YATES PETROLEUM CORPORATION
207 SOUTH FOURTH STREET
ARTESIA, NEW MEXICO 88210
TELEPHONE (505) 748-1331

February 5, 1985

Oil Conservation Division
P.O. Box 2088
Santa Fe, N.M. 87501

Attn: Richard L. Stamets

Re: Eagle Creek - San Andres
Pilot Waterflood, Case No. 7935
Order No. R-7354

Dear Sir:

Attached please find Yates Petroleum Corporation's application for authorization to inject into additional wells in the Eagle Creek-San Andres Pilot Waterflood. The three subject wells are within the existing pilot area and their conversion to injection is necessary to maintain thorough and efficient waterflood injection.

Yates Petroleum Corporation respectfully requests the application be administratively approved pursuant to Rules 701-B(3) and 701-F(4). If administrative approval is not possible, please schedule the application for hearing at the earliest possible date.

Sincerely,

YATES PETROLEUM CORPORATION

David L. Lanning
Petroleum Engineer

DLL/dt

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [XX] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [X] yes [ ] no

II. Operator: Yates Petroleum Corporation

Address: 207 S. 4th Street; Artesia, New Mexico 88210

Contact party: David L. Lanning Phone: (505) 748-1331 ext 157

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? [X] yes [ ] no
If yes, give the Division order number authorizing the project R-7354.

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 source 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: David L. Lanning Title Petroleum Engineer

Signature: David L. Lanning Date: FEB 5, 1985

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. Previously submitted in case No 7935, August 17, 1983, for institution of a Pilot Waterflood in the Eagle Creek-San Andres Field, Order No R-7354 issued September 26, 1983

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

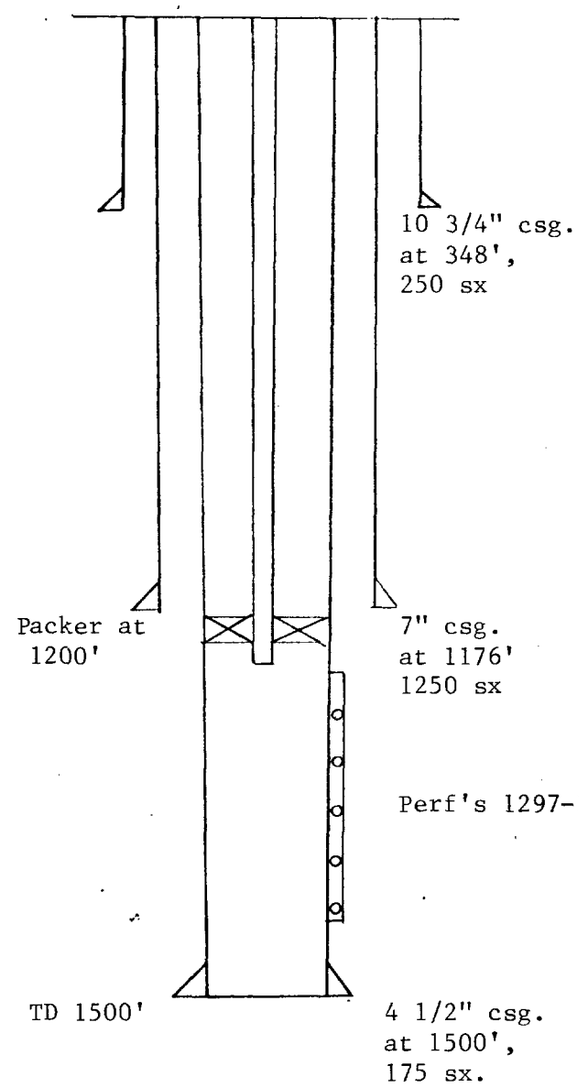
NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
YATES PETROLEUM CORPORATION	GISSLER "AV"			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
20	1980' FNL & 1980' FWL	23	17S	25E

Schematic



Tabular Data

Surface Casing

Size 10 3/4" Cemented with 250 sx.

TOC Circulated feet determined by _____

Hole size 15"

Intermediate Casing

Size 7" Cemented with 1250 sx.

TOC Circulated feet determined by _____

Hole size 9 1/2"

Long string

Size 4 1/2" Cemented with 175 sx.

TOC Circluated feet determined by _____

Hole size 6 1/4"

Total depth _____

Injection interval

1297 feet to 1420 feet

(perforated or open-hole, indicate which)

Tubing size 2 3/8" lined with Plastic (material) set in a

Plastic Coated Baker AD 1 Tension (brand and model) packer at 1200 feet

(or equivalent)

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation San Andres

2. Name of Field or Pool (if applicable) Eagle Creek

3. Is this a new well drilled for injection? ☐ Yes ☒ No

If no, for what purpose was the well originally drilled? Drilled as a producer in the Eagle Creek San Andres Field.

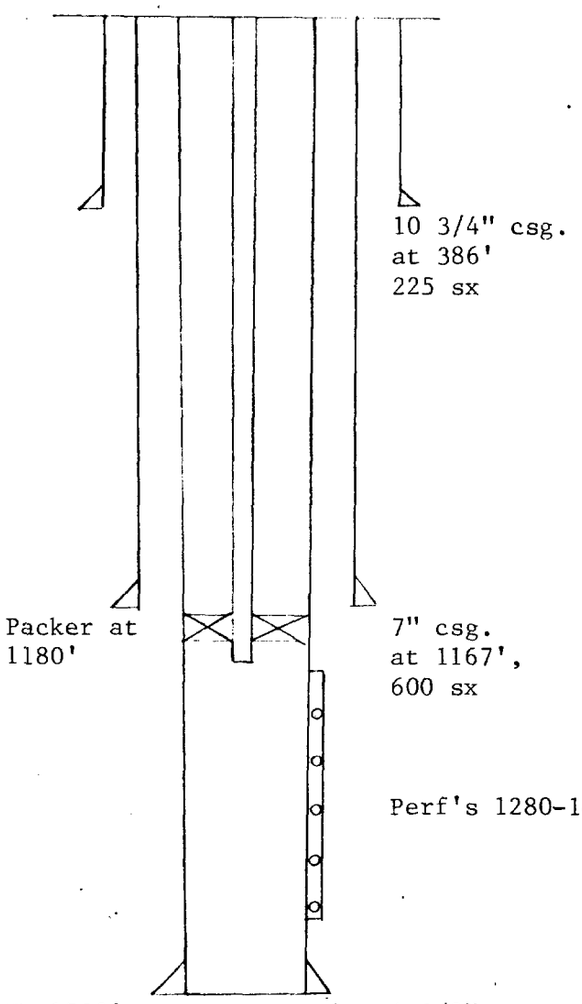
4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used) NO

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. Productive pools in the area consist of the Permo-Penn, Atoka, Strawn and Morrow at depths varying from 6000-8000'.

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
YATES PETROLEUM CORPORATION	GISSLER "AV"			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
37	1980' FSL & 1980' FWL	23	17S	25E

Schematic



Tabular Data

Surface Casing

Size 10 3/4" Cemented with 225 sx.

TOC Circulated feet determined by _____

Hole size 14 3/4"

Intermediate Casing

Size 7" Cemented with 600 sx.

TOC Circulated feet determined by _____

Hole size 9 7/8"

Long string

Size 4 1/2" Cemented with 160 sx.

TOC Circulated feet determined by _____

Hole size 6 1/4"

Total depth 1530'

Injection interval

1280 feet to 1409 feet

(perforated or open-hole, indicate which)

Tubing size 2 3/8" lined with Plastic (material) set in a

Plastic coated Baker AD 1 Tension (brand and model) (or equivalent) packer at 1180' feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation San Andres

2. Name of Field or Pool (if applicable) Eagle Creek

3. Is this a new well drilled for injection? /_/ Yes /X/ No

   If no, for what purpose was the well originally drilled? Drilled as a producer in the Eagle Creek San Andres Field

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used) NO

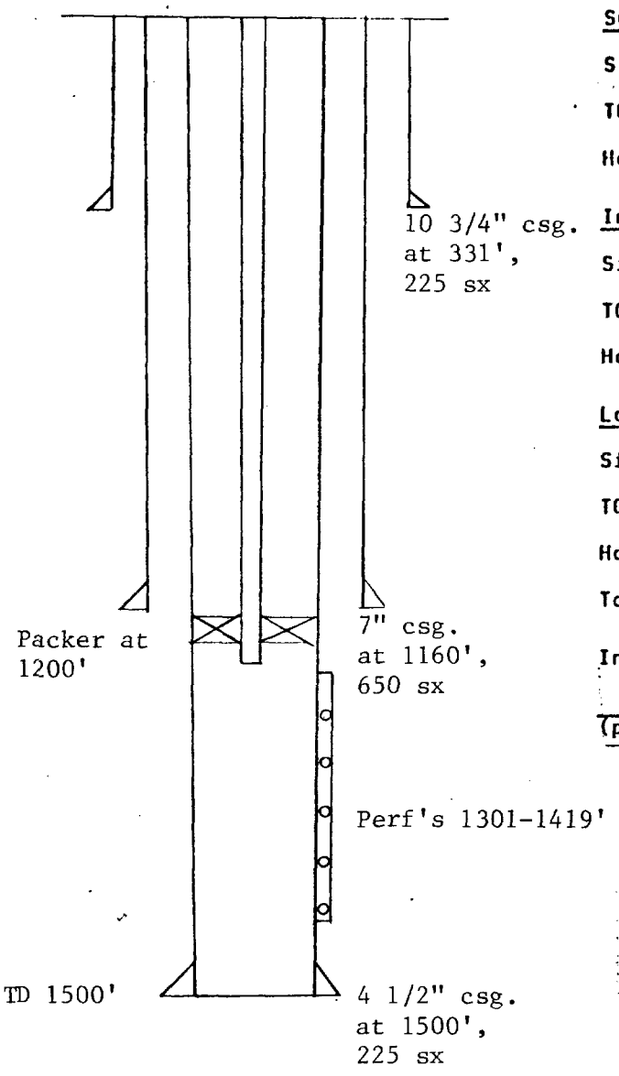
5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

   Productive pools in the area consist of the Permo-Penn, Atoka, Strawn and Morrow at depths varying from 6000-8000'.

INJECTION WELL DATA SHEET

OPERATOR	LEASE			
YATES PETROLEUM CORPORATION	GISSLER "AV"			
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE
43	2630' FNL & 1330' FWL	23	17S	25E

Schematic



Tabular Data

Surface Casing

Size 10 3/4" Cemented with 225 sx.

TOC Circulated feet determined by _____

Hole size 14 3/4"

Intermediate Casing

Size 7" Cemented with 650 sx.

TOC Circulated feet determined by _____

Hole size 9 7/8"

Long string

Size 4 1/2" Cemented with 225 sx.

TOC 740' feet determined by Temp. Survey

Hole size 6 1/4"

Total depth 1500'

Injection interval

1301 feet to 1419 feet

(perforated or open-hole, indicate which)

Tubing size 2 3/8" lined with Plastic (material) set in a

Plastic coated Baker AD 1 Tension (brand and model) (or equivalent) packer at 1200 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation San Andres

2. Name of Field or Pool (if applicable) Eagle Creek

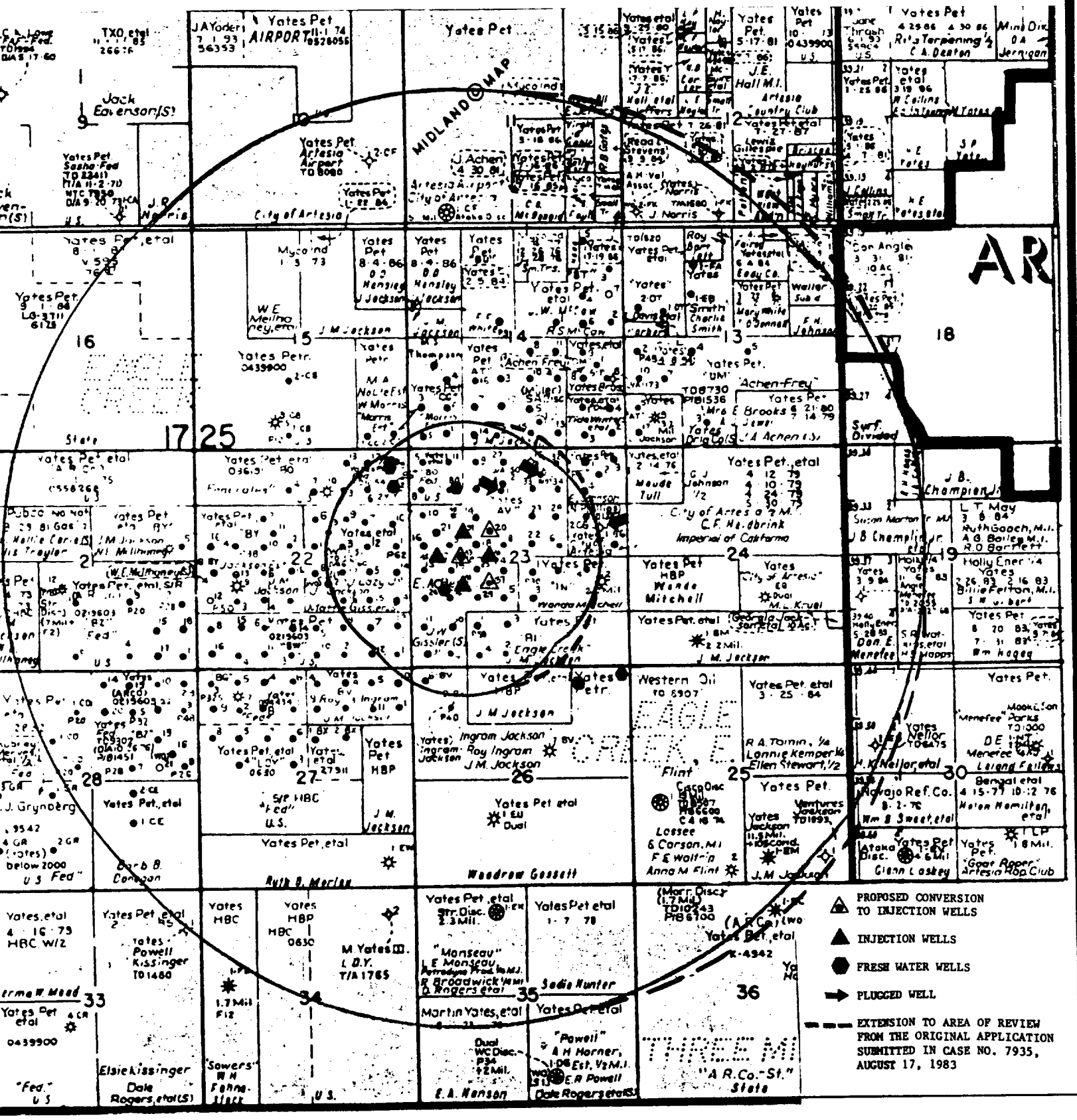
3. Is this a new well drilled for injection? [ ] Yes [X] No

   If no, for what purpose was the well originally drilled? Drilling as a producer in the Eagle Creek San Andres Field.

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used) No

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area.

   Productive pools in the area consist of the Permo-Penn, Atoka, Strawn and Morrow at depths varying from 6000-8000'.


MIDLAND MAP
PROPOSED CONVERSION TO INJECTION WELLS
INJECTION WELLS
FRESH WATER WELLS
PLUGGED WELL
EXTENSION TO AREA OF REVIEW FROM THE ORIGINAL APPLICATION SUBMITTED IN CASE NO. 7935, AUGUST 17, 1983

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Details of Wells within one-half mile of an injector

Well Name Location	Spud Date	Comp Date	TD	Type	Construction	Completion Record
Jackson "AT" #15 330' FSL & 2310' FEL S14-T17S-R25E	1/22/83	2/9/83	1500'	Prod. Oil	10 3/4" 40.5# @ 321' 14 3/4" 225 sx 7" 23# @ 1153' 9 7/8" 700 sx 4 1/2" 9.5# @ 1485' 6 1/4" 200 sx	1271-1447' A/3000 g 15% HCL SWF 60000 g/120,000#

NOTE: All other wells within one-half mile were previously submitted in case No 7935, August 17, 1983.

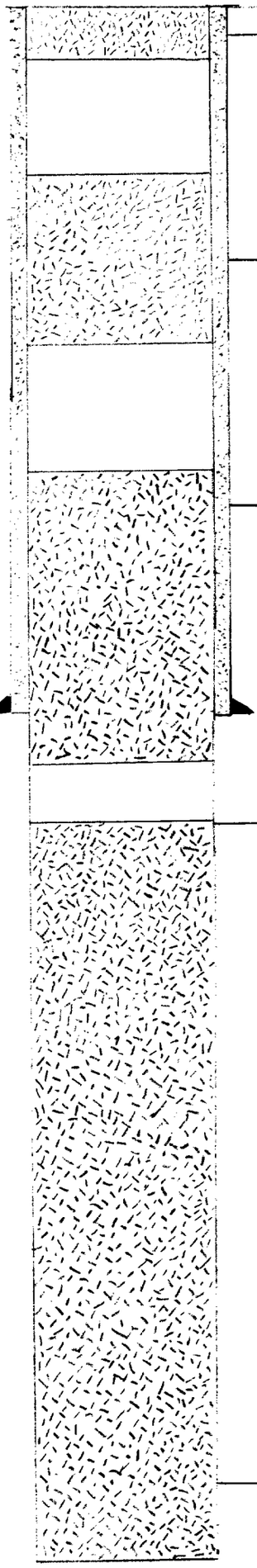
In accordance with Order No. R-7354 (10) the Heidbrink and Barger well No. 1 was re-plugged in accordance with the requirements set forth by the Divisions district office in Artesia. A plugging schematic of the Heidbrink and Barger well No. 1 is included as Attachment 1.

PART VI C-108
Attachment I

RE-PLUGGING SCHEMATIC

Heidbrink & Barger #1
1980' FNL & 660' FEL
Sec. 23-17S-25E
Eddy County, NM

Spud Date: 5/23/61
Comp Date: 7/5/61
Orig. P & A Date: 2/2/62
Replug Date: 3/84



25' cement plug @ surface

Spot 25 sx cement @ 399'

7" cement retainer @ 706'
150 sx below retainer
15 sx above retainer

7" 23# csg.
@ 819' cement to surface w/
550 sx, 5 yd. pea-gravel,
32 yd ready-mix

868-1306' 200 sx cement

1306-1372' original plug
25 sx cement

TD: 1372'

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Proposed Operation

This application is to convert three producing wells to injection on the Gissler "AV" lease of the Eagle Creek (San Andres) pool. The proposed conversions are necessary to continue the pilot flood which is in progress.

Data on the proposed operation include:

1) The average injection rate will be approximately 100 BPD per well; the maximum rate will be 300 BPD per well. The total volume of injected water for all three wells is approximately 1,000,000 bbls.
2) A closed water supply system will be used.
3) The maximum injection pressure will be 250 psi (0.2 psi per foot of depth). Higher pressures will be utilized, contingent upon NMOCD's acceptance of step-rate injectivity tests.
4) The proposed injection water is produced formation water from the Slaughter Zone, or fresh water from an overlying aquifer. An analysis of Slaughter Zone produced water is attached (see Attachment 1).
5) Not applicable.

Phone (505) 748-6100

CHEMEX

PART VII C-108

ATTACHMENT 1

P. O. Box 423
Artesia, N. M. 88210

WATER ANALYSIS REPORT

Company Yates Petroleum Corp. Date 8-4-83

Field Eagle Creek County Eddy State N.M.

Lease and Well No. Gissler AV #2 Prod. Formation

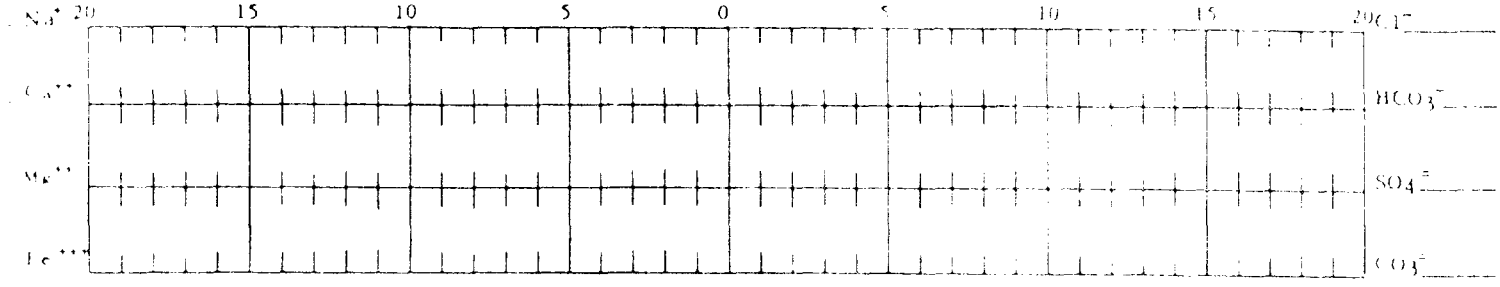
Source of Sample Mitchell S.W. transfer station - West

Sample of Prod. Water [X] Inj. Water [ ] Other [ ]

Date Collected 8-4-83 Analyst N. Weed

WATER ANALYSIS PATTERN

NUMBER BESIDE ION SYMBOL INDICATES me / L SCALE UNITS



Dissolved Solids Constituent	MG/L (PPM)	EPM
Calcium	1,760 mg/l	88
Magnesium	1,040 mg/l	85
Sodium	79,902 est. mg/l	3474
Iron	-	
Chloride	129,000 mg/l	3634
Bicarbonate	340 mg/l	6
Carbonate	-	
Sulfate	325 mg/l	7
Total Hardness	2,800 mg/l	
Total Dissolved Solids	132,465 mg/l	
Hydrogen Sulfide	5+ mg/l	
Oxygen	0	

ph 7.1

Sp. Gravity

Remarks:

Geological information was previously submitted in Case 7935, August 17, 1984.

The proposed stimulation program for each well is 1000-2000 gallons of 15% HCL acid.

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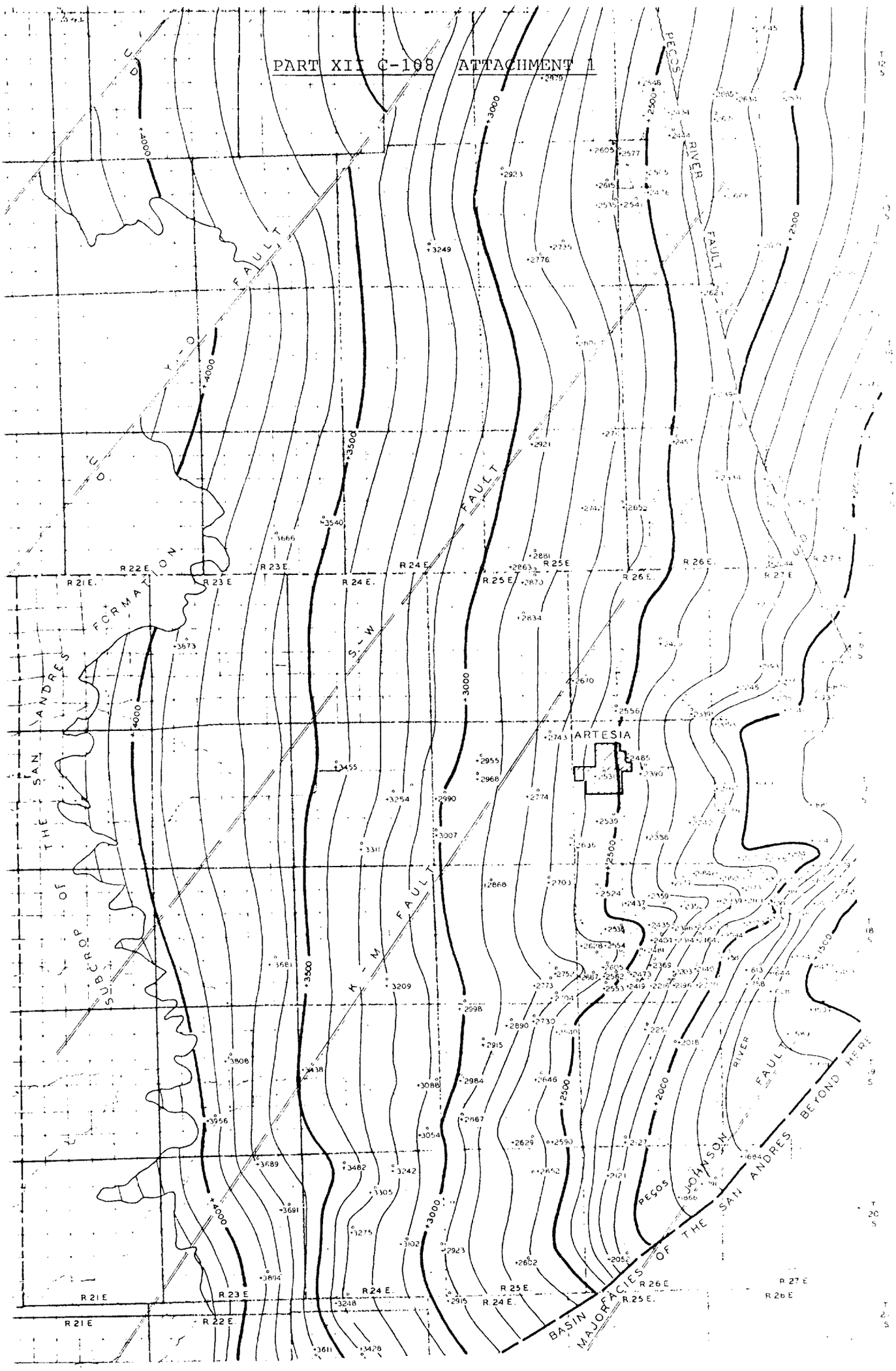
Logs for the three subject wells have been filed with the Division district office in Artesia.

Chemical analysis of fresh water was previously submitted in case No 7935, August 17, 1983.

A publication of the Roswell Geological Society in 1968 entitled "A Study of the Roswell Artesian Basin" identified the K-M fault (shown on Attachment 1), striking northeast through T17S-R25E. The fault is approximately 8800 feet from the nearest injection well described in this application and approximately 4000 feet from any part of the Eagle Creek pool that can be flooded in the future. The fault is not well defined in the San Andres Formation, but it does serve as a barrier to the movement of groundwater in the San Andres. Further description of the K-M fault appears in a excerpt from the above referenced publication, Attachment 2.

Yates Petroleum Corporation finds no evidence that there is any hydrologic connection between the Slaughter Zone and any of the fresh water aquifers in the area.



SAN ANDRES FORMATION STRUCTURE MAP

ROSWELL ARTESIAN BASIN

NEW MEXICO

CHAVES & EDDY COUNTIES,

CONTOUR INTERVAL 100 FEET

0 1 2 3 4 5 6

SCALE IN MILES

FIGURE

EXCERPT FROM "A STUDY OF THE ROSWELL ARTESIAN BASIN"

Map of New Mexico. Using sub-surface information developed during the course of this study, the strike of Six-mile Hill fault can be projected northeastward until it intercepts the Pecos River in the vicinity of Sec. 6, T8S, R26E, near the western termination of an east-west trending diabase dike known as the Railroad Mountain fault. This dike is shown on Figures 6, 9, 15, and on the Geologic Map of New Mexico. It should be noted that the projection of the Six-mile Hill fault, using subsurface data, differs from the trace of this fault shown on the Geologic Map of New Mexico. Displacement along this fault varies from a few feet in T10S, R24E, and southwestward along its strike, to more than 100 feet in T9S, R24 and 25E, where the fault bounds a collapse depression in the top of the San Andres Formation (Figure 9). This fault appears to have little effect on the local movement of ground water (Figure 10) and it does not change the distribution of permeability within the San Andres Formation (Figure 11). The tight flexure associated with the fault may cause some local variation in the water table, but the fault itself exercises no basin-wide control on the movement of ground water.

Subsurface information developed in this study has also been used to extend the hitherto mapped extent of the Y-O fault (Figures 6, 8, and 9). Fiedler and Nye (1933) described the outcrop of this fault and the present study extends the fault into the subsurface beyond its outcrop area. The extended trace of this fault intersects the Pecos River near the western end of a diabase dike known as the El Camino Del Diablo fault. The displacement along the Y-O fault increases from about 50 feet in T11S, R25E, to perhaps as much as 300 feet southwestward along its strike (Figure 9).

The Y-O fault has a strong influence on the movement of ground water across the Roswell basin. Figures 10 and 12 show a ground-water mound coincident with this fault from which water flows both northwest and southeast away from the fault. The presence of this mound indicates that transient ground water updip from this fault must flow along the fault before it resumes its normal direction of flow across the basin. The effect of this fault on the flow of ground water is further reflected by the separation of a cone of depression in the piezometric surface on the northwest side of the fault from a similar cone of depression on the southeast side of the fault. The lack of connection between these depressions indicates that permeability is probably quite high along the fault inasmuch as pumping is about the same on both sides (Mower, 1960). The comparatively greater decline of water levels on the southeast side of the fault (Figure 12) suggests, however, that the permeability of the aquifer on the southeast side of the fault is less than the permeability of the aquifer on the northwest side. This inferred change in the permeability of the aquifer is shown on Figure 11.

The K-M fault, striking northeast and lying nearly parallel to the previously described structures, is not well defined in either the San Andres Formation or the overlying younger rocks and sediments. The best resolution of this structure is found in rocks of Mississippian age where the southeast side of the fault is down thrown. This fault does, however, serve as a barrier to the movement of ground water in the San Andres Formation. Its effectiveness as a ground water barrier is reflected in the reduction in spacing of the water table contours shown on Figure 10. This increase in the gradient of the water table indicates a decrease in permeability such as is shown on Figure 11.

On the basis of information assembled during this study, there is evidence that a previously unrecognized (S-W) fault trends northeasterly between and parallel to the Y-O and K-M faults. The trace of this S-W fault, shown on Figures 6, 9, 10, 11, and 15, intercepts the Pecos River in the southwestern part of Sec. 11, T13S, R26E. There is a change in the permeability of the San Andres Formation in the vicinity of the inferred trace of this S-W fault (Figure 10). The extent to which rocks have been displaced along the S-W fault cannot be determined because of a lack of specific data in the faulted area. The change in strike from N10°E to about N27°W shown by structural contours on the top of the San Andres Formation in T11S, R25E, (Figure 9), the southwestward swing of the course of the Pecos River beginning in Sec. 23, T13S, R26E, and the similarity of these to fault indications found along the Border Hills, Six-mile, Y-O, and K-M faults, however, suggest the presence of the S-W fault.

Another probable northeasterly trending fault or fracture is indicated by some of the above criteria as passing through the Major Johnson Spring area and the southeast edge of Lake McMillan. The probable Major Johnson fault may be the discharge path for water from the artesian and shallow aquifers at the southern end of the Roswell Artesian basin.

The Pecos River fault is a north-northwest trending structure near the eastern margin of the

PART XIV C-108

A copy of this application was sent by certified mail to the owner of the surface of the Gissler "AV" lease;

Mr. J.W. Gissler
P.O. Box 987
Artesia, New Mexico 88210

A copy of the "Certificate of Mailing" is included as Attachment 1.

Yates Petroleum Corporation operates all leases within one-half mile of the proposed injection wells.

Because this application is subject to administrative approval, a copy of the legal advertisement is included as Attachment 2.

PART XIV C-108
Attachment 1

IN THE MATTER OF THE APPLICATION OF :
YATES PETROLEUM CORPORATION FOR :
ADDITIONAL INJECTION WELLS IN THE :
EAGLE CREEK - SAN ANDRES PILOT :
WATERFLOOD, EDDY COUNTY, NEW MEXICO :
:

AFFIDAVIT OF MAILING

STATE OF NEW MEXICO)
: ss.
COUNTY OF EDDY)

The undersigned, being first duly sworn, upon oath, states that on the 5th day of February, 1985, the undersigned did mail in the United States Post Office at Artesia, New Mexico, a true copy of the Application for Authorization to Inject, to the following named owner of the surface of the Gissler "AV" lease, in a securely sealed, certified mail, return receipt requested, postage prepaid envelope addressed to the following named party:

Mr. J.W. Gissler
P.O. Box 987
Artesia, New Mexico 88210

David L. Lanning

SUBSCRIBED AND SWORN TO before me this 5th day of February, 1985.

My Commission expires:

11-29-86

Donna L. Todd
Notary Public

PART XIV C-108
Attachment 2

The following legal notice was published in the Artesia Daily Press in Artesia, New Mexico on January 31, 1985.

LEGAL NOTICE

NOTICE OF PUBLICATION

Notice is hereby given that pursuant to the New Mexico Oil Conservation Division regulations, the following application for authorization for additional injection wells has been submitted for approval to the New Mexico Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501.

Yates Petroleum Corporation, 207 South 4th Street, Artesia, New Mexico, (505) 748-1331, David L. Lanning, contact party, proposes the addition of three injection wells to provide additional injection capability in the Eagle Creek-San Andres Pilot Waterflood. The proposed injection wells are as follows:

Gissler "AV" #20, 1980' FNL & FWL, Sec. 23-T17S-R25E

Gissler "AV" #37, 1980' FSL & FWL, Sec. 23-T17S-R25E

Gissler "AV" #43, 2630' FNL & 1330' FWL, Sec. 23-T17S-R25E

Injection will be into the San Andres Formation between 1280' and 1420'. Maximum injection rate will be 300 barrels of water per day per well. Maximum injection pressure is 250 psi. Higher injection pressures will be contingent upon the New Mexico Oil Conservation District's acceptance of step-rate injectivity tests.

Interested parties must file objections or requests for hearing with the New Mexico Oil Conservation Division at the above address within 15 days.

Published in The Artesia Daily Press, Artesia, N.M., Jan. 31, 1985.

Legal No. 10935.