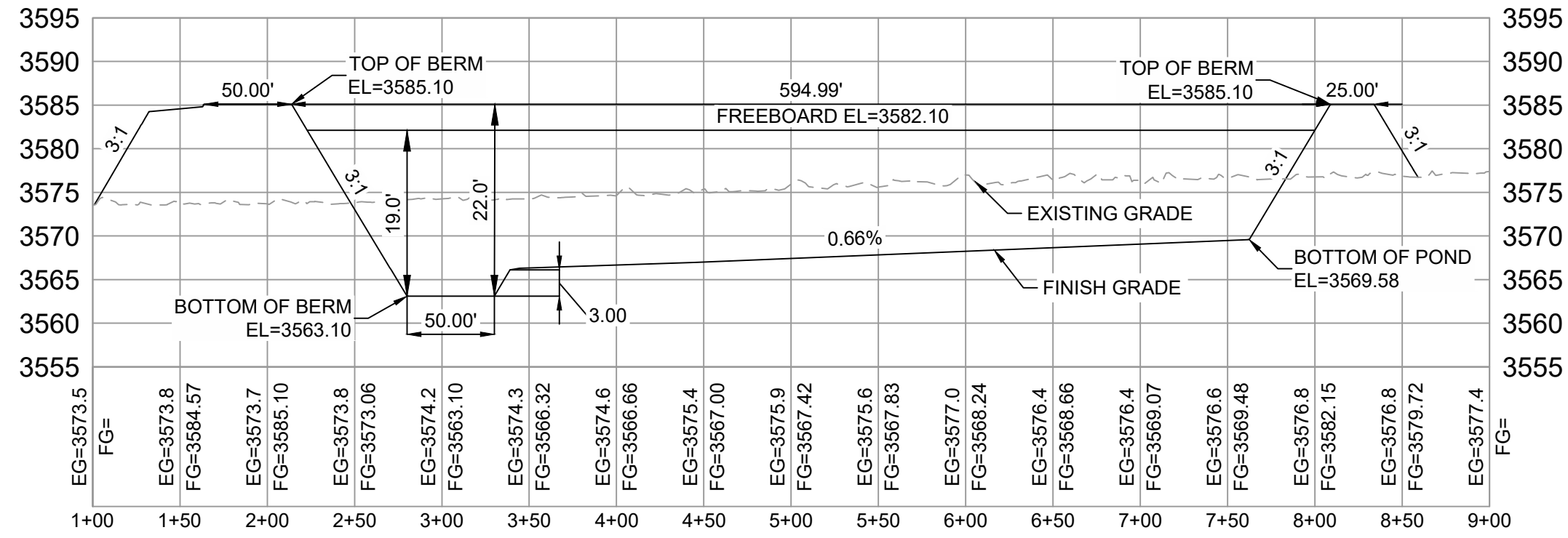
PROJECT ENGINEER:  
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DRAWN BY:  
C. JIMENEZ

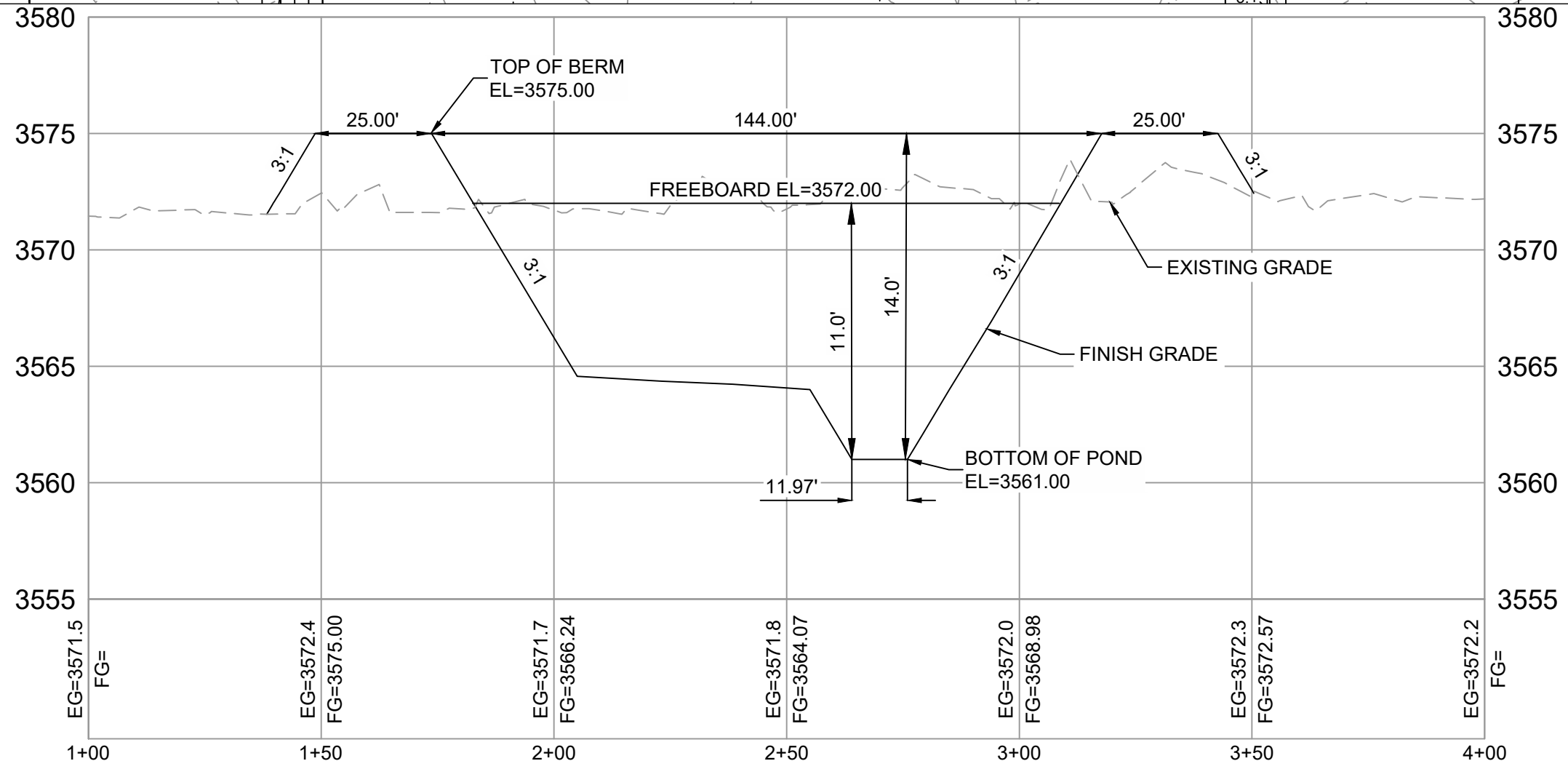
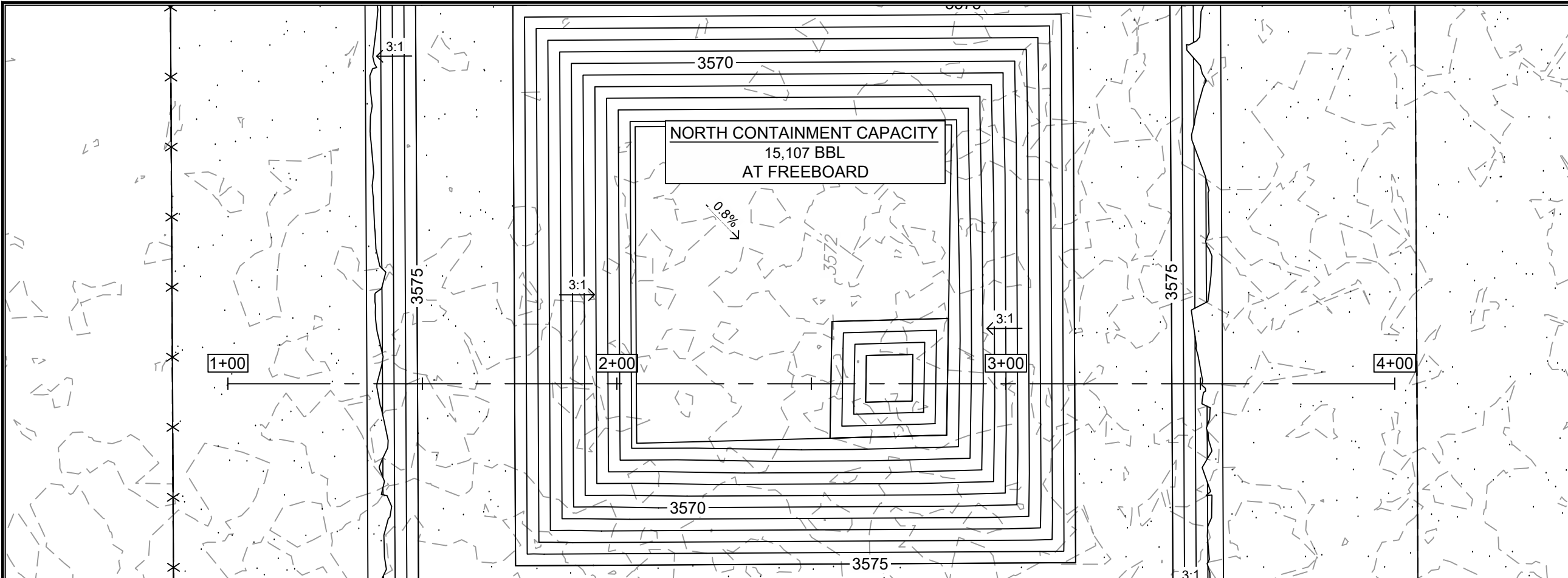


REVISIONS		
No.	DATE	DESCRIPTION
1	05/14/26	RAMPS ADDED



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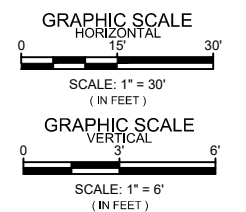


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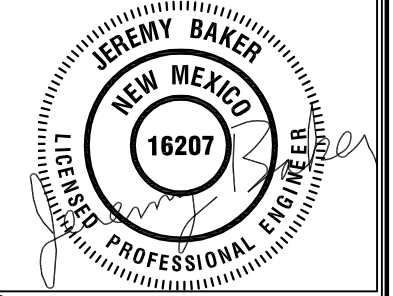
ENGINEERING  
SHEET:  
NORTH CONTAINMENT  
WEST TO EAST P&P  
OF  
PROJECT NAME:  
LOST TANKS - WEST RECYCLE  
CONTAINMENT  
FOR  
CLIENT:  
DEVON

PROJECT NUMBER:  
26054

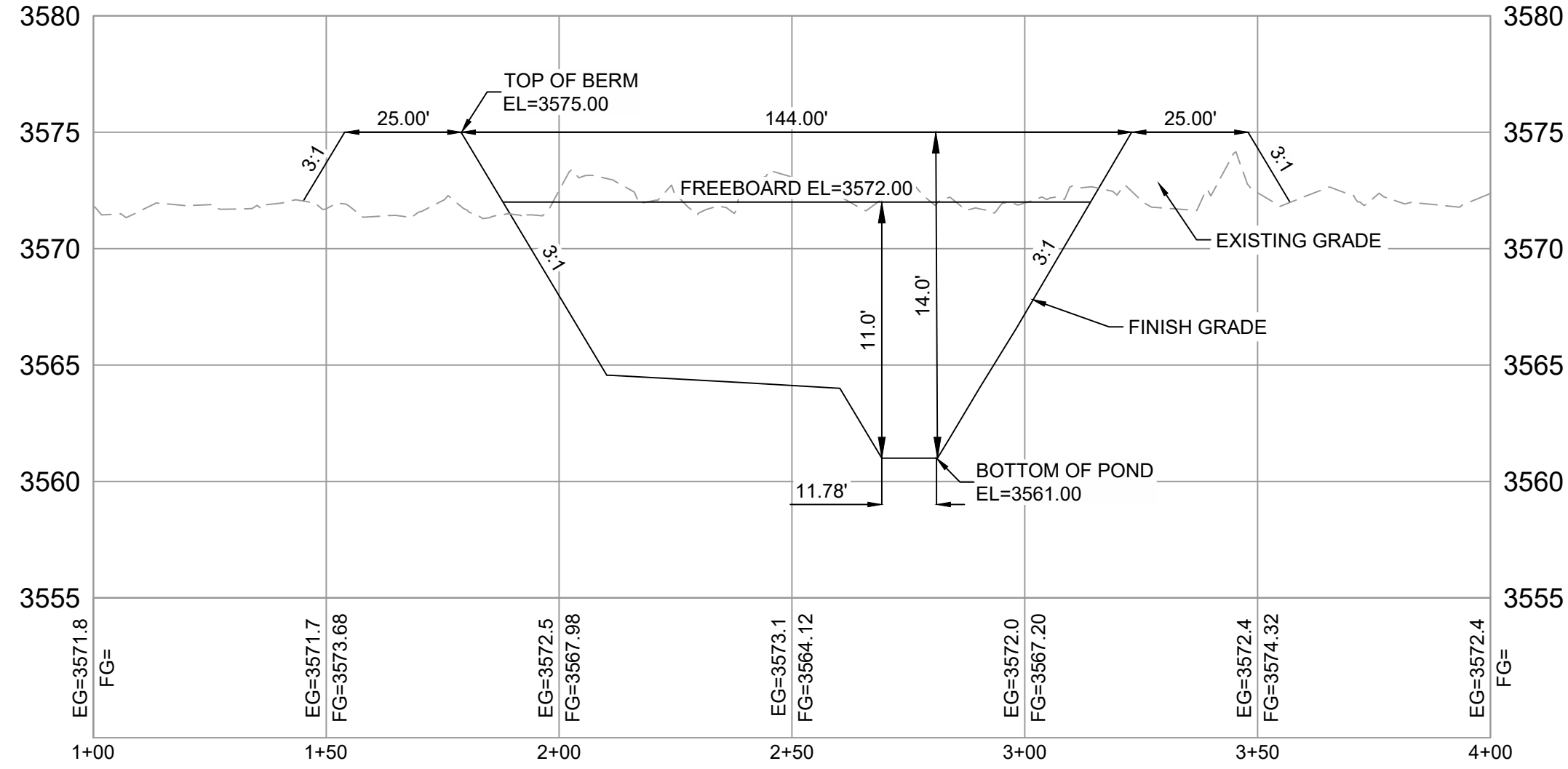
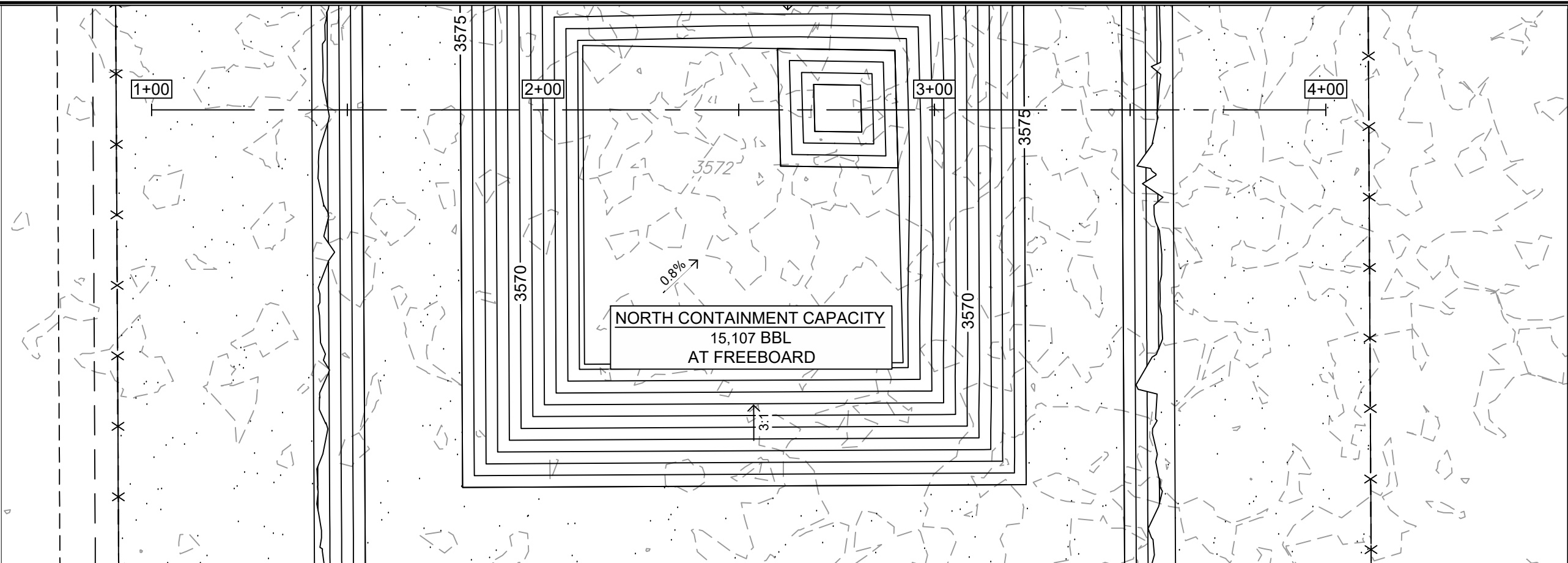
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
C. JIMENEZ



REVISIONS		
No.	DATE	DESCRIPTION



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SHEET:  
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CS-109

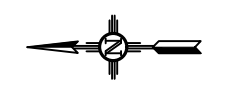
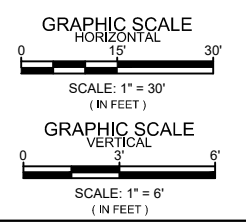


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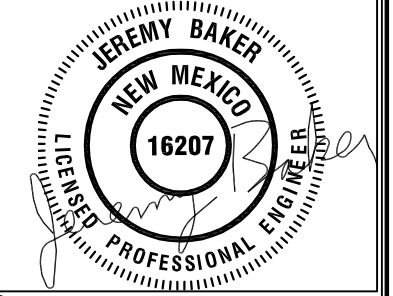
ENGINEERING SHEET:  
 NORTH CONTAINMENT  
 NORTH TO SOUTH P&P  
 OF  
 PROJECT NAME:  
 LOST TANKS - WEST RECYCLE  
 CONTAINMENT  
 FOR  
 CLIENT:  
 DEVON

PROJECT NUMBER:  
 26054

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



REVISIONS		
No.	DATE	DESCRIPTION



05/04/2026  
 SHEET:  
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 CS-110

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

PROJECT NUMBER:  
26054

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
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REVISIONS		
No.	DATE	DESCRIPTION
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NORTH 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 (%)	
3,575.00	0	14	0	-	-	0%	139,640	1,044,644	24,869	3.21	100%	
3,574.00	1	13	19,890	148,800	3,542	14%	119,749	895,845	21,327	2.75	86%	FREEBOARD
3,573.00	2	12	38,139	285,321	6,792	27%	101,500	759,324	18,077	2.33	73%	
3,572.00	3	11	54,816	410,082	9,763	39%	84,823	634,562	15,107	1.95	61%	MAX VOLUME
3,571.00	4	10	69,992	523,607	12,465	50%	69,648	521,038	12,404	1.60	50%	
3,570.00	5	9	83,734	626,414	14,913	60%	55,906	418,230	9,956	1.28	40%	STORAGE
3,569.00	6	8	96,114	719,027	17,117	69%	43,526	325,617	7,752	1.00	31%	VOLUME
3,568.00	7	7	107,200	801,965	19,092	77%	32,439	242,679	5,777	0.74	23%	
3,567.00	8	6	117,063	875,749	20,848	84%	22,577	168,895	4,021	0.52	16%	
3,566.00	9	5	125,772	940,900	22,399	90%	13,868	103,745	2,470	0.32	10%	FLOOR
3,565.00	10	4	133,396	997,939	23,757	96%	6,243	46,705	1,112	0.14	4%	VOLUME
3,564.00	11	3	138,238	1,034,159	24,619	99%	1,402	10,485	250	0.03	1%	
3,563.00	12	2	138,969	1,039,627	24,750	100%	671	5,017	119	0.02	0%	
3,562.00	13	1	139,412	1,042,944	24,829	100%	227	1,701	40	0.01	0%	SUMP
3,561.00	14	0	139,640	1,044,644	24,869	100%	0	0	0	0.00	0%	VOLUME

WEST 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 (%)	
3,585.10	0	22	0	-	-	0%	5,692,612	42,586,432	1,013,822	130.68	100%	
3,584.10	1	21	394,702	2,952,767	70,294	7%	5,297,910	39,633,665	943,528	121.62	93%	FREEBOARD
3,583.10	2	20	781,861	5,849,103	139,245	14%	4,910,751	36,737,329	874,577	112.74	86%	
3,582.10	3	19	1,161,553	8,689,578	206,866	20%	4,531,059	33,896,854	806,956	104.02	80%	MAX VOLUME
3,581.10	4	18	1,533,854	11,474,764	273,171	27%	4,158,758	31,111,668	740,651	95.47	73%	
3,580.10	5	17	1,898,842	14,205,235	338,173	33%	3,793,771	28,381,197	675,649	87.09	67%	
3,579.10	6	16	2,256,591	16,881,560	401,886	40%	3,436,021	25,704,872	611,936	78.88	60%	
3,578.10	7	15	2,607,180	19,504,315	464,324	46%	3,085,432	23,082,117	549,498	70.83	54%	
3,577.10	8	14	2,950,684	22,074,066	525,500	52%	2,741,928	20,512,366	488,322	62.95	48%	
3,576.10	9	13	3,287,180	24,591,392	585,428	58%	2,405,432	17,995,040	428,394	55.22	42%	STORAGE
3,575.10	10	12	3,616,744	27,056,860	644,122	64%	2,075,869	15,529,573	369,701	47.66	36%	VOLUME
3,574.10	11	11	3,939,452	29,471,043	701,594	69%	1,753,160	13,115,390	312,228	40.25	31%	
3,573.10	12	10	4,255,382	31,834,513	757,860	75%	1,437,230	10,751,920	255,963	32.99	25%	
3,572.10	13	9	4,564,609	34,147,841	812,931	80%	1,128,003	8,438,591	200,891	25.90	20%	
3,571.10	14	8	4,867,211	36,411,603	866,823	86%	825,402	6,174,829	146,999	18.95	14%	
3,570.10	15	7	5,163,262	38,626,366	919,548	91%	529,350	3,960,066	94,274	12.15	9%	
3,569.10	16	6	5,431,216	40,630,925	967,269	95%	261,396	1,955,507	46,553	6.00	5%	
3,568.10	17	5	5,592,221	41,835,404	995,943	98%	100,391	751,028	17,879	2.30	2%	FLOOR
3,567.10	18	4	5,665,022	42,380,030	1,008,909	100%	27,590	206,402	4,914	0.63	0%	VOLUME
3,566.10	19	3	5,682,086	42,507,685	1,011,948	100%	10,526	78,747	1,875	0.24	0%	
3,565.10	20	2	5,686,315	42,539,325	1,012,701	100%	6,297	47,107	1,121	0.14	0%	
3,564.10	21	1	5,689,800	42,565,393	1,013,321	100%	2,812	21,039	501	0.06	0%	SUMP
3,563.10	22	0	5,692,612	42,586,432	1,013,822	100%	0	0	0	0.00	0%	VOLUME



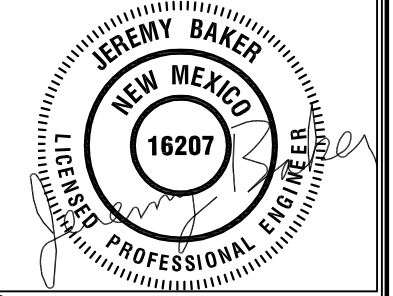
7921 N. World Dr.  
Hobbs, NM 88242  
Squarerootservices.net  
575-231-7347

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

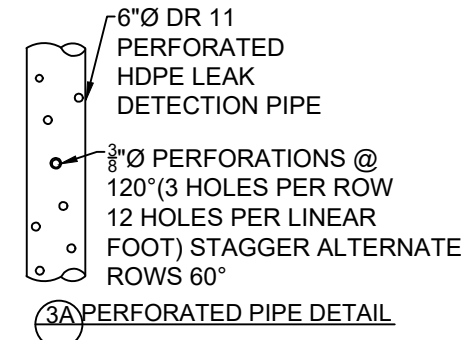
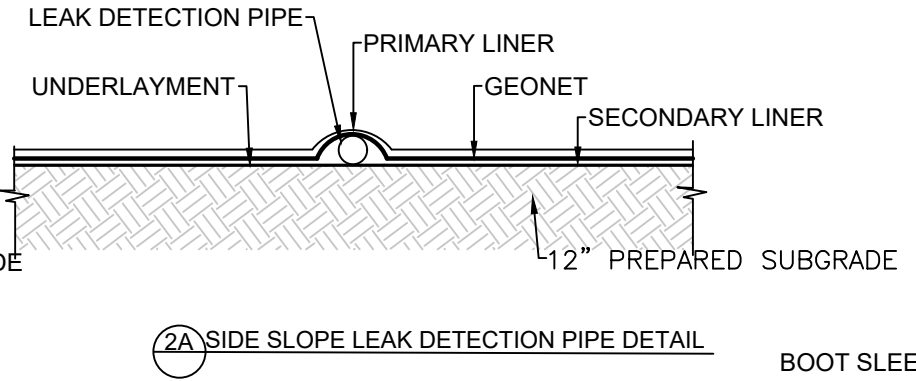
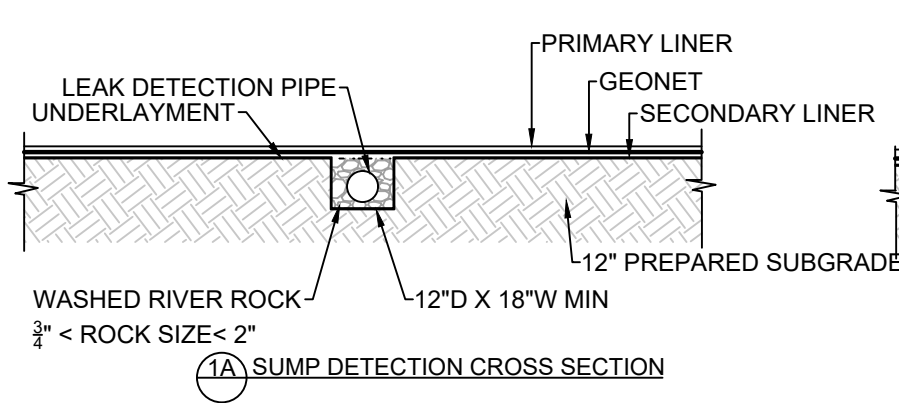
PROJECT NUMBER:  
26054

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

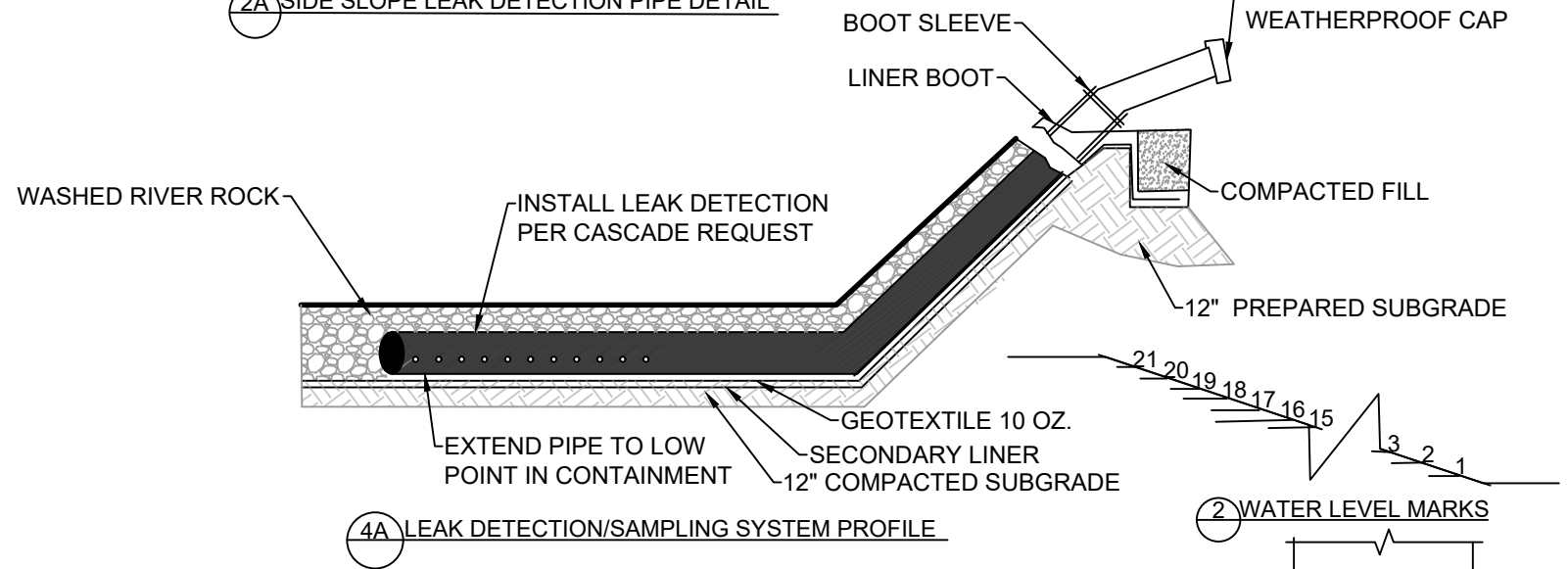
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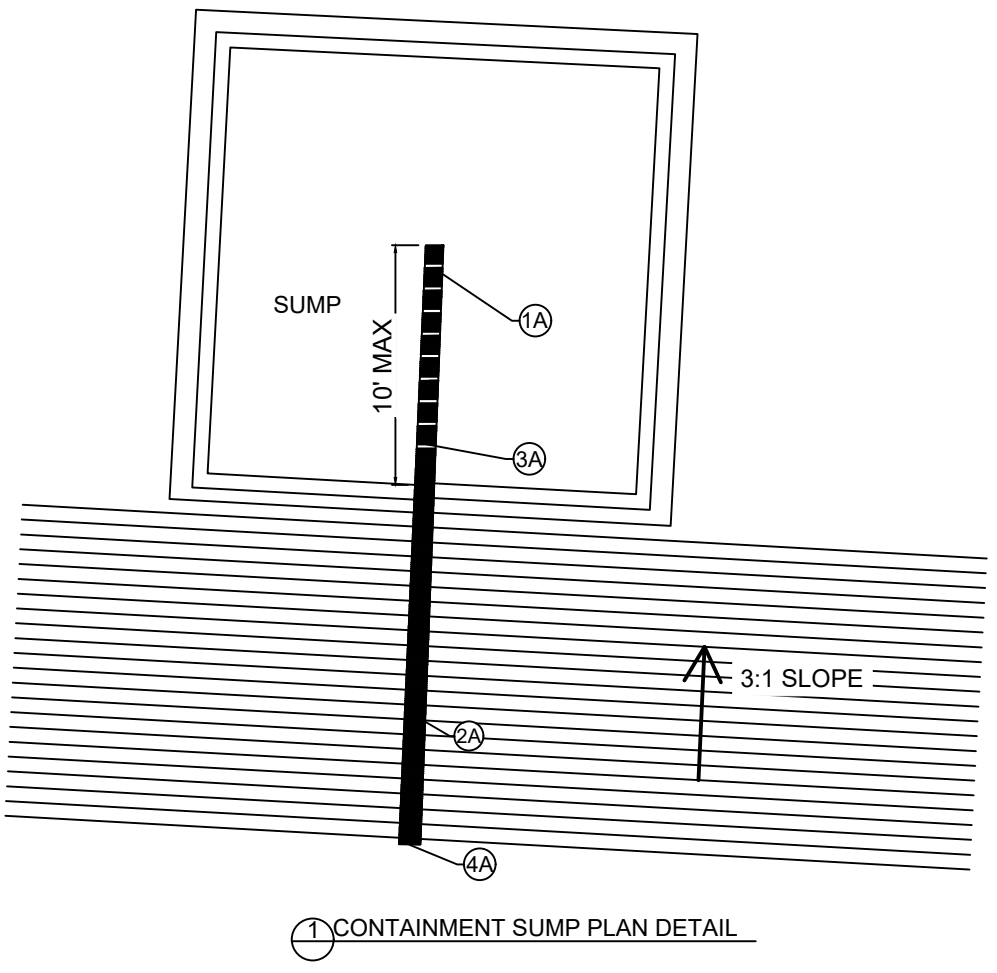
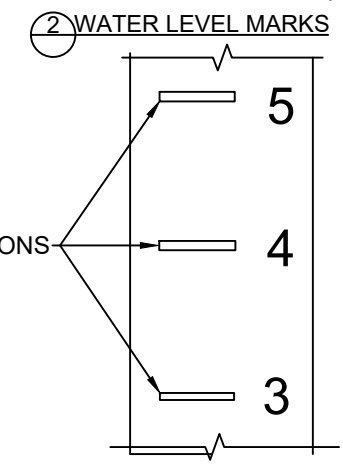
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CS-501



- 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.

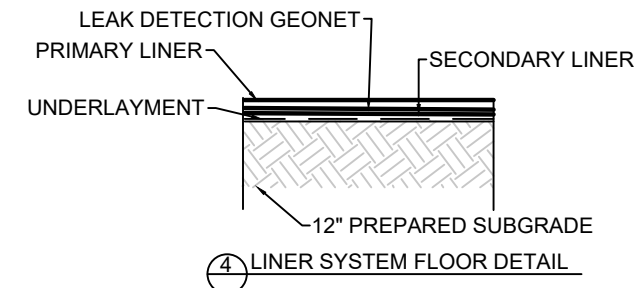
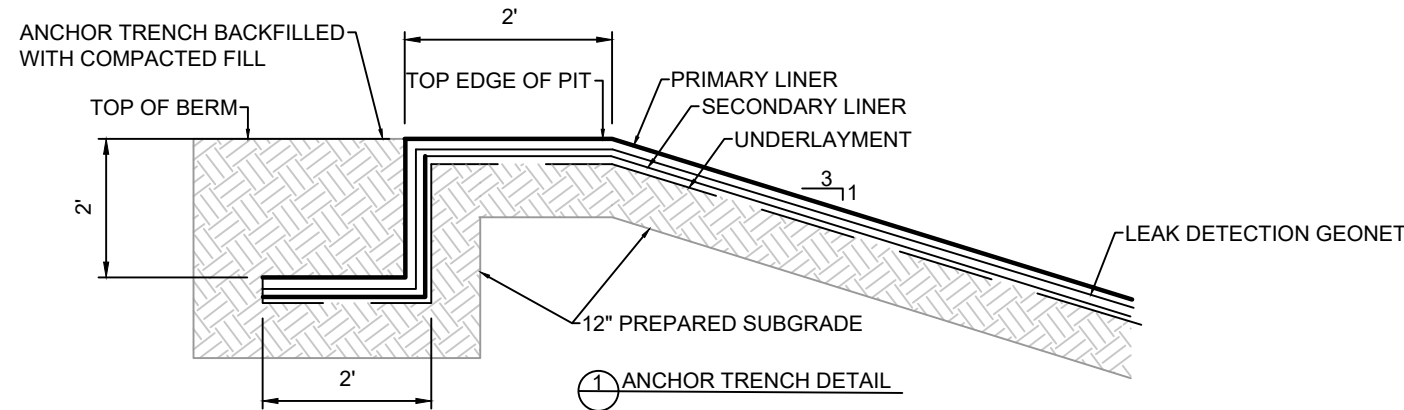


PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60 MIL HDPE LINER
LEAK DETECTION	200 MIL GEONET
SECONDARY LINER	40 MIL HDPE LINER
UNDERLAYMENT	COMPACTED SUBGRADE/10 OZ GEOTEXTILE
NORTH CONTAINMENT	
BOTTOM OF POND	3,564.00'
BERM (ROAD CREST)	3575.00'
WEST CONTAINMENT	
BOTTOM OF POND	3,563.10'
BERM (ROAD CREST)	3,585.10'
LEAK DETECTION PIPING	6-IN DR11 X PERFORATED HDPE PIPE LEAK DETECTION PIPE

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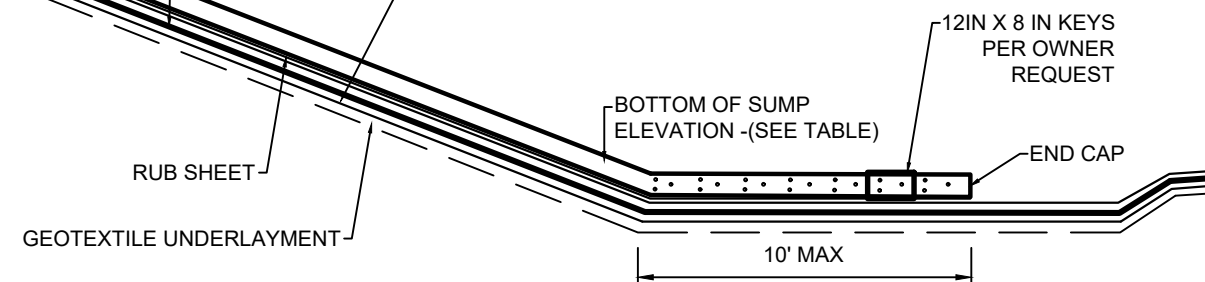
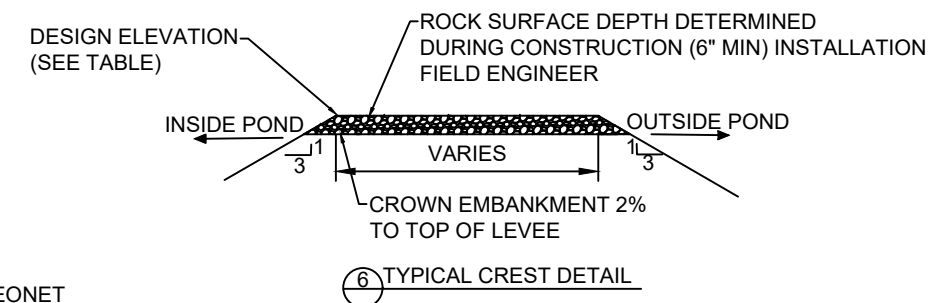
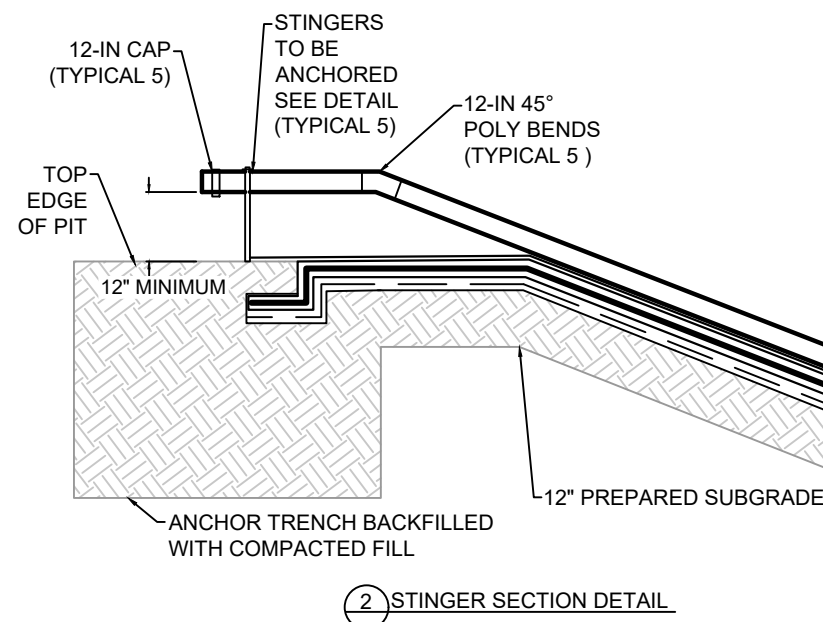
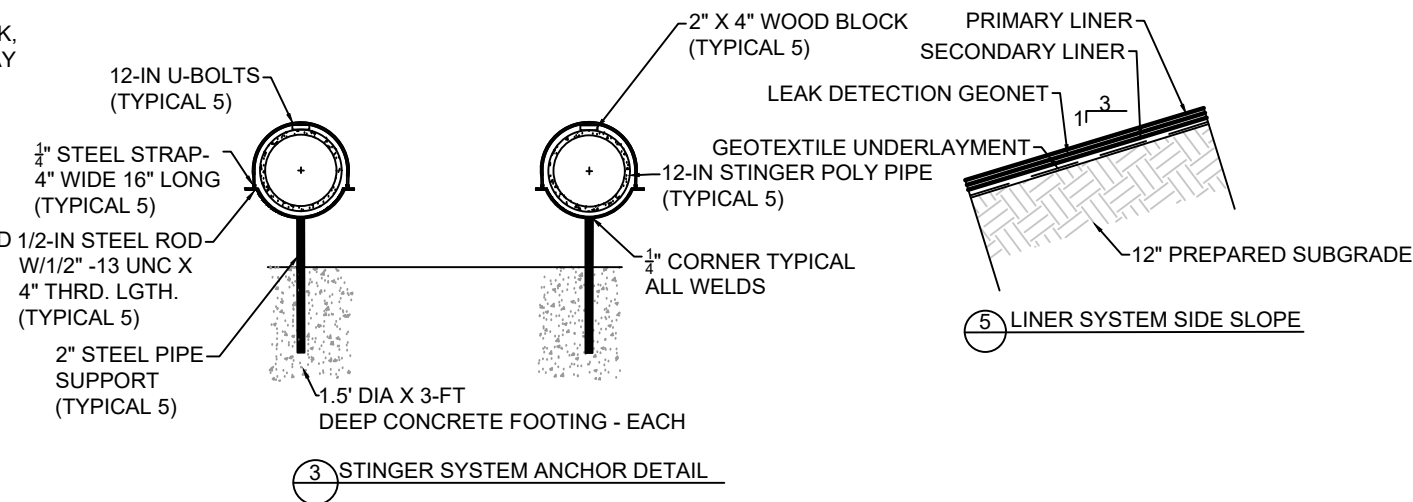


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CS-502



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 - WEST RECYCLE CONTAINMENT  
FOR  
CLIENT:  
DEVON

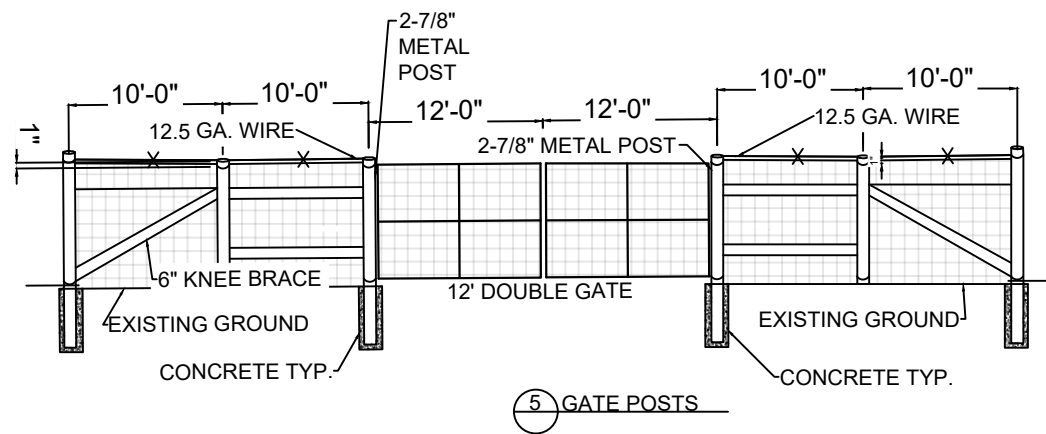
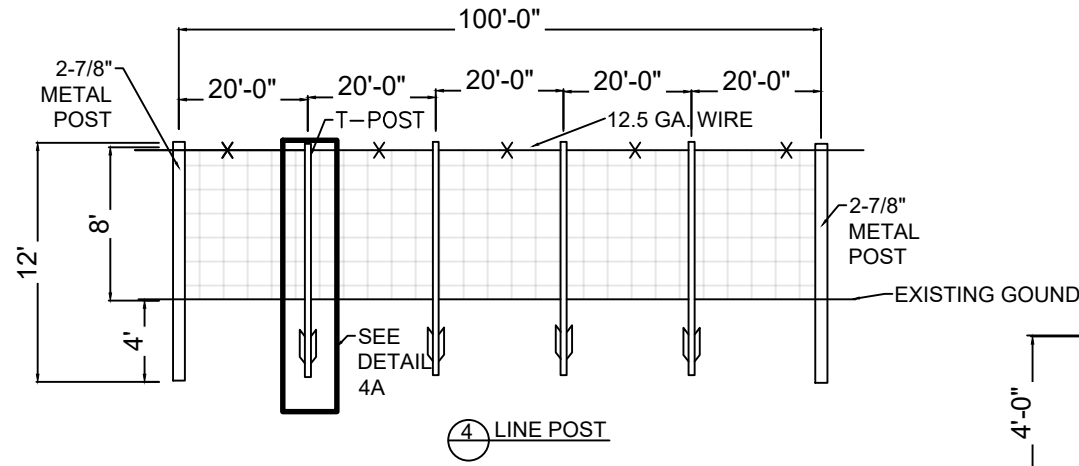
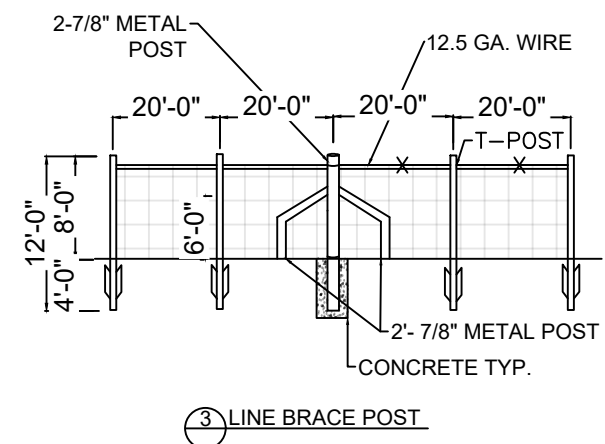
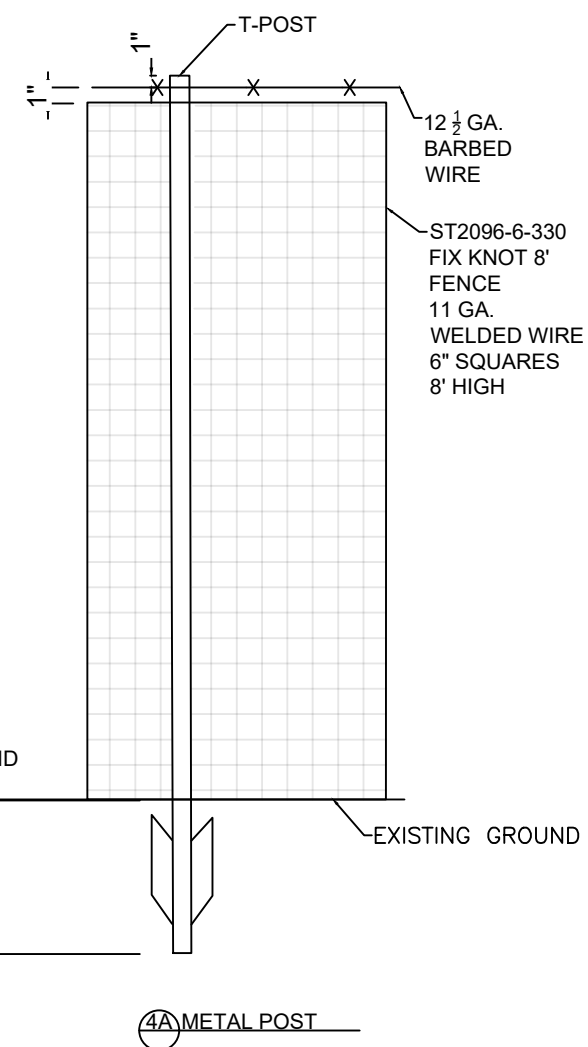
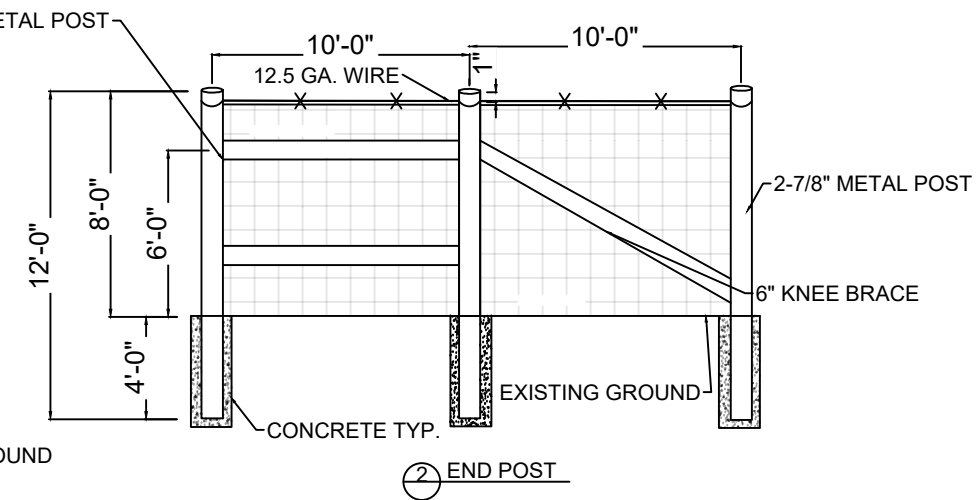
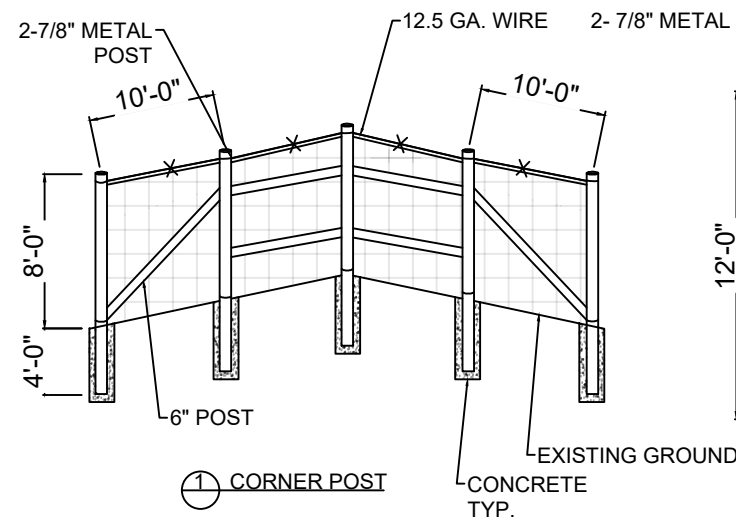
PROJECT NUMBER:  
26054

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

REVISIONS		
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## 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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Control Unit	5
Solar Panel	5
Placement	6
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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Mode Settings	10
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# Overview

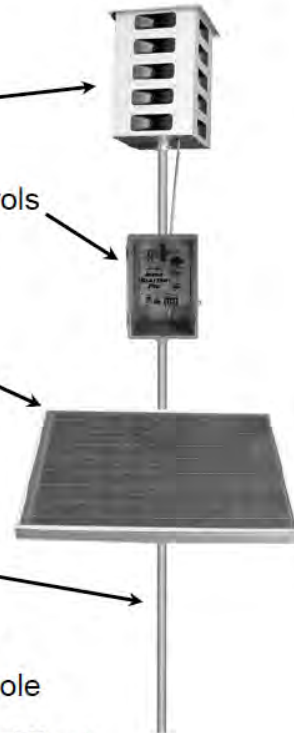
The Bird-X Mega Blaster Pro utilizes the innate power of the natural survival instincts of birds to effectively repel them. Digital recordings of distressed and alarmed birds, along with the sounds made by their natural predators are broadcast through high fidelity weather-resistant speakers over the 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

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

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*

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

(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 West & Lost Tanks West AST

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



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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 West In-ground  
Containment Registration and Lost Tanks West AST  
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 East 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.

Please note that the design drawings in Volume 2 also include a small 15,107 BBL freshwater pond. Because only freshwater will be used in it, it is not included as part of this registration, and no reference is made to it aside from the drawings. The AST treatment facility will be located on the opposing east side of the same pad.

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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Volume 3 contains:

- AST Design Sketch
- Stamped Design Drawings
- Design and Construction Plan
- AST Set Up SOP
- Operation and Maintenance Plan
- Closure Plan
- Variances and Equivalency Demonstrations for AST

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.

Additionally, this submission requests several variances associated with adapting Rule 34 to AST’s. All of the variances requested have been previously approved by the OCD. The following variance requests are detailed further in Volume 3:

1. Variance Request for OCD Approval of Alternative Test Methods to Analyze Concentrations of TPH and Chloride
2. Variance Request for OCD Approval of Alternative Fencing
3. Variance Request for 40-mil Non-Reinforced LLDPE Geomembrane as an alternative Primary and 30-mil Non-Reinforced LLDPE as an alternative Secondary Liner for Above-Ground Storage Tanks (AST’s)



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4. Variance Request for Slope and Anchor for Modular Steel AST Containments

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'.

George R. Jennings III

Senior Geologist

[gjennings@cascadeservicesllc.com](mailto:gjennings@cascadeservicesllc.com)

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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 south 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 north-north west 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 ~4,500 feet to the northeast.

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 3,506.2 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 3,563.0 feet above sea level, a depth of 56.8 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 (north)	NMOSE	3,563.0	3,565.9	>75	<3490.9	>72.1
CP-02074-POD2 (south)	NMOSE	1,593.0	3,584.3	>75	<3509.3	>53.7
Inverse Distance Weighted Average (power=2)					<b>3,506.2</b>	<b>56.8</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	10.0	22.0	12.0	3,563.0

As discussed above, 56.8 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 ~3,600 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 south 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.

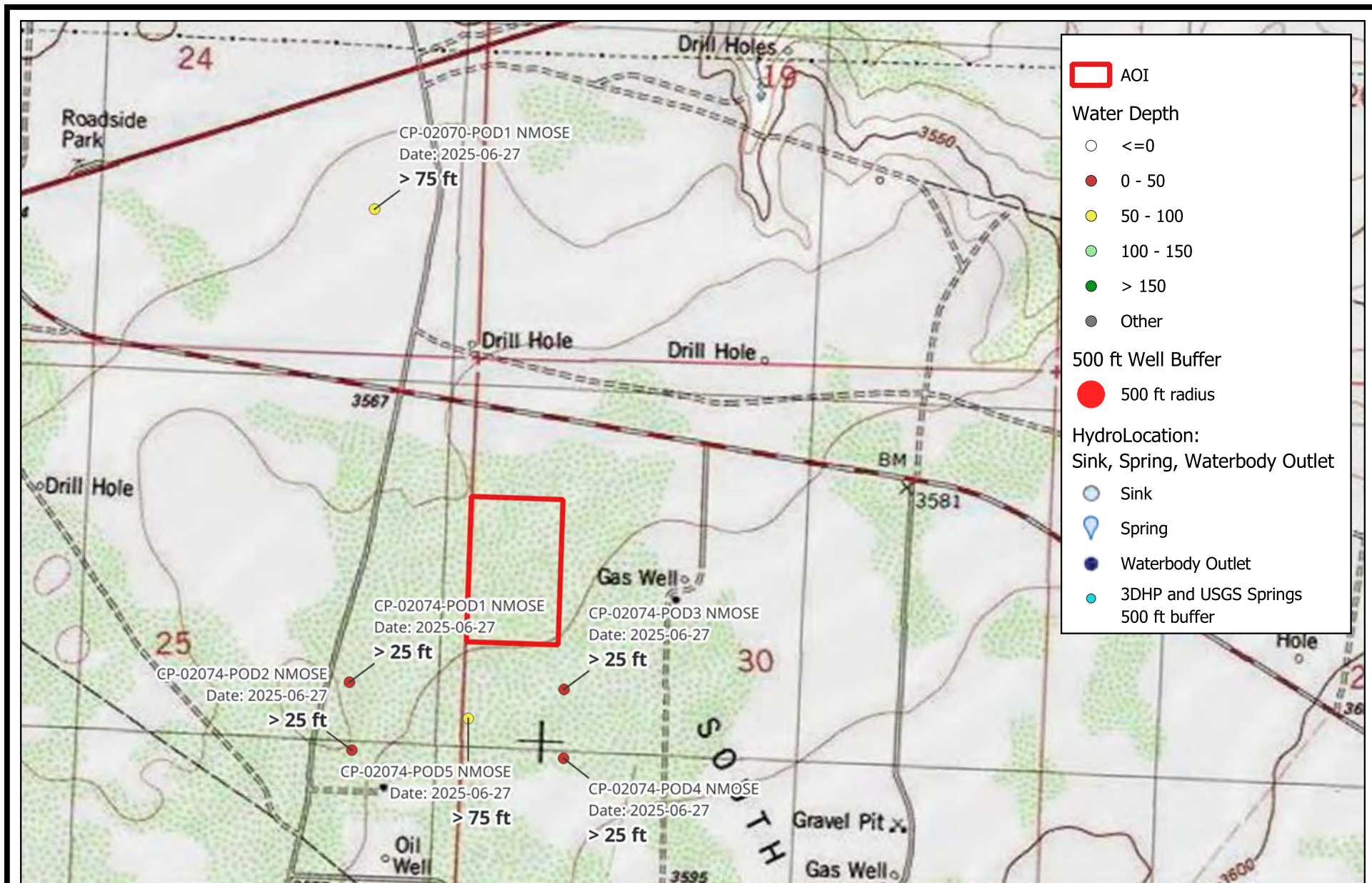
The USFWS maps these wetlands remotely, and while they provide a guide for the location of possible wetlands, they often miss-identify wetlands as defined by the State of New Mexico. In New Mexico TITLE 20: Environmental Protection Chapter 6: Water Quality Part 4: Standards for Interstate and Intrastate 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



**AOI**  
 AOI

**Water Depth**

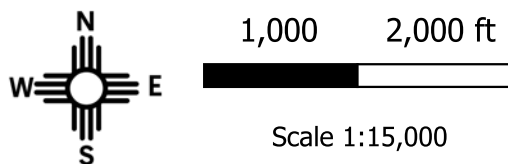
- ≤0
- 0 - 50
- 50 - 100
- 100 - 150
- > 150
- Other

**500 ft Well Buffer**

- 500 ft radius

**HydroLocation:**  
 Sink, Spring, Waterbody Outlet

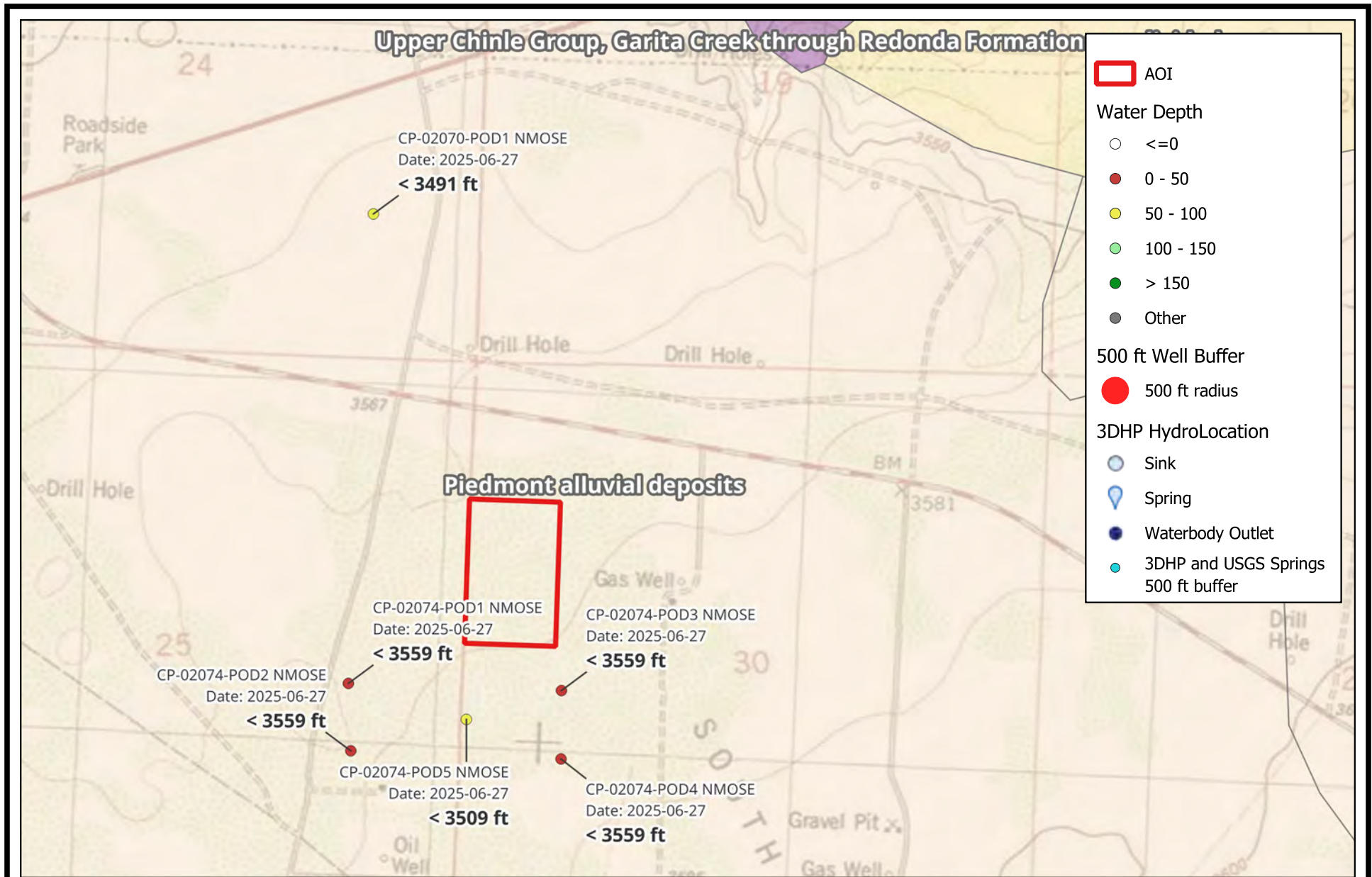
- Sink
- Spring
- Waterbody Outlet
- 3DHP and USGS Springs  
500 ft buffer



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Nearby Springs, Wells, and Borings with Ground Water Depth	Plate 1a
DEVON ENERGY PRODUCTION COMPANY, LP Lost Tanks West	May 2026



Scale 1:15,000



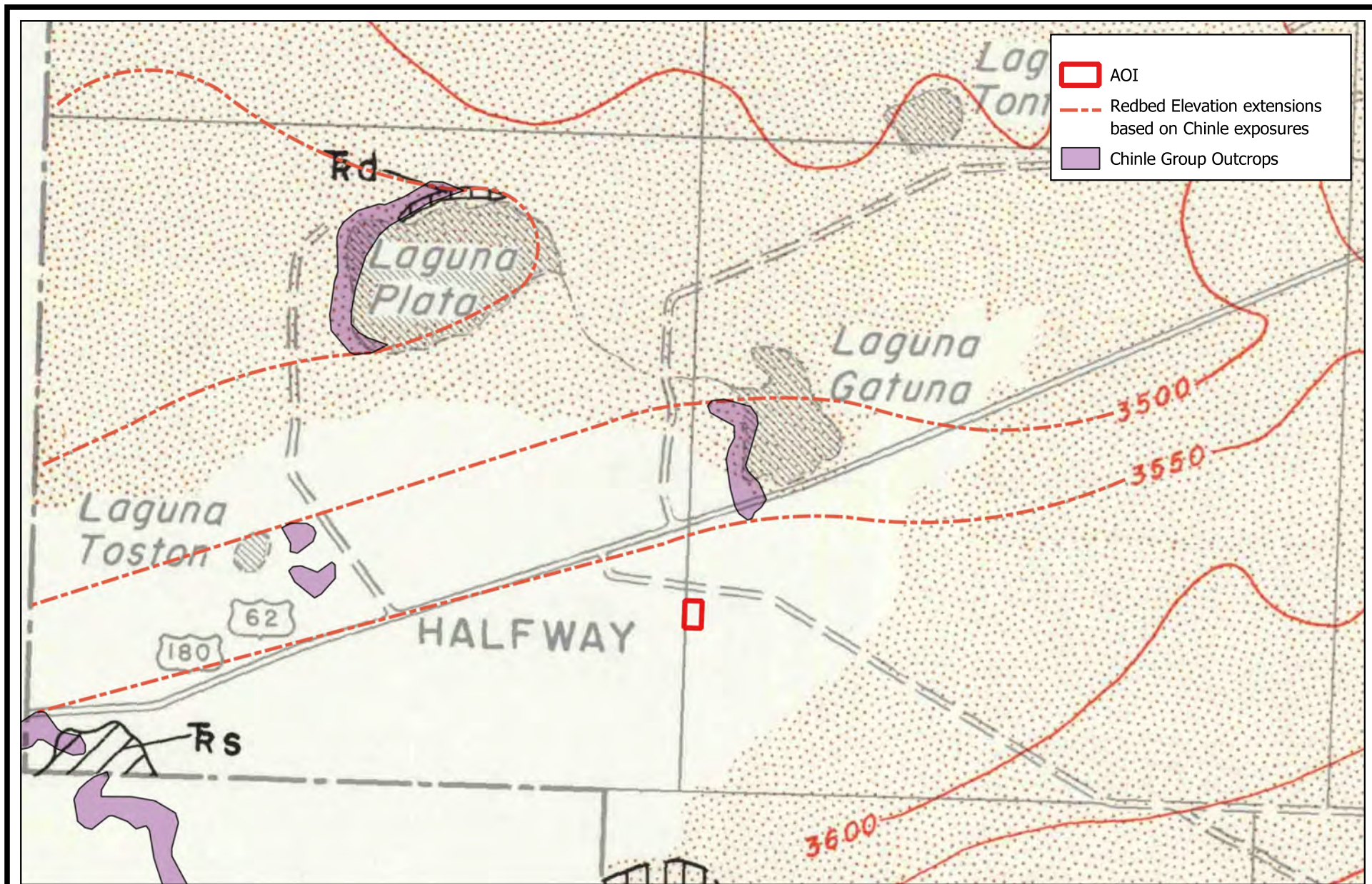
952 Echo Lane, Suite 130  
Houston, Texas 77024




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

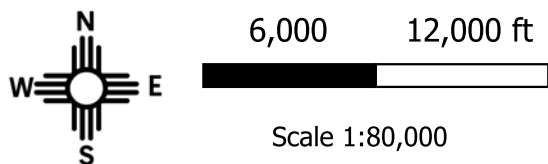
DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

Plate 1b

May 2026



	AOI
	Redbed Elevation extensions based on Chinle exposures
	Chinle Group Outcrops



**CASCADE**  
SERVICES

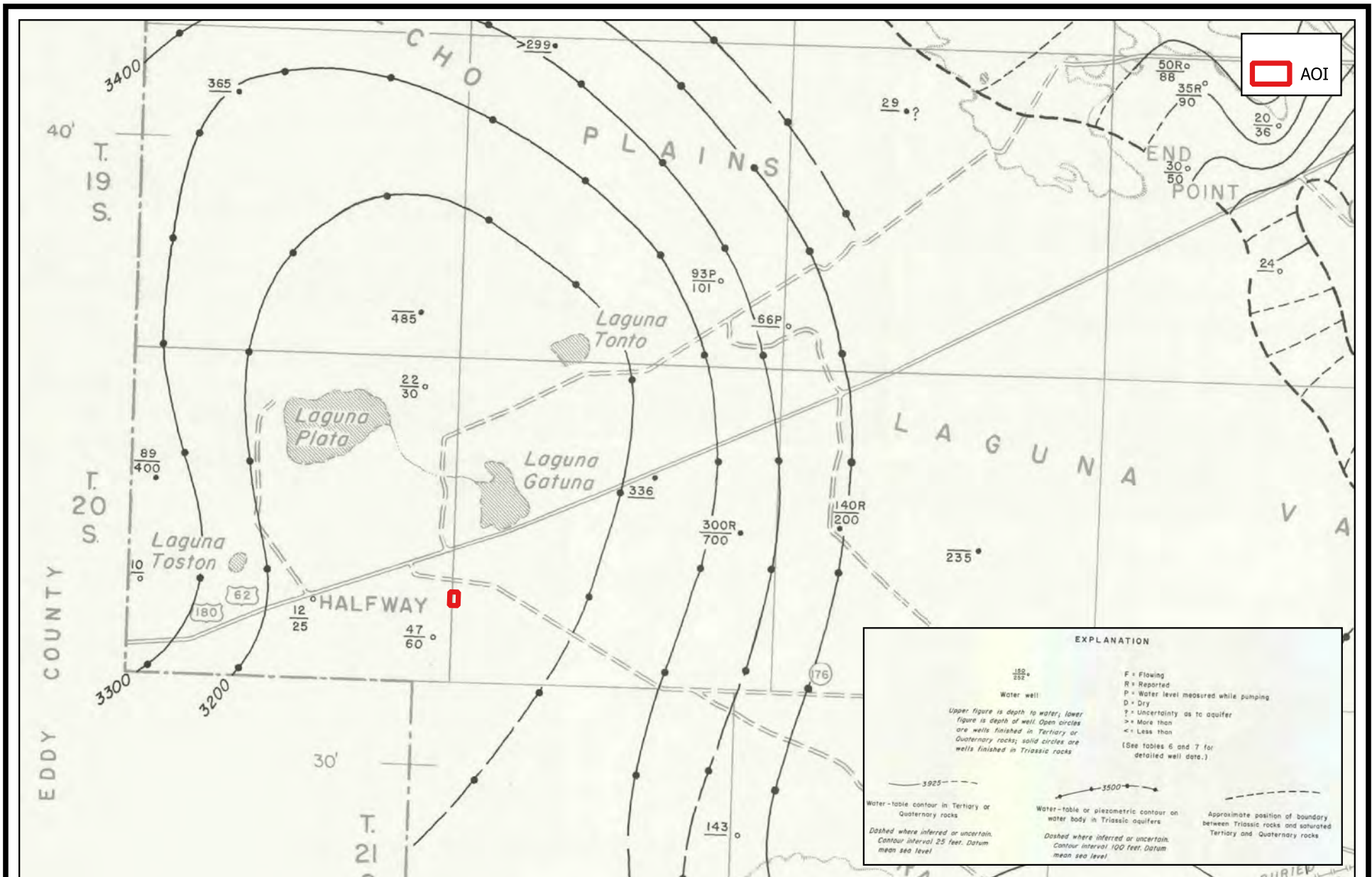
952 Echo Lane, Suite 130  
Houston, Texas 77024

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.

DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

Plate 1c

May 2026



10,000 20,000 ft



Scale 1:160,000



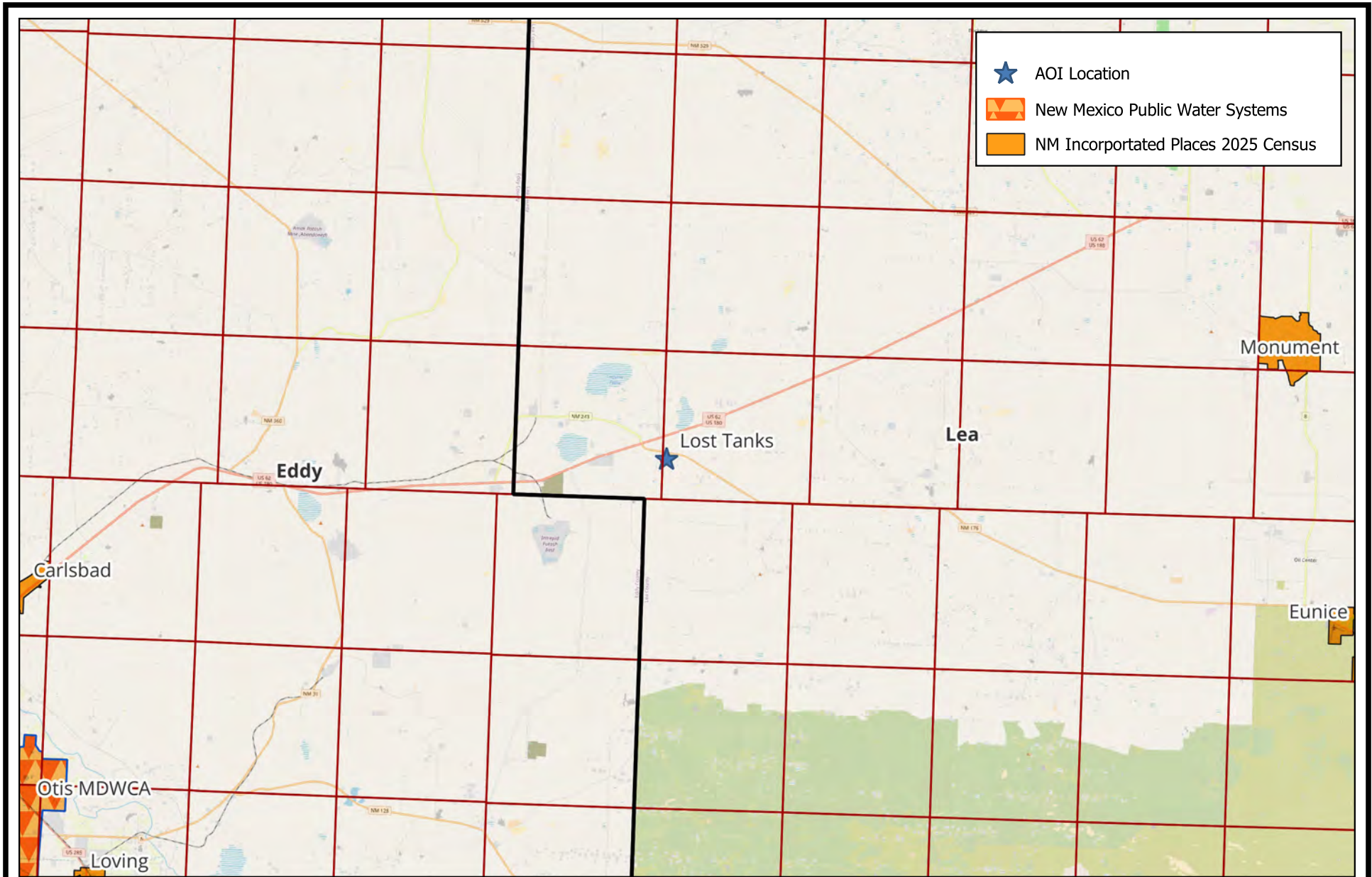
952 Echo Lane, Suite 130  
Houston, Texas 77024




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.

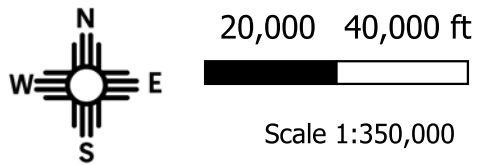
DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

Plate 1d

May 2026



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



Scale 1:350,000



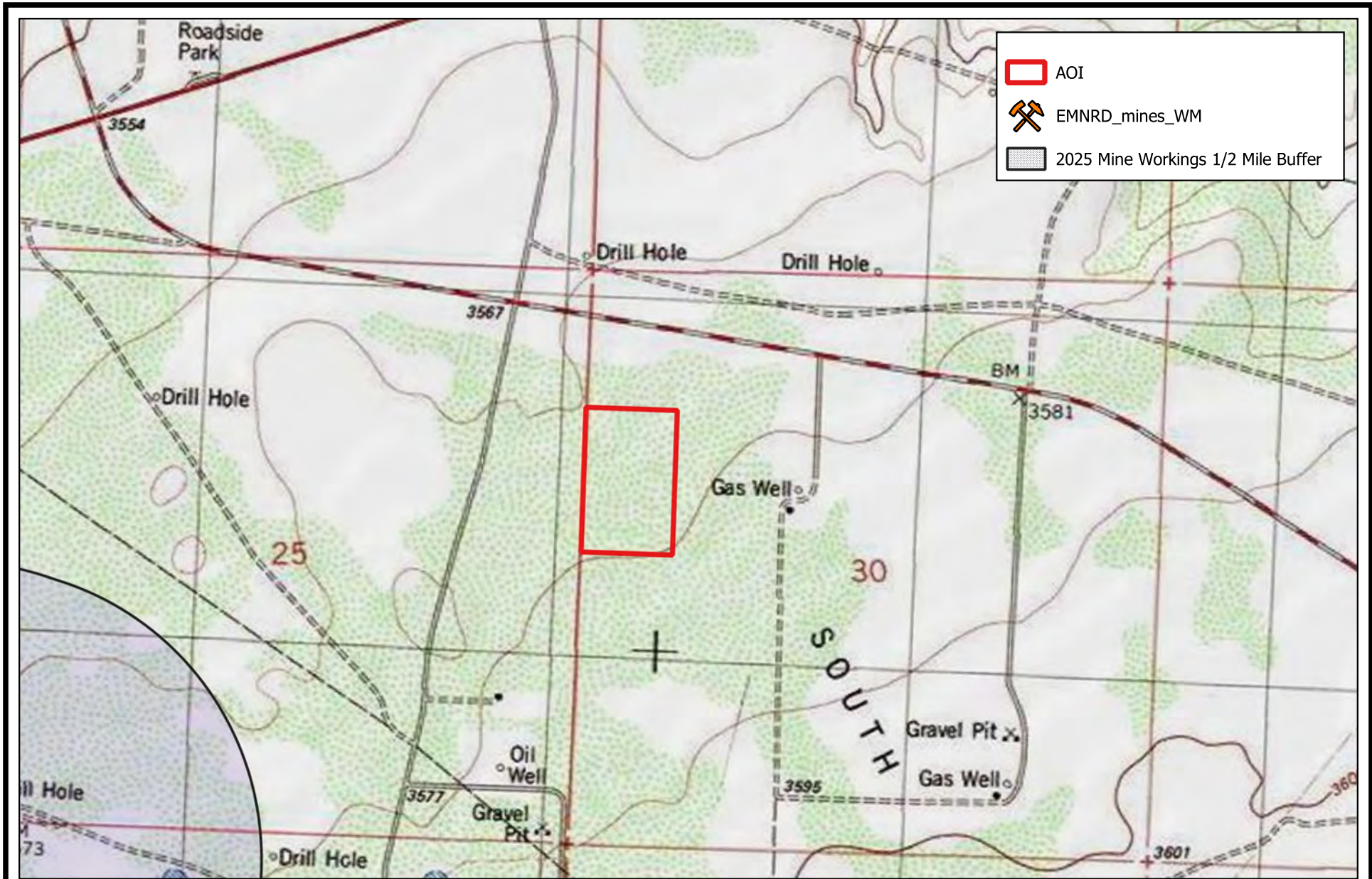
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Houston, Texas 77024

Incorporated Places and Municipal Water Supplies.

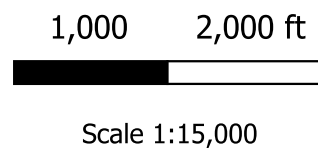
Plate 2

DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

May 2026



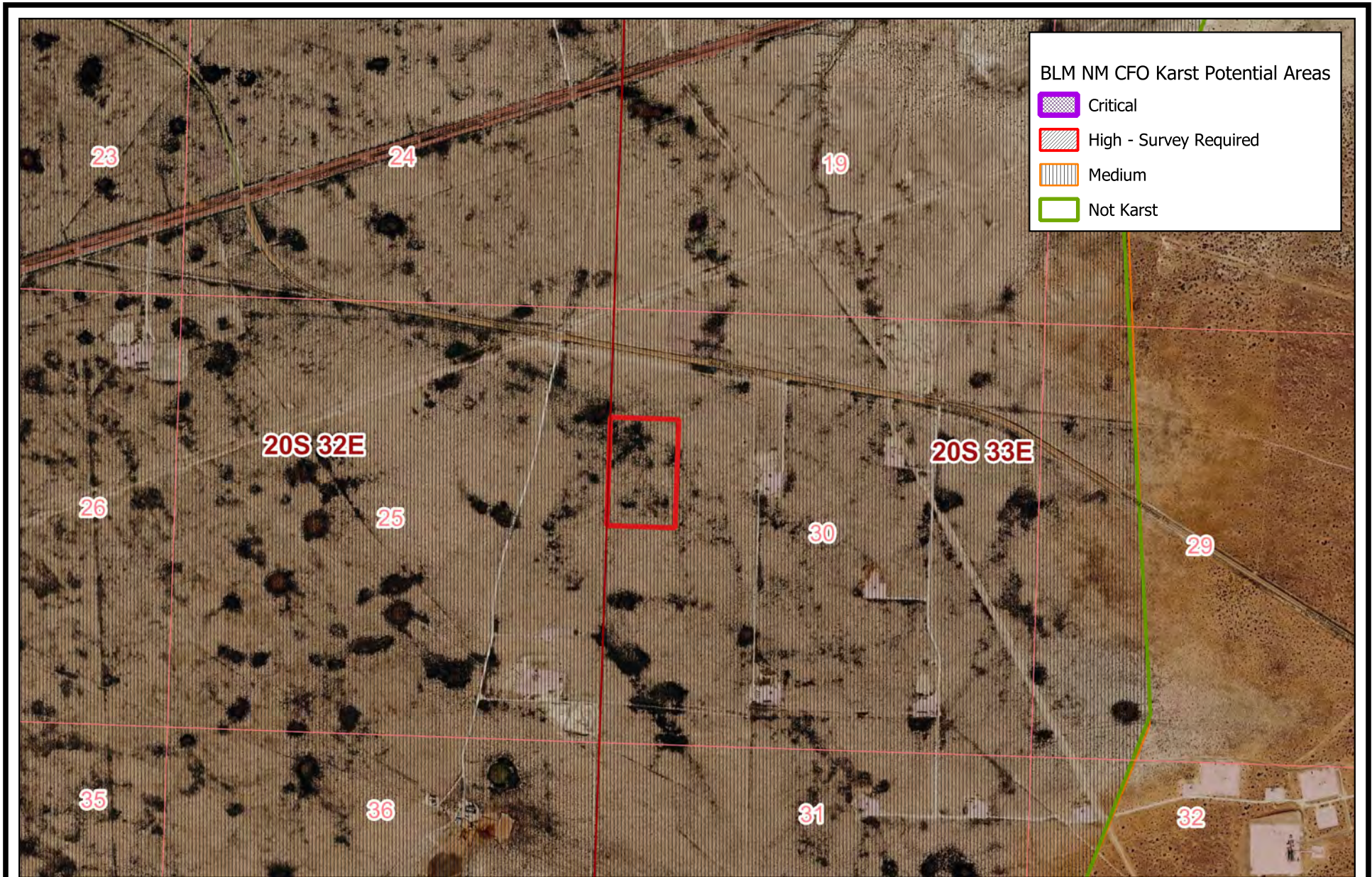
- AOI
- ⚒ EMNRD\_mines\_WM
- 2025 Mine Workings 1/2 Mile Buffer



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



1,000 2,000 ft



Scale 1:20,000



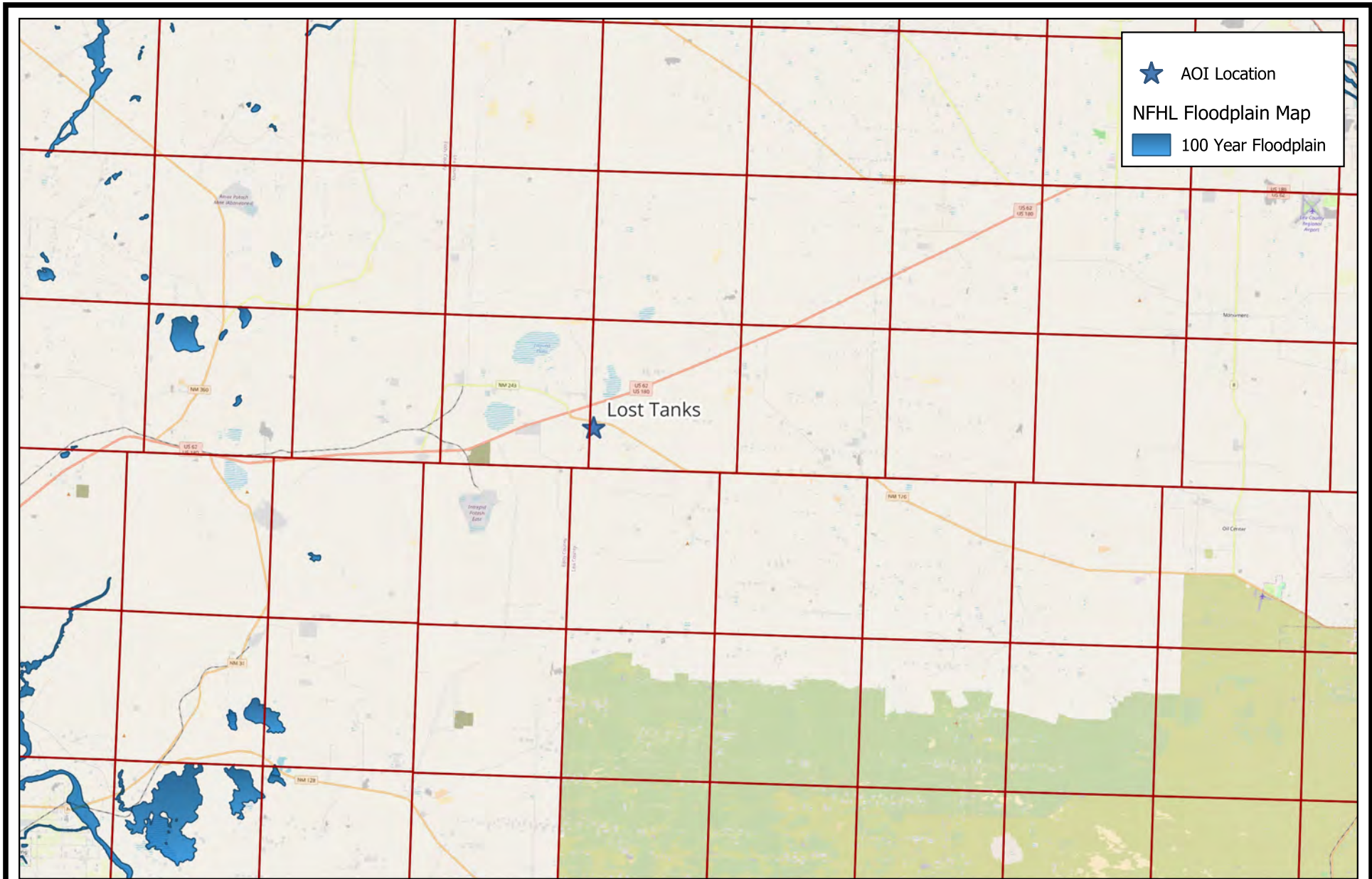
952 Echo Lane, Suite 130  
Houston, Texas 77024

Karst Potential

Plate 4

DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

May 2026



20,000 40,000 ft



Scale 1:350,000



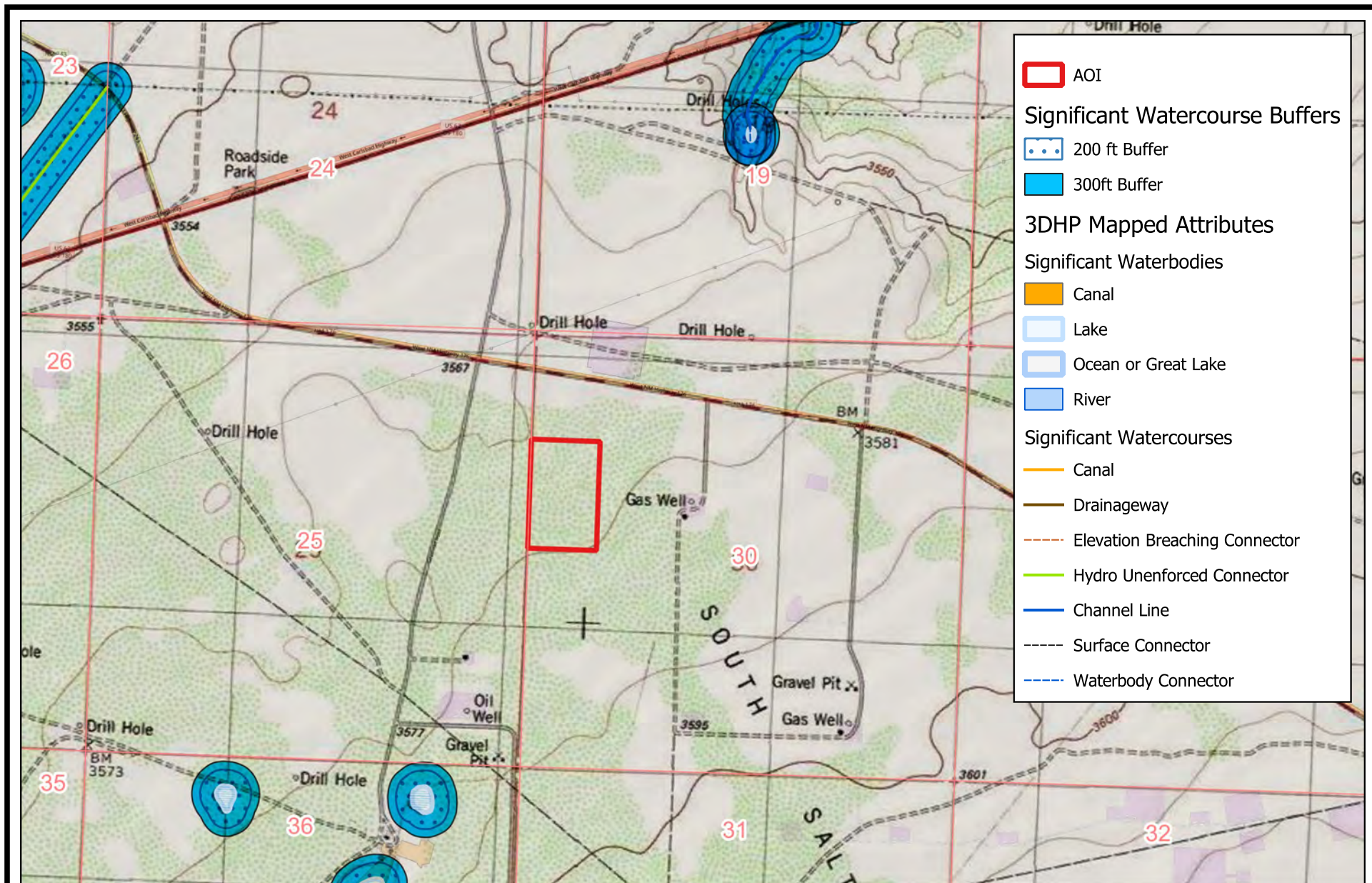
952 Echo Lane, Suite 130  
Houston, Texas 77024

100 Year Floodplain

Plate 5

DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

May 2026



1,000 2,000 ft



Scale 1:20,000



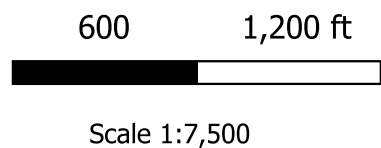
952 Echo Lane, Suite 130  
Houston, Texas 77024

Significant Watercourses and Setbacks

Plate 6

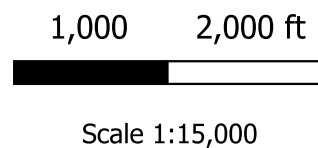
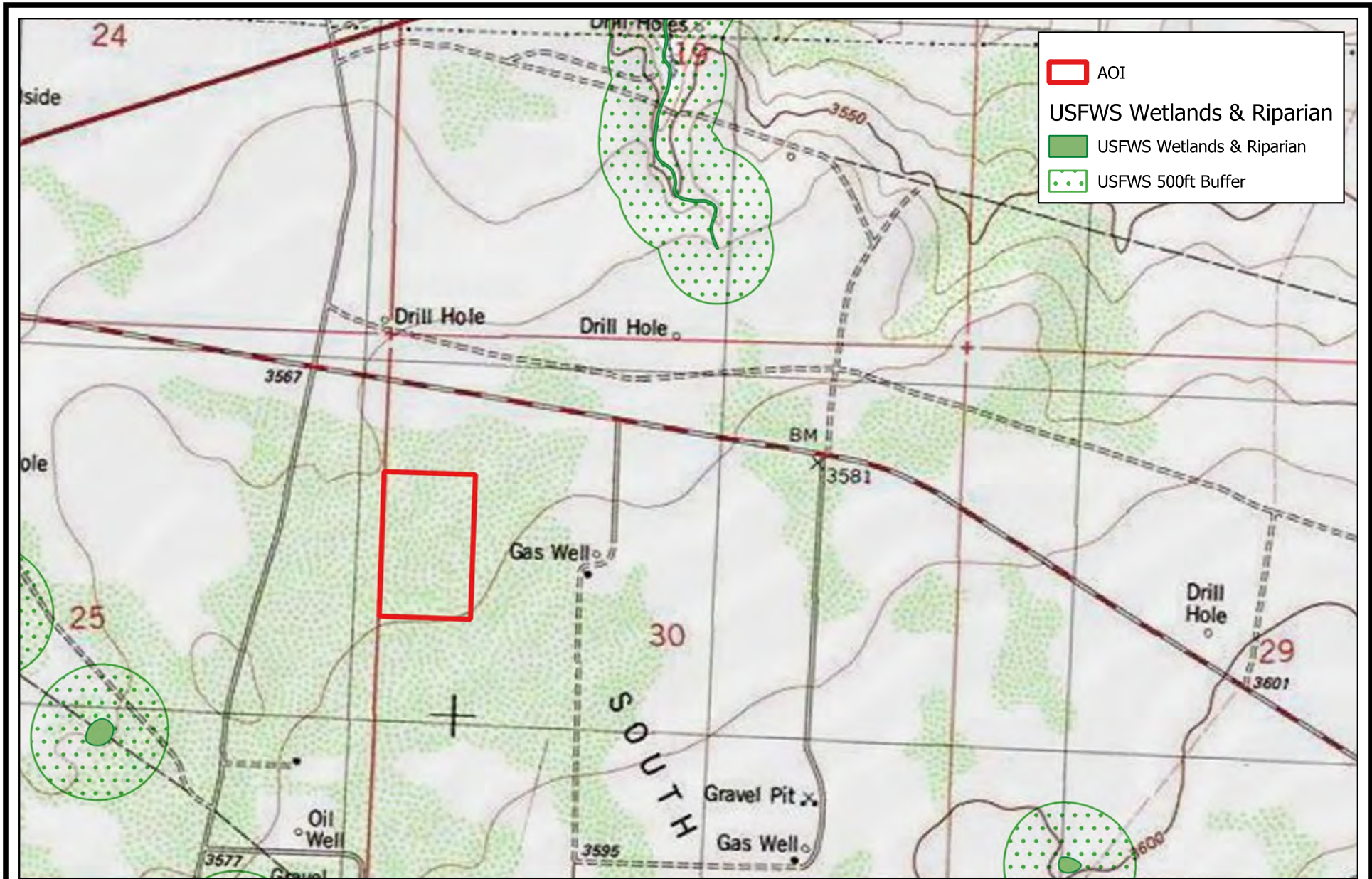
DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

May 2026



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Houston, Texas 77024

Buildings and 1000' setbacks	Plate 7
DEVON ENERGY PRODUCTION COMPANY, LP Lost Tanks West	May 2026



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Houston, Texas 77024

Wetlands and Setbacks

Plate 8

DEVON ENERGY PRODUCTION COMPANY, LP  
Lost Tanks West

May 2026



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## 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/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) 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 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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27 JUN '25 PM1:41

**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)			

OSE DII ROSWELL NM  
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

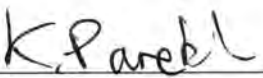
RE: Well Plugging Plan of Operations for well no. CP-2070-POD1

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,

  
\_\_\_\_\_  
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.





# 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

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



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			

OSE DII ROSWELL NM  
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)			

OSE DII ROSWELL NM  
27 JUN '25 PM1:44





**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.





| 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.



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 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

[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

## Conclusions and Recommendations:

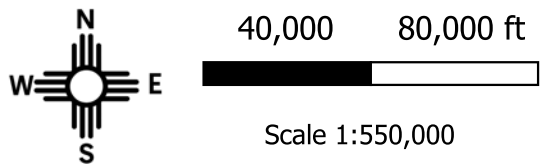
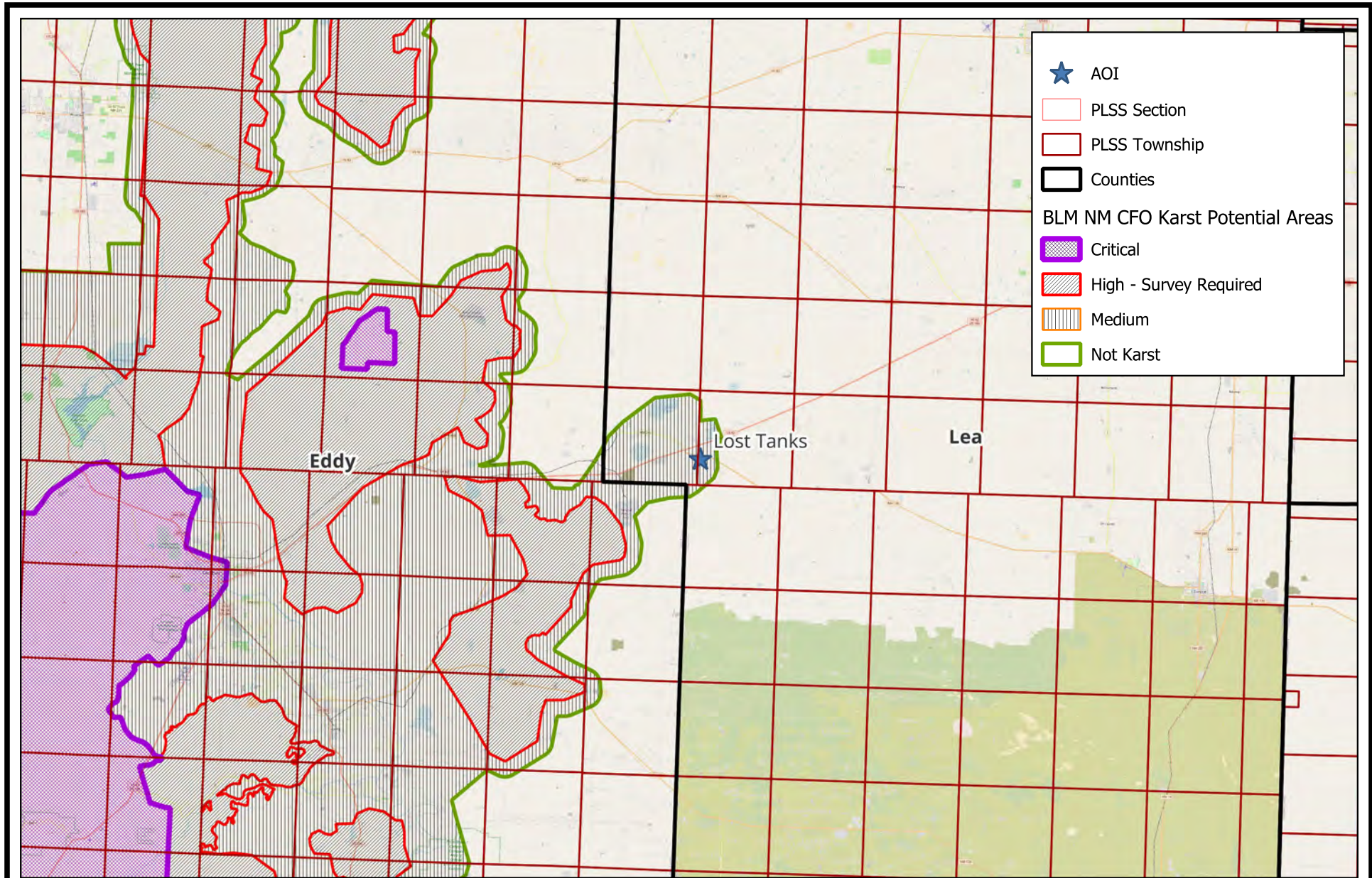
The following recommendations are needed for this CKS area:

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.**

subTerra Consulting  
1055 N, 750 W  
Monroe, UT 84754

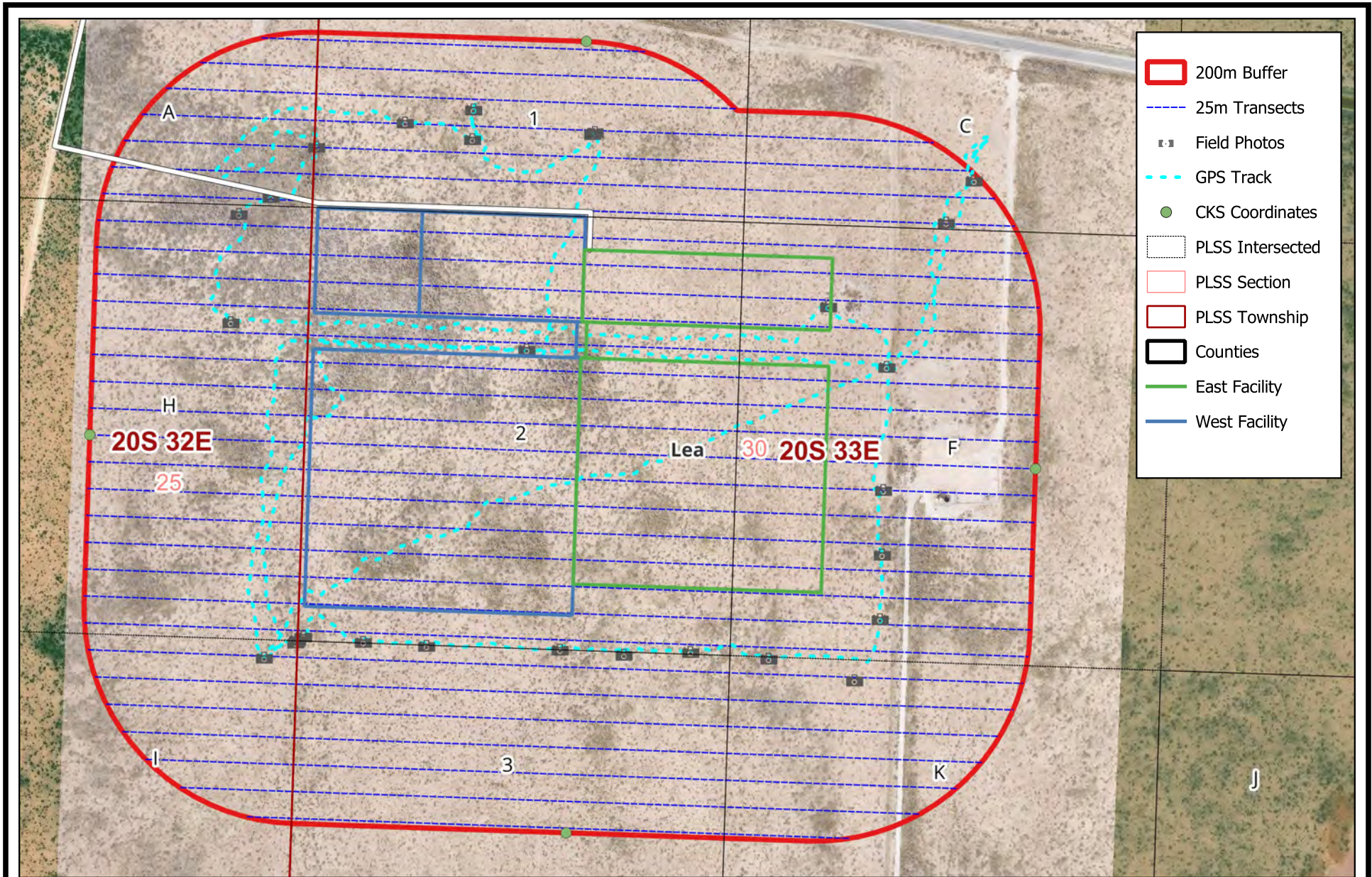
[caver1\\_2001@yahoo.com](mailto:caver1_2001@yahoo.com)  
C: 575-361-1272  
P: 575-361-8636



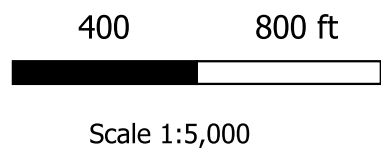
**CASCADE**  
SERVICES

**subTerra Consulting**

Location Map	Plate 1
Devon Energy Lost Tanks West and Lost Tanks East	April 2026



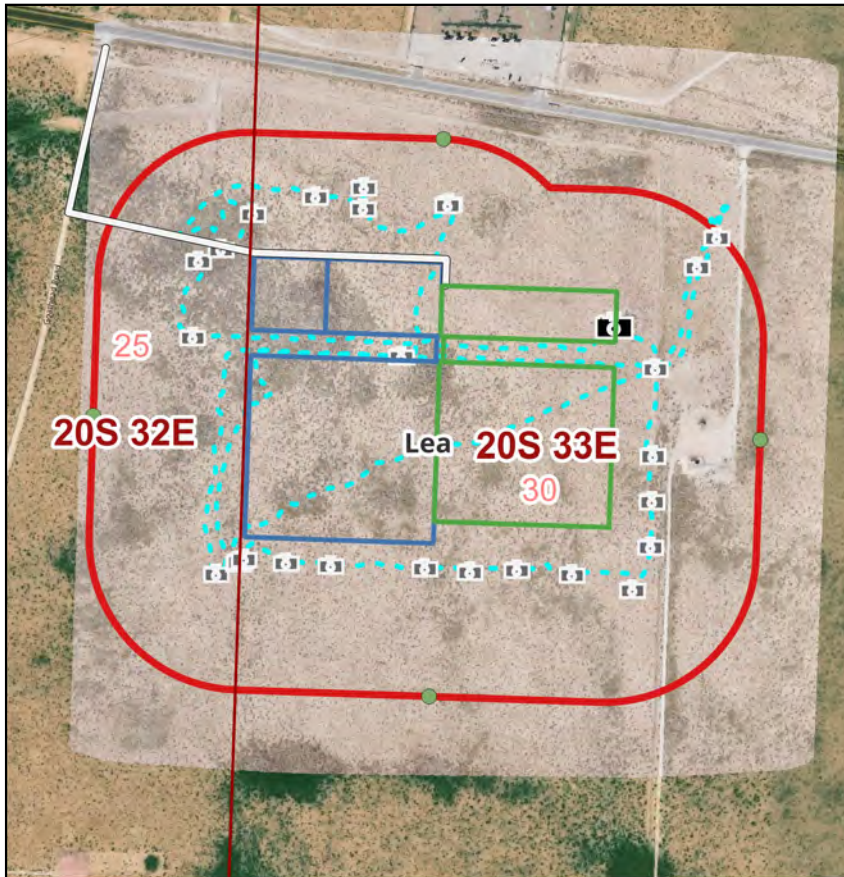
- 200m Buffer
- 25m Transects
- Field Photos
- GPS Track
- CKS Coordinates
- PLSS Intersected
- PLSS Section
- PLSS Township
- Counties
- East Facility
- West Facility



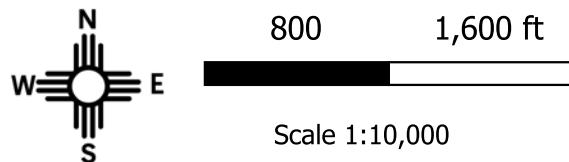
  
**subTerra Consulting**


Cave and Karst Survey (CKS) AOI
Devon Energy Lost Tanks West and Lost Tanks East

Plate 2
April 2026



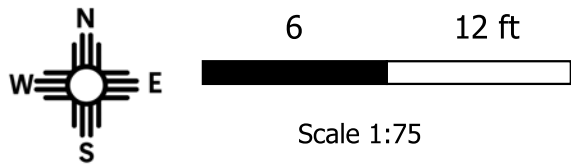
- 200m Buffer
- PLSS Intersected
- East Facility
- Photo Location
- PLSS Section
- West Facility
- GPS Track
- PLSS Township
- Counties
- CKS Coordinates



 <b>subTerra Consulting</b>	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

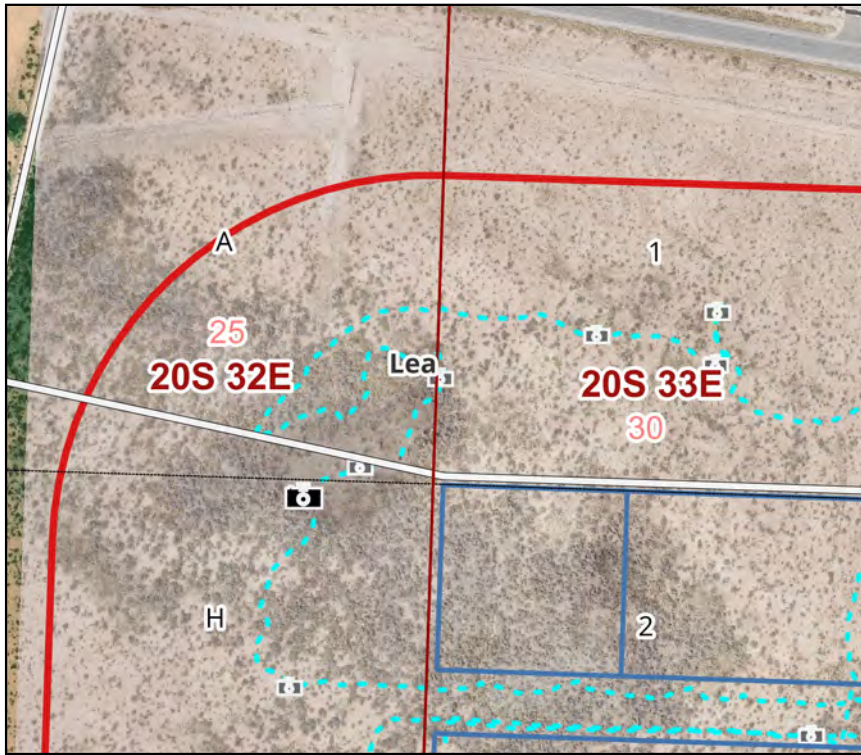


- 200m Buffer
- GPS Track
- Counties
- Field Photos
- CKS Coordinates
- East Facility
- 📷 Photo Location
- PLSS Intersected
- West Facility
- 📷 Other Photos
- PLSS Section
- PLSS Township



  
**subTerra Consulting**

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

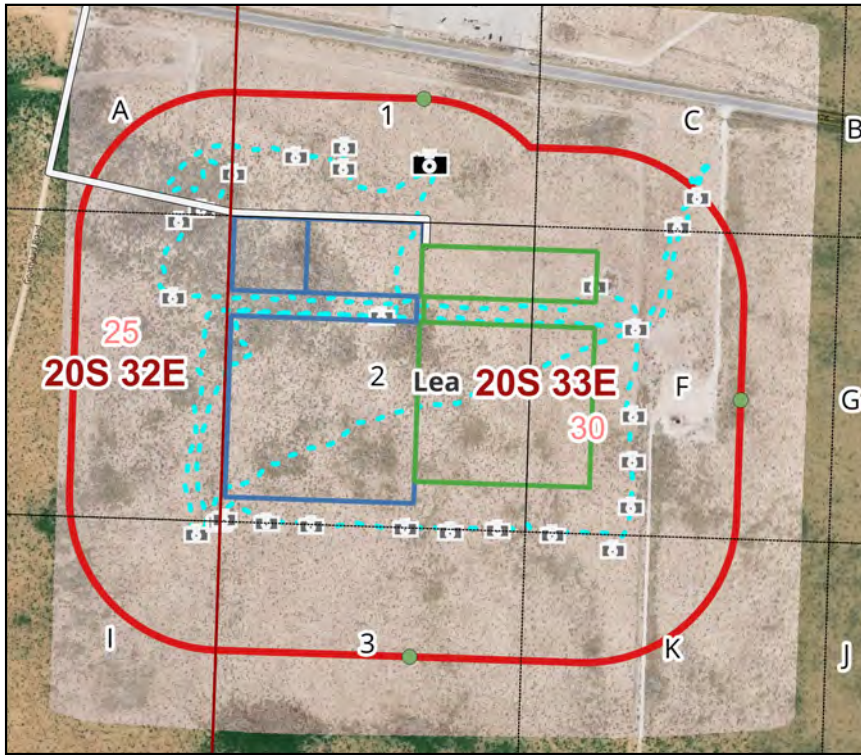


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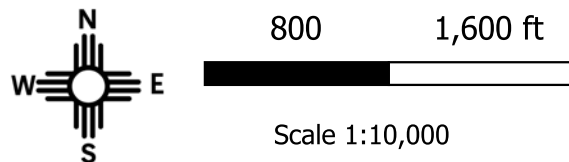
**CASCADE**  
SERVICES


**subTerra Consulting**

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



 <b>subTerra Consulting</b>	Typical terrain of the AOI	Plate 6
	Devon Energy Lost Tanks West and Lost Tanks East	April 2026



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

## Rule 34 Permit

May 2026

## Lost Tanks West AST

Section 30 Township 22S Range 33E, Lea County

### Volume 3

- C-147 and Closure Cost (in Volume 2)
- Design Sketch
- Stamped Design Drawings
- Design and Construction Plan
- AST Set Up SOP
- Operation and Maintenance Plan
- Closure Plan
- Variances and Equivalency Demonstrations



*Photo taken near the pad where the AST will go looking north. Photo represents the predominant vegetation and terrain around where the AST will be located.*

**Prepared for:**  
DEVON ENERGY PRODUCTION COMPANY, LP  
Oklahoma City, Oklahoma

**Prepared by:**  
Cascade Services LLC  
Midland, Texas

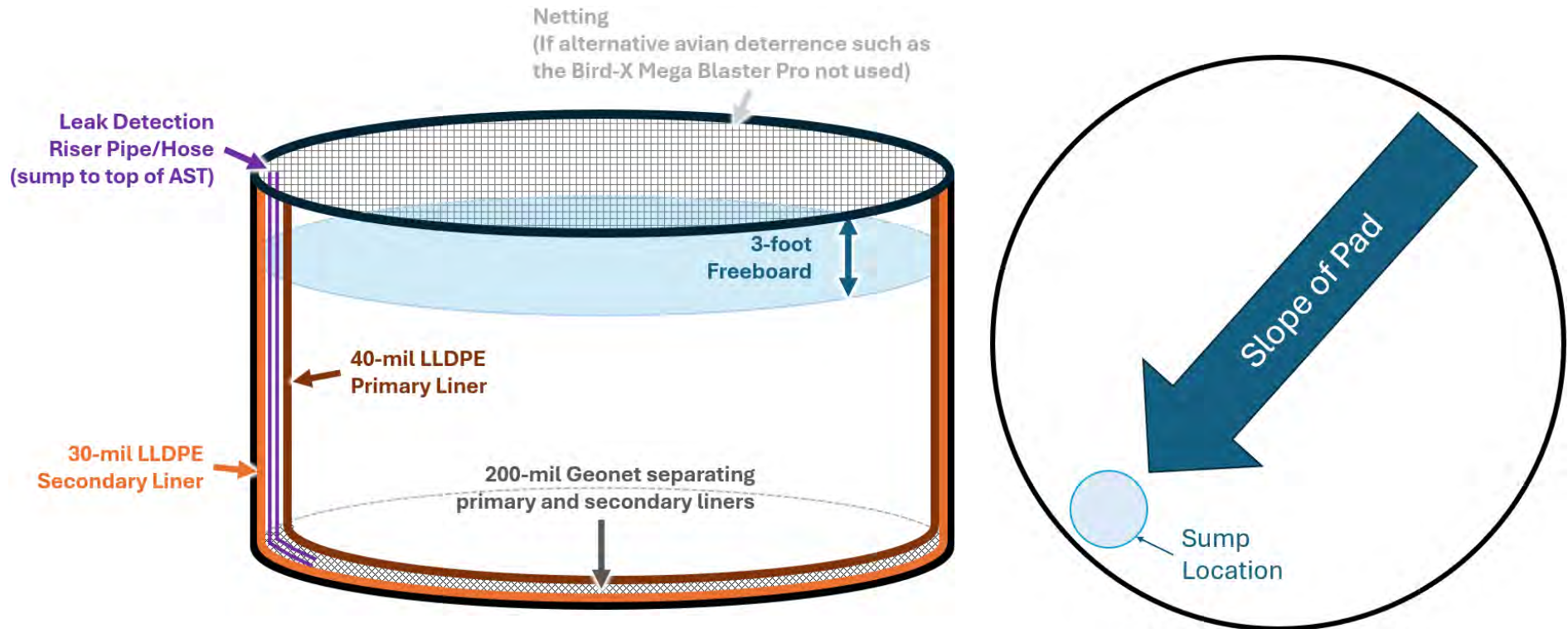


| Cascade Services, LLC | 3403-B E. County Road 44, Midland, TX 79705 |

## Design Sketch



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



## Leak Detection System

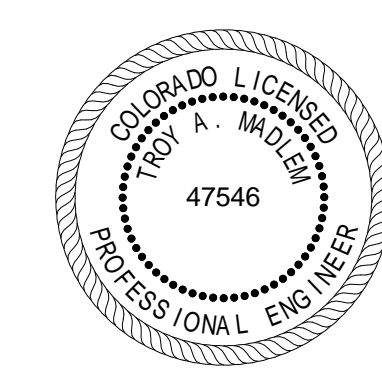
- Primary Liner: 40-mil LLDPE
- Secondary Liner: 30-mil LLDPE
- Leak Detection Drainage Layer: 200-mil Geonet
  - Situated between the Primary and Secondary Liners
- >3-inch sump excavated at the lowest point on the down slope side of the AST (per SOP)
- A small hose or pipe runs from the sump to the top of the AST
- Leak detection system inspected weekly for seepage
  - An appropriate pump is connected to the leak detections system with any discharge returning to the AST (above the Primary Liner)
  - If fluid is detected, samples are taken and the plan outlined in the Operation & Maintenance Section is followed to determine the origin of the water (i.e. produced water vs condensation)



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

## Stamped Design Drawings

# Hydrera Energy Modular Tanks 15P Water Tank (157.480' Dia.)



CERTIFIED BY: Troy A. Madlem, P.E.

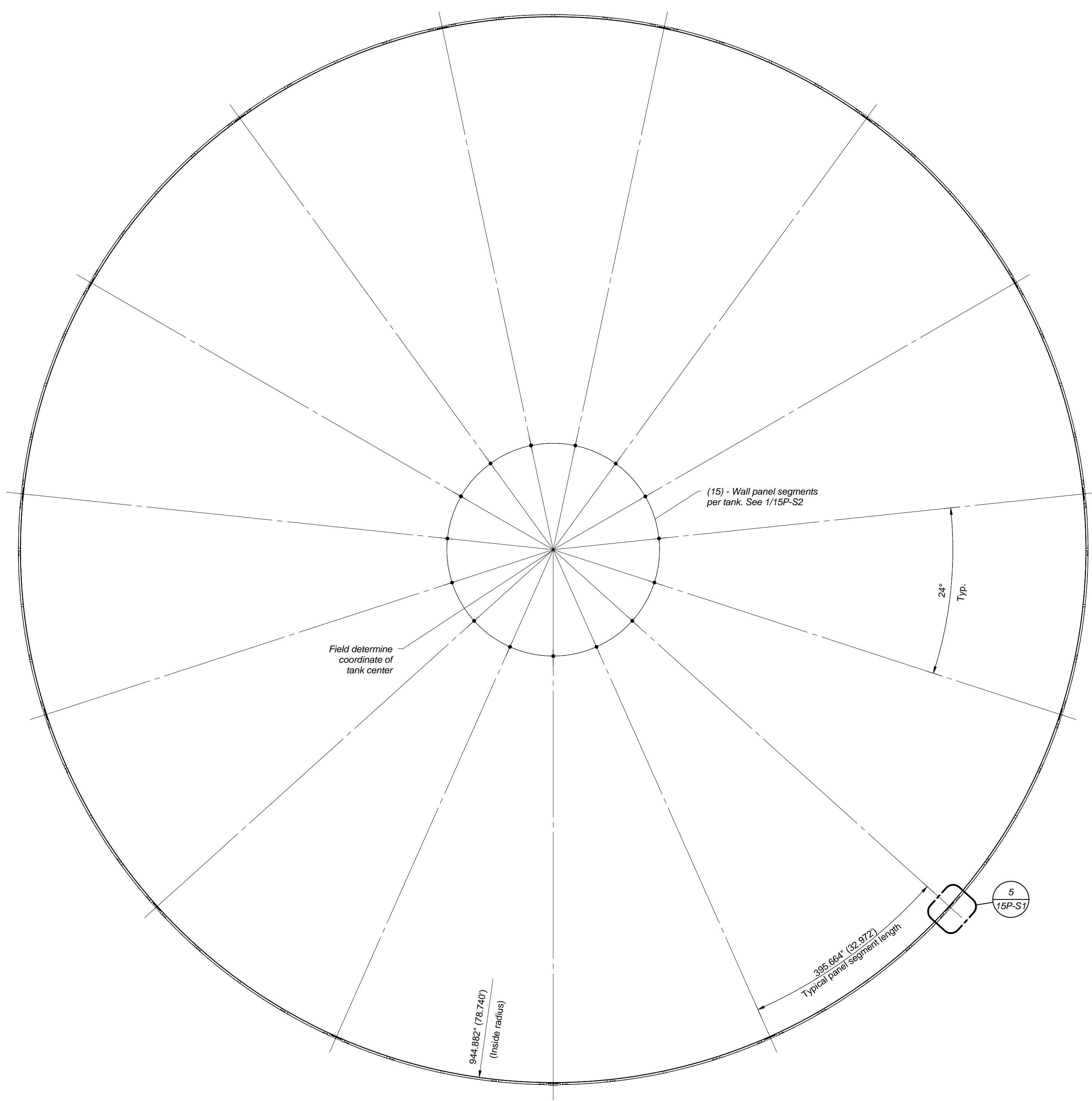
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Revision:

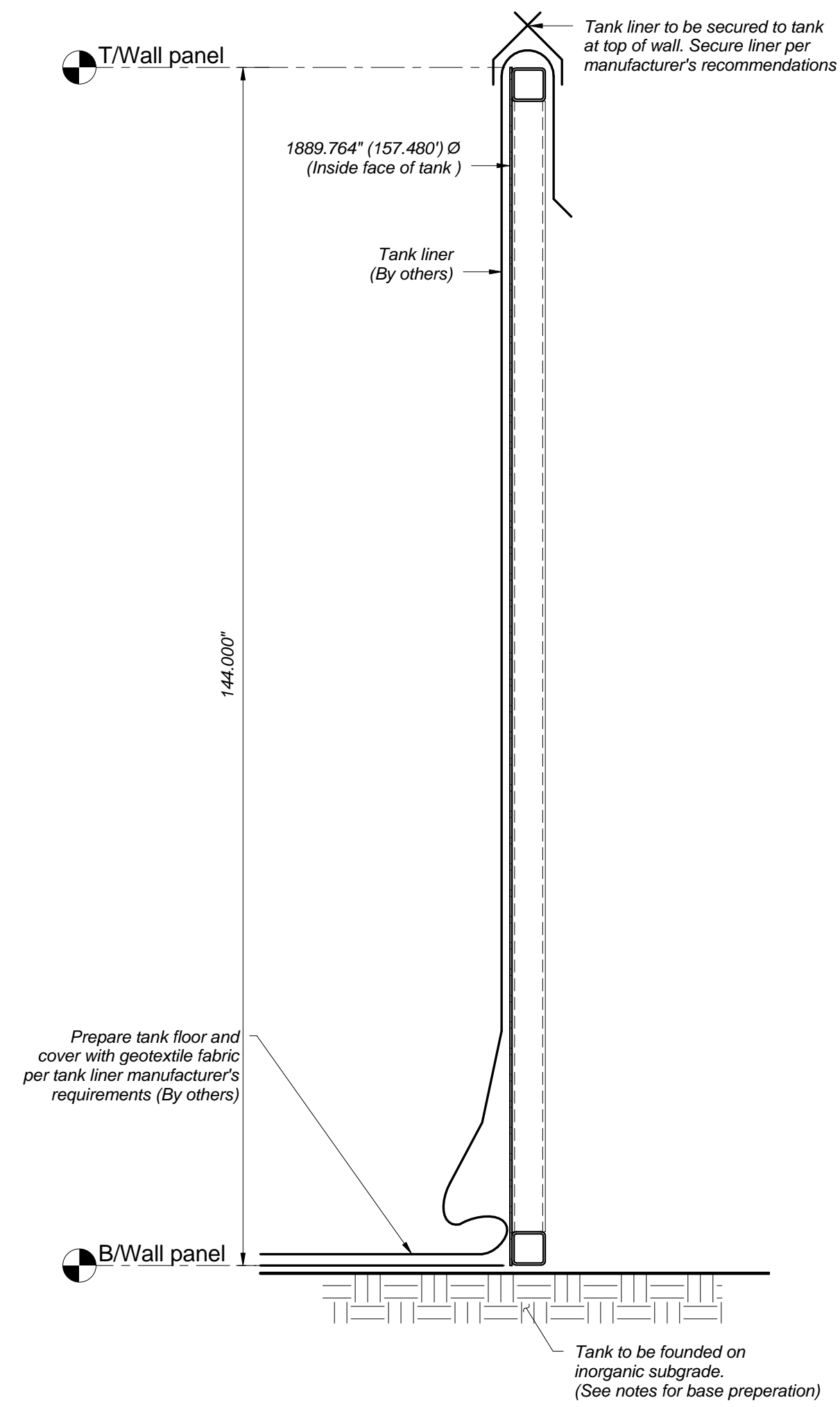
Project: FEC  
Designed: TCM  
Checked: TAM  
Scale: As indicated  
Issue Date: 06/24/13

## Tank Installation & Assembly

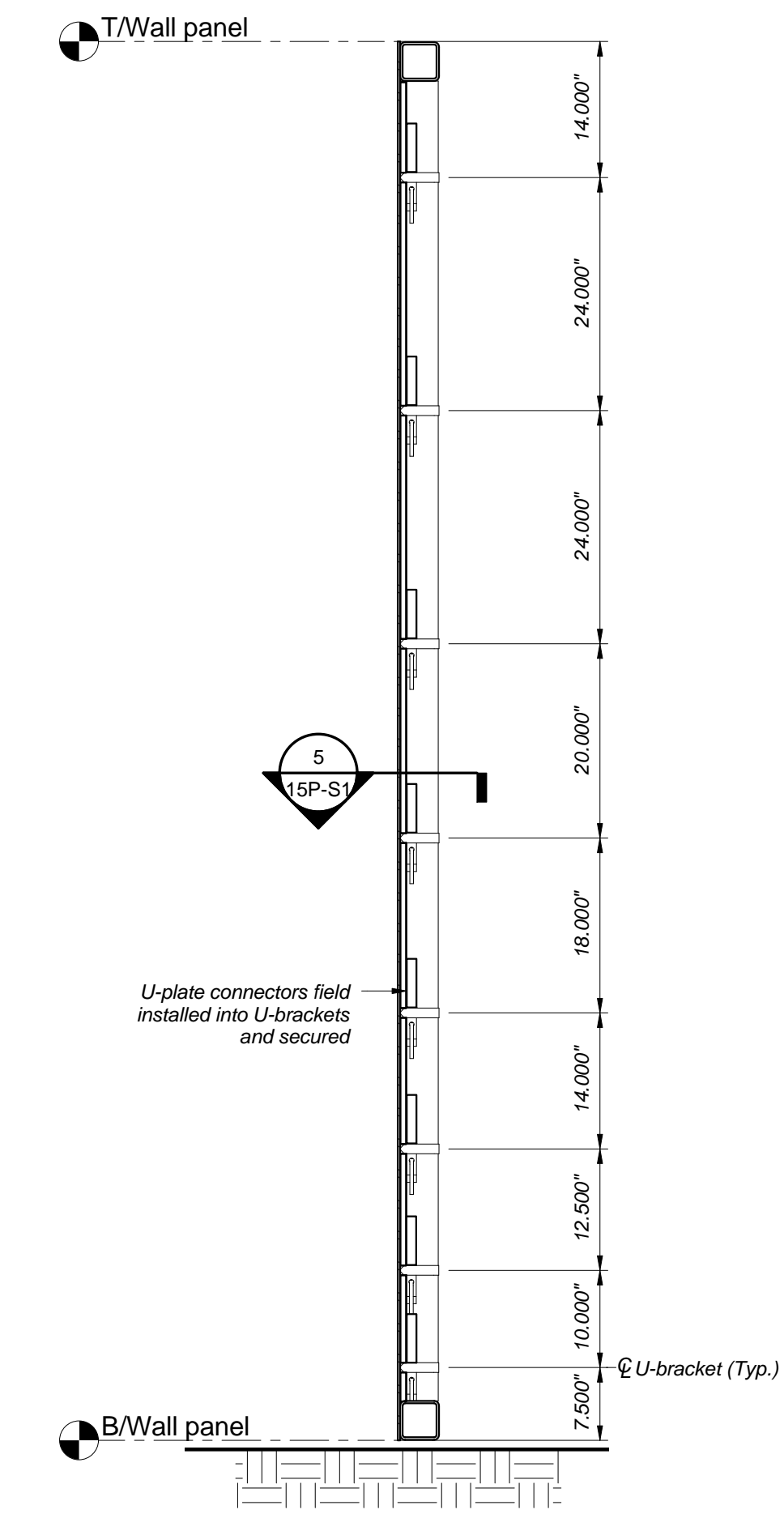
# 15P-S1



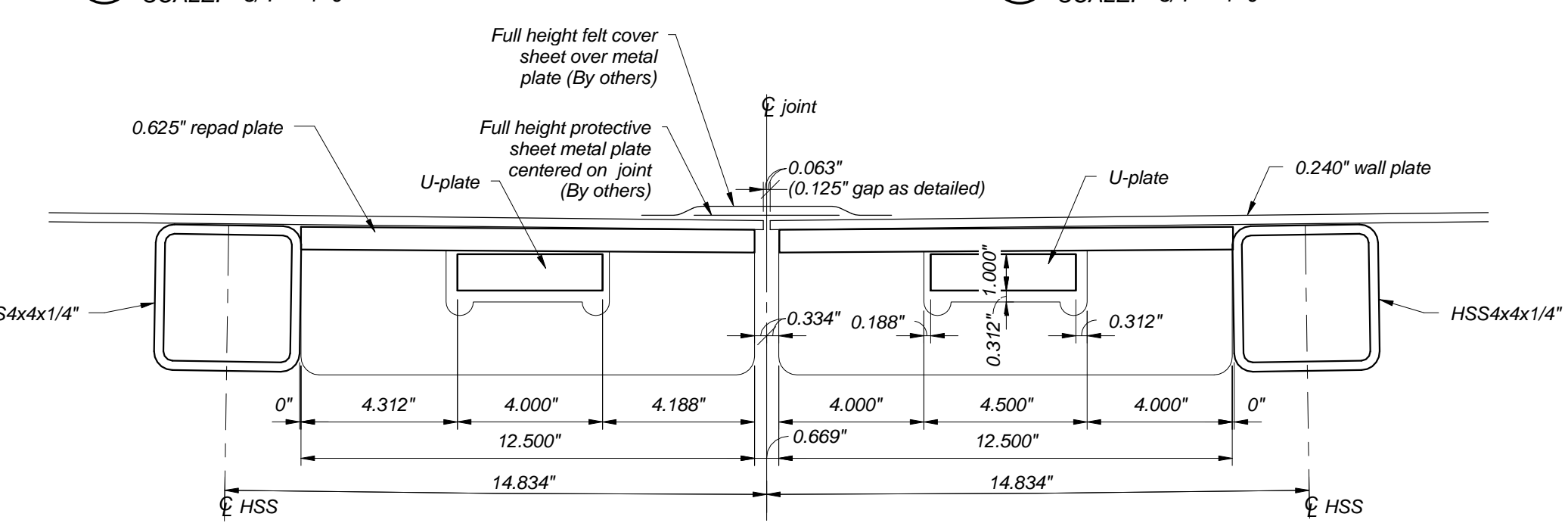
1 Tank Layout Plan  
SCALE: 3/32" = 1'-0"



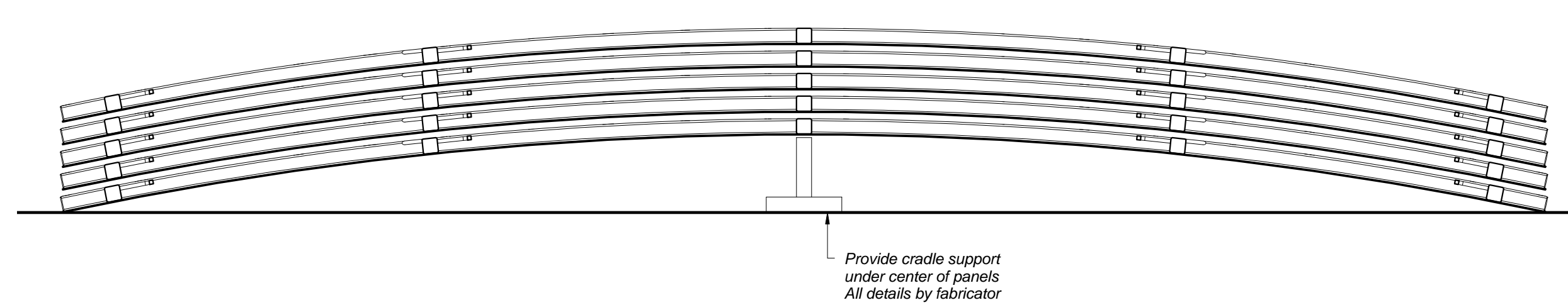
2 Typical Tank Wall Section  
SCALE: 3/4" = 1'-0"



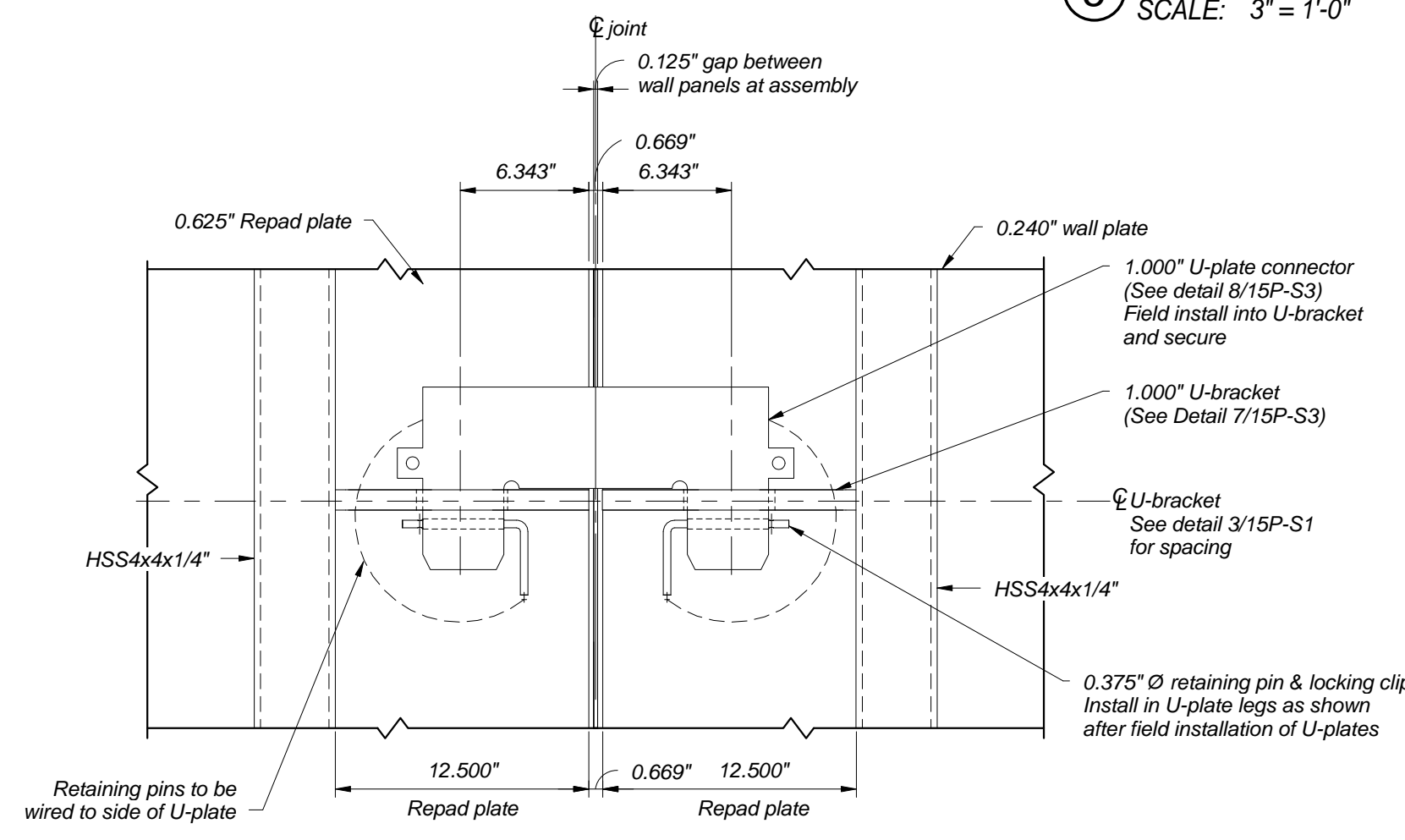
3 Wall Section at Panel Joint  
SCALE: 3/4" = 1'-0"



5 Enlarged Plan Detail  
SCALE: 3" = 1'-0"



4 Transport and Storage Detail  
SCALE: N.T.S.



6 Enlarged Elevation  
SCALE: 1 1/2" = 1'-0"

Notes:

- Contractor is responsible for means and methods of construction during tank erection and disassembly and for the safety of all personnel. All work shall be completed in strict accordance with all state and federal occupational safety and health administration requirements.
- Contractor is responsible for the stability of tank during assembly and disassembly and shall provide shoring as required until the tank is fully assembled or disassembled.
- The Contractor shall ensure all the panels are adequately supported or braced until the entire structure is assembled.
- All topsoil, organics, soft or wet soils, debris or other deleterious materials shall be removed from the tank site.
- The finished grades along the perimeter of the tank shall be level and true to plane. The maximum elevation difference across any two diametrical points shall be less than 9.000".
- The maximum deviation from plane over any 118.00' of circumference shall be less than 0.1875" and less than 0.500" over any 390.000' of circumference.
- The area surrounding the tanks shall be graded to direct surface water away from the tank.
- The edge of any (excavated) sump shall be a minimum of 36.000" from the edge of the tank wall.
- All wall panels shall be erected plumb. The maximum out-of-plumbness of the top of the panel relative to the bottom shall be less than 1.000".
- The maximum deviation from the theoretical radius shall be less than 2.000" at any point along the tank wall.
- The liner shall be securely fastened to the top of each panel in accordance with the liner's manufacturer's recommendations. The liner shall be installed with sufficient slack at the base of the panel to prevent any tension in the liner.
- The vertical lifting bar shall only be used to lift the panels into the vertical position. The lift rigging must be within 12.000" of the top rail prior to lifting the panel.



**Hydrera Energy Modular Tanks**  
**15P Water Tank (157.480' Dia.)**



CERTIFIED BY: Troy A. Madlem, P.E.

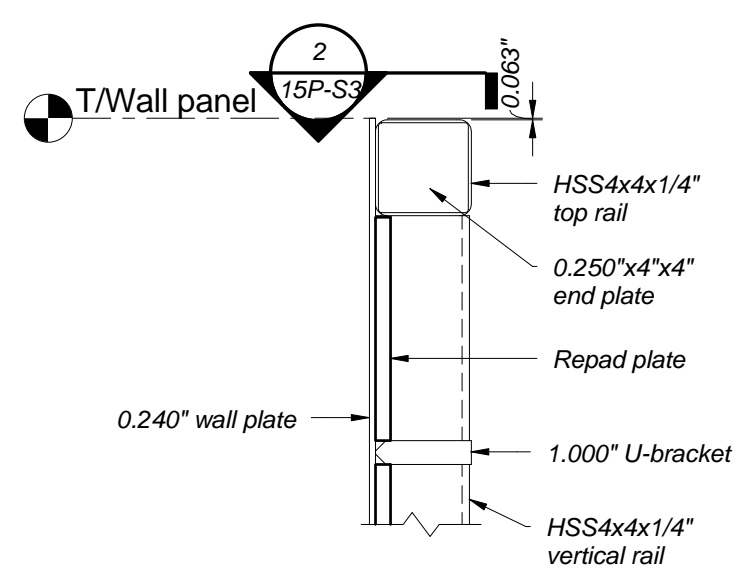
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Revision	Revisions	07/30/13
1		

Project: Design: FEC  
Drawn: TCM  
Checked: TAM  
Scale: As indicated  
Issue Date: 06/24/13

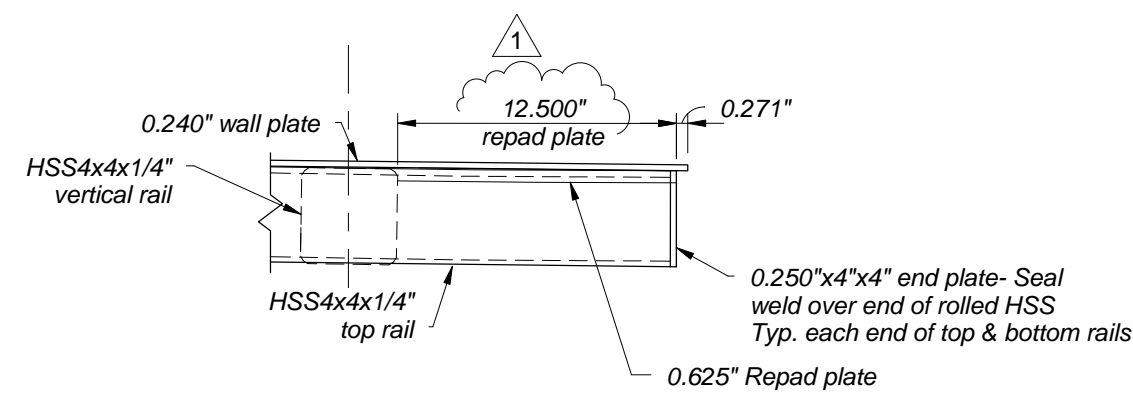
Framing Sections & Details

**15P-S3**

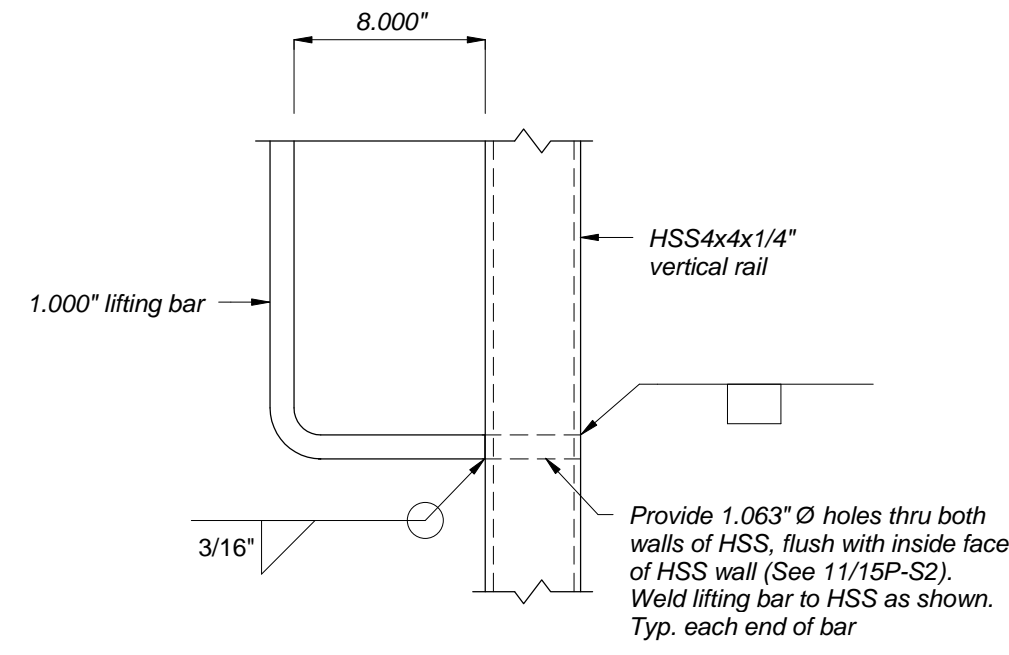


Note: Detail at bottom rail similar.

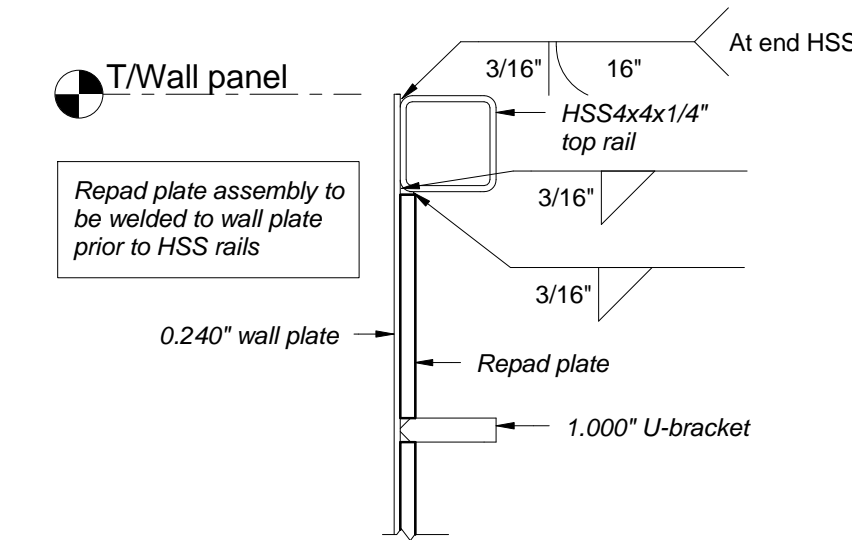
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SCALE: 1 1/2" = 1'-0"



**2 Plan Detail**  
SCALE: 1 1/2" = 1'-0"

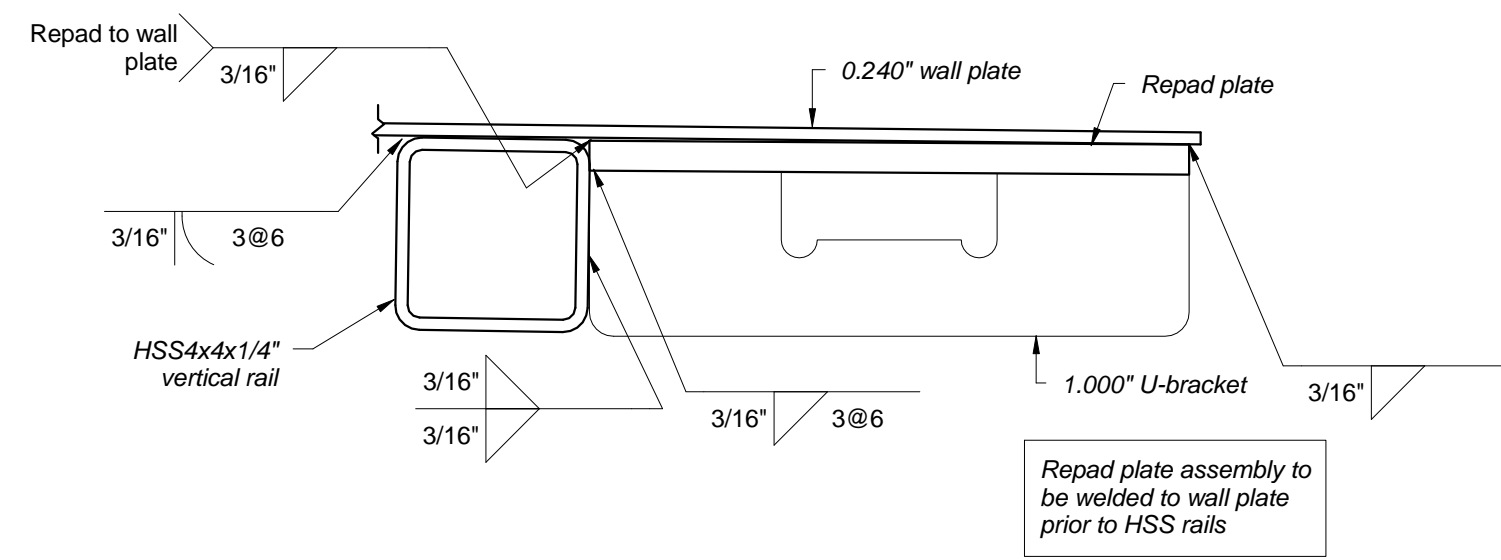


**3 Enlarged Detail**  
SCALE: 1 1/2" = 1'-0"

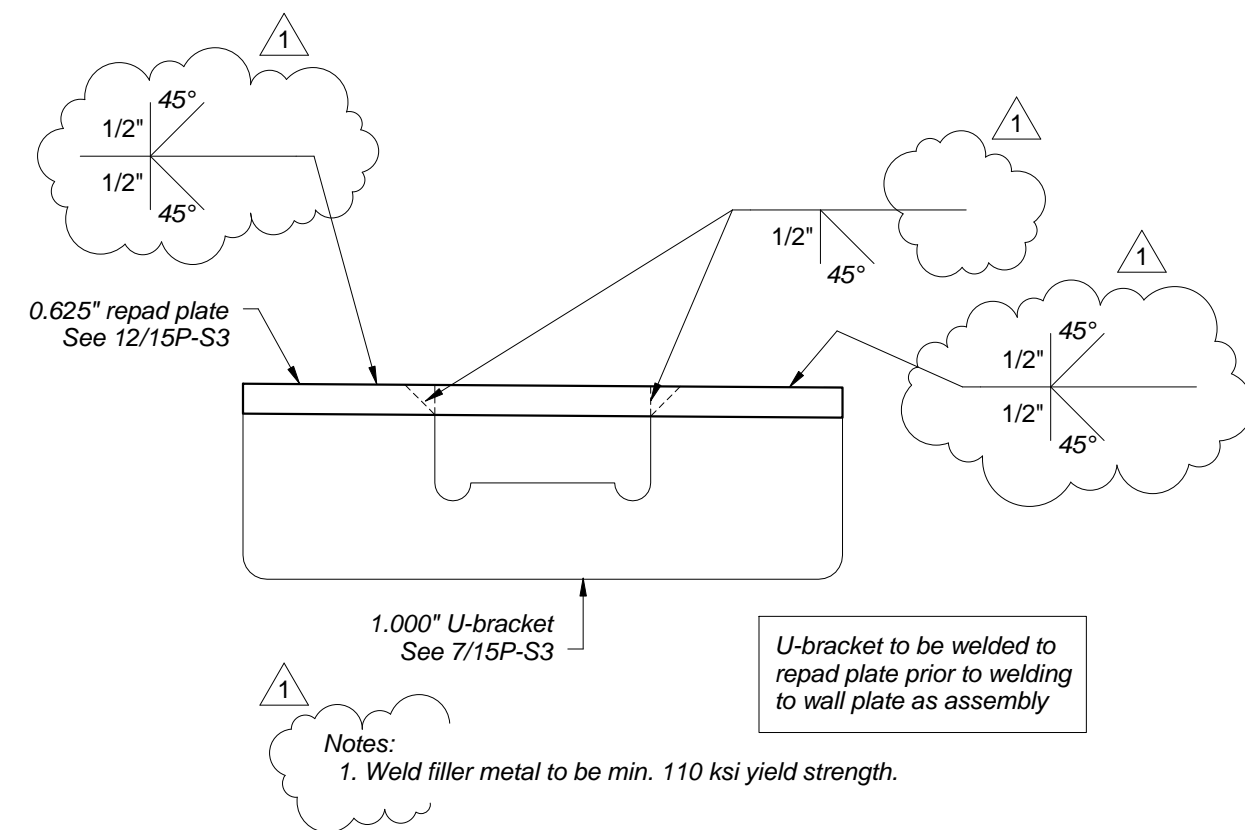


Note: Connection detail at bottom rail similar.

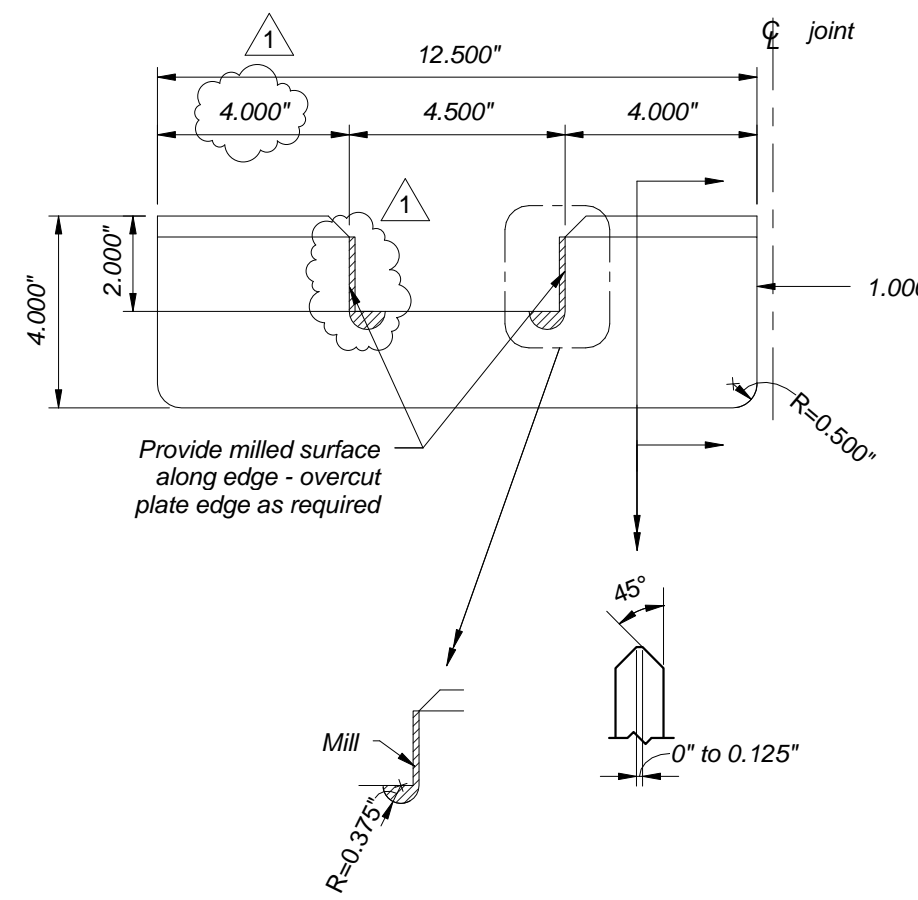
**4 Panel Connection Welds - Section**  
SCALE: 1 1/2" = 1'-0"



**5 Repad Connection**  
SCALE: 3" = 1'-0"

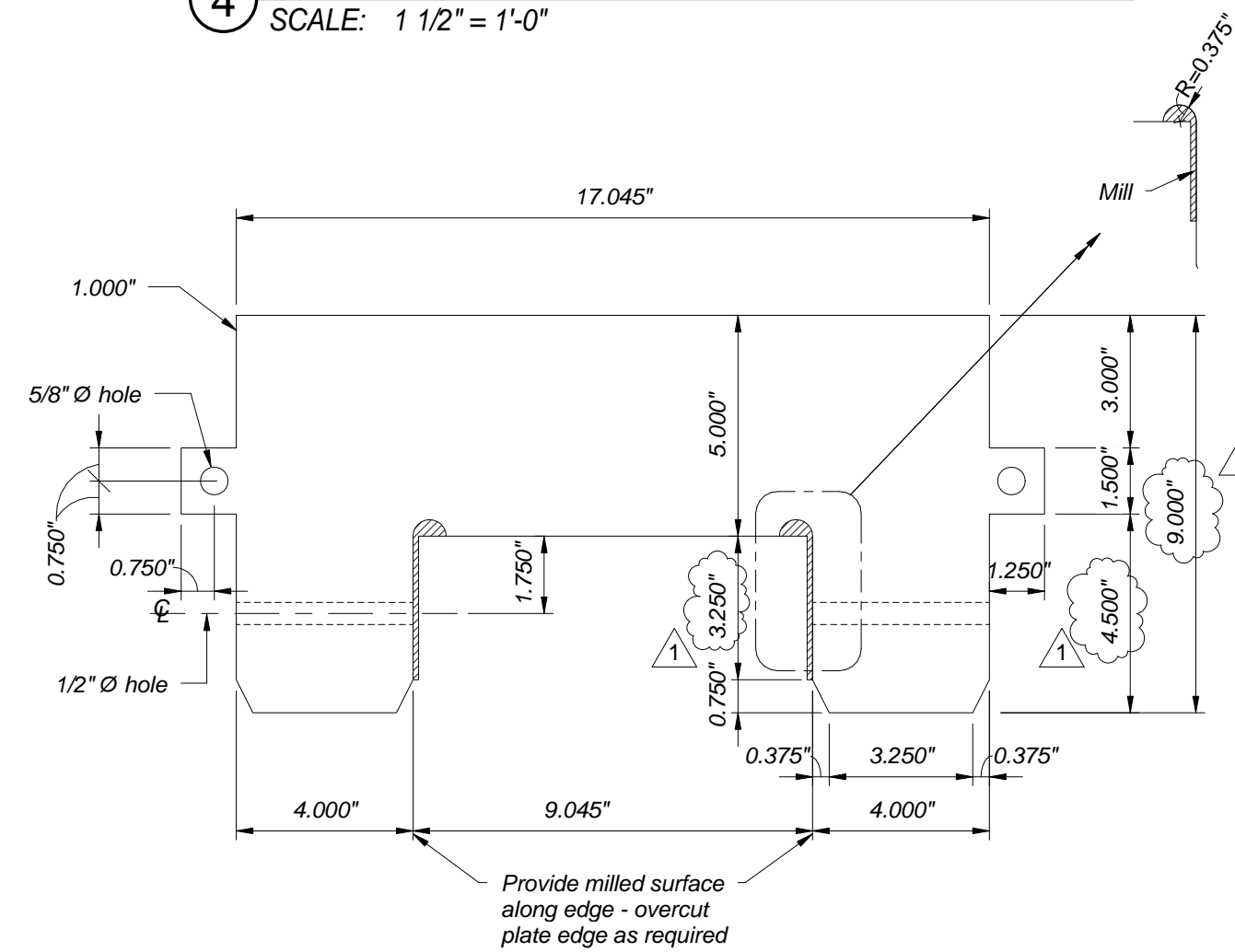


**6 U-Bracket to Repad Connection**  
SCALE: 3" = 1'-0"



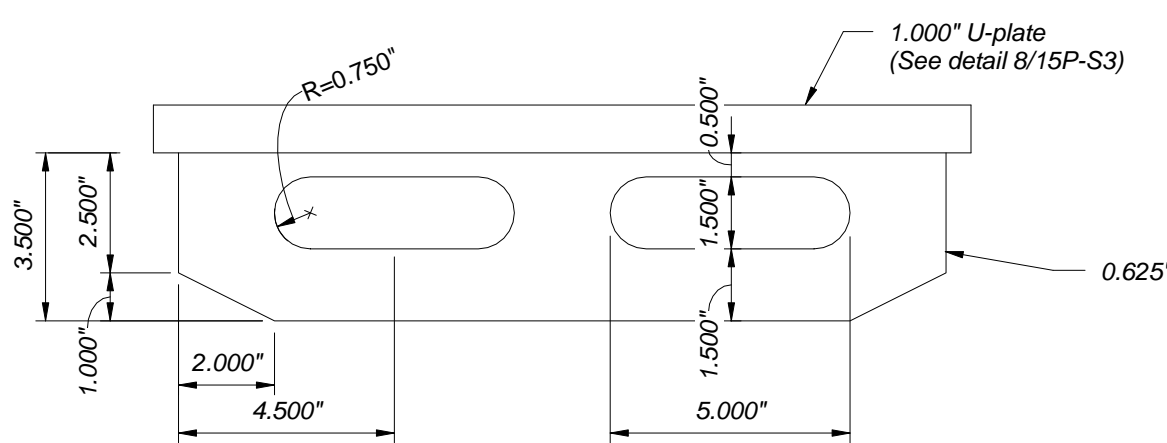
Note: U-bracket shall be ASTM A-514-B w/ min. Fy = 100 ksi.

**7 U-Bracket**  
SCALE: 3" = 1'-0"



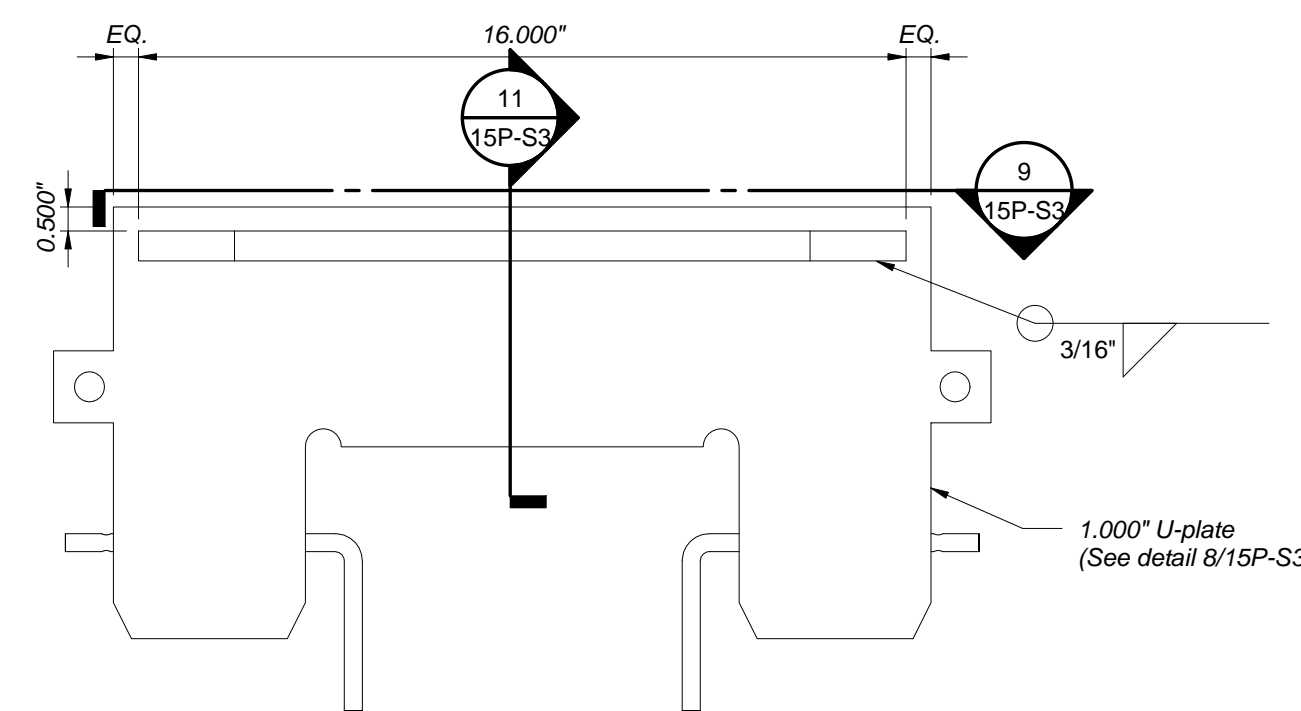
Note: U-plate shall be ASTM A-514-B w/ min. Fy = 100 ksi.

**8 U-Plate**  
SCALE: 3" = 1'-0"

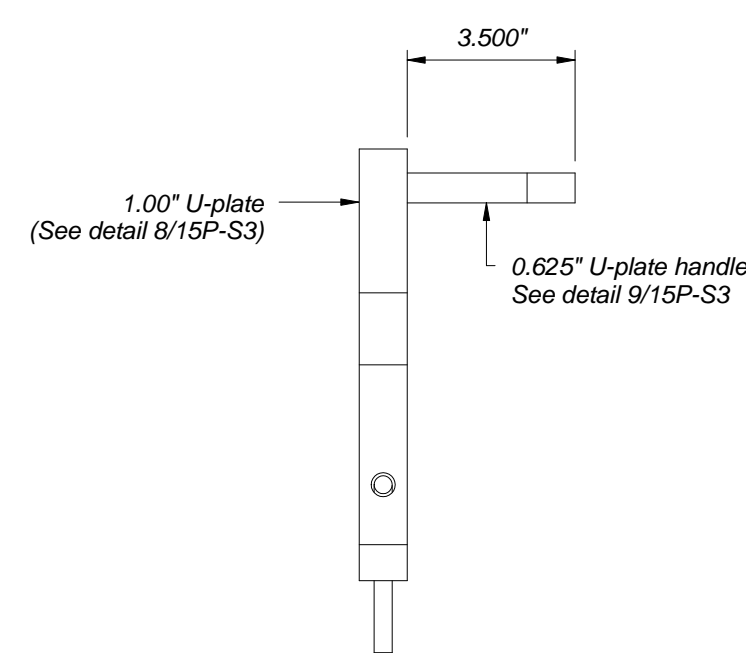


Note: U-plate handle shall be ASTM A-572, Gr. 50 w/ min Fy = 50 ksi.

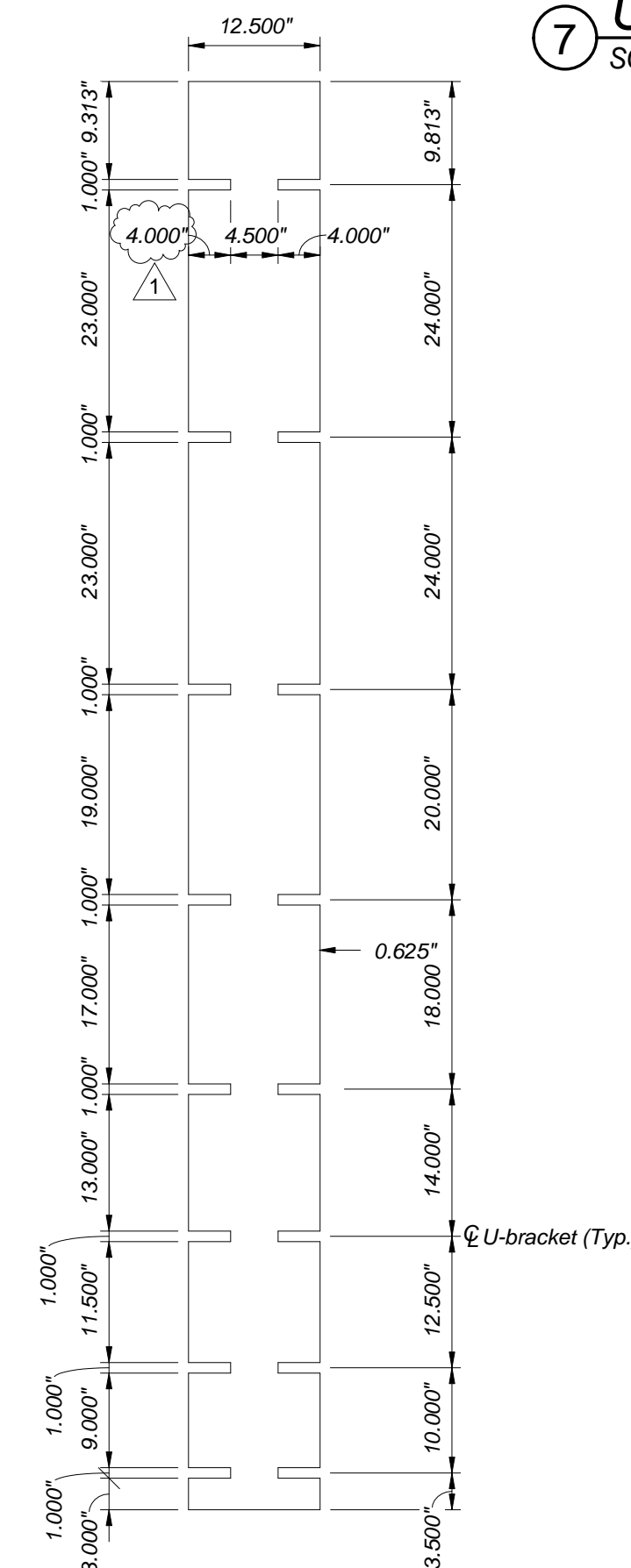
**9 U-Plate Handle**  
SCALE: 3" = 1'-0"



**10 U-Plate w/ Handle Assembly**  
SCALE: 3" = 1'-0"

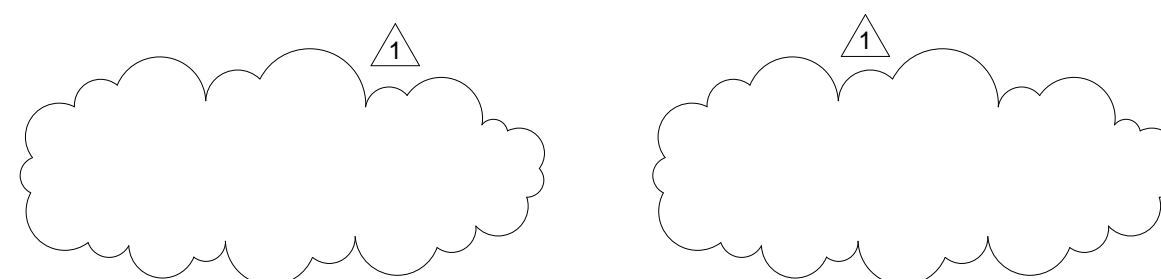


**11 U-Plate Section**  
SCALE: 3" = 1'-0"



Notes:  
1. Repad plate shall be ASTM A-572, Gr. 50 w/ min Fy = 50 ksi.

**12 Repad Elevation**  
SCALE: 3/4" = 1'-0"





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**Geotextile Product Description Sheet  
GT-110  
Nonwoven Geotextile**

GT-110 is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. SKAPS GT-110 resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. SKAPS GT-110 conforms to the physical property values listed below:

**PROPERTY TEST METHOD UNIT  
M.A.R.V.  
(Minimum Average Roll Value)**

Weight (Typical) ASTM D 5261 oz/yd<sup>2</sup> (g/m<sup>2</sup>) 10.0 (339)  
 Grab Tensile ASTM D 4632 lbs (kN) 250 (1.11)  
 Grab Elongation ASTM D 4632 % 50  
 Trapezoid Tear Strength ASTM D 4533 lbs (kN) 100 (0.444)  
 CBR Puncture Resistance ASTM D 6241 lbs (kN) 700 (3.11)  
 Permittivity\* ASTM D 4491 sec.<sup>-1</sup> 1.2  
 Water Flow\* ASTM D 4491 gpm/ft<sup>2</sup> (l/min/m<sup>2</sup>) 80 (3251)  
 AOS\* ASTM D 4751 US Sieve (mm) 100 (0.150)  
 UV Resistance ASTM D 4355 %/hrs 70/500

**PACKAGING**

Roll Dimensions (W x L) – ft. 12.5 x 360 / 15 x 300  
 Square Yards Per Roll 500  
 Estimated Roll Weight – lbs. 320

\* At the time of manufacturing. Handling may change these properties.

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**Made in U.S.A.****U.S. Fabrication & Distribution Centers**

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## TECHNICAL DATA SHEET

### Geomembrane 40mil LLDPE

Property	Test Method	Frequency (A)	Unit Metric	Solmax 140-7000
Thickness (Nominal +/- 10%) (E)	ASTM D 5199	Every roll	mm	1.00
Resin Density	ASTM D 1505	1/Batch	g/cc	<0.926
Melt Index-190/2.16(max)	ASTM D 1238	1/Batch	g/10min	1.0
Sheet Density (C)	ASTM D 1505	Every 2 rolls	g/cc	<0.939
Carbon Black Content (D)	ASTM D 4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	Every 6 rolls	Category	Cat. 1 / Cat. 2
Oxidative Induction Time (min. avg)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg)(B)	ASTM D 6693	Every 2 rolls		
Strength as Break			kN/m	23
Elongation at Break			%	800
2% Modulus (max.)	ASTM D 5323	PerFormulation	kN/m	420
Tear Resistance (min. avg.)	ASTM D 1004	Every 6 rolls	N	85
Puncture Resistance (min. avg.)	ASTM D 4833	Every 6 rolls	N	215
Dimensional Stability	ASTM D 1204	Every 6 rolls	%	+/- 2
Multi-Axial Tensile (min.)	ASTM D 5617	PerFormulation	%	90
Oven Aging-% retained after 90 days	ASTM D 5721	PerFormulation		
STD OIT (min. avg.)	ASTM D 3895		%	35
HP OIT (min. avg.)	ASTM D 5885		%	60
UV Resistance-% retained after 1600 hr	GRI-GM-11	PerFormulation		
HP-OIT (min. avg.)	ASTM D 5885		%	35

**Note;**

- (A) Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).  
 (B) Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.  
 (C) Correlation table is available for ASTM D792 vs. ASTM D1505. Both methods give the same results.  
 (D) Correlation table is available for ASTM D1603 vs. ASTM D4218. Both methods give the same results.  
 (E) The minimum average thickness is +/- 10% of the nominal value.

\*All values are nominal test results, except when specified as minimum of maximum.

\* The information contained herein is provided for reference purposes only and is not intended as warranty of guarantee. Final determination of suitability for use contemplated is the sole responsibility of the user. Solmax along with Inland Tarp & Liner assumes no liability in connection with the use of this information.

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# SKAPS TRANSNET™

## HDPE GEONET TN 220



SKAPS TRANSNET™ geonet consists of SKAPS Geonet made from HDPE resin.

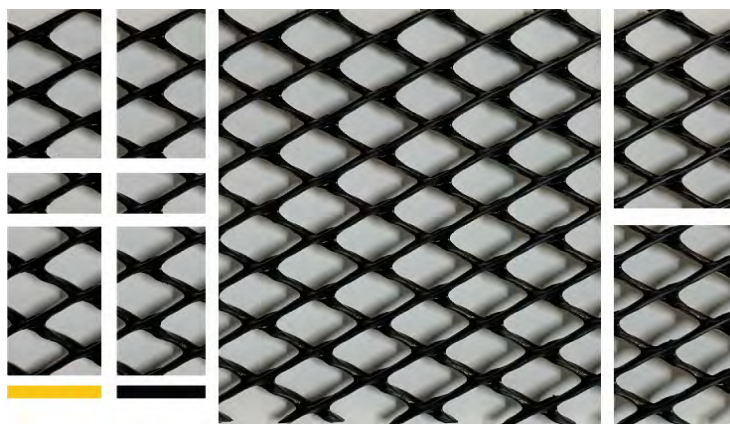
PROPERTY	TEST METHOD	UNIT	VALUE	QUALIFIER
Thickness	ASTM D 5199	mm	5.08	MAV <sup>(3)</sup>
Carbon Black	ASTM D 4218	%	2.0	MAV
Tensile Strength	ASTM D 7179	N/mm	7.87	MAV
Melt Flow	ASTM D 1238 <sup>(2)</sup>	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm <sup>3</sup>	0.94	MAV
Transmissivity <sup>(1)</sup>	ASTM D 4716	m <sup>2</sup> /sec	2.0 x 10 <sup>-3</sup>	MAV

### Notes:

(1) Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 479 kPa between steel plates after 15 minutes. Values may vary with individual labs.

(2) Condition 190/2.16

(3) Minimum average value



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## TECHNICAL DATA SHEET Geomembrane 30mil LLDPE

Property	Test Method	Frequency (A)	Unit Metric	Solmax 130-2000
Thickness (min. avg.)	ASTM D 5199	Every roll	mm	0.75
Thickness (min.)	ASTM D 5199	Every roll	mm	0.68
Resin Density	ASTM D 1505	1/Batch	g/cc	<0.926
Melt Index-190/2.16(max)	ASTM D1238	1/Batch	g/10min	1.0
Sheet Density (C)	ASTM D1505	Every 2 rolls	g/cc	<0.939
Carbon Black Content (D)	ASTM D 4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	Every 6 rolls	Category	Cat. 1 / Cat. 2
Oxidative Induction Time (min. avg)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg)(B)	ASTM D 6693	Every 2 rolls		
Strength as Break			kN/m	20
Elongation at Break			%	750
2% Modulus (max.)	ASTM D 5323	PerFormulation	kN/m	315
Tear Resistance (min. avg.)	ASTM D 1004	Every 6 rolls	N	70
Puncture Resistance (min. avg.)	ASTM D 4833	Every 6 rolls	N	200
Dimensional Stability	ASTM D 1204	Every 6 rolls	%	+/- 2
Multi-Axial Tensile (min.)	ASTM D 5617	PerFormulation	%	90
Oven Aging-% retained after 90 days	ASTM D 5721	PerFormulation		
STD OIT (min. avg.)	ASTM D 3895		%	35
HP OIT (min. avg.)	ASTM D 5885		%	60
UV Resistance-% retained after 1600 hr	GRI-GM-11	PerFormulation		
HP-OIT (min. avg.)	ASTM D 5885		%	35

Note;

(A) Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).

(B) Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.

(C) Correlation table is available for ASTM D792 vs. ASTM D1505. Both methods give the same results.

(D) Correlation table is available for ASTM D1603 vs. ASTM D4218. Both methods give the same results.

\*All values are nominal test results, except when specified as minimum of maximum.

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## Design and Construction Plan

## Design and Construction Plan

Above-Ground Storage Tanks (AST's) have a solid history of performance when designed and assembled correctly. The Design and Construction Plan and the Standard Operating Procedure (SOP) presented in the subsequent section demonstrate best practices to ensure the spirit and letter of NMAC 19.15.34 are followed. Because NMAC 19.15.34 is specifically tailored to in-ground produced water recycling facilities, several variances are requested to account for the design of ASTs, which utilize engineered vertical steel walls instead of sloped embankments and do not allow for installation of an anchor trench.

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

### Site Preparation

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

#### Foundation & Slopes:

- The leak detection system will be placed at the low point of the AST as determined by the pad slope. See attached design sketch.
- Firm, smooth base free of rocks/debris to protect liner.
- Because AST's are designed to have vertical walls, *a variance is requested for the part of 19.15.34.12 A (2) which requires inside levee slopes to be  $\geq 2H:1V$  and outside slopes to be  $\geq 3H:1V$ . Additionally, a variance is requested for the part of 19.15.34.12 A (2) which requires that "The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection 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:

- The engineered walls of the AST act as a berm to "prevent run-on of surface water" into the containment.

#### 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.

## Design and Construction Plan

### Liners & Leak Detection

#### Liner Requirements:

- Minimum: **Primary (upper) liner, Secondary (lower) liner, and leak detection system.**

#### Liner Specs:

- Primary: **40-mil LLDPE** (as previously approved).
- Secondary: **30-mil LLDPE** (as previously approved).
- Liners have a hydraulic conductivity no greater than  $1 \times 10^{-9}$  cm/sec and meet or exceed EPA SW-846 Method 9090A compatibility.
- See Engineered Drawings Section for Specs.

#### 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 at the low point based on pad slope 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:

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.

### Topsoil Stockpiling

- Strip and stockpile topsoil for closure cover if the pad is a new construction.

(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.

(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

The AST containment structure is constructed of steel walls approximately 11 feet in height, which fully enclose the containment in a manner that deters terrestrial wildlife. As such, the steel structure satisfies the enclosure requirements of Rule 34. See the variance section below.

In the spirit and letter of rule 19.15.34.12 D (1), the operator may 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”.

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

### Wildlife Protection

The AST containment structure is constructed of steel walls approximately 11 feet in height, which fully enclose the containment in a manner that deters terrestrial wildlife. As such, the steel structure satisfies the enclosure requirements of Rule 34. See the variance section below.

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.

#### 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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## Above Ground Storage Tank Set Up

## Standard Operating Procedure (SOP)

# AST Set Up SOP

Above Ground Storage Tank - Standard Operating Procedure

## 1. Planning for an AST Project

Achieving the efficient deployment, installation and removal of an AST lies in our ability to effectively plan for each phase of the project. Engagement of the proper personnel from each company involved and discussing the essential planning categories as listed below will increase the opportunity to achieve an incident-free, desired result.

- a. Essential Planning Steps:
  - b. Request for Quote
  - c. Pre-Order and Deployment Requirements
  - d. Ground Preparation
  - e. Pre-Assembly Requirements

### a. Request for Quote

Discussing and obtaining the following details is essential in building accurate AST project pricing.

1. Total Fluid Storage (barrels. or gallons) and Free-board Requirements
2. Anticipated Install Date and Rental Duration
3. Location GPS Coordinates or Physical Address
4. Location Size, Adequacy or Restrictions
5. Type of Fluid Being Stored and Material Package Strategy (liner mil thickness, single or double lined)
6. Accessory(ies) Strategy (Fill Piping, Suction Piping/Drain, Bird Netting, Lid, Leak Detection)
7. On-Site Orientation(s), Specific Certification(s), and Training Required to Gain Clearance to Access Location
8. Initial Fill Strategy (source, availability of fluid, fill rate, turn-around time for trucks)
9. Site Access Restrictions

### b. Pre-Order and Deployment Requirements

Once pricing has been submitted and accepted by the customer, a PO must be obtained from the customer prior to placing an order for the material package or accessories. Only thereafter should the project coordination be set into motion and scheduled.

Pre-Deployment Discussion:

## AST Set Up SOP

A meeting with the customer should be held prior to the tank and/or crew deployment for installation or removal. The below should be used as a guidance for the customer meeting prior to installation:

- AST Delivery and Installation Schedule
- Confirmation of Proper Ground Preparation
- Adequate Clearances Around the Tank for Crew and Equipment - 25' or greater around perimeter of tank
- Standard Equipment or Crane Installation Confirmation
- Strategy to pin the floor of the tank (fresh water, source type, fill rate, etc.)
- Customer roles/responsibilities/contact information including customer's project manager, key on site staff, and EHS staff.
- Review AST intended use and customer safety requirements.
- Review AST accessories required (fill lines, suction, egress, etc.)
- Site access and truck route requirements
- Crew start and stop time requirements or limitations.
- Forecast rental duration.
- Confirm AST size to be deployed.
- 2' minimum fluid requirement in AST always
- Conditions that could result in standby time charges or additional charges, and what prior customer approvals are required.
- Rental Start Date Strategy
- Rental End Date Strategy
- AST component storage on-site while tank is in operation.

### c. Ground Preparation

Preparation of the soil and location is required to form a dependable base for the AST. This base is also imperative in achieving the proper operation of the AST once fluid is introduced - Proper seating of the liner on the floor of the tank; Adequate, ongoing suction of the stored fluid; Favorable draining/"bottoming-out" of the tank at the end of the project.

\*Preparation of the soil and location is the sole responsibility of the customer. Ensuring proper slope and compaction prior to AST installation is the sole responsibility of the customer.

*Location preparation requirements are as follows:*

- Use laser level to grade pad to within one inch, up and down.

## AST Set Up SOP

- Confirm that there is 25' of clearance around the parameter of the tank, based on the diameter of the specific AST being installed.
- Use center pin, tape measure and marking paint to mark the diameter of the tank on the pad as per measurement chart.
- Check area for sharp objects, rocks, or any other potential hazards to the liner.
- Speak with the consultant to determine where the suction will be located and mark out where the “Y” trench will be situated.
- The suction branch of the “Y” trench should be at least twelve inches (12”) deep with the depth tapering out to six at center and level at the two other points of the “Y” trench.
- Ensure the start of the suction trench is at least three feet from the edge of the tank and the ends of “Y” trench are 10 feet from the edge.

### *Soil preparation requirements are as follows:*

- A minimum soil compaction of 95% compaction. Soil testing results are normally shared with the installation Supervisor or Field Operations Manager.

\*Soil compaction testing to be conducted via Standard Proctor Test (American Society for Testing and Materials {ASTM} Standard D698) or Modified Proctor Test (ASTM Standard D1557).

### *CALL BEFORE YOU DIG - 811*

\*It is the responsibility of the excavating company to ensure 811 - Call Before You Dig has been notified and proper clearances obtained prior to digging sump.

### *Installation Crew:*

The installation crew may have basic equipment on-site to double check that location is graded to within one inch, up and down, however does not have access to compaction testing equipment or methods. It is good practice for the installation crew to check location grade and confirm compaction testing results prior to installing the AST.

\*Inadequate ground preparation should be documented and discussed with the customer and project halted until ground preparation is complete per SOP.

## **d. Pre-Assembly Requirements**

Prior to starting the assembly process, use the steps below as guidance to achieve an incident free, efficient installation of the tank, while meeting customer and SOP requirements:

1. Conduct Job Safety Analysis

## AST Set Up SOP

2. All 3rd party personnel, sub-contractors, customers, end user representatives, and tank operators (if available) are encouraged to participate in JSA and/or pre-job meetings.
3. Inspect location/soil conditions and review compaction test results with customer.
4. If applicable, installation crew to check grade using a laser level - document slope in inches around parameter of tank.
5. Confirm a 30' clear work area around the perimeter of the tank is possible to provide access for equipment and lay-down area for AST materials and installation equipment.
6. Check that the minimum distances to existing wells, power lines, etc. are met.
7. Establish final location for the suction tube and stairs.
8. Confirm trash bin is available to dispose of packaging, cut-off materials and installation garbage.
9. Confirm that fluid is available, per initial fill strategy, to seat the floor of the tank at the desired time.

### *Standard Equipment:*

All equipment is subject to daily inspection. (Check condition, rigging, oil, water, fuel and cleanliness.) The below represents a list of the recommended, standard equipment required for assembly of the tank.

- Two (2) - 40' extending straight boom man-lifts.
- One (1) - 12,000 lb. capacity extending boom, rough terrain powered telehandler.
- One (1) - 310 backhoe or comparable.

## AST Set Up SOP

### Hand and Power Tools:

- Two extension ladders
- One Push and one house broom
- One Paint wand
- One 24" pipe wrench
- One 36" pipe wrench
- Two 4 lb. sledgehammers
- 100' and 300' tape measure
- Set of wrenches ¼" – 1 ½"
- Set of deep impact sockets ¼" – 1 ½" (3/4" drive)
- Two 36" pry bars
- 8' Dig/Frost Bar
- Two round nose shovels
- Four safety harnesses with retractable lanyards
- 300' of 3/8" rope
- Self-retracting utility knife (one per Installer)
- One 3/4" drive impact
- Patch tape, Rubbing alcohol, Patch Roller
- Wire brush
- Crescent and channel lock wrench set
- Little Giant 2,000 lb. wagon

### Rigging:

- Two tag lines
- Four 4" x 4" x 2' blocks
- Four-way chain sling
- Four 3/8" x 2' cable slings
- Four - 10' continuous loop slings (yellow)
- 2 - 1-1/4" shackles
- 4 - 3/4" shackles
- 1 - 10,000 lb. swivel
- 1 - 4" x 15' schedule 80 pipe with eyelets

### Consumables:

- Three cans of orange marking paint
- PB Blaster or Lubricant
- Gorilla tape
- Zip ties

## 2. AST Installation Process

### Laying Out the Tank:

1. Establish the center of the tank with a sandbag. This will be used to determine the tank's perimeter using model/size specific radius/diameter, using paint wand and marking paint. In addition, the center of the tank will be identifiable after the geo ground pad and liner have been rolled out as well.
2. Measure and paint perimeter circle for tank panels and measure where geo and liner(s) will begin and end including width.
3. Measure and paint where the sump or bottom drain is to be set.

## AST Set Up SOP

4. Once layout is complete, confirm minimum distances are met for on-site hazards - existing wells, power lines, production equipment, etc.

### Sump or Bottom Drain Excavation:

1. 811 must be called, with confirmation that all utilities have responded to the request before excavation commences.
2. Sump or bottom drain should be excavated on the low side of location, using a backhoe or excavator.
3. If multiple suctions are required, a minimum of 8' of separation should be placed in-between excavations.
4. Barricade any excavation with cones and tape if left unattended overnight.
5. Excavation will vary depending on what type of suction is to be installed (candy cane, bottom drain, etc.)

### Geo Ground Pad and Liner Installation:

1. All sharp objects are to be removed from inside the tank layout (rocks, sticks, debris, roots, etc.)
2. Using a 12,000# telehandler, approved rigging and liner bar, unroll the geo ground pad, placing the edge of the roll on the designated geo ground pad line marked during the layout stage. Unroll from one end of the tank to the other using a spotter, to unroll over the center of the tank.
3. Per prefabricated design, unfold the geo ground pad in both directions and pull until centered on the tank floor.
4. Steps #2 and #3 should be repeated as to roll-out and unfold the primary liner, using the designated liner marked during the layout stage.
  - a. Follow double lined AST SOP for installation of multiple liners.
5. Perform a visual inspection of the liner. If defects are found, document, take photos and repair. Take post repair photos.
6. If a bird net is required set the bird net, stands, and cables on liner. Make sure stands have protective covering on base to ensure no damage to liner is done.
7. Starting at the sump and moving counterclockwise, fold the liner inward around perimeter. The liner edge should be pulled inside the painted tank wall no less than 2'.
8. Next, holding onto the inner most edge of the liner, fold the liner back over itself, toward the outside of the tank and around the entire perimeter (creating a pocket for fluid to be trapped, eliminating escape from the floor of the tank)

## AST Set Up SOP

\*It is critical that customer and regulatory requirements are met when storing flowback, production, waste or treated fluid

\*Geo and/or liner should not be installed in winds of 15 mph or more

Sand or Geotextile Transition: Enough sand or geotextile should be placed in the ground to wall transition, around the inside perimeter of the AST to achieve a 1:1 transitional slope.

### Standing Panels (Building Tank Walls):

1. Using a 12,000# telehandler and approved rigging, begin standing panels per AST engineering requirement or forecast wind direction (if applicable)
2. Once the first panel is stood, with cribbing blocks installed under each end, use a backhoe or excavator to hold and secure the panel, allowing the telehandler to safely disconnect from the panel without losing stability or securement. The equipment used should remain connected until enough panels are installed to safely stand on their own (varies per tank size and panel engineering)
3. Establish which direction the walls will be stood up and stand one panel at a time until the last seam is joined together, ensuring a 1:1 transitional slope of sand or geotextile is installed at each panel's interior base.

### Note:

- Spotters should be used while connecting panel seams (ladder use, falling objects, moving equipment, etc.)
- Two taglines are to be used when transporting each panel from their stacked state to upright position/installation.
- Rigging should be inspected with each lift to ensure the safe handling of the suspended load.
- Pre-cut strips of 10 oz. geotextile should be installed on the inside of each seam to protect the liner from sharp edges.

### Liner Placement and Clamp Installation:

1. Unfold the liner in sections, toward the base of each panel, ensuring that the transitional material is installed properly.
2. After liner is pulled toward the base of the panel, a two-man crew in a 40' straight boom on the outside of the tank works with the team members inside the tank to begin pulling the liner edge up and over the top of each panel. The man lift crew lifts the liner edge using ropes attached by the inside crew. The man boom crew lifts a small liner section to the top of the panel and folds it over the top of the panel, while

## AST Set Up SOP

the crew inside the tank ensures that there is enough slack in the liner inside the panel wall (typically 1' of slack).

3. Once a section of liner is positioned properly (with liner slack inside the tank) and over the top of each panel wall, the man lift crew secures the top of the liner with liner clamps.
  - a. NOTE: The number of clamps per panel is dependent on the panel length and specific engineering of the tank
4. Both inside and man lift crews continue this process, working around the tank, one or two panels at a time, until the entire liner is in place.
  - a. NOTE: The crew must allow sufficient slack in the liner at the wall to allow for liner movement during filling and draining.

### Stairs, Fill Tubes, and Suction/Bottom Drain:

1. Install safety stair system, fill tubes, and suction or complete bottom drain. Ensure that stair system and tubes are appropriately secured to the tank walls according to customer specifications.
2. Upon completion of the stair system installation, the stairs should be secured as per the operating company requirements.

### Bird Net Installation (if no alternative bird deterrent approved)

1. Erect bird net stand(s) and run security cables through D-rings of each stand and secure cables to panel wall D-rings. Be sure cables are straight across the diameter of the tank.
2. Spread out bird net on liner floor. A 2-man crew in man boom will pull a section with tag line up to clamps to secure edge of net on top of panels. Continue pulling and securing bird net going around the tank. Continue to pull and secure until desired tautness is obtained.

### Final Steps and Initial Fill:

1. Trim liner around perimeter of tank, allowing for 2' - 5' of liner to hang over edge of tank. Longer trim strategy includes the installation of a perimeter cable.
2. Inspect all connections and equipment.
3. Pump a minimum of 18" of FRESH or approved water onto the floor of the tank and monitor for leaks.
4. As soon as reasonably possible, complete the initial fill on the tank, monitoring for leaks.

## AST Set Up SOP

### Ongoing Inspection Guidance:

1. When the fluid levels are lowered, it is good practice to have the operating company perform an inspection on the exposed liner. Take photos if necessary and send to the installation crew.
2. As the tank is operated day-to-day, visibly inspect each panel.
3. Inspect the accessories, piping, valves and liner clamps installed.
4. Water must NEVER go below 24 inches at the LOWEST level in the tank. 2' water marks can be painted on the inside of the tank as a reminder to the operating company.
5. Do not leave liner exposed inside tank for long periods of time. The wind will cause the liner to rub on itself. This friction will create potential pinholes.
6. All water present on the ground around the tank should be inspected to ensure it is not coming from the tank. Water spots can be traced to identify growth, if visible fluid is not running from under the tank wall or down a panel.



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## Operation and Maintenance Plan

# Operation and Maintenance Plan

## Summary:

This plan provides additional protocols to bring Above-Ground Storage Tanks (AST's) into conformance with NMOCD Rules.

The operator will use the AST 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 AST containment is to facilitate treatment, recycling, reuse, and reclamation of produced water sourced from oil and gas wells. The containment will not be used to dispose of produced water or other oilfield waste.

## Operation Plan

- A. Raw produced water from oil and gas wells will be received into the AST as part of the recycling facility, as indicated on the C-147 form.
- B. Unless specified otherwise, after treatment through the recycling facility, the treated water will then be transferred to the recycling containment.
- C. Recycled water is then removed from the recycling containment for treated water 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 AST is reached, no additional water will be transferred into the AST 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.

### 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

- F. Reports will be sent monthly to the OCD using the C-148 form to record the total volumes of produced and fresh 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.

#### 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.

## Operation and Maintenance Plan

10. **Ensure all gates are closed and locked** when personnel are not onsite.
11. **Maintain the fences** in good repair.

### 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**
- **Identify and report** to the AST contractor any **changes in site conditions** such as uneven tank panel settlement, soil settlement, liner damage, insufficient liner slack, or leaks.
- **Inspecting berms** and other diversion means (if present) 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.

#### 19.15.34.12 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.

#### 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 the leak detection system, 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 AST Facilities

#### 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. **AST Disassembly**
  - Disassemble the AST per the manufacturer's recommendations.
4. **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.**
5. **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:**

#### 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

- Backfill with clean, uncontaminated earthen material.
- 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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## Variances for Recycling Storage Containments (In-Ground and AST)

Alternative Testing Methods

Fencing

## Alternative Testing Methods

### Variance Request for OCD Approval of Alternative Test Methods to Analyze Concentrations of TPH and Chloride

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections: NMAC 19.15.17.13, 19.15.34.14, and 19.15.29. 12 D

#### NMAC 19.15.17.13 D

##### CLOSURE AND SITE RECLAMATION REQUIREMENTS:

5. The operator shall collect, at a minimum, a five point composite of the contents of the temporary pit or drying pad/tank associated with a closed-loop system to demonstrate that, after the waste is solidified or stabilized with soil or other non-waste material at a ratio of no more than 3:1 soil or other non-waste material to waste, the concentration of any contaminant in the stabilized waste is not higher than the parameters listed in Table II of 19.15.17.13 NMAC.

The referenced Table II, which is reproduced in part below, notes the Method with asterisk signifying: “\*Or other test methods approved by the division”.

<b>Table II</b>			
<b>Closure Criteria for Burial Trenches and Waste Left in Place in Temporary Pits</b>			
Depth below bottom of pit to groundwater less than 10,000 mg/l TDS	Constituent	Method*	Limit**
25-50 feet	Chloride	EPA Method 300.0	20,000 mg/kg
	TPH	EPA SW-846 Method 418.1	100 mg/kg

#### NMAC 19.15.34.14

##### CLOSURE AND SITE RECLAMATION REQUIREMENTS FOR RECYCLING CONTAINMENTS:

- 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.

The referenced Table I, which is reproduced in part below, notes the Method with asterisk signifying: “\*Or other test methods approved by the division”.

## Alternative Testing Methods

<b>Table I</b>			
<b>Closure Criteria for Recycling Containments</b>			
Depth below bottom of containment to groundwater less than 10,000 mg/l TDS	Constituent	Method*	Limit**
51 feet - 100 feet	Chloride	EPA 300.0	10,000 mg/kg
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015M	2,500 mg/kg

### 19.15.29.12 D.

#### CLOSURE REQUIREMENTS:

D. The responsible party must take the following action for any major or minor release containing liquids.

- 1) The responsible party must test the remediated areas for contamination with representative five-point composite samples from the walls and base, and individual grab samples from any wet or discolored areas. The samples must be analyzed for the constituents listed in Table I of 19.15.29.12 NMAC or constituents from other applicable remediation standards.

The referenced Table I, which is reproduced in part below, notes the Method with asterisk signifying: “\*Or other test methods approved by the division”.

<b>Table I</b>			
<b>Closure Criteria for Soils Impacted by a Release</b>			
Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/l TDS	Constituent	Method*	Limit**
≤ 50 feet	Chloride***	EPA 300.0 or SM4500 Cl B	600 mg/kg
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015M	100 mg/kg
	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg
	Benzene	EPA SW-846 Method 8021B or 8260B	10 mg/kg

The three tables above illustrate that different laboratory methods for determining the same constituent concentration are acceptable to the OCD when collecting a five-point composite sample.

## Alternative Testing Methods

As proven by repeated sampling of drilling pits in the Permian Basin, significant problems with non-petroleum drilling additives (e.g. starch) interfere with the laboratory method 4.18.1 to test for TPH. This has been observed and reported to the OCD numerous times.

**We request approval for the OCD approved Method 8015 (GRO + DRO + MRO) to be used in place of method 418.1 to test for TPH.**

**We request approval for the use of the OCD approved EPA 300.0 or OCD approved SM4500 for the analysis of chloride.**

### Demonstration that OCD Approval Will Provide Equal or Better Protection of Fresh Water, Public Health and the Environment

The intent of TPH analysis under the Pit Rule is to measure total petroleum hydrocarbons, not non-petroleum, non-polar compounds such as starches or cellulose, which can interfere with EPA Method 418.1. While Method 418.1 may provide useful information for transportation-related crude oil or condensate spills, the presence of non-polar organic additives commonly used in drilling fluids—particularly for horizontal wells—renders this method unreliable for determining compliance with the Rule. Use of EPA Method 8015 (TPH-GRO, DRO, and MRO) provides a more accurate measurement of petroleum hydrocarbons and better reflects the Commission's regulatory intent.

In prior hearings before the Oil Conservation Commission, technical arguments were presented supporting the use of SM 4500 in lieu of EPA Method 300.0 for chloride analysis under Rule 29. The Division and the Commission determined that SM 4500 provides equal or better protection of fresh water, public health, and the environment. This precedent supports the acceptance of alternative analytical methods when equivalent or superior environmental protection is demonstrated.

## Fencing

### Variance Request for OCD Approval of Alternative Fencing

The prescriptive mandates of the Rule that are the subject of this variance request are presented below

#### 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.

The AST will employ netting or sonic bird hazing (The Bird-X Mega Blaster Pro, configured with sound patterns appropriate for the Permian Basin environment). The OCD and BLM have approved of both methods, per Rule 34 and BLM Rules respectively, and have found that they protect avian species such as waterfowl and bats effectively.

The AST containment structure is constructed of vertical steel walls approximately 11 feet in height, which fully enclose the containment in a manner that deters terrestrial wildlife. As such, the steel structure satisfies the enclosure requirements of Rule 34. In combination with netting, the containment system meets the Rule's requirements for deterring and protecting both avian and terrestrial wildlife.

Because AST containments include a steel stairway providing access between ground surface and the open top, the operator proposes the following measures to deter unauthorized human access:

1. Installation of a gate or chain across the stairway;
2. Placement of appropriate signage on the gate or chain to deter unauthorized access; and
3. Provision of a locking mechanism to secure the gate when authorized personnel are not onsite.

### Demonstration That the Variance Will Provide Equal or Better Protection of Fresh Water, Public Health and the Environment

The proposed protocol provides equal or greater protection of Public Health as a 4-strand barbed wire fence.



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## Liner Equivalency Demonstrations and Variance Request

40-mil Non-Reinforced LLDPE Liner as Alternate  
Primary and 30-mil Non Reinforced LLDPE as  
Secondary Liner for Above-Ground Storage Tanks

## Liner Equivalency Demonstration

### Variance Request for 40-mil Non-Reinforced LLDPE Geomembrane as an alternative Primary and 30-mil Non-Reinforced LLDPE as an alternative Secondary Liner for Above-Ground Storage Tanks (AST's)

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections:

#### 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 applicant proposes one layer of 40-mil (or thicker) LLDPE non-reinforced as a primary liner and a secondary liner consisting of one layer of 30-mil (or thicker) LLDPE non-reinforced material.**

These proposed liners have a hydraulic conductivity not exceeding  $1 \times 10^{-9}$  cm/sec and will meet or exceed the performance requirements of EPA SW-846 Method 9090A.

NMAC 19.15.34 was written to regulate in-ground produced water recycling facilities and did not contemplate Aboveground Steel Storage Tanks (ASTs) that employ liner systems for primary and secondary containment. Proposed AST Containments utilize engineered vertical steel walls rather than sloped embankments, precluding the use of the prescribed materials.

The proposed materials are more readily available and provide superior flexibility and conformity characteristics compared to the prescriptive liner types identified in the Rule. Due to the presence of vertical steel walls, 60-mil HDPE, 45-mil or 30-mil LLDPE string-reinforced liners, and 30-mil PVC liners lack sufficient flexibility for use within these modular aboveground containments.

The following technical document demonstrates that the proposed liner system, including the integrated leak detection system, provides equal or greater protection of fresh water, public health, and the environment than the materials prescribed in the Rule. Attachments include a technical comparison of the proposed liner material relative to the requirements of NMAC 19.15.34. Material Specifications can be found in the Drawings Section.

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

**Technical Memorandum: 40-mil LLDPE as Alternative Primary with 30-mil LLDPE as Alternative Secondary Liner System for Modular Steel AST Recycling Containment**  
**NMAC 19.15.34.12 A (4)**

In consideration of the liner application for modular AST impoundments, size and depth of the AST, design details for modular tanks as well as estimated length of at least five years of service time, it is my professional opinion that a 40 mil LLDPE (non-reinforced) and a 30 mil LLDPE (non-reinforced) geomembrane system will provide the requisite barrier against produced water loss as an alternative primary and secondary liner system. *The two proposed liners, 40 mil LLDPE as Primary liner and 30 mil LLDPE Secondary liner, will function equal to or better than 45 mil String Reinforced LLDPE, 30 mil PVC, or 60 mil HDPE liners as a primary liner and 30 mil LLDPE string reinforced as a secondary liner system. Additionally, this two-layer system with integrated leak detection system, will provide requisite protection for the environment that is equal to or better than the above primary and secondary liner systems referenced in OCD rule 34.* The following are discussion points that will exhibit the attributes of a 40 mil/30 mil LLDPE lining system:

The nature and formulation of LLDPE resin is very similar to HDPE. The major difference is that LLDPE is lower density, lower crystallinity (more flexible and less chemical resistant). However, LLDPE will resist aging and degradation and remain intact for many years in exposed conditions. The LLDPE resin is virtually the same for non-reinforced 30 or 40 mil LLDPE and string reinforced 30 or 45 mil LLDPE geomembranes and both will provide requisite containment and be equally protective for this application, enduring UV and chemical degradation in the produced water environment.

Flexibility Requirements. Non-reinforced LLDPE geomembranes are less stiff and far more flexible than string reinforced geomembranes as well as 60 mil HDPE and in this regard are preferred for installations in vertical wall tanks such as this proposed installation. LLDPE provides a very flexible sheet that enables it to be fabricated into large panels, folded for shipping and installed on vertical walls transitioned to flat bottom. Non-reinforced LLDPE sheet will conform better than a string reinforced LLDPE to the tank dimensions under hydrostatic loading and will exhibit less wrinkling and creasing during and after installation.

Thermal Fusion Seaming Requirements. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Both dual wedge and single wedge thermal fusion welding is commonly used on LLDPE and QC testing by air channel (ASTM D 5820) or High Pressure Air Lance (ASTM D 4437) is fully acceptable and recognized as industry standards. In this regard, either non-reinforced LLDPE or string-reinforced LLDPE will be acceptable as far as QC and thermal fusion seaming methods are concerned.

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*Consulting Engineers*

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 between the primary and secondary LLDPE geomembranes at the base of the AST in this application provides immediate drainage to a low point or outside the Modular AST Impoundment and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the Secondary LLDPE liner .

Leakage through any Primary geomembrane is driven by size of hole and depth and will be detected by the increase of water in the drainage system and the volume being pumped out of the secondary containment. In this regard and for this variance, the Primary consists of 40 mil LLDPE geomembrane which will perform equal to or better than a single layer of string reinforced LLDPE for potential leakage. Thus, if a leak occurs through the top layer, it will be effectively contained by the second layer of 30 mil LLDPE geomembrane. If required, location of holes in the Primary can be found by Electrical Leak Location Survey (ELLS) using a towed electrode (ASTM D 7007). Holes found can then be repaired and thus water seepage into the leakage collection and drainage system will be kept to a minimum. Dependent on OCR requirements for Action Leakage Rate (ALR), the leakage volumes may only be monitored. For example, a typical ALR is < 20 gpad whereas a rapid and large leak (RLL) may be > 100 gpad. Most states specify maximum ALR values for waste and process water impoundments usually in the range of 100 to 500 gpad. However, New Mexico does not specify an ALR for waste or process water impoundments (GRI Paper No. 15).

LLDPE (and string reinforced LLDPE) can be prefabricated into large panels and thus both types offer the following for Containment:

- Prefabrication in factory-controlled conditions into very large panels (up to 30,000 sf) results in ease of installation, less thermal fusion field seams and less on site QC and CQA. (It should be noted that HDPE cannot be prefabricated into panels and requires considerably more on-site welding and QC).
- Large prefabricated panels will provide better control of thermal fusion welding in a factory environment that will improve the liner system integrity for the long term. Ease of installation of large prefabricated custom size panels results in a greater reduction of installation time and associated installation and QC costs
- The Non-reinforced LLDPE geomembrane provides superior lay flat characteristics and conformability which allows for more intimate contact with the underlying soil, geonet, or geotextile and tank walls as well as overlying materials thus providing better flow characteristics for drainage of water. String reinforced LLDPE exhibits more wrinkling and when overlaid or in contact with a geonet drain, wrinkles tend to form pockets and dams affecting drainage of any leakage water to the exterior of the Modular AST Impoundment.

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

- Both types of LLDPE geomembrane are easily repaired using the same thermal fusion bonding method without the need for special surface grading preparation for extrusion welding as is typically used in repair of HDPE geomembranes. However, string reinforced LLDPE requires that all cut edges with exposed scrim must be encapsulated with extrusion bead. No encapsulation is required on non-reinforced LLDPE.

*In summary, it is my professional opinion that the liner system of 40 mil non-reinforced LLDPE geomembrane as Primary liner and 30 mil non reinforced LLDPE Secondary liner, with integrated leak detection system, will provide protection that is equal to or better than 45 mil string reinforced LLDPE, 30 mil PVC, 60 mil HDPE (primary liner) and 35 mil LLDPEr (secondary liner) and meets requirements as defined by the rule as an alternative liner system (resistance to UV and chemical exposure and required hydraulic conductivity). Additionally, this liner system will provide a superior installation in the AST environment and function better than liners referenced in the OCD rule and will provide the requisite protection of fresh water, public health and the environment for at least 5 years in the produced water recycling environment.*

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,

*R K Frobel*

Ronald K. Frobel, MSCE, PE



References:

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

Geosynthetic Research Institute (GRI) Published Standards and Papers 2018

ASTM Standards 2018

Attachments:

R. K. Frobel C.V.



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

Slope and Anchor Variance Request  
for Above Ground Steel Tank Modular  
Recycling Storage Containments  
(AST's)

## Slope and Anchor Demonstration

### Variance Request for Slope and Anchor for Modular Steel AST

#### Containments

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections:

#### NMAC 19.15.34.12.

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

- A. An operator shall design and construct a recycling containment in accordance with the following specifications.
  - 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.
  - 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 earthfilled trench. The anchor trench shall be at least 18 inches deep.

#### **The applicant requests a variance to prescribed slope and anchor in the setting of above ground modular steel containments.**

Because NMAC 19.15.34 is specifically tailored to in-ground produced water recycling pits, variances are required to account for the professionally designed and engineered steel tank ring of ASTs, which utilize vertical steel walls instead of sloped embankments.

As such, there is no slope to consider. Additionally, there is no anchor trench as envisioned by the Rule. Instead, liners are anchored to the top of the steel wall with clips.

The following technical memorandum demonstrates that the setup of an AST with vertical walls and liners anchored at the top provide equal or better protection of fresh water, public health and the environment as sloped earthen berms with an anchor trench.

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

**Technical Memorandum: Slope and Anchor Trench Variance for Above Ground Steel Modular Containments**  
**NMAC 19.15.34.12 A (2), (3)**

**Side Slope**

The design of soil side slope (inclination) is a geotechnical engineering design consideration. Liquid impoundments such as fresh water or process water containments are usually built within an excavation or with raised earthen embankments. For a liquid impoundment with an exposed liner system, the slope soils and construction dictate slope inclination and very detailed slope stability analysis may be required to determine if slope failure within the embankment will occur once loaded with impounded water. Slope failure may also occur during construction or when the impoundment is empty. A maximum slope is usually specified and is dependent on soil type and cohesive strength, saturated or unsaturated conditions, etc. Detailed analysis for slope stability can be found in "Designing with Geosynthetics" by R.M Koerner as well as many geotechnical books.

A modular impoundment, on the other hand, consists of a professionally designed steel tank ring with vertical walls. *There is no slope to consider as the segmental steel sections are set vertical.* Design of steel tanks, in regard to hydrostatic loading, wind loading, seismic loads, etc. are thoroughly referenced with detailed procedures in the design code - American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage". *There are no requirements for maximum slope inclination other than perhaps 90 degrees or vertical wall.*

**Anchor Trench**

All earthen impoundments with a geomembrane lining system require some form of top of slope anchor, the most common of which is an excavated and backfilled anchor trench usually set back at least 3 ft from the top of slope. Again, there are detailed procedures for anchor trench design in "Designing with Geosynthetics" by R.M Koerner.

*A Modular Impoundment requires mechanical anchoring of the geomembrane at the top of the vertical steel wall using standard liner clips that prevent the geomembrane or geomembrane layers from slipping down the side wall.* These are detailed in the Tank Installation Manual. *There are no requirements for an "anchor trench" as this is not an in-ground impoundment.*

*In summary, based on the design and specifications of a modular steel impoundment, there is no requirement for a maximum interior slope angle of 2H:1V due to the fact that this impoundment is a steel tank with vertical walls. Additionally, there is no requirement for an anchor trench as the geomembrane is attached to the top of the Modular Impoundment vertical walls with large steel clips.* This provides the requisite protection of fresh water, public health and the environment for many years.

**R.K. FROBEL & ASSOCIATES**

**R.K. FROBEL & ASSOCIATES**

*Consulting Engineers*

If you have any questions on the above technical memorandum or require further information, give me a call at 303-679-0285 or email [geosynthetics@msn.com](mailto:geosynthetics@msn.com)

Sincerely Yours,

*RK Frobel*

Ronald K. Frobel, MSCE, PE



**References:**

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage"

Koerner, R.M., 2005 "Designing With Geosynthetics" Prentice Hall Publishers

**Attachments:**

R. K. Frobel C.V.



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

## Applicability of Variances for Modular AST Containments in the Permian Basin of New Mexico

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

**Technical Memorandum: Applicability of Variances for Modular AST Containments in the Permian Basin of New Mexico**  
NMAC 19.15.34.12 A (2)

I have reviewed the most recent historical variances for AST Containments in the document titled "Variances for C-147 Registration Packages Permian Basin of New Mexico" (January 2020) and examined the applicable design drawings and permits for the following modular AST containments located in the Permian Basin of New Mexico.

- C-147 Registration Package for Myox Above Ground Storage Tank Section 32, T25S, R28E, Eddy County (January 20, 2020)
- C-147 Registration Package for Fez Recycling Containment and Recycling Facility Area (100+ acres) Section 8, T25-S, R35-E, Lea County, Volume 2 – Above-Ground Storage Tank Containments
- Hackberry 16 Recycling Containments and Recycling Facility Section 16, T19S, R31E, Eddy County

Locations of the modular containments range from west of the Pecos River to slightly west of Jal, NM. All locations exhibit different surface and subsurface geology, different topography and are of various sizes and volumes. *However, in regard to structural integrity of the base soils that support the AST and in particular the geomembrane containment system, the specification requirements are the same.* The foundation soils must be roller compacted smooth and free of loose aggregate over ½ inch. Compaction characteristics must meet or exceed 95% of Standard Proctor Density in accordance with ASTM D 698. This specification requirement is specific and causes the general or earthworks contractor to meet this standard regardless of the site- specific geology or topography. Provided that the design drawings and associated specifications call out the minimum requirements for subsoils compaction (i.e., 95% Standard Proctor Density – ASTM D 698), the design engineer or owners representative will carry out soils testing on the foundation materials to provide certainty to the AST containment owner that the earthworks contractor has met these obligations.

*Thus, provided that the contractor meets the minimum specified requirements for foundation soils preparation and density, the location, geology or depth to groundwater will make no difference in regard to geomembrane liner equivalency as demonstrated by the AST variances presented in this volume and are considered valid for meeting NMOCD Rule 34 requirements for all locations within the Permian Basin of New Mexico.*

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)

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

Sincerely Yours,

*RK Frobel*

Ronald K. Frobel, MSCE, PE

References:

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A  
RECYCLING CONTAINMENT

ASTM Standards 2019



**RONALD K. FROBEL, MSCE, P.E.**

**CIVIL ENGINEERING  
GEOSYNTHETICS  
EXPERT WITNESS  
FORENSICS**

**FIRM:** R. K. FROBEL & ASSOCIATES  
Consulting Civil / Geosynthetics Engineers

**TITLE:** Principal and Owner

**PROFESSIONAL**

**AFFILIATIONS:** American Society for Testing and Materials (ASTM) -  
Founding member of Committee D 35 on Geosynthetics  
Chairman ASTM D35 Subcommittee on Geomembranes 1985-2000  
ASTM Award of Merit Recipient/ASTM Fellow - 1992  
ASTM D18 Soil and Rock - Special Service Award - 2000  
Transportation Research Board (TRB) of The National Academies  
Appointed Member A2K07 Geosynthetics 2000 - 2003  
National Society of Professional Engineers (NSPE) - Member  
American Society of Civil Engineers (ASCE) - Member  
Colorado Section - ASCE - Member  
International Society of Soil Mechanics and Foundation Engineers  
(ISSMFE) - Member  
International Geosynthetics Society (IGS) - Member  
North American Geosynthetics Society (NAGS) - Member  
International Standards Organization (ISO) - Member TC 221  
Team Leader - USA Delegation Geosynthetics 1985 - 2001  
European Committee for Standardization (CEN) - USA Observer  
EPA Advisory Committee on Geosynthetics (Past Member)  
Association of State Dam Safety Officials (ASDSO) – Member  
U. S. Committee on Irrigation and Drainage (USCID) - Member  
Technical Advisory Committee - Geosynthetics Magazine  
Editorial Board - Geotextiles and Geomembranes Journal  
Fabricated Geomembrane Institute (FGI) – Board of Directors  
Co-Chairman International Conference on Geomembranes  
Co-Chairman ASTM Symposium on Impermeable Barriers  
U.S. Naval Reserve Officer (Inactive)  
Registered Professional Engineer – Civil (Colorado)  
Mine Safety Health Administration (MSHA) Certified

**ACADEMIC**

**BACKGROUND:** University of Arizona: M.S. - Civil Engineering - 1975  
University of Arizona: B. S. - Civil Engineering – 1969  
Wentworth Institute of Technology: A.S. Architecture – 1966

**RONALD K. FROBEL, MSCE, P.E.**

**Page 2**

**PROFESSIONAL  
EXPERIENCE:**

R. K. Frobel & Associates - Consulting Engineers  
Evergreen, Colorado, Principal and Owner, 1988 - Present

Chemie Linz AG and Polyfelt Ges.m.b.H., Linz, Austria  
U. S. Technical Manager Geosynthetics, 1985 - 1988

U.S. Bureau of Reclamation, Engineering and Research Center  
Denver, Colorado, Technical Specialist in Construction  
Materials Research and Application, 1978 - 1985

Water Resources Research Center (WRRC), University of Arizona  
Tucson, AZ, Associate Research Engineer, 1975 - 1978

Engineering Experiment Station, University of Arizona  
Tucson, AZ, Research Assistant, 1974 - 1975

United States Navy, Commissioned Naval Officer, 1970 - 1973

**REPRESENTATIVE  
EXPERIENCE:**

R.K. Frobel & Associates: Civil engineering firm specializing in the fields of geotechnical, geo-environmental and geosynthetics. Expertise is provided to full service civil/geotechnical engineering firms, federal agencies, municipalities or owners on a direct contract, joint venture or sub-consultant basis. Responsibilities are primarily devoted to specialized technical assistance in design and application for foreign and domestic projects such as the following:

Forensics investigations into geotechnical and geosynthetics failures; providing expert report and testimony on failure analysis; providing design and peer review on landfill lining and cover system design, mine waste reclamation, water treatment facilities, hydro-technical canal, dam, reservoir and mining projects, floating reservoir covers; oil and gas waste containment; design of manufacturers technical literature and manuals; development and presentation of technical seminars; new product development and testing; MQA/CQA program design and implementation.

Polyfelt Ges.m.b.H., Linz, Austria and Denver Colorado: As U.S. technical manager, primary responsibilities included technical development for the Polyfelt line of geosynthetics for the U.S. civil engineering market as well as worldwide applications.

**RONALD K. FROBEL, MSCE, P.E.**

**Page 3**

U.S. Bureau of Reclamation, Denver, Colorado: As technical specialist, responsibilities included directing laboratory research, design and development investigations into geosynthetics and construction materials for use on large western water projects such as dams, canals, power plants and other civil structures. Included were material research, selection and testing, specification writing, large scale pilot test programs, MQA/CQA program design and supervision of site installations. Prime author or contributor to several USBR technical publications incorporating geosynthetics.

University of Arizona, Tucson, Arizona: As research engineer at the Water Resources Research Center, responsibilities included research, design and development of engineering materials and methods for use in construction of major water projects including potable water reservoirs, canals and distribution systems. Prime author or contributor to several WRRC technical publications.

Northeast Utilities, Hartford, Connecticut: As field engineer for construction at Northeast Utilities, responsibilities included liaison for many construction projects including additions to power plants, construction of substations, erection of fuel oil pipelines and fuel oil storage tanks. Responsibilities also included detailed review, inspection and reporting on numerous construction projects.

U.S. Navy: Commissioned Naval Officer – Nuclear Program

**PUBLICATIONS:** Over 85 published articles, papers and books.

**CONTACT DETAILS:**

**Ronald K. Frobel, MSCE, P.E.**  
**R. K. Frobel & Associates**  
**Consulting Civil/Geosynthetics Engineers**  
**PO Box 2633**  
**Evergreen, Colorado 80439 USA**  
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**Email: geosynthetics@msn.com**



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## Avian Deterrent System

# **MEGA BLASTER PRO**



## User's Manual

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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**

## Venegas, Victoria, EMNRD

---

**From:** Venegas, Victoria, EMNRD  
**Sent:** Thursday, May 28, 2026 3:55 PM  
**To:** Bruening, Josh; Bobbi Jo Crain; gjennings@CascadeServicesLLC.com  
**Subject:** FVV2614849880 LOST TANKS WEST & LOST TANKS WEST  
**Attachments:** C-147 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST AST 05.28.2026.pdf

### FVV2614849880 LOST TANKS WEST & LOST TANKS WEST AST

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 **585728**, for FVV2614849880 LOST TANKS WEST & LOST TANKS WEST AST in L-30-20S-33E, Lea County, New Mexico. [6137] DEVON ENERGY PRODUCTION COMPANY, LP requested variances from 19.15.34 NMAC for FVV2614849880 LOST TANKS WEST & LOST TANKS WEST.

The following variances have been approved:

- The variance to 19.15.34.14 NMAC Table I for the use of alternate analytical method 8015/8015M for total petroleum hydrocarbons (TPH) is approved.
- The variance to 19.15.34.14 NMAC Table I for the use of alternate analytical method EPA 300.0 or SM4500 for the analysis of chloride is approved.
- The variance to 19.15.34.12.A.(2) NMAC for the no side-slope requirement for the AST containment with vertical walls is approved.
- The variance to 19.15.34.12.A.(3) NMAC for the liners to be anchored to the top of the AST steel walls and no anchor trenches is approved.
- The variance to 19.15.34.12.A.(4) NMAC for the installation on the AST containment of a 40-mil non-reinforced LLDPE primary liner and a 30-mil non-reinforced LLDPE secondary liner is approved.
- The variance to NMAC 19.15.34.12.D to install a gate or chain across the stairway between the ground surface and the open-top of the AST containment is approved. The operator shall place an appropriate sign on the gate or chain to prevent unauthorized human access to the open top of the containment and will provide a mechanism to lock the gate when responsible personnel are not onsite.

The form C-147 and related documents for FVV2614849880 LOST TANKS WEST & LOST TANKS WEST 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.
- FVV2614849880 LOST TANKS WEST & LOST TANKS WEST is approved for five years of operation from the date of permit application of 05/16/2026. FVV2614849880 LOST TANKS WEST & LOST TANKS WEST 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.

- FVV2614849880 LOST TANKS WEST & LOST TANKS WEST consists of one (1) AST of 40,000.00 barrels, one (1) earthen containment with a capacity of 806,956.00 barrels and one (1) earthen containment with a capacity of 15,107.00 barrels.
- The total closure cost estimated of permit FVV2614849880 LOST TANKS WEST & LOST TANKS WEST in the amount of \$436,821.60, 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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST in compliance with NMAC 19.15.34 NMAC.
- **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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST. 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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST commences.
- [6137] DEVON ENERGY PRODUCTION COMPANY, LP shall notify NMOCD through OCD Permitting when recycling operations commence and cease at FVV2614849880 LOST TANKS WEST & LOST TANKS WEST.
- A minimum of 3-foot freeboard must be maintained at FVV2614849880 LOST TANKS WEST & LOST TANKS WEST 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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST 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 through OCD Permitting. If after that 6-month extension period, the FVV2614849880 LOST TANKS WEST & LOST TANKS WEST 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 on OCD form C-148 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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST.

Please reference number FVV2614849880 LOST TANKS WEST & LOST TANKS WEST in all future communications.  
Best regards,

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

CONDITIONS

Action 585728

**CONDITIONS**

Operator: DEVON ENERGY PRODUCTION COMPANY, LP 333 West Sheridan Ave. Oklahoma City, OK 73102	OGRID: 6137
	Action Number: 585728
	Action Type: [C-147] Water Recycle Long (C-147L)

**CONDITIONS**

Created By	Condition	Condition Date
vvenegas	FVV2614849880 LOST TANKS WEST & LOST TANKS WEST 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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST in compliance with NMAC 19.15.34 NMAC. • [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 FVV2614849880 LOST TANKS WEST & LOST TANKS WEST.	5/28/2026