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

RECEIVED
DEC 19 1988
OIL CONSERVATION DIVISION

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. _____

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;

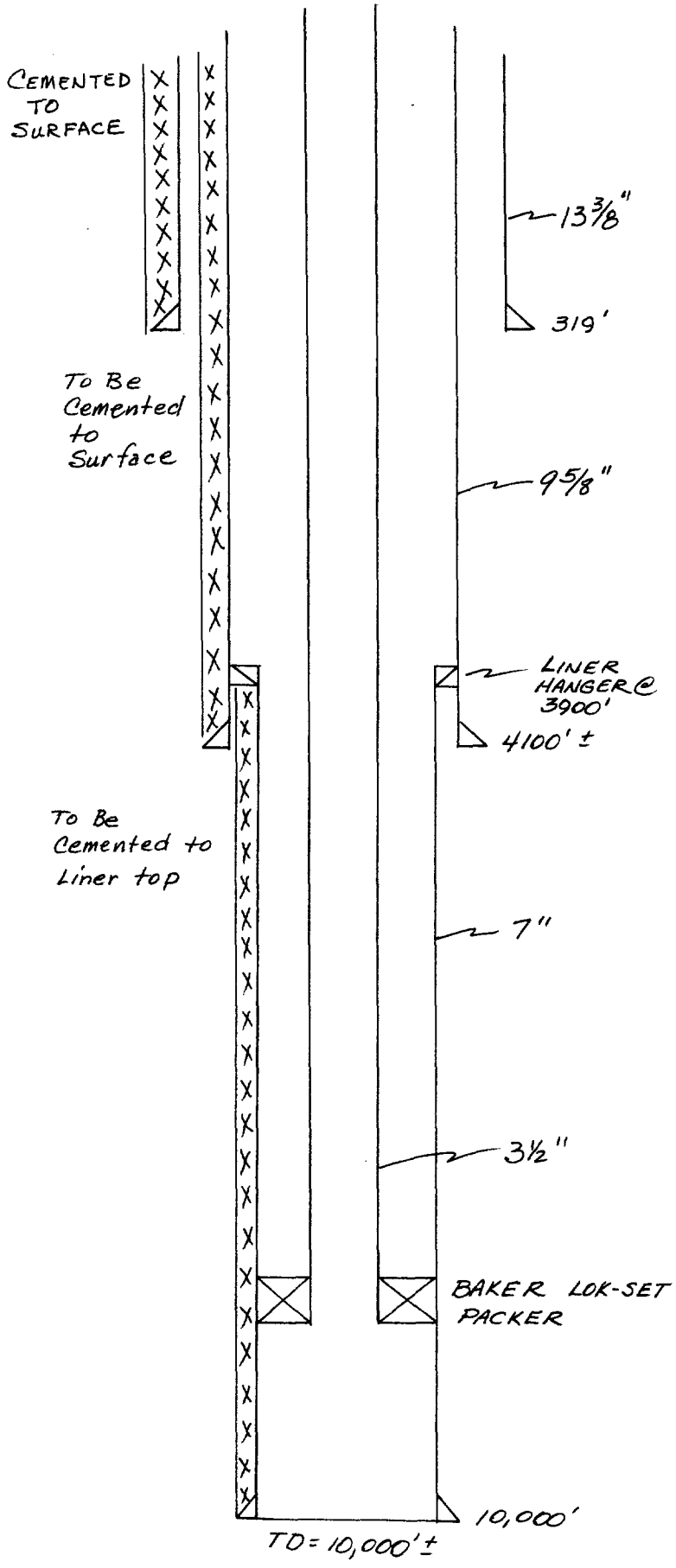
(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(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.



FIELD: UNDESIGNATED ENTRADA
POOL: ENTRADA
LEASE: NM 30016
WELL NO.: CARRACAS UNIT 27A-82
LOCATION: 1650 'F N L, 990 'F E L
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/ 385 sacks Class 'B' w/ 2% CaCl2
HOLE SIZE: 17½"

INTERMEDIATE CASING: 9 5/8", 40# & 43.5 #/ft to be set @ 4100' ±
HOLE SIZE: 12¼"

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 6¼ #/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 6¼ #/sk gilsonite
CU FT: 1330

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

COMPLETION, WELL HISTORY, TOPS ON BACK

PRESENT COMPLETION: Drilling as of 12-14-88 ZONE
PERFS: To be determined from logs

TUBING: 3½", 9.3#/ft, N-80, EUE, Smls, w/ TK-69 thin-film lining

ANCHOR @: SEATING NIPPLE @:
RODS:
PUMP:
PUMPING UNIT:
PRIME MOVER:
UNIT SHEAVE: ENGINE SHEAVE:
STROKE LENGTH: SPM:

SPUD DATE: 12-1-88 TD DATE: DRILLING AS OF 12-14-88
COMPLETION DATE, READY TO PRODUCE:

LOGS RUN: DIL; FDC-CNL-GR-SP; SDT; coal log
FORMATION TOPS: To be determined from logs

FRAC/ACID DETAIL: To be determined from log and test data

HISTORY:

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'.

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 Analyses:

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.

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:

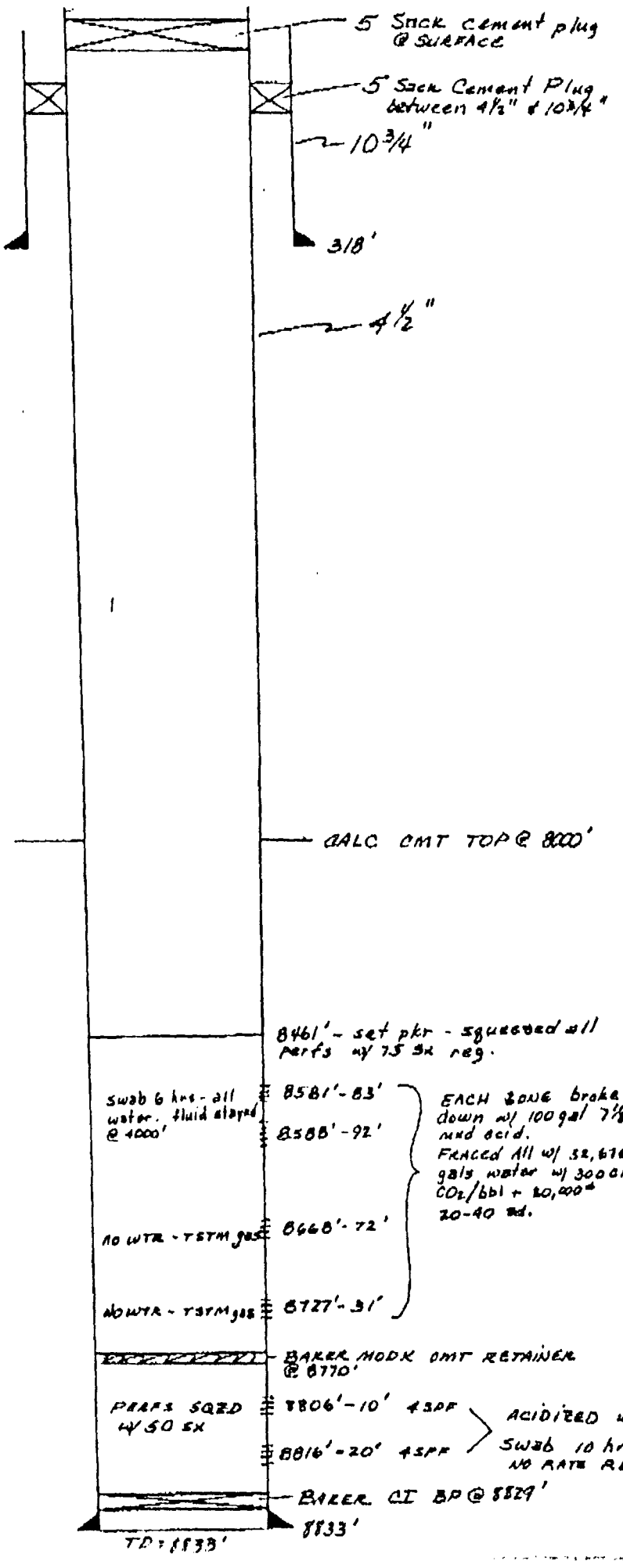
A. Geologic Data on Proposed Injection Zone:

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.



FIELD Carracas Mesa Unit
POOL Basin Dakota LEASE NM 02854 (Expired)
WELL NO. Belco 1-26
LOCATION 1040 'FNL 1040 'FWL UNIT D
SEC 26 T 32N R 05W QQ NW NW
COUNTY Rio Arriba STATE NM
ELEVATION _____ GL 7118' KB
TOTAL DEPTH 8833' PLUG DEPTH 8461' *

SURFACE CASING 11 jts 10¾", H-40, 32.75# set @ 318' KB w/ 300 sxs reg w/ 2% CaCl.

HOLE SIZE 15"

PRODUCTION CASING 277 jts, 4½", 11.60# N-80 set @ 8833' KB

HOLE SIZE 8¾"

LINER

CEMENT STAGE 1 @ 8833' W/ 140 sx 50-50 Poz w/ 6% gel + 230 sx 50-50 Poz w/ 2% gel
CEMENT STAGE 2 @ _____ W/ _____
CEMENT STAGE 3 @ _____ W/ _____

PRESENT COMPLETION NA - P+A

Tops: Dakota 8578
Morrison 8750

TUBING
ANCHOR @ _____ S.N.@ _____
RODS
PUMP UNIT
PRIME MOVER
UNIT SHEAVE _____ MOTOR SHEAVE _____
STROKE LENGTH _____ SPM _____

Calc. cement top @ 8000'.
Baker CI BP @ 8829'

API WATER ANALYSIS REPORT FORM

Company	Sample No.	Date Sampled
J. P. McHugh		9/14/88

Field	Legal Description	County or Parish	State
	S 34, T 32 N R 5 W	Rio Arriba	Co

Lease or Unit	Well	Depth	Formation	Water, B/D
C. U. 34 A #5			Fruitland Coal	

Type of Water (Produced, Supply, etc.)	Sampling Point	Sampled By

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	4287	187.2
Calcium, Ca	48	2.4
Magnesium, Mg	24	2.0
Barium, Ba		

ANIONS	mg/l	me/l
Chloride, Cl	4615	130.2
Sulfate, SO_4	0	0
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	3752	61.2

Total Dissolved Solids (calc.) 12,800

Iron, Fe (total)

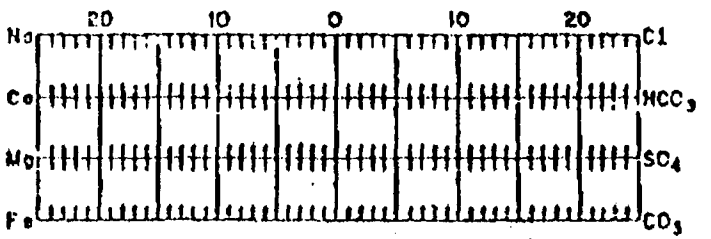
Sulfide, as H_2S 0

OTHER PROPERTIES

pH	7.46
Specific Gravity, 60/60 F.	1.007
Resistivity (ohm-meters) 73° F.	.98

WATER PATTERNS — me/l

STANDARD



LOGARITHMIC

Plot Copy

REMARKS & RECOMMENDATIONS:

2503-1617

ANALYSIS NO. 53788

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company McHugh		Sample No.	Date Sampled
Field	Legal Description	County or Parish	State
Lease or Unit CU	Well 34A #5	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.)	4035	176.19
Calcium, Ca	56	2.80
Magnesium, Mg	24	2.0
Barium, Ba		
Potassium, K^+	35	0.90

ANIONS		
Chloride, Cl	4011	112.98
Sulfate, SO_4	0	0
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	4203	68.91

Total Dissolved Solids (calc.) 12,364

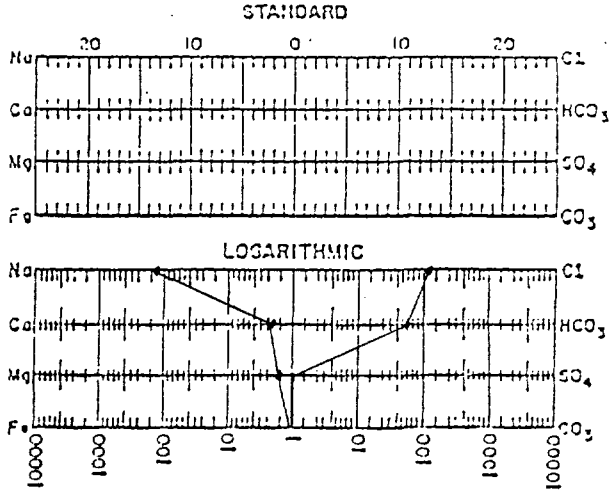
Iron, Fe (total) Fe ppm Fe ppm

Sulfide, as H_2S neg

OTHER PROPERTIES

pH	7.83
Specific Gravity, 60/60 F.	1.010
Resistivity (ohm-meters) 72° F.	.72
Total hardness	240

WATER PATTERNS — *me/l*



REMARKS & RECOMMENDATIONS:

ANALYST: Jacque Dehart
8/4/88

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

RECEIVED

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.

Well Name & No.	Location	Date Tested	TDS
MORRISON			
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
ENTRADA			
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

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 Interic Bureau of Land Management
Street and No.	P. O. Box 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	DENVER CO WELLSHIRE STA. DEC 13 1988 USPO

PS Form 3800, June 1985

P 841 883 162

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to	Mrs. Celeste Grynberg Grynberg Petroleum
Street and No.	5000 S. Quebec, Suite 500
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	DENVER CO WELLSHIRE STA. DEC 13 1988 USPO

PS Form 3800, June 1985

P 841 883 160

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to	Attn: Prod. Dept. Amoco Production Company
Street and No.	P. O. Box 800 1670 Broadway
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	DENVER CO WELLSHIRE STA. DEC 13 1988 USPO

PS Form 3800, June 1985

P 841 883 163

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to	Mr. Richard Corcoran Dugan Production Corp.
Street and No.	P. O. Box 5820
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	DENVER CO WELLSHIRE STA. DEC 13 1988 USPO

PS Form 3800, June 1985

P 841 883 159

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to	Attn: Prod. Dept. Meridian Oil Inc.
Street and No.	P. O. Box 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	DENVER CO WELLSHIRE STA. DEC 13 1988 USPO

PS Form 3800, June 1985

McHUGH

Jerome P. McHugh & Associates
Operating Affilliate: Nassau Resources, Inc.
650 South Cherry, Suite 1225
Denver, Colorado 80222
(303) 321-2111 FAX (303) 321-1563

December 13, 1988

CERTIFIED - Return Receipt Requested

U. S. Department of the Interior
Bureau of Land Management
P. O. Box 1449
Santa Fe, New Mexico 87504-1449

Amoco Production Company
P. O. Box 800
1670 Broadway
Denver, Colorado 80201
Attention: Production Department

Meridian Oil Inc.
P. O. Box 4289
Farmington, New Mexico 87499-4289
Attention: Production Department

Mrs. Celeste Grynberg
Grynberg Petroleum
5000 S. Quebec, Suite 500
Denver, Colorado 80237

Dugan Production Corp.
P. O. Box 5820
Farmington, New Mexico 87499
Attention: Mr. Richard Corcoran

Re: Water Disposal Well
NE/4 Sec. 27-T32N-R5W
Rio Arriba County, New Mexico

Gentlemen:

Nassau Resources, Inc. is proposing to drill and equip an approximate 10,000' Entrada well for the purpose of injecting disposal water into said Entrada formation. The location of the well is 1650' FNL and 990' FEL in Section 27-T32N-R5W.

Enclosed is a copy of a legal advertisement that was placed in the Rio Grande Sun of Espanola, New Mexico on November 24, 1988.

Any party wishing to file an objection or request for hearing should do so within fifteen (15) days of the date of this letter with the New Mexico Oil Conservation Division in Santa Fe.

Any questions concerning this notice should be directed to Mr. Gary Johnson of this office.

Very Truly Yours,

Kent C. Craig

KCC/rc

enclosure

PROOF-OF-NOTICE

Published November 24, 1988 in
Rio Grand Sun
238 No. Railroad Avenue
P.O. Box 790
Espanolo, 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:

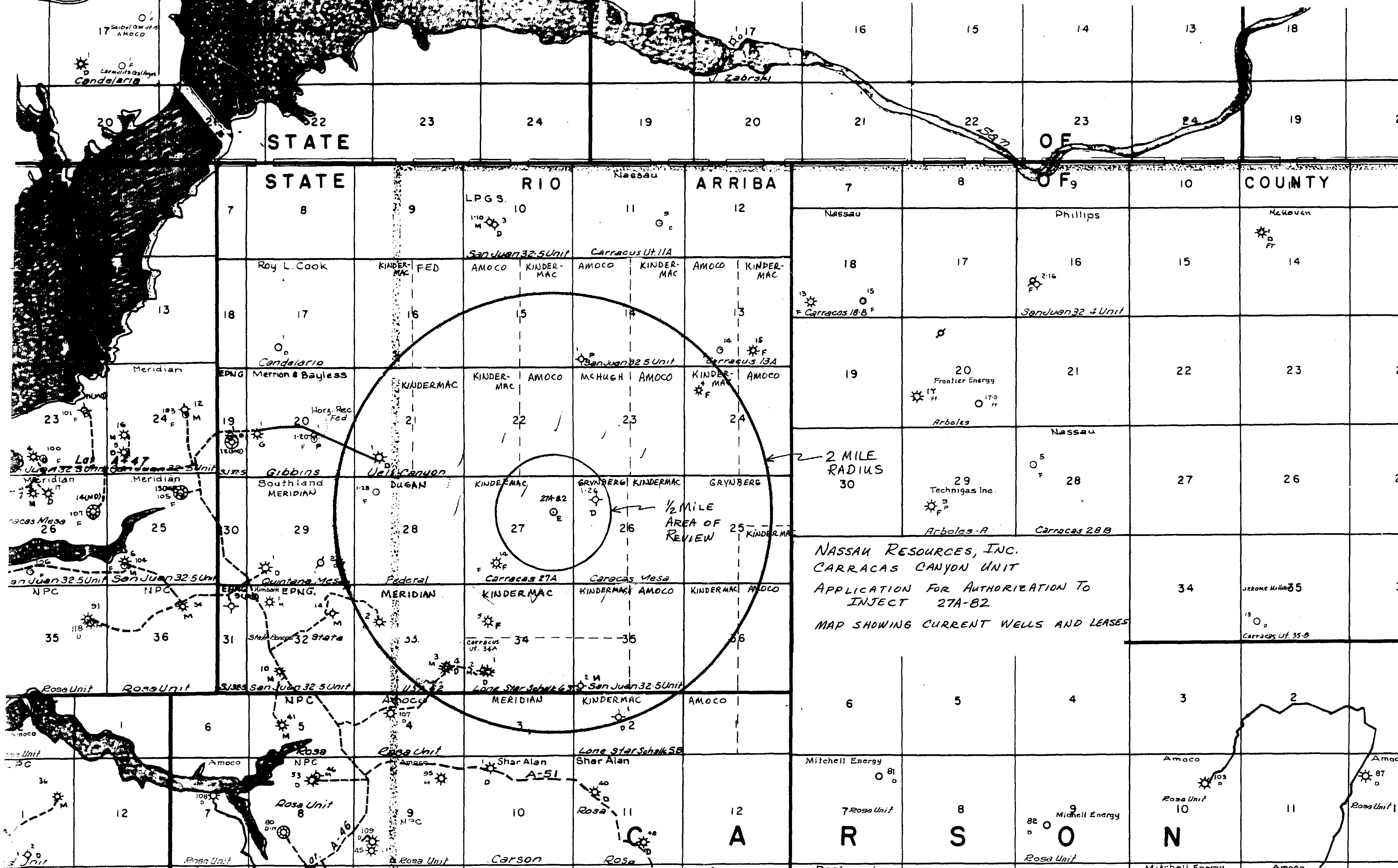
New Mexico Oil Conservation Division, 310 Old Santa Fe Trail, Room 206, Santa Fe, New Mexico 87503.

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)



NASSAU RESOURCES, INC.
CARRACAS CANYON UNIT
APPLICATION FOR AUTHORIZATION TO INJECT 27A-82
MAP SHOWING CURRENT WELLS AND LEASES
2 MILE RADIUS
1/2 MILE AREA OF REVIEW
STATE OF RIO ARRIBA COUNTY
STATE OF SAN JUAN
CARSON
27A-82
San Juan 32-5 Unit
Carracas Ut. 11A
Carracas 27A
Caracas Mesa
Lone Star Schalk 58
Rosa Unit
KINDERMAC
AMOCO
MERIDIAN
GRYNBERG
DUGAN
McHUGH
Nassau
Phillips
Frontier Energy
Technigas Inc.
Mitchell Energy
Roy L. Cook
Candelario
Gibbins
Southland MERIDIAN
Quintana Mesa
Shar Alan
A-51
Arboles
Arboles-A
Carracas 28B
Carracas 18-B
San Juan 32-4 Unit
Carracas 13A
Carracas Ut. 35-B