STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

New Mexico DRUG FREE It's a State of Mind!

BRUCE KING
GOVERNOR

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

*ADMINISTRATIVE ORDER NO. SWD-445*

RECEIVED
OCT 31 1991
OIL CON. DIV.
DIST. 3

*APPLICATION OF PHILLIPS PETROLEUM COMPANY*

ADMINISTRATIVE ORDER
OF THE OIL CONSERVATION DIVISION

Under the provisions of Rule 701(B), Phillips Petroleum Company made application to the New Mexico Oil Conservation Division on October 2, 1991, for permission to complete for salt water disposal its San Juan 32-7 Unit Well No. 301 located in Unit M of Section 34, Township 32 North, Range 7 West, NMPM, San Juan County, New Mexico.

THE DIVISION DIRECTOR FINDS THAT:

(1) The application has been duly filed under the provisions of Rule 701(B) of the Division Rules and Regulations.

(2) Satisfactory information has been provided that all offset operators and surface owners have been duly notified; and

(3) The applicant has presented satisfactory evidence that all requirements prescribed in Rule 701 will be met.

(4) No objections have been received within the waiting period prescribed by said rule.

IT IS THEREFORE ORDERED THAT:

(1) The applicant herein, Phillips Petroleum Company is hereby authorized to complete its San Juan 32-7 Unit Well No. 301 located in Unit M of Section 34, Township 32 North, Range 7 West, NMPM, San Juan County, New Mexico, in such a manner as to permit the injection of salt water for disposal purposes into the Morrison, Bluff and Entrada formations at approximately 8530 feet to approximately 9410 feet through 3 1/2-inch plastic lined tubing set in a packer located at approximately 8430 feet.

IT IS FURTHER ORDERED THAT:

The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

Prior to commencing injection operations into the well, the casing shall be pressure tested from the surface to the packer setting depth to assure the integrity of said casing.

Prior to commencing injection operations into said well, the operator shall obtain a formation water sample from the Morrison, Bluff and Entrada formations, and shall have said samples analyzed, with the results to be furnished to the Santa Fe office of the Division.

The casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface or left open to the atmosphere to facilitate detection of leakage in the casing, tubing or packer.

The injection well or system shall be equipped with a pressure limiting device which will limit the wellhead pressure on the injection well to no more than 1706 psi.

The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Morrison, Bluff and Entrada formations. Such proper showing shall consist of a valid step-rate test run in accordance with and acceptable to this office.

The operator shall notify the supervisor of the Aztec district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity test so that the same may be inspected and witnessed.

The operator shall immediately notify the supervisor of the Aztec district office of the Division of the failure of the tubing, casing or packer in said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

PROVIDED FURTHER THAT, jurisdiction of this cause is hereby retained by the Division for such further order or orders as may be deemed necessary or convenient for the prevention of waste and/or protection of correlative rights; upon failure of the operator to conduct operations in a manner which will ensure the protection of fresh water or in a manner inconsistent with the requirements set forth in this order, the Division may, after notice and hearing, terminate the injection authority granted herein.

The operator shall submit monthly reports of the disposal operations in accordance with Rule 706 and 1120 of the Division Rules and Regulations.

Approved at Santa Fe, New Mexico, on this 28th day of October, 1991.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

cc: Oil Conservation Division - Aztec ✓

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STATE OF NEW MEXICO
# ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

GARREY CARRUTHERS
GOVERNOR

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

Date: 10-7-91

attn: David Catanach

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

Re: Proposed NC_____
Proposed DHC_____
Proposed NSL_____
Proposed SWD X
Proposed WFX_____
Proposed PMX_____

Gentlemen:

I have examined the application dated 10-2-91

for the Phillips Petroleum Co. S.J. 32-7 Unit #301
Operator Lease & Well No.

M-34-32N-7W and my recommendations are as follows:
Unit, S-T-R

Approve, Blackwood + Nichols middle mesa swd #2 in section 11-31N-7W within 2 mile radius. Southland middle mesa # L-25-32N-7W just outside 2 mile radius.

Yours truly,

Jerry Sexton

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
OCT 02 1991
OIL CON. DIV.
DIST. 3

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Phillips Petroleum Company

Address: 5525 Hwy 64, NBU 3004, Farmington, NM 87401

Contact party: Louis Robinson Phone: (505) 599-3415

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: L. E. Robinson Title Sr. Drlg. & Prod. Engineer

Signature: L. E. Robinson Date: 9-24-91

* 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

ATTACHMENT
SALTWATER DISPOSAL APPLICATION
SAN JUAN 32-7
WELL NO. 301

## III. Well Data

A. (1) San Juan 32-7 Unit SWD No. 301, Section 34, T-32-N, R-7-W, 735' FSL & 761' FWL, San Juan County, New Mexico.

(2) See Saltwater Disposal Well Casing Design - Attachment No. 1

(3) 3-1/2", 9.30 #/ft, 8rd, N-80, Baker Plastic Coat 571, internal coated tubing, set at 8700'.

(4) Baker Model "DB permanent packer with seal assembly and anchor latch set at 8045'.

B. (1) Injection Formations:

| | | | |
|---|---|---|---|
| (a) | Morrison | Top - 8445' | Bottom - 8953' |
| (b) | Bluff | Top - 8953' | Bottom - 9116' |
| (c) | Entrada | Top - 9240' | Bottom - 9452' |
| (d) | Chinle | Top - 9452' | Bottom - 9500' |

Field: Undesignated

(2) The perforated interval:

8530' - 8940'
8953' - 9116'
9250' - 9410'

(3) Drilled for saltwater disposal purposes only.

(4) None

(5) Next higher zone, Dakota Sandstone (8204'-8445')
Next higher zone - None

V. Map Attached

VI. **Wells Within the Area of Review**
**32-7 #301 SWD**

There are no wells within the area of review that penetrate the proposed receiving horizons in the Jurassic Morrison, Bluff and/or Entrada Formations. The closest well penetrating these formations is the Meridian #1 Middle Mesa SWD in SW/4 Sec. 25, T-32-N, R-7-W, approximately 2-1/4 miles to the northeast.

VII. (1) Average daily rate 2,500 barrels of water per day.
Maximum daily rate 5,000 barrels of water per day.

(2) Closed system.

(3) Average injection pressure 1800 psi.
Maximum injection pressure 2700 psi.

(4) Reinjection of Fruitland Coalseam produced water. Produced water may come from the San Juan 32-8 Unit. All produced water from the San Juan 32-7 Unit will come to the proposed well.

(5) The proposed water-receiving sandstones of the Morrison, Bluff and Entrada Formations are not productive of hydrocarbons within the prescribed one-mile radius. Native state water samples from these deep formations are not available in the vicinity. All available geological and hydrological data in the deep, central part of the San Juan Basin would suggest that the waters of these formations are in excess of 10,000 ppm total dissolved solids and are probably in excess of 20,000 ppm total dissolved solids. Data presented by Stone, et al (1983) also supports that the native waters of the proposed receiving formations are saline. Wireline log data from both the subject well and the Meridian #1 Middle Mesa SWD well confirms that the interstitial waters are saline, although a precise estimate of the amount of total dissolved solids is not possible by this indirect method.

VIII. The proposed saltwater receiving formations in the San Juan 32-7 #301 SWD well are the sandstones and sandy siltstones of the Morrison Formation, the sandstones of the Bluff Sandstone, and the sandstones and sandy siltstones of the Entrada Sandstone. All three of these formations are of Late Jurassic age.

The Morrison Formation was encountered in the 32-7 #301 borehole from 8445' to 8953'. The sandstones and sandy siltstones suitable for saltwater injection occur below 8528'. The sandstones may be generally described as being light brown to reddish brown to white, medium to very fine grained, moderately well to poorly sorted, silty and calcareous in part, firm to hard, and occasionally friable. The associated siltstones are generally reddish brown to tan, slightly sandy, slightly calcareous, firm to hard, and commonly producing platy fragments upon drilling. As indicated by wireline logs, the porosity of the proposed receiving zones ranges from 4% to 18%. Formation porosity, permeability and transmissivity are enhanced by natural fracturing.

The Bluff Sandstone is comprised of white to pink, medium to very fine grained, moderately well sorted calcareous, sporadically cherty, locally silty sandstones with some interbedded siltstones and silty shales. It was encountered in the 32-7 #301 borehole between 8953' and 9116'. The porosity of the proposed receiving zones in the Bluff range from 4% to 9%, as indicated by wireline logs. Naturally occurring fractures augment the formation porosity, permeability and transmissivity of this unit.

The third proposed water-receiving zone, the Entrada Sandstone, was cut in the subject well from 9240' through 9452'. It is comprised, predominantly, of white to pink, fine to very fine grained sandstones which are moderately well to poorly sorted, silty, slightly calcareous quartzose and hard. Interbedded within the Entrada Formation are reddish brown, sandy, argillaceous, slightly calcareous siltstones. Wireline log porosity of the Entrada sandstones and siltstones range from 1 to 6%. Permeability and transmissivity of this unit are enhanced by natural fracturing of the formation.

Potential freshwater aquifers overlying the proposed injection zones at this location are at depths less than 3090'. These include porous and permeable sandstones occurring in the San Jose, Nacimento/Animas and Ojo Alamo Formations. The waters of these formations in this portion of the San Juan Basin, as indicated by data cited by Stone, et al (1983), may be characterized as follows:

San Jose Formation (0 - 969'), estimated total dissolved solids content (TDS) 550 to 2800 ppm, with dramatic variations in water quality locally;

Nacimento/Animas Formation (969' - 2561'), estimated TDS 1225 to 9100 ppm, limited quantities and highly variable quality, and;

Ojo Alamo Sandstone (2561' - 2656'), estimated TDS 1325 to 6550 ppm, variable quality and slightly saline overall.

Note: The total dissolved solids contents cited above have been calculated from specific conductance values cited by Stone, et al (1983), using the general formula: TDS (ppm) = 0.7 specific conductance (micromhos). No water samples are available from within one mile of the proposed disposal well.

**Reference**

Stone, W. J., F. P. Lyford, P. F. Frenzel, N. H. Mizell, and E. T. Padgett (1983) Hydrogeology and Water Resources of San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Hydrologic Report No. 6, 70 p.

**IX.** Injection formations will be stimulated with 400,000-900,000 lbs of 20/40 sand at 60-100 BPM with a crosslinked gel fluid system.

**X.** All available wireline logs on the 32-7 #301 well have previously been submitted to the Oil Conservation Division.

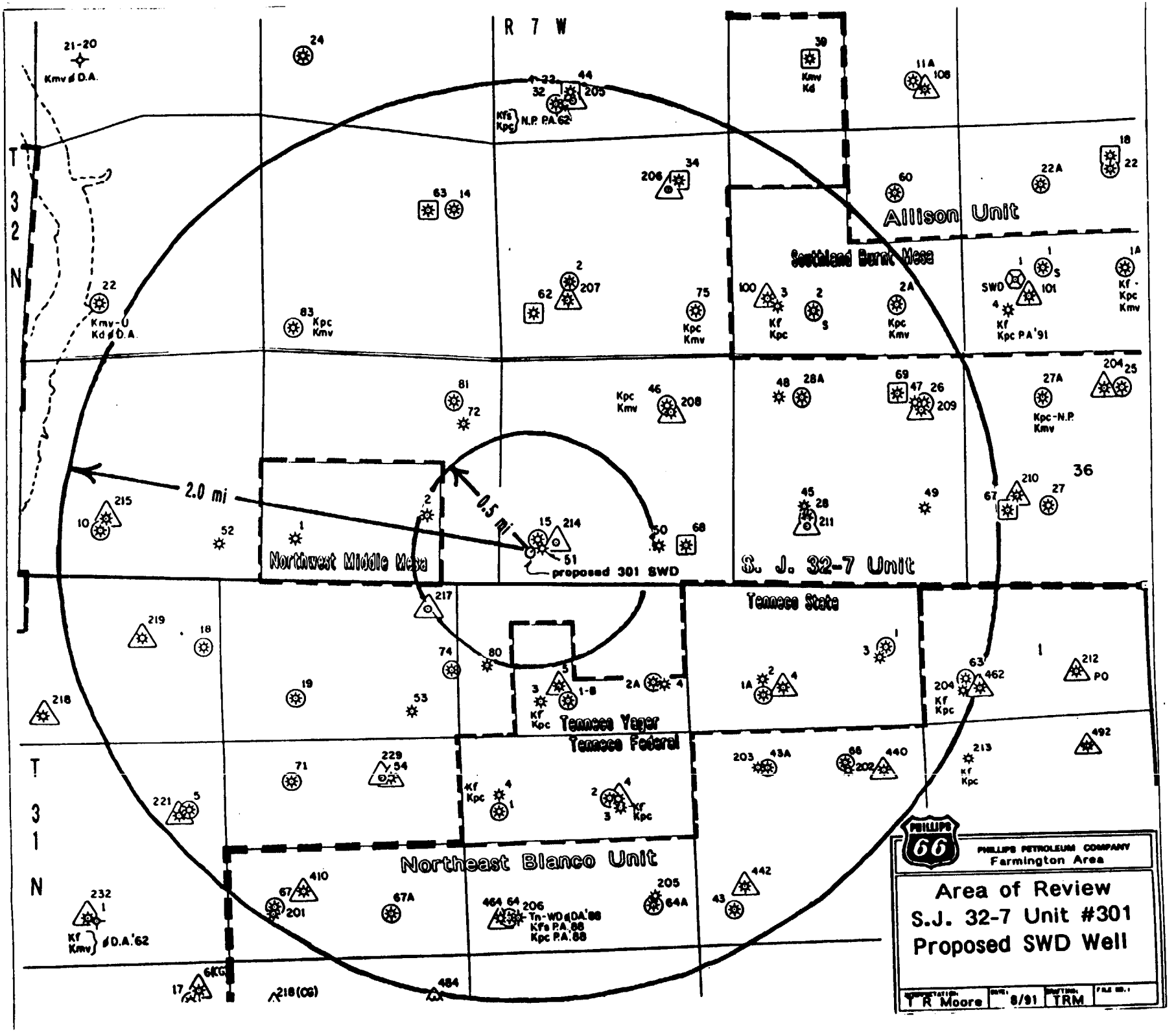
**XI.** There are no available fresh water wells for samples within one mile of the proposed disposal well.

**XII.**

**STATEMENT**

Phillips Petroleum Company geologists and engineers have examined available geologic and engineering data and can find no evidence of or reason to believe of any hydrologic connection between the proposed saltwater injection zones and any underground source of potable water.

327301B.SWD


R 7 W
T 32 N
T 31 N
Allison Unit
Southland Burnt Mesa
Northwest Middle Mesa
S. J. 32-7 Unit
proposed 301 SWD
2.0 mi
0.5 mi
Tennece State
Tennece Yager
Tennece Federal
Northeast Blanco Unit
PHILLIPS 66
PHILLIPS PETROLEUM COMPANY
Farmington Area
Area of Review
S.J. 32-7 Unit #301
Proposed SWD Well
T R Moore
8/91
TRM

San Juan 32-7 #301 SWD
SW 34 T32N-R7W
Formation Tops

GL. 6758, DF. 6775, KB. 6776

| Formation | Depth | Elevation (+/- Sea Level) |
|---|---|---|
| San Jose Fm | Surface | +6758 |
| Nacimiento | 969 | +5789 |
| Ojo Alamo Ss | 2561 | +4215 |
| Kirkland Sh | 2656 | +4120 |
| Fruitland Fm | 3194 | +3582 |
| Top of Coal | 3340 | +3436 |
| Base of Coal | 3481 | +3295 |
| Pictured Cliffs Ss (Upper) | 3540 | +3236 |
| Pictured Cliffs Ss (Lower) | 3627 | +3149 |
| Lewis Sh | 3810 | +2996 |
| Cliff House Ss | 5674 | +1102 |
| Menefee Fm | 5723 | +1053 |
| Pt. Lookout Ss | 5985 | +791 |
| Mancos Sh | 6264 | +512 |
| Gallup member | 6700 | +76 |
| Greenhorn Ls | 8020 | -1244 |
| Graneros Sh | 8076 | -1300 |
| Dakota Ss | 8204 | -1428 |
| Morrison Fm | 8445(?) | -1669(?) |
| Bluff Ss | 8953 | -2177 |
| Summerville Fm | 9116 | -2340 |
| Todilto Ls | 9209 | -2433 |
| Entrada Ss | 9240 | -2464 |
| Chinle Fm | 9452 | -2676 |
| TD | 9500 | -2724 |

AFFIDAVIT OF PUBLICATION

No. 28387

STATE OF NEW MEXICO,
County of San Juan:

CHRISTINE HILL being duly sworn, says: "That she is the NATIONAL AD MANAGER of The Farmington Daily Times, a daily newspaper of general circulation published in English in Farmington , said county and state, and that the hereto attached LEGAL NOTICE

was published in a regular and entire issue of the said Farmington Daily Times, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for ONE consecutive (days) (/////) on the same day as follows:

First Publication FRIDAY, SEPTEMBER 27, 1991

Second Publication

Third Publication

Fourth Publication

and that payment therefore in the amount of $ 14.85 has been made.

Christine Hill

Subscribed and sworn to before me this 30th day of SEPTEMBER, 1991.

Connie Andrae

Notary Public, San Juan County, New Mexico

My Comm expires: JULY 3, 1993

COPY OF PUBLICATI

**LEGAL NOTICE**

Notice is hereby given of the application of Phillips Petroleum Company Attention: R G Flesher, Area Manager, 5525 Hwy 64 NBU 3004, Farmington, New Mexico 87401, Telephone (505)599-3401, to the Oil Conservation Division, New Mexico Energy and Minerals Department, for approval of the following well for the propose of saltwater disposal

Well No 301
Unit Name:
San Juan 32-7 Unit
Location:
Section 34, T-32-N, R-7-W, San Juan County, New Mexico

The disposal formation is Morrison, Bluff, Entrada and Chinle at an approximate depth between 8530-9600 feet below the surface of the ground Expected maximum disposal rate is 5,000 barrels per day and expected maximum injection pressure is 2700 pounds per square inch

Interested parties must file objections or request for hearing with the Oil Conservation Division, P O Box 2088, Santa Fe, New Mexico 87501, within fifteen days of this publication

Legal No 28387 published in the Farmington Daily Times, Farmington, New Mexico, on Friday September 27, 1991

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:

ROBERT, WITTEN & FREDERICK S.
NATHAN, TRUSTEES
5535 E. 86TH STREET
NEW YORK, NEW YORK 10028

4. Article Number
P 565 395 763

Type of Service:
☐ Registered ☐ Insured
☐ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X

7. Date of Delivery

8. Addressee's Address *(ONLY if requested and fee paid)*

**Thank you for using Return Receipt Service.**

PS Form **3811**, Apr. 1989 * U.S.G.P.O. 1989-238-815 **DOMESTIC RETURN RECEIPT**

CERTIFIED
P 565 395 763
MAIL

PHILLIPS 66

FROM
**PHILLIPS PETROLEUM COMPANY**
NAME GAIL BEARDEN
ADDRESS 5525 HWY 64 NBU 3004
FARMINGTON, NM 87401

Form 3-A-S 8-85

| Priority 1st class | 2nd or 4th Class | Express Mail | Insured Mail | Certified Mail | Registered Mail | Special Delivery | Motor Freight | Air Express | Rail | UPS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

To ROBERT, WITTEN & FREDERICK S. NATHAN, TRUSTEES
5535 E. 86TH STREET
NEW YORK, NEW YORK 10028

**SENDER**: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1 ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*

2 ☐ Restricted Delivery *(Extra charge)*

3 Article Addressed to:

HALLWOOD PETROLEUM INC.
P.O. BOX 378111
DENVER, COLORADO 80237

4. Article Number
P 565 395 761

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5 Signature – Addressee
X

6. Signature – Agent
X

7 Date of Delivery

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr. 1989 *U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

Thank you for using Return Receipt Service.

P 565 395 761

MAIL

PHILLIPS 66

FROM

PHILLIPS PETROLEUM COMPANY

NAME GAIL BEARDEN

ADDRESS 5525 HWY 64 NBU 3004

FARMINGTON, NM 87401

Form 3-A-S 8-85

To HALLWOOD PETROLEUM INC.
P.O. BOX 378111
DENVER, CO. 80237

**SENDER**: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to

ULTRAMAR OIL & GAS, LTD.
16825 NORTHCHASE DRIVE
SUITE 1200
HOUSTON, TEXAS 77060

4. Article Number
P 565 395 762

Type of Service:
☐ Registered ☐ Insured
☐ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED

5. Signature – Addressee
X

6. Signature – Agent
X

7. Date of Delivery

8. Addressee's Address *(ONLY if requested and fee paid)*

PS Form 3811, Apr 1989 *U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

Thank you for using Return Receipt Service.

PETROLEUM COMPANY

P 565 395 762

MAIL

PHILLIPS 66

NAME GAIL BEARDEN

ADDRESS 5525 HWY 64 NBU 3004

FARMINGTON, NM 87401

FROM PHILLIPS PETROLEUM COMPANY

Form 3-A-S 8-85

To ULTRAMAR OIL & GAS, LTD.
16825 NORTHCHASE DRIVE
SUITE 1200
HOUSTON, TEXAS 77060

FARMINGTON NEW MEXICO