EOR 24 WFX 12/2/96 701

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

II. Operator: **Burlington Resources Oil & Gas Company**

Address: **P.O. Box 51810 Midland, Texas 79710-1810**

Contact party: **Donna Williams** Phone: **915-688-6943**

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 **R-10390**.

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: **Donna Williams** Title **Regulatory Compliance**

Signature: _____ Date: **11/11/96**

* 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.

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

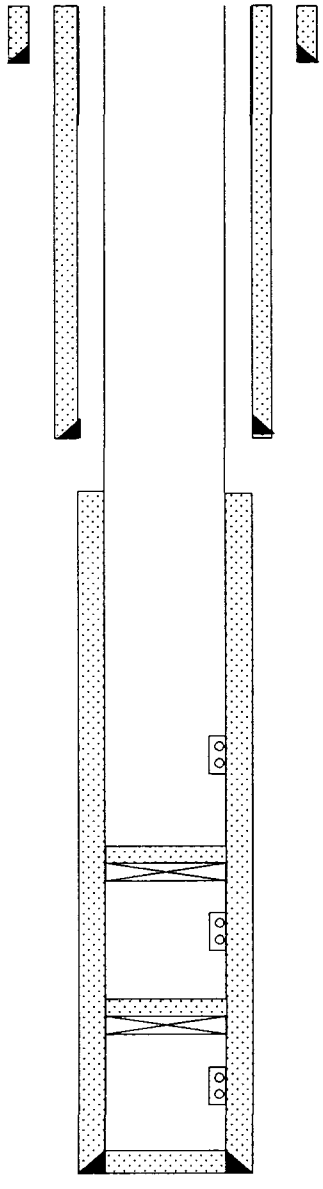
(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

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.

MERIDIAN *OIL*

FIELD: WEST CORBIN (DELAWARE) DATE SPUD: 10/22/88 COMP: 4/4/89
LEASE: E. CORBIN DEL. UNIT WELL NO. 11 ELEVATION: 3874' G.L., 3892' KB
LOCATION: 1980' FSL & 660' FWL, SEC 16, T-18-S, R-33-E
LEA COUNTY, NEW MEXICO



13-3/8" @ 358'
CEMENT W/ 350 SX
TOC @ SURF

8-5/8" @ 2,900'
CEMENT W/ 1300 SX
TOC @ SURF

DELAWARE PERFS
5218-25', 5238-46'

CIBP @ 7250'
CAP W/ 35' CEMENT

BONE SPRINGS PERFS
7300-34', 7416-30', 7999-8032'
9005-20', 9520-50'

CIBP @ 10,500'
CAP W/ 35' CEMENT

WOLFCAMP PERFS
10,858'-11,360'

5-1/2" @ 11,450'
CEMENT W/ 455 SX
DV TOOL @ 8466'
CEMENT W/ 1005 SX
TOC @ 3275', TS

EXISTING CONFIGURATION

TD: 11,450'
PBTD: 11,390'

JRG
8/8/96

MERIDIAN *OIL*

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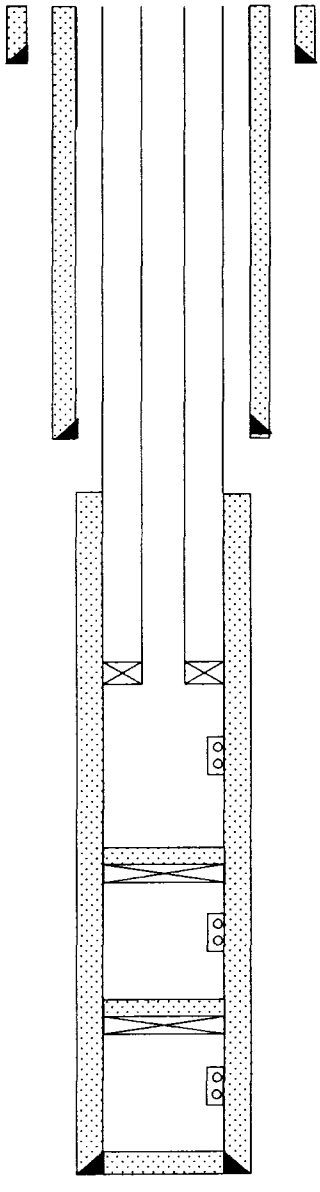


13-3/8" @ 358'
CEMENT W/ 350 SX
TOC @ SURF

8-5/8" @ 2,900'
CEMENT W/ 1300 SX
TOC @ SURF

2-3/8" IPC TUBING

PACKER SET @ 5100'

DELAWARE PERFS
5218-25', 5238-46'

CIBP @ 7250'
CAP W/ 35' CEMENT

BONE SPRINGS PERFS
7300-34', 7416-30', 7999-8032'
9005-20', 9520-50'

CIBP @ 10,500'
CAP W/ 35' CEMENT

WOLFCAMP PERFS
10,858'-11,360'

5-1/2" @ 11,450'
CEMENT W/ 455 SX
DV TOOL @ 8466'
CEMENT W/ 1005 SX
TOC @ 3275', TS

PROPOSED CONFIGURATION

TD: 11,450'
PBTD: 11,390'

JRG
8/8/96

November 11, 1996

Oil Conservation Division
2040 S. Pacheco Street
Santa Fe, New Mexico 87504

RE: Application for Authorization to Inject-Waterflood Expansion
East Corbin Delaware Unit Well No. 11
Formerly the State 16 Well No. 3
Sec. 16, T18S, R33E
Lea County, New Mexico

Gentlemen:

Burlington Resources Oil & Gas Company is applying for authorization to convert the above referenced well for the purpose of water disposal. Attached is an injection well data sheet showing the current and proposed mechanical configuration of this well. A map is also attached showing the one-half mile area of review around the well. The required information from 'Form C-108' follows.

The proposed injection well will dispose of water produced from Burlington Resources leases from the Delaware, Bone Spring, and Wolfcamp formation in the West Corbin Delaware field. Our estimated initial injection rate will be +/-1800 BPD/well. The estimated maximum rate is 3,000 BPD. We anticipate initial injection pressure to be +/-500 psi and request an operating maximum pressure of 1,050 psi. The closed injection facilities will operate on high and low level head switches and will not operate continuously. No deeper aquifers containing usable quality water are known in this area.

III. Well Data

1.) East Corbin Delaware Unit Well No. 11 (formerly State 16 # 3)
1980' FSL & 660' FWL
Sec. 16, T18S, R33E
Lea County, New Mexico

2.) Surface Casing: 13 3/8" @ 358'. Cmt w/350 sxs. TOC @ Surface
Intermediate Casing: 8 5/8" @ 2900'. Cmt w/1300 sxs. TOC @ Surface
Injection Casing: 5 1/2" @ 11450. Cmt w/1460 sxs. TOC@ 3275' (TS)

3.) Injection Tubing: 2 3/8" IPC tubing @ +/-5100'

4.) **Injection Packer:** **Guiberson G-6 packer @ +/- 5100'.**

B. 1.) **Injection Formation:** **Delaware**

2.) **Injection Interval:** **5218'-5246'**

3.) **This well will be converted to an injection well**

4.) **There will be no other open intervals in this injection well.**

5.) **The next possible lower oil zone is the First Bone Spring carbonate at an approximate top of 6,900'.**
The next possible gas zone is the Yates-Seven Rivers-Queen at an approximate producing zone depth of 4,300'.

IV. **This is a waterflood expansion of Order No. R-10390, dated the 19th of June, 1995.**

V. **Area of Review: See Exhibit 'A' which identifies the well's area of review.**

VI. **Tabulation of Data:** **Wells within Area of Review.**

1.) **Burlington Resources, State '16' # 1**
Unit J, Section 16, T18S, R33E, Lea County, New Mexico
Oil Well
Spud 2/27/87, TD=12,500'
13 3/8" @ 372' w/350 sxs, circulated
9 5/8" @ 3,000 w/1,300 sxs, circulated
5 1/2" @ 12,500 w2815 sxs, TOC@ 2,075' determined by TS
Perforated 11,231'-11,303'
Completed 4/15/87
OWWO
Perforated 11,036'-11,082'
Completed 4/26/88

Burlington Resources, East Corbin Delaware Unit # 1 WIW (formerly the State '16' # 4)
Unit M, Section 16, T18S, R33E, Lea County, New Mexico
Injection Well
Spud 10/5/89, TD-11,460'
13 3/8" @ 355' w/90 sxs, circulated
9 5/8" @ 2,900 w/1,225 sxs, circulated
5 1/2" @ 11,460' w/1,675 sxs, circulated
Perforated 11,388'-11,406'
Not Completed, CIBP @ 11,345'
Perforated 10,886'-11,238'
Completed 8/3/89
OWWO
CIBP @ 10,850' w/cmt plug @ 10,815'-10,850' w/35 sxs
Perforated 9,870'-9,946'
Not Completed, CIBP @ 9,840'
Perforated 9,010'-9,100'
Not Completed, CIBP @ 8,980'

Perforated 7,326'-7,353'
Not Completed, CIBP @ 7,280'
Perforated 5,192'-5,248'

Burlington Resources, State '16' # 2
Unit N, Section 16, T18S, R33E, Lea County, New Mexico
Oil Well
Spud 4/16/88, TD=13,651'
13 3/8" @ 350' w/370 sxs, circulated
9 5/8" @ 2,910' w/1,085 sxs
5 1/2" @ 13,640' w/1,940 sxs, TOC@2,914 (CBL)
Perforated 13,363'-13,369'
Not Completed, CIBP @ 13,300' w/cmt plug @ 13,365'-13,300' w/35 sxs
Perforated 11,400'-11,434'
Completed 7/10/88

Burlington Resources, East Corbin Delaware Unit # 2 (formerly State '16' # 5)
Unit N, Section 16, T18S, R33E, Lea County, New Mexico
Oil Well
Spud 11/29/88, TD=5,450'
8 5/8" @ 350' w/250 sxs, circulated
5 1/2" @ 5,450' w/1,200 sxs circulated TOC
Perforated 5,184'-5,544'
Completed 1/20/89

Burlington Resources, Corbin State # 1
Unit F, Section 16, T18S, R33E, Lea County, New Mexico
Oil Well
Spud 1/14/88, TD = 13,730'
13 3/8" @ 355' w/370 sxs, circulated
9 5/8" @ 3000' w/1385 sxs, circulated
5 1/2" @ 13,730' w/2,750 sxs, circulated TOC
Perforated 13,429'-13,450'
Squeezed w/100 sxs, capped w/35' cmt
Perforated 10,908'-11,476'
Not Completed, CIBP @ 10,790' w/35' cmt
Perforated 8644'-8664'
CIBP @ 8570' w/35' cmt
Perforated 6558'-6574'
Completed 8/88

VII. Proposed Operation

1.) The proposed average daily injection rate is 1800 BWPD/well. The proposed, maximum injection is 3,000 BWPD/well.

2.) The system will be closed

3.) The proposed average injection pressure is 500 psi. The proposed, maximum pressure is 1,050 psi.

4.) The source of the injection fluid is produced water from the Delaware, Wolfcamp, and Bone Spring formations. The receiving formation will be the Delaware. A water analysis showing compatibility between the produced water and the receiving formation is attached. The produced fluid sample was taken from the West Corbin Tank Batteries; water samples were taken from the East Corbin Delaware Unit (formerly the State '16' # 4) and the East Corbin Delaware Unit # 8 (formerly the Federal MA # 7).

VIII. Geological Data on the Injection Zone

LITHOLOGICAL DESCRIPTION:
The East Corbin Delaware Unit produces oil and gas from a series of fine to very fine grained arkosic sandstones of the middle Permian age Delaware group.

GEOLOGICAL NAME:
The proposed zone for injection is the Delaware formation

THICKNESS:
Approximate thickness is 56'

DEPTH:
The top of the producing zone is 5218'

FRESH WATER SOURCES:
In the immediate area of the subject wellbore, fresh water has been encountered in aquifers above 250 feet. These aquifers are found in the Pliocene age Ogallala and Pleistocene age alluvial sediments and consist for the most part of alternating calcareous silt, fine sand and clay. In this wellbore, these aquifers are present to a depth of 250' and are protected by 13 3/8" surface casing set to 358'. In addition, 5 1/2" production casing has been run to bottom and cement circulated to surface. There are no sources of fresh water underlying the injection interval.

IX. There is no proposed stimulation program planned

X. Log sections are attached with the proposed interval indicated

XI. There are no fresh water wells within one mile of the proposed injection well. The closest water wells are in Sections 14 and 27.

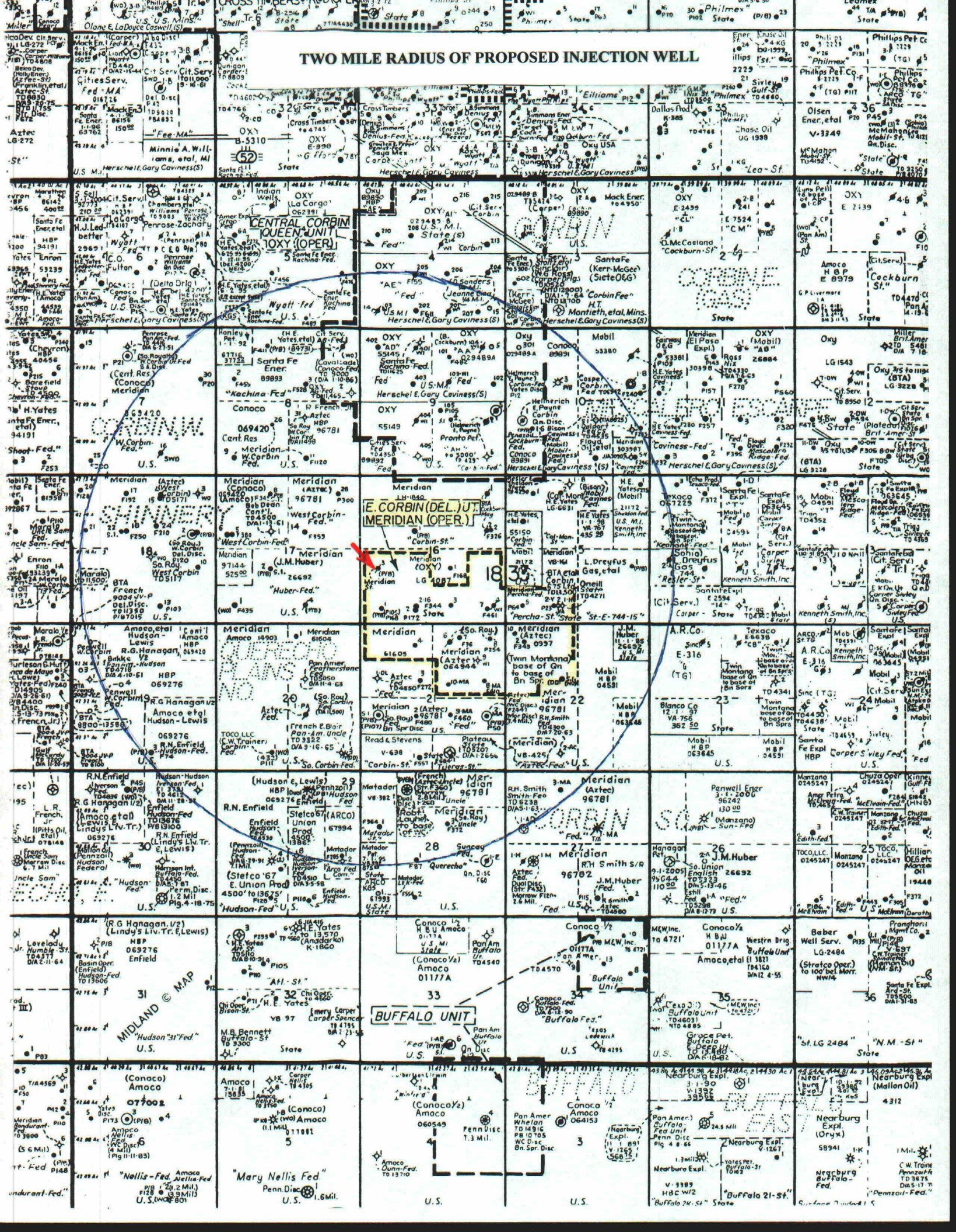
XII. **An examination of seismic data and available information indicates there is no evidence of open faults or any other hydrologic connection between the injection zone and any underground source of drinking water.**

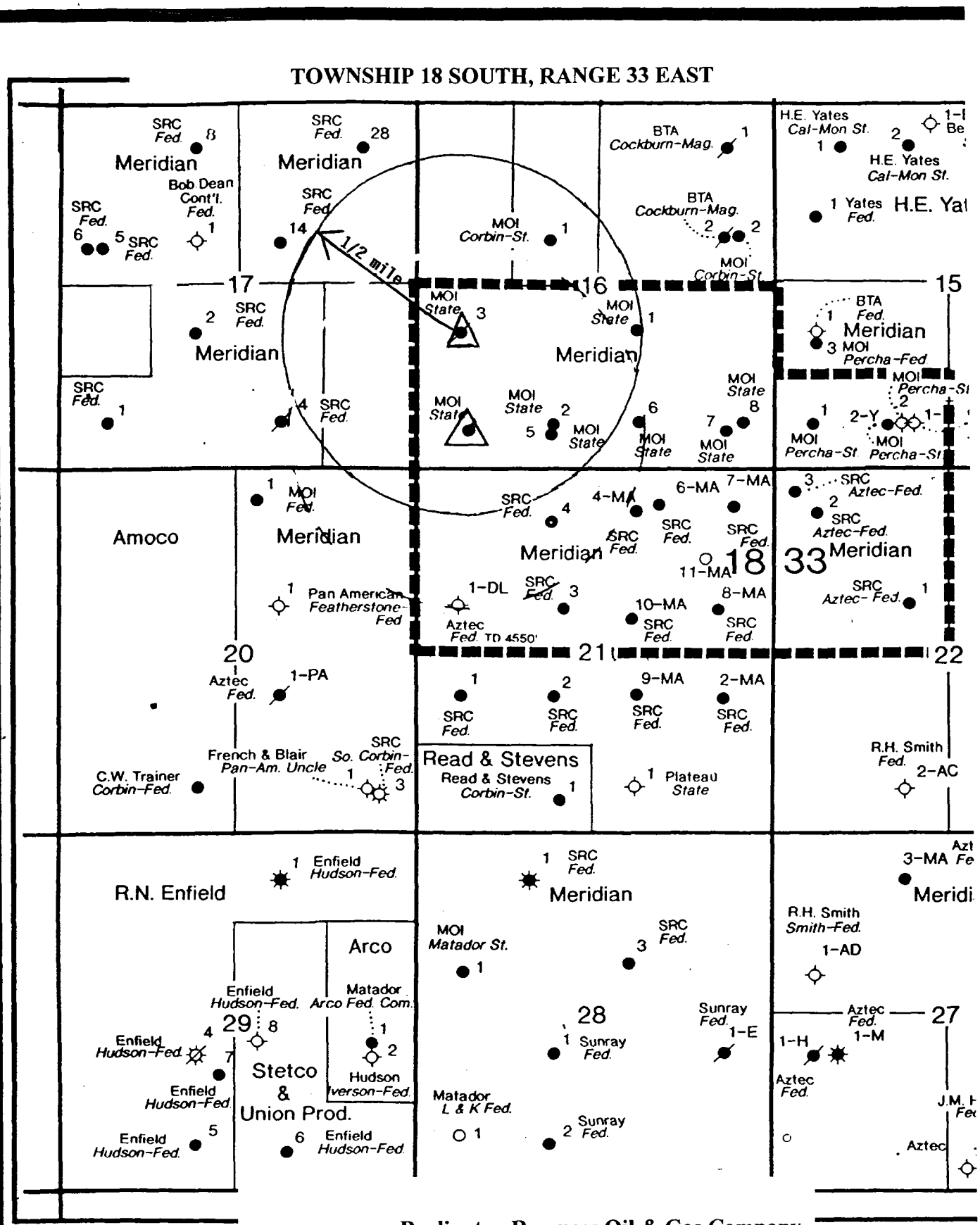
XIII. **Proof of Notice is Attached.**

XIV. **Certification is on form C108**

If any further data is required, please contact Mr. Jack Gevecker, 915-688-6982, or myself at 915-688-6943.

Donna Williams, Regulatory Compliance


TWO MILE RADIUS OF PROPOSED INJECTION WELL
CENTRAL CORBIN QUEEN UNIT
OXY (OPER)
CORBIN
E. CORBIN (DEL.) UT
MERIDIAN (OPER.)
BUFFALO UNIT
MIDLAND © MAP



Burlington Resouces Oil & Gas Company
East Corbin Delaware Unit # 11 WIW
Lea County, New Mexico
1/2 Mile Area of Review

Martin Water Laboratories, Inc.
WATER CONSULTANTS SINCE 1953
BACTERIAL AND CHEMICAL ANALYSES

P. O. BOX 1468
MONAHANS, TEXAS 79756
(915) 943-3234 or 563-1040

709 W. INDIANA
MIDLAND, TEXAS 79701
(915) 683-4521

November 23, 1994

Mr. Chet Babin
Meridian Oil Company
P.O. Box 51810
Midland, TX 79710

Subject: Recommendations relative to laboratory #1194144 (11-21-94), West Corbin Unit.

Dear Mr. Babin:

The objective herein is to provide an evaluation of the compatibility between the waters represented in these analyses in regard to injecting a mixture of Delaware, Bone Springs, and Wolfcamp into the Delaware.

It is noted that we did find a significant amount of oxygen in the water at the injection pumps, but it is obvious that this would be due to air contamination and not representative of a natural condition in this water. The air contamination would create some incompatibility as a result of soluble iron in the other waters. Of course, there was some minor iron oxide in the water at the injection pumps. However, if the air contamination is prevented, then there would be no incompatibility identified as a result of any combination of these waters. This is to say that there would be neither scaling potential nor precipitation as a result of mixing the waters.

In general, we find no evidence to suggest there would be any compatibility problem as a result of injecting the mixture of Delaware, Bone Springs, and Wolfcamp into the Delaware.

In addition to the above discussion of compatibility, the results indicate satisfactory injection quality in the present injection water. The total amount of suspended matter and the fact that the suspended material showed microscopically to be essentially all very fine material would be indicative of this satisfactory injectability.

Yours very truly,

Waylan C. Martin

WCM/mo

EXHIBIT "H"

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

TO: Mr. Chet Babin
P.O. Box 51810, Midland, TX 79710

LABORATORY NO. 1194144 (Corrected Copy)
SAMPLE RECEIVED 11-21-94
RESULTS REPORTED 11-23-94 (11-29-94)

COMPANY Meridian Oil Company LEASE West Corbin Unit
FIELD OR POOL South Corbin
SECTION 16 & 21 BLOCK ____ SURVEY T-18S &R-33E COUNTY Lea STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Produced water - taken from State "16" #4. 11-21-94
NO. 2 Produced water - taken from Federal "MA" #7. 11-21-94
NO. 3 Mixed water - taken from injection pump discharge. 11-21-94
NO. 4

REMARKS: 1 & 2. Delaware 3. Delaware, Bone Springs, & Wolfcamp

CHEMICAL AND PHYSICAL PROPERTIES

	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.1703	1.1708	1.1432	
pH When Sampled			7.2	
pH When Received	5.56	5.92	6.38	
Bicarbonate as HCO_3	161	181	327	
Supersaturation as $CaCO_3$	8	4	4	
Undersaturation as $CaCO_3$	--	--	--	
Total Hardness as $CaCO_3$	65,500	69,500	34,500	
Calcium as Ca	18,800	20,600	10,400	
Magnesium as Mg	4,495	4,374	2,066	
Sodium and/or Potassium	72,466	72,430	73,194	
Sulfate as SO_4	576	480	1,044	
Chloride as Cl	157,662	160,503	136,356	
Iron as Fe	1.5	3.6	1.8	
Barium as Ba			0	
Turbidity, Electric			51	
Color as Pt			48	
Total Solids, Calculated	254,160	258,568	223,387	
Temperature °F.			70	
Carbon Dioxide, Calculated	660	380	36	
Dissolved Oxygen,			1.8	
Hydrogen Sulfide	0.0	0.0	0.0	
Resistivity, ohms/m at 77° F.	0.050	0.050	0.053	
Suspended Oil			10	
Filtrable Solids as mg/l			20.5	
Volume Filtered, ml			400	
Total Dissolved Solids @ 180°F.	247,244	246,296	212,252	

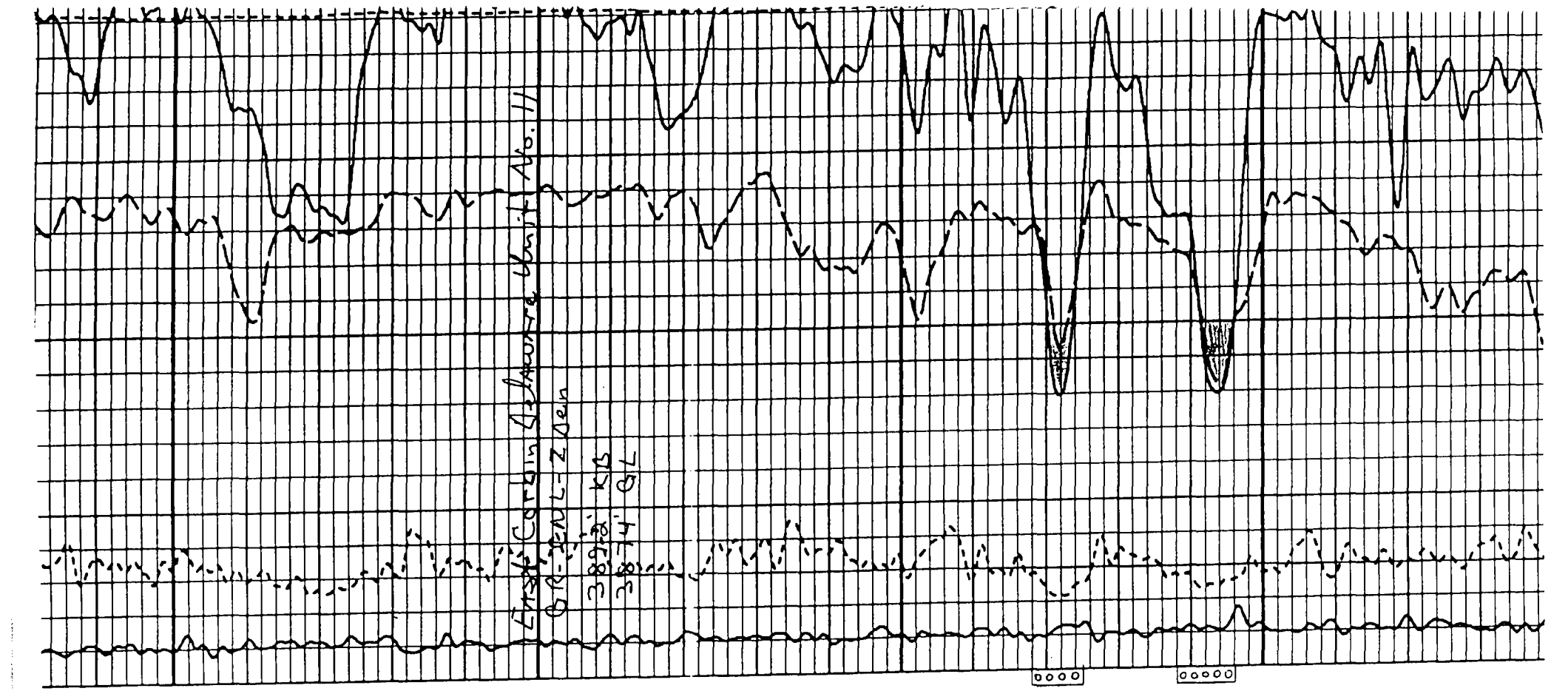
Results Reported As Milligrams Per Liter

Additional Determinations And Remarks: Letter of recommendation attached.

Form No. 3

By Waylan C. Martin, M.A.

EXHIBIT "H"


05100
05200

BURLINGTON RESOURCES OIL & GAS COMPANY
EAST CORBIN DELAWARE UNIT # 11
APPLICATION FOR AUTHORIZATION TO INJECT
SEC. 16, T18S, R33E
LEA COUNTY, NEW MEXICO

I CERTIFY THAT A COPY OF THIS APPLICATION WAS MAILED TO THE FOLLOWING ON NOVEMBER 11, 1996 BY CERTIFIED/RETURN RECEIPT MAIL.

OFFSET OPERATORS WITHIN 1/2 MILE:

BTA Oil Producers
104 S. Pecos
Midland, Texas 79701

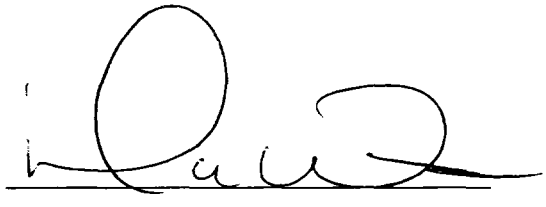
SURFACE OWNERS: (LANDS COMMITTED TO UNIT)

Bureau of Land Management
2909 West Second Street
Roswell, New Mexico 88201

Commissioner of Public Lands
P.O. Box 1148
Santa Fe, New Mexico 87504

NEWSPAPER:

Hobbs News Sun
201 N. Thorp
Hobbs, New Mexico 88240



Donna Williams, Regulatory Compliance