

September 2024

# Rule 34 Registration: Volume 1

## Dagger RF & Containments

### Section 26, T19S, R25E, Eddy County

- *Transmittal Letter*
- *Siting Criteria Demonstration with Plates & Appendices*



View east-southeast toward windmill from lease road on east side of the proposed Dagger containments.

**Prepared for:**  
**Spur Energy Partners 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

September 24, 2024

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: Spur Energy Partners, LLC, Dagger Recycling Facility and Containments  
In-ground Containment Registration  
Section 26, T19S, R25E, Eddy County

Dear Ms. Barr and Ms. Venegas:

On behalf Spur Energy Partners LLC, R.T. Hicks Consultants prepared a C-147 *registration* for the above-referenced project. Spur Energy Partners anticipates that construction will commence no sooner than mid to late October, 2024. Produced water will flow into the containments soon thereafter. Please note that Spur will use the RF and Containments for E&P operations on their wells. The operator is covered by their state-wide bond.

Volume 1 of the package contains:

- This letter
- Siting criteria demonstration for the containments

Volume 2 includes:

- C-147 Form to register the in-ground containment
- Stamped Design Drawings
- 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. OCD has previously approved an equivalency demonstration written by experts for 40-mil HDPE secondary liner. 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 game 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 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

Page 2

comply with the Rule. Nevertheless, Spur will attach 4 strands of barbed wire to the game fence if required by OCD.

Spur Energy Partners will transmit the registration package to OCD via the OCD. Online portal. In compliance with 19.15.34.10 of the Rule, Spur provided this package to the entity that owns the land upon which the RF and containments lie. The surface owner is part of Spur Energy Partners. 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: Spur Energy Partners LLC

SITE ASSESSMENT & CHARACTERIZATION

TEXT AND FIGURES

PLATES

SITING CRITERIA (19.15.34.11 NMAC)  
SPUR ENERGY PARTNERS – DAGGER CONTAINMENTS

## Distance to Groundwater

Plates 1 & 2, the well logs referenced, and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 50 feet beneath the lowest liner of the recycling containment.

Plate 1 is a topographic map that shows:

1. The Dagger Containments within the blue striped polygon with a yellow label.
2. Water wells from the OSE database as a blue triangle inside colored circles that indicate well depth. OSE wells are often miss-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section-Township-Range. OSE wells showing no depth to water and no date are typically permits issued for wells that may or not be in existence at the time of writing this submission.
3. Two geotechnical borings from a study of the site labeled MISC-501 and MISC-502

Appendix-Well Logs & USGS Data has OSE drillers' logs of three wells/borings shown on Plate 1:

- MISC-501 and MISC-502,
- RA-13210 about ½ mile north of the Dagger site, and
- RA-10496 that is about ¾ mile southeast.

The most salient information are the geotechnical borings at the site.

Plate 2 is a geologic and topographic map that shows:

- A. The Dagger Containments area is identified by the blue striped polygon with a yellow label with a surface elevation of 3420.
- B. Water wells measured by the USGS, the date of the measurement and the calculated elevation of the groundwater elevation surface.
- C. Water wells measured by professionals and documented in published reports or by staff of Hicks Consultants (Misc-#). However, MISC-502 is not shown on this plate to allow for clear labeling of the containment area.
- D. The surface geology from the New Mexico State map, which is mapped as Permian Artesia Group.

Plate 2 shows several wells measured by the USGS between 1907 and 1928. North of the Dagger location on the south side of North Seven Rivers are two of these wells with 1908 and 1909 water levels 24 and 26 feet above land surface (artesian at the surface wells USGS-9468 and USGS-9469). A 2012 reading of USGS-9369 is 152 feet below land surface. These wells are completed in the Artesia Group.

SITING CRITERIA (19.15.34.11 NMAC)  
SPUR ENERGY PARTNERS – DAGGER CONTAINMENTS**Hydrogeology**

A veneer of Quaternary Piedmont deposits (Qp) cover all bedrock in the area except in the northeast corner of the map where the Artesia Group crops out. The driller's logs and USGS data (in appendix) provide the following information regarding near surface geology and groundwater zones.

- MISC-501 and MISC-502 represent borings B-1E and B-2E, respectively. Boring B-3E is not shown on Plate 2, but Appendix Well Logs and USGS Data provides a site map of borings. Our interpretation of the data is:
  - 7-12 feet of alluvial sand/clay/gravel lie on the surface
  - Below 12 feet is the Permian bedrock described by the logger as dense carbonate with sand.
  - While the material described as carbonate may be gypsum and the sand may be sand/silt stone of the Permian Seven Rivers Formation, the most important data from these borings is the absence of groundwater to 75 feet.
- RA-13210 about ½ mile north of the Dagger site. Like the borings described above, the log is professional, and the rig used is a hollow stem auger. We interpret this well as:
  - 0-34 feet Piedmont alluvial sediments
  - 34-59 feet, reddish brown clay/sand of the Seven Rivers Formation, similar to that described in boring B-3E
  - First water at 82 feet is correct, based upon our knowledge of the boring contractor. If the boring is properly located, surface elevation is about 3418 and the elevation of groundwater is approximately (3418-82=) 3336 feet.
- RA-10496 that is about ¾ mile southeast. The driller's log is relatively good, but in 2004, field data collection by water well drillers was not as accurate or complete as after about 2015 (+/-). The depth to water of 40 feet may or may not represent a static condition in this area.

**Groundwater Data**

The USGS database presents the following data from wells nearby the proposed Dagger containment

- ✓ USGS 9369 is a well completed in the Artesia Group before 1912. The USGS data show an artesian head of about -50 feet. Measurements between 1975 and 2010 provide a depth to groundwater of about 100 feet in this confined aquifer. The most recent data from 2012 is displayed on Plate 2 as an elevation of 3253 feet AST, which corresponds to a depth to groundwater of 152 feet.
- ✓ RA-9406 has a record of measurements from about 1955 to 2015. The USGS describes this well as drawing water from the Alluvium. It is probably the windmill shown on the USGS topographic map next to RA-0726 (see Plate 1). The USGS and OSE locations of these well are slightly off if they are both the windmill as we suspect. There is no evidence on Google Earth of wells in the locations on Plates 1 and 2. The 2015 depth to water of USSG-9406 is 79 feet and the groundwater elevation shown on Plate 2 is 3314 feet ASL.

SITING CRITERIA (19.15.34.11 NMAC)  
SPUR ENERGY PARTNERS – DAGGER CONTAINMENTS

From these data we conclude:

1. The geotechnical boring logs are dry and clearly demonstrate depth to groundwater at these locations is greater than 75 feet.
2. Data from USGS -9406, which is completed in the shallow/water table aquifer of the Roswell Basin, document a 2015 depth to groundwater of 79 feet.
3. Groundwater depth in the deep artesian aquifer measured by USGS-9369 is 152 feet.
4. Groundwater at the Dagger site is at least 75-feet deep and the estimated elevation of groundwater at boring B-1E is <3345 feet ASL.
5. The surface elevation of the sumps of the three proposed containments is 3420 feet ASL. Thus, the distance between the lowest liner of the containments and the maximum observed dry sediments in borings is (3420-3345=) 75 feet.

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

Plate 3 demonstrates that the Dagger 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 municipality is Atoka, NM approximately 16 miles north of the Dagger Containment.
- The closest public wells are associated with the Carlsbad public water system about 29 miles south.

### **Distance to Subsurface Mines**

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

- the closest mines are aggregate, or caliche quarries are on the north and eastern margin of the map
- There are no subsurface mines in the area shown in Plate 4.

### **Distance to High or Critical Karst Areas**

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

- The proposed containment is located within a “medium” potential karst area.
- The nearest “high” or “critical” potential karst area is located approximately 1/4 mile south of the proposed containment.
- We observed no evidence of solution voids or unstable ground near the site during the field inspection.

### **Distance to 100-Year Floodplain**

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

- FEMA describes the location as an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted.

SITING CRITERIA (19.15.34.11 NMAC)  
SPUR ENERGY PARTNERS – DAGGER CONTAINMENTS

- As shown in the Engineering Design Drawings, the lowest elevation of the northern levee toe is at an elevation of about 3417 feet asl. Thus, the base of the levee is 6-12 feet higher than the 1% flood risk for a 100-year event.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for contact with the 100-year flood event.

### **Distance to Surface Water**

Plates show that the containment is not within 300 feet of a surface water body or a significant watercourse.

- Plate 7 depicts the proposed RF that includes the three existing fresh water ponds - one is an abandoned gravel pit to the northwest, one a stock tank (southeast) and the third appears to be a stock tank adjacent to a buried water line.
- As the engineering drawings show, the northern levee of the containments is more than 500 feet from the mapped watercourse.
- We examined the area east of the fresh water frac ponds where the 3400-foot topographic contour suggests a drainage. Appendix Site Photos shows this dry gully in more detail and it is not a significant watercourse.

### **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.

- The nearest structures are the fresh water frac ponds, lease roads, several working pads and, the windmill to the east. The windmill is more than 500-feet from the eastern edge of the project area.
- No residences or other structures are in the area.

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

Plates 1 and 7 demonstrate that the Dagger Containment site is not within 500 horizontal feet of a spring or fresh water 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.
- There are no domestic water wells located within 500 feet of the area of interest.
- No springs were identified within the mapping area (see Plate 8)

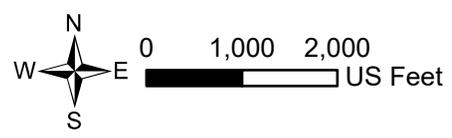
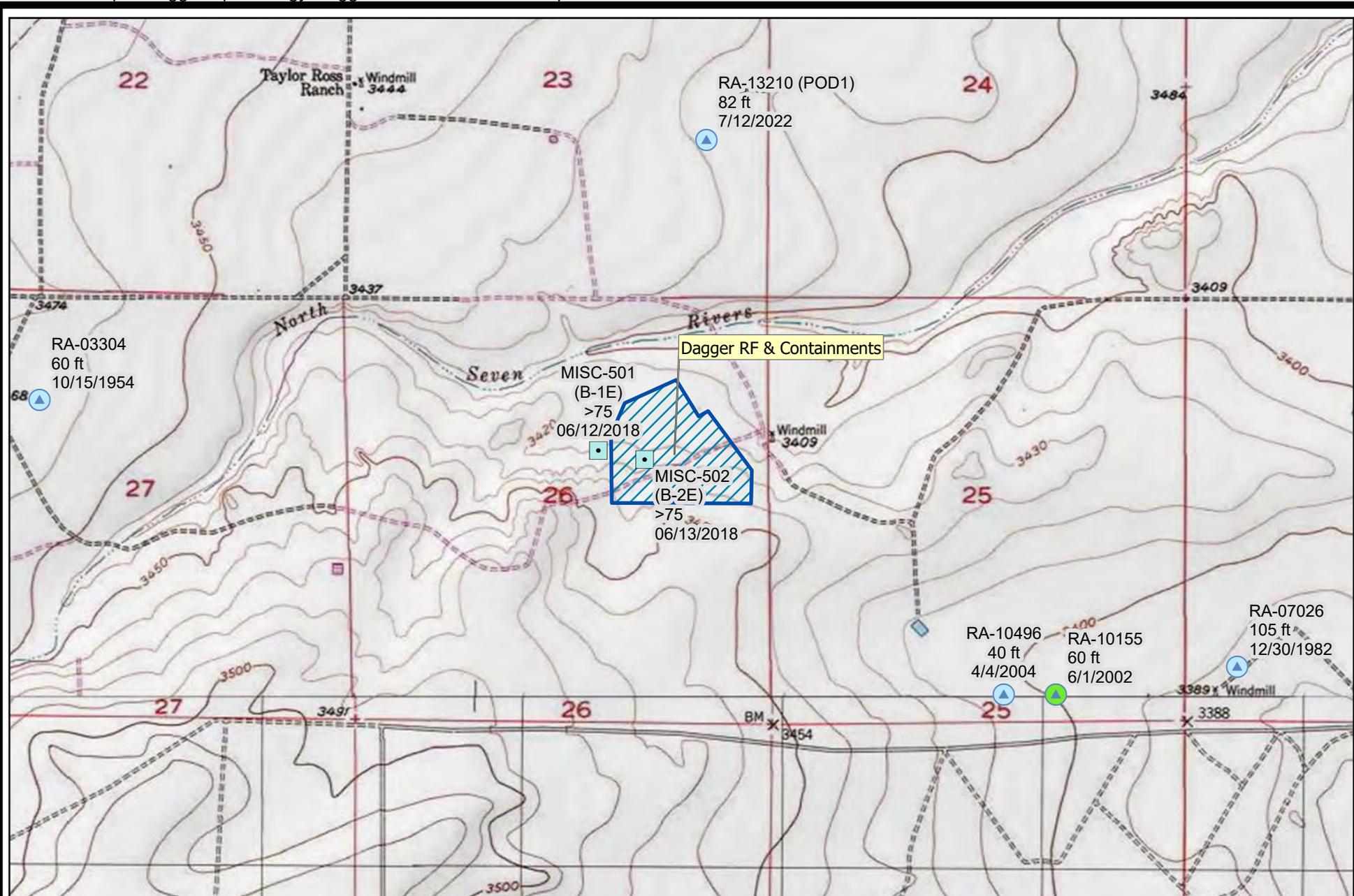
### **Distance to Wetlands**

Plate 9 demonstrates the Dagger location will not be within 500 feet of any mapped wetlands identified in the New Mexico database.

- The nearest mapped wetland is about 3000 feet southeast and the rectangular shape within a swale suggests human-made stock tank.

# PLATES

P:\Cascade Spur Dagger\SpurEnergy-Dagger RF & Containments.aprx



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Nearby Wells and Borings with Depth to Water  
 Spur Energy Partners - Dagger RF & Containment

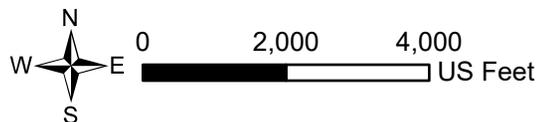
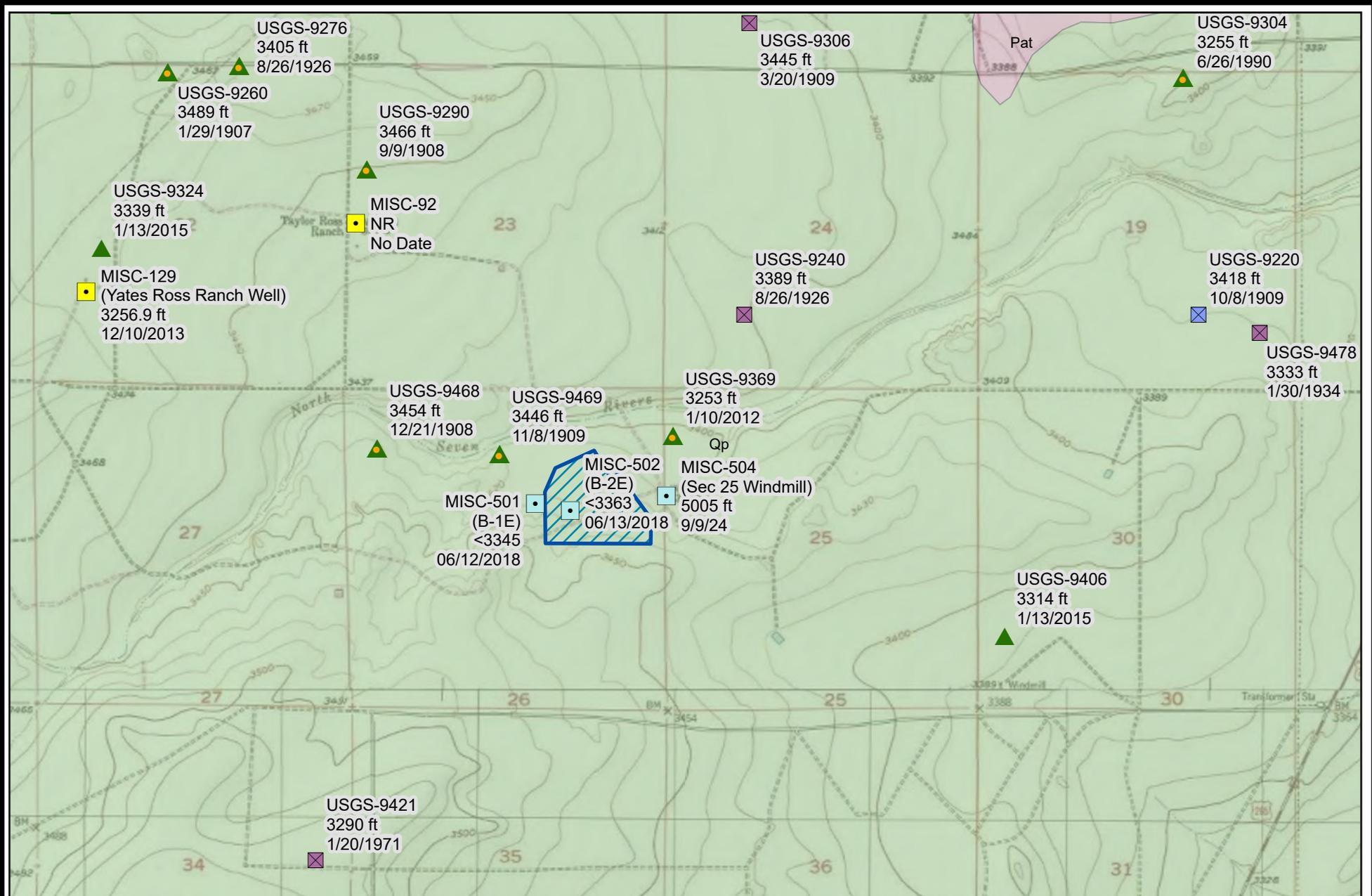
Plate 1  
 September 2024

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USGS Gauging Station (GW Elev, Date)	
Aquifer Code, Well Status	
	Alluvium/Bolsom
	Artesia Group
	313GRBG, <Null>
	313GRBG, Site was being pumped.
Misc. Water Wells (GW Elev, Date)	
Well Depth (ft)	
	No Data
	<= 150
NM_Geology	
Map Unit,Description	
	Pat,Permian-Artesia Group; shelf facies forming south-southeast trending outcrop,Pat,Permian-Artesia Group; shelf facies forming south-southeast trending outcrop
	Qp, Quaternary-Piedmont Alluvial Deposits,Qp, Quaternary-Piedmont Alluvial Deposits

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Legend for Plates 1 and 2	
	Spur Energy Partners - Dagger RF & Containment	September 2024

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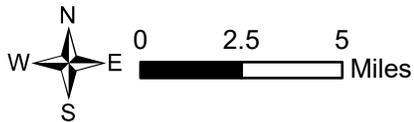
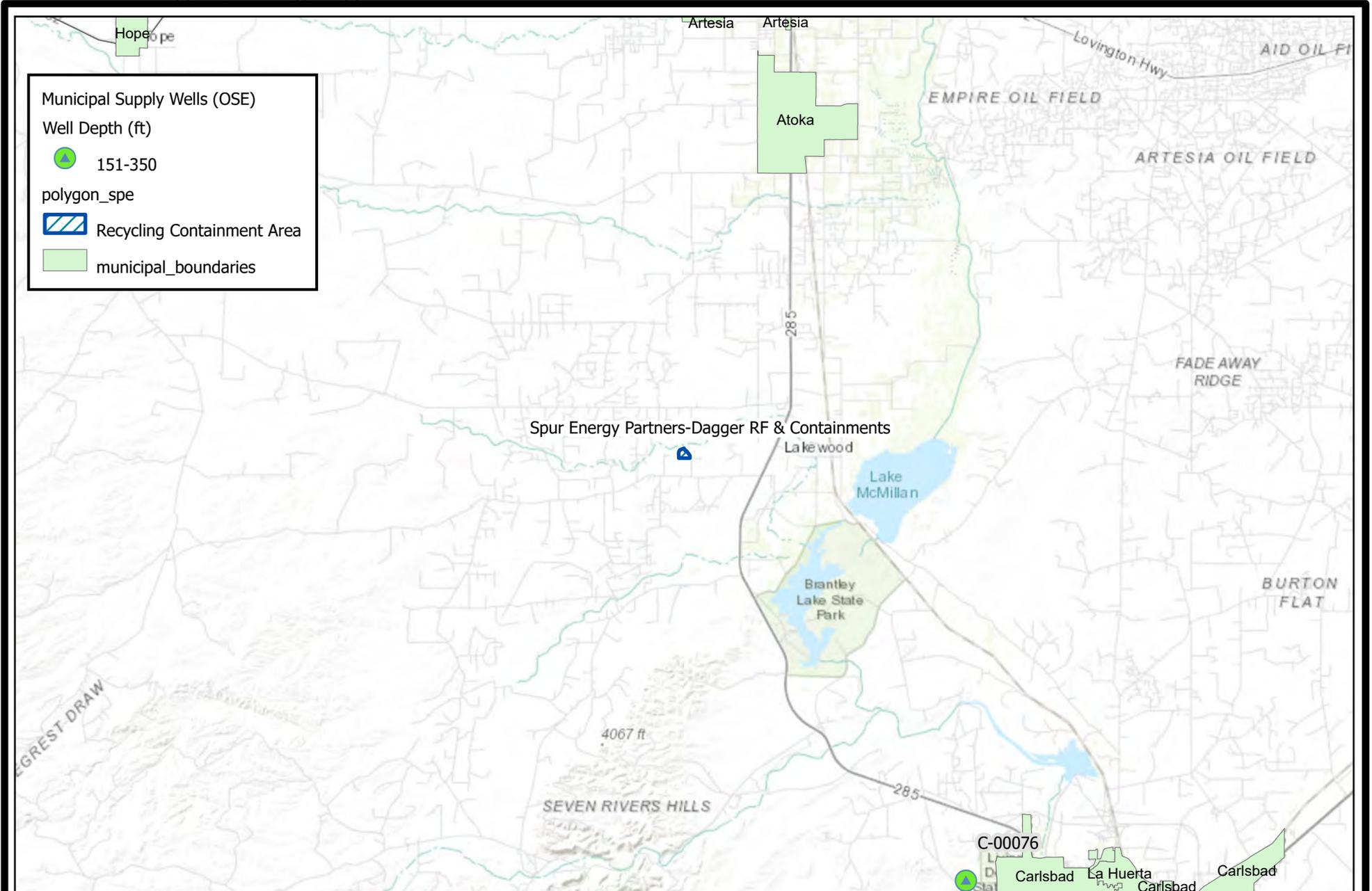
Groundwater Elevation & Geology  
 USGS and MISC Data

Plate 2

Spur Energy Partners - Dagger RF & Containment

September 2024

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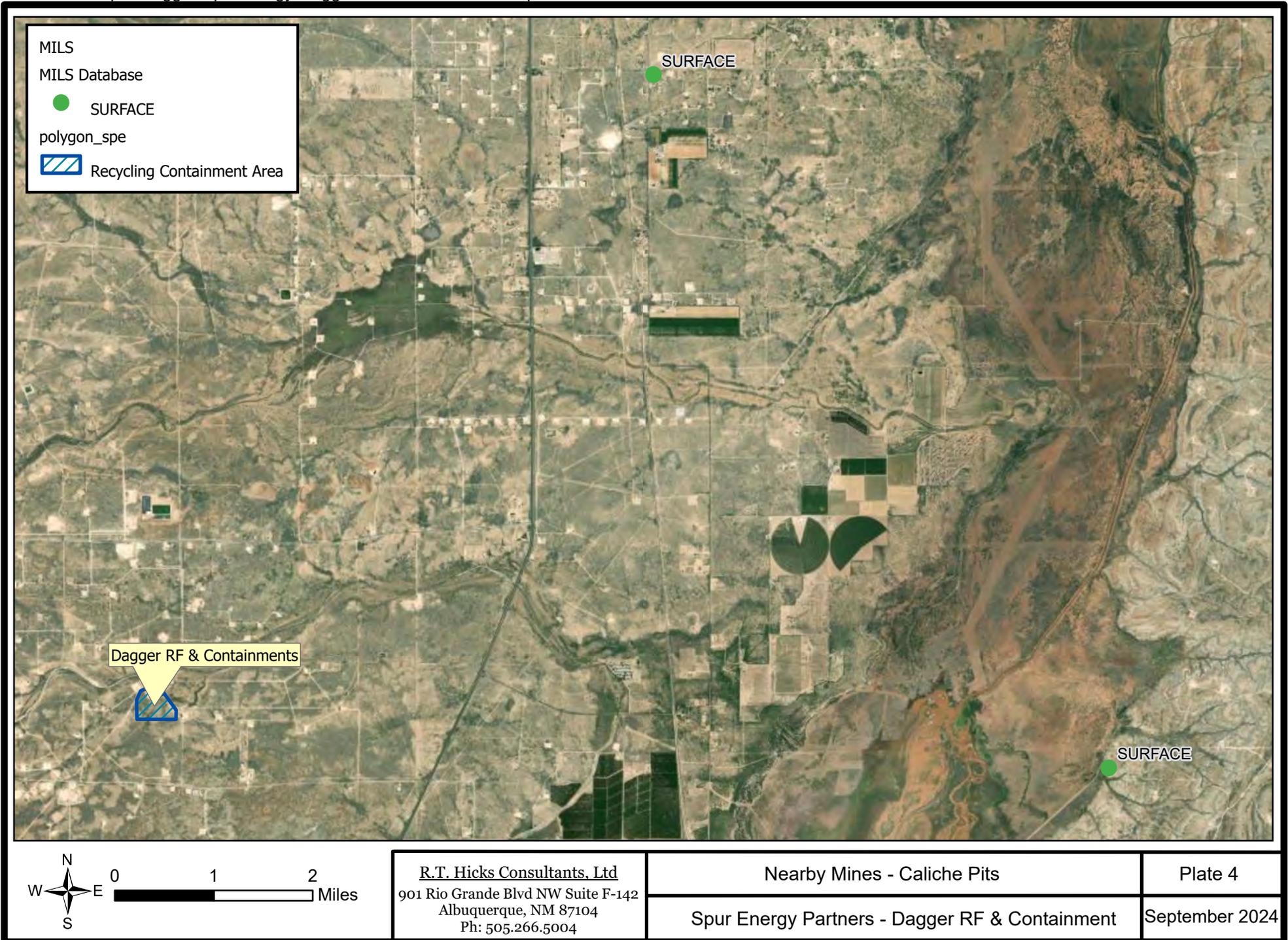


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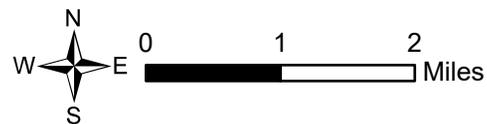
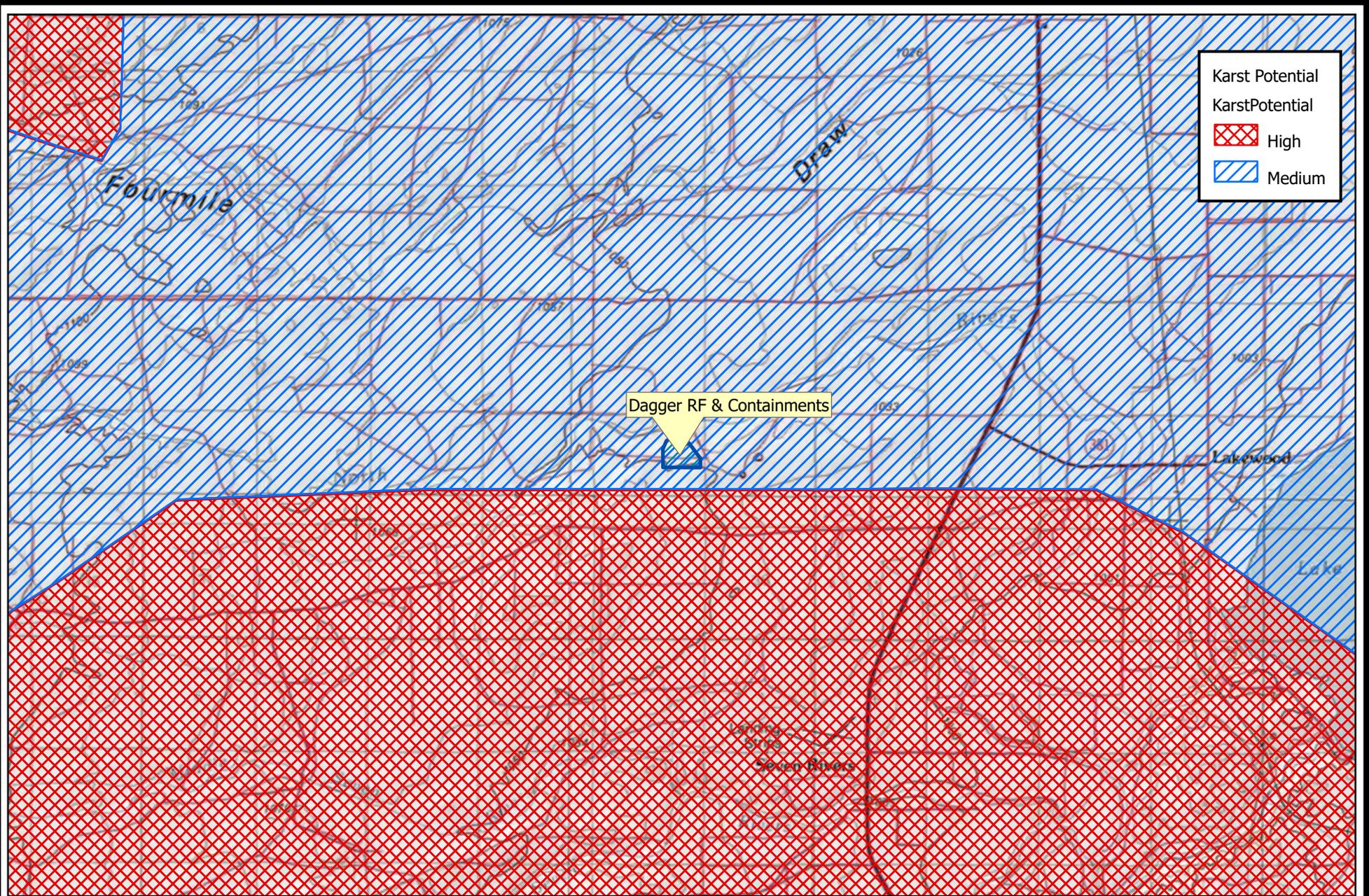
**Nearest Municipalities & Public Water Supplies**  
 Spur Energy Partners - Dagger RF & Containment

**Plate 3**  
 September 2024

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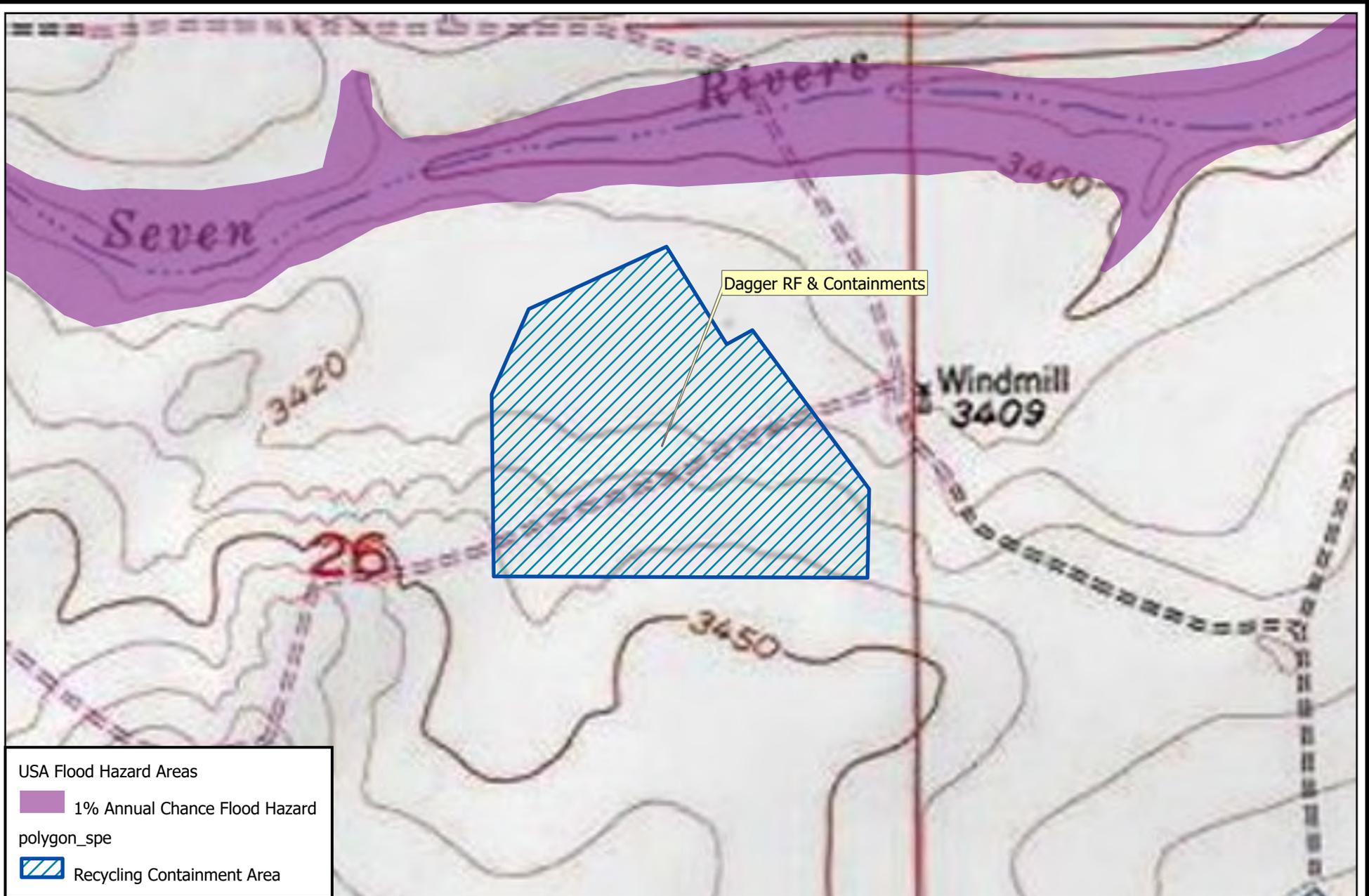


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**Nearest Municipalities & Public Water Supplies**  
 Spur Energy Partners - Dagger RF & Containment

**Plate 5**  
 September 2024

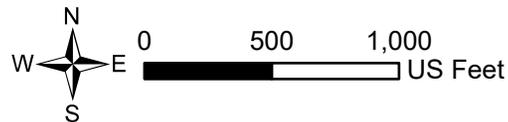
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USA Flood Hazard Areas

- 1% Annual Chance Flood Hazard

Recycling Containment Area



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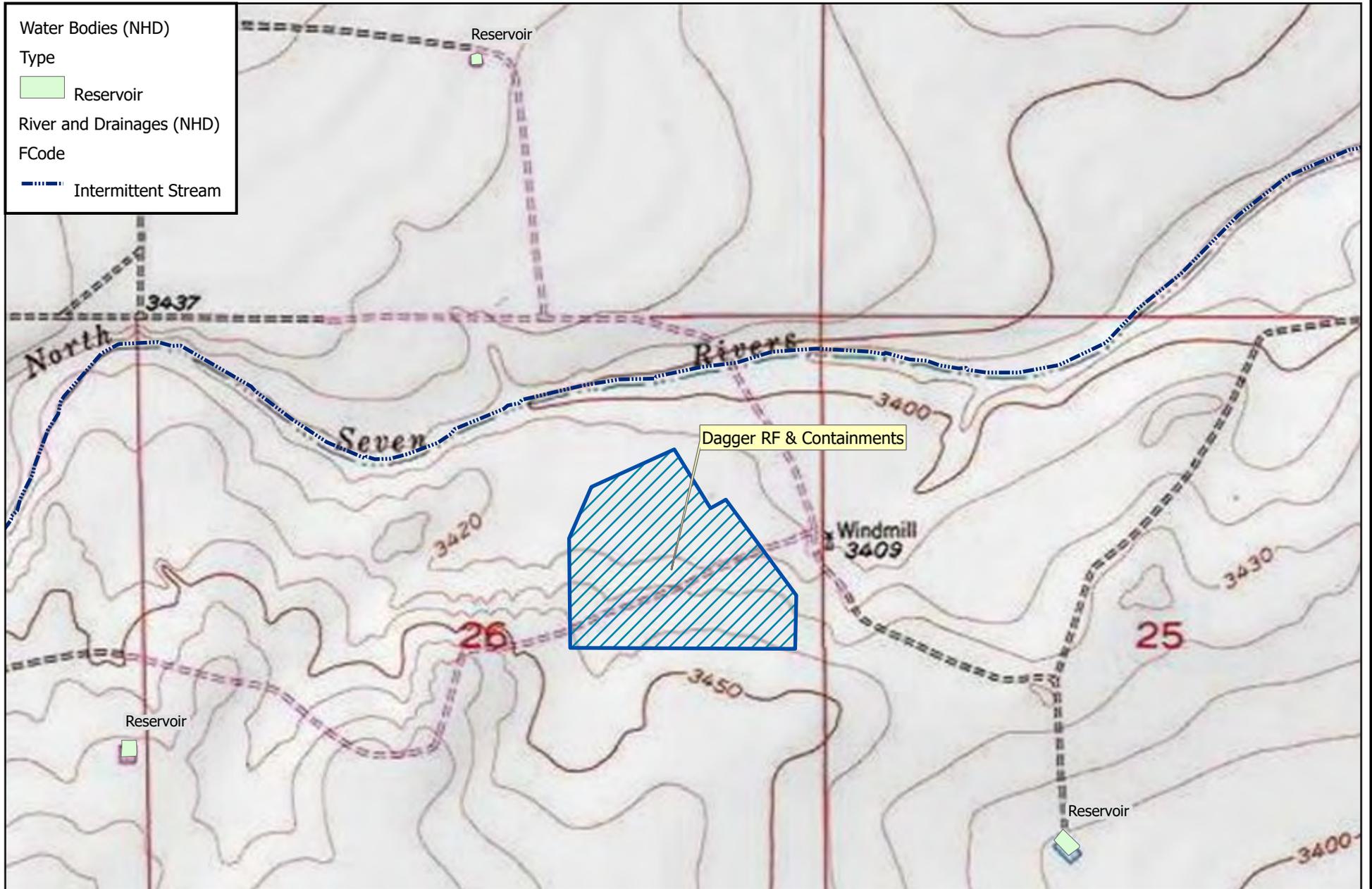
FEMA Mapped Flood Zones

Spur Energy Partners - Dagger RF & Containment

Plate 6

September 2024

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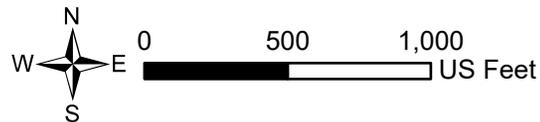
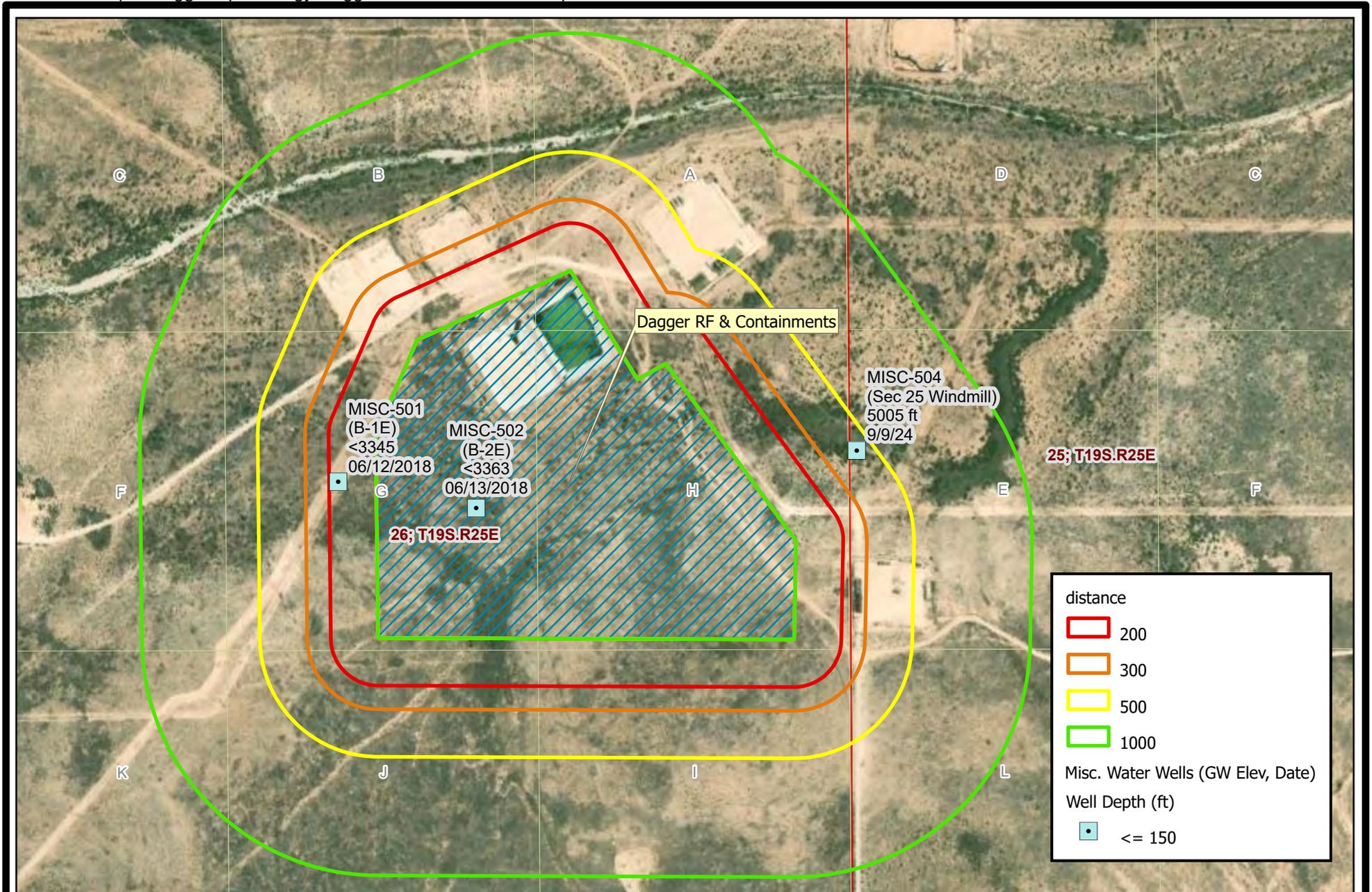


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Mapped Surface Water  
 Spur Energy Partners - Dagger RF & Containment

Plate 7  
 September 2024

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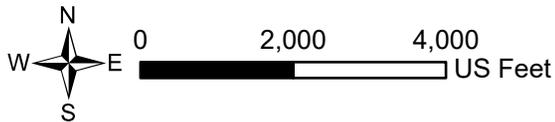
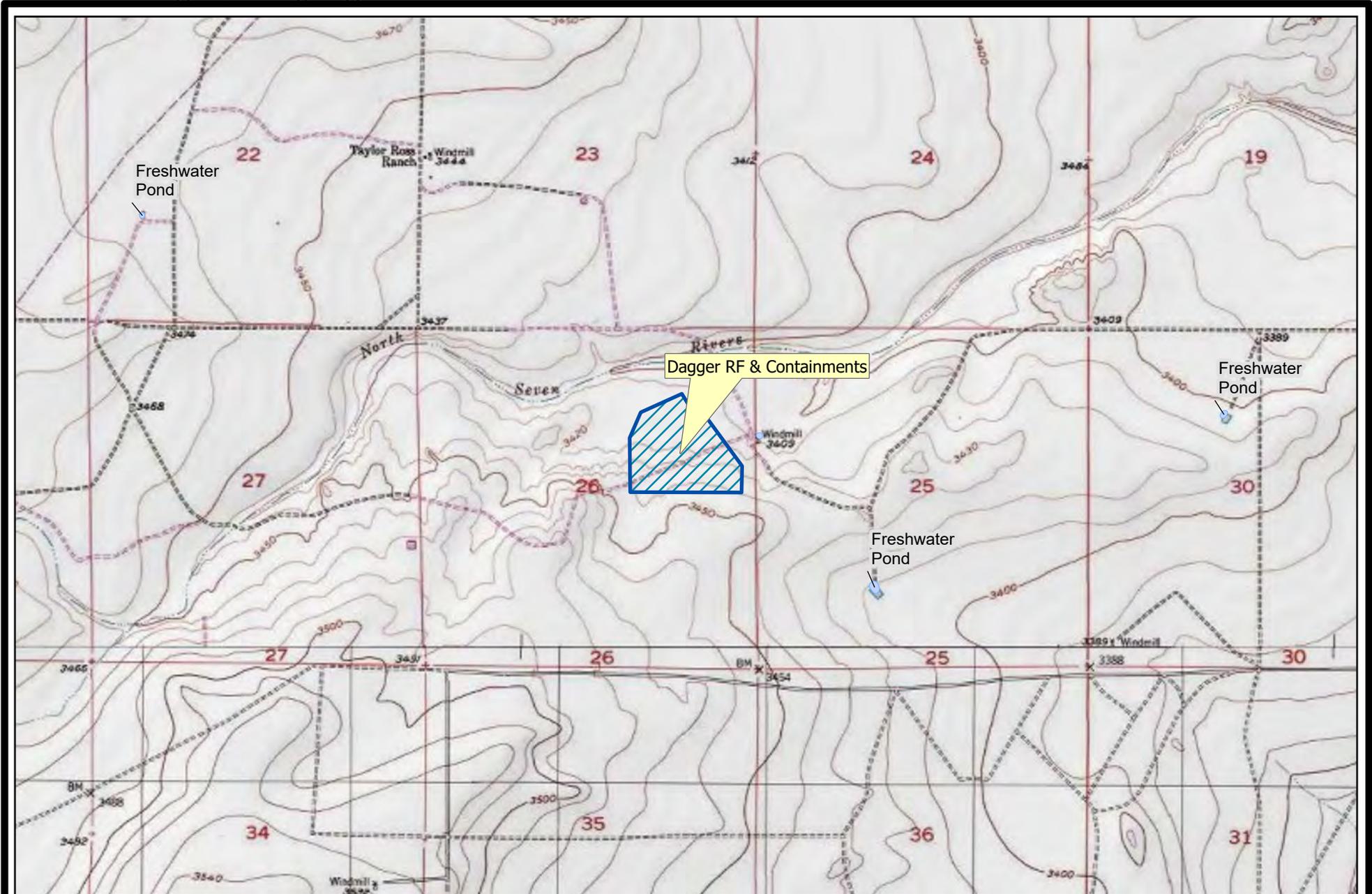


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**Nearby Structures, & Wells/Borings**  
 Spur Energy Partners - Dagger RF & Containment

**Plate 8**  
 September 2024

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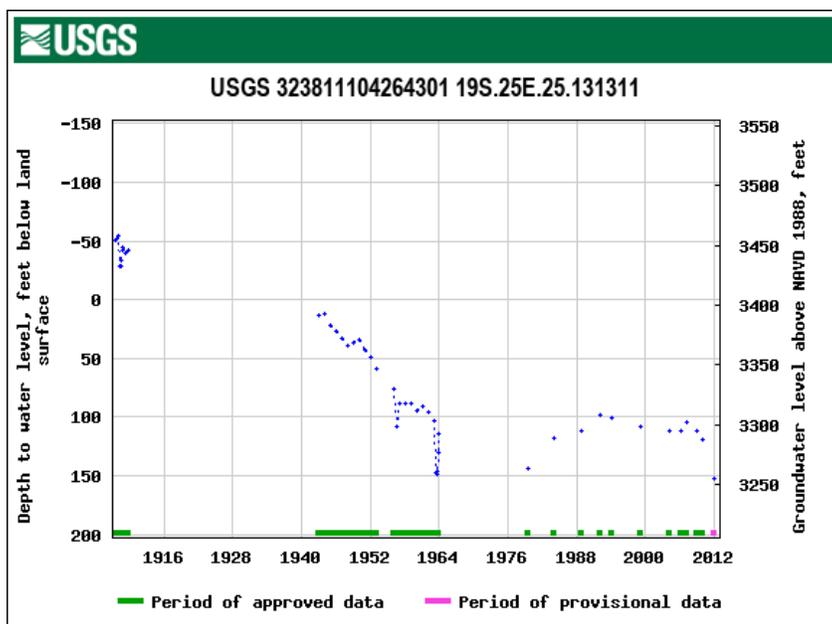
Mapped NM Wetlands  
 Spur Energy Partners - Dagger RF & Containment

Plate 9  
 Sept 2024

## WELL LOGS AND USGS DATA

**USGS 323811104264301 19S.25E.25.131311 AKA USGS-9369**

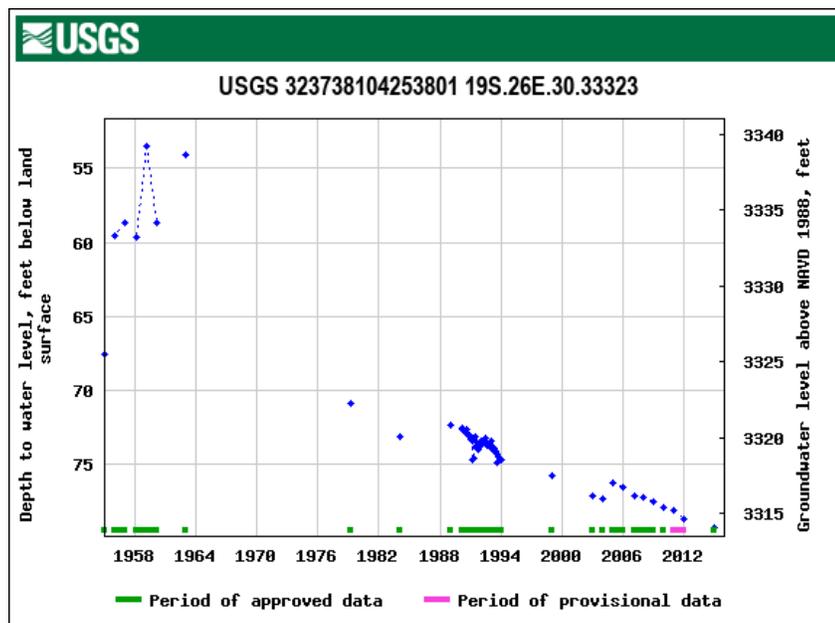
Eddy County, New Mexico  
 Hydrologic Unit Code 13060011  
 Latitude 32°38'11", Longitude 104°26'43"  
 NAD27  
 Land-surface elevation 3,405 feet above NAVD88  
 The depth of the well is 552 feet below land surface.  
 This well is completed in the Roswell Basin aquifer system (S400RSWLBS) national aquifer.  
 This well is completed in the Artesia Group (313ARTS) local aquifer.



**USGS 323738104253801 19S.26E.30.33323 AKA USGS-9406**

Eddy County, New Mexico  
 Hydrologic Unit Code 13060011  
 Latitude 32°37'38", Longitude 104°25'38"  
 NAD27  
 Land-surface elevation 3,393 feet above NAVD88  
 This well is completed in the Roswell Basin aquifer system (S400RSWLBS) national aquifer.  
 This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Probably the windmill on the USGS topographic map



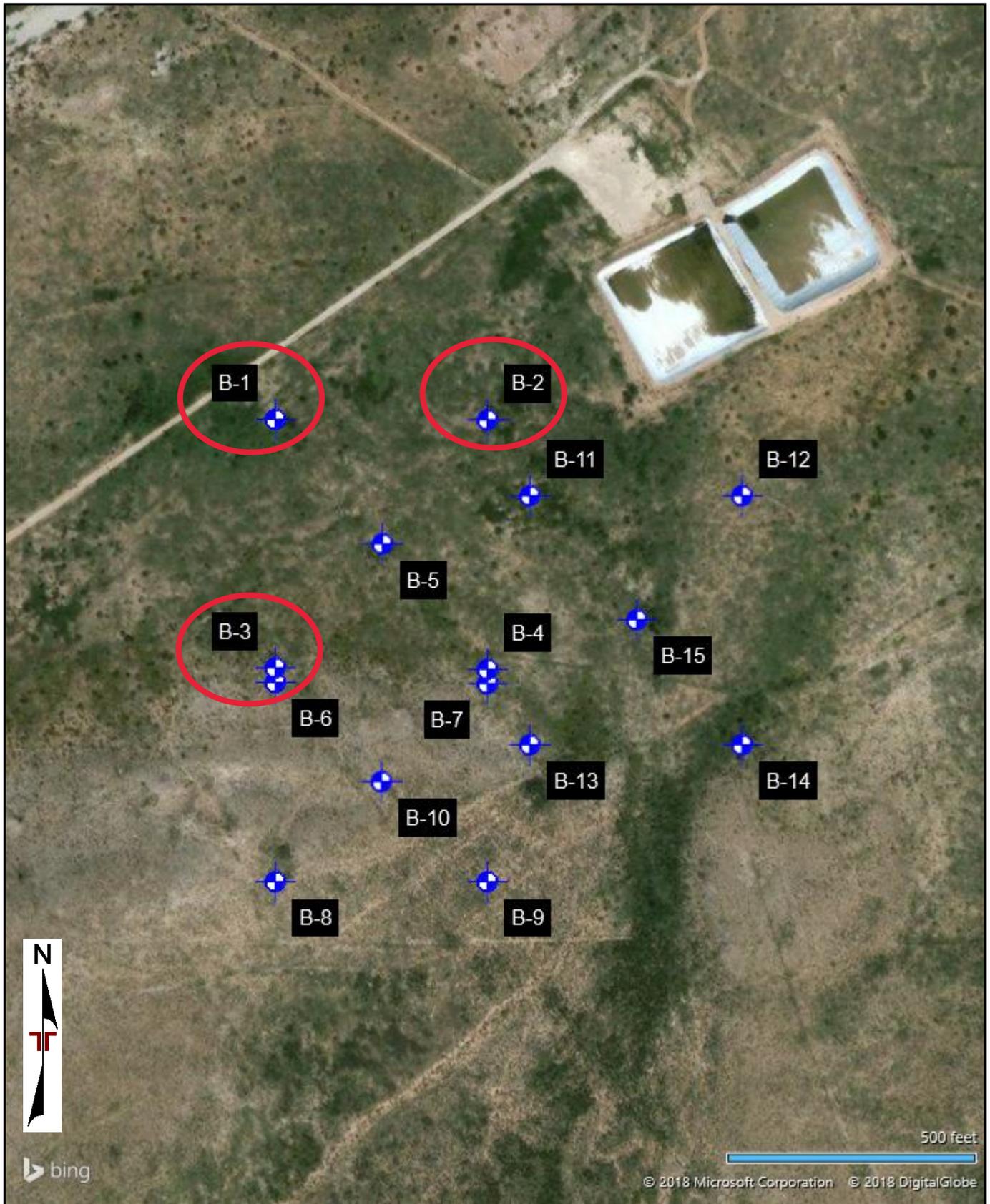


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager:	JDC
Drawn by:	DC
Checked by:	JDC
Approved by:	JDC
Project No.:	68185050
Scale:	AS SHOWN
File Name:	FIGURES
Date:	6/13/2018

**Terracon**  
 4450 Bataan Memorial E  
 Las Cruces, NM 88011-6000

**BORING LOCATION PLAN**

Eddy Co Water Impoundment Facility  
 South of Rocking Red Road  
 Eddy County, NM

Exhibit
A-2

# BORING LOG NO. B-1E

**PROJECT:** Eddy Co Water Impoundment Facility

**CLIENT:** EnviroTech Engineering & Consulting Inc  
Enid, OK

**SITE:** South of Rocking Red Road  
Eddy County, NM

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.6324° Longitude: -104.4533°  Approximate Surface Elev: 3451 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
10.0	<b>CLAYEY GRAVEL WITH SAND (GC)</b> , white, very dense, carbonate indurated	5		Hand	12-27-30 N=57				
		5		Hand	32-32-50/5"	2		29-21-8	18
		10		X	22-41-32 N=73				
		10		X	15-38-50/5"				
		15		X	22-37-32 N=69	4		NP	64
		15		X	50/5"				
		20		X	20-50/0"				
		20		X	50/1"				
		25							
		30							
		35							
		40							
		45							
		50							
		55							
		60							
		65							
		70							
		75							
	75.0 gypsum present in soil matrix <b>Boring Terminated at 75 Feet</b>	75							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:  
Hollow Stem Auger

See Exhibit A-3 for description of field procedures.  
See Appendix B for description of laboratory procedures and additional data (if any).

Notes:

Abandonment Method:  
Boring backfilled with auger cuttings upon completion.

See Appendix C for explanation of symbols and abbreviations.

**WATER LEVEL OBSERVATIONS**



Boring Started: 06-12-2018

Boring Completed: 06-12-2018

Drill Rig: CME-75

Driller: Terra Testing

Project No.: 68185050

Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_68185050 EDDY CO WATER IMP.GPJ TERRACON\_DATATEMPLATE.GDT 6/25/18

# BORING LOG NO. B-2E

**PROJECT:** Eddy Co Water Impoundment Facility

**CLIENT:** EnviroTech Engineering & Consulting Inc  
Enid, OK

**SITE:** South of Rocking Red Road  
Eddy County, NM

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL\_68185050 EDDY CO WATER IMP.GPJ TERRACON\_DATATEMPLATE.GDT 6/25/18

GRAPHIC LOG	LOCATION See Exhibit A-2 Latitude: 32.6332° Longitude: -104.4519°  Approximate Surface Elev: 3438 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS		PERCENT FINES
								LL-PL-PI		
	<p><b>LEAN CLAY WITH SAND (CL)</b>, trace gravel, brown, very stiff, carbonate indurated</p> <p>hard</p> <p>very stiff</p>	5		✎	5-11-16 N=27					
		10		✎	9-9-11 N=20	12	28-17-11	82		
		15		✎	7-9-13 N=22					
		20		✎	6-10-13 N=23					
		25		✎	7-12-19 N=31					
		30		✎	9-12-20 N=32					
		35		✎	8-14-22 N=36					
		40		✎	8-9-14 N=23					
		45		✎						
		50		✎						
		55		✎						
		60		✎						
		65		✎						
		70		✎						
		75.0	3363+/-	75						

**Boring Terminated at 75 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

<p>Advancement Method: Hollow Stem Auger</p>	<p>See Exhibit A-3 for description of field procedures. See Appendix B for description of laboratory procedures and additional data (if any). See Appendix C for explanation of symbols and abbreviations.</p>	<p>Notes:</p>						
<p>Abandonment Method: Boring backfilled with auger cuttings upon completion.</p>								
<p><b>WATER LEVEL OBSERVATIONS</b></p>	<p>4450 Bataan Memorial E Las Cruces, NM</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Boring Started: 06-13-2018</td> <td style="width: 50%;">Boring Completed: 06-13-2018</td> </tr> <tr> <td>Drill Rig: CME-75</td> <td>Driller: Terra Testing</td> </tr> <tr> <td>Project No.: 68185050</td> <td>Exhibit: A-13</td> </tr> </table>	Boring Started: 06-13-2018	Boring Completed: 06-13-2018	Drill Rig: CME-75	Driller: Terra Testing	Project No.: 68185050	Exhibit: A-13
Boring Started: 06-13-2018	Boring Completed: 06-13-2018							
Drill Rig: CME-75	Driller: Terra Testing							
Project No.: 68185050	Exhibit: A-13							





# WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

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

<b>1. GENERAL AND WELL LOCATION</b>	OSE POD NO. (WELL NO.) POD-1		WELL TAG ID NO. n/a		OSE FILE NO(S). RA-13210			
	WELL OWNER NAME(S) Spur Energy Partners LLC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 919 Milam St Ste 2475				CITY Houston	STATE TX	ZIP 77002	
	WELL LOCATION (FROM GPS)	LATITUDE	DEGREES 32	MINUTES 38	SECONDS 39.29	N		* ACCURACY REQUIRED: ONE TENTH OF A SECOND
		LONGITUDE	104	26	57.69	W		* DATUM REQUIRED: WGS 84
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE SE NE SE Sec. 23 T19S R25E, NMPM								
<b>2. DRILLING &amp; CASING INFORMATION</b>	LICENSE NO. 1249		NAME OF LICENSED DRILLER Jackie D. Atkins			NAME OF WELL DRILLING COMPANY Atkins Engineering Associates, Inc.		
	DRILLING STARTED 7/12/2022		DRILLING ENDED 7/12/2022		DEPTH OF COMPLETED WELL (FT) Soil Boring		BORE HOLE DEPTH (FT) ±101	DEPTH WATER FIRST ENCOUNTERED (FT) ±82
	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) 83.7		DATE STATIC MEASURED 7/14/2022
	DRILLING FLUID: <input 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: Hollow Stem Auger						CHECK HERE IF PITLESS ADAPTER IS INSTALLED <input type="checkbox"/>	
	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	101	±6.5	Soil Boring	--	--	--	--
<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						

OSE OIT AUG 29 2022 AM 8:45

FOR OSE INTERNAL USE		WR-20 WELL RECORD & LOG (Version 01/28/2022)	
FILE NO. RA-13210	POD NO. 1	TRN NO. 729257	
LOCATION 19S. 25E. 23. 3. 2. 4	WELL TAG ID NO. _____	PAGE 1 OF 2	

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
	FROM	TO				
	0	9	9	Sand, medium/fine grained, poorly graded, with clay, Brown	Y ✓ N	
	9	24	15	Clay, with Sand, fine grained, poorly graded, Tan Brown	Y ✓ N	
	24	34	10	Sand, medium/fine grained, poorly graded, with clay, Brown	Y ✓ N	
	34	39	5	Claystone, Consolidated, Reddish Brown	Y ✓ N	
	39	54	15	Sand, medium/fine grained, poorly graded, with clay, Reddish Brown	Y ✓ N	
	54	59	5	Claystone, Consolidated, Reddish Brown	Y ✓ N	
	59	101	42	Clay, medium plastic, with sand, fine grained, Tan Brown, moist	✓ Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:					TOTAL ESTIMATED WELL YIELD (gpm): 0.00	
<input type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:						

5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	MISCELLANEOUS INFORMATION:	Drilled soil boring, landed temporary well material, collected water sample. Removed casing material, grouted from total depth to surface using augers as tremie Plugged using Type I/II neat cement (5.2 gallons per 94 lb. sack)
		OSE DTI AUG 29 2022 AM 8:45
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: Shane Eldridge, Cameron Pruitt,	

6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:	
	 Jackie D. Atkins	8/25/2022
	SIGNATURE OF DRILLER / PRINT SIGNEE NAME	DATE

FOR OSE INTERNAL USE		WR-20 WELL RECORD & LOG (Version 01/28/2022)	
FILE NO. RA-13210	POD NO. 1	TRN NO. 729257	
LOCATION 195.25E.23.3.2.4	WELL TAG ID NO. _____	PAGE 2 OF 2	

STATE ENGINEER OFFICE  
WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well Raul Rodriguez Owner's Well No. \_\_\_\_\_  
Street or Post Office Address R 563 N 26 St  
City and State Artesia N.M. 88210

Well was drilled under Permit No. RA-10496 and is located in the:

- a. 1/4 SW 1/4 SW 1/4 SE 1/4 of Section 25 Township 19 S Range 25 E N.M.P.M.
- b. Tract No. \_\_\_\_\_ of Map No. \_\_\_\_\_ of the \_\_\_\_\_
- c. Lot No. \_\_\_\_\_ of Block No. \_\_\_\_\_ of the \_\_\_\_\_  
Subdivision, recorded in \_\_\_\_\_ County.
- d. X= \_\_\_\_\_ feet, Y= \_\_\_\_\_ feet, N.M. Coordinate System \_\_\_\_\_ Zone in the \_\_\_\_\_ Grant.

APR 14 2004

(B) Drilling Contractor Martin Water Well Drlg-Co. License No. WD-1064

Address 9775 Hope Hwy Artesia, N.M. 88210

Drilling Began April 1, 04 Completed April 4, 04 Type tools Rotary Size of hole 2 3/8 in.

Elevation of land surface or \_\_\_\_\_ at well is \_\_\_\_\_ ft. Total depth of well 110 ft.

Completed well is  shallow  artesian. Depth to water upon completion of well 40 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			
75	80	5	sand + gravel	15 <sup>+</sup>

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
5 1/2	PVC	Bell	0	110	110	—	40	100

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 291526

Date Received 4-14-04

Quad \_\_\_\_\_ FWL \_\_\_\_\_ FSL \_\_\_\_\_

File No. RA-10496 Use Perm Location No. 19-25-25-433

From	To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Topsail : Brown
1	14	13	caliche white
14	15	1	Limestone white
15	20	5	open lost circulation cemented 2sx. got circ. Back.
20	23	3	Limestone white
23	30	7	open lost circulation cemented 2sx, got circ. Back.
30	34	4	limestone white
34	40	6	lost circ. cemented 2sx, got Back
40	50	10	Limestone white
50	55		lost circulation cemented 3sx got Back
55	75	20	Limestone white
75	80	5	sand + gravel lost circ. drilled 5' in a minute
80	110	30	limestone lost circ. Dry drilled drilled Hard-show,

Section 7. REMARKS AND ADDITIONAL INFORMATION

T.D. @ 110 installed pump + tested well

Pumped 20 gpm. For 8 hrs.  
Pulled pump + installed casing  
+ gravel packed,

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Delford Martin  
Driller

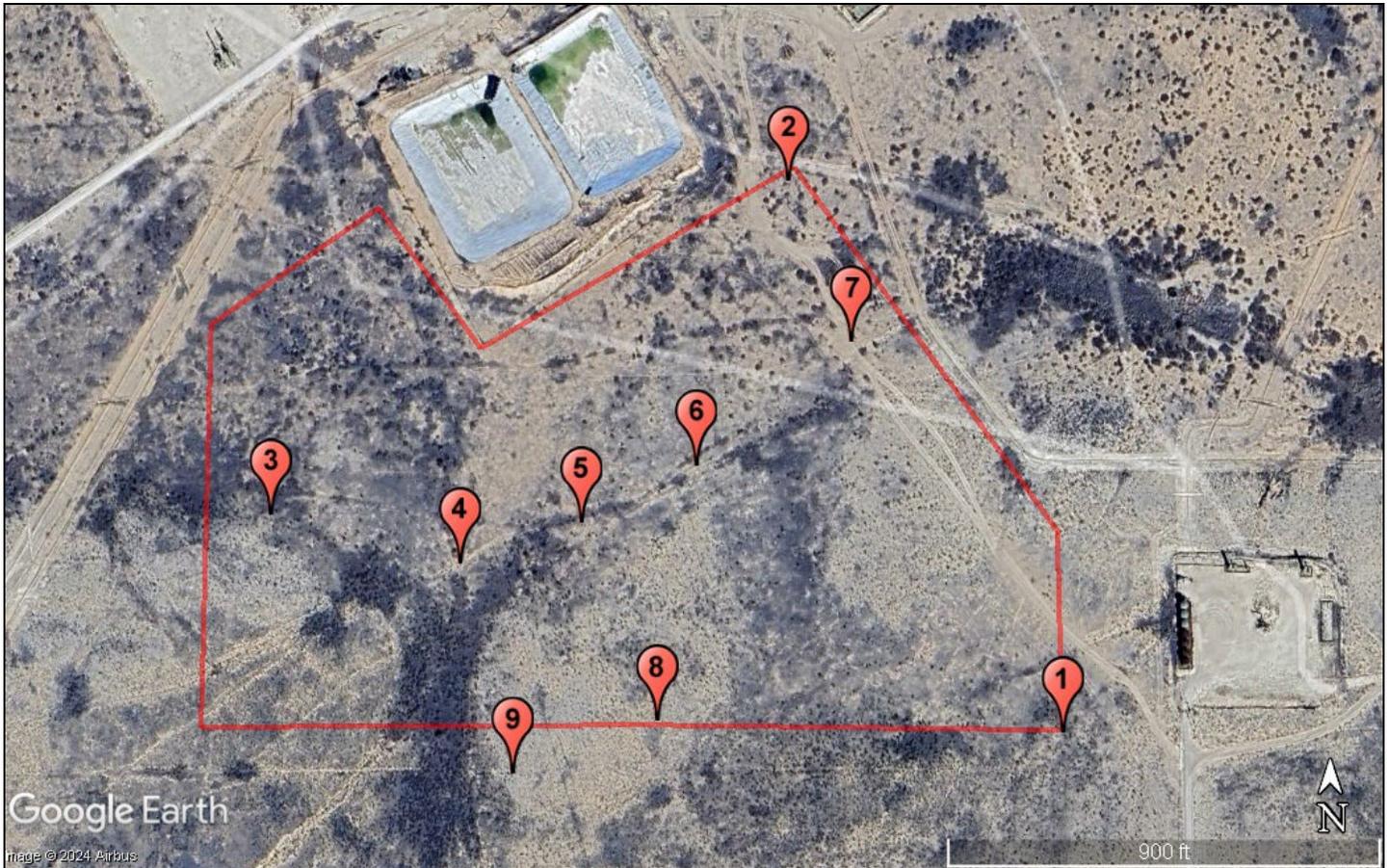
INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

## SITE PHOTOGRAHS

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

**Figures**

The photographs were taken during R T Hicks Consultants site visit on August 10, 2024. Image locations are depicted on the aerial photo below and the numbered Figures correspond to the numbers on the image. Surface is covered with tan, silty loess with sparse scrubs and grasses.



**Figure 1:** View north-northeast southeast corner of AOC, toward center of proposed location. An active two-track road winds from bottom-left to top-right.

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



**Figure 2:** View to the southwest towards the center of the site from NE corner of AOC. Two-track road widens as it turns north (right).

**Figure 3:** View east from near center of western edge of AOC. Many old two-track roads, cattle trails, and possibly abandoned pipeline routes cross the area.



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



**Figure 4:** View east from disused road and/or water line that runs southwest-northeast across the AOC. Preferential erosion/drainage is evident from the recent rains.

**Figure 5:** View west from location 5 near center of AOC, showing vegetation resulting from preferential drainage.



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



**Figure 6:** View east from possible two-track row or abandoned water line route, shown in right half of image. Windmill visible in background (inaccessible).

**Figure 7:** View east-southeast showing confluence of drainage routes, cattle trails, and disused roads, taken from active road.



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



**Figure 8:** View north from center of southern edge of AOC, at the highest elevation of the AOC.

**Figure 9:** Disused road or cattle trail, oriented east-west, approx. 80 ft south of AOC; view west



September 2024

# **Rule 34 Registration: Volume 2 Dagger RF & Containments Section 26, T19S, R25E, Eddy County**

## **In-Ground Containment**

*C-147 Form*

*Stamped Design Drawings*

*Recently Approved Plans for Design/Construction, O&M, Closure*



View east-southeast toward windmill from lease road on east side of the proposed Dagger containments.

**Prepared for:  
Spur Energy Partners LLC  
Houston, Texas**

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

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Form C-147  
Revised April 3, 2017

## Recycling Facility and/or Recycling Containment

Type of Facility:  Recycling Facility  Recycling Containment\*  
Type of action:  Permit  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: SPUR ENERGY PARTNERS LLC (For multiple operators attach page with information) OGRID #: 328947  
Address: 9655 KATY FREEWAY, SUITE 500, HOUSTON, TX 77024  
Facility or well name (include API# if associated with a well): CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW, SE  
OCD Permit Number: 2RF-209 (For new facilities the permit number will be assigned by the district office)  
U/L or Qtr/Qtr B, C, D, H Section 26 Township 19 SOUTH Range 25 EAST County: EDDY COUNTY  
Surface Owner:  Federal  State  Private  Tribal Trust or Indian Allotment

2.  
 **Recycling Facility:**  
Location of recycling facility (if applicable): Latitude 32.633238 Longitude -104.450842 NAD83  
Proposed Use:  Drilling\*  Completion\*  Production\*  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.*  
 Fluid Storage  
 Above ground tanks  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.  
 **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 32.633238 Longitude -104.450842 NAD83  
 For multiple or additional recycling containments, attach design and location information of each containment  
 Lined  Liner type: Thickness 40 & 60 mil  LLDPE  HDPE  PVC  Other \_\_\_\_\_  
 String-Reinforced  
Liner Seams:  Welded  Factory  Other \_\_\_\_\_ Volume: NE 54605 bbl Dimensions: L \_\_\_\_\_ x W \_\_\_\_\_ x D \_\_\_\_\_  
 Recycling Containment Closure Completion Date: \_\_\_\_\_ Total volumes: 1,588,901 - see attached engineered drawings

4.

**Bonding:**

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

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

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

5.

**Fencing:**

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

Alternate. Please specify FIX KNOT 8' GAME FENCE

6.

**Signs:**

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

Signed in compliance with 19.15.16.8 NMAC

7.

**Variances:**

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

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

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

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

8.

**Siting Criteria for Recycling Containment**

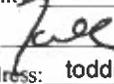
*Instructions: The applicant must provide attachments that demonstrate compliance for each siting criteria below as part of the application. Potential examples of the siting attachment source material are provided below under each criteria.*

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

9. **Recycling Facility and/or Containment Checklist:**  
 Instructions: Each of the following items must be attached to the application. Indicate, by a check mark in the box, that the documents are attached.

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

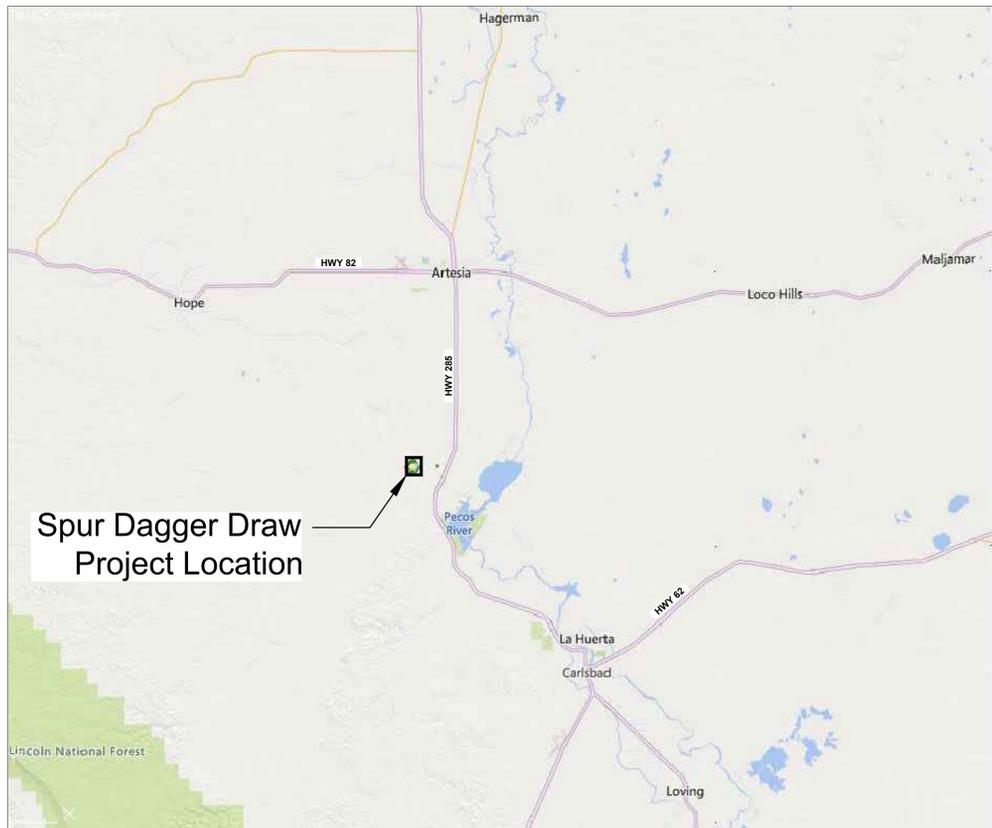
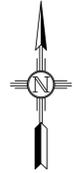
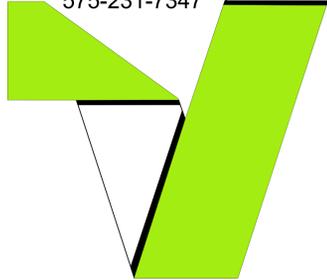
10. **Operator Application Certification:**  
 I hereby certify that the information and attachments submitted with this application are true, accurate and complete to the best of my knowledge and belief.

Name (Print): Todd Mucha Title: EVP - Water and Infrastructure  
 Signature:  Date: 09/24/2024  
 e-mail address: todd@spurenergy.com Telephone: (832) 930-8515

11. **OCD Representative Signature:** Victoria Venegas Approval Date: 10/02/2024  
 Title: Environmental Specialist OCD Permit Number: 2RF-209

- OCD Conditions
- Additional OCD Conditions on Attachment

RECYCLING CONTAINMENT DESIGN  
DRAWINGS AVIAN DETERRENT SYSTEM



Spur Dagger Draw  
Project Location

VICINITY MAP  
N.T.S.

# CIVIL PLANS

## SPUR

# DAGGER RECYCLE FACILITY

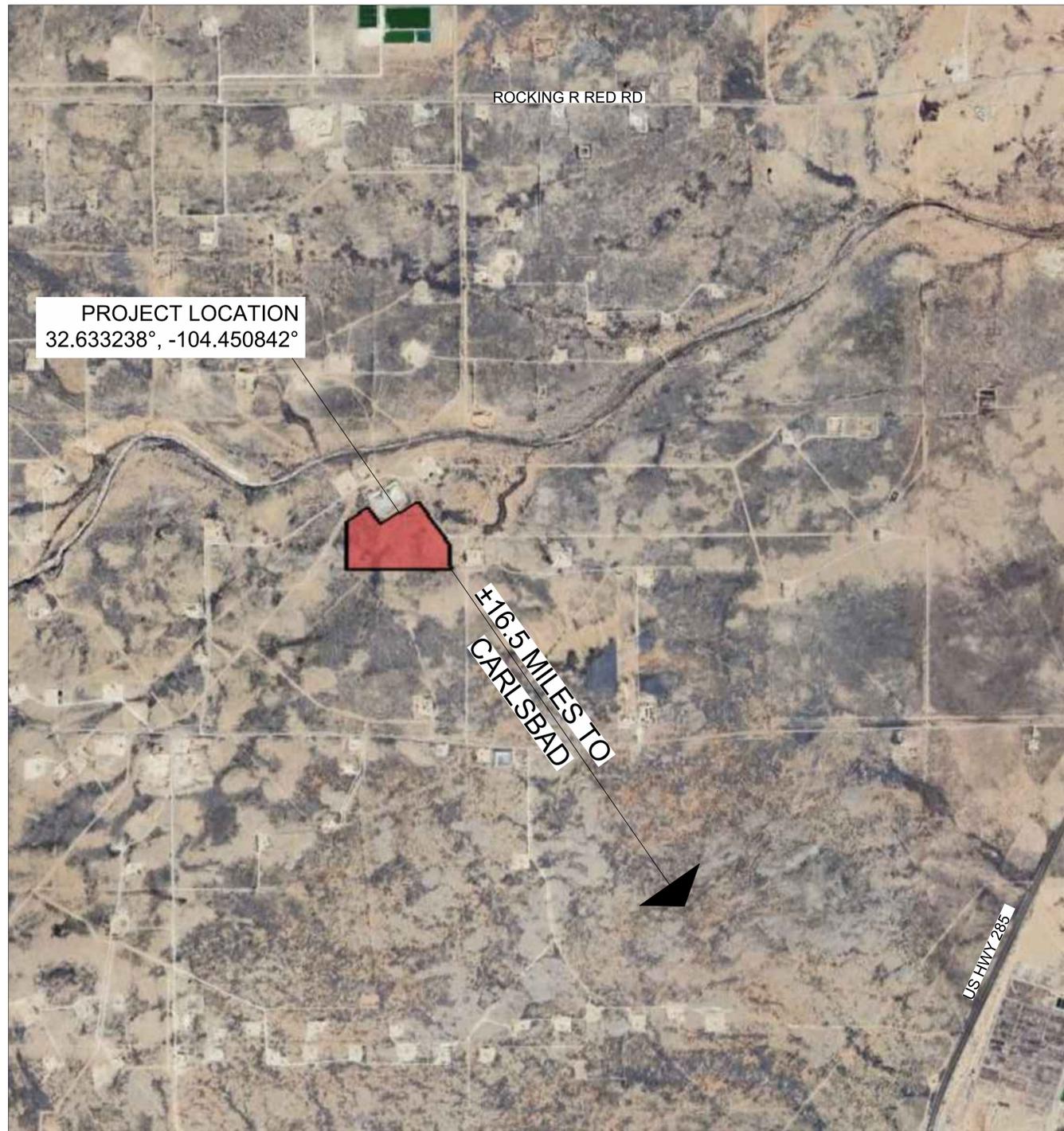
SECTION 26, TOWNSHIP 19 SOUTH, RANGE 25 EAST  
N.M.P.M., EDDY COUNTY, NEW MEXICO  
32.633238°, -104.450842°

INDEX OF SHEETS		
SHEET	NAME	DESCRIPTION
1	C-100	COVER SHEET
2	C-101	LOCATION MAP
3	C-102	GENERAL NOTES
4	CS-101	SITE PLAN
5	CS-102	SW CONTAINMENT WEST-EAST PLAN & PROFILE
6	CS-103	SW CONTAINMENT NORTH-SOUTH PLAN & PROFILE
7	CS-104	SE CONTAINMENT WEST-EAST PLAN & PROFILE
8	CS-105	SE CONTAINMENT NORTH-SOUTH PLAN & PROFILE
9	CS-106	NE CONTAINMENT PLAN AND PROFILE
10	CS-501	LINER DETAILS
11	CS-502	SUMP DETAILS
12	CS-503	FENCE DETAILS
13	CS-504	GENERAL DETAILS



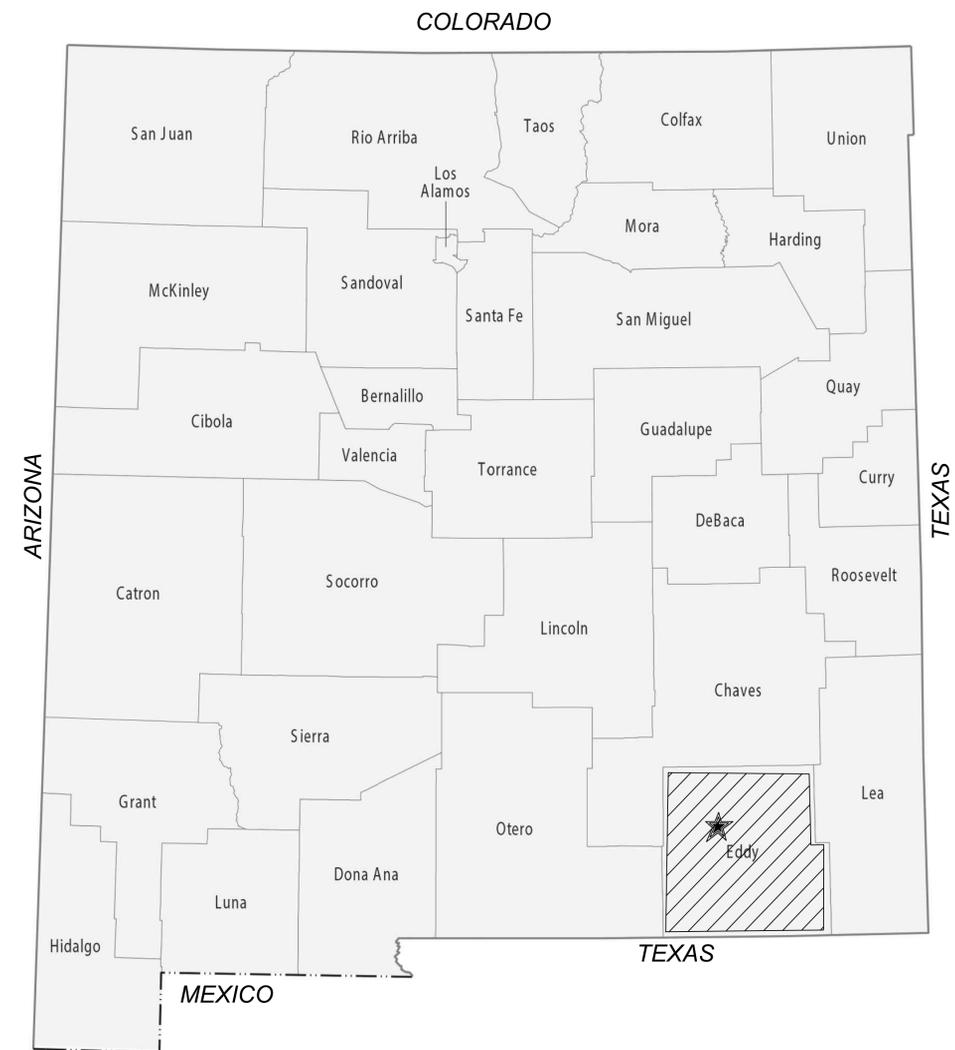
(505)-254-7310  
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.





# EDDY COUNTY

## NEW MEXICO



Engineering | Surveying  
Materials Testing

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

ENGINEERING SHEET:  
**LOCATION MAP**  
OF  
PROJECT NAME:  
**DAGGER RECYCLE FACILITY**  
FOR  
CLIENT:  
**SPUR**

PROJECT NUMBER:  
**24178**

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
JUAN C. DOMINGUEZ, EI

REVISIONS		
No.	DATE	DESCRIPTION



SHEET:  
2 of 13  
**C-101**

GENERAL NOTES

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

EARTHWORK NOTES

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

LINER NOTES

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

SUGGESTED CONSTRUCTION SEQUENCE

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



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ENGINEERING SHEET:

GENERAL NOTES

OF  
PROJECT NAME:

DAGGER RECYCLE FACILITY

FOR  
CLIENT:

SPUR

PROJECT NUMBER:

24178

PROJECT ENGINEER:

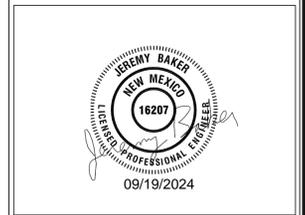
JEREMY BAKER, PE

DRAWN BY:

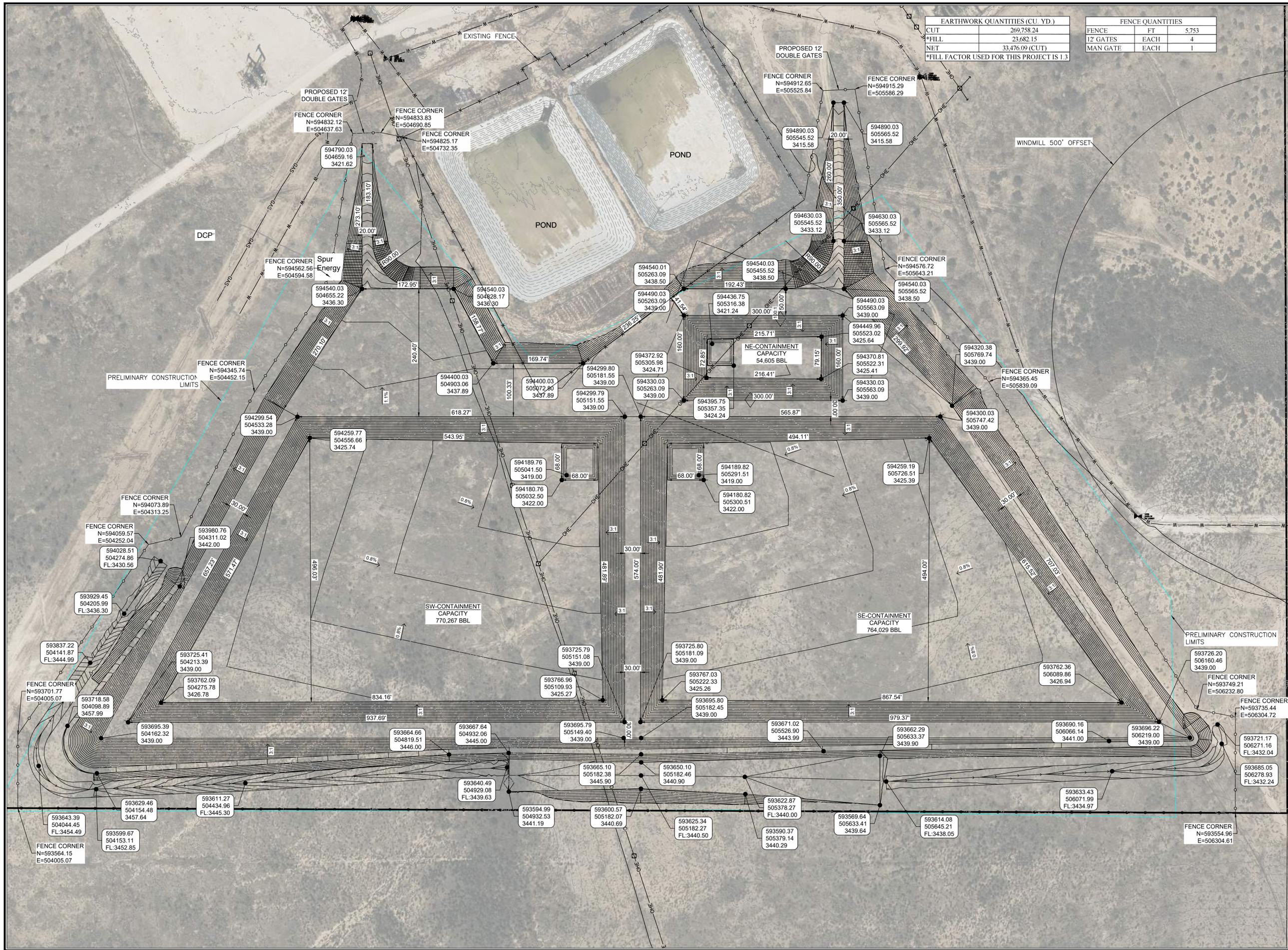
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No.	DATE	DESCRIPTION



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**C-102**



EARTHWORK QUANTITIES (CU. YD.)	
CUT	269,758.24
*FILL	23,682.15
NET	33,476.09 (CUT)
*FILL FACTOR USED FOR THIS PROJECT IS 1.3	

FENCE QUANTITIES		
FENCE	FT	5,753
12' GATES	EACH	4
MAN GATE	EACH	1

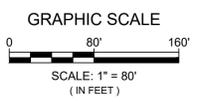
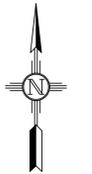


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ENGINEERING SHEET:  
**SITE PLAN**  
OF  
PROJECT NAME:  
**DAGGER RECYCLE FACILITY**  
FOR  
CLIENT:  
**SPUR**

PROJECT NUMBER:  
**24178**

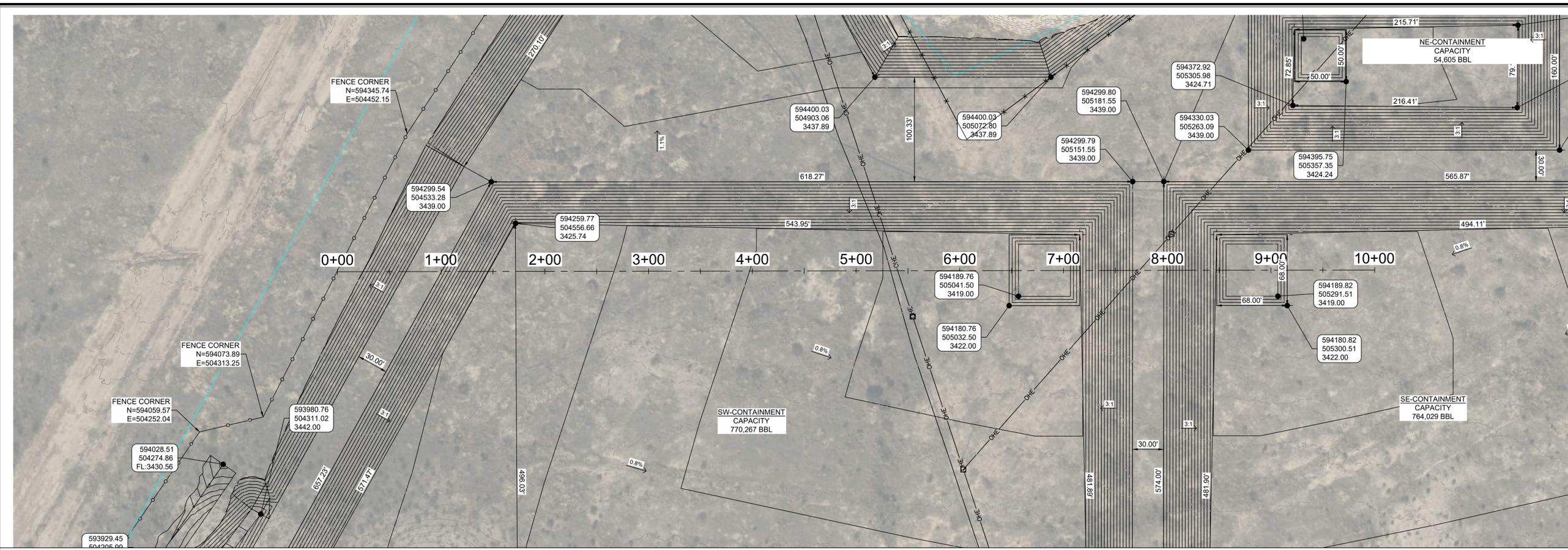
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
JUAN C. DOMINGUEZ, EI



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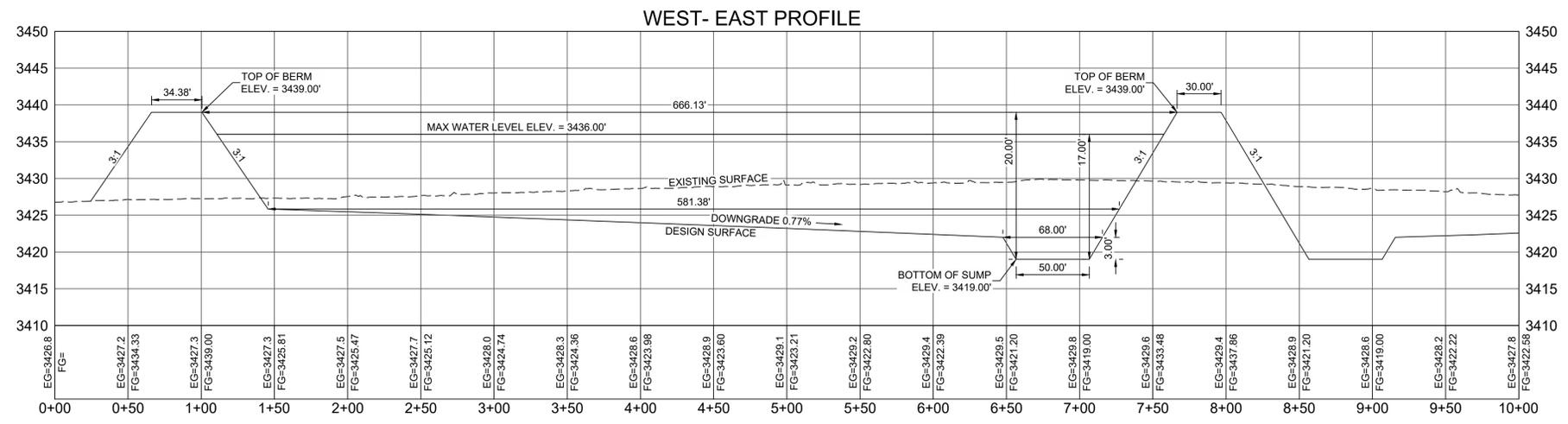
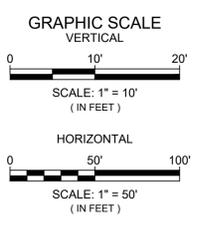
ENGINEERING SHEET:  
**SW CONTAINMENT  
 WEST-EAST PLAN & PROFILE**  
 OF

PROJECT NAME:  
**DAGGER RECYCLE FACILITY**

CLIENT:  
 FOR  
**SPUR**

PROJECT NUMBER:  
**24178**

PROJECT ENGINEER:  
 JEREMY BAKER, PE  
 DRAWN BY:  
 JUAN C. DOMINGUEZ, EI



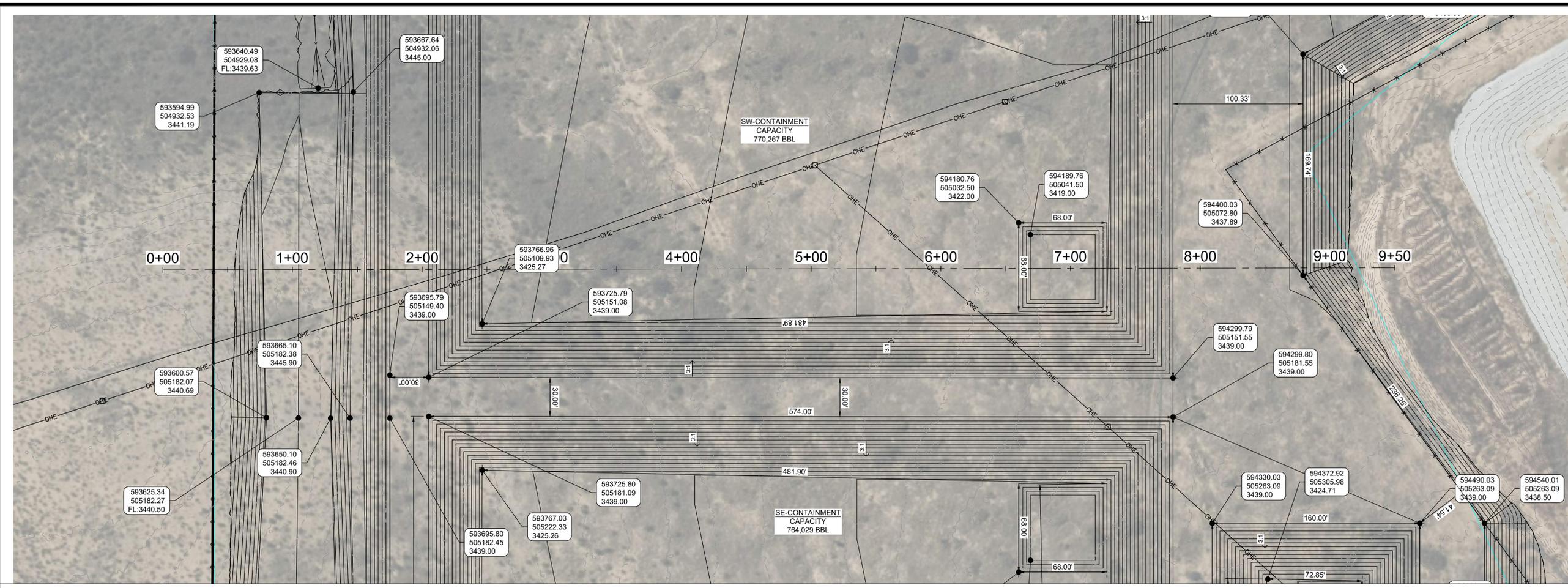
ELEVATION (FT)	CONTAINMENT DEPTH (FT)	REMAINING STORAGE (FT)	REMAINING STORAGE VOL (FT3)	REMAINING STORAGE VOL (GAL)	REMAINING STORAGE VOL (BBL)	PERCENT OF TOTAL VOL (%)	VOL IN CONTAINMENT (FT3)	VOL IN CONTAINMENT (BBL)	VOL IN CONTAINMENT (GAL)	VOL IN CONTAINMENT (AC-FT)	PERCENT OF TOTAL VOL (%)	
3439.00	0.0	20.0	0.0	-	-	0%	5,625,577	42,084,943	1,001,884	129.15	100%	FREEBOARD
3438.00	1.0	19.0	442,399	3,309,589	78,789	8%	5,183,178	38,775,354	923,095	118.99	92%	
3437.00	2.0	18.0	876,514	6,557,202	156,102	16%	4,749,063	35,527,741	845,781	109.02	84%	
3436.00	3.0	17.0	1,302,422	9,743,418	231,954	23%	4,323,155	32,341,525	769,930	99.25	77%	MAX VOLUME
3435.00	4.0	16.0	1,720,200	12,868,813	306,358	31%	3,905,378	29,216,130	695,526	89.66	69%	
3434.00	5.0	15.0	2,129,924	15,933,965	379,328	38%	3,495,653	26,150,978	622,556	80.25	62%	
3433.00	6.0	14.0	2,531,674	18,939,452	450,877	45%	3,093,903	23,145,491	551,007	71.03	55%	STORAGE VOLUME
3432.00	7.0	13.0	2,925,525	21,885,850	521,020	52%	2,700,053	20,199,093	480,864	61.98	48%	
3431.00	8.0	12.0	3,311,554	24,773,738	589,769	59%	2,314,023	17,311,205	412,114	53.12	41%	
3430.00	9.0	11.0	3,689,840	27,603,693	657,140	66%	1,935,737	14,481,250	344,744	44.44	34%	FLOOR VOLUME
3429.00	10.0	10.0	4,060,459	30,376,293	723,145	72%	1,565,118	11,708,650	278,739	35.93	28%	
3428.00	11.0	9.0	4,423,488	33,092,115	787,798	79%	1,202,089	8,992,828	214,085	27.60	21%	
3427.00	12.0	8.0	4,779,005	35,751,736	851,114	85%	846,572	6,333,207	150,770	19.43	15%	SUMP VOLUME
3426.00	13.0	7.0	5,112,225	38,244,555	910,459	91%	513,352	3,840,388	91,425	11.78	9%	
3425.00	14.0	6.0	5,370,347	40,175,569	956,429	95%	255,230	1,909,374	45,455	5.86	5%	
3424.00	15.0	5.0	5,522,947	41,317,167	983,606	98%	102,630	767,776	18,278	2.36	2%	
3423.00	16.0	4.0	5,593,739	41,846,760	996,214	99%	31,838	238,183	5,670	0.73	1%	
3422.00	17.0	3.0	5,615,035	42,006,078	1,000,006	100%	10,542	78,865	1,877	0.24	0%	
3421.00	18.0	2.0	5,619,269	42,037,753	1,000,760	100%	6,308	47,190	1,123	0.14	0%	
3420.00	19.0	1.0	5,622,759	42,063,862	1,001,382	100%	2,818	21,081	502	0.06	0%	
3419.00	20.0	0.0	5,625,577	42,084,943	1,001,884	100%	0	0	0	0.00	0%	

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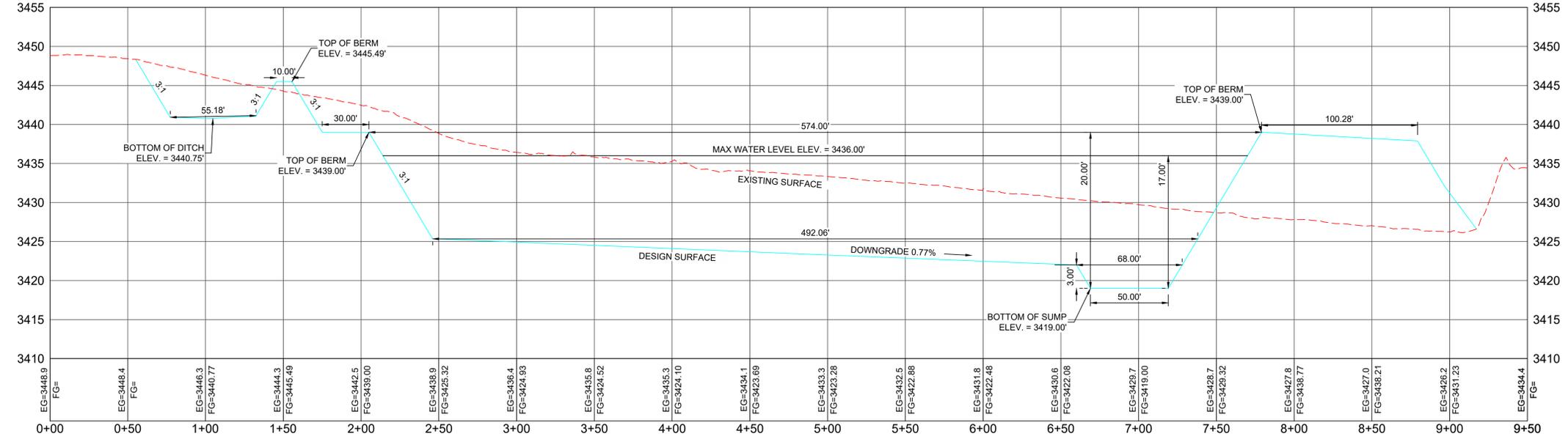
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**CS-102**



NORTH-SOUTH PROFILE



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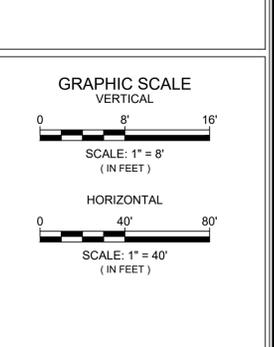
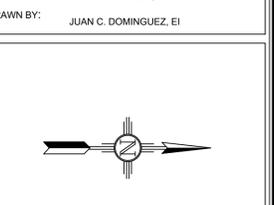
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**SW CONTAINMENT  
NORTH-SOUTH PLAN & PROFILE**  
OF

PROJECT NAME:  
**DAGGER RECYCLE FACILITY**

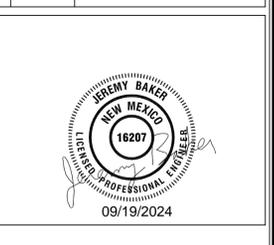
FOR  
CLIENT:  
**SPUR**

PROJECT NUMBER:  
**24178**

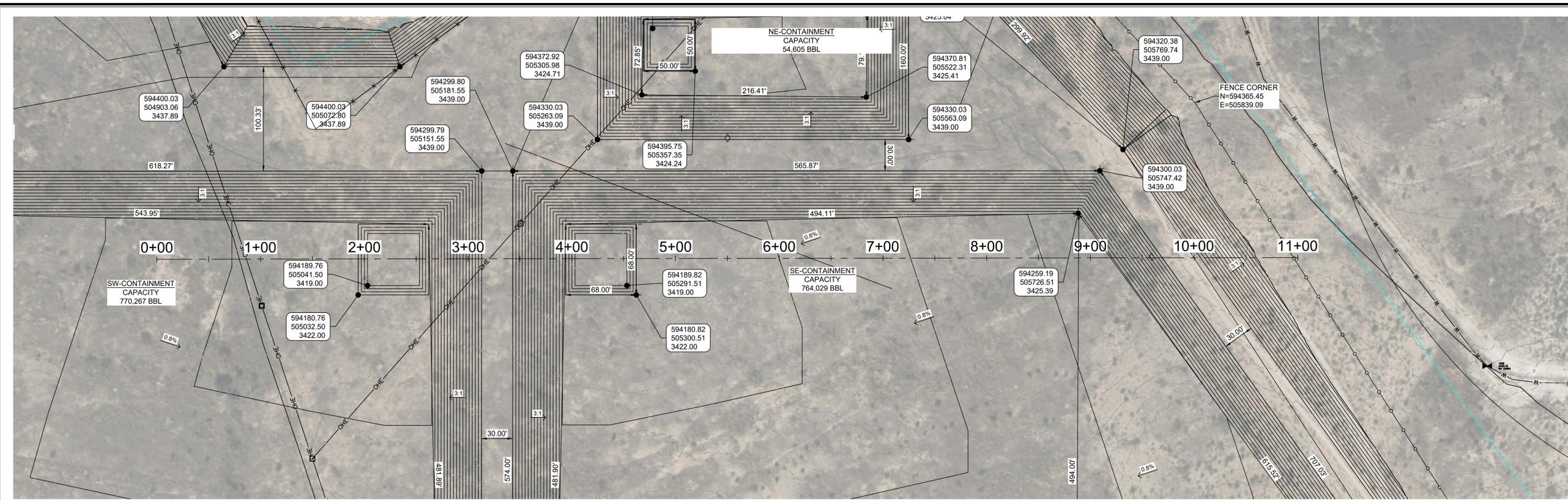
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
JUAN C. DOMINGUEZ, EI



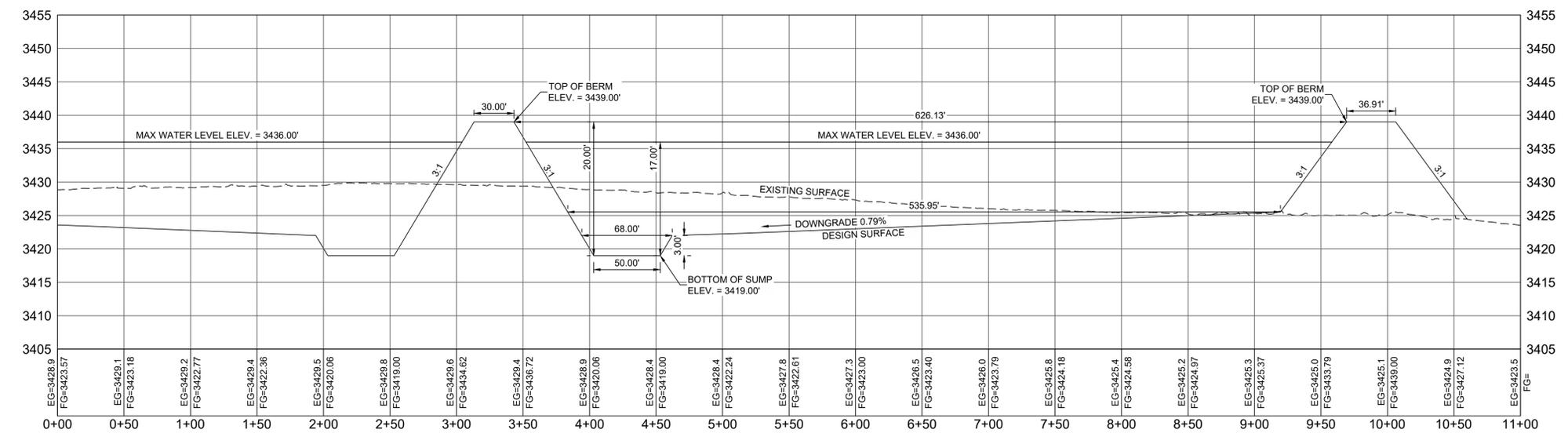
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**CS-103**



WEST- EAST PROFILE



ELEVATION (FT)	CONTAINMENT DEPTH (FT)	REMAINING STORAGE VOL (FT)	REMAINING STORAGE VOL (FT3)	REMAINING STORAGE VOL (GAL)	REMAINING STORAGE VOL (BBL)	PERCENT OF TOTAL VOL (%)	VOL IN CONTAINMENT (FT3)	VOL IN CONTAINMENT (BBL)	VOL IN CONTAINMENT (GAL)	VOL IN CONTAINMENT (AC-FT)	PERCENT OF TOTAL VOL (%)	
3439.00	0.0	20.0	0.0	-	-	0%	5,580,330.38	41,746,452	993,826	128.11	100%	
3438.00	1.0	19.0	439,266	3,286,152	78,231	8%	5,141,064.03	38,460,300	915,595	118.02	92%	FREEBOARD
3437.00	2.0	18.0	870,134	6,509,474	154,966	16%	4,710,196.19	35,236,978	838,860	108.13	84%	
3436.00	3.0	17.0	1,292,684	9,670,568	230,220	23%	4,287,646.52	32,075,884	763,606	98.43	77%	MAX VOLUME
3435.00	4.0	16.0	1,706,996	12,770,035	304,006	31%	3,873,334.67	28,976,417	689,819	88.92	69%	
3434.00	5.0	15.0	2,113,150	15,808,476	376,340	38%	3,467,180.30	25,937,976	617,485	79.60	62%	
3433.00	6.0	14.0	2,511,227	18,786,492	447,235	45%	3,069,103.07	22,959,960	546,590	70.46	55%	
3432.00	7.0	13.0	2,901,308	21,704,683	516,707	52%	2,679,022.64	20,041,768	477,119	61.50	48%	STORAGE VOLUME
3431.00	8.0	12.0	3,283,472	24,563,652	584,768	59%	2,296,858.65	17,182,800	409,058	52.73	41%	
3430.00	9.0	11.0	3,657,800	27,363,999	651,434	66%	1,922,530.78	14,382,453	342,392	44.14	34%	
3429.00	10.0	10.0	4,024,372	30,106,325	716,718	72%	1,555,958.67	11,640,127	277,108	35.72	28%	
3428.00	11.0	9.0	4,383,268	32,791,231	780,636	79%	1,197,061.98	8,955,221	213,190	27.48	21%	
3427.00	12.0	8.0	4,734,570	35,419,318	843,200	85%	845,760.37	6,327,133	150,625	19.42	15%	
3426.00	13.0	7.0	5,062,947	37,875,904	901,682	91%	517,383.72	3,870,548	92,143	11.88	9%	
3425.00	14.0	6.0	5,319,406	39,794,478	947,356	95%	260,924.14	1,951,973	46,469	5.99	5%	FLOOR VOLUME
3424.00	15.0	5.0	5,474,396	40,953,959	974,959	98%	105,934.02	792,492	18,866	2.43	2%	
3423.00	16.0	4.0	5,547,509	41,500,914	987,980	99%	32,821.45	245,537	5,845	0.75	1%	
3422.00	17.0	3.0	5,569,788	41,667,587	991,948	100%	10,542.00	78,865	1,877	0.24	0%	
3421.00	18.0	2.0	5,574,022	41,699,261	992,702	100%	6,308.00	47,190	1,123	0.14	0%	SUMP VOLUME
3420.00	19.0	1.0	5,577,512	41,725,370	993,324	100%	2,818.00	21,081	502	0.06	0%	
3419.00	20.0	0.0	5,580,330	41,746,452	993,826	100%	0	0	0	0.00	0%	



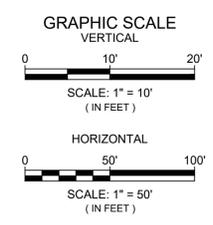
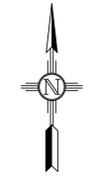
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ENGINEERING SHEET:  
**SE CONTAINMENT  
 WEST-EAST PLAN & PROFILE**  
 OF  
**DAGGER RECYCLE FACILITY**

CLIENT:  
 FOR  
**SPUR**

PROJECT NUMBER:  
**24178**

PROJECT ENGINEER:  
 JEREMY BAKER, PE  
 DRAWN BY:  
 JUAN C. DOMINGUEZ, EI

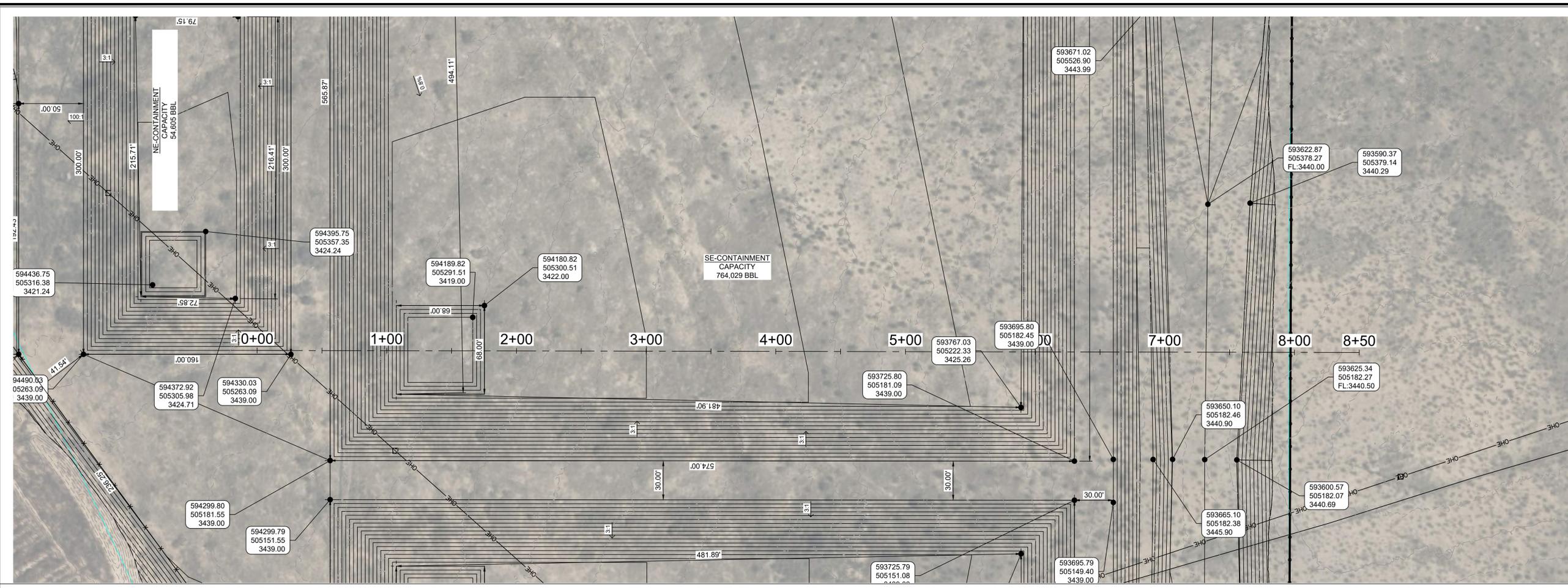


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**CS-104**



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**SE CONTAINMENT  
NORTH-SOUTH PLAN & PROFILE**  
OF

PROJECT NAME:  
**DAGGER RECYCLE FACILITY**

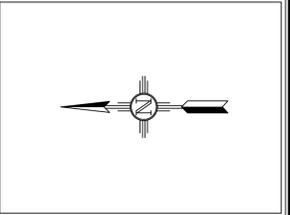
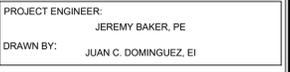
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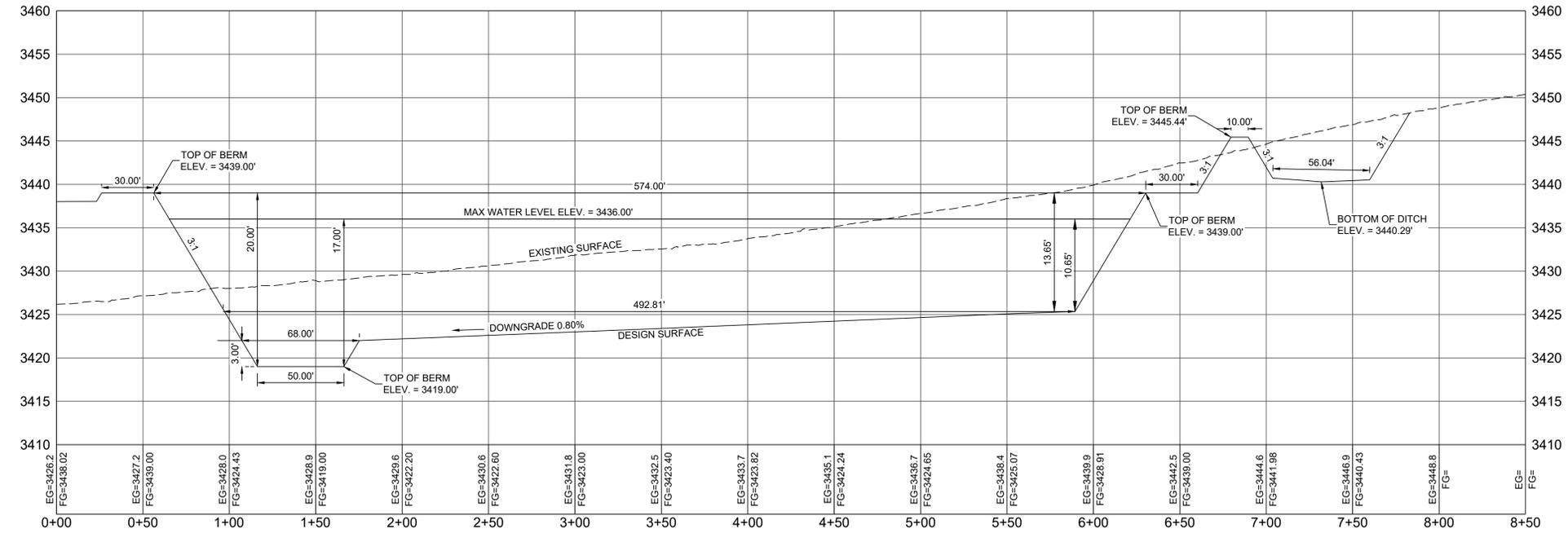
PROJECT NUMBER:  
**24178**

PROJECT ENGINEER:  
**JEREMY BAKER, PE**

DRAWN BY:  
**JUAN C. DOMINGUEZ, EI**

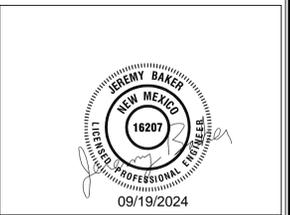


**SOUTH - NORTH PROFILE**

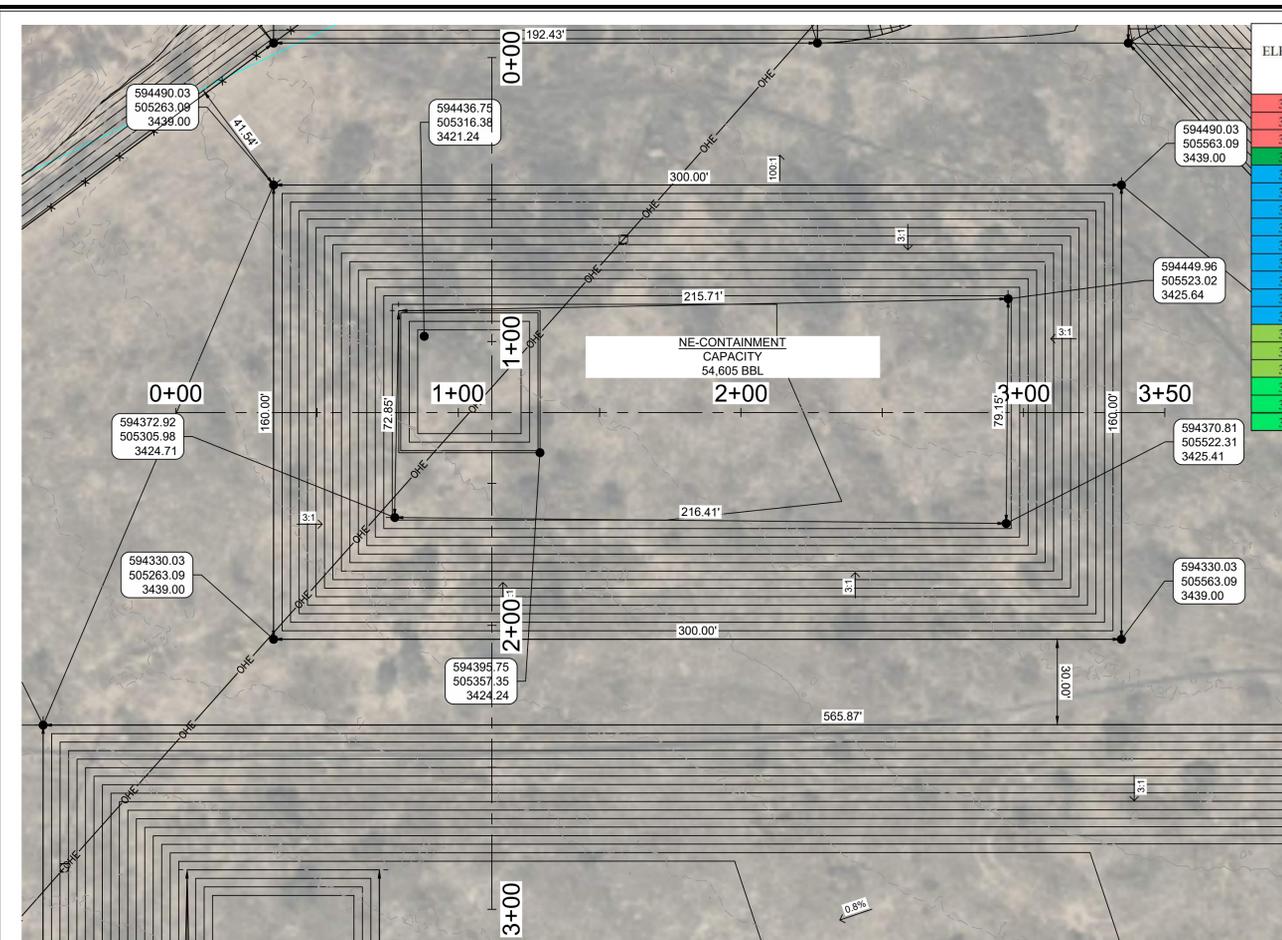


**REVISIONS**

No.	DATE	DESCRIPTION

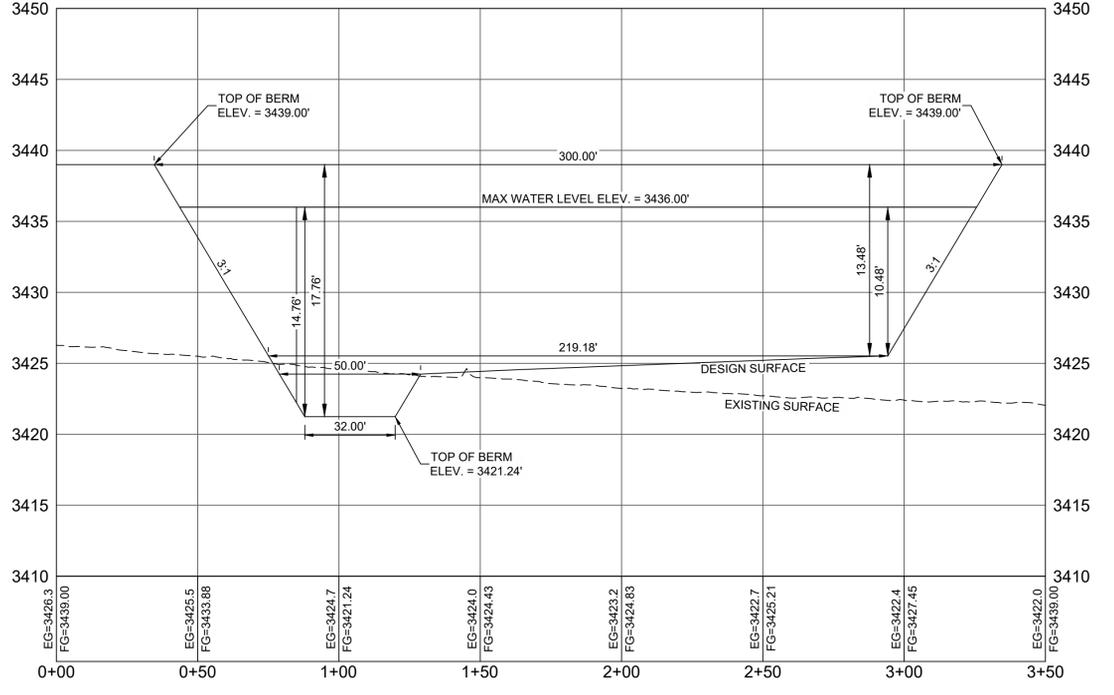


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**CS-105**

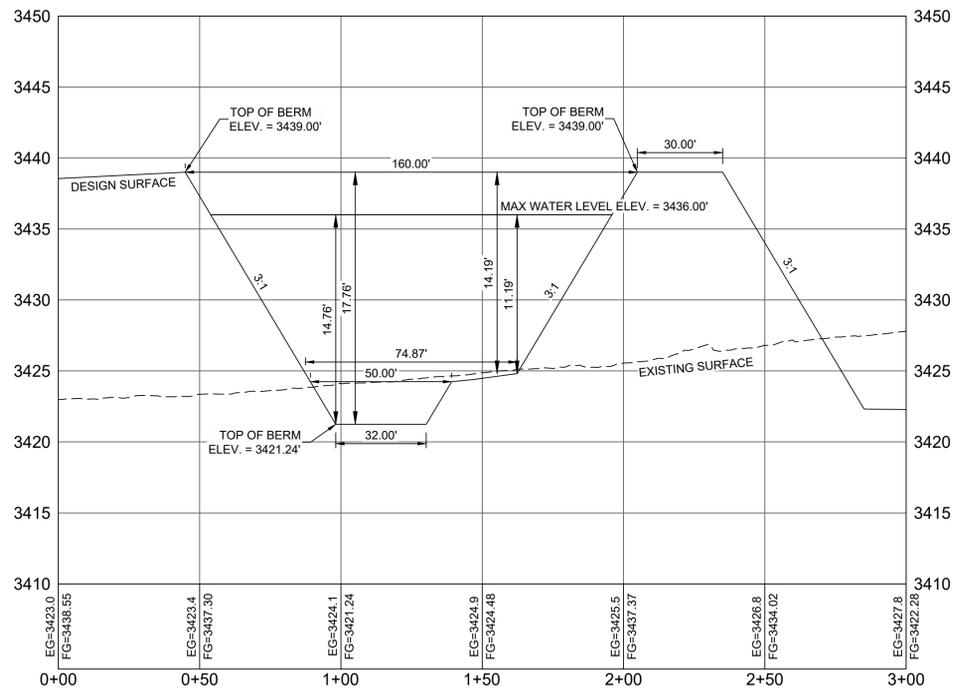


ELEVATION (FT)	CONTAINMENT DEPTH (FT)	REMAINING STORAGE (FT)	REMAINING STORAGE VOL (FT3)	REMAINING STORAGE VOL (GAL)	REMAINING STORAGE VOL (BBL)	PERCENT OF TOTAL VOL (%)	VOL IN CONTAINMENT (FT3)	VOL IN CONTAINMENT (BBL)	VOL IN CONTAINMENT (GAL)	VOL IN CONTAINMENT (AC-FT)	PERCENT OF TOTAL VOL (%)	
3,439.00	0.00	17.75	0.0	-	-	0%	442,945	3,313,673	78,886	10.17	100%	FREEBOARD
3,438.00	1.00	16.75	46,638	348,899	8,306	11%	396,307	2,964,774	70,580	9.10	89%	
3,437.00	2.00	15.75	90,588	677,689	16,133	20%	352,357	2,635,984	62,753	8.09	80%	MAX VOLUME
3,436.00	3.00	14.75	131,922	986,908	23,495	30%	311,023	2,326,765	55,391	7.14	70%	
3,435.00	4.00	13.75	170,712	1,277,096	30,403	39%	272,233	2,036,577	48,483	6.25	61%	STORAGE VOLUME
3,434.00	5.00	12.75	207,030	1,548,791	36,871	47%	235,915	1,764,882	42,015	5.42	53%	
3,433.00	6.00	11.75	240,948	1,802,532	42,911	54%	201,997	1,511,142	35,975	4.64	46%	STORAGE VOLUME
3,432.00	7.00	10.75	272,538	2,038,856	48,537	62%	170,407	1,274,817	30,349	3.91	38%	
3,431.00	8.00	9.75	301,872	2,258,304	53,762	68%	141,073	1,055,370	25,124	3.24	32%	STORAGE VOLUME
3,430.00	9.00	8.75	329,022	2,461,413	58,597	74%	113,923	852,261	20,289	2.62	26%	
3,429.00	10.00	7.75	354,060	2,648,722	63,056	80%	88,885	664,952	15,830	2.04	20%	STORAGE VOLUME
3,428.00	11.00	6.75	377,058	2,820,769	67,152	85%	65,887	492,904	11,734	1.51	15%	
3,427.00	12.00	5.75	398,088	2,978,094	70,897	90%	44,858	335,579	7,989	1.03	10%	STORAGE VOLUME
3,426.00	13.00	4.75	417,222	3,121,235	74,305	94%	25,724	192,438	4,581	0.59	6%	
3,425.00	14.00	3.75	431,772	3,230,088	76,896	97%	11,173	83,586	1,990	0.26	3%	FLOOR VOLUME
3,424.00	15.00	2.75	438,400	3,279,669	78,077	99%	4,545	34,004	810	0.10	1%	
3,423.00	16.00	1.75	440,485	3,295,265	78,448	99%	2,461	18,408	438	0.06	1%	SUMP VOLUME
3,422.00	17.00	0.75	442,059	3,307,040	78,728	100%	887	6,633	158	0.02	0%	
3,421.25	17.75	0.00	442,945	3,313,673	78,886	100%	0	0	0	0.00	0%	

WEST - EAST PROFILE



NORTH - SOUTH PROFILE



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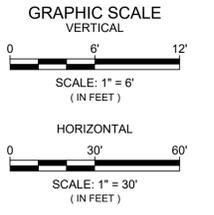
ENGINEERING SHEET:  
**NE CONTAINMENT  
PLAN AND PROFILE**  
OF

PROJECT NAME:  
**DAGGER RECYCLE FACILITY**

CLIENT:  
FOR  
**SPUR**

PROJECT NUMBER:  
**24178**

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
JUAN C. DOMINGUEZ, EI



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No.	DATE	DESCRIPTION



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**CS-106**



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ENGINEERING SHEET:

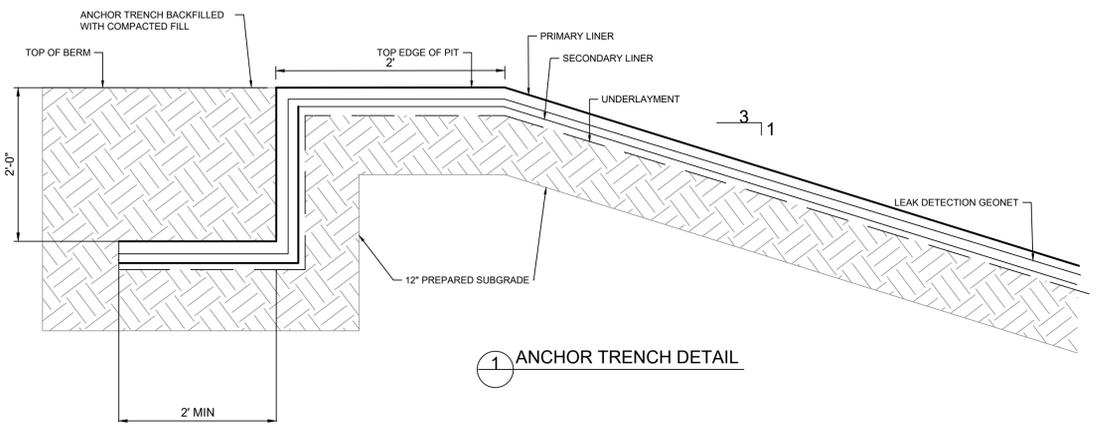
LINER DETAILS

PROJECT NAME: DAGGER RECYCLE FACILITY

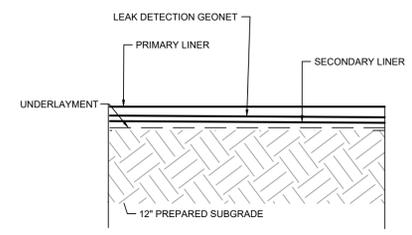
CLIENT: SPUR

PROJECT NUMBER: 24178

PROJECT ENGINEER: JEREMY BAKER, PE  
DRAWN BY: JUAN C. DOMINGUEZ, EI



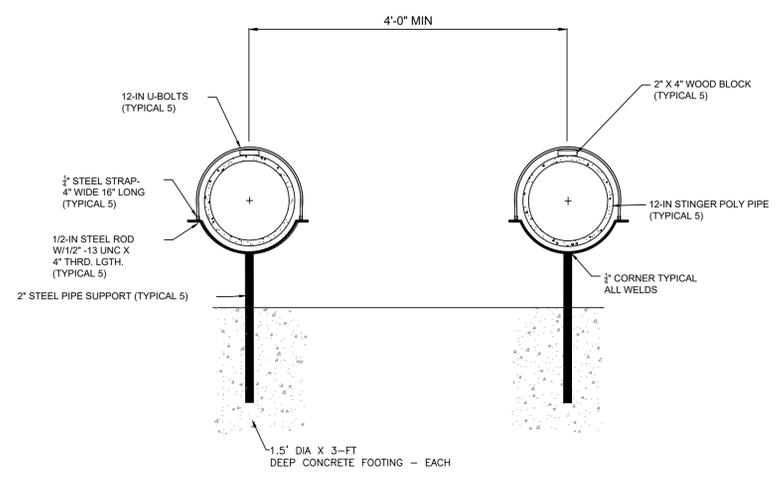
1 ANCHOR TRENCH DETAIL



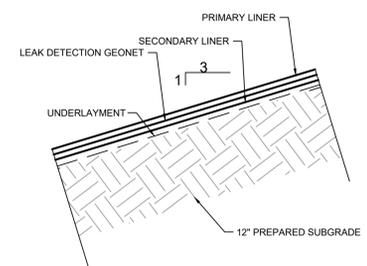
4 LINER SYSTEM FLOOR DETAIL

GENERAL NOTES:

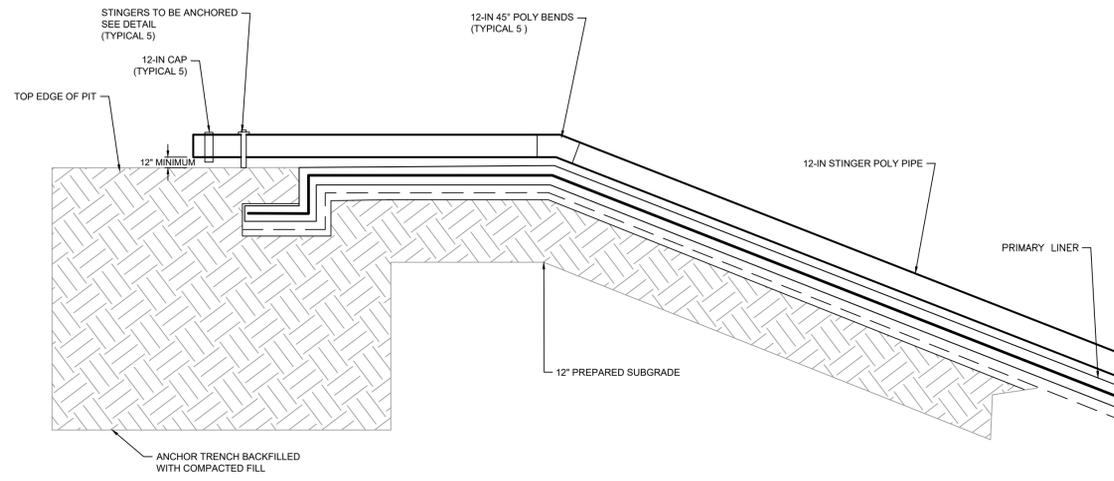
1. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCK, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MAY PUNCTURE THE HDPE LINER, A MINIMUM COMPACTED DEPTH OF 12".
2. ALL INTERIOR SLOPES AND TOP OF BERMS TO BE SMOOTH DRUM ROLLED
3. ALL EMBANKMENT SLOPES SHALL HAVE A SLOPE (H:V RATIO) OF 3:1.
4. COMPACTED EARTH EMBANKMENTS TO BE CONSTRUCTED WITH 12 INCH (MAXIMUM LOOSE LIFTS, COMPACTED TO 95% STANDARD PROCTOR DENSITY)
5. PERFORM GEOTECHNICAL ANALYSIS ON EXISTING SOIL TO CONFIRM SOIL IS SUITABLE FOR USE IN THE LEVEE.
6. LINER SPECIFICATIONS PROVIDED ON SHEET CS - 501



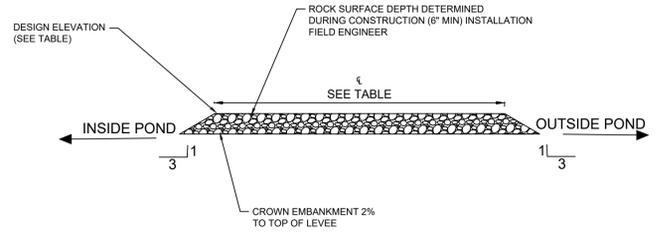
3 STINGER SYSTEM ANCHOR DETAIL



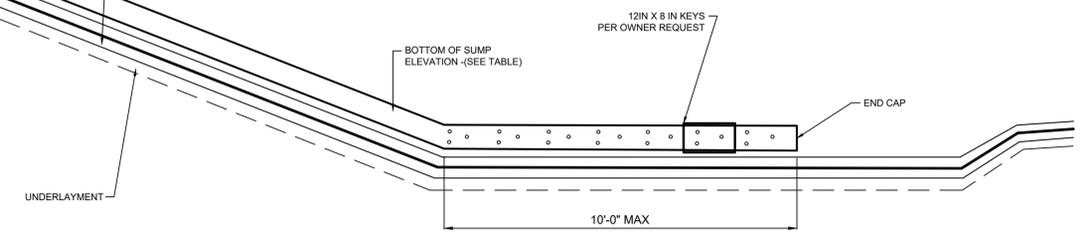
5 LINER SYSTEM SIDE SLOPE



2 STINGER SECTION DETAIL



6 TYPICAL CREST DETAIL

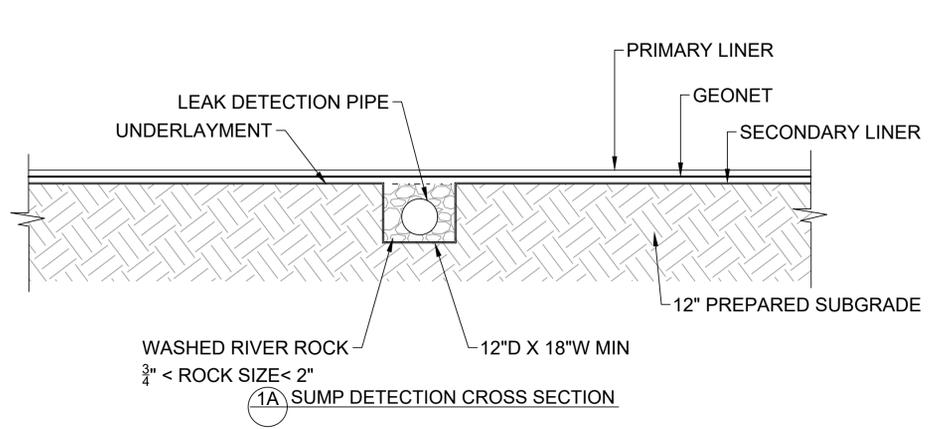


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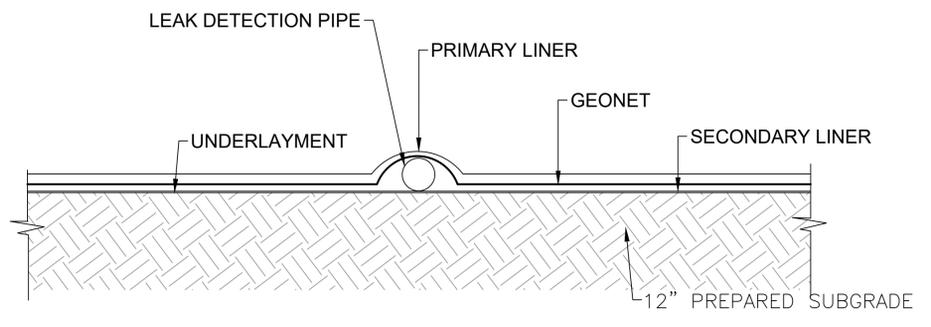
No.	DATE	DESCRIPTION



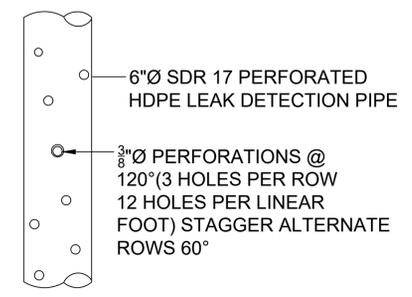
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CS-501



1A SUMP DETECTION CROSS SECTION

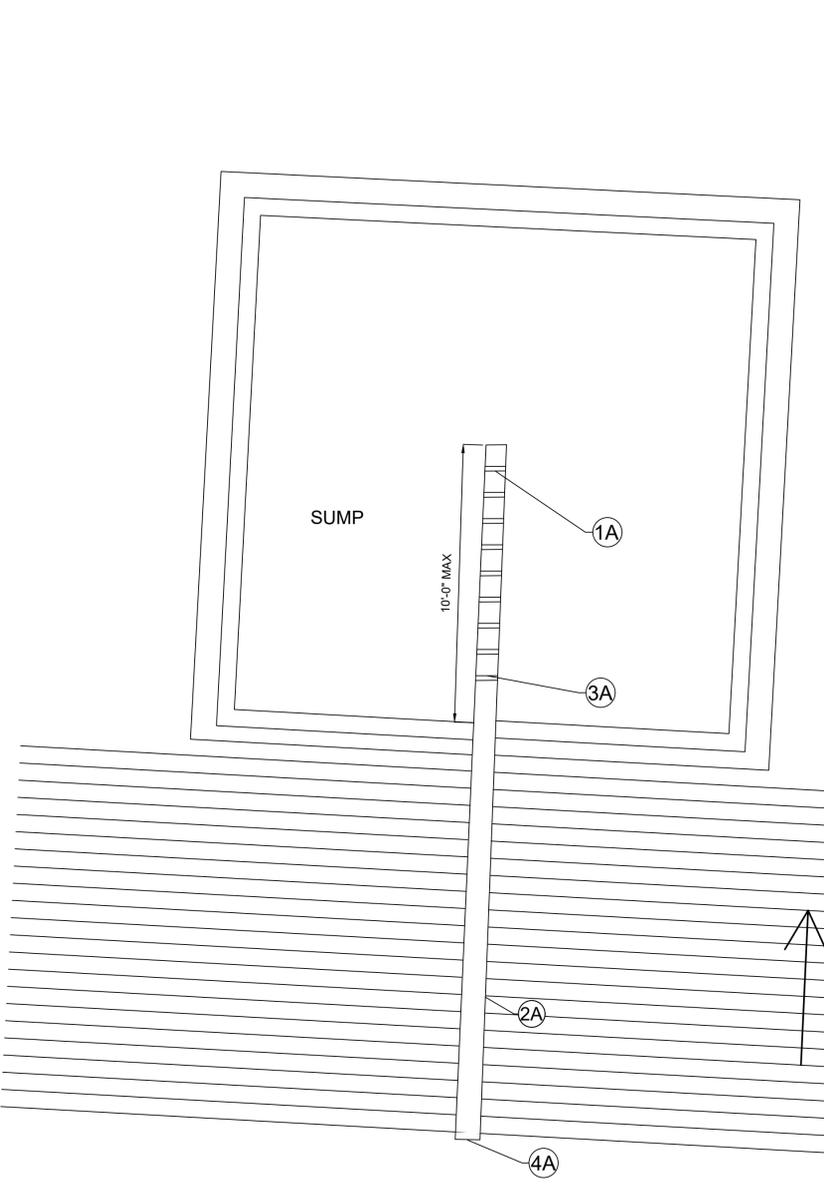


2A SIDE SLOPE LEAK DETECTION PIPE DETAIL

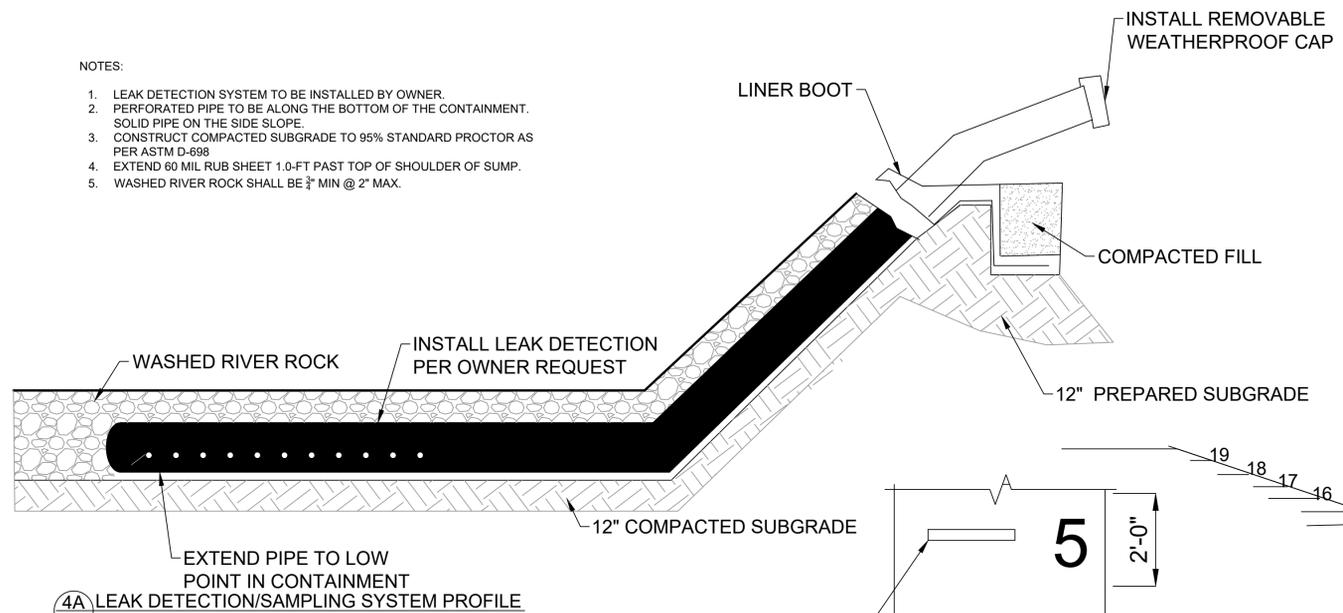


3A PERFORATED PIPE DETAIL

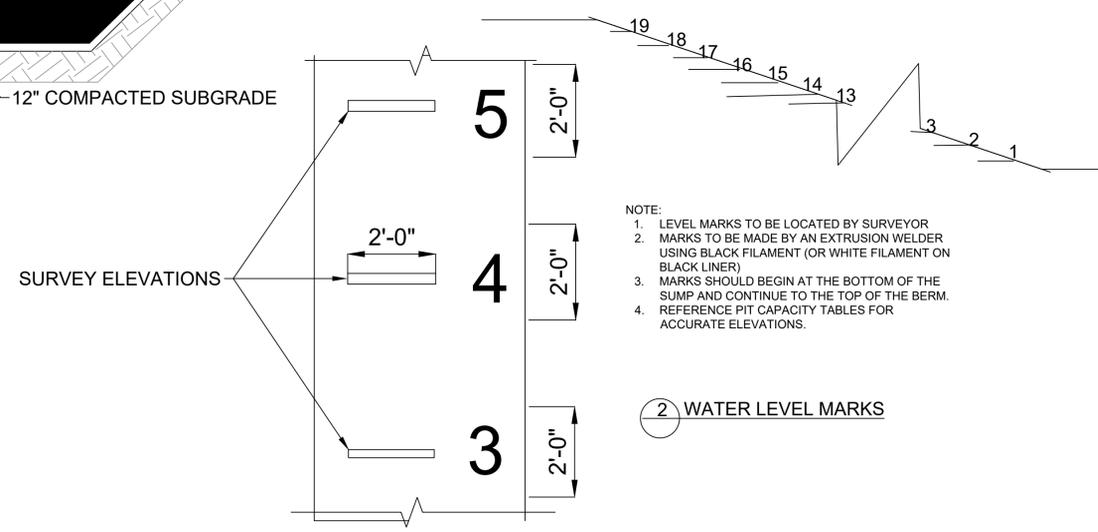
- NOTES:
1. LEAK DETECTION SYSTEM TO BE INSTALLED BY OWNER.
  2. PERFORATED PIPE TO BE ALONG THE BOTTOM OF THE CONTAINMENT. SOLID PIPE ON THE SIDE SLOPE.
  3. CONSTRUCT COMPACTED SUBGRADE TO 95% STANDARD PROCTOR AS PER ASTM D-698
  4. EXTEND 60 MIL RUB SHEET 1.0-FT PAST TOP OF SHOULDER OF SUMP.
  5.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



1 CONTAINMENT SUMP PLAN DETAIL



4A LEAK DETECTION/SAMPLING SYSTEM PROFILE



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

2 WATER LEVEL MARKS



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ENGINEERING SHEET:

SUMP DETAILS

PROJECT NAME: OF

DAGGER RECYCLE FACILITY

CLIENT: FOR

SPUR

PROJECT NUMBER: 24178

PROJECT ENGINEER: JEREMY BAKER, PE

DRAWN BY: JUAN C. DOMINGUEZ, EI

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ENGINEERING SHEET:

FENCE DETAILS

OF  
PROJECT NAME:  
DAGGER RECYCLE FACILITY

FOR  
CLIENT:  
SPUR

PROJECT NUMBER:  
24178

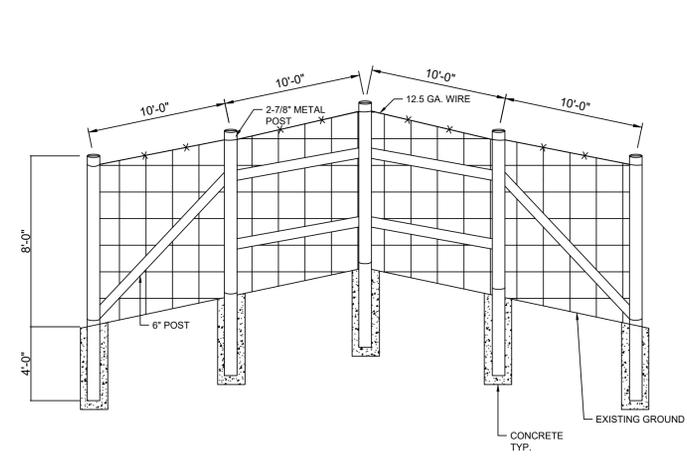
PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
JUAN C. DOMINGUEZ, EI

REVISIONS

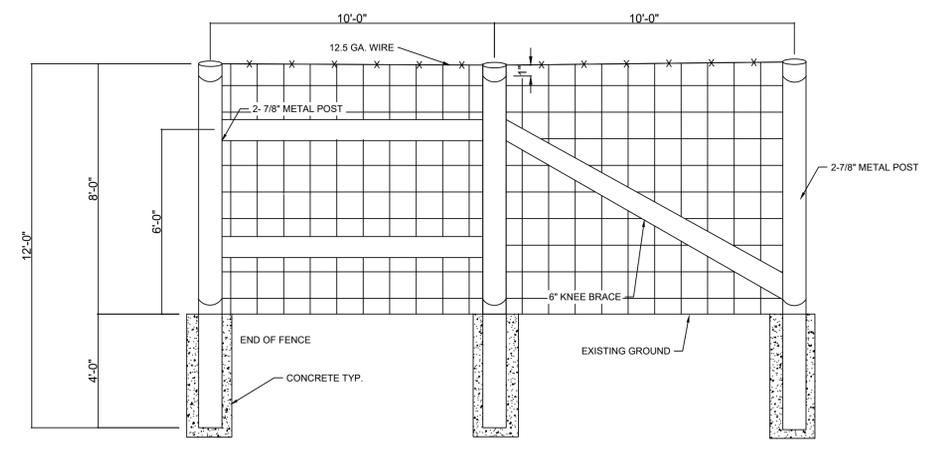
No.	DATE	DESCRIPTION



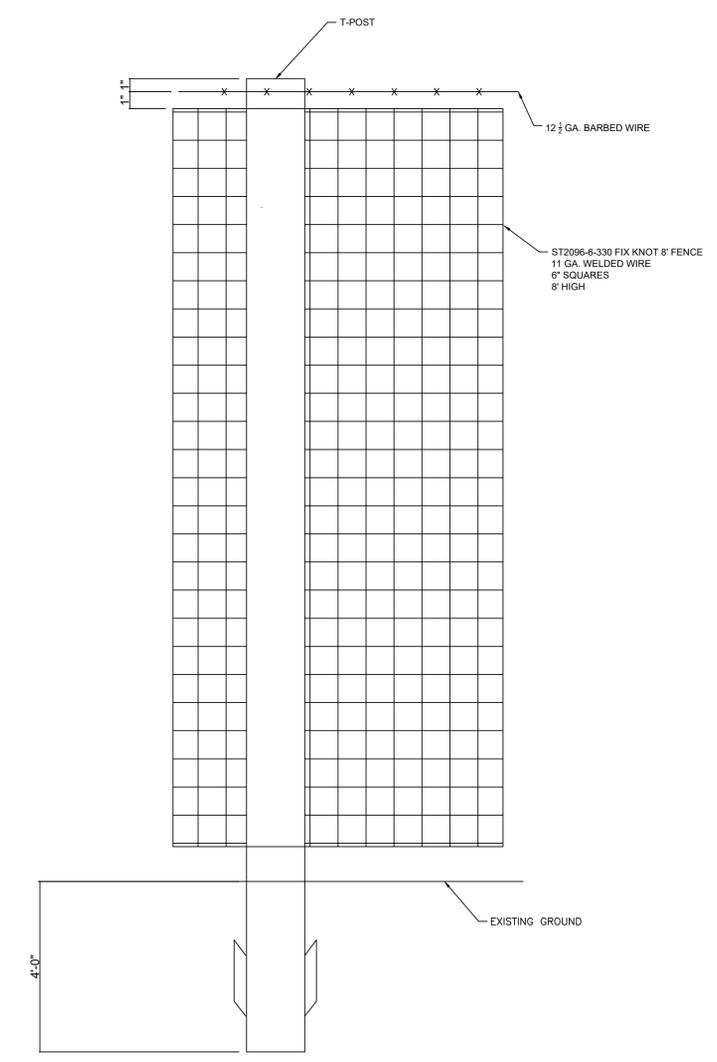
SHEET:  
12 of 13  
CS-503



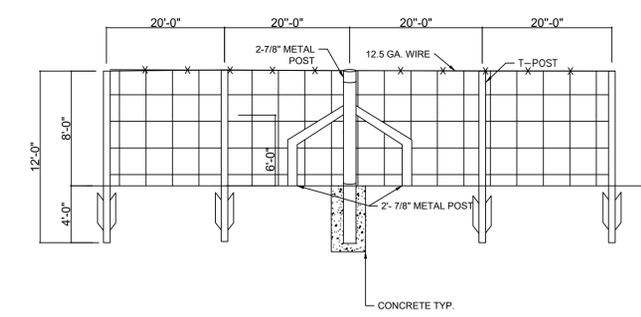
1 CORNER POST



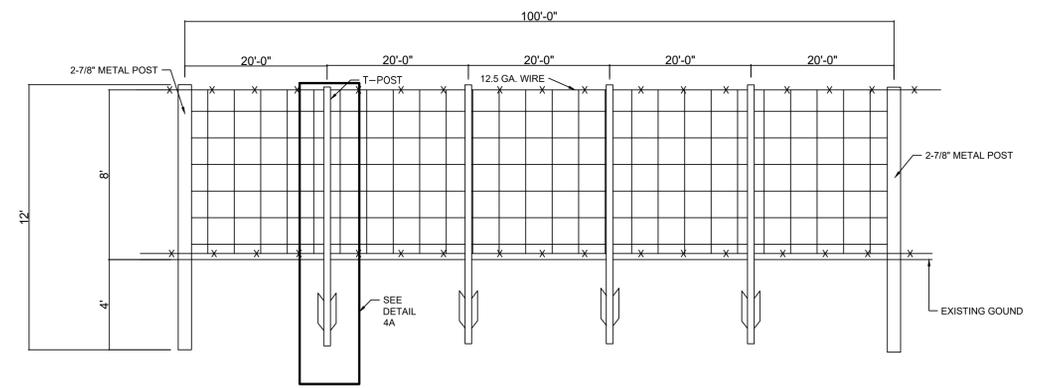
2 END POST



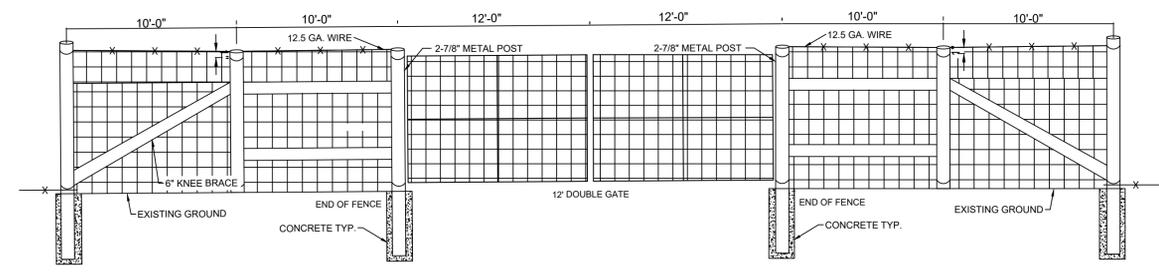
4A METAL POST



3 LINE BRACE POST



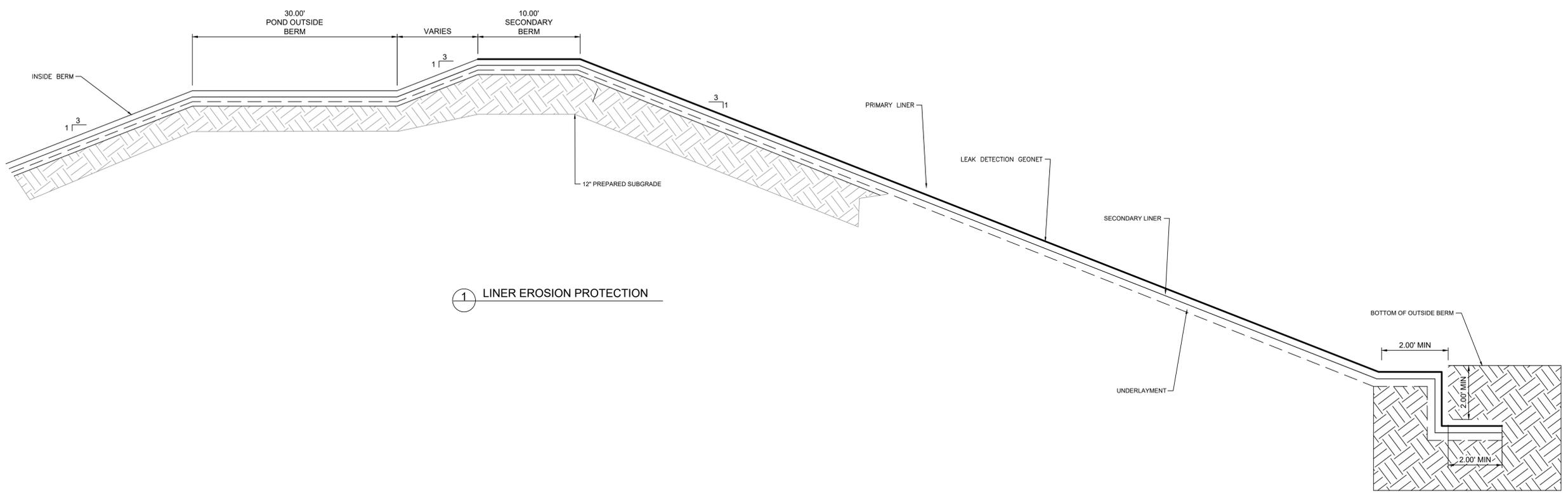
4 LINE POST



5 GATE POSTS

GENERAL NOTES:

1. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCK, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MAY PUNCTURE THE HDPE LINER, A MINIMUM COMPACTED DEPTH OF 12".
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6. LINER SPECIFICATIONS PROVIDED ON SHEET CS - 501



① LINER EROSION PROTECTION



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ENGINEERING SHEET:  
GENERAL DETAILS

OF  
PROJECT NAME:

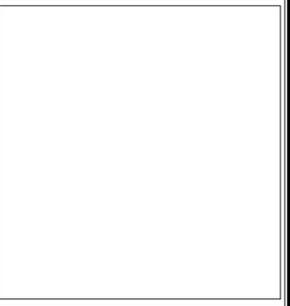
DAGGER RECYCLE FACILITY

FOR  
CLIENT:

SPUR

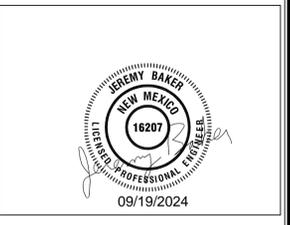
PROJECT NUMBER:  
24178

PROJECT ENGINEER:  
JEREMY BAKER, PE  
DRAWN BY:  
JUAN C. DOMINGUEZ, EI



REVISIONS

No.	DATE	DESCRIPTION



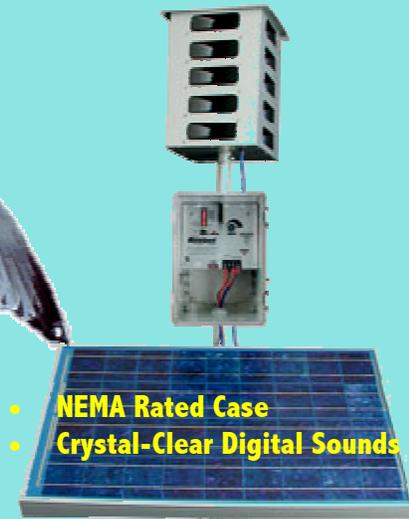
SHEET:  
13 of 13  
CS-504

# EFFECTIVE WIDE-AREA BIRD CONTROL!

## Mega Blaster PRO sonic bird repeller covers 30 acres!



Mega Blaster PRO uses intermittent distress calls to create a "danger zone" that frightens infesting birds away for good. PREDATOR cries help scare all the birds.



- NEMA Rated Case
- Crystal-Clear Digital Sounds

- Laughing Gull
- Ring-Billed Gull
- Herring Gull
- California Gull
- Black-Headed Gull
- Glaucous-Winged Gull
- Double Crested Cormorant
- Marsh Hawk

### Perfect for Landfills, Airfields, Fish Farms, Farm Fields or any multi-acre facility.

Our most powerful system features two high-output amplifiers that drive our specially-designed 20 speaker tower. The intense sound output covers up to 30 acres (12 hectares).

It features solid-state electronics mounted inside a NEMA-type control box, suitable for most any application.

The generating unit mounts easily to a post or pole using the included hardware. The unit comes pre-recorded in four different configurations for the most common bird infestations.

Choose any or all of the 8 sounds, including predators to give the birds even more of a sense of danger. Customize by choosing volume and silent time between sounds.

### Mega Blaster PRO

Complete system includes the generating unit with two built-in high-output amplifiers, 20-speaker tower with audio cables, 40 watt solar panel, battery clips and all mounting hardware.

#### CONFIGURATIONS AVAILABLE:

- Agricultural # MEGA-AG
- Crow / Raven # MEGA-CROW
- Woodpecker # MEGA-WP
- Marine / Gull # MEGA-MAR



The Bird Control 'X'-Perts

**NOTE:** This unit is capable of sound output up to 125 decibels. **HEARING PROTECTION IS RECOMMENDED.**

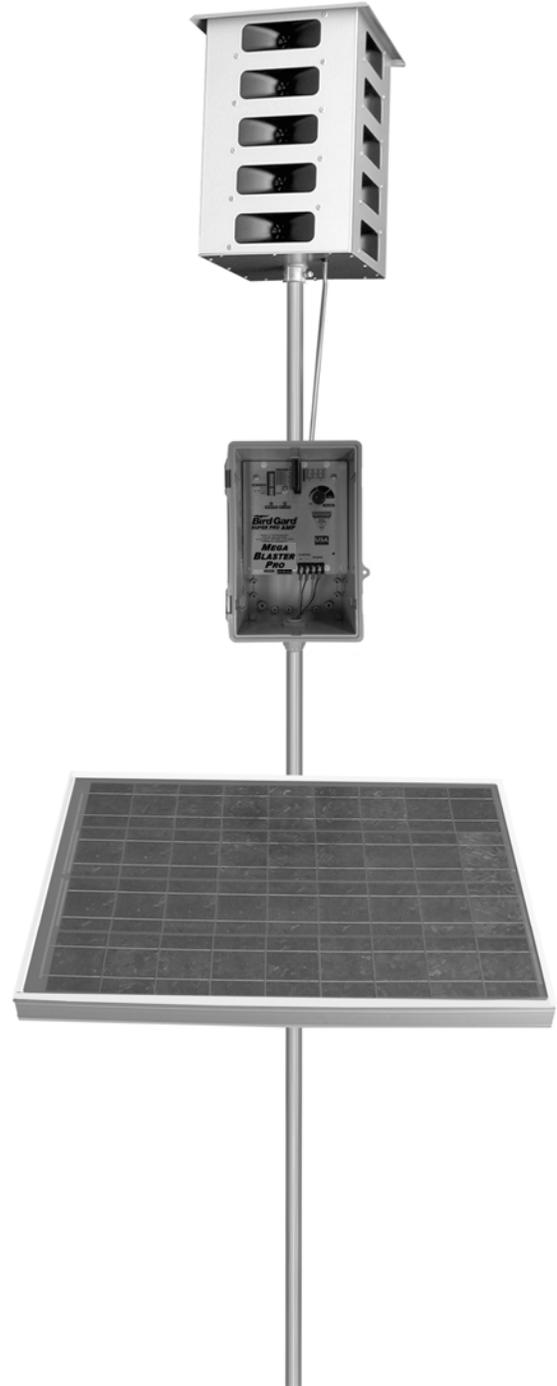


# **MEGA BLASTER PRO**



## User's Manual

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Bird Control Management Guidelines	3
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Control Unit	5
Solar Panel	5
Placement	6
Building a Mounting Pole or Mast	7
Installation	8
20-Speaker Tower	8
Solar Panel	8
Control Box	9
Solar Panel Connections	9
Settings	10
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# Overview

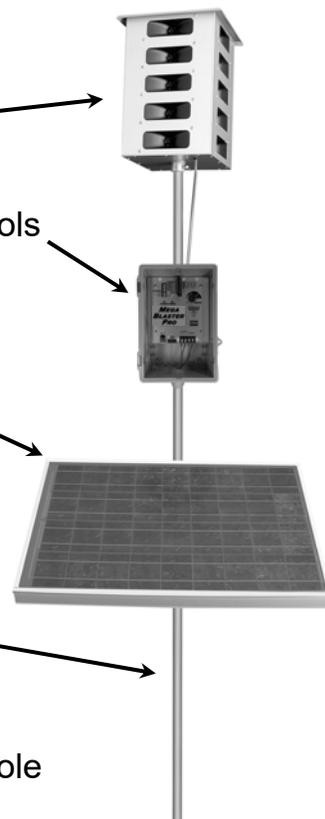
The Bird-X Mega Blaster Pro utilizes the innate power of the natural survival instincts of birds to effectively repel them. Digital recordings of distressed and alarmed birds, along with the sounds made by their natural predators are broadcast through high fidelity weather-resistant speakers over the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

**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)

# 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.

### 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 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.

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 H

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

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.

**Venegas, Victoria, EMNRD**

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**From:** Venegas, Victoria, EMNRD  
**Sent:** Wednesday, October 2, 2024 1:32 PM  
**To:** Sarah Chapman; 'BobbiJo Crain'  
**Subject:** 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096]  
**Attachments:** C-147 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] 10.02.2024.pdf

**2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096]**

Good afternoon Ms. Chapman.

NMOCD has reviewed the recycling containment permit application and related documents, submitted by [328947] Spur Energy Partners LLC on September 25, 2024, Application ID 386577, for 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] in B-26-19S-25E, Eddy County, New Mexico. The form C-147 and related documents is 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.
- [328947] Spur Energy Partners LLC shall construct, operate, maintain, close, and reclaim 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] in compliance with 19.15.34 NMAC.
- 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] is approved for five years of operation from the date of permit application. 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] permit expires on September 25, 2029. If [328947] Spur Energy Partners LLC wishes to extend operations past five years, an annual permit extension request must be submitted using form C-147 through OCD Permitting by August 25, 2029.
- 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] consists of three (3) earthen containment with a total capacity of 1,588,901.00 bbl.
- Water reuse and recycling from 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] is limited to wells owned and operated by [328947] Spur Energy Partners LLC.
- [328947] Spur Energy Partners LLC shall notify OCD when construction of 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] commences.
- [328947] Spur Energy Partners LLC shall notify OCD when recycling operations commence and cease at 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096].
- A minimum of 3-foot freeboard must be maintained at 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096], 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 Permitting. An extension to extend the cessation of operation, not to exceed six months, may be submitted using a C-147 form through OCD Permitting.
- [328947] Spur Energy Partners 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 Permitting even if there is zero activity.

- [328947] Spur Energy Partners LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096].

Please reference number 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] in all future communications.

Regards,

**Victoria Venegas** • Environmental Specialist  
Environmental Bureau  
EMNRD - Oil Conservation Division  
506 W. Texas Ave. Artesia, NM 88210  
(575) 909-0269 | [Victoria.Venegas@emnrn.nm.gov](mailto:Victoria.Venegas@emnrn.nm.gov)  
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**District III**  
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 Phone:(505) 334-6178 Fax:(505) 334-6170  
**District IV**  
 1220 S. St Francis Dr., Santa Fe, NM 87505  
 Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 386577

**CONDITIONS**

Operator: Spur Energy Partners LLC 9655 Katy Freeway Houston, TX 77024	OGRID: 328947
	Action Number: 386577
	Action Type: [C-147] Water Recycle Long (C-147L)

**CONDITIONS**

Created By	Condition	Condition Date
vvenegas	<p>• [328947] Spur Energy Partners LLC shall construct, operate, maintain, close, and reclaim 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] in compliance with 19.15.34 NMAC. 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096] permit expires on September 25, 2029. If [328947] Spur Energy Partners LLC wishes to extend operations past five years, an annual permit extension request must be submitted using form C-147 through OCD Permitting by August 25, 2029. • [328947] Spur Energy Partners LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 2RF-209 - CASCADE DAGGER SPUR INGROUND CONTAINMENTS NE, SW [fVV2427633096].</p>	10/2/2024