

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 August 1, 2011

For temporary pits, closed-loop systems, and below-grade tanks, submit to the appropriate NMOCD District Office.
For permanent pits and exceptions submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

**Pit, Closed-Loop System, Below-Grade Tank, or
Proposed Alternative Method Permit or Closure Plan Application**

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

Instructions: Please submit one application (Form C-144) per individual pit, closed-loop system, 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 Midcontinent, L.P. OGRID #: 241333
Address: Post Office Box 36366, Houston, TX 77236
Facility or well name: Shelby Federal #1E
API Number: 30-039-25343 OCD Permit Number: _____
U/L or Qtr/Qtr C Section 24 Township 27N Range 7W County: Rio Arriba
Center of Proposed Design: Latitude 36.565546° Longitude -107.529625 NAD: ☐ 1927 ☒ 1983
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.
☐ **Pit:** Subsection F or G of 19.15.17.11 NMAC
Temporary: ☐ Drilling ☐ Workover
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A
☐ Lined ☐ Unlined Liner type: Thickness _____ mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other _____
☐ String-Reinforced
Liner Seams: ☐ Welded ☐ Factory ☐ Other _____ Volume: _____ bbl Dimensions: L _____ x W _____ x D _____

3.
☐ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC
Type of Operation: ☐ P&A ☐ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent)
☐ Drying Pad ☐ Above Ground Steel Tanks ☐ Haul-off Bins ☐ Other _____
☐ Lined ☐ Unlined Liner type: Thickness _____ mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other _____
Liner Seams: ☐ Welded ☐ Factory ☐ Other _____

4.
☒ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC
Volume: 95 bbl Type of fluid: Produced water
Tank Construction material: Steel
☒ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☒ Other Buried
Liner type: Thickness _____ mil ☐ HDPE ☐ PVC ☒ Other None

5.
☐ **Alternative Method:**
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

6.

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 Four foot, pipe frame with square wire mesh

7.

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

☐ Screen ☐ Netting ☒ Other Solid

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

8.

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

9.

Administrative Approvals 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:

☒ Administrative approval(s): Requests must be submitted to the appropriate division district or the Santa Fe Environmental Bureau office for consideration of approval.

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

10.

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. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Applicant must attach justification for request. Please refer to 19.15.17.10 NMAC for guidance. Siting criteria does not apply to drying pads or above-grade tanks associated with a closed-loop system.

Ground water is less than 50 feet below the bottom of the temporary pit, permanent pit, or below-grade tank.

- Groundwater is estimated to be 430 feet below the bottom of the below-grade tank on the Shelby Federal #1E well site; see attached *Data Sheet for Deep Ground Cathodic Protection Wells*.

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).

- The below-grade tank is greater than 300 feet from a continuously flowing watercourse and greater than 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake; see attached *Topographic Map*.

Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

(*Applies to temporary, emergency, or cavitation pits and below-grade tanks*)

- The below-grade tank is greater than 300 feet from the nearest residence, school, hospital, institution, or church; see attached *Aerial Map*.

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

(*Applies to permanent pits*)

- Not applicable for below-grade tanks.

Within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.

- The below-grade tank is estimated to be 2764 meters (1.70 miles) from the nearest domestic fresh water well and greater than 1000 feet from the nearest spring; see attached *NMOSE Water Column/Average Depth to Water Report*.

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.

- The below-grade tank is not within incorporated Municipal Boundaries; see attached *Municipal Boundary Map*.

Within 500 feet of a wetland.

- The below-grade tank is greater than 500 feet from the nearest wetland; see attached *Topographic Map* and *U.S. Fish and Wildlife Service National Wetlands Inventory Map*.

Within the area overlying a subsurface mine.

- The below-grade tank is not within an area overlying a subsurface mine; see attached *NM EMNRD - Mining and Mineral Division Map*.

Within an unstable area.

- The below-grade tank is not within an unstable area; see attached *USGS Geologic Map, USGS Karst Map, and Hydrogeologic Report*.

Within a 100-year floodplain.

- The below-grade tank is outside of any known 100-year flood plain; see the attached *FIRM Flood Insurance Rate Map*.

☐ Yes ☒ No

☐ Yes ☒ No

☐ Yes ☒ No

☐ NA

☐ Yes ☐ No

☒ NA

☐ Yes ☒ No

☐ Yes ☒ No

☐ Yes ☒ No

☐ Yes ☒ No

☐ Yes ☒ No

☐ Yes ☒ No

11.

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

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

12.

Closed-loop Systems 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.

- ☐ Geologic and Hydrogeologic Data (only for on-site closure) - based upon the requirements of Paragraph (3) of Subsection B of 19.15.17.9
- ☐ Siting Criteria Compliance Demonstrations (only for on-site closure) - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ 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
- ☐ 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

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

☐ Previously Approved Operating and Maintenance Plan API Number: _____ (Applies only to closed-loop system that use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)

13.

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 H₂S, 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

14.

Proposed Closure: 19.15.17.13 NMAC**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 ☐ Closed-loop System

☐ 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 (Exceptions must be submitted to the Santa Fe Environmental Bureau for consideration)

15.

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 F 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 I of 19.15.17.13 NMAC
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

16.

Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only: (19.15.17.13.D NMAC)*Instructions: Please identify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.*

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?☐ Yes (If yes, please provide the information below) ☐ No*Required for impacted areas which will not be used for future service and operations:*☐ 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 I of 19.15.17.13 NMAC☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

17.

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 may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17.10 NMAC for guidance.*

Ground water is less than 50 feet below the bottom of the buried waste.

- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ Yes ☐ No
☐ NA

Ground water is between 50 and 100 feet below the bottom of the buried waste

- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ 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

☐ Yes ☐ No
☐ NA

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 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

☐ Yes ☐ No

Within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.

- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site

☐ 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

☐ 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

Within the area overlying a subsurface mine.

- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division

☐ Yes ☐ No

Within an unstable area.

- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map

☐ Yes ☐ No

Within a 100-year floodplain.

- FEMA map

☐ Yes ☐ No

18.

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☐ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements 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☐ 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 F of 19.15.17.13 NMAC☐ Waste Material Sampling Plan - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)☐ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

19.

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): Leslie Barnes Title: Operations Manager, Piceance & San Juan

Signature:  Date: 12/11/12

e-mail address: LeslieBarnes@chevron.com Telephone: (970) 257-6009

20.

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

OCD Representative Signature: _____ Approval Date: _____

Title: _____ OCD Permit Number: _____

21.

Closure Report (required within 60 days of closure completion): Subsection K of 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: _____

22.

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.

23.

Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:

Instructions: Please identify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Were the closed-loop system operations and associated activities performed on or in areas that will not be used for future service and operations?

☐ Yes (If yes, please demonstrate compliance to the items below) ☐ No

Required for impacted areas which will not be used for future service and operations:

- ☐ Site Reclamation (Photo Documentation)
☐ Soil Backfilling and Cover Installation
☐ Re-vegetation Application Rates and Seeding Technique

24.

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)
☐ 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

25.

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: _____

Chevron Midcontinent, LP
BGT Permit Siting Criteria Summary Sheet
Shelby Federal #1E

- Groundwater is estimated to be 430 feet below the bottom of the BGT. This was calculated using information from cathodic wells located near the site, surrounding domestic freshwater wells, and the elevation of surrounding surface water. This combined information gives an estimated groundwater elevation of 6275 feet. The topographic map indicates the site elevation to be 6710 feet. The BGT is buried five (5) feet below ground surface which gives a bottom of the BGT elevation of 6705 feet. The difference between the BGT bottom elevation and groundwater elevation is 430 feet.
- The below-grade tank is not within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake. The nearest continuously flowing watercourse is the San Juan River estimated to be 17 miles northwest of the BGT. The nearest lake is Cuervo Lake estimated to be 1.60 miles west of the BGT. The nearest significant watercourse is an un-named, ephemeral wash, that is a first order tributary of Cuervo Canyon creek, and is estimated to be 500 feet west of the BGT; see attached **Topographic Map**. (The red dot on the topographic map indicates the location of the BGT.)
- The below-grade tank is not within 300 feet of a permanent residence, school, hospital, institution, or church in existence at the time of initial application; see the attached **Aerial Map**. (The red dot on the aerial map indicates the location of the BGT.) There are no permanent residences, schools, hospitals, institutions or churches within the mapped area of the **Aerial Map**. The nearest residence is 5 miles southwest of the BGT. The nearest school, hospital, institution, or church is at least 20 miles to the southwest and northwest of the BGT.
- The BGT is not within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. There are no freshwater springs within 1000 feet of the BGT as indicated on the attached **Topographic Map**. The closest water well is estimated to be 2,764 meters (1.70 miles) southeast of the BGT and was revealed on the attached **NMOSE Water Column/Average Depth to Water Report**.
- The below-grade tank is not 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; see the attached **Municipal Boundary Map**. The closest boundary is the Nageezi Municipal Boundary located approximately 22 miles southwest of the site. (The Nageezi City Limits are colored orange and the BGT is indicated by a red circle on the **Municipal Boundary Map**.)
- The below-grade tank is not within 500 feet of a wetland; see the attached **Topographic Map** and **U.S. Fish and Wildlife Service National Wetlands Inventory Map**. Any wetlands on the topographic map are noted in dark blue. The nearest wetland area is estimated to be 4500 feet east of the BGT.
- The below-grade tank is not within an area overlying a subsurface mine; see the attached **NM EMNRD-Mining and Mineral Division Map**. The nearest mine is an aggregate mine located approximately 26 miles northwest of the BGT.
- The below-grade tank is not within an unstable area; see the attached **USGS Geologic Map** and **USGS Karst Map**. The site is indicated on the maps by a red square. The nearest Karst Feature is approximately 35 miles southeast of the site and is shown on the **USGS Karst Map**. The underlying geology is comprised of the San Jose Formation, a Tertiary formation composed of shale, siltstone and sandstone.
- The well site is outside of any known 100 year floodplains as evidenced on the attached **FIRM Flood Insurance Rate Map**. (Any floodplains are indicated by blue dotted hatching on the map.)

HYDROGEOLOGIC REPORT

Shelby Federal #1E Hydrogeologic Report

Topography and Surface Hydrology

The Shelby Federal #1E well site is located in what is considered the Colorado River Basin, within the Gould Pass, Rio Arriba County, New Mexico, United States Geological Survey (USGS) 7.5-minute Quadrangle Map approximately 22 miles to the northeast of Nageezi, New Mexico; see attached *Municipal Boundary Map*. The largest, continuously flowing streams of the Colorado River Basin are the Animas and San Juan Rivers. The San Juan River is the closest continuously flowing waterway to the site and is approximately 17 miles northwest of the site. Most stream channels within the Colorado River Basin are ephemeral, with some being intermittent (Stone et al., 1983). The tributaries of the San Juan River that contribute large quantities of water during precipitation events are Canyon Largo, Gallegos Canyon, Chaco River, and the La Plata River. The nearest significant watercourse is an un-named wash approximately 500 feet west of the BGT and is a first order tributary to Cuervo Canyon Creek. The Cuervo Canyon Creek is an ephemeral wash that only exists during periods of heavy precipitation and is a first order tributary to Canyon Largo Wash. The general topographic slope of the site is to the west. Storm water runoff flows off of the Shelby Federal #1E well site toward the west and then follows surface runoff channels toward the Cuervo Canyon Creek; see attached *Topographic Map*.

The nearest identified wetland area to the Shelby Federal #1E well site is estimated to be 4500 feet to the east of the BGT. This wetland area is identified as "other" in accordance with the attached *U.S. Fish and Wildlife Service National Wetlands Inventory Map*. The well site is not located within a 100 year flood plain; see attached *Firm Flood Insurance Rate Map*.

Residential areas are mostly within the San Juan River Valley to the north and within the Bloomfield City Municipal Boundaries. The closest permanent residence is approximately 5.0 miles to the southwest of the Shelby Federal #1E well site. The nearest schools are the Dzilh-Na-O-Dith-Hle School and Blanco Elementary located approximately 20 miles southwest and northwest respectively of the Shelby Federal #1E. All other schools, churches and institutions are all located within the Bloomfield and Nageezi City Municipal Boundaries. The closest hospital is located within Farmington, New Mexico, approximately 15 miles west of Bloomfield.

The only mining activities identified are to the northwest of the Shelby Federal #1E. The mining activities are Aggregate and Stone Mines and the nearest mine is approximately 26 miles northwest of the well site. No mines were identified within the map boundary; see attached *NM EMNRD – Mining and Mineral Division Map*.

Soil

The San Juan Basin contains a wide range of soil types, with the northwest part of the basin, including the bulk of the drainage area of the Chaco and San Juan Rivers, characterized by light-colored, cool, desertic soil types. The higher elevations bordering the basin are characterized by moderately dark to dark mountain soils, and the area in between the two zones being characterized by dark-colored, western plateau soils. The majority of the soils within the basin are of alluvial valley fill and consist of gravel, sand, silt, and clay (Stone et al., 1983). The soil type in the area of the Shelby Federal #1E well site is predominantly the Orlie fine sandy loam. This soil is characterized by moderate organic material and moderately high permeability. The unit consists of Fan alluvium and/or slope alluvium derived from sandstone and shale. The unit is relatively flat and ranges between one (1) and eight (8) percent sloping grade. It is a well drained soil with a very high available water capacity. The depth to paralithic bedrock is more than 80 inches. The underlying bedrock is mainly weathered sandstone and shale with visible outcrops along the canyon rim to the north of the well site. The unit is found between the elevations of 6,200 feet and 7,500 feet. Mean annual precipitation is between 13 to 16 inches per year (*Natural Resources Conservation Service Soil Survey*).

Geology and Groundwater Hydrology

The area geology is comprised of mostly sandstone, mudstone, and siltstone. Karst features are formed by the dissolution of soluble rocks, such as limestone and dolomite, and can be characterized by springs, caves, and sinkholes. The nearest documented Karst features are approximately 35 miles southeast of the well site in

accordance with a search of Karst features conducted from the *New Mexico Institute of Mining and Technological Petroleum Recovery Research Center Webb Mapping Portal*. The information used to create the Karst feature search was compiled using data from the *United States Geological Survey (USGS) Digital Engineering Aspects of Karst Map web site*. The identified Karst features consist of fissures, tubes and caves generally less than 1,000 feet long, 50 feet or less vertical extent, in moderately to steeply dipping beds of carbonate rock.

Most water supplies in the San Juan Basin are from groundwater that is accessed through wells completed within the surficial valley-fill deposits of Quaternary age and sandstones of Tertiary, Cretaceous, Jurassic, and Triassic age. The Shelby Federal #1E well site lies in the San Jose Formation Aquifer which dips at 7 degrees to the north-east (Frenzel, 1983). The San Jose Formation ranges from less than 200 feet in the west and south to nearly 2,700 feet in the basin center between Cuba and Gobernador (Frenzel, 1983).

The **San Jose Formation (Tsj)** is the youngest Tertiary unit in the San Juan Basin and was named by Simpson (1948, p. 277-283). It is of early Eocene age and as early as 1875 was correlated with the Wasatch Formation in Wyoming. The San Jose is the surface formation in the eastern two-thirds of the San Juan Basin. Although largely exposed in New Mexico, the San Jose also straddles the New Mexico/Colorado State boundaries. It outcrops in its west, south and northeast boundaries in a broad, and in some places irregular, southeasterly trending band in the Blanco Canyon to Largo Canyon area. On the east side, it rises structurally and outcrops in a narrow band along the west face of the Nacimiento Uplift forming the eastern boundary of the San Juan Basin. There are several smaller, isolated remnants of the San Jose Formation west of the central exposure. The San Jose has eroded deeply in some areas and because of differential resistance to erosion of its various sandstone and shale units, produces a large thickness variance and in some places formation of very rugged topographic expression (Baltz, 1967, p. 45). In some places it erodes to horseshoe-shaped badlands and massive cliffs. The San Jose overlays the nonresistant slope-forming Nacimiento Formation (Tn). Thickness of the San Jose ranges from less than 200' at the outcrop on the west and south sides to almost 2700 feet in the the Basin center (Stone, et al, p. 25). The thickness is 1300' or less on the southern part of the Tapicitos Plateau where the San Jose structurally rises and its upper beds are eroded. In the Largo Plains area (Largo Canyon) which marks the western exposure of the preserved San Jose, more than half of the Formation was removed by erosion (Baltz, p. 46). The San Jose Formation contact is that of an angular unconformity surface with the underlying Paleocene-age Nacimiento Formation near the Nacimiento Uplift, but is slightly disconformable to conformable in the Basin center (Stone, et al, p. 25). The San Jose Formation is comprised of four identifiable rock facies (in ascending order) called the Cuba Mesa, the Regina, the Llaves and the Tapicitos Members. These four members are only present in the far eastern part of the basin (Brimhall, 1973, p. 198). Within the preserved area, only the Cuba Mesa and Regina are widespread throughout the basin. The oldest Member of the San Jose is the Cuba Mesa (150-800 feet thick), which is largely a massive cliff-forming buff and yellow, rusty-weathering cross-bedded arkosic coarse-grained sandstone with lenticular reddish, green and gray shale beds (Baltz, p. 46). The Cuba Mesa is overlain in the southern two-thirds of the area by drab-colored variegated shale and interbedded soft to hard sandstones known as the Regina Member (100 to 1700 feet thick) and overlain in the northern one-third by a thick sequence of sandstone called the Llaves (50 to 1300 feet thick) which in turn intertongues and grades southward into the Regina. In the northeastern part of the area, the upper Llaves Member grades southward and westward into the red silty mudstones, siltstones and interbedded poorly consolidated sandstones of the Tapicitos Member (120-500 feet thick) (Stone, et al, p. 25).

The nearest registered water well determined by a radius search of 2796 meters (2.64 miles) from the center of the BGT on the Shelby Federal #1E well site is approximately 1,934 meters (1.70 miles) southeast of the BGT with a depth of groundwater of 300 feet below the top of casing; see attached *New Mexico Office of the State Engineer Water Column/Average Depth to Water Report* and *Topographic Map*. Due to the distances of the water wells from the well site, water well data was not solely used in the determination of depth to groundwater. Groundwater is estimated to be 430 feet below the bottom of the BGT. This was calculated using information from cathodic wells located near the site, surrounding domestic freshwater wells, and the elevation of surrounding surface water; see the attached *Topographic Map* and *Data Sheet for Deep Ground Bed Cathodic Protection Wells*. A water well is located approximately 1.7 miles to the southeast with a depth to groundwater of 300 feet, another water well is located approximately 1.80 miles to the northwest with a depth to groundwater of 500 feet and a third water well is located approximately 2.50 miles to the northeast with a depth to groundwater of 41 feet. One (1) water well is labeled on the topographic map with a blue point. Three (3) cathodic wells were located near the Shelby Federal #1E well site. A cathodic well drilled in 1965 for the Rincon Unit #27 well site, owned and operated by Union Oil Company of California, shows that groundwater was encountered at 60 feet and the cathodic well data sheet is

stamped as being accepted by the OCD in May of 1990. The Rincon Unit #27 well site is located approximately 2,200 feet to the northwest of the Shelby Federal #1E well site. A cathodic well drilled in 1976 for the Ripley #3 well site, owned and operated by Burlington Resources, shows that groundwater was encountered at 140 feet and the cathodic well data sheet is stamped as being accepted by the OCD in May of 1991. The Ripley #3 well site is located approximately 2,815 feet to the southeast of the Shelby Federal #1E well site. A cathodic well drilled in 1980 for the Rincon Unit #88A well site, owned and operated by Union Oil Company of California, shows that groundwater was encountered at 400 feet and the cathodic well data sheet is stamped as being accepted by the OCD in May of 1990. The Rincon Unit #88A well site is located approximately 3,100 feet to the northeast of the Shelby Federal #1E well site. The average surface water elevation is 6,250 feet. This combined information gives an estimated groundwater elevation of 6,285 feet. The topographic map indicates the site elevation to be 6710 feet. The BGT is buried five (5) feet below ground surface which gives a bottom of the BGT elevation of 6705 feet. The difference between the BGT bottom elevation and groundwater elevation is 430 feet.

Resources

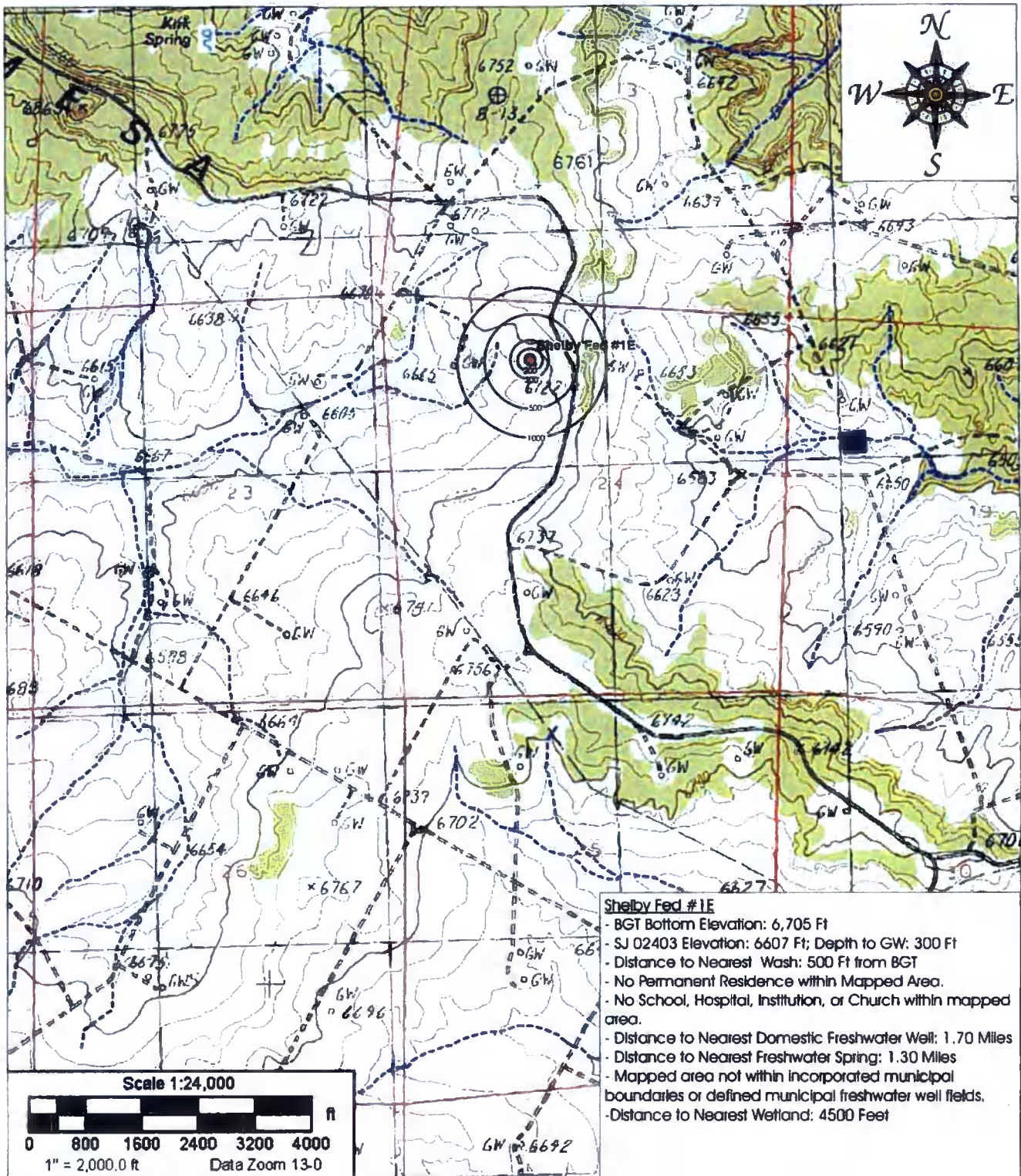
New Mexico Office of the State Engineer (NMOSE) New Mexico Water Right Reporting System (iWaters database)

Stone et al., 1983, Hydrogeology and Water Resources of the San Juan Basin, New Mexico: Socorro, New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6, 70 p.

Natural Resources Conservation Service Soil Survey web page

New Mexico Institute of Mining and Technological Petroleum Recovery Research Center Webb Mapping Portal

SITING CRITERIA COMPLIANCE DEMONSTRATIONS



Source: USGS 7.5-minute Quadrangle Map - Gould Pass, Rio Arriba County, New Mexico

LEGEND	
●	Below Grade Tank
●	Water Well
■	Wetland Area
○	Spring or Seep
~	Ephemeral Wash
PROJECT Number: 92270-1050	Date Drawn: 11/26/12



5796 U.S. HIGHWAY 64
Farmington, New Mexico 87401
505.632.0615

Topographic Map	
Chevron North America	
Shelby Federal #1E	
Section 24, Township 27 N, Range 7 W	
Rio Arriba County, New Mexico	
DRAWN BY: Christopher Arigo	PROJECT MANAGER: Greg Crabtree



Source: USGS 7.5-minute Quadrangle Map - Gould Pass, Rio Arriba County, New Mexico

LEGEND	
	Below Grade Tank
	Water Well
	Wetland Area
	Spring or Seep
	Ephemeral Wash
PROJECT Number: 92270-1050	Date Drawn: 11/26/12

envirotech
ENVIRONMENTAL SCIENTISTS & ENGINEERS

5796 U.S. HIGHWAY 64
Farmington, New Mexico 87401
505.632.0615

Aerial Map	
Chevron North America	
Shelby Federal #1E	
Section 24, Township 27 N, Range 7 W	
Rio Arriba County, New Mexico	
DRAWN BY: Christopher Arriaga	PROJECT MANAGER: Greg Crabtree

#137 30-039-06975

CPS 1082

DATA SHEET FOR DEEP GROUND BED CATHODIC PROTECTION WELLS
NORTHWESTERN NEW MEXICO
(Submit 3 copies to OCD Aztec Office)

Operator Union Oil Company of California Location: Unit Sec. 24 Twp 27N Rng 7W

Name of Well/Wells or Pipeline Serviced Rincon #137 DK/MV

Elevation 6760' Completion Date 10/18/76 Total Depth 300' Land Type* F

Casing, Sizes, Types & Depths None

If Casing is cemented, show amounts & types used None

If Cement or Bentonite Plugs have been placed, show depths & amounts used
None

Depths & thickness of water zones with description of water when possible:
Fresh, Clear, Salty, Sulphur, Etc. 55' - 70' Deep 15' Thick
170' - 185' Deep 15' Thick

Depths gas encountered: NA

Type & amount of coke breeze used: type unknown 5000 lbs

Depths anodes placed: 195' to 285'

Depths vent pipes placed: 280'

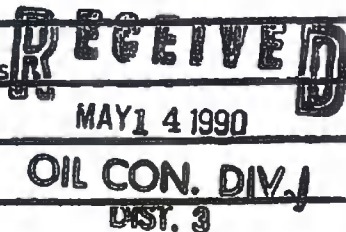
Vent pipe perforations: 216'

Remarks: El Paso Natural Gas Co. was the operator at the time this ground bed was installed

First ground bed installed at this location

If any of the above data is unavailable, please indicate so. Copies of all logs, including Drillers Log, Water Analyses & Well Bore Schematics should be submitted when available. Unplugged abandoned wells are to be included.

*Land Type may be shown: F-Federal; I-Indian; S-State; P-Free.
If Federal or Indian, add Lease Number.



27-30-039-07035
 123-30-039-07037
 177-30-039-07052

DATA SHEET FOR DEEP GROUND BED CATHODIC PROTECTION WELLS
 NORTHWESTERN NEW MEXICO
 (Submit 3 copies to OCD Aztec Office)

Operator Union Oil Company of California Location: Unit Sec. 13 Twp 27N Rng 6W

Name of Well/Wells or Pipeline Serviced Rincon #27 PC Rincon #123 MV

Rincon #177 DK

Elevation 6710' Completion Date 10/1/1965 Total Depth 360' Land Type* F

Casing, Sizes, Types & Depths None

RECEIVED

If Casing is cemented, show amounts & types used None

MAY 14 1990

OIL CON. DIV
 DIST. 9

If Cement or Bentonite Plugs have been placed, show depths & amounts used

None

Depths & thickness of water zones with description of water when possible:

Fresh, Clear, Salty, Sulphur, Etc. 60' - 90' Deep 30' Thick

175' - 210' Deep 35' Thick

Depths gas encountered: NA

Type & amount of coke breeze used: type unknown 3165 lbs

Depths anodes placed: 100' to 246'

Depths vent pipes placed: ?

Vent pipe perforations: ?

Remarks: El Paso Natural Gas Co. was the operator at the time this ground bed was installed.

First ground bed installed at this location.

If any of the above data is unavailable, please indicate so. Copies of all logs, including Drillers Log, Water Analyses & Well Bore Schematics should be submitted when available. Unplugged abandoned wells are to be included

*Land Type may be shown: F-Federal; I-Indian; S-State; P-Free.
 If Federal or Indian, add Lease Number.

88A = 30-039-21975

89 = 30-039-07628 plugged

DATA SHEET FOR DEEP GROUND BED CATHODIC PROTECTION WELLS
NORTHWESTERN NEW MEXICO
(Submit 3 copies to OCD Aztec Office)

Operator Union Oil Company of California Location: Unit Sec. 13 Twp 27N Rng 7W

Name of Well/Wells or Pipeline Serviced Rincon 88A MV Rincon #89 PC

Elevation 6648' Completion Date 6-13-80 Total Depth 620' Land Type* F

Casing, Sizes, Types & Depths None

If Casing is cemented, show amounts & types used None

If Cement or Bentonite Plugs have been placed, show depths & amounts used
None

Depths & thickness of water zones with description of water when possible
Fresh, Clear, Salty, Sulphur, Etc. 400' Deep thickness unknown

Depths gas encountered: NA

Type & amount of coke breeze used: type unknown 60 sacks

Depths anodes placed: 450' to 575'

Depths vent pipes placed: 606'

Vent pipe perforations: 300'

Remarks: El Paso Natural Gas Co. was the operator at the time this ground bed was installed

First ground bed installed at this location

If any of the above data is unavailable, please indicate so. Copies of all logs, including Drillers Log, Water Analyses & Well Bore Schematics should be submitted when available. Unplugged abandoned wells are to be included.

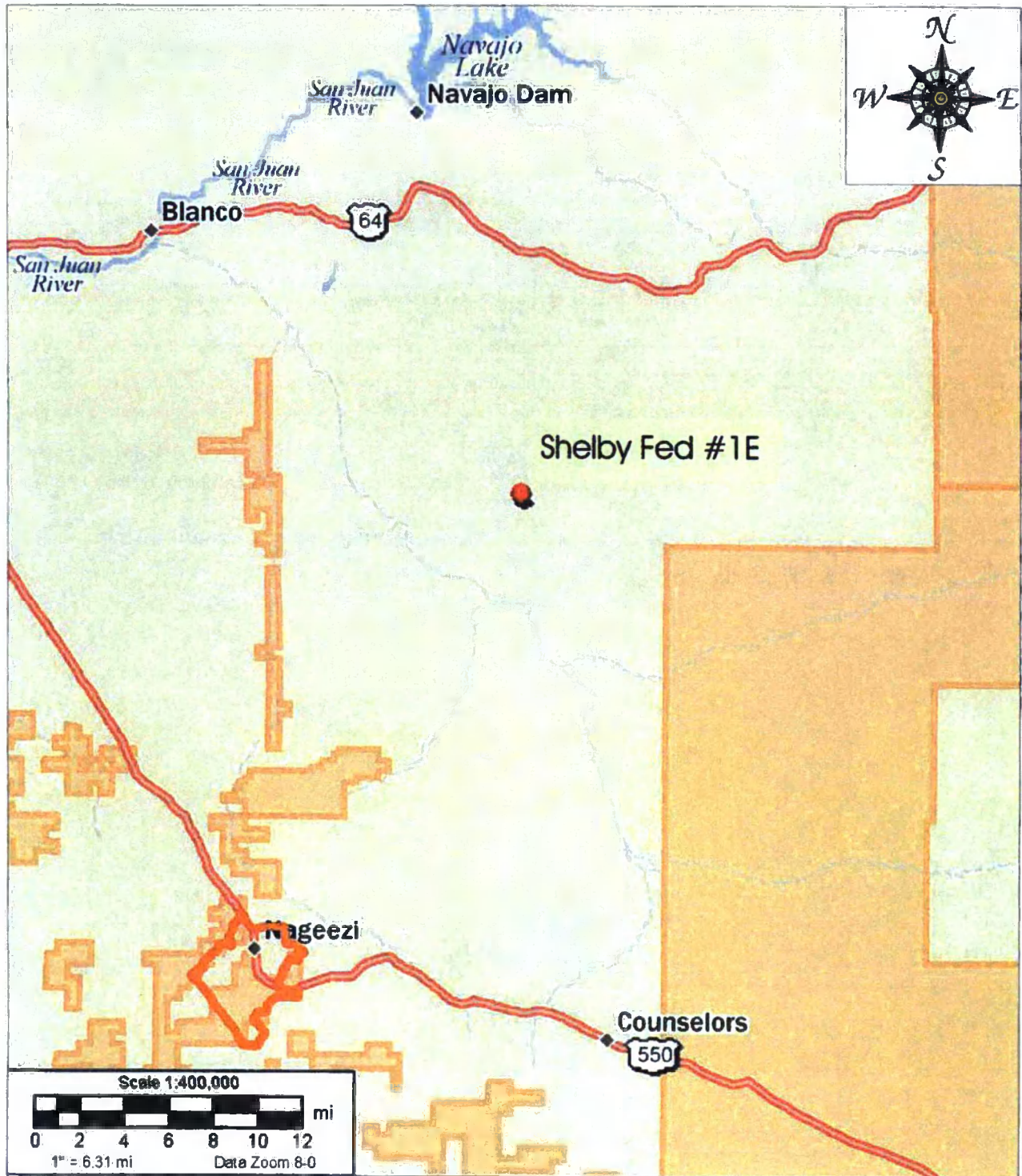
*Land Type may be shown: F-Federal; I-Indian; S-State; P-Free.
If Federal or Indian, add Lease Number.

RECEIVED

MAY 21 1990

OIL CON. DIV.]

DIST. 3



Source: Delorme Topo USA 7.0; Google Earth 2012

LEGEND

- Below Grade Tank
- / City Boundary



5796 U.S. HIGHWAY 64
Farmington, New Mexico 87401
505.632.0615

Municipality Map

Chevron North America

Shelby Fed #1E

Section 24, Township 27 N, Range 7 W

Rio Arriba County, New Mexico

PROJECT Number: 92270-1050 Date Drawn: 11/26/12

DRAWN BY:
Christopher Arigo

PROJECT MANAGER:
Greg Crabtree



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		Q Q Q			Sec	Tws	Rng	X	Y	Distance	Depth	Depth	Water
	Code	Subbasin	County	84	16	4						Well	Water	Column
SJ 02403			RA	3	1	3	30	27N 06W	274714	4047115*	2764	505	300	205
SJ 00195			SJ			2	15	27N 07W	271133	4051089*	2877	1633	500	1133
SJ 03001			RA	1	2	2	07	27N 06W	276165	4052831*	4063	141	41	100

Average Depth to Water: 280 feet

Minimum Depth: 41 feet

Maximum Depth: 500 feet

Record Count: 3

UTM NAD83 Radius Search (in meters):

Easting (X): 273628.32

Northing (Y): 4049656.97

Radius: 4250

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



U.S. Fish and Wildlife Service

National Wetlands Inventory

Chevron / Shelby Fed #1E

Nov 26, 2012



Wetlands

-  Freshwater Emergent
-  Freshwater Forested/Shrub
-  Estuarine and Marine Deepwater
-  Estuarine and Marine
-  Freshwater Pond
-  Lake
-  Riverine
-  Other

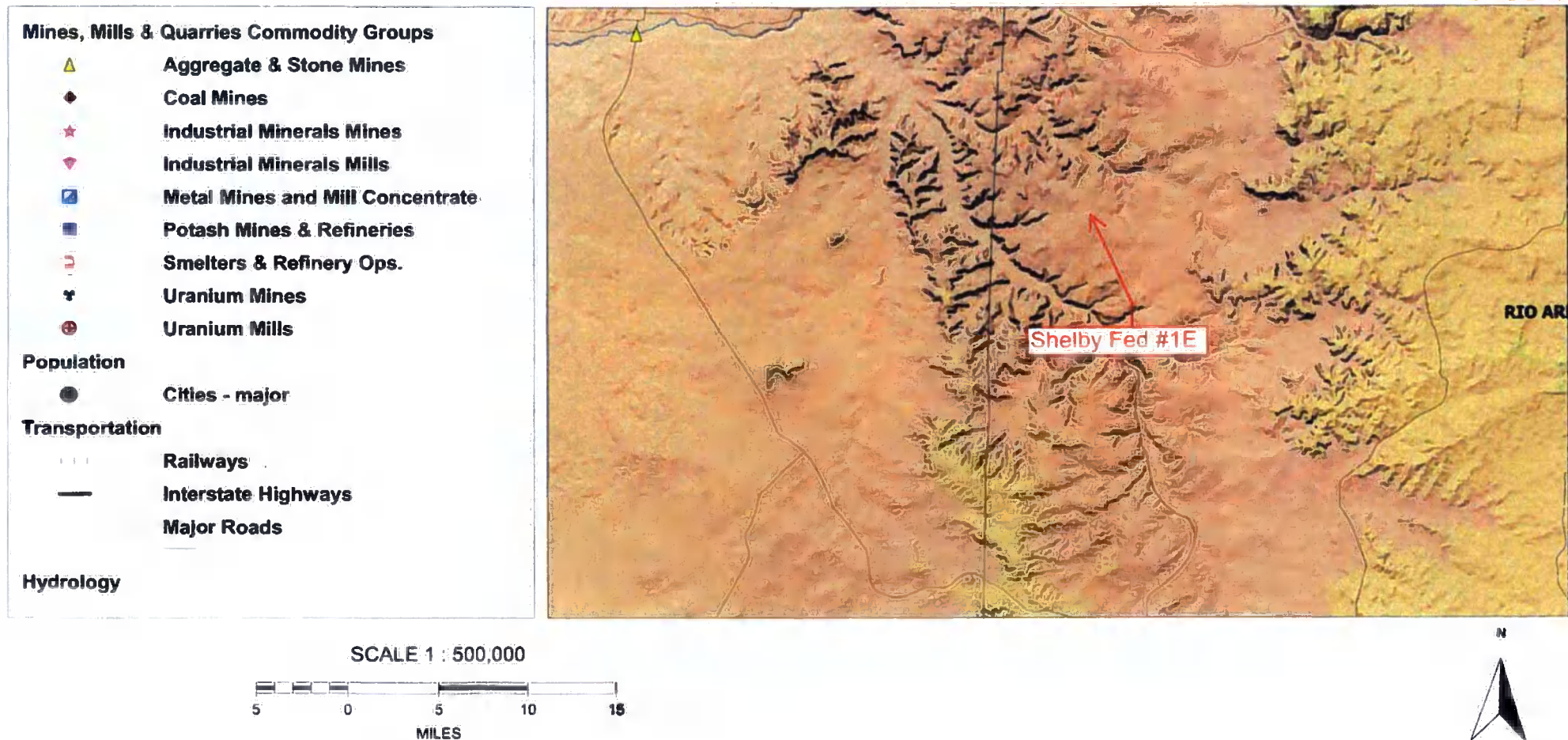
Shelby Fed #1E

User Remarks:

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

MMQonline Public Version

NM EMNRD - Mining and Mineral Division Map
Chevron North America / Shelby Fed #1E





0 2 4mi



Petroleum Recovery
Research Center































USGS Geologic Map

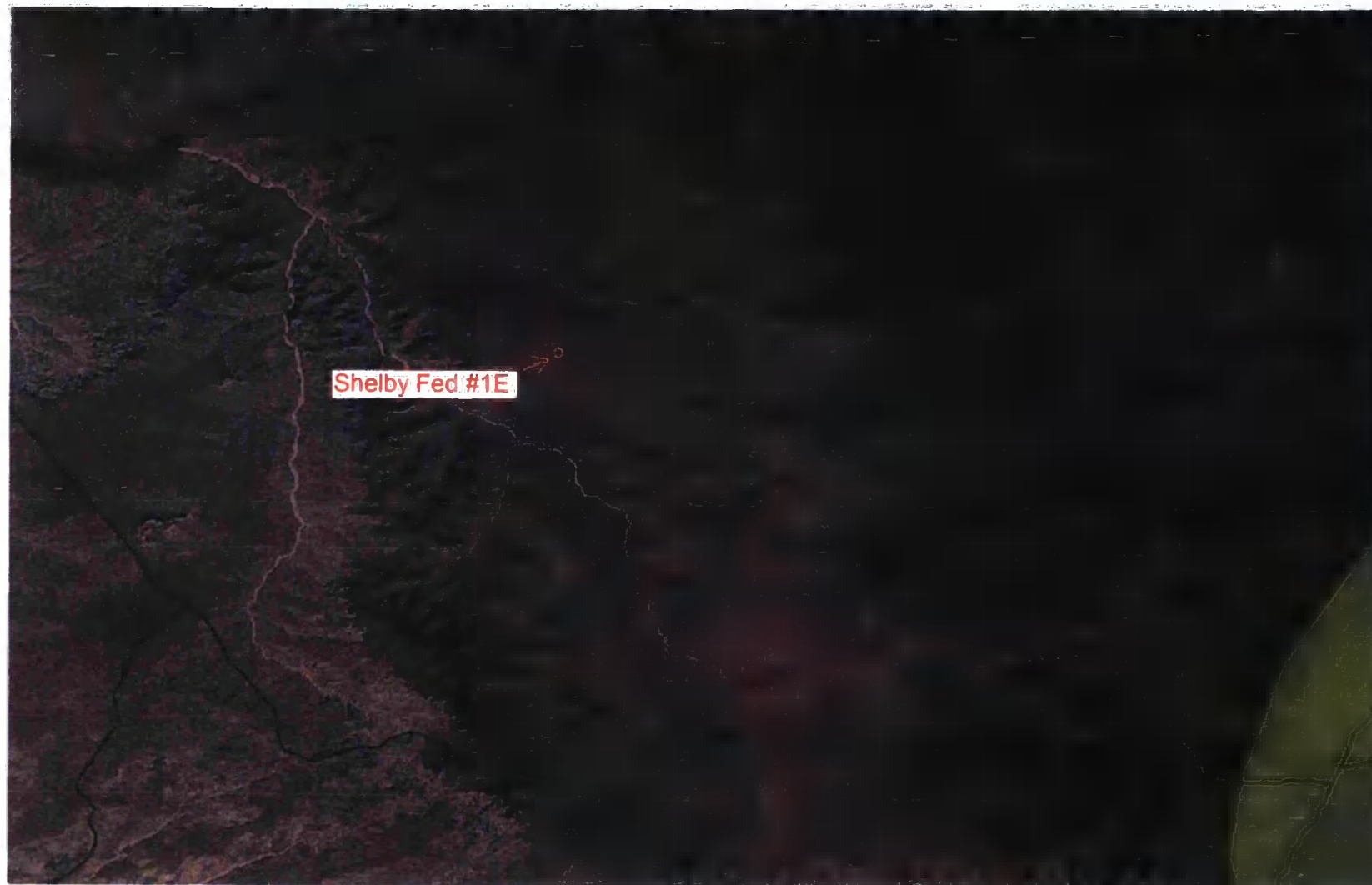
Figure:

Chevron North America/Shelby Fed #1E

11/26/2012

USGS Geologic Map Legend

	Tmb, Basalt and andesite flows; Miocene
	Tn, Macimiento Formation
	Tnb, Basalt and andesite flows; Neogene
	Tnr, Tertiary-Silicic to intermediate volcanic rocks
	Tnv, Tertiary-Neogene volcanic rocks
	To, Tertiary-Ogallala Formation
	Toa, Tertiary-Ojo Alamo Formation
	Tos, Tertiary-sedimentary and volcanoclastic rocks
	Tpb, Basalt and andesite flows; Pliocene
	Tpc, Tertiary-Poison Canyon Formation
	Tps, Tertiary-Paleogene sedimentary units
	Tsf, Tertiary-Lower and Middle Santa Fe Group
	Tsj, Tertiary-San Jose Formation
	Tual, Tertiary-Upper Oligocene andesites and basaltic andesites
	Tuau, Tertiary-Lower Miocene and uppermost Oligocene basaltic andesites
	Tui, Tertiary-Miocene to Oligocene silicic to intermediate intrusive rocks; dikes, stocks, plugs, and diatremes
	Tuim, Upper and Middle Tertiary mafic intrusive rocks
	Turf, Tertiary-Upper Oligocene silicic (or felsic) flows and masses and associated pyroclastic rocks
	Turp, Tertiary-Upper Oligocene rhyolitic pyroclastic rocks
	Tus, Upper Tertiary sedimentary units
	Tuv, Tertiary-Volcanic and some volcanoclastic rocks; undifferentiated
	Tv, Middle Tertiary volcanic rocks; undifferentiated
	Water
	X, Precambrian-Lower Proterozoic rocks; undivided
	Xn, Precambrian-Lower Proterozoic metasedimentary rocks
	Xno, Precambrian-Lower Proterozoic metamorphic rocks; dominantly mafic
	Xns, Precambrian-Lower Proterozoic metasedimentary rocks
	Xnu, Precambrian-Lower Proterozoic metamorphic rocks, undivided
	Xp, Precambrian-Lower Proterozoic plutonic rocks
	YXp, Precambrian-Middle and Lower Proterozoic plutonic rocks, undivided



0 5 10mi



Petroleum Recovery
Research Center
























USGS Karst Map

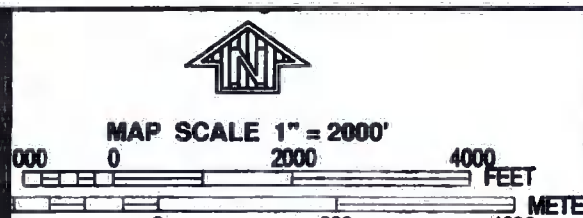
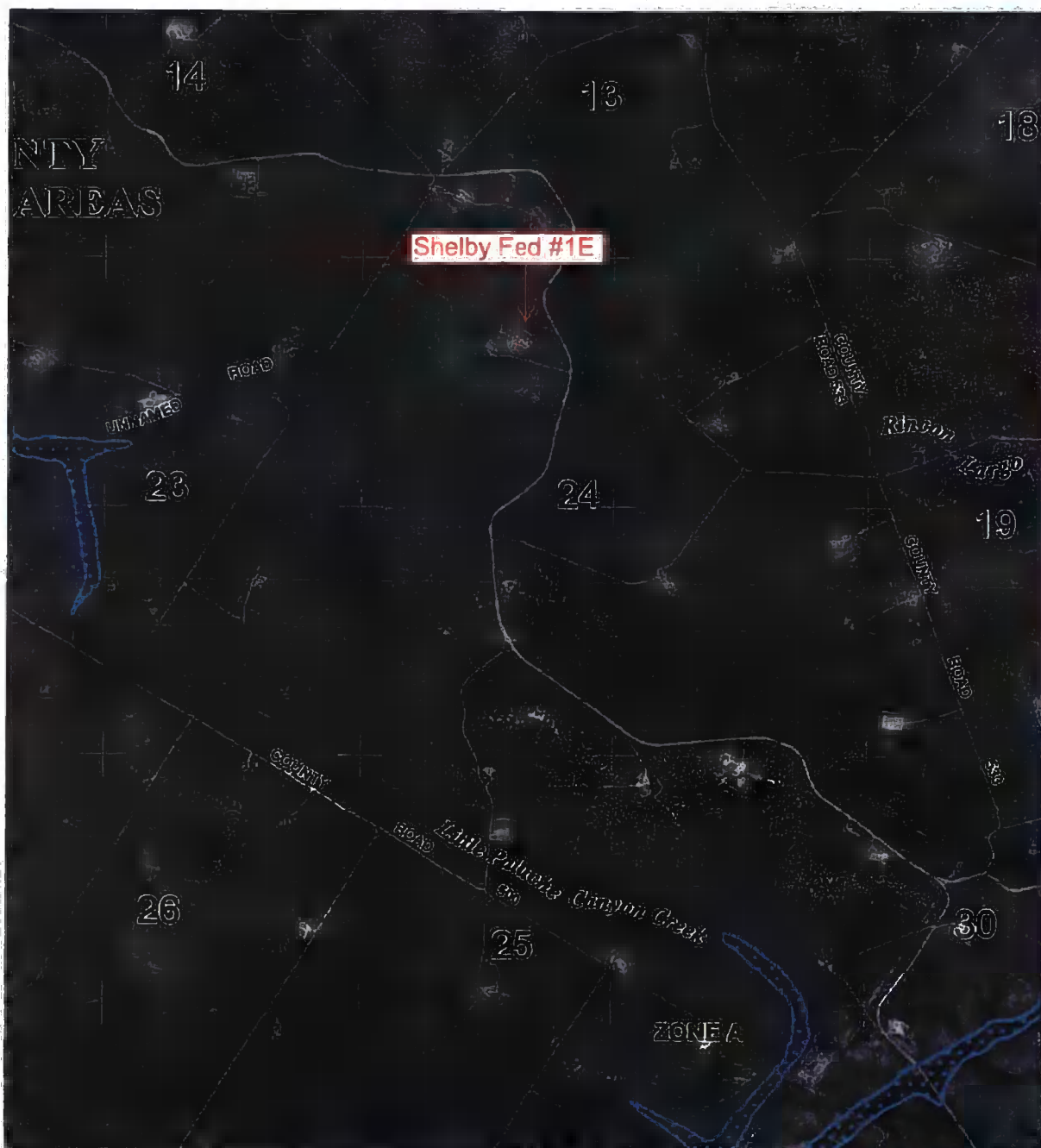
Figure:

Chevron North America/Shelby Fed #1E

11/26/2012

USGS Karst Map Legend

-  Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in metamorphosed limestone, dolostone, and marble
-  Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in moderately to steeply dipping beds of carbonate rock
-  Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of carbonate rock
-  Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of carbonate rock beneath an overburden of
-  Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in moderately to steeply dipping beds of gypsum
-  Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of gypsum
-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in metamorphosed limestone, dolostone, and marble
-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in crystalline, highly siliceous, intensely folded carbonate rock
-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in moderately to steeply dipping beds of carbonate rock
-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in gently dipping to flat-lying beds of carbonate rock
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-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in gently dipping to flat-lying beds of gypsum beneath an overburden of nongyps
-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in carbonate zones in highly calcitic granite (Alaska only)
-  Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in moderately to steeply dipping beds of carbonate rock with a thin cover of glaci
-  Fissures, tubes, and caves generally absent; where present in small isolated areas, less than 50 ft (15 m) long; less than 50 ft (15 m) vertical extent; in crystalline, highly siliceous inter
-  Fissures, tubes, and caves generally absent; where present in small isolated areas, less than 50 ft (15 m) long; less than 50 ft (15 m) vertical extent; in moderately to steeply dipping b
-  Fissures, tubes, and caves generally absent; where present in small isolated areas, less than 50 ft (15 m) long; less than 50 ft (15 m) vertical extent; in gently dipping to flat-lying beds
-  Fissures and voids present to a depth of 250 ft (75 m) or more in areas of subsidence from piping in thick, unconsolidated material
-  Fissures and voids present to a depth of 50 ft (15 m) in areas of subsidence from piping in thick, unconsolidated material
-  Fissures, tubes, and tunnels present to a depth of 250 ft (75m) or more in lava
-  Fissures, tubes, and tunnels present to a depth of 50 ft. (15 m) in lava
- Transparent - no karst



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1225D

FIRM
FLOOD INSURANCE RATE MAP
RIO ARRIBA COUNTY,
NEW MEXICO
AND INCORPORATED AREAS

PANEL 1225 OF 3175
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
RIO ARRIBA COUNTY	350048	1225	D

Notes to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35039C1225D

EFFECTIVE DATE
MARCH 15, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

BGT DESIGN PLAN

BELOW GRADE TANK (BGT) DESIGN AND CONSTRUCTION PLAN

SUBMITTED TO:

ENVIRONMENTAL BUREAU,

NEW MEXICO OIL CONSERVATION DIVISION

ON BEHALF OF:

CHEVRON USA INC., CHEVRON MIDCONTINENT, L.P., AND FOUR STAR OIL & GAS
COMPANY

P.O. Box 730

AZTEC, NEW MEXICO 87410

(505) 333-1901

Chevron
San Juan Basin
Below Grade Tank Design and Construction Plan

INTRODUCTION

In accordance with NMAC §§ 19.15.17.9(B)(4) and 19.15.17.11 Chevron (representing Chevron USA Inc, Chevron Midcontinent, L.P., and Four Star Oil & Gas Company) submits this Design and Construction Plan for below grade tanks (BGTs) in New Mexico. This Plan contains standard conditions that attach to multiple BGTs.

1. Chevron will design and construct a BGT to contain liquids and solids, prevent contamination of fresh water, and protect public health and the environment. NMAC § 19.15.17.11(A).
2. Chevron will post an upright sign not less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place on the fence surrounding the BGT, unless the BGT is located on a site where there is an existing well, signed in compliance with NMAC § 19.15.16.8, that is operated by Chevron. Chevron will post the sign in a manner and location such that a person can easily read the legend. The sign will provide the following information: Chevron's name; the location of the site by quarter-quarter or unit letter, section, township and range; and emergency telephone numbers. NMAC § 19.15.17.11(C).
3. Chevron will fence or enclose a BGT in a manner that prevents unauthorized access and will maintain the fences in good repair. Fences are not required if there is an adequate surrounding perimeter fence that prevents unauthorized access to the well site or facility, including the BGT. NMAC § 19.15.17.11(D)(1).
4. Chevron will fence or enclose a BGT located within 1000 feet of a permanent residence, school, hospital, institution or church with a chain link security fence, at least six feet in height with at least two strands of barbed wire at the top. Chevron will close and lock all gates associated with the fence when responsible personnel are not on-site. NMAC § 19.15.17.11(D)(2).
5. Chevron will fence BGTs to exclude livestock with a four foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level. NMAC § 19.15.17.11(D)(3). Chevron may install tubular steel cattle panels, as it determines appropriate (photo of cattle

panel fence submitted to NMOCD, 24 June 2009). As illustrated on the attach photo.

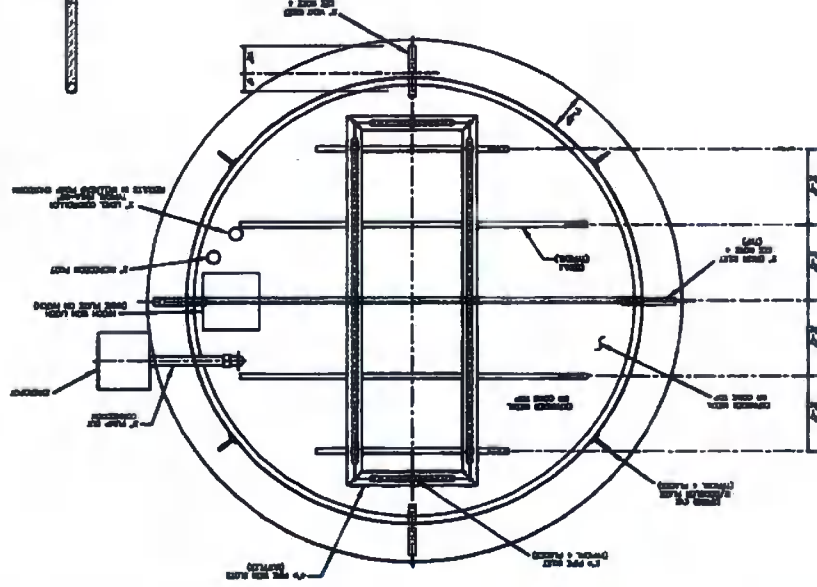
6. Chevron will screen the permanent opening on the tank top with expanding steel mesh in order to render it non-hazardous to wildlife, including migratory birds. NMAC § 19.15.17.11(E).
7. Chevron's BGTs will be constructed with the design features illustrated on the attached drawing.
8. Only double-walled, double-bottomed BGTs will be installed.
9. Chevron will use 3/16" carbon steel which is resistant to the anticipated contents and resistant to damage from sunlight. NMAC § 19.15.17.11(I)(1).
10. Chevron will construct a BGT foundation on a level base free of rocks, debris, sharp edges or irregularities to help prevent punctures, cracks or indentations of the liner or tank bottom. NMAC § 19.15.17.11(I)(2).
11. Chevron will construct a BGT to prevent overflow and the collection of surface water run-on. NMAC § 19.15.17.11(I)(3). Chevron, or a contractor representing Chevron, will install a level control device to help prevent overflow from the BGT and will use berms and/or a diversion ditch to prevent surface run on from entering the BGT. NMAC §§ 19.15.17.11(I)(3), 19.15.17.12(A)(7), and 19.15.17.12(D)(1).
12. All BGTs, in which the side walls are not open for visible inspection for leaks, will be double walled with leak detection capability. NMAC § 19.15.17.11(I)(4)(b).
13. Chevron, as the operator of a below-grade tank constructed and installed prior to June 16, 2008 that does not meet all the requirements in Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC and is not included in Paragraph (6) of Subsection I of 19.15.17.11 NMAC, is not required to equip or retrofit the below-grade tank to comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC so long as it demonstrates integrity. If the existing below-grade tank does not demonstrate integrity, the operator shall promptly remove that below-grade tank and install a below-grade tank that complies with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, as illustrated in the approved drawing. Chevron shall comply with the operational requirements of 19.15.17.12 NMAC.

14. Chevron, as the operator of a below-grade tank constructed and installed prior to June 16, 2008 that is single walled and where any portion of the tank sidewall is below the ground surface and not visible, shall equip or retrofit the below-grade tank to comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, or close it, within five years after June 16, 2008. If the existing below-grade tank does not demonstrate integrity, Chevron shall promptly remove that below-grade tank and install a below-grade tank that complies with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, as illustrated in the approved drawing. Chevron shall comply with the operational requirements of 19.15.17.12 NMAC.

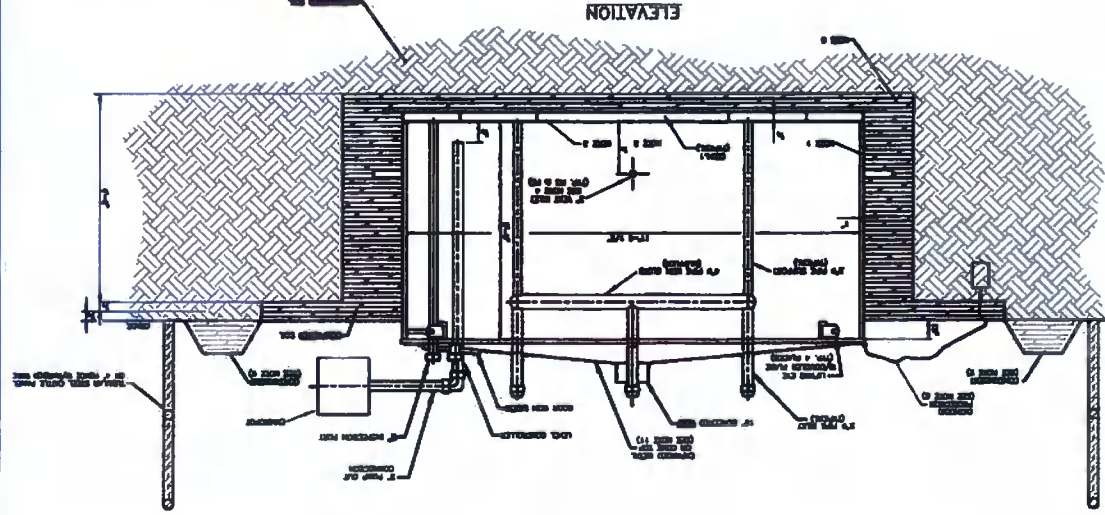
NOTES

1. FABRICATOR TO PROVIDE TEST THE AREA BETWEEN THE TANK WALLS TO ENSURE LEAK-FREE DOUBLE CONTAINMENT.
2. TANK TO BE CONSTRUCTED OF 3/16" THK. A516 STEEL. ALL PIPING TO BE SCH. 40 CARBON STEEL.
3. DOUBLE WALL DOUBLE BOTTOM.
4. BOTTOM OF THE TANK SHALL BE CONSTRUCTED OF 3/16" THK. A516 STEEL. ALL PIPING TO BE SCH. 40 CARBON STEEL.
5. TANK SHALL BE CONSTRUCTED OF 3/16" THK. A516 STEEL. ALL PIPING TO BE SCH. 40 CARBON STEEL.
6. TANK SHALL BE CONSTRUCTED OF 3/16" THK. A516 STEEL. ALL PIPING TO BE SCH. 40 CARBON STEEL.
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10. TANK SHALL BE CONSTRUCTED OF 3/16" THK. A516 STEEL. ALL PIPING TO BE SCH. 40 CARBON STEEL.
11. TANK SHALL BE CONSTRUCTED OF 3/16" THK. A516 STEEL. ALL PIPING TO BE SCH. 40 CARBON STEEL.

PLAN



ELEVATION



REVISION	DATE	BY	CHKD	APP'D
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3	10/12/17	10/12/17	10/12/17	10/12/17
4	10/12/17	10/12/17	10/12/17	10/12/17
5	10/12/17	10/12/17	10/12/17	10/12/17
6	10/12/17	10/12/17	10/12/17	10/12/17
7	10/12/17	10/12/17	10/12/17	10/12/17
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BGT OPERATING AND MAINTENANCE PLAN

BELOW GRADE TANK (BGT) OPERATING AND MAINTENANCE PLAN

SUBMITTED TO:

ENVIRONMENTAL BUREAU,
NEW MEXICO OIL CONSERVATION DIVISION

ON BEHALF OF:

CHEVRON USA INC., CHEVRON MIDCONTINENT, L.P., AND FOUR STAR OIL & GAS
COMPANY

P.O. Box 730

AZTEC, NEW MEXICO 87410

(505) 333-1901

Chevron

San Juan Basin

Below Grade Tank Operating and Maintenance Plan

INTRODUCTION

In accordance with NMAC §§ 19.15.17.9(B)(4) and 19.15.17.12 Chevron (representing Chevron USA Inc, Chevron Midcontinent, L.P., and Four Star Oil & Gas Company) submits this Operating and Maintenance Plan (O&M Plan) for below grade tanks (BGTs) in New Mexico. This O&M Plan contains standard conditions that attach to multiple BGTs. If needed for a particular BGT, a modified O&M Plan will be submitted to the New Mexico Oil Conservation Division (NMOCD or the division) for approval prior to implementation.

GENERAL PLAN:

1. Chevron, or a contractor representing Chevron, will operate and maintain a BGT to contain liquids and solids to prevent contamination of fresh water and to protect public health and environment. NMAC § 19.15.17.12(A)(1).
2. Chevron will not discharge into or store any hazardous waste in a BGT. NMAC § 19.15.17.12(A)(3).
3. If a BGT develops a leak or is penetrated below the liquid surface, Chevron will remove liquid above the damage within 48 hours, notify the appropriate division district office within 48 hours of discovery and will promptly repair the BGT. If a BGT develops a leak Chevron will remove liquid above the damage within 48 hours, notify the appropriate division district office within 48 hours of discovery and will promptly repair or replace the BGT. If replacement is required, the BGT will meet all specification included in the attached approved design drawing and comply with 19.15.17.11(I)(1-4).
4. If Chevron as an operator of a below-grade tank that was constructed and installed prior to June 16, 2008 that does not meet the requirements of Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC and discovers that the below-grade tank does not demonstrate integrity or that the below-grade tank develops any of the conditions identified in Paragraph (5) of Subsection A of 19.15.17.12 NMAC, then Chevron or their representative shall close the existing below-grade tank pursuant to the closure requirements of 19.15.17.13 NMAC and install a below-grade tank that complies with the requirements of Paragraphs

(1) through (4) of Subsection I of 19.15.17.11 NMAC. NMAC § 19.15.17.12(D)(5). If replacement is required, the BGT will meet all specification included in the attached approved design drawing.

5. If Chevron as the operator of the below-grade tank that was constructed and installed prior to June 16, 2008 that does not comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC and equips or retrofits the existing tank to comply with Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, then Chevron or their representative shall visually inspect the area beneath the below-grade tank during the retrofit and document any areas that are wet, discolored or showing other evidence of a release on form C-141. Chevron shall demonstrate to the division whether the evidence of contamination indicates that an imminent threat to fresh water, public health, safety or the environment exists. If the division determines that the contamination does not pose an imminent threat to fresh water, public health, safety or the environment, the operator shall complete the retrofit or the replacement of the below-grade tank. If Chevron or division determines that the contamination poses an imminent threat to fresh water, public health, safety or the environment, then Chevron shall close the existing below-grade tank pursuant to the closure requirements of 19.15.17.13 NMAC prior to initiating the retrofit or replacement. NMAC § 19.15.17.12(D)(6). If replacement is required, the BGT will meet all specification included in the attached approved design drawing.
6. Chevron, or a contractor representing Chevron, will use berms and/or diversion ditches to prevent surface run-on from entering the BGT by diverting surface water run-on away from the bermed area. NMAC §§ 19.15.17.12(A)(7) and 19.15.17.12(D)(1).
7. Chevron, or a contractor representing Chevron, will not allow a BGT to overflow and will maintain adequate freeboard on existing BGTs by routine inspections utilizing pumper trucks whose routes are timed based on known production rates. Fluid is pumped out on this schedule. For newly constructed BGTs Chevron, or a contractor representing Chevron, will maintain adequate freeboard by installing level control devices that automatically shut off inflow to alleviate potential overtopping. NMAC § 19.15.17.12(D)(1) and 19.15.17.12(D)(4).
8. Chevron, or a contractor representing Chevron, will remove a visible or measurable layer of oil from the fluid surface of a BGT. NMAC § 19.15.17.12(D)(2).
9. Chevron, or a contractor representing Chevron, will inspect the BGT to assess compliance with NMAC § 19.15.17.12, Operational Requirements, at least once monthly and maintain a written record of each inspection for at least five (5) years. The approved inspection form is attached.

Chevron: New Mexico Inspection Form for Below Grade Tanks

Inspection Date: _____

Below Grade Tank (BGT) Location: _____

Does the BGT have adequate freeboard to prevent overflow;	yes	no
Does the tank have visible leaks or sign of corrosion;	yes	no
Do tank valves, flanges and hatches have visible leaks;	yes	no
Is there evidence of significant spillage of produced liquids;	yes	no
Is this a single or double wall tank; _____		
Are berms and/or diversion ditches in place to prevent surface run-on from entering the BGT;	yes	no
Have visible or measurable layers of oil been removed from liquid surface fluid;	yes	no

BGT CLOSURE PLAN

BELOW GRADE TANK (BGT) CLOSURE PLAN

SUBMITTED TO:

ENVIRONMENTAL BUREAU,
NEW MEXICO OIL CONSERVATION DIVISION

ON BEHALF OF:

CHEVRON USA INC., CHEVRON MIDCONTINENT, L.P., AND FOUR STAR OIL & GAS
COMPANY
P.O. Box 730
AZTEC, NEW MEXICO 87410
(505) 333-1901

**Chevron
San Juan Basin
Below Grade Tank Closure Plan**

INTRODUCTION

In accordance with NMAC §§ 19.15.17.9(B)(4) and 19.15.17.13, Chevron (representing Chevron USA Inc, Chevron Midcontinent, L.P., and Four Star Oil & Gas Company) submits this Closure Plan for below grade tanks (BGTs) in New Mexico. This Closure Plan contains standard conditions that attach to multiple BGTs. If needed for a particular BGT, a modified Closure Plan for a proposed alternative closure will be submitted to the New Mexico Oil Conservation Division (NMOCD or the division) for approval prior to closure.

CLOSURE PLAN PROCEDURES AND PROTOCOLS (NMAC §§ 19.15.17.9(C) and 19.15.17.13).

- 1) Chevron, or a contractor acting on behalf of Chevron, will close a BGT within the time periods provided in NMAC § 19.15.17.13(A), or by an earlier date required by NMOCD to prevent an imminent danger to fresh water, public health, or the environment. NMAC § 19.15.17.13(A).
- 2) Chevron, or a contractor acting on behalf of Chevron, will close an existing BGT that does not meet the requirements of NMAC § 19.15.17.11(I)(1 through 4) or is not included in NMAC § 19.15.17.11(I)(5) within five years after June 16, 2008, if not retrofitted to comply with § 19.15.17.11(I)(1 through 4). NMAC § 19.15.17.13(A)(4).
- 3) Chevron shall close an existing below-grade tank that does not meet the requirements of Paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, if not retrofitted to comply with Paragraphs 1) through (4) of Subsection I of 19.15.17.11 NMAC, prior to any sale or change of operator pursuant to 19.15.9.9 NMAC.
- 4) Chevron, or a contractor acting on behalf of Chevron, will close a permitted BGT within 60 days of cessation of the BGT's operation or as required by the transitional provisions of NMAC § 19.15.17.17(B) in accordance with a closure plan that the appropriate division district office approves. NMAC §§ 19.15.17.13(A)(9) and 19.15.17.9(C).
- 5) In accordance with NMAC § 19.15.17.13(J)(1), Chevron will notify the surface owner by certified mail, return receipt requested, of its plans to close a BGT prior to beginning closure activities. Evidence of mailing of the notice to the address of the surface owner shown in the county tax records is sufficient to demonstrate compliance. Chevron will also notify the appropriate division district office verbally or by other means at least 72 hours, but not more than one week, prior to any closure operation. The notice shall include the operator's name and the location to be closed by unit letter, section, township and range. If the closure is associated with a particular well, then the notice shall also include the well's name, number and API number. NMAC § 19.15.17.13(J)(2).

- 6) Chevron, or a contractor acting on behalf of Chevron, will remove liquids and sludge from a BGT prior to implementing a closure method and will dispose of the liquids and sludge in a division approved facility. NMAC § 19.15.17.13(E)(1). A list of Chevron currently approved disposal facilities is included at the end of this document.
- 7) The proposed method of closure for this Closure Plan is waste excavation and removal. NMAC §§ 19.15.17.13 (E)(1).
- 8) Chevron, or a contractor acting on behalf of Chevron, shall remove the below-grade tank and dispose of it in a division-approved facility or recycle, reuse, or reclaim it in a manner that the appropriate division district office approves. When required, prior approval for disposal will be obtained. NMAC § 19.15.17.13(E)(2). Documentation regarding disposal of the BGT and its associated liner, if any, will be included in the closure report.
- 9) Waste generated during closure will be handled and disposed of in accordance with applicable laws. NMAC § 19.15.35.8(C)(1)(m) provides that plastic pit liners may be disposed at a solid waste facility without testing before disposal, provided they are cleaned well.
- 10) Chevron, or a contractor acting on behalf of Chevron, will remove on-site equipment associated with a BGT unless the equipment is required for some other purpose. NMAC § 19.15.17.13(E)(3).
- 11) Chevron, or a contractor acting on behalf of Chevron, will test the soils beneath the BGT to determine whether a release has occurred. At a minimum, 5 point composite samples will be collected along with individual grab samples from any area that is wet, discolored, or showing other evidence of a release. Samples will be analyzed for BTEX, TPH and chlorides to demonstrate that the benzene concentration, as determined by EPA SW-846 methods 8021B or 8260B or EPA method that the division approves, does not exceed 0.2mg/kg; total BTEX concentration, as determined by EPA SW-846 methods 8021B or 8260B or other EPA method that the division approves, does not exceed 50mg/kg; the TPH concentration, as determined by EPA method 418.1 or other EPA method that the division approves, does not exceed 100mg/kg; and the chloride concentration, as determined by EPA method 300.1 or other EPA method that the division approves, does not exceed 250mg/kg; or the background concentration, whichever is greater. Chevron, or a contractor acting on behalf of Chevron, will notify the NMOCD Division District office of its results on form C-141. NMAC § 19.15.17.13(E)(4).
- 12) If Chevron or the division determines that a release has occurred, Chevron will comply with NMAC §§ 19.15.29 and 19.15.30, as appropriate. NMAC § 19.15.17.13(E)(5).
- 13) If the sampling program demonstrates that a release has not occurred or that any release does not exceed the concentrations specified in NMAC § 19.15.17.13(E)(4), Chevron will backfill the excavation with compacted, non-waste containing, earthen materials; construct a division prescribed soil cover; re-contour and re-vegetate the site. The division-prescribed soil cover, recontouring and re-vegetation requirements shall comply with NMAC § 19.15.17.13)(G, H and I). NMAC § 19.15.17.13(E)(6).

- 14) As per NMAC § 19.15.17.13(G)(1), once Chevron has closed a BGT or is no longer using the BGT or an area associated with the BGT, Chevron will reclaim the BGT location and all areas associated with it including associated access roads not needed by the surface estate owner to a safe and stable condition that blends with the surrounding undisturbed area. Chevron will substantially restore impacted surface area to the condition that existed prior to its oil and gas operations by placement of soil cover as provided in NMAC § 19.15.17.13(H) (see below), re-contour the location and associated areas to a contour that approximates the original contour and blends with the surrounding topography, and re-vegetate according to NMAC § 19.15.17.13(I). NMAC § 19.15.17.13(G)(1).
- 15) Chevron may propose an alternative to the re-vegetation requirement of NMAC § 19.15.17.13(G)(1) if it demonstrates that the proposed alternative effectively prevents erosion, and protects fresh water, human health and the environment. The proposed alternative must be agreed upon in writing by the surface owner. Chevron will submit the proposed alternative, with written documentation that the surface owner agrees to the alternative, to the division for approval. NMAC § 19.15.17.13(G)(2).
- 16) Soil cover for closures where Chevron has removed the pit contents or remediated the contaminated soil to the division's satisfaction will consist of the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater. NMAC § 19.15.17.13(H)(1).
- 17) Chevron will construct the soil cover to the site's existing grade and prevent ponding of water and erosion of the cover material. NMAC § 19.15.17.13(H)(3).
- 18) As per NMAC § 19.15.17.13(I)(1) and 19.15.17.13(G)(2), Chevron will seed or plant disturbed areas during the first growing season after it is no longer using a BGT or an area associated with the BGT including access roads unless needed by the surface estate owner as evidenced by a written agreement with the surface estate owner, if any and written approval by NMOCD.
- 19) Seeding will be accomplished by drilling on the contour whenever practical or by other division approved methods. Chevron will obtain vegetative cover that equals 70% of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation) consisting of at least three native plant species, including at least one grass, but not including noxious weeds, and maintain that cover through two successive growing seasons. During the two growing seasons that prove viability, Chevron will not artificially irrigate the vegetation. NMAC § 19.15.17.13(I)(2).
- 20) Chevron will notify the division when it has seeded or planted and when it successfully achieves re-vegetation. NMAC § 19.15.17.13(I)(5).
- 21) Seeding or planting will be repeated until Chevron successfully achieves the required vegetative cover. NMAC § 19.15.17.13(I)(3).

- 22) When conditions are not favorable for the establishment of vegetation, such as periods of drought, the division may allow Chevron to delay seeding or planting until soil moisture conditions become favorable or may require Chevron to use additional cultural techniques such as mulching, fertilizing, irrigating, fencing or other practices. NMAC § 19.15.17.13(I)(4).
- 23) As per NMAC § 19.15.17.13(K), within 60 days of closure completion, Chevron will submit a closure report containing the elements required by NMAC § 19.15.17.13(K) including:
- i) Confirmation sampling results,
 - ii) A plot plan ,
 - iii) Details on back-filling, capping and covering, where applicable, including revegetation application rates and seeding technique,
 - iv) Proof of closure notice to the surface owner, if any, and the division,
 - v) Name and permit number of disposal facility, and
 - vi) Photo documentation.
- 24) The closure report will be filed on NMOCD Form C-144. Chevron will certify that all information in the closure report and attachments is correct and that it has complied with all applicable closure requirements and conditions specified in the approved closure plan. NMAC § 19.15.17.13(K).
- 25) As requested, the following are the current Chevron approved Waste Disposal Sites for the identified waste streams:

Soils and Sludges

- i) Envirotech Inc. Soil Remediation Facility, Permit No. NM-01-0011

Solids

- ii) San Juan County Regional Land Fill (NMAC § 19.15.35.8 items only, with prior NMOCD approval when required)

Liquids

- i) Key Energy Disposal Facility, Permit No. NM-01-0009
- ii) Basin Disposals Facility, Permit No. NM-01-005.

- 26) These waste disposal sites are subject to change if their certification is lost or they are closed or other more appropriate, equally protective sites become available. Chevron will provide notice if such a change is affected.