

ATTACHMENT TO FORM 9-331

DISPOSAL OF PRODUCED WATER
Power Grayburg San Andres Pool
Eddy County, New Mexico

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U. S. GEOLOGICAL SURVEY
ARTESIA, NEW MEXICO

Disposal in the Subsurface - NTL-2B

1. Authorization for disposal of produced water into the producing formation of the Power Grayburg San Andres Pool is requested using Power Deep Unit Well #1 located 1980 feet from the West and North lines of Section 6, T18S, R31E, Federal Lease Number LC 029389(e). Surface ownership is also Federal.

2. Water to be disposed of is produced from Federal Leases in the Pool operated by The Eastland Oil Company as follows:

Kenwood Federal Lease	-	40 B/D
Allied Federal Lease	-	7 B/D
Sibyl Federal Lease	-	12 B/D
Arco Federal Lease	-	20 B/D
TOTAL		<u>79 B/D</u>

A representative analysis of this formation water shows total dissolved solids of 99,445 Mg/L, Chlorides - 57,882 Mg/L, sulfates - 3,300 Mg/L, and pH of 7.0.

3. It is proposed to inject water into the Grayburg sands that are productive up structure in the Pool. These intervals are 3,506'-17', 3,534'-41', 3,580'-98', and 3,670'-82'.
4. The injection well is approximately 150 feet down structure to the oil-water contact in the Power Grayburg San Andres Pool and the sands are water productive with the same quality water that is to be returned through the disposal well.
5. There is no usable water within a 2-1/2 mile radius of the lease.
6. The Power Deep Unit #1 was drilled by American Quasar Petroleum Company of New Mexico. In a 17-1/2" hole, 720 feet of 48#, 13-3/8" casing was set and cement circulated using 375 sacks of Howco Lite and 300 sacks Class C 2% CaCl₂. A 12-1/4" hole was drilled to 4,200 feet and 32#, K-55, 8-5/8" casing set from 4,200 feet to 1,822 feet followed by 24#, K-55, 8-5/8" casing to surface. Cement consisted of 750 sacks Howco Lite and 300 sacks Class C with 2% CaCl₂. Top of cement by temperature survey was 1,300 feet from surface outside the 8-5/8" casing.
7. This well was drilled to total depth of 11,810 feet and plugged back total depth is 4,110 feet (70 sack cement plug from 4,310 feet to 4,110 feet).

8. The well will be prepared for injection by perforating the intervals indicated and treating each zone with acid. An 8-5/8" x 2" Baker Lock-set packer will be set at 3,475 feet capable of holding pressure in either direction. The 2" EUE, J-55, tubing and packer will be internally plastic-coated and fresh water with corrosion inhibitor will be circulated to fill the annulus. A maximum surface injection pressure of 875 psi is anticipated.
9. A pressure gauge on the tubing-casing annulus will be observed daily to confirm that the packer is holding and no tubing leaks exist. Injection volumes and pressure will be recorded daily. Surface storage capacity at the injection well will protect against short term shut-down of the system. In the event of longer shut-in time, the produced water will be trucked to another facility or the producing wells will be shut-down. The injection pump will be controlled from the storage tank by automatic high-low fluid level switches.