

APPLICATION FOR AUTHORIZATION TO INJECT

- I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no
- II. Operator: Nassau Resources, Inc.
Address: 650 So. Cherry St., Suite 1225; Denver, CO 80222
Contact party: Gary J. Johnson Phone: 303-321-2111
- 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: Gary J. Johnson Title Petroleum Engineer

Signature: Gary J. Johnson Date: 14 December 1988

- * 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.

RECEIVED

DEC 9 1980

OIL CONSERVATION DIV.

III. WELL DATA

A.

1. Lease Name: NM30016
Well Name: Carracas Unit 27A-82 PWD
Location: 1650' FNL, 990' FEL, Section 27, T32, R5W
Rio Arriba County, New Mexico
2. Surface Casing: 13-3/8", 54.5 #/ft., set @ 319' KB with 385 sacks Class B cement with 2% CaCl₂, in 17-1/2" hole, Cement was circulated to surface.

Intermediate Casing: 9-5/8", 40 #/ft. and 43.5 #/ft., N-80 New casing set @ 4100' KB with 555 sacks 65/35 Pozmix w/ 12 % gel and 338 sacks 50/50 Pozmix w/ 2% gel and 6-1/4 #/sack Gilsonite in 12-1/4" hole. Cement will be circulated to surface.

Production Casing/Liner: 7", 23, 26, and 29#/ft. N-80 set at 10,000' with top at 3900' to be cemented with 335 sacks 65/35 Pozmix w/ 12% gel and 325 sacks 50/50 Pozmix w/ 2% gel and 6-1/4 #/sack gilsonite in 8-3/4" hole. Cement will be circulated to the liner top.
3. Tubing to be used: 3-1/2", 9.3 #/ft., EUE Seamless tubing lined with TK-69 thin film and set at 9700'.
4. Packer: 7" Baker Lok-Set to be set at 9700'.

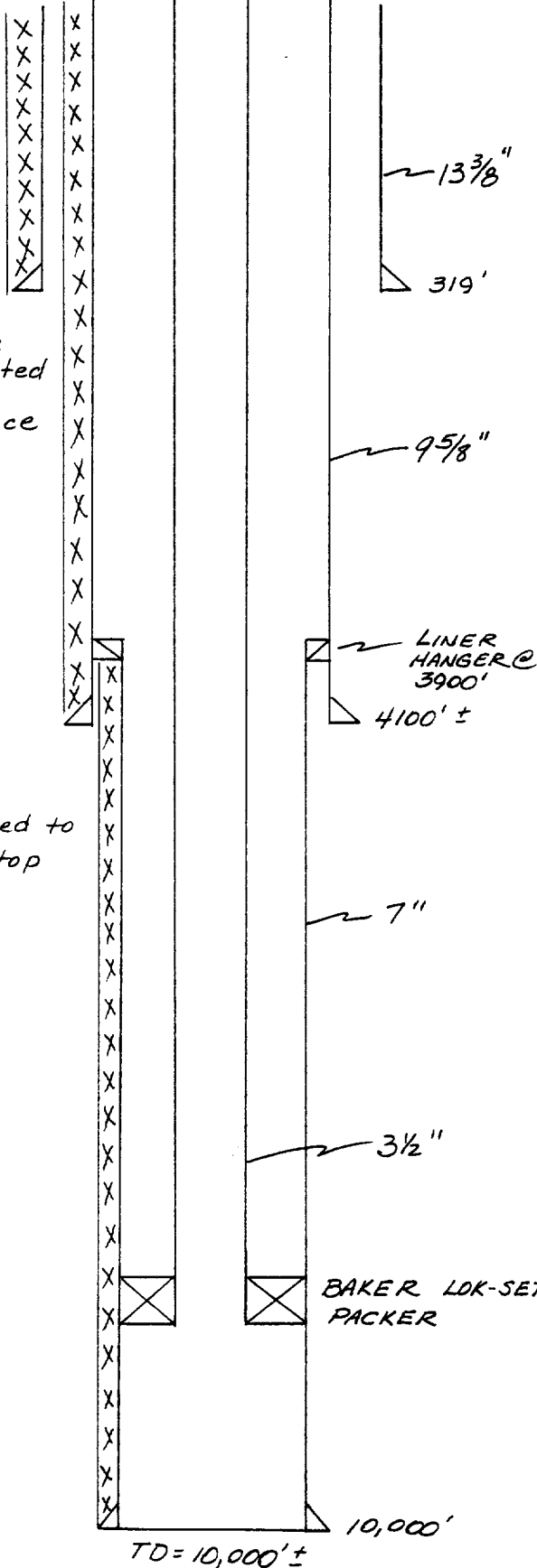
B.

1. Injection Formation: Entrada and Morrison
Field and Pool Name: Undesignated Entrada, Undesignated Morrison
2. Injection Interval: Perforations to be determined from log and drillstem test data.
Injection zones expected at 9700'-10,000'.
3. Original Purpose of Well: Well is being drilled as a Water disposal well.
4. Other Perforations: None
5. Depth to Next Oil or Gas Zone: Lower = none
Higher = Dakota @ approx. 8000'.

CEMENTED
TO
SURFACE

To Be
Cemented
to
Surface

To Be
Cemented to
Liner top



FIELD: UNDESIGNATED ENTRADA
POOL: ENTRADA
LEASE: NM 30016
WELL NO.: CARRACAS UNIT 27A-82
LOCATION: 1650' FNL, 990' FEL
UNIT LETTER: H QQ: SENE
SEC: 27 T: 32N R: 05W
COUNTY: RIO ARriba STATE: NM
ELEVATION: 7175 GL, 7187 KB
TD: 10,000' ± PBTD: _____

SURFACE CASING: 13 3/8" 54.5 #/ft
J-55 set @ 319' KB w/ 38.5
sacks Class 'B' w/ 2% CaCl₂
HOLE SIZE: 17 1/2"

INTERMEDIATE CASING: 9 5/8" 40#
43.5 #/ft to be set @ 4100' ±
HOLE SIZE: 12 1/4"

PRODUCTION CASING: _____
HOLE SIZE: _____

LINER: 7" 23, 26 & 29 #/ft, N-80
to be set @ 10,000' ± w/ top @
3900' ±
HOLE SIZE: 8 3/4"

CEMENT STAGE 1 @: 4100' w/ 555
sacks 65/35 Pozmix w/ 12% gel + 338 sacks 50/50
Pozmix w/ 2% gel and 6 1/4 #/sk
gilsonite CU FT: 1924

CEMENT STAGE 2 @: 10,000 w/ 335
sacks 65/35 Pozmix w/ 12% gel + 325 sacks 50/50 Pozmix w/
2% gel and 6 1/4 #/sk gilsonite
CU FT: 1330

CEMENT STAGE 3 @: _____ w/ _____
CU FT: _____

COMPLETION, WELL HISTORY, TOPS
ON BACK

V. Map of wells and leases within 2 miles: Attached

VI. Wells of public record that penetrate proposed injection zones within Area of Review (1/2 mile radius of well): None

VII. Proposed Operations:

A. It is proposed to drill to approximately 10000' and complete the well in the Jurassic Entrada formation for disposal of produced water from the Fruitland Coal formation. If necessary to achieve desired injectivity, the well will be additionally completed in the Jurassic Morrison formation. Details of the proposed disposal are as follows:

1. Proposed Average Daily Injection Rate: 5,000 BPD
Proposed Maximum Daily Injection Rate: 10,000 BPD
2. Open or Closed System: Proposed as Open system.
3. Proposed Average Injection Pressure: 1500 PSI
Proposed Maximum Injection Pressure: 3000 PSI
4. Source of Injection Fluid: Fruitland Coal Formation
Analysis of Injection Fluid: Attached
Compatibility with Receiving Formation: Compatible
5. Analysis of Disposal Zone Water: Attached

VIII. Geologic Data:

A. Geologic Data on Proposed Injection Zone:

1. Morrison: The Jurassic Morrison formation consists of alternating sandstone and shale beds. The sandstone to be penetrated in this proposed injection well is expected to be light blue, fine grained, very quartzitic with some siltstone.
2. Entrada: The Jurassic Entrada formation consists of light colored to red, generally massive eolian and fluvial sandstones. The lower and medial silty units grade into the upper sandy member. The upper member is a massive orange-red, friable, crossbedded, medium to coarse grained, well sorted sandstone. Thickness is approximately 200 feet.

B. Underground Sources of Drinking Water:

1. Ojo Alamo: The base of the Tertiary Ojo Alamo is expected at 3110' and is the lowest formation in this well that could be a potential source of drinking water. There are no known sources of drinking water below the proposed injection interval.

IX. Proposed Stimulation Program:

- A. It is anticipated that both prospective disposal zones will be fractured to facilitate injection. Since the zones have not yet been penetrated, the exact details of the fracs are pending log and geologic data. It is anticipated that both fracs will be a linear gel type with sand concentrations approaching 2 pounds per gallon.

X. Well Logs and Test Data:

- A. A copy of the original well logs will be submitted when the well is logged.
- B. It is planned to drillstem tests the Entrada Formation in this well during drilling operations. A swab test of the formation may also be performed upon completion to establish productivity and injectivity.

XI. Fresh Water Analysis:

- A. There are no fresh water wells from which to take samples within one mile of the proposed disposal well.

XII. Statement on Evidence of Faulting:

The applicant, Nassau Resources, Inc., has examined all geologic and engineering data available and finds no evidence of faulting or fracturing which could cause hydrologic connection between the Entrada disposal zone and the Ojo Alamo fresh water zone.

XIII. Proof of Notice: Attached.

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API WATER ANALYSIS REPORT FORM

Company <u>J. P. McHugh</u>	Sample No.	Date Sampled <u>9/14/88</u>
Field <u>334, 732N, R5K</u>	Legal Description <u>334, 732N, R5K</u>	County or Parish <u>Kno. Acadia</u>
Lease or Unit <u>334, 732N, R5K</u>	Well <u>334, 732N, R5K</u>	State <u>CO</u>
Type of Water (Produced, Supply, etc.)	Sampling Point	Water, B/D

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	4287	187.2
Calcium, Ca	28	2.4
Magnesium, Mg	29	2.4
Barium, Ba		

ANIONS

Chloride, Cl	4615	134.6
Sulfate, SO ₄	0	0
Carbonate, CO ₃	0	0
Bicarbonate, HCO ₃	374.2	6.2.0

Total Dissolved Solids (calc.) 12,800Iron, Fe (total)
Sulfide, as H₂S 0

REMARKS & RECOMMENDATIONS:

2503-1617

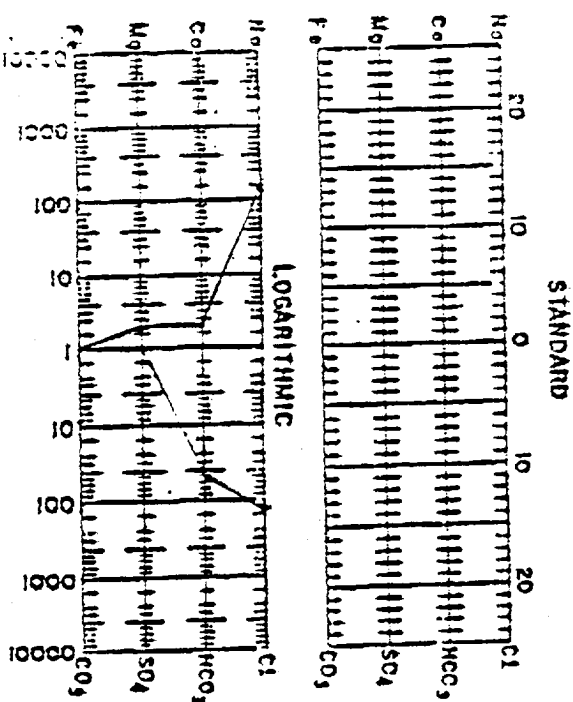
OTHER PROPERTIES

pH _____

Specific Gravity, 60/60 F. 73.3°

Resistivity (ohm-meters) 73.3°

WATER PATTERNS — me/l



Plan C-17

ANALYSIS NO. 53 3788

FIELD RECEIPT NO. _____

API FORM 15-1

API WATER ANALYSIS REPORT FORM

Company <u>McHugh</u>		Sample No.		Date Sampled	
Field		Legal Description		County or Parish State	
Lease or Unit <u>CU</u>		Well <u>34A#5</u>	Depth	Formation	Water. B/D
Type of Water (Produced, Supply, etc.)			Sampling Point		Sampled By

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	<u>4035</u>	<u>176.19</u>
Calcium, Ca	<u>56</u>	<u>2.80</u>
Magnesium, Mg	<u>24</u>	<u>2.0</u>
Barium, Ba		
Potassium, K ⁺	<u>35</u>	<u>0.90</u>

ANIONS

Chloride, Cl	<u>4011</u>	<u>112.99</u>
Sulfate, SO ₄	<u>0</u>	<u>0</u>
Carbonate, CO ₃	<u>0</u>	<u>0</u>
Bicarbonate, HCO ₃	<u>420.3</u>	<u>48.91</u>

Total Dissolved Solids (calc.)

12,364

Iron, Fe (total)

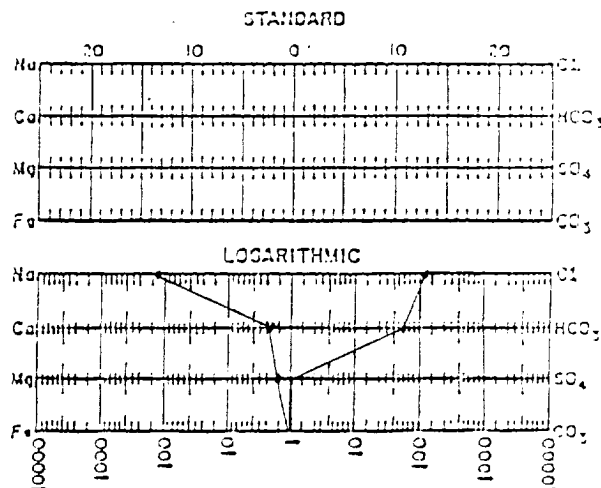
Fe⁺⁺ Fe⁺⁺⁺Sulfide, as H₂Smg

REMARKS & RECOMMENDATIONS:

OTHER PROPERTIES

pH	<u>7.43</u>
Specific Gravity, 60/60 F.	<u>1.010</u>
Resistivity (ohm-meters) <u>72° F.</u>	<u>72</u>
Total hardness	<u>240</u>

WATER PATTERNS — me/l

ANALYST: Jacque Dehart8/4/88

THE WESTERN COMPANY OF
NORTH AMERICA, FARMINGTON, NM
(505) 327-6222

Please refer any questions to: Clay Terry, District Engineer

Jerome P. McHugh
Farmington, N.M.

AUG 12 1988

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PROOF-OF-NOTICE

Published November 24, 1988 in
Rio Grand Sun
238 No. Railroad Avenue
P.O. Box 790
Española, NM 87532

**APPLICATION FOR
WATER DISPOSAL WELL**

Nassau Resources, Inc. proposes to drill a water disposal well located 1650 feet from the North line, 990 feet from the East line in Section 27-T32N-R5W, Rio Arriba County, New Mexico. The well will be drilled to the Entrada formation at a depth of 10,000 feet with water being injected at a maximum rate not to exceed 10,000 BW/day with a maximum pressure of 3500 p.s.i. Any interested party should file an objection or request for hearing within 15 days from date of this notice with:

New Mexico Oil Conservation Division, 310 Old Santa Fe Trail, Room 206, Santa Fe, New Mexico 87503.

Any questions concerning this notice should be directed to:

Mr. Gary Johnson, Nassau Resources, Inc., 650 South Cherry Street, Suite 1225, Denver, Colorado 80222, (303) 321-2111.

This notice supercedes and replaces the notice that was previously advertised in this paper on Thursday, November 17, 1988.

(Published November 24, 1988)

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)
Sent to
Mrs. Celeste Grynberg
Grynberg Petroleum
5000 S. Quebec, Suite 500
Denver, CO 80237

P.O. State and ZIP Code	Denver, CO 80237
Postage	\$.45
Certified Fee	.85
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	.90
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$ 2.20

Postmark or Date
1988
WELLSHIRE
USPO

PS Form 3800, June 1985

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)
Sent to
Mr. Richard Corcoran
Dugan Production Corp.
Five O'Clock Box 5820
Farmington, NM 87499

P.O. State and ZIP Code	Farmington, NM 87499
Postage	\$.45
Certified Fee	.85
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	.90
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$ 2.20

Postmark or Date
1988
WELLSHIRE
USPO

PS Form 3800, June 1985

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)
Attn: Prod. Dept.
Sent to
Amoco Production Company
1670 Broadway
Denver, CO 80201

P.O. State and ZIP Code	Denver, CO 80201
Postage	\$.45
Certified Fee	.85
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	.90
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$ 2.20

Postmark or Date
1988
WELLSHIRE
USPO

PS Form 3800, June 1985

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)
Attn: Prod. Dept.
Sent to
Meridian Oil Inc.
Five O'Clock Box 4289
Farmington, NM 87499-4289

P.O. State and ZIP Code	Farmington, NM 87499-4289
Postage	\$.45
Certified Fee	.85
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	.90
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$ 2.20

Postmark or Date
1988
WELLSHIRE
USPO

PS Form 3800, June 1985

P 841 883 161

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)
Sent to
U.S. Department of the Interior
Bureau of Land Management
Five O'Clock Box 1449
Santa Fe, NM 87504-1449

P.O. State and ZIP Code	Santa Fe, NM 87504-1449
Postage	\$.45
Certified Fee	.85
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	.90
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$ 2.20

Postmark or Date
1988
WELLSHIRE
USPO

PS Form 3800, June 1985

The Morrison and Entrada sandstones are not productive of oil and gas within the prescribed one mile radius. Water analyses are not available in the immediate vicinity. The following tabulation gives total dissolved solids on several wells which have penetrated the Morrison and Entrada formations.

<u>Well Name & No.</u>	<u>Location</u>	<u>Date Tested</u>	<u>TDS</u>
<u>MORRISON</u>			
Jicarilla 123 C #29	NW 5-25-4	10-29-82	24,834
Hubbell #5E	NW 17-29-10	5-29-81	19,442
Huerfano Unit #270	SW 7-26-10	7-25-80	13,474
<u>ENTRADA</u>			
Filon #21-1 Federal	SW 21-20-5	8-20-76	10,726
Dome #20-1 Santa Fe	NE 20-21-8	2-10-77	11,114