BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

APPLICATION OF SANTA FE ENERGY RESOURCES, INC. FOR SALT WATER RESOURCES, INC. FOR SALT WATER DISPOSAL, EDDY COUNTY, NEW MEXICO. 406 1 = 1997 No. 1848

Oil Conservation Oivision

Santa Fe Energy Resources, Inc. applies for authority to inject produced water into the Devonian and Montoya formations in the Jones Canyon "4" Fed. Well No. 2 ("the well"), located 1505 feet from the South line and 2381 feet from the East line of Section 4, Township 22 South, Range 24 East, N.M.P.M., Eddy County, New Mexico, and in support thereof states:

1. Applicant is a working interest owner in the S% of said Section 4, and has drilled the well thereon, to the Cisco-Canyon formation (Indian Basin-Upper Pennsylvanian Associated Pool) at a depth of 7950 - 8300 feet subsurface. The well has never been completed due to water disposal limitations at applicant's Indian Basin Central Battery.

2. Applicant proposes to re-enter and deepen the well to the Devonian and Montoya formations, at a depth of 10,600 - 11,400 feet subsurface, run and cement a 4½ inch liner, complete the well in the Cisco-Canyon formation, and install a downhole oil, gas, and water separator system. Applicant will then dispose of approximately 6000 barrels of water per day in the Devonian and Montoya formations, while producing oil, gas, and small quantities of water from the well. A copy of the Form C-108 for the well is attached hereto as Exhibit A.

3. Approval of the foregoing dual producing/disposal well will prevent waste and protect correlative rights.

WHEREFORE, Applicant requests that, after notice and hearing, the Division enter its order authorizing the relief requested above.

Respectfully submitted,

les

James Bruce Post Office Box 1056 Santa Fe, New Mexico 87504 (505) 982-2043

Attorney for Santa Fe Energy Resources, Inc.

sfe-app.swd

2

| | Application for Authorization to Inject New Mexico Oli Conservation Division Energy and Minerals Department Form C-108 AUG 1 2 1997 | |
|----|---|---|
| 1. | Cil Conservation Purpose : Secondary Recovery Pressure Maintenance Disposal Tories Storage Application Qualifies for Administrative Approval? Yes X No Court 1/84 | 8 |
| Ħ. | Operator : Santa Fe Energy Resources, Inc. Address : 550 W. Texas, Suite 1330, Midland, Texas 79701 Contact Party : Don Rogers - Project Manager Phone : 915-686-6709 | - |

III. The Jones Canyon "4" Federal #2 is located 1,505' FSL & 2,381' FEL, Section 4, T22S-R24E, Eddy Co., N.M. It is currently drilled and cased through the Cisco-Canyon formation (± 7,950' to 8,300'), but has never been completed due to facilities limitations at our Indian Basin Central Battery. Santa Fe Energy proposes to deepen the well to the Devonian-Montoya, run and cement a 4½" liner, and install a Reda AQWANOT® downhole oil, water, and gas separation system. This unit, as designed, should allow us to produce approximately 6,000 BPD of total fluid, separate 90+% of the produced water and inject it simultaneously into the Devonian-Montoya formation. The remainder of the produced water, along with oil and gas production will be lifted to the surface.

Attached are well data sheets detailing the proposed design and specifications for the casing, tubing, and injection packer on the subject well. In addition,

IV. Is this an expansion of an existing project? X Yes No

If yes, give the Division Order number authorizing the project. N/A

- V. Attached is a map identifying the proposed well's area of review. This map identifies all wells and leases within two miles of the proposed disposal well and a one-half mile radius circle has been drawn around the proposed disposal well.
- VI. There are no wells within the area of review which penetrated the proposed Devonian-Montoya injection zone.
- VII. 1. Based on the Reda AQWANOT[®] design, the produced water injection rate will be ± 5,300 BWPD.
 - 2. The system will be closed, as 90+% of the produced water will be separated and re-injected downhole.
 - 3. The average injection pressure at the disposal zone depth of 11,000 ft is estimated at 4,100 psi. Maximum injection pressure at that depth will be approximately 5,800 psi (±1000 psi @ surface)
 - 4. The subject well has not been deepened yet, therefore we do not have disposal zone water for compatibility tests. However, the Devonian formation is widely used in the area for the disposal of Cisco-Canyon produced water.
 - 5. No known samples of Devonian-Montoya produced water exist from the immediate area.



Form C-108 Page 2 Jones Canyon "4" Fed #2

- VIII. The proposed injection zone for the Cisco-Canyon produced water is the Devonian-Montoya at 11,000'. Lithologically, these two zones are similar, consisting of dolomite and cherty dolomites characterized by intercrystalline to vuggy porosity. The proposed injection zone will be selected porous intervals across an 800 foot thick Devonian-Montoya section. In October, 1994, Santa Fe drilled a fresh water supply well approximately 1½ miles to the southwest (NE/4 SW/4 of Section 8). The well was drilled to a depth of 190 feet, but did not encounter any water bearing formations. It was plugged and abandoned. There are no known sources of drinking water in the immediate area.
- IX. After running open hole logs over the Devonian-Montoya formation, porous intervals will be perforated through the 4½" liner and acidized with 20% HCl to optimize injectivity.
- X. We plan to run porosity and resistivity logs across the entire Devonian-Montoya interval.
- XI. There are no known fresh water wells within one mile of the proposed well.
- XII. Santa Fe Energy has examined available geologic and engineering data and has concluded that there is no known underground source of drinking water with open faults or other hydrologic connection which could communicate with the disposed water.
- XIII. Proof of Notice

Surface owner of proposed well :

Department of the Interior Bureau of Land Management P. O. Box 27115 Santa Fe, New Mexico 87502-7115

Leasehold owners or operators on adjacent property within one-half mile of the proposed disposal well location :

Yates Petroleum Corporation 105 South Fourth Street Artesia, New Mexico 88210

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

| Name : | Don Rogers | Title : | Project Manager |
|-------------|------------|---------|-----------------|
| Signature : | -08- | Date : | 8/8/97 |

XC : NMOCD - Santa Fe NMOCD - Artesia BLM - Carlsbad Yates Petroleum - Artesia James Bruce - Santa Fe

Santa Fe Energy Resources, Inc. Jones Canyon "4" Federal #2 Application for Authorization to Inject Weil Data for NMOCD Form C-108

III. A. (1) Name and Location

-

| | Federal Lse : Well Name : Location : | |)37 Canyon "4" Federal #2 2S-R24E (1,505' FSL & 2,381' FEL) | |
|--------------------|--|------------|---|--|
| III. A. (2) | Casing and Cement | | | |
| | Surface Casing | ; | 9-5/8" 36# K-55 ST&C csg, set @ 1,600', Float Collar 1,519'. Cmt w/200 sx Class H + 10% D53 + 2% CaCl ₂ + 600 sx Class C Lite (35:65:6) + 2% CaCl ₂ , 200 sx Cl-C 2% CaCl ₂ . Circ out 505 sx. | |
| | Production Casi | | 7" 26.0# K-55 LT&C csg, set @ 8,565', Float Collar @ 8,477'. Cmt w/480sx Class H + 0.8% D59 + 5% salt + 0.2% TIC + 0.2% anti-foam. TOC to be determined, but volumes and yield designed to circulate cement to ± 6,000'. | |
| | Injection Liner : | | Drill 6-1/8" hole from 8,565' to \pm 11,300'. Run 4½" 11.6# N-80 LT&C liner with hanger and set @ 8,500' to 11,300'. Cmt w/300 sx and circulate. | |
| III. A. (3) | Injection Tubing | <u>.</u> | 3½" 9.3# L-80, internally plastic coated tubing, attached to AQWANOT® unit discharge and set in seal assembly at \pm 8,500'. | |
| III. A. (4) | Injection Packer | <u>,</u> | 20 ft polished bore receptacle and seal assembly attached to liner hanger @ 8,500'. | |
| III. B. (1) | Injection Format | ion : | Devonian and Montoya | |
| III. B. (2) | Injection Interva | <u>l :</u> | Selected porous intervals within the Devonian-Montoya formation from 10,600'-11,400' which will be perforated through the 4½" liner. | |
| III. B. (3) | | | The proposed deepening of the referenced well is strictly for the purpose of disposal, although we intend to produce simultaneously from co-Canyon. | |
| III. 8. (4) | | | We do not plan to test any other intervals in this wellbore. | |
| III. B. (5) | | | Morrow Sands have produced in the area between 9,700'-10,000'. No formations below the Devonian-Montoya are productive in the area | |

| (Merathan) R (1 33 Will - 6 ²⁴ 1987an Basin " | Tan Internet | | 28 - Uorathon W ⁴ Oboret Id Mil Indian Mills Unit | Condus Farms tol | × | Corriente Britane Indiana Altin Julia del | | |
|---|--|--|---|---|--|--|--|--|
| U.J. Orga 1 10(10 | Alevalla Col. L.S. 1937 Herr. & Gee 0632 de . L.S. 1957 Herr. & Gee 0632 de . L.S. 1957 Herr. & Gee 1957 Herr. & G | Citalica Dida, etal Kar Mar | US 22.4 (142.36 112.36 114.24) Marothen (MW Pet, 179.1 9 149.16) (MW Pet, 179.16) (MW Pet, 179.16) | | U.S. Sama fe Siter, etc. Sala Sala | Yate 7 | | |
| - Citanii Z. TAZ: 3.0 E. 4 12 60.00 12 60.00 10 70.00 10 70.00 100 | Wing the Bart I | Creepford Creepford Criticity 0x.6. 32 V 233 1.8. 1 | 12 12 12 12 12 14 14 14 14 14 14 14 14 14 14 | Annen Anne Anne Anne Anne Anne Anne Ann | Arron Harren Har | \$ ¹ 51 | | |
| Sente faitur, etal 31767 A. A. A. Stingford Sect. S. J. | Hind Yales Pet And Ala | Transfer of the series of the | Santa Fe Entr. | 5) 54 415 54 7151 22 7151 64 7 Votes Drug , stal 1. ama 78213 54. AMA 5 1. 4 | 11 56 452 47 1/145 56 1/155 56 (445 mill) 14 50 1/145 1/15 1/155 1/155 1/155 (445 mill) 14 50 1/155 1/155 1/155 1/155 1/155 14 50 1/155 1/155 1/155 1/155 1/155 1/155 1/155 1/155 14 50 1/155 1/ | 12.25 14.517 1 Hearbui HBi Saz | | |
| i yana faina Jaminina Balanina B.S. | | • (con Post "Magazikor Prat, Paderol" U.S. | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Merburg M.H. Adturcil) M.H. For. SR 3382 (Janon H.) | | |
| W Pert AEC 20100 4 0335448 4.487.1 12 10 12 10 12 10 12 10 10 10 10 10 10 10 10 10 10 10 10 10 | Ti di T Ti di T Ti di T Ti di T Ti di T Ti di T U J U J U J U J | Sertis F. Star W. A. Market Start Santo F. Exect Santo F. E | 5786 Cal | Netro Drig. Aver Notes Drig. Aver Netro Drig. Aver Netro Drig. 2402 Netro Drig. | | Ameriot New York State American State American State S | | |
| IT MAN OUT SU USA | 11 19 1 11 19 1 11 12 1 1 23 11 13 1 1 1022 11 13 1 1 1022 11 13 1 1 1022 14 13 1 1 1022 14 13 1 1022 15 1022 16 1022 17 1022 18 10 102 18 10 100 18 100 18 100 18 1000 18 1000 18 1000 18 1000 18 100000000000000000000000000000000 | Vertes Drig., chai Parts Auri I auri Markel I auri Markel Contextini Contextini Diff. Diff. Contextini Diff. Contextini Diff. | Econica Fr Erear • • • • • • • • • • • • • • • • • • • | Nearburg Expl star bits bits hits hits hits hits hits hits hits h | Herring Expl. Herring Expl. Herrin | (Urian Exol) Veringen '2010 Veringen '0010 Initian (Cristian) Initian (Cristian | | |
| U.S. Sentafe Erer, M | *History Fed " U.S. Ibdi T | "Hickory-Fed" B.S. | State 22 | | ¥.5. | U: | | |
| 24 | D Structure Perteral Viscassi - 1 - 43 Viscassi - 1 - 43 Viscassi - 1 - 73 Viscassi - 1 - 73 Viscassi - 1 - 75 Viscassi - 75 Viscass | Votes Pri etal 54840 20 | Weiter Yesters Dr.leyetet 1000000000000000000000000000000000000 | Yayes Bet enal social et tr | anter Serter Barter Bart anter Serter Barter Barte | M.Shear 97845 994 24 | | |
| Santa Fe Energy Resources, Inc. Central Division Midland, Texas | | | | | | | | |
| EDDY COUNTY, NEW MEXICO | | | | | | | | |
| JONES CANYON "4" FED #2 AREA OF REVIEW SEC. 4, T22S, R24E DATE: #09/97 | | | | | | | | |
| | | | SCALE: 1":4000" | FILE: | | | | |