



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

4/20/98

GOVERNOR

POST OFFICE BOX 1980
HOBBS, NEW MEXICO 88241-1980
(505) 393-6161

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

RE: Proposed:

MC	_____
DHC	_____
NSL	_____
NSP	_____
SWD	<u>X</u> _____
WFX	_____
PMX	_____

Gentlemen:

I have examined the application for the:

<u>Bridgwell Oil Co</u>	<u>New Mexico</u>	<u>8</u>	<u>State</u>	<u>#3-F</u>	<u>8-9s-33e</u>
Operator	Lease & Well No.	Unit	S-T-R		

and my recommendations are as follows:

None.

Yours very truly,

Chris Williams

Chris Williams
Supervisor, District 1

/ed

BRIDWELL OIL COMPANY

OIL PRODUCERS

810 8TH STREET

WICHITA FALLS, TEXAS

76301

(940) 723-4351

J. S. BRIDWELL
ESTATE

MAIL ADDRESS
P.O. DRAWER 1830
76307

April 8, 1998

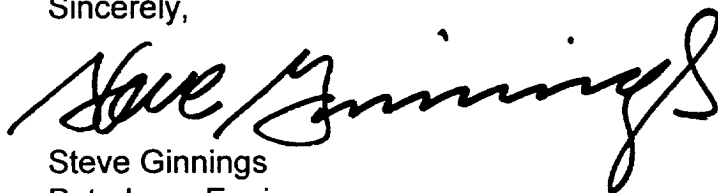
COPY

Mr. David Catanach
New Mexico Oil Conservation Division
2040 Pacheco Street
Santa Fe, New Mexico 87505

Mr. Catanach:

Enclosed is an application for authorization to inject with accompanying attachments. We respectfully request that this application be considered for administrative approval. It is our intention to convert an existing oil well completed in the San Andres to injection, and dispose of produced water from 2 other San Andres wells into the existing completion. The purpose of requesting this arrangement is the economic consideration of keeping the remaining 2 wells profitable, given that they produce less than 10 barrels of oil per day combined. In order for this production to remain commercial, the initial conversion cost must be kept at a minimum by using the existing zone. The proposed disposal into the productive zone would not be for the purpose of flooding or pressure maintenance. Thank you for your consideration of this request. Please call with any questions.

Sincerely,



Steve Ginnings
Petroleum Engineer

BRIDWELL OIL COMPANY

OIL PRODUCERS

810 8TH STREET

WICHITA FALLS, TEXAS

76301

(940) 723-4351

J. S. BRIDWELL
ESTATE

MAIL ADDRESS
P.O. DRAWER 1830
76307

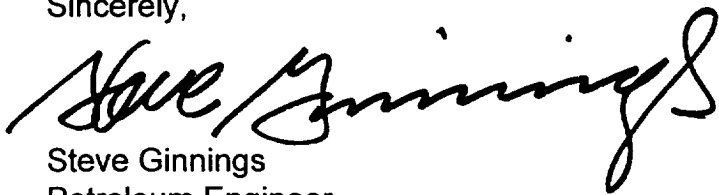
April 8, 1998

Mr. David Catanach
New Mexico Oil Conservation Division
2040 Pacheco Street
Santa Fe, New Mexico 87505

Mr. Catanach:

Enclosed is an application for authorization to inject with accompanying attachments. We respectfully request that this application be considered for administrative approval. It is our intention to convert an existing oil well completed in the San Andres to injection, and dispose of produced water from 2 other San Andres wells into the existing completion. The purpose of requesting this arrangement is the economic consideration of keeping the remaining 2 wells profitable, given that they produce less than 10 barrels of oil per day combined. In order for this production to remain commercial, the initial conversion cost must be kept at a minimum by using the existing zone. The proposed disposal into the productive zone would not be for the purpose of flooding or pressure maintenance. Thank you for your consideration of this request. Please call with any questions.

Sincerely,



Steve Ginnings
Petroleum Engineer

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: Secondary Recovery Pressure Maintenance X Disposal Storage
Application qualifies for administrative approval? X Yes No
- II. OPERATOR: Bridwell Oil Company
ADDRESS: P.O. Drawer 1830
CONTACT PARTY: Steve Ginnings PHONE: 940/723-4351
- III. WELL DATA: Complete the data required on the reverse side of this form for each well processed for injection. Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project: Yes X No
If yes, give the Division order number authorizing the project _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- * X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted.)
- * XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- 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: Steve Ginnings TITLE: Engineer
SIGNATURE: *Steve Ginnings* DATE: 3/10/98
- * If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstance of the earlier submittal. _____

WELL DATA

Lease Name: New Mexico State 8
Well Number: 3
Location: Section 8, T9S, R33E
Footage: 1980' FNL & 1980' FWL
Surface Casing: 8.625" x 28# set at 373', 250 sacks cement, cement top ground level
Production Casing: 4.5" x 9.5# set at 4535', 250 sacks cement, cement top 3800'
Cement Top: Calculated, 50% efficiency assumed
Tubing: 2.375" x 4.7# Salta lined, set within 50' of top perforation
Packer: Baker tension type, set within 50' of top perforation

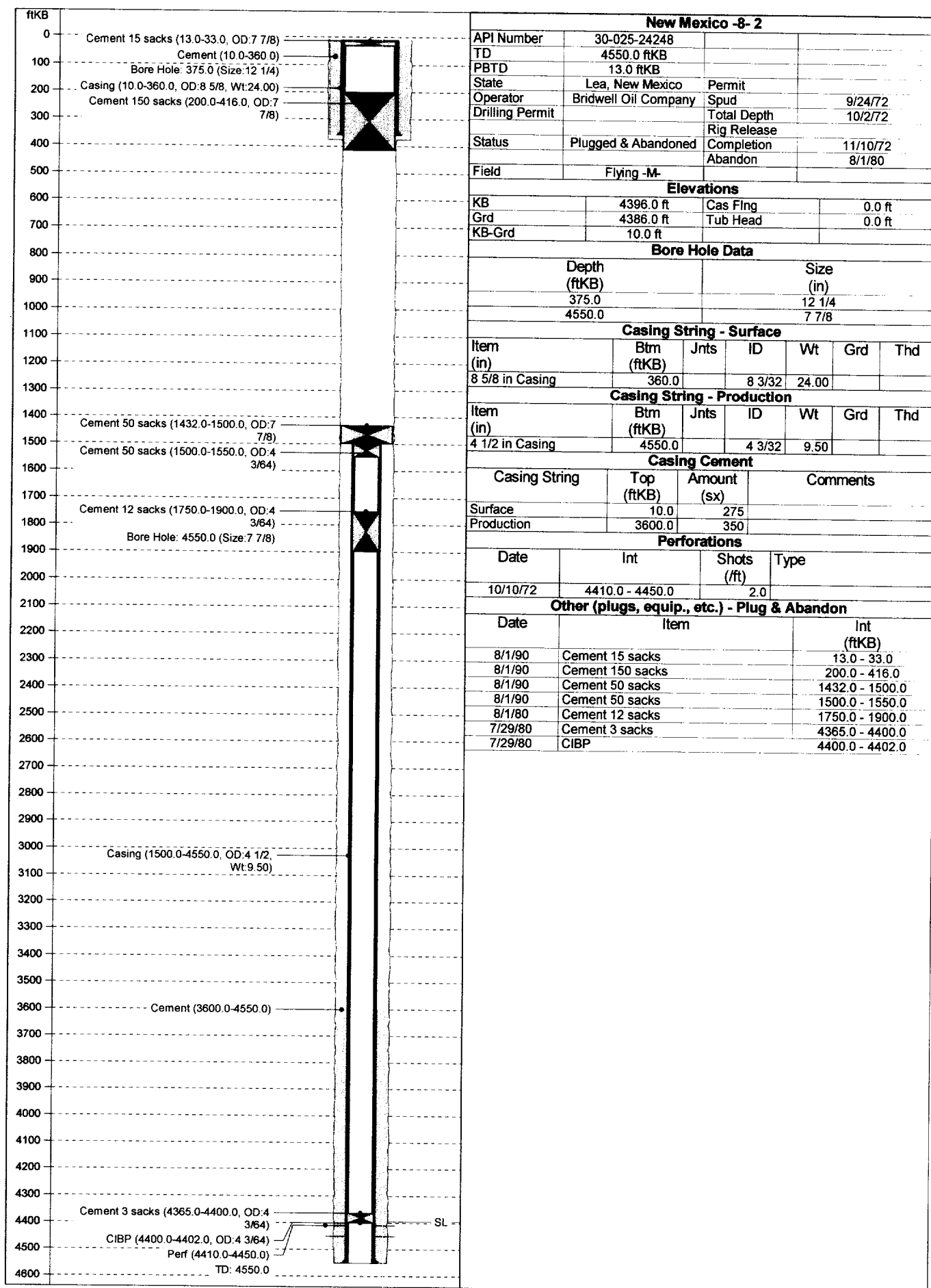
Injection Formation: San Andres Dolomite, Flying -M- Field
Injection Interval: 4424' through 4464', perforated
Well Purpose: Originally oil production
Other Perforations: None
Other Oil Zones: None

ftKB 4420 4425 4430 4435 4440 4445 4450 4455 4460 4465 4470 4475 4480 4485 4490 4495 4500 4505 4510 4515 4520 4525 4530 4535	Perf (4424.0-4428.0)	San Andres	New Mexico -8- 3						
			API Number						
			TD	4535.0 ftKB					
			PBTD	4535.0 ftKB					
			State	Lea, New Mexico		Permit			
			Operator	Bridwell Oil Company		Spud	10/18/72		
			Drilling Permit			Total Depth	10/26/72		
			Status	Active Oil		Rig Release			
						Completion	11/3/72		
						Abandon			
			Field	Flying -M-					
			Elevations						
			KB	4400.0 ft		Cas Flng	0.0 ft		
			Grd	4390.0 ft		Tub Head	0.0 ft		
			KB-Grd	10.0 ft					
			Bore Hole Data						
			Depth (ftKB)				Size (in)		
			373.0				12 1/4		
			4535.0				7 7/8		
			Logs Run						
			Date	Type		Int	Company		
			10/25/72	CAV		373.0 - 4529.0	Welex		
			10/31/72	CCL/GR		4200.0 - 4485.0	Welex		
			Formation/Horizon Tops						
			Top (ftKB)	Formation					
	4424.0	San Andres							
	Casing String - Surface								
	Item (in)	Btm (ftKB)	Jnts	ID	Wt	Grd	Thd		
	8 5/8 in Casing	373.0		8 1/64	28.00				
	Casing String - Production								
	Item (in)	Btm (ftKB)	Jnts	ID	Wt	Grd	Thd		
	4 1/2 in Casing	4535.0		4 3/32	9.50				
	Casing Cement								
	Casing String	Top (ftKB)	Amount (sx)	Comments					
	Surface	10.0	250						
	Production	3600.0	250						
	Perforations								
	Date	Int	Shots (ft)	Type					
	11/1/72	4424.0 - 4428.0	2.0						
	11/1/72	4434.0 - 4438.0	2.0						
	11/1/72	4444.0 - 4450.0	2.0						
	11/1/72	4456.0 - 4464.0	2.0						
	Stimulations & Treatments								
	Date	Type	Zone	Int	Fluid	Comments			
	11/1/72	5000 Gallons 5% Acid		4424.0 - 4464.0					
	11/1/72	4000 Gallons 15% Acid		4424.0 - 4464.0					
	11/1/72	2000 Gallons 28% Acid		4424.0 - 4464.0					
	Casing (10.0-4535.0, OD:4 1/2, Wt:9.50)								
	TD: 4535.0								

Bridwell Oil Company
Application for Disposal Permit
State 8 #3
Lea County

Table of Wells Within 1/2 Mile

Operator	Well Name	Location	Date Drilled	Total Depth	Status	Casing	Perforations & Treatment
Bridwell Oil Co.	State 7 #1	7-9S-33E	March, 1973	4,480'	Active Oil	8.625" @ 372' / 4.5" @ 4,480'	4,396' - 4,450' 6,000 gal acid
	State 8 #1	8-9S-33E	July, 1972	4,527'	Active Oil	8.625" @ 373' / 4.5" @ 4,527'	4,426' - 4,484' 11,000 gal acid
	State 8 #2	8-9S-33E	August, 1972	4,550'	Plugged	8.625" @ 360' / 4.5" @ 4,550'	4,434' - 4,448' 500 gal acid
	State 8 #3	8-9S-33E	October, 1972	4,535'	Active Oil	8.625" @ 373' / 4.5" @ 4,535'	4,424' - 4,464' 11,000 gal acid
Penroc Oil Co.	State 8 #1	8-9S-33E	October, 1972	4,600'	Active Oil	8.625" @ 362' / 4.5" @ 4,600'	4,410' - 4,450' 6,000 gal acid
	State 8 #2	8-9S-33E	April, 1974	4,500'	Active Oil	8.625" @ 800' / 4.5" @ 4,500'	4,385' - 4,425' 130 sks sand
	State 8 #3	8-9S-33E	June, 1975	4,512'	Active Oil	8.625" @ 364' / 4.5" @ 4,508'	4,396' - 4,434' 11,000 gal acid



OPERATION DATA

Average Injection Rate:	150 barrels per day
Maximum Injection Rate:	300 barrels per day
System Type:	Closed
Average Injection Pressure:	1500 psi
Maximum Injection Pressure:	2,200 psi
Water Source:	San Andres Dolomite
Receiving Formation:	San Andres Dolomite (re-injection of produced water)

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Bridwell
Lease : N. Mex. St.
Well No. : # 8
Well Name :

Sample Loc. :
Date Analyzed : 26-January-1998
Date Sampled : 01-January-1998

ANALYSIS

Produced San
Andres Water

1. pH 6.310
2. Specific Gravity 80/80 F. 1.158
3. CaCO₃ Saturation Index @ 80 F. +1.072
@ 140 F. +2.572

Dissolved Gases

MG/L EQ. WT. *MEQ/L

4. Hydrogen Sulfide 30
5. Carbon Dioxide 365
6. Dissolved Oxygen Not Determined

Cations

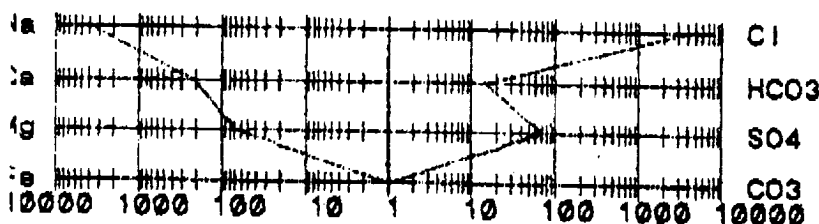
7. Calcium (Ca⁺⁺) 4,143 / 20.1 = 206.12
8. Magnesium (Mg⁺⁺) 794 / 12.2 = 65.08
9. Sodium (Na⁺) (Calculated) 88,437 / 23.0 = 3,845.09
10. Barium (Ba⁺⁺) Not Determined

Anions

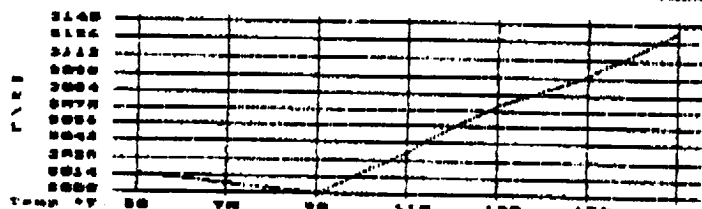
11. Hydroxyl (OH⁻) 0 / 17.0 = 0.00
12. Carbonate (CO₃⁼) 0 / 30.0 = 0.00
13. Bicarbonate (HCO₃⁻) 870 / 61.1 = 14.39
14. Sulfate (SO₄⁼) 3,450 / 48.8 = 70.70
15. Chloride (Cl⁻) 142,068 / 35.5 = 4,027.27
16. Total Dissolved Solids 240,871
17. Total Iron (Fe) 5 / 18.2 = 0.25
18. Total Hardness As CaCO₃ 13,812
19. Resistivity @ 75 F. (Calculated) 0.001 / cm.

LOGARITHMIC WATER PATTERN

*meq/L.



Calcium Sulfate Solubility Profile



COMPOUND	EQ. WT. X	*meq/L = mg/L.	
Ca(HCO ₃) ₂	81.04	14.39	1,168
CaSO ₄	88.07	70.70	4,812
CaCl ₂	55.50	121.04	8,718
Mg(HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCL ₂	47.82	65.08	3,099
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.48	3,841.15	224,554

*Milli Equivalents per Liter

This water is slightly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts, and the presence
of H₂S, CO₂ in solution.

Pro-Kem, Inc.

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Medallin
Lease : Windmill
Well No. : East
Salesman :

Now
MOR. CO
Lonses

Sample Loc. :
Formation :
Date Analyzed: 25-March-1998

ANALYSIS

Fresh Water

1. pH 7.180
2. Specific Gravity 60/60 F. 1.003
3. CaCO₃ Saturation Index @ 80 F. -0.443
@ 140 F. +0.257

Dissolved Gases

4. Hydrogen Sulfide Not Present
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

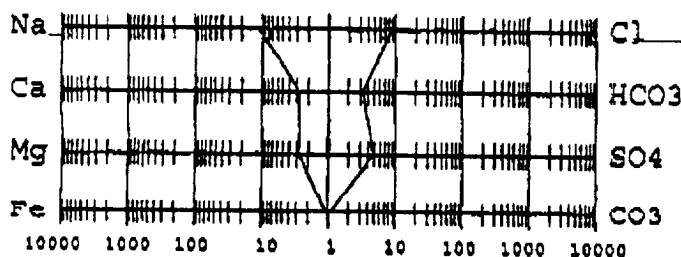
Cations

- | | | MG/L | EQ. WT. | *MEQ/L |
|--------------|---------------------|----------|---------|--------|
| 7. Calcium | (Ca ⁺⁺) | 52 | 20.1 | 2.59 |
| 8. Magnesium | (Mg ⁺⁺) | 32 | 12.2 | 2.62 |
| 9. Sodium | (Na ⁺) | 253 | 23.0 | 11.00 |
| 10. Barium | (Ba ⁺⁺) | Below 10 | | |
- (Calculated)

Anions

- | | | MG/L | EQ. WT. | *MEQ/L |
|---|----------------------------------|-------|---------|--------|
| 11. Hydroxyl | (OH ⁻) | 0 | 17.0 | 0.00 |
| 12. Carbonate | (CO ₃ ⁼) | 0 | 30.0 | 0.00 |
| 13. Bicarbonate | (HCO ₃ ⁻) | 19 | 61.1 | 0.31 |
| 14. Sulfate | (SO ₄ ⁼) | 220 | 48.0 | 4.58 |
| 15. Chloride | (Cl ⁻) | 300 | 35.5 | 8.45 |
| 16. Total Dissolved Solids | | 1,052 | | |
| 17. Total Iron (Fe) | | 2 | 18.2 | 0.08 |
| 18. Total Hardness As CaCO ₃ | | 260 | | |
| 19. Resistivity @ 75 F. (Calculated) | | 2.919 | /cm. | |

LOGARITHMIC WATER PATTERN



Calcium Sulfate Solubility Profile

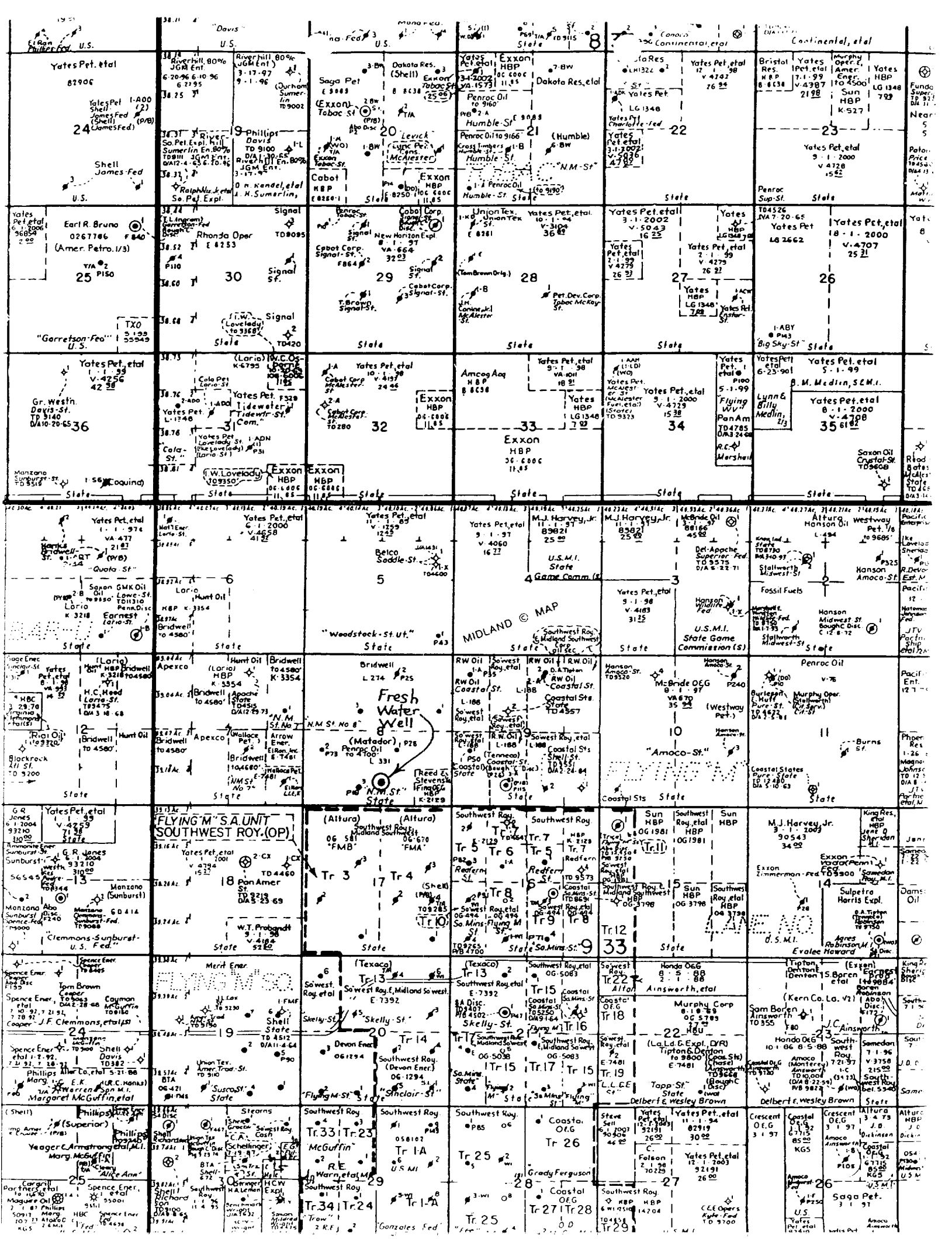


PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT. X	*meq/L - mg/L.	
Ca(HCO ₃) ₂	81.04	2.59	210
CaSO ₄	68.07	0.00	0
CaCl ₂	55.50	0.00	0
Mg(HCO ₃) ₂	73.17	0.60	44
MgSO ₄	60.19	2.02	121
MgCl ₂	47.62	0.00	0
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	2.49	177
NaCl	58.46	8.45	494

*Milli Equivalents per Liter

This water is mildly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.



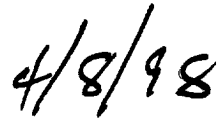
AFFIRMATIVE STATEMENT

I, Steve Ginnings, do hereby state the following based on information received from the Hobbs Office of the New Mexico Oil Conservation Division.

1. The Ogalala Aquifer is the only fresh water source in the area of the well for which this application is being made.
2. No known faults or other hydrologic connection exists between the San Andres Dolomite (disposal zone) and the Ogalala Aquifer.



Steve Ginnings



Date

PROOF OF NOTICE

OFFSET OPERATOR

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Arrow Energy Corp.
8144 Walnut Hill, Suite 998
Dallas, Texas 75231

4a. Article Number

Z 241 214 111

4b. Service Type

- ☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery

3/12/98

5. Received By: (Print Name)

6. Signature: (Addressee or Agent)

X *Christopher Reed*

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994

102595-97-B-0179

Domestic Return Receipt

OFFSET OPERATOR

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Penroc Oil Corporation
P.O. Box 5970
Hobbs, NM 88251

4a. Article Number

Z 241 214 112

4b. Service Type

- ☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery

3-16-98

5. Received By: (Print Name)

6. Signature: (Addressee or Agent)

X *B. Rice*

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994

102595-97-B-0179

Domestic Return Receipt

OFFSET OPERATOR

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Yates Oil & Gas Company
P.O. Box 1717
Midland, Texas 79702

4a. Article Number

Z 241 214 102

4b. Service Type

- ☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery

MAR 30 1998

5. Received By: (Print Name)

6. Signature: (Addressee or Agent)

X *Headman*

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994

102595-97-B-0179

Domestic Return Receipt

PROOF OF NOTICE

SURFACE OWNER

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
 - ☐ Restricted Delivery
- Consult postmaster for fee.

3. Article Addressed to:

Mr. Lynn Medlin
General Delivery
Tatum, New Mexico 88267

4a. Article Number

Z 241 214 092

4b. Service Type

- | | |
|---|---|
| ☐ Registered | ☒ Certified |
| ☐ Express Mail | ☐ Insured |
| ☐ Return Receipt for Merchandise | ☐ COD |

7. Date of Delivery

3-16-98

5. Received By: (Print Name)

6. Signature: (Addressee or Agent)

X *Katie Medlin*

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994

Domestic Return Receipt

State of New Mexico,
County of Lea.

Publisher

of _____¹ _____ weeks.

March 13 1998
and ending with the issue dated


Publisher

March 1998

Jodi Benson
Notary Public.

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937, and payment of fees for said publication has been made.

March 13, 1998
Bridwell Oil Company's Post Office Box 1830, Wichita Falls, Texas, 76707 is submitting an application to the New Mexico Oil Conservation Division for an injection permit on the New Mexico 8 State Lease well number 8. This well is located 1,980 feet from the north line and 1,980 feet from the west line of Section 8, Township 9 South, Range 33 East, Flying M field, Lea County. The purpose of this injection well will be disposal of produced water from the Bridwell New Mexico 7 and 8 State leases into the San Andres Formation at an average depth of 4,444 feet. It is anticipated that approximately 150 barrels of saltwater per day will be injected into the San Andres at a maximum pressure of 2,200 pounds per square inch. Interested parties must file objections or requests for hearing with the Oil Conservation Division, Post Office Box 2088, Santa Fe, New Mexico, 87504-2088 within 15 days. Questions regarding this application may be directed to Steve Ginnings, Bridwell Oil Company representative, at 940/723-4351 or bridwell@wf.net
#15790

BRIDWELL OIL CO.

01103055000 01518271
Bridwell Oil Company
PO Drawer 1830
WICHITA FALLS, TX 76307

