HEYCO

PETROLEUM PRODUCERS

HARVEY E. YATES COMPANY

P.O. BOX 1933 ONE SUNWEST CENTRE 505/623-6601
FAX 505/622-4221
ROSWELL, NEW MEXICO 88202-1933

December 14, 1995

Via Telefax

Case 11485

DEC 20 1995

Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Application for Authorization
to Inject Salt Water into the
Hudson 31 Federal #1 Well
Robert N. Enfield, Operator
T-18S, R-33E, N.M.P.M.
Sec. 31: 2310' FNL & 330' FEL
Lea County, New Mexico

Ladies and Gentlemen:

Harvey E. Yates Company (HEYCO) recently received a copy of Robert N. Enfield's Application for Authorization to Inject salt water into the Penrose Sand formation in the captioned well. After careful review of the application, it is HEYCO's opinion that injecting salt water into the Hudson 31 Federal #1 well could destroy HEYCO's ability to recover oil and/or gas reserves from its wells in Section 32, T-18S, R-33E.

This letter is notice to you that HEYCO objects the approval of Mr. Enfield's application, dated November 10, 1995. If you have any questions concerning this matter, please call me at 505-623-6601.

Very truly yours,

Steven M. Yates
Vice President

/mvr
xc: Robert N. Enfield
P. O. Box 2431
Santa Fe, New Mexico 87501

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
HOBBS DISTRICT OFFICE

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_____
WFX_____
PMX_____

Gentlemen:

I have examined the application for the:

_____
Operator Lease & Well No. Unit S-T-R

and my recommendations are as follows:

OK

Yours very truly,

Jerry Sexton
Supervisor, District 1

/ed

SWD 12.18.95

Speed Letter.

To Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico
87501

From Associates, Inc.
O'BRIANT ~~ENGINEERING~~
P.O. BOX 10487
MIDLAND, TEXAS 79702
(915) 683-5511

Subject
—No. 9 & 10 FOLD

Message

Attached is an Application for Authorization to Inject.

If there are any problems with this Application please call me.

Thanks!

Sheryl A. Adams
Sheryl A. Adams

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

Case 11485

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: Robert N. Enfield

Address: P. O. Box 2431, Santa Fe, New Mexico 87501

Contact party: James F. O'Briant, O'Braint & Assoc. Phone: (915) 683-5511

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? ☐ yes ☒ 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 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: James F. O'Briant Title Agent for Robert N. Enfield

Signature: James F. O'Briant Date: November 10, 1995

* 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. November, 1992

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

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.

APPLICATION FOR AUTHORIZATION TO INJECT

I. Answered on Form C-108

II Answered on Form C-108

III. WELL DATA: See attached exhibit "A" page 1 and 2.

IV. Answered on Form C-108

V Map attached: Exhibit "B", shows 2 mile radius and 1/2 mile radius.

VI. Exhibit "C" contains well data on wells within the area of review and a schematic of the plugged and abandoned well illustrating the plugging detail.

VII.
1. The proposed average daily rate is 250 BWPD, a maximum of 1500 BWPD.
2. The system will be a closed system.
3. The proposed average injection pressure is estimated at 1000 psig, and the maximum pressure estimated at 2500 psig.
4. See Exhibit "D" 4 pages various water analysis.
5. Area of review contain queen production from perforations similar to injection perforations.

VIII. Geological data Exhibit "E" attached.

There are no existing sources of underground drinking water in this area.

IX. Stimulation program: Acid as required, may not require any stimulation.

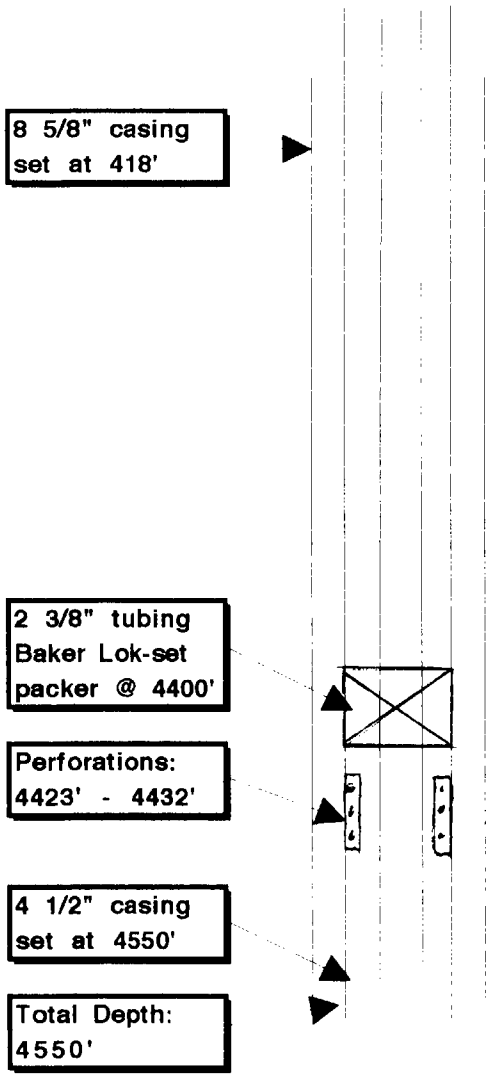
X. Logging and test data should be on file in the appropriate district office.

XI. Not applicable, there are no fresh water well in the area.

INJECTION WELL DATA SHEET

Robert N. Enfield	Hudson Federal "31"			
OPERATOR	LEASE			
No. 1	2310' FNL & 330' FEL	31	T-18-S	R-33-E
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Schematic



Tabular Data

Surface Casing

Size: 8 5/8 Cemented with 275 Sx.

TOC Surface feet determined by Circulated 75 sacks

Hole Size 12 1/4

Intermediate Casing

Size: NA Cemented with _____ Sx.

TOC _____ feet determined by _____

Hole Size _____

Long String

Size: 4 1/2 Cemented with 1675 Sx.

TOC Surface feet determined by Circulated 30 sacks

Hole Size 7 7/8

Total depth 4550'

EXHIBIT "A" PAGE 1

Injection interval

4423 feet to 4432 feet

(perforated or open-hole, indicate which)

Tubing size **2 3/8" EUE 8rd J-55** lined with **Internally lined with plastic coating** (Material) set in a

Baker Lok-Set packer (brand and model) packer at **approximately 4400'** feet

(or describe any other casing-tubing seal).

Other Data

1.) Name of the injection formation **Pennrose**

2.) Name of Field or Pool (if applicable) **Undesignated Buffalo Queen**

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

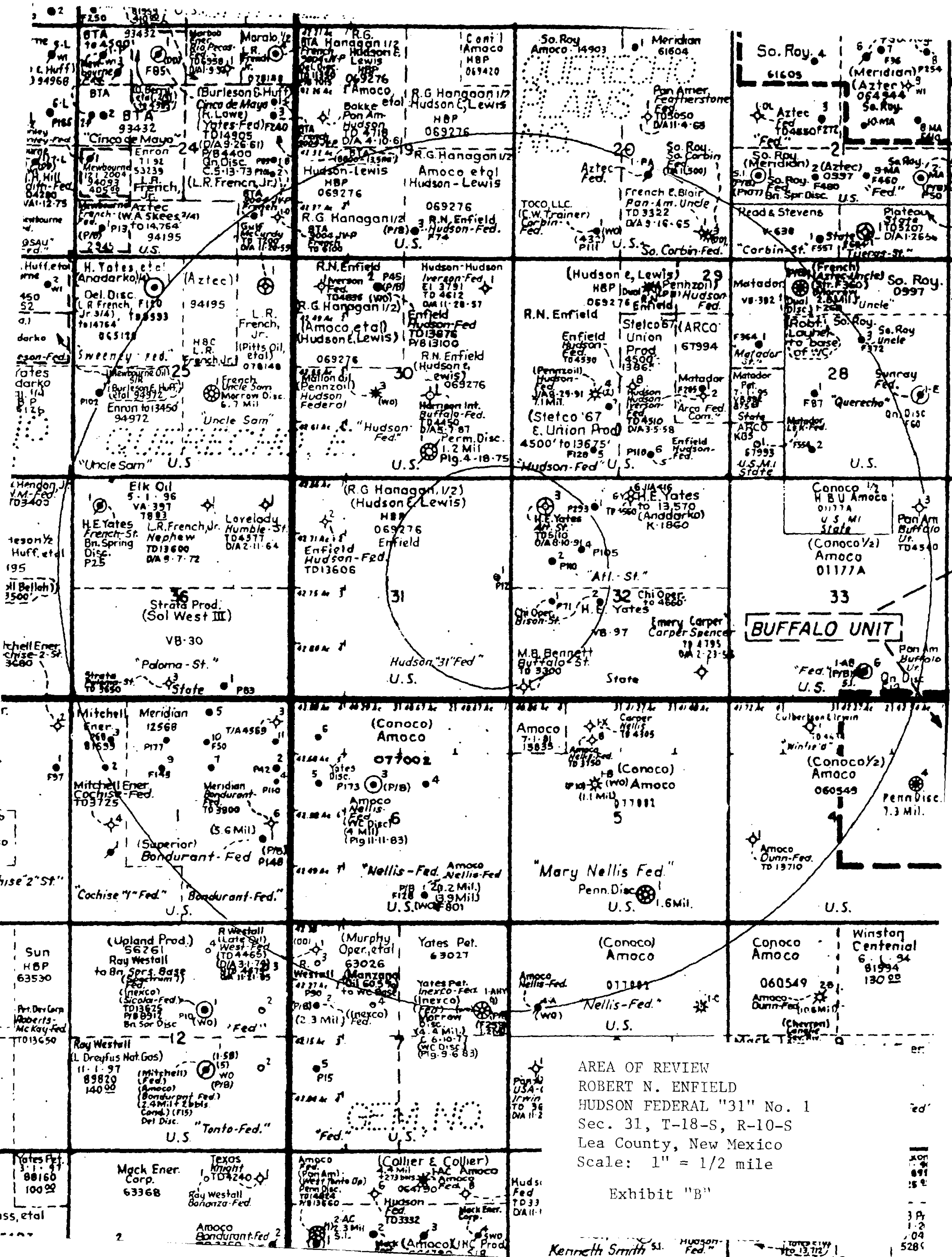
If no, for what purpose was the well originally drilled?

The well was drilled as an oil well and produced 3-4 BOPD.

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 other zones have been perforated except the Penrose zone, which is the zone to be injected into.**

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

The 1/2 mile review area contains queen producers with perforations beginning at 4424' to 4465' overall.



AREA OF REVIEW
ROBERT N. ENFIELD
HUDSON FEDERAL "31" No. 1
Sec. 31, T-18-S, R-10-S
Lea County, New Mexico
Scale: 1" = 1/2 mile

Exhibit "B"

APPLICATION FOR AUTHORIZATION TO INJECT
ROBERT N. ENFIELD HUDSON 31 FEDERAL NO. 1

WELL DATA IN AREA OF REVIEW

All wells are located in Sec. 32, T18S, R33E except subject well in Sec. 31.

Operator Lease & Well No.	Type	Csg	Prod. Sacks Cem	Date	Location	Completion	Zone
Enfield Hudson 31 Fed. #1	Act	4.5	1675	12/92	2310'FN&330'FE	4423-32'	Qn
H.E.Yates Atlantic 32 St.#2	Act	5.5	1630	6/91	1980'FN&990'FW	4424-28'	Qn
H.E.Yates Atlantic 32 St.#3	P&A	*	*	8/91	660'FN&800'FW	5120'TD	D&A
H.E.Yates Atlantic 32 St.#4	Act	5.5	1800	10/91	1650'FN&W	4428-34'	Qn
Chi Oper. Bison State #1	Act	5.5	1580	6/92	2310'FS&990'FW	4448-56'	Qn
Chi Oper. Bison State #2	Act	5.5	1150	10/92	2310'FS&2100'FW	4458-65'	Qn

* See schematic below.

Harvey E. Yates
Atlantic "32" State No. 3

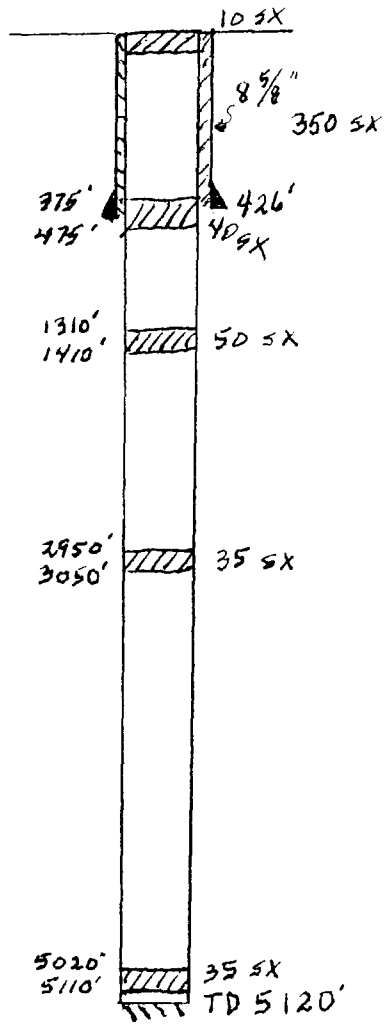


EXHIBIT "C"
WELL DATA AREA OF REVIEW
SCHEMATIC OF P&A WELL

OBE 46

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 291327
SAMPLE RECEIVED 2-28-91
RESULTS REPORTED 3-7-91

TO: Mr. Jim Brusenhan
P. O. Box 10487, Midland, TX 79702

COMPANY O'Briant Engineering LEASE Robert N. Enfield
FIELD OR POOL Corbin, S.
SECTION 19 BLOCK ____ SURVEY T-18 S&R-33E COUNTY Lea STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Produced water - taken from Hudson Federal #3 @ 1" Bleeder. 2-26-91
NO. 2
NO. 3
NO. 4
REMARKS: Bone Springs

CHEMICAL AND PHYSICAL PROPERTIES

	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.1190			
pH When Sampled				
pH When Received	6.95			
Bicarbonate as HCO_3	1,293			
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	8,800			
Calcium as Ca	2,500			
Magnesium as Mg	620			
Sodium and/or Potassium	66,717			
Sulfate as SO_4	1,509			
Chloride as Cl	107,239			
Iron as Fe	6.9			
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	179,877			
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide	0.0			
Resistivity, ohms/m at 77° F.	0.062			
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks The above results reveal no significant change in the water from this well as compared to that recovered on 2-1-91 and reported on laboratory #29127. Therefore, we would continue to conclude that as compared to our nearby records of Bone Springs, we find a mild difference in the sulfate lease; but this evidence is not sufficient to conclude another water is involved.

EXHIBIT "D" PAGE 1
WATER ANALYSIS

Form No. 3

By ____

Waylan C. Martin, M.A.

HALLIBURTON SERVICES

HOBBS, NEW MEXICO

To Robert Enfield

Sample Number 95

...iant Eng.

...tted by Wayne Fletcher/Halliburton   Date Received 3-23-92

... No. H...on Federal #2   Depth 11104-18   Formation Wolfcamp

County Lea   Field   Source swab

	10:30 AM 3-21-92		
Resistivity......	0.070 @ 72°F		
Specific Gr......	1.090		
pH...............	6.0		
Calcium* (Ca).........	3500		
Magnesium* (Mg)........	2850		
Chlorides* (Cl)........	75000 mpl		
Sulfates* (SO_4).........	2007		
Bicarbonates* (HCO_3)....	214		
Soluble Iron*....	100		
... Gravity Oil	35.9 @ 60°F		
... LOAD	+26 BO + 8 BFW		

Remarks:

*Milligrams per liter

EXHIBIT "D" PAGE 2
WATER ANALYSIS

Respectfully submitted,

Analyst: JLFLBANC

HALLIBURTON COMPANY

By ____________
CHEMIST

NOTICE

... ANY USER OF THIS REPORT AGREES THAT HALLIBURTON SHALL NOT BE LIABLE FOR

LOCATION

YOUR EXT. NO.

THE WESTERN COMPANY

WATER ANALYSIS

ANALYSIS NO.

GENERAL INFORMATION

OPERATOR Robert Enfield	DATE SAMPLED 10-6-91
WELL Hudson Fed NO.5	DATE RECEIVED 10-6-91
FIELD	SUBMITTED BY Jim Wooten
FORMATION Penrose	WORKED BY Shepherd
COUNTY LEA	SAMPLE DESCRIPTION:
STATE NM	11:00 AM. Sample
DEPTH 4398-4425	

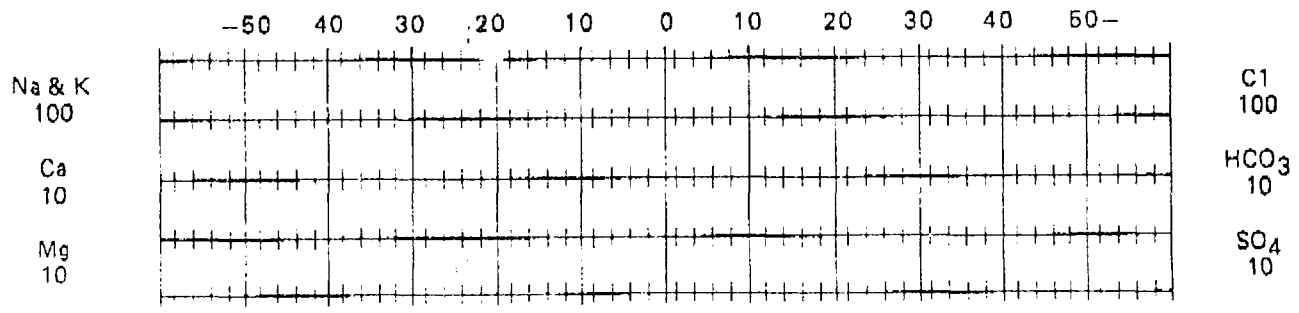
PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY	1.061 AT 72 °F		TOTAL DISSOLVED SOLIDS	PPM
pH	6.15		RESISTIVITY	PPM
IRON	100 PPM Fe^{2+}		SULFATE 2733	PPM
HYDROGEN SULFIDE	-0-		BICARBONATE 1494	PPM
HARDNESS			CHLORIDE 47125	PPM
CALCIUM	4750		SODIUM CHLORIDE	PPM
MAGNESIUM	2129	PPM	SODIUM	PPM
SODIUM & POTASSIUM	22955	PPM	POTASSIUM	PPM
PHOSPHATE				

REMARKS: +/- 2% oil in sample

EXHIBIT "D" PAGE 3
WATER ANALYSIS

for Stiff type plot (in meq./l.)



THE WESTERN COMPANY OF NORTH AMERICA
WATER ANALYSIS

ANALYSIS NO: 911113E

GENERAL INFORMATION

OPERATOR:	ROBERT ENFIELD		
WELL:	HUDSON FED. NO.7	DEPTH:	+/- 3800
FIELD:		DATE SAMPLED:	11-11-91
FORMATION:	PENROSE	DATE RECEIVED:	11-12-91
COUNTY:	LEA	SUBMITTED BY:	JIM WOOTEN
STATE:	NM	WORKED BY:	SHEPHERD
		PHONE:	505-392-5556

SAMPLE DESCR: WATER FOR ANALYSIS.

PHYSICAL AND CHEMICAL DETERMINATIONS

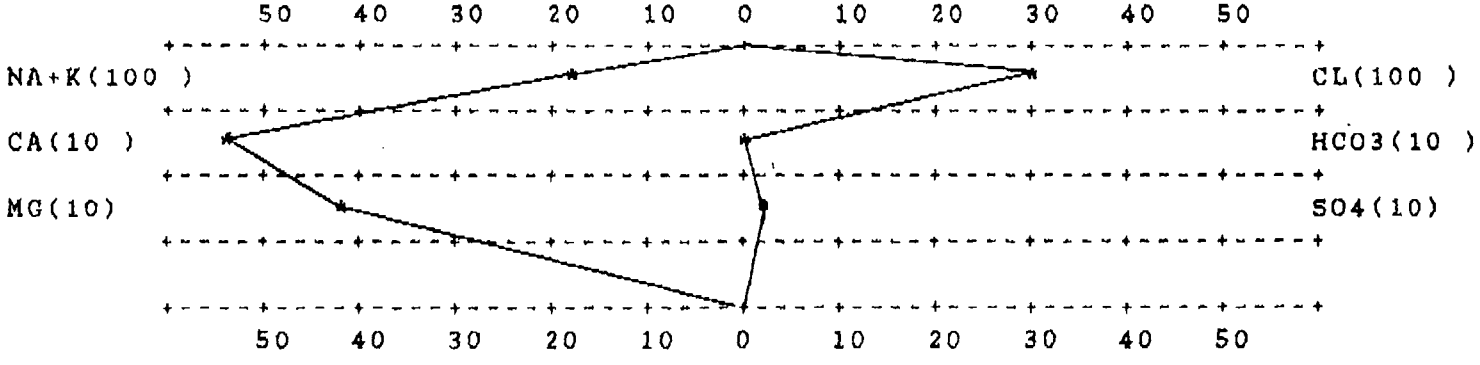
SPECIFIC GRAVITY: 1.140 AT 76 DEG. F PH = 6.40

IRON:	NOT DETERMINED		SULFATE:	1118	PPM
FE2+:	25	PPM			
SODIUM+POTASS:	51571	PPM	CHLORIDE:	111378	PPM
			SODIUM CHLORIDE (CALC):	183607	PPM
CALCIUM:	10537	PPM	BICARBONATE:	621	PPM
MAGNESIUM:	4903	PPM	TOT. HARDNESS AS CACO3:	46533	PPM
PHOSPHATE:	NOT DETERMINED		TOT. DISSOLVED SOLIDS:	211221	PPM

RESISTIVITY (CALCULATED): 0.051 OHM/METER @ 75 DEGREES F.

REMARKS:

STIFF TYPE PLOT (IN MEQ/L)



ANALYST

ROBERT N. ENFIELD
HUDSON FEDERAL "31" NO. 1
LEA COUNTY, NEW MEXICO
EXHIBIT "E"
GEOLOGICAL DATA ON INJECTION WELL

The application is to inject water into the Penrose Sand.

This sand is in the Lower Queen Formation

The sand has an overall thickness of 62' from 4390' to 4452'.

Edsel Neff
David Petroleum Corp.

There are no known underground sources of drinking water overlying or underlying in this area.

EXHIBIT "E"
GEOLOGICAL DATA
FRESH WATER DATA

dpc

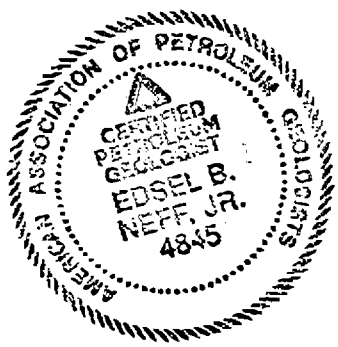
TO WHOM IT MAY CONCERN:

I have reviewed the geological and engineering data regarding the proposed disposal well in Section 31 - T18S - R33E. It is my opinion that the proposed disposal well will not have any effect on any underground source of drinking water.

Very truly yours,

Edsel Neff

Edsel B. Neff
Geologist
David Petroleum Corp.



DAVID PETROLEUM CORP.
EDWARD K. DAVID, PRESIDENT
Certified Petroleum Geologist
Off. 505/622-8850
Fax: 505/623-1801
Res. 505/622-5267
116 West First
Roswell, New Mexico 88201

AFFIDAVIT OF PUBLICATION

State of New Mexico,
County of Lea.

I, Kathi Bearden

General Manager

of the Hobbs Daily News-Sun, a daily newspaper published at Hobbs, New Mexico do solemnly swear that the clipping attached hereto was published once a week in the regular and entire issue of said paper, and not a supplement thereof for a period.

of

1 weeks.

Beginning with the issue dated

November 14, 1995

and ending with the issue dated

November 14, 1995

General Manager

Sworn and subscribed to before

me this 17th day of

November, 1995

Notary Public.

My Commission expires
March 24, 1998
(Seal)

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.

LEGAL NOTICE
November 14, 1995

Robert N. Enfield hereby gives public notice that it is applying to the Oil Conservation Division of New Mexico, Santa Fe, for a permit to dispose of produced saltwater by injection into a subsurface formation.

The applicant proposes to inject fluid into Hudson Federal "31" well No. 1, located 2310' FNL and 330' FSL, Section 31, T-18-S, R-33-E, Lea County, New Mexico. Fluid will be injected into strata in the subsurface depth interval from 4423' to 4432' in the Penrose formation at a maximum rate of 1500 barrels of water per day and/or a maximum pressure of 2500 psi.

Any objections or requests for hearing by interested parties, who can show they are adversely affected, should be submitted in writing, fifteen days of publication, to Oil Conservation Division of New Mexico, Energy and Minerals Department, P. O. Drawer 2088, Santa Fe, New Mexico 87501. For further information, contact G. Thane Akins, O'Briant & Associates, Inc., P. O. Box 10487, Midland, Texas 79702. Telephone (915) 683-5511.