

APPLICATION FOR AUTHORIZATION
TO CONVERT TO DISPOSAL

BROOKS FEDERAL '7' NO. 6

ITEM III -- A. Well Data:

Exhibit "A" is the Current Wellbore Status Schematic. Exhibit "B" is the proposed disposal wellbore sketch.

- (1) Lease Name: Brooks Federal '7'
Well No. : 6
Location : 660' FSL and 1926' FWL
Section 7, T-20S, R-33E
Lea County, New Mexico
- (2) Surface Casing : 20", 81# & 94# set at 1193'
Hole Size : 24"
Cement : 3200 sx.
Cement Top : Surface
Inter. Casing : 13 3/8", 48#, 54.5#, & 61#
set at 2734'
Hole Size : 17 1/2"
Cement : 3200 sx.
Cement Top : Surface
Inter. Casing : 9 5/8", 40#, 43.5#, & 47# set
at 8156'
Hole Size : 12 1/4"
Cement : 5500 sx. (DV
tool @ 4585')
Cement Top : Surface
Prod. Casing : 5 1/2", 17# liner set at
8136' to 10780'
Hole Size : 8 5/8"
Cement : 500 sx.
Cement Top : 8400' by
Temp. Survey
- (3) Tubing : 4 1/2", 11.6#
Internally Plastic Coated
set at 3170'
- (4) Packer : Baker Lokset (Nickel Plated)
set at 3170'

B. Formation Data:

- (1) The name of the injection formation is the Capitan Reef.
- (2) Injection will be effected through selected perforations over the interval 3220'-5050'.
- (3) This well was originally drilled for production.

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- (4) Previously perforated intervals:
 - a. 10460'-10510' isolated with CIBP at 10400' capped with 2 sx. cement.
 - b. 9400' isolated with cement retainer at 9374' and squeezed with 250 sx. cement.
 - c. 9205'-9265' isolated with 50 sx. cement plug spotted from 8089'-8179' and CIBP at 7200' capped with 2 sx. cement.
 - d. 7118'-7128' and 7140'-7160' squeezed with 100 sx. cement.
 - e. 4620'-4630' and 4970'-4975' squeezed with an unknown quantity of cement.
 - f. 3026'-3032' and 3046'-3052' are currently open but will be squeezed and tested prior to commencement of injection operations.
- (5) The next higher zone of production is the Salt Lake Yates Field at approximately 3050'. There are no zones (below the reef) productive in the area.

ITEM V ---- Map of area with radius of review: See Exhibit "C"

ITEM VI --- There are no other wells within the area of review that penetrate the proposed injection zone. All wells within the one-half mile radius are (or were) completed in the Salt Lake Yates Field at approximately 3050'. The deepest penetration is 3126' by the Brewer Drlg. Co. Monroe No. 1 located in Unit P, Section 12, T-20S, R-32E.

ITEM VII -- Proposed Operation:

- (1) Average daily injection rate = 10,000 BWPD
Maximum daily injection rate = 12,500 BWPD
- (2) System type: Closed
- (3) Average injection pressure anticipated = 0 psig
Maximum injection pressure anticipated = 600 psig
- (4) Source of injection fluid: All water in general area requested to be hauled and disposed by Gandy Corp. and Rowland Trucking Co., Inc., and wells directly connected to the pipeline system. A water analysis from a Delaware well in the area is included as Exhibit "D". A compatibility analysis is included as Exhibit "E".
- (5) A water sample from a Capitan Reef water supply well is shown in Exhibit "F".

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- ITEM VIII - A complete Capitan Reef study prepared by RE/SPEC Inc., 4775 Indian School Road NE, Suite 300, Albuquerque, NM 87110 is included as Attachment II to this application. The Capitan Reef is approximately 1950' thick at the proposed injection site with the top located at 3200' and the base at 5150'. There are no known sources of drinking water either overlying or underlying the proposed injection interval.
- ITEM IX --- Capitan Reef perforations will be selectively stimulated with 5000 gals. of 15% HCl-NE-FE acid.
- ITEM X ---- Logs are on file with the NMOCD submitted by the Texas Company on December 15, 1956. The well's name at that time was the Muse Federal No. 1.
- ITEM XI --- Fresh Water Wells: There are no fresh water wells within one mile of the proposed injection site. Please see Exhibit "G" for verification.
- ITEM XII -- All geological and engineering data indicates that there are no open faults or other hydrologic connection between the proposed injection zone and any fresh water source in the immediate area. Please see Attachment II for a complete hydrological report.
- ITEM XIII - Proof of Notice: Proof of notice to the surface owner and offset operators will be submitted at the hearing.

Elevation 3531' G.L.

CURRENT WELLBORE SCHEMATIC

1/11/93

24" Hole Size

1193' - 20", 81# & 94# Csg. Cemented w/3200 sxs
(Cement Circulated to Surface)

17 1/2" Hole Size

2734' - 13 3/8", 48#, 54.5#, & 61# Csg. Cemented w/3200 sxs
(Cement Circulated to Surface)

Perfs 3026'-32', 3046'-52' (Yates)

12 1/4" Hole Size

DV Tool @ 4585'

Perfs 4620'-30' Squeeze Cemented

Perfs 4970'-75' Squeeze Cemented

Perfs 7118'-28', 7140'-60' Squeezed w/100 sxs

C.I.B.P. @ 7200' w/2 sxs Cement

Cement Plug 8089'-8179' (50 sxs)

8136' - 5 1/2" Liner Top

8156' - 9 5/8", 40#, 43.5# & 47# Csg. Cemented w/5500 sxs
(Cement Circulated to Surface)

T.O.C. @ 8400' (Temperature Survey)

8 5/8" Hole Size

Perfs 9205'-65'

Cement Retainer @ 9374'

Perfs 9400' Squeezed w/250 sxs

T.O.C. @ 9412' (Temperature Survey)

C.I.B.P. @ 10400' w/2 sxs Cement

Perfs 10460'-10510'

10780' - 5 1/2", 17#, Csg. Cemented w/500 sxs

Cement Plug 10800'-10850'

Cement Plug 12250'-350' (40 sxs)

Cement Plug 14250'-350' (40 sxs)

Cement Plug 15050'-150' (40 sxs)

Cement Plug 15360'-560' (80 sxs)

T.D. @ 15560'

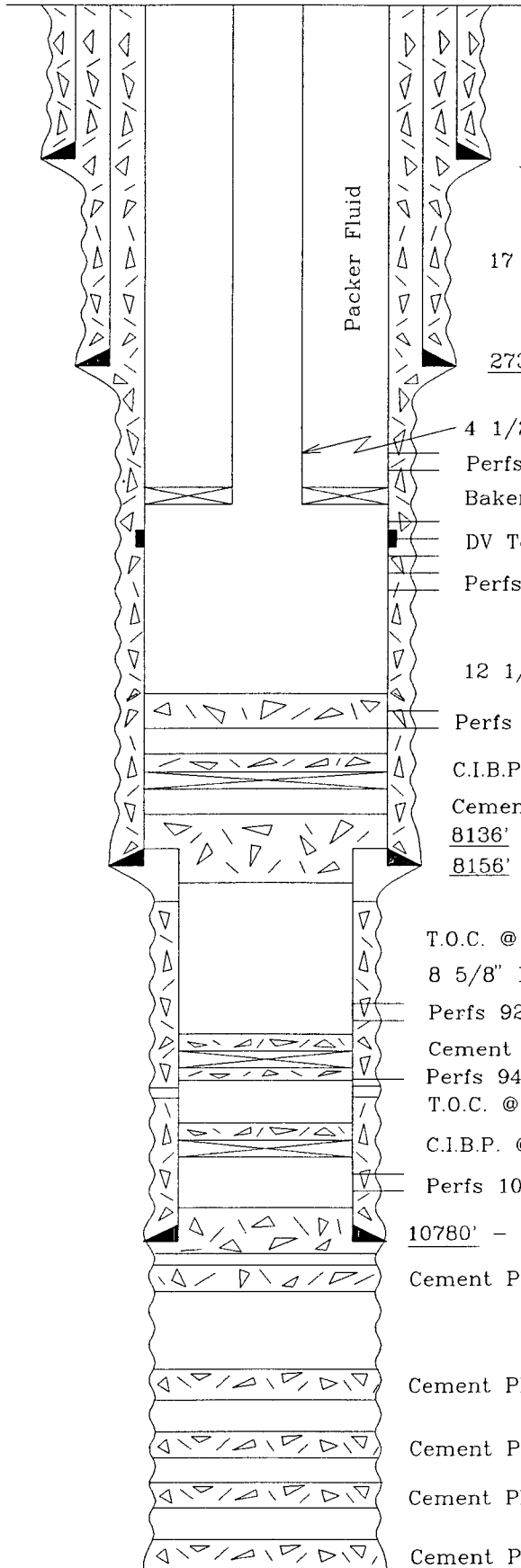
PRONGHORN SWD SYSTEM
Pronghorn SWD Well No. 1
660' FSL & 1926' FWL
Section 7, T-20S, R-33E
Lea County, New Mexico

EXHIBIT A

K.B. = +20'
Elevation 3531' G.L.

PROPOSED WELLBORE SCHEMATIC

2/26/93



24" Hole Size

1193' - 20", 81# & 94# Csg. Cemented w/3200 sxs
(Cement Circulated to Surface)

17 1/2" Hole Size

2734' - 13 3/8", 48#, 54.5#, & 61# Csg. Cemented w/3200 sxs
(Cement Circulated to Surface)

4 1/2", 11.6#, Internally Plastic Coated Tubing

Perfs 3026'-32', 3046'-52' (Yates) Cement Squeezed and Tested
Baker Lokset Packer @ 3170' (Nickel Plated)

DV Tool @ 4585'

Perfs 3220'-5050' (Capitan Reef)

12 1/4" Hole Size

Perfs 7118'-28', 7140'-60' Squeezed w/100 sxs

C.I.B.P. @ 7200' w/2 sxs Cement

Cement Plug 8089'-8179' (50 sxs)

8136' - 5 1/2" Liner Top

8156' - 9 5/8", 40#, 43.5# & 47# Csg. Cemented w/5500 sxs
(Cement Circulated to Surface)

T.O.C. @ 8400' (Temperature Survey)

8 5/8" Hole Size

Perfs 9205'-65'

Cement Retainer @ 9374'

Perfs 9400' Squeezed w/250 sxs

T.O.C. @ 9412' (Temperature Survey)

C.I.B.P. @ 10400' w/2 sxs Cement

Perfs 10460'-10510'

10780' - 5 1/2", 17#, Csg. Cemented w/500 sxs

Cement Plug 10800'-10850'

Cement Plug 12250'-350' (40 sxs)

Cement Plug 14250'-350' (40 sxs)

Cement Plug 15050'-150' (40 sxs)

Cement Plug 15360'-560' (80 sxs)

T.D. @ 15560'

PRONGHORN SWD SYSTEM
Pronghorn SWD Well No. 1
660' FSL & 1926' FWL
Section 7, T-20S, R-33E
Lea County, New Mexico

EXHIBIT B

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : ANADARKO

Date : 10-10-1991

Location: Exxon Federal #1 - Wellhead (on 8/12/91)

E 19 195 33C

Sample 1

Specific Gravity:

1.157

Total Dissolved Solids:

219389

pH:

6.30

Resistivity:

0.047 ohms • 76°F

IONIC STRENGTH:

4.952

<u>CATIONS:</u>		me/liter	mg/liter
Calcium	(Ca ⁺²)	1150	23000
Magnesium	(Mg ⁺²)	832	10100
Sodium	(Na ⁺¹)	1980	45600
Iron (total)	(Fe ⁺²)	0.752	21.0
Barium	(Ba ⁺²)	0.051	3.50
Manganese	(Mn ⁺²)	0.190	5.23

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	4.20	256
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	9.89	475
Chloride	(Cl ⁻¹)	3950	140000

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		Calcium Carbonate	Calcium Sulfate
104°F	40°C	2.5	1.00
122°F	50°C	2.7	1.00
140°F	60°C	3.1	1.00
168°F	76°C	3.6	1.0
176°F	80°C	3.8	1.0

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : ANADARKO

Date : 10-10-1991

Location: TEAS YATES & EXXON FEDERAL - COMPATIBILITY (on 10-10-1991)

Specific Gravity:

Total Dissolved Solids:

pH:

IONIC STRENGTH:

Sample 1

1.149

208003

6.35

4.649

CATIONS:

		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ²⁺)	1040	20800
Magnesium	(Mg ²⁺)	755	9170
Sodium	(Na ⁺)	1950	44800
Iron (total)	(Fe ²⁺)	0.677	18.9
Barium	(Ba ²⁺)	0.049	3.36
Manganese	(Mn ²⁺)	0.172	4.72

ANIONS:

Bicarbonate	(HCO ₃ ⁻¹)	4.54	277
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	18.6	893
Chloride	(Cl ⁻¹)	3720	132000

DISSOLVED GASES

Carbon Dioxide	(CO ₂)	1.00
Hydrogen Sulfide	(H ₂ S)	11.9
Oxygen	(O ₂)	0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium Carbonate</u>	<u>Calcium Sulfate</u>
86°F	30°C	1.6	8.6
122°F	50°C	2.5	8.3
140°F	60°C	2.9	8.3
168°F	76°C	3.4	8.0
176°F	80°C	3.6	8.0
200°F	93°C	4.1	8.0

Comments:

COMPATIBILITY = TEAS YATES = 10% & EXXON FEDERAL FEDERAL = 90%

EXHIBIT E

COMPATIBILITY BETWEEN
DELAWARE AND CAPITAN REEF WATER

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : ANADARKO

Date : 10-10-1991

Location: TEAS YATES WSW #1 (on 10-10-1991)

0 14 205 33 E

Sample 1

Specific Gravity:

1.075

Total Dissolved Solids:

105532

pH:

6.75

IONIC STRENGTH:

1.919

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	80.0	1600
Magnesium	(Mg ⁺²)	60.0	729
Sodium	(Na ⁺¹)	1660	38100
Iron (total)	(Fe ⁺²)	0.002	0.060
Barium	(Ba ⁺²)	0.031	2.10
Manganese	(Mn ⁺²)	0.003	0.090
<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	7.60	464
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	96.8	4650
Chloride	(Cl ⁻¹)	1690	60000

DISSOLVED GASES

Carbon Dioxide	(CO ₂)	10.0
Hydrogen Sulfide	(H ₂ S)	119

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium Carbonate</u>	<u>Calcium Sulfate</u>
86°F	30°C	-0.06	-17
122°F	50°C	0.87	-17
140°F	60°C	1.2	-17
168°F	76°C	1.8	-12
176°F	80°C	1.9	-12
200°F	93°C	2.4	-12



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

ELUID MARTINEZ
STATE ENG NEEP

ROSWELL

DISTRICT II
1900 West Second St.
Roswell, New Mexico 88801
(505) 622-6521

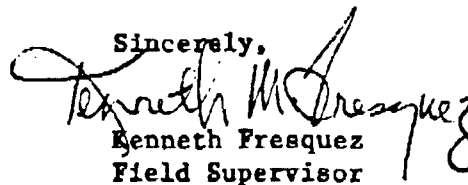
March 23, 1993

Larry Scott
Lynx Petroleum Consultants, Inc.
P. O. Box 1979
3325 Enterprise Drive
Hobbs, New Mexico 88241

Dear Mr. Scott:

This letter is to inform you that State Engineer Office records do not show any information in regard to fresh water wells within the one mile radius of the Brooks Federal "7" No. 6 located in Section 7, Township 20 South, Range 33 East in Lea County, New Mexico.

Sincerely,


Kenneth Fresquez
Field Supervisor

KF/lc

EXHIBIT G