

District I
1625 N French Dr, Hobbs, NM 88240
District II
1301 W Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S St Francis Dr, Santa Fe, NM 87505

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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 CLEZ
July 21, 2008

For closed-loop systems that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure, submit to the appropriate NMOCD District Office.

Closed-Loop System Permit or Closure Plan Application

(that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)

Type of action: ☒ Permit ☐ Closure

Instructions: Please submit one application (Form C-144 CLEZ) per individual closed-loop system request. For any application request other than for a closed-loop system that only use above ground steel tanks or haul-off bins and propose to implement waste removal for closure, please submit a Form C-144.

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 Apache Corporation OGRID #: 873
Address: 6120 S. Yale Ave., Suite 1500 Tulsa, Oklahoma 74136
Facility or well name: TW Arnold #2
API Number: 30-025 39490 OCD Permit Number: P1-01289
U/L or Qtr/Qtr F Section 11 Township 20-S Range 38-E County: Lea
Center of Proposed Design: Latitude 32.589846 N Longitude 103.255716 W NAD: ☒ 1927 ☐ 1983
Surface Owner: ☐ Federal ☐ State ☒ Private ☐ Tribal Trust or Indian Allotment

2. ☒ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC
Operation: ☒ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent) ☐ P&A
☐ Above Ground Steel Tanks or ☒ Haul-off Bins

3. **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 19.15.3.103 NMAC

4. **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.
☒ 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 Box 5) - 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: _____

5. **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: Sundance Incorporated Disposal Facility Permit Number: NM-01-0003
Disposal Facility Name: CRI Disposal Facility Permit Number: NM-01-0006
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

6. **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) Curt Jones Title: Drilling Engineer
Signature: [Signature] Date: 8-6-09
e-mail address: curt.jones@apachecorp.com Telephone: 918 491-4828

7. **OCD Approval:** ☒ Permit Application (including closure plan) ☐ Closure Plan (only)

OCD Representative Signature: _____

Approval Date: 08/13/09

Title: **Geologist**

OCD Permit Number: PI-01289

8. **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: _____

9. **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

10. **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: _____

APACHE CORPORATION

CLOSED-LOOP SYSTEM DESIGN, OPERATION, MAINTENANCE AND CLOSURE
PLAN (WITH MUD STRIPPER) Rev. 5/18/09

TYPICAL FOR NEW MEXICO WELLS

This document is intended to provide design requirements as well as operating, maintenance and closure instructions for closed-loop (drilling fluid) systems which are utilizing the QMAX MudStripper, ensuring compliance with the New Mexico Title 19, Chapter 15, Part 17 rules and regulations. Drilling units operating for Apache Corporation in New Mexico may be rigged up with a closed-loop system utilizing the QMAX MudStripper so long as it is consistent with this design and so long as it is operated, maintained and closed in a manner consistent with this document.

Design

The closed-loop system shall be designed and constructed to ensure the confinement of oil, gas or water and to prevent uncontrolled releases. We will utilize cuttings bins to contain drilled solids for transport and disposal off site at a New Mexico licensed disposal facility. Figure 1. – New Mexico Typical Closed Loop System is attached for reference when reviewing the following design specifications.

The minimum solids removal equipment shall include a high speed shaker and QMAX MudStripper.

- The shale shaker(s) shall be placed to receive all of the fluid and cuttings as they return from the well bore. Entry from the flow line shall be such that splash is minimized. It shall be placed such that the drilled solids that are removed by the screen are easily conveyed to the cuttings bin(s). If a slide is required it should be designed with as much slope as possible to minimize maintenance while drilling.
- The QMAX MudStripper should receive the liquid underflow from the shale shakers via the active tank by-pass trough system. The MudStripper shall be placed such that the clean fluid overflow from the unit is easily directed into the active tank system and the solids out of the bottom can be pumped directly into the cuttings bins.

The minimum active mud system volume shall be 500 barrels. Tank(s) shall be of steel construction and in a condition such that no leaks or uncontrolled releases would be expected.

- The tanks shall be equipped with a jetting system to allow emptying of the tanks into an above ground container.
- Any dump valves shall be in good condition and left closed at all times during regular drilling operations.

- Tank bottoms shall be sloped to facilitate clean out.

In addition to the active mud tank(s) the closed-loop system shall include at a minimum two additional steel tanks for fluid containment. Both tanks shall be placed such that fluid can easily be drawn out of them on an as needed basis with vacuum trucks.

- One steel tank shall be placed such that it can receive fluid from the choke manifold. This same tank shall be placed where returns from the well bore during cementing operations can be directed into it, diverting cement returns from the active mud system.
- Another steel tank (typically a 500 barrel "frac tank") shall be placed such that fluids from the active mud system as well as the MudStripper can be easily transferred into and out of it to help with fluid management.

All drilled solids removed from the well bore and recovered from the drilling fluid shall be collected in steel "haul-off" bins. These temporary pits for solids management shall comply with any applicable requirements for temporary pits specified in 19.15.17 NMAC.

- Cuttings bins shall be of steel construction and be capable of being closed during transport to prevent spillage.
- Cuttings bins shall be constructed and placed in a manner to facilitate removal of full bins and placement of empty bins without disrupting the drilling operations.

The entire closed-loop system as described above, with the exception of the active mud tanks, shall be placed on a 20 mil nylon reinforced liner for splash containment.

- The liner shall be of size and installed in a manner that splash from normal operations such as fluid transfer, jetting of tanks, washing down of shaker slide, etc of the closed-loop system does not reach the soil on the location.
- The liner shall be installed in a manner such that run on of surface water does not occur, and run off of splash fluids does not occur.

Operation and Maintenance

The closed-loop system shall be operated and maintained at all times in such a manner as to prevent contamination of fresh water and protect the public health and the environment. While Apache Corp relies on various third party vendors to provide, operate and maintain the closed-loop system, in the end it is the Apache Corp on-site representative who must take responsibility for the effective operation of the system. At the end of the well, all drilling fluids and drilled solids should be disposed of in a licensed disposal facility in New Mexico.

Know which licensed and approved disposal facility is closest to your location and verify they are capable and prepared to receive the cuttings and fluids from your well. Track all loads sent during the drilling of the well and up to the time the rig is moved off of the location.

Current approved facilities are;

- Controlled Recovery Inc. (877) 505-4274
- Sundance Incorporated (575) 394-2511

Ensure that the closed-loop system meets the design criteria listed above and is properly installed and fully functional prior to spud.

The shale shaker(s) must be run at all times while drilling unless the use of lost circulation material (LCM) prevents it. The shaker(s) should also be run as required while tripping to ensure that any displacement from the well bore is returned to the active system and does not run over the (stopped) shale shaker screens.

- The finest mesh screens that will not cause excessive fluid discharge shall be used at all times. Torn screens should be replaced as soon as possible.
- The shale slide shall be inspected regularly through out a tour and kept clean such that drilled solids do not build up and spill over the sides, missing the cuttings bins.

The QMAX MudStripper should be utilized at all times while drilling. A QMAX technician should be on site to monitor and control fluid levels and polymer concentrations at all times while drilling. Continual use will reduce dilution requirements.

- The MudStripper and associated feed pumps, etc. should be checked regularly through out a tour to ensure they are running properly. Notify the on site QMAX technician as soon as possible if they are found not to be working properly or at all.
- Check for and correct immediately any leaks in main tank, the feed pumps and / or discharge lines.

Inspect the active system tanks at least every tour to ensure no drilling fluid is leaking onto the location. Check any dump valves and interconnecting pipes for leaks. Correct any leaks as soon as possible upon detection.

- Jet active mud system as required to maintain desired mud weight. Be sure the jetting lines are secure and do not cause excessive splash at the steel holding tank.

Monitor and know/plan the fluid level in the steel fluid containment pits. Call for vacuum trucks with enough lead time to allow for possible delays.

- Plan for displaced fluid during cement jobs. Ensure enough vacuum trucks are on hand as required before beginning your cementing job.
- Do not mix fresh water and brine water if possible. Completely empty fresh water from the steel tanks before converting the mud system to brine water.

Inspect cuttings bins at least once per tour, noting their level, any spills and any damage to the containers that could result in loss of cutting containment.

- Ensure that you have enough empty volume to handle the high rates of penetration expected on surface holes and other portions of the wells.
- Ensure cuttings bin tops are closed before leaving location en route to the disposal site.

Check the condition of the splash containment liner daily. Look for any leaks and splash accumulation that needs to be cleaned up. Repair any leaks in the liner immediately.

- Clean up any splash accumulation on the liner using diaphragm pumps, vacuum trucks and other means as necessary.

Make every effort to operate and maintain the closed-loop system in a manner that puts no drilling fluid or well bore discharge/cuttings in contact with the location or surrounding area.

In the event of an oil spill that reaches water, or an oil spill to land over five (5) barrels take immediate action to contain the spill and make to following notifications;

- EHS Apache Hotline; 800 874-3262
- NMOCD (notify appropriate district office)

In the event of oil reaching water include the following notification in addition to the notifications listed above;

- Environmental Protection Agency (EPA) National Response Center

Closure

The “closure” of the closed-loop system must be completed within six months of the date the drilling rig is released from the location. A Closure Report must be filed with the New Mexico Oil Conservation Division within 60 days of completing the closure.

“Closure” of a closed-loop system begins with the proper disposal of all liquid mud and cuttings that are on location upon rig release. The cuttings and liquid should be transported to an approved disposal facility. This includes any fluid or solids that may be on the surface of the splash containment liner. See operating instructions above.

Next all of the equipment associated with the closed-loop system must be removed. This includes steel tanks, cuttings bins and rails. Ensure that equipment being removed and transported to the next location or other facility is clean and in such a state that no waste will be discharged during transportation.

Once all of the equipment has been removed the splash containment liner material must be gathered up and disposed of in an approved disposal facility. Ensure the liner is recovered in such a manner that any contamination is "folded in" and no discharge will occur during transportation to the disposal facility. Visually search for any wet areas, discoloration or other evidence of a mud or cuttings release to the surface. If there is no evidence of any release proceed with filing the closure report.

If there is evidence of a release of mud or cuttings to the surface collect individual grab samples from the potentially contaminated area and analyze for benzene, total BTEX, THP, the GRO and DRO combined fraction and chlorides to demonstrate that benzene, as determined by EPA SW-846 method 8021B or 8260B or other EPA method that the division approves, does not exceed 0.2 mg/kg; total BTEX, as determined by EPA SW-846 method 8021B or 8260B or other EPA methods that the division approves, does not exceed 50 mg/kg; TPH, as determined by EPA SW-846 method 418.1 or other EPA method that the division approves does not exceed 2500 mg/kg; the GRO and DRO combined fraction determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg; and chlorides as determined by EPA method 300.1 do not exceed 500 mg/kg or the background concentration, whichever is greater.

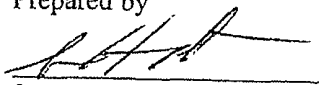
When closure is completed a closure report must be filed with the NMOCD within 60 days. The filing consists of printing a copy of the C-144 that was approved previously, completing the Closure Report on page 4 and submitting it to the NMOCD.

For our closed-loop systems in the Closure Report area of the form we will provide the closure completion date and check the "Closure Completion Date" box found approx. 2/3 of the way down the page. In the Closure Method area, check the "Waste Excavation and Removal" box. In the Closure Report Attachment Checklist put a check mark in the "Disposal Facilities Name and Permit Number". In the space to the right of the checklist write in the name(s) of the disposal facility or facilities used during both the drilling and the closure phase of the closed-loop operation. If there was no evidence of liner leakage of splashed mud or cuttings then complete the Operator Closure Certification box at the bottom of page 4 of Form C-144, sign and date it and submit it to the NMOCD.

If there was evidence of liner leakage requiring samples and analysis, in addition to the instructions for completing Form C-144 listed above, check the "Confirmation Sampling Analytical Results" box in the Closure Report Attachment Checklist and attach a copy of the soil analysis report.

Prepared by

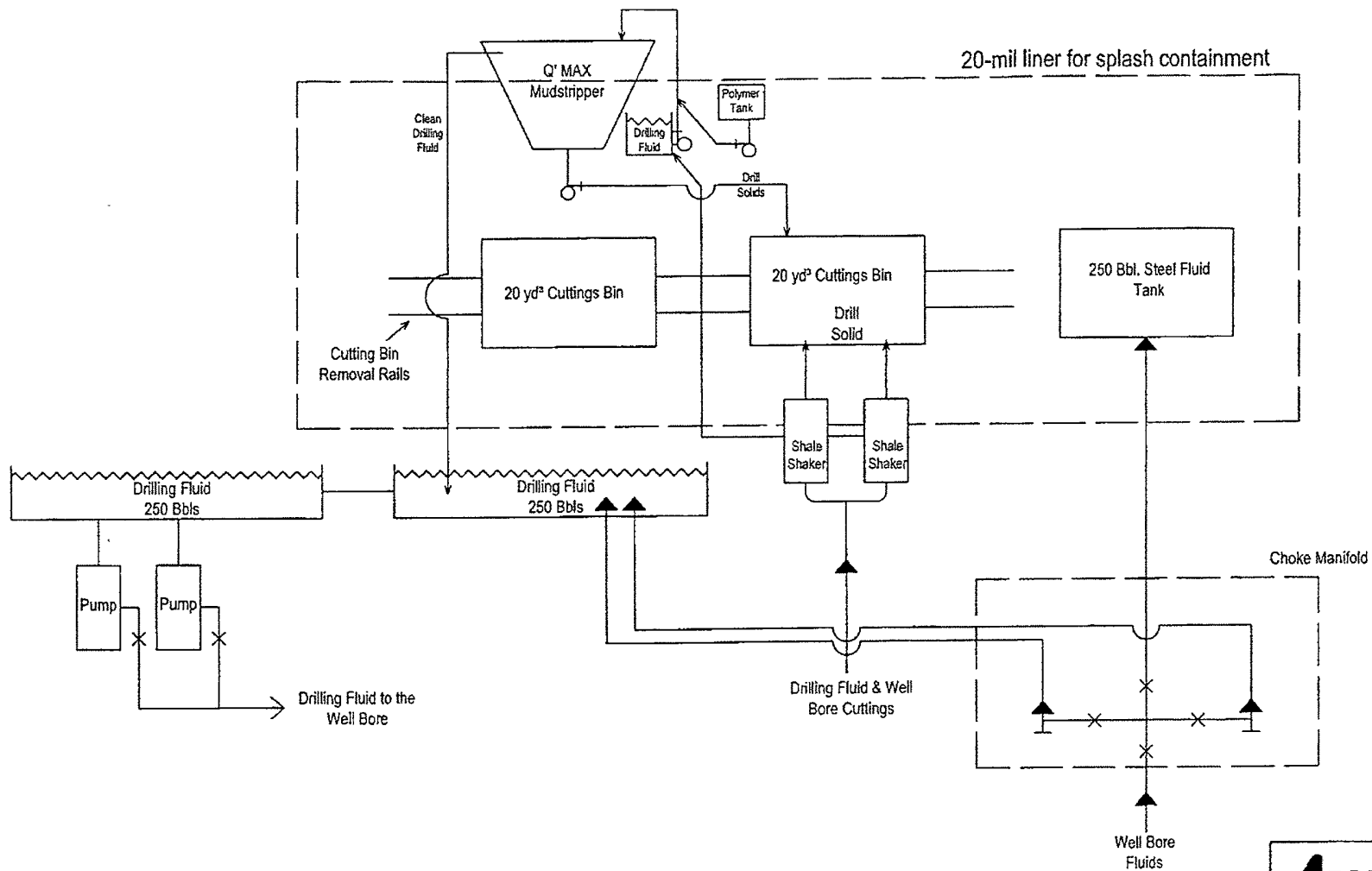
May 18, 2009



Sam Hampton, P.E.
Drilling Engineer

Attachment:

Figure 1. – New Mexico QMAX Closed-Loop System



Apache
CORPORATION
Figure 1
New Mexico Q' MAX
Closed-Loop System