

December 2024

## **Rule 34 Registration: Volume 2 Pintail East Containment Section 9, T26S, R32E, Lea County**

- *C-147*
- *Stamped Design Drawings*
- *Recently Approved Plans for Design/Construction, O&M, Closure*



*Looking northwest across the location from its southeast corner.*

**Prepared for:  
Solaris Midstream Waters, LLC  
Houston, Texas**

**Prepared by:  
R.T. Hicks Consultants, Ltd.  
901 Rio Grande NW F-142  
Albuquerque, New Mexico**

C-147 &  
LINER EQUIVALENCY DEMONSTRATION

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

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

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

1. Operator: Solaris Water Midstream LLC (For multiple operators attach page with information) OGRID #: 371643
Address: 9611 Katy Freeway, Suite 900, Houston, TX 77024
Facility or well name (include API# if associated with a well): Pintail East Containment
OCD Permit Number: 1RF-536 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr H and I Section 9 Township 26 S Range 32 E County: Lea
Surface Owner: [x] Federal [ ] State [ ] Private [ ] Tribal Trust or Indian Allotment

2. [x] Recycling Facility: Pintail Recycling Facility
Location of recycling facility (if applicable): Latitude 32.06103 N Longitude -103.67500 (approx) 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 32.05887 Longitude -103.67301 (approx.) NAD83
[ ] For multiple or additional recycling containments, attach design and location information of each containment
[ ] Lined [ ] Liner type: Thickness 60 mil pri & 40 mil sec [ ] LLDPE [x] HDPE [ ] PVC [ ] Other \_\_\_\_\_
[ ] String-Reinforced
Liner Seams: [x] Welded [ ] Factory [ ] Other \_\_\_\_\_ Volume: 1,009 K bbl Dimensions: L 710 ft x W 580 ft x D 24 ft
[ ] Recycling Containment Closure Completion Date: \_\_\_\_\_ See Attachment Drawings and Plans, Shapes are irregular.

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 \$ 652,997.25 (work on these facilities cannot commence until bonding amounts are approved)

Attach closure cost estimate and documentation on how the closure cost was calculated. See Transmittal Letter, Vol. 1

5.

**Fencing:**

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

Alternate. Please specify Fixed knot woven wire, 8- foot height. See Sheets 6 and 11 of Containment Plans

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 Transmittal Letter (Vol. 1) for Variance Information

8.

**Siting Criteria for Recycling Containment**

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

<b>General siting</b>		
<b>Ground water is less than 50 feet below the bottom of the Recycling Containment.</b> NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	Plates 1 and 2	<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	Plate 3	<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	Plate 4	<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	Plate 5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain. FEMA map	Plate 6	<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	Plate 7	<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	Plate 8	<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	Plates 1 and 7	<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	Plate 9	<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): Drew Dixon Title: SVP- Land and Regulatory  
 Signature: *Drew Dixon* Date: 12/06/2024  
 e-mail address drew.dixon@ariswater.com Telephone: 832-304-9028

11.

OCD Representative Signature: *Victoria Venegas* Approval Date: 03/04/2025  
 Title: Environmental Specialist OCD Permit Number: 1RF-536  
 OCD Conditions \_\_\_\_\_  
 Additional OCD Conditions on Attachment \_\_\_\_\_

**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/grispeccs](http://www.geosynthetic-institute.org/grispeccs)) 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)

# RECYCLING CONTAINMENT DESIGN DRAWINGS

# PINTAIL POND 2 SOLARIS WATER MIDSTREAM

LEA COUNTY, NEW MEXICO

SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST

32° 03' 31.3596" N, 103° 40' 23.9340" W

32.058711°, -103.673315°



INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION
1	COVER
2	PROJECT LOCATION
3	EXISTING SITE FEATURES
4	SITE PLAN
5	PIT CAPACITY
6	RUBSHEET & FENCE PLAN
7	CROSS SECTIONS A & B
8	SUMP DETAILS
9	LINER DETAILS
10	STINGER DETAILS
11	FENCE DETAILS
12	STORMWATER DIVERSION CHANNEL DETAIL

## CONTACTS

JEFFERY COOK - SOLARIS WATER MIDSTREAM - (713)-614-3644

ENVIROTECH ENGINEERING & CONSULTING - ROSHAN MOHAN (580)-234-8780  
(DESIGN ENGINEER)

ENVIROTECH ENGINEERING & CONSULTING - DOUG SCHRANTZ, PE (580)-234-8780  
(SUPERVISING ENGINEER)

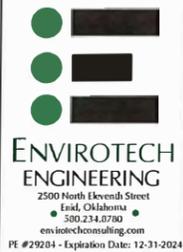


## UTILITY CAUTION

THE CONTRACTOR IS CAUTIONED THE LOCATION AND DEPTH OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON PUBLICLY AVAILABLE RECORDS OF THE VARIOUS UTILITY COMPANIES AND FIELD MEASUREMENTS. THE INFORMATION PROVIDED IS NOT TO BE RELIED ON AS BEING PRECISE OR COMPLETE. THE CONTRACTOR MUST CONTACT THE LOCAL UTILITY LOCATION CENTER AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATIONS OF THE UTILITIES.

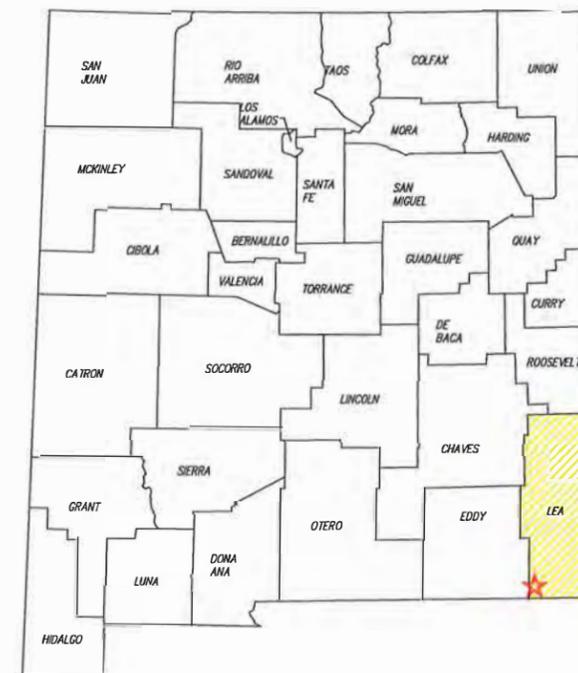


2500 N. Eleventh Street Enid, OK 73701 • 580.234.8780 • [envirotechconsulting.com](http://envirotechconsulting.com)  
PE #29284 - Expiration Date: 12-31-2024



**COPYRIGHT**  
 This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

NO.	DATE	DESCRIPTION

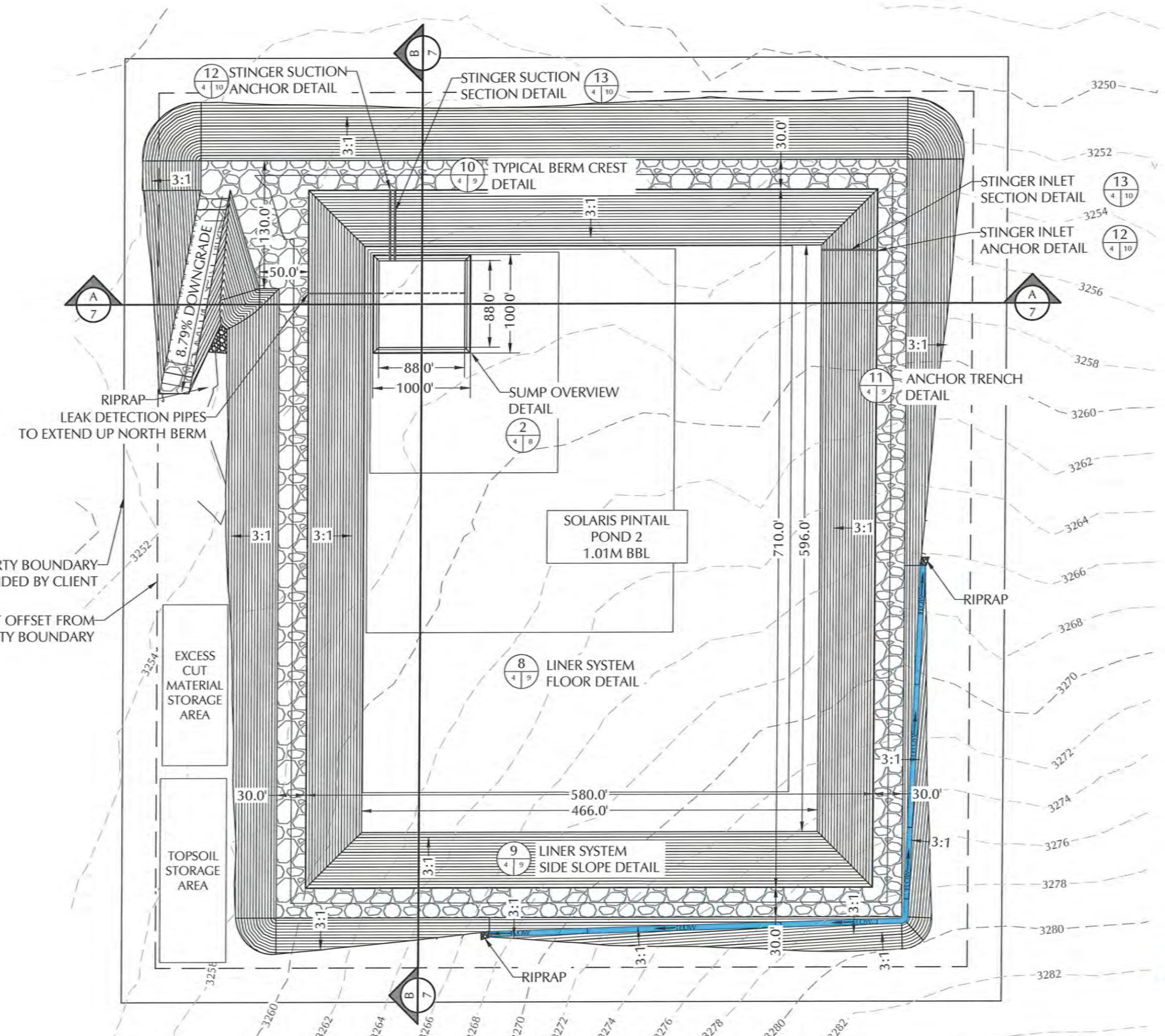


**PROJECT LOCATION**  
 PINTAIL POND 2  
 SOLARIS WATER MIDSTREAM  
 SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
 LEA COUNTY, NEW MEXICO



DATE:	NOVEMBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024335-00
SHEET NO.	2 OF 12





**ENVIROTECH ENGINEERING**  
 2500 North Nevada Street  
 Escondido, California  
 92029-2348  
 951.234.8700  
 envirotechconsulting.com  
 PE #29204 - Expired Date: 12-31-2024

**COPYRIGHT**  
 This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

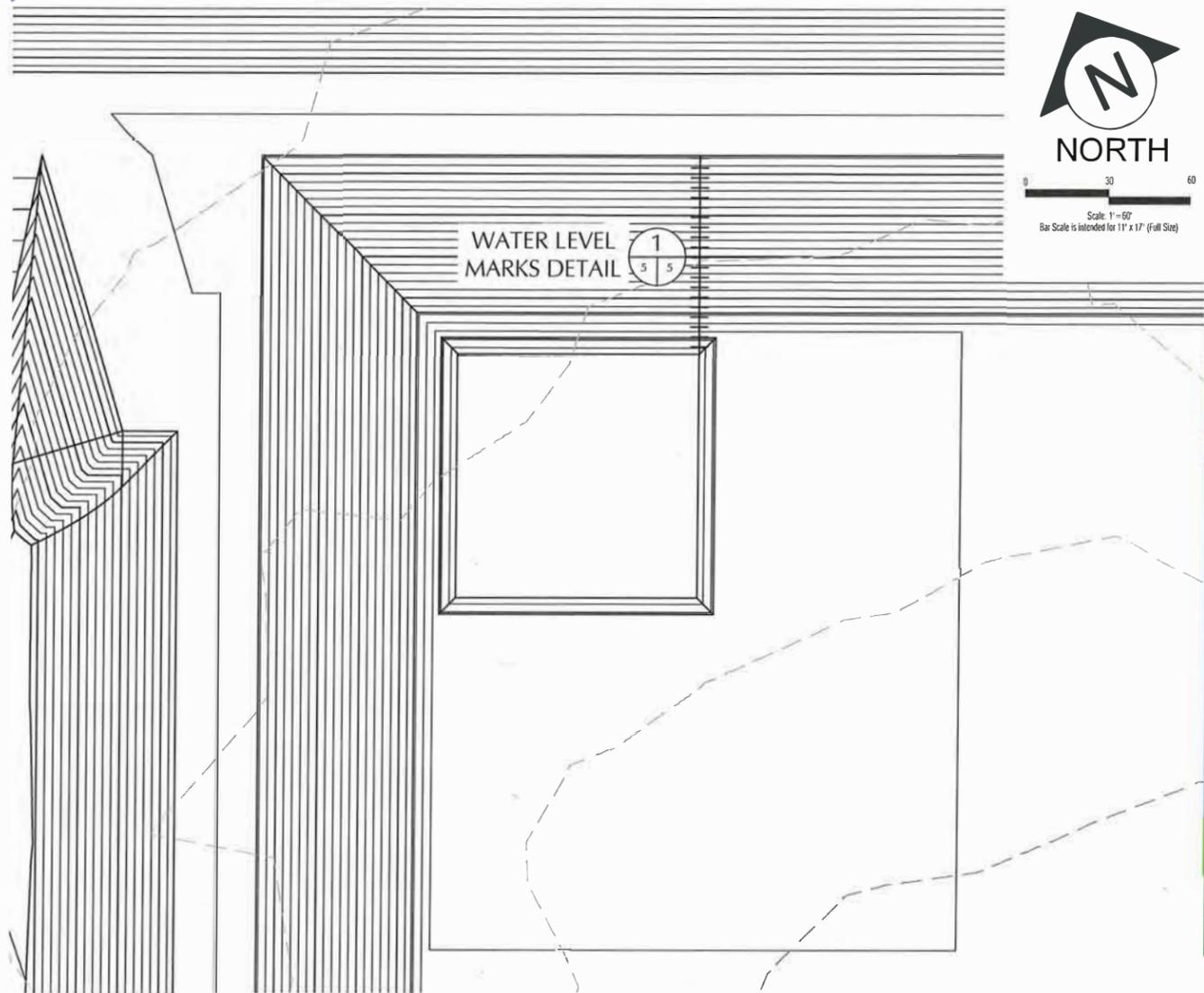
NO.	DATE	DESCRIPTION



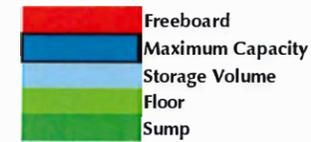
**SITE PLAN**  
**PINTAIL POND 2**  
**SOLARIS WATER MIDSTREAM**  
 SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
 LEA COUNTY, NEW MEXICO



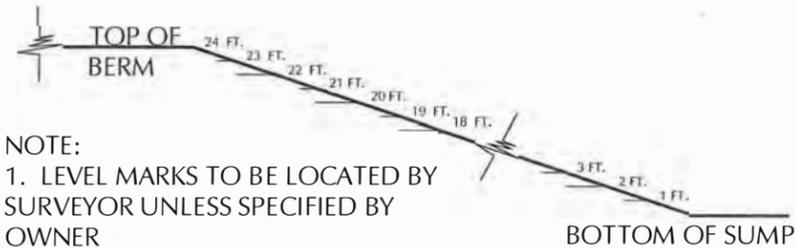
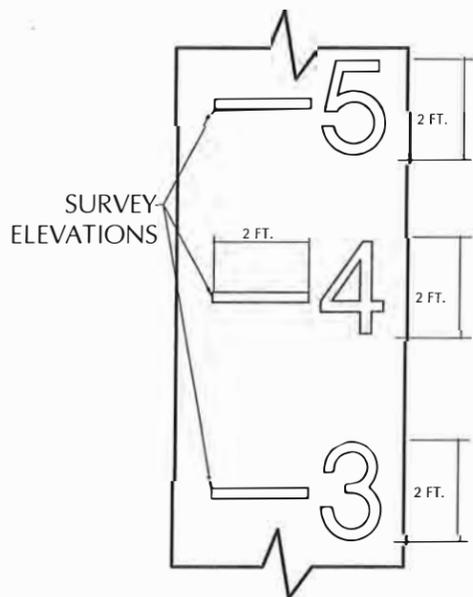
DATE:	NOVEMBER 2024
SCALE:	1" = 100'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.:	024335-00
SHEET NO.:	4 OF 12



Owner	SOLARIS WATER MIDSTREAM		
Site Name	PINTAIL POND 2		
Lagoon Features	Top	Bottom	Max
Side slope Ratio	3		3
Maximum Depth (ft)	24.0		21.0
Lagoon Top Width (ft)	580	466	562
Lagoon Top Length (ft)	710	596	692
Maximum Total Vol (ft <sup>3</sup> )	6,867,052		5,666,318
Maximum Total Vol (bbls)	1,223,153		1,009,279

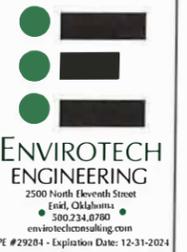


Elevation	Lagoon Liq	Storage	Remaining	Gallons	BBLS	Percent of	Vol	Gallons	Vol	Vol	Percent
ft	ft	ft	Stor Vol	Storage	Storage	Total Volume	in lagoon	Storage	in Lagoon	in Lagoon	Total Vol
			ft <sup>3</sup>	gal	bbls	%	ft <sup>3</sup>	gal	bbls	ac-ft	%
3272.25	24.0	0.0				0.0%	6,867,052	31,372,416	1,223,153	137.63	100%
3271.25	23.0	1.0	407,887	1,031,406	73,834	5.9%	6,459,165	48,321,010	1,130,500	148.20	94%
3270.25	22.0	2.0	808,108	6,043,437	143,930	11.8%	6,058,944	45,326,939	1,079,213	139.00	88%
3269.25	21.0	3.0	1,200,734	8,982,688	213,874	17.5%	5,666,318	42,389,728	1,009,279	130.08	83%
3268.25	20.0	4.0	1,585,836	11,863,639	282,468	23.1%	5,281,216	39,508,777	940,685	121.24	77%
3267.25	19.0	5.0	1,963,487	14,688,850	349,735	28.6%	4,903,565	36,683,566	873,418	112.57	71%
3266.25	18.0	6.0	2,333,760	17,458,858	415,687	34.0%	4,533,292	33,913,557	807,466	104.07	66%
3265.25	17.0	7.0	2,696,725	20,174,202	480,338	39.3%	4,170,327	31,198,213	742,815	95.74	61%
3264.25	16.0	8.0	3,052,456	22,835,423	543,701	44.5%	3,814,596	28,536,992	679,452	87.57	56%
3263.25	15.0	9.0	3,401,023	25,443,056	605,787	49.5%	3,466,029	25,929,360	617,366	79.57	50%
3262.25	14.0	10.0	3,742,500	27,997,640	666,610	54.5%	3,124,552	23,374,776	556,542	71.73	46%
3261.25	13.0	11.0	4,076,957	30,499,714	726,184	59.4%	2,790,095	20,872,701	496,969	64.05	41%
3260.25	12.0	12.0	4,404,467	32,949,818	784,519	64.1%	2,462,585	18,422,597	438,633	56.53	36%
3259.25	11.0	13.0	4,725,102	35,348,491	841,631	68.8%	2,141,950	16,023,924	381,522	49.17	31%
3258.25	10.0	14.0	5,038,934	37,696,268	897,530	73.4%	1,828,118	13,676,148	325,623	41.97	27%
3257.25	9.0	15.0	5,346,035	39,993,690	952,231	77.9%	1,521,017	11,378,725	270,922	34.92	22%
3256.25	8.0	16.0	5,646,477	42,241,295	1,005,745	82.2%	1,220,575	9,131,121	217,408	28.02	18%
3255.25	7.0	17.0	5,940,332	44,439,622	1,058,086	86.5%	926,720	6,932,794	165,067	21.27	13%
3254.25	6.0	18.0	6,227,671	46,589,209	1,109,267	90.7%	639,381	4,783,207	113,886	14.68	9%
3253.25	5.0	19.0	6,508,568	48,690,597	1,159,300	94.8%	358,484	2,681,819	63,853	8.23	5%
3252.25	4.0	20.0	6,718,121	50,258,261	1,196,625	97.8%	148,931	1,114,155	26,527	3.42	2%
3251.25	3.0	21.0	6,818,272	51,007,494	1,214,464	99.3%	48,780	364,922	8,689	1.12	1%
3250.25	2.0	22.0	6,849,358	51,240,049	1,220,001	99.7%	17,694	132,367	3,152	0.41	0%
3249.25	1.0	23.0	6,858,769	51,310,452	1,221,677	99.9%	8,283	61,963	1,475	0.19	0%
3248.25	0.0	24.0	6,867,052	51,372,416	1,223,153	100.0%	-	-	-	-	0%



- NOTE:
1. LEVEL MARKS TO BE LOCATED BY SURVEYOR UNLESS SPECIFIED BY OWNER
  2. MARKS TO BE MADE BY AN EXTRUSION WELDER USING BLACK FILAMENT (OR WHITE FILAMENT ON BLACK LINER).
  3. MARKS SHOULD BEGIN AT THE TOP OF BERM AND CONTINUE TO THE BOTTOM OF THE SUMP. (TOP OF BERM SHOULD READ 24-FT, BOTTOM OF SUMP +1-FT SHOULD READ 1-FT)
  4. REFERENCE PIT CAPACITY TABLES FOR ACCURATE ELEVATIONS

WATER LEVEL MARKS DETAIL  
NOT TO SCALE



**COPYRIGHT**  
This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

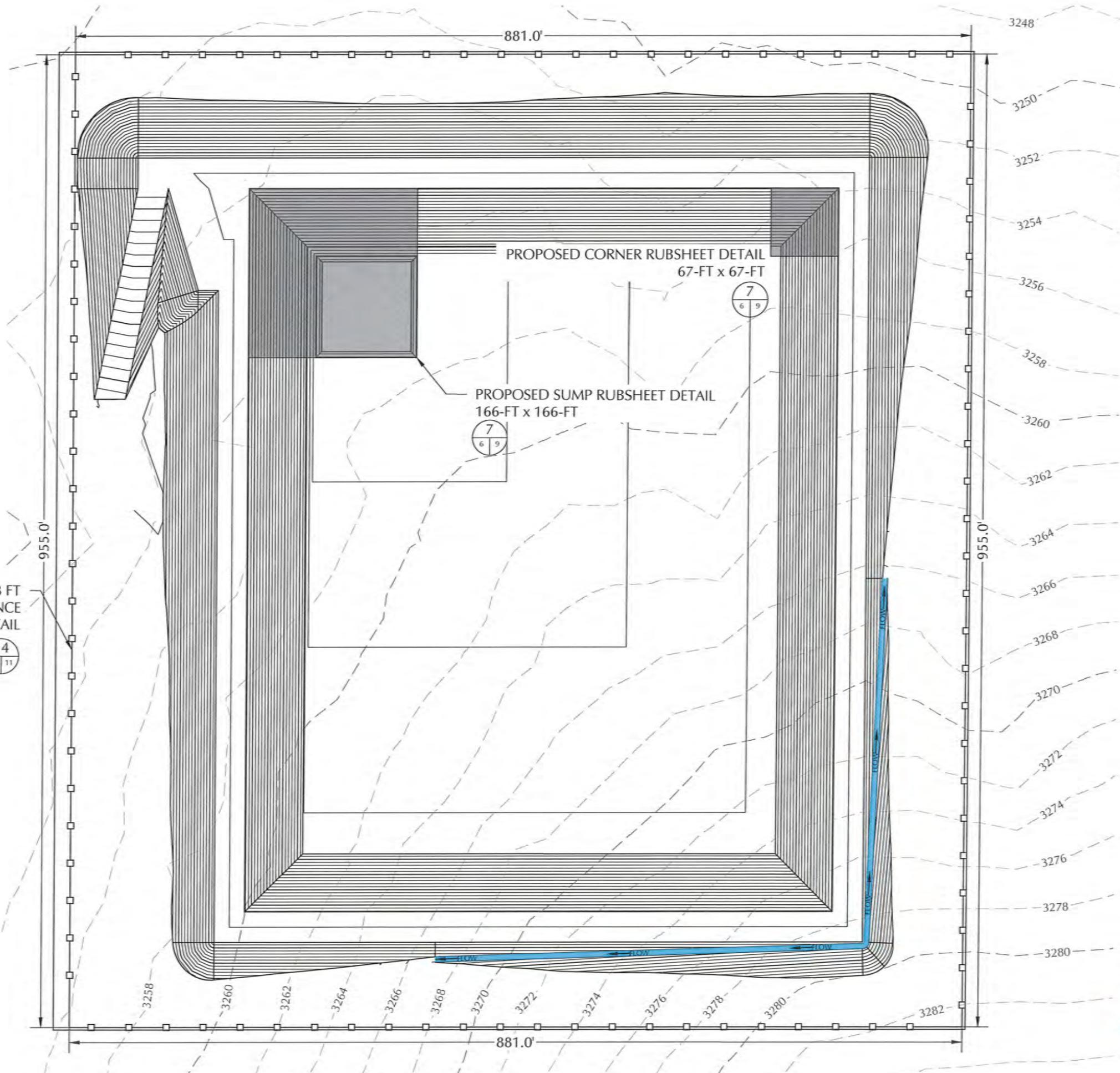
NO.	DATE	DESCRIPTION



PIT CAPACITY  
PINTAIL POND 2  
SOLARIS WATER MIDSTREAM  
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
LEA COUNTY, NEW MEXICO



DATE:	NOVEMBER 2024
SCALE:	1" = 60'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024335-00
SHEET NO.	5 OF 12



**ENVIROTECH ENGINEERING**  
 2500 North Eleventh Street  
 Escondido, CA 92029  
 619.234.6780  
 envirotechconsulting.com  
 PE #29284 - Expiration Date: 12-31-2024

- NOTES:**
1. RUBSHEET DIMENSIONS ARE TAKEN AT ANCHOR TRENCH
  2. ACCESS GATES TO BE PLACED AT BOTTOM OF ACCESS RAMPS

**COPYRIGHT**  
 This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

NO.	DATE	DESCRIPTION

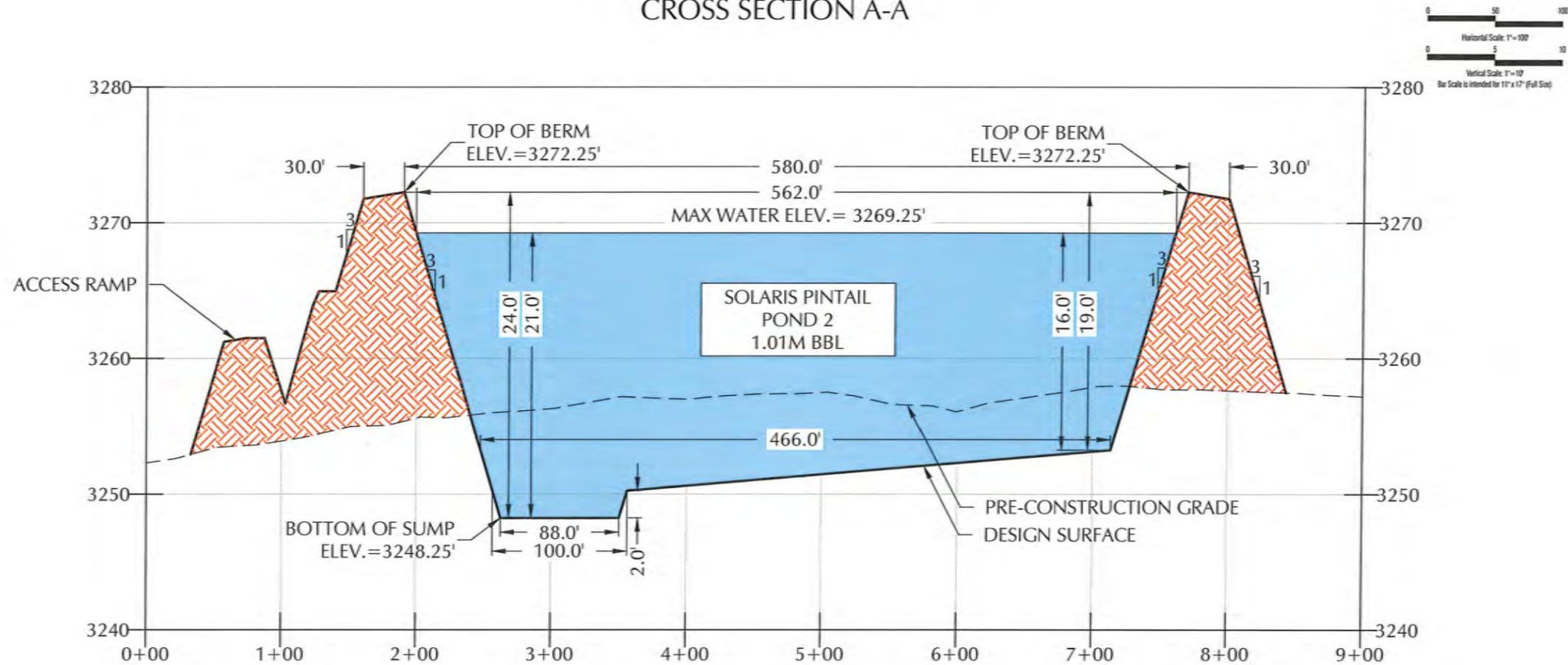


**RUBSHEET & FENCE PLAN**  
**PINTAIL POND 2**  
**SOLARIS WATER MIDSTREAM**  
 SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
 LEA COUNTY, NEW MEXICO

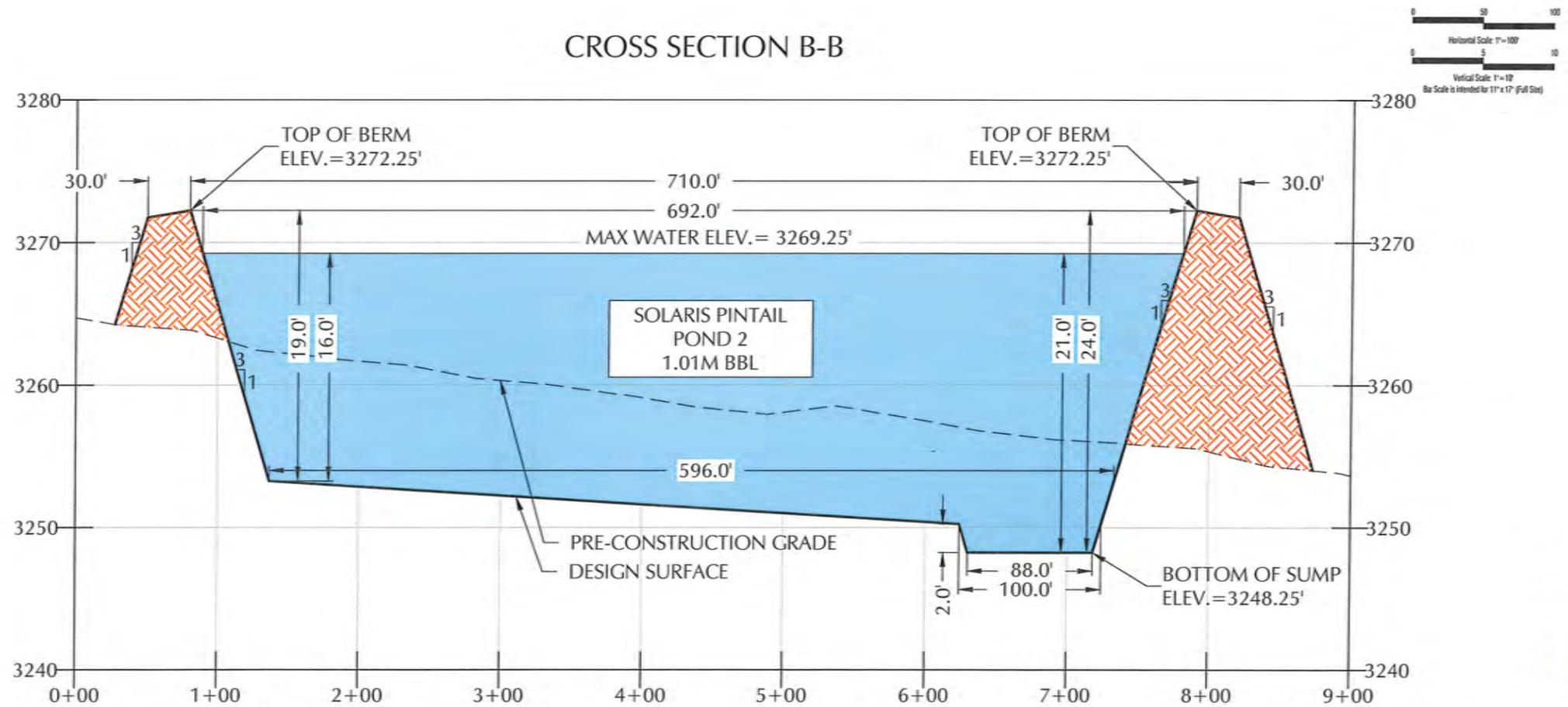


DATE:	NOVEMBER 2024
SCALE:	1" = 100'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.:	024335-00
SHEET NO.:	6 OF 12

### CROSS SECTION A-A



### CROSS SECTION B-B



**ENVIROTECH ENGINEERING**  
 2500 North Elmwood Street  
 East, Oklahoma  
 302.234.8780  
 envirotechconsulting.com  
 PE #29284 - Expiration Date: 12-31-2024

**COPYRIGHT**  
 This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

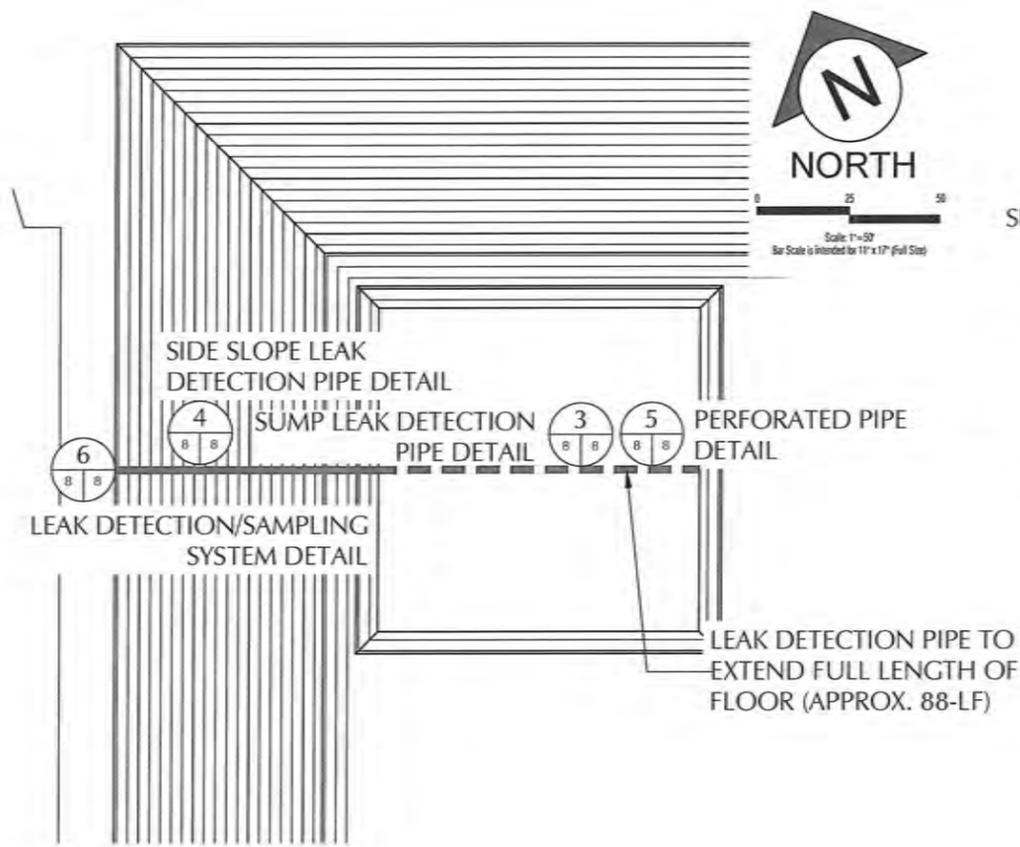
NO.	DATE	DESCRIPTION



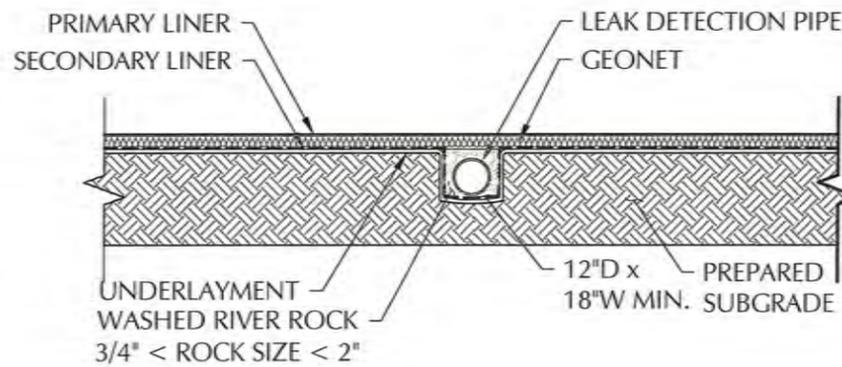
**CROSS SECTIONS A & B**  
**PINTAIL POND 2**  
**SOLARIS WATER MIDSTREAM**  
 SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
 LEA COUNTY, NEW MEXICO



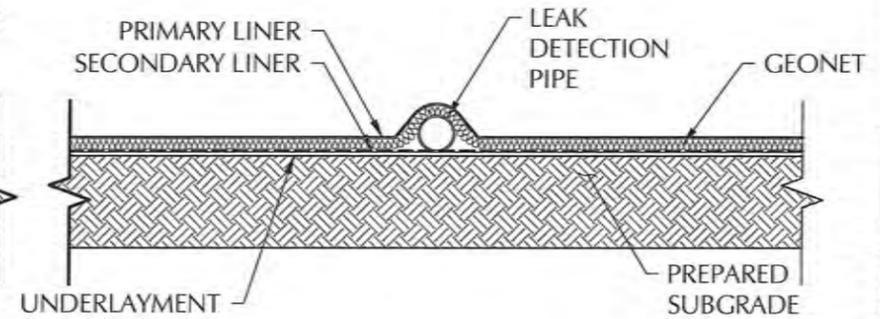
DATE:	NOVEMBER 2024
SCALE:	HORIZONTAL 1"=100' VERTICAL 1"=10'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.:	024335-00
SHEET NO.:	7 OF 12



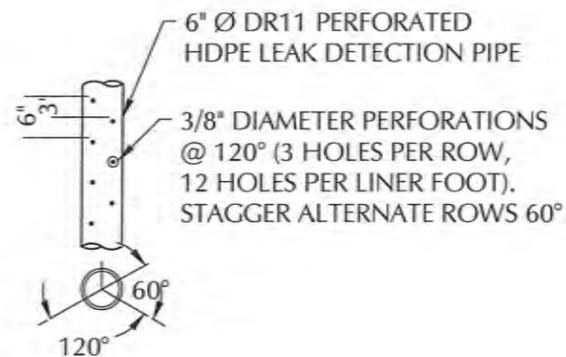
**SUMP OVERVIEW DETAIL** (2)  
NOT TO SCALE



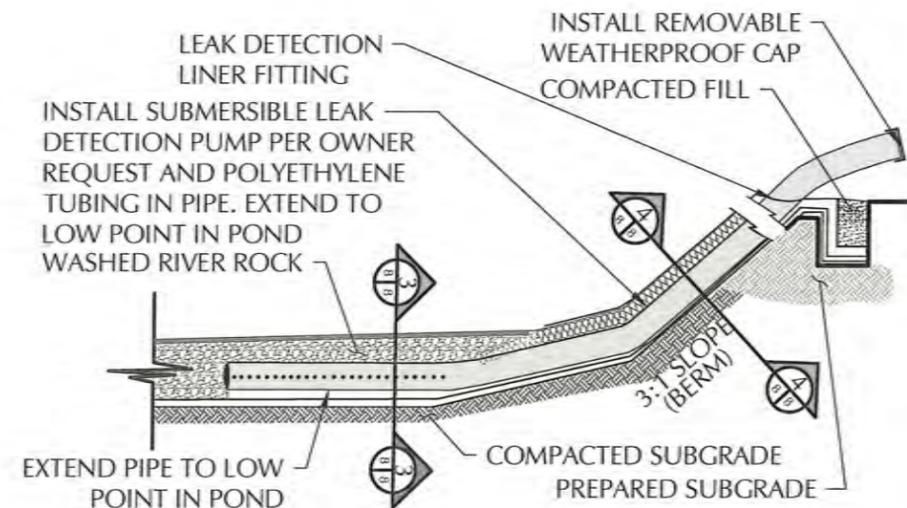
**SUMP LEAK DETECTION PIPE DETAIL** (3)  
NOT TO SCALE



**SIDE SLOPE LEAK DETECTION PIPE DETAIL** (4)  
NOT TO SCALE



**PERFORATED PIPE DETAIL** (5)  
NOT TO SCALE



**LEAK DETECTION/SAMPLING SYSTEM DETAIL** (6)  
NOT TO SCALE

PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60- MIL HDPE SMOOTH LINER
LEAK DETECTION	200-MIL GEONET
SECONDARY LINER	40-MIL HDPE SMOOTH LINER
UNDERLAYMENT	8 OZ GEOTEXTILE
SUMP	3248.25-FT ELEVATION
BERM (ROAD CREST)	DESIGN ELEV. 3272.25 FT- RD CREST (30-FT)
LEAK DETECTION PIPING	6-IN DR11.X PERFORATED HDPE LEAK DETECTION PIPE

**NOTES:**

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



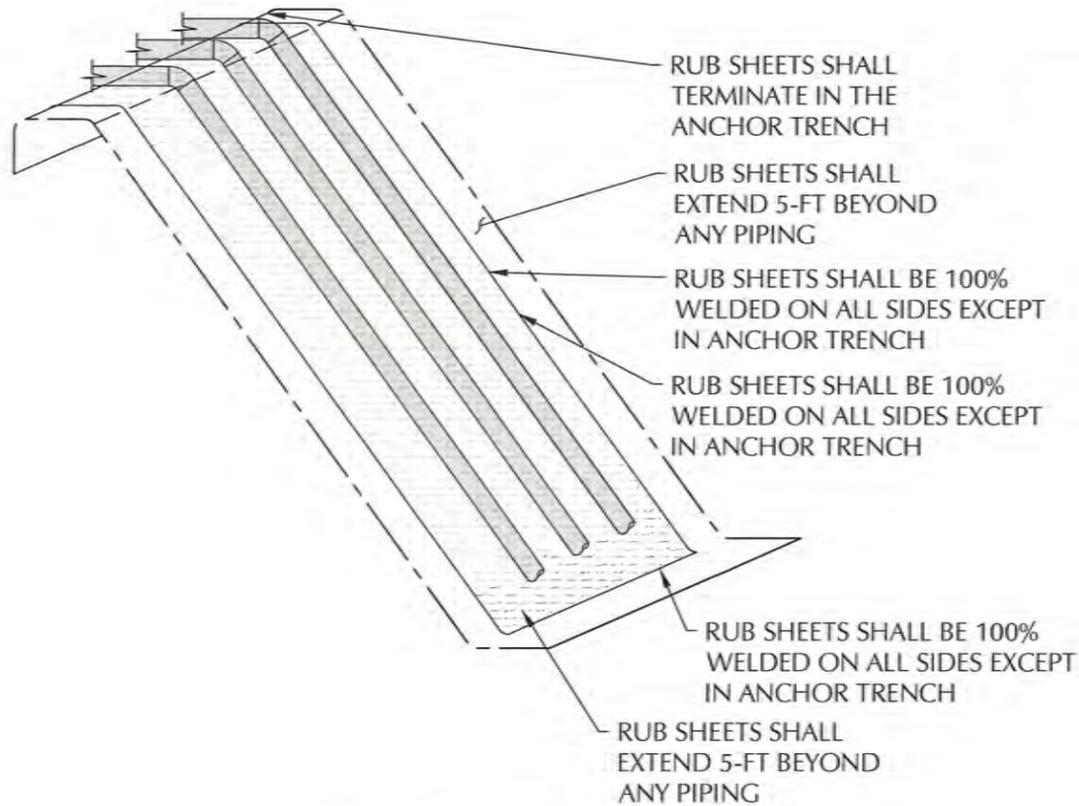
**COPYRIGHT**  
This document and the information contained may NOT be reproduced or accepted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

NO.	DATE	DESCRIPTION

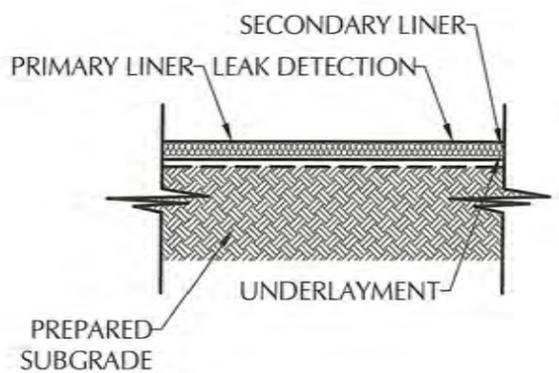


**SUMP DETAILS**  
PINTAIL POND 2  
SOLARIS WATER MIDSTREAM  
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
LEA COUNTY, NEW MEXICO

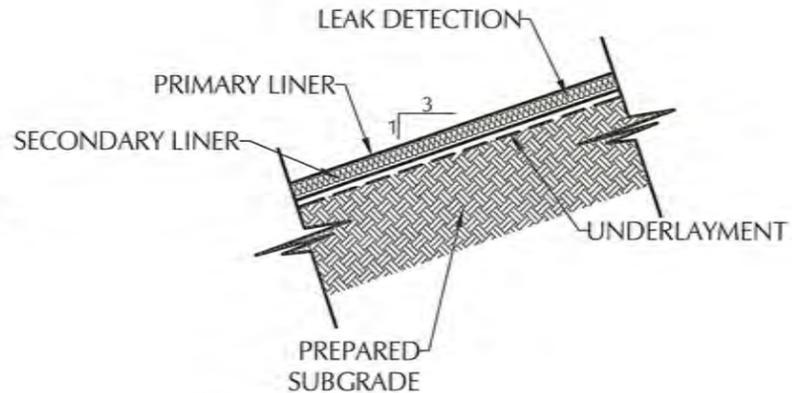
DATE:	NOVEMBER 2024
SCALE:	1" = 50'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.:	024335-00
SHEET NO.:	8 OF 12



**RUB SHEET DETAIL** (7) 6 | 9  
NOT TO SCALE



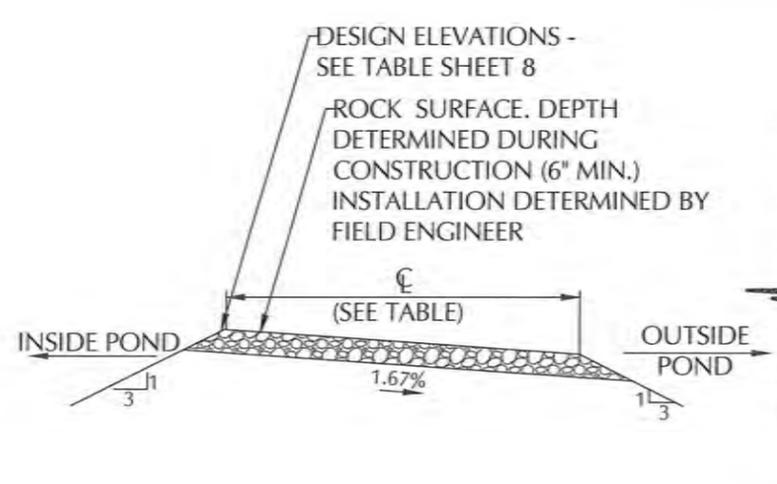
**LINER SYSTEM FLOOR DETAIL** (8) 4 | 9  
Not to Scale



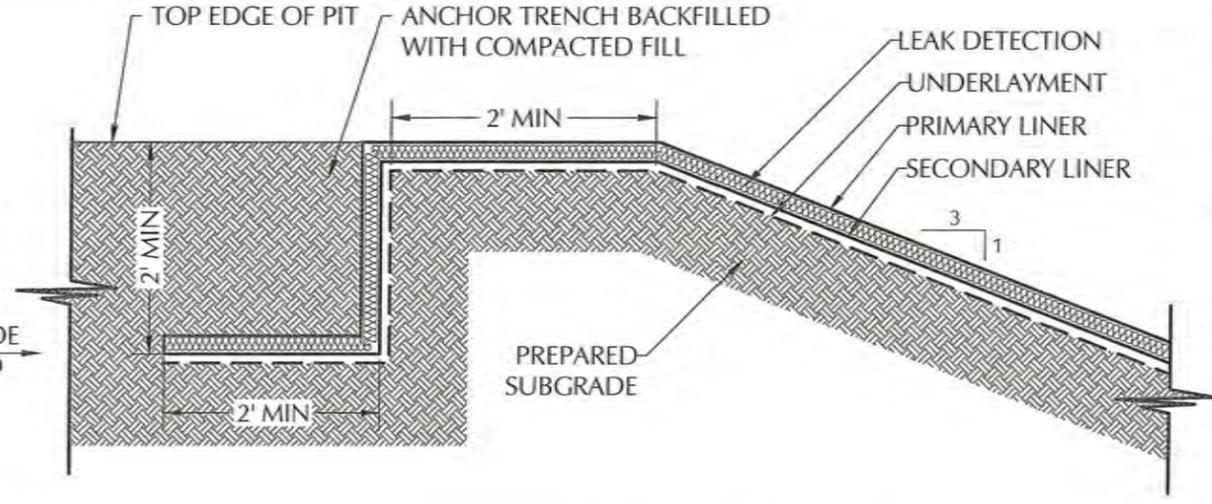
**LINER SYSTEM SIDE SLOPE DETAIL** (9) 4 | 9  
Not to Scale

**GENERAL NOTES:**

1. SEE REFERENCE TABLES SHEET 8 FOR LINER SPECIFICATIONS
2. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCK, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MIGHT PUNCTURE THE HDPE LINER.
3. ALL INTERIOR SLOPES AND TOP OF BERMS TO BE SMOOTH DRUM ROLLED.
4. ALL EMBANKMENT SLOPES SHALL HAVE A RATIO OF 3:1, COMPACTED EARTH EMBANKMENTS TO BE CONSTRUCTED WITH 8 INCH (MAXIMUM LOOSE LIFTS), COMPACTED TO 95% STANDARD PROCTOR DENSITY (ASTM D698), AND MOISTURE CONDITIONS TO +/- 2% OPTIMUM MOISTURE (ASTM D698)
5. PERFORM GEOTECHNICAL ANALYSIS ON EXISTING SOIL TO CONFIRM SOIL IS SUITABLE FOR USE IN THE LEVEE.
6. ALL BOTTOM OF PITS SHALL SLOPE TO THE SUMP.



**TYPICAL BERM CREST DETAIL** (10) 4 | 9  
Not to Scale



**ANCHOR TRENCH DETAIL** (11) 4 | 9  
Not to Scale



**COPYRIGHT**  
This document and the information contained may NOT be reproduced or excerpted here without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

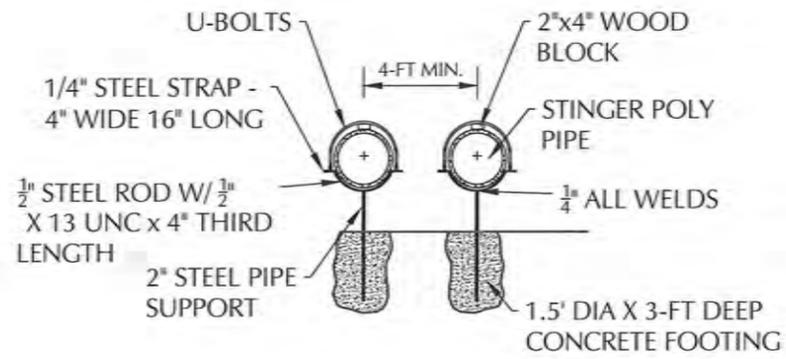
NO.	DATE	DESCRIPTION



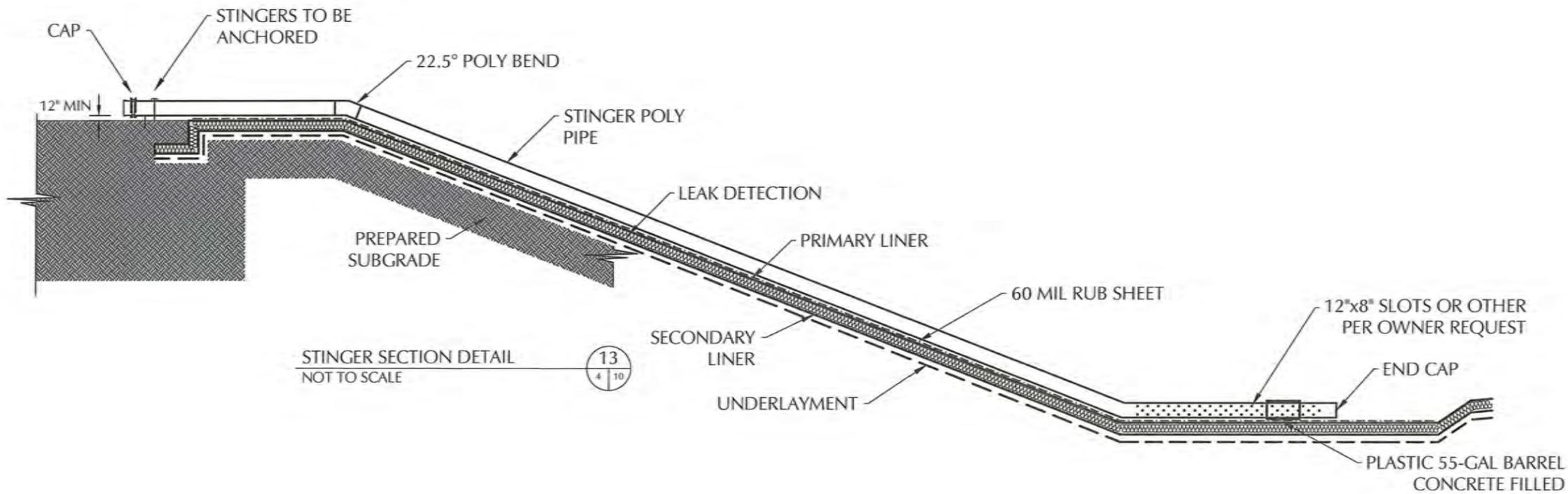
**LINER DETAILS**  
PINTAIL POND 2  
SOLARIS WATER MIDSTREAM  
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
LEA COUNTY, NEW MEXICO



DATE:	NOVEMBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024335-00
SHEET NO.	9 OF 12



STINGER SYSTEM ANCHOR DETAIL (12) NOT TO SCALE



STINGER SECTION DETAIL (13) NOT TO SCALE



**COPYRIGHT**  
 This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

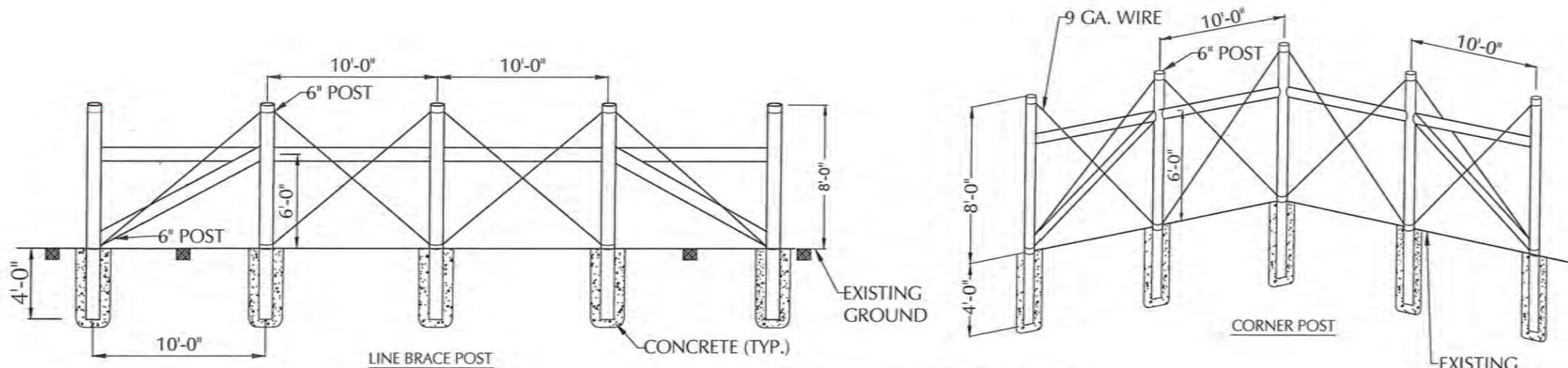
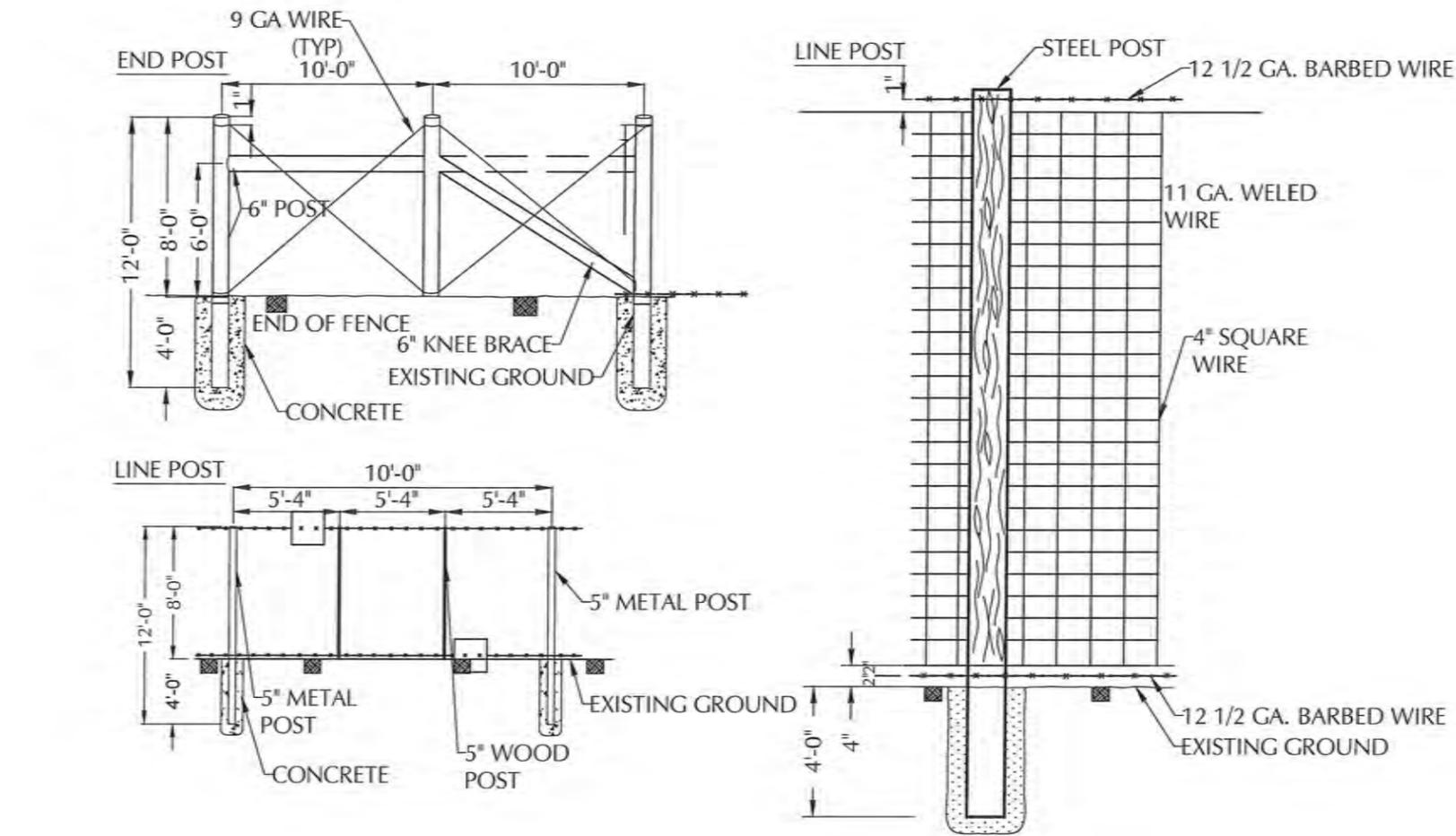
NO.	DATE	DESCRIPTION



STINGER DETAILS  
 PINTAIL POND 2  
 SOLARIS WATER MIDSTREAM  
 SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
 LEA COUNTY, NEW MEXICO



DATE:	NOVEMBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.:	1924335-00
SHEET NO.:	10 OF 12



8-FT GAME FENCE DETAIL 14  
Not to Scale

GENERAL NOTES:

1. AT EACH LOCATION WHERE AN ELECTRIC TRANSMISSION, DISTRIBUTION OR SECONDARY LINE CROSSES A BARRIER FENCE, THE CONTRACTOR SHALL FURNISH AND INSTALL A GROUND CONFORMING TO ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE- THE GROUND ROD SHALL OF A MINIMUM DIAMETER OF 1/2-IN. AND 8-FT. IN LENGTH, AND DRIVEN AT LEAST 7 1/2 FT. INTO THE GROUND. THE ROD SHALL BE CONNECTED TO EACH WIRE WITH A MINIMUM AWG NO. 8 STRANDED COPPER WIRE. GROUNDING WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
2. LINE BRACE POSTS SHALL BE SPACED AT 400 FT. INTERVALS, WHERE FENCING IS CONTINUOUS AND WHERE END, CORNER AND LINE BRACE POSTS ARE NOT SPECIFIED.
3. ALL LINE POSTS SHALL BE 5 IN. MIN. DIAMETER AND 12 FT. LONG. ALL END, CORNER AND LINE BRACE POSTS SHALL BE 6 IN. MIN. DIAMETER AND 12 FT. LONG.
4. BARBED WIRE SHALL BE DOUBLE WRAPPED AND TIED OFF AT END POSTS, CORNER POSTS AND LINE BRACE POSTS.
5. WOVEN WIRE SHALL BE SINGLE WRAPPED AND TIED OFF. FENCE TO BE CONTINUED, SHALL BE RESTARTED IN LIKE MANNER. WOVEN WIRE FENCE FABRIC SHALL CONFORM TO AASHTO M279 (ASTM A 116) DESIGN NO. 1047-6-11 WITH CLASS 1 COATING.
6. STEEL BARBED WIRE SHALL CONFORM TO AASHTO M 200 (ASTM A 121) 12-1/2 GAGE WITH CLASS 1 COATING.
7. ALL FENCE WIRE TIES, BRACE WIRES, STAPLES AND OTHER WIRE APPURTENANCES SHALL BE GALVANIZED IN CONFORMANCE WITH AASHTO M 232.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING DISTURBED OR DESTROYED SURVEY MONUMENTS TO THE APPROPRIATE ACCURACY.
9. ALL MISCELLANEOUS HARDWARE SHALL BE FURNISHED GALVANIZED OR ALUMINUM COATED. ALL METAL PIPE POSTS SHALL BE CAPPED.
10. READY MIX CONCRETE MAY BE USED AS A SUBSTITUTE FOR CLASS "A" CONCRETE FOR THE CONCRETE FOOTING IF APPROVED BY THE ENGINEER.



**COPYRIGHT**  
This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

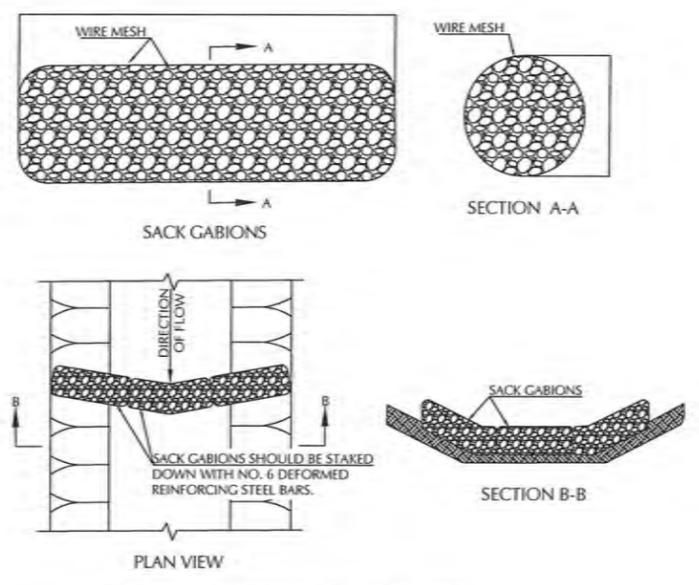
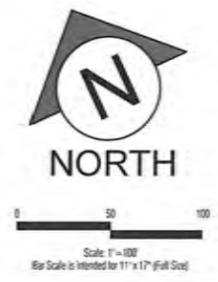
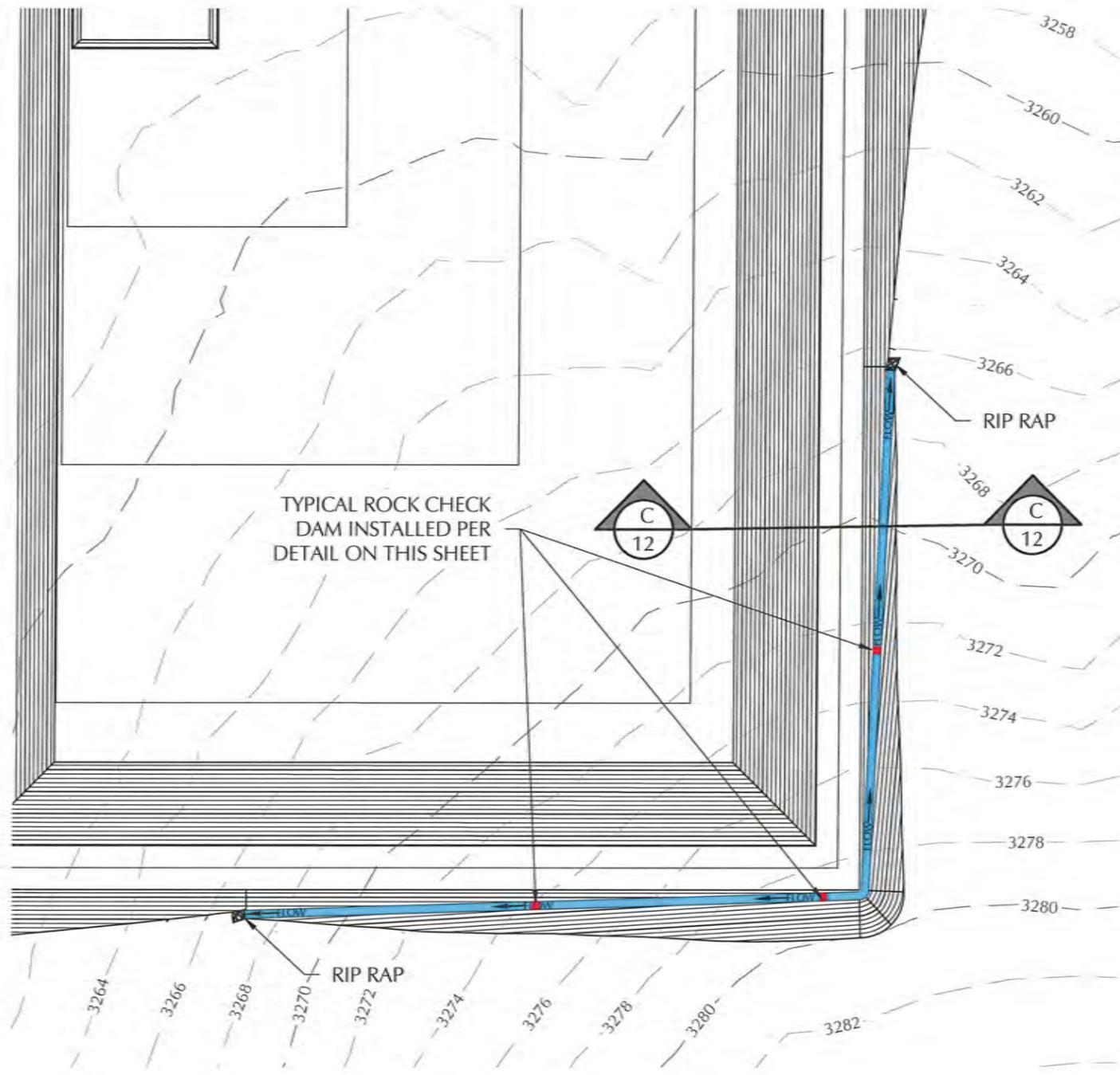
NO.	DATE	DESCRIPTION



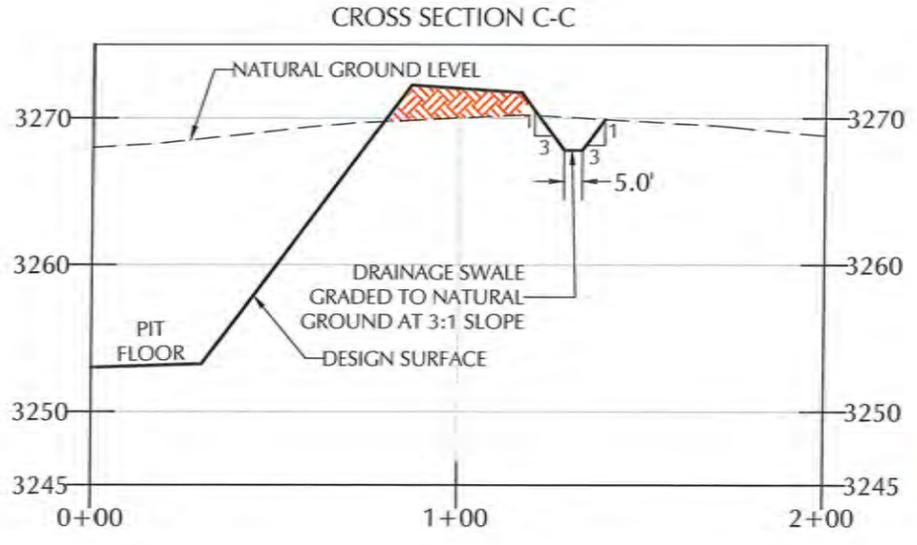
FENCE DETAILS  
PINTAIL POND 2  
SOLARIS WATER MIDSTREAM  
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
LEA COUNTY, NEW MEXICO



DATE:	NOVEMBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024335-00
SHEET NO.	11 OF 12



**ROCK CHECK DAM DETAIL**  
Not to Scale



**ENVIROTECH ENGINEERING**  
2500 North Eleventh Street  
Tulsa, Oklahoma  
918.234.8780  
envirotechconsulting.com  
PE #21034 - Expiration Date: 12-31-2024

**COPYRIGHT**  
This document and the information contained may NOT be reproduced or excerpted from without the express written permission of Envirotech Engineering and Consulting, Inc. Unauthorized copying, disclosure or construction use are prohibited by the copyright law.

NO.	DATE	DESCRIPTION



STORMWATER DIVERSION CHANNEL DETAIL  
PINTAIL POND 2  
SOLARIS WATER MIDSTREAM  
SECTION 9, TOWNSHIP 26 SOUTH, RANGE 32 EAST  
LEA COUNTY, NEW MEXICO

DATE:	NOVEMBER 2024
SCALE:	VARIES
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024335-00
SHEET NO.	12 OF 12

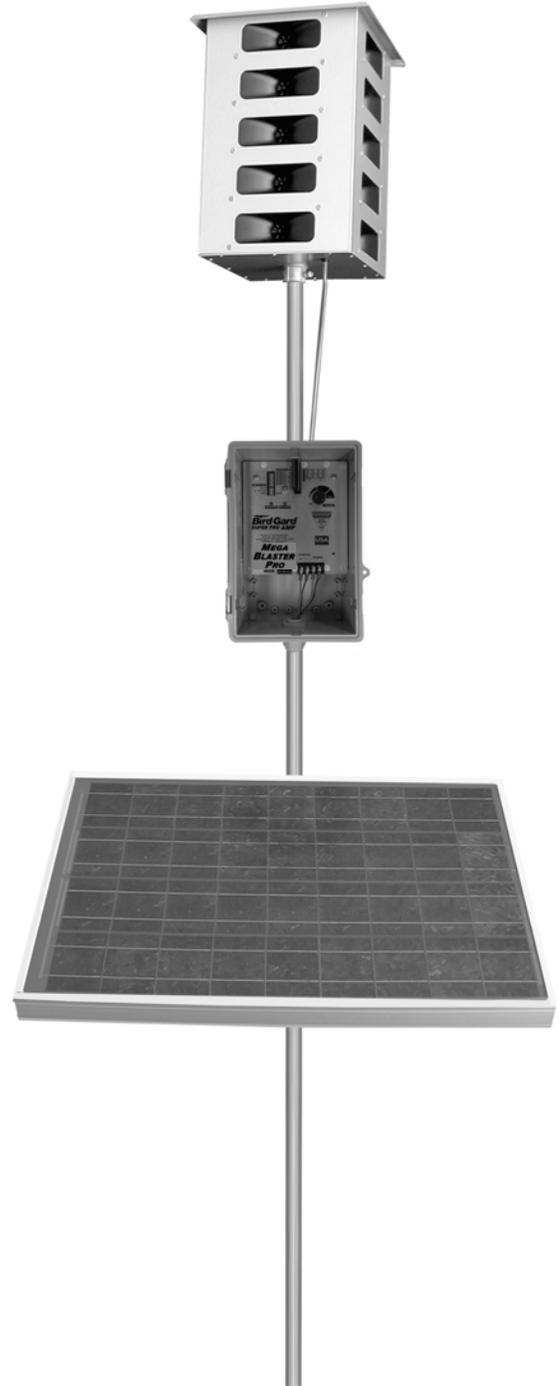
# AVIAN DETERRENT SYSTEM

# **MEGA BLASTER PRO**



## User's Manual

Overview	2
Bird Control Management Guidelines	3
Materials List	4
Assembly	5
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
Recordings	10
Mode Settings	10
Warranty	12



# 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:

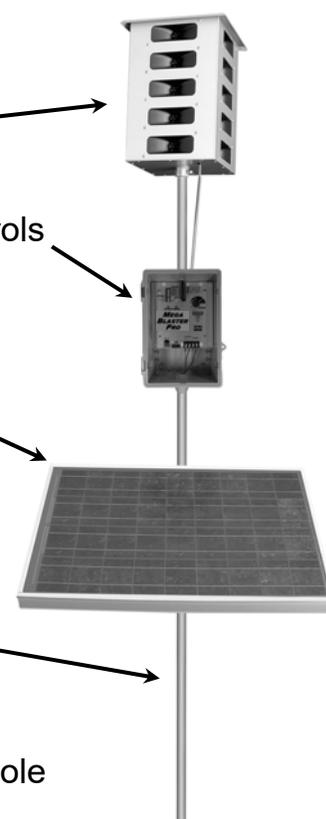
**20-Speaker Tower** broadcasts the bird sounds

**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**

# DESIGN/CONSTRUCTION PLAN

## Design and Construction Plan In Ground Containments

This plan addresses construction of the earthen containments.

Magrym Engineers is providing the design of the containment and their plans are presented in this submission.

### *Dike Protection and Structural Integrity*

The design and operation provide for the confinement of produced water, prevention of releases and prevention of overtopping due to wave action or rainfall. Additionally, the design prevents run-on of surface water as the containment is surrounded by an above-grade levee (a berm) and/or diversion ditch (between the levee and the soil stockpile) to prevent run-on of surface water.

### *Stockpile Topsoil*

Where topsoil is present, prior to constructing containment, the operator will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

### *Signage*

The operator will place 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 sign is posted in a manner and location such that a person can easily read the legend. The sign will 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

### *Fencing*

The operator will provide for a fence to enclose the recycling containment in a manner that deters unauthorized wildlife and human access. As specified in the design drawings, the operator will employ a chain-link or game fence. If required by the District Office, the operator will add four-strands of barbed wire to comply with the text of the Rule. Because feral pigs, javelina and deer are present in the area, a chain link or game fence is required in order to comply with Section 19.15.34.12 D.1 of the Rule because pigs will move beneath the lower strand of a 4-strand, 4-foot high barbed wire fence and deer will jump over. However, 19.15.34.12 D.2 requires "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". Therefore, a barbed wire specification will be added to the game fence to avoid a variance if required by the OCD District Office.

19.15.34.12 A Design and Construction Specifications

(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.  
(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

19.15.34.12 B. 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

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.

## Design and Construction Plan In Ground Containments

As stated in the O&M plan, the operator will ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.

### *Netting and Protection of Wildlife*

The perimeter game/chain-link fence will be effective in excluding stock and most terrestrial wildlife. If requested by the surface owner, the game fence can include a fine mesh from the base to 1 foot above the ground to exclude the small reptiles (e.g. dune sagebrush lizard).

The recycling containment will be protective of wildlife, including migratory birds through the implementation of an Avian Protection Plan, routine inspections and the perimeter fence.

The avian protection plan includes the use of a Bird-X Mega Blaster Pro<sup>1</sup> as a primary hazing program for avian species. The device will be equipped with sounds suitable for the Permian Basin environment. In addition to this sonic device, staff will routinely inspect the containment for the presence of avian species and, if detected, will use a blank cartridge or shell in a handgun, starter pistol or shotgun as additional hazing. Decoys of birds of prey may be placed on the game fence and other roosts around the open water to provide additional hazing.

The O&M plan calls for the operator to 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.

### *Earthwork*

The containment will 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.

This volume provides the stamped drawings for the containment with the following design/construction specifications:

- a) levee has inside grade no steeper than two horizontal feet to one vertical foot (2H: 1V).

#### 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.

#### 19.15.34.12 A

(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...

## Design and Construction Plan In Ground Containments

- b) levee outside grade is no steeper than three horizontal feet to one vertical foot (3H: 1V)
- c) top of the levee is wide enough to install an anchor trench and provide adequate room for inspection and maintenance.
- d) The containment floor design calls for a slope toward the sump in the corner(s).

### *Liner and Drainage Geotextile Installation*

The containment has a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

The primary (upper) liner is a geomembrane liner composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. It is 60-mil HDPE. The secondary liner is specified in the design drawings and is 40-mil HDPE or thicker and is equivalent to 30-mil LLDPEr (in accordance with a previously approved variance) Liner compatibility meets or exceeds a subsequent relevant publication to EPA SW-846 method 9090A.

The recycling containment design has a leak detection system between the upper and lower geomembrane liners of 200-mil geonet to facilitate drainage. The leak detection system consists 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. The containment floor design calls for a slope toward the sump in the corner(s) of the containment, as shown in the design drawings. This slope combined with the highly transmissive geonet drainage layer provide for rapid leak detection.

The liners and drainage material will be installed consistent with the Manufacturer's specifications. In addition to any specifications of the Manufacturer, protocols for liner installation include measures to:

- i. minimizing liner seams and orient them up and down, not across, a slope of the levee.
- ii. use factory-welded seams where possible.
- iii. use field seams in geosynthetic material that are thermally seamed and prior to field seaming, overlap liners four to six inches.
- iv. minimize the number of field seams and comers and irregularly shaped areas.
- v. provide for no horizontal seams within five feet of the

19.15.34.12 A

(2) ...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.

19.15.34.12 A

(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.

19.15.34.12 A

(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 x 10-9 cm/sec. Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

19.15.34.12 A

(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 x 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.

19.15.34.12 A

(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...

## Design and Construction Plan In Ground Containments

- slope's toe.
- vi. use qualified personnel to perform field welding and testing.
- vii. avoid excessive stress-strain on the liner
- viii. The edges of all liners are anchored in the bottom of a compacted earth-filled trench that is at least 18 inches deep

At points of discharge into the lined earthen containment the pipe configuration effectively protects the liner from excessive hydrostatic force or mechanical damage during filling.

The design shows that at any point of discharge into or suction from the recycling containment, the liner is protected from excessive hydrostatic force or mechanical damage. External discharge or suction lines do not penetrate the liner.

Pumping from the containment to hydraulic fracturing operations is the responsibility of stimulation contractors. Typically, lines are permanently placed in the containment with floats attached to prevent damage to the liner system. The containment may be equipped with permanent HDPE stinger (supported by a sacrificial liner or geotextile) for withdrawal of fluid if the owner deems necessary during operations.

### *Leak Detection and Fluid Removal System Installation*

The leak detection system, contains the following design elements

- a. The 200-mil HyperNet Geonet drainage material between the primary and secondary liner that is sufficiently permeable to allow the transport of fluids to the observation ports (Appendix A).
- b. The containment floor is sloped towards the monitoring riser pipe to facilitate the earliest possible leak detection of the containment bottom. A pump may be placed in the observation port to provide for fluid removal.
- c. 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 (see Appendix A).

19.15.34.12 A

(5) ...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.

19.15.34.12 A

(3) 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.

19.15.34.12 A

(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.

# OPERATIONS AND MAINTENANCE PLAN

## CLOSURE PLAN

## Operation and Maintenance Plan In Ground Containments

### Overview

The operator will operate and maintain the lined earthen containment to contain liquids and solids (blow sand and minimal precipitates from the produced water) and maintain the integrity of the liner system in a manner that prevents contamination of fresh water and protects public health and the environment as described below. The purpose of the lined earthen containment is to facilitate recycling, reuse and reclamation of produced water derived from oil and gas wells. During periods when water for E&P operations is not needed, produced water will discharge to injection wells or to a pipeline for transfer to another recycling facility. The containment will not be used for the disposal of produced water or other oilfield waste.

The operation of the containment is summarized below.

- A. Produced water generated from nearby oil and gas wells is delivered to a treatment system located as indicated in the C-147.
- B. Unless specified in the transmittal letter, after treatment, the produced water discharges into the containment.
- C. When required, produced water is removed from the containment for E&P operations. At this time, produced water will be used for drilling beneath the freshwater zones (beneath surface casing), for well stimulation (e.g. hydraulic fracturing) and other E&P uses as approved by OCD.
- D. Whenever the maximum fluid capacity of the containment is reached, treatment and discharge to the containment ceases (see Freeboard and Overtopping Plan, below).
- E. The operator will 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 (see attached example).
- F. The operator will 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.

19.15.34.10 D

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

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 In Ground Containments

- G. The containment shall be deemed to have ceased operations if less than 20% of the total fluid capacity is used every six months following the first withdrawal of produced water for use. The operator will report cessation of operations to the appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

19.15.34.13 C

A recycling containment shall be deemed to have ceased operations if less than 20% 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 appropriate division district office. The appropriate division district office may grant an extension to this determination of cessation of operations not to exceed six months.

The operation of the lined earthen containment will follow the mandates listed below:

1. The operator will not discharge into or store any hazardous waste (as defined by 40 CFR 261 and NMAC 19.15.2.7.H.3) in the containments.
2. If the containment's primary liner is compromised above the fluid's surface, the operator will 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.
3. If the primary liner is compromised below the fluid's surface, the operator will 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.
4. If any penetration of the containment liner is confirmed by sampling of fluid in the leak detection system (see Monitoring, Inspection, and Reporting Plan; below), the operator will:
  - a. Begin and maintain fluid removal from the leak detection/pump-back system,
  - b. Notify the district office within 48 hours (phone or email) of the discovery,
  - c. Identify the location of the leak, and
  - d. Repair the damage or, if necessary, replace the containment liner.
5. The operator will install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release and the operator will remove any visible layer of oil from the surface of the recycling containment.
6. The operator will report releases of fluid in a manner consistent with NMAC 19.15.29
7. The containment will be operated to prevent the collection of surface water run-on.

19.15.34.13 B

(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.

19.15.34.13 B

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

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

19.15.34.8 A

(6) All releases from the recycling and re-use of produced water shall be handled in accordance with 19.15.29 NMAC.

## Operation and Maintenance Plan In Ground Containments

8. The operator will maintain the containment free of miscellaneous solid waste or debris.
9. The operator will maintain at least three feet of freeboard for the containment and will use a free-standing staff gauge to allow easy determination of the required 3-foot of freeboard.
10. As described in the design/construction plan, the injection or withdrawal of fluids from the containment is accomplished through hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
11. The operator shall ensure that all gates associated with the fence are closed and locked when responsible personnel are not onsite.
12. The operator will maintain the fences in good repair.

### *Monitoring, Inspection, and Reporting Plan*

The operator will 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.

Weekly inspections consist of:

- reading and recording the fluid height of staff gauges,
- recording any evidence that the pond surface shows visible oil,
- visually inspecting the containment's exposed liners
- checking the leak detection system for any evidence of a loss of integrity of the primary liner.
- inspect diversion ditches and berms around the containment to check for erosion and collection of surface water run-on.
- inspect the leak detection system for evidence of damage or malfunction and monitor for leakage.

As stated above, if a liner's integrity is compromised, or if any penetration of the liner occurs, then the operator will take appropriate action within 48 hours, based on if above or below water surface, as noted above.

19.15.34.13

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

19.15.34.13 B

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

19.15.34.13 B

(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.

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.

## Operation and Maintenance Plan In Ground Containments

Monthly, the operator will:

- A. Inspect the containment for dead migratory birds and other wildlife. 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.
- B. Report 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.
- C. Record sources and disposition of all recycled water.

The operator will maintain a log of all inspections and make the log available for the appropriate Division district office's review upon request. An example of the log is attached to this section of the permit application.

### *Freeboard and Overtopping Prevention Plan*

The method of operation of the containment allows for maintaining freeboard with very few potential problems. When the capacity of the containment is reached (3-feet of freeboard), the discharge of produced water ceases and the produced water generated by nearby oil and gas wells is managed by an injection well(s).

If rising water levels suggest that 3-feet of freeboard will not be maintained, the operator will implement one or more of the following options:

- I. Cease discharging produced water to the containment.
- II. Accelerate re-use of the produced water for purposes approved by the Division.
- III. Transfer produced water from the containment to injection wells.

The reading of the staff gauge typically occurs daily when treatment operations are ongoing and weekly when discharge to the containment is not occurring.

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 In Ground Containments

### *Protocol for Leak Detection Monitoring, Fluid Removal and Reporting*

As shown in Appendix A, the leak detection system includes a monitoring system. Any fluid released from the primary liner will flow to the collection sump, where fluid level monitoring is possible at the monitoring riser pipe associated with the leak detection system.

Staff may employ a portable electronic water level meter to determine if fluid exists in the monitoring riser pipe. Obtaining accurate readings of water levels in a sloped pipe beneath a containment can be a challenge. An electrician's wire snake may be required to push the probe to the bottom of the port and the probe may be fixed in a 2-inch pipe "dry housing" to avoid false readings due to water condensation on the pipe. There are many techniques to determine the existence of water in the sumps – including low flow pumps and a simple small bailer affixed to an electrician's snake. The operator will use the method that works best for this containment.

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 in the monitoring riser pipe on a daily basis for one week to determine the rate of seepage.
2. Collect a water sample from the monitoring riser pipe to confirm the seepage is produced water from the containment via electrical conductivity and chloride measurements.
3. Notify NMOCD of a confirmed positive detection in the system within 48 hours of sampling (initial notification).
4. Install a pump into the monitoring riser pipe sump to continually (manually on a daily basis or via automatic timers) remove fluids from the leak detection system into the containment until the liner is repaired or replaced.
5. Dispatch a liner professional to inspect the portion of the containment suspected of leakage during a "low water" monitoring event.
6. Provide NMOCD a second report describing the inspection and/or repair within 20 days of the initial notification.

## Operation and Maintenance Plan In Ground Containments

If the point of release is obvious from a low water inspection, the liner professional will repair the loss of integrity. If the point of release cannot be determined by the inspection, the liner professional will develop a more robust plan to identify the point(s) of release. The inspection plan and schedule will be submitted to OCD with the second report. The operator will implement the plan upon OCD approval.

## Closure Plan In Ground Containments

### Overview

After operations cease, the operator will 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 operator shall substantially restore the impacted surface area to

- a. the condition that existed prior to the construction of the recycling containment or
- b. to a condition imposed by federal, state trust land or tribal agencies on lands managed by those agencies as these provisions govern the obligations of any operator subject to those provisions,

The surface owner will impose a closure design that conforms to their needs for the site. The operator understands that a variance will be submitted to OCD to allow for any alternative closure protocol.

### *Excavation and Removal Closure Plan – Protocols and Procedures*

The containment is expected to hold a small volume of solids, the majority of which will be windblown sand and dust with some mineral precipitates from the water

1. The operator will remove all liquids from the containment and either:
  - a. Dispose of the liquids in a division-approved facility, or
  - b. Recycle, reuse or reclaim the water for reuse in drilling and stimulation.
2. The operator will close the recycling containment by first removing all fluids, contents and synthetic liners and transferring these materials to a division approved facility.
3. After the removal of the containment contents and liners, soils beneath the containment will be tested by collection of a five-point (minimum) composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I of 19.15.34.14.
4. After review of the laboratory results:
  - a. If any contaminant concentration is higher than the parameters listed in Table I, additional delineation may be required, and the operator must receive approval before proceeding with closure.

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.

19.15.34.14 E

The operator shall substantially restore the impacted surface area to the condition that existed prior to the construction of the recycling containment.

19.15.34.14 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.

19.15.34.14 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.

19.15.34.14 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.

19.15.34.14 C

(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.

## Closure Plan In Ground Containments

- b. If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator will proceed to
- i. backfill with non-waste containing, uncontaminated, earthen material - Or
  - ii. undertake an alternative closure process pursuant to a variance request after approval by OCD.

19.15.34.14 C

(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.

### Reclamation and Re-vegetation

- a. The operator will reclaim the containment's location to a safe and stable condition that blends with the surrounding undisturbed area.
- b. 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.
- c. The disturbed area shall then be reseeded in the first favorable growing season following closure of a recycling containment.

19.15.34.14 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.

19.15.34.14 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.

### Closure Documentation

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.

19.15.34.14 H

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

The operator shall notify the division when reclamation and re-vegetation are complete. Specifically the notice will document that 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 (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

19.15.34.14 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 (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

November 2024  
Revised February 2025

# Rule 34 Registration: Volume 1

## Pintail East Containment

### Section 9, T26S, R32E, Lea County

- *Transmittal Letter (Revised)*
- *Closure Costs*
- *Siting Criteria Demonstration with Plates & Appendices (Revised)*



*Looking northwest across the location from its southeast corner.*

**Prepared for:**  
**Solaris Midstream Waters, LLC**  
**Houston, Texas**

**Prepared by:**  
**R.T. Hicks Consultants, Ltd.**  
**901 Rio Grande NW F-142**  
**Albuquerque, New Mexico**

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

February 19, 2025

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: Solaris Water Midstream, LLC, Pintail East Containment  
In-ground Containment Registration RESUBMIT  
Section 9 T26S R32E, Eddy County

Dear Ms. Barr and Ms. Venegas:

On behalf of Solaris Water Midstream, LLC, R.T. Hicks Consultants is pleased to submit a *REVISED* C-147 registration for the above-referenced project. Solaris anticipates that construction will commence as soon as possible. The recycling facility associated with this containment is RF-467, at the adjacent Pintail facility.

Volume 1 of the C-147 package contains revisions relating to medium karst:

- Transmittal Letter
- Closure cost estimate for the In-Ground Containment – *including a Cave, Karst Inventory Report.*
- Siting Criteria Demonstration with Plates and Appendices

Volume 2 is the same document previously submitted:

- The C-147 Form to register the in-ground containment
- Stamped Design Drawings with Liner Equivalency Demonstration and Avian Deterrence
- Recently Approved Plans for Design/Construction, O&M, Closure

This submission refers to the following elements that some OCD reviewers have considered variances for in-ground containments:

1. An equivalency demonstration written by experts for the proposed 40-mil HDPE secondary liner has been previously approved by OCD. We maintain that the language of the Rule is clear, and a variance is not required.
2. OCD has approved the proposed Avian Protection Plan (Bird-X Mega Blaster Pro) for other containments. Thus, the plan meets the requirement of the rule that the “otherwise protective of wildlife, including migratory birds” and a variance is not required.
3. Using the proposed deer fence in lieu of a 4-strand barbed wire fence is not a variance. Because feral pigs, javelina and deer are present in the area, a tall game fence is required to comply with Section 19.15.34.12 D.1 of the Rule. The specification for fencing provided in 19.15.34.12 D.2 contradicts D.1 because pigs will move beneath the lower strand of a 4-foot high barbed wire fence and deer will

February 19, 2025

Page 2

jump over. Thus, compliance with D.2 results in a violation of D.1. We maintain that compliance with D.1 is the critical component of the Rule and operators need not be required to submit a variance request to follow Best Management Practices and comply with the Rule. Nevertheless, Solaris will attach 4 strands of barbed wire to the game fence if required by OCD.

Solaris will transmit the registration package to OCD via the OCD.Online portal. In compliance with 19.15.34.10 of the Rule, Solaris provided this package to the BLM, the surface owner. If you have any questions or concerns regarding this permit or the attached C-147, please contact me. As always, we appreciate your work ethic and diligence.

Sincerely,  
R.T. Hicks Consultants

A handwritten signature in black ink, appearing to read "Randall T. Hicks". The signature is written in a cursive, flowing style.

Randall T. Hicks PG  
Principal

Copy: Solaris Water Midstream, LLC,

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

## **Pintail East In-Ground Containment Financial Assurance Cost Estimate**

Attached is the cost estimate for reclamation of the Pintail East Recycling In-Ground Containment. Total bonding is **\$652,997.25**.

### **Pintail East In-Ground Containment**

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

Closure sampling and analysis cost is estimated at \$1725 (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.

RT Hicks Consultants will assist with the sampling as necessary and prepare the Closure Report for the site. Total closure sampling costs are estimated at \$7500. The cost estimates from Cascade Services (attached) and from RT Hicks Consultants are presented below.

#### ***Cascade Services***

*All work elements required by Rule 34* \$ 645,497.25

#### ***RT Hicks Consultants***

Preparation of sampling results and closure report \$ 7,500.00

**Total for in ground Containment Closure Activities** **\$ 652,997.25**

The reclamation must meet terms set forth in the surface lease agreement with the landowner who received a copy of the registration.

Please contact Randall Hicks if you have any questions concerning this closure cost estimate.

**Cascade Services, LLC**

3403B E County Road 44  
 Midland, TX 79705  
 www.cascadeservicesllc.com



**Estimate**

ADDRESS	SHIP TO	ESTIMATE	1806
Solaris Water Midstream LLC	Solaris Water Midstream LLC	DATE	11/05/2024
9651 Katy Freeway, Suite 400	9651 Katy Freeway, Suite 400		
Houston, TX 77024	Houston, TX 77024		

CUSTOMER PROJECT NAME	PROJECT LOCATION COORDINATES
Pintail East Closure	Lea, County

DESCRIPTION	QTY	UNIT	RATE	AMOUNT
This is pricing a package to reclaim the single 1mm bbl pond cell 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.	1		352,466.00	352,466.00
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 3,460 ft This includes removal of all posts, braces, wire, fabric, gates, and hardware.	3,460	4.00	13,840.00
Remove and dispose of all four layers. Textile, 40 mil, net, and 60 mil	1,811,775	0.15	271,766.25

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

SUBTOTAL	645,497.25
TAX	0.00

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

TOTAL	<b>\$645,497.25</b>
-------	---------------------

\*\*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

# SITE ASSESSMENT & CHARACTERIZATION

## TEXT AND FIGURES

## PLATES

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT**Distance to Groundwater**

Plate 1, Plate 2, and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the locations is greater than 100 feet beneath the area of interest that will include the location of the Pintail Reuse Facility.

Plate 1 is a topographic map that shows:

1. The area of the Pintail Reuse Facility is identified by the blue diagonally lined polygon.
2. Water wells from the OSE database as a blue triangle inside a colored circle. OSE wells are often mislocated in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Additionally, the OSE database can include locations of proposed wells (i.e., permit applications). In this case, the permit data generally show “no date” and “DTW=0”. On Plate 1, the OSE data has been screened with permit data being eliminated. Depth to water data for the OSE wells do not necessarily represent static water levels which can be misleading.
3. Water wells from the USGS database as large triangles color-coded to the formation from which the well draws water. Depth to water and the date of measurement are presented in the Plate.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares (Misc. well database).

Plate 2 is a topographic and geologic map that shows:

1. The area of the Pintail Reuse Facility is identified by the blue diagonally lined polygon. Elevation is from about 3287 along the southern side to about 3237 feet at the northernmost point.
2. Water wells measured by the USGS, the year of the measurement and the calculated elevation of the groundwater surface.
3. Water wells from the USGS database as large triangles color-coded to the formation from which the well draws water. Depth to water and the date of measurement are presented in the Plate.
4. The geologic unit present at the Aurora site is Quaternary Older Alluvium overlying reworked Ogallala Formation materials explained below (Qoa/To).

**Hydrogeology**

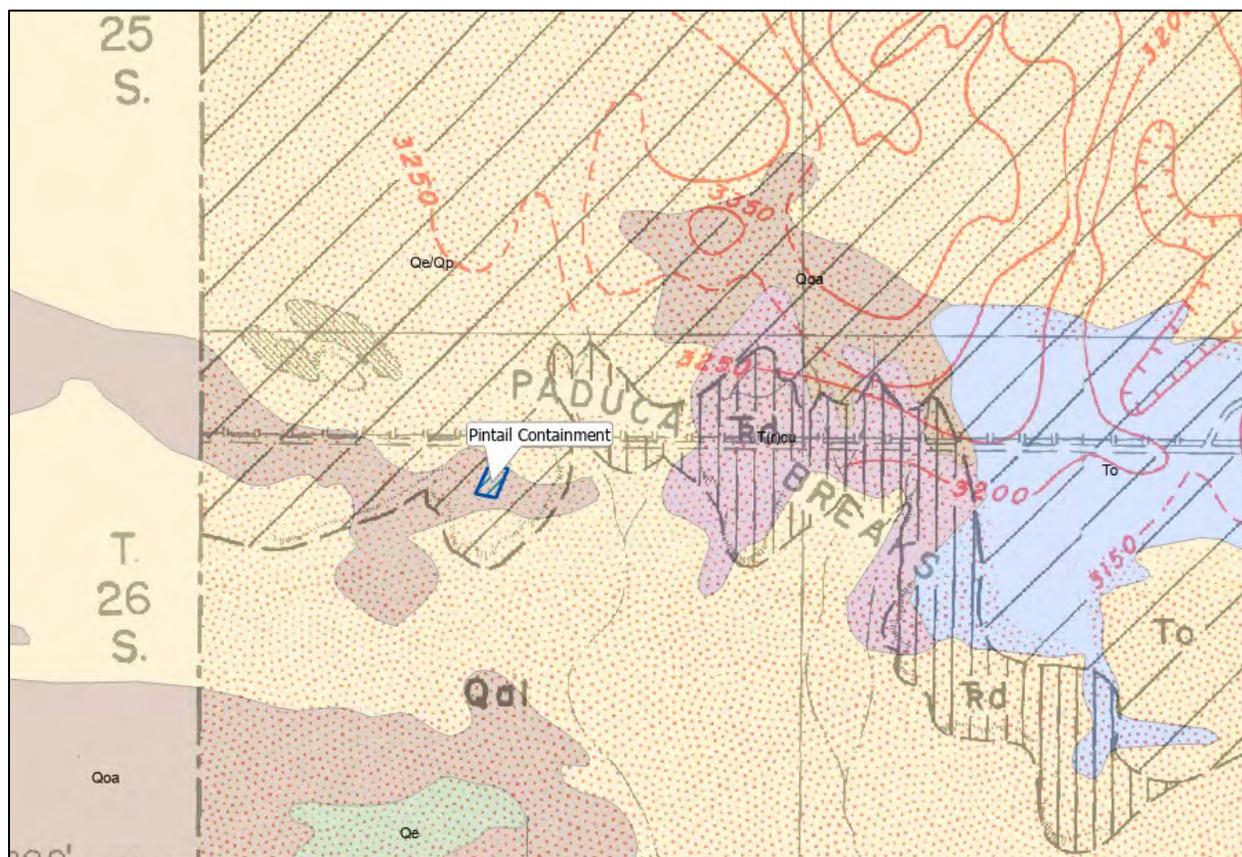
The location is within the Mescalero Plains between the Pecos River floodplain to the west and the southern High Plains that are east of the Mescalero Ridge. The material in the Mescalero Plains is derived from erosion and redeposition of Ogallala materials by the Pecos River and its tributary drainages on top of an eroded Permian and Triassic red bed surface. This reworked material is sometimes referred to as the Ogallala formation within the Mescalero Plains although the original bedding structure no longer exists. The area is mapped as surface Quaternary eolian and piedmont deposits (Qe/Qp) on Plate 2.

Figure 1, below, shows the Nicholson and Clebsch Geologic Map overlain on the colored New Mexico surface geology shown on Plate 2. About 1.2 miles northeast of the Pintail location, the Dockum formation (Trd) outcrops (or is present under a thin bed of alluvium) along a northwest to southeast axis for about 8 miles. On the south and southwestern side of this outcrop, the

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

material is mapped as Quaternary alluvium (Qal). On the north and northeastern side of the Dockum outcrop, the material is mapped as Tertiary Ogallala (To). Also shown on the Nicholson and Clebsch map are the contours of the top of the Triassic surface. This surface acts as an aquiclude, and its gradient determines the general direction of unconfined groundwater flow where such water is present. Obviously, where the Dockum formation outcrops or has little alluvium on top of it, there is no unconfined groundwater.

**Figure 1:** Nicholson and Clebsch Geologic Map with Contours (in red) of the top of the Chinle/Dockum formation (1961)



### USGS Groundwater Data

We relied upon the most recent data measured by the USGS for groundwater elevations in Plate 2. Water level data from the OSE database rely upon observed water levels by drillers during the completion of the water well. Data from the nearby USGS sites is presented below.

To start, USGS-14072 is 2.13 miles south-southwest of the Pintail location at the Battle-axe Ranch. Two measurements of groundwater elevation are recorded from 1993 (2730 feet) and 2013 (2938 feet). The more than 200-foot difference in elevation is unlikely. We consider that there are likely multiple wells at the Battle-axe Ranch possibly completed in different water bearing zones. This well is completed within the Dockum Group.

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

Moving clockwise around the Pintail Location from USGS-14072 location leads to USGS-9146, about 1.63 miles northwest of the Pintail location. Examination of historic aerial photographs shows nothing at this location. About 0.3 miles to the northeast is a location that, based upon vehicular traffic patterns and some greenness in earlier photographs, may have been the location of this well.

The USGS has recorded three measurements at USGS-9146, two in early 1983, and one in October 1988. Water table elevation varies less than a foot for all 3 measurements with the highest elevation being 3004.6 feet (Feb. 1983). The resultant depth to water is 289 feet. The well is stated to be in the Santa Rosa formation.

About 100 feet north of USGS-9146 is USGS-9141. One measurement exists from 1949 with a groundwater elevation of 3007 feet and a depth to water of 287 feet. The well is reported as being in the Rustler formation. Given similarity of the groundwater data, we consider it likely the two designations are for the same well; and if not, they are completed in the same formation. Examination of the Rustler formation structure (Hiss, 1976) at the Pintail location gives an elevation of the top surface of the Rustler formation of less than 2600 feet, about 700 feet below the ground surface. As USGS-9141 has a recorded total depth of 340 feet, we consider its stated completion in the Rustler formation as incorrect.

The given coordinates for USGS-14292 are 4.17 miles northeast of the Pintail location. Nothing is present at this location. About 0.21 miles to the west of the coordinate location is an unused corral complex with former stock tanks present. This is the likely location of the well. Two measurements exist from spring 1981 and spring 1986. Depth to water was 192 feet in 1981 and 189 feet in 1986 with corresponding groundwater elevations of 3191 feet and 3193 feet. The well is completed within the Chinle formation.

Misc-126 plots as being just west of USGS-14292. Three measurements exist for USGS-14292 from 1955, 1971, and 2012. Corresponding depths to water were 258 feet, 240 feet and 233 feet with groundwater elevations of 3144 feet, 3163 feet, and 3170 feet. We consider that Misc-126 is likely completed in a deeper water bearing zone that may be poorly connected to the horizon accessed by USG-1492.

### OSE Well Logs

We examined five drillers' logs from the NM OSE database. These are described briefly below and presented in Appendix Well logs. We note there is a paucity of wells near the site.

- Located 0.57 miles south of the Pintail location is C-04787, drilled in March 2024. No groundwater was encountered to the total depth of 55 feet.
- About 1.15 miles to the east-northeast is C-04549. It was drilled in July 2021 to a total depth of 103 feet. No groundwater was encountered. A dark brown clay was encountered at the depth of 69 feet after drilling through sands and caliche beds.
- C-02323 is a well drilled in June 1993 at a location about 2 miles south-southwest of the site. The well was drilled to a total depth of 405 feet. Depth to water at the completion of drilling was reported as 405 feet. The depth interval of 95 to 110 feet was noted as a water bearing sand and gravel but producing no useful volume of water. Below this wet zone, the detailed driller's log noted primarily red rocks and "shells" to a depth of 350

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

feet. Below 350 feet, the various units are noted as brown sand or sandstone units, possibly of the Dewey Lake formation.

- C-4209 is located almost 3 miles west of the Pintail location. There are no OSE wells closer to the location in this quadrant. The well was drilled to a depth of 360 feet in April 2018. Water was encountered at the depth of 155 feet and persisted at that depth after completion. The unit was described as red sand from 15 feet to 350 feet with a red clay for the final 10 feet.
- More than 4 miles to the east-northeast is C-04537. It was drilled to a total depth of 500 feet in June 2021. Water was encountered at and noted as being at the depth of 280 feet upon completion. The water bearing unit was described as a red sandstone from 220 feet to 340 feet. Beneath this is a non-water bearing unit of “red sandstone and red siltstone” to the total depth of 500 feet.

### Groundwater Elevation Maps

Figure 2 shows the 1961 Nicholson Clebsch groundwater elevation map overlain on an aerial photograph. The figure also shows the most recent groundwater elevation and measurement date of the USGS wells near the Pintail location. The 3000-foot contour is 1.28 miles southwest of the center of the Pintail location on a flowline (perpendicular to the contours). The 3100-foot contour is 1.66 miles northeast of the Pintail location on a flowline perpendicular to the contour. An interpolated depth to groundwater is given by  $(3000 + (1.28)/(1.28+1.66) * 100=)$  3043.5 feet. The resultant depth to water is  $(3250-3043.5=)$  206.5 feet.

The Nicholson and Clebsch map shows that groundwater is confined in this area. This finding is consistent with the USGS well data which classifies the closest wells to the Pintail location as completed in the Chinle or Dockum formations (both names are used for the same Triassic formation) or the Santa Rosa formation (which is the bottom sandstone in the Chinle/Dockum formation). The exception to this is USGS-9141 (see above) which we believe is incorrect. As such, while the potentiometric surface of groundwater is about 200 feet below ground surface, the groundwater itself is at greater depth.

SITING CRITERIA (19.15.34.11 NMAC)  
 SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

Figure 2: Nicholson and Clebsch groundwater contours (1961)

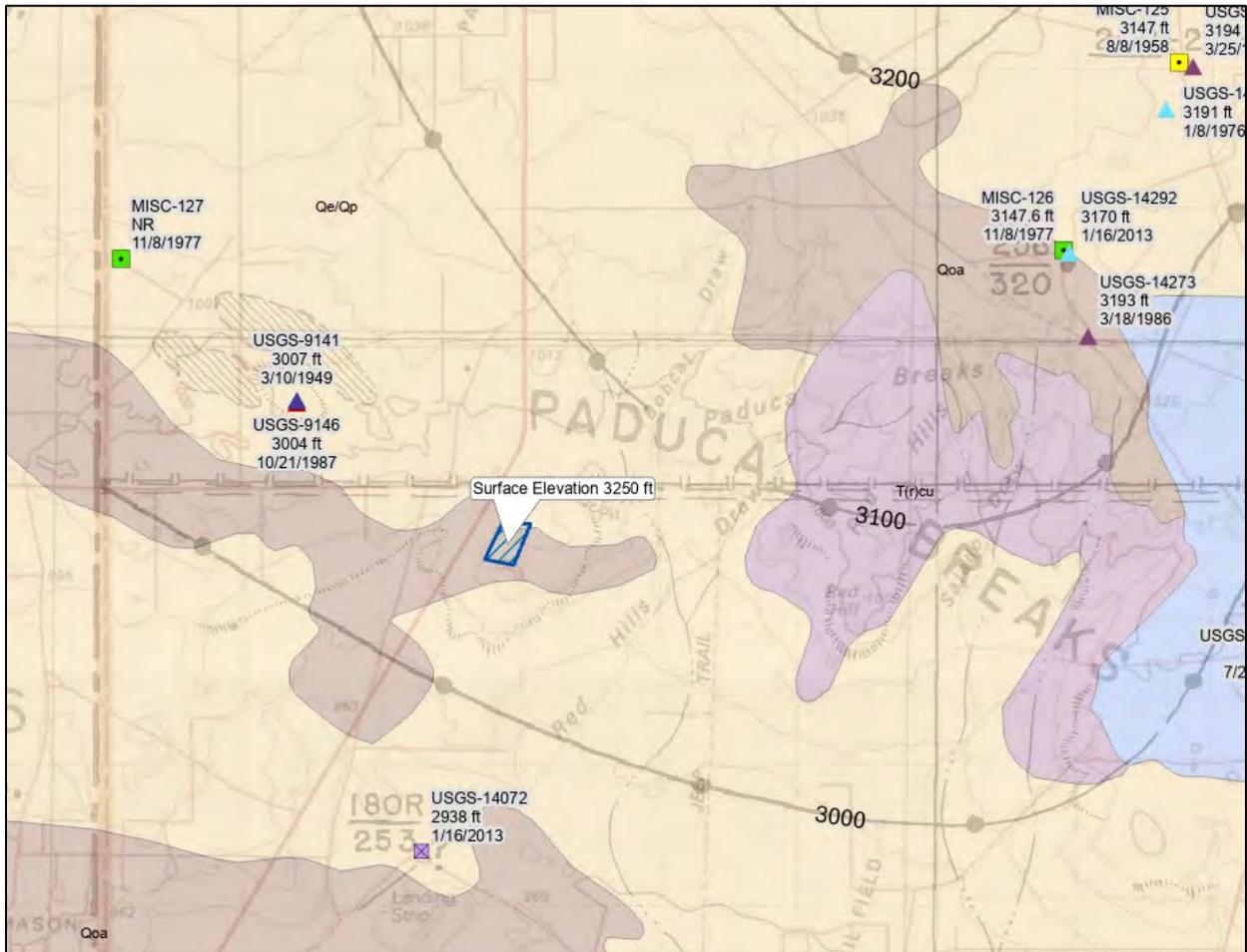
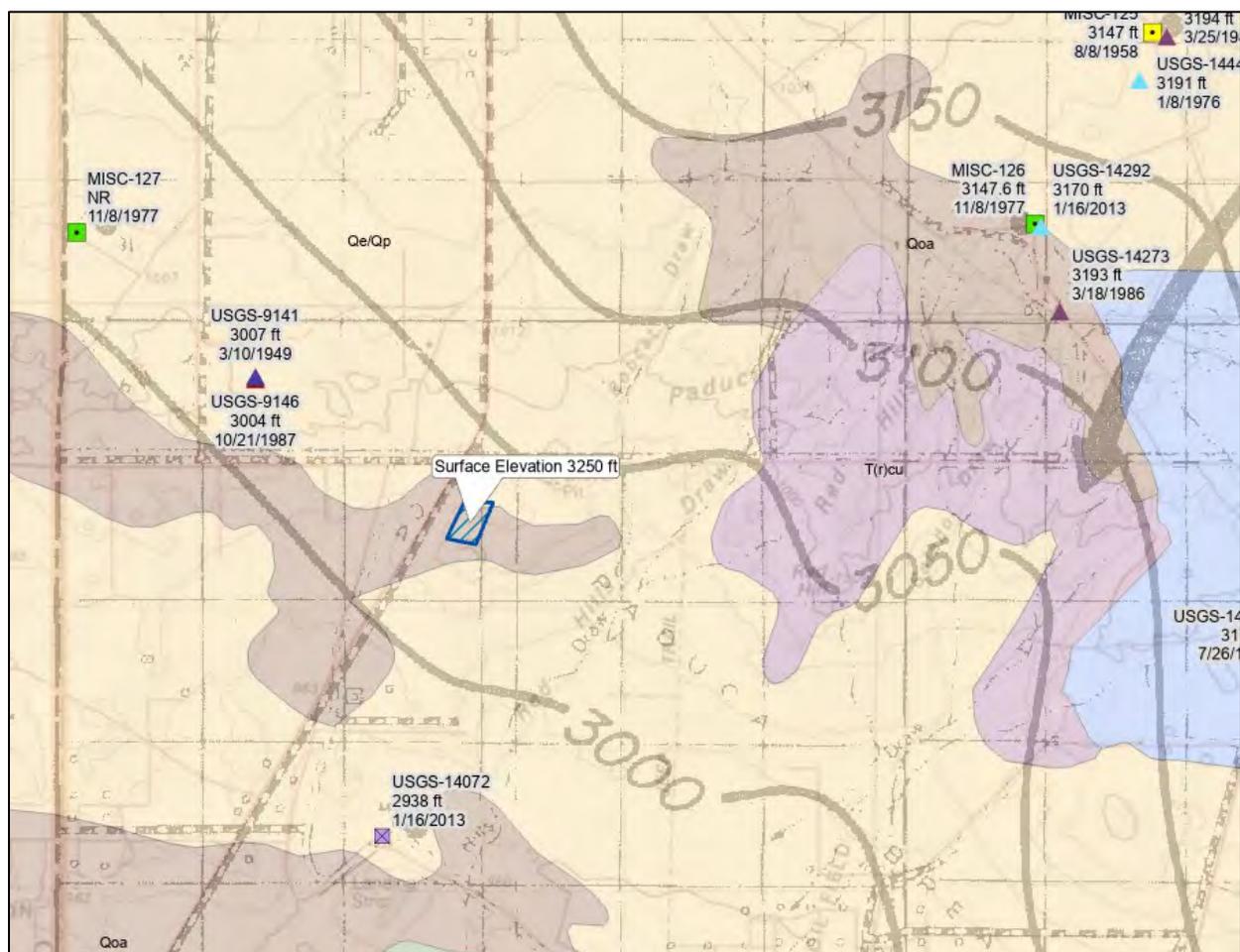


Figure 3 shows the 1978 Open File 95 groundwater elevation map overlain on an aerial photograph. Again, the groundwater elevation and date of the USGS wells near the Pintail location are shown. The 3000-foot contour is 1.15 miles southwest of the center of the Pintail location on a flowline (perpendicular to the contours). The 3100-foot contour is 0.66 miles northeast of the Pintail location on a flowline perpendicular to the contour. An interpolated depth to groundwater is given by  $(3000 + (1.15)/(1.15+0.66) * 100=)$  3063.5 feet. The resultant depth to water is 186.5 feet.

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

Figure 3: Open File Report 95 groundwater contours (1978)



## Conclusions

Our conclusions honor all data that we know are accurate to the best of our ledge. We conclude:

- Based on interpolations of the groundwater maps, the elevation of the groundwater surface at the Pintail location was about 3043 feet in 1961 and about 3063 feet in 1978. Given that the surface elevation of the Pintail Containment site is about 3250 feet ASL, the corresponding depths to water are 207 feet and 187 feet.
- None of the closest wells to the Pintail location access groundwater within the reworked Ogallala materials deposited on top of the eroded Chinle and Permian formations. The redbeds act as an aquiclude. Groundwater accessed in transmissive beds at depth is confined.
- Groundwater flow around the Pintail location is to the southwest and south.
- South to southwest of the Pintail location, the closest USGS well documents groundwater at an elevation of less than 2950 feet. Northeast of the Pintail location (up-gradient with respect to groundwater flow), the closest USGS well data document a groundwater elevation no greater than 3170 feet with a depth to water of about 230 feet.

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

- Borings C-04787, 0.57 miles to the south (March 2024), and C-04549, 1.15 miles to the north-northeast (July 2021), did not encounter groundwater at depths of 55 feet and 103 feet.

**Distance to Municipal Boundaries and Fresh Water Fields**

Plate 3 demonstrates that the Pintail East Containment is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipalities are Jal, 28 miles to the east, and Malaga, 25 miles to the northwest.
- The closest mapped public wells are about 21 miles to the east.

**Distance to Subsurface Mines**

Plate 4 and our reconnaissance of the site demonstrate that the nearest mines are caliche pits. This site is not within an area overlying a subsurface mine.

- The closest caliche pits are located 1500 feet to the west and 2200 feet east of the northeast corner of the Pintail East location.
- There are no subsurface mines in the area shown in Plate 4.

**Distance to High or Critical Karst Areas**

Plate 5 shows the Pintail East Containment is not within a mapped zone of high or critical Karst with respect to BLM mapped areas.

- The proposed facility is located within a “medium” potential karst area.
- The nearest “high” potential karst area is 15 miles west-southwest of the proposed containment.

Since December 1, 2024, OCD requires operators to commission a karst study if Rule 34 containment are built in medium karst occurrence zones, such as the Pintail East containment. For medium karst occurrence zones, surveys are required to start with an aerial survey and additional information may be required based upon the results of the survey. Appendix *Cave and Karst Resource Inventory Report Pintail East – Solaris Containment* is the required aerial survey that was conducted by a karst expert listed on the BLM Carlsbad Field Office Approved Third-Party Cave/Karst Contractors list. The Southwest Geophysical Consulting (SWG) report concludes “no surface karst features are located within the survey boundary for the PESC” (Pintail East Solaris Containment).

If OCD requires additional information based upon the results of the karst aerial survey, we recommend examining the geologic report on the area submitted via email to OCD and BLM on 1/12/25 and uploaded to the portal by Solaris soon thereafter. This document presents geologic data that support the conclusions of SWG and should assuage any concerns that “the survey area may still contain buried karst features” (page 1 of report).

**Distance to 100-Year Floodplain**

Plate 6 demonstrates that the Pintail East location is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

- FEMA describes the location as an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- The nearest mapped flood hazard area is 3 miles west-northwest.

### **Distance to Surface Water**

Plate 7 shows the closest surface water bodies are:

- The closest Lake/Pond is 3.0 miles west-northwest of the site.
- Reservoirs are present a short distance southwest of the Lake/Ponds. Surface drainage is to the south-southwest.
- The closest mapped water course, an intermittent channel, is Bobcat Draw. It is almost one mile to the east.

### **Distance to Permanent Residence or Structures**

Plate 8 and the site visit demonstrates that the location is not within 1000 feet of an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.

- There are no structures within 1000 feet of the site.
- Oil field containments are present immediately east of the site.

### **Distance to Non-Public Water Supply**

Plates 1, 7 and 8 demonstrate that the Pintail East Containment is not within 500 horizontal feet of a spring or freshwater well used for domestic or stock watering purposes, in existence at the time of initial application.

- Plate 1 shows the locations of all area water wells, active or plugged.
- The nearest well in the OSE database that accesses groundwater is about two miles to the south at the Battle-axe Ranch.
- The nearest stock watering well is at the Battle-axe Ranch also.
- No springs were identified within the mapping area (see Plate 7)

### **Distance to Wetlands**

Plate 9 demonstrates the site is not within 500 feet of mapped wetlands using the USA wetlands database.

- The nearest designated (palustrine) wetland is an oilfield containment more than 2000 feet to the northwest.
- The closest riverine wetland is Bobcat Draw, almost one mile to the east. It is mapped by the US Fish and Wildlife Service as an intermittent stream.

### **References**

© 2025 R.T. Hicks Consultants, Ltd.  
Page 8

SITING CRITERIA (19.15.34.11 NMAC)  
SOLARIS MIDSTREAM WATERS LLC – PINTAIL EAST CONTAINMENT

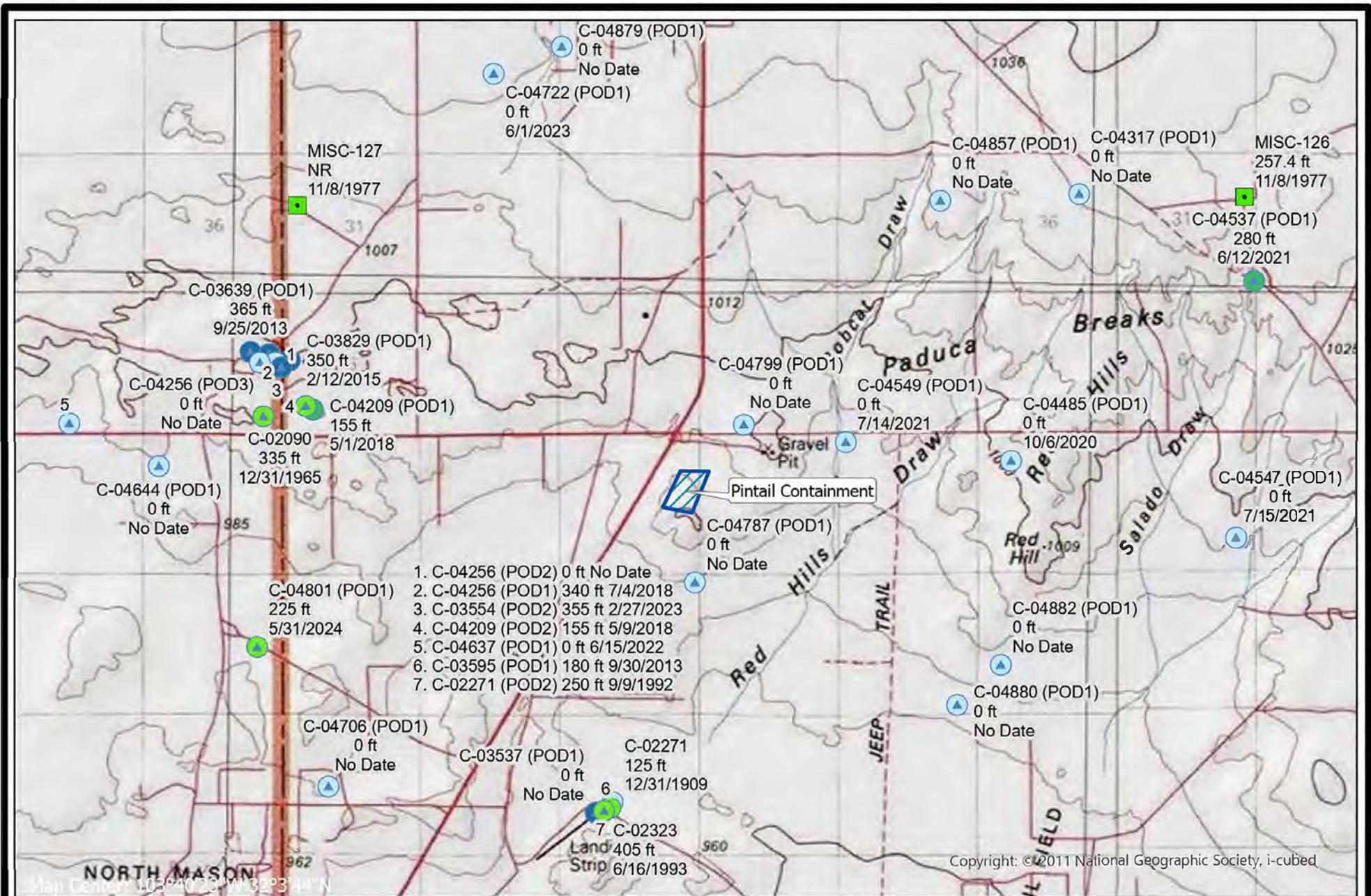
Geohydrology Associates, Inc. 1978. Collection of Hydrologic Data Eastside Roswell Range EIS Area. Open file Report 95. Denver, Colorado. Bureau of Land Management

Hiss, W.L. (1976). *Structure of the Permian Ochoan Rustler Formation, Southeast New Mexico and West Texas*. Resource Map 7. 1":4570'. Socorro, New Mexico: New Mexico Bureau of Mines and Mineral Resources

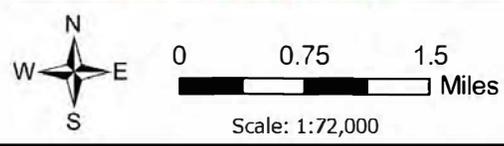
Nicholson, A., Clebsch, A. 1961. Geology and Ground-Water Conditions in Southern Lea County, New Mexico. Socorro, New Mexico. New Mexico Institute of Mining and Technology.

# PLATES

P:\TestMule\TestMule.aprx



Copyright: ©2011 National Geographic Society, i-cubed

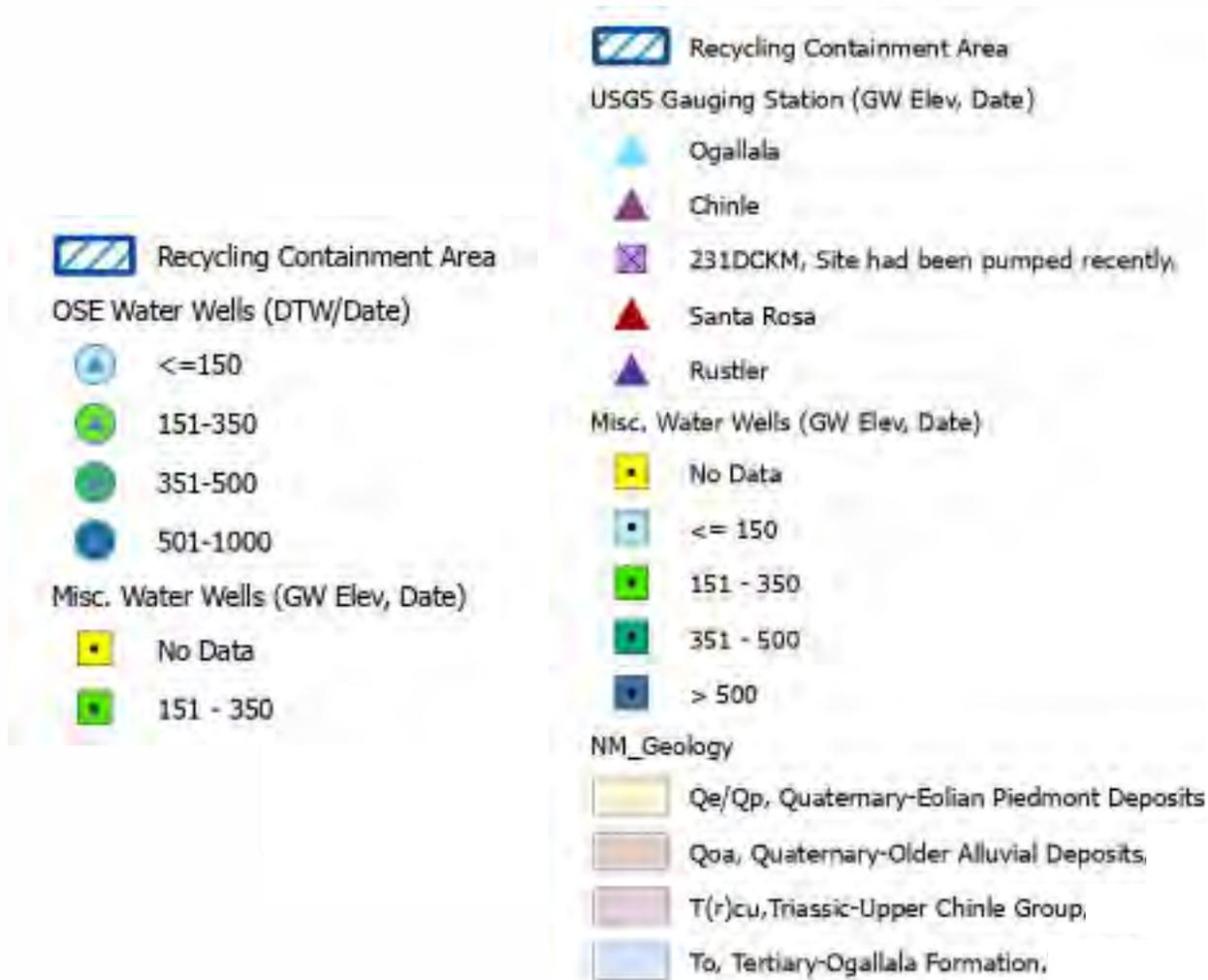


**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

Nearby Wells and Borings with Depth to Water  
 Pintail East Containment, Solaris Waters Midstream

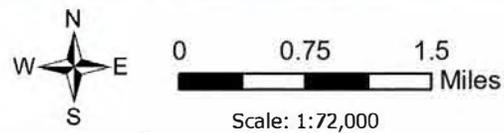
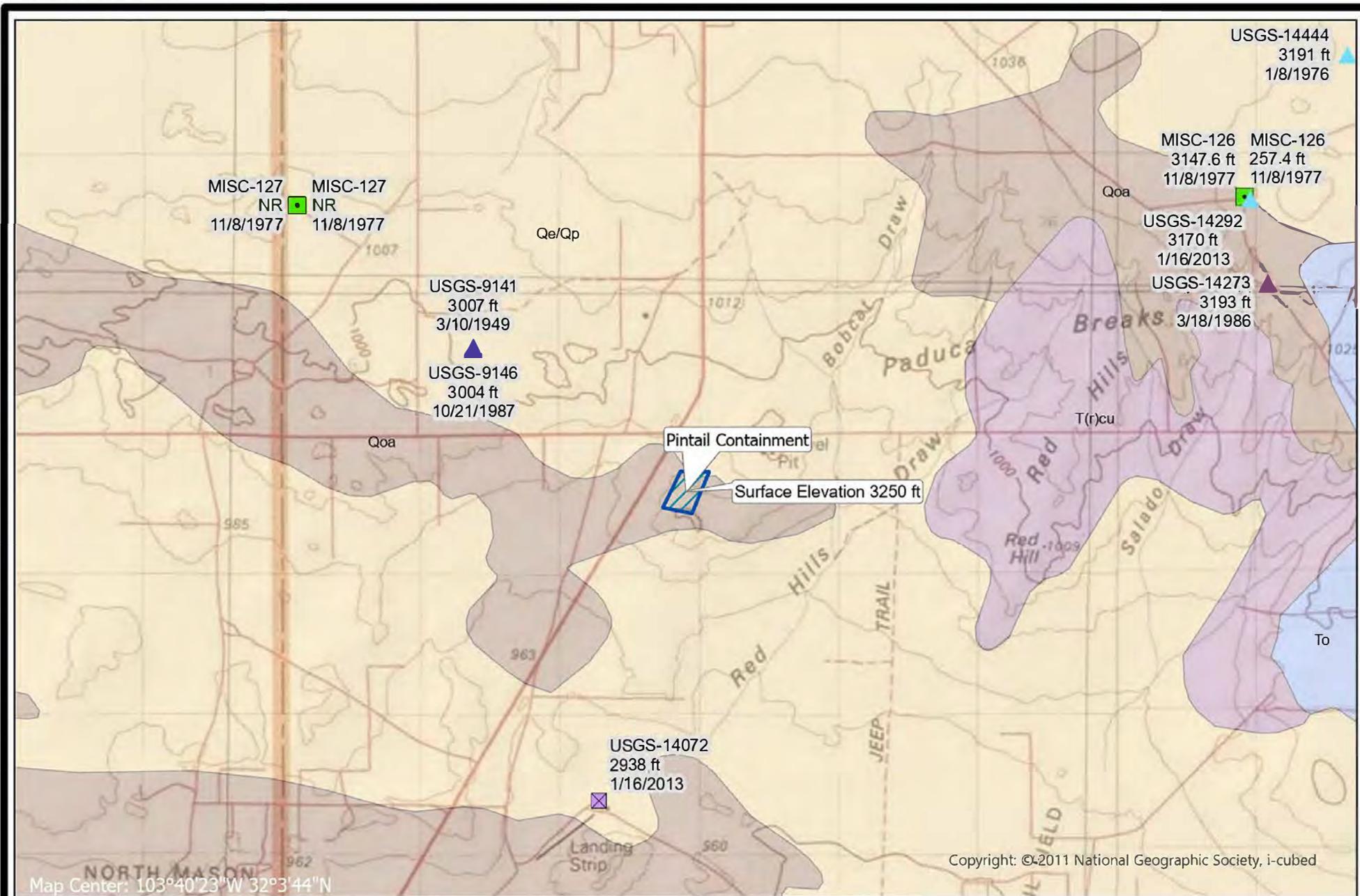
Plate 1  
 December 2024

P:\AuroraContainment\Aurora.aprx



<p>R.T. Hicks Consultants, Ltd                  901 Rio Grande Blvd NW Suite F-142                  Albuquerque, NM 87104</p>	<p>Plates 1 &amp; 2 Legend</p>	
	<p>Pintail East Containment                  Solaris Midstream Waters LLC</p>	<p>December 2024</p>

P:\TestMule\TestMule.aprx

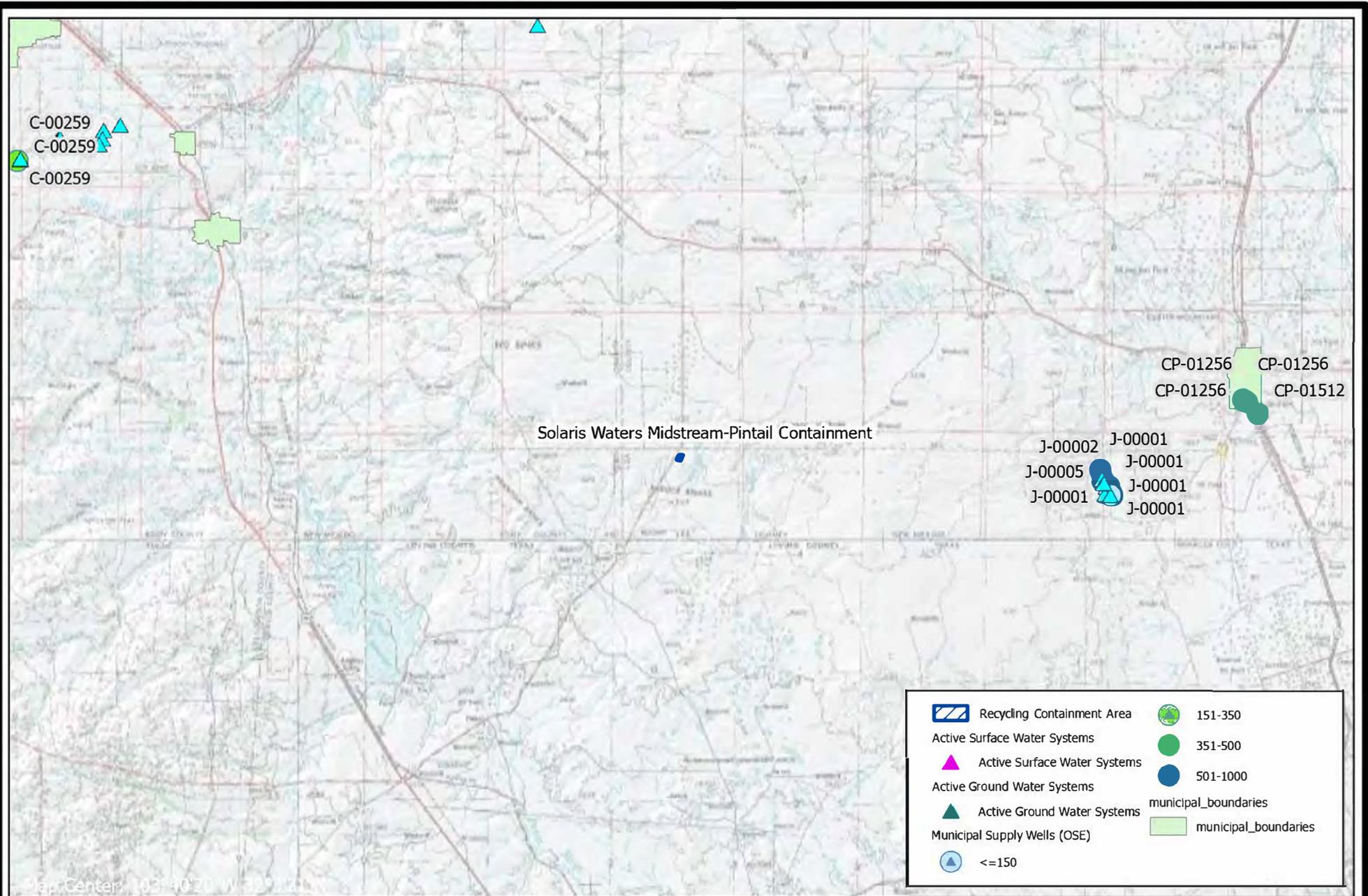


**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

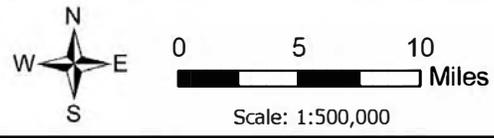
Groundwater Elevation and Geology  
 Pintail East Containment, Solaris Waters Midstream

Plate 2  
 December 2024

P:\TestMule\TestMule.aprx



Recycling Containment Area	151-350
Active Surface Water Systems	351-500
Active Surface Water Systems	501-1000
Active Ground Water Systems	municipal_boundaries
Active Ground Water Systems	municipal_boundaries
Municipal Supply Wells (OSE)	<=150



**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

Nearest Municipalities & Public Water Supplies  
 Pintail East Containment, Solaris Waters Midstream

Plate 3  
 December 2024

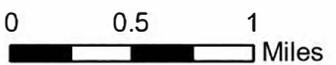
P:\TestMule\TestMule.aprx



Map Center: 105°40'20\"W 32°3'31\"N

Copyright: © 2011 Naf

	Recycling Containment Area
MILS	
	SURFACE

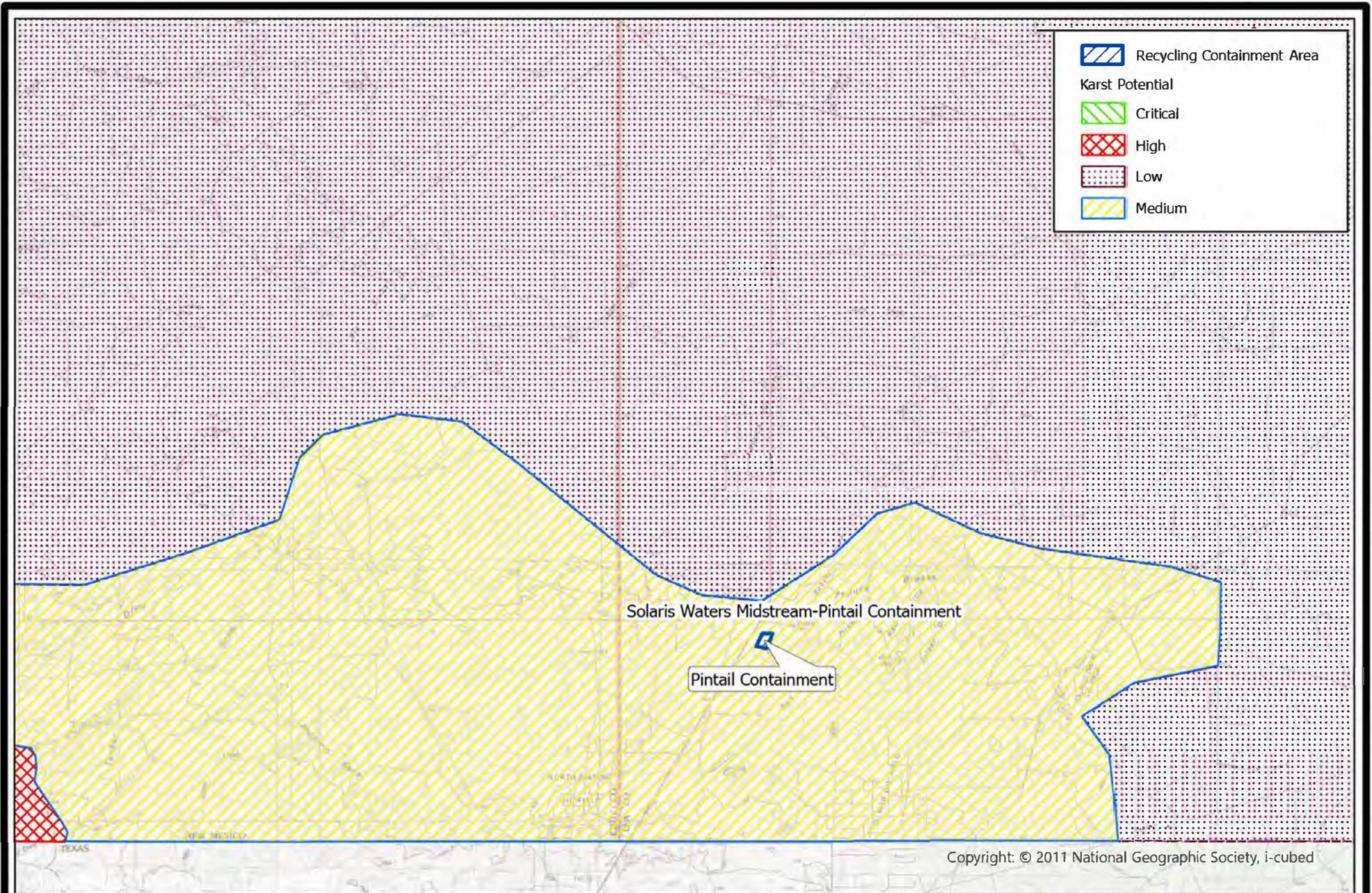


  
 Scale: 1:50,000

**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

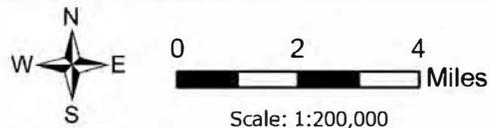
Nearby Mines - Caliche Pits  
 Pintail East Containment, Solaris Waters Midstream

Plate 4  
 December 2024

P:\TestMule\TestMule.aprx



Copyright: © 2011 National Geographic Society, i-cubed

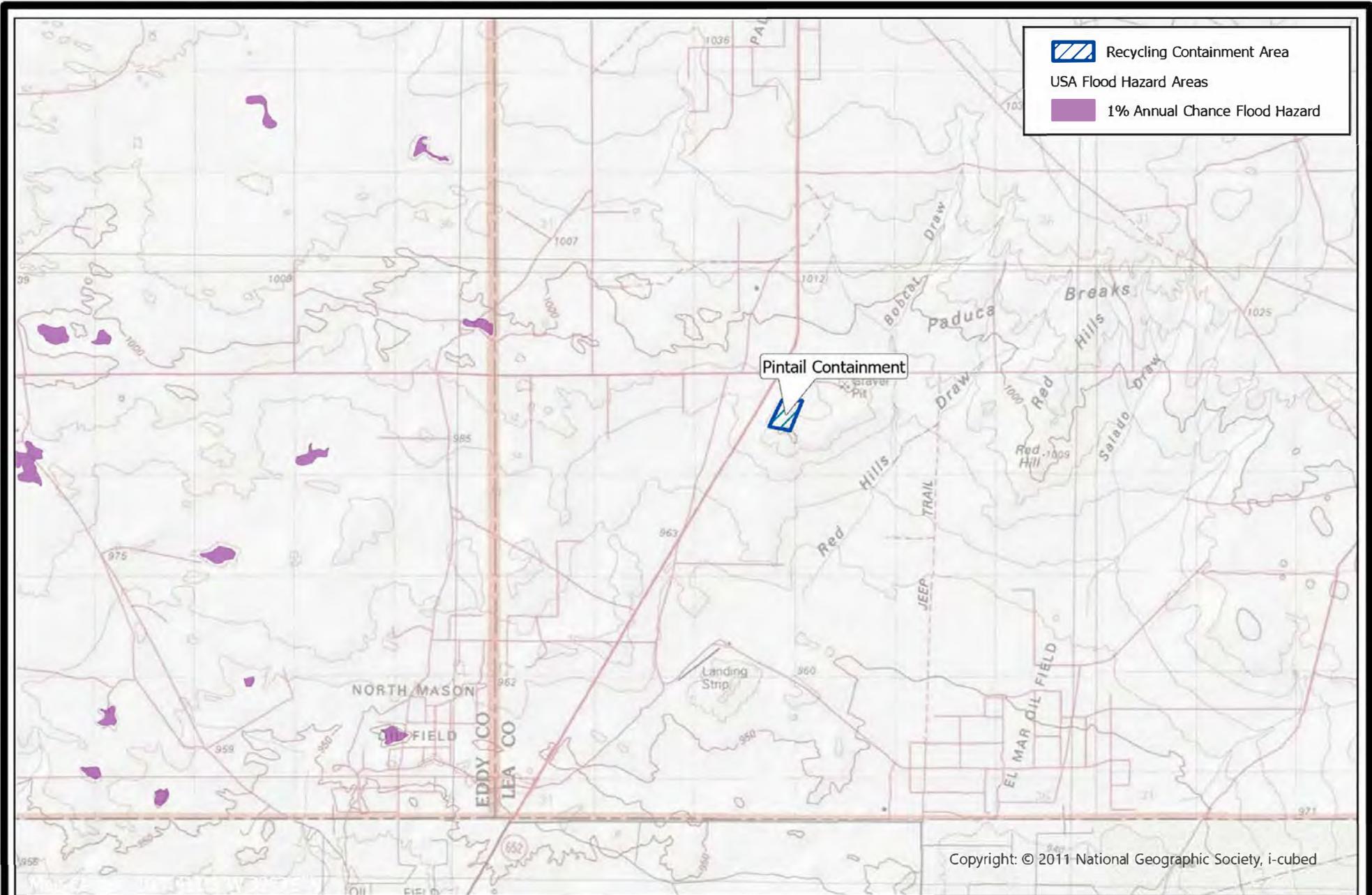


R.T. Hicks Consultants, Ltd  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

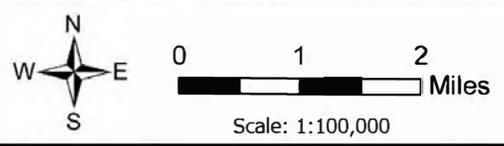
BLM Mapped Karst Potential  
 Pintail East Containment, Solaris Waters Midstream

Plate 5  
 December 2024

P:\TestMule\TestMule.aprx



Copyright: © 2011 National Geographic Society, i-cubed

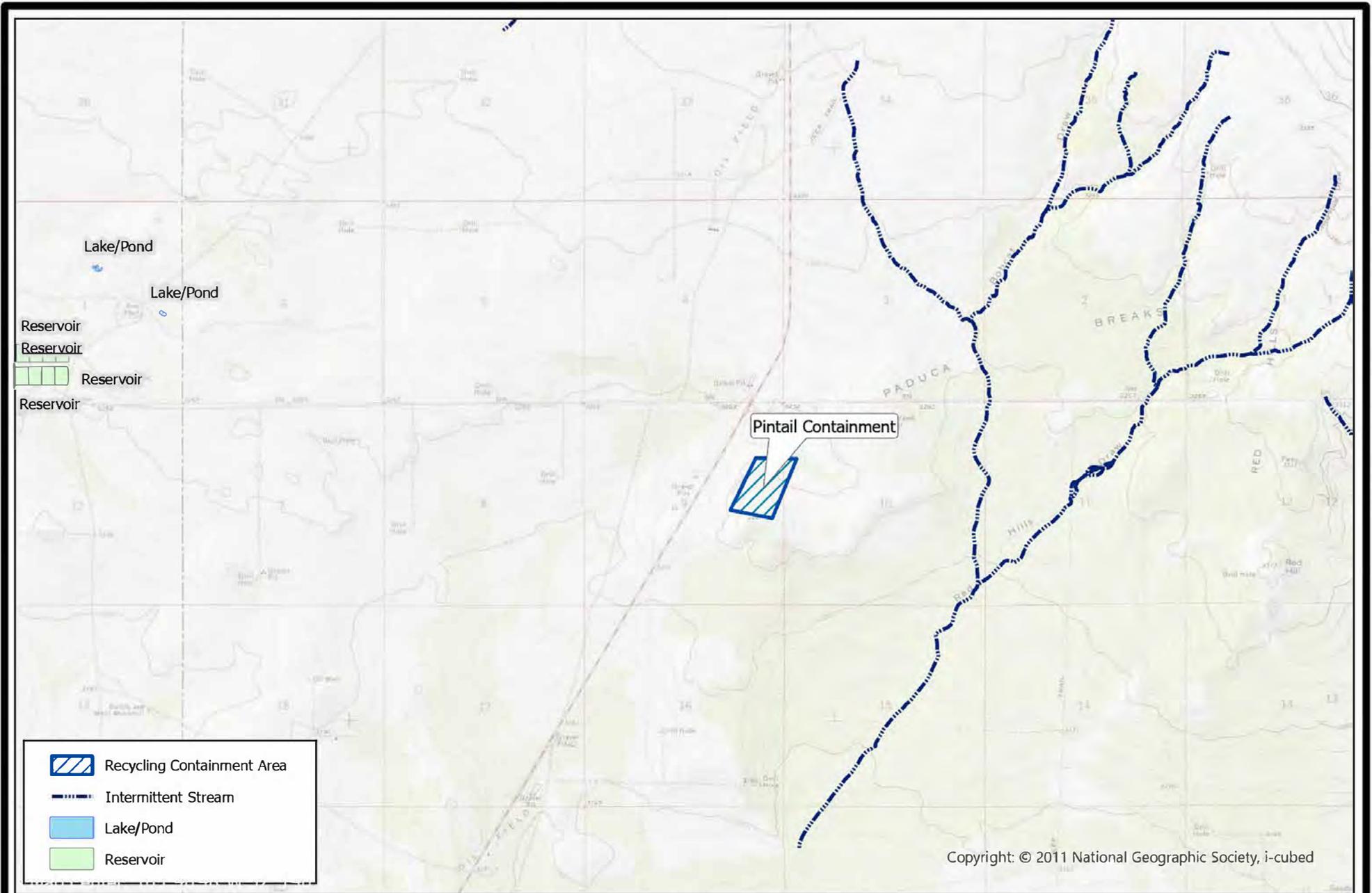


**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

**FEMA Mapped Flood Zones**  
 Pintail East Containment, Solaris Waters Midstream

**Plate 6**  
 December 2024

P:\TestMule\TestMule.aprx



**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

Mapped Surface Water  
 Pintail East Containment, Solaris Waters Midstream

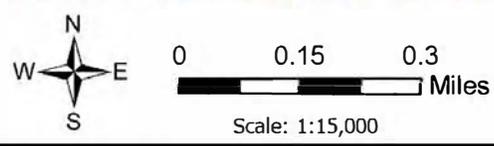
Plate 7  
 December 2024

P:\TestMule\TestMule.aprx



Copyright © 2011 National Geographic Society, Inc. Cubed, Maxar

Map Center: 15; T26S.R32E 32°3'34"N

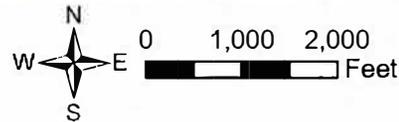


**R.T. Hicks Consultants, Ltd**  
 901 Rio Grande Blvd NW Suite F-142  
 Albuquerque, NM 87104  
 Ph: 505.266.5004

Nearest Structures (All on BLM Land)  
 Pintail East Containment, Solaris Waters Midstream

Plate 8  
 December 2024

P:\SolarisPintail2024\SolarisPintail2024.aprx

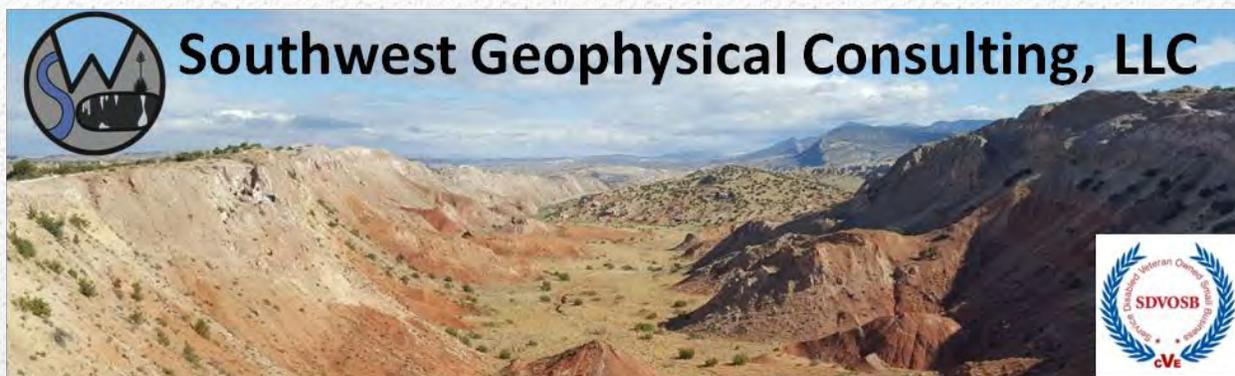


R.T. Hicks Consultants, Ltd  
901 Rio Grande Blvd NW Suite F-142  
Albuquerque, NM 87104  
Ph: 505.266.5004

USA Wetlands  
Pintail East Containment  
Solaris Midstream Waters LLC

Plate 9  
December 2024

## APPENDIX AERIAL KARST SURVEY



# **Cave and Karst Resource Inventory Report Pintail East – Solaris Containment Eddy County, New Mexico**

Prepared for:

**R.T. Hicks Consultants, Ltd.**

**901 Rio Grande Boulevard NW, Suite F-142**

**Albuquerque, NM 87104**

- Positive
  - Relocation/Realignment Recommended
  - Karst Monitor Recommended
  - Relocation/Realignment Not Required
- Negative

**February 14, 2025**

RTHC-006-20250121

Copyright 2025 – Southwest Geophysical Consulting, LLC All rights reserved.



MMXXV

**TABLE OF CONTENTS**

FRONT MATTER..... i

TABLE OF CONTENTS.....ii

LIST OF FIGURES.....iii

LIST OF TABLES.....iii

1.0 INTRODUCTION..... 1

    1.1 Goals of this Study..... 1

    1.2 Summary of Findings..... 1

    1.3 Affected Environment..... 1

    1.4 Limitations of Report..... 3

2.0 LOCATION AND DESCRIPTION OF STUDY AREA..... 4

    2.1 Description of Site..... 4

    2.2 Local Geology ..... 5

    2.3 Description of Survey..... 6

    2.4 Description of Karst Features ..... 7

3.0 RECOMMENDATIONS ..... 8

    3.1 Summary ..... 8

    3.2 Best Practices ..... 8

4.0 REFERENCES ..... 10

5.0 GLOSSARY OF TERMS AND ABBREVIATIONS ..... 11

6.0 ATTESTATION ..... 13

**LIST OF FIGURES**

Figure 1: Karst occurrence overview ..... 2  
Figure 2: Land ownership and PLSS overview..... 4  
Figure 3: Geology overview ..... 5  
Figure 4: Survey overview ..... 6

**LIST OF TABLES**

No tables are provided with this report.

## 1.0 INTRODUCTION

An aerial karst survey was commissioned by R.T. Hicks Consulting, Ltd. (hereinafter referred to as "the client"), on January 21, 2025, for the purpose of determining the presence of karst-related surface features within the Pintail East – Solaris Containment project site (hereinafter termed "PESC").

As indicated in section **1.3 Affected Environment**, the bedrock and overlying soil at the survey site are susceptible to sinkhole development and karst features may be hidden beneath the existing soil stratum. Risk associated with sinkhole formation can be minimized during development with proper foundation design and construction, and the control of site hydrology. The owner/developer must recognize, however, that a risk of sinkhole-induced damage to infrastructure does exist. The owner/developer must evaluate the risks and attendant costs of not performing a geophysical survey prior to development and must be willing to accept these risks if it is decided that a surface karst survey is sufficient. Southwest Geophysical Consulting can provide a geophysical survey. If the decision is made to conduct a geophysical survey, a cost estimate and timeline will be provided upon request.

### **1.1 Goals of this Study**

To provide the client with the location and description of any surface karst-related features within a 200-meter buffer surrounding the PESC containment area as provided by the client via e-mail (**PintailEast-Solaris.kmz**) on January 21, 2025.

### **1.2 Summary of Findings**

**No surface karst features are located within the survey boundary for the PESC project.**

The lack of surface karst features does not mean the area is not karstified and the survey area may still contain buried karst features. Caution should be exercised while clearing brush and during any excavation, trenching, or construction operations. Employing a Bureau of Land Management approved karst monitor on site during these operations should be considered.

### **1.3 Affected Environment**

The proposed PESC project is located in evaporite karst terrain, a landform that is characterized by underground drainage through solutionally enlarged conduits. Evaporite karst terrain may contain sinkholes, sinking streams, caves, and springs. Sinkholes leading to underground drainages and voids are common. These karst features, as well as occasional fissures and discontinuities in the bedrock, provide the primary sources for rapid recharge of the groundwater aquifers of the region.

Karst may develop by hypogene processes involving dissolution by upwelling fluids from depth independent of recharge from the overlying or immediately adjacent surface. Hypogene karst systems may not be connected to the surface and can remain undiscovered unless encountered during drilling or excavation.

Karst features are delicate resources that are often of geological, hydrological, biological, and archeological importance, and should be protected. The four primary concerns in these types of terrain are environmental issues, worker safety, equipment damage, and infrastructure integrity.

The Bureau of Land Management (BLM) categorizes all areas within the Carlsbad Field Office (CFO) zone of responsibility as having either low, medium, high, or critical cave potential based on geology, occurrence of known caves, density of karst features, and potential impacts to freshwater aquifers<sup>[1]</sup>. These designations are also recognized<sup>[1]</sup> by the New Mexico State Land Office (NMSLO). This project occurs within a **MEDIUM** karst occurrence zone (MKOZ)<sup>[2]</sup> (**Figure 1**).



Figure 1: Karst occurrence overview. Background image: Google Earth. Image date: March 20, 2023. Datum: WGS-84.

A medium karst occurrence zone is defined as an area in known soluble rock types that may have a shallow insoluble overburden. These areas may contain isolated karst features such as caves and sinkholes. Groundwater recharge may not be wholly dependent on karst features, but the karst features still provide the most rapid aquifer recharge in response to surface runoff<sup>[1]</sup>.

#### **1.4 Limitations of Report**

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

This report has been prepared for the use of R.T. Hicks Consulting, Ltd., in accordance with generally accepted consulting practices. Every effort has been made to ensure the information in this report is accurate as of the time of its writing. This report has not been prepared for the use by parties other than the client and their direct client, and their respective consulting advisors. It may not contain sufficient information for the purposes of other parties or for other uses.

This report was prepared upon completion of the associated fieldwork using a standard template prepared by Southwest Geophysical Consulting and is based on relevant information collected prior to fieldwork, conditions encountered on site, and data collected during the fieldwork, all of which was reviewed at the time of preparation. Southwest Geophysical Consulting disclaims responsibility for any changes that might have occurred at the site after this time. The interpreted results, locations, and depths noted in this report (if applicable) should be taken as an interpretation only and no decision should be based solely on this information. Physical verification of aerial imagery analysis results in the field should be conducted prior to moving any planned infrastructure.

To the best of our knowledge, information contained in this report is accurate at the date of issue; however, conditions on the site can change over a short period of time and, therefore, the information in this report shall not be used beyond three years past the date of the imagery collection reported in section **2.3 Description of Survey**.

## 2.0 LOCATION AND DESCRIPTION OF STUDY AREA

### 2.1 Description of Site

The PESC project site is located in Eddy County, New Mexico, 42 kilometers (26 miles) southeast of Malaga, New Mexico, and near the intersection of Pipeline Road and Orla Road (**Figure 1** and **Figure 2**). The proposed containment is within sections 9 and 10 of NM T26S R32E <sup>[3]</sup>. The region is semi-arid with an average annual precipitation of approximately 13 inches, of which about two-thirds falls as rain during summer thunderstorms from June to October. Summers are hot and sunny while winters are generally mild, with an average maximum temperature of 96°F in July and an average minimum temperature of 28°F in January<sup>[4]</sup>. This area is within the Chihuahuan Desert Thornscrub as defined by the Southwestern Regional ReGAP Vegetation map<sup>[5]</sup> and the vegetation consists mostly of areas of grass, sparse creosote, and sparse yucca, with very good visibility in most locations. See section **2.2 Local Geology** for the geology of the area. The project site is located within an MKOZ<sup>[2]</sup> (**Figure 1**) and within BLM-CFO managed land<sup>[6]</sup> (**Figure 2**).

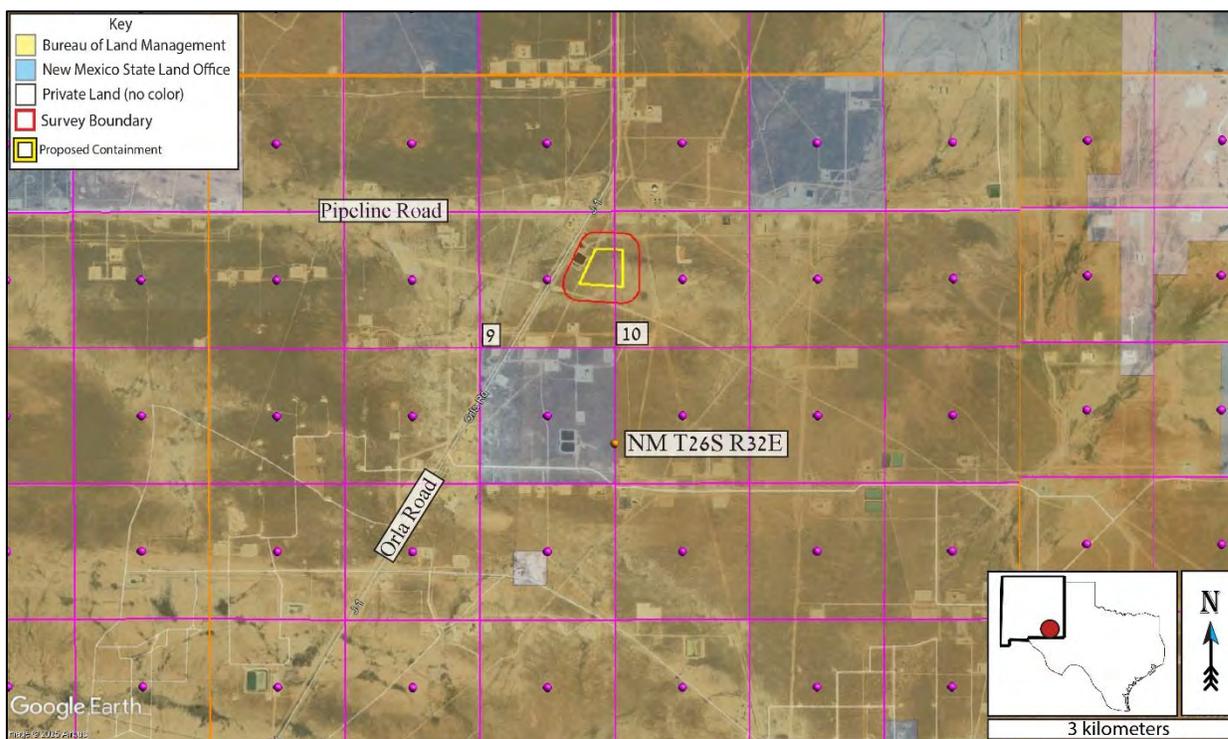


Figure 2: Land ownership and PLSS overview. Background image credit: Google Earth. Image date: March 20, 2023. Datum: WGS-84.

## 2.2 Local Geology

The area surveyed for the PESC project is located at an elevation of 983 meters (3,225 feet), ± 15 meters (49 feet), and is underlain by the Permian Dewey Lake Formation (Pdl – not pictured as it does not outcrop in this area). The area is mantled by thin gypsiferous soils (gypsite) and Quaternary eolian sand (Qe) and piedmont gravels (Qp)<sup>[7]</sup> between 0 and 6 meters in depth (Figure 3).

The Dewey Lake Formation (previously the Quartermaster) is composed of calcite-cemented, hematite-stained quartz sand grains and occasional gypsum lenses and can, in favorable conditions, form cavernous porosity within 30 meters of the top of the Permian Rustler Formation (Pru, not pictured below as it does not outcrop in the survey area) which underlies the Pdl<sup>[8]</sup>. The Dewey Lake is also known to be highly fractured near areas of heavy halite dissolution (e.g., Nash Draw) and these fractures can act as hydrologic conduits<sup>[9]</sup>.

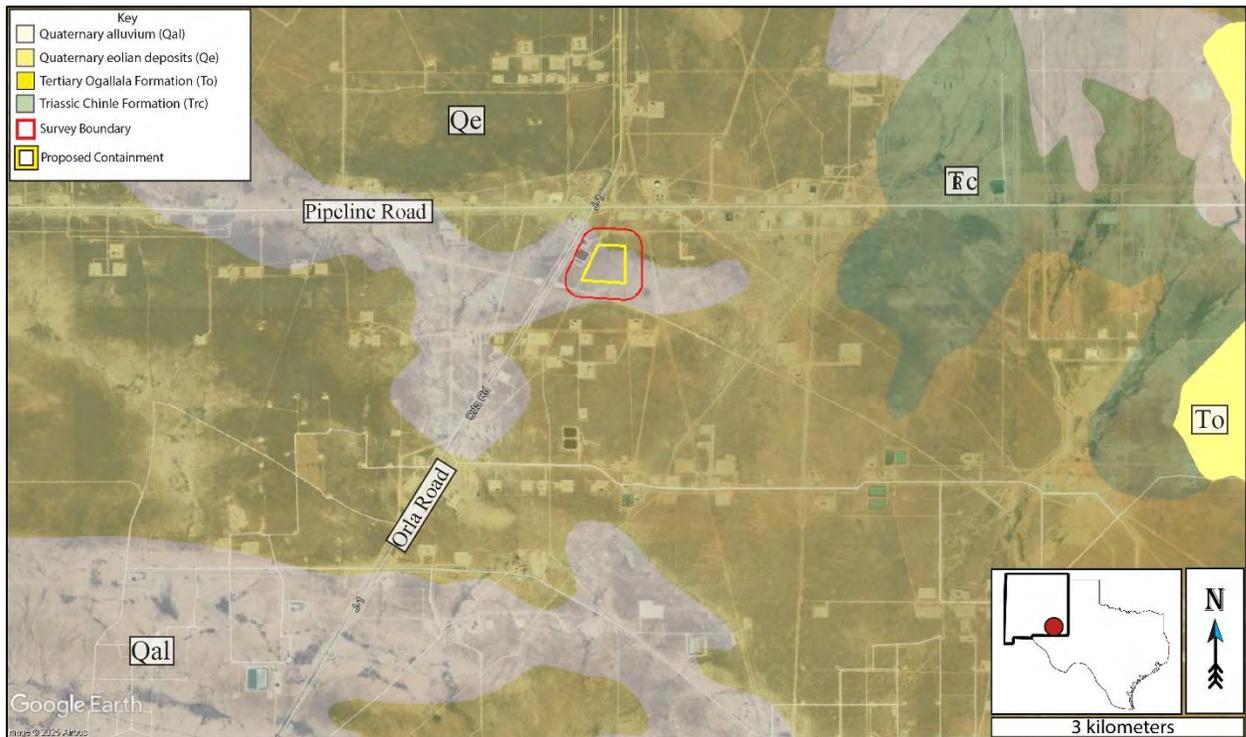


Figure 3: Geology overview. Map credit: The Digital Geologic Map of New Mexico in ARC/INFO Format, and Google Earth. Image date: March 20, 2023. Datum: WGS-84.

The survey area is covered by the easily accessible Geologic Map of New Mexico (2003) at 1:500,000 scale<sup>[7]</sup> and the Digital Geologic Map of New Mexico in ARC/INFO Format<sup>[10]</sup>.

### 2.3 Description of Survey

Southwest Geophysical Consulting, in partnership with SWCA Environmental Consultants, provides aerial karst surveys using drones that are flown by qualified, FAA licensed drone pilots and that meet the stringent Bureau of Land Management – Carlsbad Field Office requirements for both pedestrian and aerial karst surveys.

Aerial karst surveys are conducted at low elevation following a preplanned raster pattern flight path designed for the purpose of generating at least 75% imagery overlap. The collected high-resolution, georeferenced imagery is stitched together to develop orthomosaic imagery which is further developed into a digital elevation model (DEM); the DEM is then processed into a local relief model (LRM) (**Figure 4**). This LRM is color coded to enhance differences in elevation of as little as five centimeters. The orthoimagery, DEM, and LRM are uploaded to a server where they are analyzed by a highly qualified karst geologist. Finally, the data is reviewed by a senior karst geologist for quality assurance and downloaded into a table for inclusion in a written report<sup>[11]</sup>.

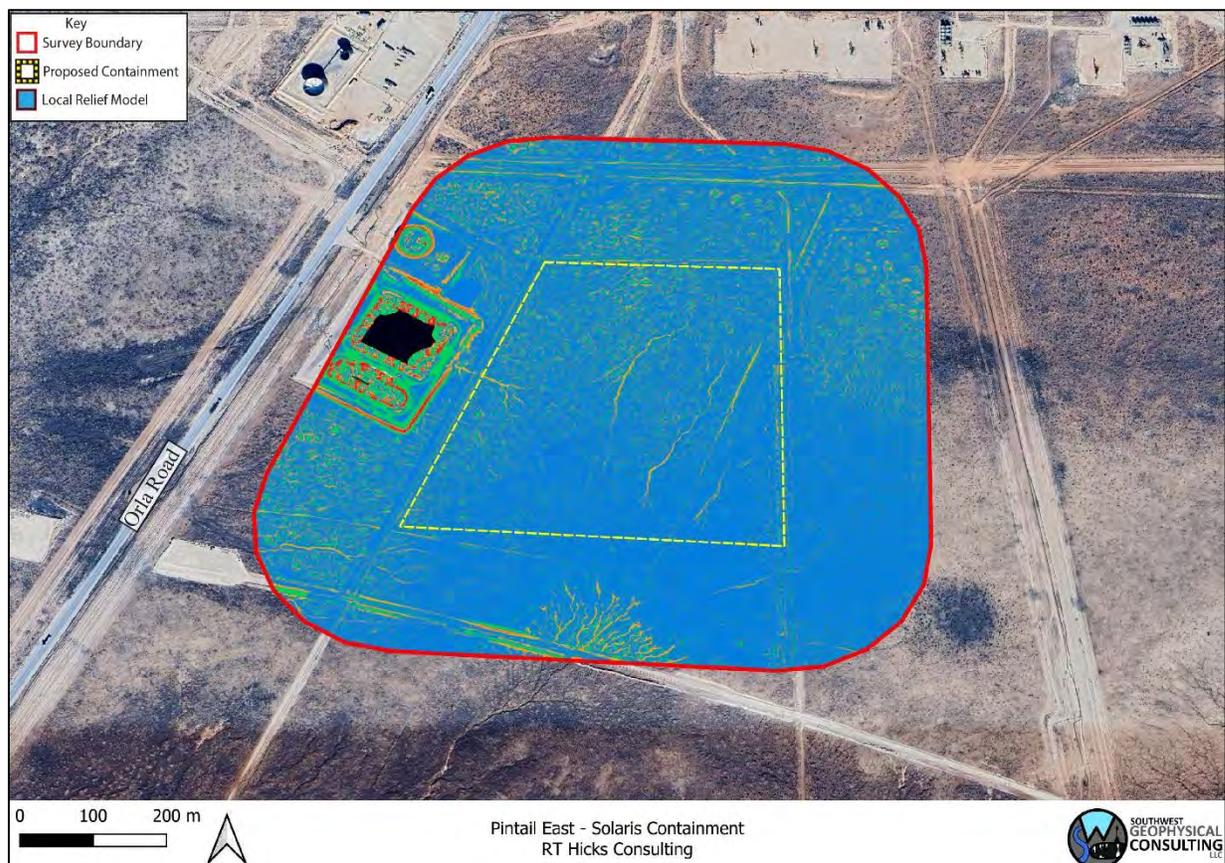


Figure 4: Survey overview. Background image credit: Google Earth. Image date: March 20, 2023. Datum: WGS-84.

The resolution of the orthoimagery is clear enough that features as small as 10 centimeters can be positively identified in most circumstances. Occasionally there are ambiguous features identified during an aerial survey that will need to be checked in the field if they impact the facility's location. Specifically, it is difficult to tell the difference between solution tubes, abandoned uncased well bores, and some burrows in drone imagery. If an ambiguous feature is located during imagery analysis, it is marked with a yellow dot in **Figure 4**. If a feature of any likelihood is subsequently verified in the field prior to publication of the report, the dot will be changed to a red triangle if confirmed as a karst feature or deleted if not.

The imagery for this study was collected via aerial survey by Pat Lagodney of SWCA on February 13, 2025. Surface karst features may have developed after this date and will not be noted in this report. Imagery analysis was completed by Britt Bommer of Southwest Geophysical Consulting on February 14, 2025.

Prior to conducting the aerial karst survey, a surface karst desk study was performed by Southwest Geophysical Consulting. The study was performed using satellite and aerial imagery from Google Earth Pro dated December 20, 2023 (please note features less than one meter in diameter are generally not visible using this method); the Southwest Geophysical Cave and Karst Database dated January 24, 2025<sup>[12]</sup>; and the Paduca Breaks West, NM-TX, 1:24,000 quad, 1973, USGS topographic map; and the latest lidar imagery from CalTopo.com. Please note that we use older topographic maps because newer maps have had caves removed from them. These searches and queries returned no results within the survey boundary.

#### **2.4 Description of Karst Features**

**No surface karst features are located within the aerial karst survey area for the PESC project.**

The lack of surface karst features does not mean the area is not karstified and the survey area may still contain buried karst features. Caution should be exercised while clearing brush and during any excavation, trenching, or construction operations. Employing a BLM-CFO approved karst monitor on site during these operations should be considered.

### 3.0 RECOMMENDATIONS

#### 3.1 Summary

- **No surface karst features are located within the aerial karst survey area for the PESC project.**
- The lack of surface karst features does not mean the area is not karstified and the survey area may still contain buried karst features.
- Caution should be exercised while clearing brush and during any excavation, grading, or construction operations.
- Employing a Bureau of Land Management approved karst monitor on site during these operations should be considered.

#### 3.2 Best Practices

This area may be prone to rapid karst formation in the underlying stratigraphy and warrants careful planning and engineering to mitigate karst-forming processes that could be accelerated by poor design considerations. Proper engineering of petroleum-related facilities following karst guidelines should be implemented during both excavation and construction. Mitigation measures for any karst features revealed during excavation shall be approved by the Bureau of Land Management – Carlsbad Field Office and follow the Natural Resources Conservation Service Conservation Practice Standard for Karst Sinkhole Treatment, Code 527, or the Bureau of Land Management Cave and Karst Management Handbook, H-8380-1.

**Keep in mind that any flow of gypsum-undersaturated waters into a small crack or crevice can rapidly dissolve any underlying gypsum and cause failure of an impoundment or infrastructure within a matter of months to a few years. It is imperative that any dikes, buffers, or liners installed are checked regularly for integrity, with repairs made immediately upon discovery of failure.**

Vigilance during construction is paramount. If voids are encountered during excavation, contact the Bureau of Land Management Karst Division at (575) 234-5972, the New Mexico State Land Office Surface Resources Division at (505) 827-5768, or a BLM-CFO approved karst vendor and request an on-site investigation from a karst expert if one is not already on site. A karst consultant can generally be available in Eddy County within five hours.

Approved karst monitors should have karst feature identification training, at least two years of supervised experience identifying karst features, wilderness first aid training, SRT training, confined space training, gas monitor training, and a minimum of SPAR cave rescue training through NCRC. They should have with them the proper gear and be prepared both physically and mentally to enter a collapse feature within minutes to perform a rescue if needed. Monitoring services with qualified karst monitors, as well as cave surveys and geophysical surveys, are available from Southwest Geophysical Consulting.

Under no circumstances should an untrained, inexperienced person enter a cave, pit, sinkhole, or collapse feature. All field employees of Southwest Geophysical Consulting have extensive caving experience and the ability to determine whether entry into a karst feature is safe or presents a hazard. In the event it is necessary to enter a karst feature, Southwest Geophysical Consulting can provide these services on request.

Cave and karst resource inventory reports for the BLM-CFO should be submitted to:

[blm\\_nm\\_karst@blm.gov](mailto:blm_nm_karst@blm.gov)

Cave and karst resource inventory reports for the NMSLO should be submitted to the respective project manager.

#### 4.0 REFERENCES

- 1 Goodbar, J. R. Vol. BLM Management Handbook H-8380-1 (ed Carlsbad Field Office) 59 (Bureau of Land Management, Denver, CO, 2015).
- 2 Decker, D., Trautner, E. & Palmer, R. (Bureau of Land Management - Carlsbad Field Office, 2025).
- 3 Earthpoint. *Earthpoint Tools for Google Earth*, <<https://www.earthpoint.us/Townships.aspx>> (2022).
- 4 W.R.C.C. *National Climate Data Center 1981-2010 Normal Climate Summary for Carlsbad, New Mexico (291469)*, 2010).
- 5 Whitehead, W. & Flynn, C. *Plant Utilization in Southeastern New Mexico: Botany, Ethnobotany, and Archaeology*. (Bureau of Land Management, Carlsbad Field Office, 2017).
- 6 NMSLO. Digital overlay (KML) of the surface land ownership in New Mexico (New Mexico State Land Office, Santa Fe, NM, 2024).
- 7 Scholle, P. A. *Geologic Map of New Mexico*. (2003).
- 8 Hills, J. M. in *Assessment of Effectiveness of Geologic Isolation Systems* (eds B.L. Scott, G.L. Benson, R.A. Craig, & M.A. Harwell) (Pacific Northwest Laboratory, 1979).
- 9 Austin, G. S. *Geology and mineral deposits of Ochoan rocks in Delaware Basin and adjacent areas*. Vol. Circular 159 (New Mexico Bureau of Mines and Mineral Resources, 1978).
- 10 Green, G. N. & Jones, G. E. *The Digital Geologic Map of New Mexico in ARC/INFO Format*, <<https://mrdata.usgs.gov/geology/state/state.php?state=NM>> (1997).
- 11 Whitehead, W., Bandy, M. & Decker, D. Protocol for Using UAV Photography for Rapid Assessment of Karst Features in Southeast New Mexico. *Proceedings of the 2022 Cave and Karst Management Symposium* (2022).
- 12 Decker, D. D., Jorgensen, G. L. & Palmer, R. in *Southwest Geophysical Cave and Karst Database* (ed LLC Southwest Geophysical Consulting) (Albuquerque, NM, 2025).

## 5.0 GLOSSARY OF TERMS AND ABBREVIATIONS

BLM-CFO	Bureau of Land Management - Carlsbad Field Office
caprock-collapse sinkhole	Collapse of roof-spanning rock into a cave or void.
cave	Natural opening at the surface large enough for a person to enter.
cover-collapse sinkhole	Collapse of roof-spanning soil or clay ground cover into a subsurface void.
GPS	Global Positioning System
grike	A solutionally enlarged, vertical, or sub-vertical joint or fracture.
(H)	High confidence modifier for a PKF. This is typically reserved for a feature that is definitely karst but has not been confirmed in the field.
HKOZ	High Karst Occurrence Zone
InSAR	Interferometric Synthetic Aperture Radar. A method by which radar signals from satellites are processed to determine the amount and rate of subsidence of an area as well as whether the area is actively subsiding.
(L)	Low confidence modifier for a PKF. This is typically a feature that cannot be ruled out as karst but is most likely NOT karst related. This modifier may also be used for pseudokarst features.
LED	Locally enclosed depression. A natural depression on the surface that collects rainwater. Some contain swallets and/or caves, others do not.
LKOZ	Low Karst Occurrence Zone
(M)	Medium confidence modifier for PKF. This is an ambiguous feature that can't be positively identified as karst without a field visit (e.g., burrows, abandoned unlined wells, solution tubes, pseudokarst).
MKOZ	Medium Karst Occurrence Zone
NCRC	National Cave Rescue Commission
NKF	Non-karst feature. Used for features originally identified as PKF that have been subsequently identified in the field as non-karst related. This term may also be used for pseudokarst features.
NMSLO	New Mexico State Land Office
Pat	Permian Artesia Group
PdI	Permian Dewey Lake Formation
PKF	Possible karst feature. This term is reserved for features identified in satellite or aerial imagery that have NOT been visited in the field. Further modifiers include (H) for high confidence, (M) for medium confidence, and (L) for low confidence. These confidence levels are based on field experience.
PLSS	Public Land Survey System

Pqg	Permian Queen/Greyburg Formation
Pru	Permian Rustler Formation
pseudokarst	Karst-like features (sinkholes, conduits, voids etc.) that are not formed by dissolution. These types of features include soil piping, lava tubes, and some cover-collapse and suffosion sinkholes.
Psl	Permian Salado Formation
Psr	Permian Seven Rivers Formation
Pt	Permian Tansill Formation
Py	Permian Yates Formation
Qal	Quaternary alluvium
Qe	Quaternary eolian deposits
Qp	Quaternary piedmont deposits
Qpl	Quaternary playa lake deposits
RKF	Recognized karst feature. This term is reserved for karst features that have been physically verified in the field.
SKF	Surface Karst Feature
SPAR	Small Party Assisted Rescue
suffosion sinkhole	Raveling of soil into a pre-existing void or fracture.
swallet	A natural opening in the surface, too small for a person, that drains water to an aquifer. Some are "open," meaning a void can be seen below; some are "closed," meaning they are full of sediment.
SWG	Southwest Geophysical Consulting, LLC
UTM	Universal Transverse Mercator (projected coordinates)
(V)	Field verified modifier for a PKF. This indicates that the feature has been visited by a qualified karst professional in the field and fully identified
WGS	World Geodetic System (geographic coordinates)

## 6.0 ATTESTATION

### David D. Decker, PhD, PG, CPG

Chief Executive Officer, Principal Geologist

Southwest Geophysical Consulting, LLC

5117 Fairfax Dr. NW

Albuquerque, NM 87114

[dave@swgeophys.com](mailto:dave@swgeophys.com)

(505) 585-2550

## CERTIFICATE OF AUTHOR

I, David D. Decker, a Licensed Professional Geologist and a Certified Professional Geologist, do certify that:

- I am currently employed as a consulting geologist in the specialty of caves and karst with an office address of 5117 Fairfax Dr. NW, Albuquerque, NM, USA, 87114.
- I graduated with a Master of Science in Applied Physics with a specialization in Sensor Systems from the Naval Post Graduate School in Monterey, California, in 2003, and a Doctor of Philosophy in Earth and Planetary Sciences from the University of New Mexico, Albuquerque, New Mexico, in 2018.
- I am a Licensed Professional Geologist in the State of Texas, USA (PG-15242) and have been since 2021. I am a Certified Professional Geologist through the American Institute of Professional Geologists (CPG-12123) and have been since 2021.
- I have been employed as a geologist continuously since 2016. I was previously employed as a Fire Controlman, Naval Flight Officer, and Aerospace Engineering Duty Officer in the U.S. Navy and operated, maintained, and installed various sensor systems including magnetic, electromagnetic, radar, communications, and acoustic systems in various capacities from 1986 through 2010.
- I have been involved in various aspects of cave and karst studies continuously since 1985, including exploration, mapping, and scientific studies.
- I have read the definition of “qualified karst professional” set out in the ASTM Standard Practice for Preliminary Karst Terrain Assessment for Site Development (ASTM E-1527). I meet the definition of “qualified professional” for the purposes of this standard.
- I am responsible for the content, compilation, and editing of all sections of report number RTHC-006-20250121 entitled, “Cave and Karst Resource Inventory Report, Pintail East – Solaris Containment, Eddy County, New Mexico.” I or a duly authorized and qualified representative of Southwest Geophysical Consulting, LLC, have personally visited this site or reviewed the aerial imagery on the date or dates mentioned in section **2.3 Description of Survey**.

- I have no prior involvement nor monetary interest in the described property or project, save for my fee for conducting this investigation and providing the report.

Dated in Albuquerque, New Mexico, February 18, 2025.



David D. Decker  
PhD, CPG-12123



## WELL LOGS AND USGS DATA

The USGS well data discussed for the Pintail Containment Facility is presented below.

USGS 320134103384101 26S.32E.21.32311

Lea County, New Mexico

Hydrologic Unit Code 13070001

Latitude 32°01'35.2", Longitude 103°41'01.8" NAD83

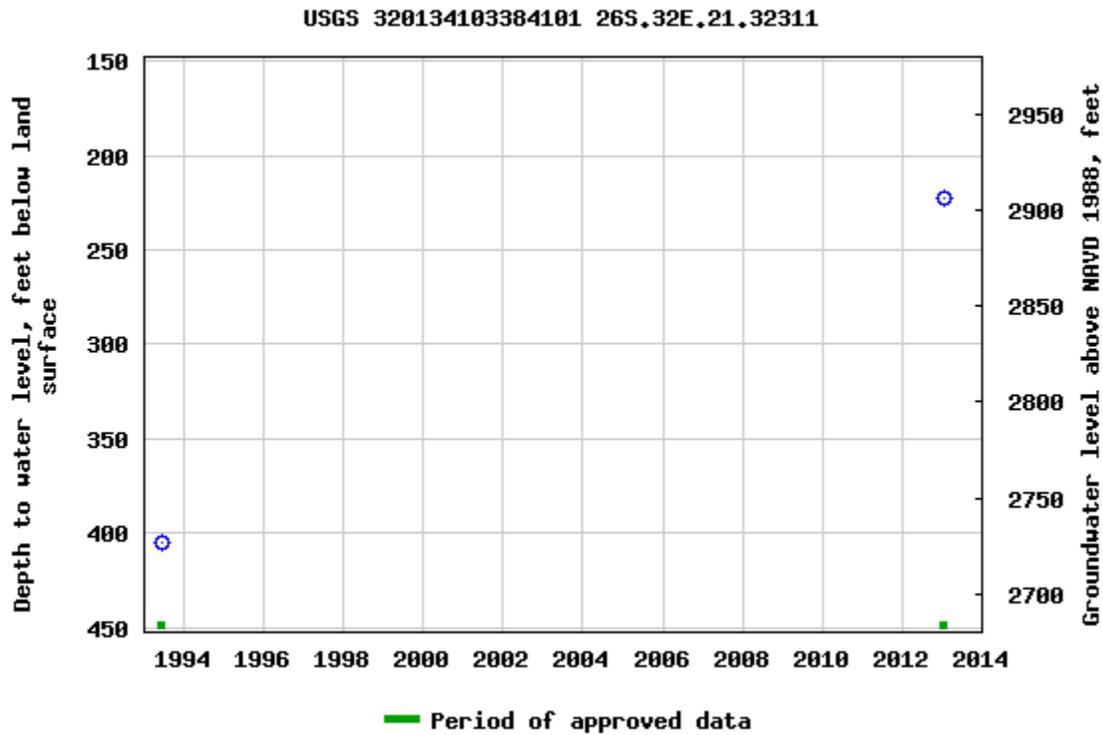
Land-surface elevation 3,130 feet above NAVD88

The depth of the well is 405 feet below land surface.

The depth of the hole is 405 feet below land surface.

This well is completed in the Pecos River Basin alluvial aquifer (N100PCSRVR) national aquifer.

This well is completed in the Dockum Group (231DCKM) local aquifer.



This is USGS-14072 at a ranch complex 2.13 miles south-southwest of the site. Groundwater elevation was 2908 [sic] in 2013

**USGS 320424103415401 26S.31E.01.421322**

Eddy County, New Mexico

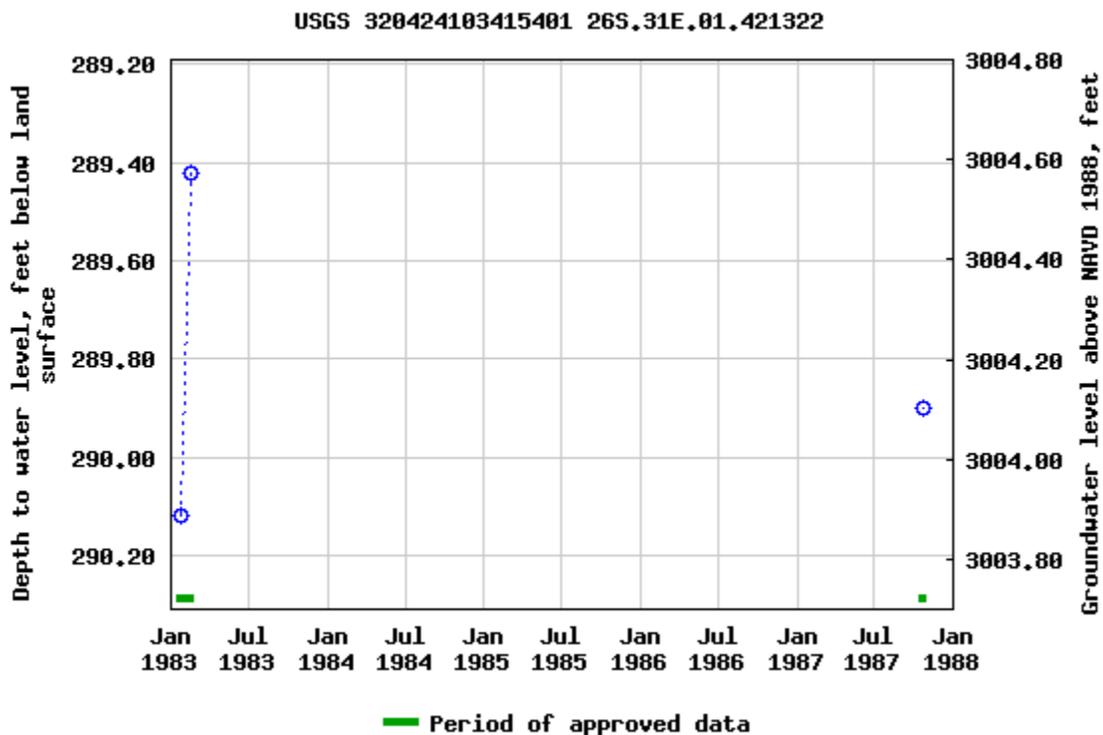
Hydrologic Unit Code 13070001

Latitude 32°04'24", Longitude 103°41'54" NAD27

Land-surface elevation 3,294 feet above NAVD88

This well is completed in the Other aquifers (N9999OTHER) national aquifer.

This well is completed in the Santa Rosa Sandstone (231SNRS) local aquifer



This location plots as USGS-9146, about 1.63 miles northwest of the Pintail location. There is nothing currently at this location. About 0.32 miles to the north-northwest of these coordinates is a possible location based upon vehicular traffic and greenness in some photographs.

**USGS 320425103415401 26S.31E.01.42110**

Eddy County, New Mexico

Hydrologic Unit Code 13070001

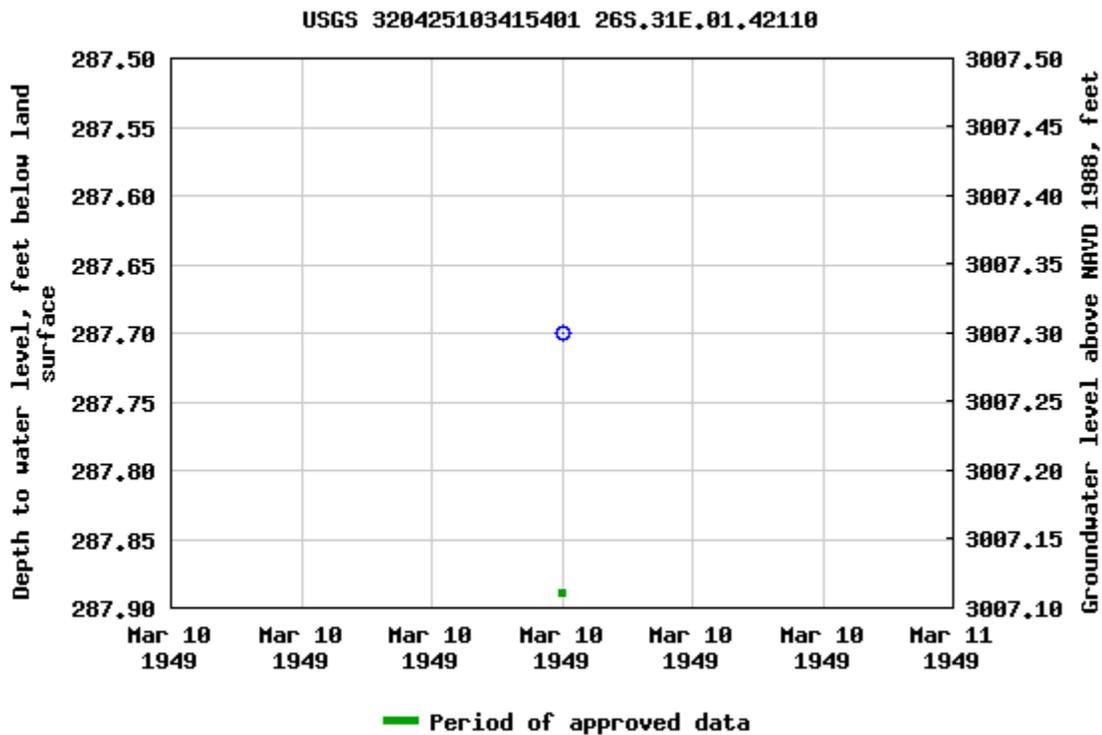
Latitude 32°04'25", Longitude 103°41'54" NAD27

Land-surface elevation 3,295 feet above NAVD88

The depth of the well is 340 feet below land surface.

This well is completed in the Other aquifers (N9999OTHER) national aquifer.

This well is completed in the Rustler Formation (312RSLR) local aquifer.



This well plots as USGS-9141, north of and adjacent to USGS-9146. The same points regarding the location of USGS-9146 apply to this well.

**USGS 320449103360101 25S.33E.31.44424**

Lea County, New Mexico

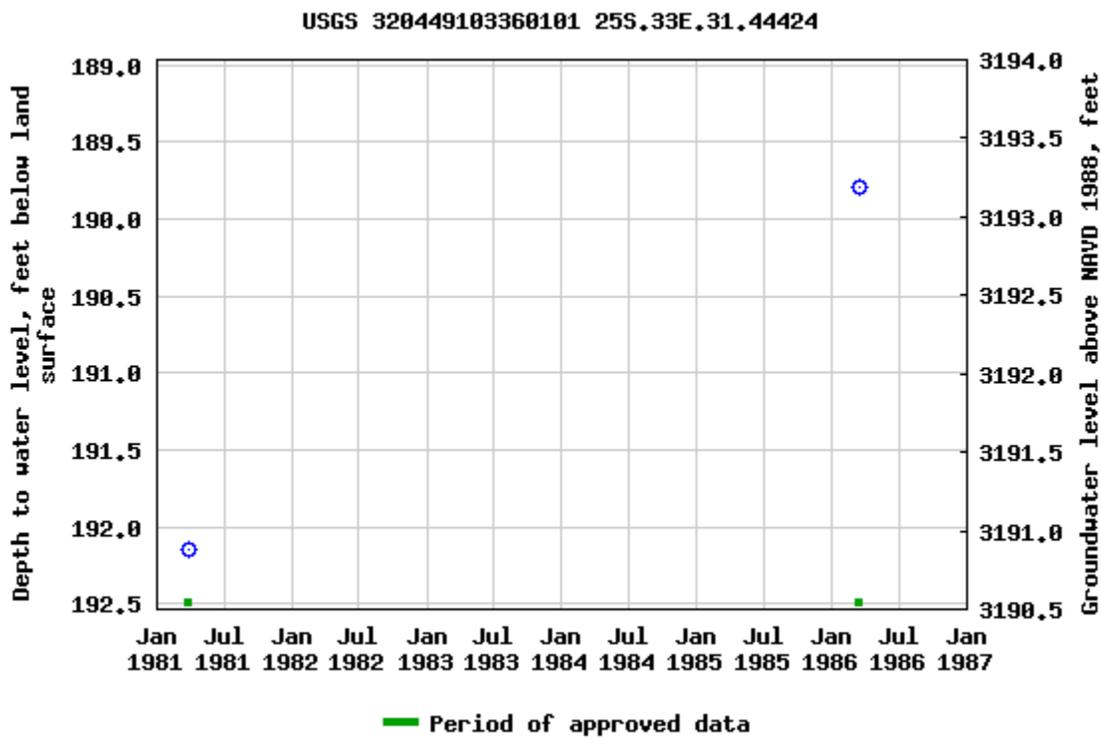
Hydrologic Unit Code 13070001

Latitude 32°04'49", Longitude 103°36'01" NAD27

Land-surface elevation 3,383 feet above NAVD88

This well is completed in the Other aquifers (N9999OTHER) national aquifer.

This well is completed in the Chinle Formation (231CHNL) local aquifer



This location is 4.17 miles northeast of the Pintail location and is USGS-14292. At the well's coordinates, nothing is present. About 0.21 miles to the west is an unused corral complex with former stock tanks present. We consider this to be the likely location of the well.

**USGS 320449103360101 25S.33E.31.44424**

Lea County, New Mexico

Hydrologic Unit Code 13070001

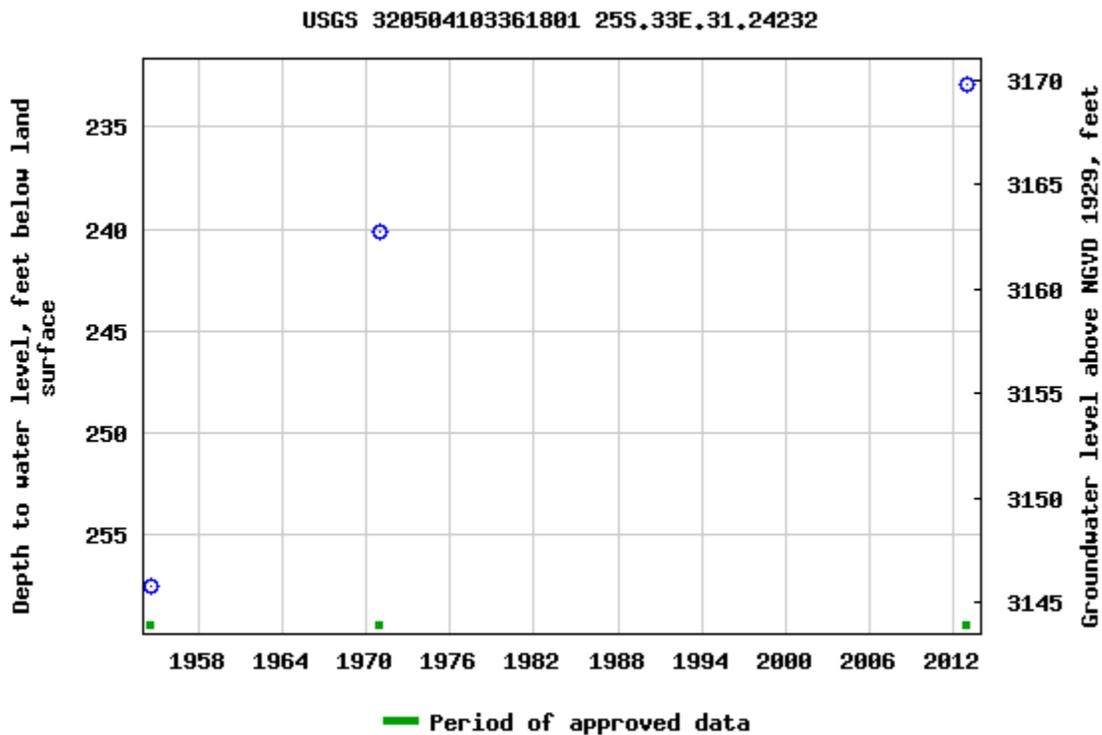
Latitude 32°05'21.6", Longitude 103°36'12.7" NAD83

Land-surface elevation 3,403.00 feet above NGVD29

The depth of the well is 320 feet below land surface.

This well is completed in the Other aquifers (N9999OTHER) national aquifer.

This well is completed in the Ogallala Formation (121OGLL) local aquifer.



These coordinates are at the same site of a former stock tank and corral complex, USGS-14292. The westernmost of the two wells is MISC-126. The well is likely close to the well above.



# PLUGGING RECORD

**NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC**

## I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: C-4787-PODI  
 Well owner: Tetra Tech on behalf of ConocoPhillips Phone No.: 512-338-1667  
 Mailing address: 8911 N Capital of Texas Hwy #2310  
 City: Austin State: TX Zip code: 78759

## II. WELL PLUGGING INFORMATION:

- 1) Name of well drilling company that plugged well: John Scarborough Drilling Inc
- 2) New Mexico Well Driller License No.: WD-1188 Expiration Date: 03/31/2024
- 3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s):  
Lane Scarborough
- 4) Date well plugging began: 02/6/2024 Date well plugging concluded: 02/6/2024
- 5) GPS Well Location: Latitude: 32 deg, 2 min, 7 sec  
Longitude: 103 deg, 40 min, 61 sec, WGS 84
- 6) Depth of well confirmed at initiation of plugging as: 55 ft below ground level (bgl),  
by the following manner: Cement-bentonite slurry (max 5.2 gallons water per 94-lb sack of Type I/II Portland cement)
- 7) Static water level measured at initiation of plugging: UNK ft bgl
- 8) Date well plugging plan of operations was approved by the State Engineer: 11/29/2023
- 9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

OCD DTI MAR 11 2024 PM 1:06

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments (“casing perforated first”, “open annular space also plugged”, etc.)
55 feet - 2 feet below ground surface:	Cement-bentonite slurry (bentonite powder) was mixed using a maximum of 5.2 gallons water per 94-lb sack of Type I/II Portland cement. PLUS 0.65 gallons per 1% increase in bentonite up to a maximum 6% bentonite by dryweight ratio.	5 gallons of cement-bentonite slurry based on 2 inch diameter hole from 2 feet to 55 feet below the ground surface	8.97 gallons theoretically based on 2 inch diameter hole to 55 feet below the ground surface	Filled from the bottom upwards to 2 feet below the ground surface using a tremie pipe. The sealant material (cement-bent onite slurry) was pumped through the tremie pipe extended to near well bottom and kept below the top of the slurry column as the well is plugged from bottom-upwar ds, while the slurry displaces the standing water column upwards from below.	
2 feet to 0 feet below ground surface: soils and pad material collected during drilling of the temporary well					

MULTIPLY	BY	AND OBTAIN
cubic feet x	7 4805	= gallons
cubic yards x	201 97	= gallons

OCD DTI MAR 11 2024 PM 1:06

**III. SIGNATURE:**

I, Lane Scarborough, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Lane Scarborough  
Signature of Well Driller

3/6/2024  
Date



# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

OSE DJJ AUG 2 2021 PM 4:45

<b>1. GENERAL AND WELL LOCATION</b>	OSE POD NO. (WELL NO.) <b>POD1 (MW-1)</b>		WELL TAG ID NO. n/a		OSE FILE NO(S) <b>C-4549</b>			
	WELL OWNER NAME(S) <b>BTA Oil Producers</b>				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS <b>104 S. Pecos St.</b>				CITY <b>Midland</b>	STATE <b>TX</b>	ZIP <b>79701</b>	
	WELL LOCATION (FROM GPS)	DEGREES <b>32</b>	MINUTES <b>4</b>	SECONDS <b>40.92</b>	* ACCURACY REQUIRED: ONE TENTH OF A SECOND			
	LATITUDE			<b>N</b>	* DATUM REQUIRED: WGS 84			
	LONGITUDE	<b>103</b>	<b>37</b>	<b>53.68</b>	<b>W</b>			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE <b>NW NW NW Sec. 11 T26S R32E</b>								
<b>2. DRILLING &amp; CASING INFORMATION</b>	LICENSE NO. <b>1249</b>		NAME OF LICENSED DRILLER <b>Jackie D. Atkins</b>			NAME OF WELL DRILLING COMPANY <b>Atkins Engineering Associates, Inc.</b>		
	DRILLING STARTED <b>07/14/2021</b>		DRILLING ENDED <b>07/14/2021</b>	DEPTH OF COMPLETED WELL (FT) <b>temporary well material</b>		BORE HOLE DEPTH (FT) <b>103</b>	DEPTH WATER FIRST ENCOUNTERED (FT) <b>n/a</b>	
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input checked="" type="checkbox"/> DRY HOLE <input type="checkbox"/> SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) <b>n/a</b>	
	DRILLING FLUID: <input checked="" type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input checked="" type="checkbox"/> OTHER - SPECIFY: <b>Hollow Stem Auger</b>							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0	103	±8.5	Boring- HSA	--	--	--	--
<b>3. ANNULAR MATERIAL</b>	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						

FOR OSE INTERNAL USE				WR-20 WELL RECORD & LOG (Version 06/30/17)			
FILE NO. <b>C-4549</b>		POD NO. <b>1</b>		TRN NO. <b>698318</b>			
LOCATION <b>26S-32E-11</b>		1.1.1		WELL TAG ID NO. <b>NA-</b>		PAGE 1 OF 2	



Revised June 1972

STATE ENGINEER OFFICE  
WELL RECORD

465266  
NOV 1992

Section 1. GENERAL INFORMATION

(A) Owner of well M.R. Madera Trust  
Street or Post Office Address P. O. Box 1689  
City and State Carlsbad, NM 88220

93 NOV 18 AM 9  
STATE ENGINEER OFFICE  
NEW MEXICO  
Owner's Well No. 10C-2323

Well was drilled under Permit No. C-2323 and is located in the:

- a. SW  $\frac{1}{4}$  NE  $\frac{1}{4}$  SW  $\frac{1}{4}$  of Section 21 Township 26S Range 32E N.M.P.M.
- b. Tract No. \_\_\_\_\_ of Map No. \_\_\_\_\_ of the \_\_\_\_\_
- c. Lot No. \_\_\_\_\_ of Block No. \_\_\_\_\_ of the \_\_\_\_\_  
Subdivision, recorded in Lea County.
- d. X= \_\_\_\_\_ feet, Y= \_\_\_\_\_ feet, N.M. Coordinate System \_\_\_\_\_ Zone in the \_\_\_\_\_ Grant.

(B) Drilling Contractor Billy Bentle License No. WD 1292  
Address Box 533 Jal, NM 88252

Drilling Began May 25, 1993 Completed June 16, 1993 Type tools cable Size of Hole 10 in.  
Elevation of land surface or \_\_\_\_\_ at well is \_\_\_\_\_ ft. Total depth of well 405 ft.  
Completed well is  shallow  artesian. Depth to water upon completion of well 405 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
		400 ft.	brown sand rock	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
	Steel pipe		0	100	10"		80	100
	steel pipe		0	200	8"			
	Steel pipe		0	405	7"		240	400

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				

Section 5. PLUGGING RECORD

Plugging Contractor \_\_\_\_\_  
Address \_\_\_\_\_  
Plugging Method \_\_\_\_\_  
Date Well Plugged \_\_\_\_\_  
Plugging approved by: \_\_\_\_\_

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 06-24-93 Quad \_\_\_\_\_ FWL \_\_\_\_\_ FSL \_\_\_\_\_  
File No. C-2323 Use Dom & Stk Location No. 26S.32E.21.32311





# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

STATE ENGINEER OFFICE  
ROSWELL, NEW MEXICO

2018 MAY 21 AM 10:46

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) C-4209-POD1		WELL TAG ID NO.		OSE FILE NO(S)		
	WELL OWNER NAME(S) Baker Ranch				PHONE (OPTIONAL)		
	WELL OWNER MAILING ADDRESS P.O. Box 24				CITY Silver City	STATE NM	ZIP 88062
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 04	SECONDS 02.5	N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84	
LONGITUDE 103      43      08.8      W							
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE							

2. DRILLING & CASING INFORMATION	LICENSE NO. WD1706	NAME OF LICENSED DRILLER Bryce Wallace			NAME OF WELL DRILLING COMPANY Elite Drillers Corporation			
	DRILLING STARTED 4/28/18	DRILLING ENDED 5/1/18	DEPTH OF COMPLETED WELL (FT) 360	BORE HOLE DEPTH (FT) 360	DEPTH WATER FIRST ENCOUNTERED (FT) 155			
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input type="checkbox"/> DRY HOLE <input checked="" type="checkbox"/> SHALLOW (UNCONFINED)				STATIC WATER LEVEL IN COMPLETED WELL (FT) 155			
	DRILLING FLUID: <input type="checkbox"/> AIR <input checked="" type="checkbox"/> MUD    ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	+2	200	11	PVC	Spline	6	SDR 21	
	200	360	11	PVC	Spline	6	SDR 21	.032

3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
	FROM	TO				
	0	25	11	Portland I/II	25	Slurry/Pour
	25	360	11	8/16 Silica Sand	145	Pour

FOR OSE INTERNAL USE				WR-20 WELL RECORD & LOG (Version 06/30/17)			
FILE NO.	C-4209	POD NO.	1	TRN NO.	621334		
LOCATION	205.32E.6.332		EXPL	WELL TAG ID NO.	N/A	PAGE 1 OF 2	





# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

[www.ose.state.nm.us](http://www.ose.state.nm.us)

OSE 07 JUN 21 2021 04:01:13

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) C-4537 <b>POD1</b>		WELL TAG ID NO. 20E6C		OSE FILE NO(S) C-4537			
	WELL OWNER NAME(S) BASIN PROPERTIES RANCHES LLC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 3300 N A STREET, BLDG 1, STE 220				CITY MIDLAND	STATE TX	ZIP 79705	
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 04	SECONDS 50.8	* ACCURACY REQUIRED: ONE TENTH OF A SECOND			
	LONGITUDE 103	36	10.7	* DATUM REQUIRED: WGS 84				
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE								
2. DRILLING & CASING INFORMATION	LICENSE NO. WD1706		NAME OF LICENSED DRILLER Bryce Wallace			NAME OF WELL DRILLING COMPANY Elite Drillers Corporation		
	DRILLING STARTED 06/11/21	DRILLING ENDED 06/12/21	DEPTH OF COMPLETED WELL (FT) 500	BORE HOLE DEPTH (FT) 500	DEPTH WATER FIRST ENCOUNTERED (FT) 280			
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input type="checkbox"/> DRY HOLE <input checked="" type="checkbox"/> SHALLOW (UNCONFINED)				STATIC WATER LEVEL IN COMPLETED WELL (FT) 280			
	DRILLING FLUID: <input checked="" type="checkbox"/> AIR <input type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0	20	12 3/4	STEEL	N/A	8.28	.337	
	0	300	7 7/8	SDR17 PVC	SPLINE	4.3	SDR17	
	300	500	7 7/8	SDR17 PVC	SPLINE	4.3	SDR17	.032
DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT			
FROM	TO							
0	20	12 3/4	CEMENT	10	TOP FILL			
0	20	7 7/8	CEMENT	6	TOP FILL			
300	500	7 7/8	8/16 SILICA SAND	46	TOP FILL			

FOR OSE INTERNAL USE		WR-20 WELL RECORD & LOG (Version 06/30/17)			
FILE NO.	<b>C-4537</b>	POD NO.	<b>1</b>	TRN NO.	<b>CA5385</b>
LOCATION	<b>SK</b>	<b>255.33E.31.444</b>	WELL TAG ID NO.	<b>20E6C</b>	PAGE 1 OF 2



## SITE PHOTOGRAHS

# R.T. HICKS CONSULTANTS, LTD.

## Figures

The photographs were taken during R T Hicks Consultants site visit on September 23, 2024. The aerial photo below shows the photograph locations as small, labeled rectangles. Photographs were taken in multiple directions at each location.



**R.T. HICKS CONSULTANTS, LTD.**

**Figure 1:** View to the east from the northwest corner. The Pintail East containment will be on the right side of the boundary, marked by stakes.



**Figure 2:** View to the south from the northwest corner. The road (on the right) is parallel to the western side of the location.



**R.T. HICKS CONSULTANTS, LTD.**

**Figure 3:** View is to the south from the northeast corner. The containment will be to the right side of the dirt road.



**Figure 4:** Looking north from the northeast corner. Oil field infrastructure is present to the north.



**R.T. HICKS CONSULTANTS, LTD.**

**Figure 5:** View is to the north from the southeast corner. The oil field infrastructure in the distance is beyond the northern edge of the location.



**Figure 6:** View is to the east from the southwest corner. The containment will be to the left of the dirt track.



**R.T. HICKS CONSULTANTS, LTD.**

**Figure 7:** *View is to the north and northeast from the southwest corner. The containment will be to the right.*



**Figure 8:** *View to the south from the center of the location.*



**R.T. HICKS CONSULTANTS, LTD.**

**Figure 9:** South of the southeast corner is a tank. No well is present. The tank can be seen on the left horizon of Figure 8.



**Venegas, Victoria, EMNRD**

---

**From:** Venegas, Victoria, EMNRD  
**Sent:** Wednesday, March 5, 2025 9:12 AM  
**To:** 'Chad Gallagher'  
**Subject:** 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023]  
**Attachments:** C-147 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023].pdf

**1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023]**

Good morning Mr. Gallagher.

NMOCD has reviewed the recycling containment permit application and related documents, submitted by [371643] SOLARIS WATER MIDSTREAM, LLC on 02/27/2025, Application ID 436861 for 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] in H-09-26S-32E, Lea County, New Mexico. The form C-147 and related documents for 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] 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.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall construct, operate, maintain, close, and reclaim 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] in compliance with 19.15.34 NMAC.
- **KARST Best Practices:**
- The operator must 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 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023]. 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.
- 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] is approved for five years of operation from the date of permit application of 02/27/2025. 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] permit expires on 02/27/2030. If [371643] SOLARIS WATER MIDSTREAM, LLC, wishes to extend operations past five years, an annual permit extension request must be submitted using form C-147 through OCD Online by 01/27/2030.
- 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] consists of one (1) earthen containment of 1,009,000.00 BBL of total capacity.
- Per Rule 19.15.34.15.A.(1) operators without existing financial assurance pursuant to 19.15.8 NMAC shall furnish financial assurance acceptable to the division in the amount of the recycling containment's estimated closure cost. The total closure cost estimate provided in the application in the amount of \$652,997.25 for 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] meets the requirements of NMAC 19.15.34.15.A.(1).
- [371643] SOLARIS WATER MIDSTREAM, LLC cannot receive produced water in 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] until after the original copy of the financial assurance has been accepted by NMOCD.
- 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.**

- [371643] SOLARIS WATER MIDSTREAM, LLC shall notify OCD when construction of 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] commences.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall notify OCD when recycling operations commence and cease at 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023].
- A minimum of 3-feet freeboard must be maintained at 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023], at all times during operations.
- If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdrawal, operation of the facility is considered ceased and notification of cessation of operations should be sent electronically to OCD Online. An extension to extend the cessation of operation, not to exceed six months, may be submitted using a C-147 form through OCD Online.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall submit monthly reports of recycling and reuse of produced water drilling fluids, and liquid oil field waste on OCD form C-148 through OCD Online even if there is zero activity.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall inspect the recycling containment and associated leak detection system 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.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023].
- Per 19.15.34.14.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.

Please reference number 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] in all future communications.  
Regards,

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

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

General Information  
Phone: (505) 629-6116

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

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

CONDITIONS

Action 436861

**CONDITIONS**

Operator: SOLARIS WATER MIDSTREAM, LLC 9651 Katy Fwy Houston, TX 77024	OGRID: 371643
	Action Number: 436861
	Action Type: [C-147] Water Recycle Long (C-147L)

**CONDITIONS**

Created By	Condition	Condition Date
vvenegas	<p>• 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] is approved for five years of operation from the date of permit application of 02/27/2025. 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] permit expires on 02/27/2030. If [371643] SOLARIS WATER MIDSTREAM, LLC, wishes to extend operations past five years, an annual permit extension request must be submitted using form C-147 through OCD Online by 01/27/2030. • [371643] SOLARIS WATER MIDSTREAM, LLC shall construct, operate, maintain, close, and reclaim 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023] in compliance with 19.15.34 NMAC. • [371643] SOLARIS WATER MIDSTREAM, LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 1RF-536 - PINTAIL EAST CONTAINMENT [fVV2506342023].</p>	3/5/2025