Drickey Queen Sand Unit-Attachment to NM Form C-108

Data for Items VII (Proposed Operation), VIII (Geologic Data), IX (Stimulation Program), and XI (Fresh Water Wells).

Lease Location: All of the Drickey Queen Sand Unit consisting of all or parts of Sections 33, 34, and 35, T13S, R31E and Sections 1, 2, 3, 4, 9, 10, 11, 14, 15, 16, and 22, T13S, R31E, Chaves County, NM.

Operator: Legacy Reserves Operating, LP

VII. Data on the Proposed Operation:

1. *The proposed average water injection rate is 600 BWPD per well, and the proposed* maximum injection rate is 1500 BWPD per well.

   The proposed average CO2 injection rate is 1250 MCFPD per well, and the proposed maximum injection rate is 3000 MCFPD per well.

   This is an Enhanced Oil Recovery Pilot in which Legacy plans to inject carbon dioxide, hydrocarbon gas, and water into the Queen Formation using a "water alternating gas (WAG)" method. Legacy is initially planning to use a fixed WAG flooding schedule and adjust it as needed based on how the Queen reservoir subsequently performs. The Project will begin using a higher WAG ratio to allow for reservoir fillup then the WAG ratio will be reduced during the primary flooding phase of the project. The WAG ratio will likely again increase as the project reaches maturity.

2. The system will be closed. Produced water will be recovered and reinjected into the Queen Formation. Produced carbon dioxide and hydrocarbon gas will be recovered and compressed then mixed with clean carbon dioxide as part of the normal injection schedule in the Project Area.

3. The proposed average and maximum water injection pressure is 800 psi. This pressure is higher than the pressure which would normally be allowed using the traditional calculation of 0.2 psi/ft X Depth (ft) to the Queen formation. Legacy and past operators have performed 25 step rate tests in the Drickey Queen Sand Unit and in the Rock Queen Unit (RQU) immediately to the north. These tests show that Legacy can safely inject at 800 psi without exceeding the fracture pressure of the Queen Formation in the Drickey Queen Sand Unit. The wells and their test results are presented on the attached map of the DQSU and the RQU. Likewise attached are the results of recent tests which were run in 8 wells in the DQSU. Tests referenced on the map which were done by prior operators were submitted to the OCD by those operators who subsequently received approval to increase surface injection pressure.

   Legacy is seeking approval to apply the average and maximum produced water injection pressure of 800 psi to all current and future water injection wells and WAG injection wells in the entire Drickey Queen Sand Unit. Legacy is also seeking to apply an average and maximum surface injection pressure for CO2 of 1200 psi based on evidence submitted as Exhibit 33, Case #14505, Order #R-1541-B authorizing a maximum surface injection pressure for CO2 of 1200 psi in the Rock Queen Unit to the north.

Oil Conservation Division
Case No. 15255
Exhibit No. 15

Data for Items VII (Proposed Operation), VIII (Geologic Data), IX (Stimulation Program), and XI (Fresh Water Wells).

As shown on Exhibit #33, Case #14505, Order R-1541-B, the higher injection pressure for carbon dioxide is necessary to account for the lower density of carbon dioxide at field operating conditions.

4. The source water for the Rock Queen Unit is recycled produced water and fresh water (Ogallala formation) from local wells. Water analyses for both and a compatibility test are attached.

VIII. The Geologic Data:

- Geologic Age: Permian
- Geologic Name: Queen Formation (a member of the Artesian Group)
- Average Thickness: 15 feet
- Lithology: Shaley sandstone
- Measured Depth: 3000' to 3100'
- Sources of underground drinking water: Ogallala formation at depths from 100' to 200'.

IX. Data on the Proposed Stimulation Program:

- Normally, a mild 7-½% NEFE HCL treatment with appropriate additives will be pumped.
- In the event a mild acid treatment is not adequate, then a gelled water/proppant hydraulic fracture treatment would be considered.

XI. Data on the Fresh Water Wells:

There is one recently-drilled fresh water well within one mile of any injection well on the Drickey Queen Sand Unit. The well is located in Section 34 (F), T13S, R31E, Chaves County, NM. A recent chemical analysis of the well's water and a map showing the location of the well are attached.