

MERIDIAN OIL

December 1, 1994

Bureau of Land Management
Robert Kent
435 Montano NE
Albuquerque, NM 87107

RECEIVED
DEC - 5 1994

OIL CON. DIV.
DIST. 3

RE: Jicarilla 89, 94, 95 and 96 Leases

- Jicarilla 89 #2A Unit D, Section 14, T27N, R03W; PC add to existing MV well.
- Jicarilla 89 #4 Unit M, Section 11, T27N, R03W; PC add to existing PC/MV well.
- Jicarilla 89 #4A Unit P, Section 11, T27N, R03W; PC add to existing MV well.
- Jicarilla 89 #5 Unit A, Section 14, T27N, R03W; PC add to existing PC/MV well.
- Jicarilla 89 #7 Unit N, Section 13, T27N, R03W, PC add to existing MV well.
- Jicarilla 94 #1 Unit B, Section 22, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 94 #5 Unit M, Section 23, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 94 #7 Unit M, Section 24, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 95 #1 Unit A, Section 35, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 95 #4 Unit M, Section 26, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 95 #5 Unit M, Section 25, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 95 #7A Unit D, Section 36, T27N, R03W, PC add to existing MV well.
- Jicarilla 95 #8 Unit A, Section 26, T27N, R03W, PC add to existing PC/MV well.
- Jicarilla 96 #2 Unit A, Section 2, T26N, R03W, PC add to existing PC/MV well.
- Jicarilla 96 #5A Unit D, Section 11, T26N, R03W, PC add to existing MV well.

Rio Arriba County, New Mexico
Downhole Commingling Request

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for the referenced wells in Rio Arriba County, New Mexico, in the Gavilan Pictured Cliffs and the Blanco Mesaverde fields.

The purpose of this letter is to notify you of such action. If you have no objections to the proposed commingling order, we would appreciate your signing this letter and returning it to this office.

Your prompt attention to this matter would be appreciated.

Sincerely,



Curtis A. Newstrom
Production Engineering

CAN/rjp

The above downhole commingling request is hereby approved:

Date: _____

MERIDIAN OIL INC.

JICARILLA 98 AND 96

RIO ARriba COUNTY, NM

MESA VERDE/PICTURED CLIFFS FORMATION



The Western Company

LABORATORY INVESTIGATION

PREPARED FOR

**MR. CURTIS NEWSTROM
RESERVOIR ENGINEER**

RECEIVED
DEC 5 1994
OIL CON. DIV.
DIST. 3

**SERVICE POINT
FARMINGTON, NM
(505) 327-6222**

**PREPARED BY
LOREN DIEDER/DAVE COLESON
DISTRICT ENGINEER
FARMINGTON**

MARCH 25, 1993

FM050219

March 25, 1993

Meridian Oil
Jicarilla 96 #2
Jicarilla 98 #5

Three samples from Jicarilla 96 #2 (1 oil, 2 water) and two samples from Jicarilla 98 #5 (2 condensates) were submitted for analysis on March 19, 1993 by Mr. Lesley K. Smith, Senior Reservoir Engineer for Meridian Oil.

These samples were to be analyzed to determine if commingling of each of the well products would have adverse effects on well production.

Samples submitted were:

1. Jicarilla 96 #2
 - a. Mesa Verde oil
 - b. Mesa Verde water
 - c. Pictured Cliffs water
2. Jicarilla 98 #5
 - a. Mesa Verde condensate
 - b. Pictured Cliffs condensate

Lab analysis performed:

1. Oil, condensate analysis
 - a. API gravity
 - b. Pour point
 - c. Cloud point
2. Water analysis
 - a. API water analysis
3. Observation and analysis of commingled oil, condensate and water as applicable for well.

Meridian Oil
Jicarilla 96 #2

Result of Analysis:
Pictured Cliffs produced water
ph : 7.12
Resistivity : 1.65
Sp. Gr. : 1.00

Cations
Sodium & Potassium 1601 mg/ l (calc.)
Calcium 48 mg/ l
Magnesium 5 mg/ l (calc.)

Anions
Chloride 2061 mg / l
Sulfate 0 mg / l
Bicarbonate 976 mg / l

Total dissolved solids 4691

Mesa Verde produced water
ph : 6.52
Resistivity : 3.70
Sp. Gr. : 1.005

Cations
Sodium & Potassium 922 mg/ l (calc.)
Calcium 40 mg/ l
Magnesium 5 mg/ l (calc.)

Anions
Chloride 1649 mg / l
Sulfate 0 mg / l
Bicarbonate 850 mg / l

Total dissolved solids 3466

Meridian Oil
Jicarilla 96 #2

Mesa Verde produced oil

Appearance	:	Light, amber oil
API gravity @ 60 degrees F	:	58.2
Cloud point	:	0 degrees C
Pour point	:	< -10 degrees C

Pictured Cliffs / Mesa Verde produced water
Combined (using high shear) with Mesa Verde produced oil (50:50
mix of waters and oil).

Appearance	:	Cloudy, amber emulsion
Separation	:	Beginning on cessation of shear
Precipitation	:	None observed
Separation @ time	:	At 1 hour - complete

Summary of results:

No precipitation or other observed adverse reaction from
combined waters or from combination of the oil and waters.

Analysis forms follow.

Analysis done by: _____
Dave Coleson



The Western Company of North America

3250 South Side River Road
Farmington, New Mexico 87401
Phone (505)327-6222
Fax (505)327-5766

API WATER ANALYSIS

Company Meridian Sample No. SL1393 Date Sampled 3/8/93
Field _____ Legal Description T26N R03W, Sec 2 County or Parish La Brea State NM
Lease or Unit A Well IC 96 # 2 Depth _____ Formation PC Water: B/D _____
Type of Water (Produced, Supply, ect.) PRODUCED Sampling Point _____ Sampled By _____

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na	<u>1601</u>	<u>69.6</u>
Calcium, Ca	<u>48</u>	<u>2.4</u>
Magnesium, Mg	<u>5</u>	<u>0.4</u>
Barium, Ba	_____	_____
_____	_____	_____
_____	_____	_____

ANIONS	mg/l	me/l
Chloride, Cl	<u>2061</u>	<u>58</u>
Sulfate, SO ₄	_____	_____
Carbonate, CO ₃	_____	_____
Bicarbonate, HCO ₃	<u>976</u>	<u>16</u>
Hydroxide, OH	_____	_____
_____	_____	_____

Total Dissolved Solids (calc.) 4691

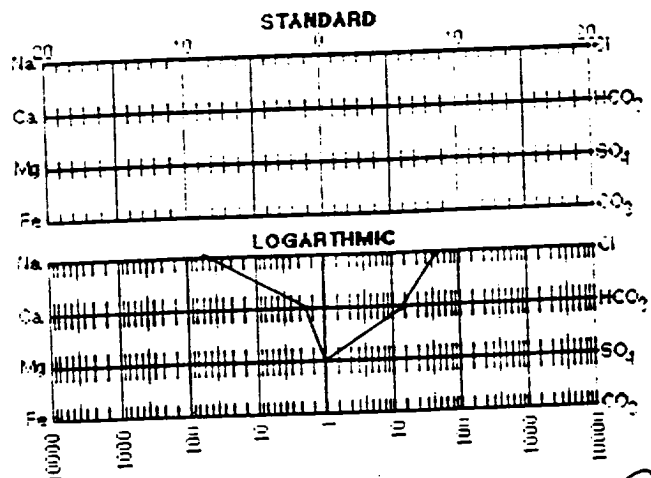
Iron, Fe (total) _____
Sulfide, as H₂S _____

Remarks & Recommendations:

OTHER PROPERTIES

pH	<u>7.12</u>
Specific Gravity, 60/60 F	<u>1.00</u>
Resistivity (cm-meters) <u>75°C</u>	<u>1.65</u>
Total Hardness	<u>140</u>
_____	_____
_____	_____

WATER PATTERNS-me/l



Analyst: DC



The Western Company of North America

3250 South Side River Road
Farmington, New Mexico 87401
Phone (505)327-6222
Fax (505)327-5766

API WATER ANALYSIS

Company Meridian Sample No. 81493 Date Sampled 3/8/93
Field _____ Legal Description T26N R03W, S02E County or Parish Rehoboth State NM
Lease or Unit A Well Je 96 # 2 Depth _____ Formation MV Water: B/D _____
Type of Water (Produced, Supply, ect.) Produced Sampling Point _____ Sampled By _____

DISSOLVED SOLIDS

CATIONS

	mg/l	me/l
Sodium, Na	<u>1014</u>	<u>44</u>
Calcium, Ca	<u>40</u>	<u>20</u>
Magnesium, Mg	<u>5</u>	<u>0.4</u>
Barium, Ba	_____	_____
_____	_____	_____

OTHER PROPERTIES

pH	<u>6.52</u>
Specific Gravity, 60/60 F	<u>1.002</u>
Resistivity (cm-meter) <u>44</u> °C	<u>3.7</u>
Total Hardness	<u>130</u>
_____	_____
_____	_____

ANIONS

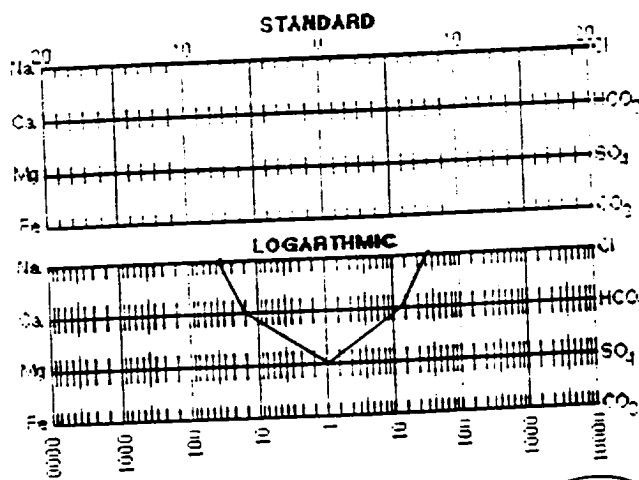
Chloride, Cl	<u>1649</u>	<u>46.5</u>
Sulfate, SO ₄	_____	_____
Carbonate, CO ₃	_____	_____
Bicarbonate, HCO ₃	<u>1096</u>	<u>18</u>
Hydroxide, OH	_____	_____
_____	_____	_____

Total Dissolved Solids (calc.) 3804

Iron, Fe (total) _____
Sulfide, as H₂S _____

Remarks & Recommendations:

WATER PATTERNS-me/l



Analyst: TL



The Western Company of North America

3250 South Side River Road
Farmington, New Mexico 87401
Phone (505)327-6222
Fax (505)327-5766

API WATER ANALYSIS

Company Meridian Sample No. 215-93 Date Sampled 3/8/93
Field _____ Legal Description T26N R03W, SEC 2 County or Parish Doña Ana State NM
Lease or Unit A Well 11C 96#2 Depth _____ Formation ECMU Water, B/D _____
Type of Water (Produced, Supply, ect.) Produced Sampling Point _____ Sampled By _____

DISSOLVED SOLIDS

CATIONS

	mg/l	me/l
Sodium, Na	<u>922</u>	<u>40</u>
Calcium, Ca	<u>40</u>	<u>20</u>
Magnesium, Mg	<u>5</u>	<u>0.4</u>
Barium, Ba	_____	_____
_____	_____	_____
_____	_____	_____

ANIONS

Chloride, Cl	<u>1649</u>	<u>46.5</u>
Sulfate, SO ₄	<u>—</u>	<u>—</u>
Carbonate, CO ₃	<u>—</u>	<u>—</u>
Bicarbonate, HCO ₃	<u>850</u>	<u>14</u>
Hydroxide, OH	_____	_____
_____	_____	_____

Total Dissolved Solids (calc.) 3466

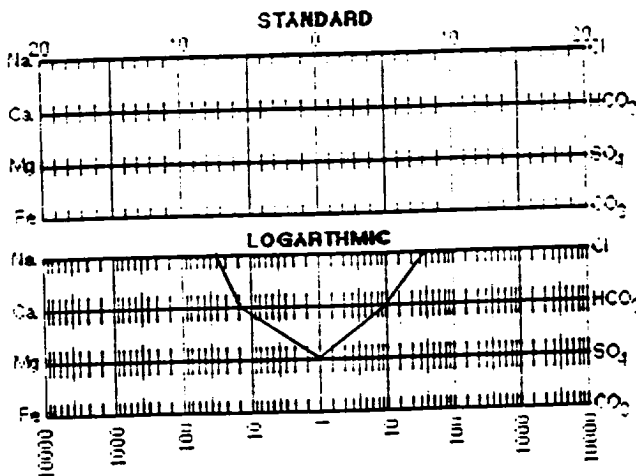
Iron, Fe (total) —
Sulfide, as H₂S —

Remarks & Recommendations:

OTHER PROPERTIES

pH	<u>7.29</u>
Specific Gravity, 60/60 F	<u>1.005</u>
Resistivity (ohm-meters) <u>70</u> °F	<u>2.2</u>
Total Hardness	<u>120</u>
_____	_____
_____	_____

WATER PATTERNS-me/l



Analyst: DC



Date 3/22/93
M13193

Rocky Mountain Region

THE WESTERN COMPANY

Oil Analysis

Operator <u>Meridian</u>	Date Sampled _____
Well <u>11c 96 #2</u>	Date Received <u>MAR. 18/93</u>
Field _____	Submitted By _____
Formation <u>MESA VERDE</u>	Worked By <u>DC</u>
Depth _____	Sample Description _____
County <u>RIO ARIDA</u>	<u>LIGHT, AMBER LIQUID</u>
State <u>N.M.</u>	_____

API Gravity 58.2 ° at 60°F

Paraffin Content _____ % by weight

Asphaltene Content _____ % by weight

Pour Point _____ °F

Cloud Point _____ °F

Comments:

56.8 @ 40° F

Analyst DC

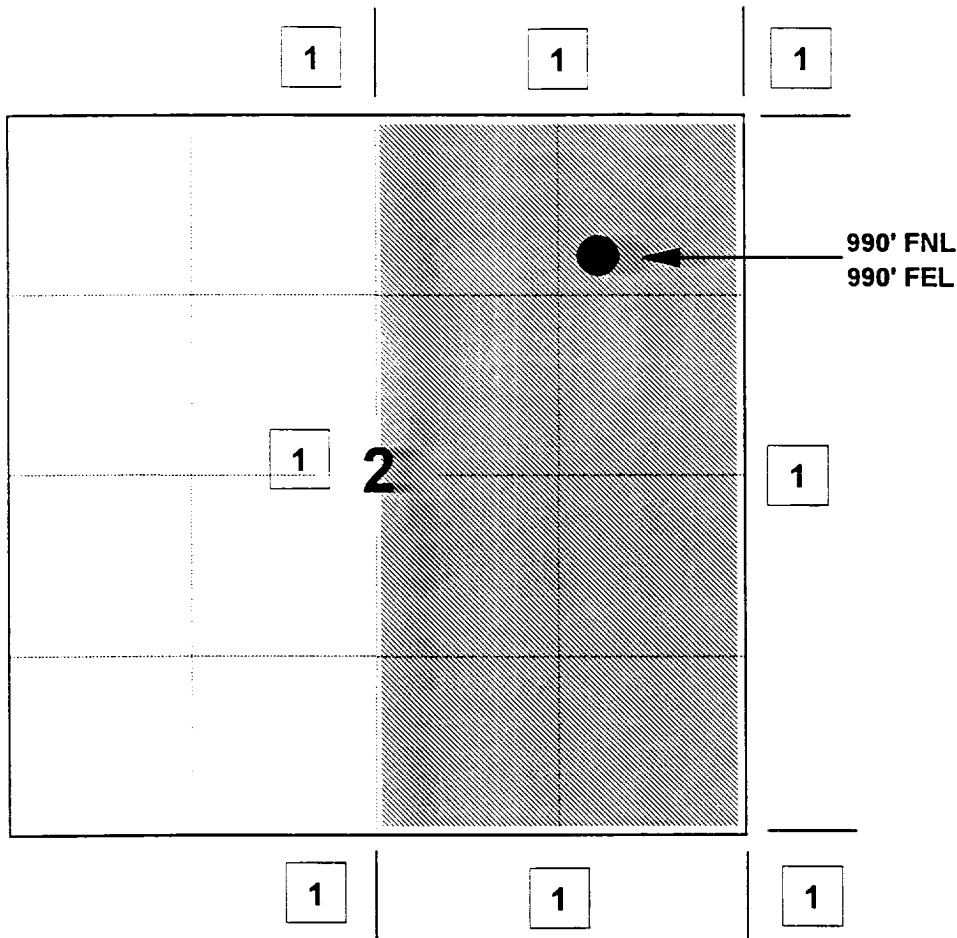
MERIDIAN OIL INC

JICARILLA 96 #2

OFFSET OPERATOR \ OWNER PLAT

Mesaverde / Pictured Cliffs Formations Commingle Well

Township 26 North, Range 3 West



1) Meridian Oil Inc

Mesaverde Formation

