ENVIROTECH

ENGINEERING

580-234-8780

QUALITY ACTIONS FOR QUALITY CLIENTS

BLACKBUCK NEW MEXICO LLC

SCOUT RECYCLE FACILITY

C-147 FLUID RECYCLING FACILITY APPLICATION

SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &

SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST

EDDY COUNTY, NEW MEXICO

SEPTEMBER 2025

025244-00

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: [X] Recycling Facility [X] Recycling Containment*

Type of action: [X] 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: Blackbuck New Mexico LLC (For multiple operators attach page with information) OGRID #: 373619
Address: 3200 SW Freeway Ste 3400 Houston, TX 77027
Facility or well name (include API# if associated with a well): Scout Recycle Treatment Containment
OCD Permit Number: 2RF-227 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr _____ Section 6 Township 25 South Range 28 East County: Eddy
Surface Owner: [ ] Federal [ ] State [X] Private [ ] Tribal Trust or Indian Allotment

2.
[ ] **Recycling Facility:**
Location of recycling facility (if applicable): Latitude 32.156256 Longitude -104.132928 NAD83
Proposed Use: [X] Drilling* [X] Completion* [X] Production* [X] Plugging *
The re-use of produced water may NOT be used until fresh water zones are cased and cemented
[ ] Other, ***requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.***
[X] Fluid Storage
[ ] Above ground tanks [X] Recycling containment [ ] Activity permitted under 19.15.17 NMAC explain type _____
[ ] Activity permitted under 19.15.36 NMAC explain type: _____ [ ] Other explain _____
[ ] For multiple or additional recycling containments, attach design and location information of each containment
[ ] **Closure Report (required within 60 days of closure completion):** [ ] Recycling Facility Closure Completion Date: _____

3.
[X] **Recycling Containment:**
[ ] Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)
Center of Recycling Containment (if applicable): Latitude 32.156255 Longitude -104.132234 NAD83
[ ] For multiple or additional recycling containments, attach design and location information of each containment
[X] Lined [ ] Liner type: Thickness 60/40 mil [ ] LLDPE [X] HDPE [ ] PVC [ ] Other _____
[ ] String-Reinforced
Liner Seams: [X] Welded [ ] Factory [ ] Other _____ Volume: 55,386 bbl Dimensions: L 210 x W 210 x D 19
[ ] Recycling Containment Closure Completion Date: _____

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 $2,306,501.14 **(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 8-ft Tall Wire Mesh 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.

General siting

Ground water is less than 50 feet below the bottom of the Recycling Containment. NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ 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	☐ Yes ☒ No ☐ NA
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division	☐ Yes ☒ No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map	☐ Yes ☒ No
Within a 100-year floodplain. FEMA map	☐ Yes ☒ 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	☐ Yes ☒ 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	☐ Yes ☒ 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	☐ Yes ☒ No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site	☐ Yes ☒ 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.

- [X] Design Plan - based upon the appropriate requirements.
- [X] Operating and Maintenance Plan - based upon the appropriate requirements.
- [X] Closure Plan - based upon the appropriate requirements.
- [X] Site Specific Groundwater Data -
- [X] Siting Criteria Compliance Demonstrations –
- [X] **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): Barry Riley Title: Senior Vice President

Signature: Barry Riley Date: 9/11/2025

e-mail address: barry.riley@blackbuckresources.com Telephone: 979-575-8802

11.
OCD Representative Signature: Victoria Venegas **Approval Date:** 10/30/2025

Title: Environmental Specialist **OCD Permit Number:** 2RF-227

- [X] OCD Conditions
- [X] Additional OCD Conditions on Attachment

District I
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Type of action: [X] 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: Blackbuck New Mexico LLC (For multiple operators attach page with information) OGRID #: 373619
Address: 3200 SW Freeway Ste 3400 Houston, TX 77027
Facility or well name (include API# if associated with a well): Scout Recycle West Containment
OCD Permit Number: 2RF-227 (For new facilities the permit number will be assigned by the district office)
U/L or Qtr/Qtr _____ Section 1 6 Township 25 South 25 South Range 27 East 28 East County: Eddy
Surface Owner: [ ] Federal [ ] State [X] Private [ ] Tribal Trust or Indian Allotment

2.
[X] **Recycling Facility:**
Location of recycling facility (if applicable): Latitude 32.156256 Longitude -104.132928 NAD83
Proposed Use: [X] Drilling* [X] Completion* [X] Production* [X] Plugging *
The re-use of produced water may NOT be used until fresh water zones are cased and cemented
[ ] Other, ***requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.***
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[ ] For multiple or additional recycling containments, attach design and location information of each containment
[ ] **Closure Report (required within 60 days of closure completion):** [ ] Recycling Facility Closure Completion Date: _____

3.
[X] **Recycling Containment:**
[ ] Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)
Center of Recycling Containment (if applicable): Latitude 32.155029 Longitude -104.135040 NAD83
[ ] For multiple or additional recycling containments, attach design and location information of each containment
[X] Lined [ ] Liner type: Thickness 60/40 mil [ ] LLDPE [X] HDPE [ ] PVC [ ] Other _____
[ ] String-Reinforced
Liner Seams: [X] Welded [ ] Factory [ ] Other _____ Volume: 763,155 bbl Dimensions: L 625 x W 625 x D 20
[ ] Recycling Containment Closure Completion Date: _____

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 $ 2,306,501.14 **(work on these facilities cannot commence until bonding amounts are approved)**

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5.

Fencing:

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

☒ Alternate. Please specify 8-ft Tall Wire Mesh Game Fence

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Signs:

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

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General siting

Ground water is less than 50 feet below the bottom of the Recycling Containment. NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ 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	☐ Yes ☒ No ☐ NA
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division	☐ Yes ☒ No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map	☐ Yes ☒ No
Within a 100-year floodplain. FEMA map	☐ Yes ☒ 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	☐ Yes ☒ No
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Signature: Barry Riley Date: 9-11-2025

e-mail address: barry.riley@blackbuckresources.com Telephone: 979-575-8802

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OCD Representative Signature: Victoria Venegas **Approval Date:** 10/30/2025

Title: Environmental Specialist **OCD Permit Number:** 2RF-227

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Liner Seams: [X] Welded [ ] Factory [ ] Other _____ Volume: 763,155 bbl Dimensions: L 625 x W 625 x D 20

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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	☐ Yes ☒ 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	☐ Yes ☒ 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	☐ Yes ☒ No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site	☐ Yes ☒ No

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- [X] Closure Plan - based upon the appropriate requirements.
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OCD Representative Signature: Victoria Venegas **Approval Date:** 10/30/2025

Title: Environmental Specialist. **OCD Permit Number:** 2RF-227

[X] OCD Conditions

[X] Additional OCD Conditions on Attachment

ENVIROTECH
ENGINEERING

September 11, 2025

Ms. Victoria Venegas
New Mexico EMNRD
Oil Conservation Division

RE: Rule 34 Variance Request –Produced Water Impoundment Bird Netting

Ms. Venegas:

Blackbuck New Mexico LLC, (Blackbuck), is requesting a variance to Rule 34-Part 12(E). Netting to ensure the recycling facility is protected from wildlife. Based on our experience from previous projects, we believe audible bird deterrents provide equal or better protection when compared to netting. In addition, they require less inspection, maintenance, and repair over the life of the facility.

Blackbuck is proposing to use the "Bird-X Mega Blaster Pro" system. This system will replace the netting required by the current rule. It should be noted that this variance has been granted on previous sites.

Should you have any questions or require additional information, please contact me by phone at 580-234-8780 or by email at mratke@envirotechconsulting.com at your convenience.

Thank you for your consideration.
Best regards,

ENVIROTECH ENGINEERING & CONSULTING, INC.

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025

Mitchell Ratke, P.E.
Senior Project Engineer, Energy Infrastructure

2500 N. Eleventh Street Enid, OK 73701 envirotechconsulting.com info@envirotechconsulting.com 580.234.8780

ENVIROTECH
ENGINEERING

September 11, 2025

Ms. Victoria Venegas
New Mexico EMNRD
Oil Conservation Division

RE: Rule 34 Variance Request –Produced Water Impoundment Fencing

Ms. Venegas:

Blackbuck New Mexico LLC, Blackbuck is requesting a variance to C-147 rule 19.15.34. Fencing requirement for requiring a fence four foot in height, with four strands of barbed wire evenly spaced between one and four feet. Blackbuck is requesting approval for a wire mesh, game fence, eight (8) feet in height. Based on our experience, we feel that the requested fencing will provide greater security to the facility for excluding animals and unauthorized individual access. Details for this type of fence can be found on Sheet 12 of 14 in Attachment D Engineering Drawings.

The proposed fencing has been approved for other C-147 facilities and used extensively on similar projects in New Mexico and Texas with outstanding success in deterring unauthorized entry by both humans and wildlife. It should be noted that this variance request has been approved on previous sites.

Should you have any questions or require additional information, please contact me by phone at 580-234-8780 or by email at mratke@envirotechconsulting.com at your convenience.

Thank you for your consideration.
Best regards,

ENVIROTECH ENGINEERING & CONSULTING, INC.

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025

Mitchell Ratke, P.E.
Senior Project Engineer, Energy Infrastructure

2500 N. Eleventh Street Enid, OK 73701 envirotechconsulting.com info@envirotechconsulting.com 580.234.8780

ENVIROTECH
ENGINEERING

September 11, 2025

Ms. Victoria Venegas
New Mexico EMNRD
Oil Conservation Division

RE: Rule 34 Variance Request –Produced Water Recycling Containment Secondary Liner

Ms. Venegas:

Blackbuck New Mexico LLC, (Blackbuck), is requesting a variance to Rule 34 Part 12(A)(4) requiring secondary liners to be 30-mil string reinforced LLDPE. Blackbuck is requesting approval to use 40-mil HDPE in place of the specified material in the proposed Recycle Containment. Based on our experience, we feel that the requested material will allow us to provide equal environmental protection in our impoundments.

Due to the construction of the 30-mil reinforced LLDPE material, nondestructive QA/QC testing cannot be performed. The proposed 40-mil HDPE will be seamed in a manner that will allow nondestructive pressure testing of the seams to ensure proper sealing.

The proposed HDPE is appropriate material for the proposed use in the impoundment and is compatible with the material that will be stored. This material will provide equal or better environmental protection as the specified 30-mil reinforced LLDPE.

The proposed new liner system cross-section for the earthen containments is as follows: prepared subgrade, 10 oz. geotextile, 40-mil HDPE, 200-mil geonet, 60-mil HDPE. This will replace the cross-section required by the current rule. It should also be noted that this variance has been granted on past sites.

Should you have any questions or require additional information, please contact me by phone at 580-234-8780 or by email at mratke@envirotechconsulting.com at your convenience.

Thank you for your consideration.
Best regards,

ENVIROTECH ENGINEERING & CONSULTING, INC.

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025

Mitchell Ratke, P.E.
Senior Project Engineer, Energy Infrastructure

2500 N. Eleventh Street Enid, OK 73701 envirotechconsulting.com info@envirotechconsulting.com 580.234.8780

TABLE OF CONTENTS

Attachments:

Figures:

SITE CRITERIA FOR RECYCLING CONTAINMENT

1.0 LOCATION

Blackbuck New Mexico LLC, (Blackbuck), is proposing to construct a recycle containment, Scout Recycle Facility, located in Section 1, Township 25 South, Range 27 East and Section 6, Township 25 South, and Range 28 East in Eddy County, New Mexico. An aerial photographic map, *Figure 1*, shows the location of the proposed facility. This report was generated for the proposed location to evaluate that the proposed facility location would be in accordance with the 19.15.34.11 NMAC Siting Requirements for Recycling Containments.

2.0 DISTANCE TO GROUNDWATER

2.1 GROUNDWATER WELLS

Banks Environmental Data (Banks) was contracted to search the New Mexico Office of State Engineers (OSE) records for water wells within a 1.0-mi. radius of the proposed facility location. According to Banks, there are six (6) groundwater wells within a 1.0-mi. radius of the proposed containment. The Banks Water Well Report is included as *Attachment A*, and *Figure 2.1* illustrates that there are six (6) water wells located within the 1.0-mi. radius of the proposed facility.

The New Mexico Oil and Gas Division (NMOCD) requires that groundwater (freshwater as defined by NMOCD rules) at the location be greater than 50-ft below the containment bottom. *Figure 2.1* demonstrates the following to meet these criteria:

1. The location of the proposed facility shown on the United States Geologic Survey (USGS) Bond Draw Quadrangle, NM 7.5 Minute Series Topographic Map.
2. A 1.0-mile radius from the site, and location of water wells in comparison to that radius. It should be noted, OSE wells can be mis-located as older wells are plotted in the center of the quarter, quarter, quarter section, township, and range.
3. The Banks search of the OSE records show there were six (6) groundwater wells located within a 1.0-mi radius from the boundary of the proposed containment.

During onsite investigation, conducted by Blackbuck Resources, a water level meter was placed in the nearest water well in proximity to the proposed facility location. This well (C-03263-POD1) is labeled as a "declared livestock watering" well and the groundwater elevation was reported to be 3,001-ft at the time of the investigation. The groundwater investigation report prepared by Blackbuck Resources is included in *Attachment B*.

2.2 AQUIFERS

Information reviewed from the Bureau of Land Management (BLM) Carlsbad Field Office shows the proposed facility is located within an aquifer system labeled "Other." *Figure 2.2* shows the site location in reference to Bureau of Land Management Declared Aquifers in the State of New Mexico.

2.3 GEOLOGY

A geological map of New Mexico was obtained from the United States Geological Survey (USGS) to review the geologic setting for the proposed containment location. Based on the review of the geologic map, the proposed facility lies within the Rustler Formation. This formation contains siltstone, gypsum, sandstone, and dolomite.

Figure 2.3 is reproduction of the USGS New Mexico Geologic Map. *Figure 2.3* shows the following:

1. Location of the proposed Containment
2. Geologic setting of the Containment

3.0 DISTANCE TO MUNICIPALITIES AND FRESHWATER FIELDS

Figure 3 demonstrates that the location is not located within incorporated municipal boundaries or within a defined municipal freshwater field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3. *Figure 3* illustrates the following:

1. The closest municipality to the proposed facility is Malaga, New Mexico, located approximately 5.3-mi. to the northeast.
2. The closest freshwater field to the proposed facility is the Black River Center for Learning located approximately 7.7-mi. to the northwest.

4.0 DISTANCE TO SUBSURFACE MINES

According to the New Mexico Mining and Minerals Division there are no subsurface mines near the proposed facility. The proposed facility location is not within an area overlying a subsurface mine. *Figure 4* illustrates the following:

1. The nearest registered subsurface mine is Roadrunner Road C0-643-0, an active mining site for Aggregate, Stone, etc. The mine is located approximately 3.2-mi. southwest of the proposed facility location.

5.0 DISTANCE TO MEDIUM, HIGH, OR CRITICAL KARST AREAS (UNSTABLE AREAS)

The Bureau of Land Management Carlsbad Field Office Cave Potential map was reviewed for the proposed facility. *Figure 5* illustrates the following:

1. The proposed facility is located in a “medium” karst potential area.
2. The proposed facility is located approximately 1.3-mi northeast, and 1.6 mi southwest of a “high” karst potential area

6.0 DISTANCE TO 100-YEAR FLOOD PLAIN

The Federal Emergency Management Agency (FEMA) Flood Map Service Center was utilized to review the flood map for the proposed facility location. The proposed facility is located on FEMA flood map panel number 35015C157D, "Zone X" and was effective on 06/04/2010. *Figure 6* demonstrates the area of the site is located on a "Zone X" panel.

1. The proposed facility is located within "Zone X." FEMA defines Zone X as an area determined to be outside 0.2% annual chance flooding. The proposed facility is not within a mapped 100-year flood plain.
2. The proposed facility is located approximately 2,800-ft southeast of a "Zone A" flood plain. FEMA defines Zone A as an area with a 1% annual chance of flooding, with no base flood elevation determined.

7.0 DISTANCE TO SURFACE WATER

After review of the Bond Draw Quadrangle, NM, USGS 7.5-Minute Series Topographic map, *Figure 7*, there is no continuously flowing surface waters located on or near the proposed facility. *Figure 7* illustrates the following:

1. No continuously flowing surface waters or other water bodies defined by NMOCD are located on the proposed facility.
2. The closest surface waterbody is China Draw located approximately 2,376-ft to the northwest.

8.0 DISTANCE TO PERMANENT RESIDENCE OR STRUCTURES

The aerial image provided in *Figure 8*, demonstrates:

1. The proposed facility is not within 1,000-ft. of an occupied permanent residence, school, hospital, institution, church, or other permanent structure. The only items of interest found were existing oil and gas infrastructure. No churches, schools, or residential structures were identified.
2. *Figure 8* and *Figure 1 (Site Map)* show that the nearest structure to the site is oil and gas infrastructure.

9.0 DISTANCE TO NON-PUBLIC WATER SUPPLY

The proposed facility must not be within 500-ft. horizontally of a spring or freshwater well used for domestic or stock watering purposes, in existence at the time of initial application. *Figure 9* demonstrates the following:

1. The proposed facility is not located within 500-ft. horizontally of a spring or freshwater well.
2. No springs were identified within the proposed facility location.
3. The closest livestock watering well (C-03263-POD) to the facility is approximately 1,060-ft. to the south of the facilities southern edge.

In addition, *Figure 2.1 (Groundwater Wells Map)* illustrates that the proposed facility location is not located within 500-ft. of known domestic water wells and that there is six (6) groundwater or domestic water wells located within 1.0-mi. of the proposed facility.

10.0 DISTANCE TO WETLANDS

The United States Fish and Wildlife National Wetlands Inventory Maps were reviewed for the area of the proposed facility. *Figure 10* confirms the proposed facility is not located within an area of a potential wetland. In addition, *Figure 10* illustrates the following:

1. The nearest potential wetlands are located approximately 600-ft to the northwest and southeast of the proposed facility. The potential wetlands closest to the proposed facility are labeled as a "Riverine" with a wetland code "R4SBJ."
2. The National Wetlands Inventory Maps do not show a potential wetland located within 500-ft. of the proposed facility location.

It should be noted the United States Fish and Wildlife Service generates the NWI maps through infrared aerial imagery and aerial photograph interpretation; no actual field reconnaissance was conducted in the making of the maps. As such, the NWI maps do not always accurately identify wetlands or the extent of those wetlands; therefore, the maps are used for preliminary analysis only.

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SITE MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 1

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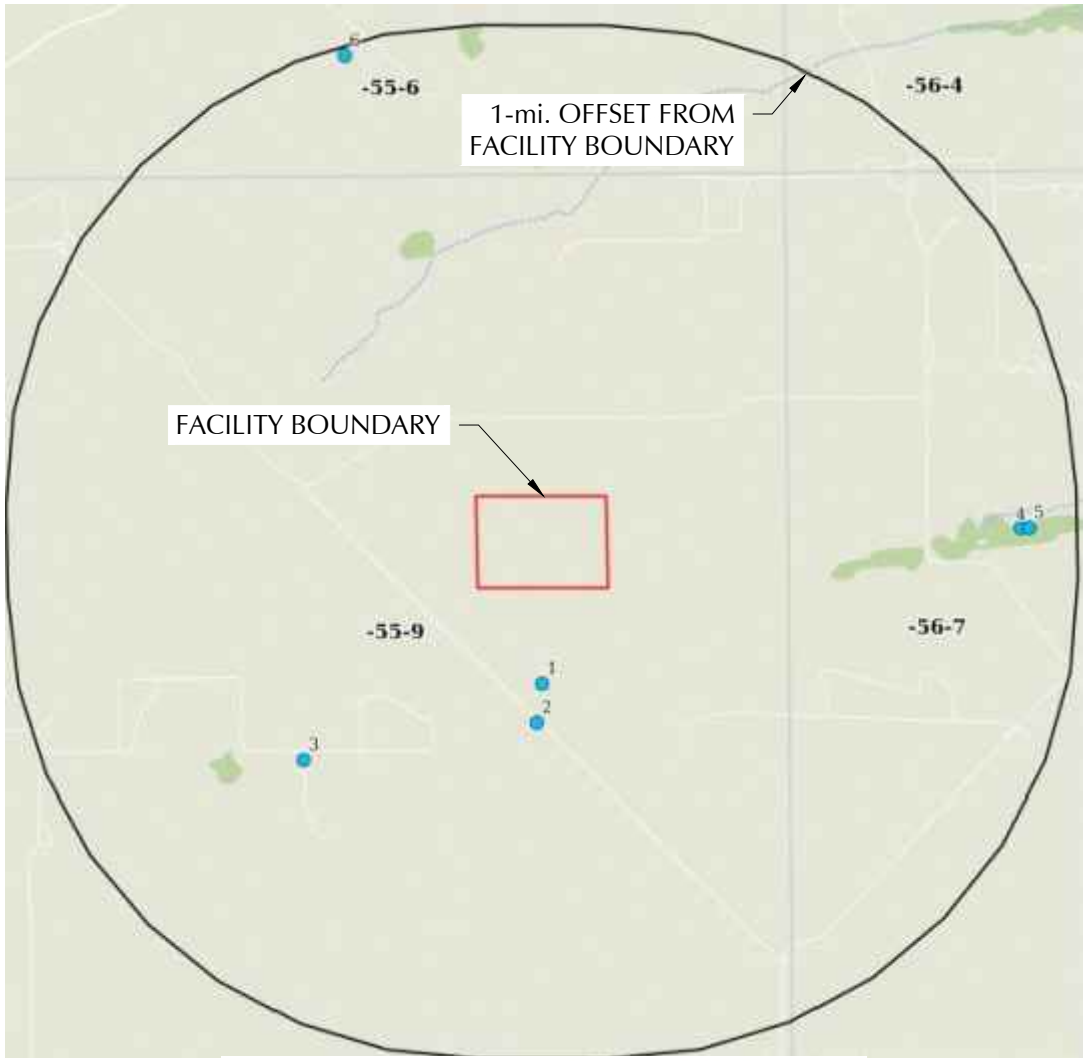
x: \Projects\2025\02\25244-00-000 blackbuck c-147 permit application\permit package\application figures\CAD\FIGURE 1 - SITE MAP.dwg



N

NORTH

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GROUNDWATER WELLS MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 2.1

9/2/2025 4:39:05 PM
X:\Projects\2025\25244-00-000 Blackbuck C-147 Permit Application\Permit Package\AAApplication Figures\CAD\FIGURE 2.1 - GROUNDWATER WELL MAP.dwg

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NEW MEXICO AQUIFERS MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 2.2

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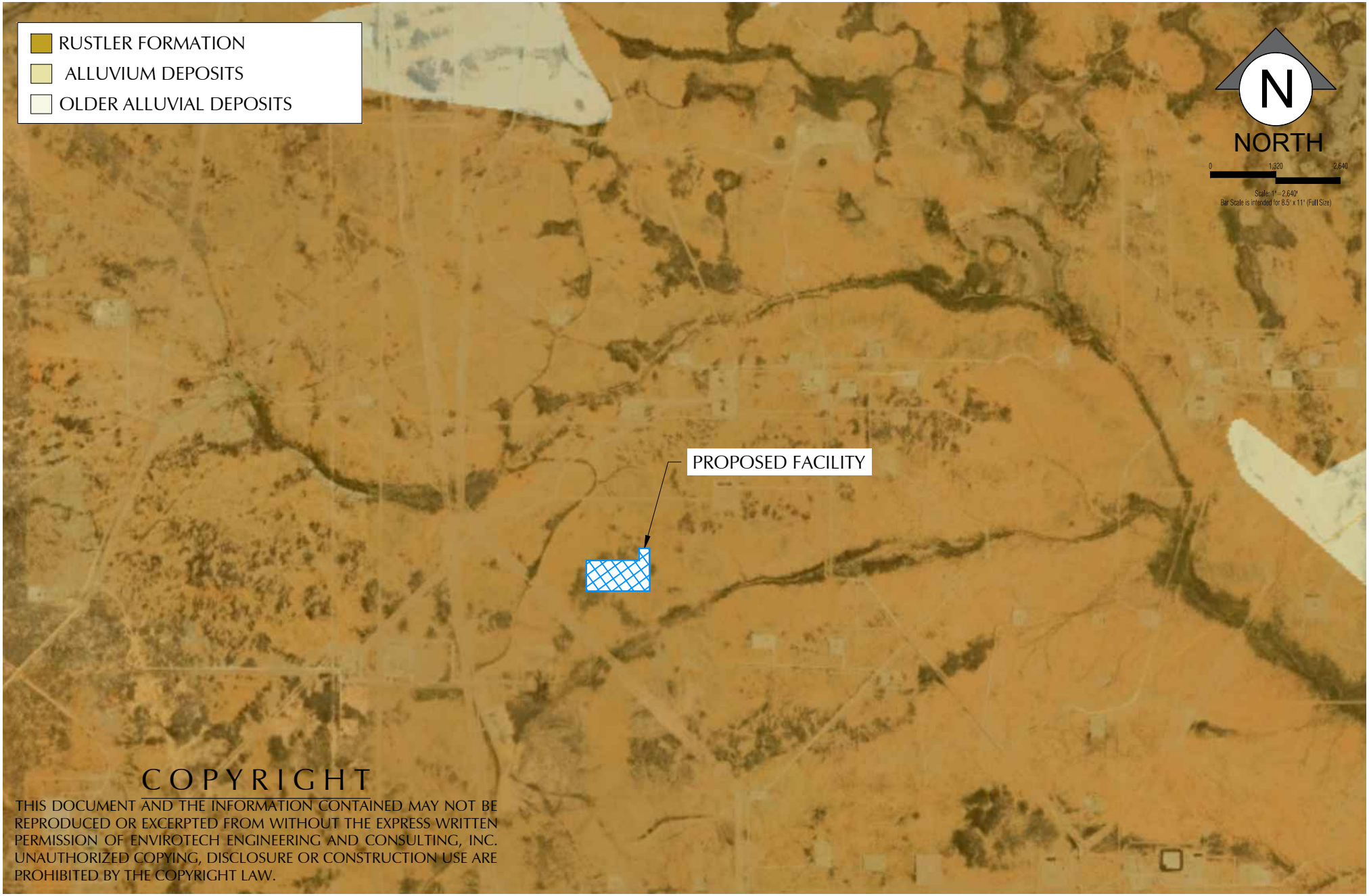
x:\Projects\2025\02\25244-00-000 blackbuck c-147 permit application\permit package\aaapplication figures\CAD\FIGURE 2.2 - NEW MEXICO AQUIFERS MAP.dwg



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NEW MEXICO GEOLOGICAL MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 2.3

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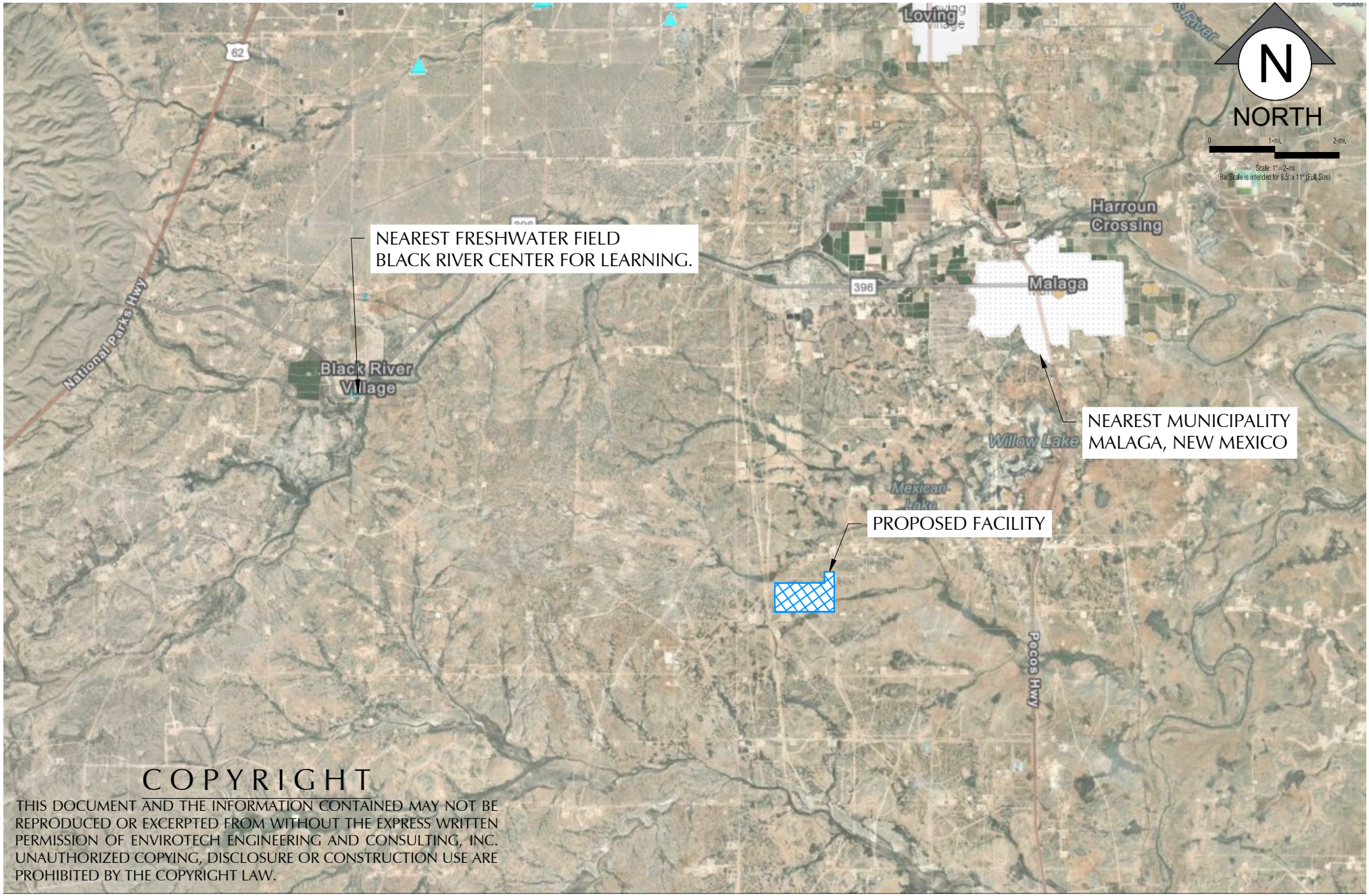
x:\Projects\2025\02.25244-00-000 blackbuck c-147 permit application\permit package\aaapplication figures\CAD\FIGURE 2.3 - NEW MEXICO GEOLOGICAL MAP.dwg



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MUNICIPALITIES & FRESHWATER FIELDS MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 3

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X:\Projects\2025\02\25244-00-000 blackbuck c-147 permit application\permit package\application figures\CAD\FIGURE 3 - MUNICIPALITIES & FRESHWATER FIELDS MAP.dwg

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NEW MEXICO REGISTERED MINES MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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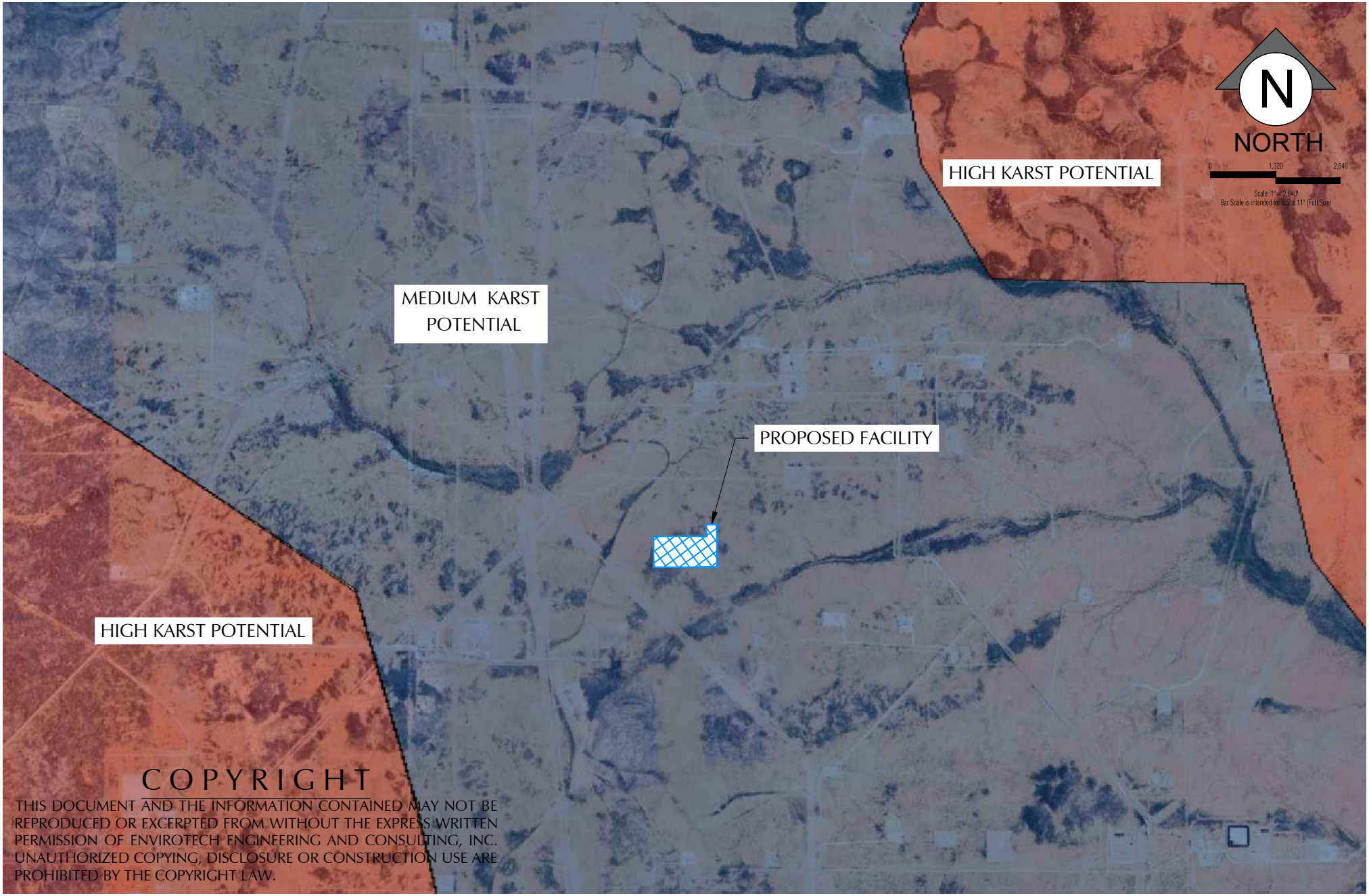
Figure 4

9/2/2025 1:33:58 PM
X:\Projects\2025\02\25244-00\000 blackbuck c-147 permit application\permit package\application figures\CAD\FIGURE 4 - NEW MEXICO REGISTERED MINES MAP.dwg



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KARST AND CAVE POTENTIAL MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 5

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x:\Projects\2025\02\25244-00\000 blackbuck c-147 permit application\permit package\aaapplication figures\CAD\FIGURE 5 - KARST AND CAVE MAP .dwg

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FEMA FLOOD MAP

SCOUT RECYCLE FACILITY
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SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 6

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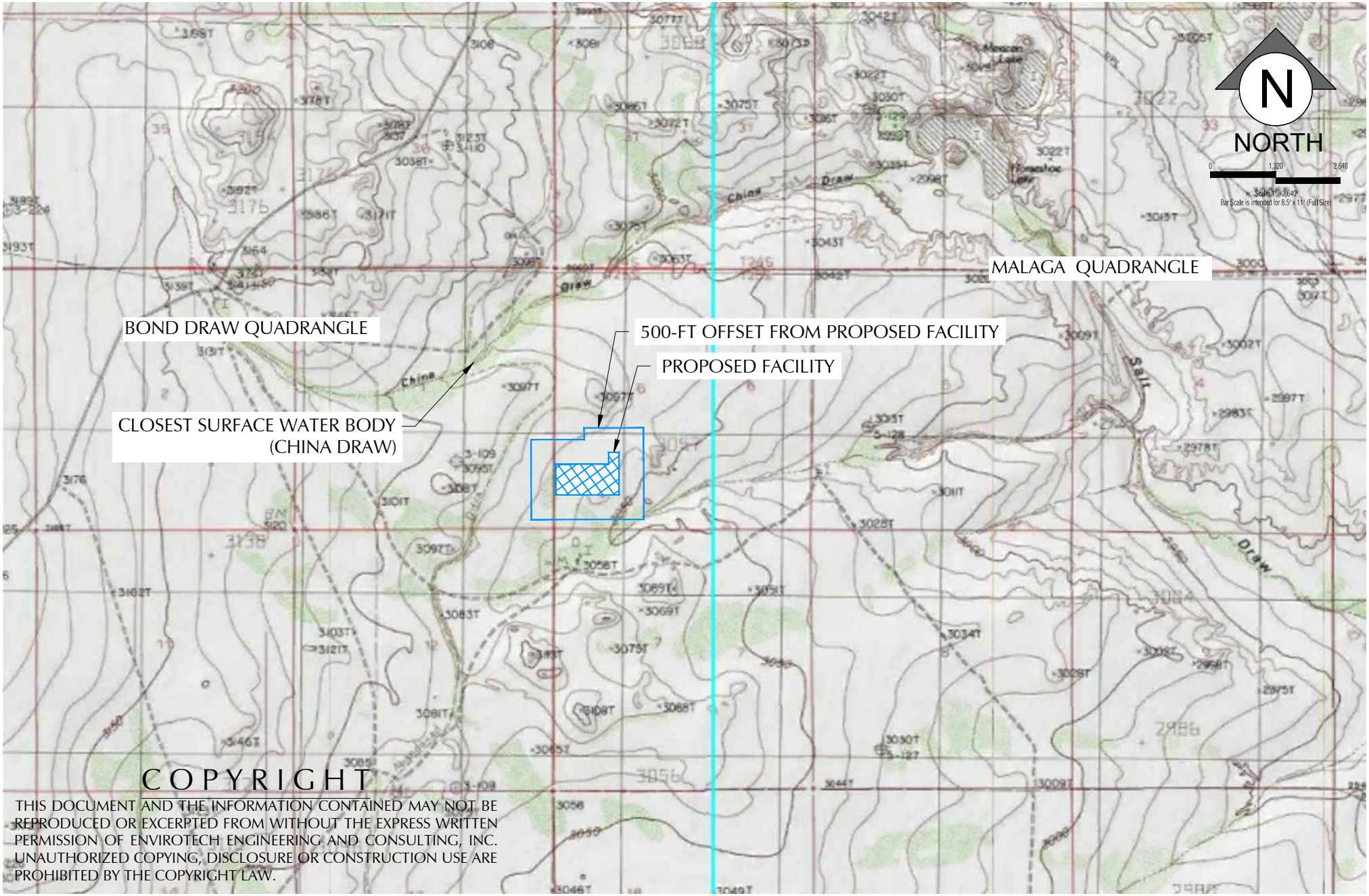

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SURFACE WATER MAP

SCOUT RECYCLE FACILITY
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SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 7

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PERMANENT RESIDENCES & STRUCTURES MAP

SCOUT RECYCLE FACILITY
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SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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Figure 8

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NON-PUBLIC WATER SUPPLY MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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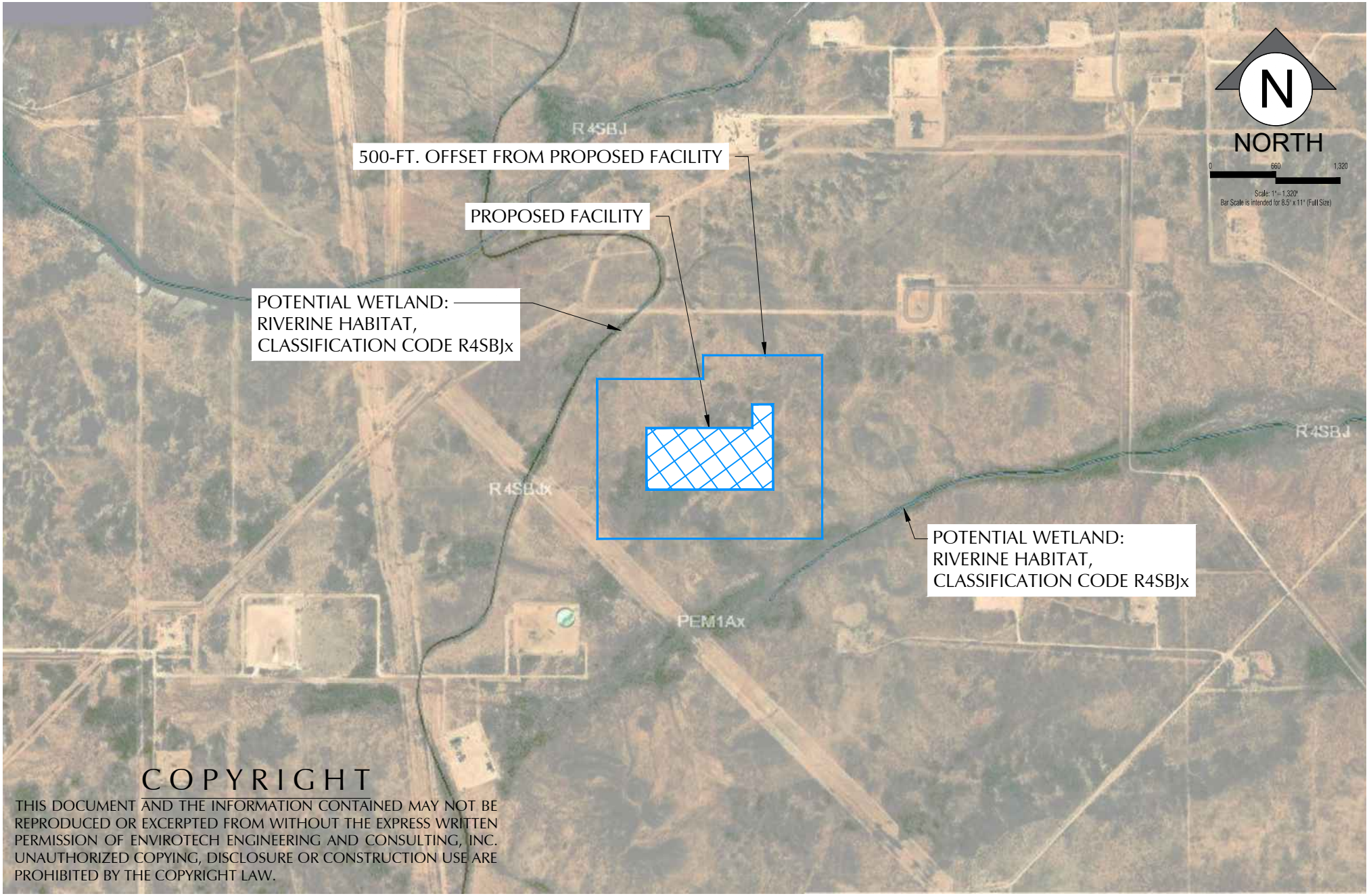
Figure 9

9/2/2025 1:34:31 PM
X:\Projects\2025\02\25244-00\000 blackbuck c-147 permit application\permit package\application figures\CAD\FIGURE 9 - NON-PUBLIC WATER SUPPLY MAP.dwg



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NWI WETLANDS MAP

SCOUT RECYCLE FACILITY
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

BLACKBUCK® RESOURCES

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Figure 10

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Attachment A

Banks Water Well Report

Prepared for:
ENVIROTECH ENGINEERING & CONSULTING, INC. - OKC
2500 N. 11th St
Enid, OK 73701

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Water Well Report

Scout Recycle Facility

NM

Eddy County

PO #: 025244-00

ES-146377

Tuesday, September 02, 2025

Table of Contents

Geographic Summary

Location
Eddy County, NM
Subject property is 34.85 acres, 0.054 square miles, and has a 0.95 mile perimeter

Coordinates (centroid)	
Lat/Long in Degrees Minutes Seconds	32° 9' 19.37", -104° 8' 2.27"
Lat/Long in Decimal Degrees	32.15538099135965, -104.133964341278
X/Y in NAD83 / UTM Zone 13N	581664.80627702, 3557987.2113676397

Elevation (centroid)
Subject Property lies 3066.63 feet above sea level.

Zip Codes Searched	
Search Distance	**Zip Codes**
Subject Property	88220
1.0 miles	88220

Topos Searched	
Search Distance	**Topo Name**
Subject Property	Bond Draw
1.0 miles	Malaga, Bond Draw

Water Well Summary

Datasets Searched	Distance	Total
US Water Well (WW)	1.0	4
NM Water Well (WW)	1.0	2
Total Wells Found		**6**

Summary Map - 1.0 Mile Radius

BANKS ENVIRONMENTAL DATA
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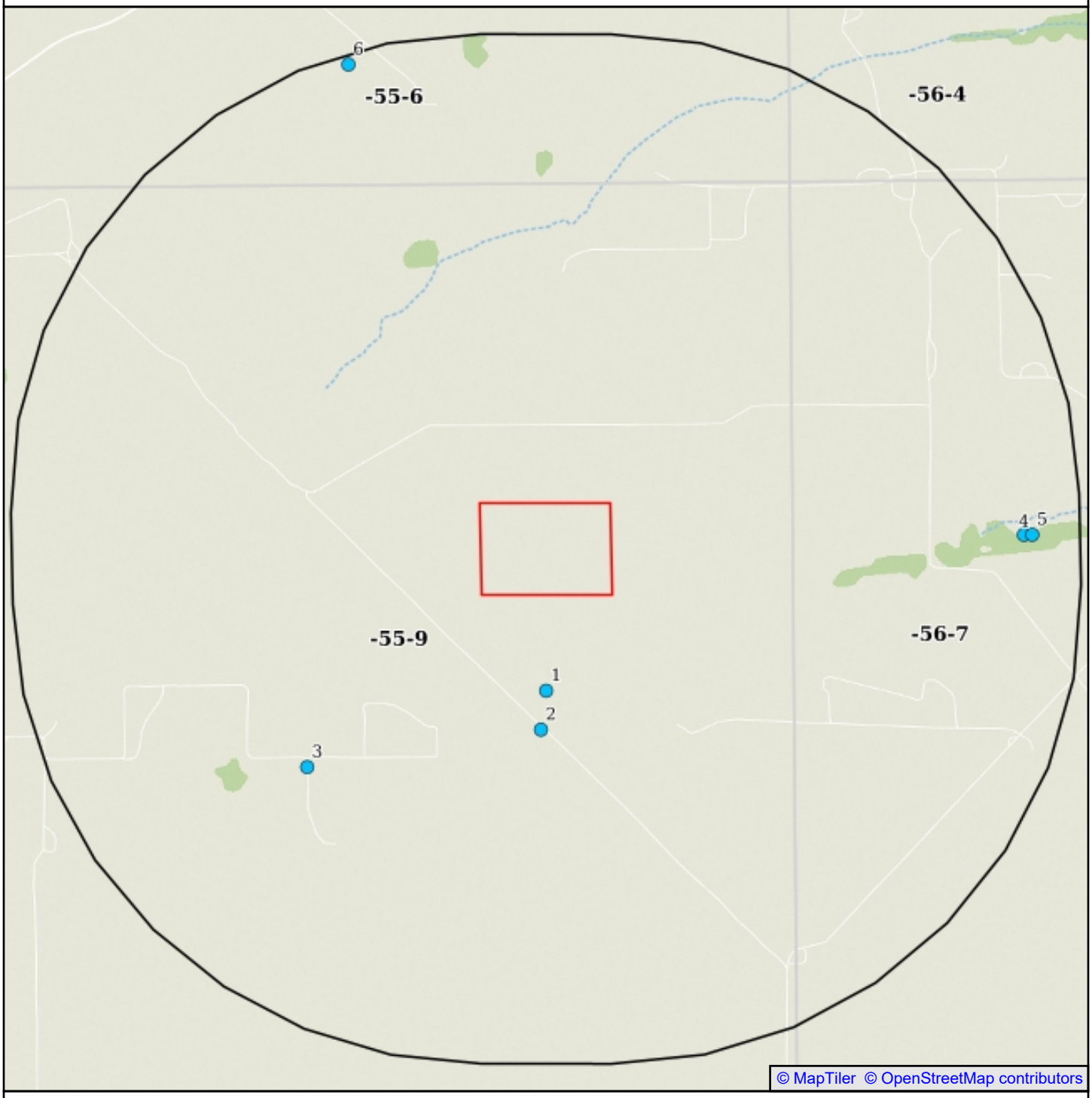


Scout Recycle Facility

Single Water Well
Water Well Cluster
US WW,NM WW

Subject Site
Search Buffer
Texas Quad Index

0' 1083' 2167'

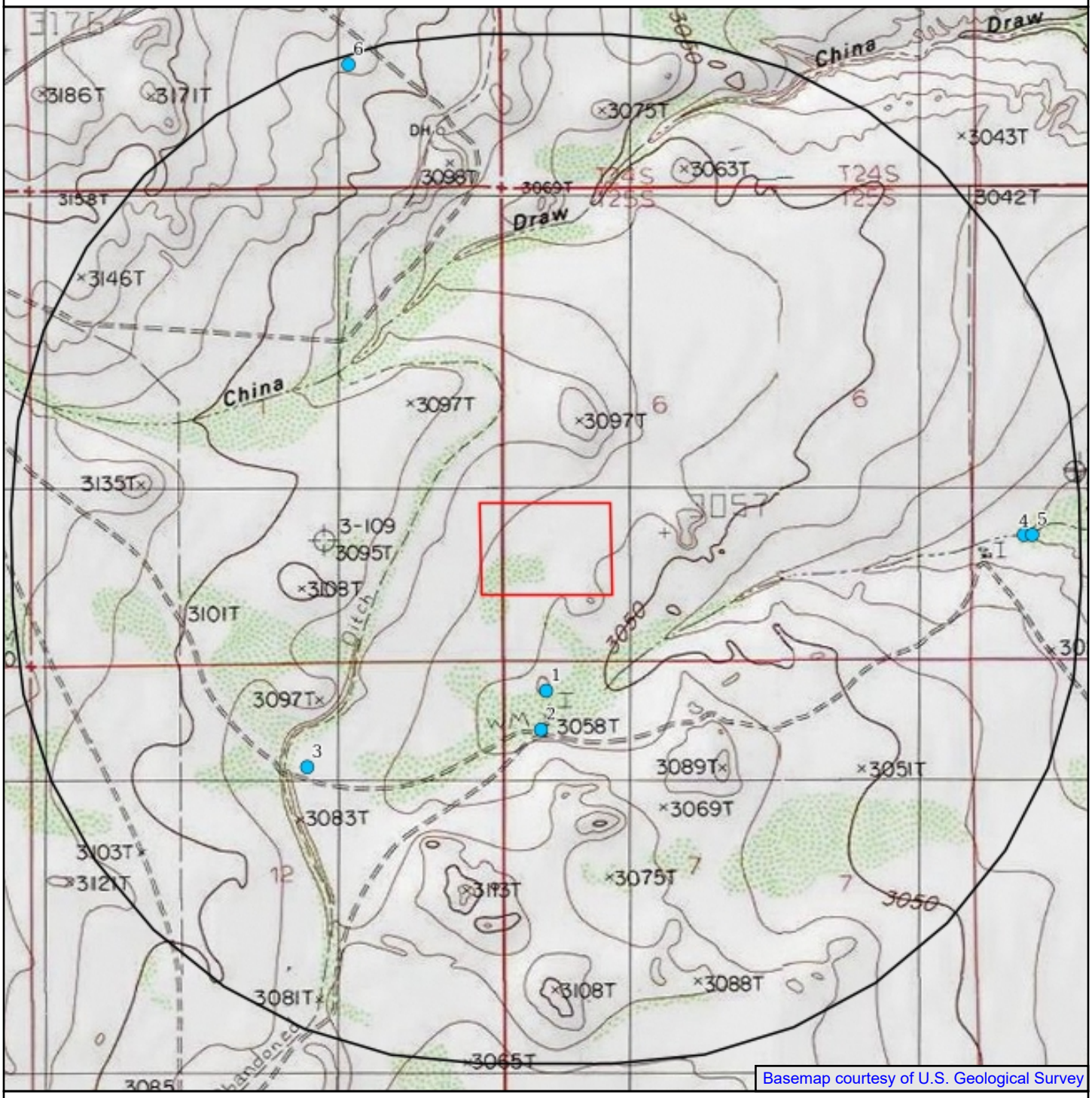
1:19500
1 in = 1625 ft
1 in = 0.308 mi
1 cm = 195 m
1 cm = 0.195 km

N

NAD83 / UTM Zone 13N
North American Datum 1983
Western Meridian: 108 0' 00" West
Eastern Meridian: 102 0' 00" West
Latitude of Origin: 0 0' 00" North

Topographic Overlay Map - 1.0 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



Scout Recycle Facility

Subject Property Quad Name(s)
See Geographic Summary

Single Water Well
Water Well Cluster
US WW,NM WW

Subject Site
Search Buffer

0' 1083' 2167'

1:19500
1 in = 1625 ft
1 in = 0.308 mi
1 cm = 195 m
1 cm = 0.195 km

N

NAD83 / UTM Zone 13N
North American Datum 1983
Western Meridian: 108 0' 00" West
Eastern Meridian: 102 0' 00" West
Latitude of Origin: 0 0' 00" North

Current Imagery Overlay Map - 1.0 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Scout Recycle Facility

Single Water Well
Water Well Cluster
US WW,NM WW

Subject Site
Search Buffer

0' 1083' 2167'

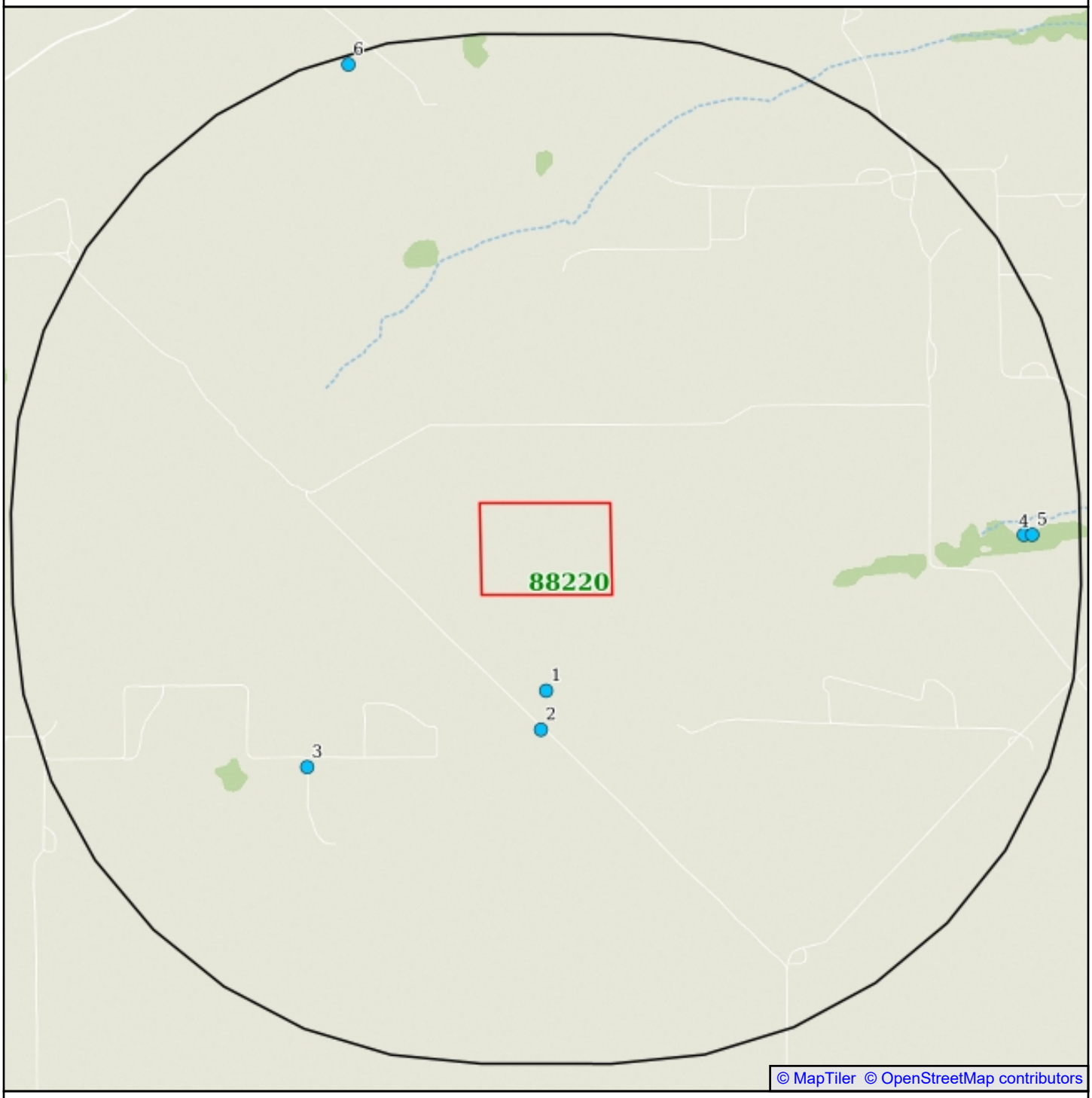
1:19500
1 in = 1625 ft
1 in = 0.308 mi
1 cm = 195 m
1 cm = 0.195 km

N

NAD83 / UTM Zone 13N
North American Datum 1983
Western Meridian: 108 0' 00" West
Eastern Meridian: 102 0' 00" West
Latitude of Origin: 0 0' 00" North

Zip Code Map - 1.0 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



Scout Recycle Facility

Single Water Well
Water Well Cluster
US WW,NM WW

Subject Site
Search Buffer
Zip Code Boundary

0' 1083' 2167'

1:19500
1 in = 1625 ft
1 in = 0.308 mi
1 cm = 195 m
1 cm = 0.195 km

N

NAD83 / UTM Zone 13N
North American Datum 1983
Western Meridian: 108 0' 00" West
Eastern Meridian: 102 0' 00" West
Latitude of Origin: 0 0' 00" North

Water Well Summary

Map ID	Source ID	Dataset	Owner	Well Type	Drill Depth	Static Level	Completion Date	Distance	Elevation	Details Page #
1	C-03263-POD1	WW	Claramai R Hayhurst		133		1964-05-06	0.20mi S	-5.91 ft	10
2	USGS321001104075601	WW	USGS	Not Reported	133			0.29mi S	-6.53 ft	11
3	USGS320855104083201	WW	USGS	Not Reported				0.52mi SW	+13.06 ft	12
4	USGS320920104065801	WW	USGS	Not Reported				0.88mi E	-54.23 ft	13
5	USGS320920104065701	WW	USGS	Not Reported				0.90mi E	-54.86 ft	14
6	C-04847-POD1	WW	Eog Resources		80		2024-07-31	0.98mi N	+44.49 ft	15

End of Water Well Summary

Map ID 1: WW

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

WW - Water Well

Map ID: 1		**Source: New Mexico Office of the State Engineer**
POD File Number: C-03263-POD1	**WW - Water Well**	**Banks ID: C-03263-POD1**
Well Address: NM		**Rel. Loc.: 0.20mi S**
Completion Date: 1964-05-06		**Drill Depth: 133.0**
Owner: Claramai R Hayhurst		**Elevation: 3060.73 ft (-5.91 ft)**

Well Description:	NON 72-12-1 LIVESTOCK WATERING
Owner Address:	1611 Mountain Shadow
Owner City:	Carlsbad
Owner State:	NM
Owner Zip:	88220
Contact Last Name:	
Contact First Name:	
Pod Status:	
Digital Log:	Go to webpage
Well Status:	DCL
Plug Date:	1899-12-30
Aquifer:	
Other Location:	

Map ID 2: WW

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID: 2		**Source: U.S. Geological Survey**
State ID: USGS320901104075601	**WW - Water Well**	**Banks ID: USGS320901104075601**
Well Address: US		**Rel. Loc.: 0.29mi S**
Completion Date:		**Drill Depth: 133.0**
Owner: USGS		**Elevation: 3060.11 ft (-6.53 ft)**

Agency Cd:	USGS
Site No:	320901104075601
Station Nm:	25S.28E.07.11143
Site Tp Cd:	GW

Map ID 3: WW

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID: 3		**Source: U.S. Geological Survey**
State ID: USGS320855104083201	**WW - Water Well**	**Banks ID: USGS320855104083201**
Well Address: US		**Rel. Loc.: 0.52mi SW**
Completion Date:		**Drill Depth:**
Owner: USGS		**Elevation: 3079.69 ft (+13.06 ft)**

Agency Cd:	USGS
Site No:	320855104083201
Station Nm:	25S.27E.12.12440
Site Tp Cd:	GW

Map ID 4: WW

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID: 4		**Source: U.S. Geological Survey**
State ID: USGS320920104065801	**WW - Water Well**	**Banks ID: USGS320920104065801**
Well Address: US		**Rel. Loc.: 0.88mi E**
Completion Date:		**Drill Depth:**
Owner: USGS		**Elevation: 3012.40 ft (-54.23 ft)**

Agency Cd:	USGS
Site No:	320920104065801
Station Nm:	25S.28E.05.33111
Site Tp Cd:	GW

Map ID 5: WW

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID: 5		**Source: U.S. Geological Survey**
State ID: USGS320920104065701	**WW - Water Well**	**Banks ID: USGS320920104065701**
Well Address: US		**Rel. Loc.: 0.90mi E**
Completion Date:		**Drill Depth:**
Owner: USGS		**Elevation: 3011.78 ft (-54.86 ft)**

Agency Cd:	USGS
Site No:	320920104065701
Station Nm:	25S.28E.05.331112
Site Tp Cd:	GW

Map ID 6: WW

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID: 6		**Source: New Mexico Office of the State Engineer**
POD File Number: C-04847-POD1	**WW - Water Well**	**Banks ID: C-04847-POD1**
Well Address: NM		**Rel. Loc.: 0.98mi N**
Completion Date: 2024-07-31		**Drill Depth: 80.0**
Owner: Eog Resources		**Elevation: 3111.12 ft (+44.49 ft)**

Well Description:	MONITORING WELL
Owner Address:	5509 Champions Dr.
Owner City:	Midland
Owner State:	TX
Owner Zip:	79706
Contact Last Name:	Grooms
Contact First Name:	Blake
Pod Status:	PLG
Digital Log:	Go to webpage
Well Status:	PMT
Plug Date:	2024-07-31
Aquifer:	
Other Location:	Core #1

End of WW Section

End of Water Well Details Section

Dataset Descriptions and Sources

Dataset	Source	Dataset Description	Update Schedule	Requested Date	Received Date	Update Date	Source Update Date
WW - Water Well (US)	U.S. Geological Survey	This dataset contains groundwater well records from the U.S. Geological Survey.	Quarterly	2025-06-11	2025-06-11	2025-06-11	2025-06-11
WW - Water Well (NM)	New Mexico Office of the State Engineer	The NM Office of the State Engineer (OSE) "Point of Diversions" (POD) layer includes well locations, surface declarations, or surface permits updated on a monthly basis. These data were extracted from the OSE W.A.T.E.R.S. (Water Administration Technical Engineering Resource System) database and geo-located (mapped). These data have varying degrees of accuracy and have not been validated. Data included in this dataset only includes PODs that have coordinates located within the State of New Mexico.	Quarterly	2025-09-02	2025-09-02	2025-09-02	2025-08-08

Disclaimer

The Banks Environmental Data Water Well Report was prepared from existing state water well databases and/or additional file data/records research conducted at the state agency and the U.S. Geological Survey. Banks Environmental Data has performed a thorough and diligent search of all groundwater well information provided and recorded. All mapped locations are based on information obtained from the source. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the actual driller. It may be possible that some water well schedules and logs have never been submitted to the regulatory authority by the water driller and, thus, may explain the possible unaccountability of privately drilled wells. It is uncertain if the above listing provides 100% of the existing wells within the area of review. Therefore, Banks Environmental Data cannot fully guarantee the accuracy of the data or well location(s) of those maps and records maintained by the regulatory authorities.

Attachment B

Groundwater Investigation Report

MEMORANDUM

Date: 9/3/2025

Subject: Measurement of Depth to Water – 32.150342°, -104.134030°

On 9/3/2025, I conducted a site visit to the 32.150342°, -104.134030° for the purpose of determining the static water level. The measurement was performed utilizing Solinst Model 101 P2 Water Level Meter, 200'.

The recorded depth to water was measured at **sixty feet (60 ft) below ground surface**.

The attached exhibit shows pictures of the test at the location.

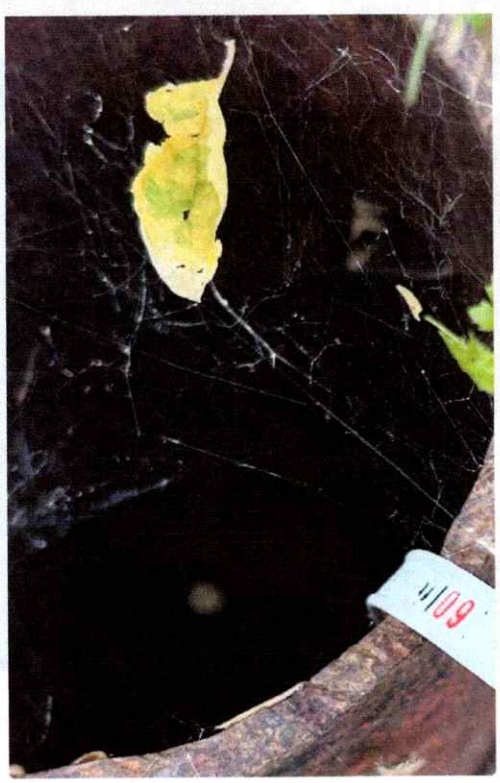
This memorandum is intended to formally document the field measurement for recordkeeping and reference purposes.

Respectfully submitted,

Cameron Weddle
Vice President – Operations

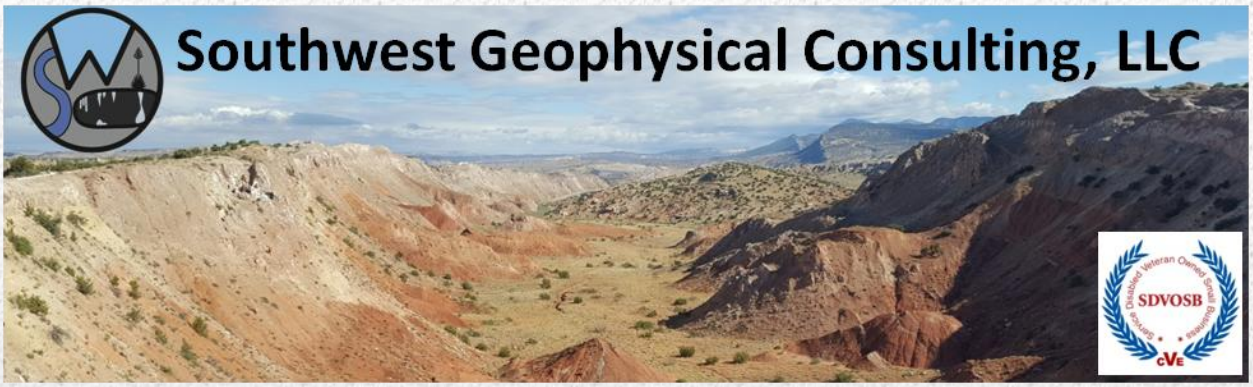
BLACKBUCK RESOURCES®

Exhibit



Attachment C

Aerial Karst Investigation Report



Cave and Karst Resource Inventory Report
Black Buck Recycle Facility
Eddy County, New Mexico

Prepared for:

Envirotech Engineering & Consulting, Inc.
2500 North 11th Street
Enid, OK 73701

☐ **Positive**

- ☐ **Relocation/Realignment Recommended**
- ☐ **Karst Monitor Recommended**
- ☐ **Relocation/Realignment Not Required**

☑ **Negative**

August 27, 2025

EVRO-009-20250801

Published by:
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MMXXV

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LIST OF TABLES

No tables are provided with this report.

1.0 INTRODUCTION

A surface karst survey was commissioned by Envirotech Engineering & Consulting, Inc. (hereinafter referred to as "the client"), on August 1, 2025, for the purpose of determining the presence of karst-related surface features within the Black Buck Recycle Facility project (hereinafter termed “BBRF”).

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

1.1 Goals of this Study

To provide the client with the location and description of any surface karst-related features within a 200-meter survey boundary surrounding the infrastructure for the BBRF project as provided by the client via e-mail (**Blackbuck Resources Recycle Facility Boundary 8.1.2025.kmz**) on August 6, 2025.

1.2 Summary of Findings

No surface karst features are located within the survey area for the BBRF project.

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

1.3 Affected Environment

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

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

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

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

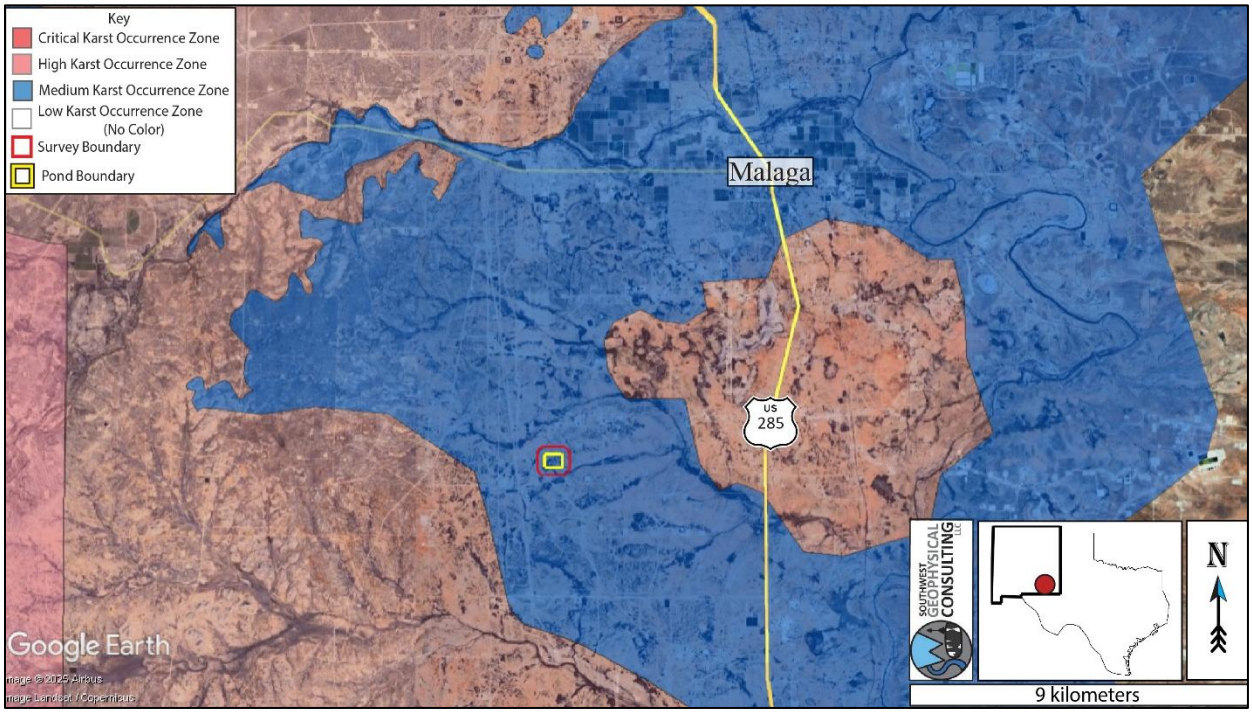


Figure 1: Karst occurrence overview. Background image: Google Earth. Image date: February 6, 2025. Datum: WGS-84.

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

1.4 Limitations of Report

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

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

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

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

2.0 LOCATION AND DESCRIPTION OF STUDY AREA

2.1 Description of Site

The BBRF project site is located in Eddy County, New Mexico, 9.7 kilometers (6.0 miles) southwest of Malaga, New Mexico, between U.S. Highway 285 and Road Runner Road (**Figure 1** and **Figure 2**). The infrastructure is located within section 1 of NM T25S R27E and section 6 of NM T25S R28E[3]. The region is semi-arid with an average annual precipitation of approximately 13 inches, of which about two-thirds falls as rain during summer thunderstorms from June to October. Summers are hot and sunny while winters are generally mild, with an average maximum temperature of 96°F in July and an average minimum temperature of 28°F in January[4]. This area is within the Chihuahuan Desert Thornscrub as defined by the Southwestern Regional ReGAP Vegetation map[5] and the vegetation consists mostly of areas of grass, sparse creosote, and sparse yucca, with very good visibility in most locations. See section ***2.2 Local Geology Summary*** for the geology of the area. The survey area is located within an MKOZ[2] (**Figure 1**) and within privately managed lands[6] (**Figure 2**).

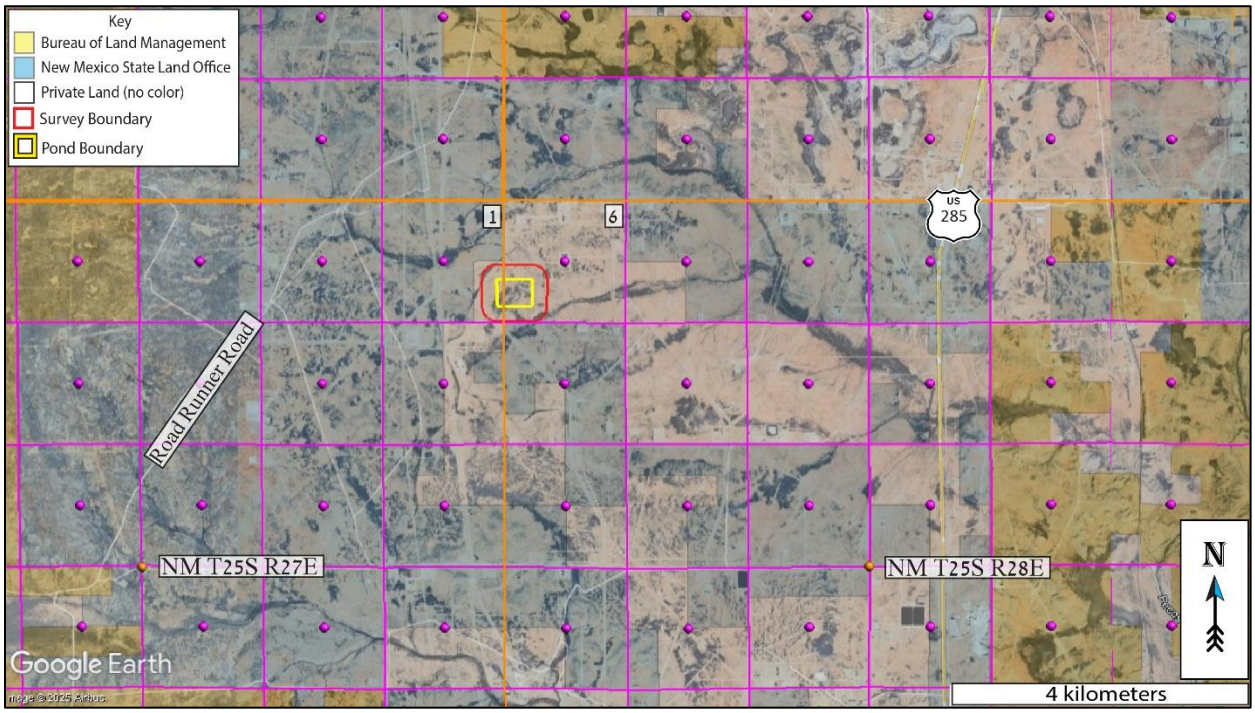


Figure 2: Land ownership and PLSS overview. Background image credit: Google Earth. Image date: February 6, 2025. Datum: WGS-84.

2.2 Local Geology Summary

The area surveyed for the BBRF project is located at an elevation of 935 meters (3,068 feet), ± 8 meters (26 feet), and is underlain by the Permian Rustler Formation (Pru). The area is mantled by thin gypsiferous soils (gypsite), and Quaternary alluvium (Qal)[7] between 0 and 6 meters in depth. (**Figure 3**).

The Rustler Formation is an evaporite facies composed mainly of thin siltstones and sandstones interbedded with claystones, dolomite, and gypsum, and contains both karst-forming strata (the Forty-niner and Tamarisk members) and two shallow aquifers (the Magenta and Culebra Dolomite members)[8].

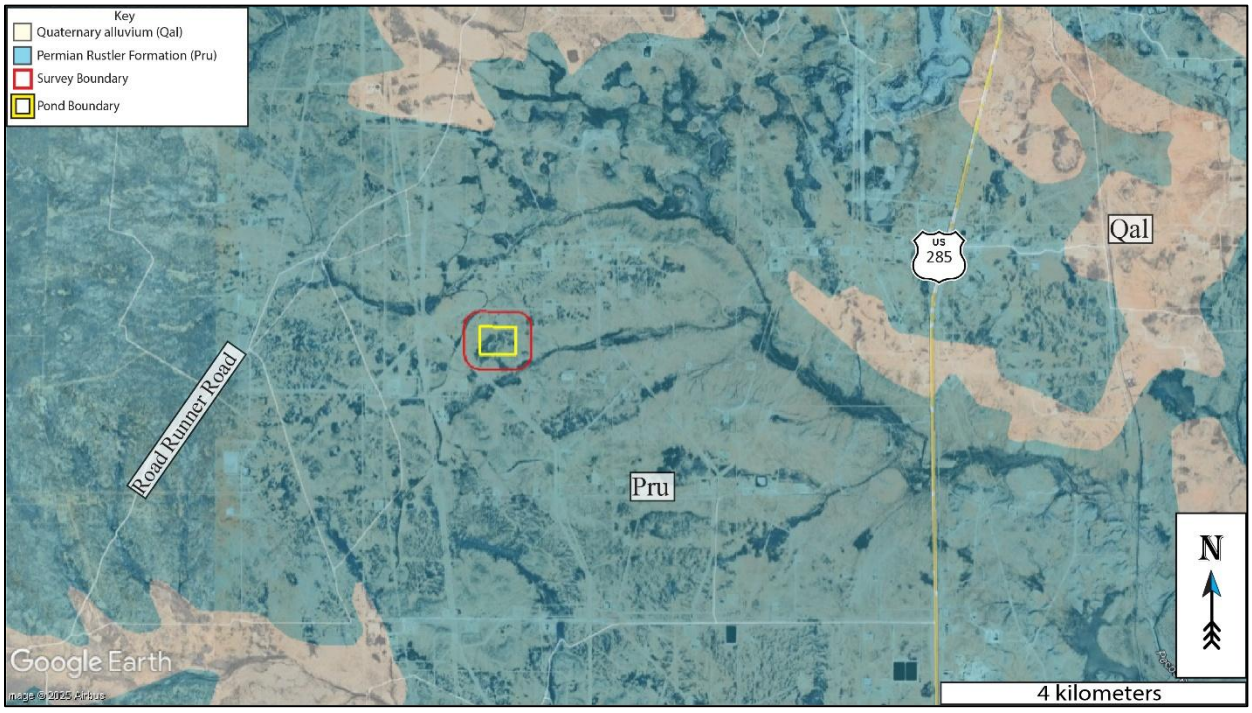


Figure 3: Geology overview. Map credit: The Digital Geologic Map of New Mexico in ARC/INFO Format, and Google Earth. Image date: February 6, 2025. Datum: WGS-84.

The Pru overlies the Permian Salado Formation (Psl), a layer of extremely soluble halite which can readily dissolve to create caves, sinkholes, and other karst features; however, due to its extremely soluble nature, only non-soluble silt and sand remain from the dissolution of this layer at the surface[8]. The Rustler Formation may be subject to collapse if a void has developed beneath it in the Salado Formation[9].

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

2.3 Description of Survey

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

Prior to conducting the surface karst survey, a desk study was performed by Southwest Geophysical Consulting. The study was performed using satellite and aerial imagery from Google Earth Pro dated February 6, 2025 (please note features less than one meter in diameter are generally not visible using this method); the Southwest Geophysical Cave and Karst Database dated August 1, 2025[11]; the Bond Draw, NM, 1:24,000 quad, 1985, USGS topographic map; and the latest lidar imagery from CalTopo.com. Please note that we use older topographic maps because newer maps have had caves removed from them. These searches and queries returned no previously recorded karst feature within the survey boundary.

Surface karst surveys are conducted by sUAS at low elevation following a preplanned raster pattern flightpath designed for the purpose of generating at least 75% imagery overlap. The collected high-resolution, georeferenced imagery is stitched together to develop orthomosaic imagery which is further developed into a digital elevation model (DEM); the DEM is then processed into a local relief model (LRM) (Error! Reference source not found.). This LRM is color coded to enhance differences in elevation of as little as five centimeters. The orthoimagery, DEM, and LRM are uploaded to a server where they are analyzed by a highly qualified karst geologist. Finally, the data is reviewed by a senior karst geologist for quality assurance and downloaded into a table for inclusion in a written report[12].

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

The imagery for this study was collected via sUAS by Pat Lagodney of SWCA on August 6, 2025. Surface karst features may have developed after this date and will not be noted in this report. Imagery analysis was completed by Dave Decker of Southwest Geophysical Consulting on August 11, 2025.

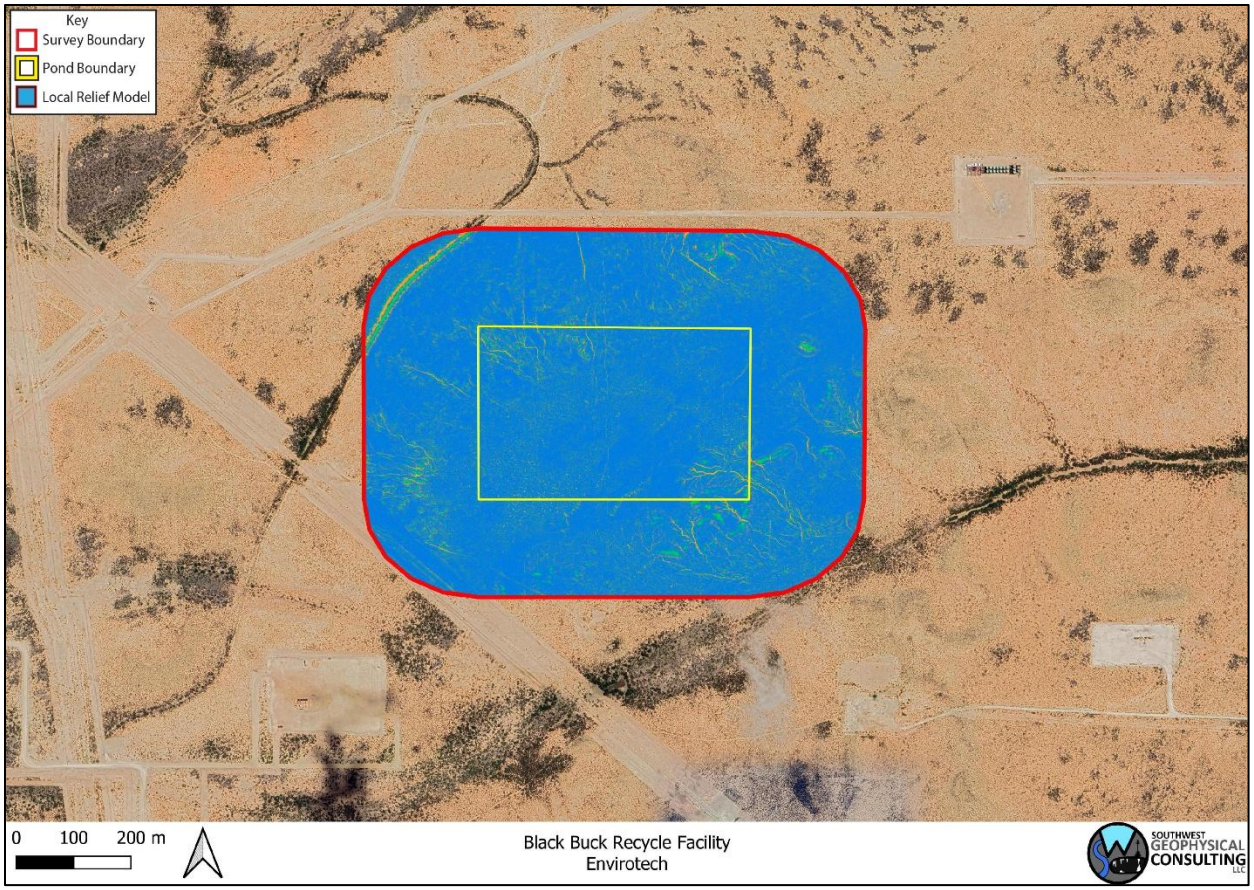


Figure 4: Survey overview. Background image credit: Google Earth. Image date: February 6, 2025. Datum: WGS-84.

2.4 Description of Karst Features

No surface karst features are located within the surface karst survey area for the BBRF project.

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

3.0 RECOMMENDATIONS

3.1 Summary

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

3.2 Best Practices

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

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

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

Approved karst monitors should have karst feature identification training, at least two years of supervised experience identifying karst features, wilderness first aid training, SRT training, confined space training, gas monitor training, and a minimum of SPAR cave rescue training through NCRC. They should have with them the proper gear and be prepared both physically and mentally to enter a collapse feature within minutes to perform a rescue if

needed. Monitoring services with qualified karst monitors, as well as cave surveys and geophysical surveys, are available from Southwest Geophysical Consulting.

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

Cave and karst resource inventory reports, karst feature investigations, and geophysical reports commissioned at the request of the land manager should be submitted to the BLM-CFO at blm_nm_karst@blm.gov.

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

4.0 REFERENCES

1 Goodbar, J. R. Vol. BLM Management Handbook H-8380-1 (ed Carlsbad Field Office) 59 (Bureau of Land Management, Denver, CO, 2015).

2 Decker, D., Trautner, E. & Palmer, R. (Bureau of Land Management - Carlsbad Field Office, 2025).

3 Earthpoint. *Earthpoint Tools for Google Earth*, <https://www.earthpoint.us/Townships.aspx> (2022).

4 W.R.C.C. *National Climate Data Center 1981-2010 Normal Climate Summary for Carlsbad, New Mexico (291469)*, 2010).

5 Whitehead, W. & Flynn, C. *Plant Utilization in Southeastern New Mexico: Botany, Ethnobotany, and Archaeology*. (Bureau of Land Management, Carlsbad Field Office, 2017).

6 NMSLO. Digital overlay (KML) of the surface land ownership in New Mexico (New Mexico State Land Office, Santa Fe, NM, 2024).

7 Green, G. N. & Jones, G. E. *The Digital Geologic Map of New Mexico in ARC/INFO Format*, <https://mrdata.usgs.gov/geology/state/state.php?state=NM> (1997).

8 Austin, G. S. *Geology and mineral deposits of Ochoan rocks in Delaware Basin and adjacent areas*. Vol. Circular 159 (New Mexico Bureau of Mines and Mineral Resources, 1978).

9 Martinez, J. D., Johnson, K. S. & Neal, J. T. Sinkholes in Evaporite Rocks. *American Scientist* **86**, 38-51 (1998).

10 Scholle, P. A. Geologic Map of New Mexico. (2003).

11 Decker, D. D., Jorgensen, G. L. & Palmer, R. in *Southwest Geophysical Cave and Karst Database* (ed LLC Southwest Geophysical Consulting) (Albuquerque, NM, 2025).

12 Whitehead, W., Bandy, M. & Decker, D. Protocol for Using UAV Photography for Rapid Assessment of Karst Features in Southeast New Mexico. *Proceedings of the 2022 Cave and Karst Management Symposium* (2022).

5.0 GLOSSARY OF TERMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
AGI	Advanced Geosciences Inc.
BLM-CFO	Bureau of Land Management - Carlsbad Field Office
brecciated	Fractured rock caused by faulting or collapse.
caprock-collapse sinkhole	Collapse of roof-spanning rock into a cave or void.
cave	Natural opening at the surface large enough for a person to enter.
cover-collapse sinkhole	Collapse of roof-spanning soil or clay ground cover into a subsurface void.
GPS	Global Positioning System
grike	A solutionally enlarged, vertical, or sub-vertical joint or fracture.
(H)	High confidence modifier for a PKF. This is typically reserved for a feature that is definitely karst but has not been confirmed in the field.
HKOZ	High Karst Occurrence Zone
karst	A landscape containing solutional features such as caves, sinkholes, swallets, and springs.
(L)	Low confidence modifier for a PKF. This is typically a feature that cannot be ruled out as karst but is most likely NOT karst related. This modifier may also be used for pseudokarst features.
LED	Locally enclosed depression. A natural depression on the surface that collects rainwater. Some contain swallets and/or caves, others do not.
LiDAR	Light Detection And Ranging
(M)	Medium confidence modifier for PKF. This is an ambiguous feature that can’t be positively identified as karst without a field visit (e.g., burrows, abandoned unlined wells, solution tubes, pseudokarst).
MKOZ	Medium Karst Occurrence Zone
NCRC	National Cave Rescue Commission
NKF	Non-karst feature. Used for features originally identified as PKF that have been subsequently identified in the field as non-karst related. This term may also be used for pseudokarst features.
NMSLO	New Mexico State Land Office
Ohm-m	Ohm-meter, a unit of measurement for resistivity. Also sometimes abbreviated Ω-m.
paleokarst	Previously formed karst features that have been filled in by erosion and/or deposition of minerals.
Pat	Permian Artesia Group
Pc	Permian Capitan Formation

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

6.0 ATTESTATION

David D. Decker, PhD, PG, CPG
Chief Executive Officer, Principal Geologist
Southwest Geophysical Consulting, LLC
5117 Fairfax Dr. NW
Albuquerque, NM 87114
dave@swgeophys.com
(505) 585-2550

CERTIFICATE OF AUTHOR

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

- I am currently employed as a consulting geologist in the specialty of caves and karst with an office address of 5117 Fairfax Dr. NW, Albuquerque, NM, USA, 87114.
- I graduated with a Master of Science in Applied Physics with a specialization in Sensor Systems from the Naval Post Graduate School in Monterey, California, in 2003, and a Doctor of Philosophy in Earth and Planetary Sciences from the University of New Mexico, Albuquerque, New Mexico, in 2018.
- I am a Licensed Professional Geologist in the State of Texas, USA (PG-15242) and have been since 2021. I am a Certified Professional Geologist through the American Institute of Professional Geologists (CPG-12123) and have been since 2021.
- I have been employed as a geologist continuously since 2016. I was previously employed as a Fire Controlman, Naval Flight Officer, and Aerospace Engineering Duty Officer in the U.S. Navy and operated, maintained, and installed various sensor systems including magnetic, electromagnetic, radar, communications, and acoustic systems in various capacities from 1986 through 2010.
- I have been involved in various aspects of cave and karst studies continuously since 1985, including exploration, mapping, and scientific studies.
- I have read the definition of “qualified karst professional” set out in the ASTM Standard Practice for Preliminary Karst Terrain Assessment for Site Development (ASTM E-1527). I meet the definition of “qualified professional” for the purposes of this standard.
- I am responsible for the content, compilation, and editing of all sections of report number EVRO-009-20250801 entitled, “Cave and Karst Resource Inventory Report, Black Buck Recycle Facility, Eddy County, New Mexico.” I or a duly authorized representative of Southwest Geophysical Consulting, LLC, have personally visited or reviewed the aerial imagery for this site on the date or dates mentioned in section ***2.3 Description of Survey***.

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

Dated in Albuquerque, New Mexico, August 28, 2025.

David D. Decker
PhD, CPG-12123

Attachment D

Engineering Drawings

SCOUT RECYCLE FACILITY

BLACKBUCK NEW MEXICO LLC

SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &

SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST

EDDY COUNTY, NEW MEXICO

32° 09' 22.5210" N, 104° 07' 58.5408" W

32.156256°, -104.132928°

BLACKBUCK® RESOURCES

CONTACTS

BARRY RILEY - BLACKBUCK RESOURCES - (713)-804-9481

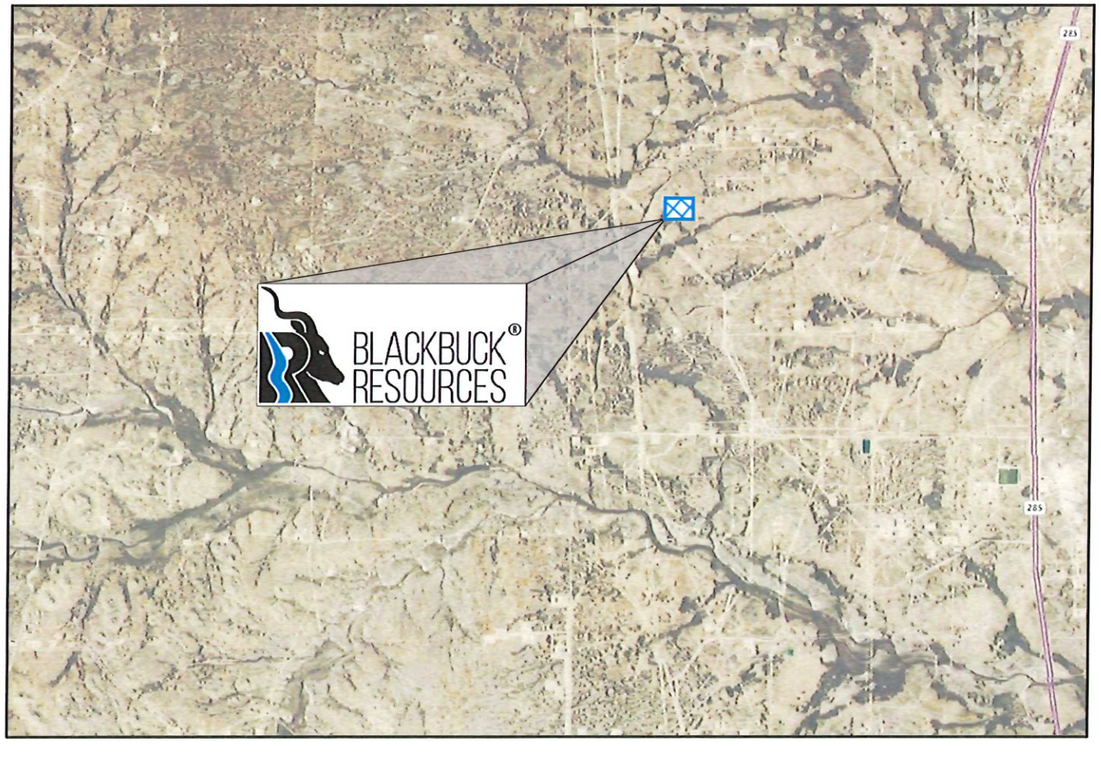
ENVIROTECH ENGINEERING & CONSULTING - SIERRA JOSSELYN (580)-234-8780 (DESIGN ENGINEER)

ENVIROTECH ENGINEERING & CONSULTING - MITCHELL RATKE, PE (580)-234-8780 (SUPERVISING ENGINEER)

nm811 Professional Resources for Damage Prevention

UTILITY CAUTION

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



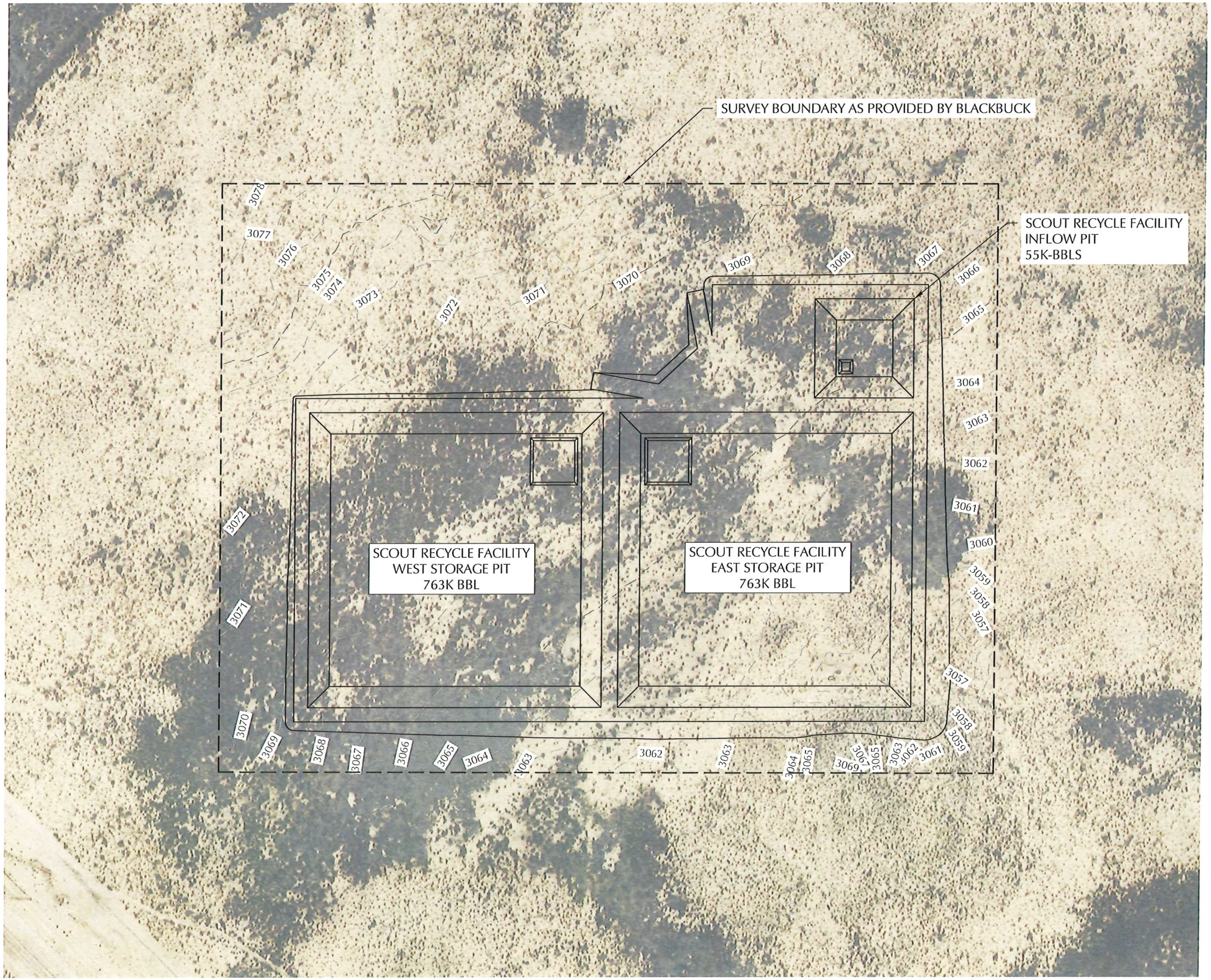
INDEX TO DRAWINGS

MITCHELL JOSEPH RATKE NEW MEXICO 29736 PROFESSIONAL ENGINEER

9-11-2025

ENVIROTECH ENGINEERING

2500 N. Eleventh Street Enid, OK 73701 • 580.234.8780 • envirotechconsulting.com
PE #29736 - Expiration Data: 12-31-2026



NORTH

Scale 1" = 200'

Bar Scale is intended for 11" x 17" (Full Size)

ENVIROTECH ENGINEERING

2500 North Eleventh Street

Enid, Oklahoma

580.234.8780

envirotechconsulting.com

P.E. #29736 - Expiration Date: 12-31-2026

NO.	DATE	DESCRIPTION

BLACKBUCK RESOURCES

EXISTING SITE FEATURES
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC

SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	1" = 200'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	3 OF 14

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER

9-11-2025

9/11/2025 9:24:55 AM
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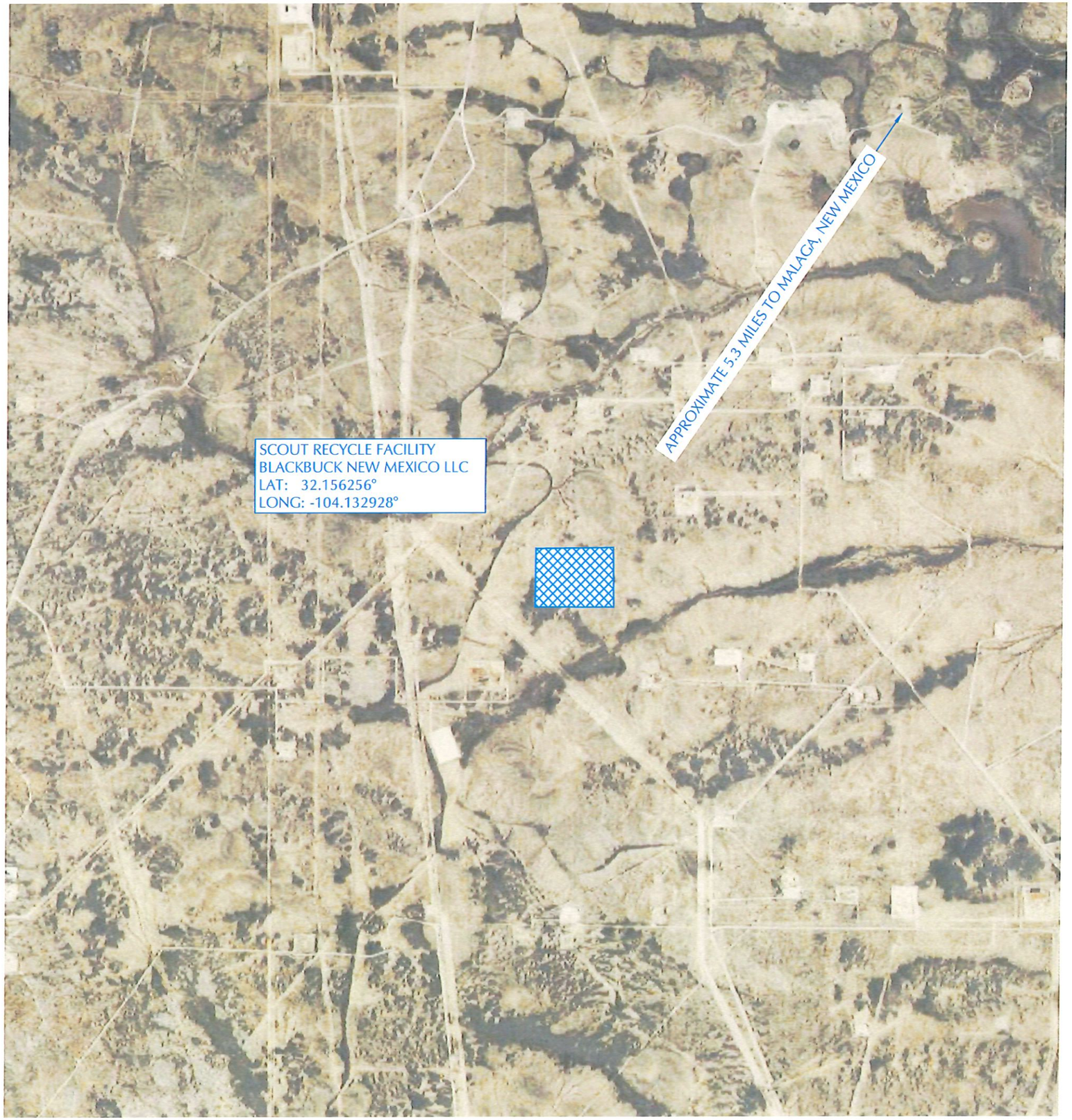

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NORTH
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Scale: 1"=2000
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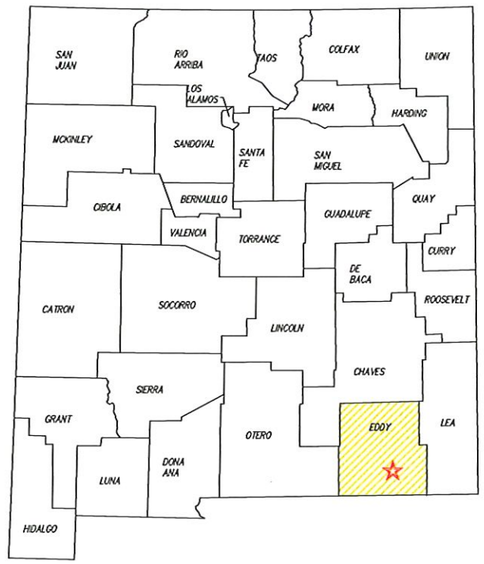

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9.11.2025

ENVIROTECH ENGINEERING
2500 North Eleventh Street
Enid, OKlahoma
580.234.8780
envirotechconsulting.com
P.E. #29736 - Expiration Date: 12-31-2026

NO.	DATE	DESCRIPTION

BLACKBUCK® RESOURCES

PROJECT LOCATION
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	1" = 2000
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	2 OF 14

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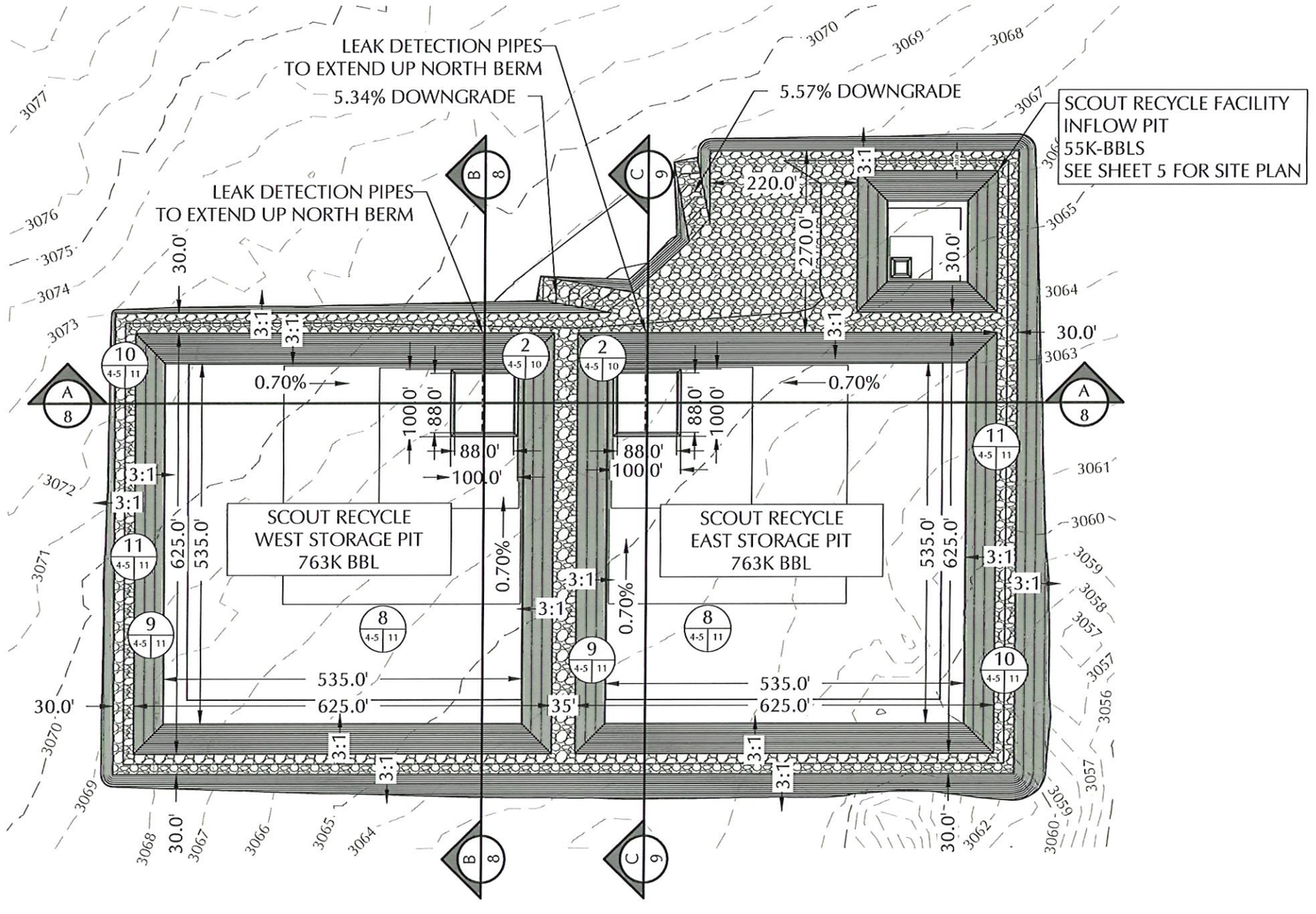
DETAIL NUMBER

SHEET NUMBER WHERE DETAIL IS LOCATED ON PLAN SHEET

SHEET NUMBER WHERE DETAIL IS LOCATED WITHIN SET



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NORTH
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Scale: 1"=200'
Bar Scale is intended for 11" x 17" (Full Size)

DETAILS KEY MAP

- 2 (4-5 | 10) SUMP OVERVIEW DETAIL
- 8 (4-5 | 11) LINER SYSTEM FLOOR DETAIL
- 9 (4-5 | 11) LINER SYSTEM SIDE SLOPE DETAIL
- 10 (4-5 | 11) TYPICAL BERM CREST DETAIL
- 11 (4-5 | 11) ANCHOR TRENCH DETAIL

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NO.	DATE	DESCRIPTION

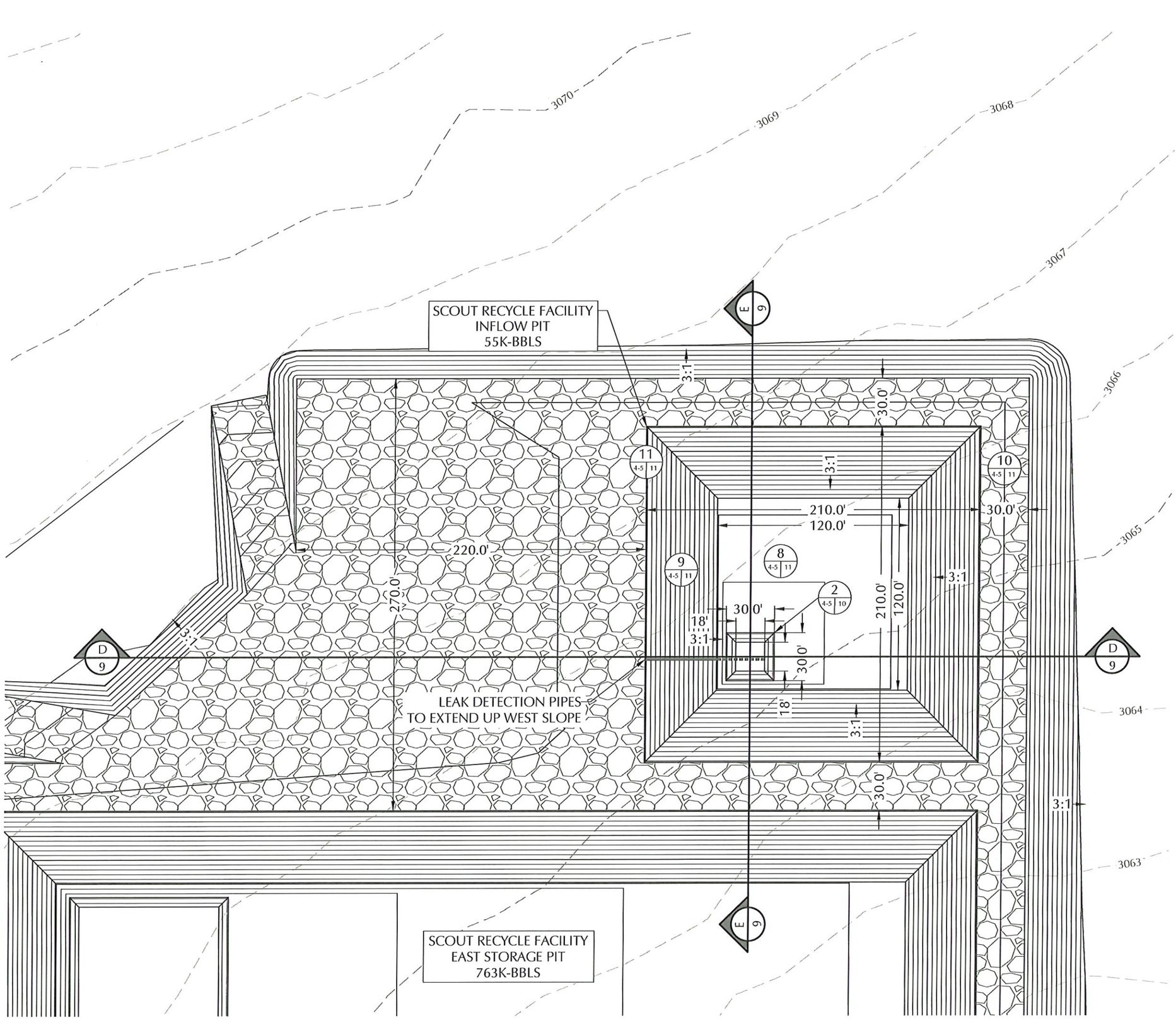
BLACKBUCK® RESOURCES

STORAGE PIT SITE PLAN
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC

SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	1" = 200'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	4 OF 14

MITCHELL, JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025



N
NORTH
0 30 60
Scale: 1"=60'
Bar Scale is intended for 11" x 17" (Full Size)

DETAILS KEY MAP

- 2 / 4-5 / 10 — SUMP OVERVIEW DETAIL
- 8 / 4-5 / 11 — LINER SYSTEM FLOOR DETAIL
- 9 / 4-5 / 11 — LINER SYSTEM SIDE SLOPE DETAIL
- 10 / 4-5 / 11 — TYPICAL BERM CREST DETAIL
- 11 / 4-5 / 11 — ANCHOR TRENCH DETAIL

MITCHELL JOSEPH RATKE
NEW MEXICO
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Enid, Oklahoma
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P.E. #29736 - Expiration Date: 12-31-2026

NO.	DATE	DESCRIPTION

BLACKBUCK® RESOURCES

INFLOW PIT SITE PLAN
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	1" = 60'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	5 OF 14

9/11/2025 9:25:06 AM
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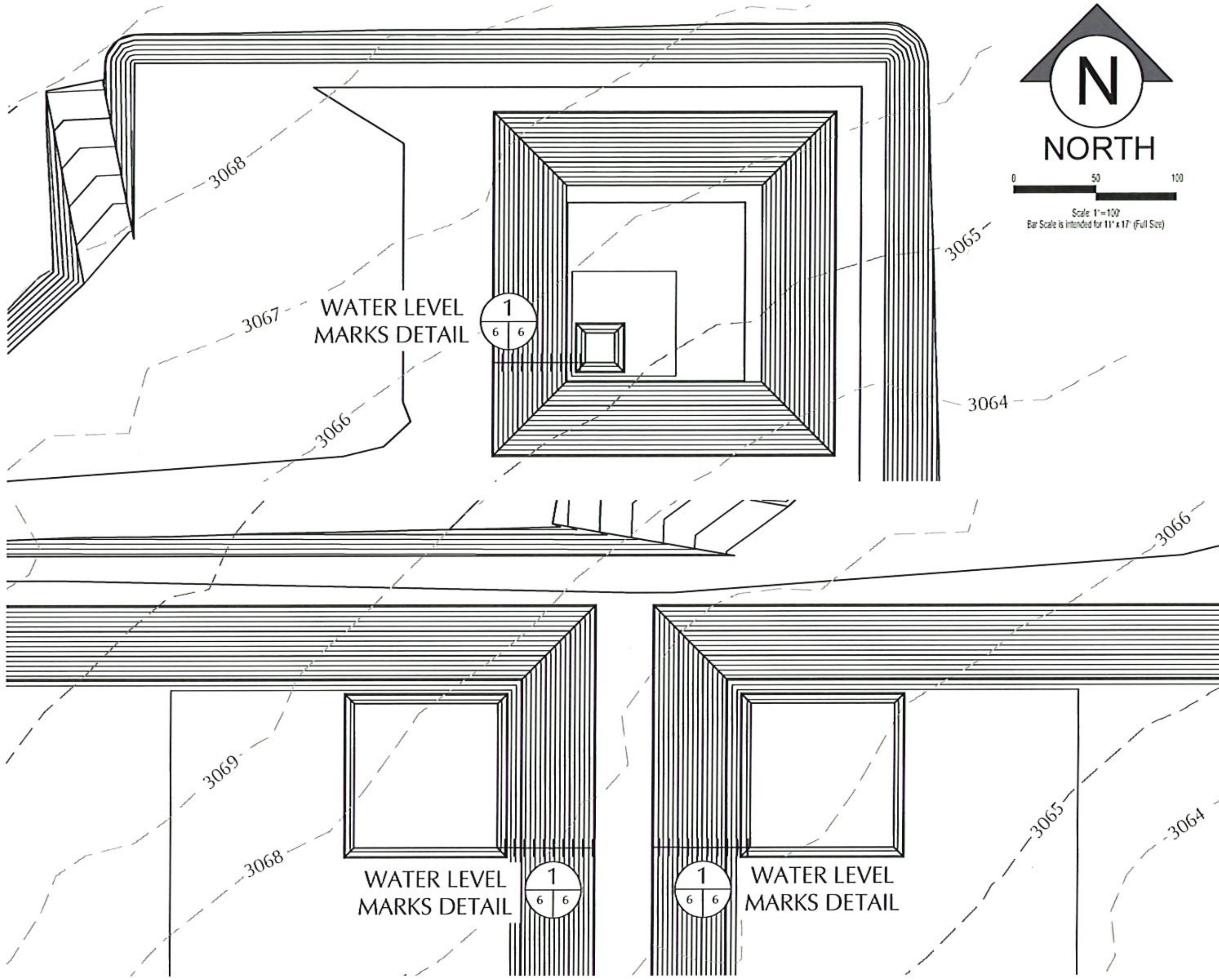

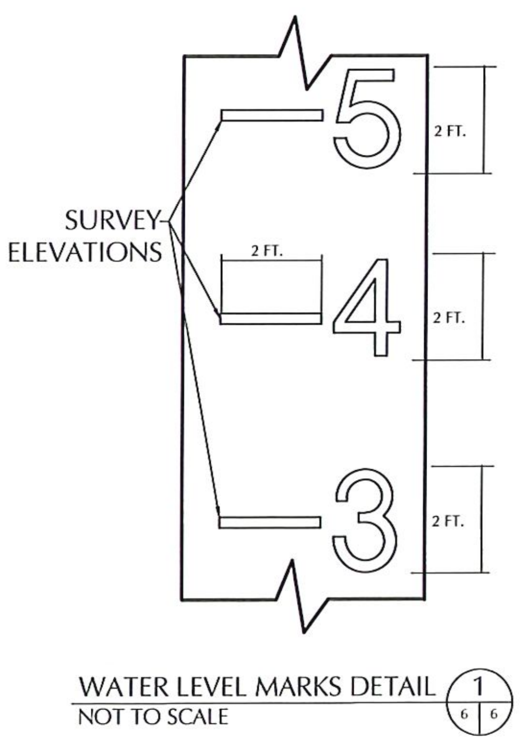

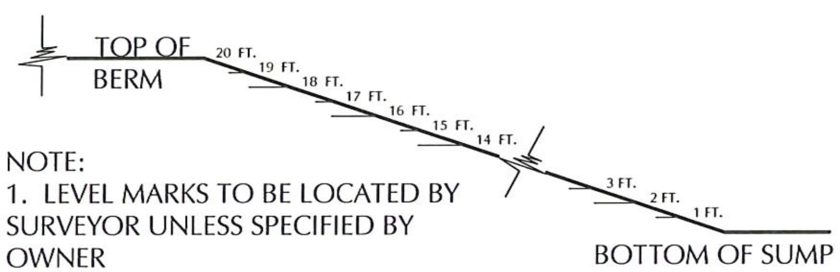

NOTE:

1. LEVEL MARKS TO BE LOCATED BY SURVEYOR UNLESS SPECIFIED BY OWNER
2. MARKS TO BE MADE BY AN EXTRUSION WELDER USING BLACK FILAMENT (OR WHITE FILAMENT ON BLACK LINER).
3. MARKS SHOULD BEGIN AT THE TOP OF BERM AND CONTINUE TO THE BOTTOM OF THE SUMP. (TOP OF BERM SHOULD READ 20-FT ON EAST AND WEST STORAGE PITS, AND 19-FT ON INFLOW PIT, BOTTOM OF SUMP +1-FT SHOULD READ 1-FT)
4. REFERENCE PIT CAPACITY TABLES FOR ACCURATE ELEVATIONS

Owner: BLACKBUCK RESOURCES
Site Name: SCOUT RECYCLE STORAGE PITS

Lagoon Features	Top	Bottom	Max Liq. Level
Side slope Ratio	3		3
Maximum Depth (ft)	20.0		17.0
Lagoon Top Width (ft)	625	535	607
Lagoon Top Length (ft)	625	535	607
Maximum Total Vol (ft³)	5,422,821		4,284,524
Maximum Total Vol (bbls)	965,908		763,155

Legend: Freeboard; Maximum Capacity; Storage Volume; Floor; Sump

Elevation ft	Lagoon Liq Depth ft	Storage ft	Remaining Stor Vol ft3	Gallons Storage gal	BBLS Storage bbls	Percent of Total Volume %	Vol in lagoon ft³	Gallons Storage gal	Vol in Lagoon bbls	Vol in Lagoon ac-ft	Percent Total Vol %
3075.25	20.0	0.0	-	-	-	0.0%	5,422,821	40,568,123	965,908	124.49	100%
3074.25	19.0	1.0	386,835	2,893,913	68,903	7.1%	5,035,986	37,674,210	897,005	115.61	93%
3073.25	18.0	2.0	766,243	5,732,267	136,483	14.1%	4,656,577	34,835,856	829,425	106.90	86%
3072.25	17.0	3.0	1,138,297	8,515,597	202,752	21.0%	4,284,524	32,052,526	763,155	98.36	79%
3071.25	16.0	4.0	1,503,067	11,244,444	267,725	27.7%	3,919,754	29,323,679	698,183	89.99	72%
3070.25	15.0	5.0	1,860,626	13,919,344	331,413	34.3%	3,562,195	26,648,780	634,495	81.78	66%
3069.25	14.0	6.0	2,211,046	16,540,837	393,829	40.8%	3,211,775	24,027,286	572,078	73.73	59%
3068.25	13.0	7.0	2,554,399	19,109,461	454,987	47.1%	2,868,422	21,458,662	510,921	65.85	53%
3067.25	12.0	8.0	2,890,757	21,625,756	514,899	53.3%	2,532,064	18,942,368	451,009	58.13	47%
3066.25	11.0	9.0	3,220,192	24,090,259	573,578	59.4%	2,202,629	16,477,864	392,330	50.57	41%
3065.25	10.0	10.0	3,542,776	26,503,510	631,036	65.3%	1,880,045	14,064,614	334,872	43.16	35%
3064.25	9.0	11.0	3,858,581	28,866,044	687,287	71.2%	1,564,240	11,702,079	278,621	35.91	29%
3063.25	8.0	12.0	4,167,679	31,178,405	742,343	76.9%	1,255,142	9,389,718	223,565	28.81	23%
3062.25	7.0	13.0	4,470,141	33,441,127	796,217	82.4%	952,680	7,126,997	169,690	21.87	18%
3061.25	6.0	14.0	4,766,041	35,654,752	848,923	87.9%	656,780	4,913,372	116,985	15.08	12%
3060.25	5.0	15.0	5,055,449	37,819,813	900,472	93.2%	367,372	2,748,310	65,436	8.43	7%
3059.25	4.0	16.0	5,271,079	39,432,938	938,879	97.2%	151,742	1,135,185	27,028	3.48	3%
3058.25	3.0	17.0	5,373,623	40,200,075	957,145	99.1%	49,198	368,048	8,763	1.13	1%
3057.25	2.0	18.0	5,405,127	40,435,757	962,756	99.7%	17,694	132,367	3,152	0.41	0%
3056.25	1.0	19.0	5,414,538	40,506,160	964,432	99.8%	8,283	61,963	1,475	0.19	0%
3055.25	0.0	20.0	5,422,821	40,568,123	965,908	100.0%	-	-	-	-	0%

Owner: BLACKBUCK RESOURCES
Site Name: SCOUT RECYCLE INFLOW PIT

Lagoon Features	Top	Bottom	Max Liq. Level
Side slope Ratio	3		3
Maximum Depth (ft)	19.0		16.0
Lagoon Top Width (ft)	210	120	192
Lagoon Top Length (ft)	210	120	192
Maximum Total Vol (ft³)	432,380		310,950
Maximum Total Vol (bbls)	77,015		55,386

Legend: Freeboard; Maximum Capacity; Storage Volume; Floor; Sump

Elevation ft	Lagoon Liq Depth ft	Storage ft	Remaining Stor Vol ft3	Gallons Storage gal	BBLS Storage bbls	Percent of Total Volume %	Vol in lagoon ft³	Gallons Storage gal	Vol in Lagoon bbls	Vol in Lagoon ac-ft	Percent Total Vol %
3075.25	19.0	0.0	-	-	-	0.0%	432,380	3,234,636	77,015	9.93	100%
3074.25	18.0	1.0	43,008	321,744	7,661	9.9%	389,372	2,912,891	69,355	8.94	90%
3073.25	17.0	2.0	83,407	623,966	14,856	19.3%	348,973	2,610,670	62,159	8.01	81%
3072.25	16.0	3.0	121,430	908,416	21,629	28.1%	310,950	2,326,220	55,386	7.14	72%
3071.25	15.0	4.0	157,149	1,175,631	27,991	36.3%	275,231	2,059,004	49,024	6.32	64%
3070.25	14.0	5.0	190,636	1,426,151	33,956	44.1%	241,744	1,808,485	43,059	5.55	56%
3069.25	13.0	6.0	221,964	1,660,515	39,536	51.3%	210,416	1,574,121	37,479	4.83	49%
3068.25	12.0	7.0	251,204	1,879,260	44,744	58.1%	181,176	1,355,376	32,271	4.16	42%
3067.25	11.0	8.0	278,429	2,082,925	49,593	64.4%	153,952	1,151,711	27,422	3.53	36%
3066.25	10.0	9.0	303,709	2,272,050	54,096	70.2%	128,671	962,586	22,919	2.95	30%
3065.25	9.0	10.0	327,118	2,447,172	58,266	75.7%	105,262	787,464	18,749	2.42	24%
3064.25	8.0	11.0	348,727	2,608,828	62,115	80.7%	83,653	625,807	14,900	1.92	19%
3063.25	7.0	12.0	368,609	2,757,562	65,656	85.3%	63,771	477,074	11,359	1.46	15%
3062.25	6.0	13.0	386,834	2,893,907	68,903	89.5%	45,546	340,729	8,113	1.05	11%
3061.25	5.0	14.0	403,476	3,018,403	71,867	93.3%	28,904	216,233	5,148	0.66	7%
3060.25	4.0	15.0	418,606	3,131,592	74,562	96.8%	13,774	103,044	2,453	0.32	3%
3059.25	3.0	16.0	428,280	3,203,960	76,285	99.1%	4,100	30,676	730	0.09	1%
3058.25	2.0	17.0	431,204	3,225,838	76,806	99.7%	1,176	8,797	209	0.03	0%
3057.25	1.0	18.0	431,936	3,231,316	76,936	99.9%	444	3,320	79	0.01	0%
3056.25	0.0	19.0	432,380	3,234,636	77,015	100.0%	-	-	-	-	0%

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025

ENVIROTECH ENGINEERING

P.E. #29736 - Expiration Date: 12-31-2026

NO.	DATE	DESCRIPTION

BLACKBUCK® RESOURCES

PIT CAPACITIES
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST & SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	1" = 100'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	6 OF 14

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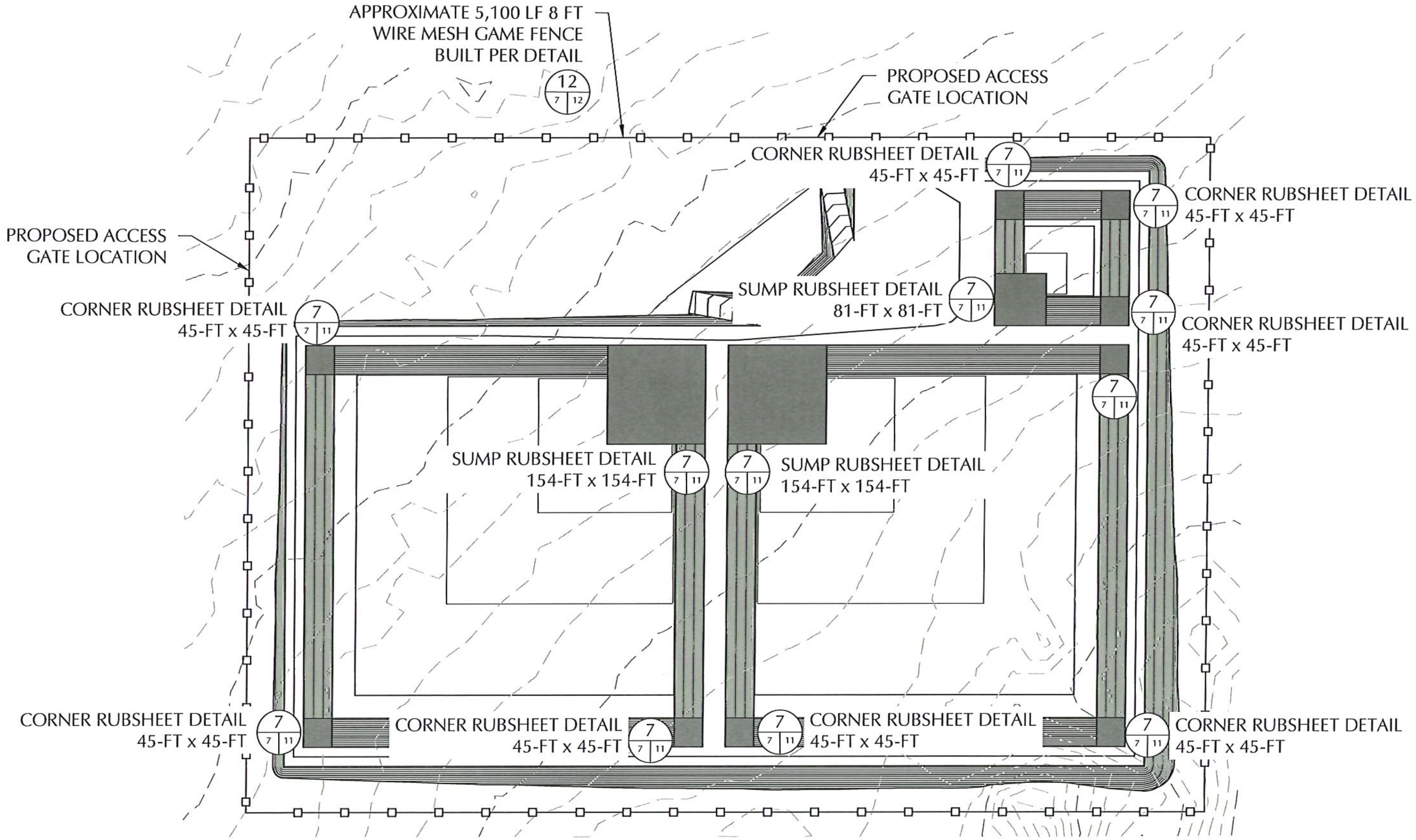

NORTH

Scale: 1"=200'

NOTE:
RUBSHEET DIMENSIONS ARE TAKEN AT THE ANCHOR TRENCH

ENVIROTECH ENGINEERING
2500 North Eleventh Street
Enid, Oklahoma
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NO.	DATE	DESCRIPTION

BLACKBUCK RESOURCES

RUBSHEET & FENCE PLAN
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025

DATE:	SEPTEMBER 2025
SCALE:	1" = 200'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	7 OF 14

9/11/2025 9:25:21 AM
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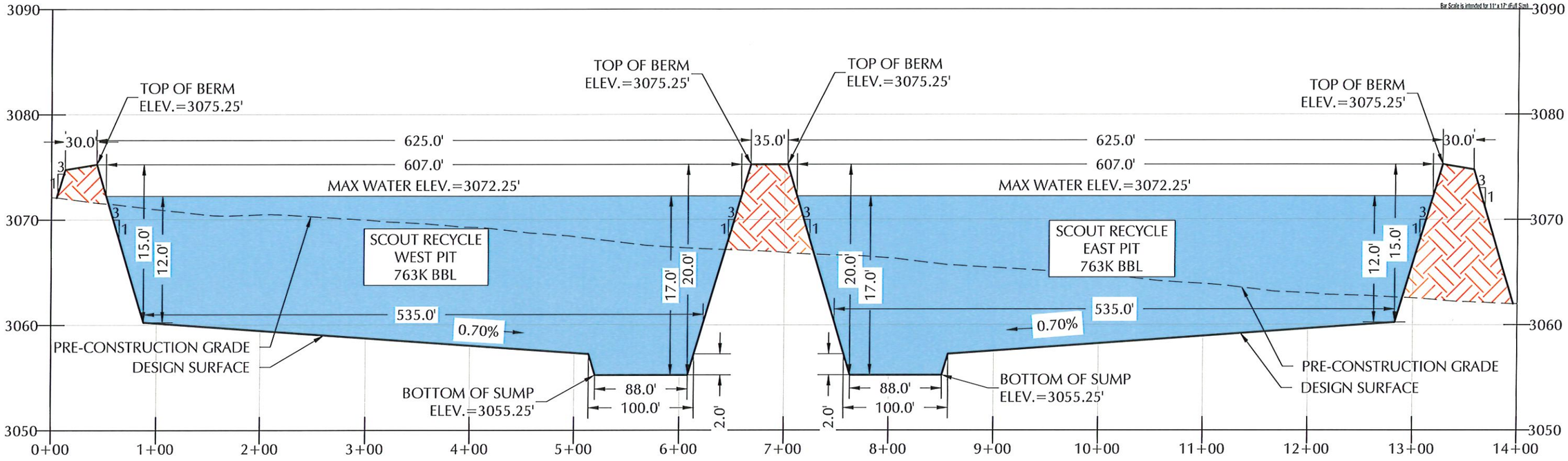
CROSS SECTION A-A



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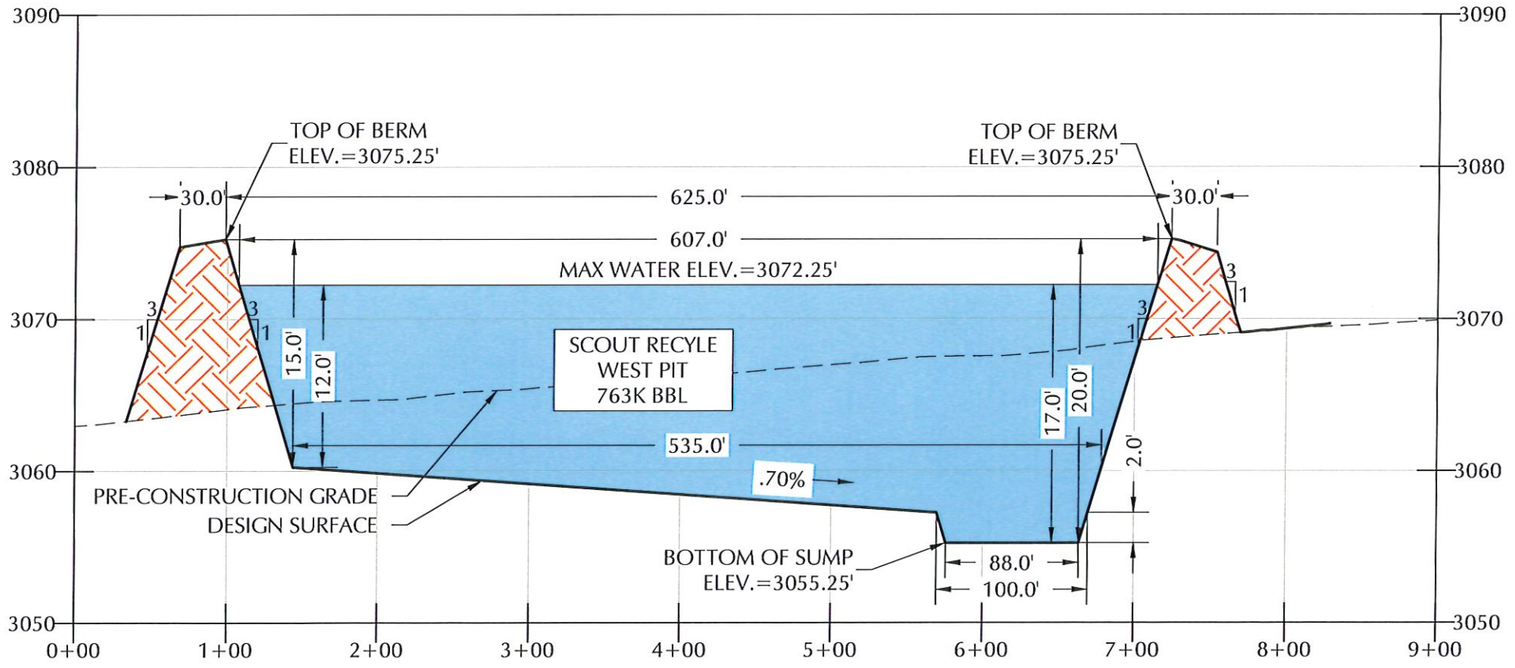

ENVIROTECH ENGINEERING
2500 North Eleventh Street
Enid, Oklahoma
580.234.8760
envirotechconsulting.com
P.E. #29736 - Expiration Date: 12-31-2026

NO.	DATE	DESCRIPTION

BLACKBUCK® RESOURCES

CROSS SECTIONS A & B
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	HORIZONTAL 1"=100' VERTICAL 1"=10'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	8 OF 14

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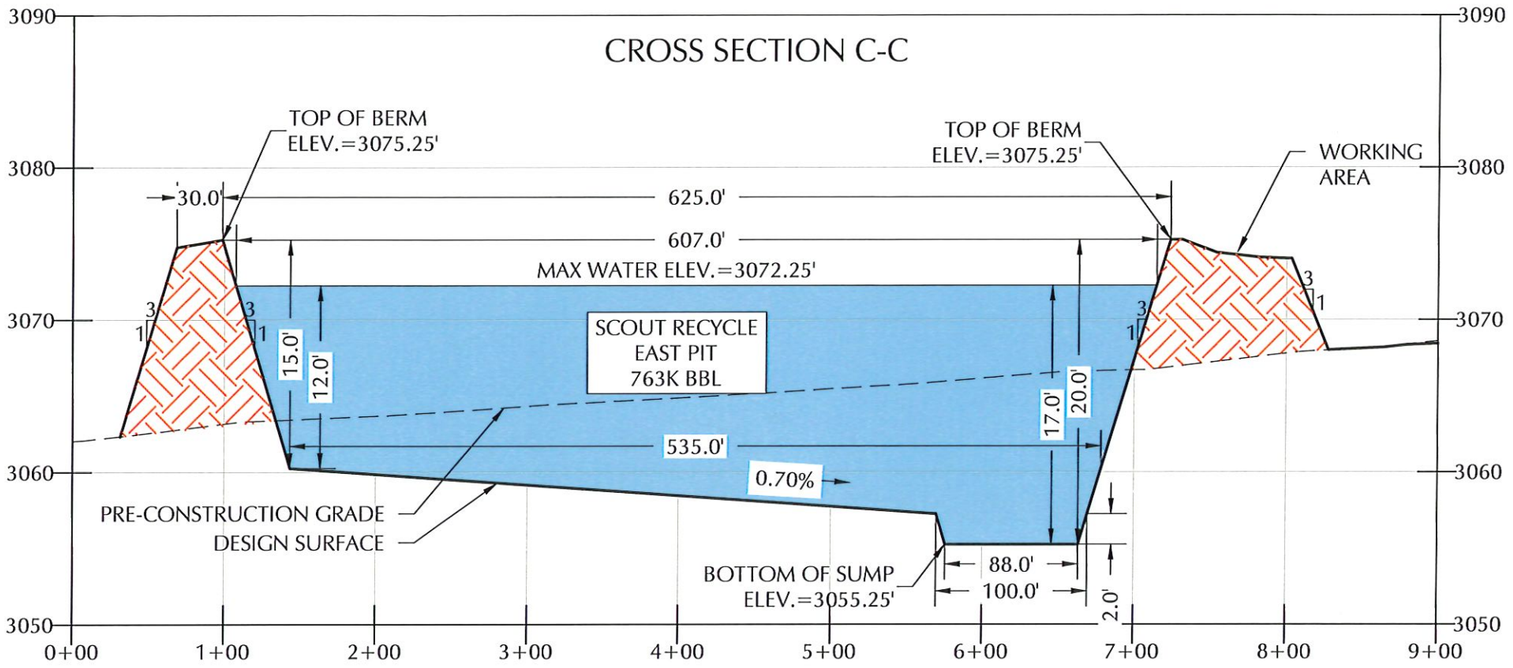
MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
9-11-2025

CROSS SECTION C-C



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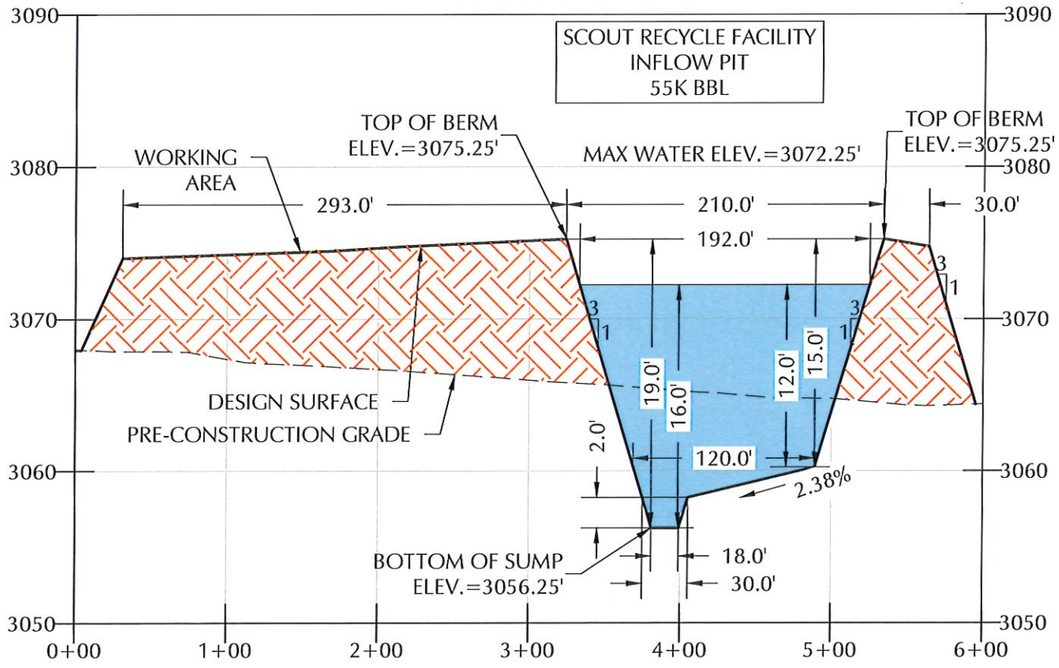

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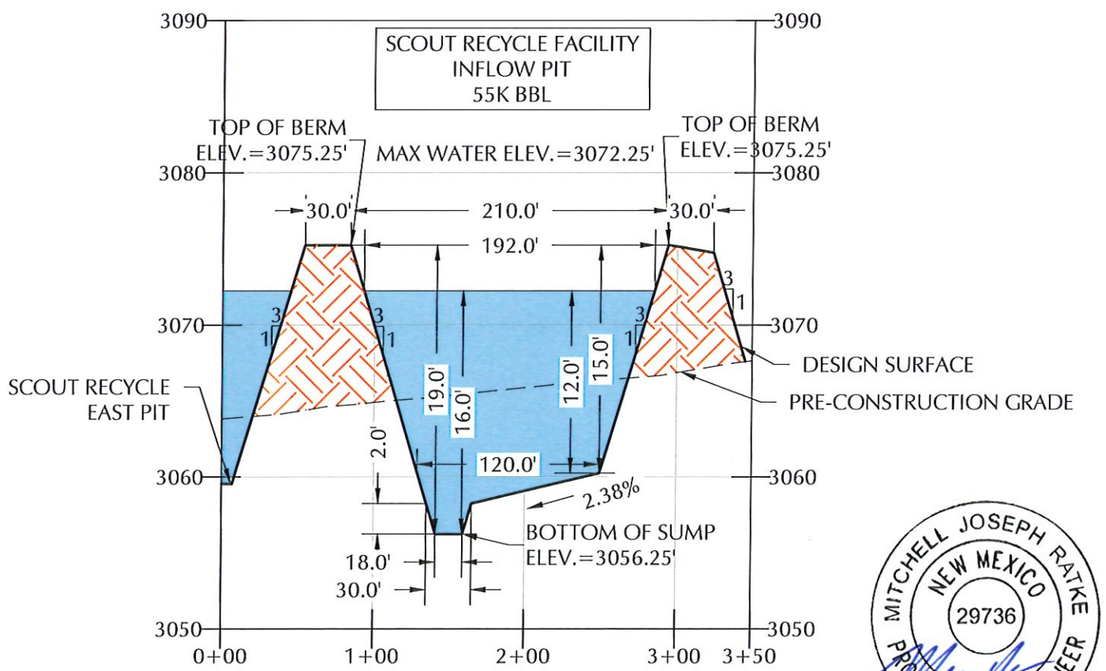


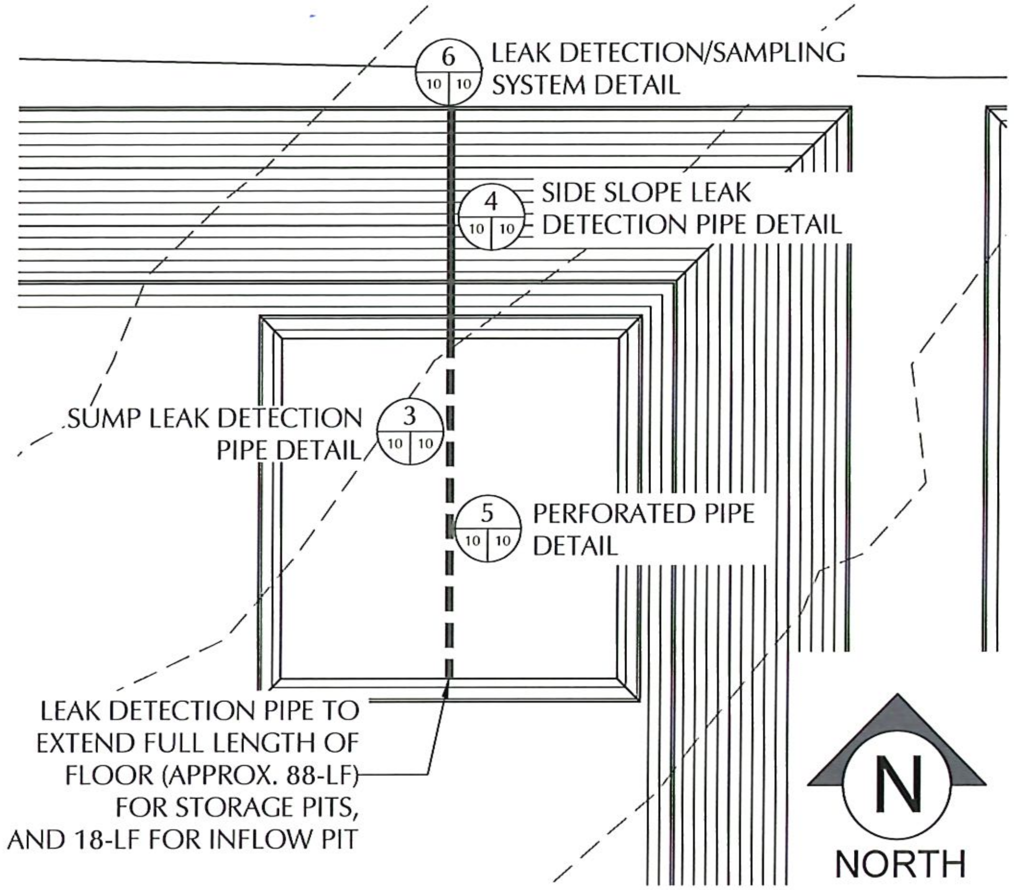
ENVIROTECH ENGINEERING
2500 North Eleventh Street
Enid, Oklahoma
580.234.8780
envirotechconsulting.com
P.E. #29736 - Expiration Date: 12-31-2026

NO.	DATE	DESCRIPTION

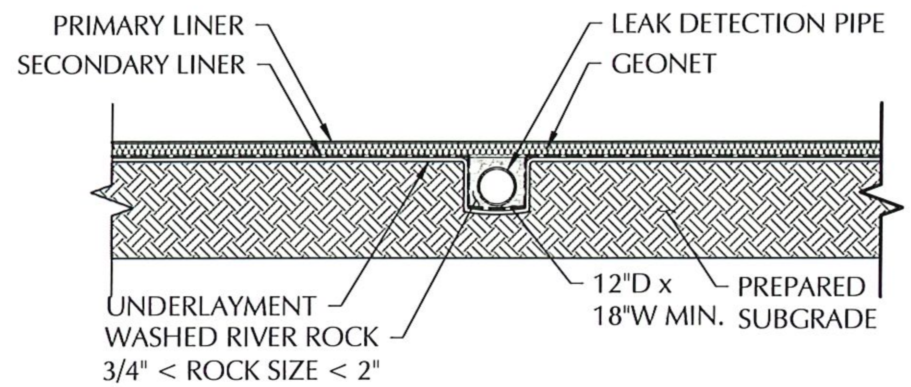
BLACKBUCK® RESOURCES

CROSS SECTIONS C, D & E
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	HORIZONTAL 1"=100 VERTICAL 1"=10
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	9 OF 14



SUMP OVERVIEW DETAIL 2 (4-5 | 10)
NOT TO SCALE



SUMP LEAK DETECTION PIPE DETAIL 3 (10 | 10)
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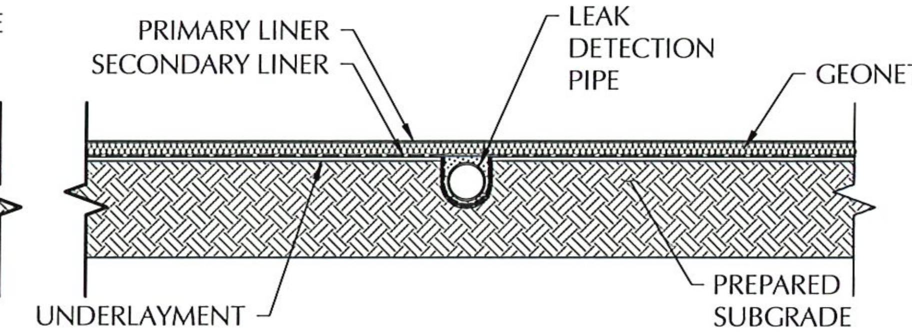
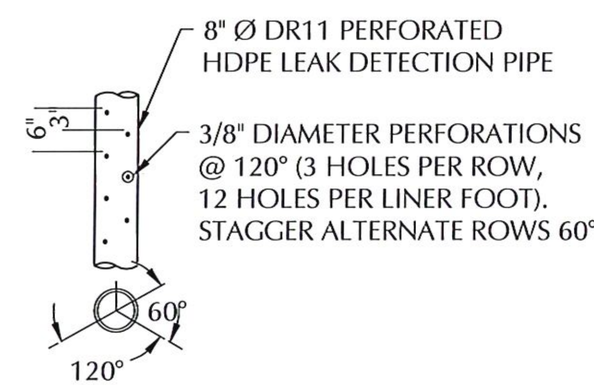
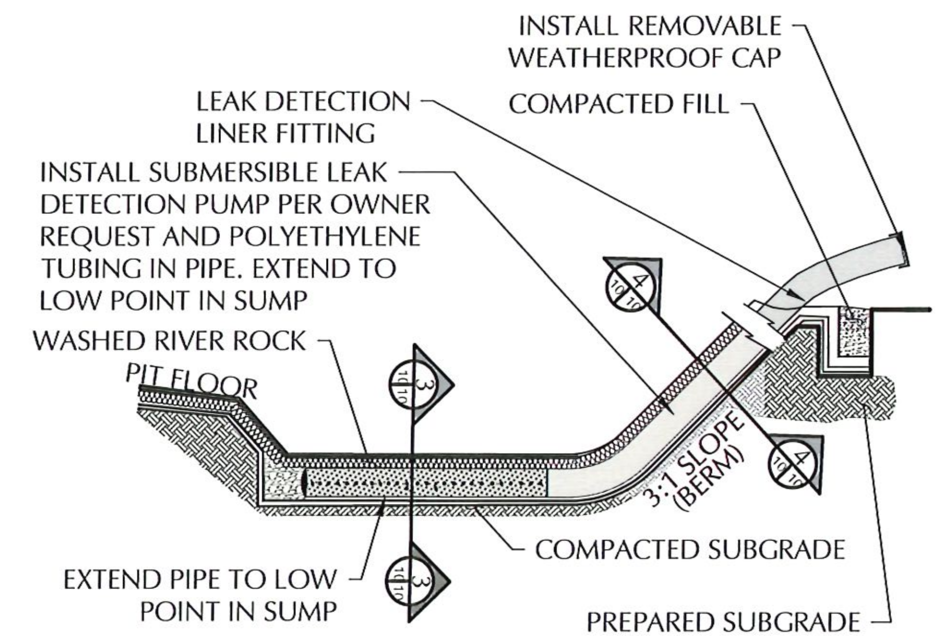


SIDE SLOPE LEAK DETECTION PIPE DETAIL 4 (10 | 10)
NOT TO SCALE



PERFORATED PIPE DETAIL 5 (10 | 10)
NOT TO SCALE



LEAK DETECTION/SAMPLING SYSTEM DETAIL 6 (10 | 10)
NOT TO SCALE

PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60- MIL HDPE SMOOTH LINER
LEAK DETECTION	200-MIL GEONET
SECONDARY LINER	40-MIL HDPE SMOOTH LINER
UNDERLAYMENT	10 OZ GEOTEXTILE
SUMP (STORAGE PIT)	3055.25-FT ELEVATION
SUMP (INFLOW PIT)	3056.25-FT ELEVATION
BERM (ROAD CREST)	DESIGN ELEV. 3075.25 FT- RD CREST (VARIES)

NOTES:
1. LEAK DETECTION SYSTEM TO BE INSTALLED BY OWNER.
2. PERFORATED PIPE TO BE ALONG THE BOTTOM OF THE SUMP. 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. WASH RIVER ROCK SHALL BE 3/4" MIN. & 2" MAX.

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9-11-2025

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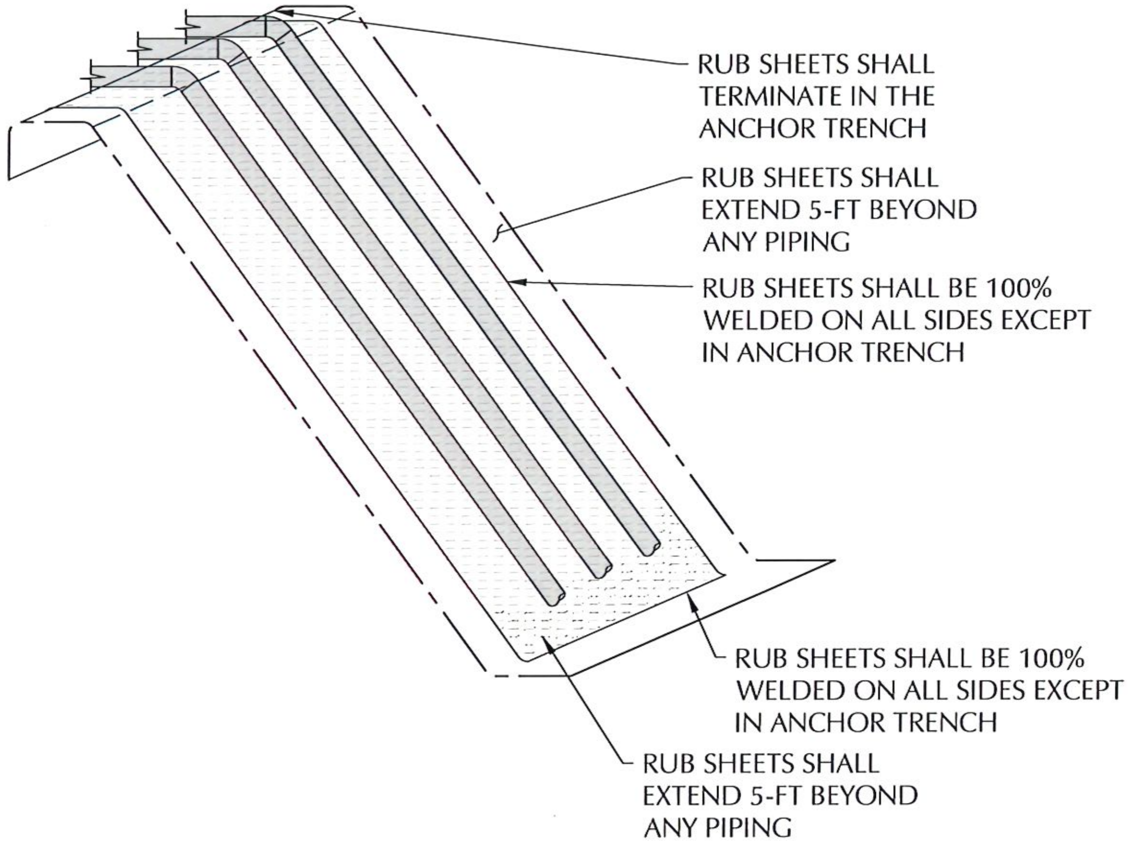
NO.	DATE	DESCRIPTION

BLACKBUCK® RESOURCES

SUMP DETAILS
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	NOT TO SCALE
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	10 OF 14



SUMP/CORNER RUB SHEET DETAIL (7 | 7 | 11)
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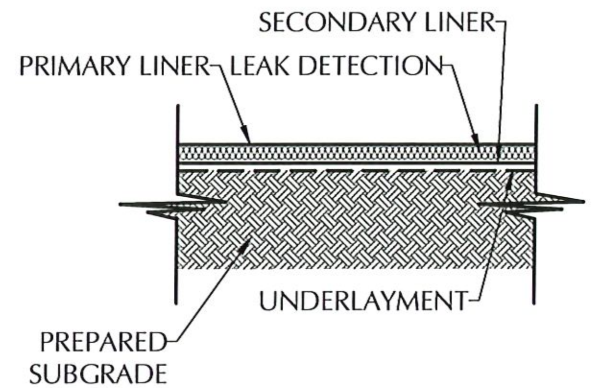

LINER SYSTEM FLOOR DETAIL (8 | 4-5 | 11)
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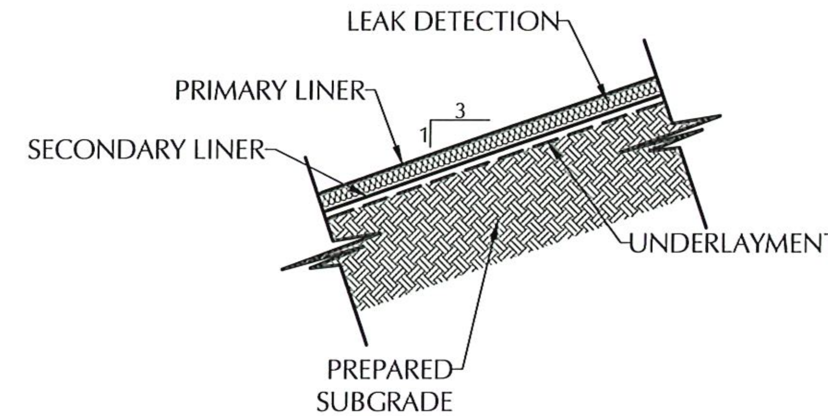
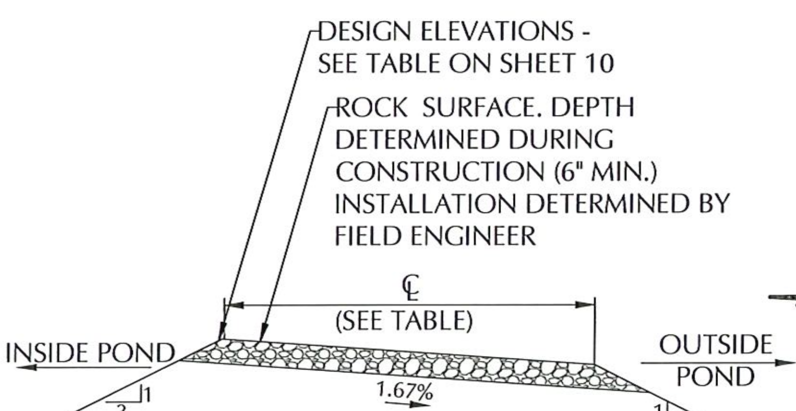


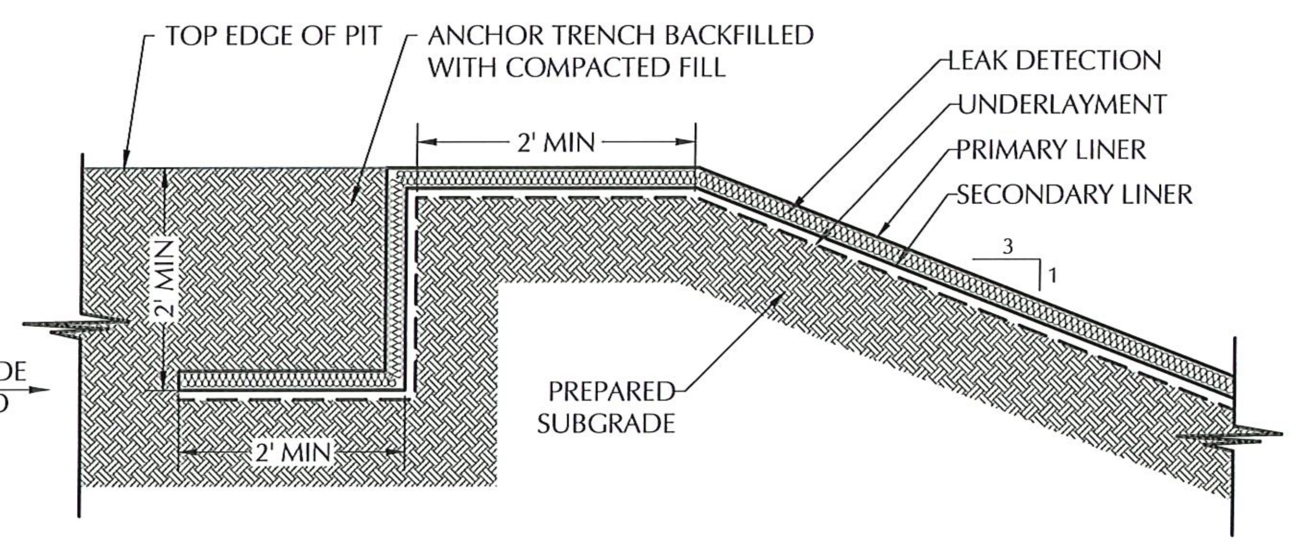
LINER SYSTEM SIDE SLOPE DETAIL (9 | 4-5 | 11)
NOT TO SCALE

GENERAL NOTES:

1. SEE REFERENCE TABLES SHEET 10 FOR LINER SPECIFICATIONS
2. PREPARED SUBGRADE MEANS COMPACTED SMOOTH SUBGRADE FREE OF ROCK, ROOTS, WOOD DEBRIS, CONCRETE RUBBLE AND ANY SHARP OBJECTS THAT MIGHT PUNCTURE THE HDPE LINER.
3. ALL INTERIOR SLOPES AND TOP OF BERMS TO BE SMOOTH DRUM ROLLED.
4. ALL EMBANKMENT SLOPES SHALL HAVE A RATIO OF 3:1, COMPACTED EARTH EMBANKMENTS TO BE CONSTRUCTED WITH 8 INCH (MAXIMUM LOOSE LIFTS), COMPACTED TO 95% STANDARD PROCTOR DENSITY (ASTM D698), AND MOISTURE CONDITIONS TO +/- 2% OPTIMUM MOISTURE (ASTM D698)
5. PERFORM GEOTECHNICAL ANALYSIS ON EXISTING SOIL TO CONFIRM SOIL IS SUITABLE FOR USE IN THE LEVEE.
6. ALL BOTTOM OF PITS SHALL SLOPE TO THE SUMP.



TYPICAL BERM CREST DETAIL (10 | 4-5 | 11)
NOT TO SCALE



ANCHOR TRENCH DETAIL (11 | 4-5 | 11)
NOT TO SCALE

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BLACKBUCK RESOURCES

LINER DETAILS
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
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SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

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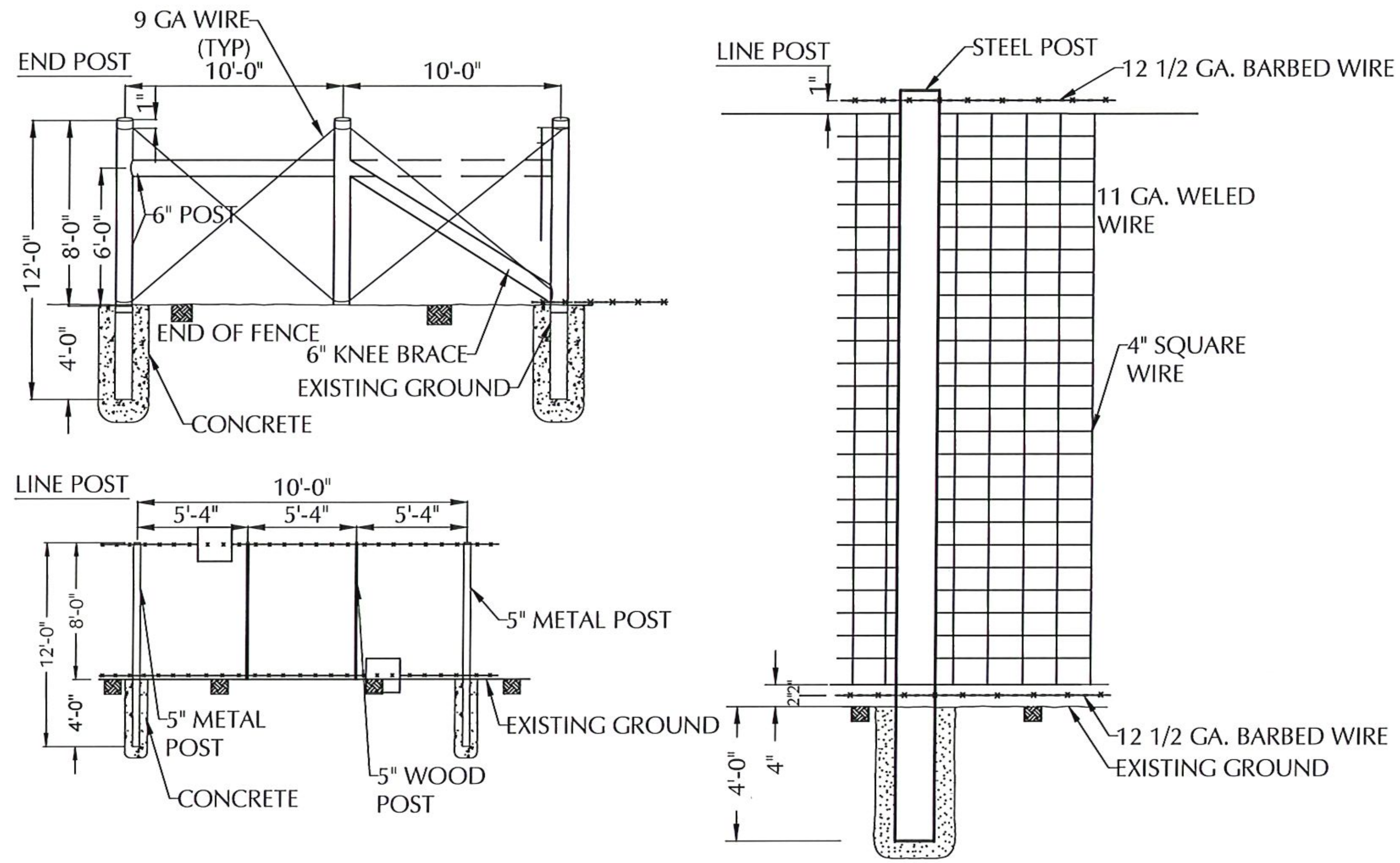
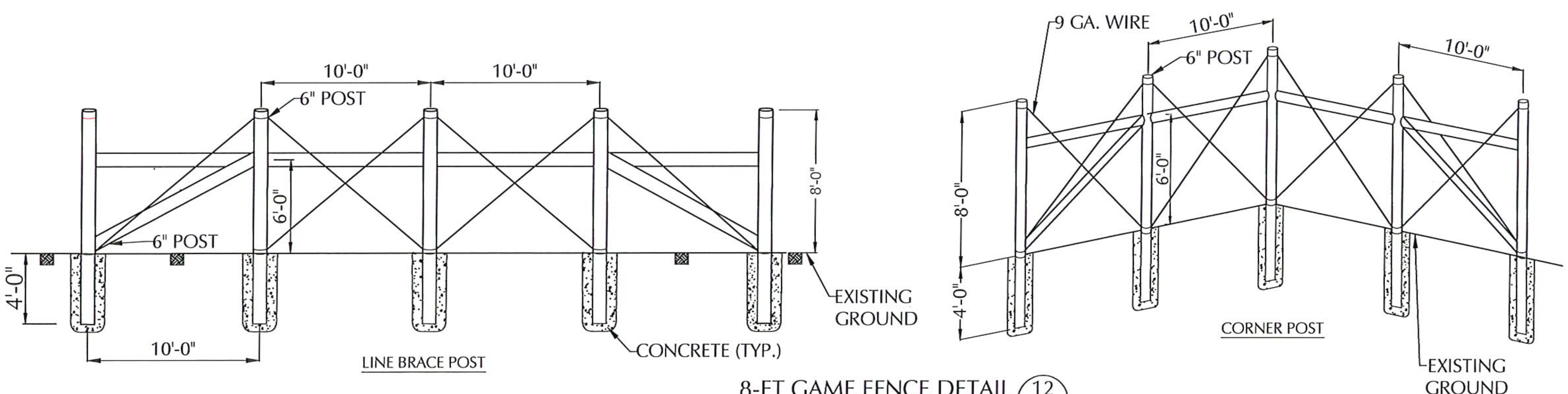
SHEET NO.	11 OF 14



GENERAL NOTES:

1. AT EACH LOCATION WHERE AN ELECTRIC TRANSMISSION, DISTRIBUTION OR SECONDARY LINE CROSSES A BARRIER FENCE, THE CONTRACTOR SHALL FURNISH AND INSTALL A GROUND CONFORMING TO ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE- THE GROUND ROD SHALL 0E A MINIMUM DIAMETER OF 1\2-IN. AND 8-FT. IN LENGTH, AND DRIVEN AT LEAST 7 1/2 FT. INTO THE GROUND. THE ROD SHALL BE CONNECTED TO EACH WIRE WITH A MINIMUM AWG NO. 8 STRANDED COPPER WIRE. GROUNDING WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
2. LINE BRACE POSTS SHALL BE SPACED AT 400 FT. INTERVALS, WHERE FENCING IS CONTINUOUS AND WHERE END, CORNER AND LINE BRACE POSTS ARE NOT SPECIFIED.
3. ALL LINE POSTS SHALL BE 5 IN. MIN. DIAMETER AND 12 FT. LONG. ALL END, CORNER AND LINE BRACE POSTS SHALL BE 6 IN. MIN. DIAMETER AND 12 FT. LONG.
4. BARBED WIRE SHALL BE DOUBLE WRAPPED AND TIED OFF AT END POSTS, CORNER POSTS AND LINE BRACE POSTS.
5. WOVEN WIRE SHALL BE SINGLE WRAPPED AND TIED OFF. FENCE TO BE CONTINUED, SHALL BE RESTARTED IN LIKE MANNER. WOVEN WIRE FENCE FABRIC SHALL CONFORM TO AASHTO M 279 (ASTM A 116) DESIGN NO. 1047-6-11 WITH CLASS I COATING.
6. STEEL BARBED WIRE SHALL CONFORM TO AASHTO M 200 (ASTM A 121) 12-1/2 GAGE WITH CLASS 1 COATING.
7. ALL FENCE WIRE TIES, BRACE WIRES, STAPLES AND OTHER WIRE APPURTENANCES SHALL BE GALVANIZED IN CONFORMANCE WITH AASHTO M 232.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING DISTURBED OR DESTROYED SURVEY MONUMENTS TO THE APPROPRIATE ACCURACY.
9. ALL MISCELLANEOUS HARDWARE SHALL BE FURNISHED GALVANIZED OR ALUMINUM COATED. ALL METAL PIPE POSTS SHALL BE CAPPED.
10. READY MIX CONCRETE MAY BE USED AS A SUBSTITUTE FOR CLASS "A" CONCRETE FOR THE CONCRETE FOOTING IF APPROVED BY THE ENGINEER.



8-FT GAME FENCE DETAIL (12 / 7 12)

Not to Scale

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BLACKBUCK RESOURCES

FENCE DETAILS
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
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SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

MITCHELL JOSEPH RATKE, NEW MEXICO, 29736, PROFESSIONAL ENGINEER
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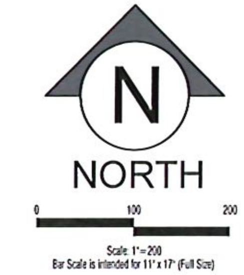
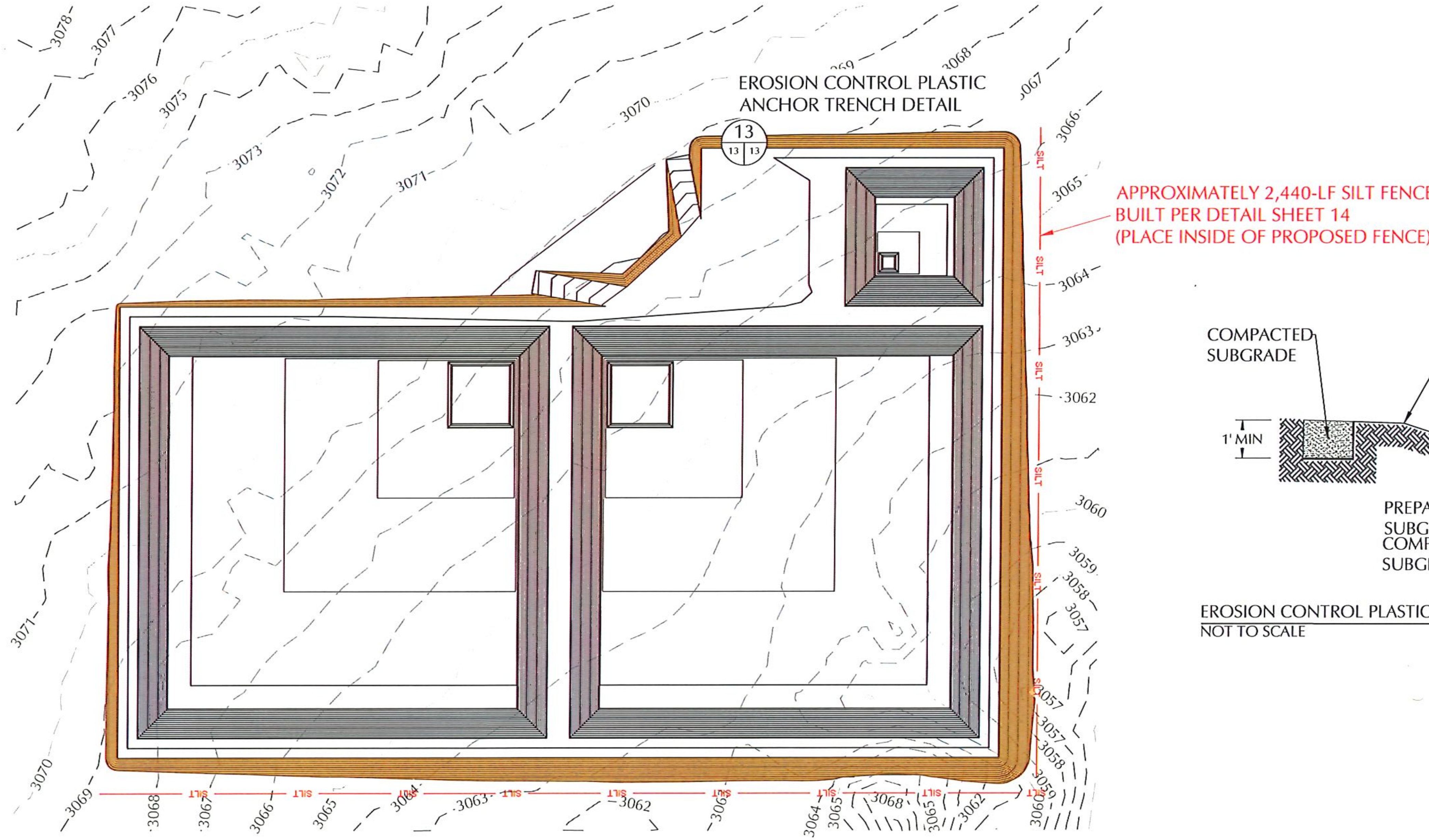
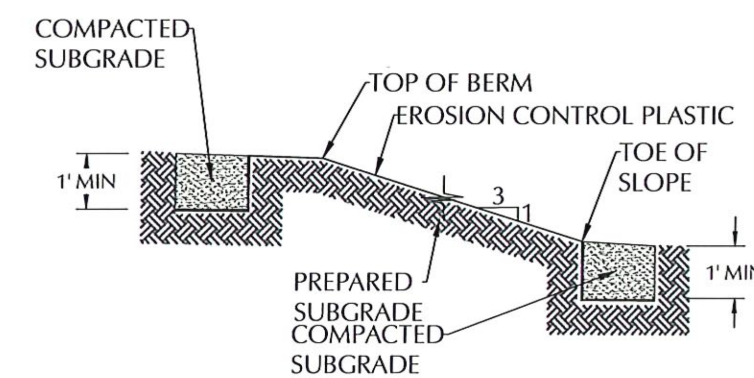
SHEET NO.	12 OF 14

30-MIL LLDPE LINER OR EQUIVALENT







EROSION CONTROL PLASTIC ANCHOR TRENCH DETAIL 13
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BLACKBUCK RESOURCES

SWPPP
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST &
SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	1" = 200'
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	13 OF 14

DAILY	WEEKLY AND/OR WITHIN 24HRS OF 0.5 STORM EVENT OR GREATER	MONTHLY AND/OR UNTIL NOTICE OF TERMINATION
CONSTRUCTION EXIT STORAGE AREAS FOR POTENTIAL POLLUTANTS: PETROLEUM FERTILIZER PAINT CONCRETE DETERGENTS CLEANING SOLVENTS WOOD/MASONRY/ROOFING MATERIAL TAR METAL STUDS OTHER HAZARDOUS MATERIALS	ALL EROSION CONTROL MEASURES CONSTRUCTION EXIT SILT FENCE- SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT REACHES ½ THE HEIGHT OF THE FENCE. INSPECT SILT FENCE FOR TEARS, SEE THAT FABRIC IS FIRMLY IN PLACE AND ALL POSTS SECURE. SEDIMENT BASIN- INSPECT FOR DEPTH OF SEDIMENT, REMOVE WHEN SEDIMENT REACHES 10% OF DESIGN CAPACITY DIVERSION DIKES- INSPECT AND REPAIR ANY BREACHES ACCESSIBLE;E DISCHARGE POINTS- ENSURE THAT EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS TEMPORARY AND PERMANENT SEEDING- INSPECT FOR BARE SPOTS, WASHOUTS AND HEALTHY GROWTH.	ALL AREAS WHICH HAVE UNDERGONE FINAL STABILIZATION ALL EROSION CONTROL MEASURES INSPECT FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING THE DRAINAGE SYSTEM AND THE RECEIVING WATER ACCESSIBLE DISCHARGE POINTS- ENSURE THAT EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATER.

A MAINTENANCE REPORT WILL BE MADE AFTER EACH INSPECTION. A COPY OF THE REPORT FORM TO BE COMPLETED IS ATTACHED TO PLANS.

INSPECTIONS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE PRIMARY PERMITTEE BY "QUALIFIED PERSONNEL". QUALIFIED PERSONNEL MEANS A PERSON WHO HAS SUCCESSFULLY COMPLETED AN EROSION AND SEDIMENT CONTROL SHORT COURSE ELIGIBLE FOR CONTINUING EDUCATION UNITS, OR AN EQUIVALENT COURSE APPROVED BY EPD.

RECORD KEEPING- A REPORT SHALL BE MADE AFTER EACH INSPECTION SUMMARIZING THE RESULTS. THE INSPECTOR MUST RECORD ANY DAMAGE OR DEFICIENCIES IN THE CONTROL MEASURES ON THE PROVIDED REPORT FORM. THE OPERATOR SHALL REPAIR ANY DAMAGE AS SOON AS PRACTICAL AND NO LATER THAN (7) SEVEN DAYS AFTER THE INSPECTION. THE PLANS MUST BE KEPT CURRENT. IT IS THE RESPONSIBILITY OF THE PRIMARY PERMITTEE TO REVISE THE METHODS USED TO CONTROL EROSION AND SEDIMENTS ONSITE.

MAJOR SOIL DISTURBANCE ACTIVITY

CONSTRUCTION ACTIVITY	SOIL DISTURBANCE	BMP
CLEARING AND GRUBBING TOPSOIL REMOVAL TREE REMOVAL - AS NECESSARY	TOPSOIL REMOVAL STOCKPILING	FILTER FABRIC RIP-RAP CHECK DAM
SEDIMENTATION PONDS AS REQUIRED UTILITY LINES GRADING	EARTHWORK CUT AND FILL ACTIVITY	FILTER FABRIC RIP-RAP CHECK DAM
CONCRETE CHANNEL FOUNDATIONS	FINISH GRADING	MAINTAIN AND MONITOR EROSION CONTROL PERMANENT GRASSING
WALKWAYS PERMANENT GRASSING AND LANDSCAPING		REMOVAL OF TEMPORARY SEDIMENT CONTROL AND TREE PROTECTION

SEEDING REQUIREMENTS

AREA	SOWING SEASON	SPECIES	SEED
CHANNEL AND ENBANKMENTS PERMANENT	SPRING-SUMMER	BERMUDA SPRIGING	BUSHEL/ACRE

FERTILIZER LBS/ACRE
450 lbs. (10-20-10)
* APPROVED EQUALS INCLUDES FRIO COUNTY SANDY SOIL AND CLAY SOILS MIXES FROM TEXAS NATIVE SEED PROJECT

PETROLEUM PRODUCTS:
ALL ONSITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTATIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY PETROLEUM TO BE STORED IN TANKS WILL BE SURROUNDED BY AN EARTHEN BERM AS A SECONDARY PROTECTIVE MEASURE. ANY ASPHALT SUBSTANCES USED ONSITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

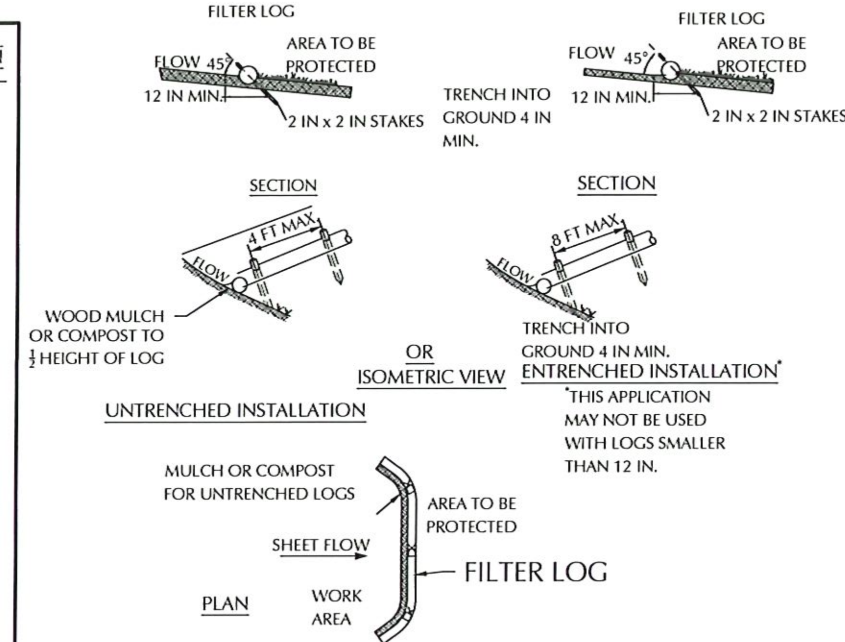
PAINTS:
ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM, BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

CONCRETE TRUCKS:
CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASHOUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH TRUCK ON SITE.

FERTILIZERS:
FERTILIZER USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE WILL BE IN A COVERED SHED. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

WASTE DISPOSAL:
KEEP PORTA-JOHNS AWAY FROM STORM DRAIN INLETS AND RECEIVING BODIES OF WATER OR RINSING OF PORTA-JOHNS INTO STORM INLETS OR RECEIVING BODIES OF WATER. RUNOFF FROM PORTA-JOHNS INTO WATER SYSTEMS IS A VIOLATION OF FEDERAL, STATE AND LOCAL ORDINANCES.

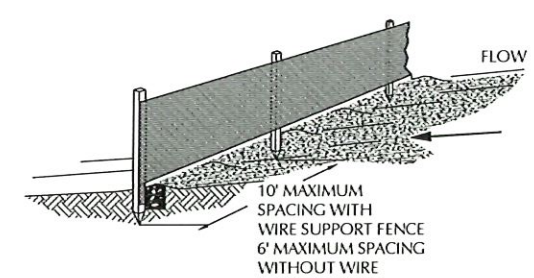
MULCH:
MULCH STORAGE MUST COMPLY WITH THE FOLLOWING SECTION OF THE STANDARD FIRE PREVENTION CODE. SECTION 502.3.1 - NO PERSON SHALL STORE IN ANY BUILDING OR UPON ANY PREMISES IN EXCESS OF 2,500 CU.FT. GROSS VOLUME OF COMBUSTIBLE EMPTY PACKING CASES, BOXES, BARRELS OR SIMILAR CONTAINERS OR RUBBER TIRES, OR RUBBER OR OTHER SIMILARLY COMBUSTIBLE MATERIALS WITHOUT A PERMIT.



CONSTRUCTION SPECIFICATIONS

1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG NETTING UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF ½ THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

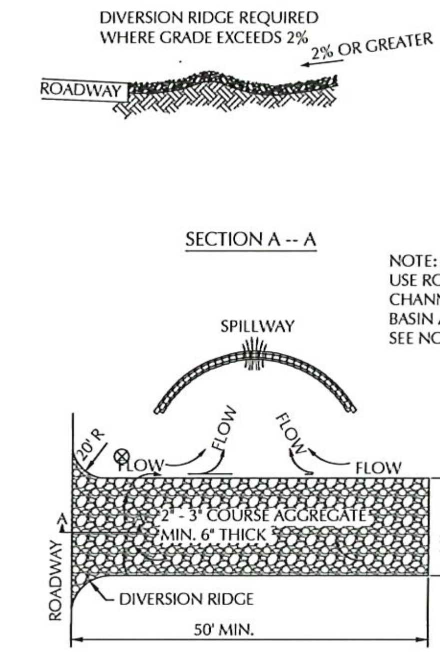
WADDLE FILTER LOG
(AS NEEDED FOR LOCALIZED WASHES)



SILT FENCE DETAILS

NOTES:

1. MUST BE INSTALLED PROPERLY TO AVOID NOTICE OF VIOLATION.
2. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE POUNDING EFFICIENCY.
3. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" MAXIMUM RECOMMENDED STORAGE HEIGHT.
4. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

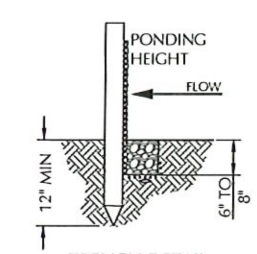


NOTE:
USE ROCK BAGS TO CHANNELIZE RUNOFF TO BASIN AS REQUIRED.
SEE NOTES.

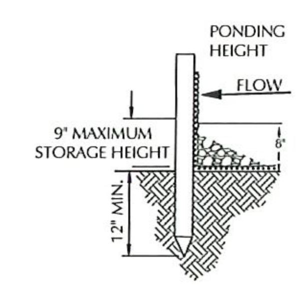
CONSTRUCTION ENTRANCE DETAILS

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ROCK BAGS OR SANDBAGS SHALL BE PLACED SUCH THAT NO GAPS ARE EVIDENT. SEE NOTES ERO-03.



TRENCH DETAIL



INSTALLATION WITHOUT TRENCHING

MITCHELL JOSEPH RATKE
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NO.	DATE	DESCRIPTION

BLACKBUCK® RESOURCES

SWPPP DETAILS
SCOUT RECYCLE FACILITY
BLACKBUCK NEW MEXICO LLC
SECTION 1, TOWNSHIP 25 SOUTH, RANGE 27 EAST & SECTION 6, TOWNSHIP 25 SOUTH, RANGE 28 EAST
EDDY COUNTY, NEW MEXICO

DATE:	SEPTEMBER 2025
SCALE:	NOT TO SCALE
DESIGNED BY:	S.JOSSELYN
DRAWN BY:	S. JOSSELYN
CHECKED BY:	M. RATKE
PROJECT NO.	025244-00
SHEET NO.	14 OF 14

Attachment E

Design and Construction Plans

Blackbuck New Mexico LLC is proposing to construct three (3) storage containments in Section 1, Township 25 South, Range 27 East & Section 6, Township 25 South, Range 28 East in Eddy County, New Mexico. This Facility shall consist of three (3) storage containments, with a total operational volume of approximately 1,581,696-bbls.

OPERATION AND MAINTENANCE PROCEDURES

Applicable mandates in Rule 34 are underlined. This plan addresses construction of lined earthen containments. *Attachment D* presents Engineering Design Plans. *Attachment F* provides liner and geotextile specifications.

Field conditions may create the need for minor modification of the containment design (e.g. changing the length, width, or depth). Any significant changes to the design will be submitted to the state for permit modification and as-built documentation will be provided.

Dike Protection and Structural Integrity

Design elements are addressed in the section of this submission containing the foundation recommendations. The recommendations are based on site-specific data. The operator, engineer, and selected contractor will review the recommendations prior to beginning the earthwork and adhere to the specific recommendations.

The design and operation provide for the confinement of produced water to prevent releases and to prevent 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 (berm) and diversion ditch 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. The topsoil will be stockpiled adjacent to perimeter fence surrounding the containment or incorporated into the levee.

Signage

The design calls for an upright sign no less than 12-in by 24-in 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:

1. The operator's name,
2. The location of the site by quarter-quarter or unit letter, section, township and range, and
3. Emergency telephone numbers.

Fencing

The design provides for a fence to enclose the Recycling Containment in a manner that deters unauthorized wildlife and human access. The design calls for a 8-ft tall wire mesh game fence around the containment to exclude wildlife (see detail contained in engineering design drawings). This fence provides greater wildlife (and human) deterrence than the minimum required barbed wire fence with four strands evenly spaced in the interval between one foot and four feet above ground level. The fence will be gated to provide access for maintenance and placement of pumps and other necessary equipment. 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 game fence around the containment will be effective in excluding antelope, deer, coyotes, and most other terrestrial wildlife.

The Recycling Containment is otherwise protective of wildlife, including migratory birds. The containment will contain treated produced water that has not shown to be a material threat to birds due to hydrogen sulfide gas or floating, free-phase hydrocarbons. 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 ad to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

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 may be placed under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.

Attachment D shows for earthen containments;

1. The levee has an inside grade no steeper than three horizontal feet to one vertical foot (3H:1V).
2. The levee outside grade is no steeper than three horizontal feet to one vertical foot (3H:1V).
3. The top of the levee is wide enough to install an anchor trench and provide adequate room for inspection and maintenance.
4. The caliche gravel placed on the outside levee provides additional erosion control.

Field conditions may create the need for changes to the design. Any changes to the construction or grade requirements due to unforeseen conditions will be reviewed and approved prior to initiating installation of the liner system. Any design change that does not conform to the NMOCD Rule will be the subject of a variance request and will be submitted to the OCD for review and approval.

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 40-mil HDPE. 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. This slope, combined with the highly transmissive geonet drainage layer, provides for the earliest possible leak detection.

The liners and drainage material will be installed consistent with the manufacture's specifications (See *Attachment F*). In addition to any specifications of the manufacturer, protocols for liner installation include measures to:

1. Minimize liner seams and orient them up and down, not across, a slope of the levee.
2. Use factory welded seams where possible.
3. Field seams in geosynthetic material are thermally seamed; prior to field seaming, overlap liner four to six inches.
4. Minimize the number of field seams and corners and irregularly shaped areas.
5. Provide for no horizontal seams within five feet of the slope's toe.
6. Use qualified personnel to perform field welding and testing.
7. Avoid excessive stress-strain on the liner.
8. The edges of all liners are anchored in the bottom of a compacted earth-filled trench that is at least 18-in 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, numerous 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 during operations, if the owner deems necessary. External discharge or suction lines do not penetrate the liner.

LEAK DETECTION AND FLUID REMOVAL SYSTEM INSTALLATION

The leak detection system, contains the following design elements:

1. The 200-mil geonet drainage material between the primary and secondary liner is sufficiently permeable to allow the transport of fluids to the observation ports (*Attachment D*).
2. The containment floor, sloped towards the monitoring riser pipe, facilitates the earliest possible leak detection of the containment bottom. A pump may be placed in an observation port to provide for fluid removal.
3. Piping will withstand chemical attack from any seepage, structural loading from stresses and disturbances from overlying water, cover materials, equipment operation, and expansion or contraction (see *Attachment D*).
4. The slope of the interior subgrade should be great enough to facilitate drainage.

Attachment F

Material Specifications

Blackbuck New Mexico LLC is proposing to construct three (3) storage containments in Section 1, Township 25 South, Range 27 East & Section 6, Township 25 South, Range 28 East in Eddy County, New Mexico. This Facility shall consist of three (3) storage containments, with a total operational volume of approximately 1,581,839-bbls.

GEOMEMBRANE SPECIFICATION

This specification covers the technical requirements for the Manufacturing and Installation of the geomembrane. All materials meet or exceed the requirements of this specification, and all work will be performed in accordance with the procedures provided in these project specifications.

1.1 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
   2. D 1238 Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
   3. D 1505 Test Method for Density of Plastics by the Density-Gradient Technique
   4. D 1603 Test Method for Carbon Black in Olefin Plastics
   5. D 3895 Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
   6. D 4218 Standard Test Method for Determination of Carbon Black in Polyethylene Compounds
   7. D 4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
   8. D 5199 Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
   9. D 5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
   10. D 5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
   11. D 5994 Standard Test Method for Measuring Core Thickness of Textured Geomembranes
   12. D 6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
   13. D 6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
   14. D 7240 Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test)

B. Geosynthetic Research Institute
   1. GRI GM 13 Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
   2. GRI GM 17 Test Properties, Testing Frequency and Recommended Warranty for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

1.2 DEFINITIONS

A. Lot - A quantity of resin (usually the capacity of one rail car) used in the manufacture of geomembranes. Finished roll will be identified by a roll number traceable to the resin lot used.
B. Construction Quality Assurance Consultant (CONSULTANT) – The Party, independent from MANUFACTURER and INSTALLER, that is responsible for observing and documenting activities related to quality assurance during the lining system construction.
C. ENGINEER- The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications.
D. Geomembrane Manufacturer (MANUFACTURER) - The party responsible for manufacturing the geomembrane rolls.
E. Geosynthetic Quality Assurance Laboratory (TESTING LABORATORY) – The Party, independent from the OWNER, MANUFACTURER, and INSTALLER, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the OWNER.
F. INSTALLER- The Party responsible for field handling, transporting, storing, deploying, seaming, and testing of the geomembrane seams.
G. Panel- Unit area of geomembrane that will be seamed in the field that is larger than 100-ft^2.
H. Patch - Unit area of geomembrane that will be seamed in the field that is less than 100-ft^2.
I. Subgrade Surface - Soil layer surface which immediately underlies the geosynthetic material(s).

1.3 SUBMITTALS POST-AWARD

A. Furnish the following product data, in writing, to ENGINEER prior to installation of the geomembrane material:
    1. Resin Data shall include the following:
    a. Certification stating that the resin meets the specification requirements (see *Table 1.9B*).
    2. Geomembrane Roll
    a. Statement certifying no recycled polymer and no more than 10% rework of the same type of material is added to the resin (product run may be recycled).
B. The INSTALLER shall furnish the following information to the ENGINEER and OWNER prior to installation:
    1. Installation layout drawings
    2. Must show proposed panel layout including field seams and details
    3. Must be approved prior to installing the geomembrane
    4. Approved drawings will be for concept only; actual panel placement will be determined by site conditions
    5. Installer's Geosynthetic Field Installation Quality Assurance Plan

C. The INSTALLER will submit the following to the ENGINEER upon completion of installation:
    1. Certificate stating the geomembrane has been installed in accordance with the Contract Documents
    2. Material and installation warranties
    3. As-built drawings showing actual geomembrane placement and seams including typical anchor trench detail

1.4 QUALITY ASSURANCE

A. The OWNER will engage and pay for the services of a Geosynthetic Quality Assurance Consultant and Laboratory to monitor geomembrane installation.

1.5 QUALIFICATIONS

A. MANUFACTURER
    1. Geomembrane shall be manufactured by the following:
        a. GSE Lining Technology, LLC
        b. approved equal
    2. MANUFACTURER shall have manufactured a minimum of 10,000,000 square feet of polyethylene geomembrane during the last year.

B. INSTALLER
    1. Installation shall be performed by one of the following installation companies (or approved equal)
        a. GSE Lining Technology, LLC
        b. GSE Approved Installers
    2. INSTALLER shall have installed a minimum of 5,000,000-ft^2 of HDPE geomembrane during the last two years.
    3. INSTALLER shall have worked in a similar capacity on at least 5 projects similar in complexity to the project described in the contract documents, and with at least 500,000-ft^2 of HDPE geomembrane installation on each project.
    4. The Installation Supervisor shall have worked in a similar capacity on projects similar in size and complexity to the project described in the Contract Documents.
    5. The INSTALLER shall provide a minimum of one Master Seamer for work on the project.
    6. Must have completed a minimum of 1,000,000-ft^2 of geomembrane seaming work using the type of seaming apparatus proposed for the use on this Project.

1.6 MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING

A. LABELING - Each roll of geomembrane delivered to the site shall be labeled by the MANUFACTURER. The label will identify:
    1. manufacturer's name
    2. product identification
    3. thickness
    4. length
    5. width
    6. roll number

B. DELIVERY - Rolls of liner will be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading.
C. STORAGE - The on-site storage location for geomembrane material, provided by the CONTRACTOR to protect the geomembrane from punctures, abrasions and excessive dirt and moisture, should have the following characteristics:
    1. level (no wooden pallets)
    2. smooth
    3. dry
    4. protected from theft and vandalism
    5. adjacent to the area being lined
D. Handling- Materials are to be handled so as to prevent damage.

1.7 WARRANTY

A. Material shall be warrantied, on a pro-rata basis, against Manufacturer's defects for a period of 5 years from the date of geomembrane installation.
B. Installation shall be warrantied against defects in workmanship for a period of 1 year from the date of geomembrane completion.

1.8 GEOMEMBRANE PROPERTIES

A. Material shall be smooth/textured polyethylene geomembrane as shown on the drawings.
B. Resin
    1. Resin shall be new, first quality, compounded and manufactured specifically for producing geomembrane.
    2. Natural resin (without carbon black) shall meet the following requirements:

Table 1.9B RAW MATERIAL PROPERTIES			
Property	Test Method	HDPE	LLDPE
Density (g/cm3)	ASTM D 1505	$\geq$0.932	$\geq$0.915
Melt Flow Index (g/10 min)	ASTM D 1238 (190/2.16)	$\leq$1.0	$\leq$1.0
OIT (minutes)	ASTM D 3895 (1 atm/200^{0}C)	$\geq$100	$\geq$100

C. Geomembrane Rolls
    1. Do not exceed a combined maximum total of 1 percent by weight of additives other than carbon black.
    2. Geomembrane shall be free of holes, pinholes as verified by on-line electrical detection, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.
    3. Geomembrane material is to be supplied in roll form. Each roll is to be identified with labels indicating roll number, thickness, length, width, and MANUFACTURER.

4. All liner sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed in section 1.09 D and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified and indicated during manufacturing, these pinholes may be corrected during installation.

D. Smooth surfaced geomembrane shall meet the requirements shown in the following data sheets below:

1. *Table 1.1* for Black HDPE
2. *Table 1.2* for Green HDPE
3. *Table 1.3* for White HDPE
    a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
    b. The white surface shall be installed upwards.
4. *Table 1.4* for Smooth Leak Location Liner HDPE
    a. The geomembrane shall have a coextruded, electrically conductive layer.
    b. The conductive layer is installed downward.
    c. Electrical testing shall be performed after liner installation by the INSTALLER.
5. *Table 1.5* for Smooth White Leak Location Liner HDPE
    a. The geomembrane shall have a coextruded, electrically conductive layer.
    b. The conductive layer is installed downward.
    c. The geomembrane shall be a white-surfaced, coextruded geomembrane.
    d. The white surface shall be installed upwards.
    e. Electrical testing shall be performed after liner installation by the INSTALLER.
6. *Table 1.6* for Black LLDPE
7. *Table 1.7* for White-surfaced LLDPE
    a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
    b. The white surface shall be installed upwards.
8. *Table 1.8* for Leak Location Liner LLDPE
    a. The geomembrane shall have a coextruded, electrically conductive layer.
    b. The conductive layer is installed downward.
    c. Electrical testing shall be performed after liner installation by the INSTALLER.
9. *Table 1.9* for White Leak Location Liner LLDPE
    a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
    b. The white surface shall be installed upwards.
    c. The geomembrane shall have a coextruded, electrically conductive layer.
    d. The conductive layer is installed downward.
    e. Electrical testing shall be performed after liner installation by the INSTALLER.

TABLE 1.1: GSE HD SMOOTH GEOMEMBRANE							
Tested Property	Test Method	Frequency	Minimum Average Values				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm^3, (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 114 63 700 12	 152 84 700 12	 228 126 700 12	 304 168 700 12	 380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	54	72	108	144	180
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(1)	Note(1)	Note(1)	Note(1)	Note(1)
Notch Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100	>100
Typical Roll Dimensions							
Roll Length(2), ft			1,120	870	560	430	340
Roll Width(2), ft			22.5	22.5	22.5	22.5	22.5
Roll Area, ft^2			25,200	19,575	12,600	9,675	7,650

- NOTES:
  - (1)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (2)Roll lengths and widths have a tolerance of ± 1%.
  - GSE HD Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 1.2: GSE GREEN SMOOTH GEOMEMBRANE							
Tested Property	Test Method	Frequency	Minimum Average Values				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm^3 , (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 114 63 700 12	 152 84 700 12	 228 126 700 12	 304 168 700 12	 380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	54	72	108	144	180
Carbon Black Content(1), % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(2)	Note(2)	Note(2)	Note(2)	Note(2)
Notch Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100	>100
Typical Roll Dimensions							
Roll Length(3), ft			1,120	870	560	430	340
Roll Width(3), ft			22.5	22.5	22.5	22.5	22.5
Roll Area, ft^2			25,200	19,575	12,600	9,675	7,650

- NOTES:
  - (1)GSE Green Smooth may have an overall ash content of 3.0% due to the green layer. These values apply to the black layer only.
  - (2)Dispersion applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (3)Roll lengths and widths have a tolerance of ± 1%.
  - GSE Green Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 1.3: GSE WHITE SMOOTH GEOMEMBRANE							
Tested Property	Test Method	Frequency	Minimum Average Values				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm^3 , (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 114 63 700 12	 152 84 700 12	 228 126 700 12	 304 168 700 12	 380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	54	72	108	144	180
Carbon Black Content(1), % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(2)	Note(2)	Note(2)	Note(2)	Note(2)
Notch Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100	>100
Typical Roll Dimensions							
Roll Length(3), ft			1,120	870	560	430	340
Roll Width(3), ft			22.5	22.5	22.5	22.5	22.5

Roll Area, ft^2	25,200	19,575	12,600	9,675	7,650

- NOTES:
  - (1)GSE White Smooth may have an overall ash content of 3.0% due to the white layer. These values apply to the black layer only.
  - (2)Dispersion applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (3)Roll lengths and widths have a tolerance of ± 1%.
  - GSE White Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 1.4: GSE LEAK LOCATION SMOOTH GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 , (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 152 84 700 12	 228 126 700 12	 304 168 700 12	 380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	72	108	144	180
Carbon Black Content(1), % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(2)	Note(2)	Note(2)	Note(2)
Notch Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length(3), ft			870	560	430	340
Roll Width(3), ft			22.5	22.5	22.5	22.5

Roll Area, ft^2	19,575	12,600	9,675	7,650

- NOTES:
  - (1)GSE Leak Location Smooth may have an overall ash content of 3.0% due to the conductive layer. These values apply to the non-conductive black layer only.
  - (2)Dispersion applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (3)Roll lengths and widths have a tolerance of ± 1%.
  - GSE Leak Location Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D746.
  - *Modified.

TABLE 1.5: GSE LEAK LOCATION WHITE SMOOTH GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3, (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 152 84 700 12	 228 126 700 12	 304 168 700 12	 380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	72	108	144	180
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Notch Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft			870	560	430	340
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2			19,575	12,600	9,675	7,650

- NOTES:
  - [(1)]GSE Leak Location White Smooth may have an overall ash content of 3.0% due to the white and conductive layers. These values apply to the black layer only.
  - [(2)]Dispersion applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ± 1%.
  - GSE Leak Location White Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 1.6: GSE ULTRAFLEX SMOOTH GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Value			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	152 800	228 800	304 800	380 800
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	56	84	112	140
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(1)	Note(1)	Note(1)	Note(1)
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length(2), ft			870	560	430	340
Roll Width(2), ft			22.5	22.5	22.5	22.5
Roll Area, ft^2			19,575	12,600	9,675	7,650

- NOTES:
  - (1)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (2)Roll lengths and widths have a tolerance of ±1 %.
  - GSE UltraFlex is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

TALBE 1.7: GSE ULTRAFLEX WHITE SMOOTH GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Value			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	152 800	228 800	304 800	380 800
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	56	84	112	140
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft			870	560	430	340
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2			19,575	12,600	9,675	7,650

- NOTES:
  - [(1)]GSE UltraFlex White Smooth may have an overall ash content greater than 3.0% due to the white layer. These values apply to the black layer only.
  - [(2)] Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex White Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

TABLE 1.8: GSE ULTRAFLEX LEAK LOCATION LINER SMOOTH GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Value			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	152 800	228 800	304 800	380 800
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	56	84	112	140
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft			870	560	430	340
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2			19,575	12,600	9,675	7,650

- NOTES:
  - [(1)]GSE UltraFlex Leak Location Smooth may have an overall ash content greater than 3.0% due to the conductive layer. These values apply to the non-conductive black layer only.
  - [(2)]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex Leak Location Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

TABLE 1.9: GSE ULTRAFLEX LEAK LOCATION LINER WHITE SMOOTH GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Value			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	152 800	228 800	304 800	380 800
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	56	84	112	140
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft			870	560	430	340
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2			19,575	12,600	9,675	7,650

- NOTES:
  - [(1)]GSE UltraFlex Leak Location White Smooth may have an overall ash content greater than 3.0% due to the white and conductive layers. These values apply to the non-conductive black layer only.
  - [(2)]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex Leak Location White Smooth is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

E. Textured surfaced geomembrane shall meet the requirements shown in the following data sheets below.
   1. *Table 2.1* for Black coextruded textured HDPE
   2. *Table 2.2* for Green coextruded textured HDPE
   3. *Table 2.3* for White coextruded textured HDPE
      a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
      b. The white surface shall be installed upwards.
   4. *Table 2.4* for Leak Location Liner coextruded textured HDPE
      a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
      b. The white surface shall be installed upwards.
   5. *Table 2.5* for White Leak Location Liner coextruded textured HDPE
      a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
      b. The white surface shall be installed upwards.
   6. *Table 2.6* for Black coextruded textured LLDPE
   7. *Table 2.7* for White coextruded textured LLDPE
      a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
      b. The white surface shall be installed upwards.
   8. *Table 2.8* for Leak Location Liner coextruded textured LLDPE
      a. The geomembrane shall have a coextruded, electrically conductive layer.
      b. The conductive layer is installed downward.
      c. Electrical testing shall be performed after liner installation by the INSTALLER.
   9. *Table 2.9* for White Leak Location Liner coextruded textured LLDPE
      a. The geomembrane shall be a white-surfaced, coextruded geomembrane.
      b. The white surface shall be installed upwards.
      c. The geomembrane shall have a coextruded, electrically conductive layer.
      d. The conductive layer is installed downward.
      e. Electrical testing shall be performed after liner installation by the INSTALLER.

TABLE 2.1: GSE HD TEXTURED GEOMEMBRANE							
Tested Property	Test Method	Frequency	Minimum Average Values				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5994	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm^3, (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 45 63 100 12	 60 84 100 12	 90 126 100 12	 120 168 100 12	 150 210 100 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	45	60	90	120	150
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(1)	Note(1)	Note(1)	Note(1)	Note(1)
Asperity Height, mil	ASTM D 7466	second roll	16	18	18	18	18
Notch Constant Tensile Load(2), hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100	>100
Typical Roll Dimensions							
Roll Length(3), ft	Double-Sided Textured Single-Sided Textured		830 1,010	700 780	520 540	400 410	330 330
Roll Width(3), ft			22.5	22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		18,675 22,725	15,750 17,550	11,700 12,150	9,000 9,225	7,425 7,425

- NOTES:
  - (1)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (2)NCTL for GSE HD Textured is conducted on representative smooth geomembrane samples.
  - (3)Roll lengths and widths have a tolerance of ± 1%.
  - GSE HD Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.2 GSE GREEN TEXTURED GEOMEMBRANE							
Tested Property	Test Method	Frequency	Minimum Average Values				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5994	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm^3, (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 45 63 100 12	 60 84 100 12	 90 126 100 12	 120 168 100 12	 150 210 100 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	45	60	90	120	150
Carbon Black Content(1), % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(2)	Note(2)	Note(2)	Note(2)	Note(2)
Asperity Height, mil	ASTM D 7466	second roll	16	18	18	18	18
Notch Constant Tensile Load(3), hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100	>100
Typical Roll Dimensions							
Roll Length(4), ft	Double-Sided Textured Single-Sided Textured		830 1,010	700 780	520 540	400 410	330 330
Roll Width(4), ft			22.5	22.5	22.5	22.5	22.5

Roll Area, ft^2	Double-Sided Textured	18,675	15,750	11,700	9,000	7,425
	Single-Sided Textured	22,725	17,550	12,150	9,225	7,425

- NOTES:
  - (1)GSE Green may have an overall ash content greater than 3.0% due to the green layer. These values apply to the black layer only.
  - (2)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (3)NCTL for GSE Green Textured is conducted on representative smooth geomembrane samples.
  - (4)Roll lengths and widths have a tolerance of ±1%.
  - GSE Green Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.3: GSE WHITE TEXTURED GEOMEMBRANE							
Tested Property	Test Method	Frequency	Minimum Average Values				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5994	every roll	30 27	40 36	60 54	80 72	100 90
Density, g/cm3 , (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 45 63 100 12	 60 84 100 12	 90 126 100 12	 120 168 100 12	 150 210 100 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	45	60	90	120	150
Carbon Black Content[1], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[2]	Note[2]	Note[2]	Note[2]	Note[2]
Asperity Height, mil	ASTM D 7466	second roll	16	18	18	18	18
Notch Constant Tensile Load[3], hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100	>100
Typical Roll Dimensions							
Roll Length[4], ft	Double-Sided Textured Single-Sided Textured		830 1,010	700 780	520 540	400 410	330 330
Roll Width[4], ft			22.5	22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		18,675 22,725	15,750 17,550	11,700 12,150	9,000 9,225	7,425 7,425

- NOTES:
  - [1]GSE White may have an overall ash content greater than 3.0% due to the white layer. These values apply to the black layer only.
  - [2]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [3]NCTL for GSE White Textured is conducted on representative smooth geomembrane samples.
  - [4]Roll lengths and widths have a tolerance of ±1%.
  - GSE White Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.4: GSE LEAK LOCATION LINER TEXTURED GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5994	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3, (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 60 84 100 12	 90 126 100 12	 120 168 100 12	 150 210 100 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	60	90	120	150
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Asperity Height, mil	ASTM D 7466	second roll	18	18	18	18
Notch Constant Tensile Load[(3)], hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(4)], ft	Double-Sided Textured Single-Sided Textured		700 780	520 540	400 410	330 330
Roll Width[(4)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		15,750 17,550	11,700 12,150	9,000 9,225	7,425 7,425

- NOTES:
  - [(1)]GSE Leak Location may have an overall ash content greater than 3.0% due to the conductive layer. These values apply to the non-conductive layer only.
  - [(2)]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]NCTL for GSE Leak Location Textured is conducted on representative smooth geomembrane samples.
  - [(4)]Roll lengths and widths have a tolerance of ±1%.
  - GSE Leak Location Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.5: GSE LEAK LOCATION LINER WHITE TEXTURED GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5994	every roll	40 36	60 54	80 72	100 90
Density, g/cm3 , (min.)	ASTM D 1505	200,000 lbs	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lbs	 60 84 100 12	 90 126 100 12	 120 168 100 12	 150 210 100 12
Tear Resistance, lb	ASTM D 1004	45,000 lbs	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	60	90	120	150
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Asperity Height, mil	ASTM D 7466	second roll	18	18	18	18
Notch Constant Tensile Load[(2)], hr	ASTM D 5397, Appendix	200,000 lbs	300	300	300	300
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(4)], ft	Double-Sided Textured Single-Sided Textured		700 780	520 540	400 410	330 330
Roll Width[(4)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		15,750 17,550	11,700 12,150	9,000 9,225	7,425 7,425

- NOTES:
  - (1)GSE Leak Location White may have an overall ash content greater than 3.0% due to the conductive and white layers. These values apply to the non-conductive black layer only.
  - (2)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - (3)NCTL for GSE Leak Location White Textured is conducted on representative smooth geomembrane samples.
  - (4)Roll lengths and widths have a tolerance of ±1%.
  - GSE Leak Location White Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.6: GSE ULTRAFLEX TEXTURED GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	60 250	90 250	120 250	150 250
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	44	66	88	110
Carbon Black Content, % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note(1)	Note(1)	Note(1)	Note(1)
Asperity Height, mil	ASTM D 7466	second roll	18	18	18	18
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length(2), ft	Double-Sided Textured Single-Sided Textured		700 650	520 420	400 320	330 250
Roll Width(2), ft			22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		15,750 14,625	11,700 9,450	9,000 7,200	7,425 5,625

- NOTES:
  - [1]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [2]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.7: GSE ULTRAFLEX WHITE TEXTURED GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	60 250	90 250	120 250	150 250
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	44	66	88	110
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Asperity Height, mil	ASTM D 7466	second roll	18	18	18	18
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft	Double-Sided Textured Single-Sided Textured		700 650	520 420	400 320	330 250
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		15,750 14,625	11,700 9,450	9,000 7,200	7,425 5,625

- NOTES:
  - [(1)]GSE UltraFlex White Textured may have an overall ash content greater than 3.0% due to the white layer. These values apply to the black layer only.
  - [(2)]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex White Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.8: GSE ULTRAFLEX LEAK LOCATION TEXTURED GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	60 250	90 250	120 250	150 250
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	44	66	88	110
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Asperity Height, mil	ASTM D 7466	second roll	18	18	18	18
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft	Double-Sided Textured Single-Sided Textured		700 650	520 420	400 320	330 250
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		15,750 14,625	11,700 9,450	9,000 7,200	7,425 5,625

- NOTES:
  - [(1)]GSE UltraFlex Leak Location Textured may have an overall ash content greater than 3.0% due to the conductive layer. These values apply to the non-conductive black layer only.
  - [(2)]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex Leak Location Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

TABLE 2.9: GSE ULTRAFLEX LEAK LOCATION WHITE TEXTURED GEOMEMBRANE						
Tested Property	Test Method	Frequency	Minimum Average Values			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm^3 (max.)	ASTM D 1505	200,000 lbs	0.939	0.939	0.939	0.939
Tensile Properties (each direction) Strength at Break, lb/in-width Elongation at Break, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in	20,000 lbs	60 250	90 250	120 250	150 250
Tear Resistance, lb	ASTM D 1004	45,000 lbs	22	33	44	55
Puncture Resistance, lb	ASTM D 4833	45,000 lbs	44	66	88	110
Carbon Black Content[(1)], % (Range)	ASTM D 1603*/4218	20,000 lbs	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lbs	Note[(2)]	Note[(2)]	Note[(2)]	Note[(2)]
Asperity Height, mil	ASTM D 7466	second roll	18	18	18	18
Oxidative Induction Time, min	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lbs	>100	>100	>100	>100
Typical Roll Dimensions						
Roll Length[(3)], ft	Double-Sided Textured Single-Sided Textured		700 650	520 420	400 320	330 250
Roll Width[(3)], ft			22.5	22.5	22.5	22.5
Roll Area, ft^2	Double-Sided Textured Single-Sided Textured		15,750 14,625	11,700 9,450	9,000 7,200	7,425 5,625

- NOTES:
  - [(1)]GSE UltraFlex Leak Location White Textured may have an overall ash content greater than 3.0% due to the white and conductive layers. These values apply to the non-conductive black layer only.
  - [(2)]Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
  - [(3)]Roll lengths and widths have a tolerance of ±1%.
  - GSE UltraFlex Leak Location White Textured is available in rolls weighing approximately 4,000 lb.
  - All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
  - *Modified.

F. Extrudate Rod or Bead
    1. Extrudate material shall be made from same type resin as the geomembrane.
    2. Additives shall be thoroughly dispersed.
    3. Materials shall be free of contamination by moisture or foreign matter.

1.9 EQUIPMENT

A. Welding equipment and accessories shall meet the following requirements:
    1. Gauges showing temperatures in apparatus such as extrusion welder or fusion welder shall be present.
    2. An adequate number of welding apparatus shall be available to avoid delaying work.
    3. Power source must be capable of providing constant voltage under combined line load.

1.10 DEPLOYMENT

A. Assign each panel a simple and logical identifying code. The coding system shall be subject to approval and shall be determined at the job site.
B. Visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.
C. Deployment of geomembrane panels shall be performed in a manner that will comply with the following guidelines:
    1. Geomembranes shall be installed according to site-specific specifications, and GSE Conductive should be installed with the Conductive layer down.
        i. *Note: A spark tester or ohm meter can be used to determine Conductive layer.*
    2. Unroll geomembrane using methods that will not damage geomembrane and will protect underlying surface from damage (spreader bar, protected equipment bucket).
    3. Place ballast (commonly sandbags) on geomembrane which will not damage geomembrane to prevent wind uplift.
    4. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it. Smoking will not be permitted on the geomembrane.
    5. Do not allow heavy vehicular traffic directly on geomembrane. Rubber-tired ATV's and trucks are acceptable if wheel contact is less than 8 psi.
    6. Protect geomembrane in areas of heavy traffic by placing protective cover over the geomembrane.
D. Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

1.11 FIELD SEAMING

A. Seams shall meet the following requirements:

1. To the maximum extent possible, orient seams parallel to the line of the slope, i.e., down and not across slope.
2. Minimize number of field seams in corners, odd-shaped geometric locations and outside corners.
3. Slope seams (panels) shall extend a minimum of 5-ft beyond the grade break into the flat area.
4. Use a sequential seam numbering system compatible with panel numbering system that is agreeable to the CONSULTANT and INSTALLER.
5. Align seam overlaps consistent with the requirements of the welding equipment being used. A 6-in overlap is commonly suggested.

B. During Welding Operations
1. Provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.

C. Extrusion Welding
1. Hot-air tack adjacent pieces together using procedures that do not damage the geomembrane.
2. Clean geomembrane surfaces by disc grinder or equivalent.
3. Purge welding apparatus of heat-degraded extrudate before welding.

D. Hot Wedge Welding
1. Welding apparatus shall be a self-propelled device equipped with an electronic controller which displays applicable temperatures.
2. Clean seam area of dust, mud, moisture and debris immediately ahead of hot wedge welder.
3. Protect against moisture build-up between sheets.

E. Trial Welds
1. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.
2. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.
3. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work and one completed at mid shift.
4. Cut four, one-inch wide by six-inch long test strips from the trial weld.
5. Quantitatively test specimens for peel adhesion, and then for shear strength.
6. Trial weld specimens shall pass when the results shown in the following tables for HDPE and LLDPE are achieved in both peel and shear test.

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TABLE 1.12.6A: MINIMUM WELD VALUES FOR HDPE GEOMEMBRANES							
Property	Test Method	30	40	60	80	100	120
Peel Strength (fusion), ppi Peel Strength (extrusion), ppi	ASTM D 6392 ASTM D 6392	49 39	65 52	98 78	130 104	162 130	196 157
Shear Strength (fusion & ext.), ppi	ASTM D 6392	61	81	121	162	203	242

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TABLE 1.2.6B: MINIMUM WELD VALUES FOR LLDPE GEOMEMBRANES						
Property	Test Method	30	40	60	80	100
Peel Strength (extrusion), ppi Peel Strength (fusion), ppi	ASTM D 6392 ASTM D 6392	36 38	48 50	72 75	96 100	120 125
Shear Strength (fusion & ext.), ppi	ASTM D 6392	45	60	90	120	150

7. The break, when peel testing, occurs in the liner material itself, not through peel separation (FTB).
8. The break is ductile.
9. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.
10. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed trial weld.

F. Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the liner installation. INSTALLER shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds.

G. Defects and Repairs
1. Examine all seams and non-seam areas of the geomembrane for defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter.
2. Repair and non-destructively test each suspect location in both seam and non-seam areas. Do not cover geomembrane at locations that have been repaired until test results with passing values are available.

1.12 FIELD QUALITY ASSURANCE

A. MANUFACTURER and INSTALLER shall participate in and conform to all terms and requirements of the Owner's quality assurance program. CONTRACTOR shall be responsible for assuring this participation.
B. Quality assurance requirements are as specified in this Section and in the Field Installation Quality Assurance Manual if it is included in the contract.
C. Field Testing
    1. Non-destructive testing may be carried out as the seaming progresses or at completion of all field seaming.
        b. Vacuum Testing
            1) Shall be performed in accordance with ASTM D 5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.
        b. Air Pressure Testing
            1) Shall be performed in accordance with ASTM D 5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.
        c. Spark Testing
            1. Shall be performed accordance with ASTM D 7240 Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test).
        d. Other approved methods.
    2. Destructive Testing (performed by CONSULTANT with assistance from INSTALLER)
        b. Location and Frequency of Testing
            1) Collect destructive test samples at a frequency of one per every 500 lineal feet of seam length.
            2) Test locations will be determined after seaming.
            3) Exercise Method of Attributes as described by GRI GM-14 (Geosynthetic Research Institute, http://www.geosynthetic-institute.org) to minimize test samples taken.

        c. Sampling Procedures are performed as follows:
            1) INSTALLER shall cut samples at locations designated by the CONSULTANT as the seaming progresses in order to obtain field laboratory test results before the geomembrane is covered.
            2) CONSULTANT will number each sample, and the location will be noted on the installation as-built.
                a) Samples shall be 12-in wide by minimal length with the seam centered lengthwise.
                b) Cut a 2-in wide strip from each end of the sample for field-testing.
                c) Cut the remaining sample into two parts for distribution as follows:
                d) One portion for INSTALLER, 12-in by 12-in

e) One portion for the Third-Party laboratory, 12-in by 18-in
f) Additional samples may be archived if required.

3) Destructive testing shall be performed in accordance with ASTM D 6392, Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.
   a) INSTALLER shall repair all holes in the geomembrane resulting from destructive sampling.
4) Repair and test the continuity of the repair in accordance with these Specifications.

3. Failed Seam Procedures
   a. If the seam fails, INSTALLER shall follow one of two options:
      1) Reconstruct the seam between any two passed test locations.
      2) Trace the weld to intermediate location at least 10-ft minimum or where the seam ends in both directions from the location of the failed test.
      b) The next seam welded using the same welding device is required to obtain an additional sample, i.e., if one side of the seam is less than 10-ft long.
      c) If sample passes, then the seam shall be reconstructed or capped between the test sample locations.
      d) If any sample fails, the process shall be repeated to establish the zone in which the seam shall be reconstructed.

1.13 REPAIR PROCEDURES

A. Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.
B. Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.
C. INSTALLER shall be responsible for repair of defective areas.
D. Agreement upon the appropriate repair method shall be decided between
   1. CONSULTANT and INSTALLER by using one of the following repair methods:
      a. Patching- Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.
      b. Abrading and Re-welding- Used to repair short section of a seam.
      c. Spot Welding- Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.
      d. Capping- Used to repair long lengths of failed seams.
      e. Flap Welding- Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.
         1) Remove the unacceptable seam and replace with new material.
E. The following procedures shall be observed when a repair method is used:
   1. All geomembrane surfaces shall be clean and dry at the time of repair.
   2. Surfaces of the polyethylene which are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.

3. Extend patches or caps at least 6 inches for extrusion welds and 4 inches for wedge welds beyond the edge of the defect, and around all corners of patch material.

F. Repair Verification
1. Number and log each patch repair (performed by CONSULTANT).
2. Non-destructively test each repair using methods specified in this Specification.

1.1 SCOPE

This specification covers the technical requirements for the Manufacturing and Installation of the nonwoven geotextile. All materials meet or exceed the requirements of this specification, and all work will be performed in accordance with the procedures provided in these project specifications.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)
1. ASTM D 5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles
2. ASTM D 4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
3. ASTM D 4533, Standard Test Method for Index Trapezoidal Tearing Strength of Geotextiles
4. ASTM D 4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
5. ASTM D 4491, Standard Test Method for Water Permeability of Geotextiles by Permittivity
6. ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile
7. ASTM D 4354, Standard Practice for Sampling of Geosynthetics for Testing
8. ASTM D 4759, Standard Practice for Determining the Specifications Conformance of Geosynthetics

1.3 SUBMITTALS

A. Prior to material delivery to project site, the contractor shall provide the engineer with a written certification or manufacturers quality control data which displays that the geotextile meets or exceeds minimum average roll values (MARV) specified herein.
B. The contractor shall submit, if required by the engineer, manufacturer's quality control manual for the geotextile to be delivered to the site.

2. PRODUCT

2.1 GEOTEXTILE

A. The nonwoven needle-punched geotextile specified herein shall be made from staple fiber.
B. The geotextile shall be manufactured from prime quality virgin polymer.
C. The geotextile shall be able to withstand direct exposure to ultraviolet radiation from Sun for up to 30 days without any noticeable effect on index or performance properties.
D. Geotextile shall meet or exceed all material properties listed in *Table 1*.

TABLE 1: GEOTEXTILE PROPERTIES			
Property	**Test Method**	**Test Frequency**	**Value**
Mass per Unit Area, oz/yd^2	ASTM D 5261	90,000-ft^2	12
Grab Tensile Strength, lb	ASTM D 4632	90,000-ft^2	320
CBR Puncture Strength, lb	ASTM D 6241	540,000-ft^2	925
Grab Elongation, %	ASTM D 4632	90,000-ft^2	50
Trapezoidal Tear Strength, lb	ASTM D 4533	90,000-ft^2	125
UV Resistance, % retained after 500 hours	ASTM D 4355	per formulation	70

2.2 MANUFACTURE

A. All rolls of the geotextile shall be identified with permanent marking on the roll or packaging, with the manufacturers name, product identification, roll number, and roll dimensions.

2.3 TRANSPORT

A. Transportation of the geotextile shall be the responsibility of the contractor.
B. During shipment, the geotextile shall be protected from ultraviolet light exposure, precipitation, mud, dirt, dust, puncture, or other damaging or deleterious conditions.
C. Upon delivery at the job site, the contractor shall ensure that the geotextile rolls are handled and stored in accordance with the manufacturer's instructions as to prevent damage.

3. EXECUTION

3.1 QUALITY ASSURANCE

A. The engineer shall examine the geotextile rolls upon delivery to the site and report any deviations from project specifications to the contractor.

3.2 INSTALLATION

A. The geotextile shall be handled in such a manner as to ensure that it is not damaged in any way. Should the contractor damage the geotextile to the extent that it is no longer usable as determined by these specifications or by the engineer, the contractor shall replace the geotextile at his own cost.
B. The geotextile shall be installed to the lines and grades as shown on the contract drawings and as described herein.
C. The geotextile shall be rolled down the slope in such a manner as to continuously keep the geotextile in tension by self-weight. The geotextile shall be securely anchored in an anchor trench where applicable, or by other approved or specified methods.
D. In the presence of wind, all geotextiles shall be weighted by sandbags or approved equivalent. Such anchors shall be installed during placement and shall remain in place until replaced with cover material.
E. The contractor shall take necessary precautions to prevent damage to adjacent or underlying materials during placement of the geotextile. Should damage to such material occur due to the fault of the contractor, the latter shall repair the damaged materials at his own cost and to the satisfaction of the engineer.
F. During placement of the geotextile, care shall be taken not to entrap soil, stones or excessive moisture that could hamper subsequent seaming of the geotextile as judged by the engineer.
G. The geotextile shall not be exposed to precipitation prior to being installed and shall not be exposed to direct sunlight for more than 15 days after installation.
H. The geotextile shall be seamed using heat seaming or stitching methods as recommended by the manufacturer and approved by the engineer. Sewn seams shall be made using polymeric thread with chemical resistance equal to or exceeding that of the geotextile. All sewn seams shall be continuous. Seams shall be oriented down slopes perpendicular to grading contours unless otherwise specified. For heat-seaming, fusion welding techniques recommended by the manufacturer shall be used.
I. The contractor shall not use heavy equipment to traffic above the geotextile without approved protection.
J. The geotextile shall be covered as soon as possible after installation and approval. Installed geotextile shall not be left exposed for more than 15 days.
K. Material overlying the geotextile shall be carefully placed to avoid wrinkling or damage to the geotextile.

SINGLE SIDED GEOCOMPOSITE

1.1 SCOPE

This specification covers the technical requirements for the manufacturing and installation of the geocomposite drainage layer. All materials meet or exceed the requirements of this specification, and all work will be performed in accordance with the procedures provided in these project specifications.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM D 1238 Standard Test Method for Melt Flow Rates of Thermoplastics
2. by Extrusion Plastometer
3. D 1505-98 Standard Test Method for Density of Plastics by the Density-Gradient Technique
4. ASTM D 4218, Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle Furnace Technique D 1603-94 Standard Test Method for Carbon Black in Olefin Plastics
5. D 4355-02 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
6. D 4491-99 Standard Test Method for Water Permeability of Geotextiles by Permittivity
7. D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
8. D 4716-00 Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
9. D 4751-99 Standard Test Method for Determining Apparent Opening Size of a Geotextile
10. D 6241 Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile- Related Products Using a 50-mm Probe D 4833-88 (1996) Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
11. D 5261-92 (1996) Standard Test Method for Measuring the Mass Per Unit Area of Geotextiles
12. D7005-03 Determining The Bond Strength (Ply-Adhesion) of Geocomposites
13. D 7179 Standard Test Method for Determining Geonet Breaking Force

B. Relevant publications from the Environmental Protection Agency (EPA):
1. Daniel, D.E. and R.M. Koerner, (1993), Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182.

1.3 DEFINITIONS

A. Construction Quality Assurance Consultant (CONSULTANT) – The Party, independent from MANUFACTURER and INSTALLER, that is responsible for observing and documenting activities related to quality assurance during the lining system construction.
B. ENGINEER - The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications.
C. Geocomposite Manufacturer (MANUFACTURER) - The party responsible for manufacturing the geocomposite rolls.
D. Geosynthetic Quality Assurance Laboratory (TESTING LABORATORY) -The Party, independent from the MANUFACTURER and INSTALLER, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the OWNER.
E. INSTALLER- Party responsible for field handling, transporting, storing and deploying the geocomposite.
F. Lot- A quantity of resin (usually the capacity of one rail car) used to manufacture polyethylene geocomposite rolls. The finished rolls will be identified by a roll number traceable to the resin lot.

1.4 QUALIFICATIONS

A. MANUFACTURER
    1. Geocomposite shall be manufactured by the following:
    a. GSE Lining Technology, Inc.
    b. Approved Equal
    2. MANUFACTURER shall have manufactured a minimum of 10,000,000-ft^2 of polyethylene geocomposite material during the last year.
B. INSTALLER
    1. INSTALLER shall have installed a minimum of 500,000 square feet of geocomposite in the last 3 years.
    2. INSTALLER shall have worked in a similar capacity on at least 5 projects similar in complexity to the project described in the contract documents, and within at least 50,000 square feet of geonet installation on each project.
    3. The Installation Supervisor shall have worked in a similar capacity on projects similar in size and complexity to the project described in the Contract Documents.

1.5 MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING

A. Labeling- Each roll delivered to the site shall be wrapped and labeled by the MANUFACTURER. The label will identify:
    1. Manufacturer's name
    2. Product identification
    3. Length
    4. Width
    5. Roll number

C. Delivery- Rolls will be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading.
D. Storage- The on-site storage location provided by the CONTRACTOR to protect the geonet from abrasions, excessive dirt and moisture, shall have the following characteristics:
    1. Level (no wooden pallets)
    2. Smooth
    3. Dry
    4. Protected from theft and vandalism
    5. Adjacent to the area being lined

E. Handling
    1. The CONTRACTOR and INSTALLER shall handle all rolls in such a manner to ensure they are not damaged in any way.
    2. The INSTALLER shall take any necessary precautions to prevent damage to underlying layers during placement of the drainage material.

1.6 WARRANTY

A. Material shall be warranted, on a pro-rata basis against defects for a period of 1-year from the date of the geocomposite installation.
B. Installation shall be warranted against defects in workmanship for a period of 1-year from the date of geocomposite completion.

2. PRODUCTS

2.1 GEOCOMPOSITE PROPERTIES

A. A geocomposite shall be manufactured by extruding two crossing strands to form a bi-planar drainage net structure with a non-woven geotextile bonded to one or both sides.
B. The geocomposite specified shall have properties that meet or exceed the values listed in the following data sheets below.

TABLE 1: GEOCOMPOSITE PROPERTIES			
Property	**Test Method**	**Frequency**	**Value**
Geocomposite			
Transmissivity (1), gal/min/ft (m2/sec) Single-Sided Composite	ASTM D 4716	1/540,000-ft^2	6.2 (1.3 x 10-3)
Ply Adhesion, lb/in	ASTM D 7005	1/50,000-ft^2	0.5
Geonet			
Geonet Core Thickness, mil (1)	ASTM D 5199	1/50,000-ft^2	270
Transmissivity (2), gal/min/ft (m2/sec)	ASTM D 4716	1/540,000-ft^2	19 (4 x 10-3)
Compressive Strength, lbs/ft	ASTM D 6364	1/540,000-ft^2	40,000
Density, g/cm3	ASTM D 1505	1/50,000-ft^2	0.94
Tensile Strength (MD), lb/in	ASTM D 7179	1/50,000-ft^2	100
Carbon Black Content, %	ASTM D 4218	1/50,000-ft^2	2.0
8 oz. Geotextile (prior to lamination)			
Mass per Unit Area, oz/yd2	ASTM D 5261	1/90,000-ft^2	8
Grab Tensile Strength, lb	ASTM D 4632	1/90,000-ft^2	220
Grab Elongation	ASTM D 4632	1/90,000-ft^2	50%
CBR Puncture Strength, lb	ASTM D 6241	1/540,000-ft^2	575
Trapezoidal Tear Strength, lb	ASTM D 4533	1/90,000-ft^2	90
AOS, US Sieve (mm)	ASTM D 4751	1/540,000-ft^2	80 (0.180)
Permittivity, sec-1	ASTM D 4491	1/540,000-ft^2	1.3
Water Flow Rate, gpm/ft2	ASTM D 4491	1/540,000-ft^2	95
UV Resistance, % Retained	ASTM D 4355 (after 500 hours)	per formulation	70

- *Note: The design engineer shall prepare the table above based on the GSE product data sheet and then delete this note*

C. Resin
1. Resin shall be new first quality, compounded polyethylene resin.
2. Natural resin (without carbon black) shall meet the following additional
a. minimum requirements:

TABLE 2: RAW MATERIAL PROPERTIES		
Property	**Test Method[(1)]**	**Value**
Density (g/cm^3)	ASTM D 1505	>0.94
Melt Flow Index (g/10 min)	ASTM D 1238	$\leq$ 1.0

[1]GSE utilizes test equipment and procedures that enable effective and economical confirmation that the product will conform to specifications based on the noted procedures. Some test procedures have been modified for application to geosynthetics. All procedures and values are subject to change without prior notification.

2.2 MANUFACTURING QUALITY CONTROL

The geocomposite shall be manufactured in accordance with the Manufacturer's Quality Control Plan submitted to and approved by the ENGINEER.
The geocomposite shall be tested according to the test methods and frequencies listed on *Table 1* which has been prepared based on product data sheets.

3. EXECUTION

3.1 FAMILIARIZATION

A. Inspection
1. Prior to implementing any of the work in the Section to be lined, the INSTALLER shall carefully inspect the installed work of all other Sections and verify that all Work is complete to the point where the installation of the Section may properly commence without adverse impact.
2. If the INSTALLER has any concerns regarding the installed work of other Sections, he shall notify the Project ENGINEER.

3.2 MATERIAL PLACEMENT

A. The geocomposite roll should be installed in the direction of the slope and in the intended direction of flow unless otherwise specified by the ENGINEER.
1. If the project contains long, steep slopes, special care should be taken so that only full length rolls are used at the top of the slope.

B. In the presence of wind, all geocomposites shall be weighted down with sandbags or the equivalent. Such sandbags shall be used during placement and remain until replaced with cover material.
C. If the project includes an anchor trench at the top of the slopes, the geocomposite shall be properly anchored to resist sliding. Anchor trench compacting equipment shall not come into direct contact with the geocomposite.
D. In applying fill material, no equipment can drive directly across the geocomposite. The specified fill material shall be placed and spread utilizing vehicles with a low ground pressure.
E. The cover soil shall be placed in the geocomposite in a manner that prevents damage to the geocomposite. Placement of the cover soil shall proceed immediately following the placement and inspection of the geocomposite.

3.3 SEAMS AND OVERLAPS

A. Each component of the geocomposite will be secured or seamed to the like component at overlaps.
B. Geonet Components
    1. Adjacent edges of the geonet along the length of the geocomposite roll shall be placed with the edges of each geonet butted against each other.
    2. The overlaps shall be joined by tying the geonet structure with cable ties. These ties shall be spaced every 5-ft along the roll length.
    3. Adjoining geocomposite rolls (end to end) across the roll width should be shingled down in the direction of the slope, with the geonet portion of the top overlapping the geonet portion of the bottom geocomposite a minimum of 12-in across the roll width.
    4. The geonet portion should be tied every 6-in in the anchor trench or as specified by the ENGINEER.

3.4 REPAIR

A. Prior to covering the deployed geocomposite, each roll shall be inspected for damage resulting from construction.
B. Any rips, tears or damaged areas on the deployed geocomposite shall be removed and patched. The patch shall be secured to the original geonet by tying every 6-in with the approved tying devices. If the area to be repaired is more than 50 percent of the width of the panel, the damaged area shall be cut out and the two portions of the geonet shall be cut out and the two portions of the geonet shall be joined in accordance with *Subsection 3.03*.

Attachment G

Operating and Maintenance Plan

Blackbuck New Mexico LLC is proposing to construct three (3) storage containments in Section 1, Township 25 South, Range 27 East & Section 6, Township 25 South, Range 28 East in Eddy County, New Mexico. This Facility shall consist of three (3) storage containments, with a total operational volume of approximately 1,581,696-bbls.

OPERATION AND MAINTENANCE PROCEDURES

In this plan, the underlined text represents the language of the Rule.

The operator will operate and maintain the lined earthen containments to contain liquids and solids (blow sand and minimal precipitates from the treated 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 nearby oil and gas wells. During periods when water for E&P operations is not needed, produced water will discharge to one of the injection wells in the operator's SWD system. The containment will not be used for the disposal of produced water or other oilfield waste.

The operation of the Recycling Containment is summarized below:

1. Via pipeline, produced water generated from nearby oil and gas wells is delivered to a treatment system located as indicated in the C-147.
2. After treatment, the produced water discharges into the containment.
3. When required, treated produced water is removed from the containment for E&P operations. At this time, treated produced water will be used for drilling beneath the fresh water zones (beneath surface casing), for well stimulation (e.g. hydraulic fracturing) and other E&P uses as approved by OCD.
4. Whenever the maximum fluid capacity of the containment is reached, treatment and discharge to the containment ceases (see Freeboard and Overtopping Plan, below).
5. 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.
6. 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.
7. 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.

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 discover, 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 Inspection and Monitoring Plan), 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 onsite, 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.
8. The operator will maintain the containment free of miscellaneous solid waste or debris.
9. The operator will maintain at least 3-ft of freeboard for the containment and will use a welded ladder gauge to allow easy determination of the required 3-ft 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:

1. Reading and recording the fluid height of staff gauges,
2. Recording any evidence that the pond surface shows visible oil,
3. Visually inspecting the containment's exposed liners, and
4. Checking the leak detection system for any evidence of a loss of integrity of the primary liner.

As stated above, if a liner's integrity is compromised, or if any penetration of the liner occurs above the water surface, then the operator will notify the District office within 48 hours (phone or email).

Monthly, the operator will:

1. Inspect diversion ditches and berms around the containment to check for erosion and collection of surface water run-on.
2. Inspect the leak detection system for evidence of damage or malfunction and monitor for leakage.
3. Inspect the containment for 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.

4. 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.
5. 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.

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-ft of freeboard), the discharge of treated produced water ceases and the produced water generated by nearby oil and gas wells is managed by disposing of fluid at a local injection well.

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

1. Cease discharging treated produced water to the containment.
2. Accelerate re-use of the treated produced water for purposes approved by the Division.
3. Transfer treated produced water from the containment to a Division approved injection well.

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

PROTOCOL FOR LEAK DETECTION MONITORING, FLUID REMOVAL, AND REPORTING

As shown in *Attachment D*, 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-in 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 treated produced water from the containment via field 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.

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.

Attachment H

Closure Plan

Blackbuck New Mexico LLC. is proposing to construct three (3) storage containments in Section 1, Township 25 South, Range 27 East & Section 6, Township 25 South, Range 28 East in Eddy County, New Mexico. This Facility shall consist of three (3) storage containments, with a total operational volume of approximately 1,581,969-bbls.

CLOSURE PLAN

In this plan, the underlined text represents the language of the Rule.

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

1. The condition that existed prior to the construction of the recycling containment or
2. 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.

EXCAVATION AND REMOVAL CLOSURE PLAN - PROTOCOLS AND PROCEDURES

The operator will remove all liquids from the pits 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

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.

After the removal of the pit contents and liners, soils beneath the pit will be tested by collection of a five-point (minimum) composite sample, which includes stained or wet soils, if any. That sample shall be analyzed for the constituents listed in Table 1 of *19.15.34.14*.

After review of the laboratory results:

a. If any contaminant concentration is higher than the parameters listed in Table 1, additional delineation may be required, and the operator must receive approval before proceeding with closure.
b. If all contaminant concentrations are less than or equal to the parameters listed in Table 1, 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.

The operator will 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.

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.

ENVIROTECH
ENGINEERING

Scout Recycle Facility
Eddy County, New Mexico
Closure Cost Estimate
025244-00

Item	Units	Quanity	$/Unit	Estimate Cost
Facility Closure				
1 Fluid removal				
Scout Recycle West Containment (763kbbls)	bbls	763,155	$ 0.50	$ 381,577.50
Scout Recycle East Containment (763kbbls)	bbls	763,155	$ 0.50	$ 381,577.50
Scout Recycle Inflow Containment (55kbbls)	bbls	55,386	$ 0.50	$ 27,693.00
2 Vac truck (final fluid removal)	hrs	80	$ 125.00	$ 10,000.00
3 Liner removal (fold-in-place)				
Erosion Control Liner	SF	121,613	$ 0.18	$ 21,890.34
West Storage Containment removal and disposal	SF	1,682,013	$ 0.18	$ 302,762.34
East Storage Containment removal and disposal	SF	1,682,013	$ 0.18	$ 302,762.34
Inflow containment removal and disposal	SF	219,934	$ 0.18	$ 39,588.12
4 Equipment removal				
Pit clean-out and residue haul-off	LS	1	$ 20,000.00	$ 20,000.00
Equipment removal (tanks, gun barrel, FWKO)	LS	1	$ 7,500.00	$ 7,500.00
Electrical decomissioning (pumps and panels)	LS	1	$ 10,000.00	$ 10,000.00
Misc equipment clean-up and removal	hr	200	$ 135.00	$ 27,000.00
Fence Removal	FT	5,100	$ 1.25	$ 6,375.00
5 Site Restoration				
Scout Recycle Facility	CY	142,695	$ 5.00	$ 713,475.00
Dozer - push in berms (bid) and final grading of the site				
Re-vegetation	AC	36.2	$ 1,500.00	$ 54,300.00
Estimated Total				**$ 2,306,501.14**

Assumptions
No Remediation will be necessary
Pit is full at time of closure
Pit berms above natural grade will be used to fill voids below natural grade

Venegas, Victoria, EMNRD

From: Venegas, Victoria, EMNRD
Sent: Thursday, October 30, 2025 10:22 AM
To: barry.riley@blackbuckresources.com; Mitchell Ratke
Subject: 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787]
Attachments: C-147 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] 10.30.2025.pdf

2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787]

Good morning Mr. Riley.
The NMOCD has reviewed the recycling containment permit application and related documents, submitted by [373619] Blackbuck New Mexico LLC on 09/16/2025, Application ID **506134**, for 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] in L-06-25S-28E, Eddy County, New Mexico. [373619] Blackbuck New Mexico LLC, requested variances from 19.15.34 NMAC for 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787].

The following variances have been approved:

- The variance from 19.15.34.13.E NMAC for the installation of an audible “Bird-X Mega Blaster Pro” bird deterrence system is approved.
- The variance to NMAC 19.15.34.12.D to install a wire mesh, game fence, eight (8) feet in height is approved.
- The variance to 19.15.34.12.A.(4) NMAC for the installation of a 40-mil HDPE secondary liner is approved. The proposed liner system cross-section for the earthen containments is as follows: prepare subgrade, 10 oz. geotextile, 40-mil HDPE secondary liner, 200-mil geonet, 60-mil HDPE primary liner.

The form C-147 and related documents for the 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] are approved with the following conditions of 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.
- 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] is approved for five years of operation from the date of the permit application of 09/16/2025. 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] permit expires on 09/16/2030.
- The 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] consists of three (3) earthen Containments: Scout Recycle West Containment: 763,155 barrels, Scout Recycle East Containment: 763,155 barrels and Scout Recycle Treatment Containment: 55,386 barrels. The total operational volume of 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] is approximately 1,581,696-bbls.
- Per NMAC 19.15.34.15.A.(1) operators without existing financial assurance pursuant to NMAC 19.15.8 shall furnish financial assurance acceptable to the division in the amount of the recycling containment’s estimated closure cost.
- The total closure cost estimated of permit 1RF-540 - SYSTEM CONNECTOR POND RECYCLING FACILITY AND AST [fVV2512941876] in the amount of $ 2,306,501.14, meets the requirements of NMAC 19.15.34.15.A. The financial assurance should be mailed to:
- **EMNRD - Oil Conservation Division,**
  Administration & Compliance Bureau Attn:

Bond Administrator 1220 S. St. Francis Drive | Santa Fe, NM 87505.

- [373619] Blackbuck New Mexico LLC, shall construct, operate, maintain, close, and reclaim the 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] in compliance with 19.15.34 NMAC.
- [373619] Blackbuck New Mexico LLC, shall notify NMOCD when construction of the 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] commences.

- **KARST Best Practices**:
  - ❖ [373619] Blackbuck New Mexico LLC must have a BLM-CFO approved karst monitor on site to assess any karst features encountered during brush clearing and grading or during the construction of the 2RF-225 - JULIETA CONTAINMENT AND REUSE FACILITY [fVV2523949621]. If voids are encountered during excavation, the operator must contact the Bureau of Land Management's Karst Division at (575) 234-5972 or a BLM-CFO-approved karst contractor and request an on-site investigation by a karst expert. The operator must also notify NMOCD through OCD Permitting.

- [373619] Blackbuck New Mexico LLC, shall notify NMOCD when recycling operations commence and cease at 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787].
- A minimum of 3-feet freeboard must be maintained 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] recycling containment, 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.
- [373619] Blackbuck New Mexico LLC, shall submit monthly reports of recycling and reuse of produced water, drilling fluids, and liquid oil field waste on NMOCD form C-148 even if there is zero activity.
- [373619] Blackbuck New Mexico 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-227 - SCOUT RECYCLE FACILITY [FVV2530330787].
- According to Table 1 of NMAC 19.15.34.14, the closure criteria for 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] is for groundwater depth of 51 to 100 feet.

Please reference number 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] in all future communications.
Best regards,

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

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https://www.emnrd.nm.gov/ocd/contact-us

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

CONDITIONS

Operator:	OGRID:
Blackbuck New Mexico LLC 3200 Southwest Freeway Houston, TX 77027	373619
	Action Number: 506134
	Action Type: [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] permit expires on 09/16/2030. • [373619] Blackbuck New Mexico LLC, shall construct, operate, maintain, close, and reclaim the 2RF-227 - SCOUT RECYCLE FACILITY [FVV2530330787] in compliance with 19.15.34 NMAC. • [373619] Blackbuck New Mexico LLC, shall submit monthly reports of recycling and reuse of produced water, drilling fluids, and liquid oil field waste on NMOCD form C-148 even if there is zero activity. • [373619] Blackbuck New Mexico 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-227 - SCOUT RECYCLE FACILITY [FVV2530330787].	10/30/2025