C-144 Permit Package
Dagger Lake 15 22 Ogopogo Pad, Temporary Pit
Section 10 of T22S, R33E, Lea County

DL 15 22 Ogopogo Fed Com #422H
DL 15 22 Ogopogo Fed Com #423H
DL 15 22 Ogopogo Fed Com #424H

Chevron USA Incorporated
6301 Deauville Blvd.
Midland, TX 79706
(432) 687-7524

February 5, 2021

New Mexico Oil Conservation Division
811 S. First St.
Artesia, NM 88210

Via Electronic Submittal

RE: Chevron USA Incorporated Temporary Pit Application
Dagger Lake 15 22 Ogopogo Fed Com Pad
Section 10 of T22S, R33E, Lea County

Ms. Victoria Venegas,

Enclosed is a complete C-144 permit application for a Temporary Pit with non-low chloride drilling fluid located at an existing Chevron USA Inc. O&G Business lease #NMNM 17440 located in Section 10, T22S R33E. This package includes the following documentation:

- C-144 for Non-Low Chloride Temporary Pit
- Siting Criteria Demonstration
- Siting Criteria Figures 1-11
- Variance Requests
- Appendix A – USGS Groundwater Data
- Appendix B – NMOSE Water Data
- Appendix C – Hydrogeologic Data
- Appendix D – Design Plan
- Appendix E – Operating and Maintenance Plan
- Appendix F – Closure Plan
- Appendix G – Evaluation of Unstable Conditions
- Attachments 1 - 3

Please do not hesitate to contact us if you require any additional information or clarification supporting the approval of this application.

Sincerely,

Tony Vallejo
Sr. Workforce Safety & Environmental Specialist – Factory
jvallejo@chevron.com

Jonathon Fisher
Wells Engineer
JonathonFisher@chevron.com

Rachel Cruz
Project Manager (Arcadis U.S., Inc.)
rachel.cruz@arcadis.com

Chevron USA Incorporated
Chevron USA Inc.
6301 Deauville Blvd
Midland, TX 79706
Tel 432 687 7524

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Midland, TX 79706
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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-144
Revised April 3, 2017

For temporary pits, below-grade tanks, and multi-well fluid management pits, submit to the appropriate NMOCD District Office.
For permanent pits submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

Pit, Below-Grade Tank, or Proposed Alternative Method Permit or Closure Plan Application

Type of action:
- ☐ Below grade tank registration
- ☒ Permit of a pit or proposed alternative method
- ☐ Closure of a pit, below-grade tank, or proposed alternative method
- ☐ Modification to an existing permit/or registration
- ☐ Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method

Instructions: Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request

Please 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: **Chevron USA Inc.** OGRID #: **4323**
Address: **6301 Deauville Blvd., Midland, TX 79706**
Facility or well name: **DL 15 22 Ogopogo Fed Com**
API Number: _____ OCD Permit Number: _____
U/L or Qtr/Qtr **I & J** Section **10** Township **22S** Range **33E** County: **Lea**
Center of Proposed Design: Latitude **32.405153** Longitude **-103.555794** NAD83
Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.
☒ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC
Temporary: ☒ Drilling ☐ Workover
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☐ Multi-Well Fluid Management Low Chloride Drilling Fluid ☐ yes ☐ no
☒ Lined ☐ Unlined Liner type: Thickness 40 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other _____
☐ String-Reinforced
Liner Seams: ☒ Welded ☐ Factory ☐ Other _____ Volume: **2 x 25,000 bbl** Dimensions: L **313 ft** x W **244 ft** x D **10 ft**

3.
☐ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC
Volume: _____bbl Type of fluid: _____
Tank Construction material: _____
☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other _____
Liner type: Thickness _____mil ☐ HDPE ☐ PVC ☐ Other _____

4.
☐ **Alternative Method:**
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

5.
Fencing: Subsection D of 19.15.17.11 NMAC *(Applies to permanent pits, temporary pits, and below-grade tanks)*
☐ Chain link, six feet in height, two strands of barbed wire at top *(Required if located within 1000 feet of a permanent residence, school, hospital, institution or church)*
☒ Four foot height, four strands of barbed wire evenly spaced between one and four feet
☐ Alternate. Please specify_____

6.
Netting: Subsection E of 19.15.17.11 NMAC *(Applies to permanent pits and permanent open top tanks)*

☐ Screen ☐ Netting ☐ Other_____

☐ Monthly inspections (If netting or screening is not physically feasible)

7.
Signs: Subsection C of 19.15.17.11 NMAC

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

☒ Signed in compliance with 19.15.16.8 NMAC

8.
Variances and Exceptions:
Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.

Please check a box if one or more of the following is requested, if not leave blank:

☒ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. **See Variance Requests**

☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

9.
Siting Criteria (regarding permitting): 19.15.17.10 NMAC

Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. **Siting criteria does not apply to drying pads or above-grade tanks.**

General siting	
Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank. - ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells	☐ Yes ☐ No ☒ NA
Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit . - ☒ NM Office of the State Engineer - iWATERS database search; ☒ USGS; ☐ Data obtained from nearby wells See Appendices A, B, Figure 7	☐ 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. **(Does not apply to below grade tanks)** - Written confirmation or verification from the municipality; Written approval obtained from the municipality **See Figures 2 & 7**	☐ Yes ☒ No
Within the area overlying a subsurface mine. **(Does not apply to below grade tanks)** - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division **See Figure 4**	☐ Yes ☒ No
Within an unstable area. **(Does not apply to below grade tanks)** - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map **See Figures 6, 8, 9, Appendix G**	☐ Yes ☒ No
Within a 100-year floodplain. **(Does not apply to below grade tanks)** - FEMA map **See Figure 3**	☐ Yes ☒ No
Below Grade Tanks	
Within 100 feet of a continuously flowing watercourse, significant watercourse, lakebed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Temporary Pit using Low Chloride Drilling Fluid (maximum chloride content 15,000 mg/liter)	
Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.) - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	☐ Yes ☐ No

Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300feet of any other fresh water well or spring, in existence at the time of the initial application. NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 100 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Temporary Pit Non-low chloride drilling fluid	
Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site **See Figure 6**	☐ Yes ☒ No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image **See Figure 2**	☐ Yes ☒ No
Within 500 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application; - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site **See Appendices A, B, and Figures 1 & 2**	☐ Yes ☒ No
Within 300 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site **See Figures 2, 5, & 6**	☐ Yes ☒ No
Permanent Pit or Multi-Well Fluid Management Pit	
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	☐ Yes ☐ No
Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No

10.

Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist: Subsection B of 19.15.17.9 NMAC

Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC

☒ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC **See Appendix C**

☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC **Attached**

☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC **See Appendix D**

☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC **See Appendix E**

☒ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC **See Appendix F**

☐ Previously Approved Design (attach copy of design) API Number: _____ or Permit Number: _____

11.

Multi-Well Fluid Management Pit Checklist: Subsection B of 19.15.17.9 NMAC

Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC

☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC

☐ A List of wells with approved application for permit to drill associated with the pit.

☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC

☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC

☐ Previously Approved Design (attach copy of design) API Number: _____ or Permit Number: _____

12.
Permanent Pits Permit Application Checklist: Subsection B of 19.15.17.9 NMAC
Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Climatological Factors Assessment
- ☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Quality Control/Quality Assurance Construction and Installation Plan
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Nuisance or Hazardous Odors, including H_2S, Prevention Plan
- ☐ Emergency Response Plan
- ☐ Oil Field Waste Stream Characterization
- ☐ Monitoring and Inspection Plan
- ☐ Erosion Control Plan
- ☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

13.
Proposed Closure: 19.15.17.13 NMAC **See Appendix F**
Instructions: Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

Type: ☒ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☐ Below-grade Tank ☐ Multi-well Fluid Management Pit ☐ Alternative

Proposed Closure Method:
- ☐ Waste Excavation and Removal
- ☐ Waste Removal (Closed-loop systems only)
- ☒ On-site Closure Method (Only for temporary pits and closed-loop systems)
  - ☐ In-place Burial ☐ On-site Trench Burial
- ☐ Alternative Closure Method

14.
Waste Excavation and Removal Closure Plan Checklist: (19.15.17.13 NMAC) ***Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.***

- ☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)
- ☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

15.
Siting Criteria (regarding on-site closure methods only): 19.15.17.10 NMAC
Instructions: Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 25 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **See Appendices A & B, and Figure 7**	☐ Yes ☒ No ☐ NA
Ground water is between 25-50 feet below the bottom of the buried waste - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **See Appendices A & B, and Figure 7**	☐ Yes ☒ No ☐ NA
Ground water is more than 100 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **See Appendices A & B, and Figure 7**	☒ Yes ☐ No ☐ NA
Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site **See Figure 6**	☐ Yes ☒ No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image **See Figure 2**	☐ Yes ☒ No
Within 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application.	☐ Yes ☒ No

- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site **See Appendices A & B, and Figure 7**	
Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within 300 feet of a wetland. US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site **See Figures 2, 5 & 6**	☐ Yes ☒ No
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 **See Figure 2**	☐ Yes ☒ No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division **See Figure 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 **See Figures 6, 8, & 9, Appendix G**	☐ Yes ☒ No
Within a 100-year floodplain. - FEMA map **See Figure 3**	☐ Yes ☒ No

16.

On-Site Closure Plan Checklist: (19.15.17.13 NMAC) ***Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.***

- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC **Attached**
- ☒ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.11 NMAC
- ☒ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC **See Appendix D**
- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved) **See Appendix F**
- ☒ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**

17.

Operator Application Certification:

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

Name (Print): Tony Vallejo Title: Sr. Work Force Safety & Environmental Specialist - Factory

Signature: Tony Vallejo Date: March 5, 2021

e-mail address: JVallejo@chevron.com Telephone: O: 432-687-7524 or C: 325-450-1413

18.

OCD Approval: ☐ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature: _____ **Approval Date:** _____

Title: _____ **OCD Permit Number:** _____

19.

Closure Report (required within 60 days of closure completion): 19.15.17.13 NMAC

Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.

☐ **Closure Completion Date:** _____

20.

Closure Method:

☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)

☐ If different from approved plan, please explain.

21.

Closure Report Attachment Checklist: ***Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.***

- ☐ Proof of Closure Notice (surface owner and division)
- ☐ Proof of Deed Notice (required for on-site closure for private land only)
- ☐ Plot Plan (for on-site closures and temporary pits)
- ☐ Confirmation Sampling Analytical Results (if applicable)
- ☐ Waste Material Sampling Analytical Results (required for on-site closure)
- ☐ Disposal Facility Name and Permit Number
- ☐ Soil Backfilling and Cover Installation
- ☐ Re-vegetation Application Rates and Seeding Technique
- ☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude _____ Longitude _____ NAD: ☐1927 ☐ 1983

22.

Operator Closure Certification:

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): _____ Title: _____

Signature:_____ Date: _____

e-mail address:_____ Telephone: _____

Siting Criteria Demonstration (19.15.17.10)

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Depth to Groundwater, 19.15.17.10.3(a)

Figure 7, Appendices A & B, and the discussion presented below demonstrate that the groundwater within the broader area of the proposed site ranges from 35 to 508 feet near the Temporary Pit. The nearest water well to the proposed reserve pit is ~1.9 miles at a depth of 508 ft.

Figure 7 depicts the location of the pit relative to the locations of water wells within 5 miles of the pit for which water level data are available. Depth to water for the most recent, reliable measurement and the well identification number are shown adjacent to each well on **Figure 7**. The approximate boundary of the Pecos River Basin alluvial aquifer is located ~24 miles to the southwest of the Temporary Pit. Water well data, including gauging dates, are detailed in **Appendix A** (USGS) and **Appendix B** (NMOSE).

All water wells located within 5 miles of the temporary pit were gauged by USGS at > 130 ft bgs.

- The nearest water well to the pit location is located approximately 2 miles to the southeast are completed in the Chinle Formation. Water level was measured at 290 ft bgs in 1996 (3,128 ft above NGVD29) within a USGS well. A second USGS well located near this well had a measured depth to water of 388 feet bgs in 1972 (3,118 ft above NGVD29). This well is also completed in the Chinle Formation.

- To the northeast, the nearest well is located 3.4 miles away and is completed in the Alluvium/Ogallala. Water level was measured at 56 ft bgs (3,604.3 ft above NAVD88) in 1986.

- To the east, the nearest well is located 3.5 miles away and is completed in the Alluvium. Water level was measured at 31 ft bgs (3,547.2 ft above NAVD88) in 1996.

- To the northwest, nearest water well to the pit location is located approximately 3.4 miles away is completed in the Chinle Formation. Water level was measured at 178 ft bgs in 1968 (3,501 ft above NGVD29) within a USGS well. A second USGS well located near this well had a measured depth to water of 179 feet bgs in 1997 (3,509 ft above NGVD29). This well is also completed in the Chinle Formation.

- No USGS water wells were found to the west and south of the proposed pit location.

A thin layer of Quaternary alluvium is present at surface in the vicinity of the proposed location and is composed of unconsolidated to partially consolidated sand, silt, clay and caliche. The alluvium thickness appears to be approximately 20 feet or less. The alluvium is underlain by the Ogallala formation which ranges up to approximately 205 feet thick in this area (Arcadis 2020[1]). The Quaternary deposits / Ogallala formation are underlain by the Triassic Dockum Group including the Chinle and Santa Rosa formations and deeper, Permian-age strata (**Figure 9**). The Chinle Formation outcrops several miles to the east of the proposed location and the Permian strata outcrop several miles to the west along the course of the Pecos River.

Geotechnical report and boring log were obtained for a proposed Dagger Lake Above-Ground Storage Tank (AST) in Section 4 located ~1.1 miles to the northwest of the proposed pit location (**Attachment 2**). The boring was installed to a depth of 70 feet. Groundwater was not encountered in the boring during drilling. The boring was backfilled with auger cuttings upon completion of the drilling.

[1] Arcadis 2020. Dagger Lake Development Area Environmental Field Survey. Prepared for Chevron.

Proximity to Surface Water, 19.15.17.10.3(b)

Figure 6 visualizes USGS contour lines and the USGS National Hydrography Dataset. The map demonstrates that the location is not within 1,000 feet of a continuously flowing waterway course, any other significant watercourse or lakebed, sinkhole, or playa lake.

- The nearest feature (ephemeral drainage) is more than 500 feet northwest of the pit location.
- The nearest surface water feature (Pecos River) is in excess of 26 miles west-southwest of the pit location.

Proximity to Occupied Residences, Schools, Hospitals, Institutions or Churches, 19.15.17.10.3(c)

The ESRI aerial imagery in **Figure 2** demonstrates that the location is not within 300 feet of occupied residences, schools, hospitals, institutions or churches.

- There are no structures within 1,000 feet of the pit location.

Proximity to springs and/or Domestic Freshwater Wells 19.15.17.10.3(d)

No springs or domestic freshwater wells have been mapped within 300 ft of the pit locations.

Proximity to Incorporated Municipal Boundaries and Fresh Water Well Fields 19.15.17.10.3(e)

Figure 1 demonstrates that the location is not within incorporated municipal boundaries or defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is the city of Carlsbad, approximately 37 miles to the west.

Proximity to Wetlands, 19.15.17.10.3(f)

Utilizing USFWS wetland data, **Figure 5** demonstrates that the proposed location is not located within 300 feet of a wetland.

- A pond associated with oil and gas development is the nearest "freshwater pond" identified by USFWS and is located approximately 4,000 feet away.
- A riverine (ephemeral) is located over 2.5 miles east of the project location.

Proximity to Subsurface Mines, 19.15.17.10.3(g)

Analysis of aerial imagery in the vicinity of the proposed temporary pit show that the nearest mines are all surficial caliche pits. There are no subsurface mines in the area as indicated in **Figure 4**.

Proximity to Unstable Area, 19.15.17.10.3(h)

Figure 8 identifies the location of the proposed temporary pit with respect to BLM Karst areas. The proposed Temporary Pit is mapped in a "Low Potential" karst area. The area lies near the northeast margin of the Delaware Basin. Bedrock occurring beneath the proposed project area consists of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations are composed chiefly of clastic (insoluble), non-karst-forming rocks. Beneath these formations are Permian-aged rocks of the Rustler and Salado Formations. These rocks contain significant beds of halite (i.e., rock salt) and anhydrite, making them susceptible to karst formation. The top of the Rustler Formation in the proposed project area is approximately 800 feet below the land surface (Crowl et al. 2011[2]). There are, however, no indications that voids or other karst features are present or are likely to form in the vicinity of the proposed location. Therefore, local karst potential is likely to be low. An Evaluation of Unstable Conditions is presented in Appendix G that details several lines of evidence in support of this position. In summary:

1. There are no dissolution features within ~10-miles of the proposed location (**Figure 11**),
2. Karst forming strata are over ~1,000-feet deep beneath the proposed location (**Appendix G – Figure G.1**),

[2] Crowl, W. J., D. E. Hulse, and G. Tucker, P.E., 2011. NI 43-101 Technical Report Prefeasibility Study for the Ochoa Project, Lea County, New Mexico. Prepared for IC Potash Corporation by Gustavsen and Associates, December 30, 2011.

3. An Arcadis field study of the area indicated no closed depressions, caves, or fissures in the immediate vicinity of the proposed pit (**Attachment 1**),
4. Tetra Tech geotechnical report and boring log from ~1.1. miles away indicated low karst potential (**Attachment 2**)
5. The Bureau of Land Management, Paul Murphy prepared the Environmental Assessment (EA), document number - DOI-BLM-P020-2020-0095-EA, evaluating DL 09 16 Loch Ness Pad 1. This EA analyses a pad near the proposed temporary pit location and karst was not analyzed in the EA and therefore was not identified an issue in the project area. (**Attachment 3**).

In the unlikely event that a void occurs during construction or operation activities, all activities must stop immediately, and the BLM should then be contacted within 24 hours to devise the best management plan to protect the environment and human safety.

Proximity to Floodplains, 19.15.17.10.3(i)

The location is within an area that has not yet been mapped by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain (**Figure 3**). In lieu of FEMA data, **Figure 10** visualizes the USDA – SSURGO Soils data for dominant flooding frequency condition. The location is not located within an area with any indication of flooding. The nearest area determined to have “Rare” flooding frequency is in excess of 1 mile away. As defined by the USDA, “*’Rare’ means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year*”.

Site Specific Information, Figures 1-11

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- Townships

0 3 6

Miles

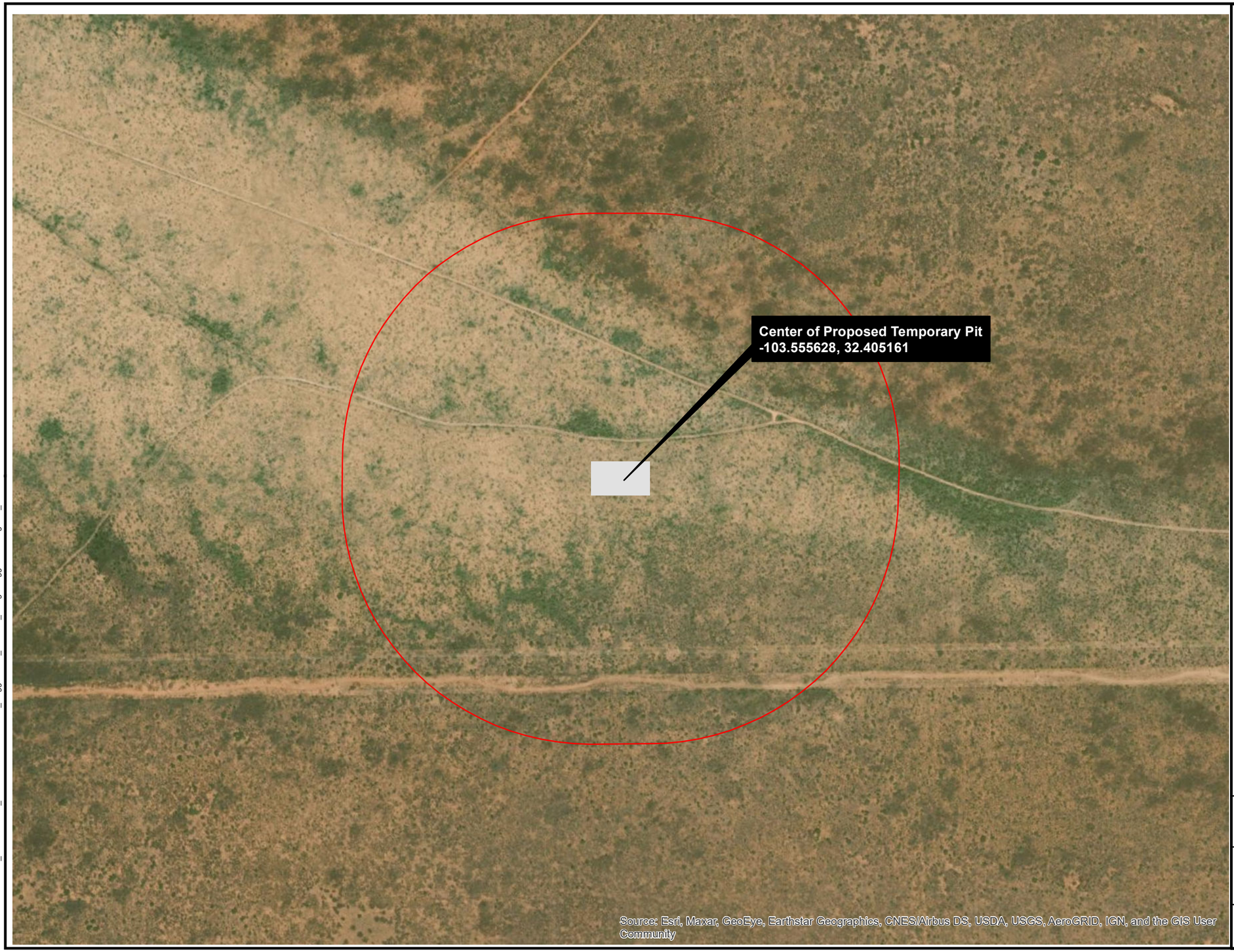
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

VICINITY MAP

ARCADIS

FIGURE 1

DIV/GROUP: ENV/MDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure1_SiteVicinity.mxd DATE: 2/1/2021 7:45:53 PM



LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer

0 300 600

Feet

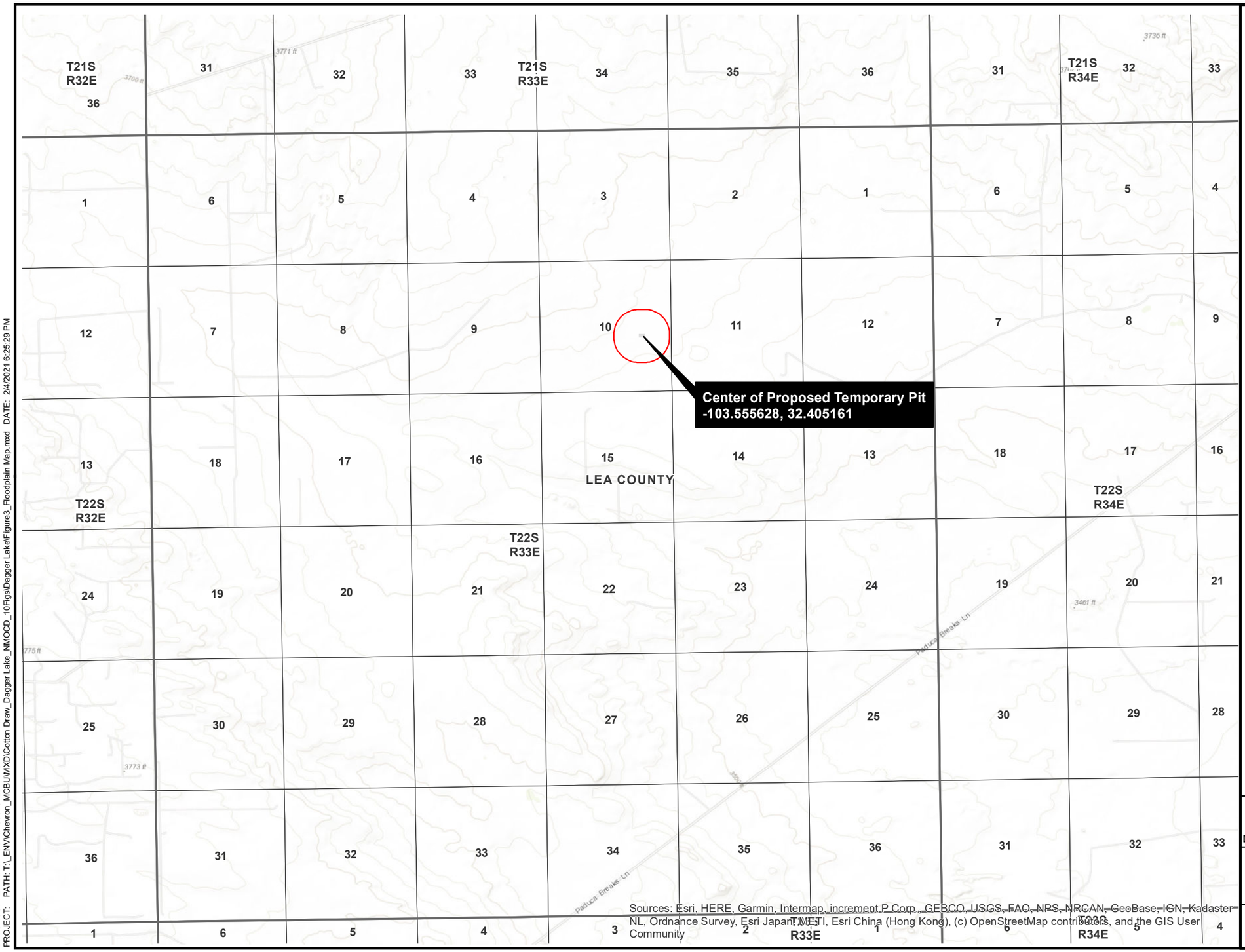
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

SITE OVERVIEW

ARCADIS

FIGURE
2

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure2_Site Overview.mxd DATE: 2/1/2021 7:57:19 PM



LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- Townships
- Sections

NOTE:
1. FLOODPLAIN DATA IS NOT AVAIABLE IN THIS MAP EXTENT.

0 3,000 6,000
Feet

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

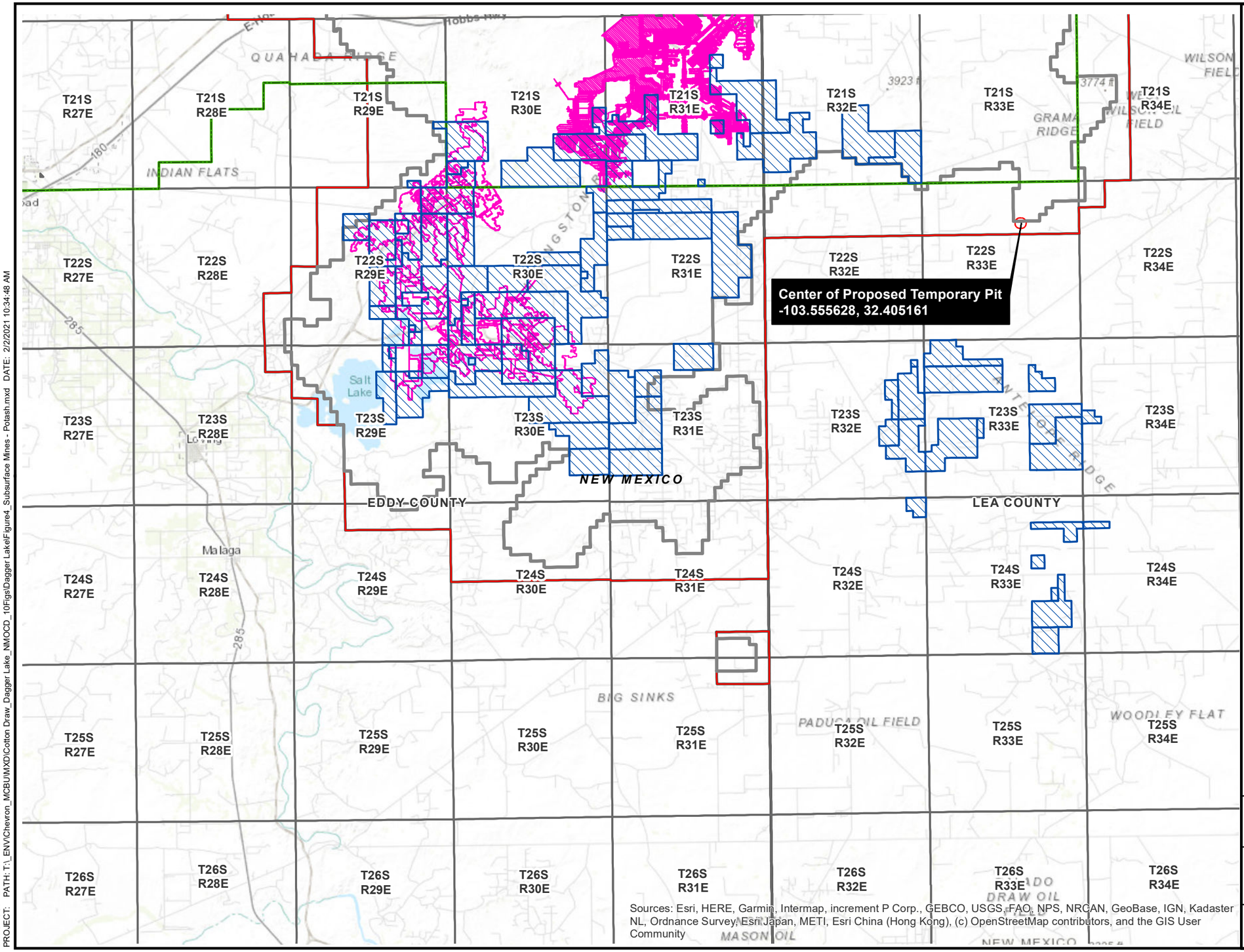
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

FLOODPLAIN MAP

ARCADIS

FIGURE 3

DIV/GROUP: ENV/MDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure3_Floodplain Map.mxd DATE: 2/4/2021 6:25:29 PM



LEGEND

- Mine Workings
- Proposed Temporary Pit
- 1,000 ft Buffer
- Potash Leases
- Four String Casing Area
- Known Potash Leasing Area
- Schedule of Proposed Actions
- Townships

0 20,000 40,000

Feet

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

SUBSURFACE MINES - POTASH

ARCADIS

FIGURE 4

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH:T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure4_Subsurface Mines - Potash.mxd DATE: 2/2/2021 10:34:48 AM

LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- Riverine
- Townships
- Sections

0 2,000 4,000

Feet

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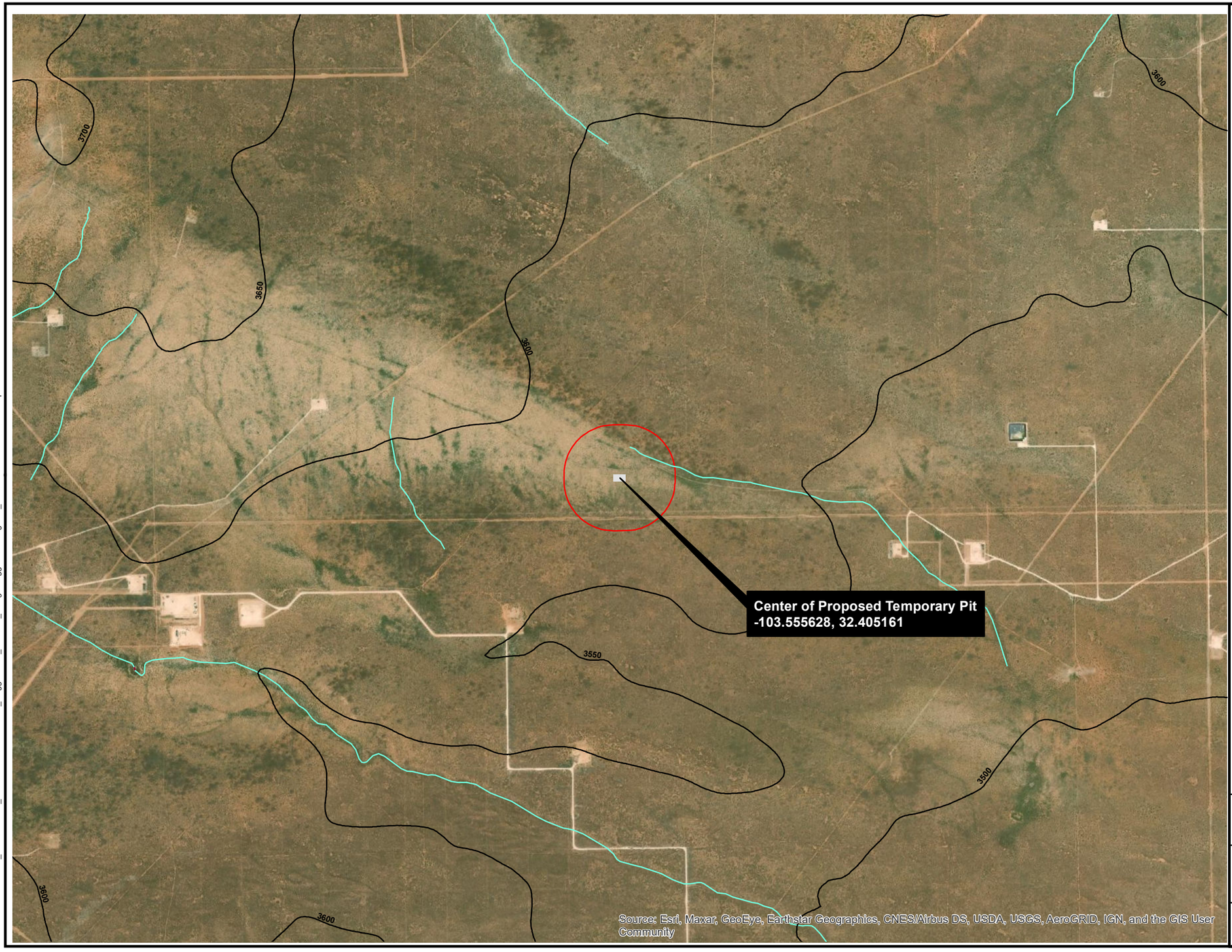
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

WETLANDS MAP

ARCADIS

FIGURE
5

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure5_Wetlands Map.mxd DATE: 2/1/2021 8:20:03 PM



LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- ArtificialPath
- StreamRiver
- USGS Contour Lines NM

0 2,000 4,000

Feet

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ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO

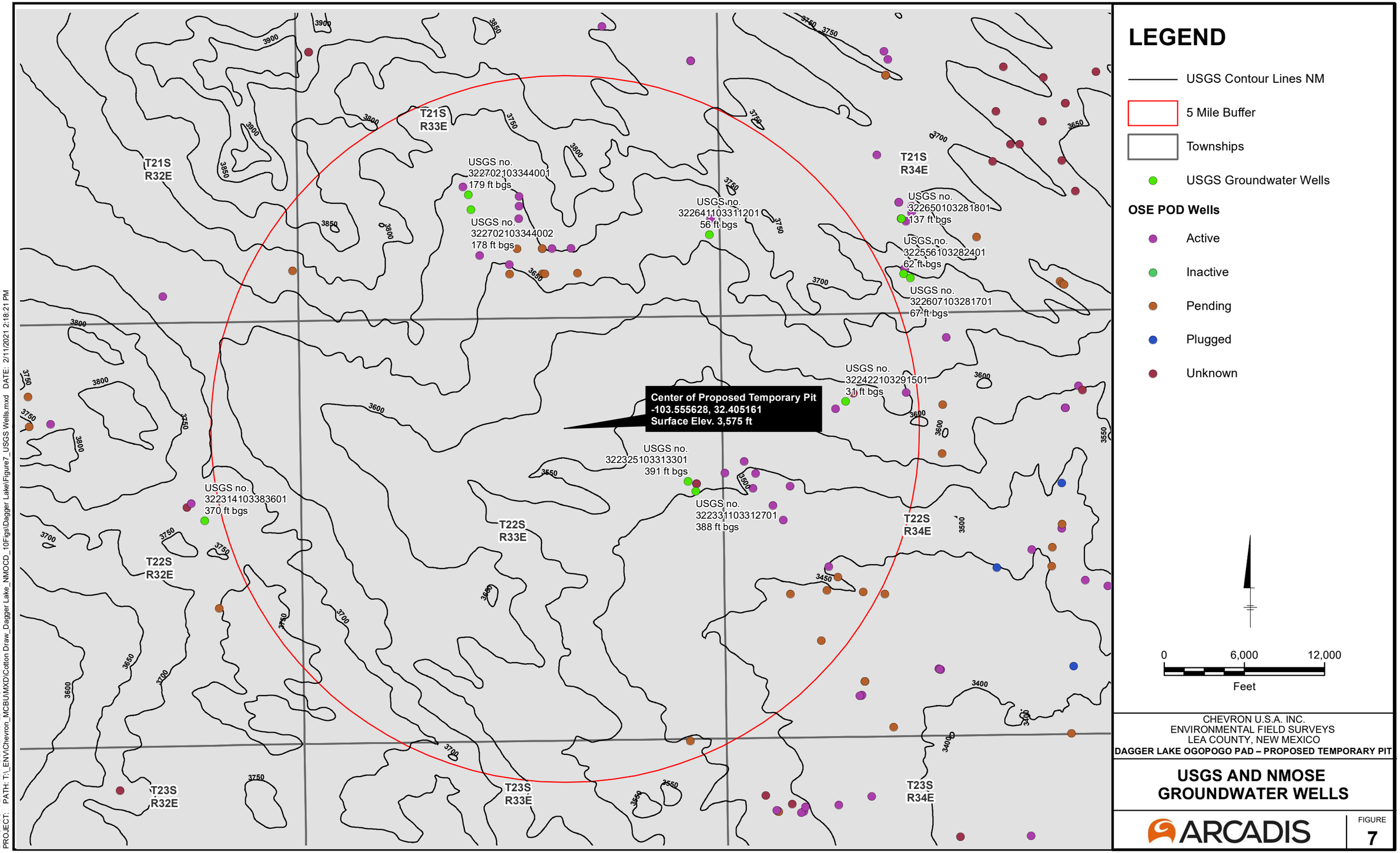
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

ELEVATION CONTOUR & NHD MAP

ARCADIS

FIGURE 6

DIV/GROUP: ENV/MDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure6_Elevation Contour & NHD Map.mxd DATE: 2/1/2021 8:31:44 PM



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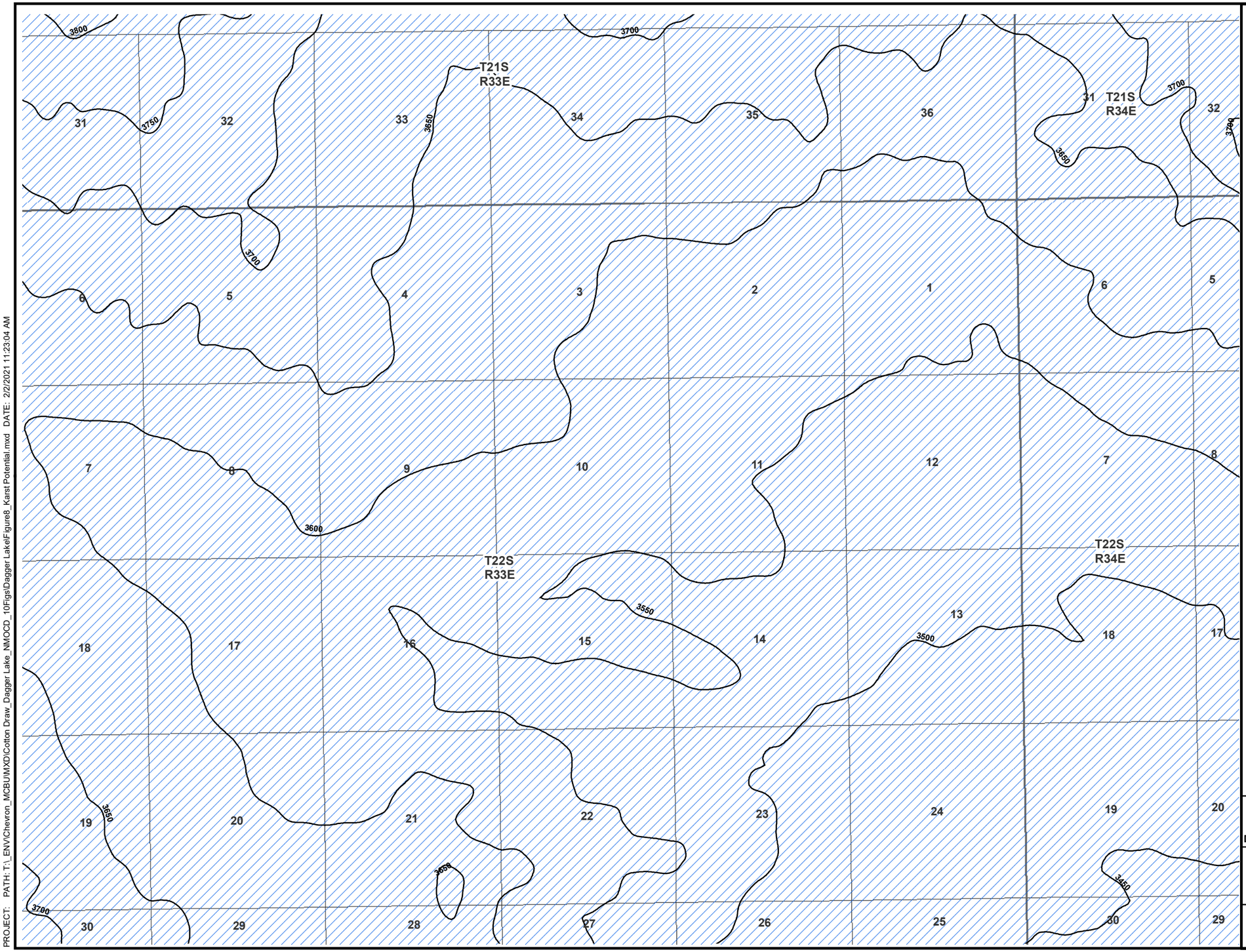


LEGEND

- USGS Contour Lines NM
- Townships
- Sections

Karst Occurence Potential

- Low

0 3,000 6,000

Feet

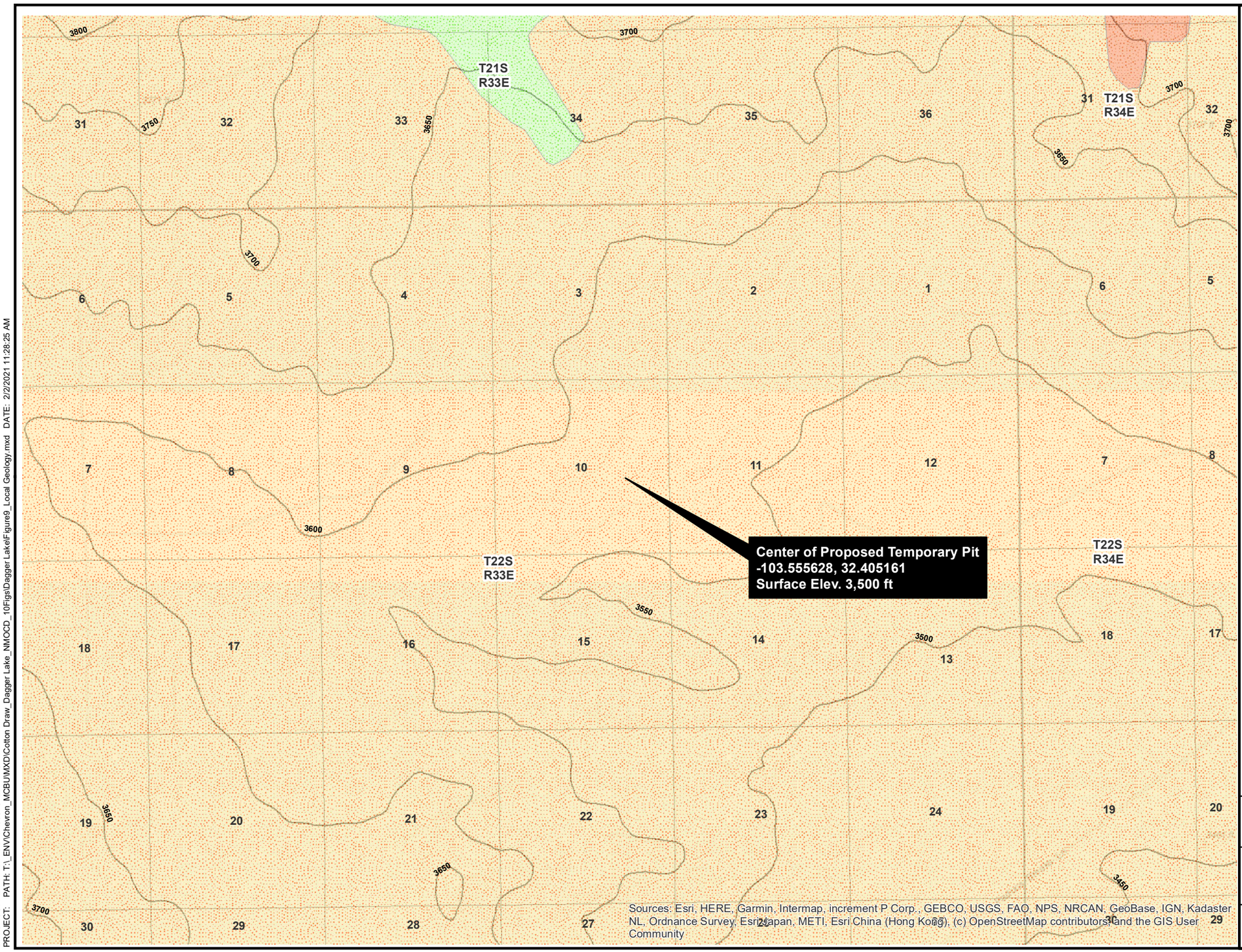
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

KARST POTENTIAL

ARCADIS

FIGURE
8

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure8_Karst Potential.mxd DATE: 2/2/2021 11:23:04 AM



LEGEND

- USGS Contour Lines NM
- Townships
- Sections

Aquifer

Geology

- Qe/Qp
- Qpl
- To

Qe: Quaternary Eolian Deposits
Qp: Quaternary Piedmont Deposits
Qpl: Quaternary Lacustrine and playa deposits
To: Ogallala Formation

0 3,000 6,000
Feet

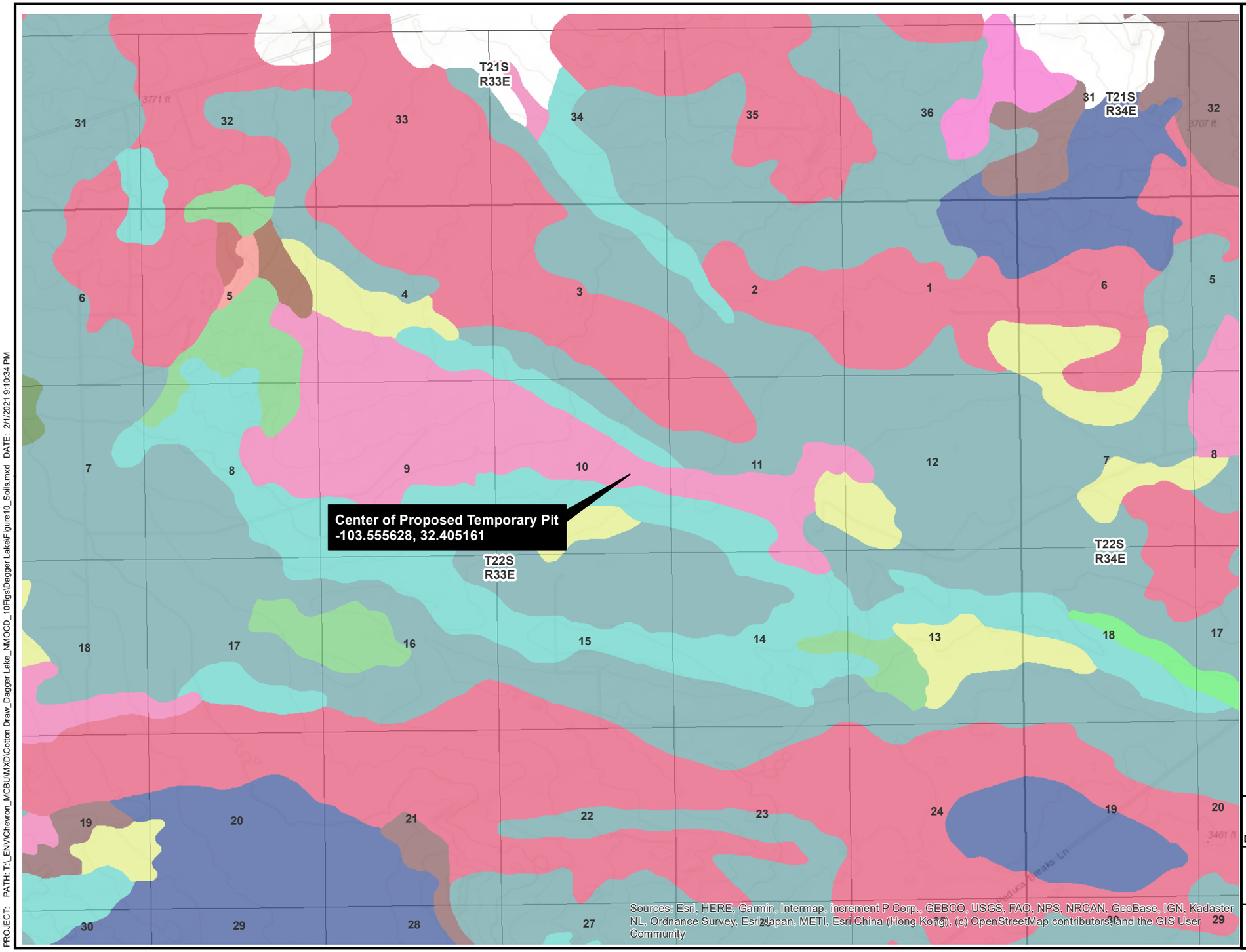
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

LOCAL GEOLOGY

ARCADIS

FIGURE
9

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure9_Local Geology.mxd DATE: 2/2/2021 11:28:25 AM



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LEGEND

- Townships
- Sections

Lea County Soil Data

- BE: Berino-Cacique loamy fine sands association
- BH: Berino-Cacique association, hummocky
- KD: Kermit-Palomas fine sands, 0 to 12 percent slopes
- KM: Kermit soils and dune land, 0 to 12 percent slopes
- KO: Kimbrough gravelly loam, 0 to 3 percent slopes
- LP: Largo-Pajarito complex
- MN: Midessa and wink fine sandy loams
- MW: Mobeetie-Potter association, 1 to 15 percent slopes
- PT: Pyote loamy fine sand
- PU: Pyote and maljamar fine sands
- SE: Simona fine sandy loam, 0 to 3 percent slopes
- SR: Simona-Upton association
- TF: Tonuco loamy fine sand
- WF: Wink fine sand

0 3,000 6,000

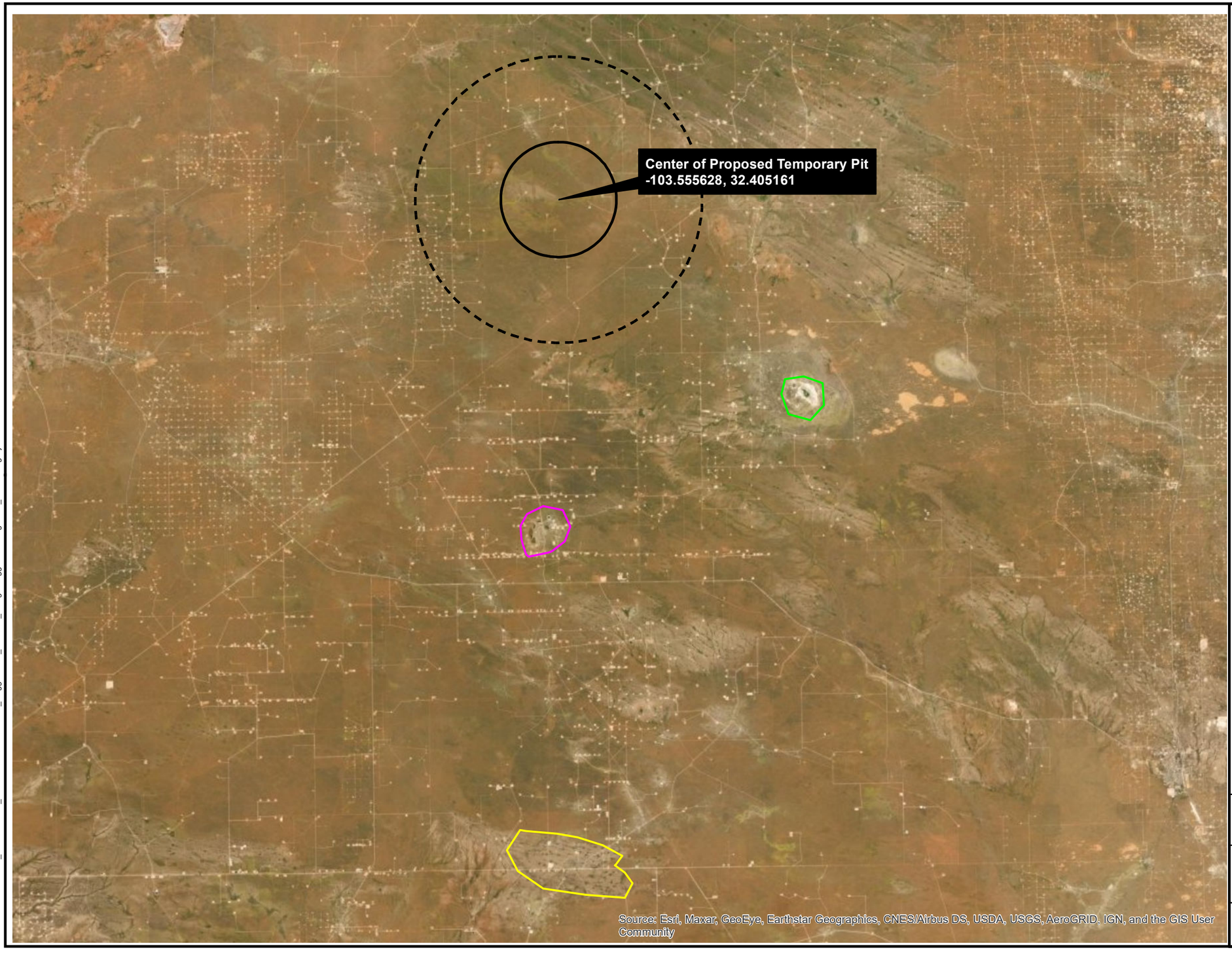
Feet

CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO
DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

SOILS

ARCADIS

FIGURE
10



LEGEND

- Proposed Temporary Pit
- San Simon Sink
- Area with Multiple Small Depressions
- Bell Lake Sink
- 2 Mile Buffer
- 5 Mile Buffer

Note: Boundaries of sink and depression features are approximate.

0 3 6

Miles

CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
LEA COUNTY, NEW MEXICO

DAGGER LAKE OGOPOGO PAD – PROPOSED TEMPORARY PIT

AERIAL IMAGERY OF DISSOLUTION FEATURES

ARCADIS

FIGURE 11

DIV/GROUP: ENV/MDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\MXD\Cotton Draw_Dagger Lake_NMOCD_10Figs\Dagger Lake\Figure12_Aerial Imagery of Dissolution Features.mxd DATE: 2/24/2021 5:58:59 PM

Variance Requests

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Variance Requests
Dagger Lake 15 22 Ogopogo Pad
Temporary Pit

Variance Request 1 of 2 – Extension of Closure Timeline for Temporary Pit

Reason for the requested variance

The Operator wishes to standardize closure practices and procedures across all active development areas where Temporary Pits are used. A closure timeline extension allows for improved flexibility in managing closure operations and would improve efficiency by allowing the closure of multiple pits during a single campaign.

The closure timeline is stated with the definition of a Temporary Pit, in that a pit *"must be closed within six months from the date the operator releases the drilling or workover rig from the first well using the pit"*.

For purposes of this variance, the Operator proposes a timeline based on the date of the first occurrence of Rig Down Move Out (RDMO). RDMO is defined as the activity when the drilling rig is moved off location. Typically, RDMO occurs after the completion of drilling the last well on the pad. On pads where the Operator plans to return to the pad, multiple RDMO dates occur. This variance does not consider subsequent RDMO affecting the closure timeline dates after the first RDMO. The Operator proposes dewatering the pit within 30 days of RDMO and proposes closing the pits within 1 year of RDMO.

The Operator uses a batch drilling process for drilling multiple wells on a single pad. The common procedure is to drill all the surface hole sections first followed by intermediate hole sections and finally production hole sections. The drilling rig skid moves to the next well without performing rig down activities when batch drilling. For the proposed four-well pad, the rig drills surfaces in the order of wells one to four, then intermediates in the order of wells four to one, and finally productions in the order of one to four. Note that specific orders may change based off well design and location specific factors, but the process of skidding and batch drilling is consistent throughout.

If the Operator ceases operations before drilling is complete and the rig is moved off the pad location, this constitutes a RDMO date and the 1-year closure criteria is based off the earliest RDMO date.

The Operator may utilize a smaller surface rig for the drilling of surface holes if permitted to do so. The rig down and move out of the surface rig does not constitute an RDMO date if the larger rig intending to drill production holes arrives within 3 months.

Demonstration that the variance will provide equal or better protection of fresh water, public health and the environment.

In order to uphold the Operator's commitment to people and the environment, the following assurances will be provided in excess of the baseline requirements of 19.15.17 NMAC.

- The Operator will dewater the Temporary Pit within 30 days after RDMO.
- The Operator will utilize a 40-mil HDPE liner, as proposed in **Variance 2**.
- No fluid will be stored in the pit for any purpose after the completion of drilling activities other than in the event of emergency actions as described in 19.15.17.14 NMAC.
- The pits will be visually inspected on a monthly basis between RDMO and closure.
- If fluid is seen in the pit during inspection, then the Operator will mobilize equipment to have the pits drained within 7 days.
- The operator will maintain a fence around the perimeter of the pits and ensure it remains in good repair until closure.

Variance Request 2 of 2 – Proposed Use of High-Density Polyethylene (HDPE) Liner for Temporary Pit in lieu of Linear Low-Density Polyethylene (LLDPE) Liner

Memorandum

To: New Mexico Oil Conservation Division (NMOCD)

From: Chevron MCBU - Facilities Engineering Group

Subject: Variance Request for Use of HDPE Liner Material for Temporary Reserve Pits in New Mexico

Date: 7/23/2020

Chevron requests a variance to NMAC 19.15.17.11 (F) for use of high-density polyethylene (HDPE) geomembrane for the lining of temporary drilling reserve pits. HDPE is a preferred material which Chevron will install during drilling reserve pit construction. Chevron will utilize an HDPE geomembrane which offers equal or better performance than a typically available 20-mil string reinforced linear low-density polyethylene (LLDPE) material detailed in 19.15.17.11 (F), NMAC. An HDPE liner of equivalent thickness or greater than the 20-mil LLDPE will be installed. The following are considered in the design for implementation of the HDPE material to ensure the product is an equivalent, to the LLDPE material described, for temporary reserve drilling pits in New Mexico.

- An HDPE liner that has a thickness of less than 30-mils will be installed in a reserve pit as a shop-fabricated, extruded liner, and will not be field welded. Only HDPE liners of 30-mils in thickness or greater will be field welded for use in the temporary reserve pits.
- HDPE has lower permeability compared to LLDPE. This provides high barrier protection for soils during drilling operations and usage of the pits.
- HDPE may be installed with an underlying geotextile or similar material to provide additional protection from puncture or stress cracking. The subgrade for the liner system will be screened of deleterious materials and rocks and will be suitable for the liner installation. The use of geotextile or similar material will be evaluated on a specific case-by-case basis by Chevron.
- The HDPE liner used in Chevron's temporary reserve pits will have an equivalent or higher tear resistance and puncture resistance than that of a typical 20-mil string reinforced liner.
- HDPE material properties and liner has improved UV resistance to degradation when compared to LLDPE. This allows for extended life and improved long-term durability in pit liner applications.

All requirements for temporary pits' design and construction will be met in accordance with NMAC 19.15.17.11 and liner compatibility will comply with EPA SW-846 Method 9090A. Any requirements that may not be able to be adequately addressed, will be addressed under a separate variance request on a case-by-case basis.

Disclaimer: Tetra Tech, Inc. has not evaluated the full design of temporary reserve pits for Chevron and is not involved in the construction or operation of Chevron's lined, temporary reserve pits. Chevron understands that they will ensure that specific pit designs meet the criteria and intent of the NMAC and applicable codes for each pit location and construction.

7/23/2020

7/23/2020
Nathan Langford, P.E.
Tetra Tech, Inc.

SOLMAX

TECHNICAL DATA SHEET

HDPE Series, 40 mils

Black, Smooth

2801 Boul. Marie-Victorin Varennes, Quebec Canada J3X 1P7
Tel: (450) 929-1234 Sales: (450) 929-2544 Toll free in North America:1-800-571-3904 www.Solmax.com www.solmax.com

PROPERTY	TEST METHOD	FREQUENCY(1)	UNIT Imperial	
SPECIFICATIONS				
Thickness (min. avg.)	ASTM D5199	Every roll	mils	40.0
Thickness (min.)	ASTM D5199	Every roll	mils	36.0
Melt Index - 190/2.16 (max.)	ASTM D1238	1/Batch	g/10 min	1.0
Sheet Density (8)	ASTM D792	Every 10 rolls	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - standard (avg.)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 2 rolls		
Strength at Yield			ppi	88
Elongation at Yield			%	13
Strength at Break			ppi	162
Elongation at Break			%	700
Tear Resistance (min. avg.)	ASTM D1004	Every 5 rolls	lbf	28
Pun ture Resis ance (min. avg.)	ASTM D4833	Every 5 rolls	lbf	80
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch Per	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
Low Temperature Brittleness	ASTM D746	Certified	°F	- 106
SUPPLY SPECIFICATIONS (Roll dimensions may vary ±1%)				

NOTES

1. Testing frequency based on standard roll dimension and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsability of the user. SOLMAX assumes no liability in connection with the use of this information.

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

SOLMAX

TECHNICAL DATA SHEET

HDPE Series, 40 mils

Black, Top Side Single Textured

2801 Boul. Marie-Victorin Varennes, Quebec Canada J3X 1P7
Tel: (450) 929-1234 Sales: (450) 929-2544 Toll free in North America: 1-800-571-3904 www.Solmax.com www.solmax.com

PROPERTY	TEST METHOD	FREQUENCY(1)	UNIT Imperial	
SPECIFICATIONS				
Nominal Thickness		-	mils	40
Thickness (min. avg.)	ASTM D5994	Every roll	mils	38.0
Lowest ind. for 8 out of 10 values			mils	36.0
Lowest ind. for 10 out of 10 values			mils	34.0
Asperity Height (min. avg.) (3)	ASTM D7466	Every roll	mils	16
Textured side		-		Top
Melt Index - 190/2.16 (max.)	ASTM D1238	1/Batch	g/10 min	1.0
Sheet Density (8)	ASTM D792	Every 10 rolls	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - standard (avg.)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 2 rolls		
Strength at Yield			ppi	88
Elongation at Yield			%	13
Strength at Break			ppi	88
Elongation at Break			%	150
Tear Resistance (min. avg.)	ASTM D1004	Every 5 rolls	lbf	30
Pun ture Resis ance (min. avg.)	ASTM D4833	Every 5 rolls	lbf	90
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch Per	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
Low Temperature Brittleness	ASTM D746	Certified	°F	- 106
SUPPLY SPECIFICATIONS (Roll dimensions may vary ±1%)				

NOTES

1. Testing frequency based on standard roll dimension and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
3. Lowest individual and 8 out of 10 readings as per GRI-GM13 / 17, latest version.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.

Appendix A

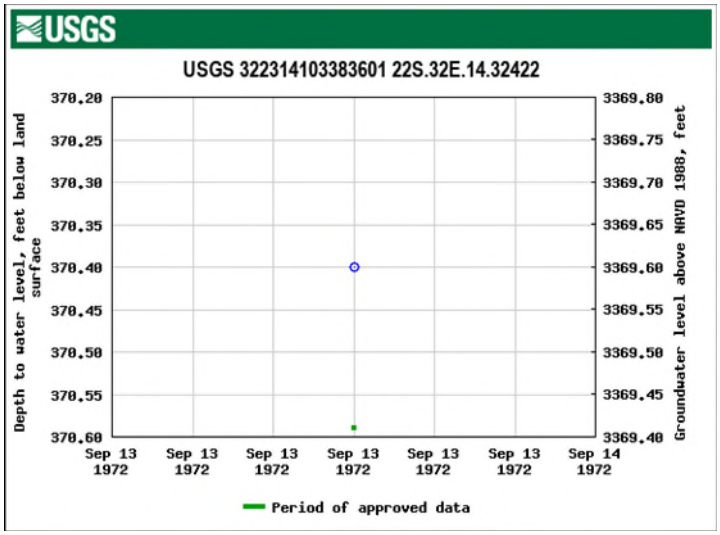
United States Geological Survey

Groundwater Data

Appendix A – USGS Groundwater Data

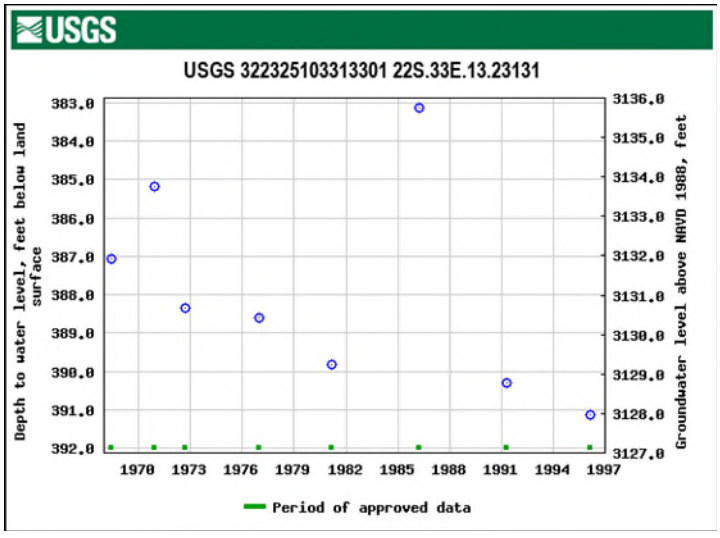
USGS 322314103383601 22S.32E.14.32422

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°23'14", Longitude 103°38'36" NAD27
Land-surface elevation 3,740 feet above NAVD88
The depth of the well is 380 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.



USGS 322325103313301 22S.33E.13.23131

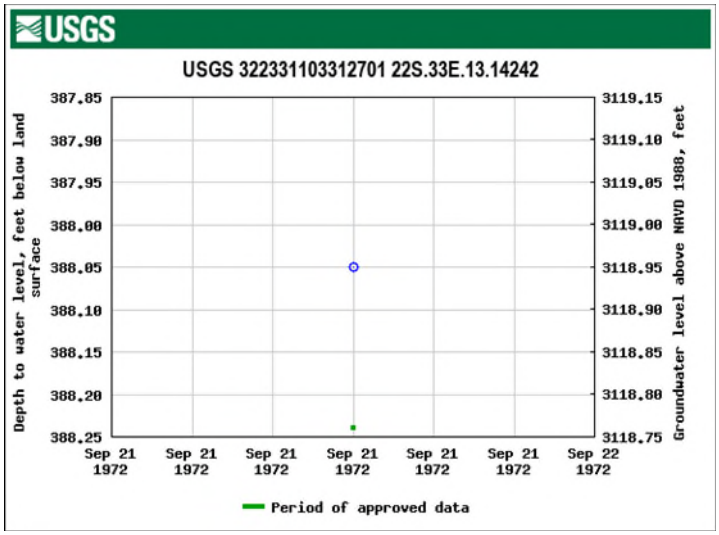
Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°23'38.6", Longitude 103°31'33.6" NAD83
Land-surface elevation 3,519 feet above NAVD88
The depth of the well is 508 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Chinle Formation (231CHNL) local aquifer.



Appendix A – USGS Groundwater Data

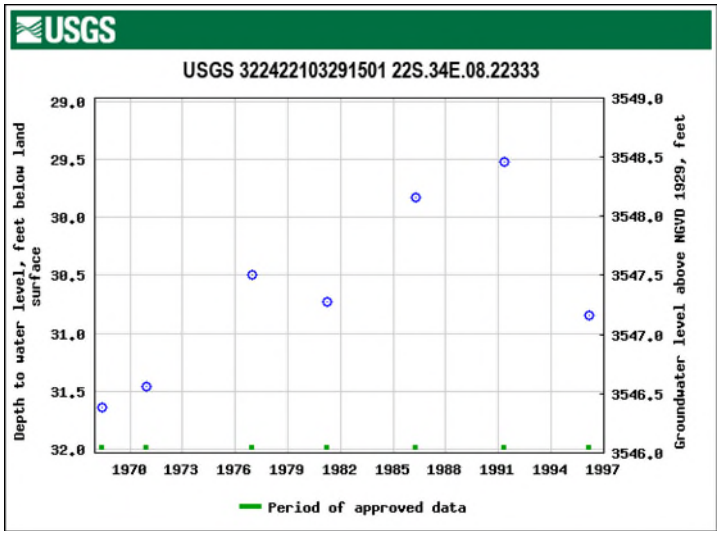
USGS 322331103312701 22S.33E.13.14242

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°23'31", Longitude 103°31'27" NAD27
Land-surface elevation 3,507 feet above NAVD88
The depth of the well is 490 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Chinle Formation (231CHNL) local aquifer.



USGS 322422103291501 22S.34E.08.22333

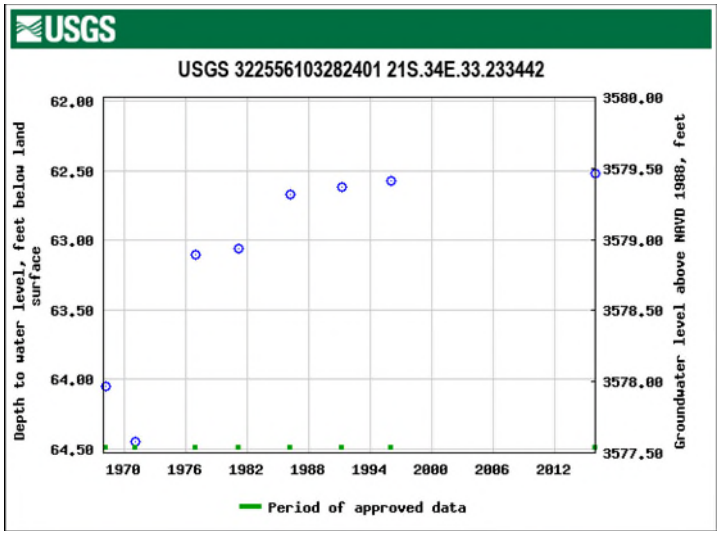
Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°24'36", Longitude 103°29'15" NAD27
Land-surface elevation 3,578.00 feet above NGVD29
The depth of the well is 35 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.



Appendix A – USGS Groundwater Data

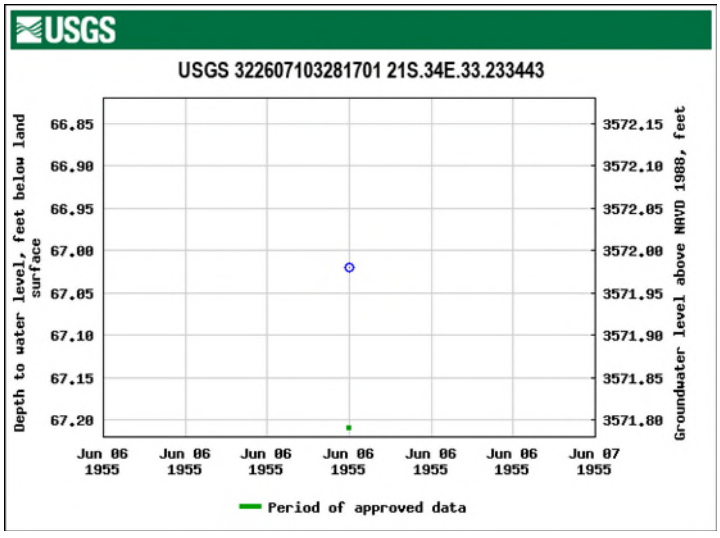
USGS 322556103282401 21S.34E.33.233442

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°26'10.1", Longitude 103°28'22.7" NAD83
Land-surface elevation 3,642 feet above NAVD88
The depth of the well is 92 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Ogallala Formation (121OGLL) local aquifer.



USGS 322607103281701 21S.34E.33.233443

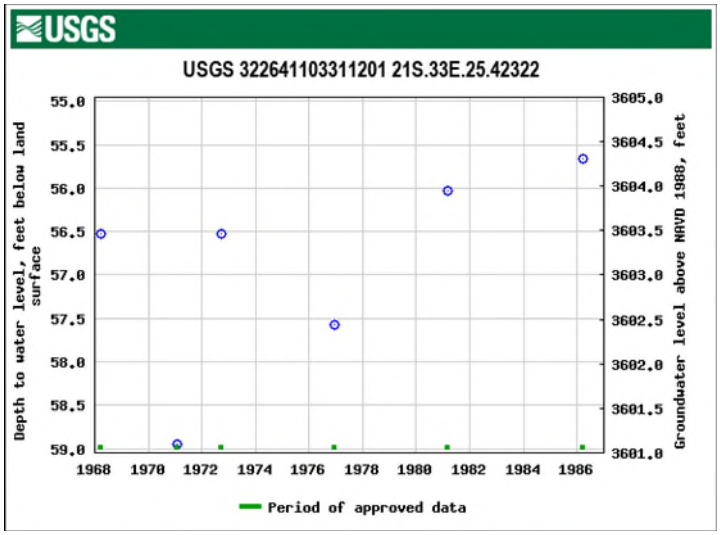
Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°26'07", Longitude 103°28'17" NAD27
Land-surface elevation 3,639 feet above NAVD88
The depth of the well is 80 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Ogallala Formation (121OGLL) local aquifer.



Appendix A – USGS Groundwater Data

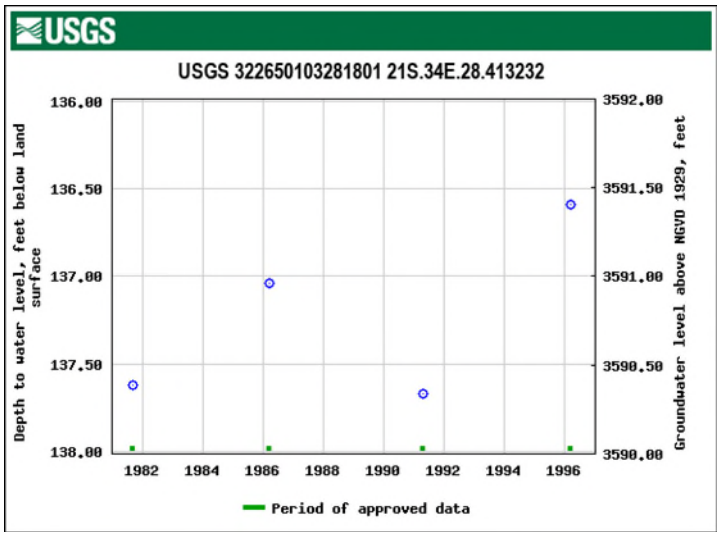
USGS 322641103311201 21S.33E.25.42322

Lea County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°26'41", Longitude 103°31'12" NAD27
Land-surface elevation 3,660 feet above NAVD88
The depth of the well is 68 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.



USGS 322650103281801 21S.34E.28.413232

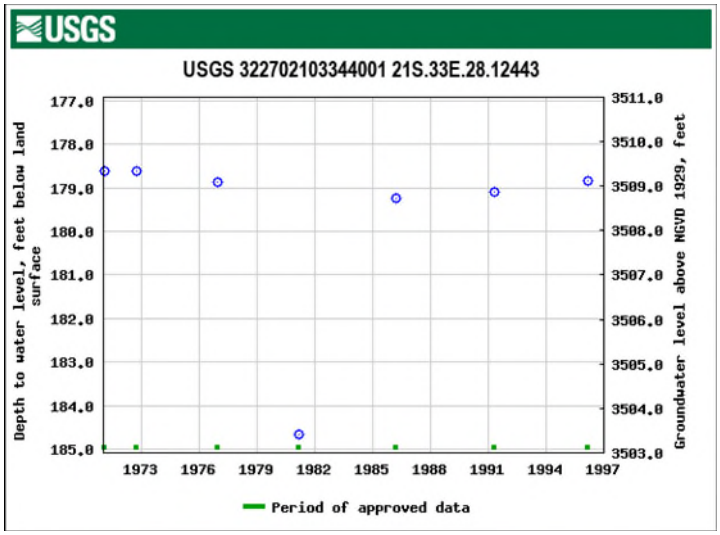
Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°26'51", Longitude 103°28'24" NAD27
Land-surface elevation 3,728.00 feet above NGVD29
The depth of the well is 170 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Ogallala Formation (121OGLL) local aquifer.



Appendix A – USGS Groundwater Data

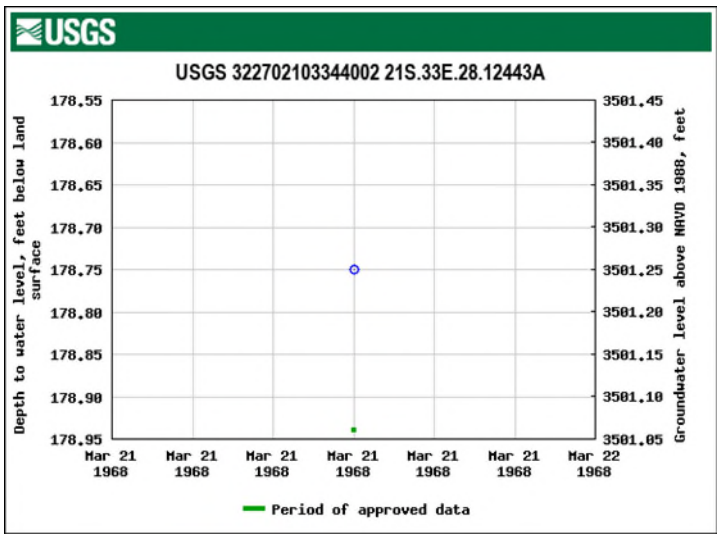
USGS 322702103344001 21S.33E.28.12443

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°27'13", Longitude 103°34'42" NAD27
Land-surface elevation 3,688.00 feet above NGVD29
The depth of the well is 224 feet below land surface.
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Chinle Formation (231CHNL) local aquifer.



USGS 322702103344002 21S.33E.28.12443A

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°27'02", Longitude 103°34'40" NAD27
Land-surface elevation 3,680 feet above NAVD88
This well is completed in the Other aquifers (N9999OTHER) national aquifer.
This well is completed in the Chinle Formation (231CHNL) local aquifer.



Appendix B

New Mexico Office of the State Engineer

Water Column/Average Depth to Water Data

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 00592 POD1	CP	ED		3	2	13	22S	33E	638834	3585015*	3252	427		
CP 01724 POD1	CP	LE	3	1	1	18	22S	34E	639475	3585260	3779	1172	800	372
CP 01356 POD1	CP	LE	4	2	2	33	21S	33E	634560	3590014	3959	1098	555	543
CP 01411 POD1	CP	LE		2	2	34	21S	33E	635968	3590386	4124	1149		
CP 01411 POD2	CP	LE		1	2	34	21S	33E	635534	3590380	4127	1125		
CP 01725 POD1	CP	LE	1	2	1	18	22S	34E	639914	3585521	4149	1137	800	337
CP 00854 POD1	CP	LE	1	1	2	33	21S	33E	633879	3590223	4414	950	600	350
CP 01721 POD1	CP	LE	4	2	1	18	22S	34E	640181	3585244	4467	1108	820	288
CP 01723 POD1	CP	LE	4	4	1	18	22S	34E	640117	3584905	4496	1140	785	355
CP 01355 POD1	CP	LE	2	1	3	27	21S	33E	634773	3591061	4912	1192	582	610
CP 01455 POD1	CP	LE	4	1	4	18	22S	34E	640574	3584515	5055	1033	615	418
CP 01357 POD1	CP	LE	4	3	1	27	21S	33E	634782	3591347	5190	1286	578	708
CP 01722 POD1	CP	LE	4	4	2	18	22S	34E	640964	3584949	5298	1122	785	337
CP 01362 POD1	CP	LE	3	4	4	18	22S	34E	640809	3584182	5395	1032	613	419
CP 01349 POD1	CP	LE	2	3	1	27	21S	33E	634782	3591569	5408	1188	572	616
CP 00600 POD1	CP	LE		2	4	25	21S	33E	639152	3591054*	5828	65		
CP 00601 POD1	CP	LE		2	1	28	21S	33E	633502	3591791*	5997	223		
CP 01720 POD1	CP	LE	1	3	2	08	22S	34E	642003	3586723	6189	1190	824	366
CP 00597 POD1	CP	LE		2	2	08	22S	34E	642410	3587074*	6628	35		
CP 00865 POD1	CP	LE	2	2	3	20	22S	34E	641845	3583118	6787	885	605	280
CP 00744	CP	LE		1	2	09	22S	34E	643618	3587091*	7830	460		

***UTM location was derived from PLSS - see Help**

Average Depth to Water: **681 feet**

Minimum Depth: **555 feet**

Maximum Depth: **824 feet**

Record Count: 21

UTMNAD83 Radius Search (in meters):

Easting (X): 635831 **Northing (Y):** 3586264 **Radius:** 8047

Appendix C – Hydrogeologic Data

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Appendix C – Hydrogeologic Data
Dagger Lake 15 22 Ogopogo Pad Pit
Temporary Pit

Topography and Surface Hydrology

The location of the proposed temporary pit is in southwestern Lea County, New Mexico between the Mescalero Ridge and the Pecos River in the Pecos Valley section of the Great Plains physiographic province. The pit lies at an elevation of 3,575 ft above sea level and the general area in the vicinity of the pit is characterized by relatively flat to gentle sloping terrain with many shallow depressions and occasional dunes, but no well-established drainages. The land surface slopes gently to the southeast at approximately 45 feet per mile.

Surface water in the vicinity of the proposed pit is affected naturally by the shallow geology, precipitation, and some water erosion. The area is located in the semi-arid southwest near the northern edge of the Chihuahuan Desert. The climate is characterized by low annual precipitation, low humidity, and high average annual temperature and ranges from dry subhumid to arid. Precipitation is variable both regionally and seasonally and averages about 12 inches or less annually with the greatest rainfall occurring as monsoonal storms during the summer months. The area is situated at the southwest edge of the Great Plains dust-bowl area and is sometimes subjected to severe windstorms (Nicholson and Clebsch 1961).

Southwestern Lea County, including the temporary pit area, lies within the Lower Pecos River Basin. The major stream in this Basin is the Pecos River, which is located approximately 26 miles to the west southwest of the proposed pit location in southeastern Eddy County. Surface water in the Lower Pecos River Basin comes from three main sources: inflow from the Upper Pecos River Basin, flood inflow from storm events, and groundwater base inflow. The Pecos River bisects Eddy County and runs through the center of the City of Carlsbad. The Pecos River is dammed by Brantley Dam and by Avalon Dam 10 miles northwest and five miles north of Carlsbad, respectively, and by Red Bluff Dam located just across the New Mexico – Texas state line and west-southwest of the proposed pit location.

The proposed pit location is not within 1,000 feet of a continuously flowing waterway course, any other significant watercourse or lakebed, sinkhole, or playa lake (**Figure 6**). The nearest feature (ephemeral drainage) is more than 500 feet northwest of the pit location. The nearest surface water feature (Pecos River) is in excess of 26 miles west-southwest of the pit location.

Soils

The most common soil map units within the survey area are the Kermit Soils & Dune Sand (KM) and the Simona Fine Sandy Loam (SE), which are composed primarily of loamy sand. Within Lea County, these soil types are summarized by the USDA as well-drained soils that have a fine sand or sandy clay loam subsoil. These soil map units are

often used for range and wildlife within the SDDA (USDA 1974 and 2016a). The soil map units within the survey area are listed in the following table. A map depicting the distribution of the soil map units within the SDDA is provided in **Figure 10**. Ecological Site Descriptions (ESDs) are groups of soil map units that respond similarly to ecological processes. The survey area consists of one ESD, loamy sand, and the characteristics are further outlined below.

Table 2. Soils Within the Survey Area

Soil Abbreviation and Name	Slope
PU – Pyote & Maljamar Fine Sand	0-3 percent
KM – Kermit Soils & Dune Sand	0-12 percent
SE – Simona Fine Sandy Loam	0-3 percent
TF - Tonuco Loamy Fine Sand	0-3 percent
BE – Bernio – Cacique Loamy Fine Sands Association	0-3 percent

Loamy Sand

The majority of the soils within the survey area are classified as loamy sand soils. These loamy sand soils consist of the Pyote & Maljamar, Kermit, Simona, and Tunuco soil series with additional minor soil types. These soils are typically moderately deep that consist of loamy sand underlain by sandy clay loam and cemented materials. Slopes range from 0 to 3 percent within these sandy soils, with some areas (Kermit soils) ranging from 0-12 percent slope. If these soils are unprotected by plant cover, they are easily wind blown into low hummocks. These soils have rapid permeability and are well drained. These soils support grassland vegetative communities dominated by species such as sand bluestem, yellow Indiangrass, black grama, dropseed species, and little bluestem. Dominant shrub species observed within these soils were creosote bush (*Larrea tridentate*), mesquite (*Prosopis glandulosa*), rubber rabbitbrush (*Ericameria nauseosa*), and yucca sp. (*Yucca sp*.). The annual grasses and forbs population will fluctuate with the variation of amount of rainfall annually and with the seasons. Without brush and graze control the vegetative communities within these soils will become shrub dominate, and there will be a loss of grass cover and increased surface soil erosion (USDA 2016b).

Geology

The area in the vicinity of the proposed pit is underlain by recent eolian deposits consisting of drift sand a few feet in thickness, lacustrine and playa-lake deposits, and local occurrences of sand dunes. The eolian deposits are underlain by Pleistocene to recent alluvial deposits consisting of unconsolidated to partially consolidated sand, silt, clay and caliche (**Figure 9**). Alluvium thickness in this area appears to be approximately 20 feet or less. Ogallala Formation underlies the alluvium and consists of sand, silt, clay, gravel and caliche. Its thickness ranges up to approximately 205 feet in the survey area. Triassic Dockum strata underlie the Ogallala Formation and its thickness appears to be over 1,000 feet or more in some places. The Dockum Group has been divided into three

formations: lower red shale, siltstone, and very fine-grained sandstone called the Tecovas Formation (or Pierce Canyon redbeds); middle reddish-brown and gray sandstone called the Santa Rosa sandstone; and upper brick-red to maroon and purple shale with thin beds of fine red or gray sandstone and siltstone called the Chinle Formation.

- The Tecovas or Pierce Canyon redbeds (considered Permian by some geologists and sometimes correlated with the Dewey Lake redbeds) overlie the Rustler Formation. The Tecovas consists of red sandy shale and fine-grained sandstones with greenish–gray inclusions and can be several hundred feet thick.
- The Santa Rosa sandstone consists of reddish-brown and gray, medium- to coarse-grained, micaceous, well-cemented sandstone and conglomerate. The sandstone is typically cross-bedded and is interbedded with red shale and siltstone. The thickness of the Santa Rosa sandstone can be several hundred feet in this area.
- The Chinle Formation consists of a series of red shales and thin interbedded sandstones and appears to be several hundred feet thick in this part of southern Lea County.

Permian strata consisting of the Dewey Lake redbeds (sometimes correlated with the Tecovas Formation) and the Rustler Formation underlie the Triassic Dockum. The Dewey Lake is a series of red beds consisting of micaceous red siltstone, shale, and sandstone with gypsum cementation

The Rustler Formation consists largely of anhydrite, gypsum, interbedded sandy clay and shale, and dolomitic limestone near the upper part of the formation. The Rustler overlies the Salado Formation and is approximately 400 feet thick in this area (Nicholson and Clebsch 1961). The Rustler typically consists of a lower clastic unit composed mainly of red and gray shale and some interbedded anhydrite and an upper anhydrite unit containing dolomitic limestone beds of varying thicknesses.

Geologic units in the general area of the proposed pit that contain potentially usable groundwater are the Ogallala Formation, the Dockum Group, and possibly the Rustler Formation.

Groundwater

In the vicinity of the proposed pit, the Ogallala Formation, the Dockum Group and the Rustler Formation have the potential to provide small quantities of water to water supply wells. No water wells were found at or within approximately two miles of the proposed pit (**Figures 7**). Several water wells have been identified 2 to 5 miles of the proposed pit location which are used primarily to support domestic, livestock and / or oil and gas exploration water needs. The depths of the wells along with USGS data indicate that some are completed in the Alluvium/Ogallala and some completed in the Dockum formation.

Depth to Water: An analysis of publicly available data from the MNOSE and USGS indicate that the depth to groundwater beneath the proposed location is in excess of 100 feet based on the closest wells which are located more than 2 miles to the east-southeast. Based on the USGS data, the depths to water within a 5-mile radius of the proposed pit range from 31 feet to (in an Alluvium/Ogallala wells located approximately 3.5 miles east of the site) to 391 feet in a Triassic Dockum (Chinle) well located over 2 miles east-southeast of the proposed site. The NMOSE data shows depths to water ranging from 555 feet to 824 feet across the general area and corresponding well depths ranging up to 1,286 feet. The NMOSE wells appear to be completed in the Triassic Dockum or possibly the Rustler.

This part of Lea County appears to be situated at or near the northern edge of the Pecos River Basin Alluvium aquifer. In this area, the alluvium present appears to be 20 feet in thickness or less and contains very limited to no water based on data from the USGS and NMOSE database and is underlain by the Ogallala aquifer. The Ogallala aquifer is a source of potable water in this general area. The Groundwater within 5 miles of the proposed location does not appear to be present in the Pecos River Basin Alluvial aquifer. The proposed location is not located above the mapped extent of the Pecos River Basin Alluvial aquifer. The Triassic Dockum formations which underlie the Alluvium/Ogallala are also sources of potable water. There are several water wells within 5 miles of the location based on the USGS and NMOSE data and zero water wells within 1 mile of the location. Reported well yields in the NMOSE database for the water wells in this area range up to 100 gallons per minute.

Recharge:

Recharge is by direct precipitation and infiltration from intermittent streamflow and subsurface groundwater flow from upgradient areas. The region is characterized by an annual precipitation of 10 to 20 inches and high average annual evaporation rates. Most recharge is episodic and associated with periods of heavy rainfall. Recharge is most likely to occur during long-duration rainfall events or periods of frequent, smaller rainfall events. Otherwise the water has a high likelihood of being lost to evapotranspiration. The average annual recharge rate for the Pecos River Basin aquifer in Lea Co., NM is between 0 and 0.5 inches/year (Hutchison et al., 2011).

References

Hutchison, W. R., I. C. Jones and R. Anaya. 2011. Update of the groundwater availability model for the Edwards-Trinity (plateau) and Pecos Valley aquifers of Texas.

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Nicholson, Alexander, Jr. and Clebsch, Alfred, Jr. 1961. Ground-Water Report 6 – Geology and Ground-Water Conditions in Southern Lea County, New Mexico. United States Geological Survey in cooperation with the New Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Division and the New Mexico State Engineer.

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USDA. 2016. Sandy Ecological Site Characteristics. [Web page]. Located at https://esis.sc.egov.usda.gov/ESDReport/fsReport.aspx?approved=yes&repType=regular&id=R042XA051NM. Accessed: September 2017.

Appendix D – Design Plan

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Appendix D – Design Plan

Dagger Lake 15 22 Ogopogo Pad Pit

Temporary Pit

The Operator will design and construct the temporary pit to contain liquids and solids; prevent contamination of fresh water; and protect public health and the environment. The Design and Construction will follow the requirements listed below:

- The topsoil will be stripped and stockpiled prior to construction for use as the final cover during closure.
- A sign, consistent the requirements of 19.15.16.8 NMAC, will be utilized and made viewable at the location of the pit.
- Fencing will be in place around the perimeter of the pits and the Operator will ensure it remains in good repair until closure.
- Netting will not be installed on the temporary pit; however, the operator will inspect for and report any discovery of dead migratory birds or other wildlife while the pit contains fluid and is in use.
- The design of the pit, including the berms, geomembrane material, and construction notes below, is intended to ensure the confinement of liquids to prevent releases.
- The subgrade and interior slopes will be screened for deleterious materials and rocks and will be suitable for the liner installation. An underlying geotextile may be used to provide additional protection from puncture or stress cracking.
- The slopes of the pit will be constructed at a two horizontal to one vertical foot ratio.
- A 40-mil HDPE liner resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions, and ultraviolet light will be installed in the pit. Liner compatibility will comply with EPA SW-846 Method 9090A. Technical data sheets for the liner material can be found in *Variance Request 2 of 2 – Proposed Use of High-Density Polyethylene (HDPE) Liner for Temporary Pit in lieu of Linear Low-Density Polyethylene (LLDPE) Liner.*
- Liner seams will be minimized as is practical during construction and will only be oriented up and down a slope. When field welding the liner seams, the liner will overlap a minimum of 4 inches and a maximum of 6 inches. Welds will be minimized in corners and irregularly shaped area. Welds will only be performed by qualified personnel.
- Construction will avoid excessive stress-strain on the liner by screening the subgrade for deleterious materials and rock and using geotextile where needed, utilized experienced personnel for the installation of the liner, taking care when unrolling liner material and limitingthe use of any machinery that could damage the liner.
- The edged of the liner will be anchored in the bottom of a compacted earth field trench that is 18 inches deep.

- Impingement of liquids onto the liner will be prevented by use of a loose hose discharge method. The design ensures fluid enters a malleable section of hose laying on the pit berm prior to entering the pit preventing direct impingement.
- The design includes a 4 foot berm and bar ditch around the entirety of the pit to prevent run on of surface water. The berm will be maintained from construction to closure.
- The volume of the temporary pit is 6.6 acre-ft including freeboard.
- No venting or flaring of gas will take place during the construction, use, and closure of the pit and, as such, the entirety of the pit will be lined.

DL 15 22 Ogopogo Well Pad

Construction Work Package

CWP #: 1	Date Printed: 2/8/2021

1.0 Scope

Construction of required access roads, 3-well BGWH well pad, and standard drilling reserve pit for the first three Ogopogo wells in Dagger Lake, NM. All required drawings are in appendix 5.

- Well pad dimensions: 680'x480'
  - Complete compaction of strong back and sand silo areas per the provided geotechnical report
- 20' wide access roads: 2,800' long
- Construction two cells of drilling reserve pit

All checksheets in appendix 6 shall be filled out and verified by Chevron construction rep

As Built will be required on all pads

Contracting Plan

Contract Type	Contractor	Contact Information
Unit Rates	Sweatt	
T&M (if not defined in unit rates)		

2.0 Location

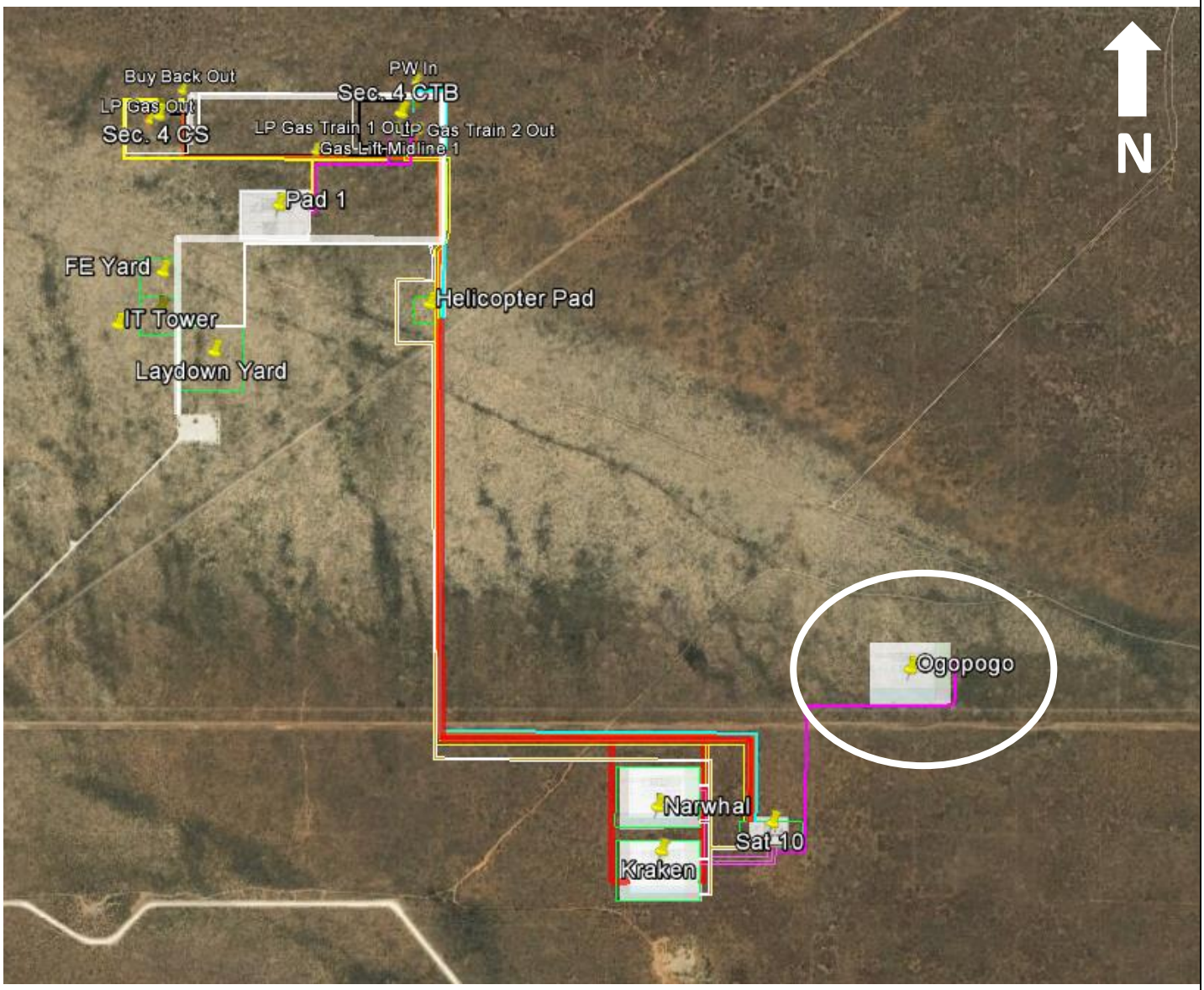
Facility	Dagger Lake Ogopogo Pad			
	LAT	32.403926°	LONG	-103.556787°

SITE LAYOUT

DL 15 22 Ogopogo Well Pad

Construction Work Package

CWP #: 1	Date Printed: 2/8/2021



3.0 Execution Plan

GENERAL

- CONTRACTOR will complete work per Service Order agreements
- CONTRACTOR will contact One Call and appropriate local agencies to locate buried utilities within the proposed construction area. On-site Chevron personnel will be responsible for locating underground utilities owned by Chevron that are not located by One Call or affiliated contractors.

Well Pad Construction

- CONTRACTOR shall construct a three well below-grade well head (BGWH) pad with drilling reserve pit per drawing dimensions provided in appendix 5.
    a. Entire pad shall be cleared and grubbed to ensure removal of topsoil. If maximum 6" of grubbing is not sufficient, CONTRACTOR is to submit and RFI on how to proceed.
    b. When leveling the pad, fill material shall not be placed in lifts greater than 8" thick. Each lift shall be moisture treated, compacted, and proof rolled.
    c. The subgrade surface shall be scarified and rolled to prevent ponding and allow the strongback area to be clear of collecting water.
- CONTRACTOR shall excavate and compact walking area and shaker area per the Geotechnical Report provided in appendix 5.
    a. Caliche shall be sourced from CHEVRON approved pits in the project area.
    b. The entire cleared pad area shall have a caliche cap of at least 6 inches after compaction.
- CONTRACTOR shall excavate and contour reserve pit per standard drawing and cut/fill requirements.

Roads

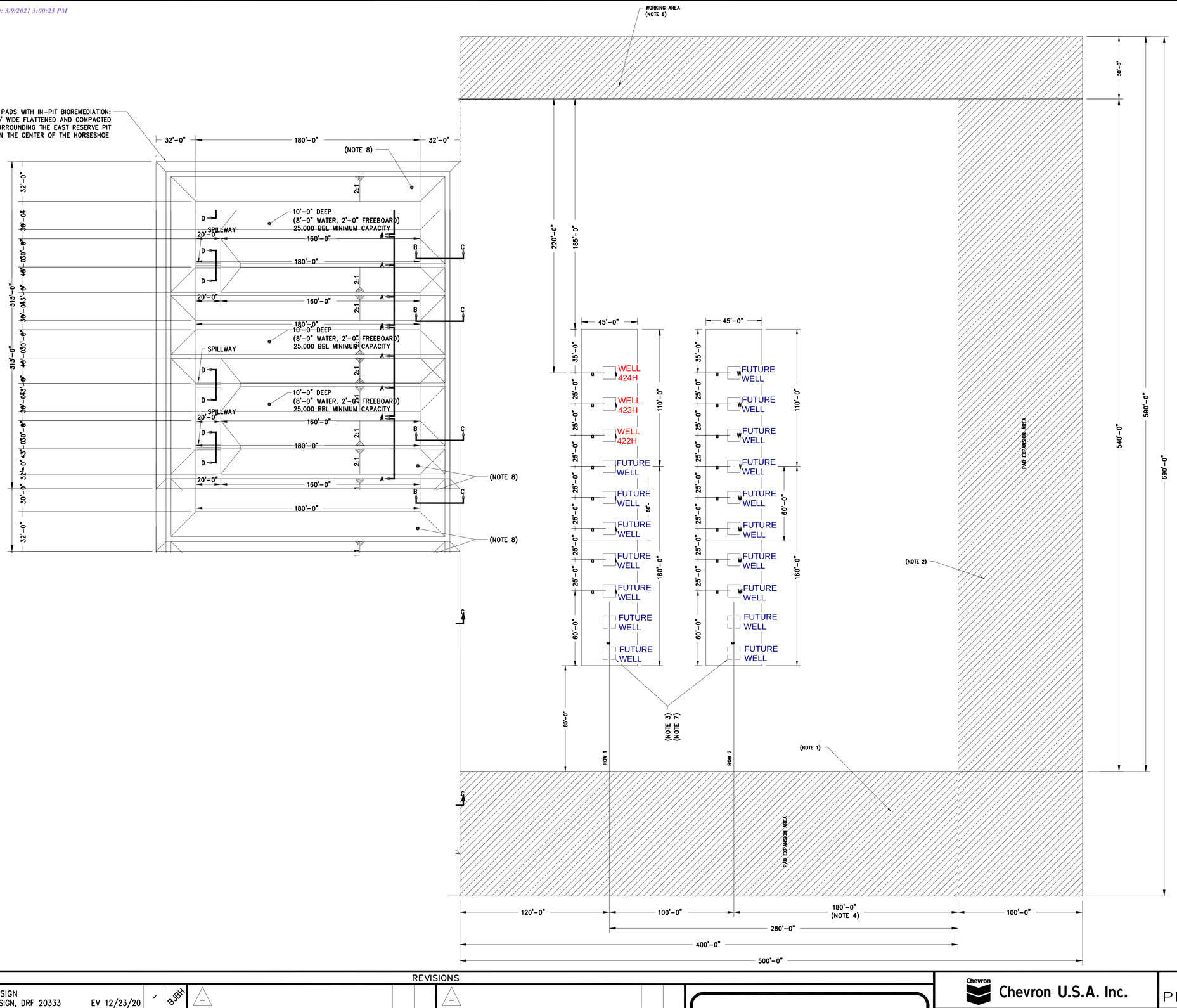
- The road construction shall be built in accordance with local and state laws, BLM requirements, and drawings provided. Some other considerations to follow:
    a. Leveling – This work consists of cutting and compact filling the natural soils where necessary to obtain a smooth longitudinal grade along the road and a sub-grade to accept the caliche top course. Maximum slope of the roads to the pad shall be 4°.
    b. Caliche top course shall be placed and compacted in 8" lifts. Road shall be graded to create the proper crown (2%) to drain water.
    c. Roads/Ramps shall be twenty (20) feet wide with five (5) feet of right of way (ROW) clearing on each side of the road.

Line Crossings

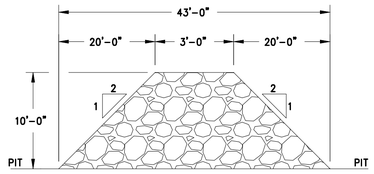
- CONTRACTOR shall abide by MCBU Excavation Dig Procedure and any MCBU or Carlsbad Line Crossing requirements.

4.0 Materials
4.1 Chevron Order
None
4.2 Contractor Order
All civil material and equipment required to complete the project scope

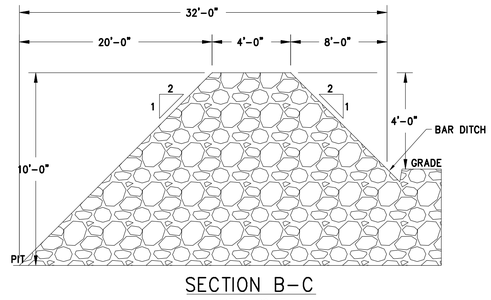
5.0 Project Details / Drawings	
5.1	Factory Standard BGWH Open Loop Pad
5.2	Dimension Plat – New Disturbance with Reserve Pit



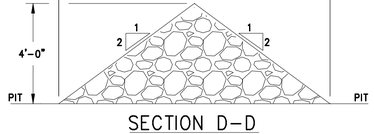
MAGNETIC NORTH



SECTION A-A
NOT TO SCALE



SECTION B-C
NOT TO SCALE



SECTION D-D
NOT TO SCALE

NOTES:

1. AREA ADDED FOR ADDITIONAL WELLS TO ROWS.
2. AREA ADDED FOR SECOND ROW.
3. EACH ADDITIONAL WELL ADDED TO A ROW EXTENDS THE PAD 25' TOWARD THE EAST OR THE WEST, DEPENDING ON ITS LOCATION RELATIVE TO WELL #1. REMOVING WELLS FROM A ROW OR EXECUTION PHASE WILL DECREASE THE TOTAL EAST-WEST PAD DIMENSIONS BY 25'. THE MAXIMUM NUMBER OF WELLS PER ROW IS 10.
4. DIMENSION SOUTH OF THE WELLS CAN BE REDUCED TO 260' IF BASIS OF DESIGN IS CONVENTIONAL FRAC OPERATIONS.
5. 20' WORKING AREA (NOT SHOWN ON THE DRAWING) BORDERS THE PAD AND IS NOT PART OF THE PERMITTED PAD.
6. EXTEND THE WORKING AREA ALONG THE EAST-SIDE OF THE PAD FROM 20' TO 50' FOR ANY EXECUTION PHASES AFTER PHASE 1 TO STORE PRODUCTION FACILITY EQUIPMENT DURING WELLS OPERATIONS.
7. WELL NUMBERING CHANGES BASED ON #WELLS IN EACH PHASE.
8. PAINT 8' LONG PIT LEVEL MARKERS EVERY 2' FROM THE BOTTOM LABEL BY THE LENGTH OF THE INCLINE FROM THE BOTTOM OF THE PIT.

DRILLING IN NORTH DIRECTION

ROW #1 = SHALLOW/MEDIUM LANDINGS
ROW #2 = MEDIUM/DEEPER LANDINGS
WELL SPACING = 25'-0"
ROW SPACING = 100'-0"

TOTAL PAD FOOTPRINT FROM WELL #3

N= 120'-0"
S= 380'-0"
E= 395'-0"
W= 295'-0"
OR 640'X500'

LEGEND

PHASE 1 WELLS
PHASE 1A WELLS
PHASE 2 WELLS
PHASE 2A WELLS

80' 40' 0' 20' 40' 60' 80'

SCALE: 1"=40'

SHEET CIV024

REVISIONS

2020 DESIGN BASIN DESIGN, DRF 20333	EV 12/23/20	JLH	–	–	–
–			–	–	–
–			–	–	–

FOR REVIEW

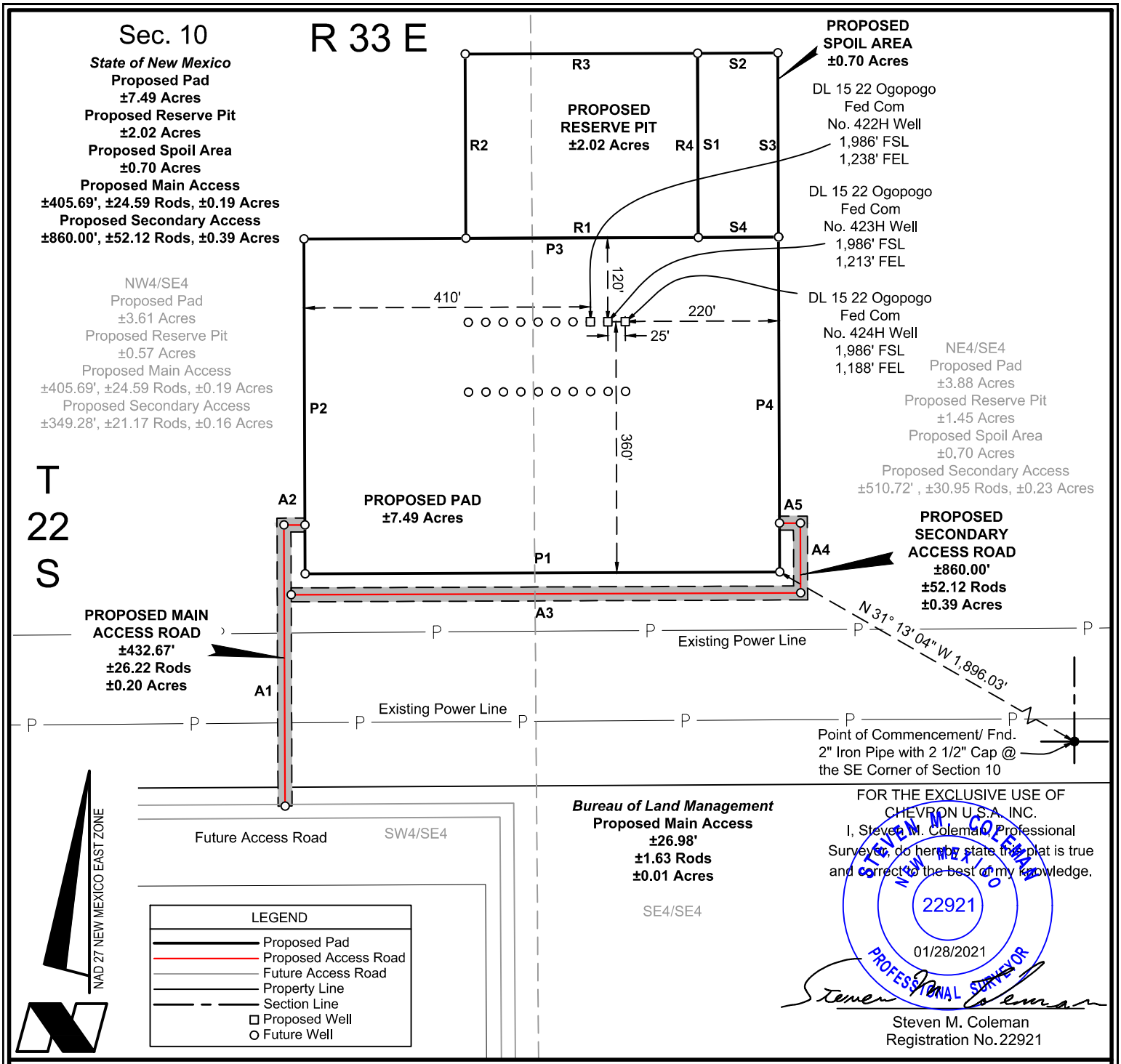
Chevron U.S.A. Inc.

FACTORY STANDARD DRAWINGS
PROJECT DESCRIPTION – COUNTY, STATE

CIVIL – FACTORY STANDARD UNDERGROUND WELL PAD WITH RESERVE PITS PLAN

DR. JLH
ENG. KVPY

FACTSTD-UGWPD-CIV-PVD-MCB-0001-02



Page 1 of 2

SURFACE USE PLAT

SCALE: 1" = 200'

200' 0 100' 200'

CHEVRON U.S.A. INC.

PROPOSED PAD & ACCESS ROADS
DL 15 22 OGOPOGO FED COM PAD
SECTION 10, T22S-R33E
LEA COUNTY, NEW MEXICO

FENSTERMAKER
C. H. Fenstermaker & Associates, L.L.C.
135 Regency Sq. Lafayette, LA 70508
Ph. 337-237-2200 Fax. 337-232-3299
www.fenstermaker.com

	REVISIONS			
DRAWN BY: DMB	#	BY:	DATE:	DESCRIPTION:
PROJ. MGR.: GDG	4	DMB	01/14/2021	Add reserve pit
DATE: 03/09/2020	5	DMB	01/21/2021	Add spoil area
FILENAME: T:\2019\2191038\DWG\DL 15 22 Ogopogo Fed Com SUP_R3.dwg				

NW PAD CORNER			NE PAD CORNER		
X=	739,720'	NAD 27	X=	740,400'	NAD 27
Y=	511,812'		Y=	511,815'	
LAT.	32.404693° N		LAT.	32.404686° N	
LONG.	103.556609° W		LONG.	103.554406° W	
X=	780,903'	NAD83/86	X=	781,583'	NAD83/86
Y=	511,873'		Y=	511,876'	
LAT.	32.404816° N		LAT.	32.404810° N	
LONG.	103.557093° W		LONG.	103.554890° W	
ELEV.	+3567'	NAVD88	ELEV.	+3565'	NAVD88

SW PAD CORNER			SE PAD CORNER		
X=	739,722'	NAD 27	X=	740,402'	NAD 27
Y=	511,332'		Y=	511,335'	
LAT.	32.403373° N		LAT.	32.403367° N	
LONG.	103.556614° W		LONG.	103.554411° W	
X=	780,904'	NAD83/86	X=	781,584'	NAD83/86
Y=	511,393'		Y=	511,396'	
LAT.	32.403497° N		LAT.	32.403490° N	
LONG.	103.557099° W		LONG.	103.554895° W	
ELEV.	+3560'	NAVD88	ELEV.	+3556'	NAVD88

NW RESERVE PIT CORNER			NE RESERVE PIT CORNER		
X=	739,951'	NAD 27	X=	740,284'	NAD 27
Y=	512,077'		Y=	512,079'	
LAT.	32.405416° N		LAT.	32.405413° N	
LONG.	103.555854° W		LONG.	103.554775° W	
X=	781,134'	NAD83/86	X=	781,467'	NAD83/86
Y=	512,138'		Y=	512,139'	
LAT.	32.405540° N		LAT.	32.405537° N	
LONG.	103.556338° W		LONG.	103.555260° W	
ELEV.	+3570'	NAVD88	ELEV.	+3569'	NAVD88

SW RESERVE PIT CORNER			SE RESERVE PIT CORNER		
X=	739,952'	NAD 27	X=	740,285'	NAD 27
Y=	511,813'		Y=	511,815'	
LAT.	32.404691° N		LAT.	32.404687° N	
LONG.	103.555857° W		LONG.	103.554778° W	
X=	781,135'	NAD83/86	X=	781,468'	NAD83/86
Y=	511,874'		Y=	511,875'	
LAT.	32.404814° N		LAT.	32.404811° N	
LONG.	103.556341° W		LONG.	103.555263° W	
ELEV.	+3566'	NAVD88	ELEV.	+3565'	NAVD88

NW CORNER SPOIL AREA			NE CORNER SPOIL AREA		
X=	740,284'	NAD 27	X=	740,399'	NAD 27
Y=	512,079'		Y=	512,079'	
LAT.	32.405413° N		LAT.	32.405412° N	
LONG.	103.554775° W		LONG.	103.554403° W	
X=	781,467'	NAD83/86	X=	781,582'	NAD83/86
Y=	512,139'		Y=	512,140'	
LAT.	32.405537° N		LAT.	32.405535° N	
LONG.	103.555260° W		LONG.	103.554887° W	
ELEV.	+3569'	NAVD88	ELEV.	+3567'	NAVD88

SW CORNER SPOIL AREA			SE CORNER SPOIL AREA		
X=	740,285'	NAD 27	X=	740,400'	NAD 27
Y=	511,815'		Y=	511,815'	
LAT.	32.404687° N		LAT.	32.404686° N	
LONG.	103.554778° W		LONG.	103.554406° W	
X=	781,468'	NAD83/86	X=	781,583'	NAD83/86
Y=	511,875'		Y=	511,876'	
LAT.	32.404811° N		LAT.	32.404810° N	
LONG.	103.555263° W		LONG.	103.554890° W	
ELEV.	+3565'	NAVD88	ELEV.	+3565'	NAVD88

DL 15 22 OGOPOGO FED COM NO. 422H WELL			DL 15 22 OGOPOGO FED COM NO. 423H WELL			DL 15 22 OGOPOGO FED COM NO. 424H WELL		
X=	740,131'	NAD 27	X=	740,156'	NAD 27	X=	740,181'	NAD 27
Y=	511,694'		Y=	511,694'		Y=	511,694'	
LAT.	32.404358° N		LAT.	32.404358° N		LAT.	32.404358° N	
LONG.	103.555281° W		LONG.	103.555200° W		LONG.	103.555119° W	
X=	781,313'	NAD83/86	X=	781,338'	NAD83/86	X=	781,363'	NAD83/86
Y=	511,754'		Y=	511,755'		Y=	511,755'	
LAT.	32.404482° N		LAT.	32.404482° N		LAT.	32.404481° N	
LONG.	103.555766° W		LONG.	103.555685° W		LONG.	103.555604° W	
ELEV.	+3563'	NAVD88	ELEV.	+3563'	NAVD88	ELEV.	+3563'	NAVD88

PROPOSED PAD		
COURSE	BEARING	DISTANCE
P1	S 89° 47' 07" W	680.00'
P2	N 00° 12' 53" W	480.00'
P3	N 89° 47' 07" E	680.00'
P4	S 00° 12' 53" E	480.00'

PROPOSED RESERVE PIT		
COURSE	BEARING	DISTANCE
R1	S 89° 47' 07" W	333.00'
R2	N 00° 12' 53" W	264.00'
R3	N 89° 47' 07" E	333.00'
R4	S 00° 12' 53" E	264.00'

PROPOSED SPOIL AREA		
COURSE	BEARING	DISTANCE
S1	N 00° 12' 53" W	264.00'
S2	N 89° 47' 07" E	115.00'
S3	S 00° 12' 53" E	264.00'
S4	S 89° 47' 07" W	115.00'

PROPOSED EAST ACCESS ROAD		
COURSE	BEARING	DISTANCE
A3	N 89° 47' 07" E	730.00'
A4	N 00° 12' 53" W	100.00'
A5	S 89° 47' 07" W	30.00'

PROPOSED WEST ACCESS ROAD		
COURSE	BEARING	DISTANCE
A1	N 00° 12' 53" W	402.67'
A2	N 89° 47' 07" E	30.00'

FOR THE EXCLUSIVE USE OF CHEVRON U.S.A. INC.
I, Steven M. Coleman, Professional Surveyor, do hereby state this plat is true and correct to the best of my knowledge.

STEVEN M. COLEMAN NEW MEXICO 22921 PROFESSIONAL SURVEYOR

01/28/2021

Steven M. Coleman
Registration No. 22921

DISCLAIMER: At this time, C. H. Fenstermaker & Associates, L.L.C. has not performed nor was asked to perform any type of engineering, hydrological modeling, flood plain, or "No Rise" certification analyses, including but not limited to determining whether the project will impact flood hazards in connection with federal/FEMA, state, and/or local laws, ordinances and regulations. Accordingly, Fenstermaker makes no warranty or representation of any kind as to the foregoing issues, and persons or entities using this information shall do so at their own risk.

NOTE:
Please be advised, that while reasonable efforts are made to locate and verify pipelines and anomalies using our standard pipeline locating equipment, it is impossible to be 100 % effective. As such, we advise using caution when performing work as there is a possibility that pipelines and other hazards, such as fiber optic cables, PVC pipelines, etc. may exist undetected on site.

NOTE:
Many states maintain information centers that establish links between those who dig (excavators) and those who own and operate underground facilities (operators). It is advisable and in most states, law, for the contractor to contact the center for assistance in locating and marking underground utilities. For guidance, New Mexico One Call www.nm811.org.

SURFACE USE PLAT

Page 2 of 2

CHEVRON U.S.A. INC.

PROPOSED PAD & ACCESS ROADS
DL 15 22 OGOPOGO FED COM PAD
SECTION 10, T22S-R33E
LEA COUNTY, NEW MEXICO

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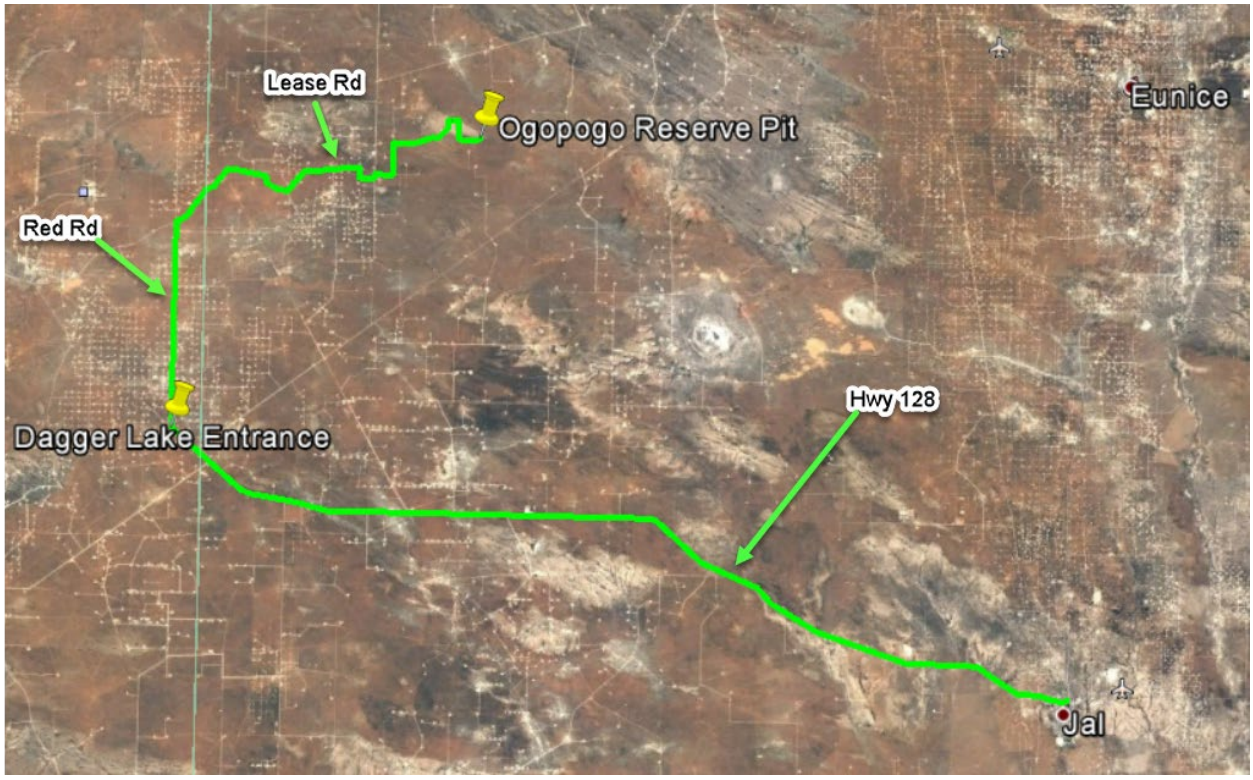
135 Regency Sq. Lafayette, LA 70508
Ph. 337-237-2200 Fax. 337-232-3299
www.fenstermaker.com

	REVISIONS			
DRAWN BY: DMB	#	BY:	DATE:	DESCRIPTION:
PROJ. MGR.: GDG	4	DMB	01/14/2021	Add reserve pit
DATE: 03/09/2020	5	DMB	01/21/2021	Add spoil area
FILENAME: T:\2019\2191038\DWG\DL 15 22 Ogopogo Fed Com SUP_R3.dwg				

Dagger Lake
Driving Directions



Head West out of Jal, NM

- Continue west on Hwy 128 for ~34.5 miles, then turn right (north) on Red Rd
- Continue north on Red Rd for ~7.3 miles, before turning right (east) into the lease road that leads to the Dagger Lake development entrance.
- Continue east on main lease road for ~5.1 miles, at the cross intersection continue driving where the road makes a left (northeast)
- Continue east on main lease road for ~2.9 miles, turn right (south)
- Continue south for ~0.4 miles, turn left (east)
- Continue east for ~0.5 miles, turn left (north) at the T intersection
- Continue north for ~0.18 miles, turn right (east) and drive through cattleguard
- Continue east for ~0.64 miles, turn left (north)
- Continue north for ~1.1 miles, turn right (east)
- Continue east for ~2.1 miles, turn slightly left (north) at the well pad/tank battery location
- Continue north for ~0.3 miles, make a sharp right
- Continue east for ~0.4 miles, make a right turn (south)
- Continue south for ~0.7 miles, turn left (east)
- Continue driving (east) on lease road for ~0.7 miles, where you will reach the Grizzly Pad reserve pit location.

GPS: 32.166933, -103.659297

Delivery Contacts:
Patrick McMahon – 432-266-8681
Tom Donaghe – 575-779-9776

Appendix E – Operating and Maintenance Plan

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Appendix E – Operating and Maintenance Plan
Dagger Lake 15 22 Ogopogo Pad Pit
Temporary Pit

The Operator and Rig Contractor will operate and maintain the Temporary Pit to contain liquids and solids, maintain the integrity of the liner system in a manner that prevents contamination of fresh water and protects public health and the environment as described below.

The operation of the Temporary Pit is summarized below.

Prior to arrival of the drilling rig, the separate pit sections are filled with the fluid required for drilling operations of the wells on the well pad. Typically, these fluids are a low chloride brackish water and a high chloride saturated brine.

During open loop drilling operations, fluid is pulled from one end of the Temporary Pit and sent to the rig pumps to be transferred downhole as the drilling fluid. Upon returning to the surface, the fluid and associated drilled solids flow to the opposite end of the Temporary Pit.

When conducting Closed Loop drilling activities, the Temporary Pit may be utilized for cuttings disposal for purposes of maintaining mud weight, mitigating downhole hazards, and managing other unforeseen circumstances. The Temporary Pit is only to be utilized in conjunction with Closed Loop drilling when drilling activities are done using Water Based Drilling Fluids. In this circumstance, drilled solids are separated from the drilling fluid with solids control equipment and then moved to the Temporary Pit.

During well cementing operations, if the low chloride fluid in the Temporary Pit meets specifications set by the Operator and Cementing Contractor, that fluid will be used as mix water for the blending of the cement slurry. During cementing operations, excess cement returns may be placed in the Temporary Pit.

Throughout well construction, if the fluid in the Temporary Pit meets the specifications set by the Operator and Rig Contractor, that fluid may be used as rig water for component cleaning and engine cooling.

If downhole problems occur during drilling operations, such as fluid losses or waterflows, the Temporary Pit is used to assist with fluid management into and out of the well. Transfer pumps and hoses are used to move these fluids.

After the drilling rig is mobilized off the well pad, any remaining fluids in the Temporary Pit will be removed and reused, recycled, or disposed of in a manner consistent with Division rules.

The operation of the Temporary Pit will follow the requirements listed below:

- All cuttings placed into the Temporary Pit will be produced and disposed of within the boundaries of one single lease, pursuant to the Pit Rule definition of “Onsite”.

- The Operator will not discharge into or store any hazardous waste (as defined by 40 CFR 261 and NMAC 19.15.2.7.H.3) in the pits.

- If the pit liner’s integrity is compromised above the water line, then the Operator will repair the damage within 48 hours of discovery.

- If the pit develops a leak, or if any penetration of the pit liner occurs below the liquid’s surface, then the Operator shall notify the appropriate division office pursuant to the requirements of 19.15.29 NMAC, remove all liquid above the damage or leak within 48 hours of discovery, and repair the damage or replace the pit liner as applicable.

- The injection or withdrawal of liquids from a pit is 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.

- Engineering drawings demonstrate that the elevation and slopes of the pit prevent the collection of surface water run-on.

- The Operator will maintain on site an oil absorbent boom to contain and remove oil from the pit’s surface.

- The Operator will maintain the pit free of miscellaneous solid waste or debris.

- The Operator will maintain at least two feet of freeboard for the Temporary Pit. If, during extenuating circumstances, a freeboard of less than two feet is required, then a log will be maintained describing such circumstances.

- The Operator will remove all free liquids from the surface of a temporary pit within 30 days from the date the Operator releases the last drilling or workover rig associated with the relevant pit permit. The Operator will note the date of the drilling or workover rig’s release on form C-105 or C-103 upon well or workover completion.

Appendix F – Closure Plan

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Appendix F – Closure Plan
Dagger Lake 15 22 Ogopogo Pit
Temporary Pit

Discussion of Onsite Cuttings Disposal

The proposed Temporary Pit will contain drill cuttings from the vertical sections of wells 422H, 423H, and 424H. All cutting from vertical drilling will be produced and disposed of within the boundaries of one single lease, pursuant to the Pit Rule definition of "Onsite". The disposal and closure activities will take place within the design footprint of the Temporary Pit. Proposed closure operations will be conducted in accordance with the Closure and Site Reclamation Requirements detailed in 19.15.17.13 NMAC.

Closure Notice

If planned activities deviate from this Closure Plan, an updated Closure Plan will be submitted to the Division for approval prior to initiating any closure activities.

The Operator will notify the State Land Office at least 72 hours, but not more than one week, prior to any closure activities as per approved Conditions of Approval. This notice will include the project name and location description.

The Operator shall additionally notify the district office verbally and in writing at least 72 hours, but not more than one week, prior to any closure operation. This noticed will include the Operator's name and the location to be closed by unit letter, section, township, and range.

Protocols and Procedures

1. The Operator will remove all liquids from the Temporary Pit and either:
    a. Dispose of the liquids in a division-approved facility,
    or
    b. Recycle, reuse or reclaim the water for reuse in drilling and stimulation.
2. A five-point (minimum) composite sample will be collected from the contents of the Temporary Pit and sent to an accredited laboratory for analysis of the constituents listed in Table 2 of 19.15.17.13 NMAC.
    a. If any concentration is higher than limits listed in Table 2, blending calculations will be used to determine the amount of soil or non-waste material needed to blend with the pit contents to achieve the Table 2 limit. The mixing ratio of soil or non-waste material to pit contents shall not exceed 3:1.
    b. If all constituent concentrations are less than or equal to the parameters listed in Table 2 of 19.15.17.13 NMAC, no mixing shall occur.

3. The Operator will conduct blending operations, as required, and conduct a paint filter liquids test to ensure that the contents of the former pit are sufficiently stabilized to support the cover materials.
4. Cover materials will be installed as described in 'Cover Design' (below).
5. Following the implementation of the cover design, the Operator will revegetate the area as outlined in 'Reclamation and Revegetation' (below).

Cover Design

After blending with non-waste containing, uncontaminated, earthen material, the Operator will cover the former Temporary Pit according to the following procedure.

1. The contents of the former pit will be positively contoured ('turtle-backed') to promote drainage away from the former pit contents and reduce infiltration. Compaction of pit materials over time and as a result of placement of overburden will be taken into consideration.
2. A 20-mil string reinforced LLDPE geomembrane liner will be installed above the pit materials.
3. At least 4-feet of compacted, uncontaminated, non-waste containing earthen fill with chloride concentrations less than 600 mg/kg will be placed above the liner.
4. Either the background thickness of topsoil or 1-foot of suitable material to establish vegetation at the site, whichever is greater, will be placed over the earthen fill.
5. The location will be recontoured to match the pre-disturbance topography and prevent surface erosion and ponding.
6. The Operator will revegetate the area as described below in 'Reclamation and Revegetation'.

Closure Report

1. Within 60 days of closure completion, the Operator will submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results, information required by 19.15.17 NMAC, a plot plan including the exact location of the former pit, details of the cover design, and photographs.
2. 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 approved closure plan.
3. A steel marker will be placed at the location per the requirements in Subsection F of 19.15.17.13 NMAC.

Closure Timing

As discussed in **Variance 1**, the Operator proposes closure activities will be completed within a timeline not to exceed 1 year from the rig down move out (RDMO) date. This date will be noted on form C-105 or C-103, filed with the Division upon the well's completion.

Reclamation and Revegetation

The Operator will reclaim the disturbed area to a safe and stable condition that existed prior to oil and gas operations and that blends with the surrounding undisturbed area. Areas with ongoing production or drilling operations will not be reclaimed as described herein, but will be stabilized and maintained to minimize dust and erosion

For all areas relevant to 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 and regrade the area to achieve erosion control, long-term stability, preservation of surface water flow patterns, and prevent ponding.
2. Notify the Division when the surface grading work is complete.
3. Reseed the area with an appropriate seed mix in the first favorable growing season following closure. Reseeding and weed control measures will be taken, if necessary.
4. Notify the Division when reclamation is complete: vegetative cover has been established that reflects a life-form ratio of plus or minus 50 % of pre-disturbance levels and a total percent plant cover of at least 70 % of pre-disturbance levels, excluding noxious weeds.

Alternative to Closure in Place

In the event the concentration of any contaminant in the contents, after mixing with soil or non-waste material, is higher than constituent concentrations shown in 19.15.17.13 NMAC, then the waste shall be removed from the Temporary Pit and disposed of at one of the following Division approved off-site facilities.

Sundance Services (Parabo, Inc.) M-29-21S-38E Permit No. NM-01-003	R360 Permian Basin, LLC 4507 W. Carlsbad Hwy, Hobbs, NM 88240 Permit No. NM-01-0006

Appendix G – Evaluation of Unstable Conditions

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Appendix G – Evaluation of Unstable Conditions
Dagger Lake 15 22 Ogopogo Pad
Temporary Pit

Summary

Figure 8 identifies the location of the proposed temporary pit with respect to BLM Karst areas. The BLM categorizes all areas within the Carlsbad Field Office (CFO) as having either low, medium, high or critical cave potential based on geology, occurrence of known caves, density of karst features, and potential impacts to fresh water aquifers. The proposed Temporary Pit is mapped by BLM CFO in a "Low Potential" karst area.

The proposed temporary pit lies near the northeast margin of the Delaware Basin. Bedrock ocurring beneath the proposed temporary pit consists of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations are composed chiefly of clastic (insoluble), non-karst-forming rocks. Beneath these formations are Permian-aged rocks of the Rustler and Salado Formations. These rocks contain significant beds of halite (i.e., rock salt) and anhydrite, making them susceptible to karst formation. The top of the Rustler Formation in the proposed temporary pit is approximately 800 feet below the land surface (Crowl et al. 2011).

Despite the great depth to karst-forming rocks, a number of large depressions and "sinks" are noted in the region. Bell Lake Sink and three other unnamed sinks, each about two miles in diameter, occur approximately 10 miles south of the proposed temporary pit (Berg 2012, Figure 11). San Simon Sink is located approximately 10 miles southeast of the proposed temporary pit (Bachman 1973, Berg 2012, **Figure 11**).

In summary, evidence of karst in the region consists predominantly of large depressions that likely formed over millions of years; although there is evidence that subsidence is ongoing, at least at San Simon Sink. These depressions were most-likely created by the dissolution of salt beds in the upper part of the Salado Formation and in the Rustler Formation, even though these are overlain by approximately 800 feet of insoluble rocks.

There are no indications that voids or other karst features are present or are likely to found in the area of the proposed temporary pit. The following lines of evidence, detailed in the sections below, support this position:

1. There are no dissolution features within `10-miles of the proposed location (**Figure 11)**,
2. An Arcadis field study of the area indicated no closed depressions, caves, or fissures in the immediate vicinity and general area of the proposed pit (**Attachment 1**),
3. Tetra Tech geotechnical report and boring log from ~1.1 miles away indicated low karst potential (**Attachment 2**).

The Bureau of Land Management, Paul Murphy prepared the Environmental Assessment (EA), document number - DOI-BLM-P020-2020-0095-EA, evaluating DL 09 16 Loch Ness Pad 1. This EA analyses a pad near the proposed temporary pit location and karst was not analyzed in the EA and therefore was not identified an issue in the project area. (**Attachment 3**).

Structurally, the region surrounding the proposed pit location is relatively undeformed, with a 0 to 3 percent slope, and the nearest mapped fault is 30-miles to the southwest (USGS 2021).

Dissolution Features Evident on Aerial Imagery

The nearest apparent dissolution features to the proposed location are (**Figure 11**):

- Bell Lake Sink and three other unnamed sinks, each ~2-miles in diameter, are present approximately 10-miles south of the proposed location.
- San Ramon Sink is present ~10-miles southeast of the proposed location.

Depth to Karst-Forming rocks

Figure G.1 shows a stratigraphic section of the formations beneath the proposed pit. The upper 1,000-feet of subsurface consists of insoluble, clastic material. These deposits are underlain by soluble, karst-forming strata.

Surface to ~1,000-feet: Based on a review of available literature for the region, no significant intervals of soluble rocks are present in the Quaternary and Triassic deposits that constitute the upper ~1,000-feet of subsurface. Because this material is largely insoluble, the potential for karst features to form within this interval is very low (Lucas and Anderson, 1993).Deeper formations at >1,000-feet: The top of the Rustler Formation is approximately 400 feet thick beneath the surface at the location of the proposed pit (Nicholson and Clebsch 1961). The Rustler Formation overlies the Salado Formation. These formations both contain thick, highly soluble beds of anhydrite and halite. The Bell Lake Sink, San Simon Swale, and San Simon Sink formed by the dissolution of salt from these deep formations. The resulting surface subsidence (as a result of deep dissolution) is a very slow process that has been ongoing for millions of years to form these large depressions (Bachman, 1973 and Berg, 2012).

Period	Formation	Thickness (ft)		Description
Quaternary		100		Unconsolidated eolian and unconsolidated to partially consolidated alluvial deposits
Triassic	Chinle	200 - 300		Red shales and thinly interbedded sandstone
	Santa Rosa	200 - 300		Sandstone and interbedded siltstone and red shale
Permotriassic	Quartermaster (Dewey Lake)	560		Mudstone, siltstone, claystone, and interbedded standstone
Permian	Rustler	400		Anydrite, halite, dolomite, sandy siltstone, and polyhalite

*Figure G.1: Stratigraphic section beneath the location of the proposed temporary pit (*Nicholson and Clebsch 1961 as cited in Arcadis 2020*)*

Arcadis Environmental Field Survey

An environmental field survey was conducted by Arcadis in February 2020 in the area surrounding the location of the proposed pit (**Figure 8 and Attachment 1**). The on-site survey did not identify any closed depressions, caves, or fissures. The survey determined that the occurrence of voids in the surveyed area was “unlikely” based on a review of the literature, aerial photography, and an assessment of on-site conditions.

Tetra Tech Geotechnical Report and Boring Log

Geotechnical report and boring log from 2020 for the proposed Dagger Lake Above-Ground Storage Tank (AST) in Section 4 located ~1.1 miles to the northwest of the proposed pit location was reviewed (Attachment 2). The boring was installed to a depth of 70 feet. Groundwater was not encountered in the boring during drilling. The boring was backfilled with auger cuttings upon completion of the drilling.

- Proposed Dagger Lake Section 4 AST Containment
  - ~1.1. miles northwest of proposed pit location
  - Boring B1 (center) was drilled to 70 ft
  - 0 ft – 8.5 ft
    - Loose, Reddish Brown, Silty Sand, Weakly Cemented, Dry
  - 8.5 ft – 18.5 ft
    - Very Dense, Pink to Reddish, Sand, Non-Plastic, Uncemented, Trace Subangular Gravel, Dry
    - Switch Drilling Method to Air Rotary at 10 ft

- 18.5 ft – 62 ft
  - Very Dense, Reddish Brown, Silty Sand, Low-Plasticity, Weakly Cemented, Trace Subangular Gravel, Dry
- 62 ft – 70 ft
  - Limestone, Slightly Weathered, Hard, Reddish Yellow, Fine Grained, Broken, Dry
- Groundwater was not encountered in the boring during drilling. The boring was backfilled with auger cuttings upon completion of the drilling.

Mitigation of Karst Potential

While the BLM did not identify any karst mitigation requirements in the EA near the temporary pit location, the following commitments will be applied as a best practice in development of the proposed pit.

General Construction:

• No blasting
• The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
• All linear surface disturbance activities will avoid sinkholes and other karst features, if they are identified during construction, to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
• All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

•The pad will be constructed and leveled by adding the necessary fill and caliche –no blasting.
• The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
• The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
• No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
• The topsoil stockpile shall be located outside the bermed well pad.
• Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
• No storm drains, tubing or openings shall be placed in the berm.
• If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
• The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim

reclamation has been completed.
• Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
• Following a rain event, all fluids will be vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

References

Arcadis 2020. Dagger Lake Final Environmental Field Survey Report. Prepared for Chevron.

Hill, C.A. 1996. Geology of the Delaware Basin, Guadalupe, Apache and Glass Mountains: New Mexico and West Texas: Permian Basin Section: Midland, Texas, SEPM, 480 pp.

Land, Lewis and George Veni. 2014. Electrical resistivity surveys, Johnson Estate drill site, Loving County, Texas. National Cave and Karst Research Institute Report of Investigation 5, Carlsbad, NM. March 2014.

Nicholson, Alexander, Jr. and Clebsch, Alfred, Jr. 1961. Ground-Water Report 6 - Geology and Ground-Water Conditions in Southern Lea County, New Mexico, United States Geological Survey in cooperation with the New Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Division and the New Mexico State Engineer.

Stafford, Kevin W., Laura Rosales-Lagarde, and Penelope J. Boston. 2008. Castile evaporite karst potential map of the Gypsum Plain, Eddy County, New Mexico and Culberson County, Texas: A GIS methodological comparison. Journal of Cave and Karst Studies 70 (1): 35-46.

Tetra Tech 2020. Baseline Sampling Results and Boring log for Dagger Lake AST Pad located in Lea County, New Mexico.

U.S. Geological Survey (USGS) 2021. New Mexico Faults, from the USGS Geologic Map Database. Available online at https://my.usgs.gov/eerma/data/index/4f4e496ee4b07f02db5a354e

Attachments 1 - 3

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

Attachment 1
Arcadis Environmental Field Survey, Section 10, Karst Evaluation, Dagger Lake (2020)

Attachment 2
Tetra Tech Baseline Sampling Results and Boring Log, Dagger Lake Above-Ground Storage Tank (AST), Section 4 (2020)

Attachment 3
DOI-BLM-NM-P020-2020-0095-EA, Section 1.6, Scoping, Public Involvement, and Issues (2019)

Attachments 1 – Arcadis Environmental Field Survey for Dagger Lake, Abbreviated to Karst Section (2020)

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

ARCADIS Design & Consultancy for natural and built assets

Chevron U.S.A. Inc.

ENVIRONMENTAL FIELD SURVEY

Dagger Lake Development Area

February 2020

ENVIRONMENTAL FIELD SURVEY

Dagger Lake Development Area

Prepared for:

Tony Vallejo

HES Specialist

Chevron MCBU

6301 Deauville Blvd

Midland, TX 79706

Prepared by:

Arcadis U.S., Inc.

Midland

Texas 79701

Tel 432 687 5400

Fax 432 687 5401

Our Ref.:

30006265

Date:

February 2020

distinguishable unit. This classification system recognizes that although significant fossil localities may occasionally occur in a geologic unit, a few widely spaced localities do not necessarily indicate a higher class. The primary purpose of the PFYC System is to assess the possible impacts from surface disturbing activities and help determine the need for pre-disturbance surveys and monitoring during construction.

All bedrock geologic deposits within the survey area are considered PFYC 2 (**Figure 11**). Bedrock in the area is from Holocene to middle Pleistocene in age (about 781 to 12 thousand years ago). Previous geologic mapping and field observations indicate that deposits include the Eolian and Piedmont deposits (NMBGMR 2003). The Eolian and Piedmont deposits consist of interlayed eolian sands and piedmont slope deposits (NMBGMR 2003).

9.1 Survey Findings and Mitigation

A specific paleontological survey of the proposed project area was not conducted; however, no fossils were incidentally observed during the environmental field survey. The survey area is classified as a PFYC 2; therefore, if at any time fossils are discovered, all activities must stop and the BLM must be contacted within 24 hours.

10 KARST

The term karst describes distinct terranes that are attributable to high solubility of underlying bedrock. Common features of such terranes include sinkholes and caves, which are formed as the bedrock is dissolved by groundwater. Karst aquifers represent saturated bedrock where its permeability has been enhanced by dissolution processes. Such aquifers can be important sources of potable groundwater.

The proposed project area lies near the northeast margin of the Delaware Basin. As discussed in further detail in Section 11.2, bedrock ocurring beneath the proposed project area consists of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations are composed chiefly of clastic (insoluble), non-karst-forming rocks. Beneath these formations are Permian-aged rocks of the Rustler and Salado Formations. These rocks contain significant beds of halite (i.e., rock salt) and anhydrite, making them susceptible to karst formation. The top of the Rustler Formation in the proposed project area is approximately 800 feet below the land surface (Crowl et al. 2011).

Despite the great depth to karst-forming rocks, a number of large depressions and “sinks” are noted in the region. Bell Lake Sink and three other unnamed sinks, each about two miles in diameter, occur approximately 10 miles south of the project area (Berg 2012). A portion of San Simon Swale, an approximately 18-mile long by 6-mile wide closed depression that terminates at San Simon Sink traverses the southern portion of the site. San Simon Sink is located approximately 10 miles southeast of the project area (Bachman 1973, Berg 2012). Using Google Earth Imagery (dated 11/20/2015), the dimensions of San Simon Sink are approximately one mile long by one-half mile wide by 75 feet deep. These depressions formed by the dissolution of salt from the upper part of the Salado Formation as well as from the overlying Rustler Formation (Bachman 1973). Solution subsidence in San Simon Sink has

been active within the past century; however, solution and subsidence in this area of southeastern New Mexico has been ongoing for millions of years (Bachman 1973).

In summary, evidence of karst in the region consists predominantly of large depressions that likely formed over millions of years; although there is evidence that subsidence is ongoing, at least at San Simon Sink. These depressions were most-likely created by the dissolution of salt beds in the upper part of the Salado Formation and in the Rustler Formation, even though these are overlain by approximately 800 feet of insoluble rocks. Except for the San Simon Swale, no evidence of depressions in the survey area were identified on available topographic mapping or by examining recent Google Earth imagery.

10.1 Survey Findings and Mitigation

Karst potential is mapped by the BLM as “low” in the survey area (**Figure 12**). There was no evidence of subsidence in the area (for example, concentric cracks in the soil surrounding the opening or other evidence of slumping).

11 HYDROLOGY

Potential impacts to water resources in the survey area due the construction and operation of Chevron’s proposed project were evaluated by comparing the location of these features (ponds, streams, wetlands, etc.) to the proposed surface disturbance. This analysis is based on the examination of the 1988 Carlsbad BLM RMP and evaluation of data compared to the environmental field survey.

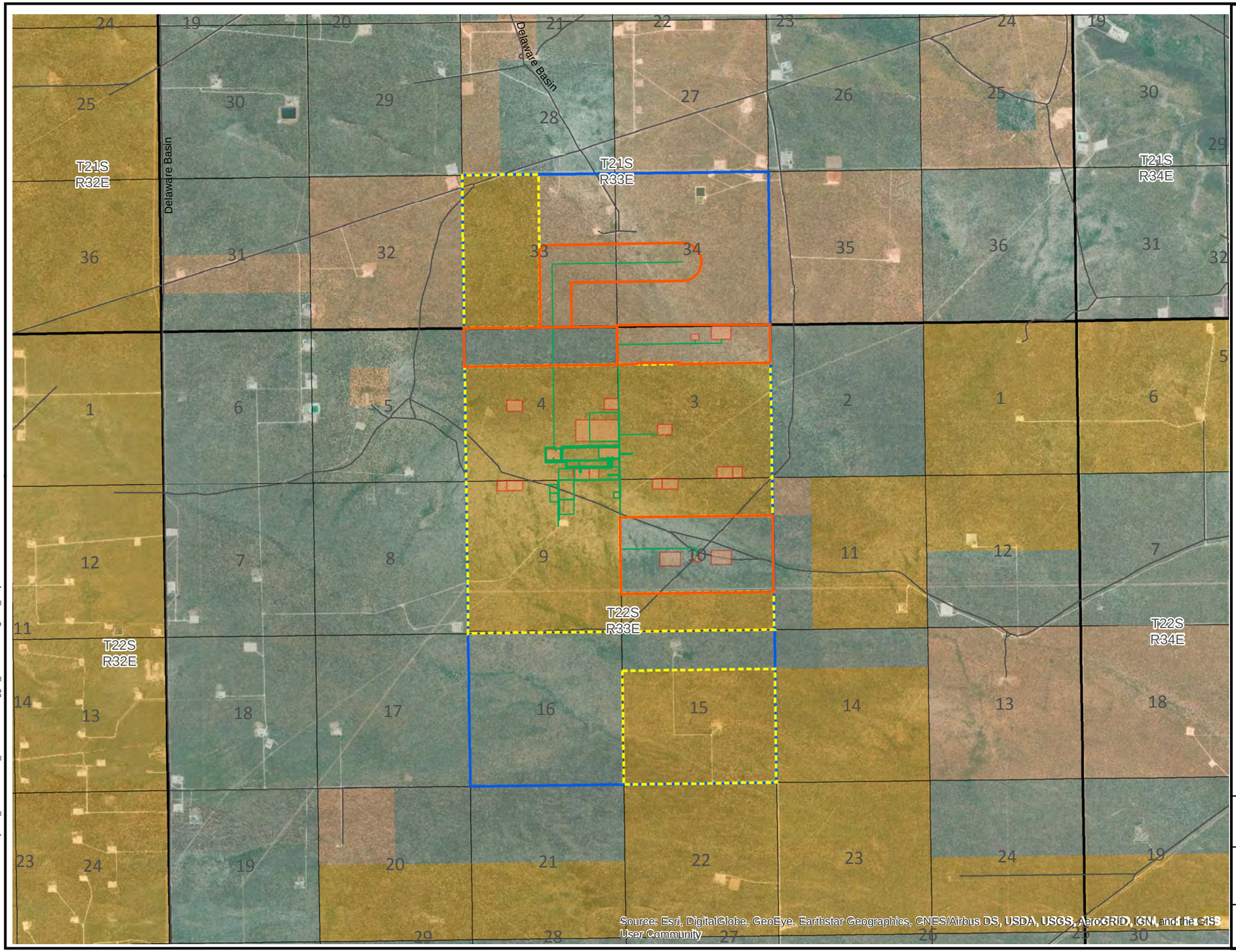
11.1 Surface Hydrology

The survey area is situated approximately 37 miles east of the City of Carlsbad and south of State Highway 176 in southwestern Lea County, New Mexico. This area is characterized by relatively flat to gentle sloping terrain with many shallow depressions and occasional dunes, but no well-established drainages. National Wetlands Inventory (NWI) Online Data Mapper show three intermittent streambeds that are seasonally flooded within the survey area (**Figure 13**).

Surface water within the proposed project area is affected naturally by the shallow geology, precipitation, and some water erosion. The area is located in the semi-arid southwest near the northern edge of the Chihuahuan Desert. The climate is characterized by low annual precipitation, low humidity, and high average annual temperature and ranges from dry subhumid to arid. Precipitation is quite variable both regionally and seasonally and averages about 12 inches or less annually with the greatest rainfall occurring as monsoonal storms during the summer months. The area is situated at the southwest edge of the Great Plains dust-bowl area and is sometimes subjected to severe windstorms (Nicholson and Clebsch 1961).

Southwestern Lea County, including the survey area, lies within the Lower Pecos River Basin. The major stream in this Basin is the Pecos River, which is located approximately 26 miles to the west southwest of the survey area in southeastern Eddy County. Surface water in the Lower Pecos River Basin comes from three main sources: inflow from the Upper Pecos River Basin, flood inflow from storm events, and groundwater base inflow. The Pecos River bisects Eddy County and runs through the center of the City of

FIGURES



LEGEND

- Survey Area (February 2020)
- Proposed Pad
- Dagger Lake Development Area
- Previous Survey Area (February 2019)
- Townships
- Sections
- Proposed ROW
- Lea County Roads

SURFACE OWNERSHIP

- Bureau of Land Management
- Private
- State

0 4,000 8,000

Feet

CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
DAGGER LAKE DEVELOPMENT AREA
LEA COUNTY, NEW MEXICO

ENVIRONMENTAL FIELD SURVEY AREA

ARCADIS

FIGURE 2

DIV/GROUP: ENV/AMDV DB: avl00976 LD: PIC: PM: TM:
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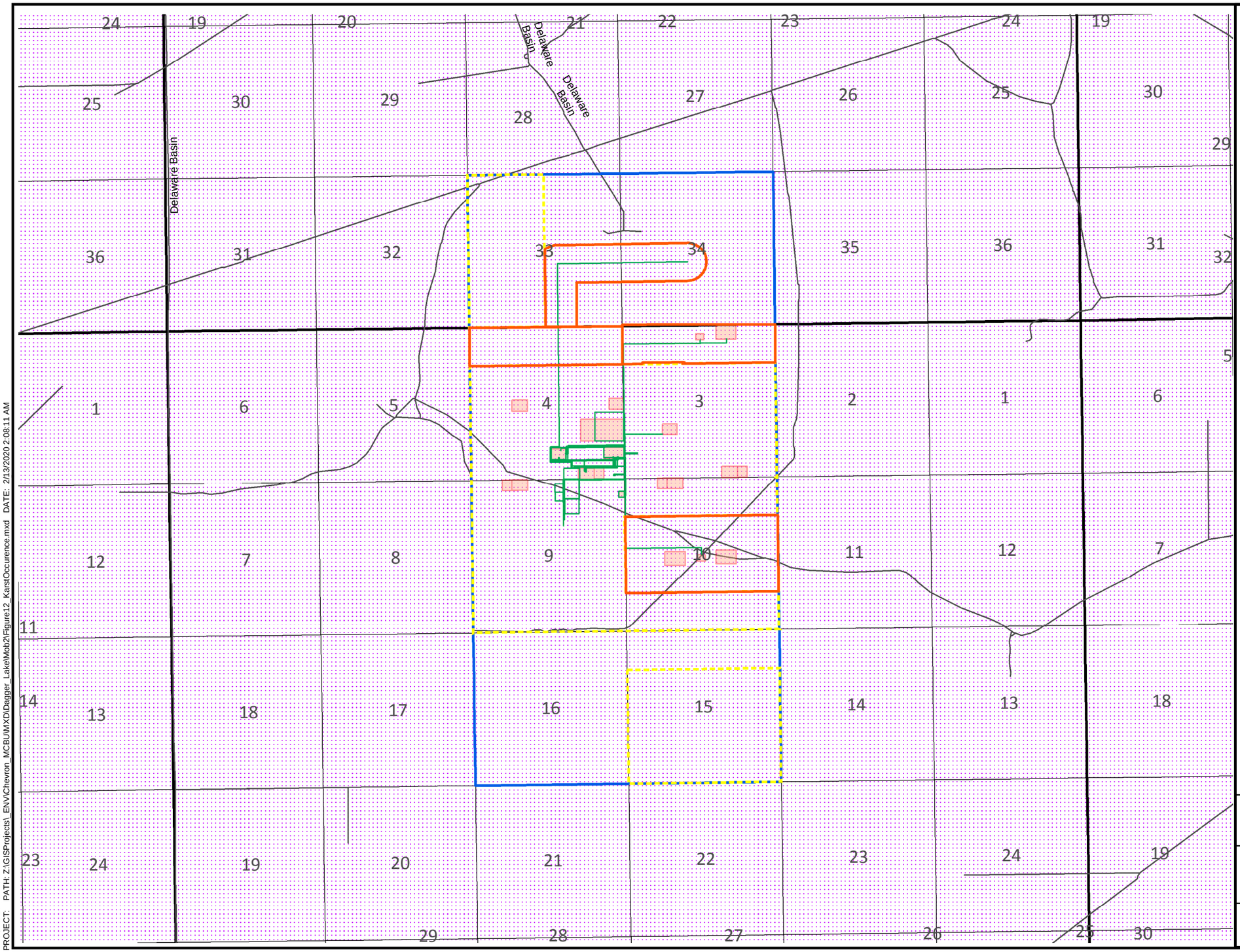

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PROJECT: PATH: Z:\GISProjects_ENV\Chevron_MCBU\MXD\Dagger_Lake\Mob2\Figure12_KarstOccurence.mxd DATE: 2/13/2020 2:08:11 AM

LEGEND

- Survey Area (February 2020)
- Proposed Pad
- Dagger Lake Development Area
- Previous Survey Area (February 2019)
- Townships
- Sections
- Proposed ROW
- Lea County Roads
- Low Potential Karst

0 4,000 8,000

Feet

CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
DAGGER LAKE DEVELOPMENT AREA
LEA COUNTY, NEW MEXICO

KARST POTENTIAL ZONES

ARCADIS

FIGURE
12

APPENDIX A

Resumes

PERSONNEL RESUME

ARCADIS Design & Consultancy for natural and built assets

CHARLES G. HOLDER

BIOLOGIST

EDUCATION

BS Wildlife & Fisheries Science 2014
Texas A&M University

YEARS OF EXPERIENCE

Total – 4
With Arcadis – 1

CORE SKILLS

1. Wildlife ID and Trapping
2. Plant ID
3. Optical Gas Imaging Certified
4. ACOE Wetland Delineation Training

Mr Holder is a wildlife biologist with experience in university research, wind energy, and nuisance wildlife removal. As a university researcher, he has experience with trapping, banding, and radio collaring birds, as well as using radio telemetry to track birds. He has experience in pre-construction projects, surveying potential turbine sites for nests and raptor activity, and mortality monitoring on post construction wind farms, as well as acting as the bias corrections coordinator on the project. He also has experience trapping wildlife in residential settings.

Project Experience

Field Surveys for Oil and Gas Development Production Expansion

Confidential Client, Lea and Eddy County, New Mexico

Conducted multiple field surveys for proposed oil and gas development projects in Lea and Eddy County New Mexico. Documented wildlife, vegetation, hydrology, and multiple other applicable resources to assist in identification of potential design constraints and to support the National Environmental Policy Act documentation.

Barn Owl Nest Monitoring

Confidential Client, Eddy County, New Mexico

Monitored an active barn owl nest during construction. Worked with the construction crew to modify working practices in an effort to prevent the female from abandoning the nest. Construction occurred extremely close to the nest but the project was ultimately successful.

Scheer's Beehive Cactus Survey

Confidential Client, Eddy County, New Mexico

Assisted with four surveys for the Bureau of Land Management special status plant, Scheer's Beehive Cactus. During the surveys, one Scheer's Beehive Cactus was documented and observed multiple look alike species.

Gypsum Milkvetch Survey

Confidential Client, Eddy County, New Mexico

Assisted with one survey for the Bureau of Land Management special status plant, Gypsum Milkvetch. No Gypsum Milkvetch was found during the survey.

Project Experience Continued

Pre-construction Nest Clearance

Confidential Client 2019.

Conducted pre-construction nest clearing surveys for oil and gas development in Eddy and Lea counties NM. Nests were found systematically walking transects, the nests were identified as active or inactive, and all inactive nests were removed to discourage nesting activity prior to construction. Active nests and all raptor's nests were monitored on a weekly basis until construction was complete.

Hayhusrt Geophysical Investigation

Confidential Client 2019.

Assisted in geophysical surveys by helping set up Electrical Resistivity Imaging (ERI) lines in order to determine the location of bedrock fracture zones and/or delineating tunnels and cavernous zones.

Attwater's Prairie Chicken Nutrition Study

Texas A&M University.

Conducted a study on radioactive isotopes in the Attwater's Prairie Chicken diet. Gathered plan and insect samples in the field, and processed samples for isotope analysis using a ball-and-cup grinder.

Pre-construction Pad Surveys

Tetra Tech Inc. 2017.

Conducted pre-construction transmission line and turbine pad surveys for a windfarm project. Assisted biologist in identifying bird nests in the path of construction equipment, as well as monitor raptor nests when construction equipment is in vicinity.

Post-construction Mortality Surveys

Tetra Tech Inc. 2016-2017.

As Field Crew leader, conducted post construction bird and bat mortality monitoring surveys on a newly constructed wind farm in Texas. Also acted as "Bias-corrections Coordinator" and conducted searcher efficiency trials as well as carcass persistence trials.
Multiple Studies on the Decline of Quail Populations

Multiple Studies

Texas Tech University, Wildlife Toxicology Laboratory. 2015.

Conducted field research for multiple studies on the decline of quail populations. Responsible for animal-friendly trapping, handling, and tracking of birds. Performed sage and accurate dissections both in the field and lab.

Multiple Studies

Texas Tech University, Wildlife Toxicology Laboratory. 2015.

- Study of Survival Rates and Female Nest Success using Radio Telemetry
- Study of Eye Worms and Caecal Worms in Hunter-harvested Quail
- Study of Eye Worms and Caecal Worms in Grasshoppers

CHARLESTON SHIRLEY

ENVIRONMENTAL SCIENTIST I, BIOLOGIST

EDUCATION

BS Natural Resource Management
Louisiana State University and Agricultural & Mechanical College
2013

YEARS OF EXPERIENCE

Total – 4 years
With Arcadis – <1 year

Mr. Shirley has more than two years of experience in the consulting field. He specializes in conducting surveys and monitoring of flora and fauna with an emphasis on threatened species, endangered species and species of concern. Previously he has worked with the military, public agencies and private landowners. He is an authorized biologist with the desert tortoise, Gopherus agassizii.

Project Experience

Ongoing Maintenance Activities on Pipeline System in the Southern California Deserts

SoCal Gas Company, Southern California Desert Areas

As an authorized biologist, monitored sites for wildlife and environmental compliance as excavation, pipe removal and replacement occurred. Performed pre-construction clearance surveys for flora and fauna.

Development Project

Confidential Client, Coyote Springs, Nevada

As an authorized biologist, conducted radio telemetry tracking of transmittered tortoises. Handled tortoises and collected body metrics and replaced transmitters on all tortoises. Monitored sites as crews worked in sensitive wildlife areas.

Water Treatment Installation

Tetra Tech, Henderson, Nevada

Performed inspection on all tortoise prevention devices. Checked site for compliance.

Range-wide Monitoring Program

U.S. Fish and Wildlife Service, Nevada, California and Utah

As an authorized biologist, tracked all transmittered tortoises, removed transmitters from all individuals being removed from project study, and managed data entry for submission to USFWS.

Community Solar Project

Valley Electric Association, Pahrump, Nevada

Monitored areas of construction for flora and fauna in ecologically sensitive areas during transmission line maintenance.

Monitoring Avian Productivity and Survivorship (MAPS) Banding

Louisiana Department of Wildlife and Fisheries and Institute for Bird Populations, Louisiana

Safely and quickly extracted birds from mist nets. Determined age and sex of passerine and non-passerine birds. Tooke body metrics including mass, wing cord and reproductive status.

Gopher Tortoise Health Assessment

Louisiana Department of Wildlife and Fisheries, Louisiana

Assisted with collection and processing of bodily fluids of gopher tortoise. Managed live traps and handling of tortoises.

Inventory of Recently Purchased Lands

U.S. Department of Defense, Fort Polk, Louisiana

Conducted an inventory of wildlife and habitat types on lands recently acquired by the military. Worked closely with representatives of the client during active military training to assess health and condition of the endangered red-cockaded woodpecker. Marked areas of clearcutting and suggested other forms of habitat management. Completed indices for diatoms found in flowing water bodies.

Wildlife Mortality Study

Invenergy, Bishop Hill, Illinois

Served as acting assistant field crew supervisor. Managed establishment and maintenance of transect plots on private lands. Worked with the client and private land owners to conduct a wildlife mortality study. Conducted placement trials and carcass removal trials.

Attachments 2 – Tetra Tech Baseline Sampling Results and Boring Log, Dagger Lake Above-Ground Storage Tank (AST), Section 4 (2020)

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

TETRA TECH

September 3, 2020

Ms. Anna Deily
Facilities Infrastructure Engineer
Chevron North America – MCBU
Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

RE: Baseline Sampling Results and Boring Log for Dagger Lake AST Pad located in Lea County, New Mexico

Dear Ms. Deily:

Tetra Tech Inc. (Tetra Tech) was retained by Chevron to conduct baseline environmental sampling and drill a deep boring for purposes of identifying groundwater at the proposed Dagger Lake produced water above-ground storage tank (AST) pad. The pad is located in Lea County, New Mexico. The GPS coordinates for the proposed tank pad are N 32.417858° and W 103.569555°. The site location is shown on a topographic map, Figure 1, and an aerial map, Figure 2.

Chevron requested that Tetra Tech drill a deep boring at the produced water AST pad and perform baseline environmental sampling. The purpose of the deep boring is for observation of the presence of groundwater at the tank site. The purpose of the environmental baseline sampling is to establish a baseline of existing soil conditions at this site prior to the installation of the produced water tank and start of operations. As part of the baseline sampling program, Chevron requested that Tetra Tech collect soil samples at 8-inches in depth below the surface with a hand-auger and the samples be analyzed by a qualified laboratory for BTEX, TPH, and Chlorides.

Boring

On August 25th and 26th, one (1) boring, B-1, was installed to a depth of 70 feet. Groundwater was not encountered in the boring during drilling. The boring was backfilled with auger cuttings upon completion of the drilling. Standard Penetration Tests SPTs were performed at five to ten foot intervals in the upper 40 feet for understanding the relative density of the soils. A copy of the boring log is included in Appendix A. The boring location for B-1 is shown in Figure 2.

Environmental Baseline Sampling and Laboratory Analyses

Tetra Tech personnel conducted the baseline environmental soil sampling on August 25th, 2020 and a total of five (5) sample points (AH-1 through AH-5) were collected using a hand-auger with sampling bucket. Four (4) of the five sample locations were at the perimeter of the proposed 190'-diameter, produced water tank; and one (1) sample was located in the middle area of the AST. All soil samples were collected at 8-12" below ground surface (bgs). The sample locations are shown in Figure 2.

Each of the five (5) samples (AH-1 through AH-5) were collected and placed into laboratory-provided containers and delivered to the laboratory under chain of custody. The samples from the site were delivered to Xenco Laboratories in Midland, Texas, for chloride analysis by Method SM 4500 Cl B, TPH analysis by method SW8015 (Mod) Extended, and BTEX by method EPA 8021B.

Tetra Tech
901 W. Wall St, Suite 100 Midland, TX 79701
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

The laboratory results are summarized in Table 1. Copies of the laboratory reports and results are included in Appendix B.

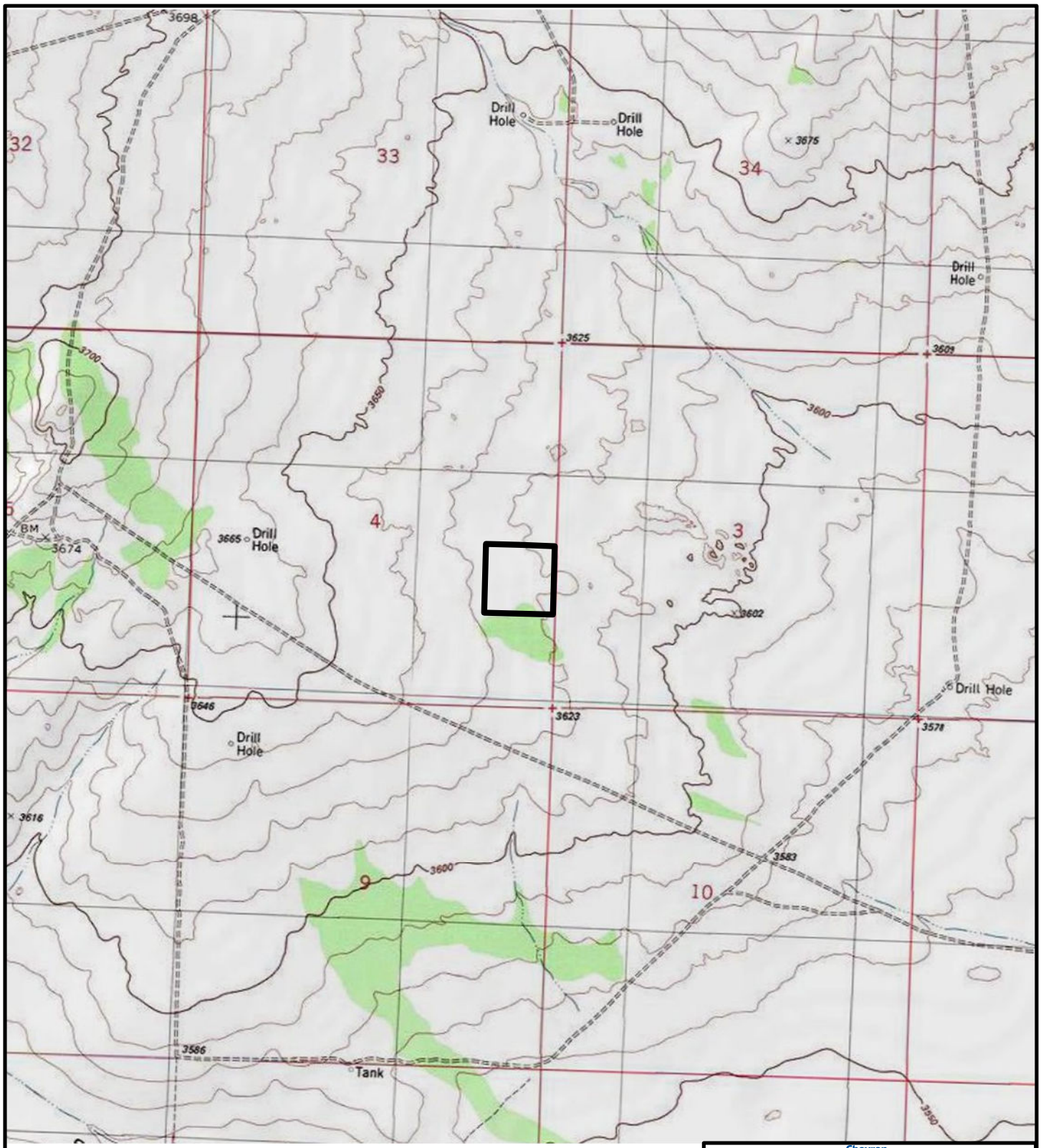
If Chevron should require additional support with this project, please contact Nathan Langford at 432-250-0652 or if we can be of further assistance.

Sincerely,

TETRATECH, INC

Nathan Langford, PE
Project Manager

Figures



LEGEND

SITE LOCATION

N
W
E
S

0 1,000 2,000
Feet

SOURCE: MODIFIED FROM USGS, GRAMA RIDGE, NM 1984 QUADRANGLE.

Chevron

Figure 1

Dagger Lake Produced Water AST
(32.4179, -103.56902)

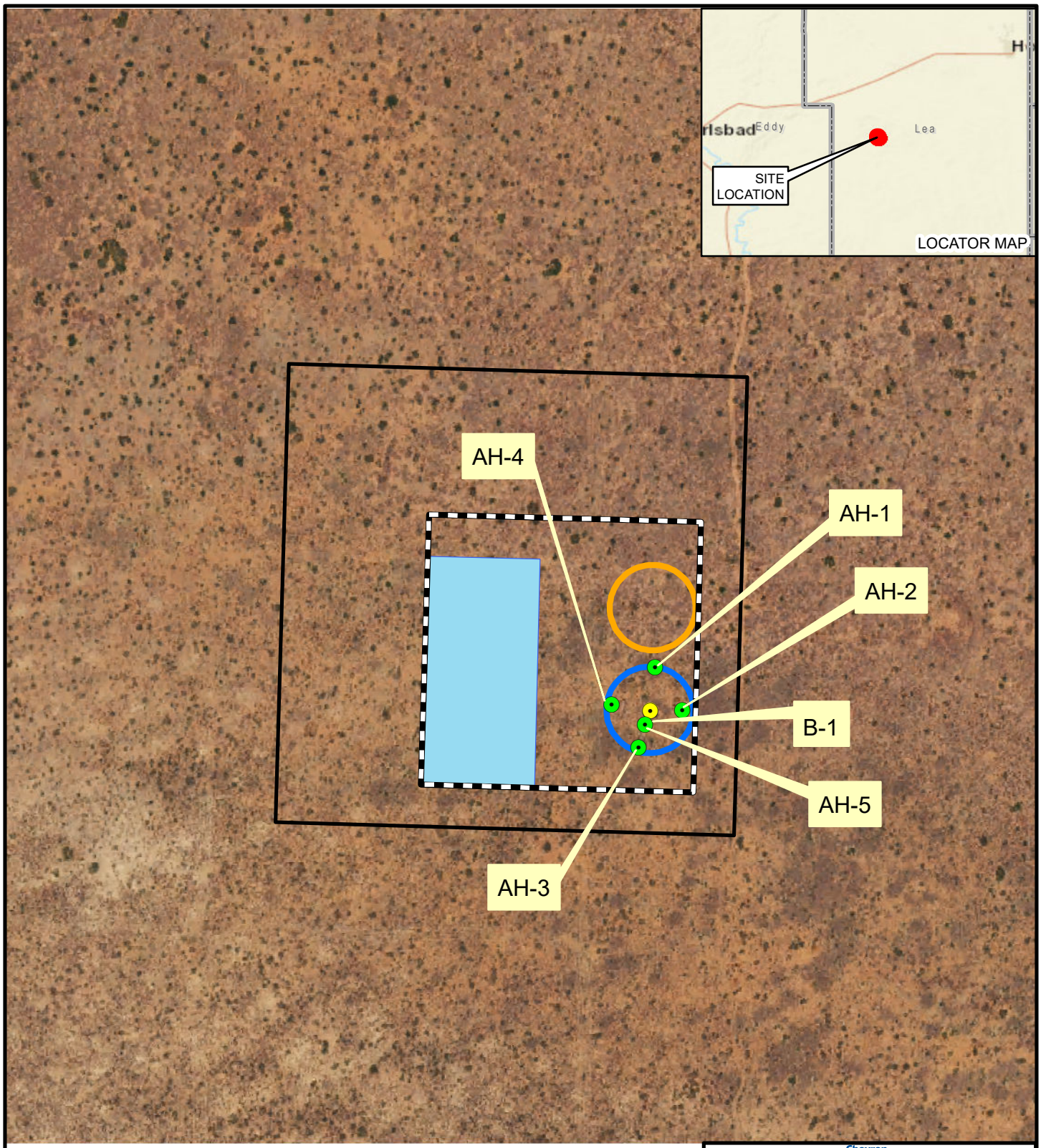
Topographic Map
Lea County, New Mexico

Project : 212C-MD-02292

Date : 9/3/2020

File : H:\GIS\212C-MD-02292

Date Saved: 9/3/2020 User: joel.peters Path: C:\GIS\chevron\212C_MD_02292 Chevron Dagger Lake\212C_MD_02292_Chevron_DaggerLakePWAST_Fig1_Topo.mxd



LEGEND

- 70-FOOT BORING (B-1)
- AUGER HOLE (AH-1 TO AH-5)
- FRESHWATER POND
- BERMED AREA
- BRACKISH WATER AST
- PRODUCED WATER AST
- WATER INFRASTRUCTURE APPROVED IN APD

N W E S

0 150 300
Feet

SOURCE: MODIFIED FROM USDA NAIP IMAGERY, 2018.

Chevron

Figure 2

Dagger Lake Produced Water AST
(32.4179, -103.56902)

Aerial Map
Lea County, New Mexico

Project : 212C-MD-02292	
Date : 9/3/2020	
File : H:\GIS\212C-MD-02292	

Date Saved: 9/3/2020 User: joel.peters Path: C:\GIS\chevron\212C_MD_02292 Chevron Dagger Lake\212C_MD_02292_Chevron_DaggerLakePWAST_Fig2_Aerial.mxd

Tables

Table 1
Summary of Analytical Results
Chevron N.A. E1, MCBU
Dagger Lake AST Pad
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth	Chloride[1]	BTEX[2]					TPH[3]		
				Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	GRO C_6 - C_{10}	DRO > C_{10} - C_{28}	Total TPH (GRO+DRO)
		ft. bgs	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
AH-1	8/25/2020	'0.5-1	11.2	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<49.8	<49.8	<49.8
AH-2	8/25/2020	'0.5-1	9.36	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<50.0	<50.0	<50.0
AH-3	8/25/2020	'0.5-1	8.53	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<50.0	<50.0	<50.0
AH-4	8/25/2020	'0.5-1	9.66	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<49.9	<49.9	<49.9
AH-5	8/25/2020	'0.5-1	8.67	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<50.0	<50.0	<50.0

NOTES:

ft. Feet

bgs Below ground surface

mg/kg Milligrams per kilogram

TPH Total Petroleum Hydrocarbons

GRO Gasoline range organics

DRO Diesel range organics

1 SM4500Cl-B

2 EPA 8021B

3 SW8015 (Mod) Extended

Appendix A

TETRA TECH
Tetra Tech, Inc.
901 West Wall, Suite 100
Midland, Tx. 79701
Phone: 432-682-4559
Fax:

BOREHOLE ID: B-1

CLIENT Chevron **PROJECT NAME** Dagger Lake PW AST Boring

PROJECT NUMBER 212C-MD-02292 **PROJECT LOCATION** Lea County, NM

DATE(S) OF DRILLING: 08/26/2020 **GROUND ELEVATION: NA** **METHOD: Auger/Air Rotary**

CONSULTANT: Tetra Tech, Inc. **LATITUDE: 32.41790 N** **LOGGED BY: Carlos Tomlinson**

DRILLING CONTRACTOR: TSS Drilling, Inc **LONGITUDE: 103.56950 W** **DRILLED BY: Tim Y.**

Notes: No groundwater encountered.

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0						Loose, Reddish Brown, **SILTY SAND**, Low-Plasticity, Weakly Cemented, Dry
	SS 1	100	8-8-9			
	SS 2	100	9-12-32	SM		Changes to Dense, Pink, Traces Subangular Gravel at 3.5'.
5						Changes to Non-Plastic, Uncemented at 4.5'.
						8.5
	SS 3	100	50/5"			Very Dense, Pink to Reddish, **SAND**, Non-Plastic, Uncemented, Trace Subangular Gravel, Dry
10						Switch Drilling Method to Air Rotary at 10.0'.
	SS 4	100	31-32-37	SM		
15						Loose Sand Layer from 16.0' to 18.5'.
						18.5
	SS 5	100	18-30-46			Very Dense, Reddish Brown, **SILTY SAND**, Low-Plasticity, Weakly Cemented, Trace Subangular Gravel, Dry
20				SM		
25						

BOREHOLE/TP/WELL - TT DRAFT_DAGGER LAKE PW AST.GPJ LAB SUMMARY.GDT 9/3/20

(Continued Next Page)

TETRA TECH
Tetra Tech, Inc.
901 West Wall, Suite 100
Midland, Tx. 79701
Phone: 432-682-4559
Fax:

BOREHOLE ID: B-1

CLIENT Chevron **PROJECT NAME** Dagger Lake PW AST Boring

PROJECT NUMBER 212C-MD-02292 **PROJECT LOCATION** Lea County, NM

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
25						Very Dense, Reddish Brown, **SILTY SAND**, Low-Plasticity, Weakly Cemented, Trace Subangular Gravel, Dry *(continued)*
30	SS 6	100	*24-40-43*			
35						
40	SS 7	100	*26-45-50/4"*	SM		
45						
50						

BOREHOLE/TP/WELL - TT DRAFT_DAGGER LAKE PW AST.GPJ LAB SUMMARY.GDT 9/3/20

(Continued Next Page)

TETRA TECH
Tetra Tech, Inc.
901 West Wall, Suite 100
Midland, Tx. 79701
Phone: 432-682-4559
Fax:

BOREHOLE ID: B-1

CLIENT Chevron **PROJECT NAME** Dagger Lake PW AST Boring

PROJECT NUMBER 212C-MD-02292 **PROJECT LOCATION** Lea County, NM

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	BLOW COUNTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
55				SM		Very Dense, Reddish Brown, **SILTY SAND**, Low-Plasticity, Weakly Cemented, Trace Subangular Gravel, Dry *(continued)*
60						
						62.0
						LIMESTONE, Slightlly Weathered, Hard, Reddish Yellow, Fine Grained, Broken, Dry
65						
70						70.0
						Borehole terminated at 70.0 ft.

BOREHOLE/TP/WELL - TT DRAFT_DAGGER LAKE PW AST.GPJ LAB SUMMARY.GDT 9/3/20

Water Encountered: (YES) at Depth (ft) _____ **(NO)**

Appendix B

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Certificate of Analysis Summary 671100

Tetra Tech- Midland, Midland, TX

Project Name: DL AST

Project Id: 212C-MD-02292
Contact: Nathan Langford
Project Location: New Mexico

Date Received in Lab: Wed 08.26.2020 16:10
Report Date: 08.31.2020 16:30
Project Manager: Jessica Kramer

Analysis Requested		671100-001		671100-002		671100-003		671100-004		671100-005	
	Field Id:	AH-1		AH-2		AH-3		AH-4		AH-5	
	Depth:	5-1 ft		5-1 ft		5-1 ft		5-1 ft		5-1 ft	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	08.25.2020 00:00		08.25.2020 00:00		08.25.2020 00:00		08.25.2020 00:00		08.25.2020 00:00	
BTEX by EPA 8021B	***Extracted:***	08.28.2020 10:30		08.28.2020 10:30		08.28.2020 10:30		08.28.2020 10:30		08.28.2020 10:30	
	Analyzed:	08.28.2020 18:18		08.28.2020 18:39		08.28.2020 18:59		08.28.2020 19:20		08.28.2020 19:42	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00200	0.00200	<0.00198	0.00198	<0.00199	0.00199	<0.00199	0.00199	<0.00200	0.00200
Toluene		<0.00200	0.00200	<0.00198	0.00198	<0.00199	0.00199	<0.00199	0.00199	<0.00200	0.00200
Ethylbenzene		<0.00200	0.00200	<0.00198	0.00198	<0.00199	0.00199	<0.00199	0.00199	<0.00200	0.00200
m,p-Xylenes		<0.00399	0.00399	<0.00397	0.00397	<0.00398	0.00398	<0.00398	0.00398	<0.00399	0.00399
o-Xylene		<0.00200	0.00200	<0.00198	0.00198	<0.00199	0.00199	<0.00199	0.00199	<0.00200	0.00200
Total Xylenes		<0.00200	0.00200	<0.00198	0.00198	<0.00199	0.00199	<0.00199	0.00199	<0.00200	0.00200
Total BTEX		<0.00200	0.00200	<0.00198	0.00198	<0.00199	0.00199	<0.00199	0.00199	<0.00200	0.00200
Inorganic Anions by EPA 300/300.1	***Extracted:***	08.26.2020 18:00		08.26.2020 18:00		08.26.2020 18:00		08.26.2020 18:00		08.26.2020 18:00	
	Analyzed:	08.27.2020 00:34		08.27.2020 00:50		08.27.2020 00:56		08.27.2020 01:01		08.27.2020 01:06	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		11.2	5.04	9.36	5.03	8.53	5.04	9.66	4.99	8.67	5.05
TPH By SW8015 Mod	***Extracted:***	08.26.2020 17:00		08.26.2020 17:00		08.26.2020 17:00		08.26.2020 17:00		08.26.2020 17:00	
	Analyzed:	08.27.2020 04:01		08.27.2020 04:24		08.27.2020 04:46		08.27.2020 05:09		08.27.2020 05:32	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		<49.8	49.8	<50.0	50.0	<50.0	50.0	<49.9	49.9	<50.0	50.0
Diesel Range Organics (DRO)		<49.8	49.8	<50.0	50.0	<50.0	50.0	<49.9	49.9	<50.0	50.0
Motor Oil Range Hydrocarbons (MRO)		<49.8	49.8	<50.0	50.0	<50.0	50.0	<49.9	49.9	<50.0	50.0
Total TPH		<49.8	49.8	<50.0	50.0	<50.0	50.0	<49.9	49.9	<50.0	50.0

BRL - Below Reporting Limit

Jessica Kramer

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

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Analytical Report 671100

for

Tetra Tech- Midland

Project Manager: Nathan Langford

DL AST

212C-MD-02292

08.31.2020

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-37), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2019-058), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-20-26), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-18)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-23)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-21)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-8)
Xenco-Tampa: Florida (E87429), North Carolina (483)

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08.31.2020

Project Manager: **Nathan Langford**
Tetra Tech- Midland
901 West Wall ST
Midland, TX 79701

Reference: Eurofins Xenco, LLC Report No(s): **671100**
DL AST
Project Address: New Mexico

Nathan Langford:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the Eurofins Xenco, LLC Report Number(s) 671100. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by Eurofins Xenco, LLC. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 671100 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting Eurofins Xenco, LLC to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Jessica Kramer
Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

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Sample Cross Reference 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH-1	S	08.25.2020 00:00	5 - 1 ft	671100-001
AH-2	S	08.25.2020 00:00	5 - 1 ft	671100-002
AH-3	S	08.25.2020 00:00	5 - 1 ft	671100-003
AH-4	S	08.25.2020 00:00	5 - 1 ft	671100-004
AH-5	S	08.25.2020 00:00	5 - 1 ft	671100-005

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CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: DL AST

Project ID: *212C-MD-02292*
Work Order Number(s): *671100*

Report Date: *08.31.2020*
Date Received: *08.26.2020*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3135707 TPH By SW8015 Mod

Surrogate o-Terphenyl recovered below QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 671100-002,671100-004.

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Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id: **AH-1** Matrix: Soil Date Received:08.26.2020 16:10

Lab Sample Id: 671100-001 Date Collected: 08.25.2020 00:00 Sample Depth: 5 - 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Tech: SPC % Moisture:

Analyst: SPC Date Prep: 08.26.2020 18:00 Basis: Wet Weight

Seq Number: 3135641

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**11.2**	5.04	mg/kg	08.27.2020 00:34		1

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P

Tech: DVM % Moisture:

Analyst: ARM Date Prep: 08.26.2020 17:00 Basis: Wet Weight

Seq Number: 3135707

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.8	49.8	mg/kg	08.27.2020 04:01	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.8	49.8	mg/kg	08.27.2020 04:01	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.8	49.8	mg/kg	08.27.2020 04:01	U	1
Total TPH	PHC635	<49.8	49.8	mg/kg	08.27.2020 04:01	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	76	%	70-130	08.27.2020 04:01	
o-Terphenyl	84-15-1	72	%	70-130	08.27.2020 04:01	

eurofins | Environment Testing Xenco

Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id:	**AH-1**	Matrix:	Soil	Date Received:	08.26.2020 16:10
Lab Sample Id:	671100-001	Date Collected:	08.25.2020 00:00	Sample Depth:	5 - 1 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5035A
Tech:	AMF			% Moisture:	
Analyst:	AMF	Date Prep:	08.28.2020 10:30	Basis:	Wet Weight
Seq Number:	3135896				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	08.28.2020 18:18	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	08.28.2020 18:18	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	08.28.2020 18:18	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	08.28.2020 18:18	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	08.28.2020 18:18	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	08.28.2020 18:18	U	1
Total BTEX		<0.00200	0.00200	mg/kg	08.28.2020 18:18	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	102	%	70-130	08.28.2020 18:18	
4-Bromofluorobenzene	460-00-4	102	%	70-130	08.28.2020 18:18	

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Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id: **AH-2** Matrix: Soil Date Received:08.26.2020 16:10

Lab Sample Id: 671100-002 Date Collected: 08.25.2020 00:00 Sample Depth: 5 - 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Tech: SPC % Moisture:

Analyst: SPC Date Prep: 08.26.2020 18:00 Basis: Wet Weight

Seq Number: 3135641

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**9.36**	5.03	mg/kg	08.27.2020 00:50		1

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P

Tech: DVM % Moisture:

Analyst: ARM Date Prep: 08.26.2020 17:00 Basis: Wet Weight

Seq Number: 3135707

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	08.27.2020 04:24	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	08.27.2020 04:24	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	08.27.2020 04:24	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	08.27.2020 04:24	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	71	%	70-130	08.27.2020 04:24	
o-Terphenyl	84-15-1	68	%	70-130	08.27.2020 04:24	**

eurofins | Environment Testing Xenco

Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id:	**AH-2**	Matrix:	Soil	Date Received:	08.26.2020 16:10
Lab Sample Id:	671100-002	Date Collected:	08.25.2020 00:00	Sample Depth:	5 - 1 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5035A
Tech:	AMF			% Moisture:	
Analyst:	AMF	Date Prep:	08.28.2020 10:30	Basis:	Wet Weight
Seq Number:	3135896				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00198	0.00198	mg/kg	08.28.2020 18:39	U	1
Toluene	108-88-3	<0.00198	0.00198	mg/kg	08.28.2020 18:39	U	1
Ethylbenzene	100-41-4	<0.00198	0.00198	mg/kg	08.28.2020 18:39	U	1
m,p-Xylenes	179601-23-1	<0.00397	0.00397	mg/kg	08.28.2020 18:39	U	1
o-Xylene	95-47-6	<0.00198	0.00198	mg/kg	08.28.2020 18:39	U	1
Total Xylenes	1330-20-7	<0.00198	0.00198	mg/kg	08.28.2020 18:39	U	1
Total BTEX		<0.00198	0.00198	mg/kg	08.28.2020 18:39	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	103	%	70-130	08.28.2020 18:39	
1,4-Difluorobenzene	540-36-3	104	%	70-130	08.28.2020 18:39	

eurofins | Environment Testing Xenco

Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id: **AH-3** Matrix: Soil Date Received:08.26.2020 16:10

Lab Sample Id: 671100-003 Date Collected: 08.25.2020 00:00 Sample Depth: 5 - 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Tech: SPC % Moisture:

Analyst: SPC Date Prep: 08.26.2020 18:00 Basis: Wet Weight

Seq Number: 3135641

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**8.53**	5.04	mg/kg	08.27.2020 00:56		1

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P

Tech: DVM % Moisture:

Analyst: ARM Date Prep: 08.26.2020 17:00 Basis: Wet Weight

Seq Number: 3135707

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	08.27.2020 04:46	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	08.27.2020 04:46	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	08.27.2020 04:46	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	08.27.2020 04:46	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	72	%	70-130	08.27.2020 04:46	
o-Terphenyl	84-15-1	73	%	70-130	08.27.2020 04:46	

eurofins | Environment Testing Xenco

Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id:	**AH-3**	Matrix:	Soil	Date Received:	08.26.2020 16:10
Lab Sample Id:	671100-003	Date Collected:	08.25.2020 00:00	Sample Depth:	5 - 1 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5035A
Tech:	AMF			% Moisture:	
Analyst:	AMF	Date Prep:	08.28.2020 10:30	Basis:	Wet Weight
Seq Number:	3135896				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	08.28.2020 18:59	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	08.28.2020 18:59	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	08.28.2020 18:59	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	08.28.2020 18:59	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	08.28.2020 18:59	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	08.28.2020 18:59	U	1
Total BTEX		<0.00199	0.00199	mg/kg	08.28.2020 18:59	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	103	%	70-130	08.28.2020 18:59	
4-Bromofluorobenzene	460-00-4	101	%	70-130	08.28.2020 18:59	

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Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id: **AH-4** Matrix: Soil Date Received:08.26.2020 16:10

Lab Sample Id: 671100-004 Date Collected: 08.25.2020 00:00 Sample Depth: 5 - 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P

Tech: SPC % Moisture:

Analyst: SPC Date Prep: 08.26.2020 18:00 Basis: Wet Weight

Seq Number: 3135641

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**9.66**	4.99	mg/kg	08.27.2020 01:01		1

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P

Tech: DVM % Moisture:

Analyst: ARM Date Prep: 08.26.2020 17:00 Basis: Wet Weight

Seq Number: 3135707

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<49.9	49.9	mg/kg	08.27.2020 05:09	U	1
Diesel Range Organics (DRO)	C10C28DRO	<49.9	49.9	mg/kg	08.27.2020 05:09	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<49.9	49.9	mg/kg	08.27.2020 05:09	U	1
Total TPH	PHC635	<49.9	49.9	mg/kg	08.27.2020 05:09	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	70	%	70-130	08.27.2020 05:09	
o-Terphenyl	84-15-1	68	%	70-130	08.27.2020 05:09	**

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Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id:	**AH-4**	Matrix:	Soil	Date Received:	08.26.2020 16:10
Lab Sample Id:	671100-004	Date Collected:	08.25.2020 00:00	Sample Depth:	5 - 1 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5035A
Tech:	AMF			% Moisture:	
Analyst:	AMF	Date Prep:	08.28.2020 10:30	Basis:	Wet Weight
Seq Number:	3135896				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	08.28.2020 19:20	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	08.28.2020 19:20	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	08.28.2020 19:20	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	08.28.2020 19:20	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	08.28.2020 19:20	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	08.28.2020 19:20	U	1
Total BTEX		<0.00199	0.00199	mg/kg	08.28.2020 19:20	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	95	%	70-130	08.28.2020 19:20	
1,4-Difluorobenzene	540-36-3	102	%	70-130	08.28.2020 19:20	

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Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id: **AH-5** Matrix: Soil Date Received:08.26.2020 16:10
Lab Sample Id: 671100-005 Date Collected: 08.25.2020 00:00 Sample Depth: 5 - 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: SPC % Moisture:
Analyst: SPC Date Prep: 08.26.2020 18:00 Basis: Wet Weight
Seq Number: 3135641

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**8.67**	5.05	mg/kg	08.27.2020 01:06		1

Analytical Method: TPH By SW8015 Mod Prep Method: SW8015P
Tech: DVM % Moisture:
Analyst: ARM Date Prep: 08.26.2020 17:00 Basis: Wet Weight
Seq Number: 3135707

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons (GRO)	PHC610	<50.0	50.0	mg/kg	08.27.2020 05:32	U	1
Diesel Range Organics (DRO)	C10C28DRO	<50.0	50.0	mg/kg	08.27.2020 05:32	U	1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<50.0	50.0	mg/kg	08.27.2020 05:32	U	1
Total TPH	PHC635	<50.0	50.0	mg/kg	08.27.2020 05:32	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	130	%	70-130	08.27.2020 05:32	
o-Terphenyl	84-15-1	134	%	70-130	08.27.2020 05:32	**

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Certificate of Analytical Results 671100

Tetra Tech- Midland, Midland, TX

DL AST

Sample Id:	**AH-5**	Matrix:	Soil	Date Received:	08.26.2020 16:10
Lab Sample Id:	671100-005	Date Collected:	08.25.2020 00:00	Sample Depth:	5 - 1 ft
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5035A
Tech:	AMF			% Moisture:	
Analyst:	AMF	Date Prep:	08.28.2020 10:30	Basis:	Wet Weight
Seq Number:	3135896				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	08.28.2020 19:42	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	08.28.2020 19:42	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	08.28.2020 19:42	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	08.28.2020 19:42	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	08.28.2020 19:42	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	08.28.2020 19:42	U	1
Total BTEX		<0.00200	0.00200	mg/kg	08.28.2020 19:42	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	103	%	70-130	08.28.2020 19:42	
1,4-Difluorobenzene	540-36-3	103	%	70-130	08.28.2020 19:42	

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Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit. **ND** Not Detected.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

QC Summary 671100

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Tetra Tech- Midland

DL AST

Analytical Method: Inorganic Anions by EPA 300/300.1 — Prep Method: E300P
Seq Number: 3135641 — Matrix: Solid — Date Prep: 08.26.2020
MB Sample Id: 7710234-1-BLK — LCS Sample Id: 7710234-1-BKS — LCSD Sample Id: 7710234-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	247	99	247	99	90-110	0	20	mg/kg	08.26.2020 22:49	

Analytical Method: Inorganic Anions by EPA 300/300.1 — Prep Method: E300P
Seq Number: 3135641 — Matrix: Soil — Date Prep: 08.26.2020
Parent Sample Id: 671059-009 — MS Sample Id: 671059-009 S — MSD Sample Id: 671059-009 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	14.0	248	277	106	277	106	90-110	0	20	mg/kg	08.27.2020 00:19	

Analytical Method: Inorganic Anions by EPA 300/300.1 — Prep Method: E300P
Seq Number: 3135641 — Matrix: Soil — Date Prep: 08.26.2020
Parent Sample Id: 671079-007 — MS Sample Id: 671079-007 S — MSD Sample Id: 671079-007 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	12.0	249	271	104	270	104	90-110	0	20	mg/kg	08.26.2020 23:05	

Analytical Method: TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3135707 — Matrix: Solid — Date Prep: 08.26.2020
MB Sample Id: 7710243-1-BLK — LCS Sample Id: 7710243-1-BKS — LCSD Sample Id: 7710243-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<50.0	1000	1050	105	1010	101	70-130	4	20	mg/kg	08.27.2020 08:01	
Diesel Range Organics (DRO)	<50.0	1000	1170	117	1050	105	70-130	11	20	mg/kg	08.27.2020 08:01	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	105		106		98		70-130	%	08.27.2020 08:01
o-Terphenyl	122		120		105		70-130	%	08.27.2020 08:01

Analytical Method: TPH By SW8015 Mod — Prep Method: SW8015P
Seq Number: 3135707 — Matrix: Solid — Date Prep: 08.26.2020
MB Sample Id: 7710243-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Motor Oil Range Hydrocarbons (MRO)	<50.0	mg/kg	08.27.2020 09:55	

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

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QC Summary 671100

Tetra Tech- Midland

DL AST

Analytical Method: **TPH By SW8015 Mod** Prep Method: SW8015P
Seq Number: 3135707 Matrix: Soil Date Prep: 08.26.2020
Parent Sample Id: 671100-001 MS Sample Id: 671100-001 S MSD Sample Id: 671100-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons (GRO)	<50.0	999	1080	108	1040	104	70-130	4	20	mg/kg	08.27.2020 09:08	
Diesel Range Organics (DRO)	<50.0	999	1150	115	1080	108	70-130	6	20	mg/kg	08.27.2020 09:08	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	107		105		70-130	%	08.27.2020 09:08
o-Terphenyl	116		95		70-130	%	08.27.2020 09:08

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5035A
Seq Number: 3135896 Matrix: Solid Date Prep: 08.28.2020
MB Sample Id: 7710430-1-BLK LCS Sample Id: 7710430-1-BKS LCSD Sample Id: 7710430-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0976	98	0.0929	93	70-130	5	35	mg/kg	08.28.2020 14:10	
Toluene	<0.00200	0.100	0.0862	86	0.0819	82	70-130	5	35	mg/kg	08.28.2020 14:10	
Ethylbenzene	<0.00200	0.100	0.0869	87	0.0824	82	70-130	5	35	mg/kg	08.28.2020 14:10	
m,p-Xylenes	<0.00400	0.200	0.170	85	0.161	81	70-130	5	35	mg/kg	08.28.2020 14:10	
o-Xylene	<0.00200	0.100	0.0847	85	0.0808	81	70-130	5	35	mg/kg	08.28.2020 14:10	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	97		101		101		70-130	%	08.28.2020 14:10
4-Bromofluorobenzene	86		96		94		70-130	%	08.28.2020 14:10

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5035A
Seq Number: 3135896 Matrix: Soil Date Prep: 08.28.2020
Parent Sample Id: 671103-003 MS Sample Id: 671103-003 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Benzene	<0.00200	0.0998	0.0733	73	70-130	mg/kg	08.28.2020 14:52	
Toluene	<0.00200	0.0998	0.0531	53	70-130	mg/kg	08.28.2020 14:52	X
Ethylbenzene	<0.00200	0.0998	0.0405	41	70-130	mg/kg	08.28.2020 14:52	X
m,p-Xylenes	<0.00399	0.200	0.0778	39	70-130	mg/kg	08.28.2020 14:52	X
o-Xylene	<0.00200	0.0998	0.0400	40	70-130	mg/kg	08.28.2020 14:52	X

Surrogate	MS %Rec	MS Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	105		70-130	%	08.28.2020 14:52
4-Bromofluorobenzene	98		70-130	%	08.28.2020 14:52

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

Chain of Custody

Work Order No: 671100

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432) 704-5440 EL Paso,TX (915) 585-3443 Lubbock,TX (806) 794-1296 Craslbad, NM (432) 704-5440
Phoenix,AZ (480) 355-0900 Atlanta,GA (770) 449-8800 Tampa,FL (813) 620-2000 West Palm Beach, FL (561) 689-6701
www.xenco.com Page _____ of _____

Project Manager:	Nathan Langford	Bill to: (if different)	
Company Name:	Tetra Tech	Company Name:	
Address:	9081 W. Wall St #1000	Address:	
City, State ZIP:	Midland TX 79701	City, State ZIP:	
Phone:	432.215-9426	Email:	Nathan.Langford.com

Work Order Comments

Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐
State of Project:
Reporting:Level II ☐ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

Project Name:	DL AST	Turn Around	
Project Number:	212C-MD-02292	Routine ☒	
Project Location	New Mexico	Rush:	
Sampler's Name:	Carlos Tomlinso	Due Date:	
PO #:		Quote #:	

SAMPLE RECEIPT			
Temperature (°C):	2.7 / 2.3	Temp Blank:	Yes (No)
Received Intact:	(Yes) No	Wet Ice:	(Yes) No
Cooler Custody Seals:	Yes No (N/A)	Thermometer ID	DL-8
Sample Custody Seals:	Yes No (N/A)	Correction Factor:	-0.4
		Total Containers:	

ANALYSIS REQUEST

Preservative Codes

MeOH: Me
None: NO
HNO3: HN
H2S04: H2
HCL: HL
NaOH: Na
Zn Acetate+ NaOH: Zn

TAT starts the day recevied by the lab, if received by 4:00pm

Lab ID	Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	TPH - 8015	BTEX	Cl	Sample Comments
	AH-1	Soil	8/25		0-1'	1				32.41813, -103.56952
	AH-2	Soil	8/25			1				32.41788, -103.56928
	AH-3	Soil	8/25			1				32.41765, -103.56959
	AH-4	Soil	8/25			1				32.4790, -103.56983
	AH-5	Soil	8/25			1				32.47790, -103.56956

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

Circle Method(s) and Metal(s) to be analyzed TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U 1631 / 245.1 / 7470 / 7471 : Hg

	Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1			8/26/20	2		
3				4		
5			1610	6		

Revised Date 022619 Rev. 2019.1

Eurofins Xenco, LLC

Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 08.26.2020 04.10.00 PM

Work Order #: 671100

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-8

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	2.3	
#2 *Shipping container in good condition?	**Yes**	
#3 *Samples received on ice?	**Yes**	
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**	
#5 Custody Seals intact on sample bottles?	**N/A**	
#6*Custody Seals Signed and dated?	**Yes**	
#7 *Chain of Custody present?	**Yes**	
#8 Any missing/extra samples?	**No**	
#9 Chain of Custody signed when relinquished/ received?	**Yes**	
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**	
#11 Container label(s) legible and intact?	**Yes**	
#12 Samples in proper container/ bottle?	**Yes**	BTEX was in bulk container
#13 Samples properly preserved?	**Yes**	
#14 Sample container(s) intact?	**Yes**	
#15 Sufficient sample amount for indicated test(s)?	**Yes**	
#16 All samples received within hold time?	**Yes**	
#17 Subcontract of sample(s)?	**N/A**	
#18 Water VOC samples have zero headspace?	**N/A**	

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 08.26.2020
Brianna Teel

Checklist reviewed by: Jessica Kramer Date: 08.31.2020
Jessica Kramer

Attachments 3 – DOI-BLM-NM-P020-2020-0095-EA, Section 1.6, Scoping, Public Involvement, and Issues (2019)

Temporary Pit containing non-low chloride fluids

Dagger Lake 15 22 Ogopogo Pad Pit

Section 10, T22S, R33E

U.S. Department of the Interior
Bureau of Land Management

2019

Carlsbad Field Office
Environmental Assessment

Environmental Assessment DOI-BLM-NM-P020-2020-0095-EA

CHEVRON U.S.A. INC

Lease No. NMNM 96244

DL 09 16 LOCH NESS FED COM P1 16H
DL 09 16 LOCH NESS FED COM P1 17H
DL 09 16 LOCH NESS FED COM P1 18H
DL 04 33 LOCH NESS FED COM P1 4H
DL 04 33 LOCH NESS FED COM P1 5H
DL 04 33 LOCH NESS FED COM P1 6H

Department of the Interior
Bureau of Land Management
Pecos District
Carlsbad Field Office
620 E Greene Street
Carlsbad, NM 88220
Phone: (575) 234-5972

Confidentiality Policy
Any comments, including names and street addresses of respondents, you submit may be made available for public review. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

TABLE OF CONTENTS

- **Clean Water Act of 1977, as amended (30 USC 1251)** - Establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
- **Endangered Species Act of 1973 (16 USC 1531 et seq.)** - Protects critically imperiled species from extinction as a consequence of economic growth and development untempered by adequate concern and conservation.
- **Federal Cave Resources Protection Act of 1988 (16 USC 4301 et seq.)** - Protects significant caves on federal lands by identifying their location, regulating their use, requiring permits for removal of their resources, and prohibiting destructive acts
- **Lechuguilla Cave Protection Act of 1993** - Protects Lechuguilla Cave and other resources and values in and adjacent to Carlsbad Caverns National Park
- **Migratory Bird Treaty Act of 1918 (16 USC 703-712)** - Implements the convention for the protection of migratory birds.
- **Mining and Mineral Policy Act of 1970, as amended (30 USC 21)** - Fosters and encourages private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs
- **National American Graves Protection and Repatriation Act of 1990 (25 USC 301)** - Provides a process for museums and Federal agencies to return certain Native American cultural items such as human remains, funerary objects, sacred objects, or objects of cultural patrimony to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations and includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking
- **National Historic Preservation Act of 1966, as amended (16 USC 470)** - Preserves historical and archaeological sites.
- **Wild and Scenic Rivers Act of 1968, as amended (16 USC 1271 et seq.)** - Preserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations
- **Wilderness Act of 1964 (16 USC 1131 et seq.)** - Secures for the American people of present and future generations the benefits of an enduring resource of wilderness

Air quality standards in New Mexico are under the jurisdiction of the New Mexico Environment Department/Air Quality Bureau (NMED/NMAQB). The Environmental Improvement Act, NMSA 1978, and the Air Quality Control Act, NMSA 1978, dictate state air quality standards. Also, 40 CFR § 60 “Standards of Performance for New Stationary Sources” is administered by the NMED/NMAQB.

Additionally, Chevron would comply with all applicable federal, state, and local laws and regulations; obtain the necessary permits for drilling, construction, completion, and operation; and certify that Surface Use Agreements have been reached with the private landowners, where required.

1.6. Scoping, Public Involvement, and Issues

The Carlsbad Field Office (CFO) publishes Land Use Planning (LUP) and National Environmental Policy Act (NEPA) documents to the national register known as ePlanning. The register allows you to review and comment online on BLM NEPA and planning projects. A hard copy of this NEPA project has been made available in the Carlsbad Field Office as well as in electronic format on ePlanning at https://eplanning.blm.gov

The CFO uses Geographic Information Systems (GIS) in order to identify resources that may be affected by the proposed action. A map of the project area is prepared to display the resources in the area and to identify potential issues. The proposed action was circulated among CFO resource specialists in order to identify any issues associated with the project. The issues that were raised include:

How would air quality, including GHG emissions, be impacted by the proposed action?

- How would climate change be impacted by the proposed action?
- How would water resources be impacted by the propose action?
- How would watershed resources be impacted by the proposed action?
- How would soils be impacted by the proposed action?
- How would potash resources be impacted by the proposed action?
- How would wildlife/habitat be impacted by the proposed action?
- How would special status species be impacted by the proposed action?
- How would vegetation be impacted by the proposed action?
- Could noxious weeds be introduced to the project area as a result of the proposed action?
- How would range management be impacted by the proposed action?
- How would visual resources be impacted by the proposed action?
- How would cultural resources be impacted by the proposed action?
- How would paleontological resources be impacted by the proposed action?

2. PROPOSED ACTION AND ALTERNATIVE(S)

2.1. Proposed Action

The BLM Carlsbad Field Office is proposing to allow Chevron to drill six horizontal oil wells and associated infrastructure. Chevron would strip the available topsoil from the well pad area and stockpile on where interim reclamation is planned be completed upon completion of the wells. The well sites would then be leveled and surfaced with mineral material. Chevron would take approximately 30 days to drill each proposed well. After the proposed well is drilled and completed, the proposed well location would be downsized to approximately a 2.95 acre surfaced pad. All areas not needed for production would be reclaimed by removing the caliche, recontouring the area, spreading the stockpiled topsoil over the area, and seeding the area. It is likely that the proposed wells would be drilled within four years from approval.

3.12.1. *Affected Environment*

Paleontological resources are any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth. Fossil remains may include bones, teeth, tracks, shells, leaves, imprints, and wood. Paleontological resources include not only the actual fossils but also the geological deposits that contain them and are recognized as nonrenewable scientific resources protected by federal statutes and policies.

The primary federal legislation for the protection and conservation of paleontological resources occurring on federally administered lands are the Paleontological Resources Preservation Act of 2009 (PRPA), the Federal Land Policy and Management Act of 1976 (FLPMA), and the National Environmental Policy Act of 1970 (NEPA). BLM has also developed policy guidelines for addressing potential impacts to paleontological resources (BLM, 1998a, b; 2008, 2009). In addition, paleontological resources on state trust lands are protected by state policy from unauthorized appropriation, damage, removal, or use.

The Potential Fossil Yield Classification (PFYC) is a tool that allows the BLM to predict the likelihood of a geologic unit to contain paleontological resources. The PFYC is based on a numeric system of 1-5, with PFYC 1 having little likelihood of containing paleontological resources, whereas a PFYC 5 value is a geologic unit that is known to contain abundant scientifically significant paleontological resources. The fossil resources of concern in this area are the remains of vertebrates, which include species of fish, amphibians, and mammals.

3.12.2. *Impacts from the Proposed Action*

Direct and Indirect Impacts

Direct impacts would result in the immediate physical loss of scientifically significant fossils and their contextual data. Impacts indirectly associated with ground disturbance could subject fossils to damage or destruction from erosion, as well as creating improved access to the public and increased visibility, potentially resulting in unauthorized collection or vandalism. However, not all impacts of construction are detrimental to paleontology. Ground disturbance can reveal significant fossils that would otherwise remain buried and unavailable for scientific study. In this manner, ground disturbance can result in beneficial impacts. Such fossils can be collected properly and curated into the museum collection of a qualified repository making them available for scientific study and education.

The location of the proposed project is within a PFYC 2, where management concern in negligible. A pedestrian survey for paleontological resources was not necessary and there should be no impacts to paleontological resources.

Mitigation Measures

There are no mitigation measures for this project, as currently proposed.

3.13. Impacts from the No Action Alternative

The No Action Alternative is used as the baseline for comparison of environmental effects of the analyzed alternatives. Under the No Action Alternative, the proposed project would not be drilled, built or constructed and there would be no new direct or indirect impacts to natural or cultural resources from oil and gas production. The natural and cultural resources in the project area would continue to be managed under the current land and resource uses.

3.14. Cumulative Impacts

Cumulative impacts are the combined effect of past projects, specific planned projects, and other reasonably foreseeable future actions within the project study area to which oil and gas exploration and development may add incremental impacts. This includes all actions, not just oil and gas actions that may occur in the area including foreseeable non-federal actions.

The combination of all land use practices across a landscape has the potential to change the visual character, disrupt natural water flow and infiltration, disturb cultural sites, cause increases in greenhouse gas emissions, fragment wildlife habitat and contaminate groundwater. Cumulative impacts analysis to air quality, GHG emissions, water use and quality is included in Chapter 3, under sections 3.1 and 3.2. The likelihood of these impacts occurring is minimized through standard mitigation measures, special Conditions of Approval and ongoing monitoring studies.

All resources are expected to sustain some level of cumulative impacts over time, however these impacts fluctuate with the gradual abandonment and reclamation of wells. As new wells are being drilled, there are others being abandoned and reclaimed. As the oil field plays out, the cumulative impacts will lessen as more areas are reclaimed and less are developed.

4. SUPPORTING INFORMATION

4.1. List of Preparers

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Appendices

Appendix A. Emissions Estimates for Oil and Gas Wells

Emissions for a one-well horizontal and oil gas well on federal lands are included in Tables 4-1 and 4-2. Emissions for vertical wells were omitted from this analysis due to current predominant technological drilling methods being horizontal. Additionally, presenting horizontal oil and gas wells emissions estimates represent a more conservative summary of emissions when compared to emissions from a vertical well with the exception SO_2 which could be 4-5x greater in a vertical well scenario however sulfur dioxide emissions are still estimated to be within the same magnitude and less <1 ton per year of SO_2 emissions per well.

Table A-1 Emission Estimates for One Horizontal Oil Well

Activity/ Phase	Annual Emissions (Tons)*							
	PM_{10}†	$PM_{2.5}$	NO_x	SO_2	CO	VOC**	HAPs	CO_2e
Construction	2.41	0.49	5.21	0.11	1.44	0.42	0.42	578.89
Operations	2.90	0.33	0.80	0.00	1.11	0.75	0.75	126.81
Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.089
Reclamation**	0.00	0.00	0.18	0.00	0.08	0.00	0.00	0.00
Total	**5.31**	**0.81**	**6.19**	**0.11**	**2.63**	**1.17**	**1.17**	**705.79**

* Values where a “0.00” appear may be too small and not appear due to rounding.

† Reclamation PM_{10} emissions were estimated to be twice the value of Maintenance PM_{10} values.

**VOC emissions at the operational phase represent a 95% control efficiency and estimates potential emissions representing the contribution for “one oil well” from the emissions at storage tanks, gathering facilities, etc.

Table A-2 Emission Estimates for One Horizontal Gas Well

Activity/Phase	Annual Emissions (Tons)*							
	PM_{10}†	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs	CO_2e
Construction	0.64	0.31	5.18	0.11	1.41	0.61	0.41	1125.79
Operations	0.28	0.18	0.34	0.00	0.46	0.16	0.18	126.81
Maintenance	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.089
Reclamation†	0.00	0.00	0.18	0.00	0.08	0.00	0.00	0.00
Total	**0.92**	**0.49**	**5.71**	**0.11**	**1.95**	**0.77**	**0.59**	**1252.69**

* Values where a “0.00” appear may be too small and not appear due to rounding.

† Reclamation PM_{10} emissions were estimated to be twice the value of Maintenance PM_{10} values.

Emission estimates for a construction, operations, maintenance and reclamation are included. Construction emissions for both an oil and gas well include well pad construction (fugitive dust), heavy equipment combustive emissions, commuting vehicles and wind erosion. Operations emissions for an oil well include well workover operations (exhaust and fugitive dust), well site visits for inspection and repair, recompletion traffic, water and oil tank traffic, venting, compression and well pumps, dehydrators and compression station fugitives. Operations emissions for a gas well include well workover operations (exhaust and fugitive dust), wellhead and compressor station fugitives, well site visits for inspection and repair, recompletions, compression, dehydrators and compression station fugitives. Maintenance emissions for both oil and gas wells are for road travel and reclamation emission activities are for interim and final activities and include truck traffic, a dozer, blade and track hoe equipment.

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CONDITIONS

Action 20288

CONDITIONS

Operator: CHEVRON U S A INC 6301 Deauville Blvd Midland, TX 79706	OGRID: 4323
	Action Number: 20288
	Action Type: [C-144] PIT Generic Plan (C-144)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	NMOCD has reviewed [4323] CHEVRON USA INC, Application and Form C-144 received on March 9, 2021, for the proposed DAGGER LAKE 15 22 OGOPOGO FED COM [fVV2112641752] Reserve Pit, in Unit Letter I, Section 10, Township 22S, Range 33E, Lea County, New Mexico. This application has been approved with conditions. The Conditions of Approval and signed C-144 will be emailed and also can be found in the facility file [fVV2112641752] at OCD Imaging.	5/25/2021