November 2024

Rule 34 Registration: Volume 1
Sand Dune In-Ground Containment
Section 10, T24S, R31E, Eddy County

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

An old two track "road" crosses the northeast quadrant of the "project area" described in this submittal. This image shows the nature of the vegetation and blow sand that characterizes the surface.

Prepared for:
Solaris Water Midstream, LLC
Houston, Texas

Prepared by:

R.T. Hicks Consultants, Ltd.
Albuquerque, New Mexico

Cascade Services, LLC
Midland, Texas

R. T. HICKS CONSULTANTS, LTD.

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

November 21, 2024

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

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

RE: Solaris Water Midstream, LLC, Sand Dune Containment and Recycling Facility
In-ground Containment Registration and
Section 10 T24S R31E, Eddy County

Dear Ms. Barr and Ms. Venegas:

On behalf of Solaris Water Midstream, LLC, R.T. Hicks Consultants is pleased to submit a C-147 permit application for the above-referenced project. Solaris anticipates that construction will commence no sooner than December 2024. Produced water will flow into the containment shortly thereafter.

Volume 1 of the C-147 package contains:

- Transmittal Letter
- Closure cost estimate for the In-Ground Containment
- Siting Criteria Demonstration with Plates and Appendices

Volume 2 contains:

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

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

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

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

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

Sincerely,
R.T. Hicks Consultants

Randall T. Hicks PG
Principal

Copy: Solaris Water Midstream, LLC,
BLM

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

Estimate

ADDRESS
Solaris Water Midstream LLC
9651 Katy Freeway, Suite 400
Houston, TX 77024

SHIP TO
Solaris Water Midstream LLC
9651 Katy Freeway, Suite 400
Houston, TX 77024

ESTIMATE 1780
DATE 10/28/2024

CUSTOMER PROJECT NAME
CVX Sand Dunes Closure

PROJECT LOCATION COORDINATES
32.225434°, -103.760250°

DESCRIPTION	QTY	UNIT	RATE	AMOUNT
This is pricing a package to reclaim the single 1mm bbl pond cell Mobilize equipment to site. Dirt reclaim of pond consist of- Bury all material (Caliche, Gypsum, Sand, ect.) below ground level, backfill pond area with uncontaminated soil from pond walls. Pond area will be reclaimed to natural elevations and water flow patterns. All stockpiled strippings will be put down last to ensure ground has been completely returned to native design.	1		221,603.00	221,603.00
Environmental soil sampling This will include digging 6 sample locations for each containment. One composite sample from 0-4 feet below surface and one discrete sample from each location at 4.25 feet Cost include trip, labor, materials, and laboratory testing	1		1,725.00	1,725.00
Environmental Soil testing Before earthwork can begin the soil must be tested for contamination in case of liner leakage. Cost include trip, labor, materials, and laboratory testing of 18 tests.	1		2,700.00	2,700.00
Broadcast seeding of pond area Seed will be a native mix for Eddy County NM Includes purchase of seed mix and placement	1		3,000.00	3,000.00

Fence removal and disposal Fence estimated at 3,768 ft This includes removal of all posts, braces, wire, fabric, gates, and hardware.	3,768	4.00	15,072.00
Remove and dispose of all four layers. Textile, 40 mil, net, and 60 mil	2,706,000	0.15	405,900.00

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

Remit Checks To:
Cascade Services LLC
PO Box 200954
Dallas, TX 75320-0954
**THIS ESTIMATE IS SUBJECT TO THE TERMS & CONDITIONS ATTACHED.

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

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

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

Questions? Email AR@Cascadeservicesllc.com

SUBTOTAL	650,000.00
TAX	0.00
TOTAL	**$650,000.00**

Accepted By

Accepted Date

SITING CRITERIA DEMONSTRATION

Distance to Groundwater

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

Plates 1 and 2 are topographic and geologic maps that show:

1. The Sand Dune Containment area identified by the blue stippled polygon (see Plate 1).
2. Water wells from the OSE database as a blue triangle inside colored circles that indicate well depth. OSE wells are often mislocated in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Additionally, the OSE database can include locations of proposed wells (i.e. permit applications). In this case, the permit data generally show "no date" and "DTW=0" as data. In this area, Plate 1 includes a number of borings that did not encounter groundwater but did provide quality boring logs (see Appendix Well Logs)
3. Water wells from the USGS database as large triangles color-coded to the formation from which the well draws water.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares (Misc. well database).
5. The depth-to-water from the most recent available measurement for each well is provided adjacent to the well symbol on Plate 1.
6. The groundwater elevation from the most recent available measurement for each well is provided adjacent to the well symbol on Plate 2.

Note that Plate 1 shows OSE and MISC only and Plate 2 shows wells from the USGS database.

Hydrogeology

The Rustler Formation crops out in the northwestern corner of Plate 2. Thus, in this area, the Dewey Lake (now known as the Quartermaster Formation) and Chinle Formations were removed by erosion. USGS data suggest that water wells throughout the area of Plate 2 are completed in the Rustler (purple triangles). North of the Sand Dune Containment, the USGS labels water wells as drawing water from the Dewey Lake Formation (purple rectangles showing pumped or recently pumped wells). The USGS does not identify any wells within the area of Plate 2 as drawing water from the Chinle Formation, which is the dominant regional aquifer several miles east of the containment location.

Several driller's logs in Appendix Well Logs and located on Plate 2 support the conclusion that the uppermost water bearing unit is the Quartermaster Formation (Dewey Lake),

- C-4499 (BH-1), located about 1.9 miles southwest of the Sand Dune location. BH-1 is a dry boring to 110 feet. The driller's log from this well is good and suggests the Dewey Lake contact is 25 feet below surface.
- Well C-2405 was drilled in 1994, a year earlier than C-2464. It is located slightly northeast of the Sand Dune Containment location and C-2464 (Plate 1). It had a depth to

water upon completion of 160 feet. The water-bearing strata are from 210 feet to 270 feet. Dewey Lake bedrock appears to be at a depth of 40 feet.

USGS Groundwater Data

We relied upon the most recent data measured by the USGS, published data, and measurements by Hicks Consultants to create Plate 2. Water level data from the OSE database rely upon observed water levels by drillers during the completion of the water well. The OSE dataset provides some useful data in certain areas but were not used to generate groundwater elevations for these Plates. Based upon our field survey and examination of Google Earth images, we are confident that the wells shown on Plate 2 are located within ¼ mile of the plotted point.

The closest water well to the Sand Dune facility is USGS-8847, about 1.3 miles to the northwest. The USGS data for this well is presented in Appendix Well Logs. The text is directly from the USGS database, as is the graph. Plate 2 shows this well was pumped/pumping in 2013, but the pumping water level is less than 12 feet lower than the data from 1964. We consider this change insignificant. Depth to water is more than 420 feet in both cases. This is mapped by the USGS as a Rustler Formation well.

USGS-8899 is about 2.4 miles west of the Sand Dune Containment location. The well is inside a closed depression and completed within shallow alluvium. Depth to water is about 66 feet. The well logs from C-02440 and C-04508 (see below) demonstrate that the alluvium containing groundwater at USGS-8899 is considerably thinner outside of the depression and that below the alluvium, non-water bearing formations to greater depth are present to depths of at least 110 feet. These facts allow us to conclude that the well within the closed depression accesses a localized body of perched water that is suitable for stock or domestic uses.

OSE Wells

C-02440 is located about 1450 feet northwest of the northwest corner of the Sand Dune Containment site. It was drilled to a total depth of 350 feet in 1995 with an air rotary rig. No water was identified. The drilling log records 45 feet of intermixed sand and caliche deposited on top of 165 feet of brown, sandy shale. Beneath the shale is 140 feet of a hard brown sandstone.

C-04508 was drilled in 2020 at a location about 0.70 miles south of the southwest corner of the site. Drilling was done with a hollow stem augur. Sand and caliche account for the uppermost 20 feet of the boring. Red brown siltstones and claystones separate several off-white sandstones. No water bearing zones were identified in the 110 foot deep boring.

C-04687 was drilled in 2022 at a location about 1.60 miles east of the eastern side of the site. Sand and caliche accounted for the upper 13 feet of the boring. Red clays with some interbedded sand and sandstones were present for the underlying 62 feet. Sand, sandstone, and a limestone were noted in the bottommost 35 feet to the total depth of 110 feet. As with the previously described borings, no water bearing zones were found.

C-2460 is located about 1.25 miles northeast of the Sand dune location. About 33 feet of sand, caliche, and clay were drilled through before encountering brown lithified shales and sandstones to a total depth of 320 feet in 1995. A water bearing sand was encountered between 278 feet and 288 feet. Depth to water upon completion was 210 feet documenting that the groundwater was confined. As the estimated yield of 5 gal/min was considered insufficient, the boring was plugged.

Calculated Minimum Depth to Water at the Location

In order to calculate a depth to water beneath the Sand Dune Containment location, we constructed a 1.35 mile north to south transect from C-02440 to C-04508 as shown on Figure 1. This lineation passes about 285 feet west of the southwestern corner of the Sand Dune Containment location.

- At C-02440, the ground elevation is 3480 feet. No water was encountered in the 350-foot deep boring. Therefore, the groundwater elevation is less than (3480-350=) 3130 feet.
- At C-04508, the ground elevation is 3548. No water was encountered to the depth of 110 feet. The groundwater elevation at this location is less than (3548-110=) 3438 feet.
- To calculate a minimal depth to groundwater on this transect at the Sand Dune location, we note that the possible depth to groundwater will be least at the southwestern corner of the Sand Dune location. This corner is about 0.55 miles south of C-02440 and 285 feet east of the transect. The interpolated groundwater elevation on the transect is 3223 feet. The resulting minimal depth to water at the Sand Dune site is (3510-3223 =) 287 feet.

In the same manner, we constructed a 2.10 mile west to east transect from C-02440 to C-0487. This transect passes about 930 feet north of the northeastern corner of the Sand Dune Containment site.

- At C-02440, the groundwater is described above and is less than (3480-350=) 3130 feet.
- At C-04687, the ground elevation is 3551. No water was encountered to the depth of 110 feet. The groundwater elevation at this location is less than (3551-110=) 3441 feet.
- The depth to groundwater on this transect will be least at the northeastern corner of the Sand Dune location. This corner is about 0.59 miles east of C-02440. The interpolated groundwater elevation on the transect north of the northeastern corner of the site is 3171.6 feet. Using the ground elevation of the northeastern corner of the location gives a minimal depth to water of (3530-3171.6 =) 358.4 feet.

Conclusions

Our conclusions honor all data that we know are accurate to the best of our knowledge. We employed the most recent data, and we conclude:

- The ground surface elevation of the Sand Dune Containment location is about 3530 feet ASL.
- The Dewey Lake Formation is the uppermost aquifer beneath the site, and we believe this groundwater zone is connected to (albeit weakly) the overlying Chinle (Santa Rosa) and underlying Rustler.
- The closest boring to the Sand Dune Containment location is C-02440, 0.43 miles northwest of the northwest corner of the location. The boring is at a surface elevation of 3480 feet. No groundwater was found at this location to a depth of 350 feet in 1995.

- Using the three OSE wells discussed above (C-02440 in 1995, C-04508 in 2020 and C-04687 in 2022), north to south and west to east interpolations of the maximal groundwater elevation beneath the Sand Dune Containment location yielded elevations of 3223 feet and 3172 feet, respectively. These interpolations inherently overstates the groundwater elevation: as they are based upon borings that did not encounter groundwater.
- The depth to groundwater beneath the middle of the Sand Dune Containment site is no less than (3530-3223=) 307 feet.
- USGS well data for a number of nearby wells suggest that groundwater is confined, i.e. this groundwater is within strata at greater depth (Appendix Well Logs).
- The depth to water data presented in Plate 1 suggests a depth to groundwater of more than 200 feet and less than 500 feet is also reasonable.

Distance to Municipal Boundaries and Fresh Water Fields

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

- The closest municipality is Malaga, NM approximately 20 miles west of the Sand Dune Containment.
- The closest public well fields belong to the City of Jal. These municipal supply wells are about 28 miles to the southeast.

Distance to Subsurface Mines

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

- Closest caliche pits are about one mile to the south with another located about 1.75 miles to the northeast. Additional pits are present about 2.4 miles to the west and 2.2 miles to the southeast.
- There are no subsurface mines in the area shown in Plate 4.

Distance to High or Critical Karst Areas

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

- The proposed containment is located within a “low” potential karst area.
- The nearest “high” or “critical” potential karst area is located approximately 8 miles northwest of the proposed containment.
- We observed no evidence of solution voids or unstable ground near the site during the field inspection.

Distance to 100-Year Floodplain

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

- FEMA describes the location as an area with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.
- The nearest mapped flood hazard is about 4 miles west in a closed depression

Distance to Surface Water

Plate 7 shows that the closest intermittent streams mapped by the USGS are about 3 miles west-southwest of the proposed Sand Dune Containment. The site visit and photographs demonstrate that the Containment area is not within 300 feet of a continuously flowing watercourse or 200-feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark) or spring.

The closest mapped water bodies are Lake/Ponds south-southwest of the site, one of which is an excavated stock tank.

Distance to Permanent Residence or Structures

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

- The nearest structures are a lease road along the eastern side of the containment project area and several working pads immediately to the north.
- No residences or other structures are in the area.

Distance to Non-Public Water Supply

Plates 1 and 7 demonstrates that the Sand Dune Containment site is not within 500 horizontal feet of a spring or fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- Plate 1 shows the locations of all area water wells, active or plugged.
- There are no domestic water wells located within 1,000 feet of the area of interest.
- No springs were identified within the mapping area (see Plate 8)

Distance to Wetlands

Plate 9 demonstrates the Sand Dune location is not within 300 feet of any mapped wetlands identified in the New Mexico database.

- The nearest designated wetland is the same lake/pond to the south discussed earlier in the surface water section
- Natural wetlands (freshwater ponds) are not observed in the area.

PLATES

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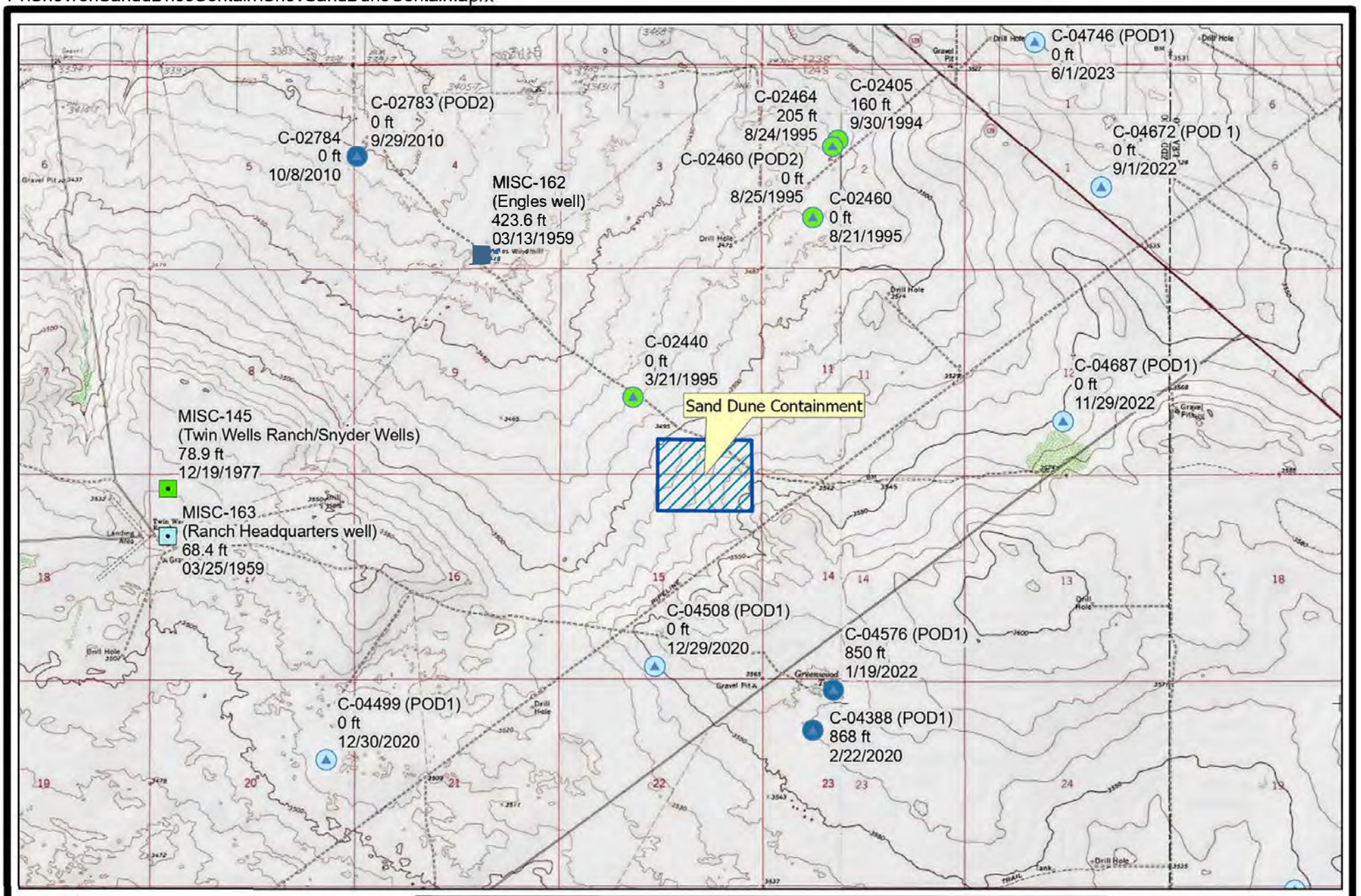

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Wells and Borings with Depth to Water Sand Dune Containment Solaris Midstream Waters LLC	Plate 1 August 2024

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OSE Water Wells (DTW/Date)

Well Depth (ft)

- 151-350
- 351-500
- 501-1000
- <1000

USGS Gauging Station (GW Elev, Date)

Aquifer Code, Well Status

- Alluvium/Bolsom
- Chinle
- Santa Rosa
- Dewey Lake Redbeds, Site had been pumped recently.
- Dewey Lake Redbeds, Site was being pumped.
- Rustler
- Rustler, Site was being pumped.
- Azotea Tongue of Seven Rivers Formation

Misc. Water Wells (GW Elev, Date)

Well Depth (ft)

- No Data
- <= 150
- 151 - 350
- 351 - 500
- > 500

Recycling Containment Area

NM_Geology

Map Unit,Description

- Qe/Qp, Quaternary-Eolian Piedmont Deposits
- Qp, Quaternary-Piedmont Alluvial Deposits,Qp, Quaternary-Piedmont Alluvial Deposits

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Plates 1 & 2 Legend Sand Dune Containment Solaris Midstream Waters LLC	July 2024

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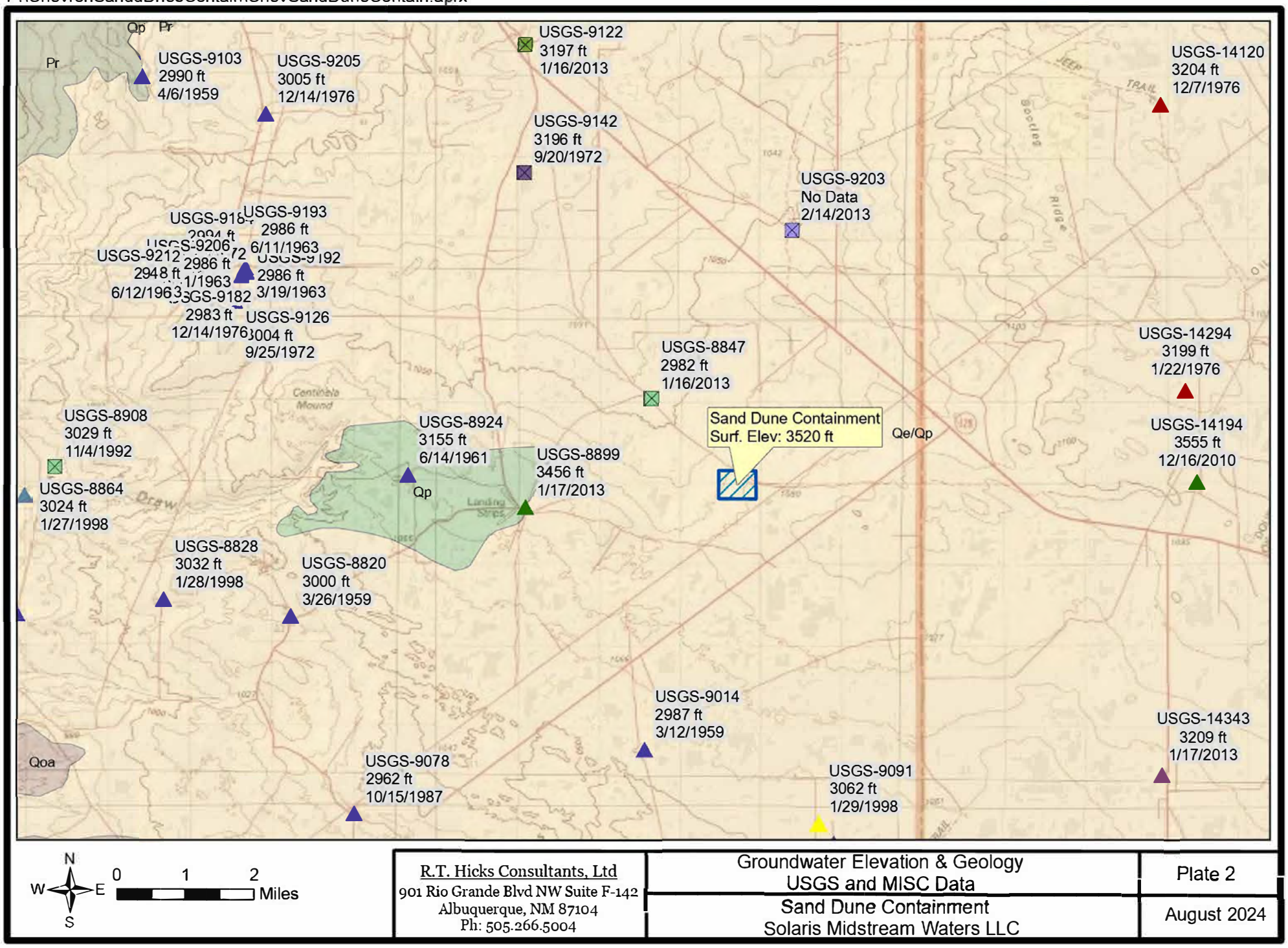

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Groundwater Elevation & Geology USGS and MISC Data Sand Dune Containment Solaris Midstream Waters LLC	Plate 2 August 2024

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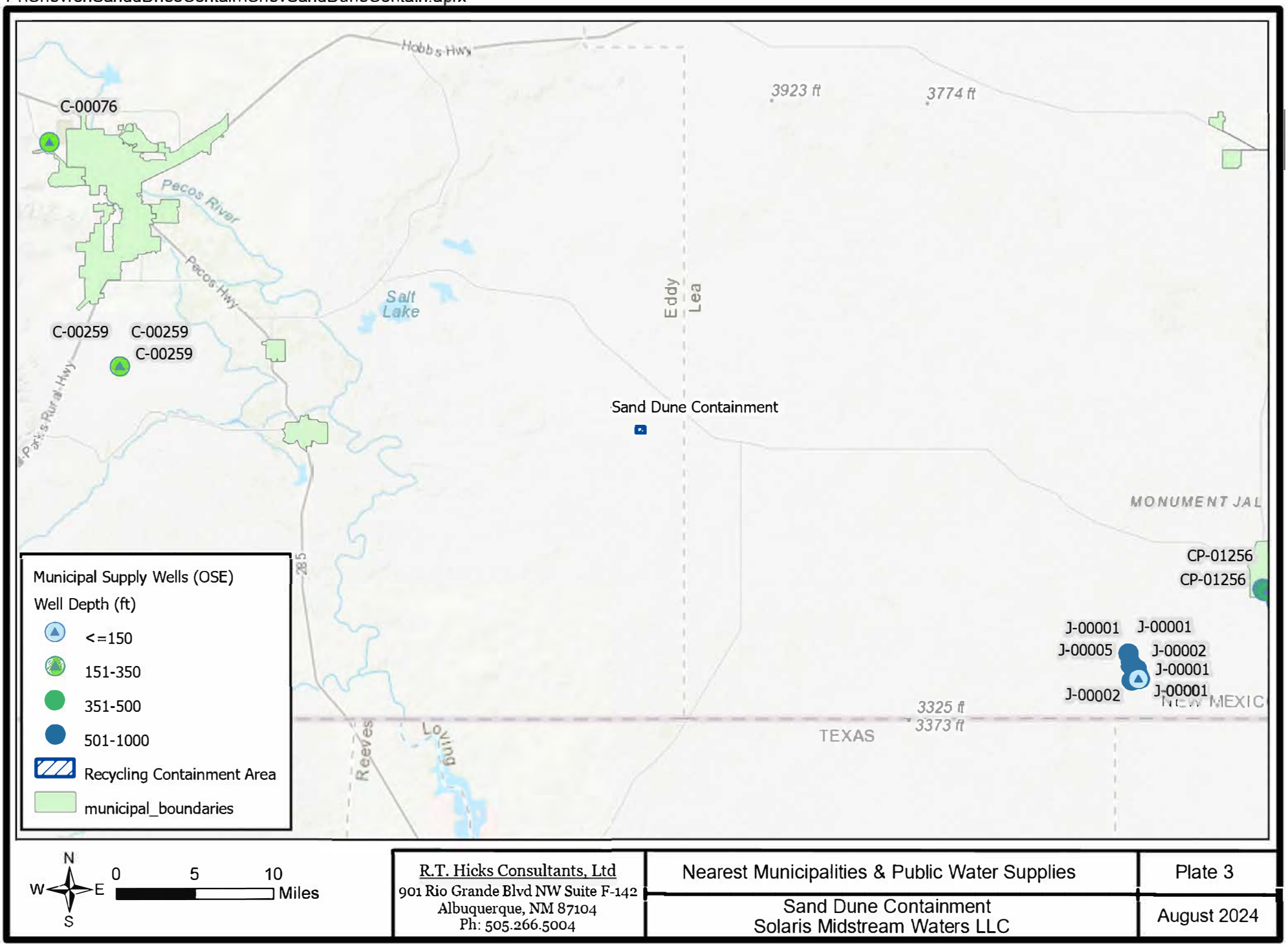

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Municipalities & Public Water Supplies Sand Dune Containment Solaris Midstream Waters LLC	Plate 3 August 2024

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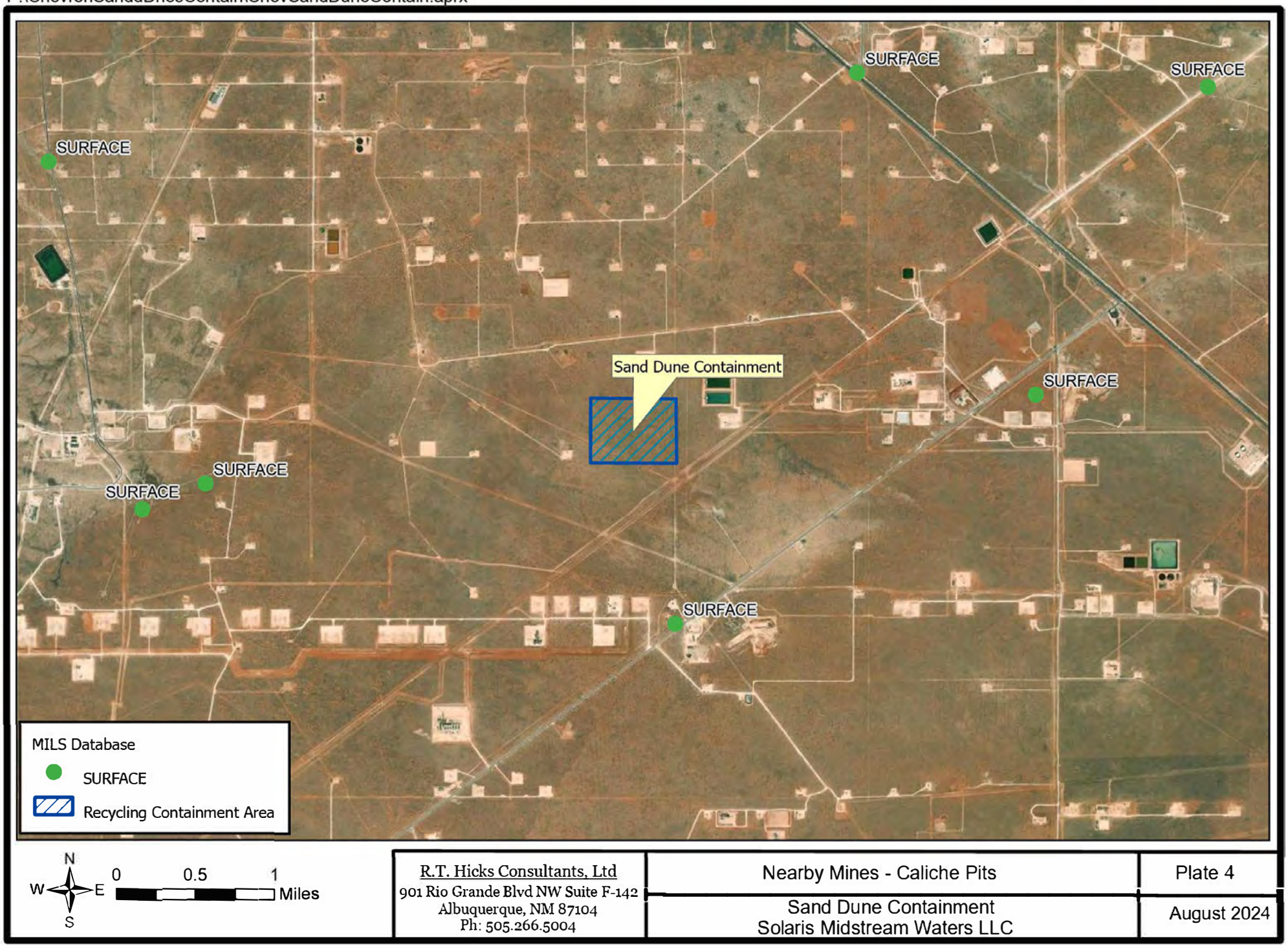

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Nearby Mines - Caliche Pits

Plate 4

Sand Dune Containment
Solaris Midstream Waters LLC

August 2024

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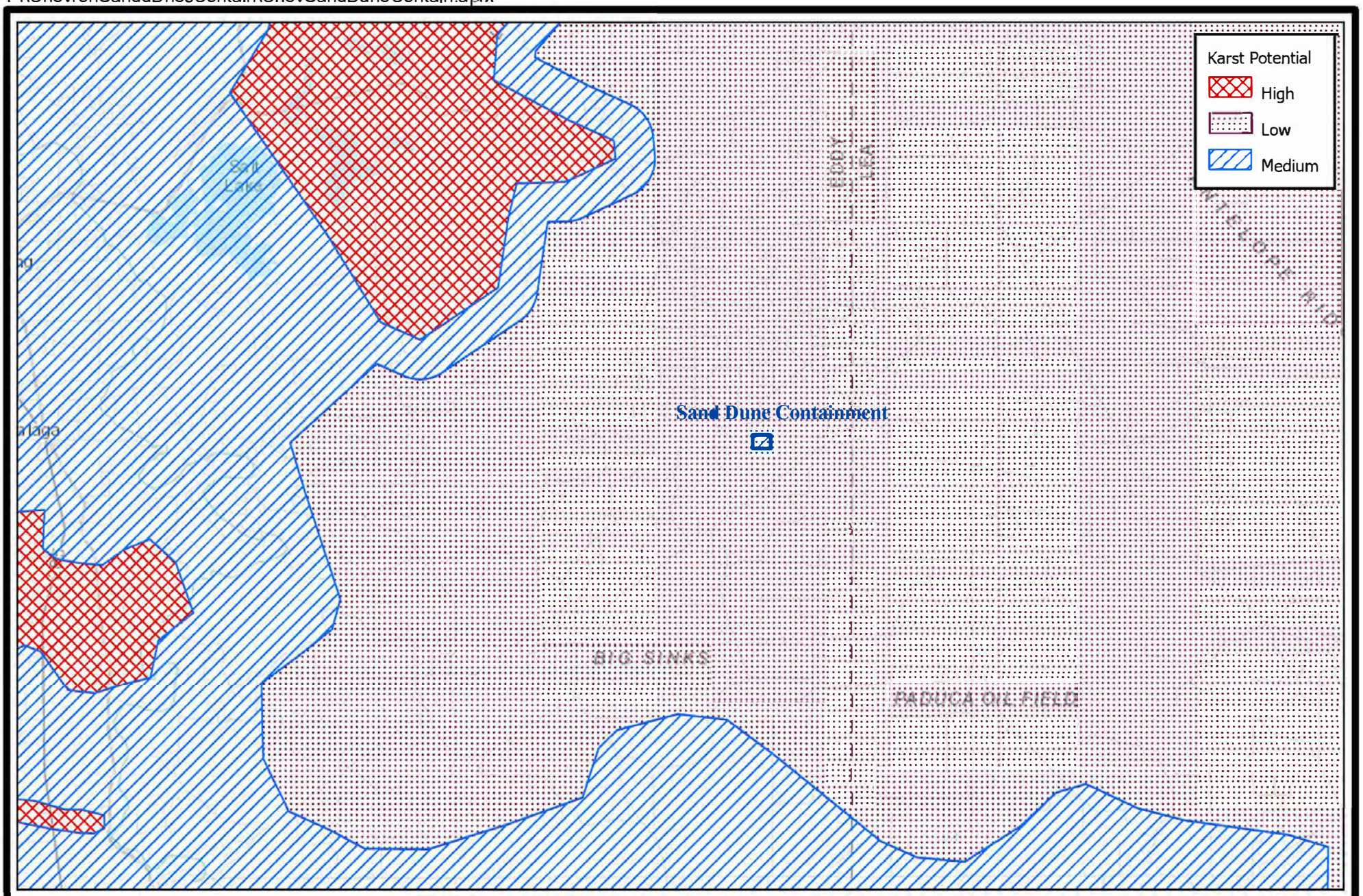

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Karst Potential Sand Dune Containment Solaris Midstream Waters LLC	Plate 5 August 2024

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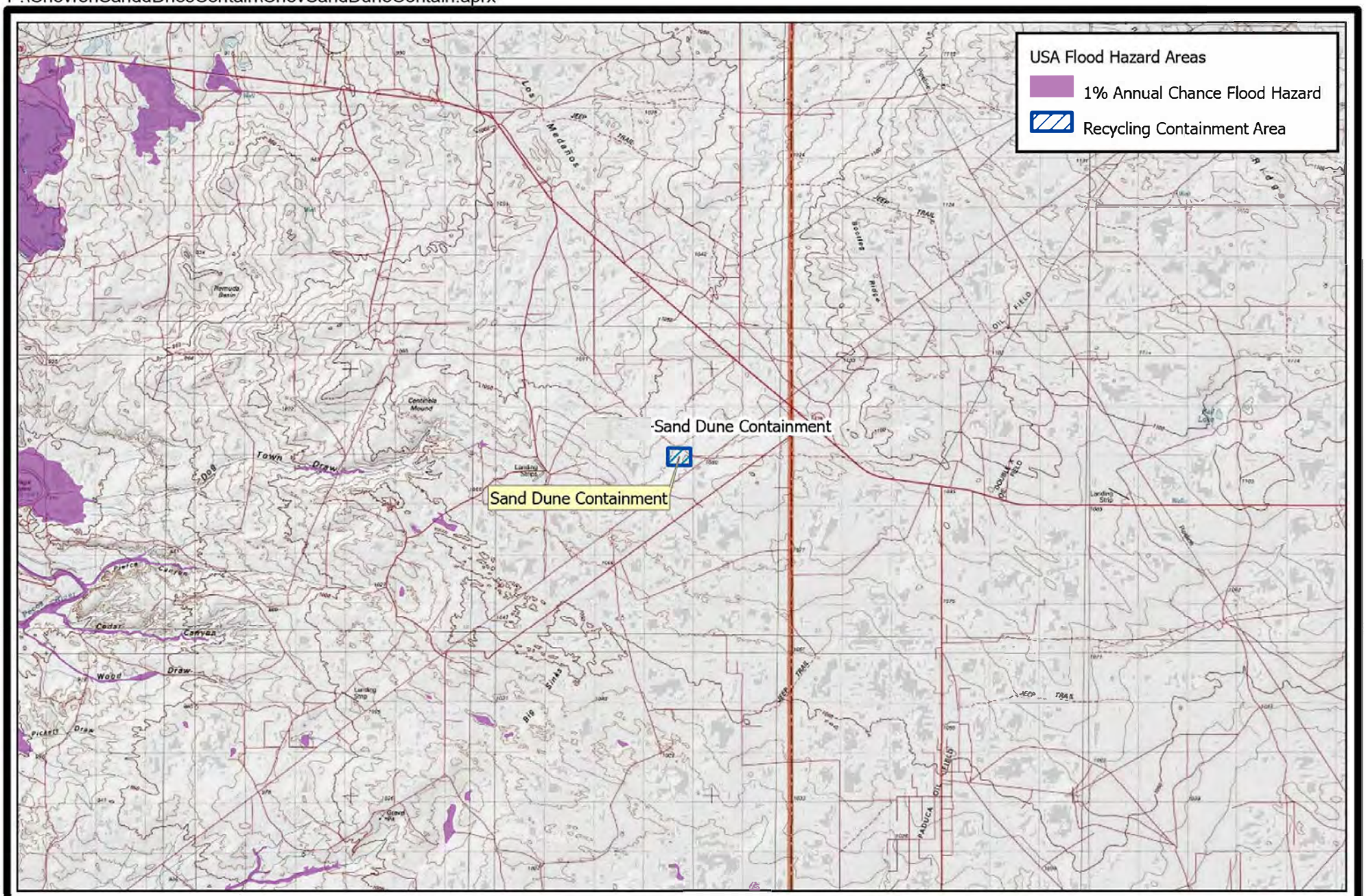

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	FEMA Mapped Flood Zones Sand Dune Containment Solaris Midstream Waters LLC	Plate 6 August 2024

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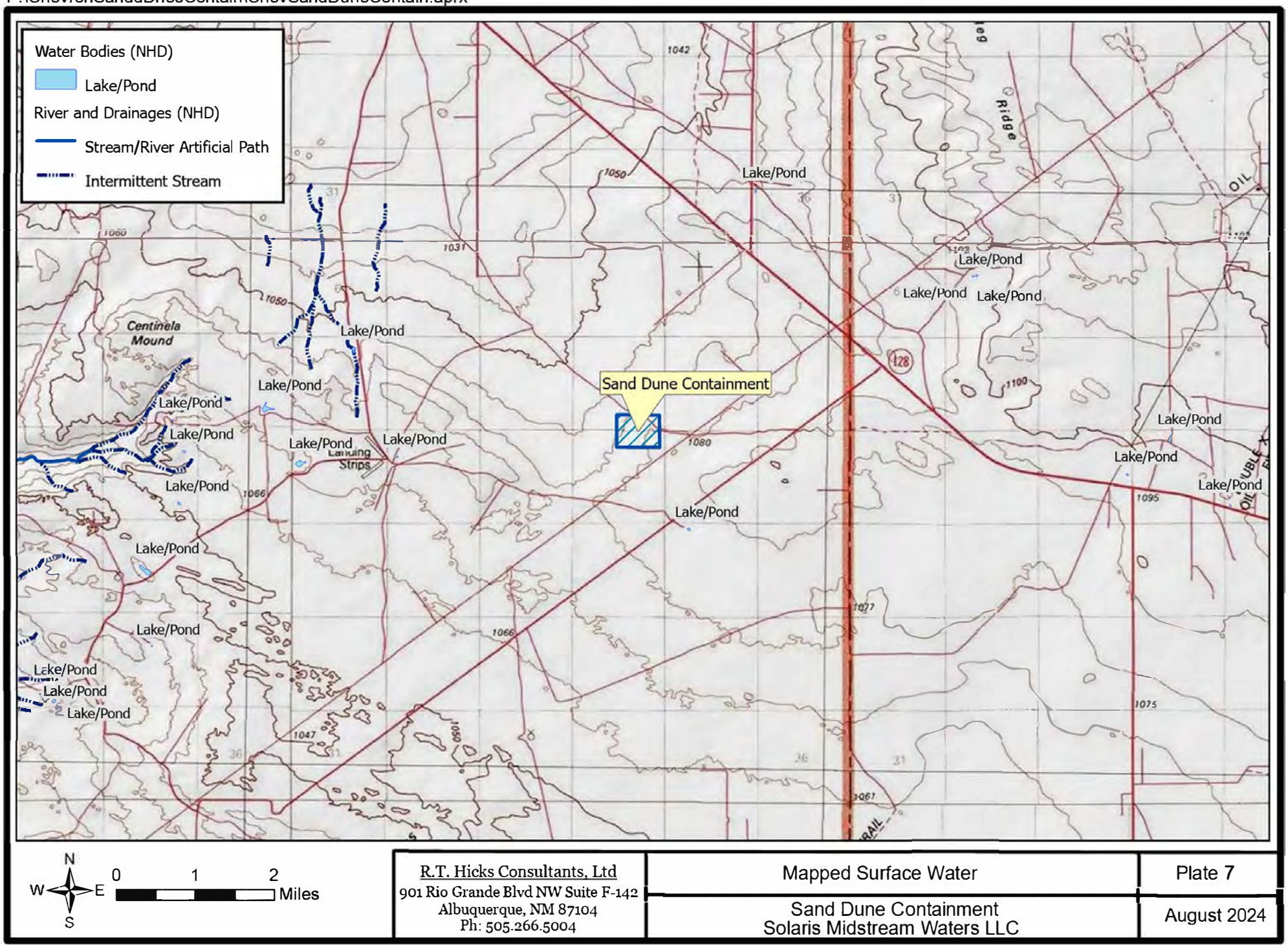

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Mapped Surface Water Sand Dune Containment Solaris Midstream Waters LLC	Plate 7 August 2024

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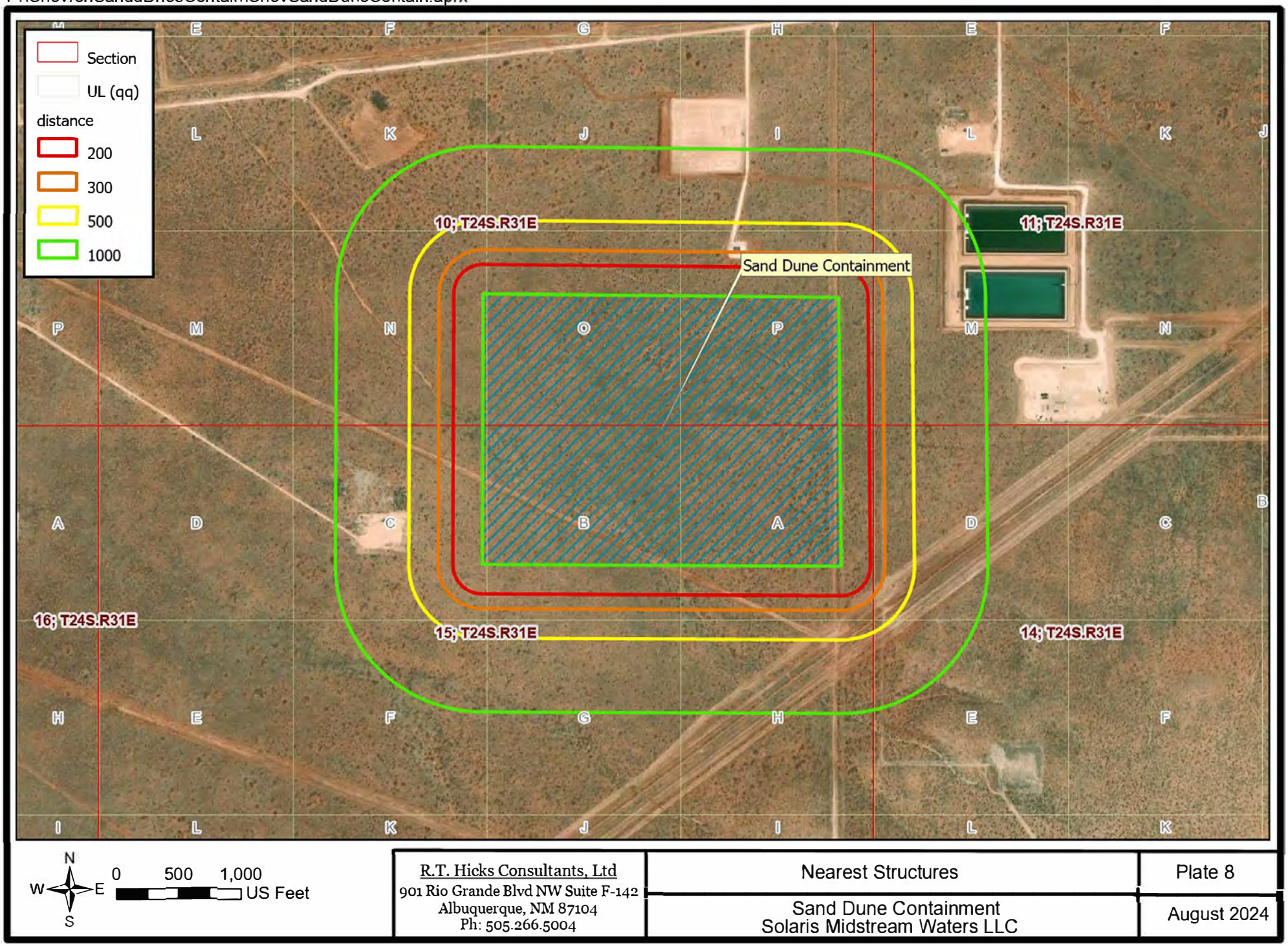

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Structures	Plate 8
	Sand Dune Containment Solaris Midstream Waters LLC	August 2024

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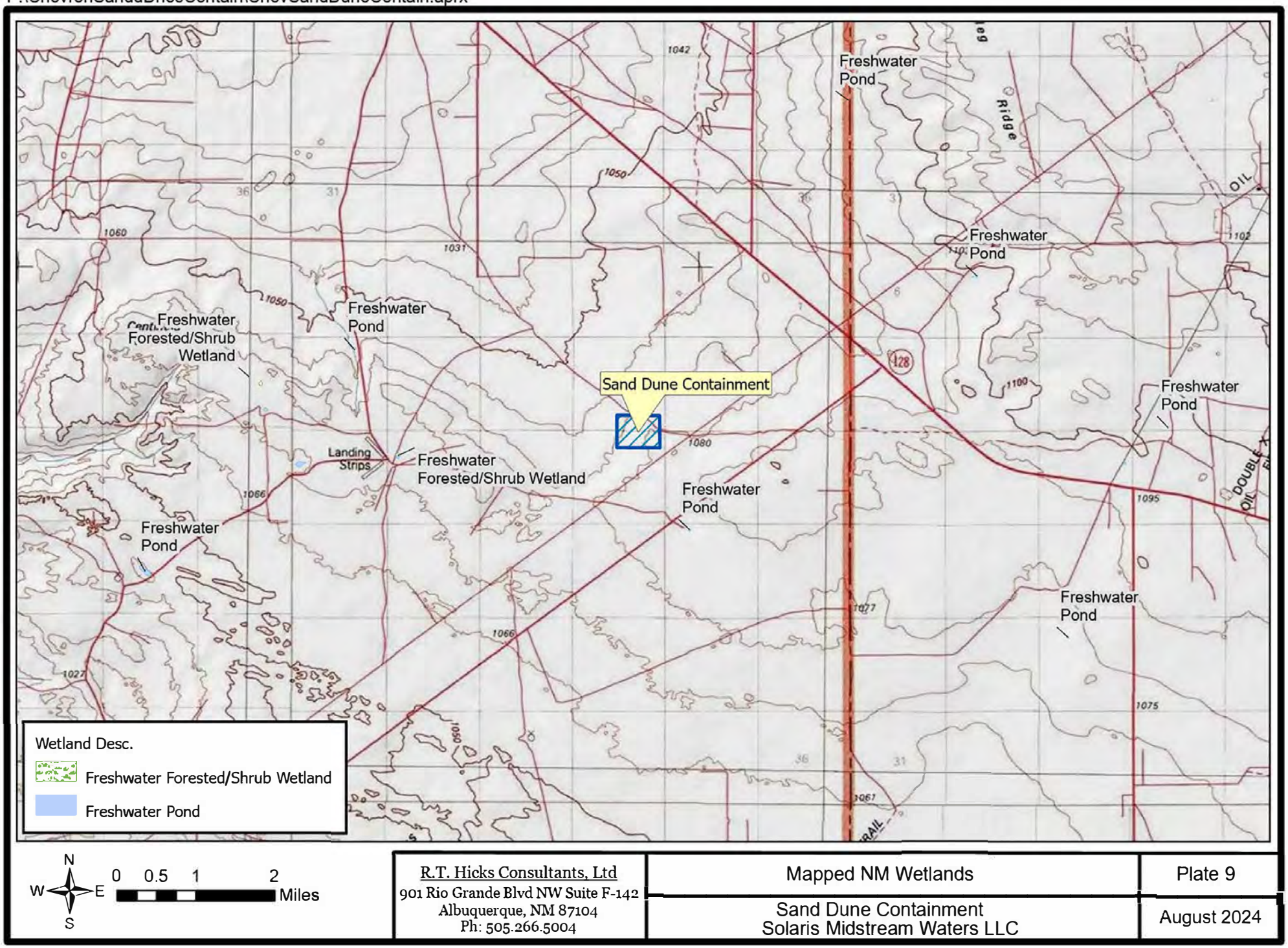


R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Mapped NM Wetlands Sand Dune Containment Solaris Midstream Waters LLC	Plate 9 August 2024

WELL LOGS AND USGS DATA

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

465596

Section 1. GENERAL INFORMATION

'95 MAY 23 AM 12:09

STATE ENGINEER OFFICE
SANTA FE NEW MEXICO

(A) Owner of well Sonat Exploration Owner's Well No. C-2440

Street or Post Office Address 110 W. Louisiana, Suite 500

City and State Midland, TX 79701

Well was drilled under Permit No. _____ and is located in the:

a. NE ¼ SW ¼ ____ ¼ ____ ¼ of Section 10 Township 24S Range 31E N.M.P.M.
Eddy Co.

b. Tract No. _____ of Map No. _____ of the _____

c. Lot No. _____ of Block No. _____ of the _____
Subdivision, recorded in _____ County.

d. X= _____ feet, Y= _____ feet, N.M. Coordinate System _____ Zone in the _____ Grant.

(B) Drilling Contractor West Texas Water Well Service License No. WD 1184

Address 3432 W. University Odessa, TX 79764

Drilling Began 03-20-95 Completed 03-21-95 Type tools air rotary Size of hole 8 3/4 in.

Elevation of land surface or _____ at well is _____ ft. Total depth of well 350 ft.

Completed well is ☐ shallow ☐ artesian. Depth to water upon completion of well _____ ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
			No water encountered formation log on back	

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

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

Section 5. PLUGGING RECORD

Plugging Contractor West Texas Water Well Service

Address 3432 W. University, Odessa, TX 79764

Plugging Method pumped cement slurry

Date Well Plugged 03-22-95

Plugging approved by:

_____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1	0	350	133
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received 04-25-95

Quad _____ FWL _____ FSL _____

File No. C-2440 Use "Dry Hole" OWD Location No. 24S.31E.10.32433

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	9	9	Sand
9	15	6	Caliche
15	38	23	Sand
38	45	7	Caliche
45	210	165	Brown sandy shale
210	350	140	Dark brown sandstone (hard - no water)

Section 7. REMARKS AND ADDITIONAL INFORMATION

STATE ENGINEER OFFICE
ROSWELL NEW MEXICO
'95 APR 25 AM 10 26

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

Robert E. Chandler
Driller

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

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

465677

Section 1. GENERAL INFORMATION

'95 SEP 28 AM 10 28

STATE ENGINEER OFFICE
SANTA FE, NEW MEXICO

(A) Owner of well Sonat Exploration Owner's Well No. #1

Street or Post Office Address c/o Glenn's Water Well Service, Inc.

City and State P.O. Box 692 Tatum, New Mexico 88267

Well was drilled under Permit No. C- 2460 and is located in the:

a. ____ ¼ ____ ¼ ____ ¼ SW ¼ of Section 2 Township 24-S. Range 31-E N.M.P.M.

b. Tract No. ____ of Map No. ____ of the ____

c. Lot No. ____ of Block No. ____ of the ____
Subdivision, recorded in ____ County.

d. X= ____ feet, Y= ____ feet, N.M. Coordinate System ____ Zone in the ____ Grant.

(B) Drilling Contractor Glenn's Water Well Service, Inc. License No. WD 421

Address P.O. Box 692 Tatum, New Mexico 88267

Drilling Began 8/21/95 Completed 8/21/95 Type tools rotary Size of hole 7 7/8 in.

Elevation of land surface or ____ at well is ____ ft. Total depth of well 320 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 210 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
278	288	10	sand	5

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
well was back filled with mud and dirt to plug					

Section 5. PLUGGING RECORD

Plugging Contractor ____

Address ____

Plugging Method ____

Date Well Plugged ____

Plugging approved by:

State Engineer Representative

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

FOR USE OF STATE ENGINEER ONLY

Date Received 09-07-95

Quad ____ FWL ____ FSL ____

File No. C-2460 Use OWD Location No. 24S.31E.2.32322

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	2	2	sand
2	12	10	clay
12	45	33	caleche
45	62	17	brown shale
62	84	22	brown sandstone
84	108	24	sandy brown shale
108	132	24	brown sandrock
132	136	4	brown shale
136	142	6	sandrock
142	145	3	hard rock
145	230	85	brown shale (sandy)
230	234	4	blue sandrock (hard)
234	258	24	brown shale
258	278	20	brown sandrock
278	288	10	good sand (redish white)
288	294	6	brown shale and rock
294	320	26	brown shale

STATE ENGINEER OFFICE SANTA FE, NEW MEX. 35 SEP 7 AM 11 42

Section 7. REMARKS AND ADDITIONAL INFORMATION

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

Corky Glenn
Driller

INSTRUCTIONS: This form should be [redacted]ed in triplicate, preferably typewritten, an[redacted]tted to the appropriate district office of the State Engineer. All sections, exc[redacted]ction 5, shall be answered as completely a[redacted]curately as possible when any well is [redacted] and when this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
POD1 (BH-01)	n/a	C-4508

WELL OWNER NAME(S)	PHONE (OPTIONAL)
XTO Energy (Kyle Littrell)	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
6401 Holiday Hill Dr.	Midland	TX	79707

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32°	12'	46.69"	N
	LONGITUDE	-103°	45'	55.29"	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

SW SE Sec. 15 T24S R31E

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1249	Jackie D. Atkins	Atkins Engineering Associates, Inc.

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
12/29/2020	12/29/2020	temporary well material	110	n/a

COMPLETED WELL IS: ☐ ARTESIAN ☑ DRY HOLE ☐ SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): n/a

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow Stem Auger

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	110	±8.5	Boring- HSA	--	--	--	--

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	C-4508	POD NO.	1	TRN NO.	686651
LOCATION	Exp 1 24S.31E.15.344			WELL TAG ID NO.	—

PAGE 1 OF 2

OSE DII FEB 12 2021 PM3:10

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	14	14	SAND, medium-fine grain, poorly graded,someclaiche, light-brown-tan,dry	Y ✓ N	
14	15	1	SAND, fine grain, poorly graded,someclaiche, light-brown-tan,dry	Y ✓ N	
15	25	5	CALICHE, moderately consolidated,silty, some gravel, off-white-tan, dry	Y ✓ N	
25	46	21	SILTSTONE, mod. consolidated, some sand, red-brown, dry	Y ✓ N	
46	64	18	CLAYSTONE, mod. consolidated, cohesive, few sand, red-brown, dry	Y ✓ N	
64	72	8	SANDSTONE, high consolidated, medium-grain, well graded,white/lightbrown	Y ✓ N	
72	90	18	CLAYSTONE, high consolidated, cohesive, medium plasticity, few sand, red-br	Y ✓ N	
90	101	11	SANDSTONE, high consolidated, fine grain, few silt,white/offwhite	Y ✓ N	
101	108	7	CLAYSTONE, high consolidated, cohesive, med.-low plasticity, few sand, red-b	Y ✓ N	
108	111	3	SANDSTONE, high consolidated, fine grain, few silt, white/offwhite, dry	Y ✓ N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 0.00

5. TEST; RIG SUPERVISION

WELL TEST: TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION: Temporary well materials removed and the soil boring backfilled using drill cuttings from total depth to ten feet below ground surface, then hydrated bentonite chips from ten feet below ground surface to surface. Logs adapted from WSP on-site geologist.

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

Shane Eldridge

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:

Jack Atkins — Jackie D. Atkins — 02/11/2021

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO. C-4508	POD NO. 1	TRN NO. 648651	
LOCATION		WELL TAG ID NO. —	PAGE 2 OF 2

OSE DII FEB 12 2021 PM3:10

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

OSE DII DEC 21 2022 PM3:17

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.): C-04687- POD 1	WELL TAG ID NO.	OSE FILE NO(S.): C-04687
WELL OWNER NAME(S): OXY USA INC		PHONE (OPTIONAL): 575-390-28285
WELL OWNER MAILING ADDRESS: PO BOX 4294		CITY: HOUSTON STATE: TX ZIP: 77210

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	13	41.99	N
	LONGITUDE	-103	43	55.00	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE: SUNDANCE SDS 11-1 SWD

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1184	RUSSELL SOUTHERLAND	WEST TEXAS WATER WELL SERVICE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/29/2022	11/29/2022	110		

COMPLETED WELL IS: ☐ ARTESIAN ☑ DRY HOLE ☐ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): N/A

DRILLING FLUID: ☑ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☑ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER – SPECIFY:

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
			NO CASING IN HOLE				

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
			N/A		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 04/30/19)

FILE NO. C-04687	POD NO. 1	TRN NO. 739086	
LOCATION 24S.31E.12.4.2.3		WELL TAG ID NO.	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	6		RED SAND	Y ✔ N	
6	13		SANDY CALICHIE	Y ✔ N	
13	20		RED SANDY CLAY	Y ✔ N	
20	75		RED CLAY W/ SANDSTONE STREAKS	Y ✔ N	
75	105		SAND, SANDSTONE	Y ✔ N	
105	110		REDE SAND W/ LIMESTONE	Y ✔ N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☑ OTHER – SPECIFY: DRY HOLE

TOTAL ESTIMATED WELL YIELD (gpm): 0.00

5. TEST; RIG SUPERVISION

WELL TEST: TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

OSE DII DEC 21 2022 PM3:17

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

RUSSELL SOUTHERLAND

6. SIGNATURE

BY SIGNING BELOW, I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED WELL. I ALSO CERTIFY THAT THE WELL TAG, IF REQUIRED, HAS BEEN INSTALLED AND THAT THIS WELL RECORD WILL ALSO BE FILED WITH THE PERMIT HOLDER WITHIN 30 DAYS AFTER THE COMPLETION OF WELL DRILLING.

Russell Southerland — RUSSELL SOUTHERLAND — 11/29/2022

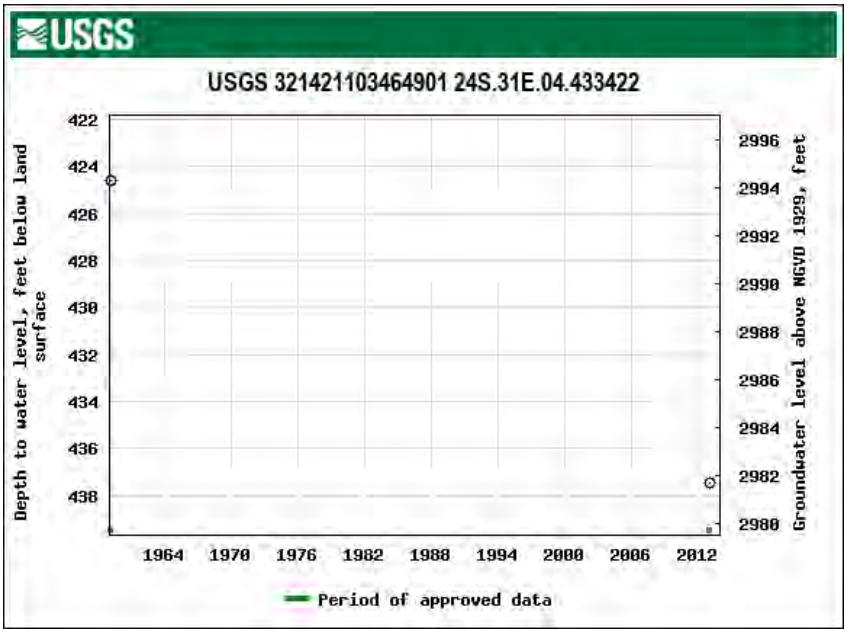
SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 04/30/2019)

FILE NO. C-04687	POD NO. 1	TRN NO. 739086	
LOCATION 24S.31E.12.4.2.3		WELL TAG ID NO.	PAGE 2 OF 2

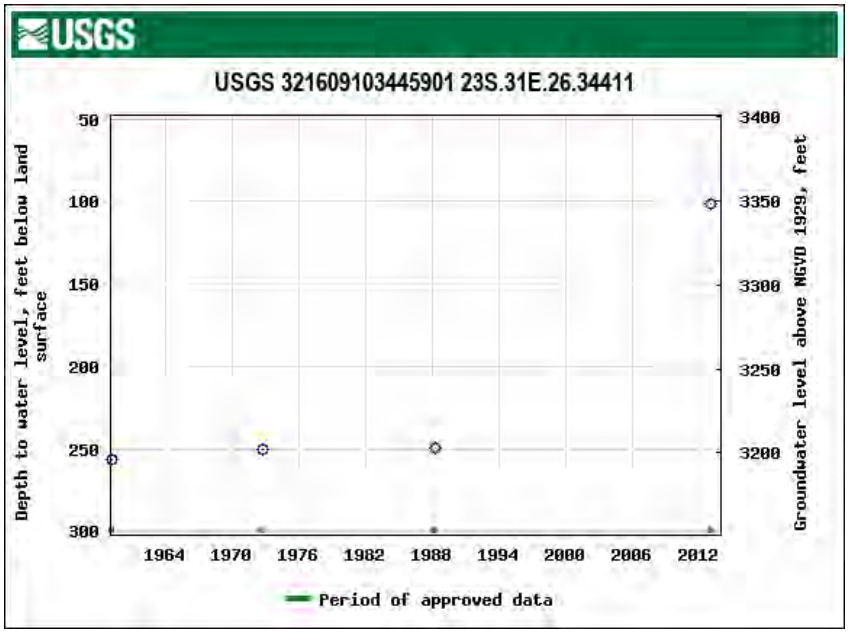
USGS 321421103464901 24S.31E.04.433422 AKA USGS-8847

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°14'23.7",
Longitude 103°46'47.8" NAD83
Land-surface elevation 3,419.00 feet above NGVD29
The depth of the well is 627 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Rustler Formation (312RSLR) local aquifer.



USGS 321609103445901 23S.31E.26.34411 AKA USGS 9203

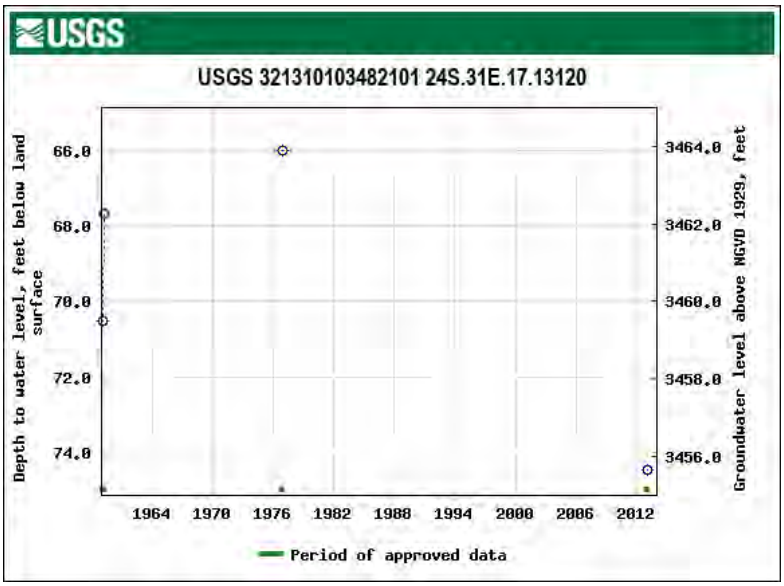
Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°16'11.9",
Longitude 103°45'01.2" NAD83
Land-surface elevation 3,451.00 feet above NGVD29
The depth of the well is 365 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Dewey Lake Redbeds (312DYLK) local aquifer.



https://nwis.waterdata.usgs.gov/nwisweb/data/img/USGS.321609103445901.19590204.20130117..0.gwlevels.pres.gif

USGS 321310103482101 24S.31E.17.13120 AKA USGS 8899

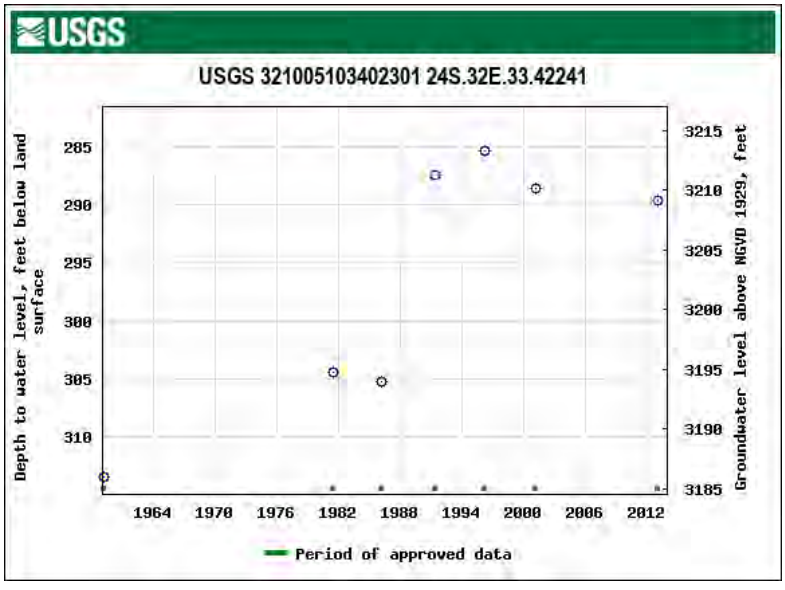
Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°13'14.1", Longitude 103°48'23.4" NAD83
Land-surface elevation 3,530.00 feet above NGVD29
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.



USGS 8899 is about 3.0 miles west-southwest of the Sand Dunes AST and is considered to access water in the alluvial deposits overlying the Rustler material. Nearly 50 years of record show a variation in water levels of about 8 feet. We consider this insignificant.

USGS 321005103402301 24S.32E.33.42241 AKA USGS-14343

Lea County, New Mexico
Hydrologic Unit Code 13070001
Latitude 32°10'21.6", Longitude 103°40'18.9" NAD83
Land-surface elevation 3,499.00 feet above NGVD29
The depth of the well is 367 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Chinle Formation (231CHNL) local aquifer.

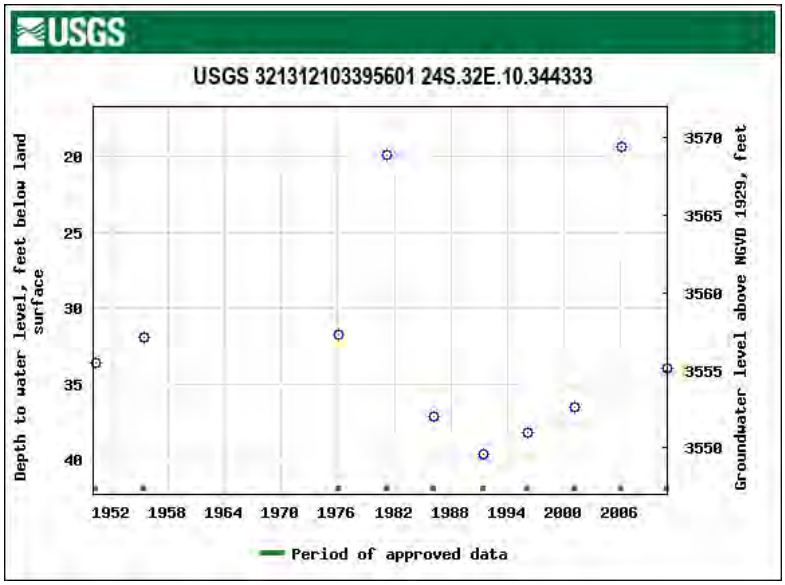


USGS-14343 is at the southeast corner of Plate 2. The USGS data are presented above. The data from the USGS indicate this well draws water from the Chinle Formation. As it lies about 5 miles east and 4 miles south, this characterization appears likely. The data are from about 1959 to 2013 and show a groundwater surface increase of nearly 30 feet (from 305 feet bgs to 285 feet bgs) but a stable water level since about 1990.

About 5.5 miles due east of the Sand Dune Containment is the "Cotton Place" well that lies within a closed depression (Plate 2). The data presented below show a depth to water ranging from 20-40 feet below surface. This groundwater zone is localized and perched on the underlying bedrock.

USGS 321312103395601 24S.32E.10.344333 AKA USGS 14194

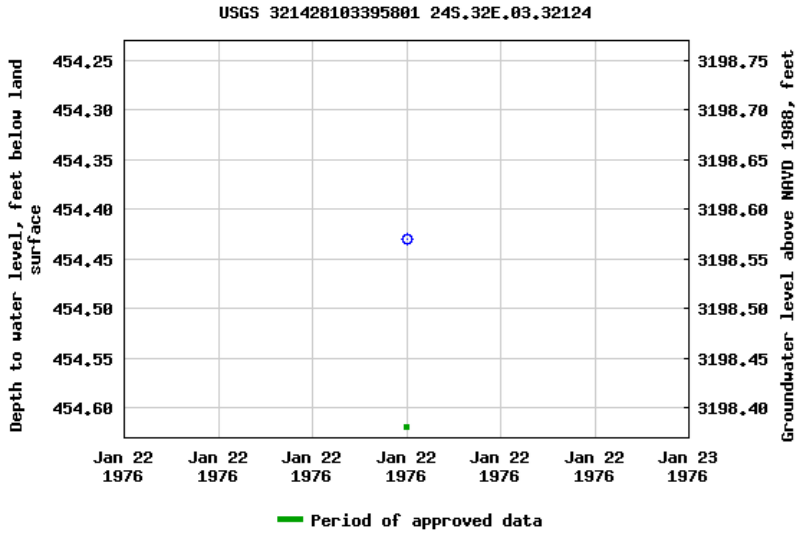
Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°13'30.4", Longitude 103°39'52.7" NAD83
Land-surface elevation 3,589.00 feet above NGVD29
The depth of the well is 60 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.



USGS 321428103395801 24S.32E.03.32124 aka USGS-14294

Lea County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°14'28", Longitude 103°39'58" NAD27
Land-surface elevation 3,653 feet above NAVD88
The depth of the well is 550 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Santa Rosa Sandstone (231SNRS) local aquifer.

The actual well location is most likely 0.34 miles to the north-northeast wherein a windmill, a water tank, and a fenced area containing cows can be clearly seen in a March 2012 image.



North of Cotton Place is USGS-14294 and Misc-12. These two wells have only one measurement each and it is posted on Plate 2. The USGS data show well 14294 is a Santa Rosa (lower Chinle) well and Misc-12 is probably a Chinle Formation well also. The lower ground water elevations at these two wells support our conclusion that the Cotton Place well within the closed depression is a localized body of perched water that is suitable for stock or domestic uses.

SITE PHOTOGRAHS

Figures

The photographs were taken during R T Hicks Consultants site visit on July 19, 2024. The aerial photo below shows the photograph locations as numbered white circles. North is up in the aerial image.

Figure 1: *View northeast from location 1 at center of 2-track road where it cuts through the northeast portion of the Containment location.*

Figure 2: *View to the southwest towards the center of the site from location 1 (NE corner), from recently constructed ROW.*

Figure 3: *Looking northwest toward center of Containment Location from location 3 (southeast corner). Eolian sand with small, low dunes dotted with shrubs and native grasses on the surface.*

Figure 4: *View north-northwest from center of southern boundary of Containment location, identified as location 4. Gas ROW runs NW-SE through western half of Containment location.*

Figure 5: *View west from location 5 (center). Surface of the western half of Containment location exhibits more compacted sand and fewer dunes.*

Figure 6: *View east toward the center of the Containment location from location 6 at the center of the western boundary.*

Figure 7: *Drainage feature west of Containment location, view northwest from location 7. This photograph illustrates the nearest discernable drainage to the Containment location.*

December 2024

Rule 34 Registration: Volume 2
Solaris CVX Sand Dune In-Ground Containment
Section 10, T24S, R31E, Eddy County

Volume 2 In-Ground Containment

- ***C-147 Form***
- ***Stamped Design Drawings, Avian Hazing System & Liner Equivalency Demonstration***
- ***Recently Approved Plans for Design/Construction, O&M, Closure***

An old two track "road" crosses the northeast quadrant of the "project area" described in this submittal. This image shows the nature of the vegetation and blow sand that characterizes the surface.

Prepared for:
Solaris Water Midstream, LLC
Houston, Texas

Prepared by:

R.T. Hicks Consultants, Ltd.
Albuquerque, New Mexico

Cascade Services, LLC
Midland, Texas

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

Form C-147
Revised October 11, 2022

Recycling Facility and/or Recycling Containment

Type of Facility: ☐ Recycling Facility ☑ Recycling Containment*

Type of action: ☐ Permit ☑ Registration ☐ Modification ☐ Extension ☐ Closure ☐ Other (explain) _____

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

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

1.

Operator: Solaris Water Midstream, LLC (For multiple operators attach page with information) OGRID #: 371643

Address: 9651 Katy Freeway, Ste 400, Houston, TX 77024

Facility or well name (include API# if associated with a well): Solaris CVX Sand Dune Recycling Facility

OCD Permit Number: 2RF-215 (For new facilities the permit number will be assigned by the district office)

U/L or Qtr/Qtr P Section 10 Township 24S Range 31E County: Eddy

Surface Owner: ☑ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.

☑ **Recycling Facility:**

Location of recycling facility (if applicable): Latitude 32.225080 Longitude -103.753366 NAD83

Proposed Use: ☑ Drilling* ☑ Completion* ☑ Production* ☑ Plugging *

The re-use of produced water may NOT be used until fresh water zones are cased and cemented

☐ Other, ***requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.***

☑ Fluid Storage

☑ Above ground tanks ☑ Recycling containment ☐ Activity permitted under 19.15.17 NMAC explain type_____

☐ Activity permitted under 19.15.36 NMAC explain type:_____ ☐ Other explain _____

☐ For multiple or additional recycling containments, attach design and location information of each containment

☐ **Closure Report (required within 60 days of closure completion):** ☐ Recycling Facility Closure Completion Date:_____

3.

☑ **Recycling Containment:**

☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)

Center of Recycling Containment (if applicable): Latitude 32.225434 Longitude -103.760250 NAD83

☐ For multiple or additional recycling containments, attach design and location information of each containment

☑ Lined ☐ Liner type: Thickness 60 & 40 mil ☐ LLDPE ☑ HDPE ☐ PVC ☐ Other _____

☐ String-Reinforced

Liner Seams: ☑ Welded ☐ Factory ☐ Other _____ Volume: 1.157MM bbl Dimensions: L_____ x W_____ x D_____

☐ Recycling Containment Closure Completion Date:_____ See attached Design Drawings

4.

Bonding:

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

☑ Bonding in accordance with 19.15.34.15(A)(1). Amount of bond $ see Vol 1 details **(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 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.

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

10.

Operator Application Certification:

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

Name (Print): Drew Dixon Title: SVP- Land and Regulatory

Signature: Drew Dixon Date: 12/13/2024

e-mail address drew.dixon@ariswater.com Telephone: 832-304-9028

11.

OCD Representative Signature: Victoria Venegas **Approval Date:** 01/02/2025

Title: Environmental Specialist **OCD Permit Number:** 2RF-215

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

CVX SAND DUNES RECYCLE FACILITY

SOLARIS WATER MIDSTREAM

EDDY COUNTY, NEW MEXICO

32° 13' 31.5618" N, -103° 45' 36.8994" W
32.225434°, -103.760250°

INDEX TO DRAWINGS

CONTACTS

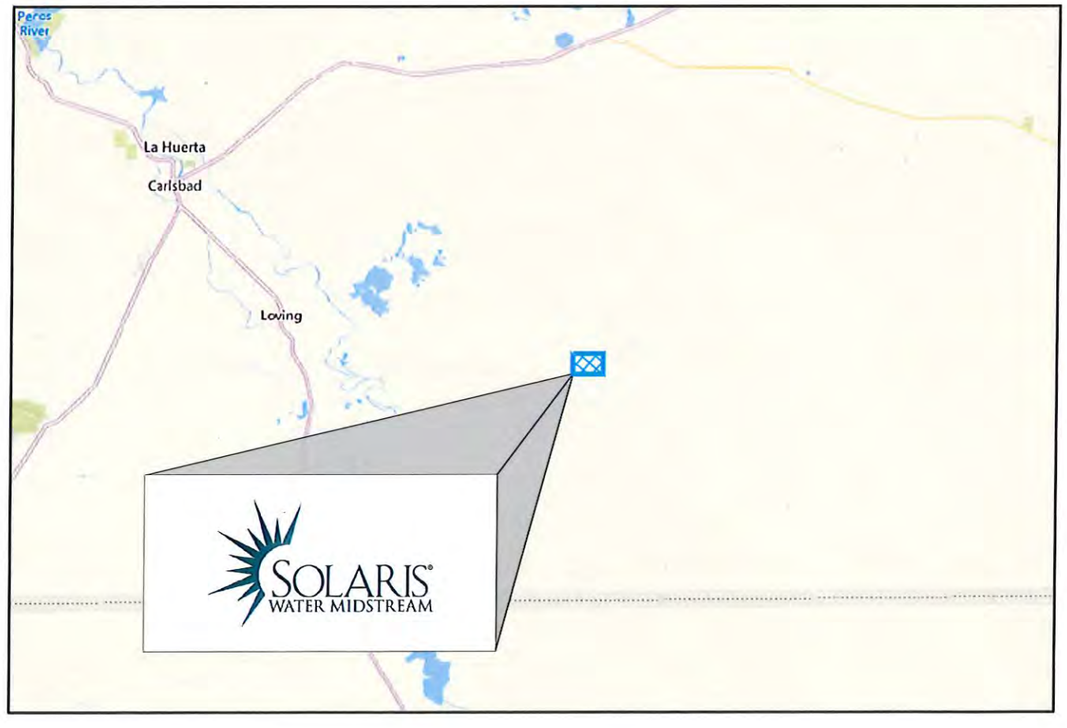
JEFFERY COOK - SOLARIS WATER MIDSTREAM - (713)-614-3644

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

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

UTILITY CAUTION

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



MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
10-25-2024

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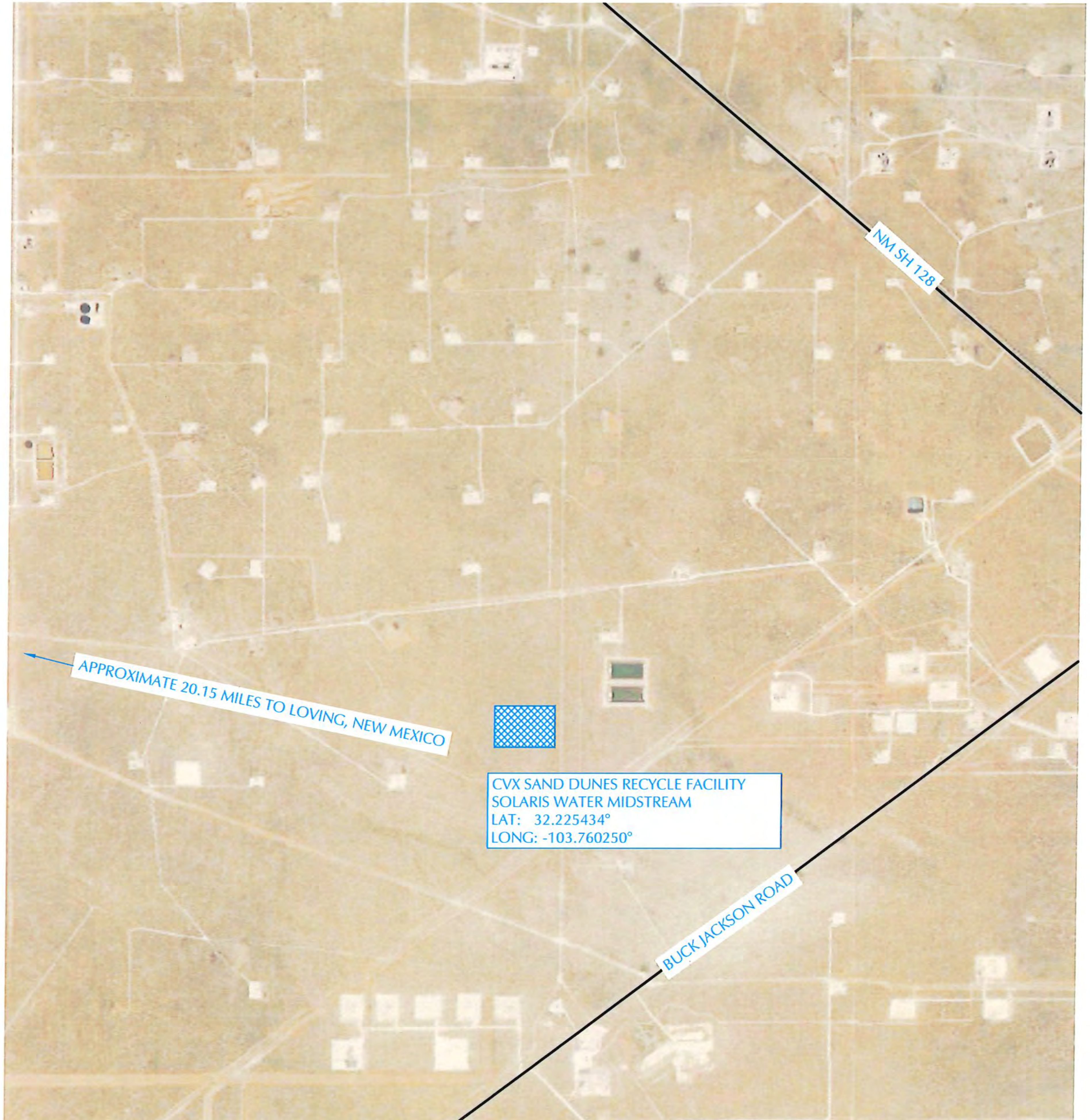
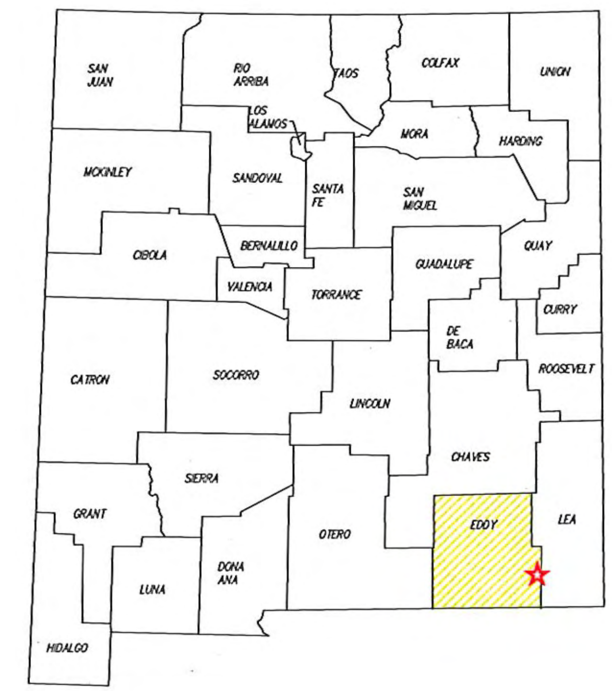


NORTH



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29736
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10-25-2024

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PE #29284 - Expiration Data: 12-31-2024

NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

PROJECT LOCATION
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

DATE:	OCTOBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	2 OF 11

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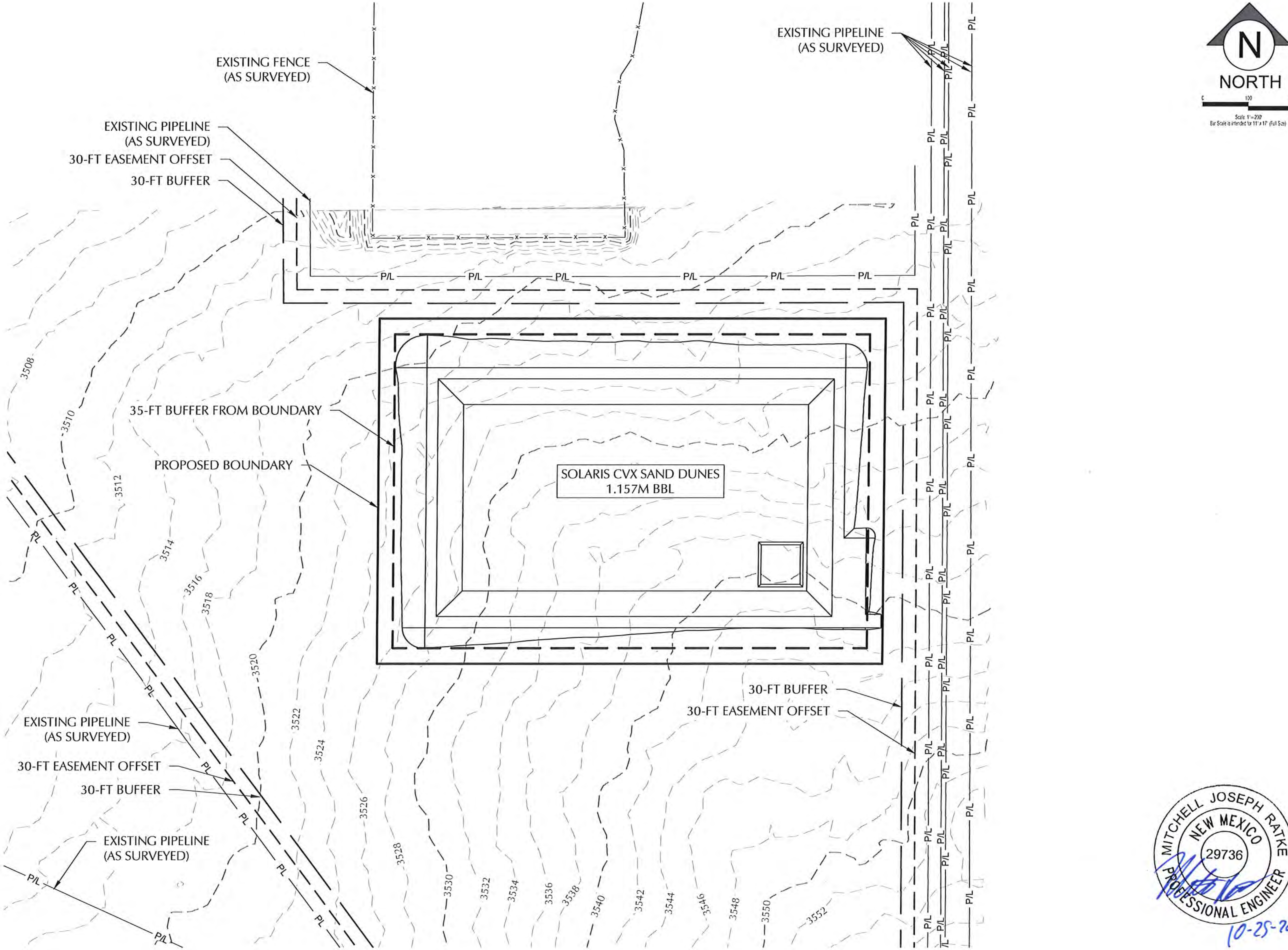

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Enid, Oklahoma
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PE #23284 - Expiration Date: 12-31-2024

NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

EXISTING SITE FEATURES
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM

SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

DATE:	OCTOBER 2024
SCALE:	1" = 200'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	3 OF 11

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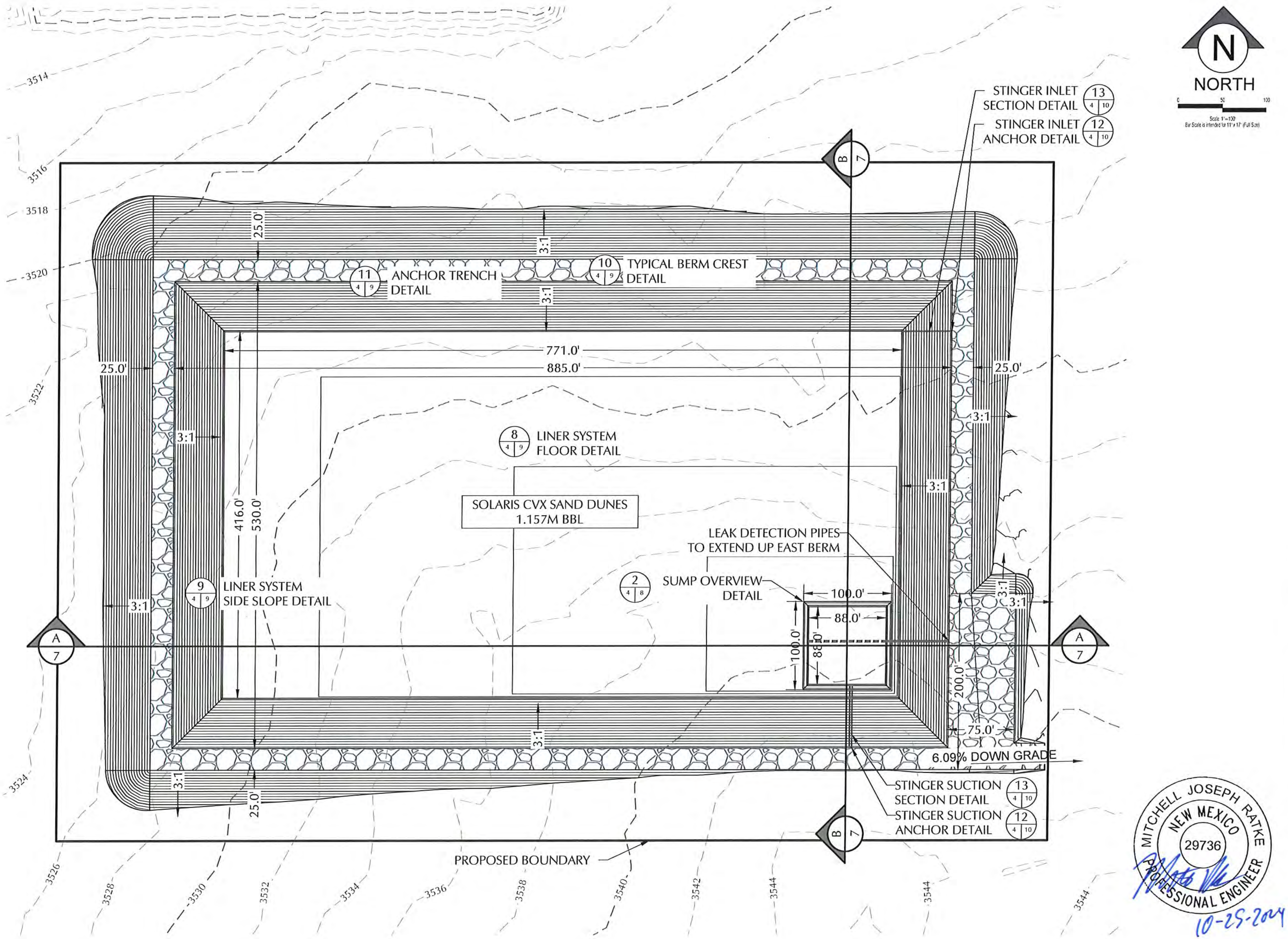

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PE #29284 - Expiration Date: 12-31-2024

NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

SITE PLAN
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

DATE:	OCTOBER 2024
SCALE:	1" = 100'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	4 OF 11

10/25/2024 11:29:28 AM
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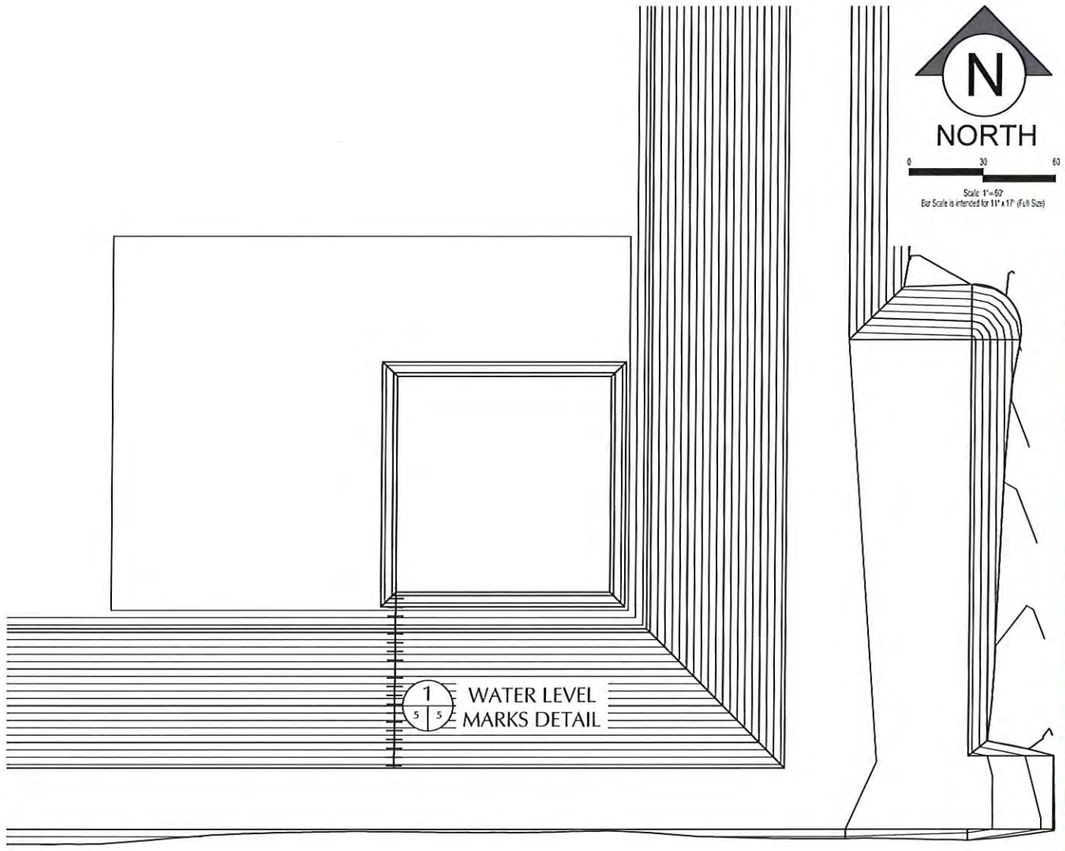
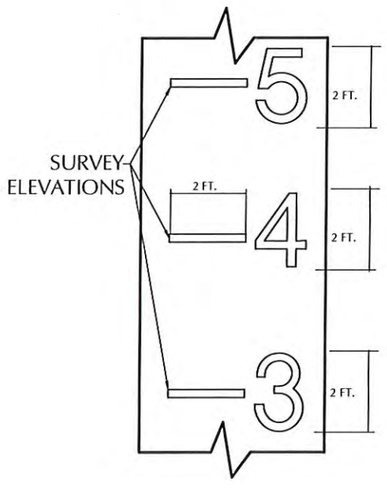
Released to Imaging: 1/2/2025 9:07:07 AM

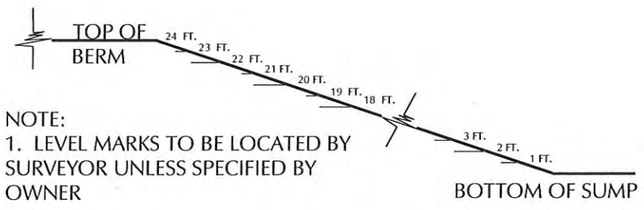


Owner	SOLARIS WATER MIDSTREAM		
Site Name	CVX SAND DUNES RECYCLE FACCILITY		
	Top	Bottom	Max Liq. Level
Lagoon Features			
Side slope Ratio	3		2
Maximum Depth (ft)	24.0		22.0
Lagoon Top Width (ft)	885	771	873
Lagoon Top Length (ft)	530	416	518
Maximum Total Vol (ft^3)	7,868,543		6,499,457
Maximum Total Vol (bbls)	1,401,537		1,157,677

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 ft^3	Gallons Storage gal	Vol in Lagoon bbls	Vol in Lagoon ac-ft	Percent Total Vol %
3543.50	24.0	0.0				0.0%	7,868,543	58,864,570	1,401,537	180.64	100%
3542.50	23.0	1.0	464,755	3,476,810	82,782	5.9%	7,403,788	55,387,760	1,318,756	169.97	94%
3541.50	22.0	2.0	921,093	6,890,695	164,064	11.7%	6,947,450	51,973,875	1,237,473	159.49	88%
3540.50	21.0	3.0	1,369,086	10,242,133	243,860	17.4%	6,499,457	48,622,438	1,157,677	149.21	83%
3539.50	20.0	4.0	1,808,806	13,531,679	322,183	23.0%	6,059,737	45,332,891	1,079,355	139.11	77%
3538.50	19.0	5.0	2,240,326	16,759,881	399,045	28.5%	5,628,217	42,104,689	1,002,493	129.21	72%
3537.50	18.0	6.0	2,663,716	19,927,258	474,459	33.9%	5,204,827	38,937,312	927,079	119.49	66%
3536.50	17.0	7.0	3,079,049	23,034,368	548,437	39.1%	4,789,494	35,830,202	853,100	109.95	61%
3535.50	16.0	8.0	3,486,398	26,081,742	620,994	44.3%	4,382,145	32,782,828	780,544	100.60	56%
3534.50	15.0	9.0	3,885,834	29,069,920	692,141	49.4%	3,982,710	29,794,650	709,396	91.43	51%
3533.50	14.0	10.0	4,277,428	31,999,439	761,891	54.4%	3,591,115	26,865,131	639,646	82.44	46%
3532.50	13.0	11.0	4,661,254	34,870,840	830,258	59.2%	3,207,289	23,993,731	571,279	73.63	41%
3531.50	12.0	12.0	5,037,383	37,684,660	897,254	64.0%	2,831,160	21,179,911	504,284	64.99	36%
3530.50	11.0	13.0	5,405,886	40,441,436	962,891	68.7%	2,462,657	18,423,135	438,646	56.53	31%
3529.50	10.0	14.0	5,766,837	43,141,708	1,027,184	73.3%	2,101,706	15,722,863	374,354	48.25	27%
3528.50	9.0	15.0	6,120,307	45,786,014	1,090,143	77.8%	1,748,236	13,078,556	311,394	40.13	22%
3527.50	8.0	16.0	6,466,367	48,374,895	1,151,783	82.2%	1,402,176	10,489,675	249,754	32.19	18%
3526.50	7.0	17.0	6,805,091	50,908,887	1,212,116	86.5%	1,063,452	7,955,683	189,421	24.41	14%
3525.50	6.0	18.0	7,136,550	53,388,530	1,271,155	90.7%	731,993	5,476,040	130,382	16.80	9%
3524.50	5.0	19.0	7,460,815	55,814,360	1,328,913	94.8%	407,728	3,050,210	72,624	9.36	5%
3523.50	4.0	20.0	7,702,244	57,620,487	1,371,916	97.9%	166,299	1,244,084	29,621	3.82	2%
3522.50	3.0	21.0	7,816,551	58,475,616	1,392,277	99.3%	51,992	388,955	9,261	1.19	1%
3521.50	2.0	22.0	7,850,849	58,732,204	1,398,386	99.8%	17,694	132,367	3,152	0.41	0%
3520.50	1.0	23.0	7,860,260	58,802,607	1,400,062	99.9%	8,283	61,963	1,475	0.19	0%
3519.50	0.0	24.0	7,868,543	58,864,570	1,401,537	100.0%	-	-	-	-	0%





NOTE:
1. LEVEL MARKS TO BE LOCATED BY SURVEYOR UNLESS SPECIFIED BY OWNER

2. MARKS TO BE MADE BY AN EXTRUSION WELDER USING BLACK FILAMENT (OR WHITE FILAMENT ON BLACK LINER).

3. MARKS SHOULD BEGIN AT THE TOP OF BERM AND CONTINUE TO THE BOTTOM OF THE SUMP. (TOP OF BERM SHOULD READ 24-FT, BOTTOM OF SUMP +1-FT SHOULD READ 1-FT)

4. REFERENCE PIT CAPACITY TABLES FOR ACCURATE ELEVATIONS

WATER LEVEL MARKS DETAIL (1 / 5 5)
NOT TO SCALE

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SOLARIS WATER MIDSTREAM

PIT CAPACITY
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
10-25-2024

DATE:	OCTOBER 2024
SCALE:	1" = 60'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	5 OF 11

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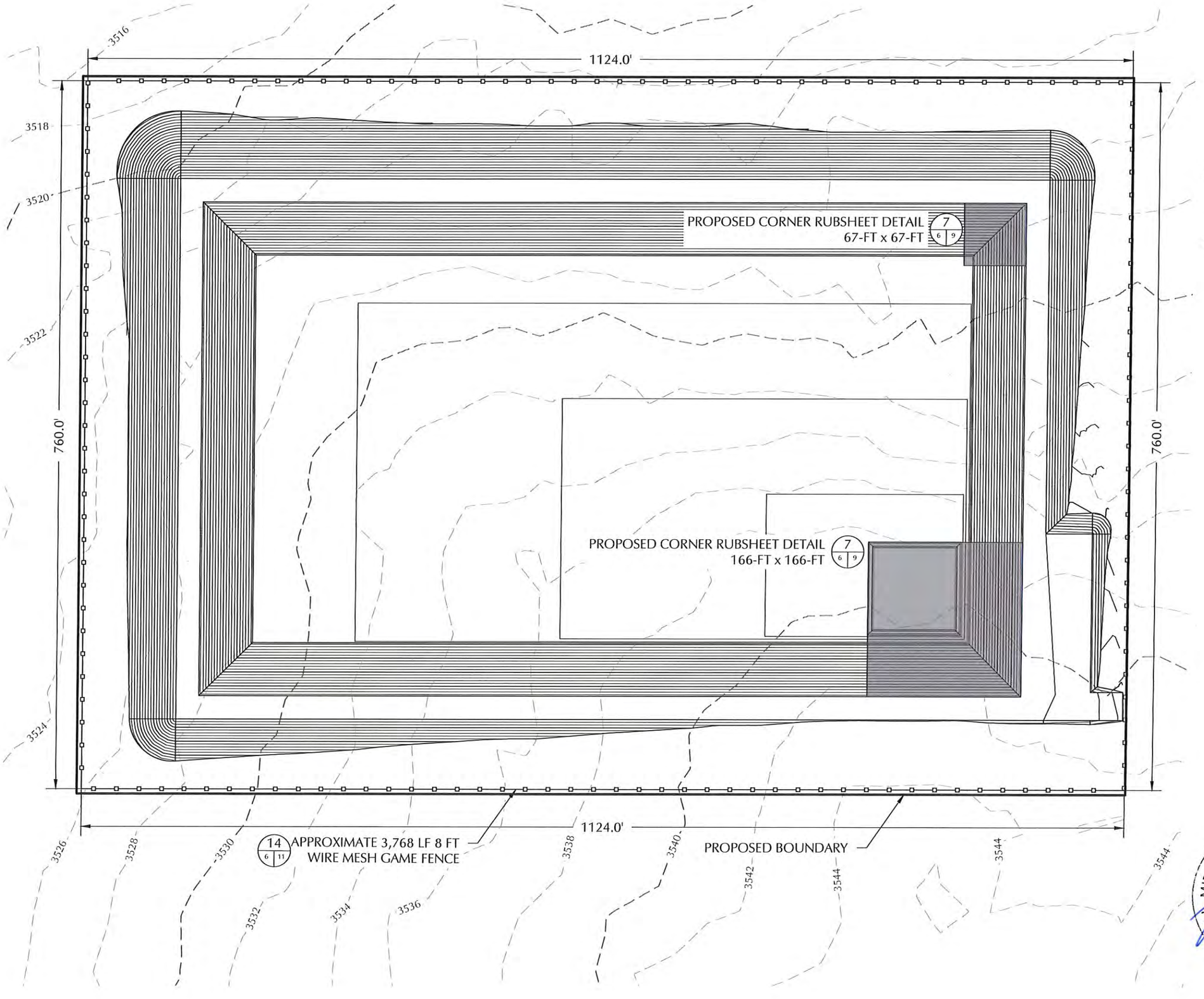

N
NORTH
0 50 100
Scale: 1"=100'
Bar Scale is intended for 11" x 17" (Full Size)

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

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SOLARIS WATER MIDSTREAM

RUBSHEET & FENCE PLAN
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
10-25-2024

DATE:	OCTOBER 2024
SCALE:	1" = 100'
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	6 OF 11

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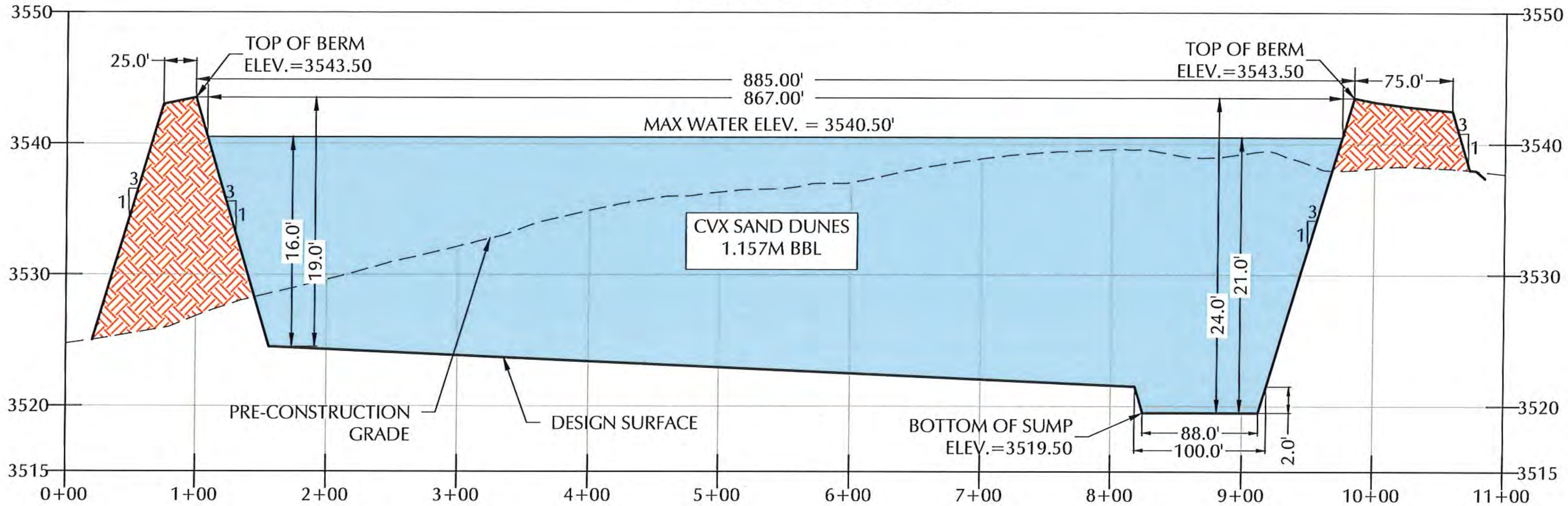
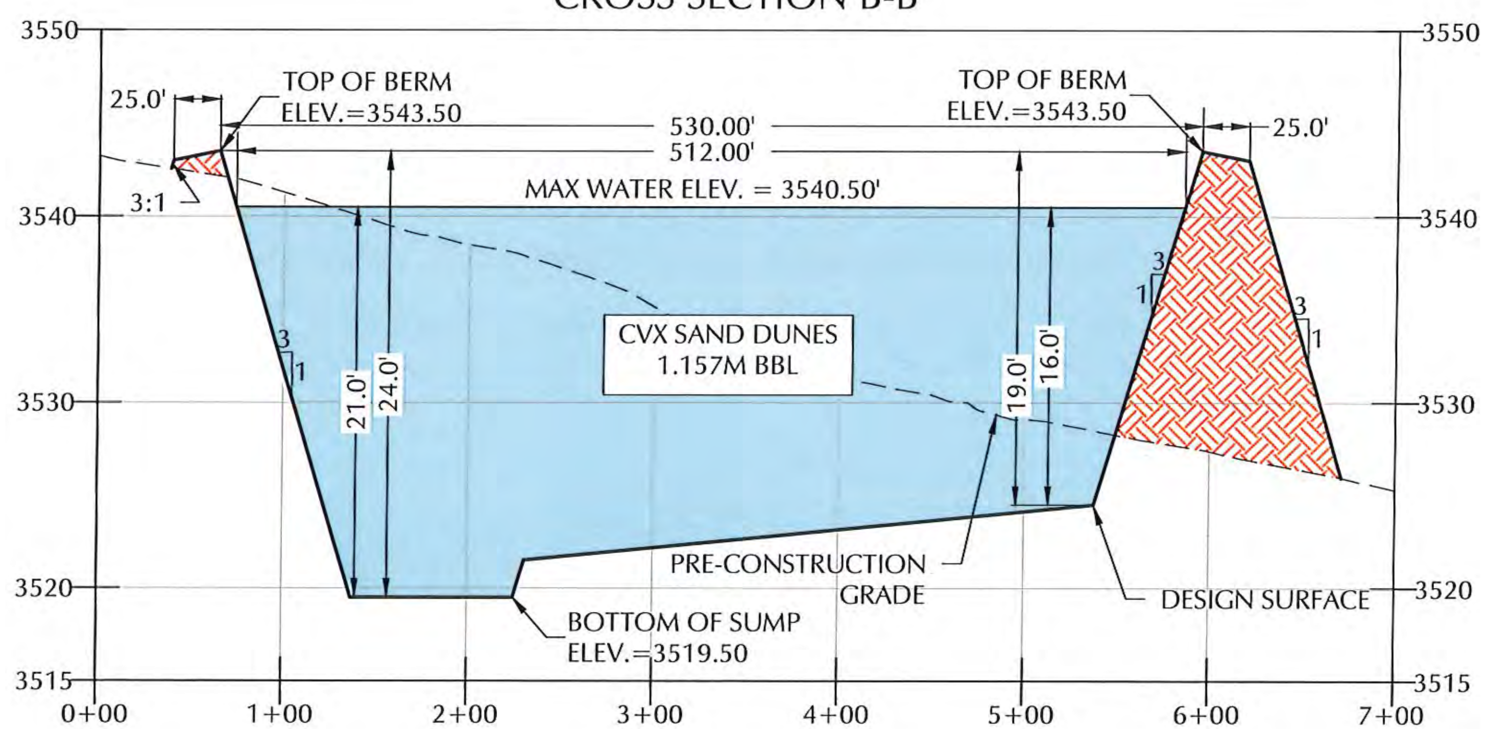
CROSS SECTION A-A



CROSS SECTION B-B



Horizontal Scale: 1"=100'
Vertical Scale: 1"=10'
Bar Scale is intended for 11" x 17" (Full Size)

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Enid, Oklahoma
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PE #29284 - Expiration Date: 12-31-2024

NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

CROSS SECTIONS A & B
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

DATE:	OCTOBER 2024
SCALE:	HORTIZONTAL 1'=100 VERTICAL 1'=10
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	7 OF 11

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10-25-2024

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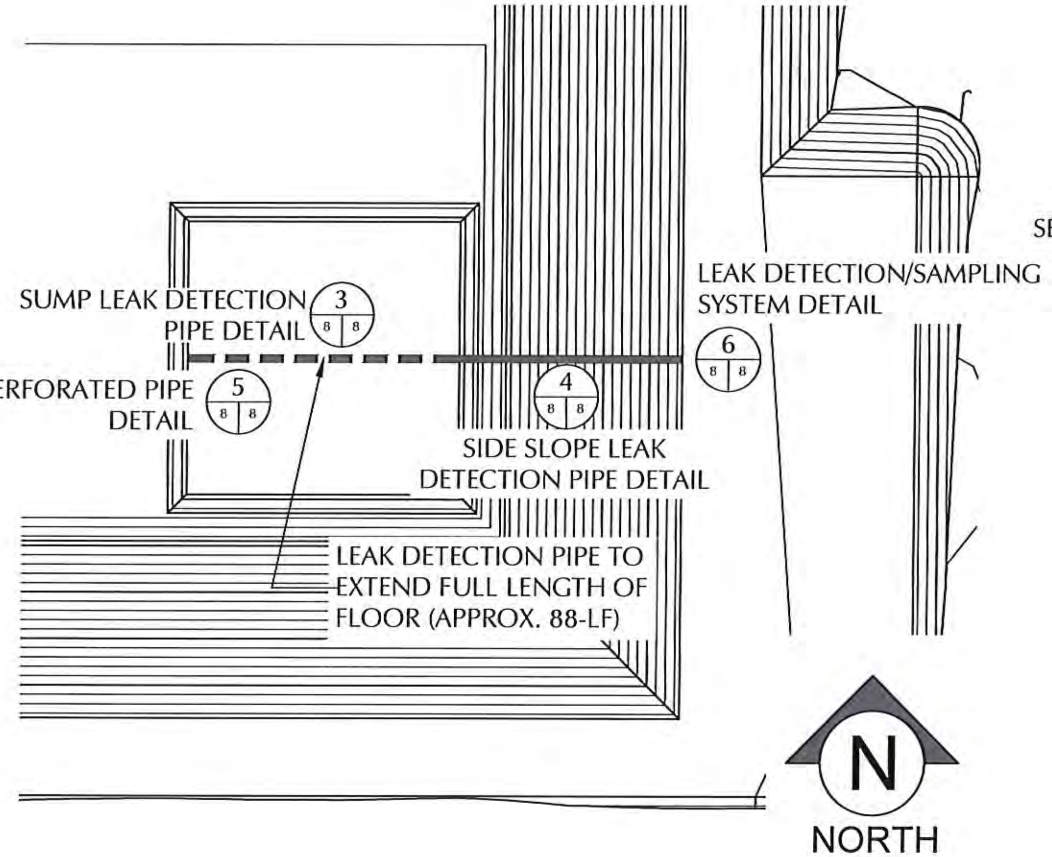
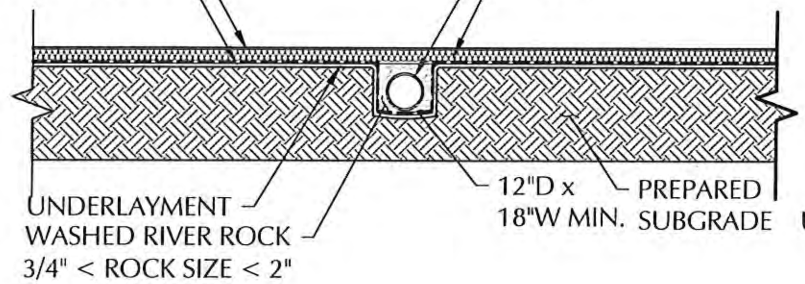
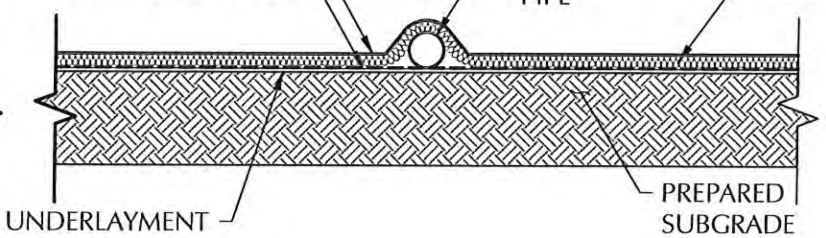


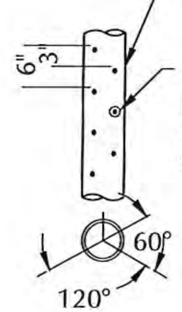
SUMP OVERVIEW DETAIL (2, 4 | 8)
NOT TO SCALE



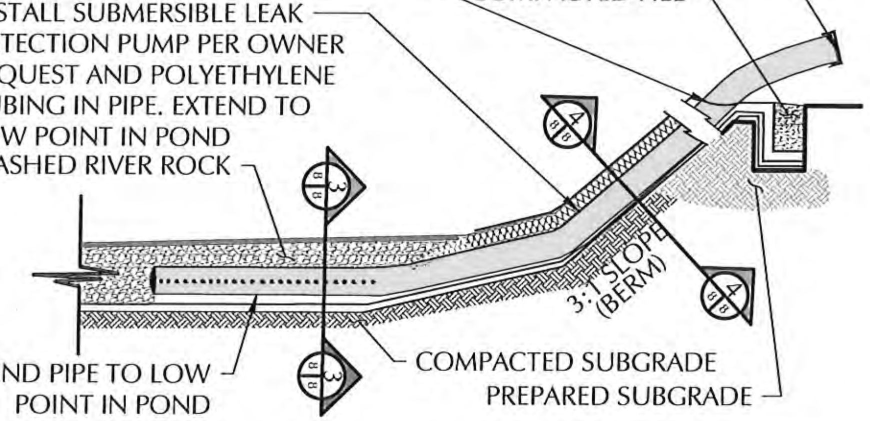
SUMP LEAK DETECTION PIPE DETAIL (3, 8 | 8)
NOT TO SCALE



SIDE SLOPE LEAK DETECTION PIPE DETAIL (4, 8 | 8)
NOT TO SCALE



PERFORATED PIPE DETAIL (5, 8 | 8)
NOT TO SCALE



LEAK DETECTION/SAMPLING SYSTEM DETAIL (6, 8 | 8)
NOT TO SCALE

PROPOSED PIT REFERENCE TABLE	
DETAIL	DESCRIPTION
PRIMARY LINER	60- MIL HDPE SMOOTH LINER
LEAK DETECTION	200-MIL GEONET
SECONDARY LINER	40-MIL HDPE SMOOTH LINER
UNDERLAYMENT	8 OZ GEOTEXTILE
SUMP	3,519.50-FT ELEVATION
BERM (ROAD CREST)	DESIGN ELEV. 3,543.50 FT- RD CREST (25-FT)
LEAK DETECTION PIPING	6-IN DR11.X PERFORATED HDPE LEAK DETECTION PIPE

NOTES:
1. LEAK DETECTION SYSTEM TO BE INSTALLED BY OWNER.
2. PERFORATED PIPE TO BE ALONG THE BOTTOM OF THE POND. 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.

MITCHELL JOSEPH RATKE
NEW MEXICO
29736
PROFESSIONAL ENGINEER
10-25-2024

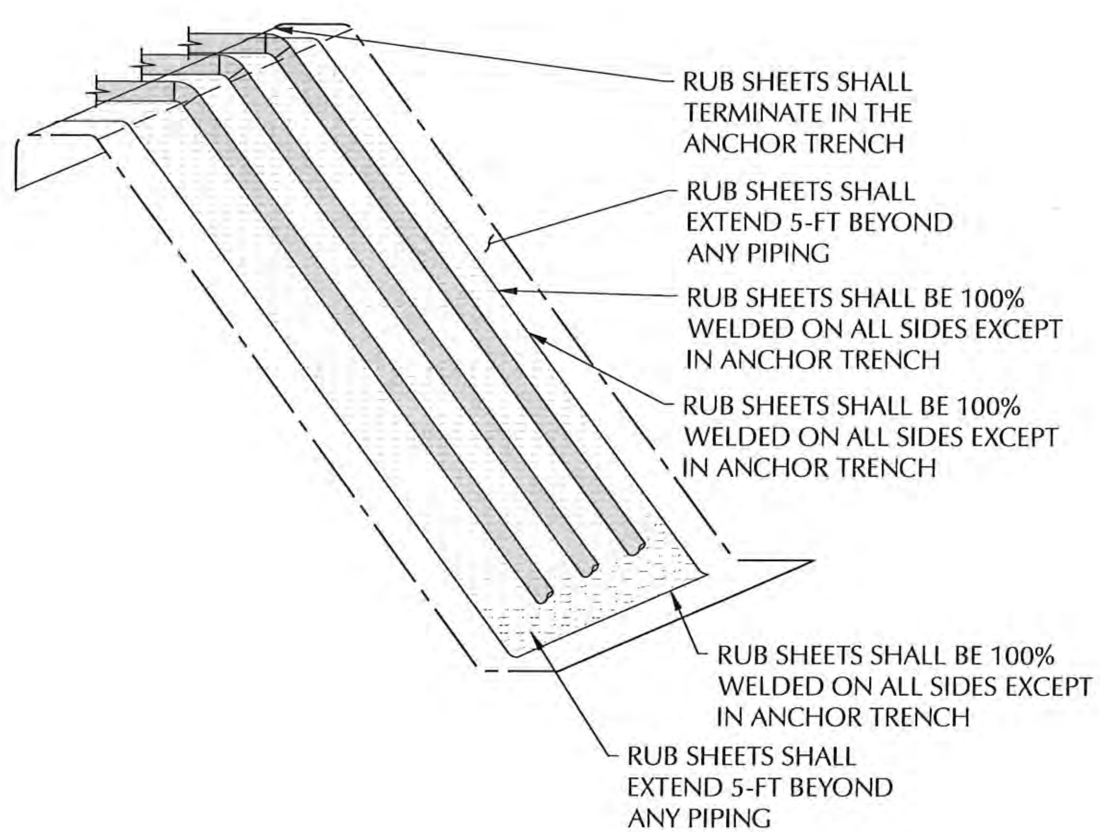
ENVIROTECH ENGINEERING

NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

SUMP DETAILS
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

DATE:	OCTOBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	8 OF 11



RUB SHEET DETAIL (7, 6 | 9)
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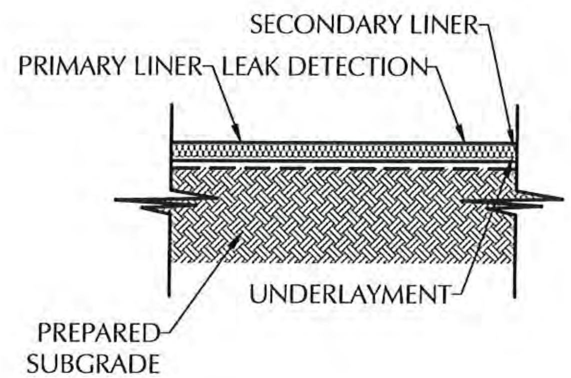
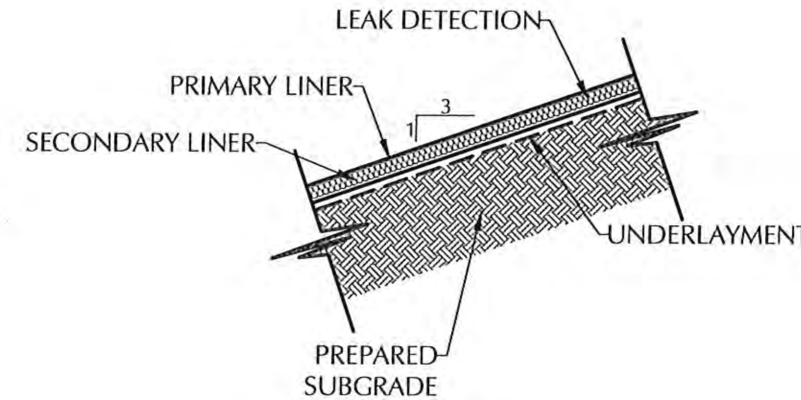


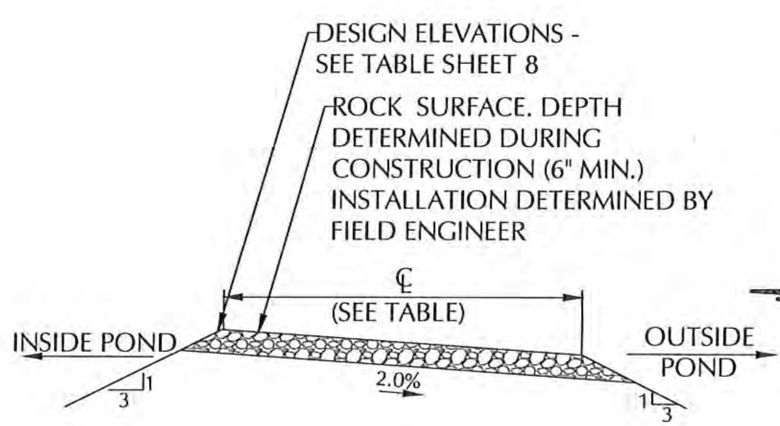
LINER SYSTEM FLOOR DETAIL (8, 4 | 9)
Not to Scale



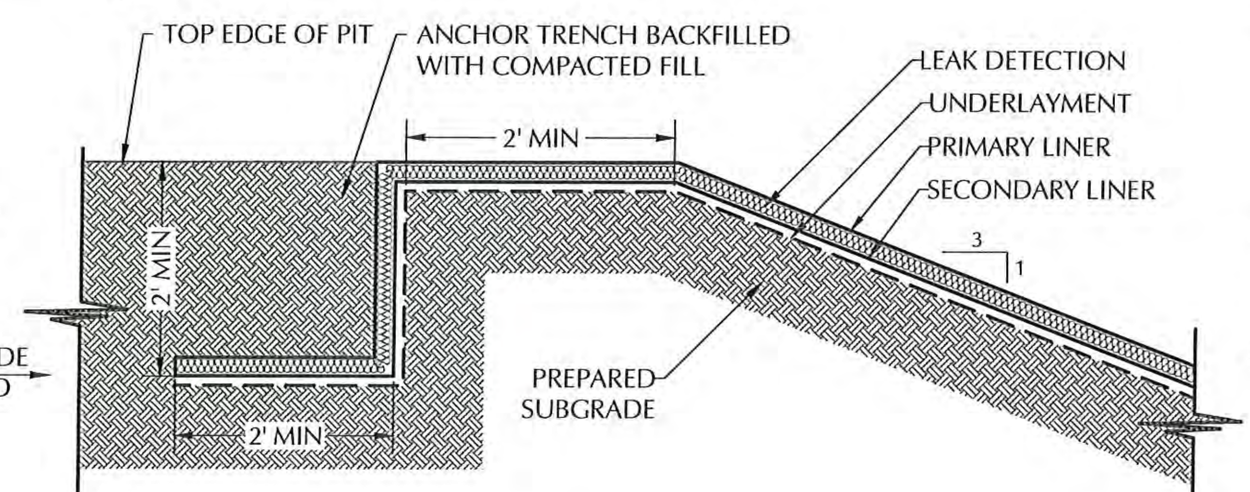
LINER SYSTEM SIDE SLOPE DETAIL (9, 4 | 9)
Not to Scale

GENERAL NOTES:

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



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



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

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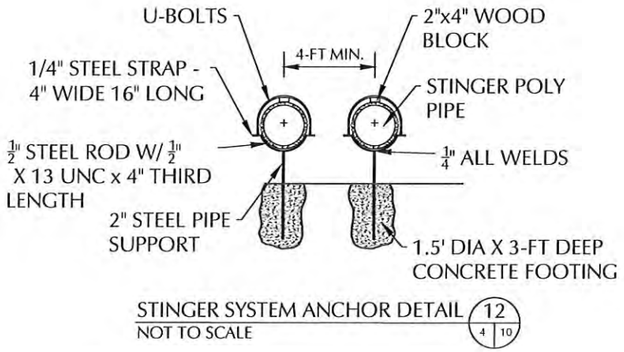
PE #29284 - Expiration Date: 12-31-2024

NO.	DATE	DESCRIPTION

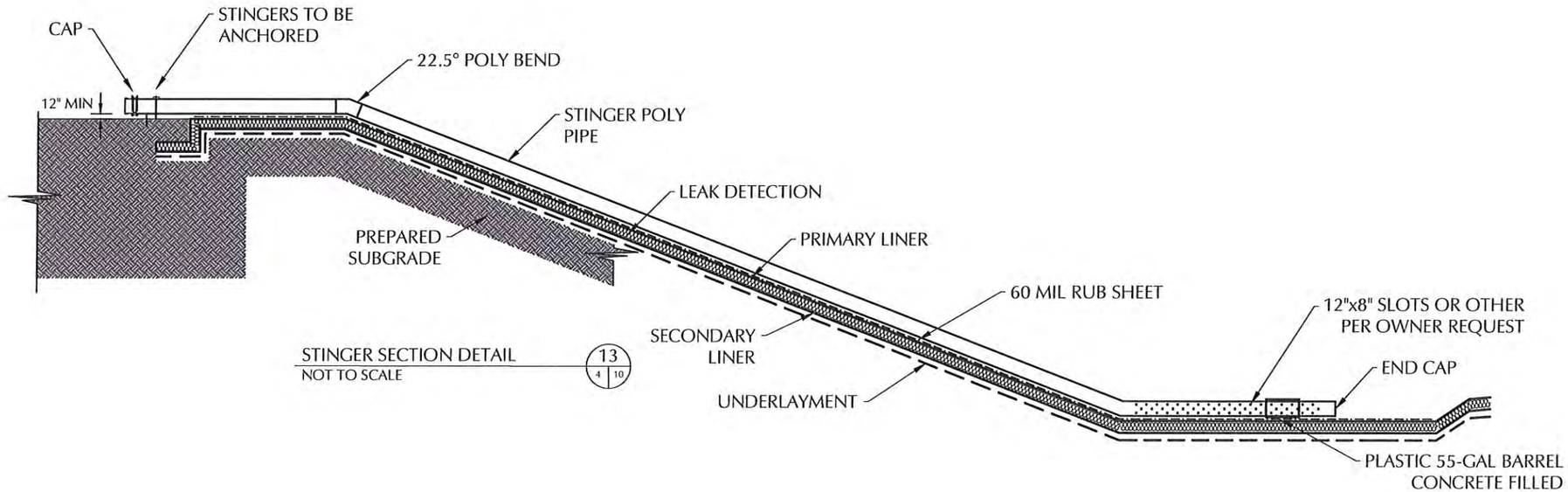
SOLARIS WATER MIDSTREAM

LINER DETAILS
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

DATE:	OCTOBER 2024
SCALE:	NOT TO SCALE
DESIGNED BY:	R. MOHAN
DRAWN BY:	R. MOHAN
CHECKED BY:	D. SCHRANTZ
PROJECT NO.	024316-00
SHEET NO.	9 OF 11



STINGER SYSTEM ANCHOR DETAIL 12 (4 | 10)
NOT TO SCALE



STINGER SECTION DETAIL 13 (4 | 10)
NOT TO SCALE

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NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

STINGER DETAILS
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
EDDY COUNTY, NEW MEXICO

MITCHELL JOSEPH RATKE
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PROFESSIONAL ENGINEER
10-25-2024

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PROJECT NO.	024316-00
SHEET NO.	10 OF 11

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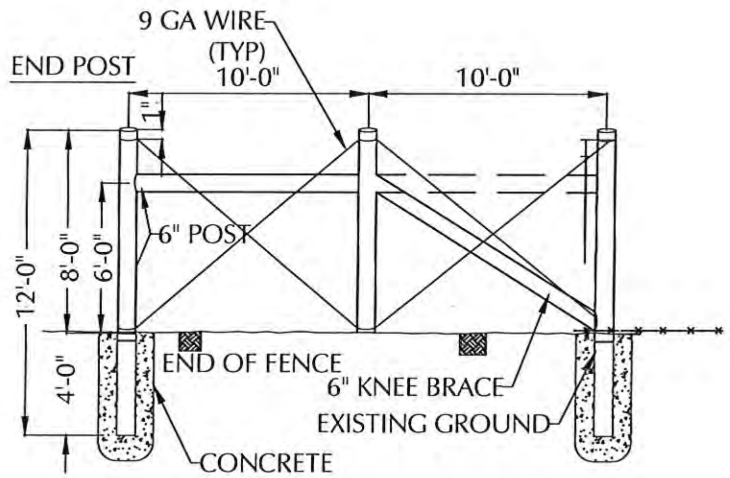

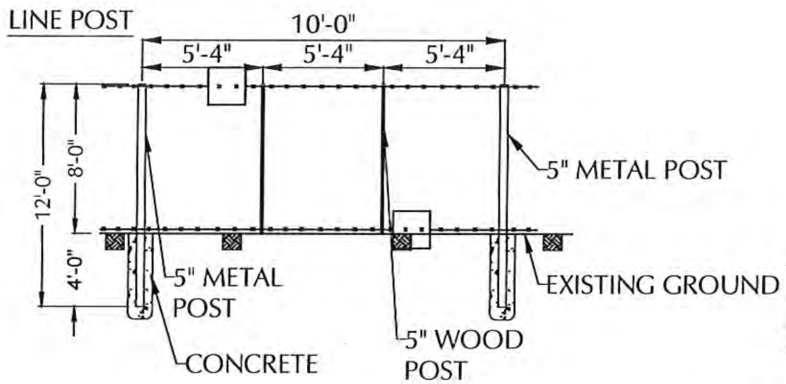

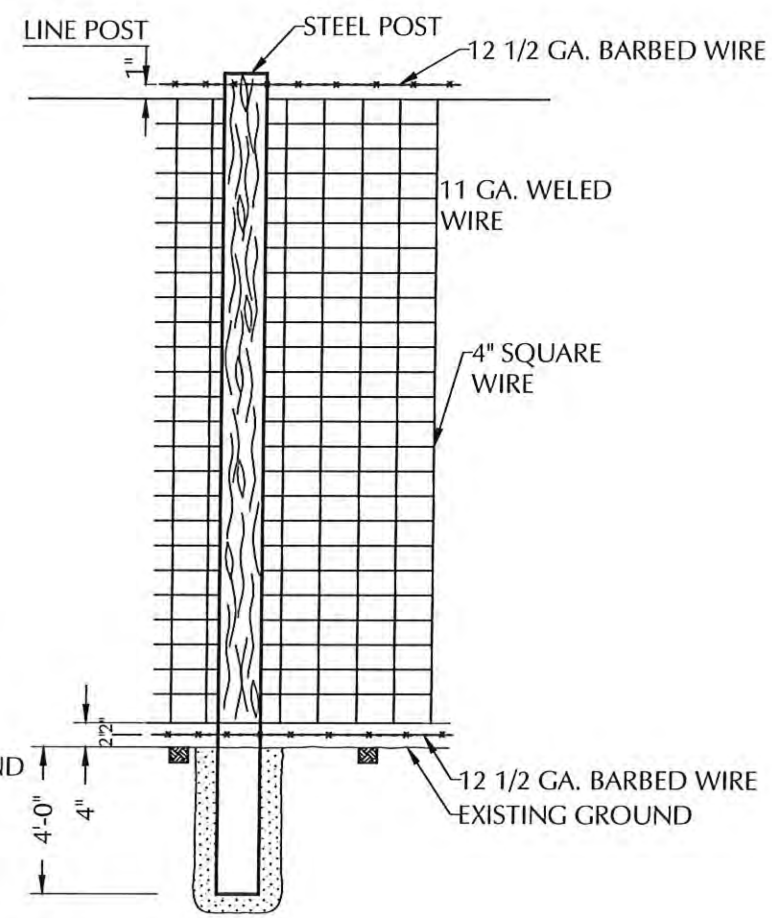

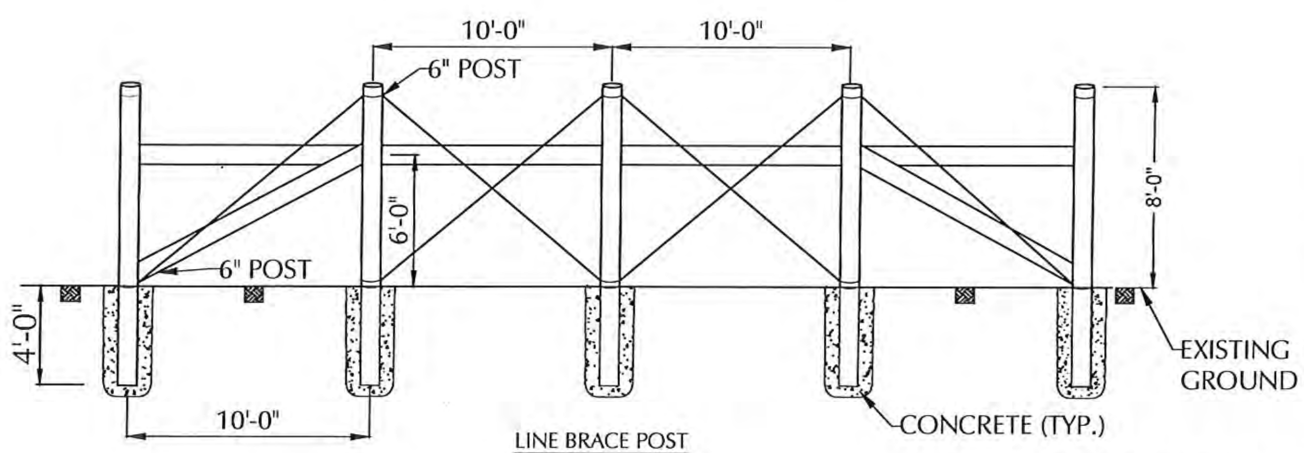

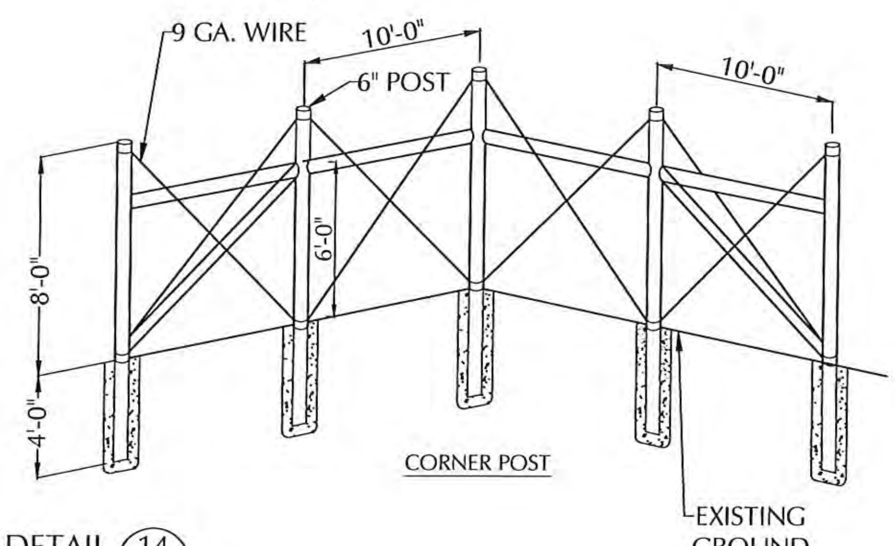

8-FT GAME FENCE DETAIL 14 (6 | 11)

Not to Scale

GENERAL NOTES:

1. AT EACH LOCATION WHERE AN ELECTRIC TRANSMISSION, DISTRIBUTION OR SECONDARY LINE CROSSES A BARRIER FENCE, THE CONTRACTOR SHALL FURNISH AND INSTALL A GROUND CONFORMING TO ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE- THE GROUND ROD SHALL 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.

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NO.	DATE	DESCRIPTION

SOLARIS WATER MIDSTREAM

FENCE DETAILS
CVX SAND DUNES RECYCLE FACILITY
SOLARIS WATER MIDSTREAM
SECTION 10, TOWNSHIP 24 SOUTH, RANGE 31 EAST
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DATE:	OCTOBER 2024
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PROJECT NO.	024316-00
SHEET NO.	11 OF 11

RECYCLING CONTAINMENT DESIGN

DRAWINGS AVIAN DETERRENT SYSTEM

LINER EQUIVALENCY DEMONSTRATION

EFFECTIVE WIDE-AREA BIRD CONTROL!

Mega Blaster PRO sonic bird repeller covers 30 acres!

Mega Blaster PRO uses intermittent distress calls to create a "danger zone" that frightens infesting birds away for good.

PREDATOR cries help scare all the birds.

- NEMA Rated Case
- Crystal-Clear Digital Sounds

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

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

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

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

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

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

CONFIGURATIONS AVAILABLE:

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

Mega Blaster PRO

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

BIRD-X

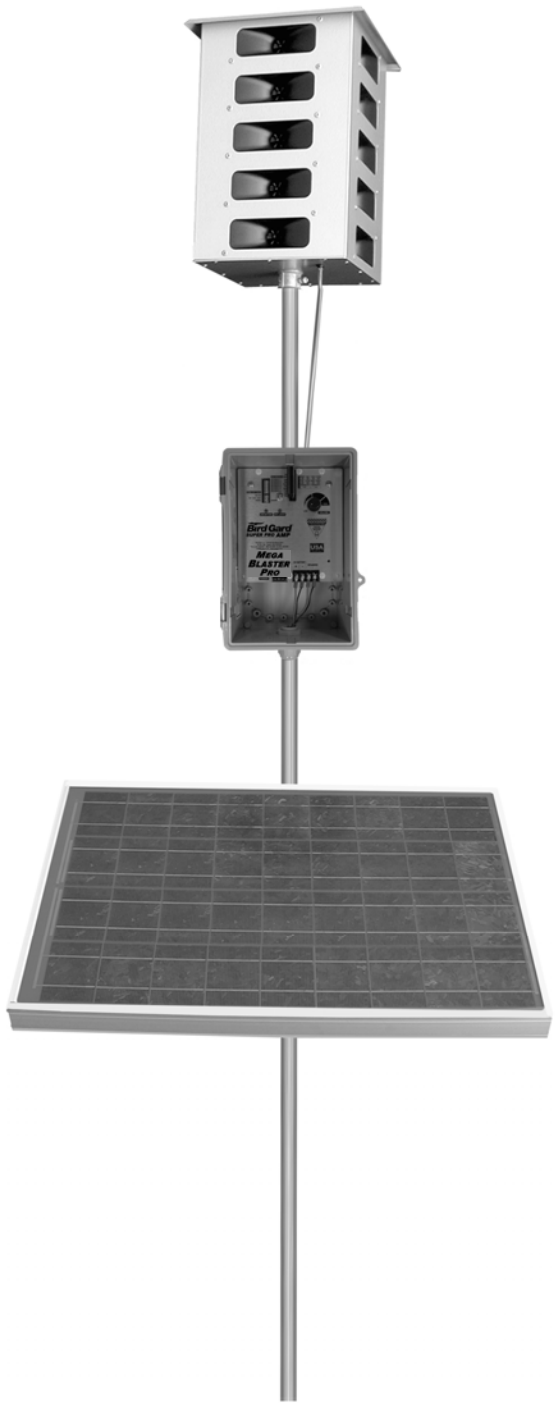
The Bird Control 'X'-Perts

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

MEGA BLASTER PRO

BIRD-X

User's Manual



Overview

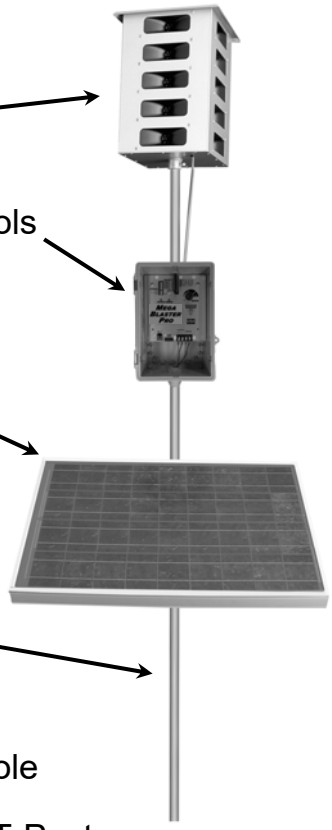
The Bird-X Mega Blaster Pro utilizes the innate power of the natural survival instincts of birds to effectively repel them. Digital recordings of distressed and alarmed birds, along with the sounds made by their natural predators are broadcast through high fidelity weather-resistant speakers over the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

Your Bird-X Mega Blaster Pro system consists of:

20-Speaker Tower broadcasts the bird sounds

Control Unit produces the bird sounds and contains all operational controls

Solar Panel recharges the 12-volt deep cycle battery



Items needed but <u>not</u> included:

(1) **Mounting Pole** or **Mast** tall enough to raise the 20-Speaker Tower at least 5 feet above the top of the areas, trees or other obstructions

(1) **12-volt Deep Cycle Battery** (RV/Marine) Group 27 or larger wet cell

(1) **T-Post** or similar (Optional) may be needed to support the mounting pole

(1) **Bailing Wire or zip-tie** (Optional) to secure the Mounting Pole to the T-Post

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

Bird Control Management Guidelines

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

For best results:

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

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

R.K. FROBEL & ASSOCIATES
Consulting Engineers

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

NMAC 19.15.34.12 A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sincerely Yours,

R K Frobel

Ronald K. Frobel, MSCE, PE

References:

NMAC 19.15.34.12 A DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

Geosynthetic Research Institute (GRI) Published Standards and Papers 2017
www.geosynthetic-institute.org

ASTM Geosynthetics Standards 2017
www.ASTM.org/Standards

DESIGN/CONSTRUCTION PLAN

Design and Construction Plan In Ground Containments

This plan addresses construction of the earthen containments.

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

19.15.34.12 A Design and Construction Specifications
(1). The operator shall design and construct a recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall.
(8). The operator of a recycling containment shall design the containment to prevent run-on of surface water. The containment shall be surrounded by a berm, ditch or other diversion to prevent run-on of surface water

Dike Protection and Structural Integrity

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

Stockpile Topsoil

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

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

Signage

The operator will place an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the containment. The sign is posted in a manner and location such that a person can easily read the legend. The sign will provide the following information:

- the operator's name,
- the location of the site by quarter-quarter or unit letter, section, township and range, and
- emergency telephone numbers

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

Fencing

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

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

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

Netting and Protection of Wildlife

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

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

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

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

The O&M plan calls for the operator to inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

Earthwork

The containment will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.

19.15.34.12 A
(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity…

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

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

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

19.15.34.12 A
(2) …The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot (3H:1V). The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance.

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.

19.15.34.12 A
(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions.

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

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

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

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

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

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

19.15.34.12 A
(5) The operator of a recycling containment shall minimize liner seams and orient them up and down, not across, a slope of the levee. Factory welded seams shall be used where possible. The operator shall ensure field seams in geosynthetic material are thermally seamed. Prior to field seaming, the operator shall overlap liners four to six inches…

slope's toe.

vi. use qualified personnel to perform field welding and testing.

vii. avoid excessive stress-strain on the liner

viii. The edges of all liners are anchored in the bottom of a compacted earth-filled trench that is at least 18 inches deep

19.15.34.12 A
(5) …The operator shall minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the slope's toe. Qualified personnel shall perform field welding and testing.

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.

19.15.34.12 A
(3) The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

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.

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

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

Leak Detection and Fluid Removal System Installation

The leak detection system, contains the following design elements

a. The 200-mil HyperNet Geonet drainage material between the primary and secondary liner that is sufficiently permeable to allow the transport of fluids to the observation ports (Appendix A).
b. The containment floor is sloped towards the monitoring riser pipe to facilitate the earliest possible leak detection of the containment bottom. A pump may be placed in the observation port to provide for fluid removal.
c. Piping will withstand chemical attack from any seepage, structural loading from stresses and disturbances from overlying water, cover materials, equipment operation or expansion or contraction (see Appendix A).

OPERATIONS AND MAINTENANCE PLAN

CLOSURE PLAN

Operation and Maintenance Plan
In Ground Containments

Overview

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

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

The operation of the containment is summarized below.

A. Produced water generated from nearby oil and gas wells is delivered to a treatment system located as indicated in the C-147.
B. Unless specified in the transmittal letter, after treatment, the produced water discharges into the containment.
C. When required, produced water is removed from the containment for E&P operations. At this time, produced water will be used for drilling beneath the freshwater zones (beneath surface casing), for well stimulation (e.g. hydraulic fracturing) and other E&P uses as approved by OCD.
D. Whenever the maximum fluid capacity of the containment is reached, treatment and discharge to the containment ceases (see Freeboard and Overtopping Plan, below).
E. The operator will keep accurate records and shall report monthly to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148 (see attached example).
F. The operator will maintain accurate records that identify the sources and disposition of all recycled water that shall be made available for review by the division upon request.

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

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

Operation and Maintenance Plan
In Ground Containments

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

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

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

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

19.15.34.13 B
(4) If the containment's primary liner is compromised above the fluid's surface, the operator shall repair the damage or initiate replacement of the primary liner within 48 hours of discovery or seek an extension of time from the division district office.
(5) If the primary liner is compromised below the fluid's surface, the operator shall remove all fluid above the damage or leak within 48 hours of discovery, notify the division district office and repair the damage or replace the primary liner.

19.15.34.13 B
(7) The operator shall install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release.
(1) The operator shall remove any visible layer of oil from the surface of the recycling containment.
19.15.34.8 A

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

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

19.15.34.13
(6) The containment shall be operated to prevent the collection of surface water run-on.

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

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

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

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

Monitoring, Inspection, and Reporting Plan

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

Weekly inspections consist of:

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

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

Monthly, the operator will:

A. Inspect the containment for dead migratory birds and other wildlife. Within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.
B. Report to the division the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility for disposition by use on form C-148.
C. Record sources and disposition of all recycled water.

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

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

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

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

Freeboard and Overtopping Prevention Plan

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

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

I. Cease discharging produced water to the containment.

II.Accelerate re-use of the produced water for purposes approved by the Division.

III. Transfer produced water from the containment to injection wells.

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

Protocol for Leak Detection Monitoring, Fluid Removal and Reporting

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

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

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

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

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

Closure Plan
In Ground Containments

Overview

After operations cease, the operator will remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use.

19.15.34.14 A
Once the operator has ceased operations, the operator shall remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use.

The operator shall substantially restore the impacted surface area to

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

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

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

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

Excavation and Removal Closure Plan – Protocols and Procedures

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

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

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

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

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

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

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

Reclamation and Re-vegetation

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

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

Closure Documentation

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

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

The operator shall notify the division when reclamation and re-vegetation are complete. Specifically the notice will document that all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

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

19.15.34.14 F
Reclamation of all disturbed areas no longer in use shall be considered complete when all ground surface disturbing activities at the site have been completed, and a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

Venegas, Victoria, EMNRD

From: Venegas, Victoria, EMNRD
Sent: Thursday, January 2, 2025 9:00 AM
To: 'Chad Gallagher'
Subject: 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746]
Attachments: C-147 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746].pdf

2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746]

Good morning Mr. Gallagher,
NMOCD has reviewed the recycling containment permit application and related documents, submitted by [371643] SOLARIS WATER MIDSTREAM, LLC on 12/15/2024, Application ID 411951, for 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] in P-10-24S-31E, Eddy County, New Mexico. The form C-147 and related documents for 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] are approved with the following conditions of approval:

- The purpose of this permit is for oil and gas activities regulated under the NMAC 19.15.34.3 STATUTORY AUTHORITY: 19.15.34 NMAC is adopted pursuant to the Oil and Gas Act, Paragraph (15) of Section 70-2-12(B) NMSA 1978, which authorizes the division to regulate the disposition of water produced or used in connection with the drilling for or producing of oil and gas or both and Paragraph (21) of Section 70-2-12(B) NMSA 1978 which authorizes the regulation of the disposition of nondomestic wastes from the exploration, development, production or storage of crude oil or natural gas.
- 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] is approved for five years of operations from the date of permit application of 12/15/2024. 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] permit expires on 12/15/2029. If [371643] SOLARIS WATER MIDSTREAM, LLC wishes to extend operations past five years, an annual extension request must be submitted using on form C-147 Long through OCD Permitting by 11/15/2029.
- 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] consists of one (1) inground containment with a fluid capacity of 1,157,000.00 barrels.
- The total closure cost estimated of 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] in the amount of $650,000.00 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**.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall construct, operate, maintain, close, and reclaim 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] in compliance with NMAC 19.15.34 NMAC.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall notify OCD, through OCD Permitting, when construction of 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] commences.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall notify NMOCD through OCD Permitting when recycling operations commence and cease at 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746].
- A minimum of 3-feet freeboard must be maintained at 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] at all times during operations.
- If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdrawal, operations of the 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] are considered ceased and a notification of cessation of operations should be sent electronically to OCD Permitting. A request to extend the cessation of operations, not to exceed six months, may be submitted using a C-147 form through OCD Permitting. If after that 6-month extension period, the 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] is not utilized at a minimum of 20% fluid

capacity, no additional extensions would be granted, and the operator would be directed to remove all fluids and proceed with the closure requirements.

- [371643] SOLARIS WATER MIDSTREAM, LLC shall submit monthly reports of recycling and reuse of produced water, drilling fluids, and liquid oil field waste on OCD form C-148 via OCD Permitting even if there is zero activity.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall inspect the recycling containment and associated leak detection systems weekly while it contains fluids. The operator shall maintain a current log of such inspections and make the logs available for review by the division upon request according to 19.15.34.13.A.
- [371643] SOLARIS WATER MIDSTREAM, LLC shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field waste at 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746].

Please reference number 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] in all future communications.
Regards,

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

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

CONDITIONS

Operator: SOLARIS WATER MIDSTREAM, LLC 9651 Katy Fwy Houston, TX 77024	OGRID: 371643
	Action Number: 411951
	Action Type: [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	• 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] is approved for five years of operations from the date of permit application of 12/15/2024. 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] permit expires on 12/15/2029. If [371643] SOLARIS WATER MIDSTREAM, LLC wishes to extend operations past five years, an annual extension request must be submitted using on form C-147 Long through OCD Permitting by 11/15/2029. • [371643] SOLARIS WATER MIDSTREAM, LLC shall construct, operate, maintain, close, and reclaim 2RF-215 - SOLARIS CVX SAND DUNE RECYCLING FACILITY [fVV2500230746] in compliance with NMAC 19.15.34 NMAC.	1/2/2025