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: Dec 11, 1990

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

Re: Proposed MC_____
Proposed DHC___✓__
Proposed NSL_____
Proposed SWD_____
Proposed WFX_____
Proposed PMX_____

Gentlemen:

I have examined the application dated Dec 4, 1990

for the Meridian M. E. Condon #20E
Operator Lease & Well No.

F-13-7 25N-10W and my recommendations are as follows:
Unit, S-T-R

Approve

Yours truly,

BLM

MERIDIAN OIL

December 3, 1990

Mr William J. LeMay
N. M. Oil Conservation Division
P. O. Box 2088
Santa Fe, N.M. 87501-2088

Re: Commingling Application
McClanahan #20E DK
1840' FNL; 1660' FWL
Section 13, T28N R10W
San Juan County, N. M.

Dear Mr. LeMay:

Meridian Oil Inc. is applying for an administrative downhole commingling order for the referenced well in the Armenta Gallup and Basin Dakota fields. The ownership of the zones to be commingled is common. All of the offsetting drilling blocks are operated by Meridian Oil. The Bureau of Land Management will receive notification of this proposed downhole commingling.

This well was completed on 11-13-80 in the Dakota interval. It has a present cumulative production of 497 MMCF & 4,497 BO since first delivery to SUG on 2-26-81. Its current capacity is 60 MCF/D & 0.5 BOPD. This well is listed as "marginal" in the State Proration Schedule.

In 1982 and 1983, Union Texas Petroleum and Amoco Production Company conducted extensive Gallup drilling in Kutz Canyon. Although drilling was suspended by these two companies during 1983 due to poor economics, most of the wells were first delivered to pipeline thus have been producing for about seven years.

Meridian Oil recently completed a study of these Armenta Gallup wells and concluded that although substantial oil and gas reserves are present in this Gallup reservoir, they definitely do not provide economic justification to drill. In addition, the necessity of pumping equipment also discourages Gallup development. The recompletion of an existing Dakota well in the Gallup could result in a dual completion with the upper producing interval being pumped. This option is not advisable from an operations point of view, the operating risk is too high.

We believe that the only possible way to economically develop the Gallup reserves in this area is to commingle

the Gallup with an existing Dakota well. Recompletion rather than drilling is much more economical and the addition of the Dakota gas to the Gallup oil and gas should eliminate that expensive cost of pumping equipment. Included with this application are the production curves of four recently commingled Armenta Gallup / Basin Dakota wells. These total well production curves all show a production increase when the wells were commingled. These wells all produce by plunger lift systems. Also included with this application is a cross section from one of these recently commingled wells, Pierce A #2E GL/DK (E 34 29 10) to show the continuity of the Gallup and Dakota to the referenced well. Granting this application will be in the best interest of conservation, the prevention of waste, and the protection of correlative rights.

We plan to commingle the subject well by pulling the Dakota tubing and setting a retrievable bridge plug above the Dakota perforations. The Gallup will be perforated, stimulated, and tested. The bridge plug will then be retrieved and a single string of tubing run to the lower producing interval.

The reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed downhole commingling. The fluids from each zone are compatible and no precipitates will be formed to cause damage to either reservoir. See the attached fluid analyses. In addition, none of the four nearby commingled Gallup / Dakota wells has experienced any fluid compatibility problems due to commingling. The daily production will not exceed the limit of Rule 303c, Section 1a, Part 1.

The shut-in bottom hole pressures for the Gallup and Dakota are 484 psi and 584 psi, respectively. The Gallup BHP was taken from the nearest Gallup well, Zachry #41 (O 12 28 10). The Dakota in the referenced well makes no water, and the Gallup in the nearby wells makes less than 1/2 barrel per day.

The District Office in Aztec will be notified anytime the commingled well is shut-in for seven (7) consecutive days.

To allocate the commingled production to each of the zones, Meridian will consult with the District Supervisor of the Aztec District Office of the Division to determine an allocation formula for each of the productive zones. This will be done using flow tests from the Gallup during recompletion operations.

Included with this letter is a copy of the letter to the

BLM, wellbore diagrams both before and after commingling, production curves from the referenced well, the nearest Gallup well, and the four nearby recently commingled gallup / Dakota wells, pertinent data sheet, cross section, a map of nearby Gallup wells, and nearby Dakota wells, and a detailed report of fluid compatibility.

Yours truly,

P. M. Pippin
Sr. Production Engineer

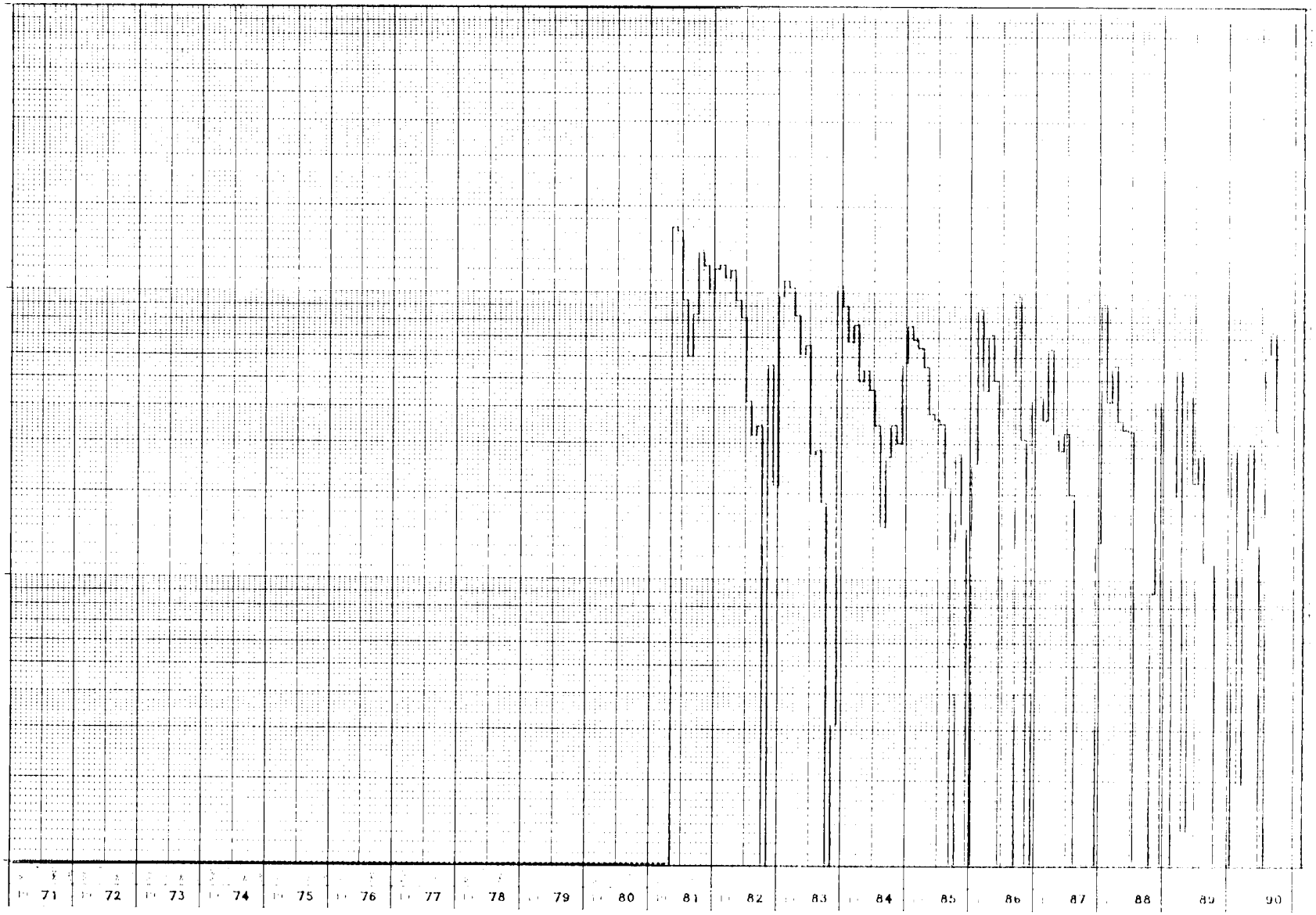
PMP:pmp
attachments

cc: Frank Chavez - OCD

PROJECT	:	DWIGHTS NUMBER	: 30428N10W13F00DK
STATE	: NEW MEXICO	LEASE/WELL NAME	: MCCLANAHAN
COUNTY	: SAN JUAN	RESERVOIR	:
LOCATION	: 13F28N 10W	FIELD	: BASIN DAKOTA (PRORATED GAS)
PAGE NUMBER	: 0000001-A	OPERATOR	: SOUTHLAND ROYALTY CO

20E

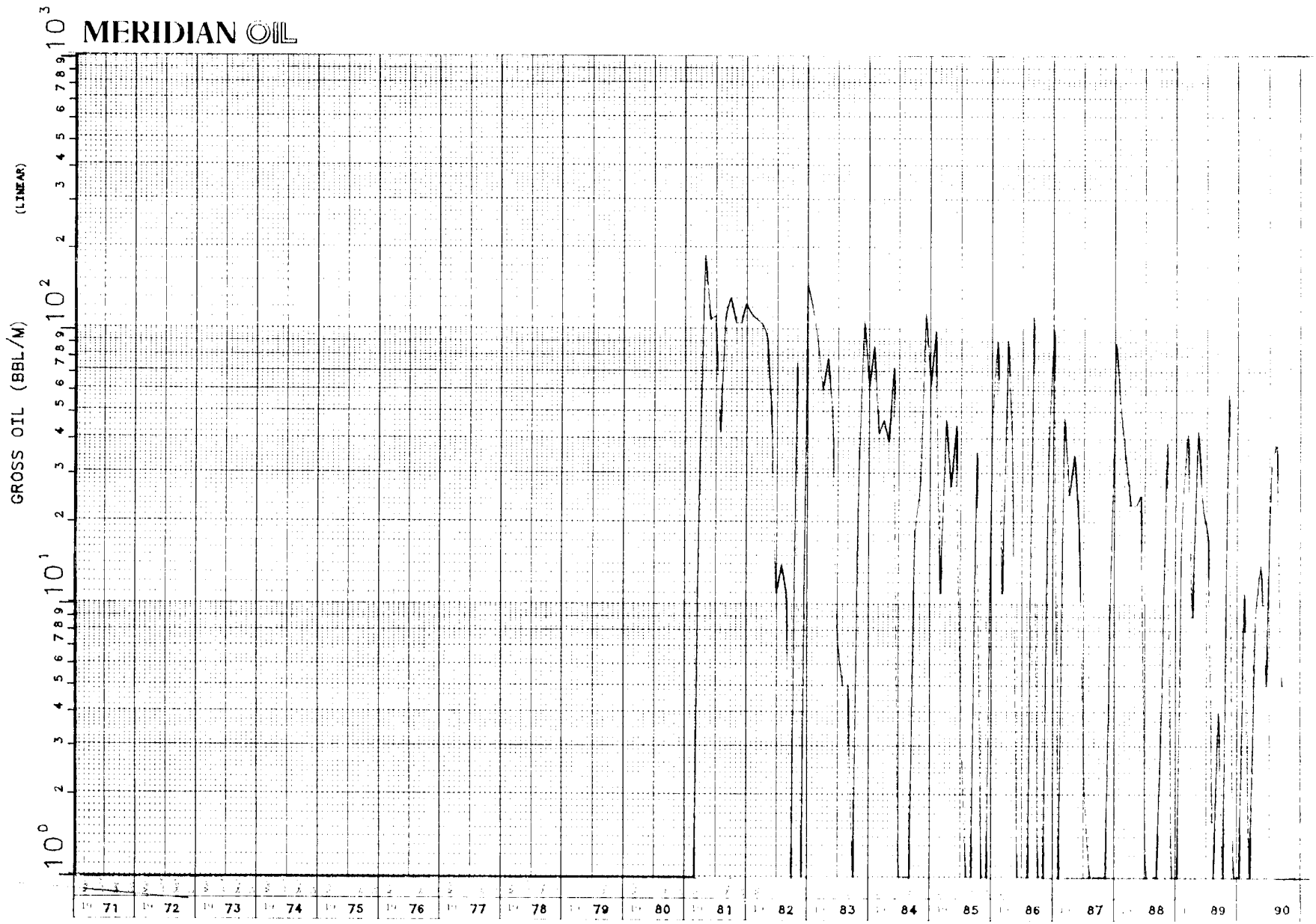
MERIDIAN OIL



GAS BY MONTH

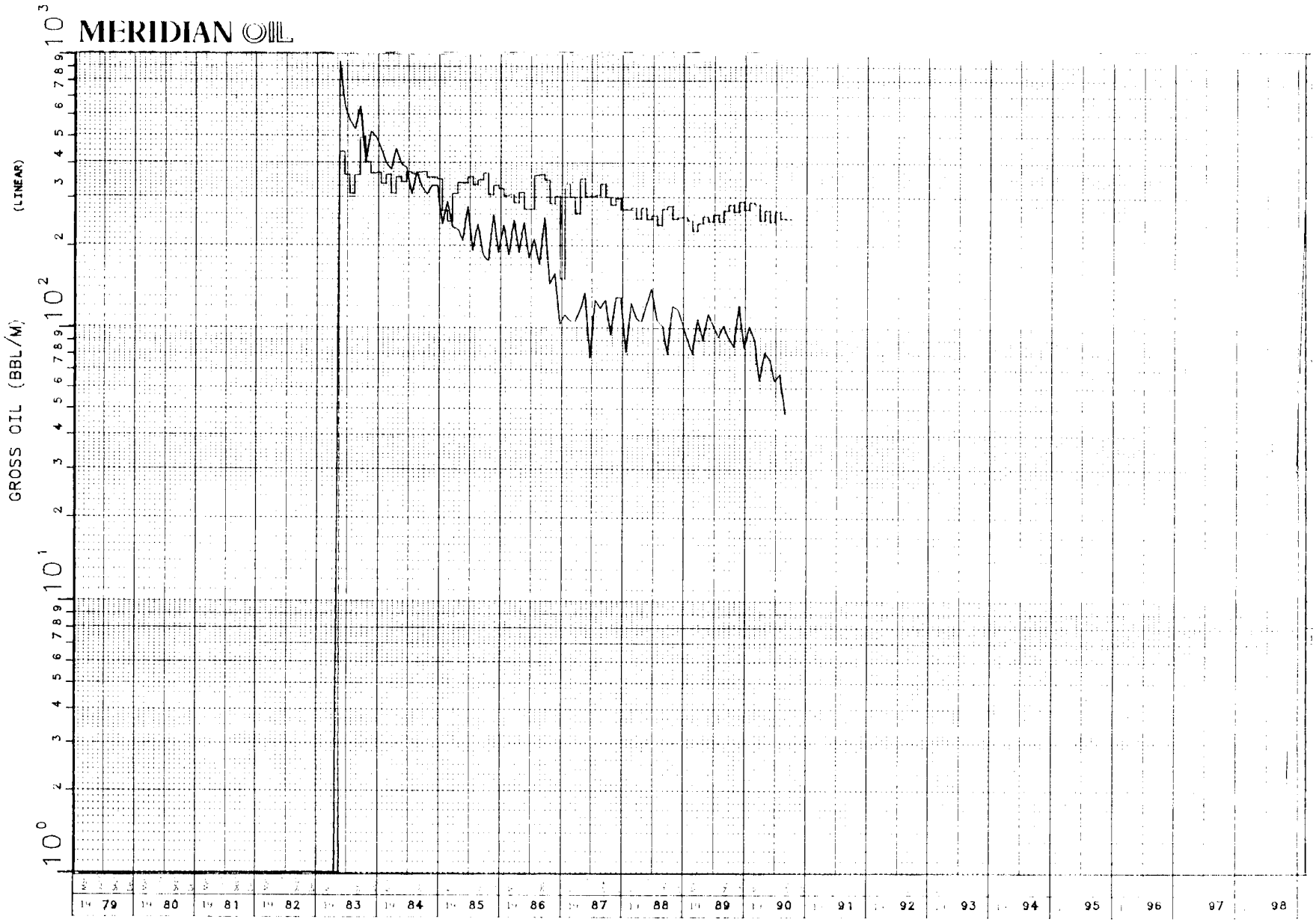
PROJECT :
STATE : NEW MEXICO
COUNTY : SAN JUAN
LOCATION : 13F28N 10W
PAGE NUMBER : 0000001-A

DWIGHTS NUMBER : 30428N10W13F00DK
LEASE/WELL NAME : MCCLANAHAN
RESERVOIR :
FIELD : BASIN DAKOTA (PRORATED GAS)
OPERATOR : SOUTHLAND ROYALTY CO



OIL BY MONTH

PROJECT	XX	DWIGHTS NUMBER	30428N10W12000GP
STATE	NEW MEXICO	LEASE/WELL NAME	ZACHRY
COUNTY	SAN JUAN	RESERVOIR	
LOCATION	12028N 10W	FIELD	ARMENTA GALLUP
PAGE NUMBER	0000001-A	OPERATOR	MERIDIAN OIL INC



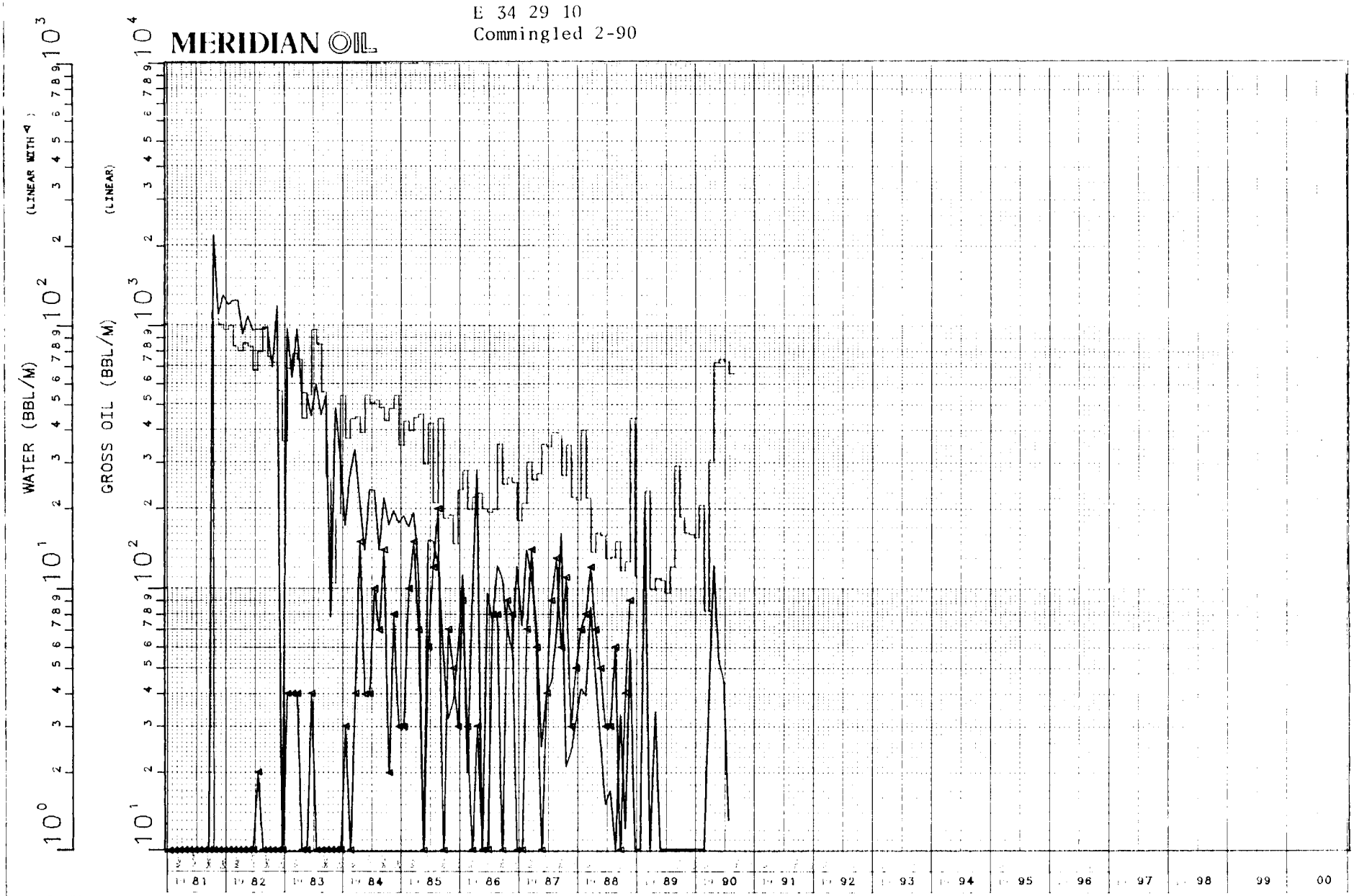
OIL BY MONTH GAS BY MONTH

DISTRICT :
STATE :
COUNTY :
PROJECT NAME : PIERCE A #2E

DP-NO :
WELL NAME & NO : PRODUCTION TOTALS
FIELD NAME :
OPERATOR :
PAGE NUMBER : 0000001-A

E 34 29 10
Commingled 2-90

MERIDIAN OIL



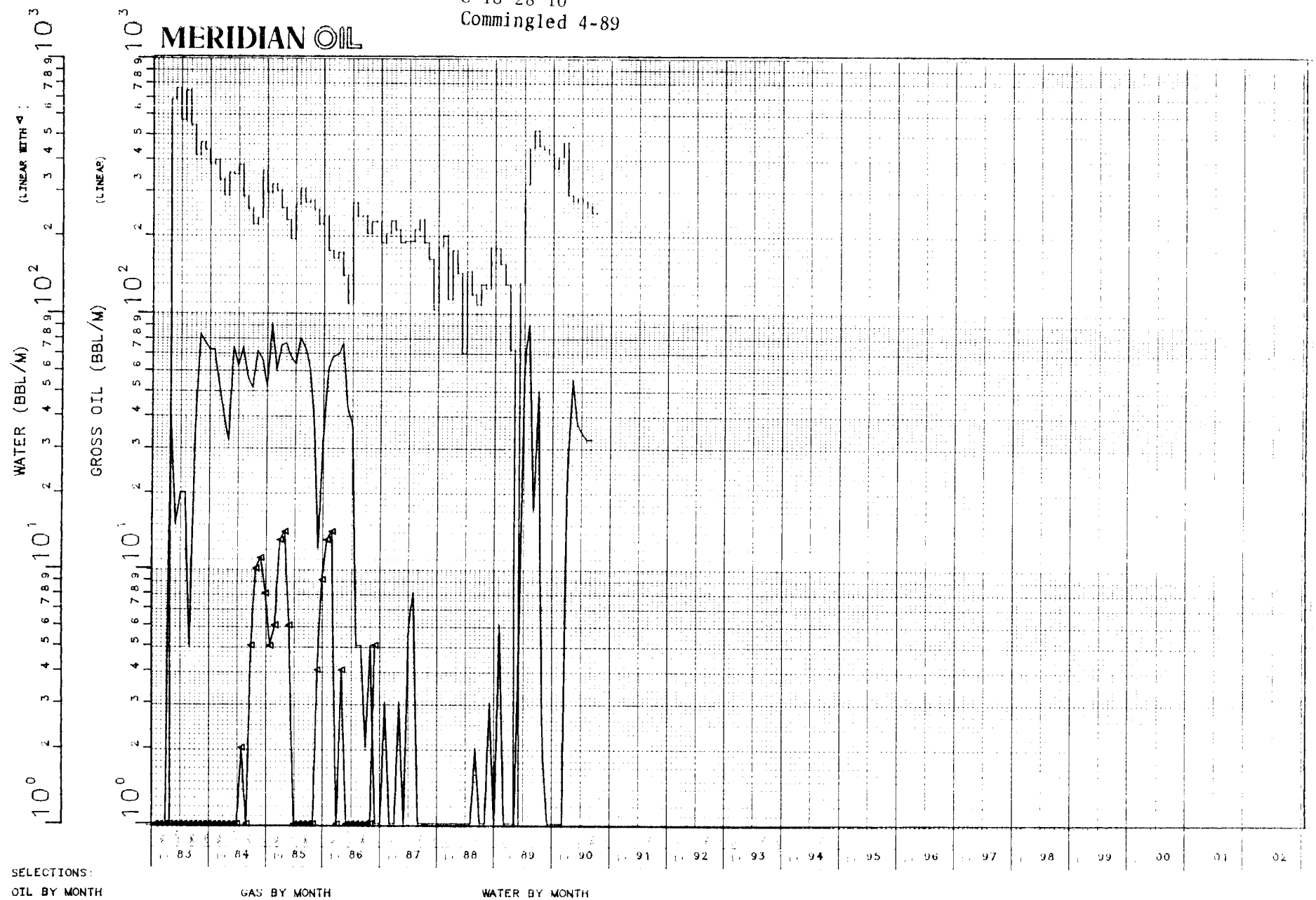
SELECTIONS:
OIL BY MONTH
GAS BY MONTH
WATER BY MONTH

DISTRICT
STATE
COUNTY
PROJECT NAME CONGRESS LACHMAN #4E

DP-NO
WELL NAME & NO PRODUCTION TOTALS
FIELD NAME
OPERATOR
PAGE NUMBER : 0000001-A

C 18 28 10
Commingled 4-89

MERIDIAN OIL



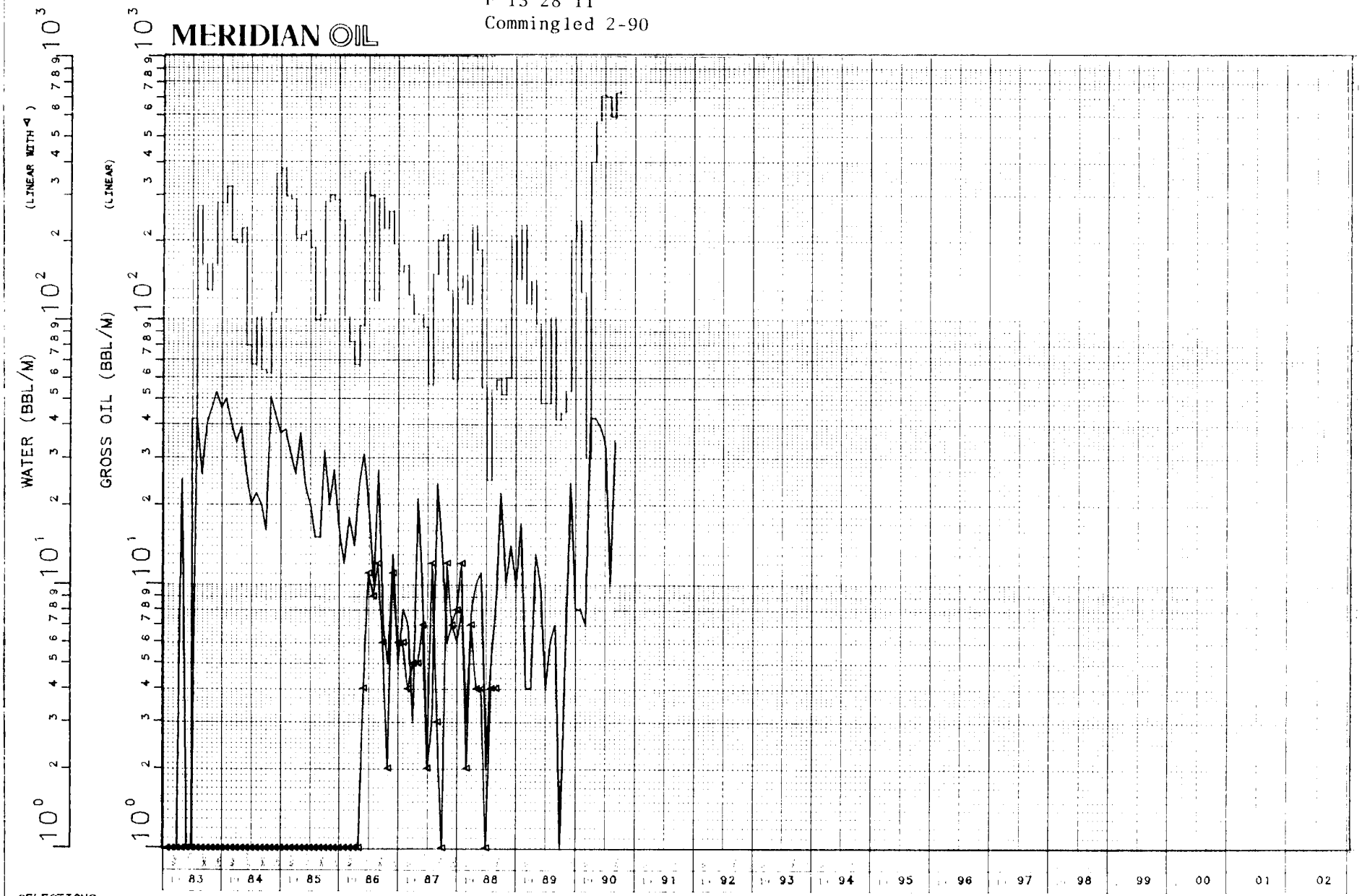
SELECTIONS:
OIL BY MONTH
GAS BY MONTH
WATER BY MONTH

DISTRICT
STATE
COUNTY
PROJECT NAME ANGEL PEAK B #22E

DP-NO
WELL NAME & NO PRODUCTION TOTALS
FIELD NAME
OPERATOR
PAGE NUMBER 0000001-A

F 13 28 11
Commingled 2-90

MERIDIAN OIL



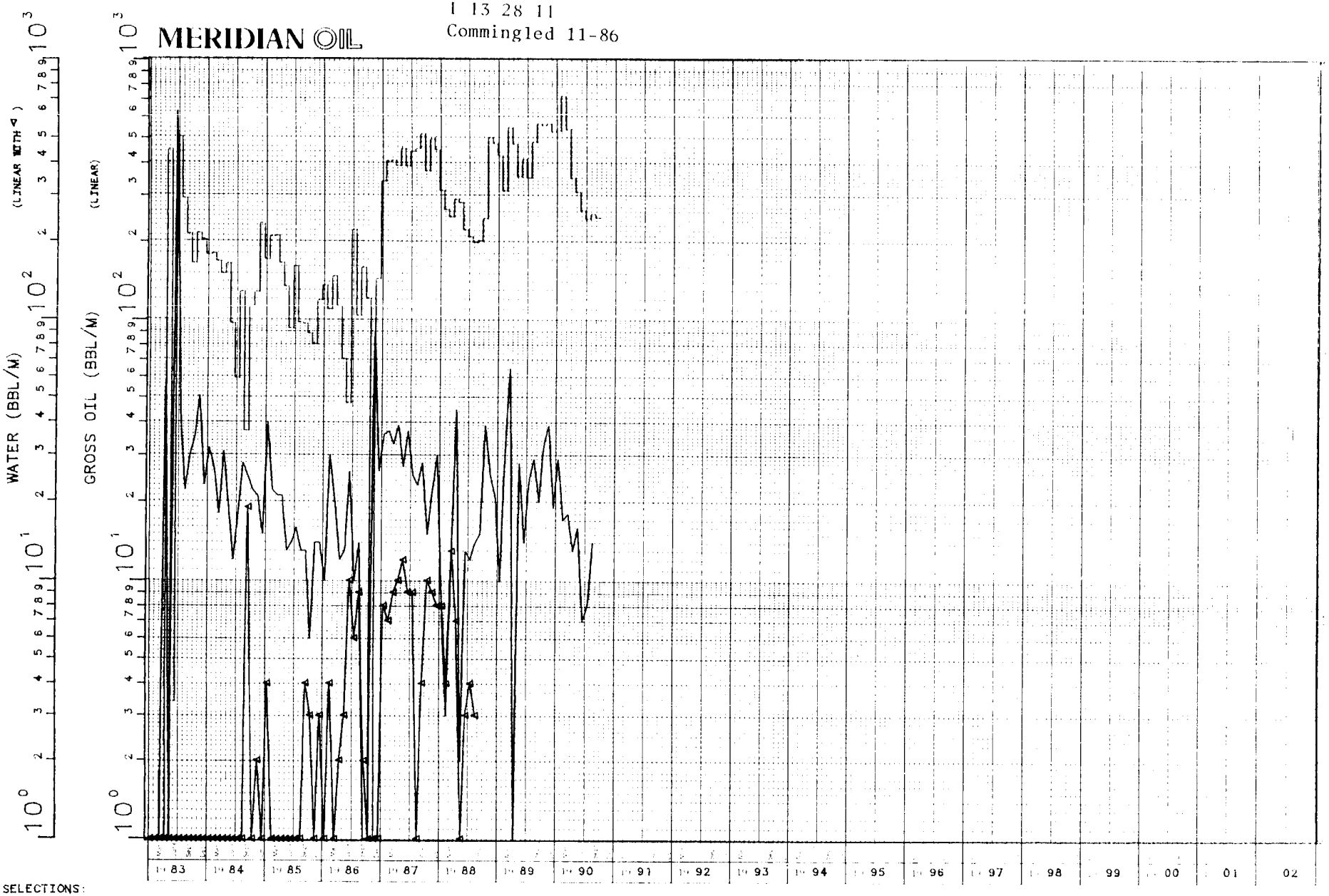
SELECTIONS:
OIL BY MONTH
GAS BY MONTH
WATER BY MONTH

DISTRICT
STATE
COUNTY
PROJECT NAME: ANGEL PEAK B #24E

DP-NO
WELL NAME & NO: PRODUCTION TOTALS
FIELD NAME
OPERATOR
PAGE NUMBER: 0000001-A

I 13 28 11
Commingled 11-86

MERIDIAN OIL



SELECTIONS:
OIL BY MONTH
GAS BY MONTH
WATER BY MONTH

MERIDIAN OIL

December 3, 1990

Bureau of Land Management
1235 La Plata Hwy.
Farmington, N. M. 87401

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their McClanahan #20E GAL/DK well located 1840' FNL 1660' FWL, Section 13 T28N R10W, N.M.P.M., San Juan County, New Mexico, in the Armenta Gallup and Basin Dakota.

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 the attached copy of this letter and returning it to this office.

Your prompt attention to this matter would be appreciated.

Yours truly,

P. M. Pippin
Sr. Production Engineer

PMP:pmp

The above downhole commingling request is hereby approved:

_____

Date:_____

Meridian Oil Inc., 3535 East 30th St., P.O. Box 4289, Farmington, New Mexico 87499-4289, Telephone 505-327-0251

Pertinent Data Sheet - McCLANAHAN #20E DK

Location: 1840'FNL 1660' FWL, SEC.13, T28N R10W, SAN JUAN COUNTY, N.M.

Field: Basin Dakota

Elevation: 5777'GL
12'KB

TD: 6634'
PBTD: 6588'

Completed: 11-13-80

GWI:
NRI:

Initial Potential:

DK: SICP= 1013 psi

Casing Record:

Hole Size	Csg. Size	Wt. & Grade	Depth Set	Cement	Top/Cmt.
12-1/4"	8-5/8"	24# K-55	208'	140 sx	circ. cmt
7-7/8"	5-1/2"	15.5# K-55	6634'	220 sx	5276'(CBL)
			Stg tool @ 4710'	240 sx	4685'(CBL)
			Stg tool @ 2193'	160 sx	1914'(CBL)

Tubing Record: 2-3/8" 4.7# J-55 6211' (201 jts)
S.N. @ 6180'

Formation Tops:

Ojo Alamo	1310'	Gallup	5442'
Fruitland	1715'	Greenhorn	6208'
Pictured Cliffs	1950'	Graneros	6267'
Mesaverde	3585'	Dakota	6386'
Point Lookout	4260'		

Logging Record: Induction, Density, CBL, TDT

Stimulation:
Perfed Dk w/1/spf @ 6329', 34', 93', 98', 6404', 09', 14', 45', 71', 84', 97'. Total 11 holes. Fraced w/74,800# sand in 30# gel.

Workover History: None

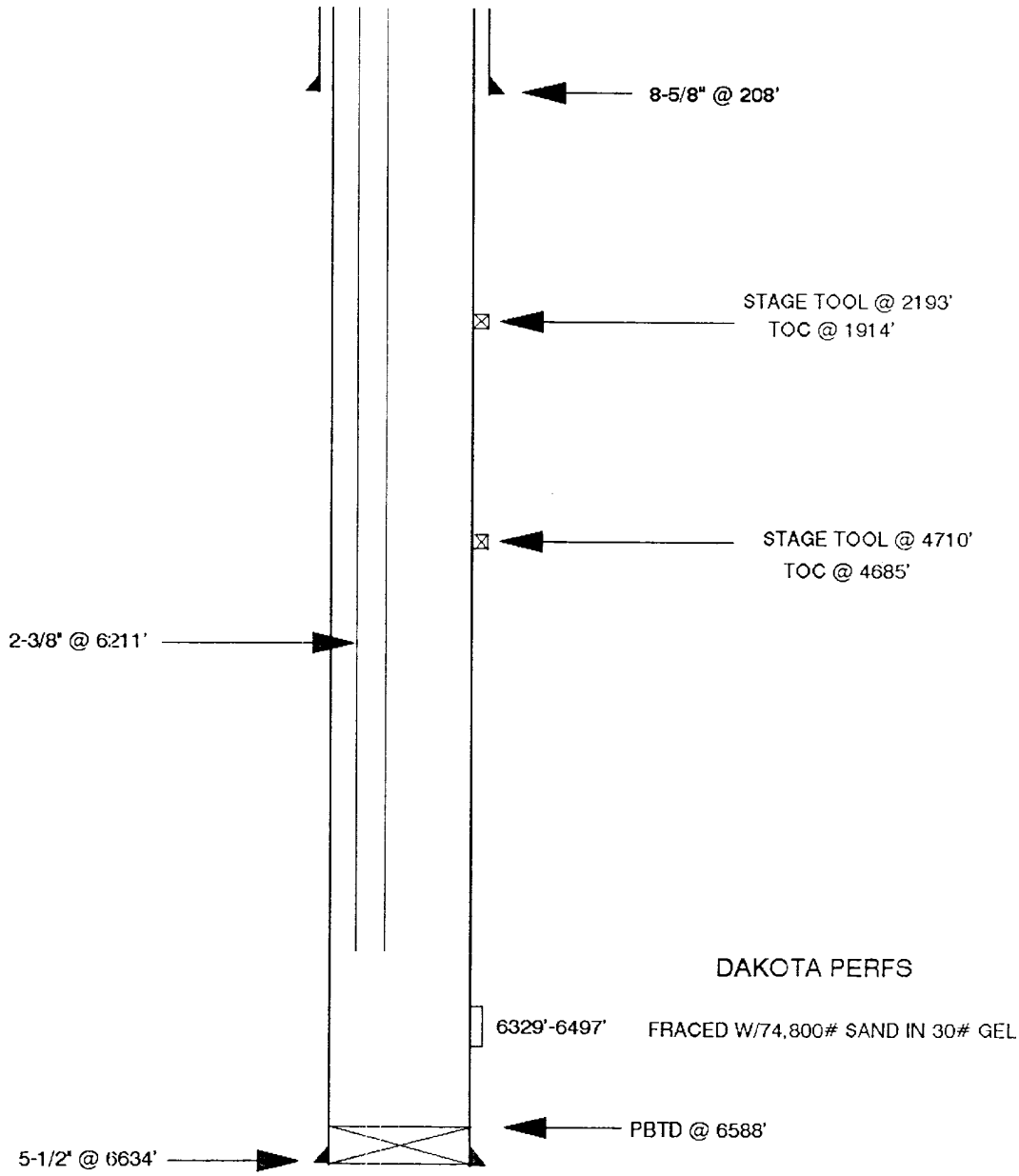
Production History: First delivered to SUG on 2-26-81. DK cum = 497 MMCF & 4,497 BO. See attached production curves. Cathodic protection installed 5-27-82.

McCLANAHAN #20E DK

UNIT F SECTION 13 T28N R10W

SAN JUAN COUNTY, NEW MEXICO

PRESENT

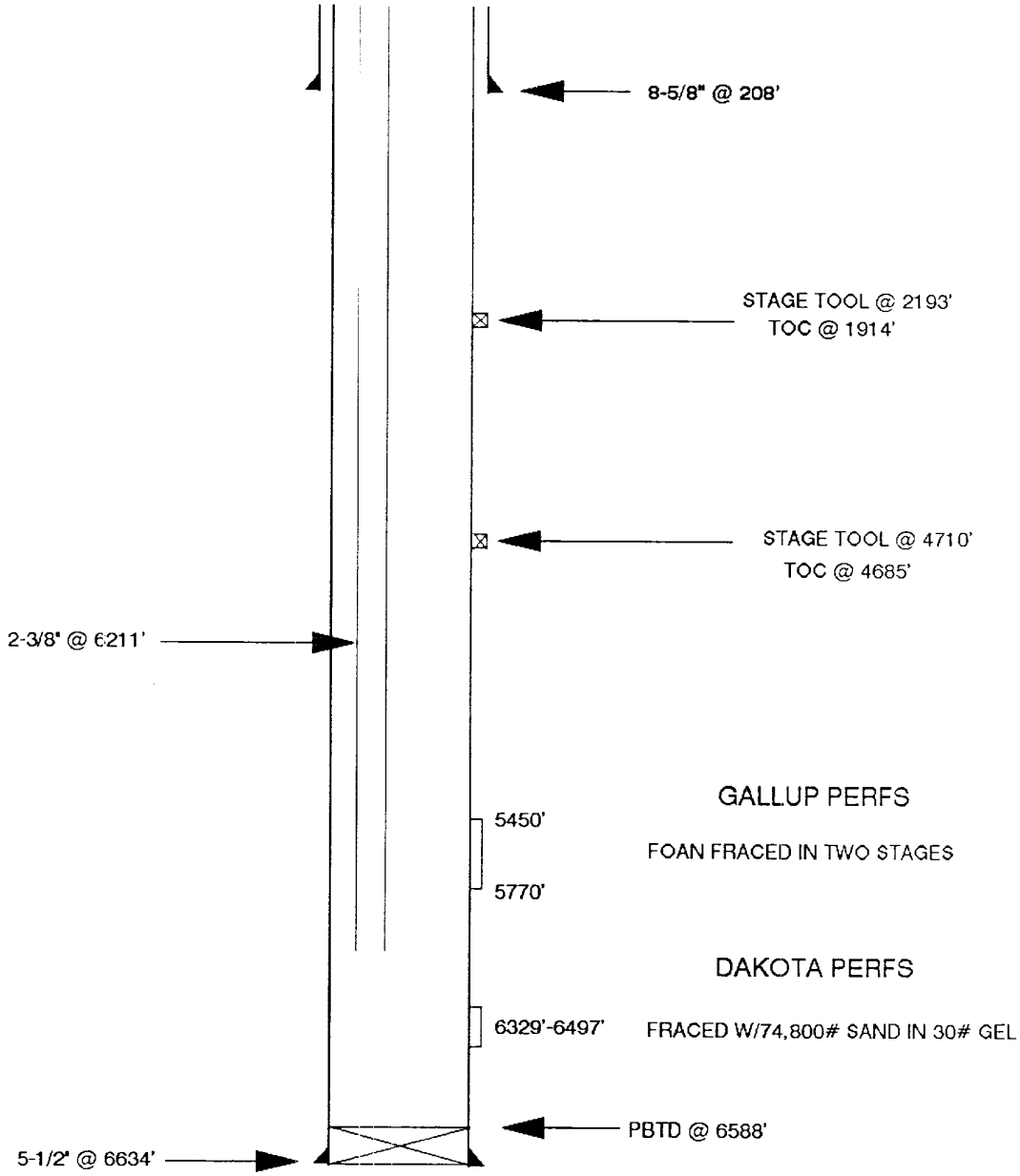


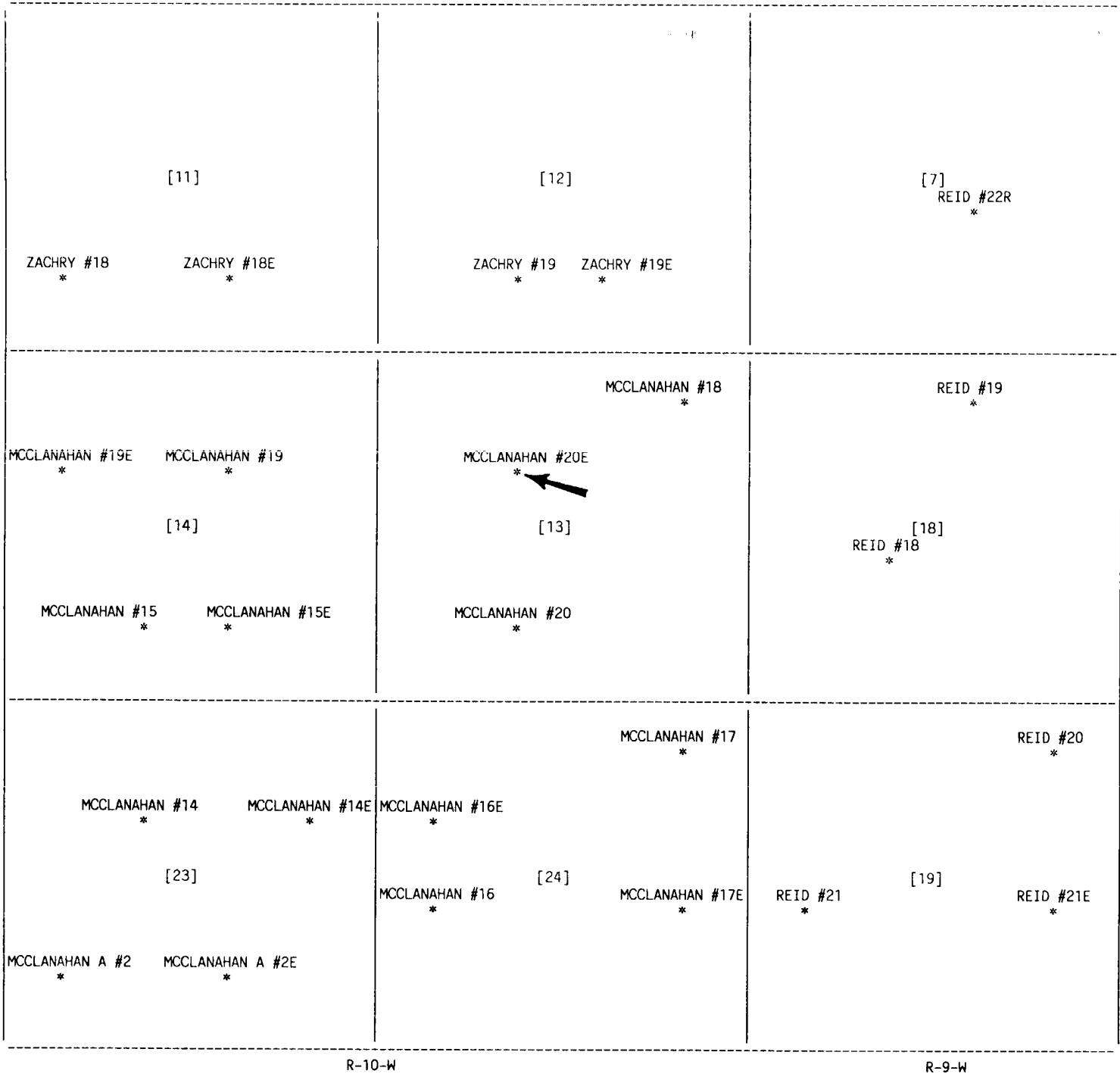
McCLANAHAN #20E DK

UNIT F SECTION 13 T28N R10W

SAN JUAN COUNTY, NEW MEXICO

AFTER COMMINGLING





DATE: OCTOBER 26, 1990

NAME: MCCLANAHAN #20E

FORM: DAKOTA

LOCATION
UNIT: F
SEC: 13
TWN: 28
RNG: 10

LEGEND

FIRST DELIVERY *
WELLNAME
IWHSIP-WHSIP-YEAR
MCF/D-Pwp FLOW-CUM (MMCF).
BTU CONTENT AS OF 8-1-90

MERIDIAN OIL
ZACHRY 41 - GALLUP
McCLANAHAN 20E - DAKOTA
LEASE FLUIDS

LABORATORY INVESTIGATION

OF

ZACHRY 41, MCCLANAHAN 20E

DAKOTA AND GALLUP FLUIDS COMPATIBILITY

OCTOBER 30, 1990

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

MERLABII

MERIDIAN OIL
ZACHRY 41 - GALLUP
McCLANAHAN 20E - DAKOTA
LEASE FLUIDS

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.

MERLABII

MERIDIAN OIL
ZACHRY 41 - GALLUP
McCLANAHAN 20E - DAKOTA
LEASE FLUIDS

On Tuesday, October 30, 1990, 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 Gallup and Dakota fluids in the McClanahan 20 E 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 McClanahan 20 E Dakota fluids with Zachry 41 Gallup 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

McCLANAHAN #20E DK

UNIT F SECTION 13 T28N R10W

SAN JUAN COUNTY, NEW MEXICO

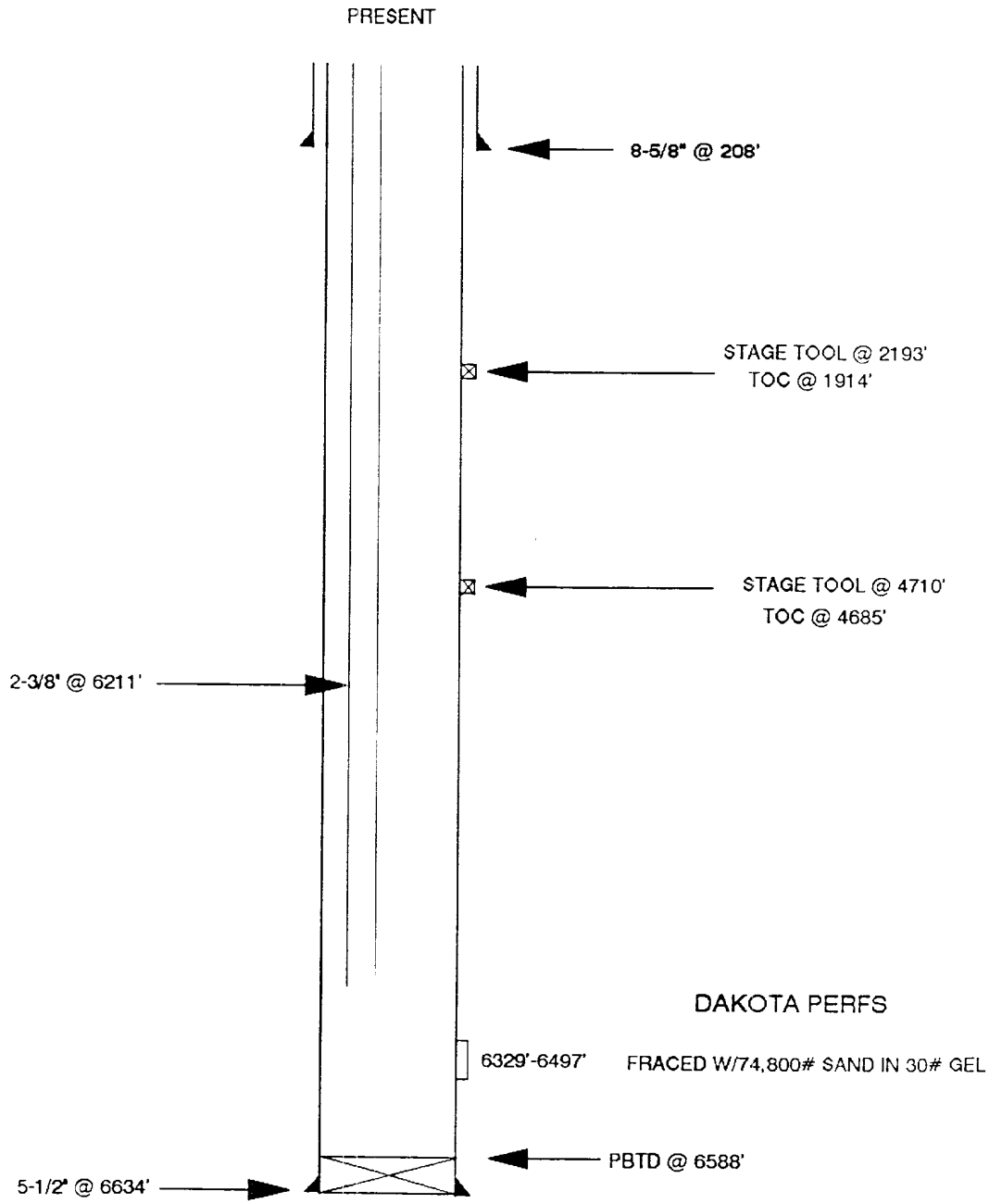


FIGURE 1

McCLANAHAN #20E DK

UNIT F SECTION 13 T28N R10W

SAN JUAN COUNTY, NEW MEXICO

AFTER COMMINGLING

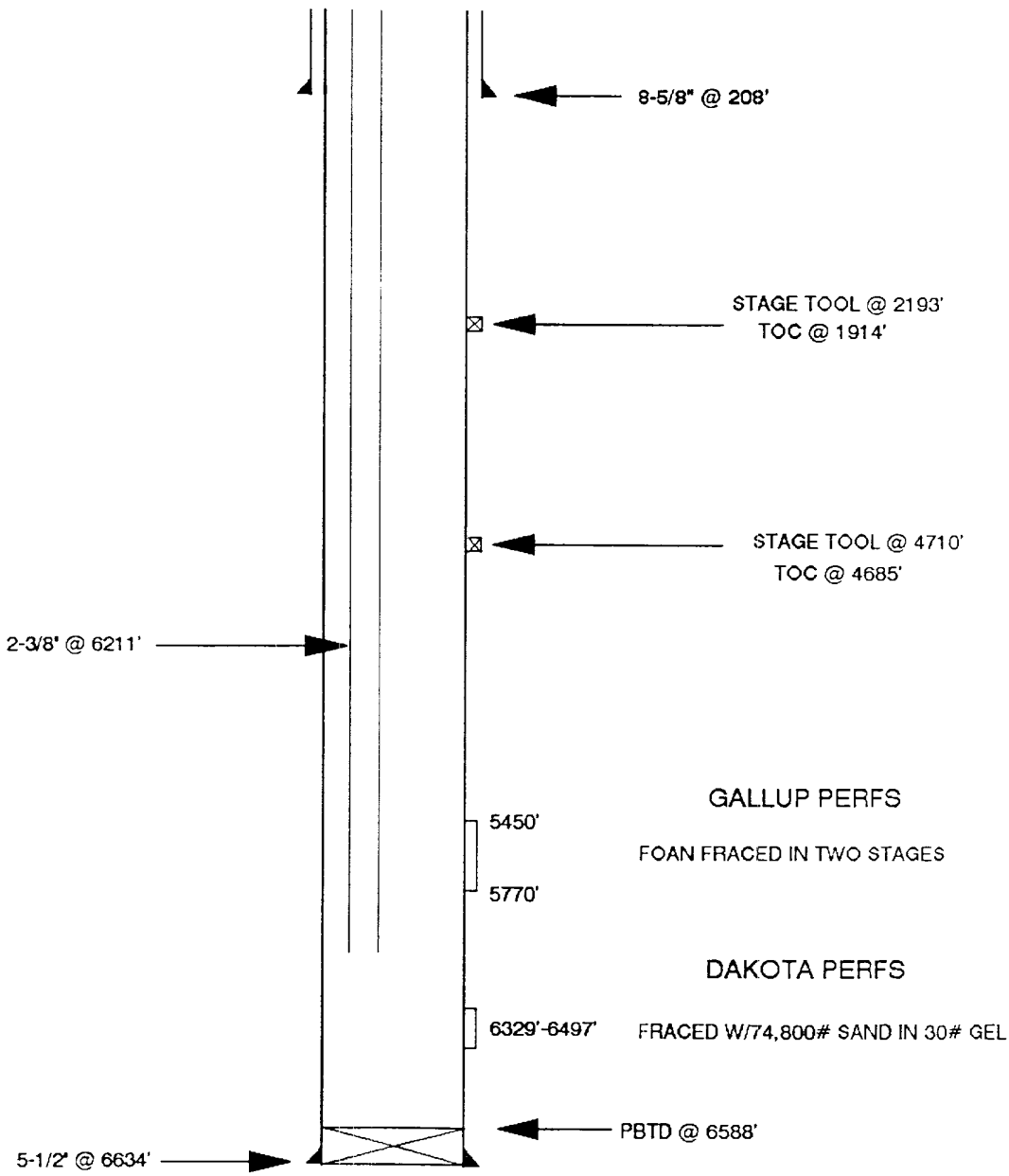


FIGURE 2

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
ZACHRY 41 - GALLUP
McCLANAHAN 20E - DAKOTA
LEASE FLUIDS

DATA

SAMPLE #1 - MCCLANAHAN 20 E	
ZONE	GALLUP
API GRAVITY @ 60° F	51.9°
CLOUD POINT	22° F*
POUR POINT	<18° F
PARAFFIN CONTENT	0%
SAMPLE #2 - ZACHRY 41	
ZONE	DAKOTA
API GRAVITY @ 60° F	41.90°
CLOUD POINT	50° F
POUR POINT	<18° F
PARAFFIN CONTENT	0.97%
SAMPLE #3 50:50 MIX OF FLUIDS	
ZONE	50:50 MIX GAL/DK
API GRAVITY @ 60° F	47.30°
CLOUD POINT	42°*
POUR POINT	<18° F
PARAFFIN CONTENT	.49%

*UNABLE TO ACCURATELY DETERMINE DUE TO THE DARK COLOR OF THE SAMPLE.

MERLABII

MERIDIAN
ZACHRY 41 - GALLUP
MCCLANAHAN 20E - DAKOTA
LEASE FLUIDS

CALCULATIONS

Cool down effects due to gas expansion:

Reference: Perry's Handbook of Chemical Engineering

RE: Adiabatic Expansion of Ethane, Methane

$$T_s + T_r \left(\frac{P_s}{P_r}\right) \left(\frac{K-1}{K}\right), \text{ where}$$

T_s = Surface Temperature

T_r = Reservoir Temperature

P_s = Surface Pressure

P_r = Reservoir Pressure

K = $\frac{\text{Specific heat at constant pressure}}{\text{Specific heat at constant volume}}$

Assumed values for maximum cool down due to gas expansion:

T_s = Unknown

T_r = 160° F

P_s = 500 psi

P_r = 2000 psi

K = 1.2

$$T_s = 160 \left(\frac{500}{2000}\right)^{0.1667}$$

T_s = 127°F

NOTE:

A total cooldown of 33° F would be expected

ANALYSIS NO. 54-18-90

FIELD RECEIPT NO. _____

API FORM 45-1

API WATER ANALYSIS REPORT FORM

Company	Sample No.	Date Sampled	
Meridian		10-29-90	@ 8:40 am

Field	Legal Description	County or Parish	State

Lease or Unit	Well	Depth	Formation	Water, B/D
	Zachry -41		Gallup	

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

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	247	10.74
Calcium, Ca	4	.22
Magnesium, Mg	3	.28
Barium, Ba	—	—
Potassium, K^+	5	.13

ANIONS		
Chloride, Cl	223	6.28
Sulfate, SO_4	8	.17
Carbonate, CO_3	0	0
Bicarbonate, HCO_3	300	4.92
OH	0	0

Total Dissolved Solids (calc.) 790

Iron, Fe (total) 4 ppm 0.0 ppm

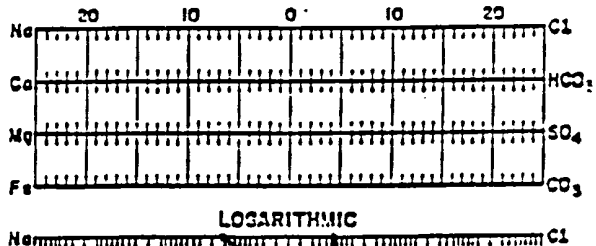
Sulfide, as H_2S neg

OTHER PROPERTIES

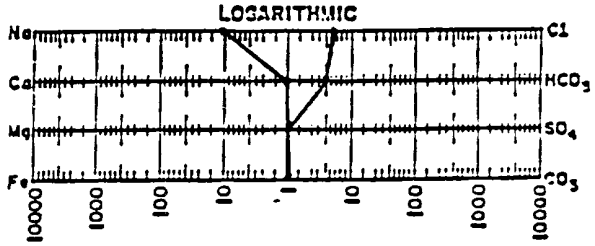
pH	7.21
Specific Gravity, 60/60 F.	1.004
Resistivity (ohm-meters) 76 F.	9.0
Total hardness	25

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

Analysis No. 54-06-90
Date 11-16-90

The Western Company

Oil Analysis

Operator Meridian
Well Zachry 41
Field
Formation Gallup
Depth
County
State

Date Sampled 10-29-90
Date Received 11-05-90
Submitted By Mike Pippin
Worked By LLee
Sample Description 187 ml dark brown oil + 1 ml free H_2O

API Gravity 41.9 ° at 60°F
*Paraffin Content .97 % by weight
*Asphaltene Content — % by weight
Pour Point <18 °F
Cloud Point ≈ 50 °F

Comments:

Cloud Point only an estimate due to dark color of sample.

Analyst LLee

*Report calculations and data on back.

11-16-90

Dark brown oil

Zachry #1 - Gallup

187 ml + .6% (≈ 1ml) free H_2O

S.G. = $\frac{8.12}{10.0}$ @ 71°F = .812

$\frac{141.5}{.812} - 131.5 = 42.761$ °API @ 71°F

Temp. Correction: 42.76 - .905 = 41.855 OR 41.9 °API @ 60°F

Funnel: 103.25 g	103.25
Watchglass + Papers: 73.51 g	73.53
F. Glass: 76.15 g	76.15
252.91 g	252.93 g

Sample: 2.07g

% Paraffin: $\frac{252.93 - 252.91}{2.07} \times 100 = .97\%$ Paraffin

Cloud Pt: ≈ 50°F

Pour Pt: < 18°F

Analysis No. 54-05-90
Date 11-12-90

The Western Company

Oil Analysis

Operator Meridian
Well McClanahan 20E
Field
Formation Dakota
Depth
County
State

Date Sampled 10-25-90
Date Received 11-05-90
Submitted By Mike Pippin
Worked By LLee
Sample Description 170 ml clear yellowish brown oil + 0% free H_2O.

API Gravity 51.9 ° at 60°F
*Paraffin Content 0 % by weight
*Asphaltene Content — % by weight
Pour Point <18 °F
Cloud Point 22 °F

Comments:

Analyst LLee

*Report calculations and data on back.

11-12-90

McClanahan 30E - Dakota

170 ml clear yellowish brown oil + 0% free H_2O

S.G = $\frac{7.64}{10.0}$ @ 78° = .764

$\frac{141.5}{.764} - 131.5 = 53.71$ °API @ 78°F

Temp. Correction: 53.71 - 1.81 = 51.9 °API @ 60°F

Funnel: 103.25 g — 103.25g

Watchglass + Papers: 73.52 g — 73.52g

E. Glass: 76.16 — 76.16g

252.93g — 252.93g

Sample: 2.01 g

Cloud Pt: 22°F

Pour Pt: <18°F

% Paraffin: $\frac{252.93 - 252.93}{2.01} \times 100 = 0\%$ Paraffin

Analysis No. S4-07-90
Date 11-20-90

The Western Company

Oil Analysis

Operator Meridian
Well McClanahan 20E / Zachry 41
Field
Formation Dakota / Gallup
Depth
County
State

Date Sampled 10-25-90 / 10-29-90
Date Received 11-05-90
Submitted By Mike Pippin
Worked By LLee
Sample Description 50:50 mix of McClanahan 20E oil & Zachry 41 oil

API Gravity 47.3 ° at 60°F
*Paraffin Content .49 % by weight
*Asphaltene Content — % by weight
Pour Point <18 °F
Cloud Point 42 °F

Comments:

Analyst LLee

*Report calculations and data on back.

11-20-90

50:50 mix (Zachry #1 : McClanahan 20E)

$\frac{7.87}{10.0}$ @ 70°F = .787

$\frac{141.5}{.787} - 131.5 =$ 48.297 °API @ 70°F

Temp. Correction: 48.30 − .966 = 47.3 °API @ 60°F

Funnel: 103.25 g	103.25 g
watchglass + Papers: 42.99	43.00 g
E. Glass: 76.16	76.16 g
222.4 g	222.41 g

Sample: 2.05g

% Paraffin: $\frac{222.41 - 222.4}{2.05} \times 100 =$ .49 % Paraffin

Cloud Pt: 42°F

Pour Pt: < 18°F

ANALYSIS #
DATE: 11-30-90

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

OPERATOR: Meridian
WELL: McClanahan 20E /
FIELD: Zachry 41
FORMATION: Dakota / Gallup
DEPTH:
COUNTY:

SUBMITTED BY: Mike Rippin
SOURCE OF SAMPLE:
DATE SAMPLED: 10-25-90 / 10-29-90
DATE RECEIVED: 11-05-90
API GRAVITY OF OIL: 47.3° API

TYPE & CONC. OF FLUID: 26% Dakota Oil,
~~TYPE & CONC. OF INHIBITOR~~: 28% Gallup Oil &
~~TYPE & CONC. OF SOLIDS~~: 46% Gallup water
TEST TEMPERATURE: 73°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	25	2		3		4		5		6		7		8	
2	2	43	3		4		5		6		7		8		9	
3	3	46	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)		46														
Vol. Emulsion / Sludge		0														
Solids*																
Interface**																
Vol. Sediment																

REMARKS: 26 ml Dakota McClanahan 20E oil + 28 ml Gallup Zachry 41 oil + 46 ml Gallup Zachry 41 water

* 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

KIOW

ZACHRY #48

PIERCE A #2E

34

ZACHRY #50

35

36

T 29 N

ZACHRY #31

ZACHR #

ZACHRY #34

ZACHRY #36

ZACHRY #28

ZACHRY #47

ZACHRY #49

ZACHRY #51

ZACHRY #52

10

ZACHRY #39

11

ZACHRY #37

12

ZACHRY #38

ZACHRY #42

ZACHRY #40

ZACHRY #56

ZACHRY #55

ZACHRY #54

ZACHRY #41

T 28 N

ZACHRY #35

EXISTING GALLUP WELL

PROPOSED GALLUP WELL

McCLANAHAN #20E

15

13

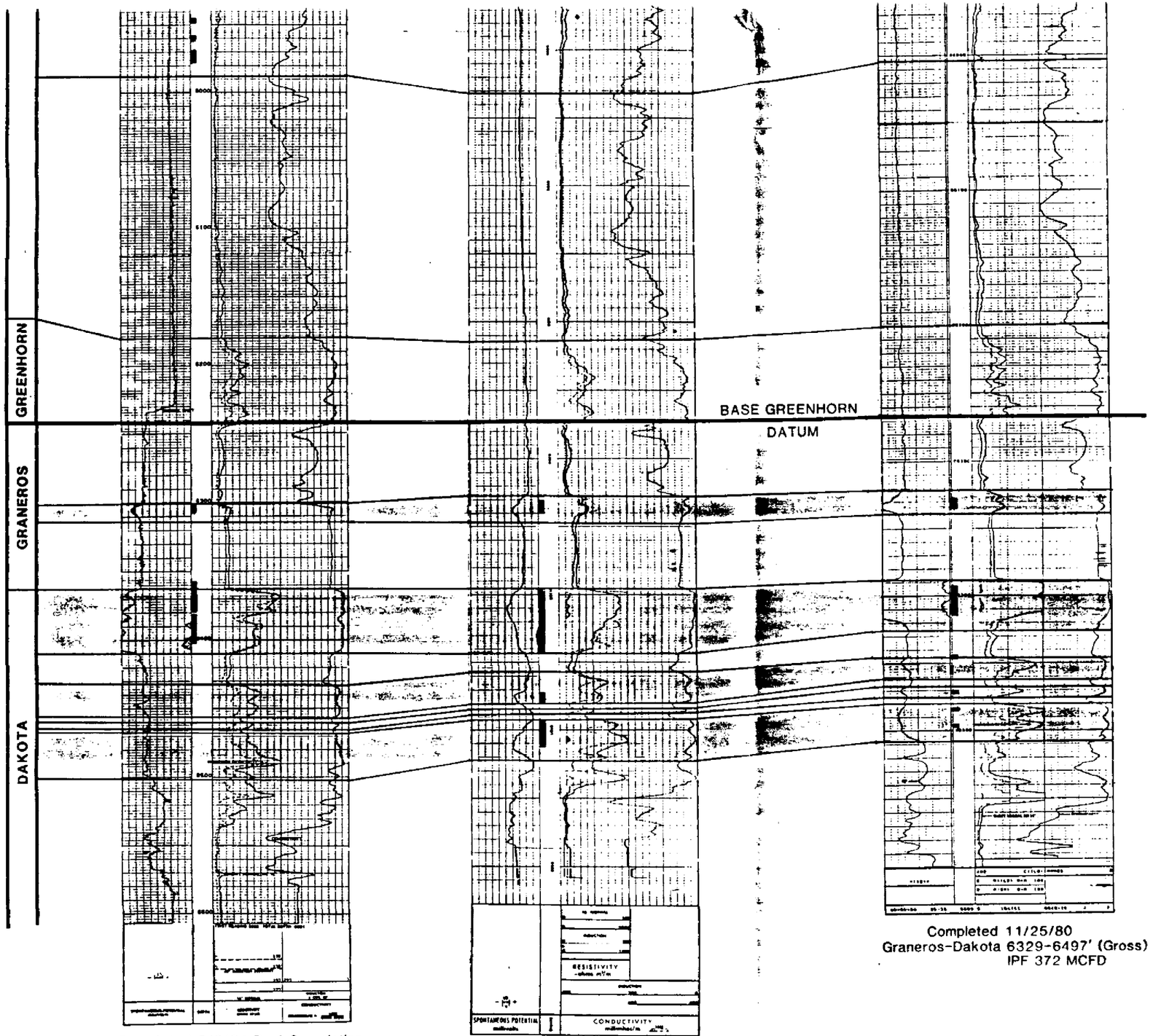
MERIDIAN OIL

ARMENTA GALLUP WELLS

SAN JUAN COUNTY, N. M.

COMMINGLE APPLICATION

McCLANAHAN #20E



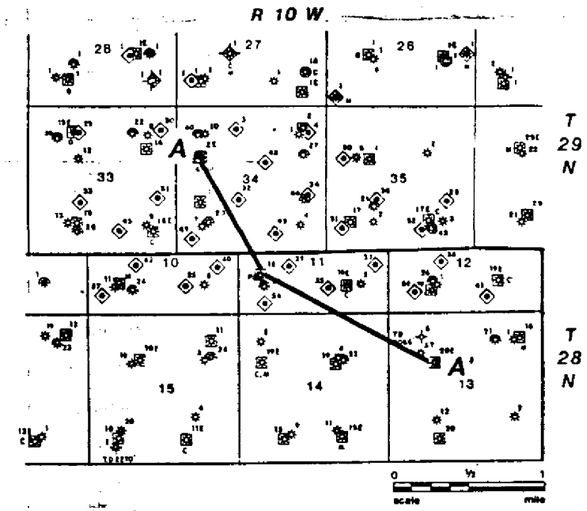
Completed 6/8/81 Dual Completion
Gallup 5417-5977' (Gross)
IPP 35 BO, 160 MCFD
Graneros-Dakota 6303-6402' (Gross)
IPF 548 MCFD

Commingled Gallup & Graneros-Dakota 2/90

Completed 1/3/62
Graneros-Dakota 6230-6412' (Gross)
IPF 5659 MCFD

OWWO - Completed 12/2/83
Pictured Cliffs 1844-1880'
Dakota 6230-6412' (Gross)
Dual Completion IPF 1599 MCFD

Completed 11/25/80
Graneros-Dakota 6329-6497' (Gross)
IPF 372 MCFD



MERIDIAN OIL

STRATIGRAPHIC CROSS-SECTION
GALLUP - DAKOTA INTERVALS
ARMENTA FIELD
T28 & 29N - R10W
SAN JUAN COUNTY, N. M.

K. Stewart-Hicks 10/90

NORTHWEST **A** — 4500' — 6800' — **A'** SOUTHEAST

MERIDIAN OIL INC.
PIERCE A NO. 2E
NW 34-29N-10W
SAN JUAN CO., N. M.
GL: 5632 KB: 5645
Resistivity Log

MERIDIAN OIL INC.
ZACHRY NO. 18
NW 11-28N-10W
SAN JUAN CO., N. M.
GL: 5642 KB: 5651
Resistivity Log

SOUTHLAND ROYALTY CO.
McCLANAHAN NO. 20-E
NW 13-28N-10W
SAN JUAN CO., N. M.
GL: 5777 KB: 5789
Resistivity Log

UPPER MANCOS

GALLUP

R. 10 W.

28 27 26