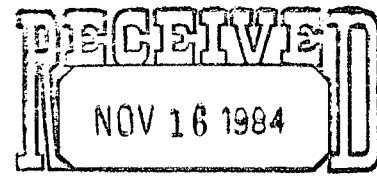


CERTIFIED MAIL

November 14, 1984



OIL CONSERVATION DIVISION
SANTA FE



Southland Royalty Company

Mr. Joe D. Ramey
New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

RE: Downhole Commingling
SRC - Hillstrom #3
NW/4, Section 35, T32N, R12W
San Juan County, New Mexico
Fruitland/Pictured Cliffs

Dear Mr. Ramey:

Southland Royalty Company requests permission to downhole commingle production from the Fruitland and Pictured Cliffs formations in this dual well. The Fruitland formation cannot continuously produce enough gas to lift the oil it produces. With the additional gas from the Pictured Cliffs formation, we feel that the Fruitland oil will be produced with fewer problems.

The gas produced from each zone is similar, and the Fruitland oil produced has no adverse effect on the Pictured Cliffs formation. Bottom hole pressures are similar for the two formations and there will be no crossflow between the zones, therefore no production will be lost.

Production allocation between the two zones was determined from the decline curves and cumulative production from each zone. Proposed allocation is as follows:

Oil Production	100% Fruitland	
Gas Production	95% Pictured Cliffs	71%
	5% Fruitland	29%

Royalty ownership in both zones of the well are identical. The well is currently producing and the deliverability tests were run in June 1984 and are included. In addition, copies of gas analysis from each zone, decline curves, production plats and miscellaneous data are included with this package for your information.

A copy of this application has also been sent to the Bureau of Land Management and all offset operators.

Sincerely,

Doug R. Harris
Petroleum Engineer

DRH/eg

P.O. DRAWER 570 (505) 325-1841 FARMINGTON, NEW MEXICO 87401

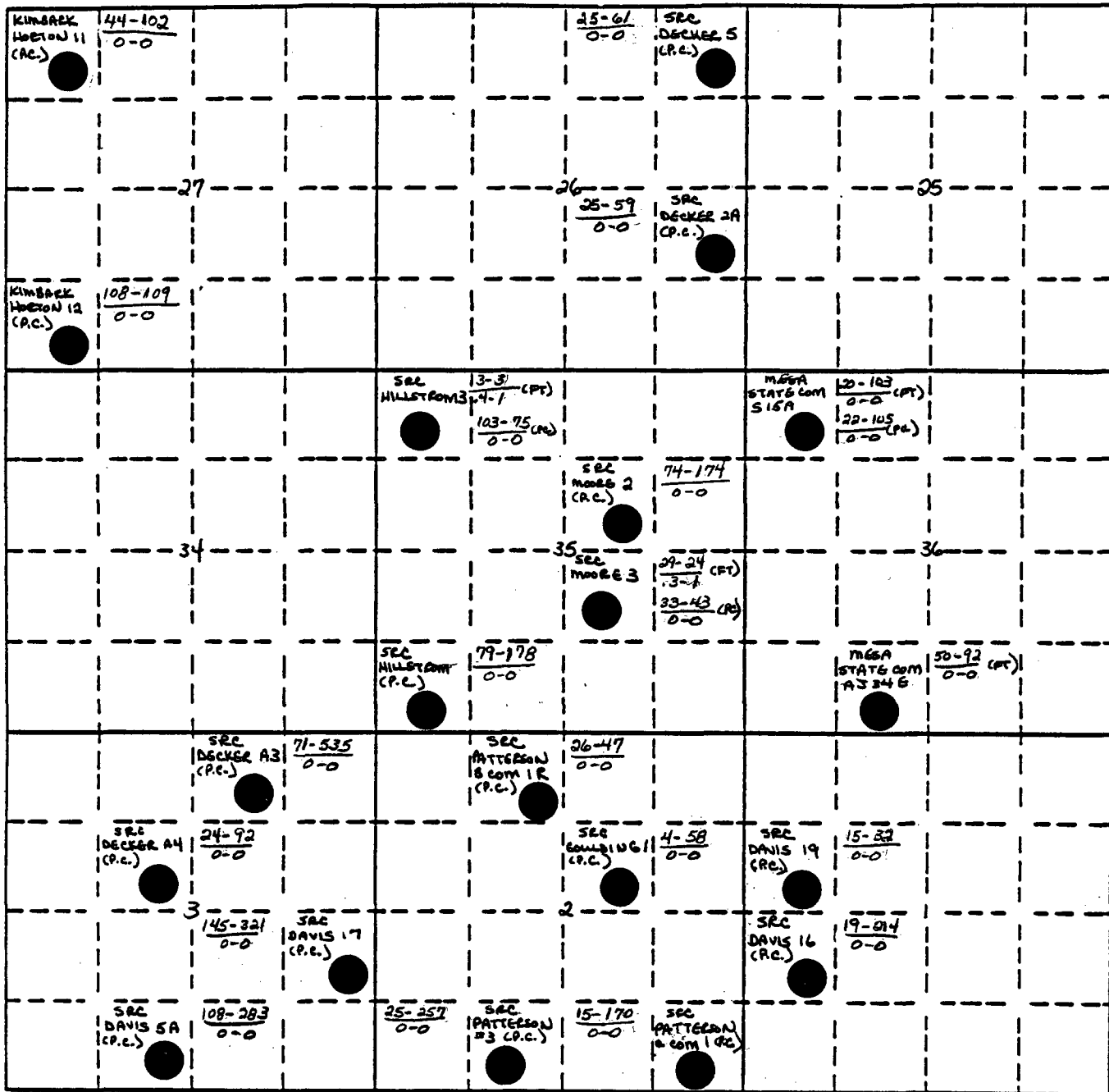
Attachments

MISCELLANEOUS DATA

HILLSTROM #3

Fruitland Bottom Hole Pressure	708 psi
Pictured Cliffs Bottom Hole Pressure	718
Fruitland Oil Gravity	47.8°
BTU/cf at 14.73/60°/Dry (Fruitland)	1287
BTU/cf at 14.73/60°/Dry (Pictured Cliffs)	1176

12W



32N

31N

S.R.C.

Kirby Oil &
offset operators.

SOUTHLAND ROYALTY COMPANY

HILLSTROM #3 (P.T. - P.C.)

LOCATION (35-32N-12W) SAN JUAN

TYPE OF MAP PRODUCTION

CONTOURED

C.I.

BY DATE REVISED BY DATE REFERENCE DATE

NOTES

MCFO-MMCF to 1-84
BOPD-MBO

GAS ANALYSIS: TRANSCRIPTION OF TAPE FROM AUTOMATIC CHROMATOGRAPH

1

NAME/LOCATION: 11/15/82
STREAM NO. 4

STATION NO. 929710

SPECIFIC GRAVITY 0.7338 BTU/CF 14.73/60F/DRY: 1286.6

COMPONENT	MOL %	G.P.M.
CARBON DIOXIDE	0.143	0.0000
NITROGEN	0.401	0.0000
METHANE	79.560	0.0000
ETHANE	8.350	2.2340
PROPANE	7.981	2.1970
ISOBUTANE	1.258	0.4110
N-BUTANE	1.468	0.4630
ISOPENTANE	0.288	0.1050
N-PENTANE	0.225	0.0810
HEXANE +	0.343	0.1510
TOTAL	100.017	5.6420

WELL # 9297-10/803 DUE: 9/00/82
NAME: HILLSTROM 003 FRT
RUN# 302 FREQ: 12 LAST BTU:
DATE PULLED: 11/15/82 STREAM: 2
DATE TESTED: 11/17/82 TIME: 0

*****NEW WELL-HEAD STATION*****

BTU MASTER WELL NO. 9297-10
NAME ON BTU MASTER HILLSTROM 3
LAST TEST DATE ON MASTER 00/00/00
BTU FROM THAT TEST 0
TEST FREQUENCY 12

TEST RUN: 15:49 17/11/82

(ECBTU/074)

SEE ~~TWO~~ RUN 14:11 & 15:58

1

SOUTHERN UNION GATHERING COMPANY
REPORT OF BTU TEST RESULTS

TO: SOUTHLAND ROYALTY CO (826)

REF: HILLSTROM 3 PC
9329
NORTHWEST NEW MEXICO (70)

DATE OF THIS TEST: 6/14/84
DATE OF LAST TEST: 5/16/83
TEST FREQUENCY: NOT SPECIFIED

RESULTS: SPECIFIC GRAVITY: 0.6646
BTU/CF @ 14.73/60F/DRY: 1176.0

	MOL %	G. P. M.
CARBON DIOXIDE	0.143	0.0000
NITROGEN	0.347	0.0000
METHANE	86.480	0.0000
ETHANE	7.410	10.9820
PROPANE	3.478	0.9570
ISOBUTANE	0.633	0.2070
N-BUTANE	0.814	0.2560
ISOPENTANE	0.285	0.1040
N-PENTANE	0.185	0.0670
HEXANE +	0.240	0.1050
	-----	-----
TOTAL	100.015	12.6780

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENTP. O. BOX 2088
SANTA FE, NEW MEXICO 87501Form C-122-A
Revised 10-1-78WELL DELIVERABILITY TEST REPORT FOR 19 84

POOL NAME Glades	POOL SLOPE n = .85	FORMATION Fruitland	COUNTY San Juan
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COMPANY Southland Royalty Company			WELL NAME AND NUMBER Hillstrom #3		
UNIT LETTER D	SECTION 35	TOWNSHIP 32N	RANGE 12W	PURCHASING PIPELINE Southern Union Gathering	
CASING O.D. - INCHES 4.5000	CASING I.D. - INCHES 4.0520	SET AT DEPTH - FEET 2999	TUBING O.D. - INCHES	TUBING I.D. - INCHES	TOP - TUBING PERF. - FEET
GAS PAY ZONE FROM 2430 TO 2602		WELL PRODUCING THRU CASING X TUBING		GAS GRAVITY .669	GRAVITY X LENGTH 1626
DATE OF FLOW TEST FROM 6-12-84 TO 6-19-84			DATE SHUT-IN PRESSURE MEASURED 6-26-84		

PRESSURE DATA - ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c - Item d)	(f) Friction Loss (a - c) or (b - c)	(g) Average Meter Pressure (Integr.)
450		450	451	-1	+0	429
(h) Corrected Meter Pressure (g + e)	(i) Avg. Wellhead Press. $P_i = (h + f)$	(j) Shut-in Casing Pressure (DWt)	(k) Shut-in Tubing Pressure (DWt)	(l) $P_c =$ higher value of (j) or (k)	(m) Del. Pressure $P_d =$ <u>80</u> % P_c	(n) Separator or Dehydrator Pr. (DWt) for critical flow only
428	428	608		608	486	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume - MCF/D	Quotient of $\frac{\text{Item c}}{\text{Item d}}$	$\sqrt{\frac{\text{Item c}}{\text{Item d}}}$	Corrected Volume
2	.9977	.9988	Q = 2 MCF/D

WORKING PRESSURE CALCULATION

$(1 - e^{-n})$	$(P_c Q_m)^2 (1000)$	$R^2 = (1 - e^{-n}) (P_c Q_m)^2 (1000)$	P_i^2	$P_w^2 = P_i^2 + R^2$	$P_w = \sqrt{P_w^2}$
.112	.0087	.0010	183184	183184	428

DELIVERABILITY CALCULATION

$D = Q \left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2} \right]^n =$	2	$\left[\frac{133468}{186480} \right]^n =$	.7157	$=$	.7525	$=$	2	MCF/D
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REMARKS:

SUMMARY

Item h	428	Psia
P_c	608	Psia
Q	2	MCF/D
P_w	428	Psia
P_d	486	Psia
D	2	MCF/D

Company Southland Royalty Company

By R. E. Field

Title District Manager

Witnessed By

Company

SEP 24 1984

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 19 84

Form C122-A
 Revised 8-77

POOL NAME BLANCO PC	POOL SLOPE n = .85	FORMATION PICTURED CLIFFS	COUNTY SAN JUAN
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COMPANY SOUTHLAND ROYALTY			WELL NAME AND NUMBER HILLSTROM 3		
UNIT LETTER D	SECTION 35	TOWNSHIP 32N	RANGE 12W	PURCHASING PIPELINE SOUTHERN UNION GATHERING	
CASING O.D. - INCHES 4.5000	CASING I.D. - INCHES 4.0520	SET AT DEPTH - FEET 2999	TUBING O.D. - INCHES 1.9000	TUBING I.D. - INCHES 1.6100	TOP - TUBING PERF. - FEET 2838
GAS PAY ZONE FROM 2694 TO 2873		WELL PRODUCING THRU CASING TUBING X		GAS GRAVITY .662	GRAVITY X LENGTH 1879
DATE OF FLOW TEST FROM 06/12/84 TO 06/19/84			DATE SHUT-IN PRESSURE MEASURED 06/26/84		

PRESSURE DATA - ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWI) 00	(b) Flowing Tubing Pressure (DWI) 451	(c) Flowing Meter Pressure (DWI) 449	(d) Flow Chart Static Reading 451	(e) Meter Error (Item c - Item d) 2-	(f) Friction Loss (a-c) or (b-c) 2+	(g) Average Meter Pressure (Integr.) 444
(h) Corrected Meter Pressure (g+e) 442	(i) Avg. Wellhead Press. $P_i = (h+f)$ 444	(j) Shut-in Casing Pressure (DWI) 00	(k) Shut-in Tubing Pressure (DWI) 610	(l) P_c = higher value of (i) or (k) 610	(m) Del. Pressure $P_d = 80 \times P_c$ 488	(n) Separator or Dehydrator P_r (DWI) for critical flow only _____

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume - MCF/D 42	Quotient of $\frac{\text{Item c}}{\text{Item d}}$.9955	$\sqrt{\frac{\text{Item c}}{\text{Item d}}}$.9977	Corrected Volume Q = 42 MCF/D
--	---	--	---

WORKING PRESSURE CALCULATION

(10^{-3}) .128	$(F_c Q_m)^2 (1000)$ 478	$R^2 = \frac{1}{(10^{-3}) (F_c Q_m)^2 (1000)}$ 61	P_i^2 197,136	$P_w^2 = P_i^2 + R^2$ USE PT2	$P_w = \sqrt{P_i^2}$ 444
----------------------------	------------------------------------	---	---------------------------	---	------------------------------------

DELIVERABILITY CALCULATION

$D = Q \left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2} \right]^n =$ 42	$\left(\frac{133,956}{174,964} \right)^n =$.7656	$=$.7969	$=$ 33 MCF/D
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REMARKS:

SUMMARY

Item h **442** Psia
 P_c **610** Psia
 Q **42** MCF/D
 P_w **444** Psia
 P_d **488** Psia
 D **33** MCF/D

Company **SOUTHLAND ROYALTY**
 By **R. E. F. [Signature]**
 Title **DISTRICT PRODUCTION MANAGER**
 Witnessed By _____
 Company _____

SEP 24 1984

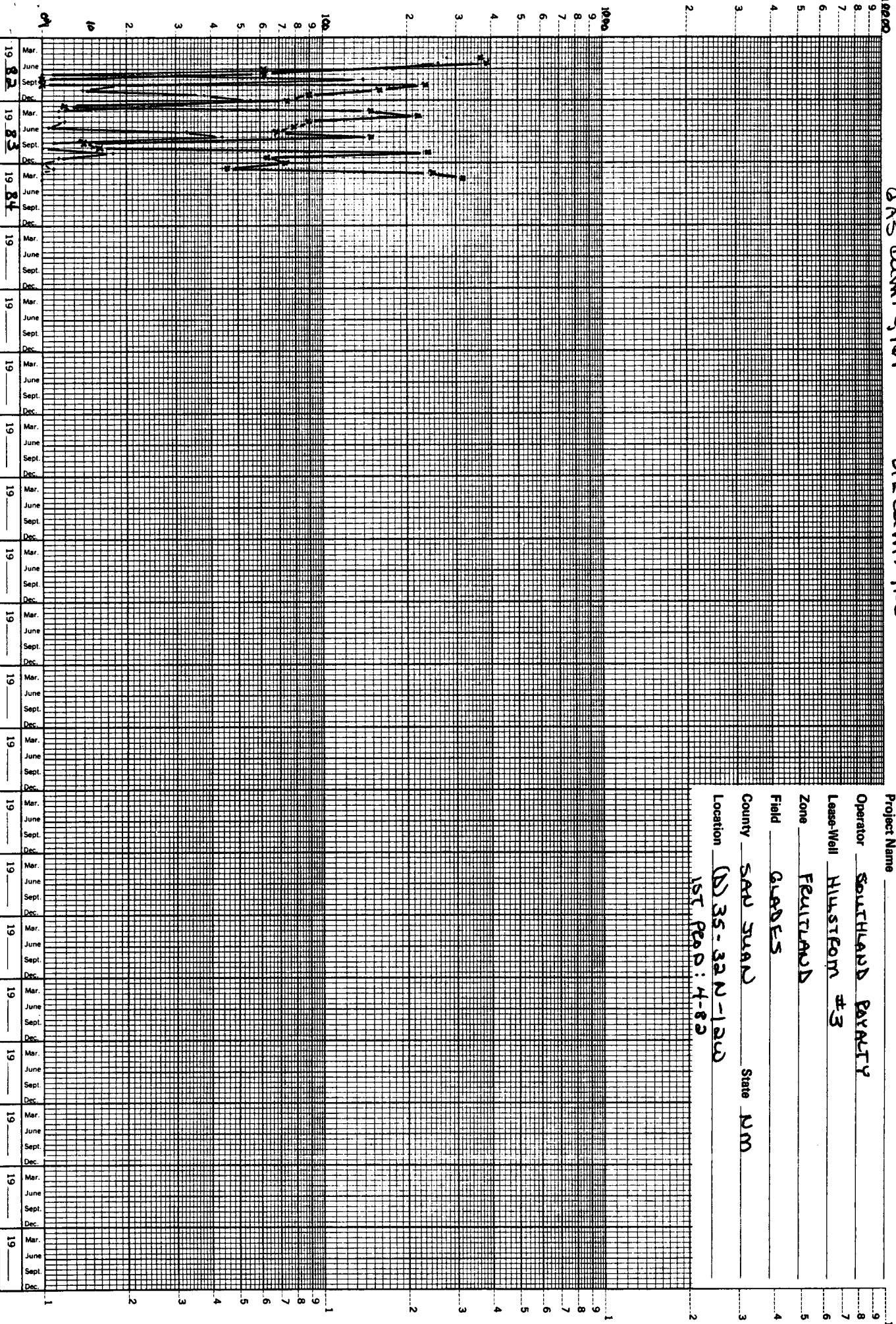


Southland Royalty Company

X-X GAS
- - - OIL

GAS cum: 3,161

OIL cum: 1,100



Project Name _____

Operator SOUTHLAND RYALTY

Lease Well HILSTROM #3

Zone FRUITLAND

Field GLADES

County SAN JUAN State NM

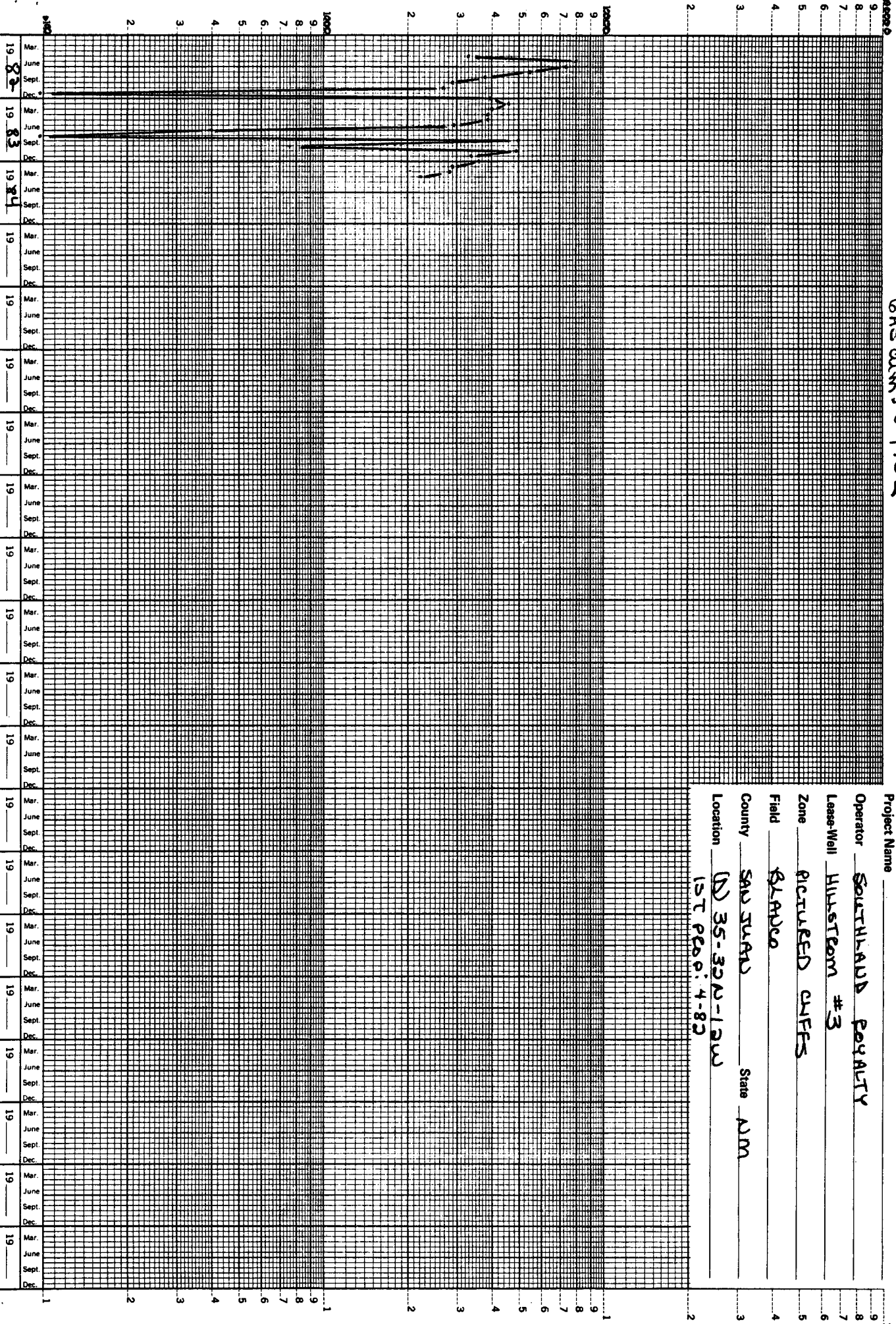
Location (B) 35-32N-12W

1st PERD: 4-82



Southland Royalty Company

GAS cum: 83,162



Project Name

Operator SOUTHLAND ROYALTY

Lease Well HILSTROM #3

Zone PICTURED MFFS

Field BLADCO

County SAN JUAN State NM

Location 100 35-32N-12W

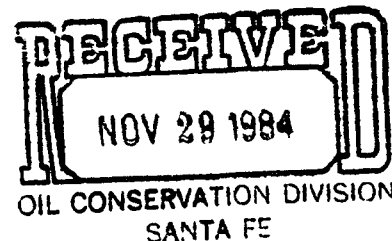
100 35-32N-12W



Southland Royalty Company

November 27, 1984

Mr. Dave Catanach
New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

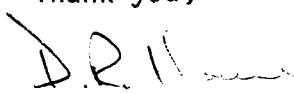


Re: Downhole Commingling
SRC - Hillstrom #3 and Chamberlain #2
San Juan County, New Mexico
Fruitland/Pictured Cliffs

Dear Dave,

As per our telephone conversation on 11-16-84, a five day production test was run on the subject wells and is attached. If you need any more information, please feel free to contact me on this matter.

Thank you,


D. R. Harris
Area Engineer

DRH/bgw

5 Day Deliverability Test

Hillstrom #3 - Blanco Pictured Cliffs

"D" 35-32-12

11-17-84	94 MCF/D	79%
11-18-84	97 MCF/D	73%
11-19-84	131 MCF/D	72%
11-20-84	65 MCF/D	65%
11-21-84	99 MCF/D	67%
		<u>71% Avg.</u>

Hillstrom #3 - Glades Fruitland

"D" 35-32-12

11-17-84	24 MCF/D	21%
11-18-84	33 MCF/D	27%
11-19-84	52 MCF/D	28%
11-20-84	35 MCF/D	35%
11-21-84	49 MCF/D	33%
		<u>29% Avg.</u>

Chamberlain #2 - Blanco Pictured Cliffs

"A" 14-32-12

11-17-84	73 MCF/D	N/A
11-18-84	159 MCF/D	79%
11-19-84	131 MCF/D	81%
11-20-84	94 MCF/D	85%
11-21-84	104 MCF/D	85%
		<u>82.5% Avg.</u>

Chamberlain #2 - Undesignated Fruitland

"A" 14-32-12

11-17-84	0 MCF/D	N/A
11-18-84	42 MCF/D	21%
11-19-84	30 MCF/D	19%
11-20-84	17 MCF/D	15%
11-21-84	17 MCF/D	15%
		<u>17.5% Avg.</u>



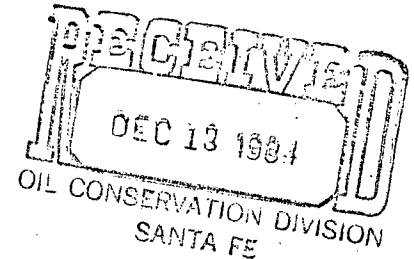
STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

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

OIL CONSERVATION DIVISION
BOX 2088
SANTA FE, NEW MEXICO 87501

DATE Dec. 7, 1984

RE: Proposed MC _____
Proposed DHC ✓ _____
Proposed NSL _____
Proposed SWD _____
Proposed WFX _____
Proposed PMX _____



Gentlemen:

I have examined the application dated 11/14/84
for the Southland Royalty Co. Wellbore #3 D-35-32N-12W
Operator Lease and Well No. Unit, S-T-R

and my recommendations are as follows:

Approve

Yours truly,

Frank J. Cherry