MERIDIAN OIL

OIL CONSERVATION DIVISION
RECEIVED
'94 JUN 7 AM 8 50

June 3, 1994

New Mexico Oil Conservation Division
Attn: Mr. Bill LeMay
P.O. Box 2088
310 Old Santa Fe Trail
Santa Fe, New Mexico

RE: **Sharp #1**
Unit D, Section 18, T28N, R08W
San Juan, New Mexico
Downhole Commingling Request

Dear Mr. LeMay:

Meridian Oil respectfully requests administrative approval to downhole commingle the Blanco Mesaverde and Otero Chacra (extension) pools in the referenced well. Ownership for the zones to be commingled is common. All offset interest owners shown on the attached plat and the Bureau of Land Management will receive notice of this commingling application.

Precedent for commingling the referenced zones in this area has been established in the Grambling A #3 (Unit G, Section 28, T28N, R08W) per NMOCD Administrative Order #DHC-817, dated September 4, 1991. This well is producing with no adverse effects from commingling.

The Sharp #1 was completed openhole in the Mesaverde and stimulated with a solidified nitroglycerine shot in 1951. Currently the well produces 30 MCFD and less the 0.5 BOPD. The well has cumulative production of 2450 MMCF and 1.5 MBO. Meridian plans to sidetrack the existing wellbore and complete both the Mesaverde and Charca intervals. A post sidetrack deliverability of 230 MCFD and 1.5 BOPD is predicted from the Mesaverde interval.

Based on Chacra completions in this area, ultimate reserves of 250 MMCF and an initial deliverability of 130 MCFD are estimated for the Chacra zone in the Sharp #1. Although significant reserves are in place, new drill wells can not be economically justified based solely on reserves found in the Chacra. The only feasible way to produce the Chacra at this location and prevent potential waste of these reserves is to commingle production with an existing wellbore.

The fluids in the two reservoirs are compatible and no precipitates will be formed which could potentially damage either reservoir. (See attached fluid analyses and compatibility tests.) The reservoir parameters of each zone are such that underground waste will not be caused by the proposed commingling. The estimated shut-in pressures for the Mesaverde and Chacra are 700 psi and 800 psi, respectively.

The allocation of the commingled production will be calculated using flow tests from the Mesaverde and Chacra zones during completion operations. Meridian will consult with the district supervisor of the Aztec NMOCD office for approval of the allocation.

Approval of this commingling application will prevent resources from being wasted and protect correlative rights. Included with this letter are plats showing ownership of offsetting leases for both formations, copies of letters to offset operators and the Bureau of Land Management, and a detailed report of fluid compatibility.

If you have any questions concerning this matter please contact Mr. Sean Woolverton at (505) 326-9837. Your attention to this matter is greatly appreciated.

Sincerely,

Travis D. Stice
Regional Engineer

SCW:scw
Attachments
cc: Frank T. Chavez - NMOCD/Aztec
Peggy Bradfield
Well File

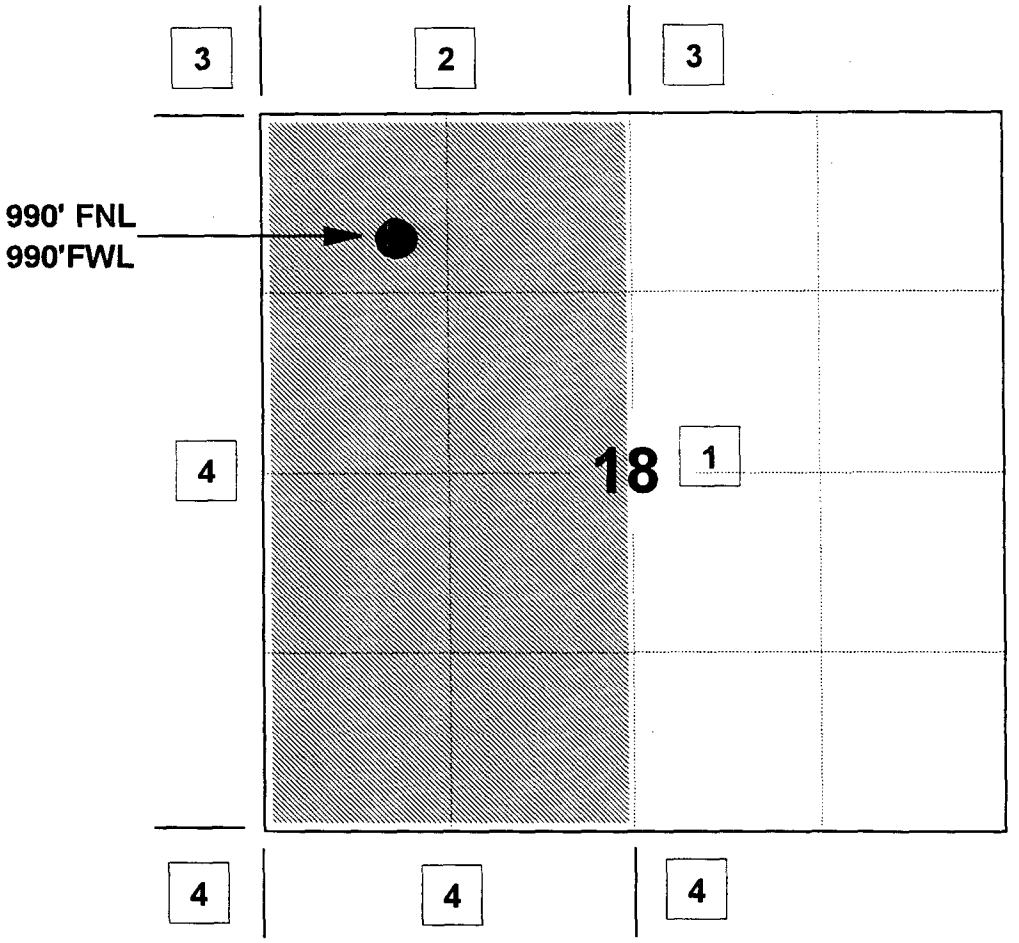
MERIDIAN OIL INC

SHARP #1

OFFSET OPERATOR \ OWNER PLAT

Mesaverde / Chacra Commingle Well

Township 28 North, Range8 West



1) Meridian Oil Inc

2) Meridian Oil Inc & Southland Royalty Company

3) Meridian Oil Inc &

Amoco Production Company PO Box 800, Denver, CO 80201

4) Amoco Production Company

Mesaverde Formation

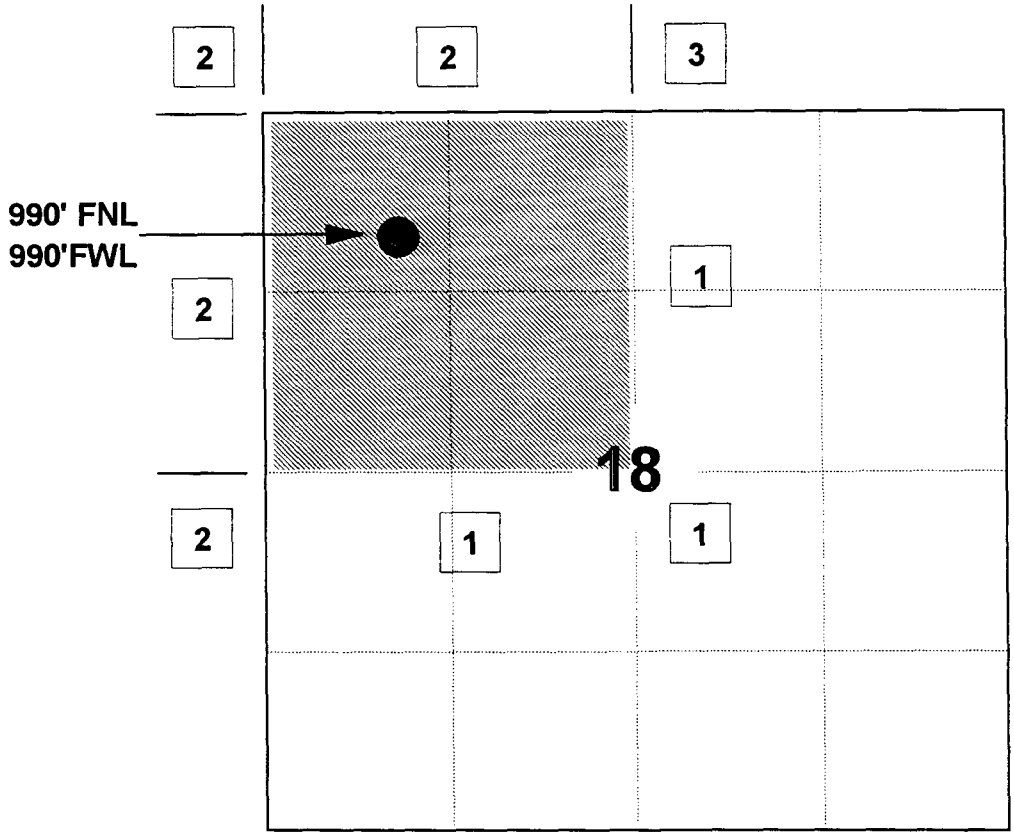
MERIDIAN OIL INC

SHARP #1

OFFSET OPERATOR \ OWNER PLAT

Mesaverde / Chacra Commingle Well

Township 28 North, Range8 West



1) Meridian Oil Inc

2) Amoco Production Company PO Box 800, Denver, CO 80201

Chacra Formation

MERIDIAN OIL

May 25, 1994

Bureau of Land Management
1235 La Plata Highway
Farmington, New Mexico 87401

RE: **Sharp #1**
Unit D, Section 18, T28N, R08W
San Juan, New Mexico
Downhole Commingling Request

Gentlemen:

Meridian Oil Inc. is in the process of applying for a downhole commingling order from the New Mexico Oil Conservation Division (NMOCD) for the referenced well located in San Juan County, New Mexico. The approved application will commingle the Blanco Mesaverde and the Otero Chacra pools.

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

Your prompt attention to this matter would be appreciated.

Yours truly,

Sean Woolverton

Sean C. Woolverton
Reservoir Engineer

SCW:scw

Wavier approval.

_____

Date:_____

MERIDIAN OIL

May 25, 1994

Amoco Production Company
Attn: David Simpson
P.O. Box 800
Denver, CO 80201

RE: **Sharp #1**
Unit D, Section 18, T28N, R08W
San Juan, New Mexico
Downhole Commingling Request

Dear Mr. Simpson:

Meridian Oil Inc. is in the process of applying for a downhole commingling order from the New Mexico Oil Conservation Division (NMOCD) for the referenced well located in San Juan County, New Mexico. The approved application will commingle the Blanco Mesaverde and the Otero Chacra pools.

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

Your prompt attention to this matter would be appreciated.

Yours truly,

Sean Woolverton

Sean C. Woolverton
Reservoir Engineer

SCW:scw

Wavier approval.

_____

Date:_____

MERIDIAN OIL
ALBRIGHT 7A - MESA VERDE
ALBRIGHT 2J - CHACRA
LEASE FLUIDS

LABORATORY INVESTIGATION

OF

ALBRIGHT MESA VERDE AND CHACRA FLUIDS COMPATABILITY

JANUARY 23, 1991

PREPARED FOR:

MERIDIAN OIL, INC
MIKE PIPPIN
PETROLEUM ENGINEER

PREPARED BY:

BRIAN P. AULT
PETROLEUM ENGINEER
WESTERN COMPANY OF
NORTH AMERICA

SERVICE POINT
FARMINGTON, NEW MEXICO
505-327-6222

SUMMARY OF RESULTS

1. No precipitation of materials was observed from either admixture of fluids.

2. Emulsion testing was performed. There should be no serious concern over the formation of a stabilized emulsion at well bore temperatures.

3. The cloud point of oil mixtures dropped or remained the same upon mixing of fluids.

4. According to calculations not enough cool down from gas expansion will occur to alter paraffin deposition significantly.

MERIDIAN OIL
ALBRIGHT 7A - MESA VERDE
ALBRIGHT 2J - CHACRA
LEASE FLUIDS

ALBRIGHT 7-1 MV/CH
SAN JUAN COUNTY, NEW MEXICO

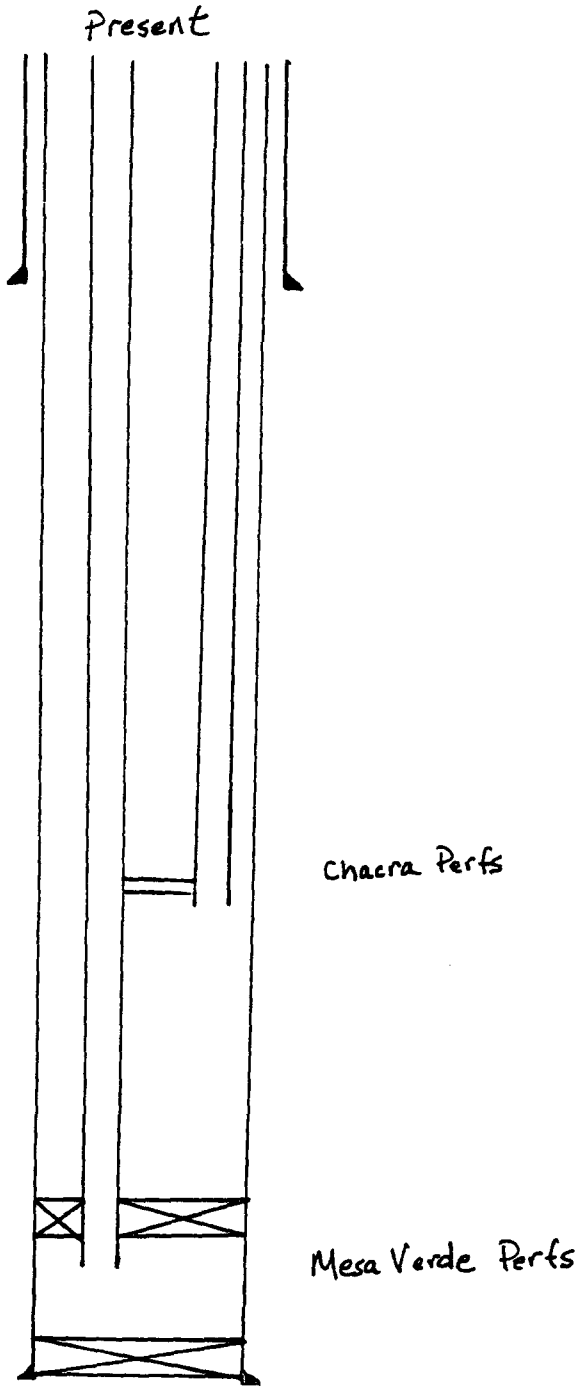


FIGURE 1

MERIDIAN OIL
ALBRIGHT 7A - MESA VERDE
ALBRIGHT 2J - CHACRA
LEASE FLUIDS

ALBRIGHT 7-A MV/CH
SAN JUAN COUNTY, NEW MEXICO

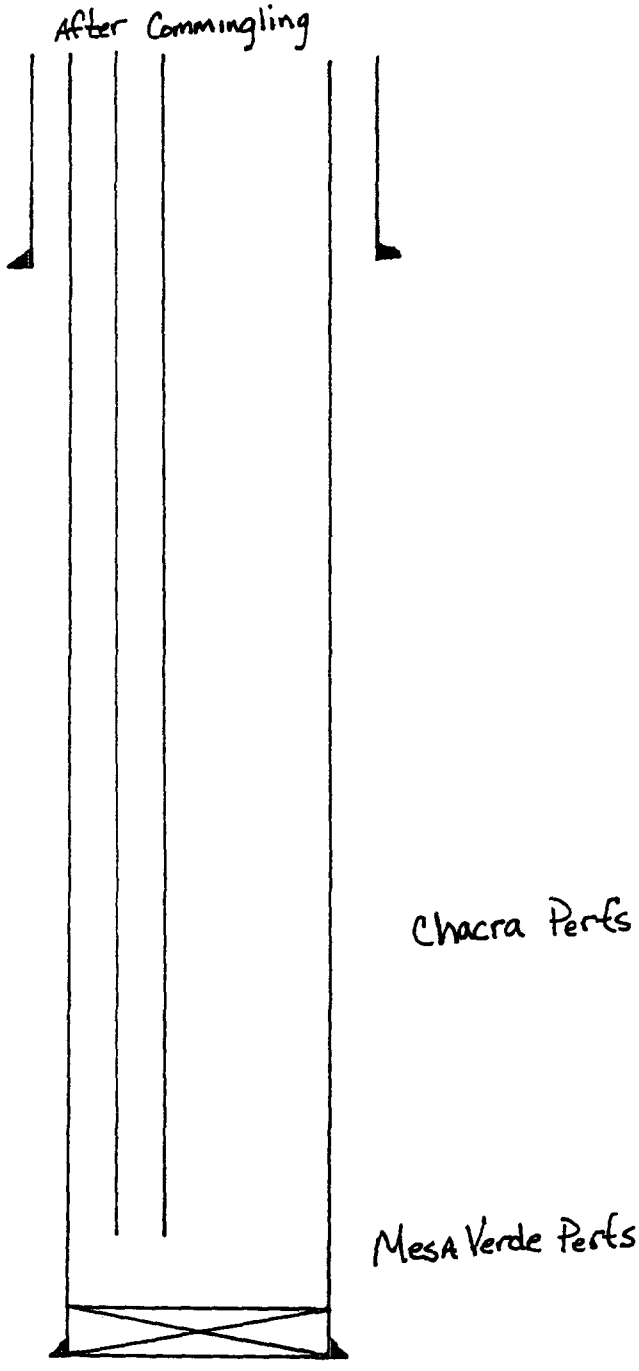


FIGURE 2

MERIDIAN OIL
ALBRIGHT 7A - MESA VERDE
ALBRIGHT 2J - CHACRA
LEASE FLUIDS

On Thursday, January 10, 1991, a request for laboratory work was placed by Mike Pippin, Petroleum Engineer of Meridian Oil, Inc.

PURPOSE

Two oil samples were received of Mr. Pippin with the request we investigate the concern of potentially detrimental effects due to commingling of Mesa Verde and Chacra fluids in the Albright 7A wellbore.

INVESTIGATION

1. Background information - current wellbore.

   a. Figure 1

   b. Figure 2

   c. BHST Gradient: 1.375° f/100 ft.

   d. Current production problems are primarily due to paraffin deposition from surface down to more/less 1000' depth.

   e. Commingling Order Mixture Requirements:

      The commingling requests present the mixing of Albright 7-A Mesa Verde fluids with Albright 2-J Chacra fluids.

      The tests performed simulated the mixture of fluids that may result from this commingling action. Each oil component was analyzed for API gravity, paraffin, pour point and cloud point. Each water component was analyzed for dissolved solids, pH, specific gravity and resistivity. The mixture of oils addressed the potential increase in precipitation of materials and the potential increase in paraffin content by a synergistic effect of mixing oils of different constitution. Emulsion tests simulated the mixing environment of the wellbore where the water component of a fluid could be tied up in a resulting emulsion without the ability to break out and allow separation of the oil and water constituents. The emulsion test results

present the number of ml (% of mixture) of water breakout at listed time intervals. The volume of test sample (mixture) used in the emulsion tests is 100 ml.

2. Concerns to address in analysis:

   a. The precipitation of materials produced by the admixture of oils of potentially different constitution.

   b. The creation of emulsions due to the admixture of different fluids.

   c. Increased paraffin deposition by additive properties of oils.

   d. Increased paraffin deposition due to the reduction of temperature accompanying gas expansion.

3. Steps taken in analysis

   a. API Analysis of oils including: API Gravity
      Pour Point
      Cloud Point
      Paraffin Content

   b. Discussion with Mr. Pippen regarding the well bore production environment, e.g., mode of hydrocarbon production, pump type and operation, water components of production fluids, current paraffin problems, etc.

   c. Mixing of oils in appropriate cases with additional cloud point testing to determine resulting fluid characteristics.

   d. API Water Analysis

   e. Emulsion tendency testing via mixing of fluids in appropriate cases.

MERIDIAN OIL
ALBRIGHT 7A - MESA VERDE
ALBRIGHT 2J - CHACRA
LEASE FLUIDS

DATA

SAMPLE #1 - ALBRIGHT 7A	
ZONE	MESA VERDE
API GRAVITY @ 60° F	55.1°
CLOUD POINT	60°F
POUR POINT	<10°F
PARAFFIN CONTENT	0.91%
SAMPLE #2 - ALBRIGHT 2J	
ZONE	CHACRA
API GRAVITY @ 60° F	54.10°
CLOUD POINT	<10° F
POUR POINT	<10° F
PARAFFIN CONTENT	0%
SAMPLE #3 50:50 MIX OF ALBRIGHT 7A AND 2J FLUIDS	
ZONE	50:50 MIX MV/CH
API GRAVITY @ 60° F	53.20°
CLOUD POINT	48°F
POUR POINT	<10° F
PARAFFIN CONTENT	0.27%

CALCULATIONS

Cool down effects due to gas expansion:

Reference: Perry's Handbook of Chemical Engineering

RE : Adiabatic Expansion of Ethane, Methane

$T_s + T_r (P_s/P_r) (K-1/K)$, where

T_s = Surface Temperature

T_r = Reservoir Temperature

P_s = Surface Pressure

P_r = Reservoir Pressure

K = Specific Heat at constant pressure/Specific heat at constant volume

Assumed values for maximum cool down due to gas expansion:

T_s = Unknown

T_r = 140°F

P_s = 500 psi

P_r = 1500 psi

K = 1.2

T_s = 140 (500/1500) 0.1667

T_s = 117°F

NOTE:

A total cooldown of 23°F would be expected

ANALYSIS NO. 51-03-91

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company	Sample No.	Date Sampled	
Meridian Oil		01-11-91	@ 1:30
Field	**Legal Description**	**County or Parish**	**State**
.	S22 T29N R10W		
Lease or Unit	**Well**	**Depth**	**Formation**	**Water, B/D**
Albright	7-A		Mesa Verde	
Type of Water (Produced, Supply, etc.)	**Sampling Point**	**Sampled By**	

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	1258	54.68
Calcium, Ca	38	1.90
Magnesium, Mg	9	.74
Barium, Ba	—	—
Potassium, K^+	18	.46

ANIONS		
Chloride, Cl	1977	55.78
Sulfate, SO_4	0	0
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	122	2.00
OH	0	0

Total Dissolved Solids (calc.) 3422

Iron, Fe (total) H,HT 0,0 ppm

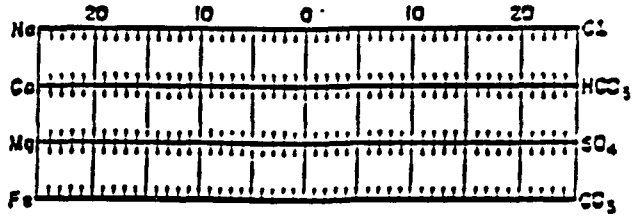
Sulfide, as H_2S neg

OTHER PROPERTIES

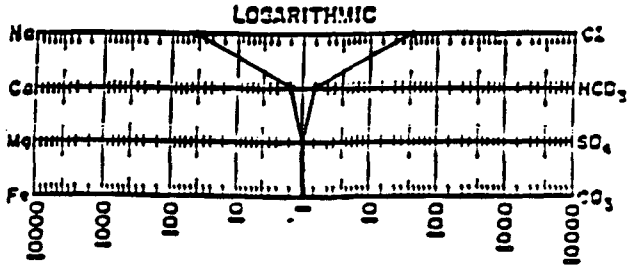
pH	6.55
Specific Gravity, 60/60 F.	1.002
Resistivity (ohm-meters) 72 F.	1.64
Total hardness	132

WATER PATTERNS — me/l

STANDARD



LOGARITHMIC



REMARKS & RECOMMENDATIONS:

ANALYST: Lee

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

Please refer any questions to: BRIAN AULT , District Engineer

Date 01-16-91

51-01-91

Rocky Mountain Region

THE WESTERN COMPANY

Oil Analysis

Operator Meridian Oil
Well Albright 7-A
Field Sec 7 T29N R10W
Formation Mesa Verde
Depth
County San Juan
State NM

Date Sampled 01-11-91
Date Received 01-15-91
Submitted By Mike Pippin
Worked By LHee
Sample Description 500 mL clear brown oil + 0% free H2O.

API Gravity 55.1 ° at 60°F
Paraffin Content .91 % by weight
Asphaltene Content — % by weight
Pour Point <10 °F
Cloud Point 60 °F

Comments:

Analyst LLee

Paraffin Content

wt. beaker + sample _____
- wt. beaker - 81.407
(wt. sample) 2.869

wt. Buchner funnel, watch glass, and filter papers 146.223

After filtering:

wt. beaker + paraffin residue 81.408
- wt. beaker (from above) 81.407
(wt. paraffin in beaker) .001

wt. funnel, glass, papers + paraffin residue 146.248
- wt. funnel, watch glass filter papers from above 146.223
(wt. paraffin in these) .025

Total wt. paraffin:

wt. paraffin in beaker .001
+ wt. paraffin in others .025
Total paraffin .026 grams

Paraffin content (%) =

$\frac{.026}{2.869}$ = $\frac{\text{Total paraffin}}{\text{Sample wt.}}$ X 100 = .91 %

Asphaltene Content

wt. tube + sample _____
- wt. tube - _____
(wt. sample) _____

wt. tube & residue _____
- wt. tube - _____
(wt. residue) _____

Asphaltene content (%)

$\frac{\text{wt. residue}}{\text{wt. sample}}$ X 100 = _____

S.G. = $\frac{7.55}{10.0}$ @ 68°F = .755

°API @ 68°F = $\frac{141.5}{\text{S.G.}}$ - 131.5 = 55.917

Temp. Correction : °API @ 60°F

55.917 - .859 = 55.06 or 55.1 °API @ 60°F

LYSIS NO. 51-02-91

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company	Sample No.	Date Sampled
Meridian Oil		01-11-91 @ 1:45

Field	Legal Description	County or Parish	State
	S22 T29N R10W		

Lease or Unit	Well	Depth	Formation	Water, B/D
Albright	2-J		Chacra	

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

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	2982	129.65
Calcium, Ca	48	2.40
Magnesium, Mg	15	1.20
Barium, Ba	—	—
Potassium, K^+	18	.46

ANIONS		
Chloride, Cl	4601	129.79
Sulfate, SO_4	0	0
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	239	3.92
OH	0	0

Total Dissolved Solids (calc.) 7903

Iron, Fe (total) H,HH 0,0 ppm

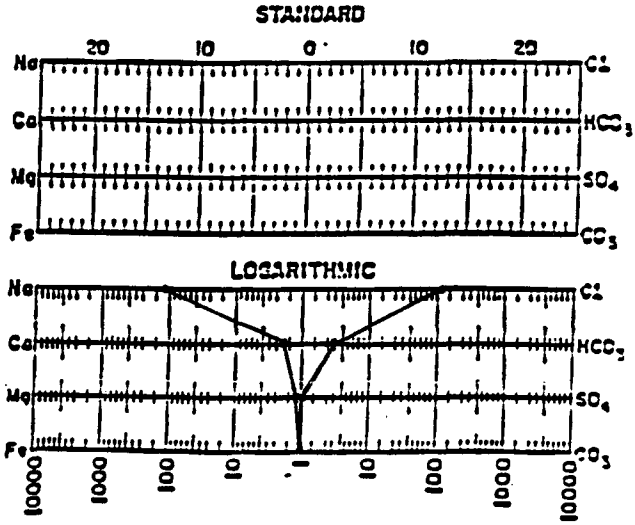
Sulfide, as H_2S neg

REMARKS & RECOMMENDATIONS:

OTHER PROPERTIES

pH	7.25
Specific Gravity, 60/60 F.	1.007
Resistivity (ohm-meters) 72F.	.75
Total hardness	180

WATER PATTERNS — me/l



ANALYST: LHP

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

Please refer any questions to: BRIAN AULT, District Engineer

Date 01-17-91

51-02-91

Rocky Mountain Region

THE WESTERN COMPANY

Oil Analysis

Operator Meridian Oil
Well Albright 2-J
Field Sec 7 T29N R10W
Formation Chacra
Depth
County San Juan
State NM

Date Sampled 01-11-91
Date Received 01-15-91
Submitted By Mike Pippin
Worked By LHee
Sample Description 115 ml
clear oil + 400 ml (78%)
free H2O.

API Gravity 54.1 ° at 60°F

Paraffin Content 0 % by weight

Asphaltene Content —— % by weight

Pour Point <10 °F

Cloud Point <10 °F

Comments:

Analyst LLee

Paraffin Content

wt. beaker + sample _____
- wt. beaker - 98.160
(wt. sample) 2.956

wt. Buchner funnel, watch glass, and filter papers 122.664

After filtering:

wt. beaker + paraffin residue 98.160
- wt. beaker (from above) 98.160
(wt. paraffin in beaker) 0

wt. funnel, glass, papers + paraffin residue 122.664
- wt. funnel, watch glass filter papers from above 122.664
(wt. paraffin in these) 0

Total wt. paraffin:

wt. paraffin in beaker 0
+ wt. paraffin in others 0
Total paraffin 0 grams

Paraffin content (%) =

$\frac{0}{2.956} = \frac{\text{Total paraffin}}{\text{Sample wt.}} \times 100 = 0$ %

Asphaltene Content

wt. tube + sample _____
- wt. tube - _____
(wt. sample) _____

wt. tube & residue _____
- wt. tube - _____
(wt. residue) _____

Asphaltene content (%)

$\frac{\text{wt. residue}}{\text{wt. sample}} \times 100 =$ _____

S.G. = $\frac{7.56}{10.0}$ @ 75°F = .756

°API @ 75°F = $\frac{141.5}{\text{S.G.}} - 131.5 = 55.669$

Temp. Correction: °API @ 60°F

55.669 - 1.570 = 54.1 °API @ 60°F

Date 01-19-91

51-03-91

Rocky Mountain Region

THE WESTERN COMPANY

Oil Analysis

Operator Meridian Oil

Well Albright 7-A/Albright 2-J

Field Sec 2 T29N R10W

Formation Mesa Verde/Chacra

Depth

County San Juan

State NM

Date Sampled 01-11-91

Date Received 01-15-91

Submitted By Mike Pippin

Worked By Lee

Sample Description 50/50 mix of Albright 7-A oil & Albright 2-J oil.

API Gravity 53.2 ° at 60°F

Paraffin Content .27 % by weight

Asphaltene Content ——— % by weight

Pour Point <10 °F

Cloud Point 48 °F

Comments:

Analyst LLee

Paraffin Content

wt. beaker + sample _____
- wt. beaker - 81.405
(wt. sample) 2.918

wt. Buchner funnel, watch glass, and filter papers 146.234

After filtering:

wt. beaker + paraffin residue 81.407
- wt. beaker (from above) 81.405
(wt. paraffin in beaker) .002

wt. funnel, glass, papers + paraffin residue 146.240
- wt. funnel, watch glass filter papers from above 146.234
(wt. paraffin in these) .006

Total wt. paraffin:

wt. paraffin in beaker .002
+ wt. paraffin in others .006
Total paraffin .008 grams

Paraffin content (%) =

$\frac{.008}{2.918} = \frac{\text{Total paraffin}}{\text{Sample wt.}} \times 100 = .27\ \%$

Asphaltene Content

wt. tube + sample _____
- wt. tube - _____
(wt. sample) _____

wt. tube & residue _____
- wt. tube - _____
(wt. residue) _____

Asphaltene content (%)

$\frac{\text{wt. residue}}{\text{wt. sample}} \times 100 =$ _____

S.G. = $\frac{7.60}{10.0}$ @ 74°F = .760

°API @ 74°F = $\frac{141.5}{\text{S.G.}} - 131.5 = 54.684$

Temp. Correction: °API @ 60°F

54.684 - 1.441 = 53.24 or 53.2 °API @ 60°F

ANALYSIS #
DATE: 01-21-91

water-oil Fig. 1
~~ACID-OIL~~ EMULSION TESTS DATA SHEET

7.5% a-J oil + 25.5% a-J

OPERATOR: Meridian Oil
WELL: Albright 7-A & a-J
FIELD: Sec 7 T29N R10W
FORMATION: Mesa Verde/Chacra
DEPTH:
COUNTY: San Juan

SUBMITTED BY: Mike Pippin
SOURCE OF SAMPLE: wellhead
DATE SAMPLED: 01-11-91
DATE RECEIVED: 01-15-91
API GRAVITY OF OIL: 53.2° @ 60°F

TYPE & CONC. OF FLUID: +32.5% 7-A oil + 34.5% 7-A H
~~TYPE & CONC. OF EMULSITOR:~~
~~TYPE & CONC. OF SOLIDS:~~
TEST TEMPERATURE: 76°F
~~OIL/TREATMENT FLUID RATIO:~~
ANALYSIS BY: Lee

PERCENTAGE OF ORIGINAL ~~ACID~~ water SEPARATED AT VARIOUS TIME INTERVALS AFTER EMULSIFYING

Test Number																
Additives & Concentration, Gal/1000 Gal																
Elapsed Time	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol
1 min	1	59.5	2		3		4		5		6		7		8	
2	2		3		4		5		6		7		8		9	
3	3		4		5		6		7		8		9		10	
4	4		5		6		7		8		9		10		11	
5	5		6		7		8		9		10		11		12	
6	6		7		8		9		10		11		12		13	
7	7		8		9		10		11		12		13		14	
8	8		9		10		11		12		13		14		15	
9	9		10		11		12		13		14		15		16	
10	10		11		12		13		14		15		16		17	
20	20		21		22		23		24		25		26		27	
30	30		31		32		33		34		35		36		37	
Total Vol (ml)		59.5														
Vol. Emulsion / Sludge																
Solids*																
Interface**	V	1 mL														
Vol. Sediment																

REMARKS:

* Preferential wetting of solids: OB=oil-wet bottom; OO=oil-wet oil phase; WB=water-wet bottom; WO=water-wet oil phase
OI=oil-wet interface; WI=water-wet interface
** Interface: F=Fluid; S=Solid; V=Viscous

7.5 mL Albright a-J Chacra oil + 25.5 mL Albright a-J Chacra water
+ 32.5 mL Albright 7-A Mesa Verde oil + 34.5 mL Albright 7-A Mesa Verde H_2