

MERIDIAN OIL

OIL CONSERVATION DIVISION
RECEIVED
'91 JUN 20 AM 9 18

June 18, 1991

Mr. William J. LeMay
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

RE: San Juan 32-9 Unit SWD #5
Application of Meridian Oil Inc.
For a Salt Water Disposal Permit
San Juan County, New Mexico

Dear Mr. LeMay:

Meridian Oil Inc. requests approval of the attached permit for a salt water disposal well in the Morrison/Entrada formation.

It is intended to locate the San Juan 32-9 Unit SWD #5 at 15' from the north line and 240' from the east line of Section 18, T-31N, R-9-W, San Juan County, New Mexico.

A copy of this application is being submitted to offset operators within the area of review and surface landowners by certified mail, return receipt requested. They are being requested to furnish the NMOCD's Santa Fe office with a Waiver of Objection and return one executed copy to Meridian.

Attached is Form C-108, along with other required support data for this proposal.

Sincerely,



G. T. Dunn

Enclosures

WAIVER

_____ hereby waives objection to Meridian Oil Inc.'s San Juan 32-9 Unit SWD #5 as proposed above.

By: _____ Date: _____

xc: Union Texas Petroleum - Offset Operator
Bureau of Land Management - Surface Owner
Aztec Division of NMOCD - Division District Office

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. Operator: Meridian Oil Inc.

Address: P.O. Box 4289, Farmington, NM 87499

Contact party: G. T. Dunn Phone: (505) 326-9837

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. ATTACHED

* 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. ATTACHED

VII. Attach data on the proposed operation, including: ATTACHED

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. ATTACHED

IX. Describe the proposed stimulation program, if any. ATTACHED

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.) ATTACHED

* 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. ATTACHED

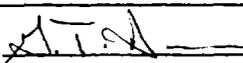
XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water. ATTACHED

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: G. T. Dunn Title Regional Production Engineer

Signature:  Date: 6/18/91

* 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.

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.

III. A. Proposed Disposal Well Data

(1) Lease Name: San Juan 32-9 Unit SWD
Well Number: 5

Location: 15' FNL, 240' FEL, Section 18, T31N-R9W
San Juan County, New Mexico

(2) Wellbore Casing Configuration:

<u>Casing</u>	<u>Hole Size</u>	<u>Csq. Size</u>	<u>Depth Set</u>	<u>Cement</u>	<u>Top/Cement</u>
Surface	17 1/2"	13 3/8"	200'	350 cf	Surf-Calc.
Intermediate	12 1/4"	9 5/8"	3863'	1835 cf	Surf-Calc.
Injection	8 3/4"	7"	7863'	1180 cf	3000'-Calc.
Liner	6 1/4"	4 1/2"	7650-9388'	275 cf	Circ.-Calc.

(3) Injection Tubing:

4 1/2" O.D., 10.5 #/ft., K-55 plastic coated tubing to 7500' and tapered to 2 3/8" O.D., 4.7 #/ft., J-55 plastic coated tubing.
Setting Depth: 8100'

(4) Isolation Packer:

Size: 4 1/2" x 2 3/8"
Type: Otis
Model: "BWB"

Seal Assembly:

Type: Otis
Model: 212 Molded Seal

B. (1) Formation Name: Morrison/Entrada

(2) Injection Intervals:

Morrison: 8135-8700' Perforated
Bluff: 8700-8860' Perforated
Entrada: 9025-9335' Perforated

(3) The purpose for drilling this well is to dispose of produced water.

(4) There are to be no additional perforated intervals in the proposed well.

(5) There are no lower producing zones. The next higher producing interval is the Dakota formation at 7883-8138'.

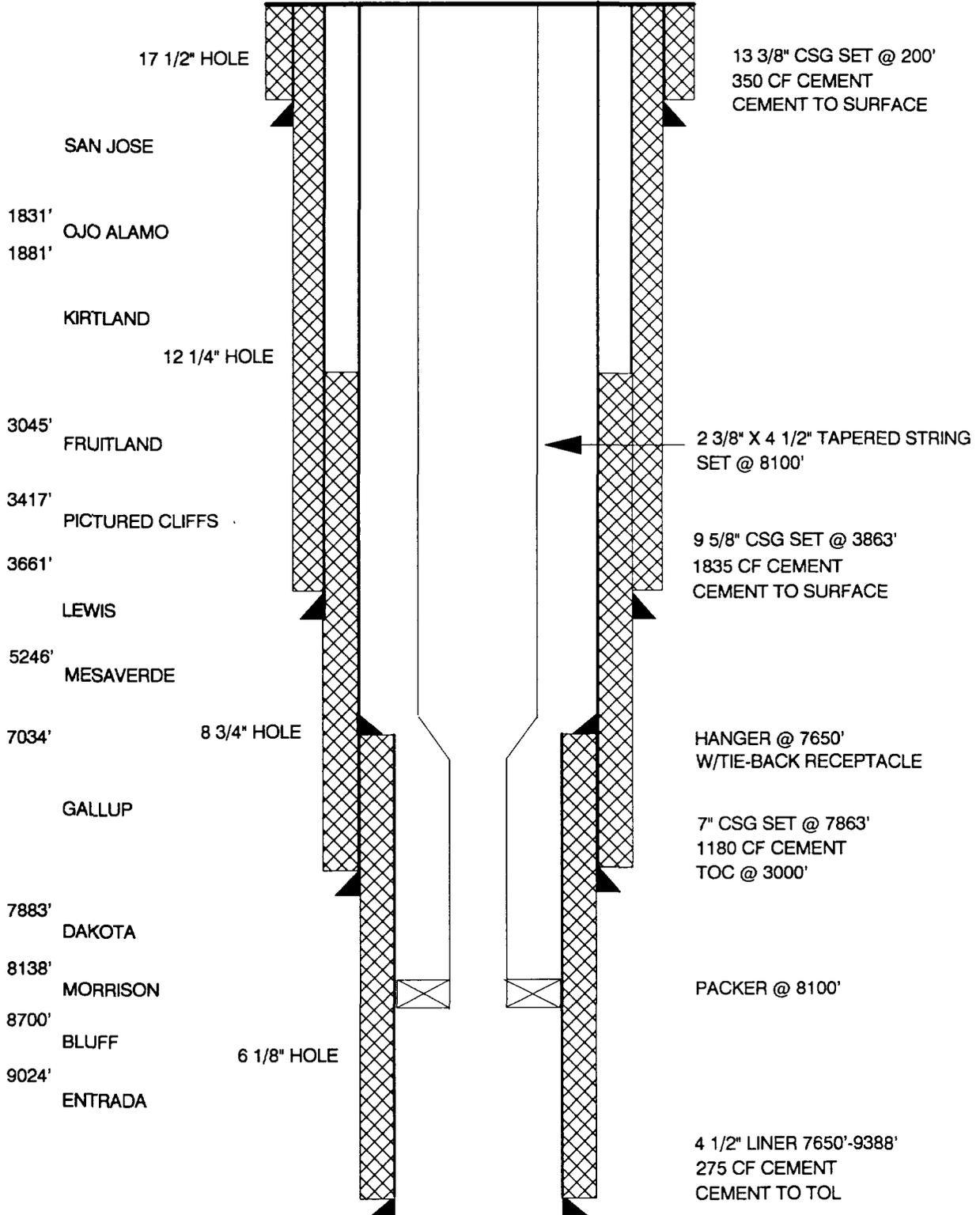
VI. There are no wells penetrating the proposed depth interval within the area of review.

- VII. (1) The proposed average injection rate is estimated at 5000 bwpd. The estimated maximum is 7500 bwpd.
- (2) The system will be closed.
- (3) The estimated maximum surface injection pressure is 1870 psig. A step rate test will be conducted after stimulation to determine the maximum allowable injection pressure.
- (4) The source of injected fluid will be produced water from the Fruitland Coal formation.
- (5) Injection is for disposal purposes into a zone not productive of oil and gas. The distance to the nearest well penetrating the proposed zone is Amoco's Pritchard SWD well at approximately 4 1/2" miles to the southeast in 34-31-09. The nearest Meridian SWD well is the Cedar Hill SWD #1 at approximately 6 1/2 miles to the northwest in 29-32-10. A chemical analysis of the candidate's formation water will be supplied when available.
- VIII. The proposed injection zones are the Morrison, Bluff and Entrada. All are sandstones. From ground level (6605'), the Morrison interval is estimated at 8138-8700', having a thickness of 562'. The Bluff interval is estimated at 8700-8862', having a thickness of 162'. The Entrada interval is estimated at 9024-9339', having a thickness of 315'.
- The only overlying fresh water aquifer is the Ojo Alamo, having an estimated base depth of 1881' from ground level. There is no fresh water zone known below the injection zone.
- IX. The proposed stimulation program will consist of sand water fracturing each interval using 2500 pounds of 20/40 sand per net foot of formation interval. Proppant concentration will be from 1 to 8 ppg. The fracturing fluid will be a 40 ppg cross-linked gel.
- X. No logs or test data are available at present but will be filed when run and processed.
- XI. There are no water wells within a 1 mile radius of the candidate well.
- XII. An examination of geologic and engineering data indicates no evidence of open faults or any other hydrologic connection between the disposal zone and any source of drinking water. This conclusion is based on proof of isolation between upper gas and oil bearing zones within the area of review.

SAN JUAN 32-9 UNIT SWD #5

NE - 18 - 31N - 09W
SAN JUAN COUNTY, NEW MEXICO

LITHOLOGY



Submit to Appropriate District Office
 State Lease - 4 copies
 Fee Lease - 3 copies

State of New Mexico
 Energy, Minerals and Natural Resources Department

Form C-102
 Revised 1-1-89

OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

DISTRICT I
 P.O. Box 1980, Hobbs, NM 88240

DISTRICT II
 P.O. Drawer DD, Artesia, NM 88210

DISTRICT III
 1000 Rio Brazos Rd., Aztec, NM 87410

WELL LOCATION AND ACREAGE DEDICATION PLAT

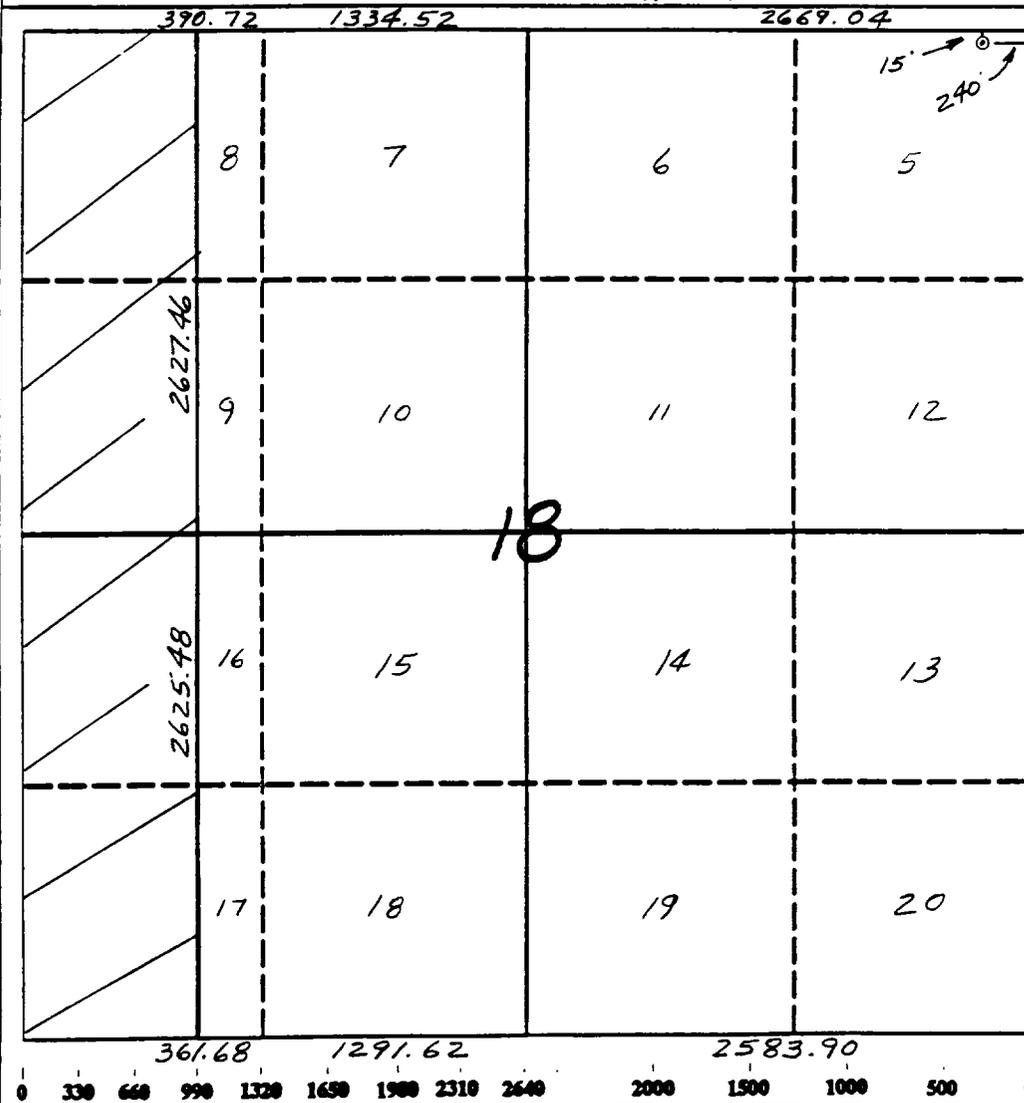
All Distances must be from the outer boundaries of the section

Operator Meridian Oil Inc.			Lease San Juan 32-9 Unit SWD (SF-078438)		Well No. 5
Unit Letter A	Section 18	Township 31 North	Range 9 West	County San Juan	
Actual Footage Location of Well: 15 feet from the North line and 240 feet from the East line					
Ground level Elev. 6605'	Producing Formation Morrison/Entrada		Pool	Dedicated Acreage: n/a Acres	

- Outline the acreage dedicated to the subject well by colored pencil or hectare marks on the plat below.
- If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
- If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?
 Yes No If answer is "yes" type of consolidation unitization

If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.)

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.



OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Peggy Bradfield
 Signature
 Peggy Bradfield
 Printed Name
 Regulatory Affairs
 Position
 Meridian Oil Inc.
 Company
 Date
 5-7-91

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
 5-2-91

Neale C. Edwards
 Signature
 Registered Professional Surveyor
 NEW MEXICO
 6857
 6857
 REGISTERED LAND SURVEYOR
 Certificate
 Neale C. Edwards

AFFIDAVIT OF PUBLICATION

COPY OF PUBLICATI

No. 27859

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 THREE consecutive (days) (/////) on the same day as follows:

- First Publication TUESDAY, JUNE 11, 1991
- Second Publication WEDNESDAY, JUNE 12, 1991
- Third Publication THURSDAY, JUNE 13, 1991
- Fourth Publication _____

and that payment therefore in the amount of \$ 34.53 has been made.

Christine Hill

Subscribed and sworn to before me this 14th day of JUNE, 1991.

Connie Andrae
Notary Public, San Juan County,
New Mexico

My Comm expires: JULY 3, 1993

LEGAL NOTICE
INTENT TO DISPOSE OF WATER IN THE SUBSURFACE
 Meridian Oil Inc., as Operator, of the San Juan 32-9 Unit proposes to dispose of water in the Morrison and Entrada formations. The injection well will be the San Juan 32-9 Unit SWD # 5 located 15' FNL, 240' FEL, Section 18, T-31-N, R-09-W, N.M.P.M., San Juan county, New Mexico. Depth of injection is proposed at -8135' - 9335'. Maximum anticipated injection rate is 7500 BWP/D at a maximum surface injection pressure of 1870 psig. Questions should be addressed to Meridian Oil Inc., Attention G.T. Dunn, P.O. Box 4289, Farmington, New Mexico 87499, or call (505) 326-9837. Objections to this proposal or request for hearing by interested parties must be filed with the New Mexico Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days. Legal No 27859 published in the Farmington Daily Times, Farmington, New Mexico on Tuesday, Wednesday, and Thursday, June 11, 12, and 13, 1991.

MERIDIAN OIL

NEW MEXICO
OIL CONSERVATION
DIVISION
1991 JUL 24 10 07

June 18, 1991

432

Mr. William J. LeMay
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

RE: San Juan 32-9 Unit SWD #5
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For a Salt Water Disposal Permit
San Juan County, New Mexico

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Attached is Form C-108, along with other required support data for this proposal.

Sincerely,



G. T. Dunn

Enclosures

WAIVER

Union Texas Petroleum hereby waives objection to Meridian Oil Inc.'s San Juan 32-9 Unit SWD #5 as proposed above.

By: W.K. Cooper Date: 7/18/91

xc: Union Texas Petroleum - Offset Operator
Bureau of Land Management - Surface Owner
Aztec Division of NMOCD - Division District Office

Foreman: Lyle Nations

STRICKCO
Water Analysis Laboratories
FARMINGTON, NEW MEXICO 87401

= SAMPLE OF INJECTED FLUID INTO
CEDAR HILL SWD #1
CEDAR HILL

File WA/0210/90

Company MERIDIAN OIL INC. Well Name SWD #1 Sample No. 2

Formation Fruitland Coal Depth N/A Sampled From After Filters

Location Cedar Hill Field Basin Fruitland County San Juan State NM

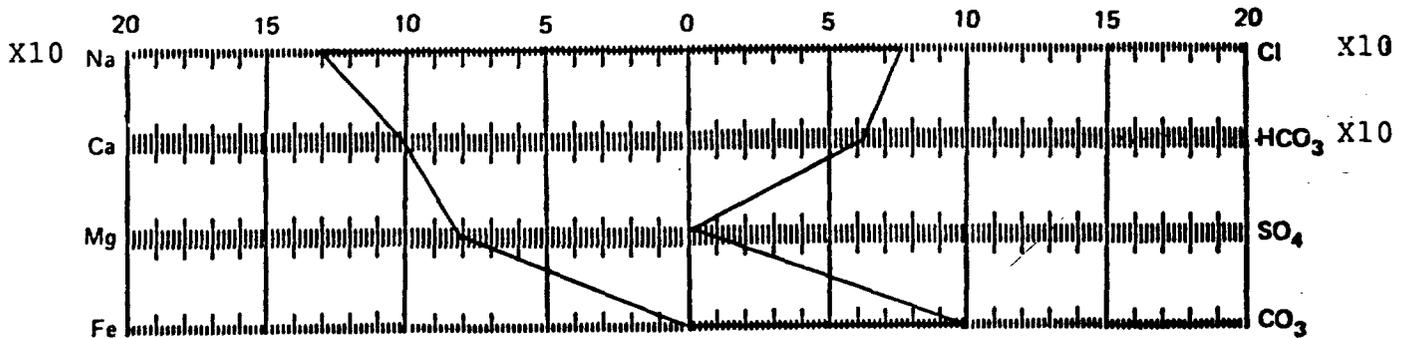
Date Sampled 10/29/90 Date Analyzed 10/30/90 Engineer WDS

Total Dissolved Solids 10,365 mg/L Calculated Sp. Gr. 1.010 @ 68 °F.

Resistivity 0.79 ohm-meters @ 68 °F. Measured pH 8.46 @ 68 °F. Measured

Constituents	meq/L	mg/L	Constituents	meq/L	mg/L
Sodium	<u>130.1</u>	<u>2,991</u>	Chloride	<u>76.1</u>	<u>2,698</u>
Calcium	<u>10.0</u>	<u>200</u>	Bicarbonate	<u>62.0</u>	<u>3,782</u>
Magnesium	<u>8.0</u>	<u>97</u>	Sulfate	<u>-0-</u>	<u>-0-</u> (Grav.)
Iron	<u>-0-</u>	<u>-0-</u>	Carbonate	<u>10.0</u>	<u>300</u>
Hydrogen Sulfide	<u>Absent</u>		Hydroxide	<u>-0-</u>	<u>-0-</u>

Scale: meq/L



All analyses except iron determination performed on a filtered sample.

FORMATION FLUID SAMPLE FROM CEDAR HILL SWD # 1



API WATER ANALYSIS REPORT FORM

Company MERIDIAN OIL COMPANY	Sample No. #1	Date Sampled 7/11/88
Field NE 29-32-10	County or Parish SJ	State
Lease or Unit Cedar Hill SWD #1	Depth	Water, B/D
Type of Water (Produced, Supply, etc.)	Formation Cluff Summerville	Sampled By M. M. M...

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	4086	178.4
Calcium, Ca	227	22.0
Magnesium, Mg	37	3.0
Barium, Ba		

OTHER PROPERTIES

pH	4.43
Specific Gravity, 60/60 F.	1.006
Resistivity (ohm-meters)	1.40
Conductivity	µmho

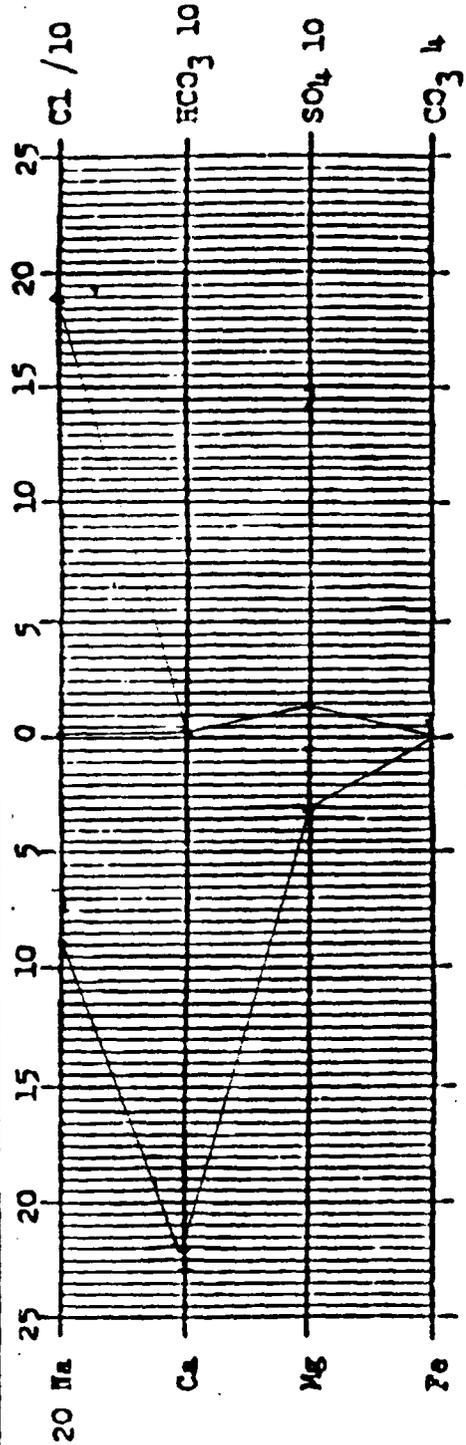
Total Dissolved Solids (calc.) 12,000

ANIONS

Chloride, Cl	190.0
Sulfate, SO ₄	12.76
Carbonate, CO ₃	0.07
Bicarbonate, HCO ₃	

Iron, Fe (total) Sulfide, as H₂S

REMARKS & RECOMMENDATIONS:
2503-617



Scale: mm



FORMATION FLUID SAMPLE FROM CEDAR HILL SWD#1

API WATER ANALYSIS REPORT FORM

Company MERIDIAN OIL COMPANY	Sample No. F-1	Date Sampled
Field Legal Description NE 29-32-10	County or Parish Sj	State
Lease or Unit Cedar Hill SWD #1	Depth Mbedda	Water, B/D
Type of Water (Produced, Supply, etc.)	Sampling Point	Sampled By M. Mason

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	6246	22.7
Calcium, Ca	27	1.2
Magnesium, Mg	13	1.2
Barium, Ba		

OTHER PROPERTIES

pH	8.37
Specific Gravity, 60/60 F.	1.000
Resistivity, (ohm-meters)	1.32
Conductivity	µmho

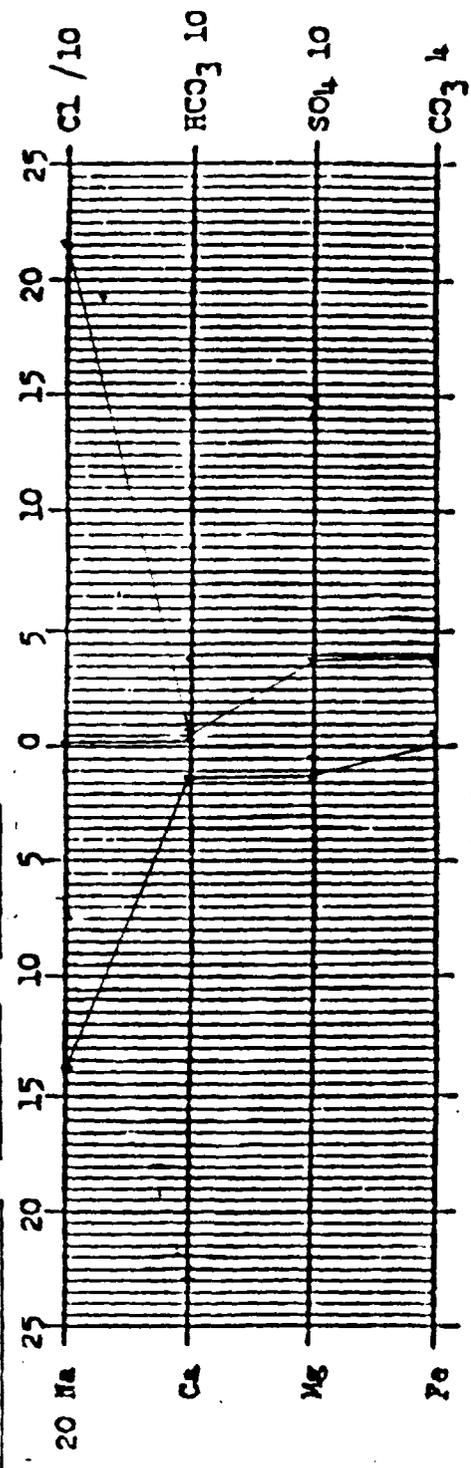
ANIONS

Chloride, Cl	7633	215.0
Sulfate, SO ₄	1400	39.6
Carbonate, CO ₃	450	13.0
Bicarbonate, HCO ₃	336	3.3

Total Dissolved Solids (calc.) 14,600

Iron, Fe (total) Sulfide, as H₂S neg

REMARKS & RECOMMENDATIONS: 2503-1615



Scale: ppm