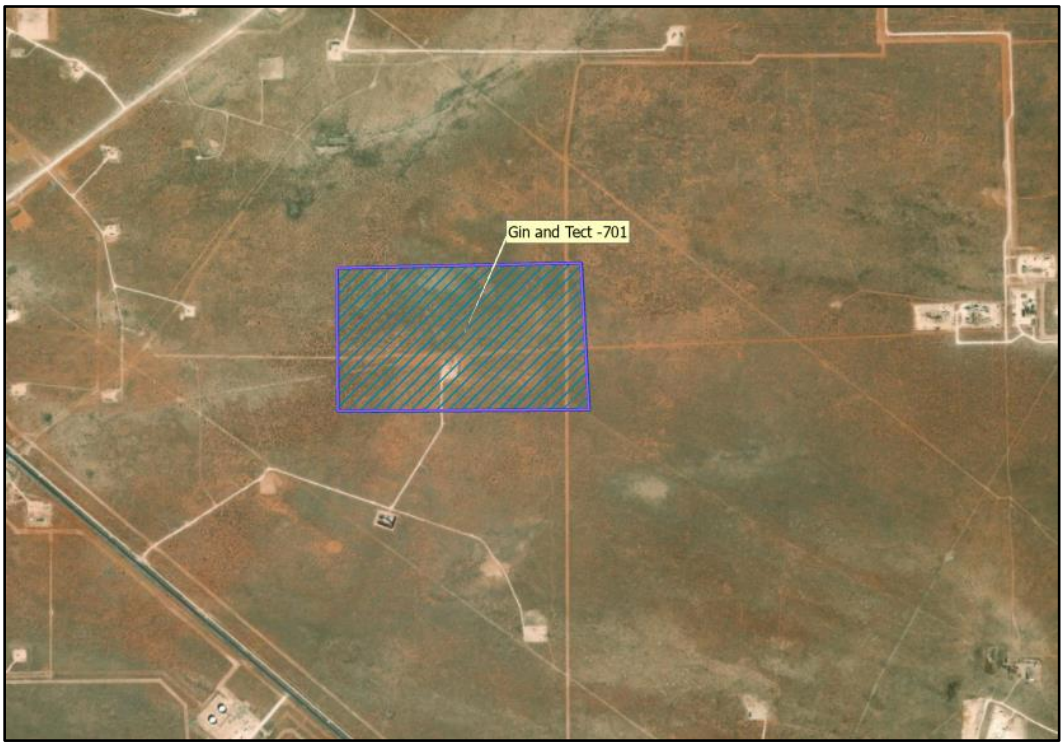
March 2024

Rule 34 Registration: Volume 1
Gin and Tectonics Facility
Sections 4, 5, 8, and 9, T24S, R32E, Lea County

- ***Transmittal Letter***
- ***Liner System Variance***
- ***Siting Criteria Demonstration with Plates & Appendices***



Aerial View of the Gin and Tectonics Facility site showing nature of landscape.

Prepared for:
COG Operating LLC
Midland, Texas

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

TRANSMITTAL LETTER

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996

March 13, 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
506 West Texas
Artesia, NM 88210
Via E-Mail

RE: COG Production – Gin and Tectonics Recycling Facility and AST Containments
Sections 4, 5, 8, and 9, T24S, R32E, Lea County
REVISED Permit Application

Dear Ms. Barr and Ms. Venegas:

On behalf of COG Operating LLC, R.T. Hicks Consultants prepared a revised C-147 *permit application* for the above-referenced project. Due to a modification of a hydraulic stimulation schedule, everyone involved with this project was rushed and we discovered after our delivery of the permit application that the primary liner for the harpoon tanks was NOT 30-mil PVC. Thus, we retained R. K. Frobel & Associates to evaluate the proposed liner system and provide an opinion of suitability for use in this project. Mr. Frobel's opinion is a critical part of the attached variance request.

Volume 1 of the package contains:

- This letter
- A variance request for the proposed harpoon tank liner system
- Siting criteria demonstration for the facility

Depth to groundwater data demonstrate that confined groundwater is accessed from the Santa Rosa formation (or deeper formations) at depths of 350 feet or greater. There are isolated instances of localized, perched unconfined groundwater at Cottons Place (1.4 miles east of the site) and Twin Wells Ranch (more than 6 miles to the west). As explained in the submission, shallow perched water does not exist around the Gin and Tectonics site. Other setback data are clearly displayed in the Plates of the submission.

Volume 2 includes previously-approved documents with no changes as indicated below:

- C-147 Form to register one (1) Harpoon Tank containment
- Stamped Design Drawings for the H15P Harpoon Frac Tank.
- Recently OCD Approved Plans for Design/Construction,
- Set Up SOP for the Harpoon Tank
- O&M, Closure (Keg Shell 2RF-197) as the Harpoon Tank will follow the same basic protocols.
- Variances for AST Storage Containments
- Variances Applicable to the Permian Basin in General

COG Operating will upload this document via the OCD.Online portal and, in compliance with 19.15.34.10 of the Rule, transmit this document to the BLM, the surface owner's representative.

This is the first (of three) Harpoon Tank permits prepared by Hicks Consultants.

Please note that the C-147 form in this submission has a date of 2017. We have checked it carefully against the 2022 revised form and found no discrepancies in information. In the future, we will use the updated form.

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

David J. Hamilton

Senior Hydrogeologist
David Hamilton

Copy: COG Production c/o Tim Reed, ConocoPhillips

VARIANCE FOR LINER SYSTEM

Statement Explaining Why The Applicant Seeks A Variance For Utilizing A 30 Mil Woven Coated Fabric (WCF) Liner Material With PVC Coating As An Alternative Short Term And Disposable Upper Or Primary Liner For "Harpoon" Modular Steel AST Containments And 60-Mil HDPE As The Secondary Liner Within A Secondary Containment Structure As Shown On The Attached Drawing.

COG Operating evaluated four options to facilitate recycling produced water at this location in lieu of using fresh water:

A. The proposed Harpoon ASTs
B. A 40,000 bbl. AST containment (the smallest available standard AST containment)
C. Minion Tank ASTs

Their evaluation showed the Harpoon AST containments provide the required fluid flow with a smaller footprint and simpler set-up and dis-assembly than the 40,000 bbl. AST or the Minion Tanks. The smaller footprint allows the recycling project to function on an existing pad that will be used for other E&P activities. The ease of construction/dis-assembly allows transfer of the recycling ASTs from one project to the next as each project has a lifespan of only 1-3 months. While Minion tanks are slightly less expensive to use, ConocoPhillips determined Harpoon Tank ASTs are a better option for these recycling projects.

Regulation Requiring a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of 19.15.34.12

NMAC 19.15.34.12 A DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

> **(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.

Rule 34 did not consider Above Ground Steel Storage Tanks that employ liners as a primary and secondary containment method. Rule 34 considered only in-ground, double-lined containments, and listed specifications for liners with a predicted lifespan of more than 5 years (e.g., 60 mil HDPE) with annual evaluation/OCD approvals thereafter. Although the three types of primary liners prescribed by Rule 34 are not always suitable for use in typical steel wall AST containments (see Appendix OCD-Approved Variances for ASTs in the C-147 permit application) or "Harpoon" AST containments due primarily to weight and flexibility, the HDPE and RPE are used for the secondar lining systems.

Description of Proposed Action

The applicant proposes to use one layer of a 30 mil Woven Coated Fabric (WCF) with PVC coating as a primary liner and a 60 mil HDPE secondary liner(within secondary containment as shown in Plate 1) and 200-mil geonet drainage layer between the liners. The three recycling projects that will used Harpoon ASTs are:

1. Gin & Tectonics – one Harpoon Tank used for less than 2 months
2. Bandana – 2 Harpoon Tanks used for less than 3 months
3. Viking Helmet – 2 Harpoon Tanks used for less than 3 months

This proposed single use liner is a 30 mil Woven Coated Fabric with PVC polymer coating designed and prefabricated into panels for Harpoon Tanks.

The 30 mil Woven Coated Fabric is a single use liner with a hydraulic conductivity no greater than 1 x 10 -9 cm/sec and meets or exceeds the physical/mechanical values listed on the attached manufacturers Technical Data Sheet (TDS)

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

Protection of Fresh Water

The attached technical document from Ron Frobel provides evaluation and data that demonstrate the proposed 30 mil WCF primary liner is acceptable for the proposed projects because

1. The 60-mil HDPE secondary liner within secondary containment will capture any seepage from the primary liner.
2. Approval of this variance limits use of the liner to hold fluids to less than 3 months (active life).
3. The tanks will contain water only during well stimulation events when field staff are always present and will be able to address any seepage caused by accidents or acts of nature
4. The disposable primary WCF liner will be washed down, folded/rolled, and removed to a waste management facility without contamination to site soils.

As stated above, the operator elects to provide maximum practical protection from a release to soil by employing a secondary containment system of 60 mil HDPE that is not generally employed for standard ASTs. This system is described in Plates 1 and 2 of the submission.

Finally, anecdotal information from Hydrera suggests that Harpoon Tanks used for short duration projects such as that proposed in this variance request have not released E&P fluids .

We conclude that the Harpoon AST system provides equal protection of fresh water relative to using fresh water or the two other modular tank alternatives. .

Protection of Public Health

In our analysis, the only risks to public health posed the Harpoon AST Containments occurs from

1. transportation of equipment on public roads,
2. emissions to the atmosphere that increase the earth warming, and
3. construction activities of the Harpoon Tank produced water system

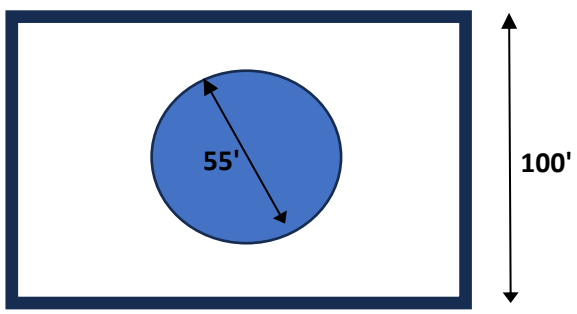
Because the Harpoon AST containments are smaller than a 40,000 bbl. AST containment, it generates less emissions due to less transportation. The risk to construction workers is slightly less than assembling a 40,000 bbl. AST. We conclude that the use of the proposed Harpoon Tank Containments provides a small but measurable reduction of risk to public health.

Using fresh water in lieu of recycling produced water generates less public health risk during the time of the project, but reducing the volume of fresh water available for beneficial use is a public health risk in the future.

Protection of the Environment

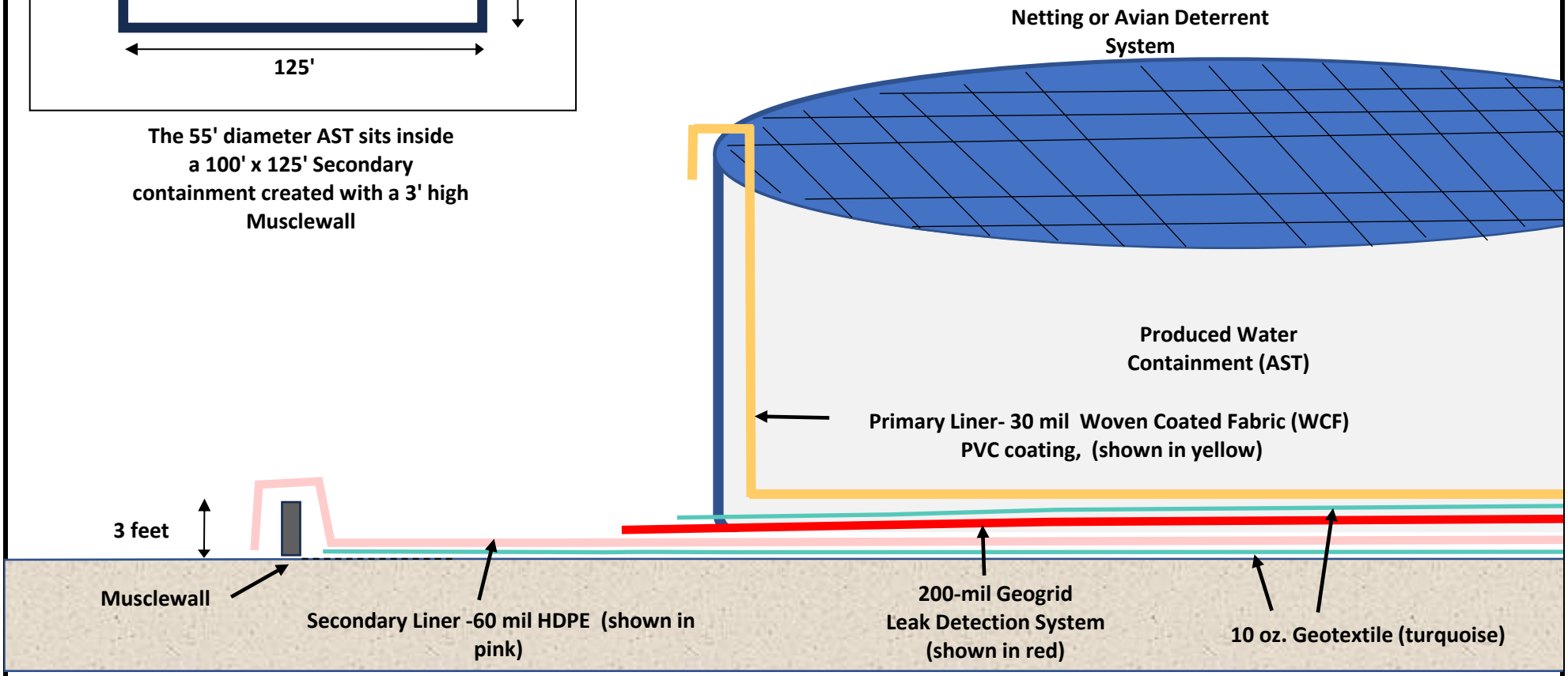
The robust secondary containment structure proposed for these Harpoon Tank containments reduces the risk to impairment of soil/vegetation due to accidental releases relative to a 40,000 bbl. AST that does not employ secondary containment. Using 2-3 Harpoon Tanks (at Bandana or Viking Helmut) will store approximately the same volume of treated produced water as a 40,000 bbl. AST and creates less risk of soil impairment because the probability that all four Harpoon tanks fail at the same time is small. Risks to wildlife, visibility, and viewsheds are the same for both alternatives. We conclude that the use of the proposed Harpoon Tank Containments provides a small reduction of risk to the environment.

Schematic Plan View



The 55' diameter AST sits inside a 100' x 125' Secondary containment created with a 3' high Musclewall

Schematic Cross Section



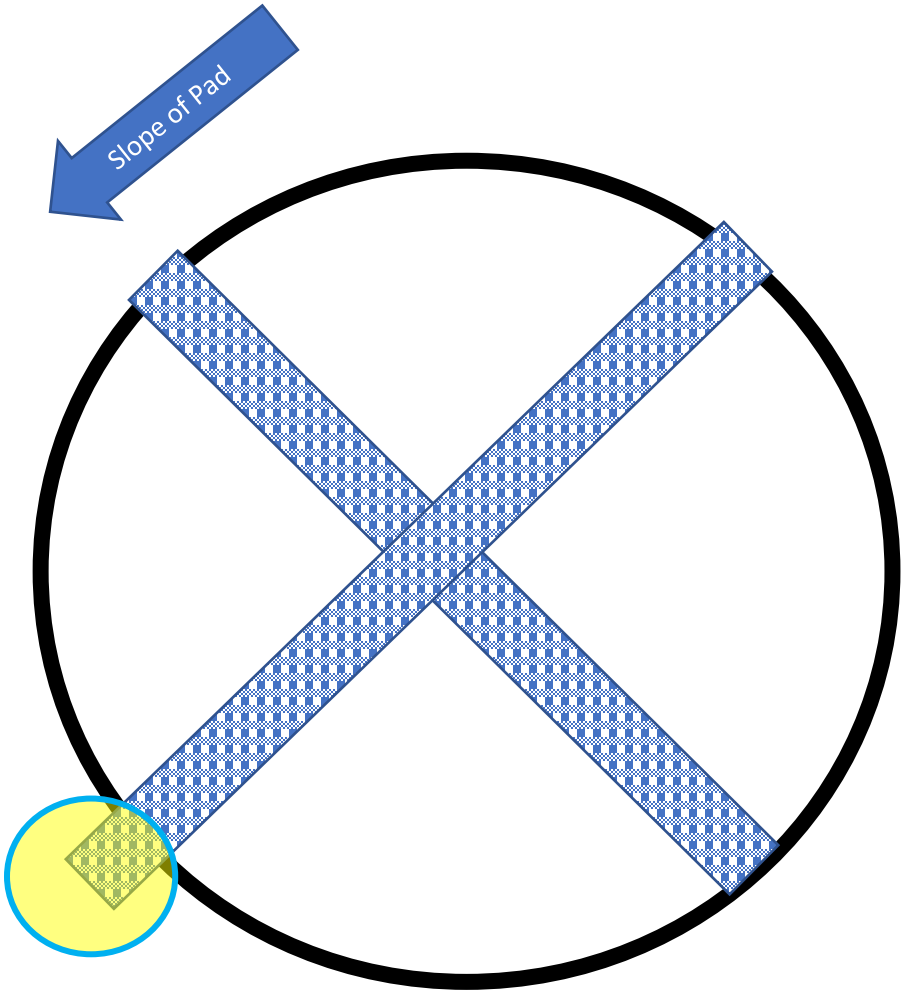
R.T. Hicks Consultants Albuquerque, NM	Design Sketch	Plate A
	COG Operating- Harpoon Tank	February 2024

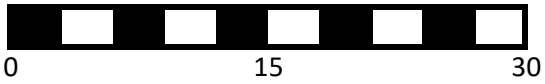
Determine slope of pad and low point of the Harpoon tank footprint

From top to bottom, the sequence of liners and materials is:

i) The Primary Liner is 30 mil Woven Coated Fabric (WCF) with the coating being PVC
ii) 10 oz Geotextile layer
iii) 200 mil Geogrid Leak Detection System
iv) The Secondary Liner is 60 mil HDPE
v) 10 oz Geotextile layer

Sump at lowest point of the AST set up
Leak detection riser pipe/hose installed per SOP





R.T. Hicks Consultants Albuquerque, NM	**Layout of Geogrid Leak Detection Matting**	**Plate B**
	COG Operating - Harpoon Tank	**February 2024**

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Mr. Randall Hicks, PG
R.T. Hicks Consultants Ltd.
901 Rio Grande Boulevard
Suite F-142
Albuquerque, New Mexico 87104

March 12, 2024

RE: Technical Memorandum
30 mil PVC Woven Coated Fabric (WCF) for Short Term Primary Liner System
ConocoPhillips Harpoon Tanks
COG Projects: Gin & Tectonics, Viking Helmet, Bandana

Dear Mr. Hicks:

At your request, I have investigated the material and suitability of application for 30 mil PVC Woven Coated Fabric (WCF) as a short-term disposable primary liner for use on the Conoco Phillips Harpoon Tanks. I have reviewed the Harpoon Tank Design and applicable correspondence as well as the Technical Data Sheet (TDS) for the proposed lining system provided by Southplus Inc. and Hydrera Water Services (See Attachment). In consideration of lining system application (modular Harpoon AST impoundment), size of the Harpoon AST, design details for the tanks and secondary containment as well as estimated length of up to 3 months of service time, it is my professional opinion that the proposed 30 mil PVC WCF will provide the requisite barrier against processed water or clean water loss. It should be noted for this application that the 30 mil PVC WCF is temporary for a limited time span of less than 3 months. The proposed 30 mil PVC WCF liner used as a primary liner in the short term will function as a requisite liquid barrier. Additionally, as shown in the design of the Harpoon Tank System, the secondary geomembrane is a 60 mil HDPE which will effectively trap any seepage water from the primary 30 mil PVC WCF. The geonet drainage layer between the primary and secondary two-layer system as proposed will provide requisite protection for the environment and will allow rapid detection and collection of any seepage. For the proposed 3-month useful life, the liner system as described in Plates A and B of the C-147 permit application should perform the same as a 40,000 bbl. AST that does not include 60-mil HDPE as secondary containment. The following are discussion points that will exhibit the attributes and use of a short-term disposable 30 mil PVC WCF for the primary lining system within the Harpoon Tank Design.

The Structure and Coating of the 30 mil PVC coated WCF. The WCF is composed of a 5-layer polymer coated polyester woven fabric structure of relative low density and low crystallinity (more flexibility and high mechanical properties). However, the WCF will resist aging and degradation and remain intact for short duration applications in exposed conditions and will provide requisite containment and be resistant to leakage for this application. The major difference is in the fact that this is a fabric with a coating as opposed to an internal scrim reinforced liner with thicker polymer layers on either side.

The lower life expectancy and thus limited short term use exposed is primarily due to the lower thickness of the PVC coatings on the woven fabric structure of the 30 mil WCF.

Flexibility Requirements. The WCF liners are less stiff and more flexible than 45 mil string reinforced LLDPE geomembranes and 60 mil HDPE and in this regard are preferred for installations in vertical wall tanks such as this proposed installation. The 30 mil PVC WCF provides a very flexible sheet that enables it to be fabricated into large panels, folded for shipping, and installed on vertical walls transitioned to flat bottom. The 30 mil PVC WCF sheet material will conform to the tank dimensions under hydrostatic loading and will exhibit less wrinkling and creasing during and after installation.

Thermal Fusion Seaming Requirements. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Single wedge thermal fusion welding or IR welding is commonly used on WCF with QC testing by High Pressure Air Lance (ASTM D 4437). As indicated by the supplier, panel welds are produced by IR with 2-inch overlaps and sealed edges with 1 inch PVC tape. In this regard, the proposed 30 mil PVC coated WCF is acceptable as far as QC and IR thermal fusion seaming methods are concerned.

Potential for Leakage through the Primary and Secondary Liners. Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The geonet drainage media between the primary and secondary geomembranes at the base of the Harpoon Tank in this application provides immediate drainage to a low point or outside the Tank but within the 60 mil HDPE Secondary Impoundment and thus no hydrostatic head or driving gradient is available to push leakage water through a hole in the Secondary HDPE liner. Thus, if a leak occurs through the top layer or primary 30 mil PVC WCF, it will effectively be contained by the secondary layer of 60 mil HDPE geomembrane. It should be noted that due to the 5-layer construction of the Southport Plus, Inc. 30 mil PVC WCF, calculated hydraulic conductivity should be in the range of 1.0 to 1.5 10E-14 cm/s and lower than the rule requirement of 10E-09 cm/s. Additionally, although EPA SW-846 Method 9090A is a landfill specification, PVC coating on the 30 mil PVC WCF in this application will pass the testing specification.

The 30 mil PVC WCF roll goods are prefabricated into large panels and thus offer the following for Containment:

- Prefabrication in factory-controlled conditions into very large panels (up to 30,000 sf) results in ease of installation, less thermal fusion field seams and less on-site QC and CQA.

- Large, prefabricated panels provide better control of welding in a factory environment that will improve the liner system integrity for the long term. As referenced on the attached Southport Plus, Inc TDS, factory seams are 2 inch in width and formed by IR thermal fusion. Additionally seam edges are covered with a 1-inch-wide PVC tape.

- Ease of installation of large prefabricated custom size panels results in a greater reduction of installation time and associated installation and QC costs.

In summary, it is my professional opinion that the 30 mil PVC coated WCF liner material as shown on the attached Southport Plus, Inc. TDS will provide a Primary liner system that will provide requisite seepage control and containment for the ConocoPhillips Harpoon Tank application. The utilization of a 30 mil PVC coated WCF for the Primary in the short term of less than 3 months will provide the requisite protection of fresh water, public health, and the environment and especially for the estimated 3-month life span of the proposed Impoundments.

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,

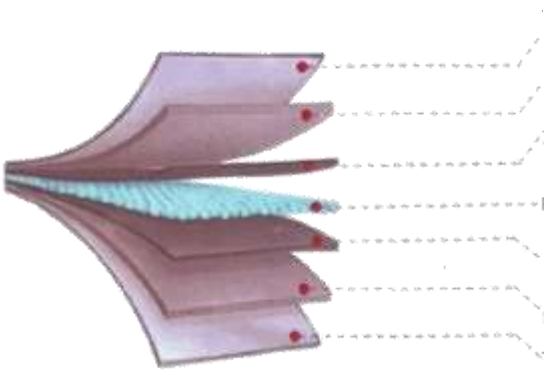
R K Frobel

Ronald K. Frobel, MSCE, PE

References:
Section 19.15.34.12 OCD rule for impoundments
ConocoPhillips Harpoon Tank Design Drawings
Variance Request Conoco Phillips COG
Gin & Tectonics, Viking Helmet, Bandana
Attachments:
Southport Plus, Inc. Technical Data Sheet (TDS)

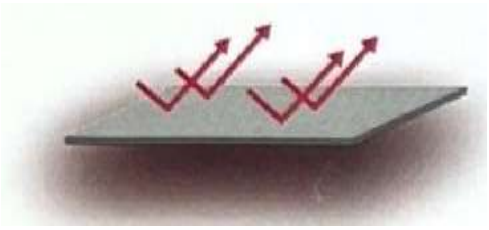
Southplus Inc.

Harpoon PVC Liner

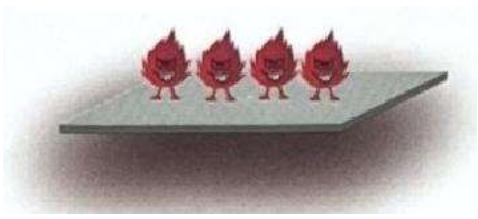


Product description:
Special hot-melt coating technology, high strength, low shrinkage polyester fabric coated with virgin PVC resin, then treated with acrylic surface treatment on both sides (tailor made to match customers' requirement).

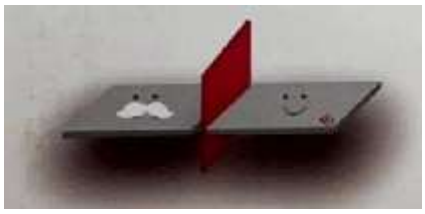
Liner is made by high frequency welding machine with 2-inch overlap, then seam sealed with 1 inch PVC tape.



UV-resistance
Professional surface treatment, effectively protecting the fabric stability against UV.

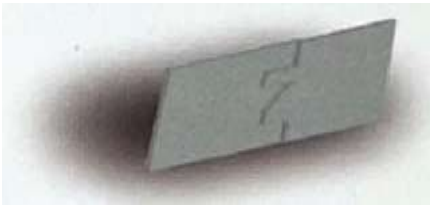


Fire-resistant
Different formulation can match B1, B2, M2, BS7837, NFPA701 & FR standards.



Anti-aging
Variety of formulation to meet different customers and different applications for anti-aging.

Acid and Alkali resistant
Coating with special elements to resist the fabric erosion by acid and alkali.



Welding
Liner was welded by HF welding technology with seam reinforcement to prevent any leaking.

Oil Resistant
Unique coating formulation and process which Is suitable for anti-oil operations.

Southplus Inc.

TC-1000

Items	Value/Unit				Ref. test method
Base fabric	Polyester				
Coating Type	PVC				
Yarn	1000*1000D				
Construction	14*14	cm²	36x36	in²	
Base Fabric Weight	315	g/m²	9.26	oz/yd²	
Total Weight	1000	g/m²	29	oz/yd²	
Thickness	0.82	mm			
Breaking Strength, Strip (Warp/Weft)	4700/4400	N/5cm	528/494	Lb./in	ASTM D751
Tear Strength, Tongue tearing (Warp/Weft)	250/200	N	56/45	Lb.	ASTM D751
Adhesion (IVK)	120	N/5cm	13.5	Lb. /in	ASTM D751
Temperature resistance	-30～+70	℃	-22～158	℉	ASTM D2136/D1204
Puncture resistance	380	N	85	Lb.	ASTM D751
Bursting strength		I	＞300	PSI	ASTM D3786
Hydrostatic resistance (water column)	＞4903	mbar			AATCC TM127-2017
Carbon black content	2%				ASTM D4218
Accelerated UV weathering	＞90%				ASTM G151 Strength retention after 2000hrs exposure @.077W/㎡/nm

Contact information
Southplus Inc. Tel: +1-714-2440921 Address: 5095 E. Airport Dr. Ontario, CA 91761

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 locations is greater than 100 feet beneath the area of interest that will include the location of the Gin and Tectonics Reuse Facility and the 701/702/703 Reuse Facility. (The site area will only be referred to as the Gin and Tectonics site for simplicity in this document.)

Plate 1 is a topographic map that shows:

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

Plate 2 is a topographic and geologic map that shows:

1. The site for the reuse facilities is identified by the blue stippled polygon. Elevation is from about 3640 feet at the northeastern corner to about 3600 feet ASL at the southwestern corner of the site.
2. Water wells measured by the USGS, the year of the measurement and the calculated elevation of the groundwater surface.
3. The geologic unit beneath the facilities site is Quaternary Older Alluvium overlying reworked Ogallala Formation materials explained below (Qoa/To).

Hydrogeology

The location is within the Mescalero Plains between the Pecos River floodplain to the west and the southern High Plains that are east of the Mescalero Escarpment. The material in the Mescalero Plains is derived from erosion and redeposition of Ogallala materials by the Pecos River and its tributary drainages. In the Mescalero Plains, this reworked material is sometimes referred to as Ogallala formation although the original bedding no longer exists. The area is mapped as surface Quaternary eolian and piedmont deposits (Qe/Qp).

Groundwater Data

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

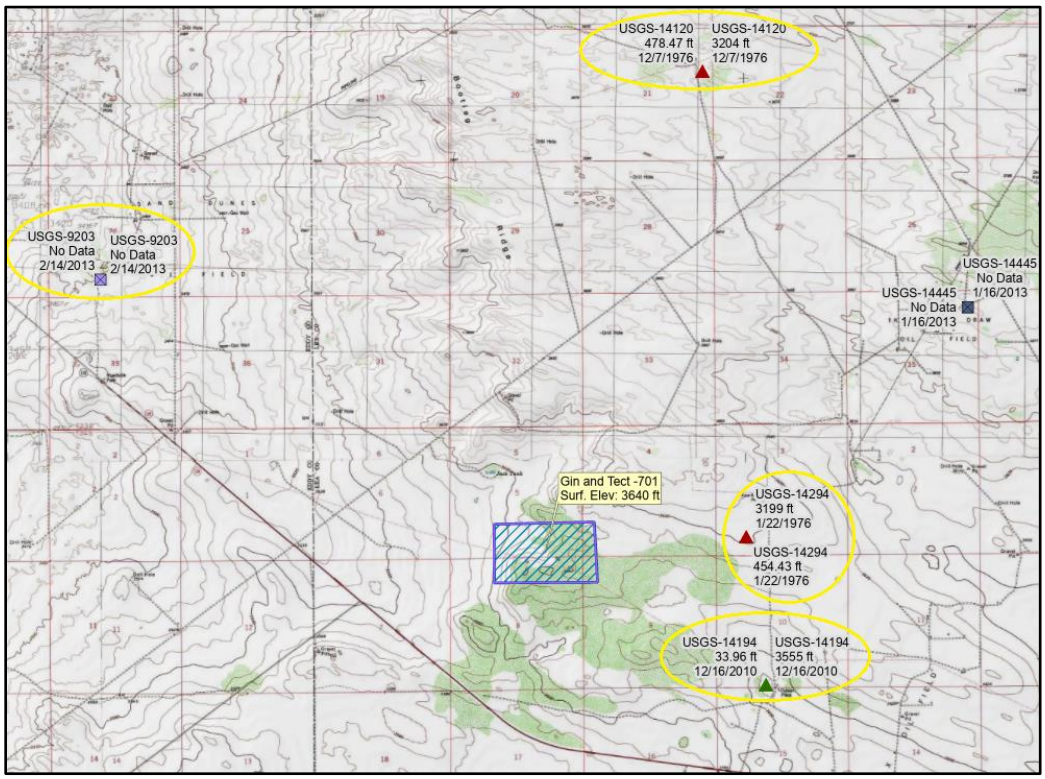


Figure 1 - Location and data of USGS Wells relative to the site location.

The location of USGS-14120 366 is about 3.6 miles north-northeast of the Gin and Tectonics site. Nothing is present at this location. About 750 feet northwest of the given coordinates are several cattle corrals and a dismantled windmill, present in the 2012 to 2017 images. Earlier images are not sufficiently clear to establish its presence. We consider it likely that USGS-14120 is a well associated with the ranching features. Depth to water measurements taken in 1972 and 1977 document a depth to water of 480 feet and 478 feet respectively. The well is completed within the Santa Rosa Sandstone.

USGS-9203 is about 3.5 miles northwest of the site. A windmill and water tanks for cattle is present at the site. It is plotted at almost the same location as Misc-161. No data is listed in 2013 for that USGS well identifier. A search of the USGS database also returned USGS-321809103445901 at the same coordinates. Three measurements were taken from 1960 to 1988. Depth to water was about 250 feet. Total depth of the well is 365 feet and it is listed as completed in the Dewey Lakes Redbeds, beneath the Santa Rosa formation. It is likely that the water bearing formation is the confined Santa Rosa formation. In 2013 a depth to water is recorded as 101 feet. It is unlikely that the potentiometric surface has increased by 150 feet in the 25 years between measurements. More likely is that the deeper well has been replaced by a shallower well accessing unconfined groundwater.

USGS-14294 is 1.15 miles east of the site. Nothing is present at the given longitude-latitude. A windmill is present 0.3 miles north of this location and is present in all historic images that are sufficiently clear (to 1996). A depth to water measurement of 454 feet was obtained in 1976. The well has a total depth of 550 feet and is completed in the confined Santa Rosa Sandstone.

USGS-14194 is 1.5 miles southeast of the site. A ranch house and cattle corrals are present and are identified as the Cotton Place on the USGS topographic map. Just west of the ranch structures is a depression. Both the ranch and the depression are in a drainage that flows to the southeast. The drainage terminates about 1.25 miles upstream of the Cotton Place in an upland. The eastern end of the site includes the westward sloping side of this upland.

The well has a total depth of 60 feet and is completed within the alluvial surface deposits. Nine measurements exist between 1954 and 2011. Depth to water varies from 32 feet to 40 feet reaching the greatest depth once in 1990. On two occasions (1980 and 2006), the depth to water was 20 feet. Aerial photographs exist for June and July of 2005. In June, the depression has surface water covering an area about 240 feet by 100 feet. In July, there is no surface water present. The 1980 and 2006 depth to water measurements of 20 feet are most likely a result of a temporarily high water table from surface water recharge due to large precipitation events filling part of the depression.

As all depressions are eventually filled by sediment, this depression was probably larger in earlier times. The bottom of the depression (i.e. the middle of a pond) will be composed of very fine-grained materials (clays) deposited within the depression forming an aquiclude for the perched water that the Cotton Place well accesses.

A similar feature exists at the Twin Wells Ranch, 6.3 miles west of the site. It is also located within a depression in a shallow drainage flowing to the south. The depth to water (USGS-8899) was measured as 74 feet in 2013. Wells between the Twin Wells Ranch and Cottons Place have a depth to water of from 205 feet to 868 feet.

We examined the documentation of four wells from the NM OSE database. These are described briefly below and presented in Appendix Well Logs.

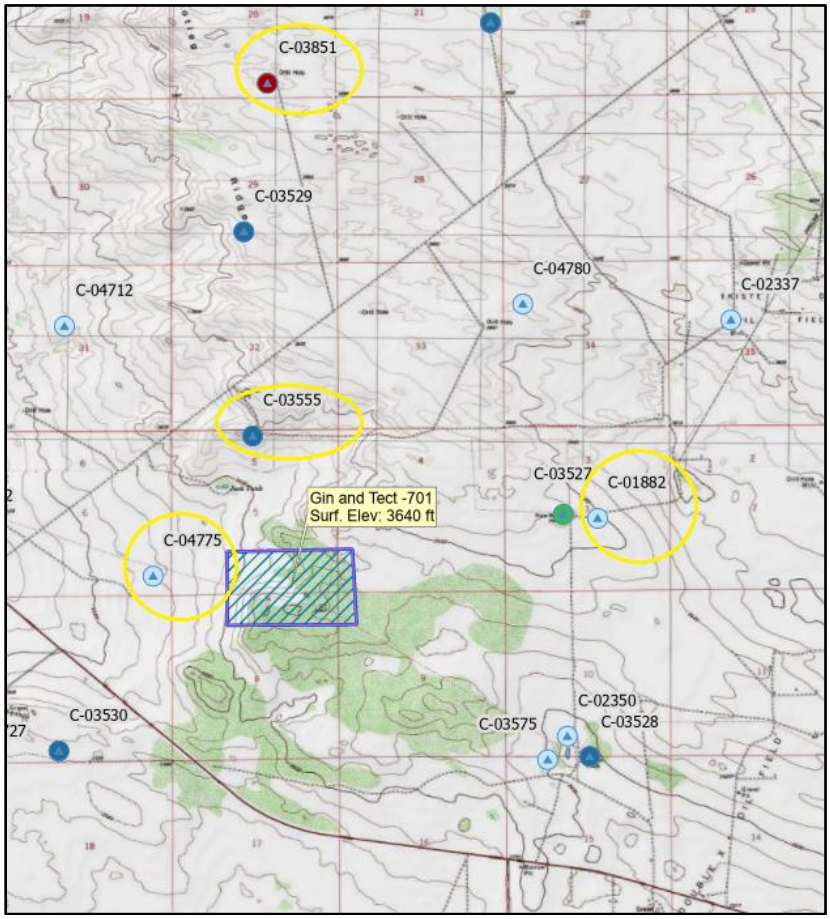


Figure 2: - Location and data of OSE Wells relative to the site location.

- C-03851 is a well drilled in October 2015 at a location almost 3 miles north of the site. The well was drilled to a total depth of 1,405 feet. Groundwater was first encountered at the depth of 1,354 feet in the Culebra Dolomite with a later static water depth of 713 feet. The log identifies a Chinle formation sandstone from the depth of 130 feet to 440 feet. The Santa Rosa Sandstone was recorded between the depths of 440 feet to 576 feet. In southeastern New Mexico, unconfined water is often encountered on top of the Chinle formation. Confined water is frequently found in the Santa Rosa formation. No water was encountered in those formations at this location.
- C-03555 is about 0.75 miles north of the site. It was drilled to a total depth of 600 feet in October 2013. Water was first encountered at the depth of 475 feet. A static water depth of 380 feet existed after well completion. The water bearing zone was described as a brown sandstone present in the depth interval of 475 feet to 550 feet. The description is consistent with that of the Santa Rosa Sandstone.
- C-04775 is downhill and 0.55 miles west of the site at an elevation of about 3560 feet. The western side of the site, the lowest part of the Gin and Tectonics site, is at an elevation of about 3590 feet. The boring was made in December 2023 for Devon Energy

to identify groundwater conditions. The boring was advanced to a depth of 105 feet. No groundwater was found, and the boring was plugged with bentonite chips in accordance with the OSE approved plugging plan.

- C-01882 is about 1.4 miles east of the site and was also drilled for Devon Energy to identify groundwater conditions in October 2023. The boring was advanced to a depth of 105 feet from the surface elevation of about 3650 feet. No groundwater was found and the boring was plugged with bentonite chips in accordance with OSE approved plugging plan.

Groundwater in the Gin and Tectonics site area exists in two situations.

i) It is present as confined water at depth from the Santa Rosa Sandstone or deeper formations at depths of hundreds of feet

ii) There are instances of isolated perched water within drainage feature depressions. Cottons Place (1.4 miles southeast of the site) and the Twin wells Ranch (6 miles southwest of the site) are the closest examples.

C-04775 and C-01882 demonstrate with certainty that groundwater at the site is at greater depth than 50 feet.

Distance to Municipal Boundaries and Fresh Water Fields

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

- The closest municipalities are Loving and Malaga, approximately 20 miles to the west.
- The closest mapped public wells are more than 20 miles to the southeast.

Distance to Subsurface Mines

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

- The closest caliche pit is located 0.65 miles to the northwest.
- There are no subsurface mines in the area shown in Plate 4.

Distance to High or Critical Karst Areas

Plate 5 shows the Aurora Reuse Facility is not within mapped zone of high or critical Karst with respect to BLM mapped areas.

- The proposed facility is located within a “low” potential karst area.
- The nearest “high” or “critical” potential karst area is more than 10 miles west-northwest of the proposed containment.

Distance to 100-Year Floodplain

Plate 6 demonstrates that the Aurora Reuse Facility are 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.

- The nearest mapped flood hazard areas are more than 15 miles to the west.

Distance to Surface Water

Plate 7 shows the closest surface water bodies are:

- A Lake/Pond is more than 1000 feet northwest of the site.
- The next closest Lake/Ponds are 1.4 miles to the southeast.
- The closest mapped water courses are about 7 miles to the west.

Distance to Permanent Residence or Structures

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

- There are no structures within 1000 feet of the site.
- Oil field infrastructure is present around the site.

Distance to Non-Public Water Supply

Plates 1, 7 and 8 demonstrate that the Aurora Reuse Facility 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.
- The nearest well in the OSE database is more than one half mile to the north.
- The nearest stock watering well is about 1.4 miles to the southeast.
- No springs were identified within the mapping area (see Plate 7)

Distance to Wetlands

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

- The nearest designated wetland is Jack Tank, a freshwater pond more than 1900 feet to the north.
- The USA wetlands database, which relies upon aerial imagery rather than more detailed investigations, identified all the surface water bodies of Plate 7 as wetlands.

SITING CRITERIA DEMONSTRATION PLATES

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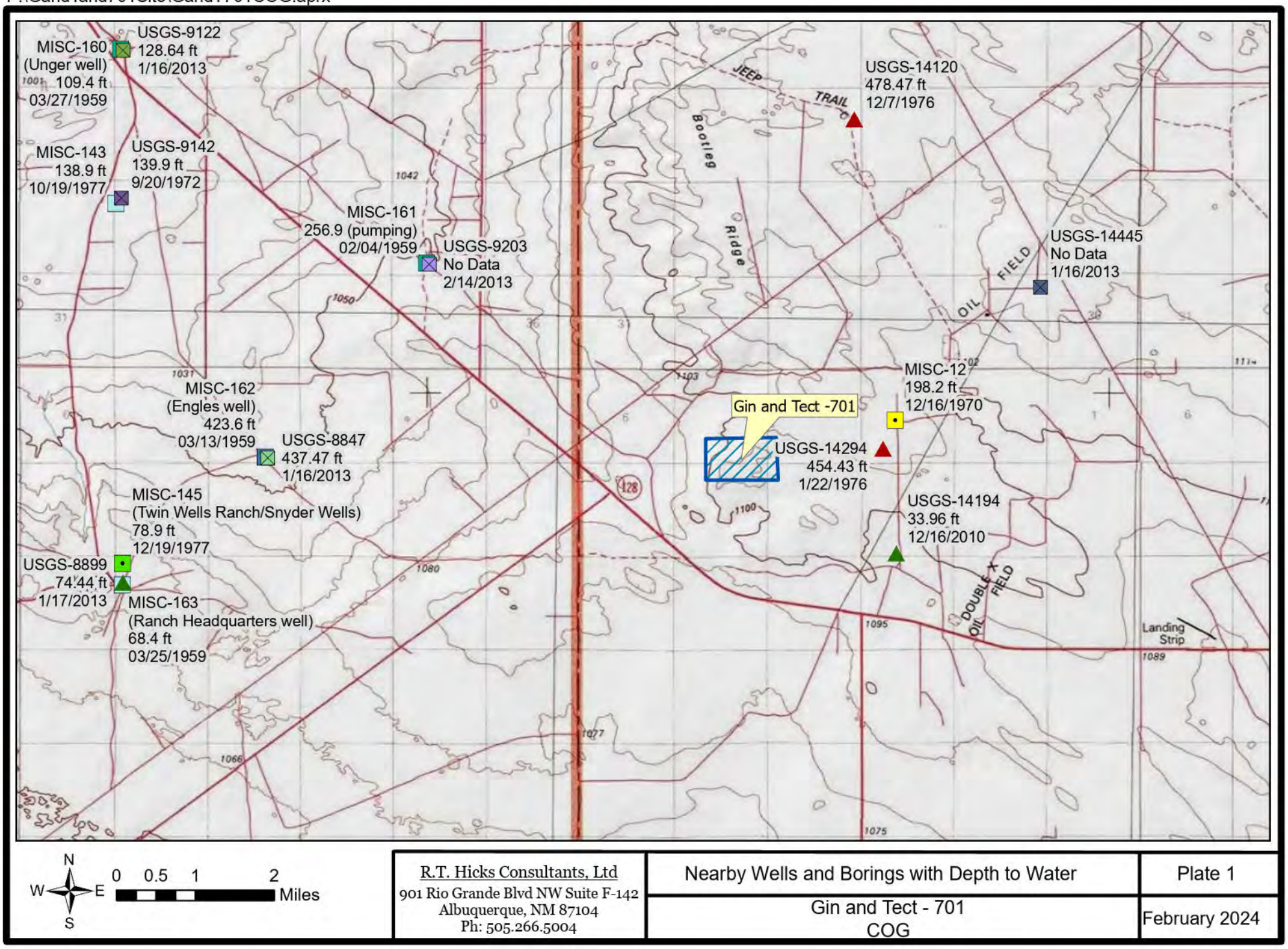

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Wells and Borings with Depth to Water	Plate 1
	Gin and Tect - 701 COG	February 2024

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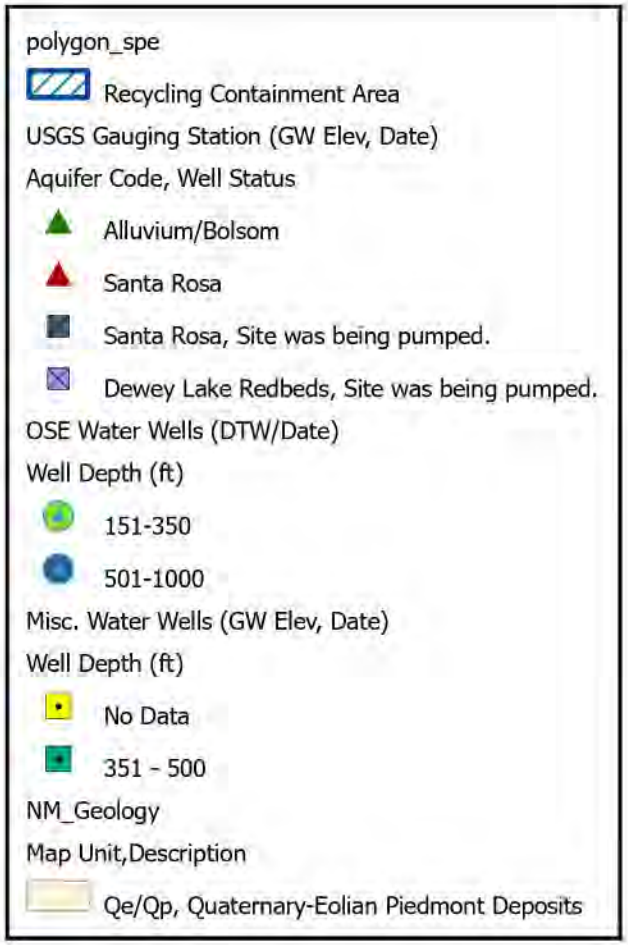

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Plates 1 & 2 Legend	
	Gin and Tect - 701 COG	January 2024

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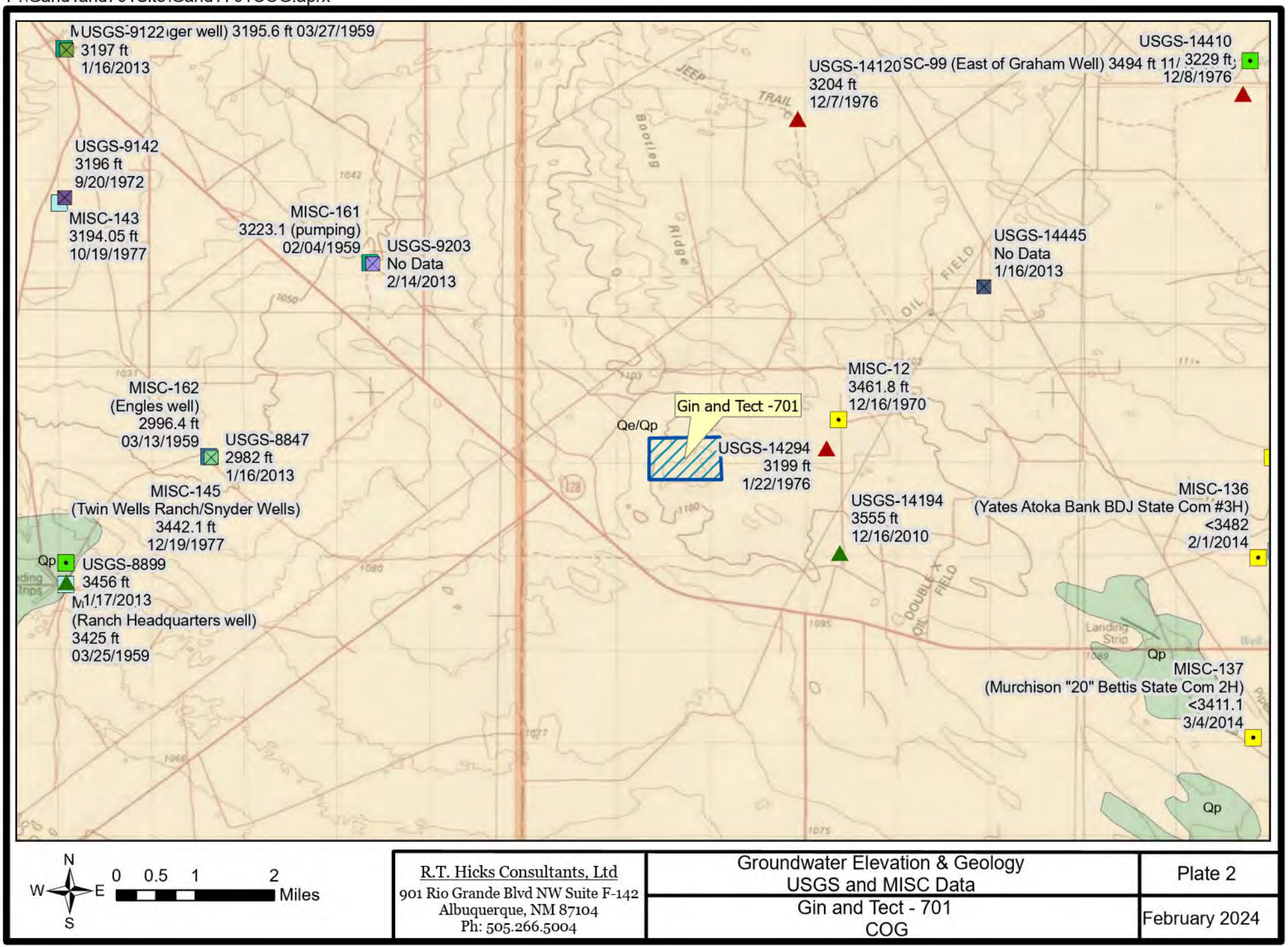

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Groundwater Elevation & Geology USGS and MISC Data	Plate 2
	Gin and Tect - 701 COG	February 2024

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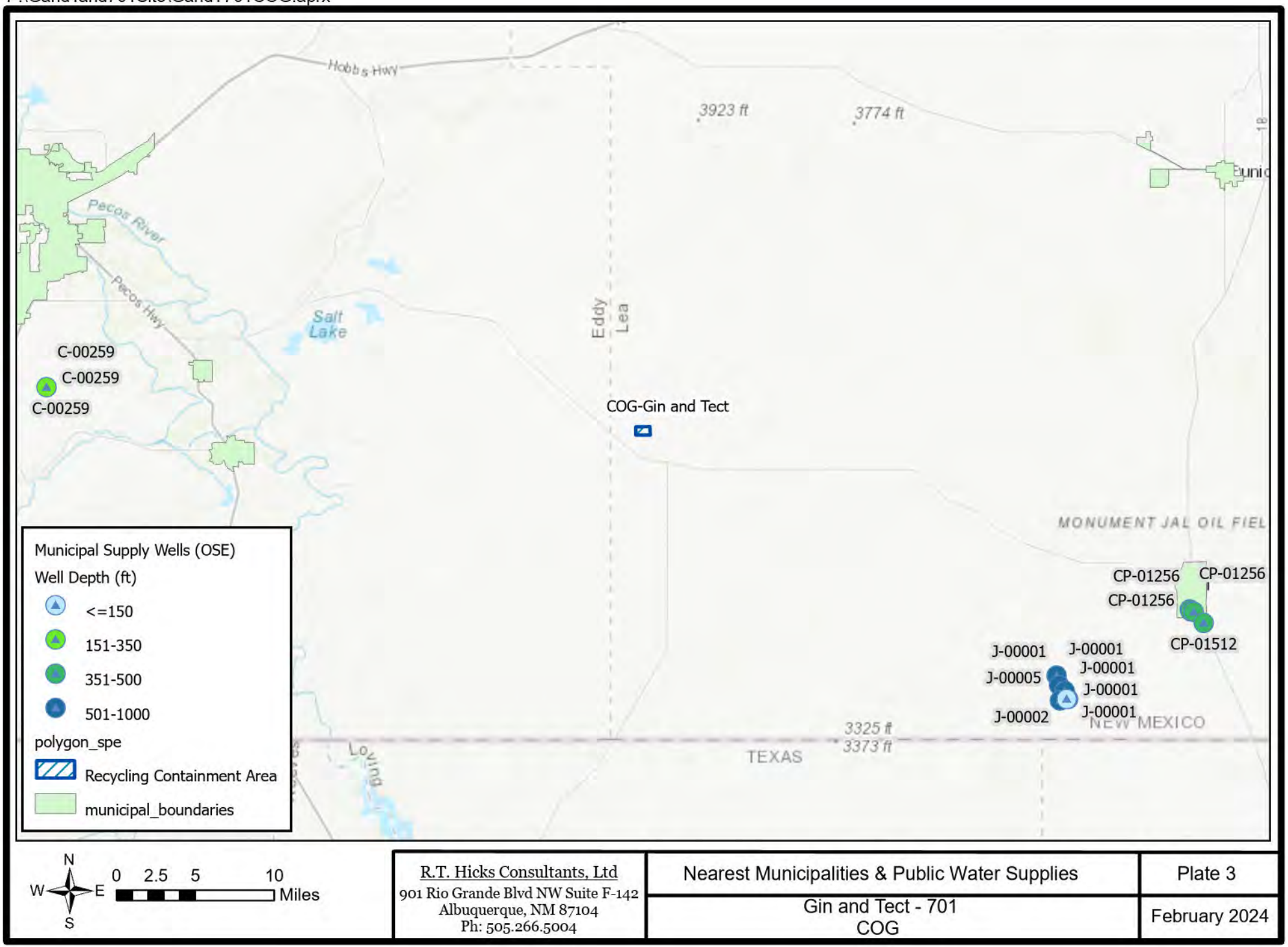

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Municipalities & Public Water Supplies	Plate 3
	Gin and Tect - 701 COG	February 2024

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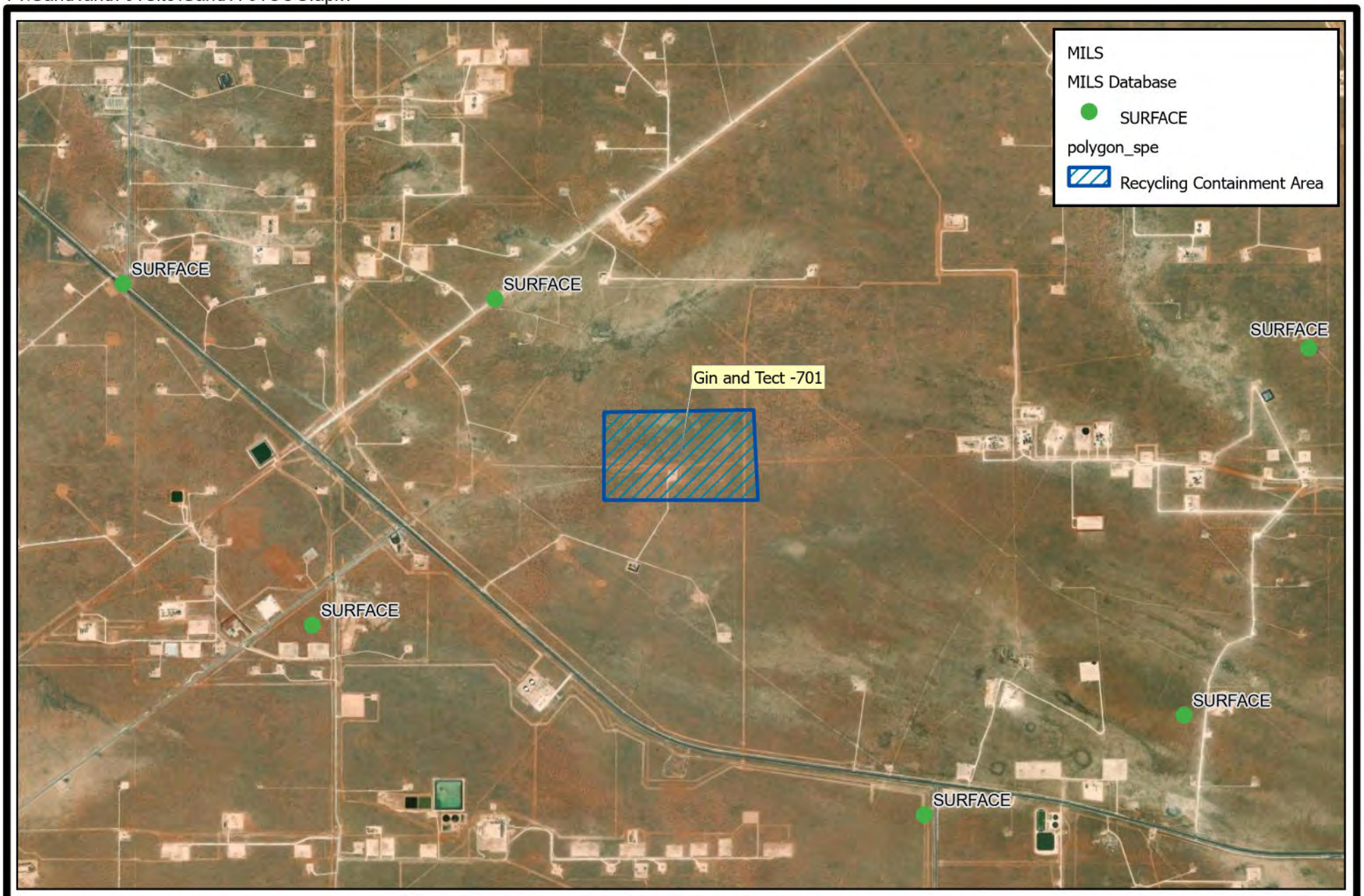

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Mines - Caliche Pits	Plate 4
	Gin and Tect - 701 COG	February 2024

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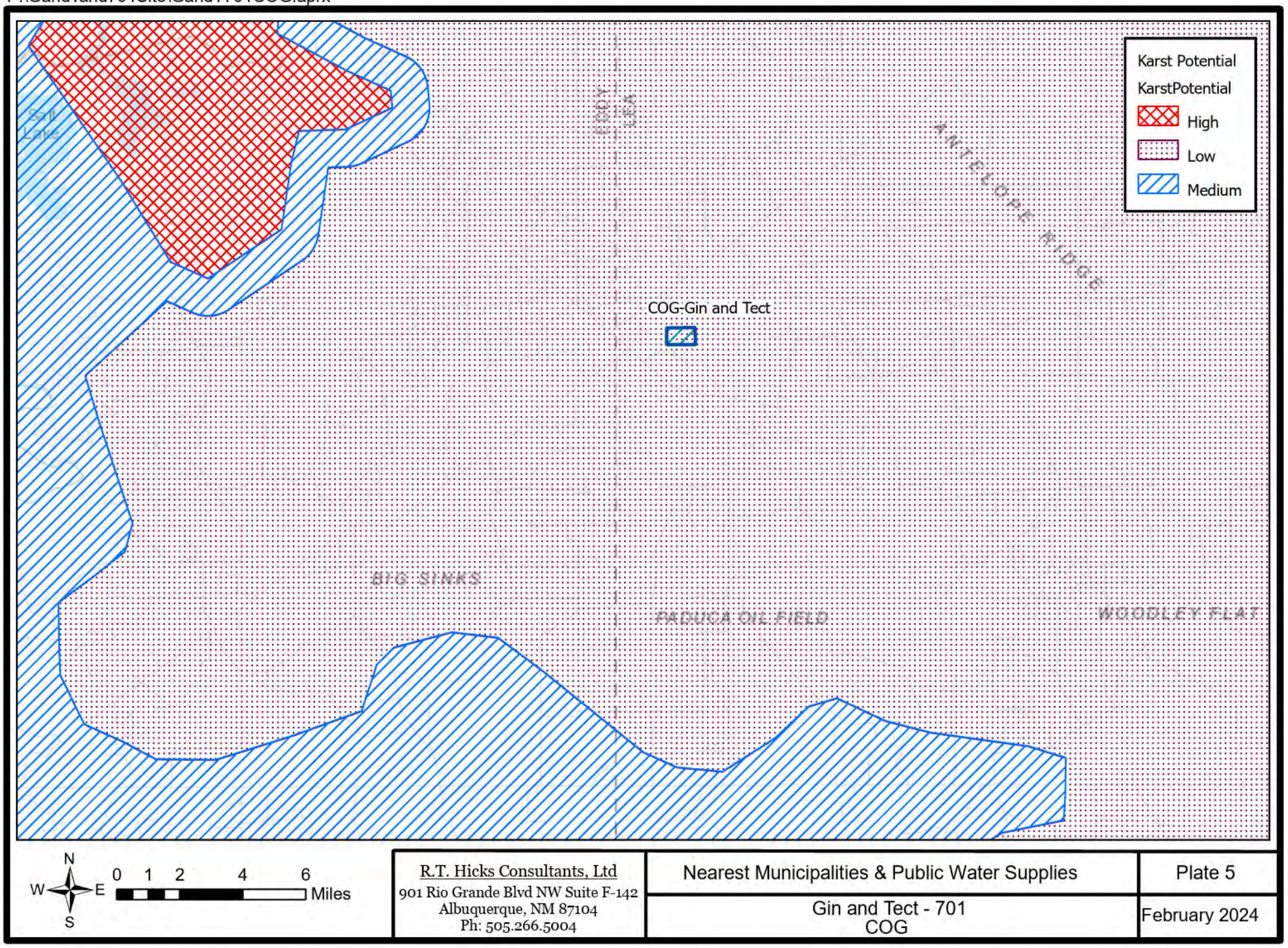

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Municipalities & Public Water Supplies	Plate 5
	Gin and Tect - 701 COG	February 2024

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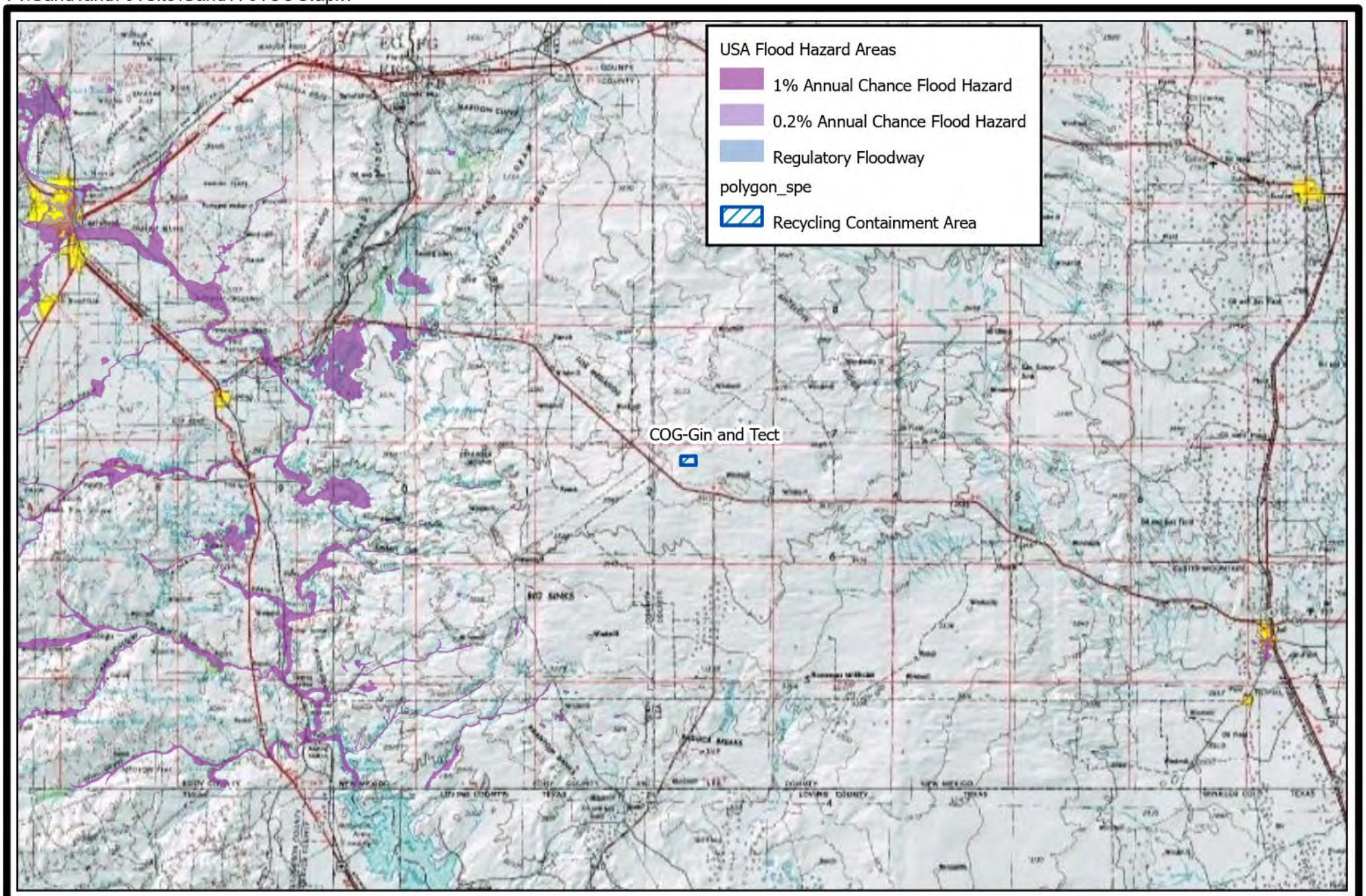

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

FEMA Mapped Flood Zones

Plate 6

Gin and Tect - 701
COG

February 2024

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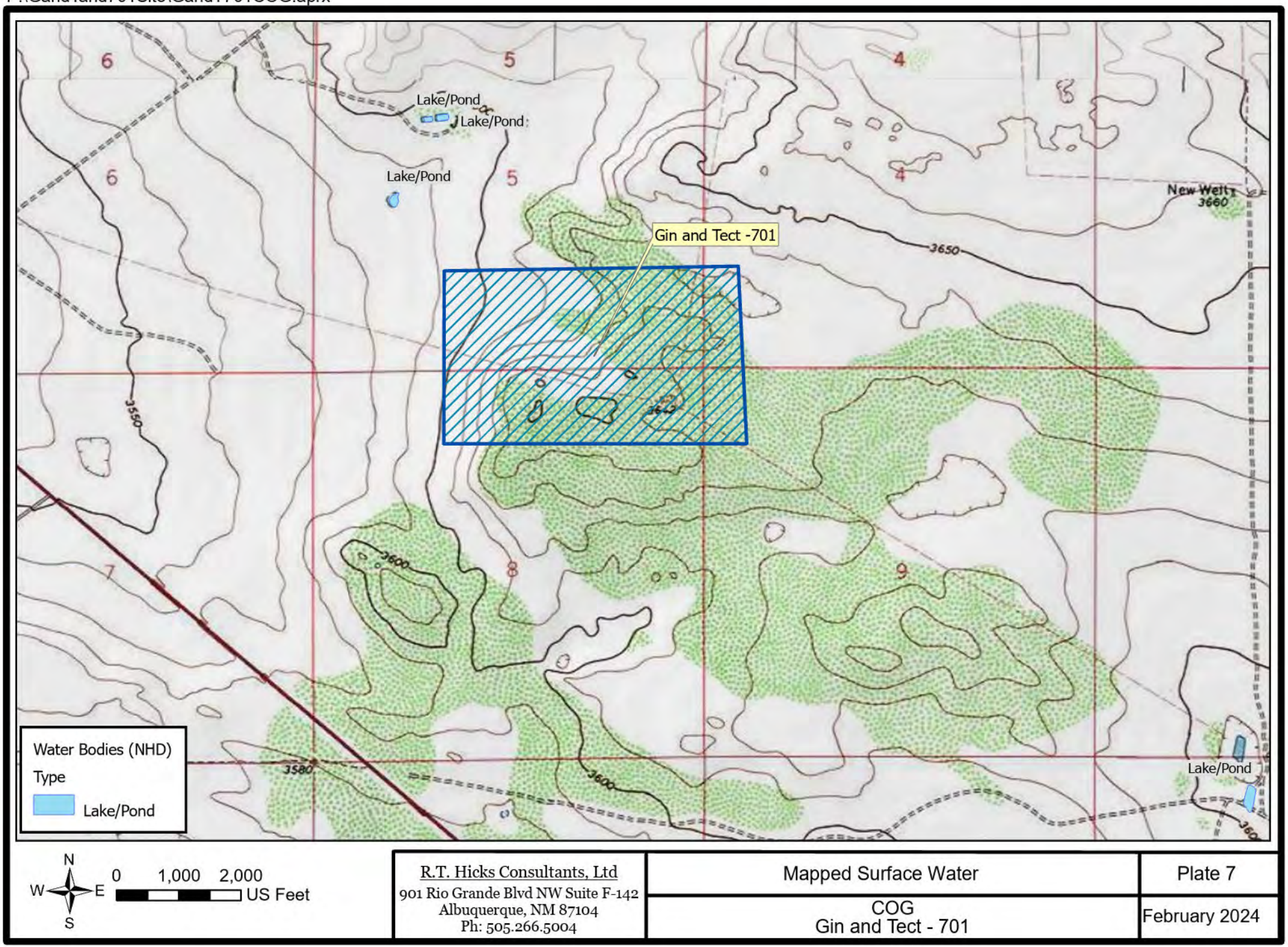

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Mapped Surface Water	Plate 7
	COG Gin and Tect - 701	February 2024

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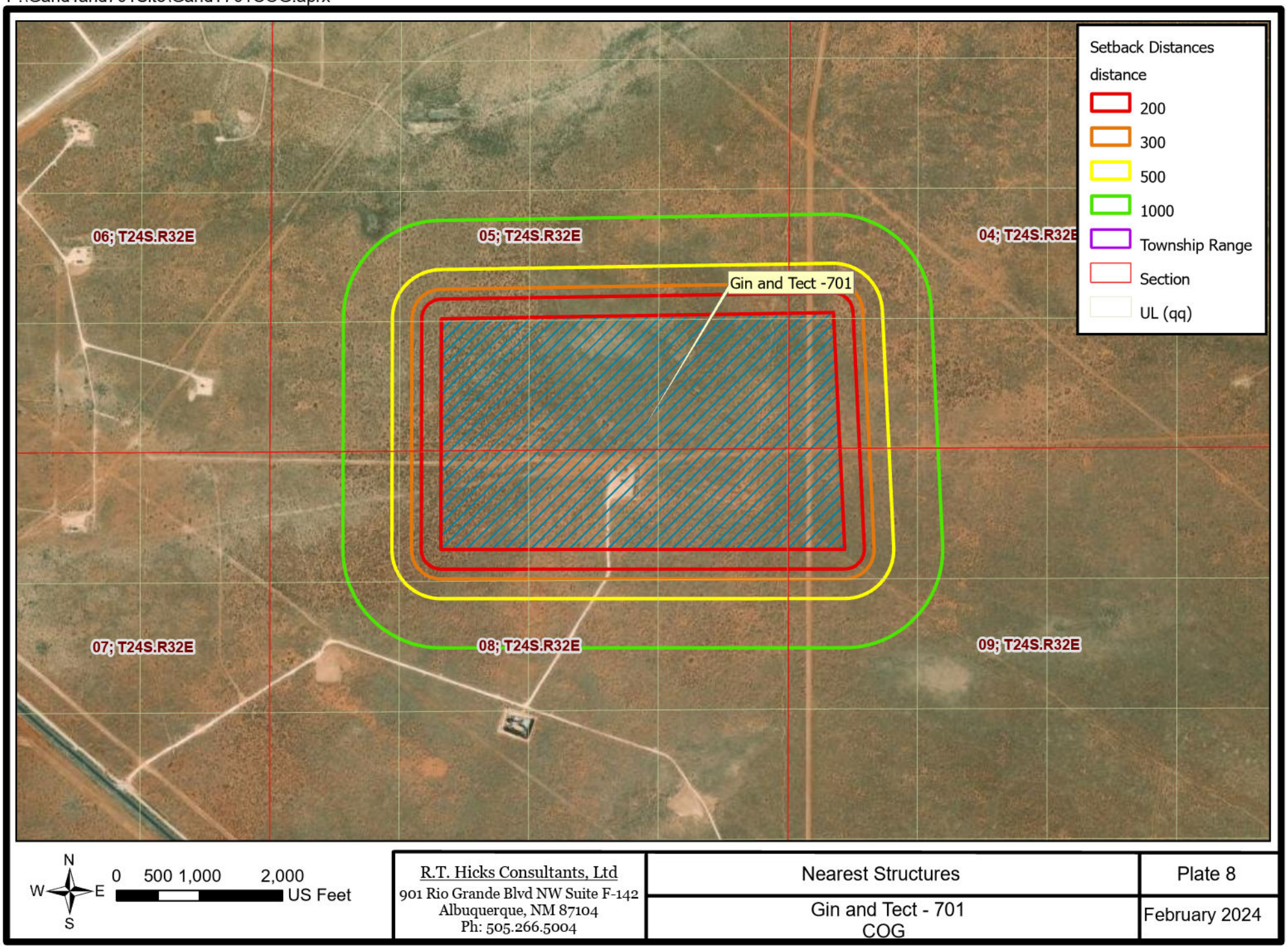

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Nearest Structures	Plate 8
Gin and Tect - 701 COG	February 2024

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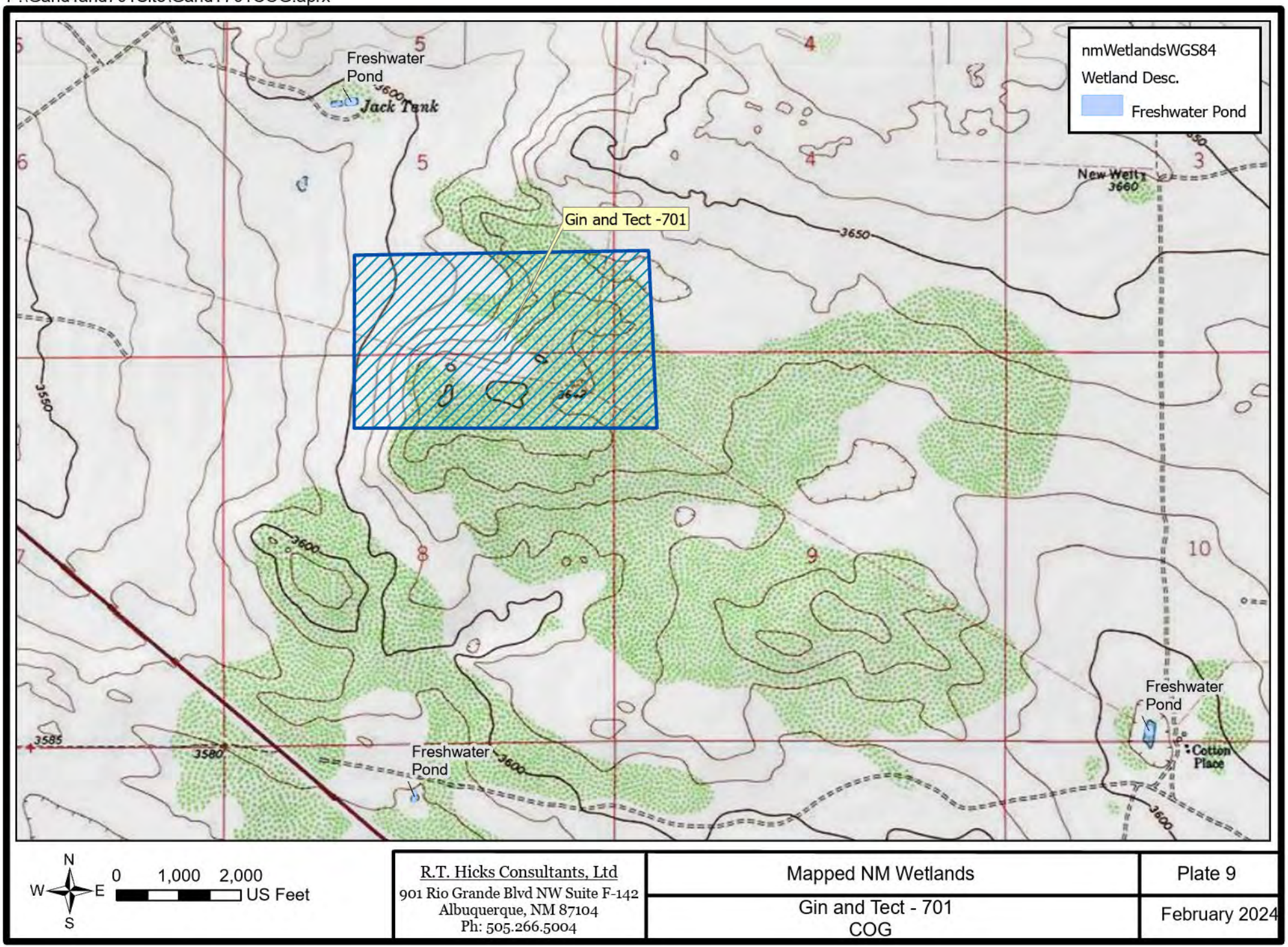


R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Mapped NM Wetlands	Plate 9
	Gin and Tect - 701 COG	February 2024

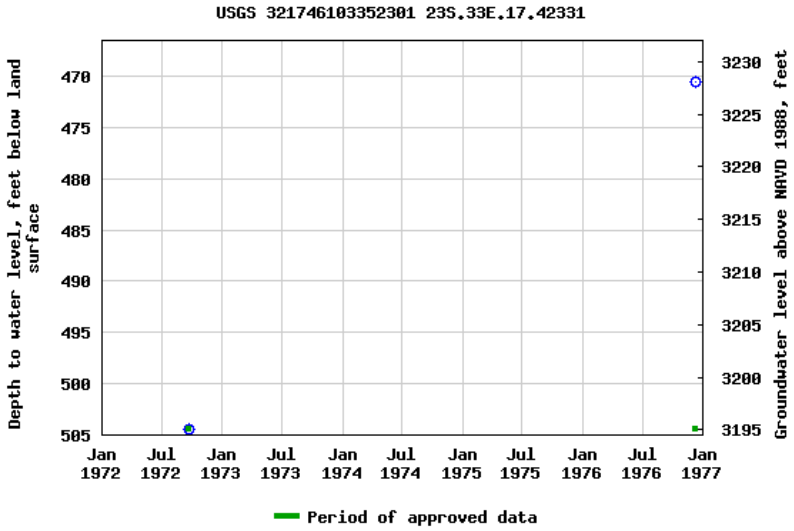
APPENDIX WELL LOGS & USGS DATA

The USGS well data discussed in the Site Specific criteria is presented below.

USGS 321746103352301 23S.33E.17.42331

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°17'46", Longitude 103°35'23" NAD27
Land-surface elevation 3,699 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.

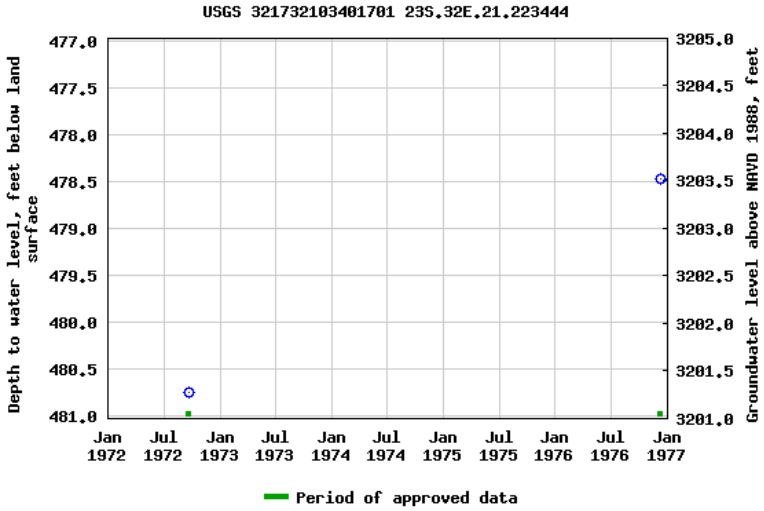
This location is currently at the western end of a caliche pit. It is about 1900 feet south of the Graham well. At the Graham Well, it appears that the adjacent stock tank is fed by an electric pump. A windmill may have been present in earlier time. It is 3.37 miles east of the Aurora site and is likely USGS 14410, the Graham Well.



USGS 321732103401701 23S.32E.21.223444

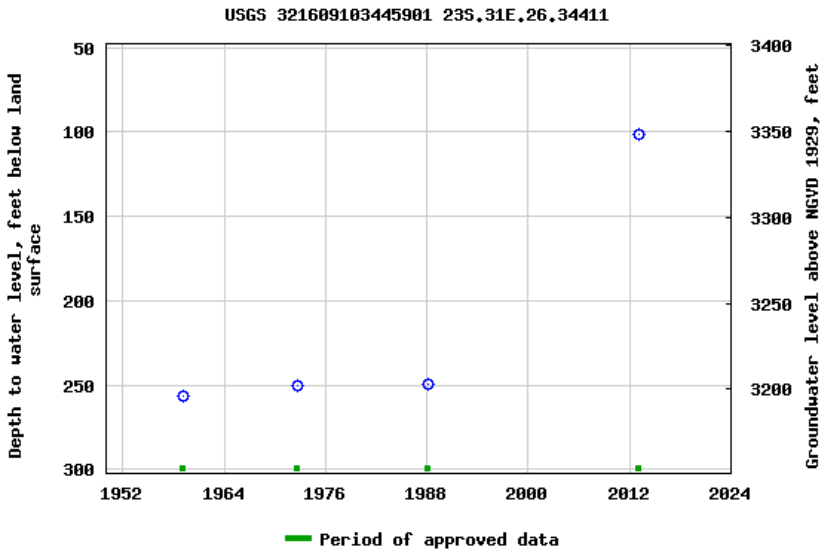
Lea County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°17'32", Longitude 103°40'17" NAD27
Land-surface elevation 3,682 feet above NAVD88
The depth of the well is 550 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Santa Rosa Sandstone (231SNRS) local aquifer.

Nothing is presently visible at this location. A complex of cattle yards is present 700 feet to the NW. A windmill is about 750 feet NW of the given latitude, longitude. The site is 3.6 miles northeast of the Gin and Tectonics site. This is USGS-14120



USGS 321609103445901 23S.31E.26.34411

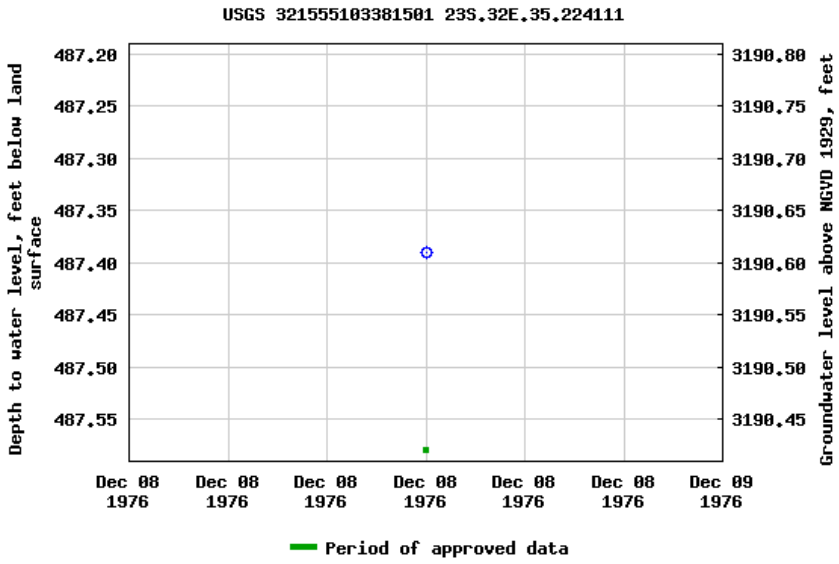
Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°16'11.9", Longitude 103°45'01.2" NAD83
Land-surface elevation 3,451.00 feet above NGVD29
The depth of the well is 365 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Dewey Lake Redbeds (312DYLK) local aquifer.
This well is USGS-9203.



USGS 321555103381501 23S.32E.35.224111

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°15'59.0", Longitude 103°38'17.6" NAD83
Land-surface elevation 3,678.00 feet above NGVD29
The depth of the well is 700 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.

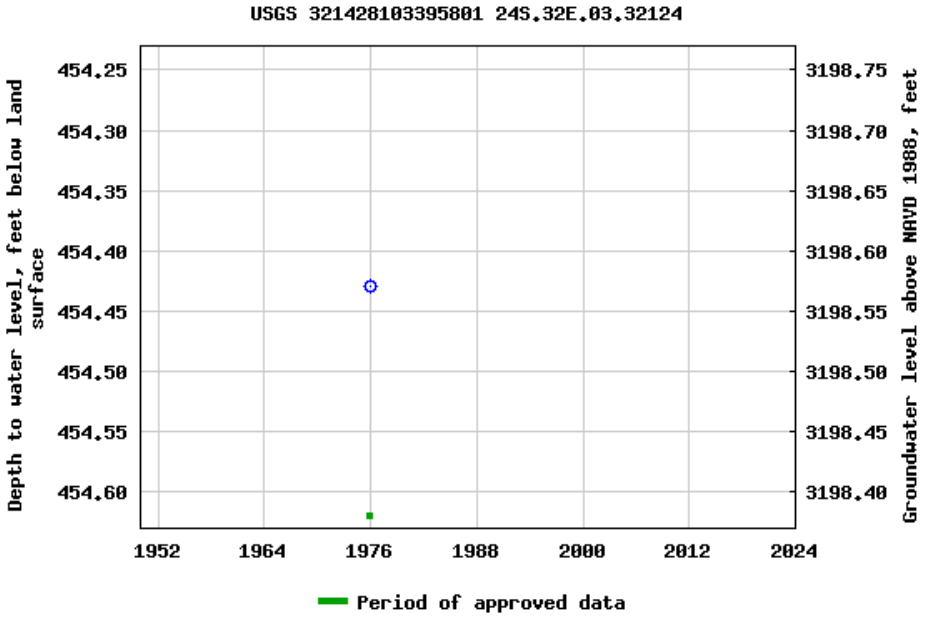
Nothing is currently present at this lat-long. A 1996 image shows a possible livestock watering feature. The location is 3.21 miles northeast of the Gin and Tectonics site. The well is USGS-14445.



USGS 321428103395801 24S.32E.03.32124

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.

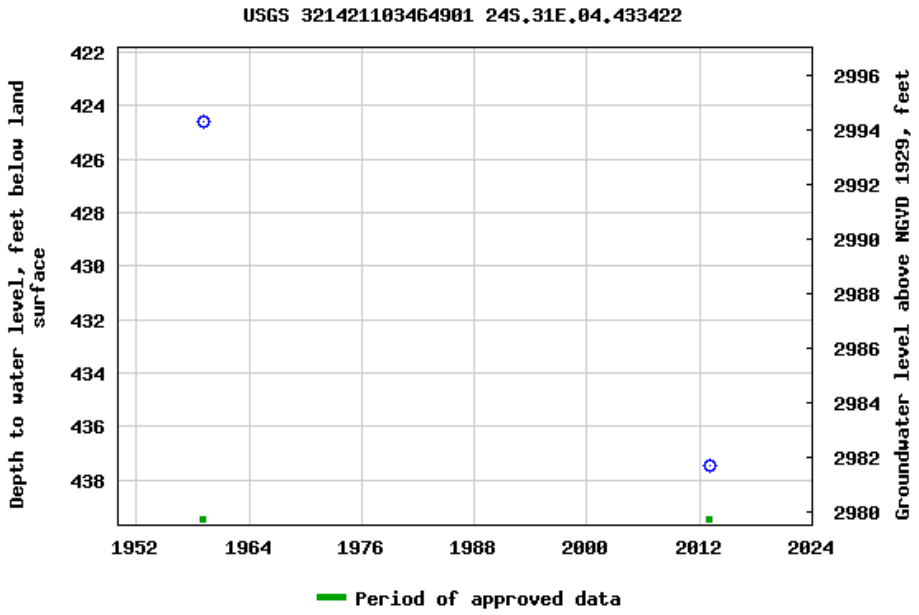
Nothing is currently present at this latitude and longitude. About 1700 feet to the north is a windmill and stock tank. Most likely, this well is USGS-14294. It is located about 1.3 miles east of the Gin and Tectonics site.



USGS 321421103464901 24S.31E.04.433422

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.

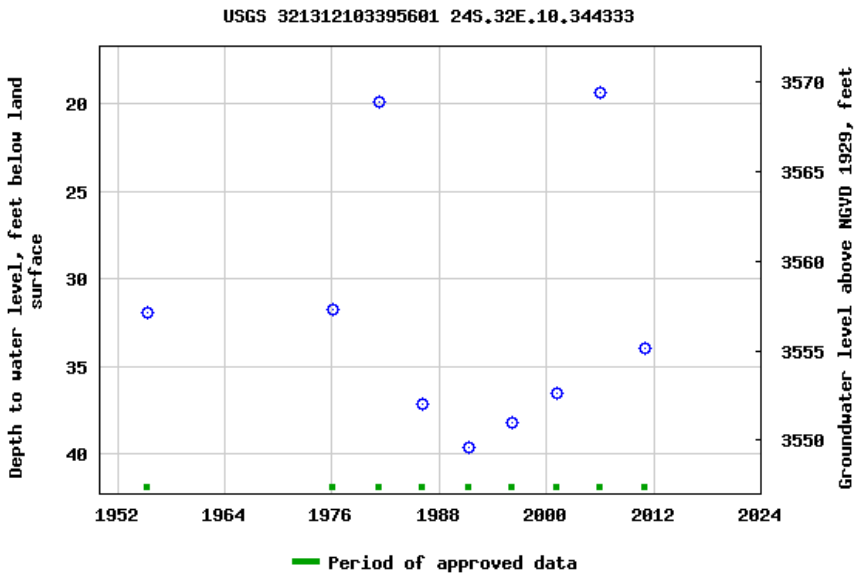
The well is USGS-8847 and is 4.7 miles west of the Gin and Tectonics site.



USGS 321312103395601 24S.32E.10.344333

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.

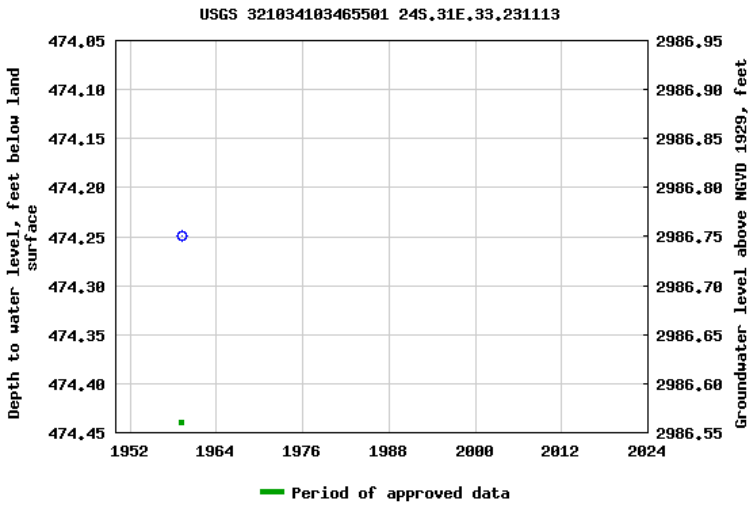
This well is USGS-14194 located at Cottons Place 1.4 miles southeast of the site.



USGS 321034103465501 24S.31E.33.231113

Eddy County, New Mexico
Hydrologic Unit Code 13070001
Latitude 32°10'38.2", Longitude 103°46'53.0" NAD83
Land-surface elevation 3,461.00 feet above NGVD29
The depth of the well is 740 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.

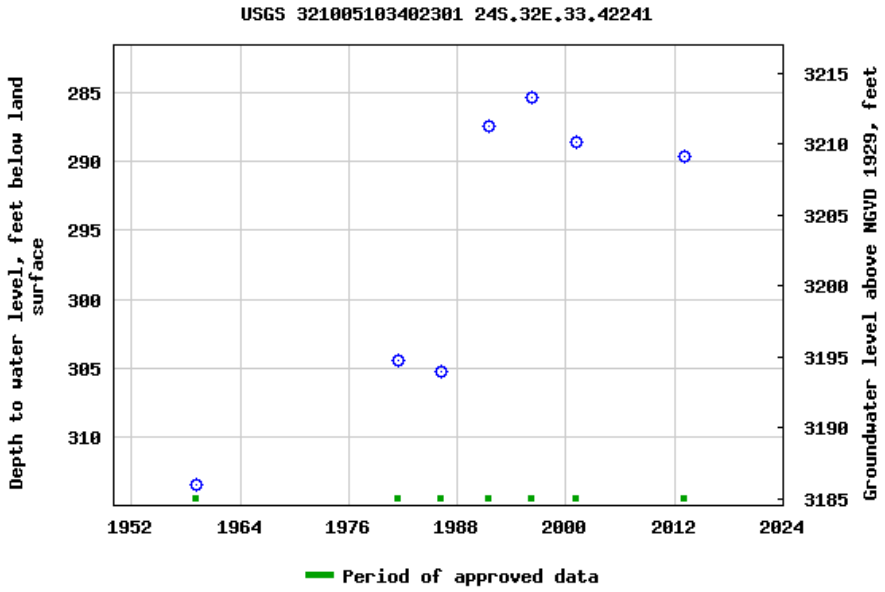
The well is 6.3 miles southwest of the Gin and tectonics site.



USGS 321005103402301 24S.32E.33.42241

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.

The well is 4.58 miles south of the Gin and Tectonics site.



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
POD-1	C-3851
WELL OWNER NAME(S)	**PHONE (OPTIONAL)**
WIPP- Department of Energy Carlsbad Field Office	(575)234-7488
WELL OWNER MAILING ADDRESS	**CITY / STATE / ZIP**
PO Box 3090	Carlsbad / NM / 88221-3090

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	17	2.3	N
	LONGITUDE	103	41	42.3	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

3.5 mi. east of Redd Rd. Section 20, Township 23s, Range 32e

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1723	Randy Stewart	Stewart Brothers Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
8-19-15	10-2-15	1392	1405	1354

COMPLETED WELL IS: [x] ARTESIAN [ ] DRY HOLE [ ] SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): 713

DRILLING FLUID: [ ] AIR [x] MUD ADDITIVES – SPECIFY:

DRILLING METHOD: [x] 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	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
+2	35	24	LCS	weld	14	.375	n/a
35	1354	12.250	Blank FRP	Threaded	5	.25	n/a
1354	1383	12.250	Slotted FRP	Threaded	5	.25	.070
1383	1393	12.250	Blank FRP	Threaded	5	.25	

RECEIVED OFFICE
2015 NOV 10 PM 3:35

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
0	35	24	neat cement	61	tremie
35	1347	12.250	neat cement	1080	tremie
1347	1352	12.250	Gelacryl seal	3.25	tremie
1352	1353	12.250	Bentonite pellets	.35	tremie
1353	1383	12.250	6-9 Sand	19.60	tremie
1383	1389	12.250	Gelacryl seal	3.92	tremie
1389	1405	12.250	bentonite seal(.65 cu/ft)6-9 sand	9.80	tremie

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 10/29/15)

FILE NUMBER	C-3851	POD NUMBER	1	TRN NUMBER	564731
LOCATION	23S.32E.20.4.3.3			monitor	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	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	6	Pad material & brown sand	Y ✓N	
6	36	30	Caliche	Y ✓N	
36	120	84	Gatuna Sandstone	Y ✓N	
120	440	320	Chinle Sandstone	Y ✓N	
440	576	136	Santa Rosa Sandstone	Y ✓N	
576	1198	622	Dewey Lake Sandstone	Y ✓N	
1198	1228	30	Anhydrite	Y ✓N	
1228	1238	10	Mudstone	Y ✓N	
1238	1248	10	Anhydrite	Y ✓N	
1248	1265	17	Magenta Dolemite	Y ✓N	
1265	1332	67	Anhydrite	Y ✓N	
1332	1340	8	mudstone	Y ✓N	
1340	1354	14	Anhydrite	Y ✓N	
1354	1380	16	Culebra Dolemite	✓Y N	3.00
1380	1390	10	mudstone	Y ✓N	
1390	1405	15	Anhydrite	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): 3.00

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2015 NOV 10 PM 3:35

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:

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

Danny L White

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 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Danny White / Danny L. White — 10/31/15

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER C-3851	POD NUMBER 1	TRN NUMBER 564731	
LOCATION 23S.32E.20.4.3.3		monitor	PAGE 2 OF 2

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO

2023 NOV -7 A 11:11

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): C-3555-POD1	OSE FILE NUMBER(S): C-3555
WELL OWNER NAME(S): Mark McCloy - McCloy Ranches	PHONE (OPTIONAL): 432-940-4459
WELL OWNER MAILING ADDRESS: Box 1076 254 Diamond Road	CITY: Jal STATE: NM ZIP: 88252

WELL LOCATION (FROM GPS): DEGREES / MINUTES / SECONDS

LATITUDE 32 15 12.71 N

LONGITUDE 103 41 49.24 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: Hwy 128 mm 20 4 miles North - 1/4 east

2. DRILLING & CASING INFORMATION

LICENSE NUMBER: 1654	NAME OF LICENSED DRILLER: John Sirman	NAME OF WELL DRILLING COMPANY: Sirman Drilling & Const. LLC
DRILLING STARTED: 10/20/13	DRILLING ENDED: 10/21/13	DEPTH OF COMPLETED WELL (FT): 600'-0
BORE HOLE DEPTH (FT): 600'-0	DEPTH WATER FIRST ENCOUNTERED (FT): 475-0	
COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☑ SHALLOW (UNCONFINED)	STATIC WATER LEVEL IN COMPLETED WELL (FT): 380'-0	
DRILLING FLUID: ☐ AIR ☑ MUD ☐ ADDITIVES – SPECIFY:		
DRILLING METHOD: ☑ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER – SPECIFY:		

DEPTH (feet bgl) FROM	TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	460	10	PVC	Certa-Lok	6	DR-17	Blank
460	520	10	PVC	Certa-Lok	6	DR-17	.032 screen
520	600	10	PVC	Certa-Lok	6"	DR-17	Blank

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT
0	20	10	3/8 bentonite hole plug	6 Bags	gravity
34	600	10	3/8 pea gravel pack	4 yds	gravity

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	C-3555	POD NUMBER		TRN NUMBER	534311

LOCATION 24S.32E.05 1-2-2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	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	10	10	white caliche	☐Y ☒N	
10	60	50	Red sand	☐Y ☒N	
60	75	15	Brown Sandstone	☐Y ☒N	
75	100	25	grey sandstone	☐Y ☒N	
100	110	10	Red clay	☐Y ☒N	
110	160	50	Brown Sandstone	☐Y ☒N	
160	400	240	Red clay	☐Y ☒N	
400	450	50	Brown Sandstone	☐Y ☒N	
450	475	25	Red Clay	☐Y ☒N	
475	550	75	Brown Sandstone & sand	☒Y ☐N	5
550	600	50	Red clay	☐Y ☒N	
				☐Y ☐N	
				☐Y ☐N	
				☐Y ☐N	
	600			☐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): 5

STATE ENGINEER OFFICE RECEIVED NOV 04 2013 ROSWELL, NM

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:

None

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

none

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 20 DAYS AFTER COMPLETION OF WELL DRILLING:

John Sirman — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

11/3/13 — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	C-3555	POD NUMBER		TRN NUMBER	534311

LOCATION 24S.32E.05 1-2-2

WELL PLUGGING PLAN OF OPERATIONS

NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP: ☐ Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: C-4775-POD1

Name of well owner: Devon Energy Resources

Mailing address: 205 E Bender Road # 150 County: Lea

City: Hobbs State: NM Zip code: 88240

Phone number: 405-318-4697 E-mail: Dale.Woodall@DVN.com

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Vision Resources , Jason Maley

New Mexico Well Driller License No.: 1833 Expiration Date: 10/07/2023

IV. WELL INFORMATION: ☐ **Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.**

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

1) GPS Well Location: Latitude: 32 deg, 14 min, 26.8944 sec
Longitude: -103 deg, 42 min, 26.1864 sec, NAD 83

2) Reason(s) for plugging well(s):

32.240804,-103.707274 - No water found

3) Was well used for any type of monitoring program? no If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? no If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: No water feet below land surface / feet above land surface (circle one)

6) Depth of the well: 105 feet

751179

7) Inside diameter of innermost casing: 2 inches.

8) Casing material: PVC

9) The well was constructed with:

☐ an open-hole production interval, state the open interval:

■ a well screen or perforated pipe, state the screened interval(s): 100-105 Feet

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? no If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? If yes, please describe:

12) Has all pumping equipment and associated piping been removed from the well? Yes If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

☐ **If plugging method differs between multiple wells on same site, a separate form must be completed for each method.**

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well:

Temporary PVC casing will be removed and approximately 9.4 Cubic feet bentonite chips will be placed in well.

2) Will well head be cut-off below land surface after plugging? No well head will be installed.

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface: DNA

4) Type of Cement proposed: DNA

5) Proposed cement grout mix: DNA gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: DNA batch-mixed and delivered to the site

DNA mixed on site

7) Grout additives requested, and percent by dry weight relative to cement:

Grout not planned

8) Additional notes and calculations:

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

Devon plans to have a licensed water well driller install an exploratory soil boring on location to determine the depth of groundwater. The soil boring will be installed up to a depth of 105 feet below ground surface (ft bgs). Temporary PVC well material will be placed to a depth of the boring and secured at the surface. The temporary well will be in place for a minimum of 72 hours at which time the well will be gauged for the presence of water. If water is encountered at any point during the boring installation, the soil boring will be plugged using a slurry of Portland Type 1/11 Neat Cement less than 6.0 gallons of water per 94 lb sack. If no water is encountered, the boring will be plugged using hydrated bentonite with drill cuttings to plug the upper 10 ft. bgs. The event will begin September 25, 2023 and continue through November 06, 2023.
Mesa Verde 6 Federal #011 at 32.240804,-103.707274.

VIII. SIGNATURE:

I, Dale Woodall, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

Dale Woodall — Signature of Applicant

9/14/2023 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.

_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 21st day of September, 2023

Mike A. Hamman P.E., New Mexico State Engineer

By: K. Parekh

KASHYAP PAREKH

W.R.M. I

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)	Does Not Apply (DNA)	DNA	DNA
Bottom of proposed interval of grout placement (ft bgl)	DNA	DNA	DNA
Theoretical volume of grout required per interval (gallons)	DNA	DNA	DNA
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement	DNA	DNA	DNA
Mixed on-site or batch-mixed and delivered?	DNA	DNA	DNA
Grout additive 1 requested	DNA	DNA	DNA
Additive 1 percent by dry weight relative to cement	DNA	DNA	DNA
Grout additive 2 requested	DNA	DNA	DNA
Additive 2 percent by dry weight relative to cement	DNA	DNA	DNA

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)	1-ft. Fill to one-ft below ground surface. Top 1-ft will be filled with soil backfill.		Zero feet below grade.
Bottom of proposed sealant of grout placement (ft bgl)	Bottom 105.0-ft. 0-20': Pour from surface 20' to 105': Tremie in bentonite chips.		
Theoretical volume of sealant required per interval (gallons)	Under a 100 gallons of water/enough to be adequate for hydrating the bentonite		
Proposed abandonment sealant (manufacturer and trade name)	Wyoming Bentonite		

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
ROSWELL
1900 West Second St.
Roswell, New Mexico 88201
Phone: (575) 622-6521
Fax: (575) 623- 8559

Applicant has identified wells, listed below, to be plugged. Jason Maley (Vision Resources) (WD-1833) will perform the plugging.

Permittee: Devon Energy
NMOSE Permit Number: C-4775-POD1

NMOSE File	Casing diameter (inches)	Well depth (feet bgl)	Approximate static water level (feet bgl)	Latitude	Longitude
C-4775-POD1	6.5 (Soil Boring)	55	Unknown	32° 14' 26.8944"	103° 42' 26.1864"

Specific Plugging Conditions of Approval for Well located in Eddy County, New Mexico.

1. Water well drilling and well drilling activities, including well plugging, are regulated under 19.27.4 NMAC, which requires any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the New Mexico Office of the State Engineer (NMOSE). Therefore, the firm of a New Mexico licensed Well Driller shall perform the well plugging.

2. Ground Water encountered: The total Theoretical volume of sealant required for abandonment of soil boring well is approximately 94.0 gallons. Total minimum volume of necessary sealant shall be calculated upon sounding the actual pluggable depth of well, which is estimated at 55 feet.

3. Dry Hole: The total Theoretical volume of sealant required for abandonment of soil boring well is approximately 17.2 gallons. Total minimum volume of necessary sealant shall be calculated upon sounding the actual pluggable depth of well, which is estimated at 10 feet.

4. Ground Water encountered: Type I/II Portland cement mixed with 5.2 to 6.0 gallons of fresh water per 94-lb sack of cement is approved for the plugging the well.

5. Dry Hole: (a) Drill cuttings up to ten feet of land surface. (b) 10 feet to 0 feet – Hydrated bentonite. The bentonite shall be hydrated separately with its required increments of water prior to being mixed into the cement slurry.

6. Sealant shall be placed by pumping through a tremie pipe extended to near well bottom and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces

the standing water column upwards from below. Tremie pipe may be pulled as necessary to retain minimal submergence in the advancing column of sealant.

7. Should cement "shrinks-back" occur in the well, use of a tremie for topping off is required for cement placement deeper than 20 feet below land surface or if water is present in the casing. The approved sealant for topping off is identified in condition 3. and 4. of these Specific Conditions of Approval.

8. Any open annulus encountered surrounding the casing shall also be sealed by the placement of the approved sealant. When plugging shallow wells with no construction or environmental concerns, and if the well record on a well to be plugged shows a proper 20-foot annular seal, a plugging plan can propose the use of clean fill material to a nominal 30 feet bgs, then placing an OSE approved sealant to surface. Lacking that information, we would require an excavation of at least 2-feet which shall then be filled in its entirety with sealant to surface.

9. Should the NMED, or another regulatory agency sharing jurisdiction of the project authorize, or by regulation require a more stringent well plugging procedure than herein acknowledged, the more-stringent procedure should be followed. This, in part, includes provisions regarding pre-authorization to proceed, contaminant remediation, inspection, pulling/perforating of casing, or prohibition of free discharge of any fluid from the borehole during or related to the plugging process.

10. NMOSE witnessing of the plugging of the soil boring will not be required.

11. Any deviation from this plan must obtain an approved variance from this office prior to implementation.

12. A Well Plugging Record itemizing actual abandonment process and materials used shall be filed with the State Engineer within 30 days after completion of well plugging. For the plugging record, please resurvey coordinate location for well and note coordinate system for GPS unit. Please attach a copy of these plugging conditions.

The NMOSE Well Plugging Plan of Operations is hereby approved with the aforesaid conditions applied.

Witness my hand and seal this 21st day of September 2023

Mike A. Hamman, P.E. State Engineer

By: K. Parekh

Kashyap Parekh
Water Resources Manager I

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
ROSWELL

Mike A. Hamman, P.E.
State Engineer

DISTRICT II
1900 West Second St.
Roswell, New Mexico 88201
Phone: (575) 622-6521
Fax: (575) 623-8559

September 21, 2023

Devon Energy
205 East Bender Road # 150
Artesia, NM 88210

RE: Well Plugging Plan of Operations for well no. C-4775-POD1

Greetings:

Enclosed is your copy of the Well Plugging Plan of Operations for the above referenced well subject to the attached Conditions of Approval. The proposed method of operation is found to be acceptable and in accordance with the Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells 19.27.4 NMAC adopted June 30, 2017 by the State Engineer. subject to the attached Conditions of Approval.

Within 30 days after the well is plugged, the well driller is required to file a complete plugging record with the OSE and the permit holder.

Sincerely,

K. Parekh

Kashyap Parekh
Water Resources Manager I

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).
C-04780 POD1		C-04780 POD1

WELL OWNER NAME(S)	PHONE (OPTIONAL)
EOG Resources	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
5509 Champions Dr	Midland	TX	79705

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	15	51.8862	N
	LONGITUDE	-103	40	8.3748	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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1706	Bryce Wallace	Elite Drillers Corporation

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
10/27/23	10/27/23	80	80	N/A

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

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

DATE STATIC MEASURED: N/A

DRILLING FLUID: ☑ AIR ☐ MUD ADDITIVES – SPECIFY:

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

CHECK HERE IF PITLESS ADAPTER IS INSTALLED ☐

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)
		6	N/A				

RECEIVED JAN 7 2025 PM 1:30

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
		6	N/A		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 01/28/2022)

FILE NO. C-04780	POD NO. 1	TRN NO. 751921	
LOCATION 23S.32E.34.131		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	5	5	RED SAND/CALICHE	Y ✓ N	
5	10	5	RED TAN SAND	Y ✓ N	
10	15	5	RED TAN SAND W/ CALICHE	Y ✓ N	
15	20	5	CALICHE W/ TAN SAND	Y ✓ N	
20	25	5	RED TAN SAND W/ CALICHE	Y ✓ N	
25	35	5	TAN SAND/SMALL CALICHE ROCK	Y ✓ N	
35	80	45	TAN/RED SAND W/ SMALL CALICHE ROCK	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:

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:

OSE DIT NOV 7 2023 PM 1:03

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

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:

Bryce Wallace — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

11/01/23 — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 01/28/2022)

FILE NO. C-04780	POD NO. 1	TRN NO. 751921	
LOCATION 23S.32E.34.131		WELL TAG ID NO.	PAGE 2 OF 2

Mike A. Hamman, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 751921
File Nbr: C 04780
Well File Nbr: C 04780 POD1

Nov. 14, 2023

BLAKE GROOMS
EOG RESOURCES
5509 CHAMPIONS DR.
MIDLAND, TX 79705

Greetings:

The above numbered permit was issued in your name on 10/11/2023.

The Well Record was received in this office on 11/07/2023, stating that it had been completed on 10/27/2023, and was a dry well. The well is to be plugged according to 19.27.4.30 NMAC.

Please note that another well can be drilled under this permit if the well is completed and the well log filed on or before 10/10/2024.

If you have any questions, please feel free to contact us.

Sincerely,

Rodolfo Chavez
(575)622-6521

drywell

SITE VISIT PHOTOGRAPHS

Figures

The photographs were taken during R T Hicks Consultants site visit on February 13, 2024. The aerial photo below shows the photograph locations as numbered yellow rectangles. The purple rectangle outlines the Gin and Tectonics site. North is up in the aerial image.

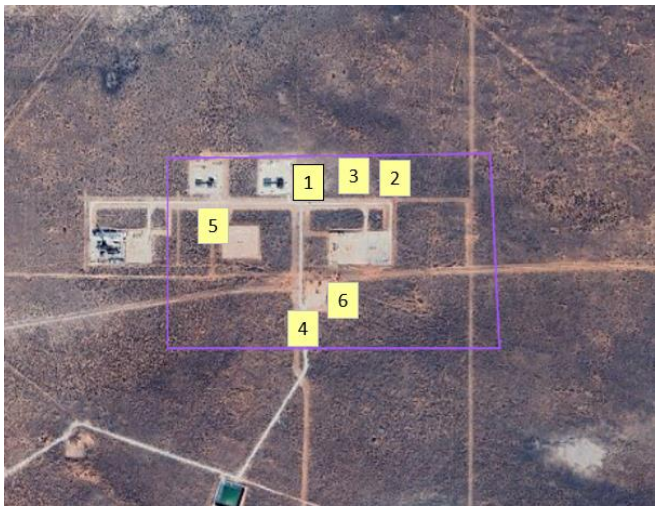


Figure 1: *View to the east from location 5.*

Figure 2: *View is to the north from location 5.*

Figure 3: *Looking west from location 5. The terrain slopes downwards to both the north and west from this location.*

Figure 4: *View is to the south from location 6. The eolian deposits are present throughout the area.*

Figure 5: *View to the south from location 2. Undisturbed eolian deposits are to the left.*

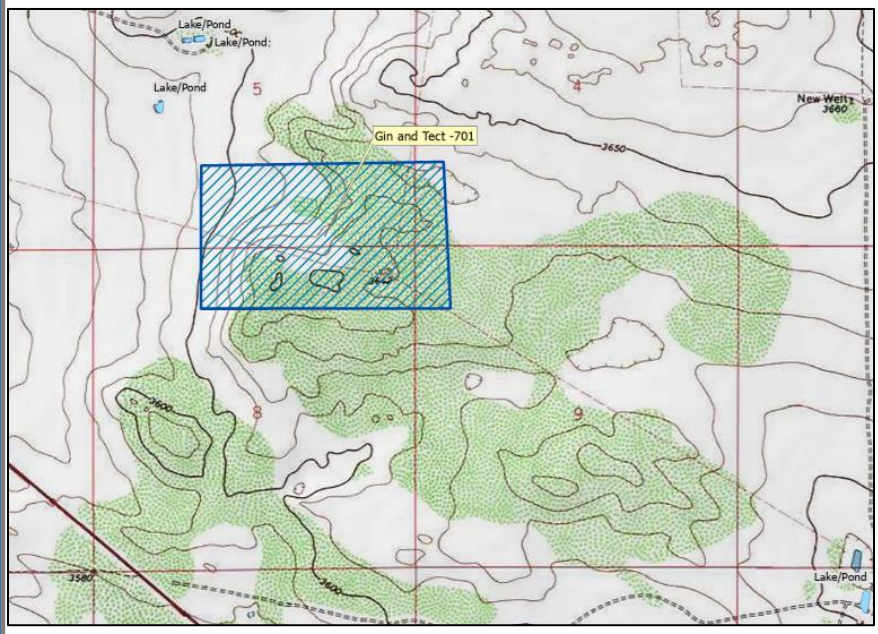
Figure 6: *View to the east from location 2.*

Figure 7: *View to the south from location 1. The terrain slopes upwards towards the center of the site.*

March 2024

Volume 2
C-147 Registration Package for Gin And Tectonics AST Containment
Sections 4, 5, 8, and 9, T24S, R32E, Lea County

- C-147
- Stamped Design Drawings
- Design/Construction Plans for Above Ground Tank (AST) Containments
- HydrEra Energy Services Assembly SOP
- O&M and Closure Plans
- Variances and Equivalency Demonstrations



Topographic Map of the Gin and Tectonics site area.

Prepared for:
COG Operating LLC
600 Illinois Ave
Midland, Texas

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

C-147

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

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

Form C-147
Revised April 3, 2017

Recycling Facility and/or Recycling Containment

Type of Facility: ☒ Recycling Facility ☒ Recycling Containment*

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

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

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

1.

Operator: COG Operating LLC OGRID #: 229137

Address: 600 W. Illinois Ave., Midland TX, 79701

Facility or well name (include API# if associated with a well): Gin and Tectonics AST Containment

OCD Permit Number: _____ (For new facilities the permit number will be assigned by the district office)

U/L or Qtr/Qtr: Unit P Section: 5 Township: 24S Range: 32E County: Lea

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

2.

☒ **Recycling Facility:**

Location of (if applicable): Latitude: 32.1521967 N Longitude: - 103.674065 W approximately (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: 32.24007 N Longitude: - 103.69281 W approx. (NAD83)

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

☒ Lined ☒ Liner type: Thickness See Variance (Vol. 1) , ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other Secondary-60 mil HDPE

☐ String-Reinforced

Liner Seams: ☒ Welded ☒ Factory ☐ Other Total Volume:: 14,950 bbl , With 3 ft freeboard: 13,710 bbl Dimensions: 54.5 ft diameter, 36 ft high

See Drawings and Plans

☐ Recycling Containment Closure Completion Date: _____

4.

Bonding:

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

☐ Bonding in accordance with 19.15.34.15(A)(1). Amount of bond $_____ **(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: See variances. Vol. 2 .

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. Previously approved variances with exception of Liner System Variance

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 Volume 1 Plates - see Plates 1-2	☐ 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 Plate 3	☐ Yes ☒ No ☐ NA
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division Plate 4	☐ Yes ☒ No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map Plate 5	☐ Yes ☒ No
Within a 100-year floodplain. FEMA map Plate 6	☐ 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 Plate 7	☐ 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; See aerial photo; satellite image Plate 8	☐ 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. Plates 1 and 7 - NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site	☐ Yes ☒ No
Within 500 feet of a wetland. Plate 9 - 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): Timothy Reed Title: DB Water Superintendent

Signature: Tim Reed Date: 08/07/2024

e-mail address timothy.reed@conocophillips.com Telephone: 432-238-8399

11.
OCD Representative Signature: Victoria Venegas **Approval Date:** 04/08/2024

Title: Environmental Specialist **OCD Permit Number:** 1RF-516

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

STAMPED DESIGN DRAWINGS for 14,950bbls HARPOON TANK

HydrEra Energy Services

H15P – Harpoon Frac Tank
Design Basis

March 2021

The following individual has developed the attached structural calculations

Troy A. Madlem, PE
Registration # 140266

All inquiries of the findings within may be directed to:

Frost Engineering & Consulting Company
201 Lincolnway West, Suite 200
Mishawaka, Indiana 46544

Office: (574) 344-5900

Email: jalthouse@Frosteng.net

Design Data – Harpoon Frac Tank

1. Design Standards & References:
   a. API 650*
   b. ASCE 7-16
   c. AISC 360-16
   d. USGS Unified Hazards Tool 2020
2. Service Life — 25 years
3. Gravity Loads:
   a. Self weight of tank components
   b. Various fluid depths with specific gravity (S.G.) = 1.00 – 1.25
4. Risk Category — I
5. Wind Load (Mean recurrence interval = 50 years):
   a. Basic Wind Speed
      i. NM, WY, OK, ND, WV — 81.3 mph (3-second gust)
      ii. CO — 86.0 mph (3-second gust)
      iii. TX, LA — 116.2 mph (3-second gust)
   b. Exposure Category — C
   c. Directionality Factor — 0.85
   d. Topographic Factor — 1.00
   e. Elevation Factor — 1.00 (At sea level)
   f. Exposure Coefficient — 1.04
6. Seismic Loads (Mean recurrence interval = 50 years)**:
   a. Soil Site Class — D (Default)
   b. Seismic Use Group (SUG) — I
   c. S_{DS}
      i. TX, PN, ND, LA, WV — 0.10g
      ii. NM, CO, OK — 0.28g
      iii. WY — 0.39g
   d. S_{D1}
      i. TX, PN, ND, LA, WV — 0.04g
      ii. NM, CO, OK — 0.13g
      iii. WY — 0.20g
   e. R_{wi} (Impulsive response modification factor) — 3.5
   f. R_{wc} (Convective response modification factor) — 2.0

*API 650 represents the relevant industry standard for tank construction

**Seismic design is defined as a Purchaser's option per API 650.

Minimum Safety Factor				
Fluid Height (ft)	36	35	34	32.73
Free Board (ft)	0	1	2	3.27
Specific Gravity				
1.00	2.29	2.38	2.46	2.57
1.05	2.19	2.28	2.36	2.46
1.10	2.10	2.18	2.26	2.36
1.15	**2.02**	**2.09**	**2.16**	**2.26**
1.20	1.94	2.01	2.08	2.17
1.25	1.87	1.94	2.00	2.09

Notes:

1. Safety factor represents the nominal capacity to demand ratio for the governing limit state and load scenario
2. The Owner targeted minimum safety factor for in-service conditions is 2.0

DRAWING LIST	
SHEET	DESCRIPTION
1 of 14	TITLE PAGE
2 of 14	GENERAL ARRANGEMENT
3 of 14	MANWAY PANEL ASSEMBLY
4 of 14	PANEL ASSEMBLY
5 of 14	RETURN PIPING PANEL ASSEMBLY
6 of 14	PANEL ASSEMBLY - PART DETAILS
7 of 14	REPAD/CONNECTOR PLATE - LEFT SIDE
8 of 14	REPAD/CONNECTOR PLATE - RIGHT SIDE
9 of 14	EYE PAD CONNECTOR
10 of 14	OVAL MANWAY ASSEMBLY
11 of 14	4" NPS STANP PIPE
12 of 14	4" NPS FILL NECK
13 of 14	TRANSPORT STAND
14 of 14	TOMCAT LEVEL GAUGE BRACKET

HYDRERA ENERGY SERVICES

H15P - HARPOON FRAC TANK

RedFox Project No: RF21046A

PO: HAR-008

STATE OF TEXAS
TROY ANDREW MADLEM
140266
LICENSED PROFESSIONAL ENGINEER

03/29/2021

REVISIONS					
REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
A	3/17/21	ISSUED FOR APPROVAL	Dan Griffiths		
0	3/25/21	ISSUED FOR CONSTRUCTION	Dan Griffiths		

RedFox Design & Drafting Inc
151 Vancouver Crescent
Red Deer, AB T4R 0P2
PH: (403) 877-9859
E: dan@redfox-design.ca
www.redfox-design.ca

REDFOX DESIGN & DRAFTING INC.

Drawn By:	Dan Griffiths
Date:	March-17-2021
Checked By:	-
Approved By:	-
Customer Project No:	HAR-008
RedFox Project No:	RF21046A

GENERAL NOTES

1. THE ABOVE GROUND STORAGE TANK HAS BEEN DESIGNED IN ACCORDANCE WITH THE AMERICAN PETROLEUM INSTITUTE STANARD 650.
2. ALL STRUCTURAL STEEL MEMBERS DESIGNED IN ACCORDANCE WITH ANSI/AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
3. ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM MATERIALS PROPERTIES:

MATERIAL SPECIFICATIONS			Minimum Yield Stress (ksi)	Minimum Rupture Stress (ksi)
SHAPE	CANADA	USA (ASTM)		
HSS	G40.21 50W	A500 Gr. C	50	62
PLATE	G40.21 50W	A572	50	65
PLATE	G40.21 44W	A572	44	65
PLATE	QT-100	A514	100	110
BAR	AISI 1020	A36	36	58

4. FABRICATION SHALL CONFORM TO ANSI/AISC 360-16.
5. ALL WELDING SHALL BE IN ACCORDANCE WITH AWS D1.1 USING E70XX ELECTRODES. WELDING SHALL BE PERFORMED BY WELDERS CERTIFIED FOR THE WELD TYPE AND POSITIONS INVOLVED ACCORDING TO THE CURRENT EDITION OF AWS D1.1.
6. UNLESS OTHERWISE NOTED ALL CONNECTIONS ARE TO BE 3/16" CONTINUOUS FILLET WELDS.
7. MINIMUM FABRICATED THICKNESS OF ALL 10 GAUGE ELEMENTS SHALL BE 0.1345".

ASSEMBLY NOTES

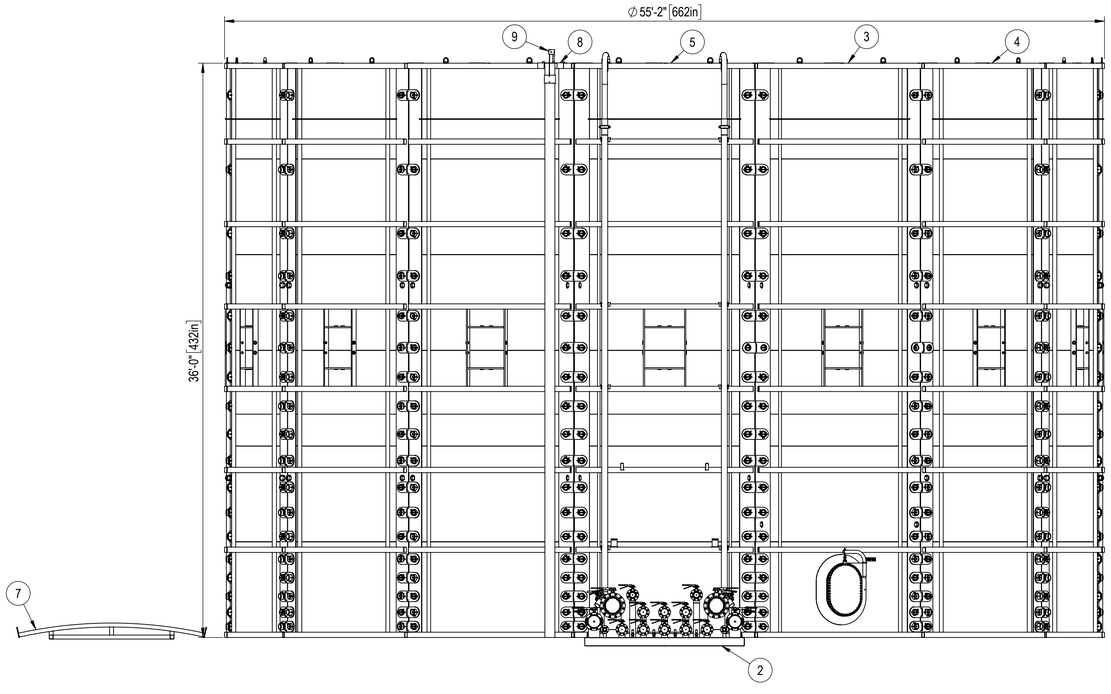
1. ERECTOR SHALL PROVIDE ALL MATERIAL, EQUIPMENT AND LABOR THAT IS REQUIRED FOR TEMPORARY STABILITY OF THE TANK DURING ERECTION.
2. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCES TO INSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS, TIE DOWNS, ETC.
3. TANK AND SUMP ARE TO BE SUPPORTED BY LEVEL FOUNDATION, DESIGNED BY OTHERS.
4. TANK IS TO BE USED IN COMPLIANCE WITH LOCAL & FEDERAL JURISDICTION.

SPECIFICATIONS

1. ABOVE GROUND STORAGE TANK IS RATED FOR 15 PANEL ASSEMBLY FOR FLUIDS UP TO 1.15 SPECIFIC GRAVITY.
2. MINIMUM REQUIRED SOIL BEARING CAPACITY AT 1.15 S.G.= 3000 lbs/ft² (145 kPa).
3. TANK VOLUMES (ZERO FREEBOARD):
   - 14950 US BBL
   - 2378.5 m³
   - 83982 ft³

FINISHING DETAILS

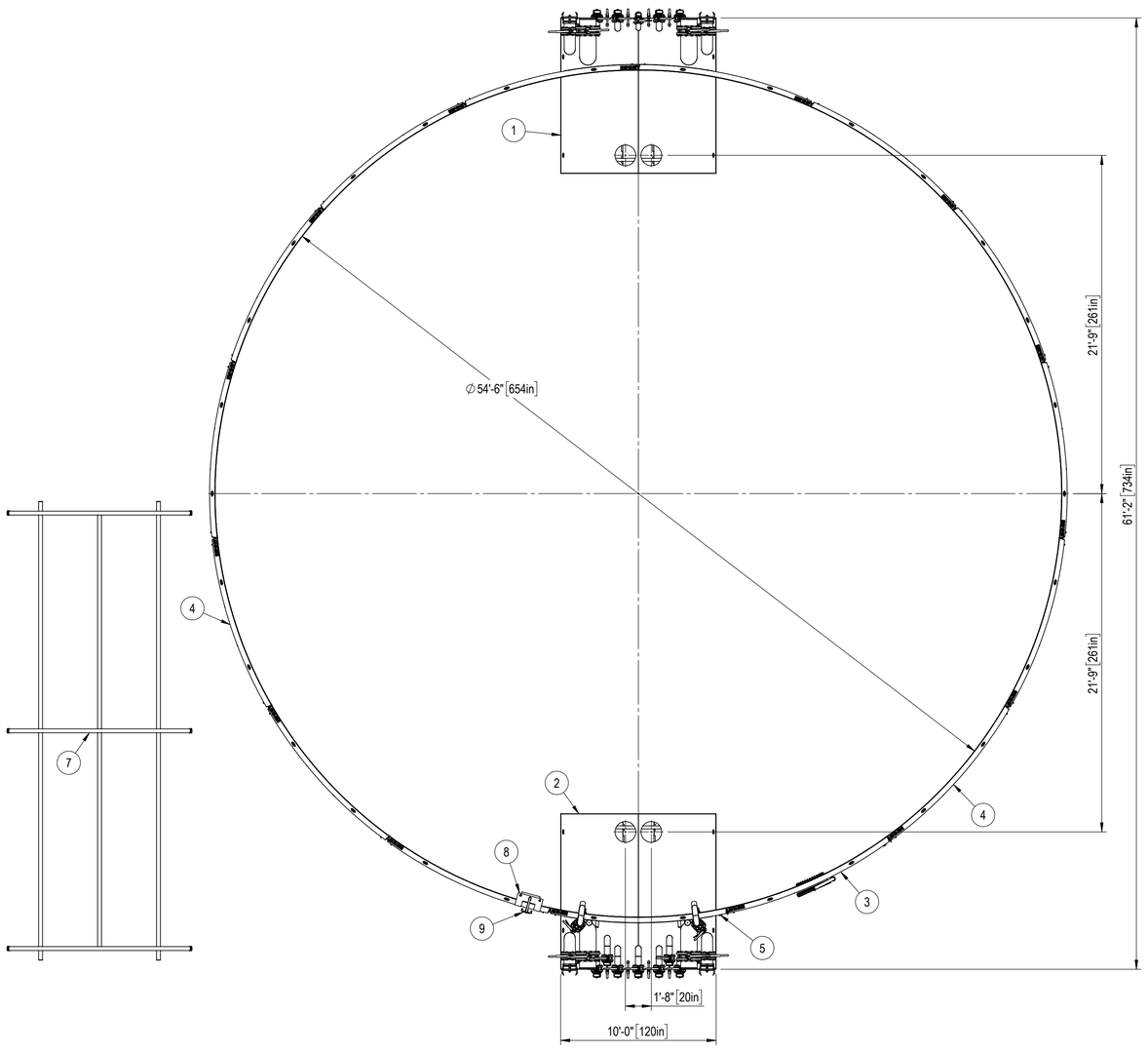
1. PANELS : ENDURA EXCEL D2M (SIGNAL BLUE CLR33994)
2. PANEL CONNECTOR: ENDURA EXCEL D2M (GREEN CLR42186)
3. HYDRERA DECAL CENTERED VERTICALLY ON EVERY SECOND PANEL 72" ABOVE GRADE.
4. STENCIL "MADE IN USA" SHALL BE PLACED ON BOTTOM RIGHT OF EACH PANEL. LOCATED 12" FROM BOTTOM OF PANEL TO THE CENTER OF THE STENCIL.



BILL OF MATERIALS

ITEM	PART NUMBER	QTY	DESCRIPTION	WEIGHT (lbs)
1	H15P-1001	1	FILL MANIFOLD ASSEMBLY	3377
2	H15P-1002	1	SUMP MANIFOLD ASSEMBLY	3776
3	H15P-1003	1	MANWAY PANEL ASSEMBLY	7537
4	H15P-1004	13	PANEL ASSEMBLY	6970
5	H15P-1005	1	RETURN PIPING PANEL ASSEMBLY	7746
6	H15P-1006	2	4" NPS FILL NECK	32
7	H15P-1007	3	PANEL TRANSPORT STAND	1028
8	H15P-1008	1	TOMCAT LEVEL GAUGE BRACKET	23
9	H15P-1009	1	TOMCAT GAUGE BOARD ASSEMBLY (36'-0" GUIDED) c/w MAGNETS AND WEIGHTS	
10	H15P-1010	1	BLADDER ASSEMBLY	2406

TOTAL WEIGHT: 114329 lbs



RedFox Design & Drafting Inc
151 Vancouver Crescent
Red Deer, AB T4R 0P2
PH: (403) 877-9859
E: dan@redfox-design.ca
www.redfox-design.ca

Drawn By:	Dan Griffiths
Date:	March-17-2021
Checked By:	-
Approved By:	-

H15P - HARPOON FRAC TANK

H15P - HARPOON TANK ASSEMBLY GENERAL ARRANGEMENT

Customer Project No:	RedFox Project No:	Drawing Number:	Sheet: 2 of 14	Rev:
HAR-008	RF21046A	RF21046A-2		0

Southplus Inc.

TC-1000

Items	Value/Unit				Ref. test method
Base fabric	Polyester				
Coating Type	PVC				
Yarn	1000*1000D				
Construction	14*14	cm²	36x36	in²	
Base Fabric Weight	315	g/m²	9.26	oz/yd²	
Total Weight	1000	g/m²	29	oz/yd²	
Thickness	0.82	mm			
Breaking Strength, Strip (Warp/Weft)	4700/4400	N/5cm	528/494	Lb./in	ASTM D751
Tear Strength, Tongue tearing (Warp/Weft)	250/200	N	56/45	Lb.	ASTM D751
Adhesion (IVK)	120	N/5cm	13.5	Lb. /in	ASTM D751
Temperature resistance	-30～+70	℃	-22～158	℉	ASTM D2136/D1204
Puncture resistance	380	N	85	Lb.	ASTM D751
Bursting strength		I	＞300	PSI	ASTM D3786
Hydrostatic resistance (water column)	＞4903	mbar			AATCC TM127-2017
Carbon black content	2%				ASTM D4218
Accelerated UV weathering	＞90%				ASTM G151 Strength retention after 2000hrs exposure @.077W/㎡/nm

Contact information
Southplus Inc. Tel: +1-714-2440921 Address: 5095 E. Airport Dr. Ontario, CA 91761

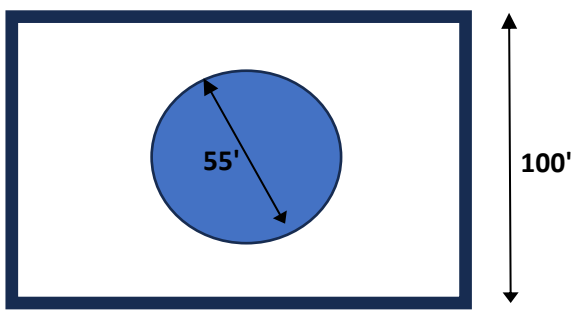
HYDRALINE™ HD60

HIGH DENSITY POLYETHELYNE – LAYFLAT

		HydraLine™ HD60			
		IMPERIAL		METRIC	
PROPERTIES	TEST METHOD	TEST VALUE	TESTING FREQUENCY (MINIMUM)	TEST VALUE	TESTING FREQUENCY (MINIMUM)
Appearance		Black, White, & Custom Colors Available with Minimum Order Quantity			
Thickness (min. avg.)	ASTM D5199	60 Mils	Per roll	1.50 mm	Per roll
Formulated Density (minimum)	ASTM D1505 / ASTM D792	0.940 g/cc	200,000 lb	0.940 g/cc	90,000 kg
Tensile Properties (min. avg.) [1] - yield strength - break strength - yield elongation - break elongation	ASTM D6693 Type IV	126 lb/in. 228 lb/in. 12 % 700 %	20,000 lb	22 kN/m 40 kN/m 12 % 700 %	9,000 kg
Tear Resistance (min. avg.)	ASTM D1004	42 lb	45,000 lb	187 N	20,000 kg
Puncture Resistance (min. avg.)	ASTM D4833	108 lb	45,000 lb	480 N	20,000 kg
Stress Crack Resistance [1]	ASTM D5397 (App.)	500 hr	Per GRI-GM10	500 hr	Per GRI-GM10
Carbon Black Content (range) [1]	ASTM D4218	2.0-3.0 %	20,000 lb	2.0-3.0 %	9,000 kg
Carbon Black Dispersion	ASTM D5596	Pass	45,000 lb	Pass	20,000 kg

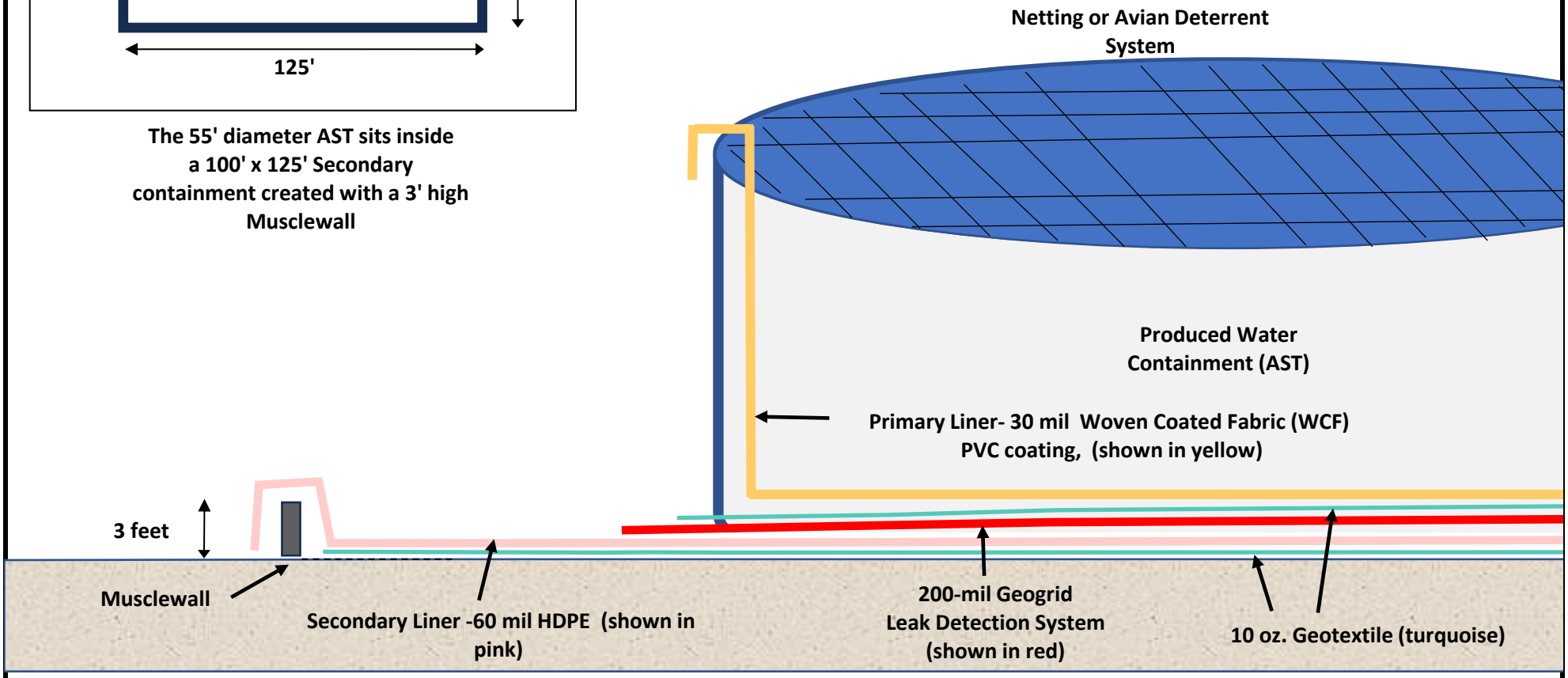
[1] See reference notations for the listed test methods located in the Geosynthetics Research Institute; GRI-GM13 Standard Specification.

Schematic Plan View



The 55' diameter AST sits inside a 100' x 125' Secondary containment created with a 3' high Musclewall

Schematic Cross Section



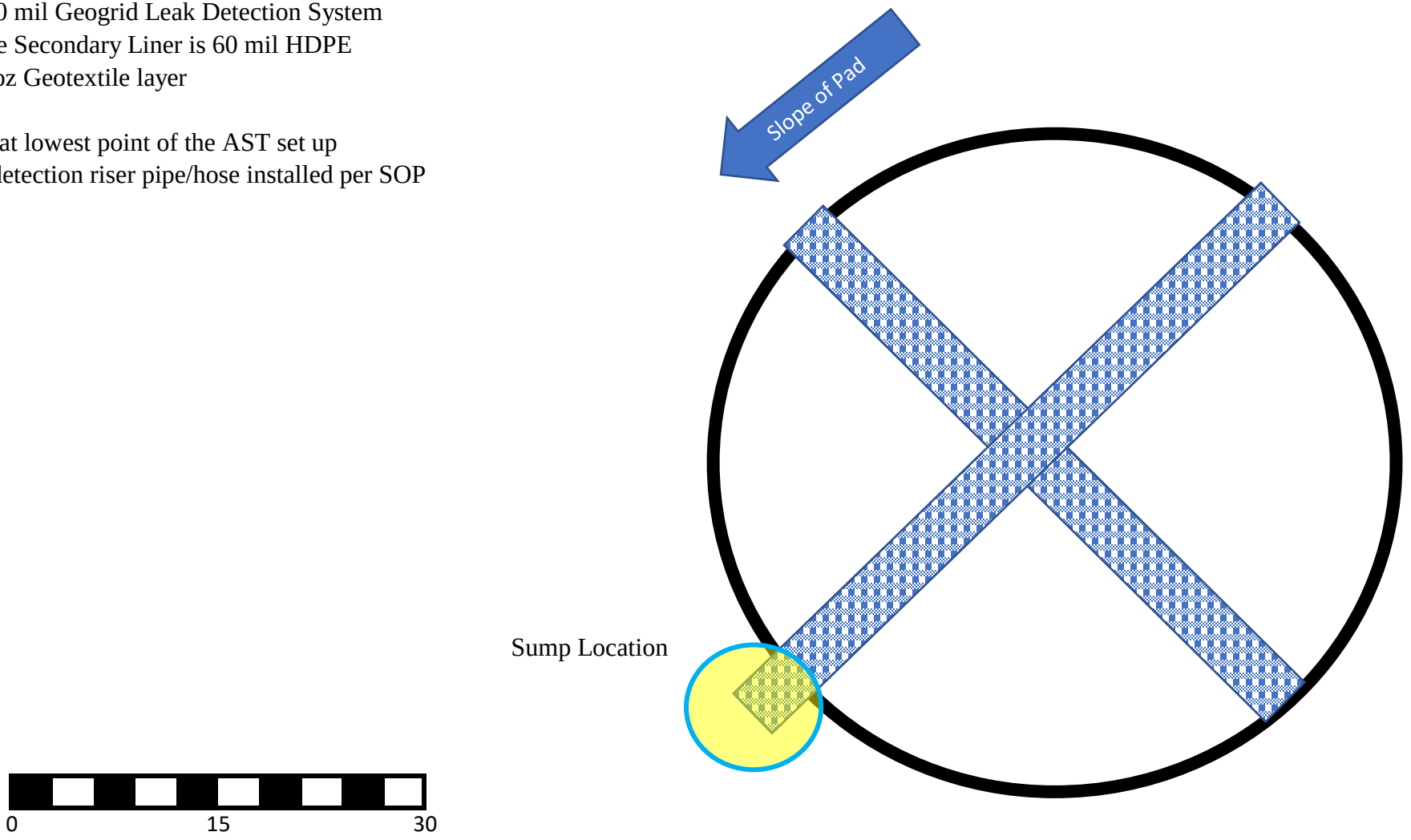
R.T. Hicks Consultants Albuquerque, NM	Design Sketch	Plate A
	COG Operating- Gin and Tectonics Harpoon Tank	February 2024

Determine slope of pad and low point of the Harpoon tank footprint

From top to bottom, the sequence of liners and materials is:

i) The Primary Liner is 30 mil Woven Coated Fabric (WCF) with the coating being PVC
ii) 10 oz Geotextile layer
iii) 200 mil Geogrid Leak Detection System
iv) The Secondary Liner is 60 mil HDPE
v) 10 oz Geotextile layer

Sump at lowest point of the AST set up
Leak detection riser pipe/hose installed per SOP



R.T. Hicks Consultants Albuquerque, NM	**Layout of Geogrid Leak Detection Matting**	**Plate B**
	COG Operating - Gin and Tectonics Harpoon Tank	**February 2024**

DESIGN AND CONSTRUCTION FOR ABOVE GROUND TANK (AST) CONTAINMENTS

Design and Construction Plan
Above Ground Tank (AST) Containments

General

Examination of the engineering drawings, the SOP for set-up, plus the history of solid performance of these Harpoon AST Containments demonstrates that the AST Containment is designed and will be assembled to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall. As the Harpoon AST Containments are less than 60 feet in diameter, wave action is not a meaningful consideration.

19.15.34.12 A
(1) The operator shall design and construct a recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall.

The Harpoon AST Containments are constructed of 36-foot high steel panels and are netted or employ the Mega Blaster Pro avian deterrent system to prevent ingress of migratory birds. Should OCD deny the requested variance for fencing, the Harpoon AST Containments will be enclosed by a 4-strand barbed wire fence to comply with the Rule to fence or enclose a recycling containment in a manner that deters unauthorized wildlife and human access and shall maintain the fences in good repair.

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.

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 conspicuous places surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following information: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers.

19.15.34.12 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.

Site Preparation

Foundation for AST Containment

Preparation of the soils on site is required to form a dependable base for the AST Containment in accordance with the SOP. If the location of the AST Containment is on an existing pad, the operator has stripped and stockpiled the topsoil for use as the final cover or fill at the time of closure. If the pad is new construction, the operator will strip and stockpile the soil for reclamation upon cessation of site activities.

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

The foundation soils may be roller compacted smooth and free of loose aggregate over ½ inch. If required by the AST Set Up protocol, compaction characteristics must meet or exceed 95% of Standard Proctor Density in accordance with ASTM D 698.

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. 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.

Examination of the SOP shows that the AST Containment contractor will conform to the following mandates of the Rule:

- the AST Containment will have a properly constructed compacted earth foundation and interior slopes (vertical steel) 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 will be placed under the liner to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.
- If the AST Containment is within a levee, the inside grade is no steeper than two horizontal feet to one vertical foot (2H: 1V) and the outside grade no steeper than three horizontal feet to one vertical foot (3H: IV). The vertical steel walls of the AST Containment are the *subject of a requested variance*.

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.

The Operator will ensure that at a point of discharge into or suction from the recycling containment, the liner is protected from excessive hydrostatic force or mechanical damage and external discharge or suction lines shall not penetrate the liner.

Liner and Leak Detection Materials

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 liner and geotextile specifications show that 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 *an equivalent liner [to that stated in Rule 34] approved by OCD pursuant to a variance.* The liner system is presented in an earlier section of this submission.

All secondary liners shall be *an equivalent liner [to that stated in Rule 34] or approved by OCD pursuant to a variance.* The liner system is presented in an earlier section of this submission.

Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

The AST Containment will have a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet to facilitate drainage.

Install Secondary Liner, Leak Detection System and Secondary Containment

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 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.

All AST containments holding produced water will have a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. The rule states that the edges of all secondary liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep. *The lack of an anchor trench with an AST Containment is also the subject of requested variance.*

19.15.34.12 A
(4) 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 primary liner installed in the Harpoon AST is 0.83 mm (32.5 mil) thick PVC. The secondary liner is 60 mil HDPE.

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 AST Containment Contractor will cause the recycling containment will have a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet 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 (see attached design sketch).

The 36-foot high steel walls of the Harpoon AST clearly prevent run-on of surface water into the AST. The steel walls provide an excellent diversion of run-on into the AST, thereby complying with the Rule.

19.15.34.12 A
(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.

AST Containment Setup

As with the secondary liner, AST Containment contractor will minimize liner seams and orient them up and down, as much as possible, not across, a slope. Factory welded seams shall be used where possible. AST Containment contractor will employ field seams in geosynthetic material that are thermally seamed. Prior to field seaming, AST Containment contractor shall overlap liners four to six inches and minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the AST Containment bottom. Qualified personnel shall perform field welding and testing.

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. 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.

Fluid Injection/Withdrawal Flow Diverter

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.

19.15.34.13 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.

HARPOON TANK AST SET-UP SOP BMPs

HYDRERA ENERGY SERVICES (US) CORP.

Standard Operating Procedure
Harpoon Tank Setup

Division: United States

SOP Title: Harpoon Tank Set up

Effective Date:	January 1, 2021
Review Date:	January 1, 2022

Change History:

SOP Number	Effective Date	Significant Changes	Review/Created by:
Harpoon-001	January 1, 2021	Initial version	Kai Magnussen, Dan Kubek
Harpoon-001	May 1, 2021	Revision 1	Kai Magnussen, Dan Kubek
Harpoon-001	July 8, 2021	Revision 2	Kai Magnussen, Dan Kubek
Harpoon-001	October 12, 2021	Revision 3	Kai Magnussen, Dan Kubek
Harpoon-001	December 23, 2021	Revision 4 (Double Liner)	Kai Magnussen, Dan Kubek

1. **Purpose:** The purpose of this Standard Operating Procedure is to provide guidance to a field technician to properly set up HydrEra's Harpoon Tank System.

2. **Introduction:** HydrEra Energy Services (US) Corp (HES) believes that, the Health and Safety of every employee/contractor is of extreme importance. Towards this idea and with a safe workplace as one of our main goals, every employee, contractor, supervisor, and manager is committed to supporting our HSE Program. Injury prevention and maintaining a safe and healthy working environment for all our employees, benefits HES, and all who work for and

with us. Every employee/contractor of the company is responsible for personal safety and the safety of fellow workers. The responsibility begins with the company president and continues through each level of management to reach every employee/contractor, including even the newest personnel. This responsibility cannot be delegated or otherwise set aside. This same corporate attention to safety transcends to the protection of the general public and also to the physical resources belonging to or leased to HES It is the position of HES that the company's safety policies and procedures will, as a minimum, comply with all federal provincial and local regulations applicable to employee/contractor safety. The HSE program calls for the participation of all employees/contractors working toward an environment in which every job or task is performed in the safest practical manner by a well trained workforce using the proper equipment. The benefits of such efforts are numerous and obvious.

3. **Scope:** This SOP precludes that the worker has the required training, tickets and authorization prior to beginning any operations. This SOP is not meant to take the place of or minimize the need for supervision, training and/or client/customer site requirements. It is also in no way comprehensive (as defined by "cannot be added to"). This SOP can be added to as long as the additions further enhance the following: Safety, environmental protection, productivity, (without compromising the first two).

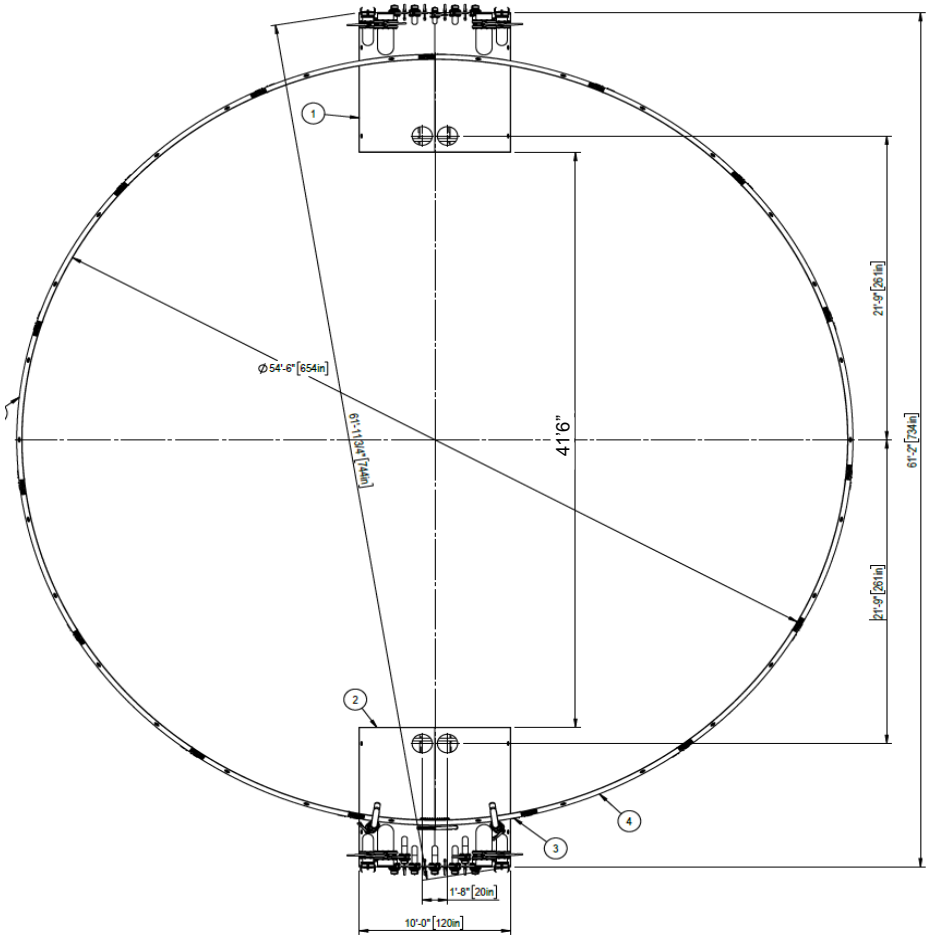
ATTENTION: Use the personal protective equipment (PPE) and safety procedures for all steps at all times. ANSI/CSA approved hard hat, rated safety glasses, harden toe footwear, gloves and fire rated (FR) clothing are required at all times on job service locations. Hoisted loads are required to have a minimum of one tag line. Personnel are required to be properly harnessed and anchored when exceeding a height of 3 meters. Visual inspections are to be done by all workers on tools and equipment before being put into use. This includes but is not limited to hand tools, ladders, AST tanks and auxiliary equipment.

4. **Process:**

Tank Pad Preparation/Groundwork:

- Approx. 1-2 workers plus operators.
- Work with customer to identify Harpoon location and direction of fill and suction manifolds. Customer should provide level work surface clear of any sharp objects

- Mark the location of the suction manifold, as per customer request, and mark a square with the dimensions 12’ x 12’.
- Using the suction manifold location as a reference, mark another 12’ x 12’ square exactly 39’6” away, ensuring that the two are square. This will account for and extra foot of room around each manifold to allow for adjustments.
- Dig out these boxes to an approximate depth of 8”. The manifold boxes will be placed into the dug out areas, and levelled at approx. 1” below the grade where the panels will be installed. Use a laser level to confirm the height and level of the placement.
- The top plate of the manifolds must be at pr below grade, it cannot be set above grade, as this will affect the setting of the panels.
- The interior edges of the two manifold boxes should be 41’6” apart, and be square to each other.
- Measure from the panel tab on the top of the boxes to a distance of 27’8” to find the exact center of the tank.
- From this center mark, paint a circle with a radius of 27’8” to show where the panels will be placed.
- Use laser level and equipment (skid steer, excavator, etc) to grade pad to within 0.5”+/- off of level. Ensure a safe working distance at all times when working near heavy equipment. Ensure that the operator makes eye contact and shuts down prior to approaching.



- Spacing around the tank must be at least 20 feet when using a telehandler to set panels, and a minimum of 10 feet when setting panels with a crane.
- Check the tank pad area for sharp objects, rocks or any other potential hazards to the liner.

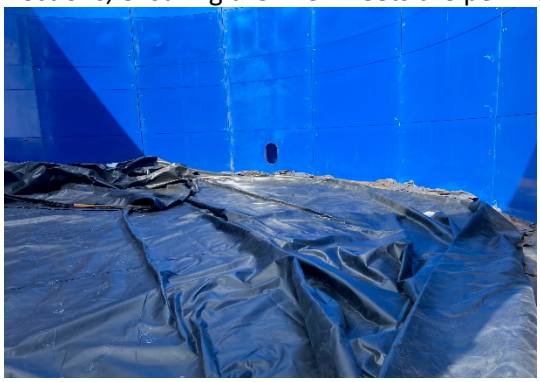
Groundcloth Installation:

- Approx. 5 workers.
- Ensure that tank perimeter circle is well marked on the ground.
- Use equipment to place groundcloth roll on edge of perimeter line.
- Groundcloth will be unrolled using equipment and/or man power.
- Once unrolled, check to ensure groundcloth covers tank perimeter line. The groundcloth will have 1’ of material outside the tank wall perimeter
- Unfold both directions and adjust to cover entire tank pad area
- Find center and ensure that the pad center and geo center are lined up
- Ensure suction and fill manifolds are installed properly, with the groundcloth over top the manifolds.
- Locate the inlet ports on both suction and fill manifolds. Cut out holes 3” larger than the rectangular inlet gasket and place over manifold ports. **IMPORTANT:** Ensure there is no overlap of the groundcloth and the inlet gaskets, as this can result in a possible leak.
- Geotextile rolls may be used in place of ground cloth.

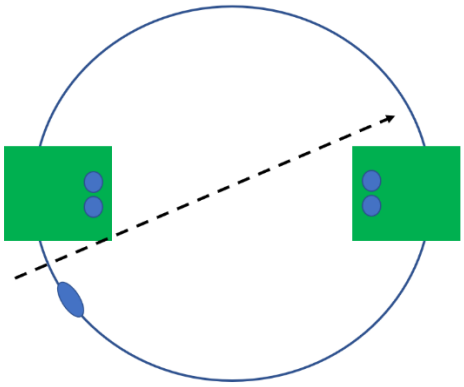

Setting the liner(s):

- Approx. 5-6 workers.
- **TPU:** Using equipment, place the liner roll on the center point of the tank, or at the perimeter line, depending on the roll style (scroll roll vs. full roll)
- Unroll the liner perpendicular to the manifolds, ensuring the ends of the liner meet the perimeter line.


- Unfold the butterfly folded liner in both directions, ensuring the liner meets the perimeter line.

- Ensure that the engineered liner ports (present on reusable TPU liners) align with the suction and fill manifold ports. Adjust the liner as necessary to ensure perfect placement.
- **RPP:** The center line for deployment of the disposable RPP liner will be halfway between the manifold opening and the manway opening. Unroll from the point, across the tank to the far side. This will ensure that the manway opening and suction openings will not have liner seams that interfere with the gaskets.



- Ensuring the liner is in the perfect position during this step is not imperative. Adjustment of the positioning of the liner is possible once 2-3 points are lifted up the wall. The liner floor can be adjusted into place at this point.
- Fold liner walls back inside the mark on the ground to allow room to place tank walls.
- Fold groundcloth in on top of liner, to protect the liner from the bottom edge of the panels.
- NOTE: when using a TPU liner for the first time, it will unroll from the 12 o'clock position to the 6 o'clock position (manifold to manifold) with the manway being in the 5 o'clock position. New liners will be sticky and more difficult to deploy.

Placing tank panels:

- Approx. 5-6 workers including equipment operators.
- Stage panels near working area.
- Harpoon panels can be safely and efficiently installed using a telehandler or crane.
- Panels will connect to HydrEra telehandler attachment for lifting and placement. The telehandler attachment will lock into the panel, allowing for adjustments using the machine. All personnel must stay back 30 ft during critical lifts (standing the panel) and must keep all body parts clear when making adjustments with the telehandler.
- **IMPORTANT:** When transitioning the panel from horizontal to vertical position, the entire panel must be kept up and off the ground. Panels must only be moved around the work area in the vertical position. Failure to adhere to these guidelines may cause injury or damage to the equipment.

- Review Telehandler load chart and SOP. Ensure operators are experienced and licensed to operate specific equipment. If using a crane, it must be a minimum of 30 ton, with an experienced and licensed operator and rigger.
- Attach telehandler #1 to the primary panel. Lift panel vertically and move into position directly on top of the suction manifold. Panel base will nest into the channel on the top of the suction manifold.
- Panels should be placed directly on the 27’8” perimeter line.
- The primary panel will be set centered on the manifold that will be next to the manway panel. The manway panel will be installed second, on the right side of the primary panel. Continue setting panels counter-clockwise.

- Telehandler #1 will remain attached to the manway panel, while telehandler #2 or the crane lifts and installs panels 2-8. (shown here using a crane and telehandler)

- Panels will be placed vertically side by side, while connection plates are rotated and installed over male panel lugs. Install connection plates from the bottom, working upwards. Once plates are in place the pressure pin will be installed from the outside-in to lock the connection. Once the pressure pin is installed, a keeper pin will be installed in the pressure pin to prevent any horizontal movement. Continue this for all 18 connection plates, using a man-lift to install the upper connection plates. Ensure that individuals in/operating the man-lift are properly trained and use proper PPE for working at heights. Moving the free end of the panel in and out can help the connection plates be installed efficiently.
- When a panel is set, a small wood block should be placed under the unconnected edge of the panel to allow for easier connection of the next panel. Once the next panel is fully connected, the panel will be lifted and block removed.
- **IMPORTANT:** While personnel are working in the man lift at height, no one may enter the space below the basket. Any falling items could cause serious injury.

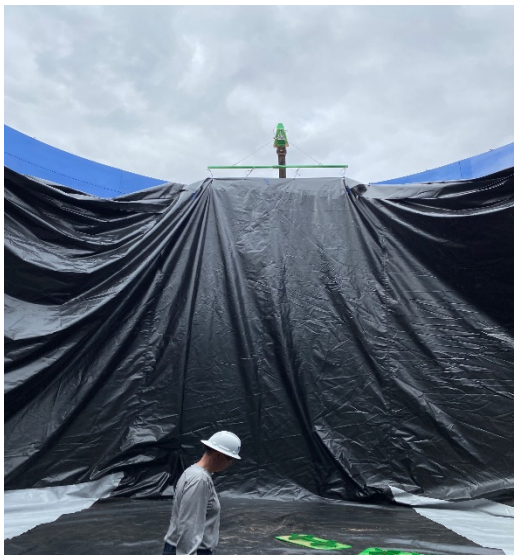
- Once the sixth panel is installed, telehandler #1 can release from the manway panel. The two telehandlers (or telehandler and crane) will then work in opposite directions around the tank installing panels. The first telehandler can also be used to begin pulling the liner up and over the walls.
- Measure the panel widths along the perimeter marking as you go to ensure proper placement and spacing.
- Leave 1-3 panels out perpendicular to the manifolds to allow for egress and to help pull liner more efficiently.
- Once the liner has been pulled up at three points (see step below) the panels will be closed up and the final connection made.

Installing the liner:

- Approx. 5-6 workers.
- Position telehandler or crane in line with the primary panel, directly in front of the suction manifold. Using the jig winch and spreader bar, or crane and spreader bar, lift the liner up and over the walls, ensuring the liner is square and straight. TPU and RPP liners will have guide lines indicating the center of the four quarters of the liner. These marks must line up with the center of the two manifolds, and perpendicular to the manifolds. The side locations will be found by measuring 3.75 panels away from the center of the manifolds.
- Ensure the groundcloth is properly covering and protecting the liner where the ground meets the wall.

- Personnel in the manlift will secure liner to the panel using the straps and horizontal securement bar. The liner will be supported by these straps and its own weight on the top edge of the panels until the liner is completely installed, at which point a perimeter strap or cable will be installed to complete the liner installation.
- On the second, third and fourth pulls, use the equipment to keep the liner lifted above the wall. This will allow for the personnel in the man baskets to lift the liner flaps by hand and secure to the horizontal securement bar.

- Lift the liner around the tank at 4 equal points (quarters – 3.75 panels each) and fold over the walls. Liner will be attached to the horizontal liner bar. Personnel in man lifts will pull up the sagging areas and secure the liner to the outside of the tank panels. The liner edges will be secured tightly to the horiztonal bar using small cinch straps. When the liner is tight to the bar, the liner is in its final position. Ensure that individuals in/operating the man-lift are properly trained and use proper PPE for working at heights, and that tools in the basket are tied off from falling.



- Ensure the liner is fully seated to the base of the tank walls inside, with no bridging of the liner. This can be done visually and aided by using water to help the edges meet the tank walls. If using water, ensure all valves on fill and suction manifolds are closed.
- Once the liner is fully pulled up around the tank, install the perimeter strap to cinch the liner tight against the tank walls to prevent wind from entering underneath the liner.
- Once the liner is lifted and in place, the connections will be made. IMPORTANT: the connections must be made AFTER the liner lifting is complete to avoid possible tears if the liner is over-pulled.
- Install the manway seal, providing an extra egress point.
- Ensure that the liner is properly lined up and in place. Install upper and lower seal and suction cap on each of the two fill ports and two suction ports. Ensure liner is flat and sealed properly at connection point, and there is no interference with the groundcloth or any pebbles.

Double liner installation:

- Approx 5-6 workers
- Prior to installing the perimeter strap, the second liner (primary containment) will be lifted into the interior of the tank.
- Deploy the second liner using the same procedure as the first liner.
- Lift the second liner and secure over the panel walls, using the same procedure as the first liner, ensuring that the primary liner is fully seated at the base of the panels, while not pinning the secondary liner and creating a tight area.
- Install the perimeter strap around the exterior of both liners.
- Secure the manway connection and the manifold connections, installing an additional gasket between the two liners. Ensure there are no folds in the liner as it meets the gaskets.
- Proceed with the Harpoon tank finishing steps as you would with a single liner.

Installing the upper fill tubes:

- Approx. 2-3 workers
- Lift the upper tubes using the manlift.
- Hold in place while 1-2 workers use man-lift and attach the Victaulic connection outside of tank. Ensure that individuals in/operating the man-lift are properly trained and use proper PPE for working at heights.

- Once the fill tube in in place, connected and over the liner, tighten the wall clamp to prevent movement.

Tank completion:

- Ensure the manifold inlets are installed properly and securely.
- Install the float gauges and guide wires from the top of the wall, to the floor of the tank, as well as the magnetic gauge board to the outside of the tank.

- Prior to adding fluid to the Harpoon Tank, ensure all valves are closed and ports not in use have a blind or blank installed.
- Ensure Manway bolts are torqued to the specifications listed on the safety stickers.
- Do not attempt to use the Harpoon Tank in a manner outside the normal operating procedures outlined on the safety sticker.
- Walk around the tank and do a visual inspection on all connection plates and pins.
- Ensure there is no undue stress on the liner material.
- Ensure that there are no gaps between the bottom of the panels and the ground.
- Contact a representative with any additional questions or concerns.

If any issues arise or you have any questions or concerns please contact Dan Kubek (587-990-5765) or Kai Magnussen (516-540-9944)

Operations and Maintenance Plan

Closure Plan

Operations and Maintenance Plan
Above Ground Tank Containment (AST)

General Specifications

This plan provides additional protocols to cause the proposed recycling containments (AST Containments) to conform to NMOCD Rules.

19.15.34.10 B
Recycling containments may hold produced water for use in connection with drilling, completion, producing or processing oil or gas or both.
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.

The operator will maintain and operate the recycling containments and facility in accordance with the following plan to contain liquids and maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment.

19.15.34.10 B
Recycling containments may hold produced water for use in connection with drilling, completion, producing or processing oil or gas or both. Such fluids may include fresh water, brackish water, recycled and treated water, fluids added to water to facilitate well drilling or completion, water produced with oil and gas, flowback from operations, water generated by an oil or gas processing facility or other waters that are gathered for well drilling or completion but may not include any hazardous waste.

- The operator will use the treated produced water in the containments for drilling, completion (stimulation), producing or processing oil or gas or both. If other uses are planned, the operator will notify the OCD though the submission of a modified C-147.

- For all exploration and production operations that use produced water, the operator will conduct these activities in a manner consistent with hydrogen sulfide gas provisions in 19.15.11 NMAC or NORM provisions in 19.15.35 NMAC, as applicable.

19.15.34.8 A
(5) All operations in which produced water is used shall be conducted in a manner consistent with hydrogen sulfide gas provisions in 19.15.11 NMAC or NORM provisions in 19.15.35 NMAC, as applicable.

- The operator will address all releases from the recycling and re-use of produced water in accordance with 19.15.29 NMAC.

19.15.29.6
To prohibit releases and require persons who operate or control the release or the location of the release to report the unauthorized release of oil, gases, produced water, condensate or oil field waste including regulated NORM or other oil field related chemicals, contaminants or mixtures of those chemicals or contaminants that occur during drilling, producing, storing, disposing, injecting, transporting, servicing or processing and to establish procedures for reporting, site assessment, remediation, closure, variance and enforcement.

Operations and Maintenance Plan
Above Ground Tank Containment (AST)

• The operator will not discharge into or store any hazardous waste in the recycling containments, but they may hold fluids such was freshwater, brackish water, recycled and treated water, water generated by oil or gas processing facilities, or other waters that are gathered for well drilling or completion. The recycling facility will not be used for the disposal of produced water. The operator will maintain the containments free of miscellaneous solid waste or debris.	19.15.34.9 G Recycling facilities may not be used for the disposal of produced water.
• The operator will verify that no oil is on the surface of the contained fluid. If oil is observed, the oil shall be removed using an absorbent boom or other device and properly disposed at an approved facility. An absorbent boom or other device will be maintained on site.	19.15.34.13 B (1) The operator shall remove any visible layer of oil from the surface of the recycling containment (7) The operator shall install, or maintain on site, an oil absorbent boom or other device to contain an unanticipated release.
• The operator will install and use a header and diverter described in the design/construction plan in order to prevent damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes during injection or withdrawal of liquids.	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.
• The operator shall maintain at least three feet of freeboard at each containment.	19.15.34.13 B (2) The operator shall maintain at least three feet of freeboard at each containment.
• If the liner develops a leak or if any penetration of the liner occurs above the liquid's surface, then the operator will repair the damage or initiate replacement of the liner within 48 hours of discovery or will seek a variance from the division district office within this time period.	19.5.34.13 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.
• If visible inspection suggests that the liner developed a leak or if any penetration of the liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours of discovery. The operator will also notify the district division office within this same 48 hours of the discovery and repair the damage or replace the liner.	(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.

- In the event of a leak due to a hole in the liner, the following steps will be followed:
  1. If the source of the fluid is uncertain, comparative field tests may need to be performed on both the water in the containment and that which may have been released (e.g. pH, conductance, and chloride).
  2. If the fluid is found to be coming from the containment, determine the location from which the leak is originating.
  3. Mark the point where the water is coming out of the tank.
  4. Locate the puncture or hole in the liner.
  5. Empty the containment to the point of damage in liner.
  6. Clean area of liner that needs to be repaired.
  7. Cut out piece of material (patch or tape) to overlay liner.
  8. Either weld the patch to the injured area in the liner or apply tape over the rupture.
  9. Make sure rupture is completely covered.
  10. Monitor as needed.

19.15.29.8 B.
Requirements. For all releases regardless of volume, the responsible party shall comply with 19.15.29.8 NMAC and shall remediate the release. For major and minor releases, the responsible party shall also comply with 19.15.29.9, 19.15.29.10, 19.15.29.11, 19.15.29.12 and 19.15.29.13 NMAC.

The operator will inspect and remove, as necessary, surface water run-on accumulated in the secondary containment

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

Monitoring, Inspections, and Reporting

An inspection log will be maintained by the operator and will be made available to the division upon request. Inspection will include: freeboard monitoring, leak detection, identifying potential hazards that may have developed, change in site conditions or if the contents of the containment change from the initial use.

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.

Weekly inspections consist of:

- Reading and recording the fluid height of staff gauges and freeboard
- Recording any evidence of visible oil on surface

- Visually inspecting the containments exposed liners
- Checking the leak detection system for any evidence of a loss of integrity of the primary liner
- Inspect any 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.

- Inspect netting for damage or dead wildlife, including migratory birds. Operator shall report the discovery of a dead animal to the appropriate wildlife agency and to the district within 30 days of discovery. Further prevention measures may be required.

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.

Additional monitoring to identify hazards that may have developed, changes in site conditions, tank use, and to enable early detection of structural issues such as uneven tank panel settlement, soil settlement, liner damage, insufficient liner slack or leaks. If changes are noted the AST contractor should be notified

- If observed conditions indicate a potential tank failure is imminent, the vicinity will be immediately cleared and the AST will be drained.

Monthly, the operator will:

- 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.
- Record sources and disposition of all recycled water.

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.

Cessation of Operations

If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdraw, operation of the facility has ceased and the division district office will be

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

notified. The division district may grant an extension not to exceed six months to determine the cessation of operations.

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 operator will remove all fluids from the recycling facility within 60 days of cessation of operations. An extension, not to exceed 2 months, may be granted by the district division for the removal of fluids from the facility.

19.15.34.14 A
Once the operator has ceased operations, the operator shall remove all fluids within 60 days and close the containment within six months from the date the operator ceases operations from the containment for use. The division district office may grant an extension for the removal of all fluids not to exceed two months.

The breakdown of the containments follows the reverse order of the setup steps presented in the set-up manual.

Closure Plan

The containments are expected to contain a small volume of solids, the majority of which will be windblown sand and dust with some mineral precipitates from the water.

The operator will notify the division district (phone or email) before initiating closure of the containments and/or facility.

Excavation and Removal Closure Plan – Protocols and Procedures

1. Residual fluids in the containments will be sent to disposal at a division-approved facility.
2. The operator will remove all solid contents and transfer those materials to the following division-approved facility:
   Disposal Facility Name: R360
   Permit Number NM 01-0006
3. If possible, geomembrane textiles and liners that exhibit good integrity may be recycled for use as an under liner of tank batteries or other use as approved by OCD.
4. Disassemble the recycling containment infrastructure according to manufacturer's recommendations
5. After the disassemble of the containments and removal of the contents and liners, soils beneath the tanks will be tested as follows
   a. Collect a five-point (minimum) composite from beneath the liner to include any obviously stained or wet soils, or any other evidence of impact from the containments for laboratory analyses for the constituents listed in Table I of 19.15.34.14 NMAC.
   b. If any concentration is higher than the parameters listed in Table I, additional delineation may be required, and closure activities will not proceed without Division approval.
   c. If all constituents' concentrations are less than or equal to the parameters listed in Table I, then the operator will backfill the facility as necessary using non-waste containing, uncontaminated, earthen material and proceed to reclaim the surface to pre-existing conditions.

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.
(1) If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.
(2) If all contaminant concentrations are less than or equal to the parameters listed in Table I, then the operator can proceed to backfill with non-waste containing, uncontaminated, earthen material.

Closure Plan
Above Ground Tank Containment (AST)

Closure Documentation

Within 60 days of closure completion, the operator will submit a closure report (Form C-147) to the District Division, with necessary attachments to document all closure activities are complete, including sampling results and details regarding backfilling and capping as necessary.

In the closure report, the operator will 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 the closure plan.

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.

Reclamation and Revegetation

The operator will reclaim the surface to safe and stable pre-existing conditions that blends with the surrounding undisturbed area. "Pre-existing conditions" may include a caliche well pad that existed prior to the construction of the recycling containment and that supports active oil and gas operations.

Areas not reclaimed as described herein due to their use in production or drilling operations will be stabilized and maintained to minimize dust and erosion.

For all areas disturbed by the closure process that will not be used for production operations or future drilling, the operator will

1. Replace topsoils and subsoils to their original relative positions
2. Grade so as to achieve erosion control, long-term stability and preservation of surface water flow patterns
3. Reseed in the first favorable growing season following closure

Federal, state trust land, or tribal lands may impose alternate reclamation and revegetation obligations that provide equal or better protection of fresh water, human health, and the environment. Revegetation and reclamation plans imposed by the surface owner will be outlined in communications with the OCD.

The operator will notify the division when the site meets the surface owner's requirements or exhibits a uniform vegetative cover 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. The operator will notify the Division when reclamation and re-vegetation is complete.

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

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

19.15.34.14 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.

February 2024

Variances and/or Equivalency Demonstrations for:

1) Slope and Anchor Variance Request for Above Ground Steel Tank Modular Recyclingg Storage Containments
2) Alternative Testing Variance Request
3) Fencing Variance Request

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

Slope and Anchor Variance Request for Above Ground Steel Tank Modular Recycling Storage Containments

STATEMENT EXPLAINING WHY THE APPLICANT SEEKS A VARIANCE FOR SLOPE AND ANCHOR FOR MODULAR STEEL AST CONTAINMENT

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of NMAC 19.15.34.12.

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT:

A. An operator shall design and construct a recycling containment in accordance with the following specifications.

(2) A recycling containment shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile is required under the liner when needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity. *The operator shall construct the containment in a levee with an inside grade no steeper than two horizontal feet to one vertical foot (2H:1V). The levee shall have an outside grade no steeper than three horizontal feet to one vertical foot (3H:1V).* The top of the levee shall be wide enough to install an anchor trench and provide adequate room for inspection and maintenance.

(3) Each recycling containment shall incorporate, at a minimum, a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. *The edges of all liners shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep*.

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

With respect to storage of produced water for use in lieu of fresh water, Rule 34 is written for earthen, lined pits, not free-standing modular impoundments that employ liners as their primary fluid containment system. A modular impoundment consists of a professionally designed steel tank ring with vertical walls. There is no slope to consider as the segmental steel sections are set vertical.

There is no anchor trench as envisioned by the Rule, liners are anchored to the top of the steel walls with clips, no anchor trench is required.

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

The following technical memorandum provides supportive data to demonstrate equal or better protection of fresh water, public health and the environment by providing the requisite containment and protection.

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Technical Memorandum: Slope and Anchor Trench Variance for Above Ground Steel Modular Containments

NMAC 19.15.34.12 A (2), (3)

Side Slope

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

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

Anchor Trench

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

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

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

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R.K. FROBEL & ASSOCIATES
Consulting Engineers

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

Sincerely Yours,

R K Frobel

Ronald K. Frobel, MSCE, PE

References:

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

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

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

Attachments:

R. K. Frobel C.V.

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October 2023

Variances and/or Equivalency Demonstrations for:

Alternative Testing Variance Request

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

The prescriptive mandates of the Rule that are the subject of this request are the following subsections of NMAC 19.15.17.13 [emphasis added], 19.15.34.14 and 19.15.29. 12 D

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

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

Table II
Closure Criteria for Burial Trenches and Waste Left in Place in Temporary Pits

Depth below bottom of pit to groundwater less than 10,000 mg/l TDS	Constituent	Method*	Limit**
25-50 feet	Chloride	EPA Method 300.0	20,000 mg/kg
	TPH	EPA SW-846 Method 418.1	100 mg/kg

> **19.15.34.14 CLOSURE AND SITE RECLAMATION REQUIREMENTS FOR RECYCLING CONTAINMENTS:**
> **C.** The operator shall test the soils beneath the containment for contamination with a five-point composite sample which includes stained or wet soils, if any, and that sample shall be analyzed for the constituents listed in Table I below.
> **(1)** If any contaminant concentration is higher than the parameters listed in Table I, the division may require additional delineation upon review of the results and the operator must receive approval before proceeding with closure.

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

Table I
Closure Criteria for Recycling Containments

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

After sampling solids of more than 50 drilling pits in the Permian Basin, we have observed and reported to OCD on numerous occasions significant problems with non-petroleum drilling additives (e.g. starch) interfering with the laboratory method 418.1. It is not surprising that in many instances we found no correlation between the laboratory results using 418.1 and the results using Method 8015.

We request approval of Method 8015 (GRO + DRO + MRO) for Method 418.1.

> **19.15.29.12 D. CLOSURE REQUIREMENTS.** The responsible party must take the following action for any major or minor release containing liquids.
> **(1)** The responsible party must test the remediated areas for contamination with representative five-point composite samples from the walls and base, and individual grab samples from any wet or discolored areas. The samples must be analyzed for the constituents listed in Table I of 19.15.29.12 NMAC or constituents from other applicable remediation standards.

The referenced Table I, is reproduced in part below.

Table I
Closure Criteria for Soils Impacted by a Release

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

We request approval of EPA 300.0 or SM4500 for the analysis of chloride.

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

The purpose of TPH analyses in the Pit Rule is to measure total petroleum hydrocarbons not all non-polar compounds, such as starch or cellulose that can interfere with Method 418.1. While Method 418.1 may provide some useful data for transportation of crude oil or condensate spills to disposal, the addition of non-polar organic materials in drilling fluids, especially for horizontal wells, renders Method 418.1 highly problematic to determine compliance with the Rule. Using Method 8015 for TPH (GRO+DRO+MRO) provides a better measurement of what we believe the Commission intended operators to measure.

In hearings before the Oil Conservation Commission technical arguments were presented regarding the use of SM4500 in lieu of EPA 300.00 for chloride analysis for Rule 29. The Division and the Commission agreed that these two methods provide equal or better protection of fresh water, public health and the environment.

January 2024

Variance Request for Fencing Requirement

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are presented below with emphasis **added**:

> 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.
> 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 subject Harpoon Tank employs netting or sonic bird hazing (Mega Bird X with bird calls specific to the Permian Basin). These methods effectively protect avian species such as waterfowl and bats. OCD and BLM have approved both methods per Rule 34 and by BLM Rules respectively.

The steel structure of the Harpoon Tank is 36-feet high, which obviously encloses the containment "in a manner that deters…[terrestrial] wildlife." Thus, the steel structure meets the mandate of the Rule for enclosure. Thus, netting and the steel structure meet the mandate of Rule 34 for deterring/protecting avian and terrestrial wildlife.

Because Harpoon Tank Containments do not have a steel stairway between ground surface and the open top, humans cannot reasonably enter the tank, obviating the need for locked fences to "deters… human access.

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

We believe a reasonable person would agree that the proposed protocol provides equal protection of Public Health as a 4-strand barbed wire fence.

January 2024

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

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Technical Memorandum: Applicability of Variances for Modular AST Containments in the Permian Basin of New Mexico

NMAC 19.15.34.12 A (2)

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

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

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

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

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

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Sincerely Yours,

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Ronald K. Frobel, MSCE, PE

References:

NMAC 19.15.34.12 DESIGN AND CONSTRUCTION SPECIFICATIONS FOR A RECYCLING CONTAINMENT

ASTM Standards 2019

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

TITLE: Principal and Owner

PROFESSIONAL AFFILIATIONS:

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

ACADEMIC BACKGROUND:

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

PROFESSIONAL EXPERIENCE:

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

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

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

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

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

United States Navy, Commissioned Naval Officer, 1970 - 1973

REPRESENTATIVE EXPERIENCE:

R.K. Frobel & Associates: Civil engineering firm specializing in the fields of geotechnical, geo-environmental and geosynthetics. Expertise is provided to full service civil/geotechnical engineering firms, federal agencies, municipalities or owners on a direct contract, joint venture or sub-consultant basis. Responsibilities are primarily devoted to specialized technical assistance in design and application for foreign and domestic projects such as the following:
Forensics investigations into geotechnical and geosynthetics failures; providing expert report and testimony on failure analysis; providing design and peer review on landfill lining and cover system design, mine waste reclamation, water treatment facilities, hydro-technical canal, dam, reservoir and mining projects, floating reservoir covers; oil and gas waste containment; design of manufacturers technical literature and manuals; development and presentation of technical seminars; new product development and testing; MQA/CQA program design and implementation.

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

Venegas, Victoria, EMNRD

From: Venegas, Victoria, EMNRD
Sent: Monday, April 8, 2024 2:37 PM
To: 'Reed, Timothy M'; Harrington, Brantley
Cc: 'David Hamilton'; r@rthicksconsult.com
Subject: 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450]
Attachments: C-147 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] 04.08.2024.pdf

1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450]

Good afternoon Mr. Reed.
NMOCD has reviewed the recycling containment permit application and related documents, submitted by [217817] CONOCOPHILLIPS COMPANY on 03/05/2024, for 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] in O-05-24S-32E, Lea County, New Mexico. [217817] CONOCOPHILLIPS COMPANY requested variances from 19.15.34 NMAC for 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] related to 19.15.34. NMAC

The following variances have been approved:

- The variance to 19.15.34.14 NMAC Table I for the use of alternate analytical method 8015/8015M for total petroleum hydrocarbons (TPH) is approved.
- The variance to 19.15.34.14 NMAC Table I for the use of alternate analytical method EPA 300.0 or SM4500 for the analysis of chloride is approved.
- The variance to 19.15.34.12.A.(2) NMAC for the no side-slope requirement for the AST containment with vertical walls is approved.
- The variance to 19.15.34.12.A.(3) NMAC for the liners to be anchored to the top of the AST steel walls with clips and no anchor trenches is approved.
- The variances from 19.15.34.13.E NMAC for fencing and netting are approved. The Harpoon Tank employs netting or sonic bird hazing that is protective of wildlife. The steel structure of the Harpoon Tank is 36-feet high and encloses the containment in a manner that deters unauthorized wildlife and human access.
- The variance to 19.15.34.12.A.(4) NMAC for the installation on the AST containment of a liner/leak detection system as described below, is approved.
    - From top to bottom, the sequence of liners and materials is:
        - The Primary Liner is 30 mil Woven Coated Fabric (WCF) with the coating being PVC.
        - 10 oz Geotextile layer
        - 200 mil Geogrid Leak Detection System
        - The Secondary Liner is 60 mil HDPE.
        - 10 oz Geotextile layer
        - Sump at lowest point of the AST set up.
        - The 55' diameter AST sits inside a 100' x 125' Secondary containment created with a 3' high muscle-wall and a 60 mil HDPE secondary liner.

The form C-147 and related documents for the 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] is approved with the following conditions of conditions of approval:

- The purpose of this permit is for oil and gas activities regulated under the NMAC 19.15.34.3 STATUTORY AUTHORITY: 19.15.34 NMAC is adopted pursuant to the Oil and Gas Act, Paragraph (15) of Section 70-2-

12(B) NMSA 1978, which authorizes the division to regulate the disposition of water produced or used in connection with the drilling for or producing of oil and gas or both and Paragraph (21) of Section 70-2-12(B) NMSA 1978 which authorizes the regulation of the disposition of nondomestic wastes from the exploration, development, production or storage of crude oil or natural gas.

- [217817] CONOCOPHILLIPS COMPANY must limit containment operation to no more than a 3-month period after liquids are first placed in the containment.
- [217817] CONOCOPHILLIPS COMPANY must notify OCD through e-Permitting when liquids are first placed in the containment.
- [217817] CONOCOPHILLIPS COMPANY must notify OCD through e-Permitting when the containment stops receiving liquids.
- [217817] CONOCOPHILLIPS COMPANY must ensure the tanks only contain fluids during well stimulation events when field staff are always present.
- [217817] CONOCOPHILLIPS COMPANY must utilize a vacuum truck to remove water captured in the secondary containment during a rain event to ensure secondary containment capacity is not compromised in the event of a release from the tank.
- [217817] CONOCOPHILLIPS COMPANY shall construct, operate, maintain, close, and reclaim the 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] in compliance with 19.15.34 NMAC.
- Water reuse and recycling from 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] is limited to wells owned or operated by [217817] CONOCOPHILLIPS COMPANY per 19.15.34.15(A)(2) NMAC.
- [217817] CONOCOPHILLIPS COMPANY shall notify NMOCD when construction of the 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] commences.
- A minimum of 3-feet freeboard must be maintained in 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] recycling containment, at all times during operations.
- [217817] CONOCOPHILLIPS COMPANY shall submit monthly reports of recycling and reuse of produced water form C-148 through OCD Online.
- [217817] CONOCOPHILLIPS COMPANY shall comply with 19.15.29 NMAC Releases in the event of any release of produced water or other oil field wastes at 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450].

Please reference number 1RF-516 - GIN AND TECTONICS AST CONTAINMENT FACILITY [fVV2409339450] in all future communications.
Regards,

Victoria Venegas ● Environmental Specialist
Environmental Bureau
EMNRD - Oil Conservation Division
506 W. Texas Ave. Artesia, NM 88210
(575) 909-0269 | Victoria.Venegas@emnrd.nm.gov
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District I
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Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Operator:	OGRID:
CONOCOPHILLIPS COMPANY 600 W. Illinois Avenue Midland, TX 79701	217817
	Action Number: 323814
	Action Type: [C-147] Water Recycle Long (C-147L)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	[217817] CONOCOPHILLIPS COMPANY must limit containment operation to no more than a 3-month period after liquids are first placed in the containment. [217817] CONOCOPHILLIPS COMPANY must notify OCD through e-Permitting when liquids are first placed in the containment. [217817] CONOCOPHILLIPS COMPANY must notify OCD through e-Permitting when the containment stops receiving liquids. [217817] CONOCOPHILLIPS COMPANY shall submit monthly reports of recycling and reuse of produced water form C-148 through OCD Permitting.	4/8/2024