

R. T. HICKS CONSULTANTS, LTD.

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March 20, 2014

Mr. Mike Bratcher
NMOCD District 2
811 S. First Street
Artesia, New Mexico 88210
Via E-mail and US Mail



RE: Variance Request for Dagger Draw Multi-Well Fluid Management Pit #1

Dear Mike:

On behalf of Yates Petroleum, R.T. Hicks Consultants requests that OCD consider a modification to the Dagger Draw MWFM Pit Operation and Maintenance Plan. Specifically, the following text has been added on the bottom of page 2 (see attachment):

On a quarterly basis the operator will report the following information:

- *Any reports generated as a result of the Yates Petroleum Avian Protection Plan*
- *The location (UL, S, T, R), identifier (e.g. well/ API number and volume of treated produced water used for each hydraulic fracturing event*
- *The volume of fresh water, if any, used for hydraulic fracturing*
- *The total volume of treated produced water and fresh water used in the quarter.*

We believe this addition clarifies some reporting issues and provides OCD with a summary of fresh water and produced water use for the project. This reporting commitment may assist OCD in the review of the variance submitted on March 4, 2014 relating to the requirement to restrict the use of the MWFM Pit to wells with approved APDs.

Again, time is of the essence for this project as Yates stands ready to move forward with the geotechnical investigation and construction of the pit with or without OCD approval of the March 4 variance request. As soon as OCD approves the permit and rules on the variance request for the alternative drainage mat and secondary liner, which comprise the leak detection system, Yates will authorize Pettigrew and Associates to commence the geotechnical investigation required to provide foundation construction recommendations.

Sincerely,
R.T. Hicks Consultants, Ltd.

A handwritten signature in black ink, appearing to read "Randall Hicks".

Randall Hicks
Principal

Copy: Yates Petroleum
Scott Dawson, NMOCD

C-144 Supplemental Information: Operation and Maintenance Plan Multi-Well Fluid Management Pit

Operating and Maintenance Procedures

Yates Petroleum will operate and maintain the MWFM Pit to contain liquids and solids (blow sand and minimal precipitates from the treated produced water) and maintain the integrity of the liner system in a manner that prevents contamination of fresh water and protects public health and the environment as described below. The purpose of the MWFM pit is to facilitate recycling, reuse and reclamation of produced water derived from nearby oil and gas wells listed in Appendix E. During periods when water for E&P operations is not needed, produced water will discharge to one of the injection wells in the Dagger Draw SWD system, which is also listed in Appendix E.

The operation of the MWFM pit is summarized below.

- A. Via pipeline, produced water generated from nearby oil and gas wells is delivered to a treatment system located within the perimeter fence on the north side of the MWFM pit. The treatment capacity of the proposed unit is about 8,000 bbls/day.
- B. After initial treatment, the produced water flows into frac tanks which provide the required residence time after treatment to remove H₂S and certain other constituents, then discharges into the pit
- C. When required, treated produced water is removed from the pit for E&P operations. At this time, treated produced water will be used for drilling beneath the fresh water zones (beneath surface casing), for well stimulation (e.g. hydraulic fracturing) and other E&P uses as approved by OCD.
- D. Typically, two wells will be stimulated during the same contractor mobilization event. Each stimulation requires about 120,000 bbls and each stimulation event occurs over a several day period (set up-fracturing-demobilization). Because the pit cannot be 100% evacuated of fluid and the treated produced water serves other E&P uses (e.g. drilling), the pit must hold more than 240,000 bbls prior to each stimulation event.
- E. A treatment rate of 8,000 bbl/day allows stimulation of two wells per month.
- F. Whenever the maximum fluid capacity of the pit is reached, treatment and discharge to the pit ceases (see Freeboard and Overtopping Plan, below)

The operation of the MWFM pit will follow the mandates listed below:

1. The operator will not discharge into or store any hazardous waste (as defined by 40CFR 261 and NMAC 19.15.2.7.H.3) in the pits.
2. If the pit liner's integrity is compromised above the water line, then The operator will repair the damage within 48 hours of discovery.
3. If any penetration of the pit liner is visually identified below the normal high water mark of the pit, then The operator will suspend operations of the pit, remove all liquid above the damage or leak within 48 hours, notify the district office within 48 hours (phone or email) of the discovery and repair the damage or replace the pit liner.
4. If any penetration of the pit liner is confirmed by sampling of fluid in the leak detection system (see Inspection and monitoring plan), The operator will
 - a. Begin and maintain fluid removal from the leak detection/pump-back system
 - b. notify the district office within 48 hours (phone or email) of the discovery
 - c. Schedule a shut-down of produced water treatment/re-use, then
 - i. remove all liquids
 - ii. identify the location of the leak and
 - iii. repair the damage or replace the pit liner prior to continuing operation
5. The operator will report releases of fluid to the subsurface in a manner consistent with NMAC 19.15.29

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6. As shown in the engineering drawings (Appendix A), the injection and withdrawal or treated and untreated produced water is accomplished through a piping system to prevent liner damage.
7. Appendix A also demonstrates that the elevation and slopes of the pit prevent the collection of surface water run-on.
8. No oil or floating hydrocarbon shall be present in the MWFM pit. In the on-site storage building, The operator will maintain an oil absorbent boom to contain and remove oil from the pit's surface.
9. The operator will maintain the pit free of miscellaneous solid waste or debris.
10. The operator will maintain at least three feet of freeboard for the permanent pit and will use a free-standing staff gauge to allow easy determination of the required 3-foot of freeboard.
11. The operator will ensure that all gates associated with the fence are closed and locked when responsible personnel are not on-site.

Monitoring, Inspection, and Reporting Plan

When the pit holds fluid, the operator will inspect the pit daily and document such inspections until the pit is closed. Daily inspections consist of

- a. reading and recording the fluid height of staff gauges
- b. recording any evidence that the pond surface shows visible oil
- c. visually inspecting the pit's exposed liners.

If a liner's integrity is compromised, or if any penetration of the liner occurs above the water surface, then the operator will notify the Artesia district office within 48 hours (phone or email).

After back-to-back stimulation of two wells, the fluid level in the pit should be relatively low and the nature (e.g. jetting) of water that is actively leaving and/or entering the pit should be visible. At this time, the daily inspection includes:

1. a thorough examination of the liner (e.g. with binoculars) for any possible loss of integrity.
2. Watching the movement of fluid into and/or out of the pit to monitor any liner damage due to fluid jets, vibration or other problems with the manifold system (see Design and Construction Plan for data relating to this equipment).

Monthly, the operator will

- A. Inspect diversion ditches and berms around the pit to check for erosion and collection of surface water run-on.
- B. For the first year, measure H₂S concentrations on the down-wind side of the pit.
- C. Inspect the leak detection system for evidence of damage or malfunction and monitor for leakage (see Design and Construction Plan for data relating to this system).
- D. inspect the pit for dead migratory birds and other wildlife. Within 30 days of discovery, the operator will report such findings to the USFWS and to the Artesia Division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring.

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

- On a quarterly basis the operator will report the following information:
- Any reports generated as a result of the Yates Petroleum Avian Protection Plan

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- The location (UL, S, T, R), identifier (e.g. well/ API number) and volume of treated produced water used for each hydraulic fracturing event
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- The total volume of treated produced water and fresh water used in the quarter.

Freeboard and Overtopping Prevention Plan

The method of operation of the pit allows for maintaining freeboard with very few potential problems. When the capacity of the pit is reached (3-feet of freeboard), the discharge of treated produced water ceases and the produced water generated by nearby oil and gas wells is managed by one of the injection wells identified in Appendix E.

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

- I. Cease discharging produced water scheduled for recycling to the pit
- II. Accelerate re-use of the treated produced water for purposes approved by the Division
- III. Transfer treated produced water from the pit to one of the injection wells listed in Appendix E

The reading of the staff gauge occurs daily. In order for the MWFM Pit to rise 1-foot above the required 3-feet of freeboard (thus creating only 2-feet of freeboard) a total volume of 25,000 bbls of treated must enter the pit. At a treatment rate of 8,000 bbls/day, this 1-foot rise requires 3 days of discharge. Overtopping the pit would require more than a week of inattention, which is essentially impossible, given the need to maintain the treatment unit.

Protocol for Leak Detection Monitoring, Fluid Removal and Reporting

As shown in Appendix A, the leak detection system includes a monitoring system. Any fluid released from the primary liner will flow to the collection sump where fluid level monitoring is possible at the monitoring riser pipe associated with the leak detection system (see Appendix A). Yates personnel will employ a portable electronic water level meter to determine if fluid exists in the monitoring riser pipe. Obtaining accurate readings of water levels in a sloped pipe beneath a pit can be a challenge. An electrician's wire snake may be required to push the probe to the bottom of the port and the probe may be fixed in a 2-inch PVC pipe "dry housing" to avoid false readings due to water condensation on the pipe. There are many techniques to determine the existence of water in the sumps – including low flow pumps.

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

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

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