Case No.

1596

Large Exhibits
MISSING

Case No.

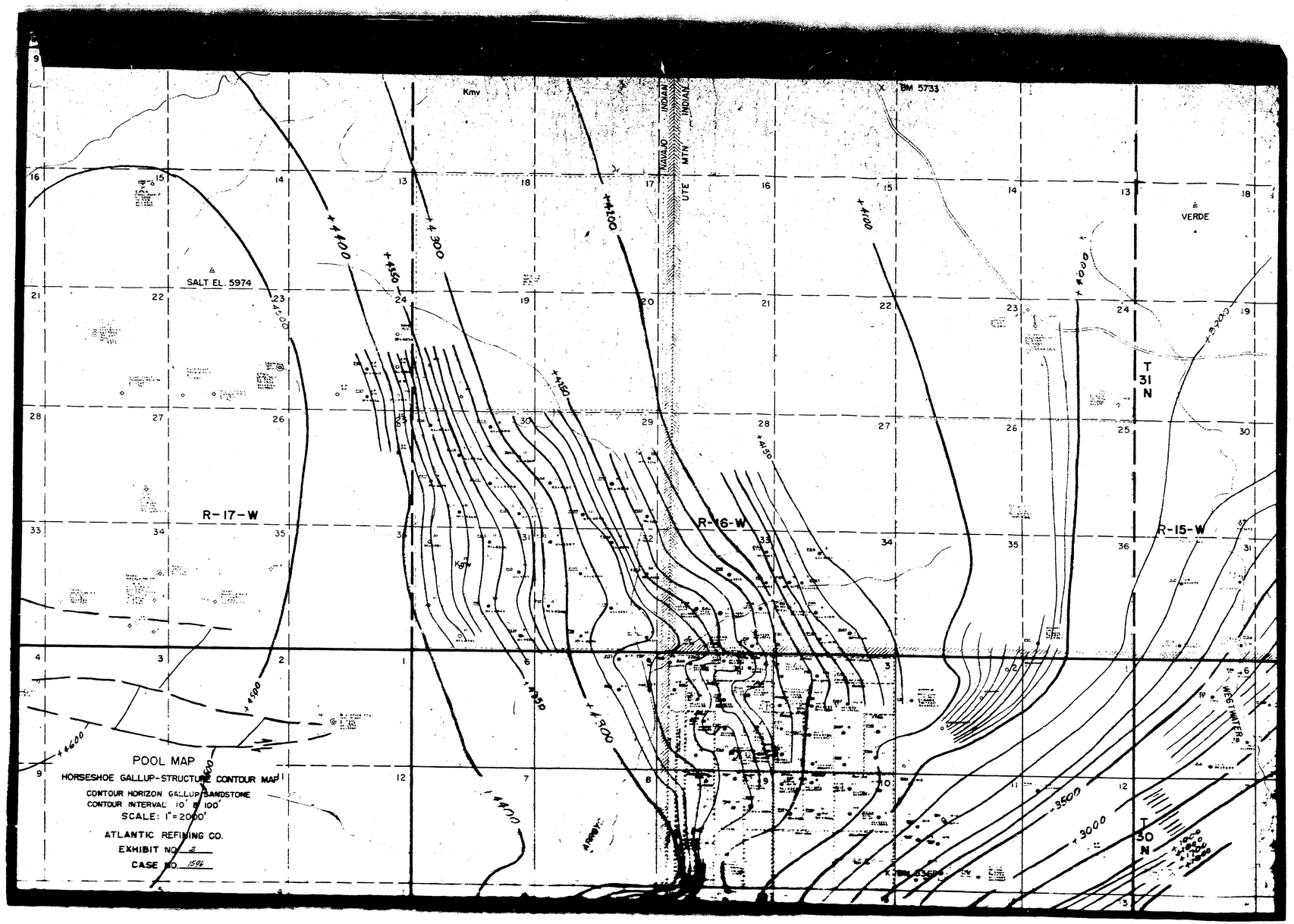
~~5596~~

72

Large Exhibits
MISSING

CASE 1596: El Paso Nat. Gas Co. application for establishment of 2 common sources of supply, administrative procedure for DC's & commingling, Horseshoe-Gallup Field.

109


SALT EL. 5974
BM 5733
VERDE
NAVAJO INDIAN
UTE INDIAN
MTN
R-17-W
R-16-W
R-15-W
T 31 N
T 30 N
WEST WATER
+4100
+4200
+4300
+4400
+4500
+4600
+4700
+4800
+4900
+5000
+3500
+3000
POOL MAP
HORSESHOE GALLUP-STRUCTURE CONTOUR MAP
CONTOUR HORIZON GALLUP SANDSTONE
CONTOUR INTERVAL 10' & 100'
SCALE: 1"=2000'
ATLANTIC REFINING CO.
EXHIBIT NO. 2
CASE NO. 1594

SW

C

C'

NE

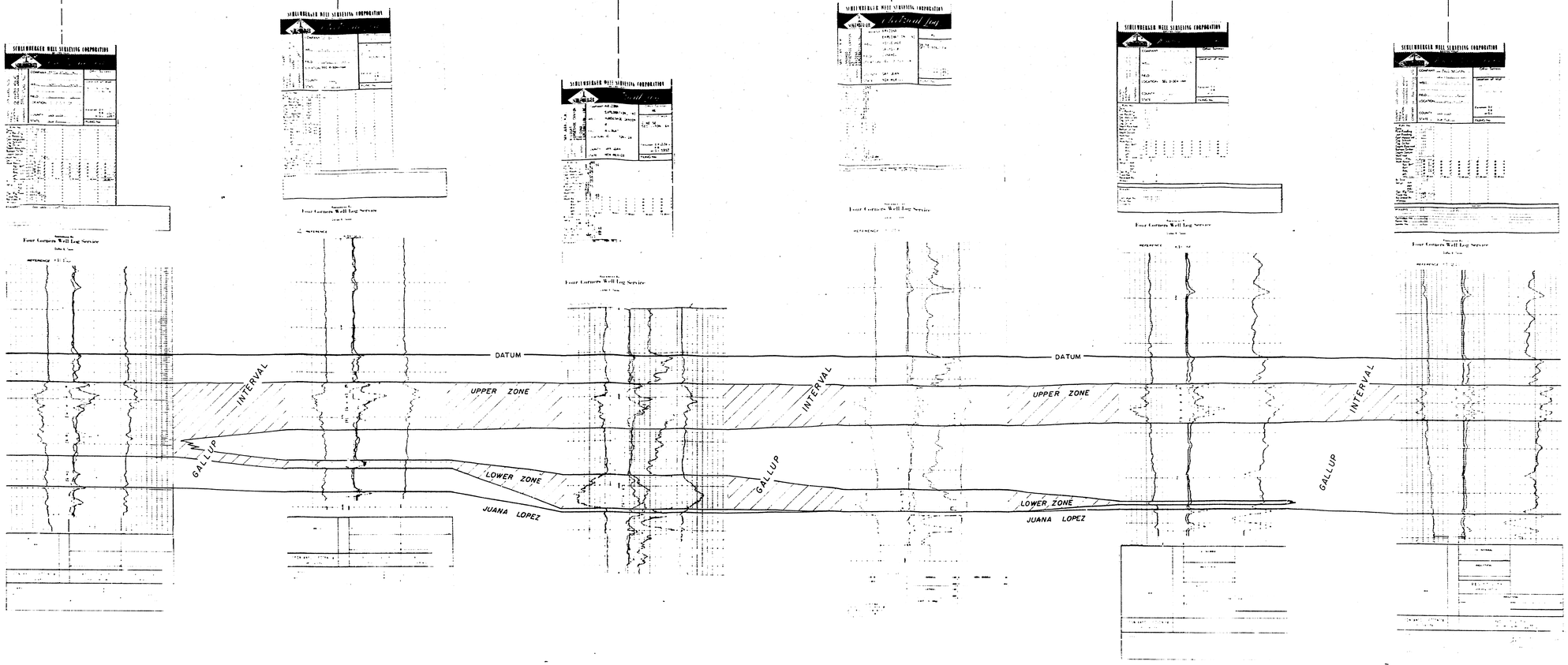
80 ac.

40 ac.

40 ac.

80 ac

80 ac



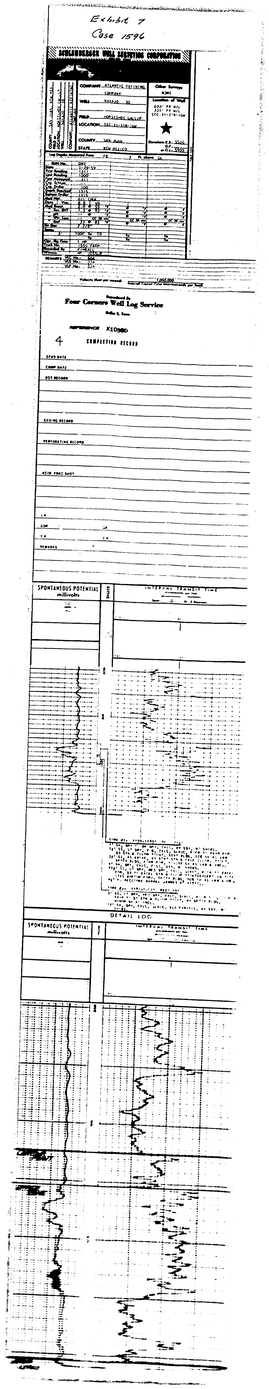
CROSS SECTION C - C'
[illegible] FIELD
SHOWING GALLUP INTERVAL
San Juan Co., New Mexico

Vertical Scale: 1" = 100'
Geologist: D. Jennings - Jan 1959
Drafted by: J. Irvin & R. Williams

THE ATLANTIC REFINING CO
EXHIBIT NO. ____
CASE NO. ____

110

Exhibit 7
Case 1596



111

SPONTANEOUS POTENTIAL
millivolts
INTERVAL TRANSIT TIME
microseconds per foot
DETAIL LOG

112

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Sonic Log

COMPANY ATLANTIC REFINING COMPANY
WELL NAVAJO 32
FIELD HORSESHOE GALLUP
LOCATION SEC. 31-31N-16W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Surveys
NONE

Location of Well
NEW MEXICO
6th. P.M.
E 17 B

Elevation: K.B. [illegible]
D.F.
or G.L.

COUNTY SAN JUAN NEW MEX.
FIELD HORSESHOE GALLUP
LOCATION NAVAJO 32
WELL
COMPANY ATLANTIC REFINING

Log Depths Measured From KB 7 Ft. above G.L.

	RUN No.			
Date				
First Reading				
Last Reading				
Feet Measured				
Cdg. Schlum.				
Cdg. Driller				
Depth Reached				
Bottom Driller				
Mud Mat.				
Dens.	Visc.			
Mud Resist.				
Res. BHT				
pH				
Wtr. Loss		CC 30 min	CC 30 min	CC 30 min
Mud Resist.				
Bit Size				
Spac.				
	To	To	To	To
Opr. Rig Time				
Truck No.				
Recorded By				
Witness				

Received
Oil Cons. Division
Santa Fe, New Mexico
DEC 15 1958
DATE

1,000,000
Interval transit time (microseconds per foot)
Velocity (feet per second)

REMARKS
VIC No.
VIS No.
VIP No.

INTERVAL TRANSIT TIME
microseconds per foot
Scale 3
Fr. 2 Revolvers

DEPTHS 1100 1200 1300

SPONTANEOUS POTENTIAL
millivolts

1 SPACING

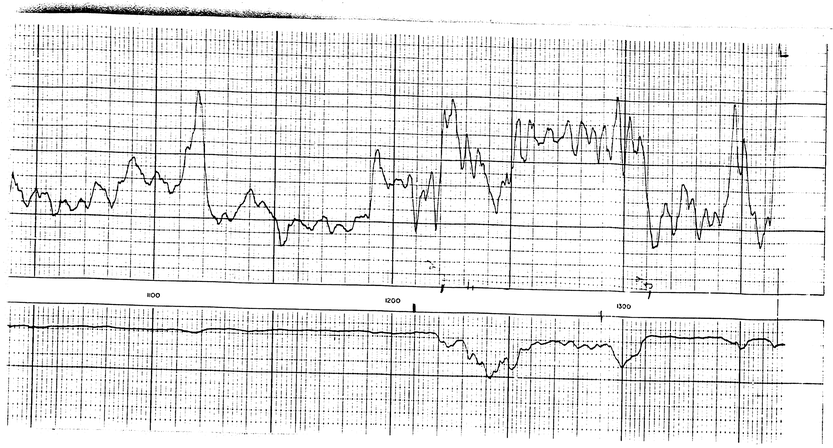
DETAIL LOG

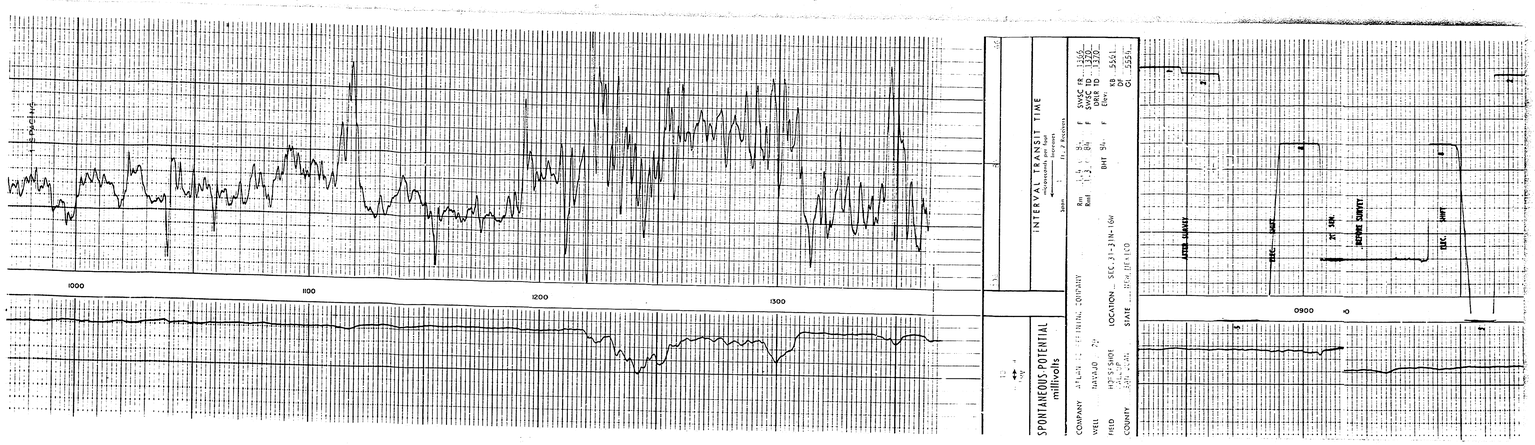
INTERVAL TRANSIT TIME
microseconds per foot
Scale 3
Fr. 2 Revolvers

DEPTHS 1000 1100 1200

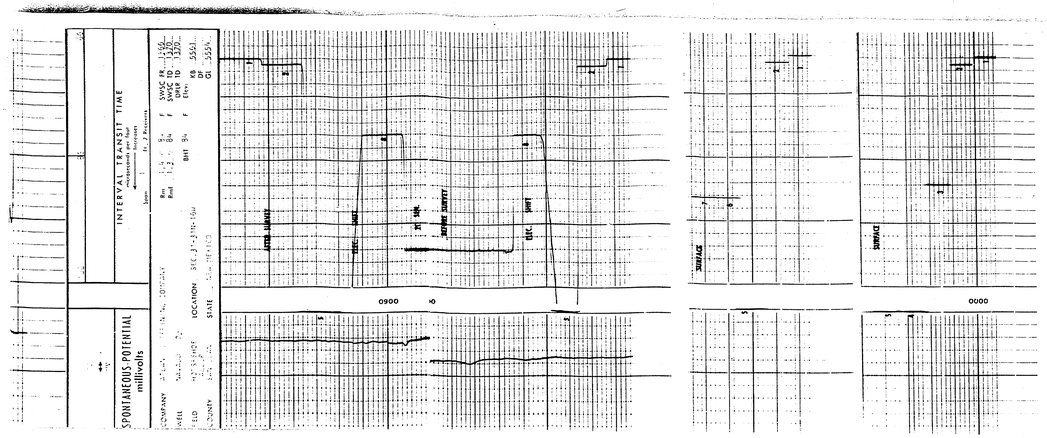
SPONTANEOUS POTENTIAL
millivolts

113


1100
1200
1300


1000
1100
1200
1300
INTERVAL TRANSIT TIME
SPONTANEOUS POTENTIAL
millivolts
COMPANY
WELL
FIELD
COUNTY
LOCATION
STATE
0900
0

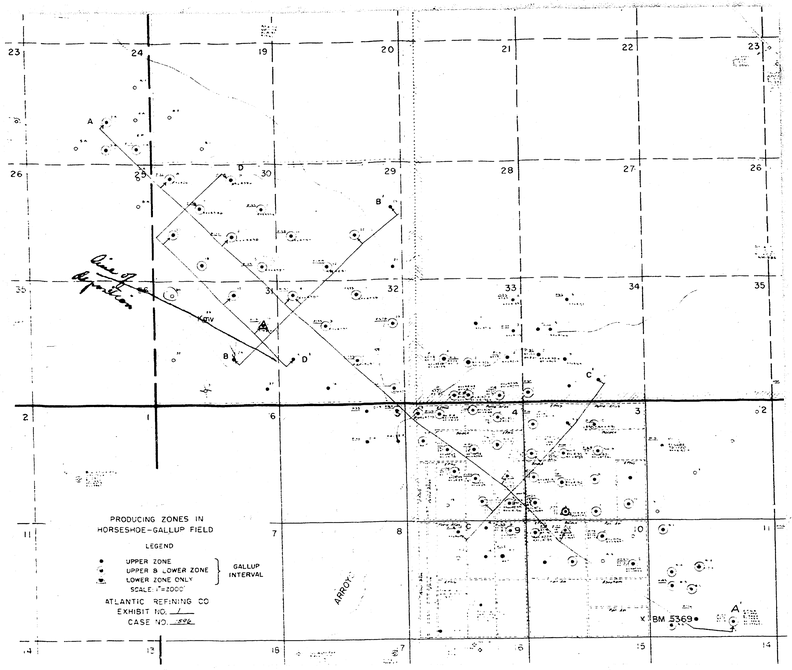
114

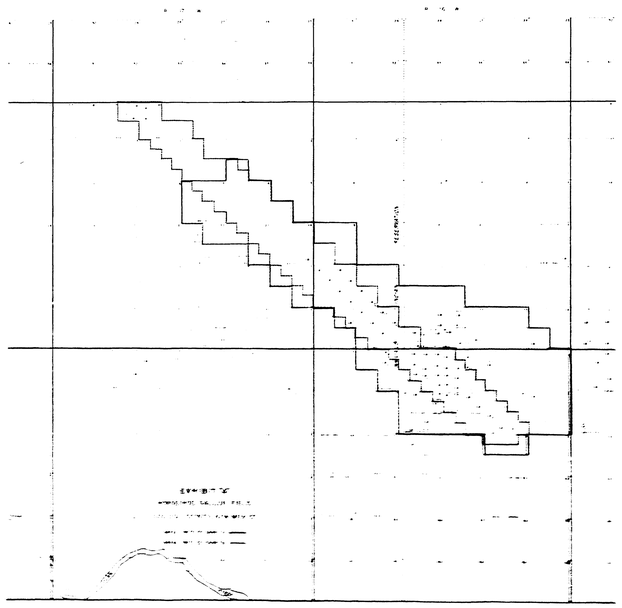


1 YOKE-CABLE ZERO
2 ELECTRICAL ZERO
3 LATERAL CALIBRATION SIGNAL OF 10 MICROSECONDS PER FOOT
4 INTERNAL CALIBRATION SIGNAL OF 100 MICROSECONDS PER FOOT
5 CHANNEL CALIBRATION SIGNAL OF 100 MICROSECONDS PER FOOT
6 MARKING OF PROTECTOR TUBE, 1 FOOT SPACING
7 MARKING OF PROTECTOR TUBE, 5 FOOT SPACING
8 MARKING OF PROTECTOR TUBE, 100 MICROSECONDS PER FOOT WITH ELECTRICAL SHIFT AT CALIBRATE SENSITIVITY
9 INTERNAL CALIBRATION SIGNAL OF 100 MICROSECONDS PER FOOT WITH ELECTRICAL SHIFT AT CALIBRATE SENSITIVITY

RECEIVED
FEB 16 1959
DRLG. Supv.

115





CASE NO. 1576
THE ATLANTIC REFINING CO.
EXHIBIT NO. 8

CORE LABORATORIES, Inc.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 1

CORE ANALYSIS RESULTS

Company THE ATLANTIC REFINING COMPANY — Formation UPPER & LOWER TOCITO — File RP-3-922
Well NAVAJO NO.29 — Core Type DIAMOND CORE — Date Report 2-11-59
Field HORSESHOE GALLUP — Drilling Fluid OIL EMULSION MUD — Analysts CLIFFORD
County SAN JUAN — State NEW MEX. — Elev. 5554 GR — Location SEC 31 31N 16W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MAXIMUM MD	PERMEABILITY 90° MD	POROSITY %	RESIDUAL FLUID SATURATION % PORE VOLUME OIL	RESIDUAL FLUID SATURATION % PORE VOLUME WATER	GRAIN DENSITY	LITHOLOGICAL ABBREVIATIONS	SAMPLE DESCRIPTION AND REMARKS
1	1221-22	0.06	0.02	2.6	7.7	90.0			
2	22-23	0.08	0.02	6.3	11.1	73.0			
3	23-24	0.08	0.02	8.7	33.3	21.7			
4	24-25	0.06	0.04	11.0	19.1	69.1			
5	25-26	0.06	0.03	7.2	11.1	79.2			
6	26-27	1.6	1.1	8.1	14.8	59.3			
7	27-28	0.96	0.04	13.2	21.2	73.8			
8	28-29	0.60	0.02	10.6	13.2	79.2			
9	29-30	0.54	0.09	9.2	13.0	75.0			
10	30-31	0.35	0.04	11.3	24.8	63.7			
11	31-32	0.06	0.04	11.3	12.6	65.3			
12	32-33	443	269	20.2	14.9	57.8			
13	33-34	258	111	20.6	18.0	36.9			
14	34-35	0.16	0.13	17.4	7.5	48.4			
15	35-36	0.17	0.07	9.2	16.3	51.1			
16	36-37	0.26	0.09	8.8	15.9	59.1			
17	37-38	87	44	16.6	25.3	28.3			
18	38-39	0.70	0.41	20.7	12.1	21.7			
19	39-40	100	49	17.8	14.6	57.4			
20	40-41	4.8	4.5	16.7	16.8	44.3			
21	41-42	155	79	18.8	13.8	41.5			
22	42-43	212	32	25.1	12.4	29.9			
23	43-44	279	171	24.8	11.7	34.7			
24	44-45	49	26	21.4	19.6	32.3			
25	45-46	58	35	14.3	18.9	52.4			
26	46-47	12	3.9	18.3	6.0	62.8			
27	47-48	0.70	0.26	13.5	8.9	64.1			
28	48-49	134	77	25.6	12.9	30.9			
29	49-50	372	1.0	17.0	11.2	21.8			
30	50-51	0.43	0.14	7.7	9.7	53.2			
31	51-52	19	4.4	19.0	13.2	29.5			
32	52-53	11	1.6	11.9	23.5	35.1			
33	53-54	0.70	0.41	15.8	12.7	51.3			
34	54-55	0.55	0.26	12.6	19.8	31.0			
35	55-56	0.43	0.09	8.3	12.7	79.8			
36	56-57	0.26	0.20	14.0	17.9	28.6			
37	57-58	0.13	0.06	6.4	7.8	67.2			
38	58-59	0.17	0.06	10.7	4.7	68.2			
39	59-60	0.25	0.02	11.5	4.3	81.7			
40	60-61	0.14	0.05	10.6	6.6	73.5			
41	61-62	0.11	0.07	10.8	6.5	72.2			
42	1262-63	0.07	0.03	11.0	6.4	76.4			

CASE NO. 1576
THE ATLANTIC REFINING CO.
EXHIBIT NO. 9

CORE LABORATORIES, Inc.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 2

CORE ANALYSIS RESULTS

Company THE ATLANTIC REFINING COMPANY — Formation UPPER & LOWER TOCITO — File RP-3-922
Well NAVAJO NO.29 — Core Type DIAMOND CORE — Date Report 2-11-59
Field HORSESHOE GALLUP — Drilling Fluid OIL EMULSION MUD — Analysts CLIFFORD
County SAN JUAN — State NEW MEX. — Elev. 5554 GR — Location SEC 31 31N 16W

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43	1263-64	0.08	0.06	11.2	4.5	76.8			
44	64-65	0.06	0.05	13.8	4.6	75.9			
45	65-66	0.06	0.02	9.4	5.3	73.4			
46	66-67	0.03	0.02	10.1	5.0	79.2			
47	67-68	0.04	0.02	9.5	5.3	84.2			
48	68-69	0.05	0.03	10.3	6.8	79.4			
49	69-70	0.11	0.04	9.2	5.4	90.2			
50	70-71	0.11	0.03	9.4	5.7	89.4			
51	71-72	0.06	0.02	9.2	5.4	89.1			
52	72-73	0.41	0.07	10.8	4.6	85.2			
53	73-74	0.09	0.08	10.4	6.7	82.7			
54	74-75	0.07	0.04	10.5	4.8	81.9			
55	75-76	0.81	0.09	10.4	6.7	86.5			
56	76-77	0.80	0.06	10.4	6.7	85.3			
57	77-78	0.36	0.10	11.5	5.8	85.2			
58	78-79	0.06	0.05	11.1	4.5	79.5			
59	79-80	0.12	0.10	8.3	6.0	79.5			
60	80-81	0.33	0.09	11.5	6.3	80.0			
61	81-82	0.04	0.04	8.3	6.5	81.9			
62	82-83	0.10	0.02	9.5	5.3	80.0			
63	83-84	0.38	0.07	10.1	6.9	81.2			
64	84-85	0.17	0.05	11.2	6.3	89.7			
65	85-86	0.19	0.09	9.3	9.7	74.2			
66	86-87	0.22	0.06	5.1	0.0	60.8			
67	87-88	0.47	0.09	11.2	6.3	79.3			
68	88-89	0.12	0.10	10.4	6.7	84.6			
69	89-90	0.04	0.02	7.7	0.0	72.4			
70	90-91	0.16	0.06	8.6	0.0	84.9			
71	91-92	0.15	0.13	9.9	5.1	86.9			
72	92-93	1.0	0.13	8.0	6.3	78.4			
73	93-94	0.07	0.05	6.8	0.0	67.6			
74	94-95	0.52	0.10	10.0	7.0	80.0			
75	95-96	0.26	0.13	6.4	7.8	78.1			
76	96-97	0.04	0.03	6.9	10.1	79.7			
77	97-98	0.80	0.36	15.3	13.1	30.1			
78	98-99	1.0	0.19	16.6	7.8	30.1			
79	1299-00	4.2	1.0	21.6	13.0	32.4			
80	1300-01	68	2.5	19.0	20.5	38.4			
81	01-02	0.17	0.04	6.7	10.4	71.6			
82	02-03	0.35	0.02	7.5	9.3	58.7			
83	03-04	0.45	0.16	12.1	14.9	57.9			
84	1304-05	0.62	0.13	11.2	14.3	59.3			

CORE LABORATORIES, Inc.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 3

CORE ANALYSIS RESULTS

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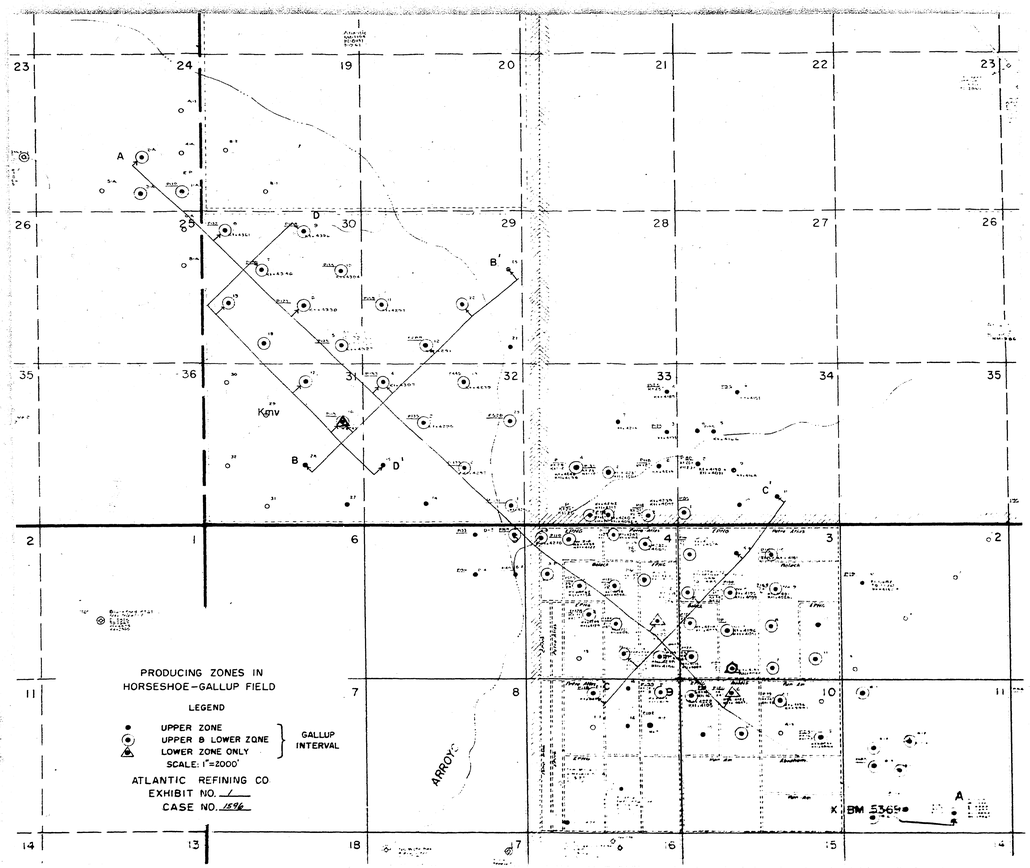
Field HORSESHOE GALLUP — Drilling Fluid OIL EMULSION MUD — Analysts CLIFFORD
County SAN JUAN — State NEW MEX. — Elev. 5554 GR — Location SEC 31 31N 16W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MAXIMUM MD	PERMEABILITY 90° MD	POROSITY %	RESIDUAL FLUID SATURATION % PORE VOLUME OIL	RESIDUAL FLUID SATURATION % PORE VOLUME WATER	GRAIN DENSITY	LITHOLOGICAL ABBREVIATIONS	SAMPLE DESCRIPTION AND REMARKS
85	1305-06	0.80	0.67	12.5	9.6	60.8			
86	06-07	1.0	0.16	11.3	12.6	67.3			
87	07-08	0.34	0.27	10.8	11.1	63.9			
88	08-09	0.65	0.25	11.1	7.2	63.1			
89	09-10	0.12	0.06	11.7	6.0	79.2			
90	1310-11	0.04	0.01	10.1	6.9	87.1			

116


A
A'
B
B'
C
C'
D
D'
Kgnv
ARROYO
K BM 5365
PRODUCING ZONES IN
HORSESHOE-GALLUP FIELD
LEGEND
UPPER ZONE
UPPER & LOWER ZONE
LOWER ZONE ONLY
GALLUP INTERVAL
SCALE: 1"=2000'
ATLANTIC REFINING CO.
EXHIBIT NO. 1
CASE NO. 1696

117

A

NW

1 — 3/4 Mi. — 2 — 3/4 Mi. — 3 — 3/4 Mi. — 4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi.

SCHLUMBERGER WELL SURVEYING CORPORATION

Four Corners Well Log Service

DATUM

CONTOUR POINT

UPPER ZONE

GALLUP INTERVAL

LOWER ZONE

JUANA LOPEZ

A'

SE

4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi. — 7 — 3/4 Mi. — 8 — 1 1/3 Mi. — 9

Four Corners Well Log Service

CONTOUR POINT

UPPER ZONE

GALLUP INTERVAL

LOWER ZONE

JUANA LOPEZ

DATUM

CONTOUR POINT

UPPER ZONE

LOWER ZONE

JUANA LOPEZ

CONTOUR POINT

UPPER ZONE

LOWER ZONE

JUANA LOPEZ

CROSS SECTION A-A'

THE ATLANTIC REFINING CO

EXHIBIT NO. _____

CASE NO. _____

1191

SW

B

B'

NE

80 Ac.

80 Ac.

80 Ac.

80 Ac.

80 Ac.

DATUM

CONTOUR POINT

UPPER ZONE

INTERVAL

GALLUP

LOWER ZONE

JUANA LOPEZ

CROSS SECTION B — B'

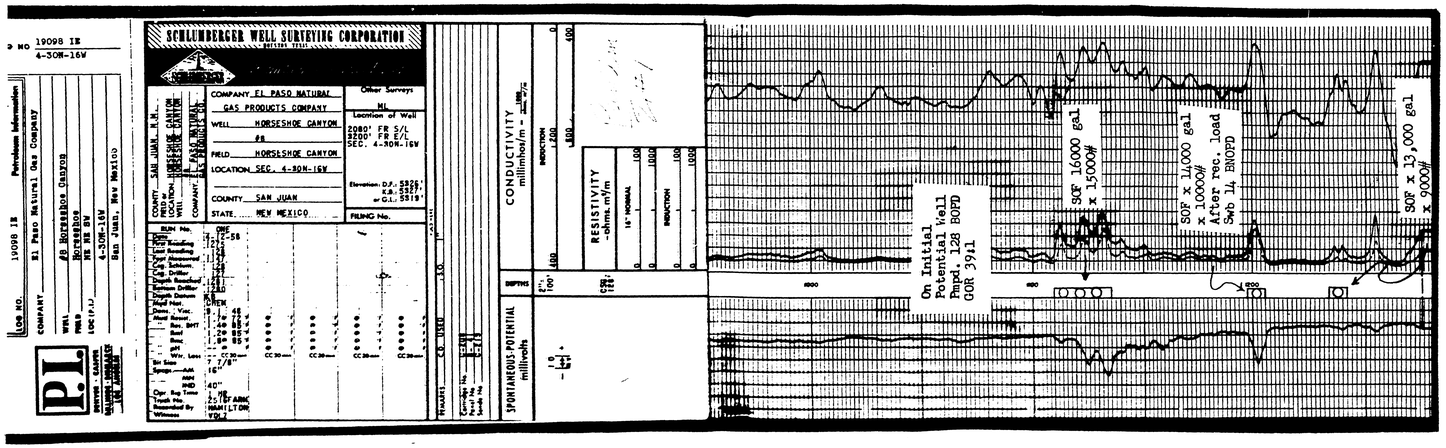
WOODWARD-GALLUP POOL
B-B' CROSS SECTION
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

Horizontal Scale: None
Vertical Scale: 20' = 100'
Geology By: D. Jeffers - Jan 1959
Drafted By: J. Irvin & E. Gilliam

ATLANTIC REFINING CO.
EXHIBIT NO. 4
CASE NO. 1

129

121

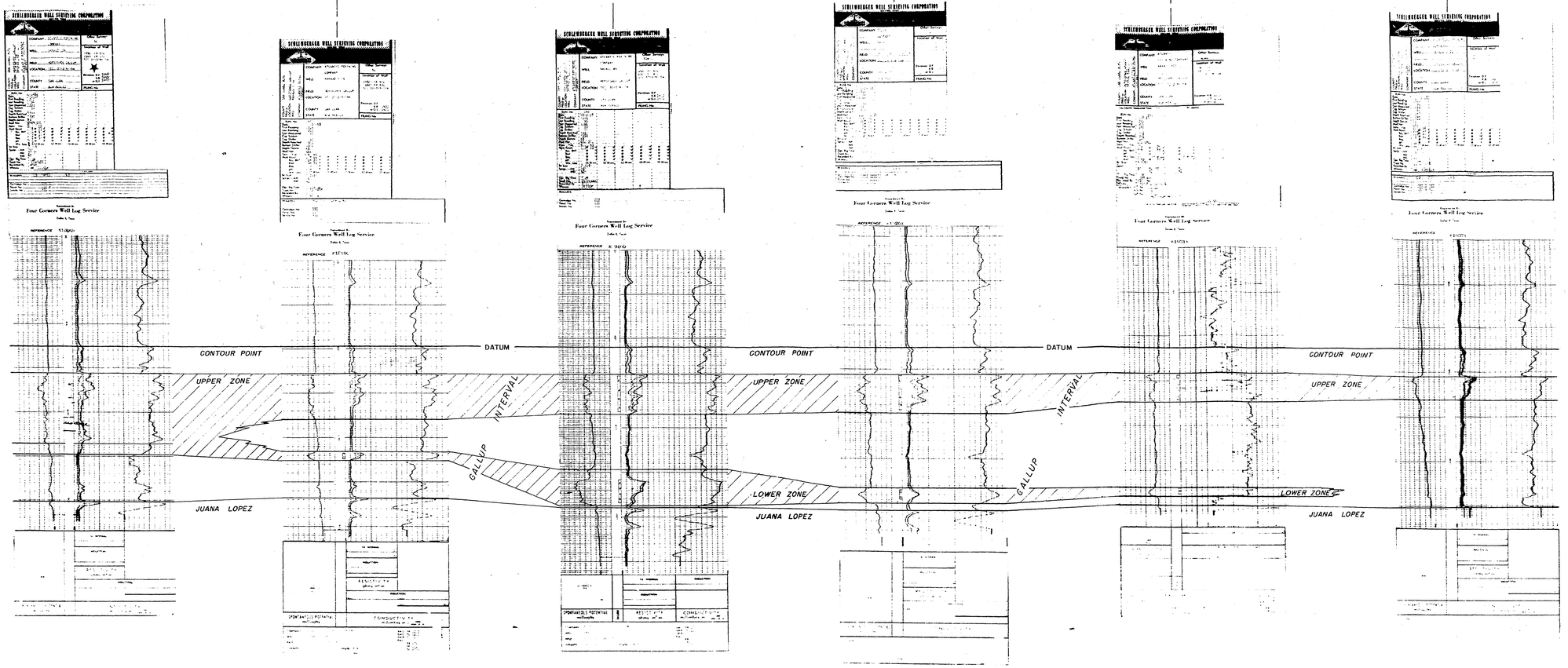

SCHLUMBERGER WELL SURVEYING CORPORATION
COMPANY EL PASO NATURAL GAS PRODUCTS COMPANY
WELL HORSESHOE CANYON #8
FIELD HORSESHOE CANYON
LOCATION SEC. 4-30N-16W
COUNTY SAN JUAN
STATE NEW MEXICO
Other Surveys
ML
Location of Well
2080' FR S/L
3200' FR E/L
SEC. 4-30N-16W
Elevation: D.F. 5825'
G.L. 5817'
or C.L. 5819'
FILING No.
CONDUCTIVITY millimhos/m
RESISTIVITY -ohms.m²/m
SPONTANEOUS POTENTIAL millivolts
On Initial Potential Well
Pmpd. 128 BOPD
GOR 3941
SOF 16000 gal x 15000#
SOF x 11,000 gal x 10000#
After rec. load Swb 14 BNOPD
SOF x 13,000 gal x 9000#

B

SW

1 — 80 Ac. — 2 — 80 Ac. — 3 — 80 Ac. — 4 — 80 Ac. — 5 — 80 Ac. — 6

B′ NE



CROSS SECTION B — B′

NORTHWEST-GALLUP POOL
DATUM CROSS SECTION
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

Horizontal Scale: None
Vertical Scale: 20′ = 1"
Geology By: R. Jeanne - Jan 1956
Drafted By: J. Irvin & K. Williams

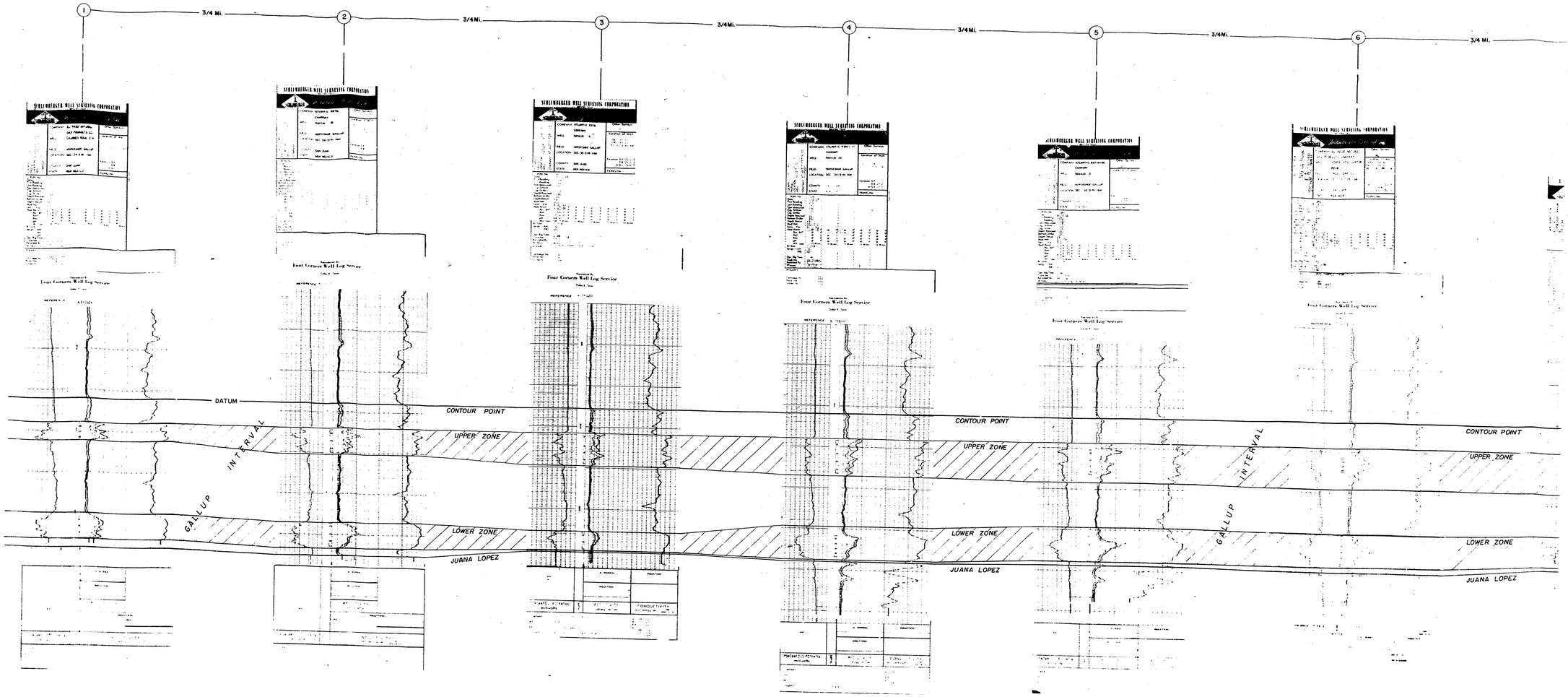
SHEET NO. 2
NOTE NO.

122

A

NW

1 — 3/4 Mi. — 2 — 3/4 Mi. — 3 — 3/4 Mi. — 4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi.

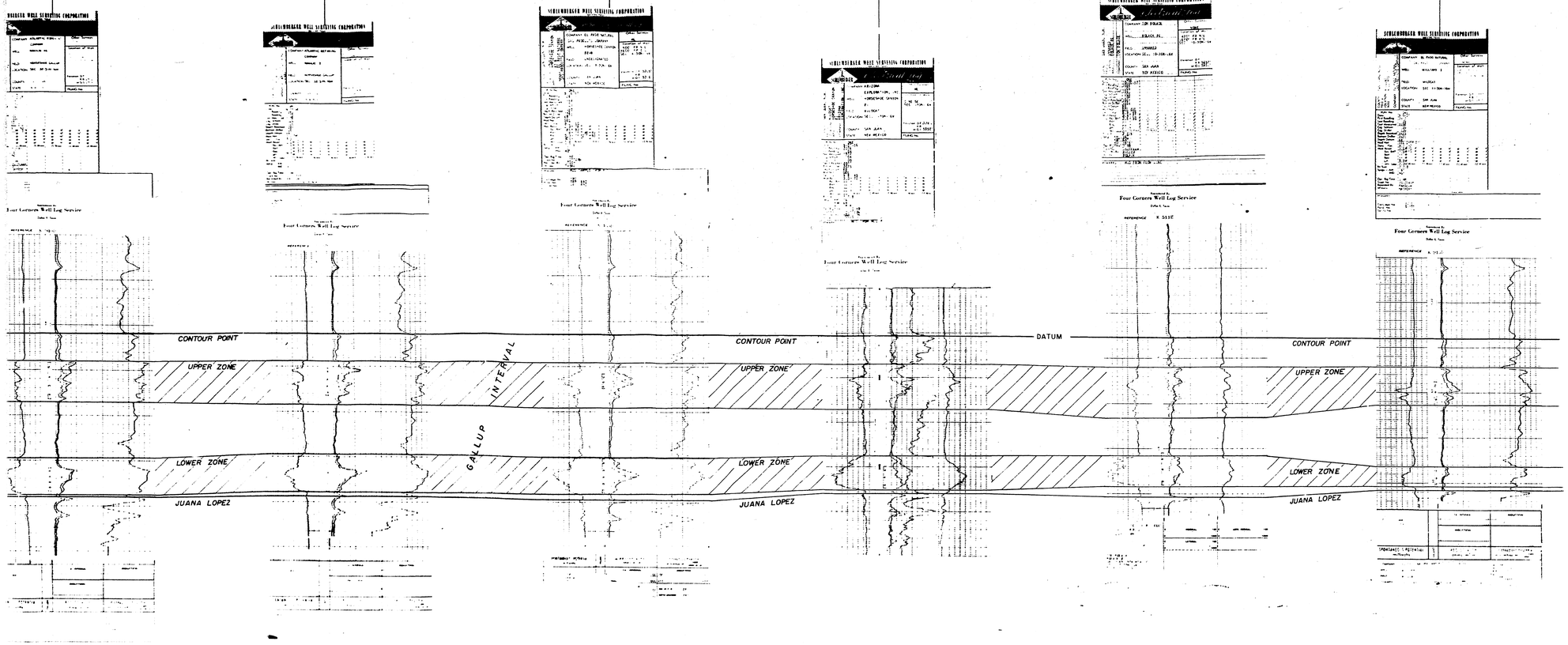


123

A'

SE

4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi. — 7 — 3/4 Mi. — 8 — 1 1/3 Mi. — 9



CROSS SECTION A - A'

THE ATLANTIC REFINING CO
EXHIBIT NO. _____
CASE NO. _____

124

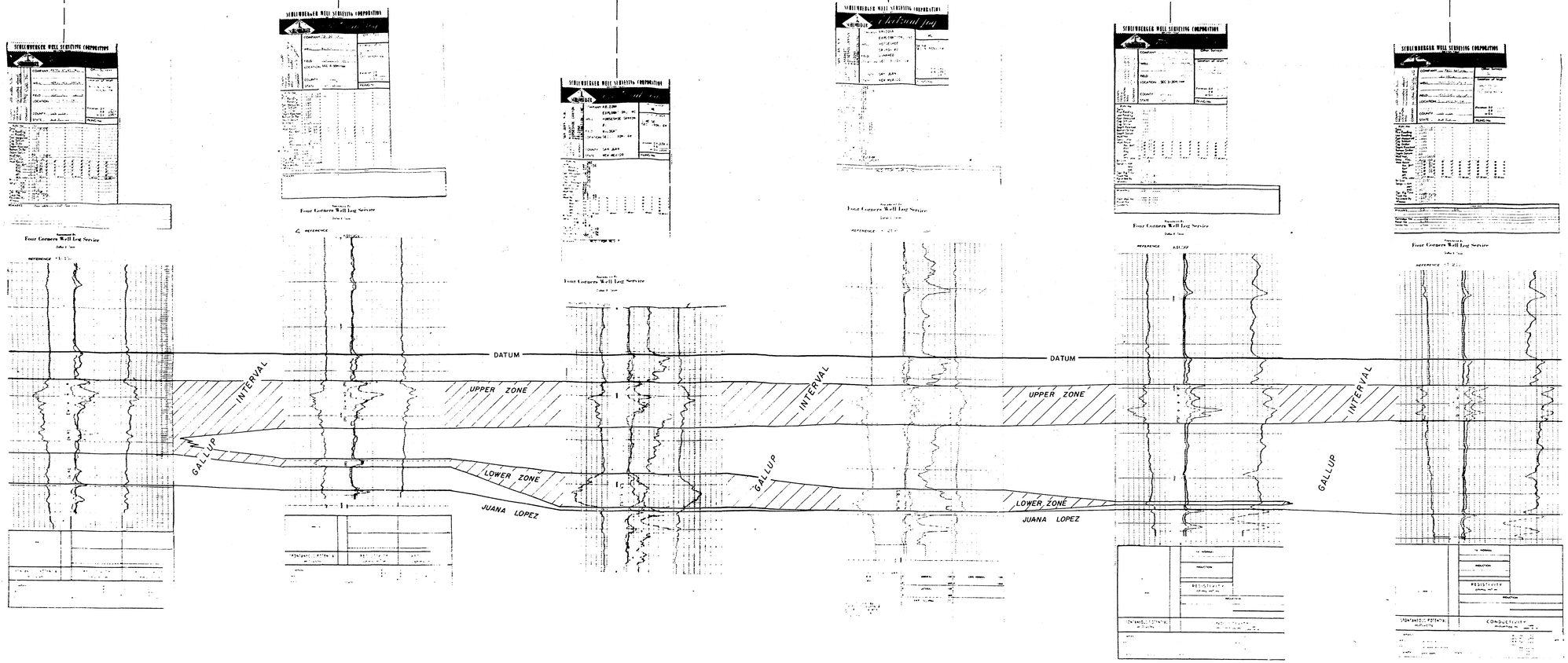
SW

C

C'

NE

1 — 80 ac. — 2 — 40 ac. — 3 — 40 ac. — 4 — 80 ac — 5 — 80 ac — 6



CROSS SECTION C—C'
TUNICIFF-GALLUP POOL
SW NE CROSS SECTION
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

Horizontal Scale: None
Vertical Scale: 1" = 200'
Geology By: D. Jennings - Jan 1959
Drafted By: J. Irvin & K. Williams

THE ATLANTIC REFINING CO
EXHIBIT NO. 7
CASE NO. 15

125

NE

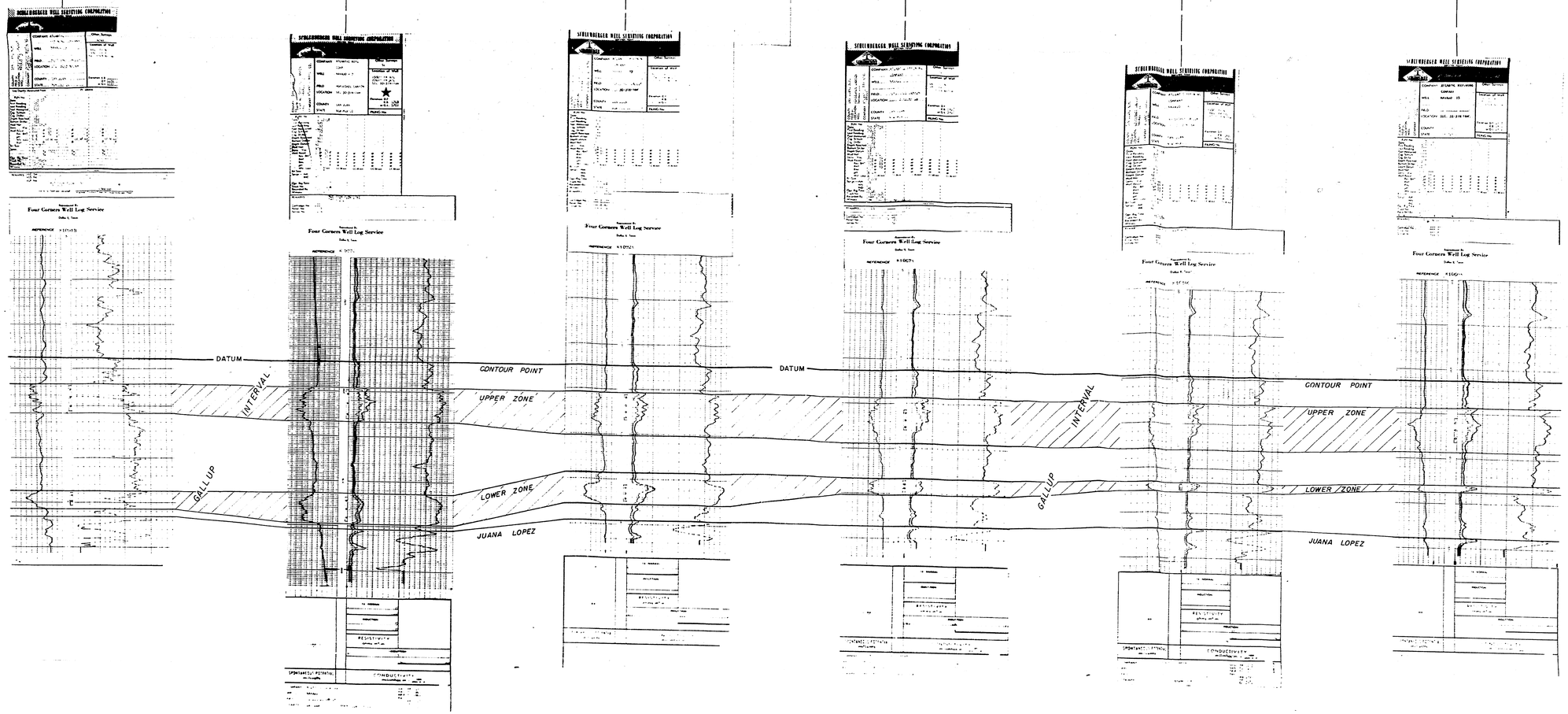
D

SW

D'

SE

1 — Appx 1/3 Mi — 2 — Appx 1/3 Mi — 3 — Appx 1/3 Mi — 4 — Appx 1/3 Mi — 5 — Appx 1/3 Mi — 6



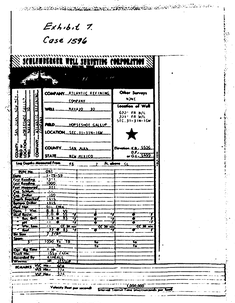
CROSS SECTION D—D'
HOMESTRETCH-GALLUP POOL
SO SW SE CROSS SECTION
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

Horizontal Scale: None
Vertical Scale: 1" = 100'
Geology By: D. Jennings - Jan 1959
Drafted By: J. Jones & W. Williams

THE ATLANTIC REFINING CO
EXHIBIT NO. ____
CASE NO. ____

126

Exhibit 7.
Case 1596


SCHLUMBERGER WELL SURVEYING CORPORATION

COMPANY ATLANTIC REFINING COMPANY
WELL NAVAJO 20
FIELD WILDCAT
LOCATION SEC 20-T19N-R5W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Services: NONE

Location of Well: 820' FS 820' FE SEC. 20-T19N-R5W

Elevation: G.L. 5535
K.B. 5547

Log Depth measured from KB

Date Run					
Run No.					
Depth-Driller					
Depth-Logger					
Btm. Logged Interval					
Top Logged Interval					
Type Fluid in Hole					
Salinity, PPM Cl					
Density					
Level					
Max. Rec. Temp.					
Operating Time					
Recorded By					
Witnessed By					

Velocity Run per second: 1,000,000

Recorded by
Four Corners Well Log Service
Dallas, Texas

REFERENCE K10980

4

COMPLETION RECORD

LOAD ACID

CHEM CUT

BIT RECORD

CASING RECORD

PERFORATING RECORD

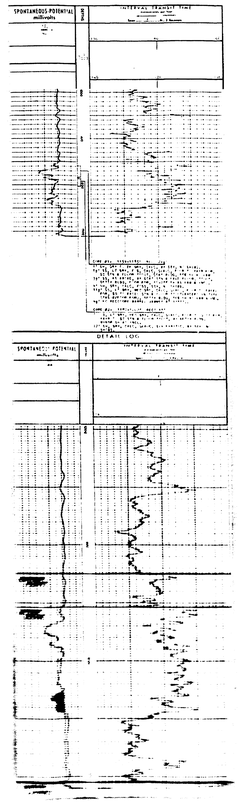
ACID TREAT SHOT

1st

2nd

1 st

REMARKS


SPONTANEOUS POTENTIAL millivolts

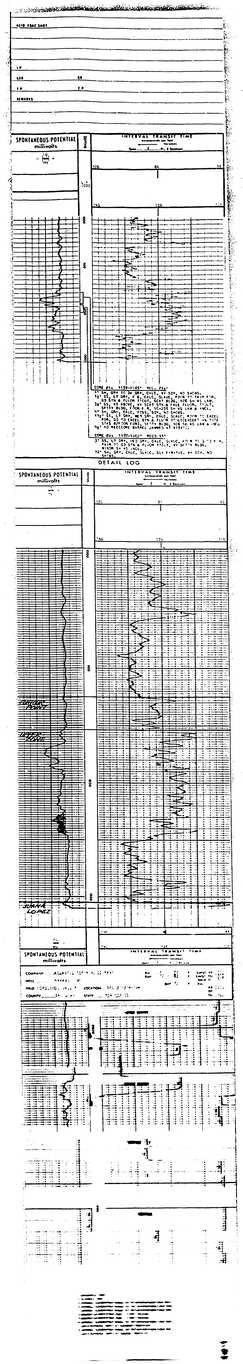
INTERVAL TRANSIT TIME microseconds per foot

DEPTH 100'

SPONTANEOUS POTENTIAL millivolts

INTERVAL TRANSIT TIME microseconds per foot

127


SPONTANEOUS POTENTIAL
millivolts
INTERVAL TRANSIT TIME
microseconds per foot
DETAIL LOG
SPONTANEOUS POTENTIAL
millivolts
INTERVAL TRANSIT TIME
microseconds per foot
SPONTANEOUS POTENTIAL
millivolts
INTERVAL TRANSIT TIME
microseconds per foot

128

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Electrical Log

COMPANY TOM BOLACK
Fig. 1 log
WELL BOLACK # 8
FIELD HORSESHOE CANYON
LOCATION SEC. 3-30N-16W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Surveys
NONE

Location of Well
2265' FR E/L
1760' FR S/L
SEC. 3-30N-16W

Elevation: D.F. —
K.B. 5727
or G.L. —

FILING No.

COUNTY SAN JUAN, N.M.
FIELD or LOCATION HORSESHOE CANYON BOLACK # 8
WELL BOLACK #8
COMPANY TOM BOLACK

RUN No.	ONE									
Date	1-5-59									
First Reading	1730									
Last Reading	160 (MUD LEVEL)									
Feet Measured	1566									
Csg. Schlum.	--									
Csg. Driller	--									
Depth Reached	1731									
Bottom Driller	1731									
Depth Datum	KB									
Mud Nat.	CHEM GEL									
Dens. Visc.	8.1 66									
Mud Resist.	-- @ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F
" Res. BHT	-- @ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F
" Rmf	-- @ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F
" Rmc	-- @ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F
" pH	-- @ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F	@ °F
" Wtr. Loss	-- CC 30 min	CC 30 min		CC 30 min		CC 30 min		CC 30 min		CC 30 min
Bit Size	7 7/8" = CSG. TO TD									
Spcgs.—AM	16"									
AM-	64"									
AO	18'8"									
Opr. Rig Time	1 1/2 HRS									
Truck No.	2515 FARR									
Recorded By	WOOD									
Witness	MR. BOLACK & MR. STOBBS									

REMARKS MUD FROM MUD PIT

RESISTIVITY ohms, m²/m — SHORT NORMAL 100 0 1000 0 — LATERAL 100 0 1000 0 — LONG NORMAL 100 0 1000

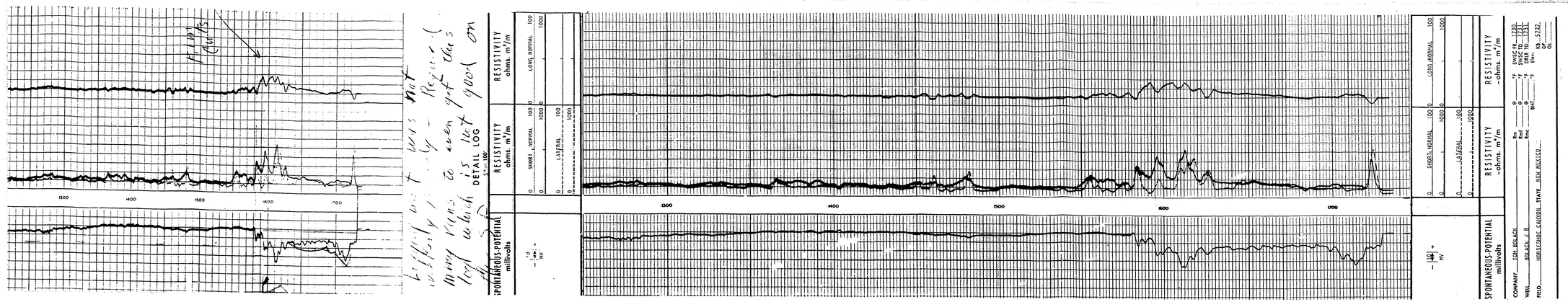
DEPTHS 1" = 100' 1" = 50'

0230 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700

SPONTANEOUS-POTENTIAL millivolts — 10 + −

Fig. 1 log
Not Used
Log of well
Regional

129


DETAIL LOG
RESISTIVITY
ohms. m²/m
SHORT NORMAL
LONG NORMAL
LATERAL
SPONTANEOUS-POTENTIAL
millivolts
1300
1400
1500
1600
1700
COMPANY TIDE BIDLACK
WELL BIDLACK # 8
FIELD LUDLESBURG CANYON STATE NEW MEXICO
Rm
Rmf
Rmc
BHT
SWSC FR 1310
SWSC TO 1731
DMR TD 1731
Elev. KB 5322
GL

130

Memo

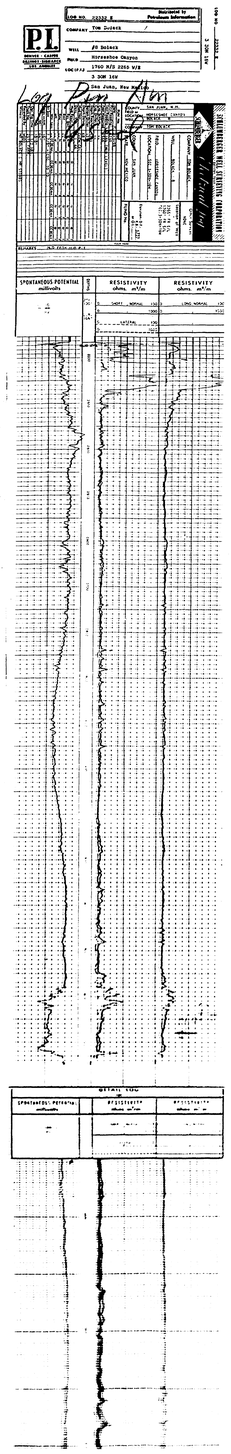
From

To

a page submitted by Tom Bolack after the hearing. Log #1

Purports to show that the log used by Paulsen (see 22) was not representative of the sand encountered from 1630 to 1720. Notations on logs are Bolack's.

131



Memo

From

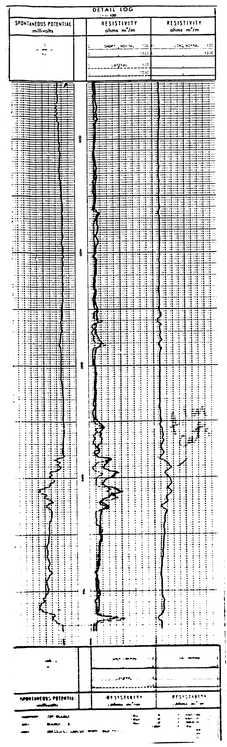
To

Logs submitted by Tom Bolack after the hearing. Log # 1

Purports to show that the log used by Poulsen (#2) was not representative of the ~~oolite~~ encountered from 1630 to 1720.

Notations on logs are Bolack's.

132



CASE NO. 1584
THE ATLANTIC REFINING CO.
EXHIBIT NO. 6

CORE LABORATORIES, Inc.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 1

CORE ANALYSIS RESULTS

Company THE ATLANTIC REFINING COMPANY — Formation UPPER & LOWER TOCITO — File RP-3-922
Well NAVAJO NO.29 — Core Type DIAMOND CORE — Date Report 2-11-59
Field HORSESHOE GALLUP — Drilling Fluid OIL EMULSION MUD — Analyses CLIFFORD
County SAN JUAN — State NEW MEX. — Elv. 5554 GR — Location SEC 31 31N 16W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS		POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE SPACE		SAMPLE DESCRIPTION AND REMARKS
		MAX.	90°		OIL	TOTAL WATER	
1	1221-22	0.06	0.02	2.6	7.7	50.0	
2	22-23	0.06	0.02	6.3	11.1	73.0	
3	23-24	0.08	0.02	8.7	33.3	51.7	
4	24-25	0.06	0.04	11.0	19.1	69.1	
5	25-26	0.06	0.03	9.2	11.1	79.2	
6	26-27	1.6	1.1	8.1	14.8	79.2	
7	27-28	0.96	0.04	13.2	23.2	75.8	
8	28-29	0.60	0.02	10.6	13.2	79.2	
9	29-30	0.52	0.09	9.2	13.0	75.0	
10	30-31	0.35	0.04	11.3	24.8	63.7	
11	31-32	0.06	0.04	11.3	12.4	65.5	
12	32-33	443	269	20.2	14.9	82.4	
13	33-34	258	111	20.6	18.0	76.9	
14	34-35	0.16	0.13	17.4	7.7	88.2	
15	35-36	0.13	0.07	9.2	16.3	68.4	
16	36-37	0.26	0.06	8.8	35.9	39.1	
17	37-38	87	44	16.6	25.3	58.3	
18	38-39	0.70	0.41	20.7	12.1	81.9	
19	39-40	100	49	19.8	14.6	77.4	
20	40-41	1.8	4.5	16.7	16.8	64.3	
21	41-42	151	79	18.8	13.8	61.5	
22	42-43	220	12	25.1	12.6	35.9	
23	43-44	479	171	24.8	11.7	34.7	
24	44-45	49	26	22.6	19.6	51.1	
25	45-46	56	35	14.3	18.9	52.4	
26	46-47	17	3.9	18.3	6.0	68.6	
27	47-48	0.70	0.26	13.5	8.9	66.1	
28	48-49	134	77	25.6	12.9	30.9	
29	49-50	375	1.0	17.9	12.2	21.8	
30	50-51	0.43	0.24	17.7	9.1	53.2	
31	51-52	39	1.4	19.0	13.2	29.5	
32	52-53	11	1.6	11.9	23.5	39.3	
33	53-54	0.70	0.41	15.8	19.7	53.3	
34	54-55	0.55	0.26	12.6	19.8	31.0	
35	55-56	0.42	0.09	8.3	15.7	39.8	
36	56-57	0.26	0.20	14.0	17.9	48.4	
37	57-58	0.13	0.06	6.4	7.8	69.2	
38	58-59	0.17	0.06	10.7	4.7	66.2	
39	59-60	0.25	0.02	11.5	4.3	83.7	
40	60-61	0.14	0.09	10.6	5.6	75.5	
41	61-62	0.11	0.07	10.8	6.5	72.2	
42	1262-63	0.09	0.03	11.0	6.4	76.4	

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 1

CORE ANALYSIS RESULTS

THE ATLANTIC REFINING COMPANY — GALLUP — File RP-3-901
NAVAJO NO. 29 — DIAMOND CORE — Date Report 2-6-59
HORSESHOE GALLUP — WATER BASE MUD — Analyst CLIFFORD
SAN JUAN — NEW MEXICO

Lithological Abbreviations

1	1263-64			6.8	16.7	65.2
2	64-65			9.1	19.7	39.4
3	65-66		178	20.4	15.7	35.3
4	66-67			11.7	5.8	62.5
5	67-68			13.4	13.7	37.1
6	68-69		295	23.3	12.5	32.2
7	69-70		422	18.5	14.9	35.7
8	70-71		44	22.6	17.5	25.6
9	71-72			11.9	6.4	64.5
10	72-73			22.8	13.0	33.8
11	73-74			19.7	12.1	26.6
12	74-75		3.13	15.0	16.7	46.1
13	75-76			11.5	9.5	62.9
14	76-77		196	11.7	9.1	44.3
15	77-78			11.7	12.6	54.0
16	78-79			11.2	10.5	57.8
17	79-80			9.2	10.7	47.1
18	80-81			11.0	13.5	49.1
19	81-82		7.7	20.8	19.0	37.0
20	82-83			6.1	15.1	45.0
21	1283-1284			5.4	9.3	90.0
22	1284-85			5.9	9.1	79.0
23	85-86			9.3	9.6	54.8
24	86-87			6.7	8.2	59.5
25	87-88		13.4	6.7	6.7	89.5
26	88-89			8.7	6.6	79.8
27	89-90			9.7	6.6	79.7
28	90-91			9.7	12.7	49.1
29	91-92			11.2	13.2	51.0
30	92-93			10.2	17.4	34.1
31	93-94			10.2	14.6	66.1
32	94-95			11.9	19.8	47.2
33	95-96			11.4	11.4	64.3
34	96-97			9.6	9.6	61.0

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 2

CORE ANALYSIS RESULTS

Company THE ATLANTIC REFINING COMPANY — Formation UPPER & LOWER TOCITO — File RP-3-922
Well NAVAJO NO.29 — Core Type DIAMOND CORE — Date Report 2-11-59
Field HORSESHOE GALLUP — Drilling Fluid OIL EMULSION MUD — Analyses CLIFFORD
County SAN JUAN — State NEW MEX. — Elv. 5554 GR — Location SEC 31 31N 16W

Lithological Abbreviations

43	1263-64		0.08	0.06	11.2	4.5	76.8
44	64-65		0.06	0.05	13.8	4.6	75.9
45	65-66		0.06	0.02	9.4	5.3	73.4
46	66-67		0.03	0.02	10.1	5.0	79.2
47	67-68		0.04	0.02	9.5	5.3	84.2
48	68-69		0.08	0.03	10.3	6.8	79.6
49	69-70		0.11	0.04	9.4	5.4	90.2
50	70-71		0.11	0.03	9.4	5.3	89.4
51	71-72		0.06	0.02	9.2	5.4	89.1
52	72-73		0.11	0.07	10.8	4.6	85.2
53	73-74		0.09	0.08	10.4	6.7	82.7
54	74-75		0.07	0.04	10.5	6.7	82.7
55	75-76		0.11	0.09	10.4	4.8	81.9
56	76-77		0.20	0.06	10.4	6.7	86.5
57	77-78		0.36	0.10	11.5	6.7	86.5
58	78-79		0.06	0.04	11.5	7.8	85.2
59	79-80		0.12	0.10	11.1	4.5	79.3
60	80-81		0.33	0.09	8.3	6.0	79.5
61	81-82		0.04	0.04	11.5	4.3	80.0
62	82-83		0.10	0.04	8.3	6.5	81.9
63	83-84		0.38	0.02	9.5	5.3	80.0
64	84-85		0.17	0.07	10.1	6.9	81.2
65	85-86		0.19	0.03	11.2	6.3	85.7
66	86-87		0.22	0.09	9.3	9.7	72.2
67	87-88		0.47	0.06	5.1	0.0	80.8
68	88-89		0.12	0.09	11.2	6.3	89.3
69	89-90		0.12	0.10	10.4	6.7	82.6
70	90-91		0.06	0.02	2.7	0.0	70.4
71	91-92		0.16	0.06	8.6	8.1	84.7
72	92-93		0.29	0.13	9.0	5.1	86.9
73	93-94		1.0	0.11	8.9	5.1	78.8
74	94-95		0.09	0.05	8.8	6.3	78.8
75	95-96		0.52	0.10	8.8	0.0	67.6
76	96-97		0.26	0.13	10.0	7.0	80.0
77	97-98		0.04	0.03	6.4	7.8	78.1
78	98-99		0.80	0.36	6.9	10.1	79.7
79	1299-00		1.0	0.39	15.3	13.1	30.1
80	1300-01		1.2	1.0	18.6	7.8	30.1
81	01-02		63	2.5	21.6	13.0	30.4
82	02-03		0.17	0.04	19.0	20.5	38.6
83	03-04		0.35	0.02	6.7	10.4	71.6
84	1304-05		0.45	0.16	7.5	9.3	58.7
			0.62	0.13	12.1	14.9	57.9
					11.2	14.3	39.5

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

File RP-3-918 — Page No. 2
Well Navajo No. 30

CORE ANALYSIS RESULTS

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE SPACE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
27	1240-41	1.2	12.6	12.7	68.2	
28	41-42	0.09	11.9	11.8	65.6	
29	42-43	0.05	12.1	9.9	62.0	
30	43-44	0.04	7.6	5.3	83.0	
31	44-45	0.58	8.1	2.5	49.3	
32	1245-46	0.06	2.8	7.1	42.9	

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 3

CORE ANALYSIS RESULTS

Company THE ATLANTIC REFINING COMPANY — Formation UPPER & LOWER TOCITO — File RP-3-922
Well NAVAJO NO.29 — Core Type DIAMOND CORE — Date Report 2-11-59
Field HORSESHOE GALLUP — Drilling Fluid OIL EMULSION MUD — Analyses CLIFFORD
County SAN JUAN — State NEW MEX. — Elv. 5554 GR — Location SEC 31 31N 16W

Lithological Abbreviations

85	1305-06	0.80	0.67	12.5	9.6	60.8	
86	06-07	1.0	0.16	13.3	12.1	67.3	
87	07-08	0.34	0.27	10.8	13.1	63.9	
88	08-09	0.65	0.59	11.1	9.2	63.1	
89	09-10	0.12	0.06	13.7	6.0	73.2	
90	1310-11	0.04	0.01	10.1	6.9	87.1	

UPPER TOCITO
LOWER TOCITO

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 1

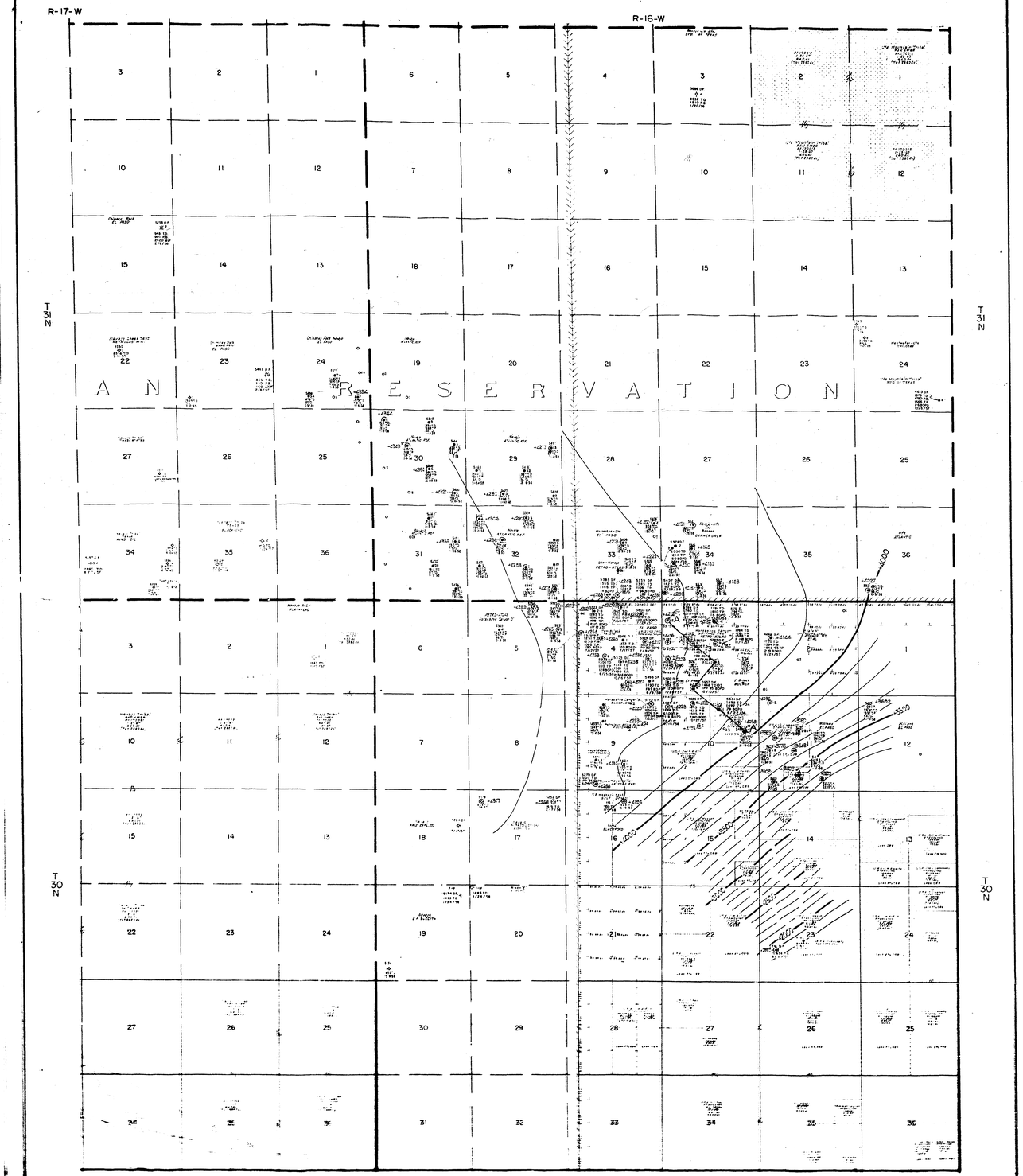
CORE ANALYSIS RESULTS

Company The Atlantic Refining Company — Formation As Noted — File RP-3-918
Well Navajo No. 30 — Core Type Diamond — Date Report 2-3-59
Field Horseshoe Gallup — Drilling Fluid Oil Emulsion — Analyses Clifford
County San Juan — State New Mexico — Elv. 5499.12 GR — Location Sec 31-31N-16W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS	POROSITY PER CENT	RESIDUAL SATURATION PER CENT PORE SPACE		SAMPLE DESCRIPTION AND REMARKS
				OIL	TOTAL WATER	
	Upper Tocito					
1	1160-61	0.03	8.4	33.3	38.1	
2	61-62	<0.01	6.2	29.0	54.9	
3	62-63	0.01	9.2	21.7	69.1	
4	63-64	<0.01	7.8	37.5	52.0	
5	1164-65	0.04	6.6	27.3	59.1	
6	1169-70	0.20	5.2	13.5	54.8	
7	70-71	79	15.0	16.0	28.7	
8	71-72	251	18.7	13.9	11.4	
9	72-73	0.16	11.4	27.2	41.0	
10	73-74	176	18.8	18.6	24.0	
11	74-75	0.08	10.1	20.8	46.6	
12	75-76	140	9.7	14.4	34.1	
13	76 77	91	13.4	14.9	28.4	
14	77-78	0.05	9.0	15.6	40.1	
15	78-79	8.5	11.3	25.7	41.6	
16	1179-80	0.04	9.7	16.9	48.4	
17	1187-88	1.1	17.7	16.9	33.1	
18	88-89	0.40	11.7	12.8	42.7	
19	1189-90	0.02	6.3	17.0	47.2	
	Lower Tocito					
20	1233-34	96	19.5	15.4	40.0	
21	34-35	176	17.3	17.9	32.4	
22	35-36	0.48	12.1	11.4	47.2	
23	36-37	0.81	8.0	6.2	78.5	
24	37-38	0.24	10.5	11.6	71.4	
25	38-39	0.04	12.6	11.1	68.2	
26	1239-40	0.07	13.6	11.7	64.7	

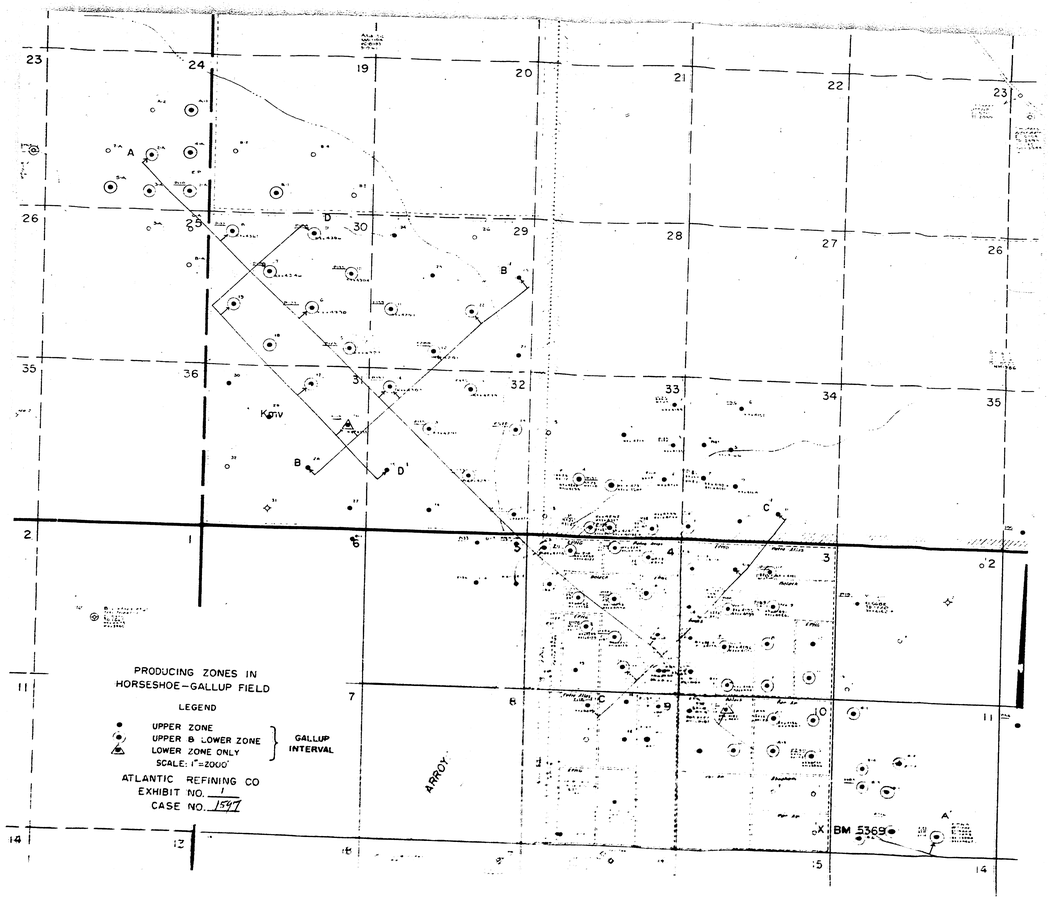
133



STRUCTURE MAP
HORSESHOE GALLUP FIELD
TOP OF GALLUP
C I = 100'
SAN JUAN CO., NEW MEXICO
SCALE 1" = 2000'

X-2

134


PRODUCING ZONES IN
HORSESHOE-GALLUP FIELD
LEGEND
UPPER ZONE
UPPER & LOWER ZONE
LOWER ZONE ONLY
GALLUP INTERVAL
SCALE: 1"=2000'
ATLANTIC REFINING CO
EXHIBIT NO. 1
CASE NO. 1597
ARROY
BM 5369
A
A'
B
B'
C
C'
D
D'

135

A

NW

1 — 3/4 Mi. — 2 — 3/4 Mi. — 3 — 3/4 Mi. — 4 — 3/4 Mi. — 5 — 3/4 Mi. — 6

SCHLUMBERGER WELL SURVEYING CORPORATION

Induction-Electrical Log

COMPANY EL PASO NATURAL GAS PRODUCTS CO.
WELL CHUMEE ROUL 2-A
FIELD HORSESHOE GALLUP
LOCATION SEC. 24-31N-16W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Surveys

Location of Well

Elevation DF GL KB

Filing No.

Interpreted by Four Corners Well Log Service

Scale 1 Inch

REFERENCE

DATUM

CONTOUR POINT

UPPER ZONE

INTERVAL

GALLUP

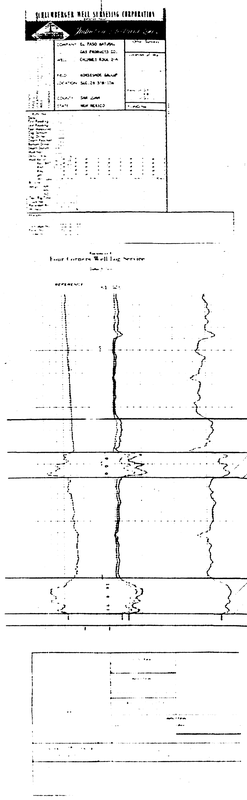
LOWER ZONE

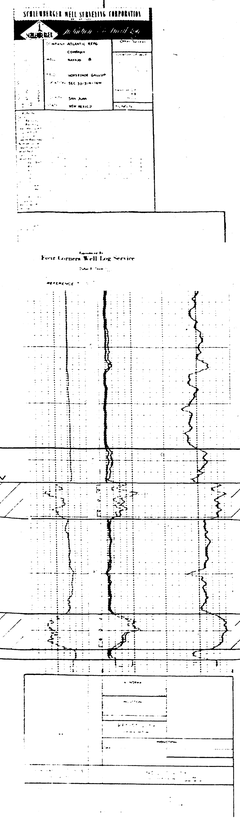
JUANA LOPEZ

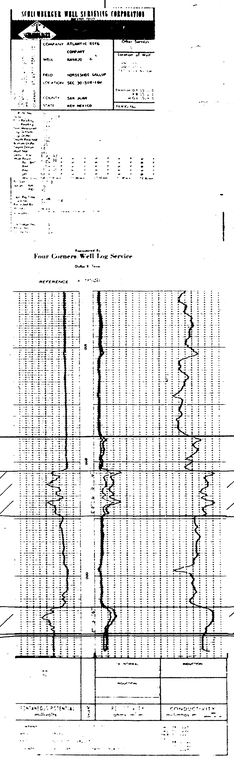
A

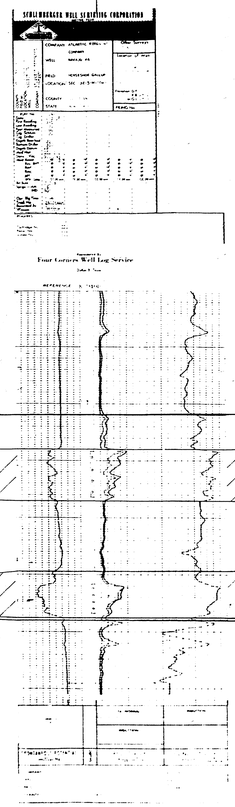
NW

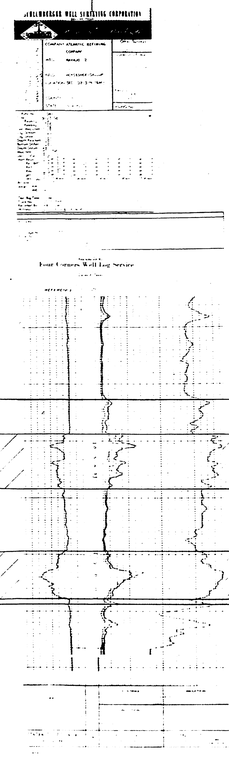
1 — 3/4 Mi. — 2 — 3/4 Mi. — 3 — 3/4 Mi. — 4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi.

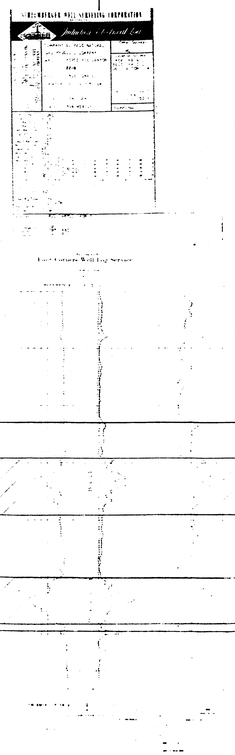


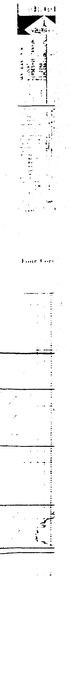












DATUM — CONTOUR POINT — CONTOUR POINT — CONTOUR POINT

UPPER ZONE — UPPER ZONE — UPPER ZONE

INTERVAL — INTERVAL

GALLUP — GALLUP

LOWER ZONE — LOWER ZONE — LOWER ZONE

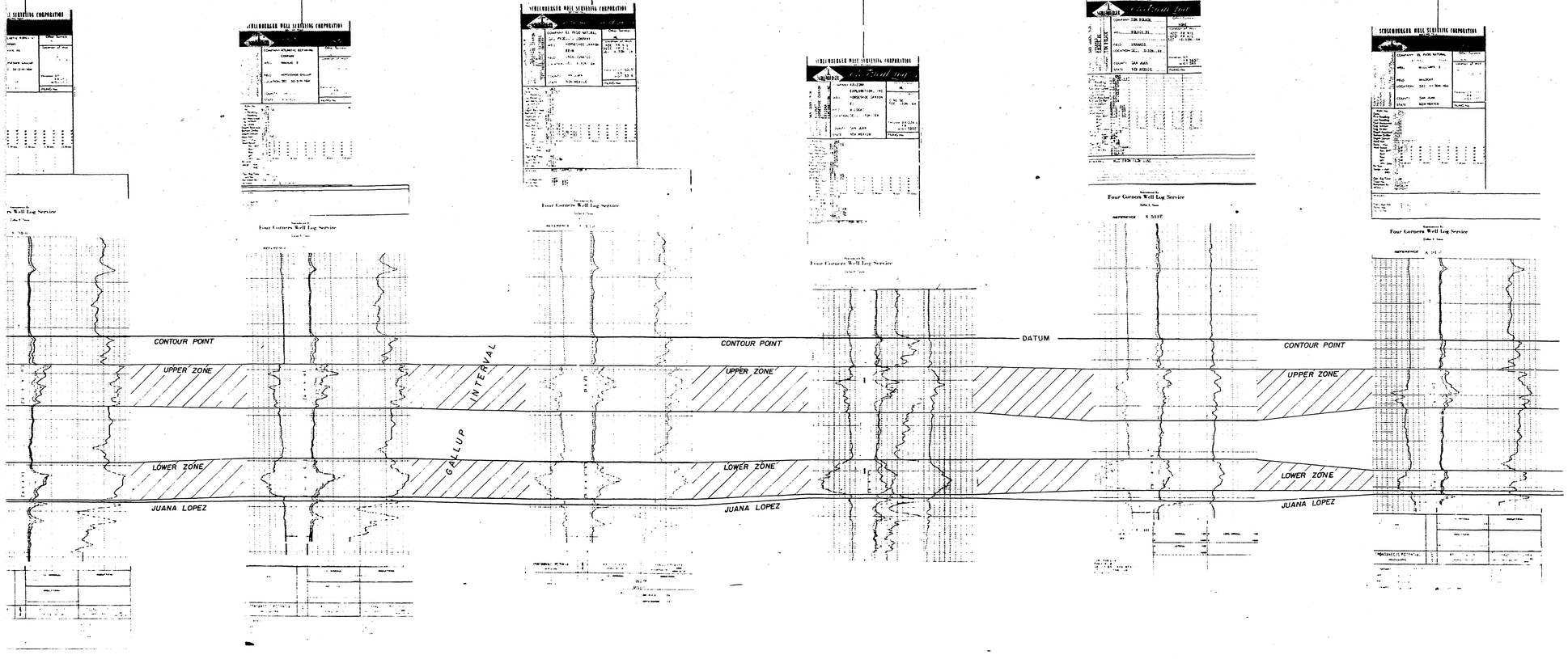
JUANA LOPEZ — JUANA LOPEZ — JUANA LOPEZ

136

A'

SE

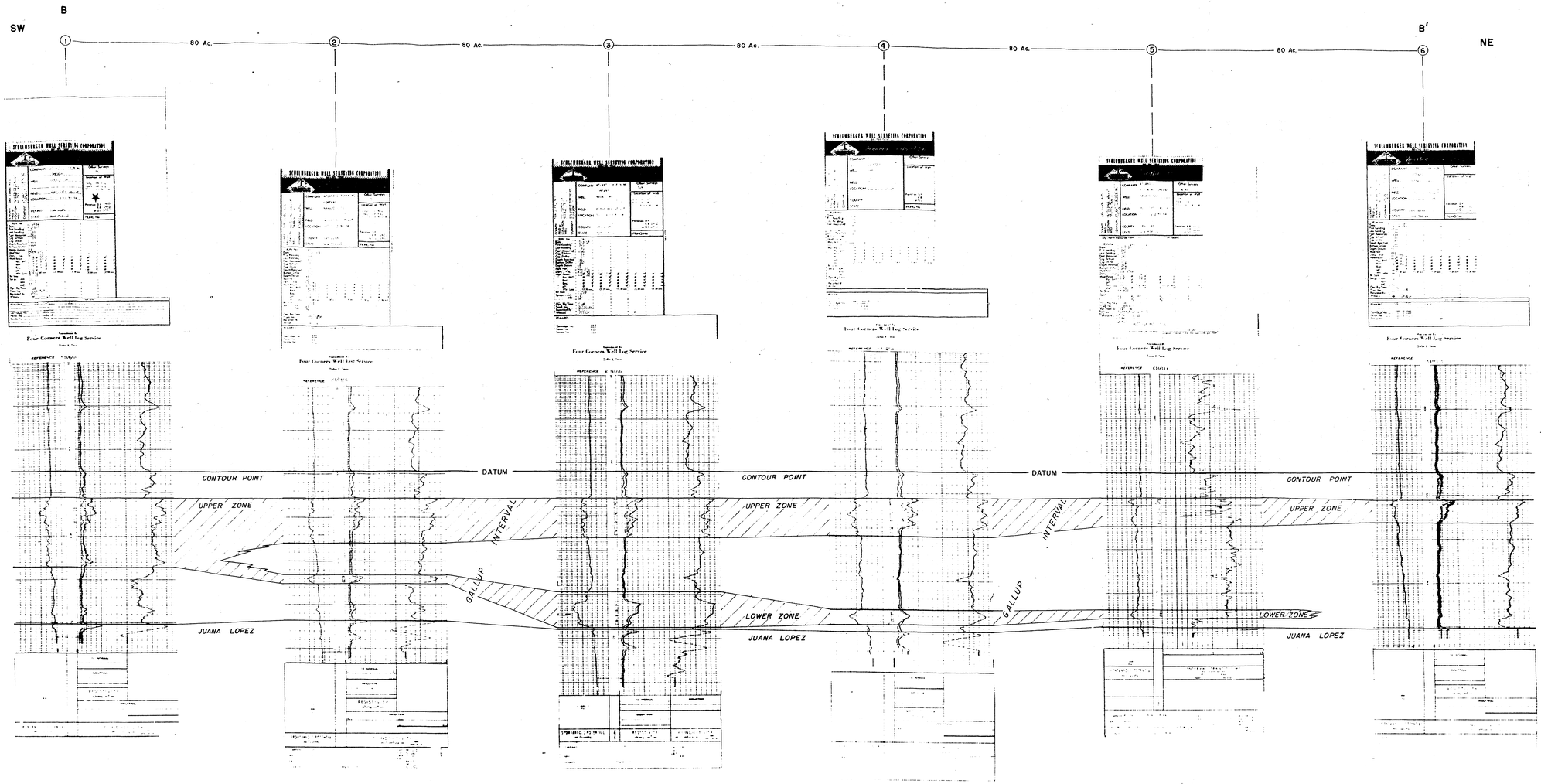
4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi. — 7 — 3/4 Mi. — 8 — 1 1/3 Mi. — 9



CROSS SECTION A-A'

THE ATLANTIC REFINING CO
EXHIBIT NO. _____
CASE NO. _____

137



...RIOS SECTION B — B'

WHITEWATER-GALLUP FIELD
SHALE CROSS SECTION
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

Horizontal Scale: None
Vertical Scale: 2" = 100'
Geology By: D. Jessup - Jan 1954
Drafted By: J. Irwin & F. Williams

EXHIBIT NO. 5
DOCKET NO.

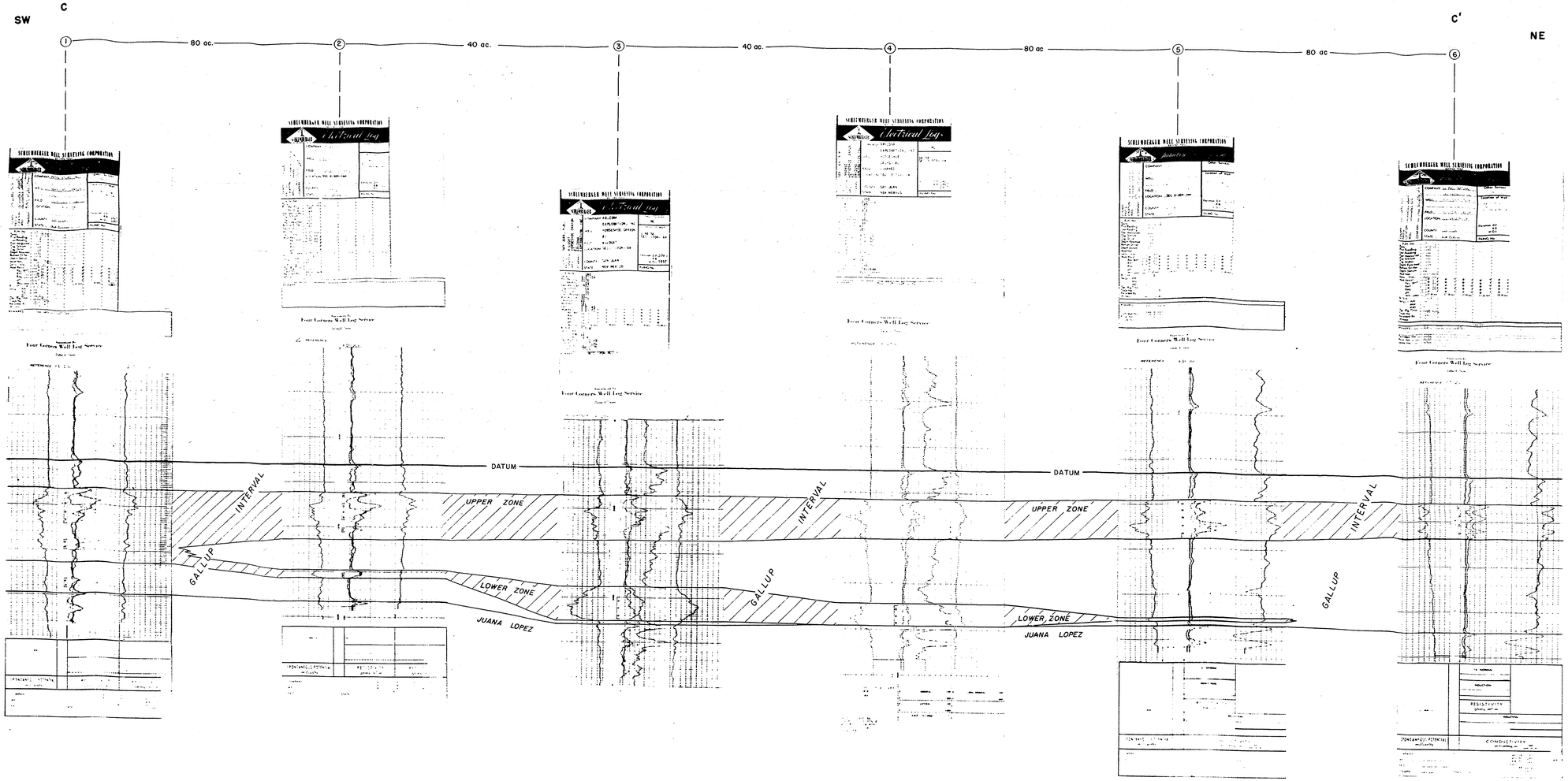
138

SW

C

C'

NE

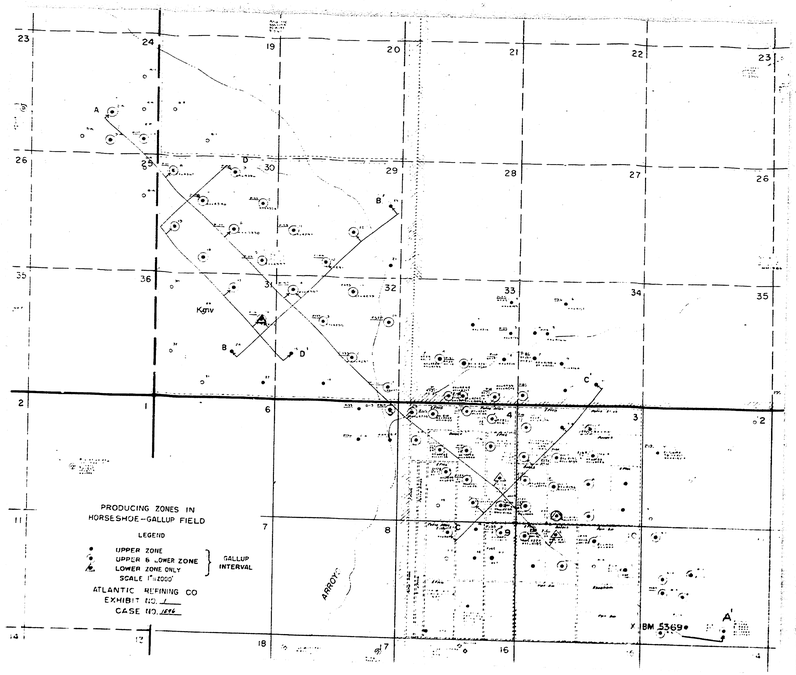


CROSS SECTION C – C'
HOSPAH-GALLUP POOL
AND AN CROSS SECTION
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

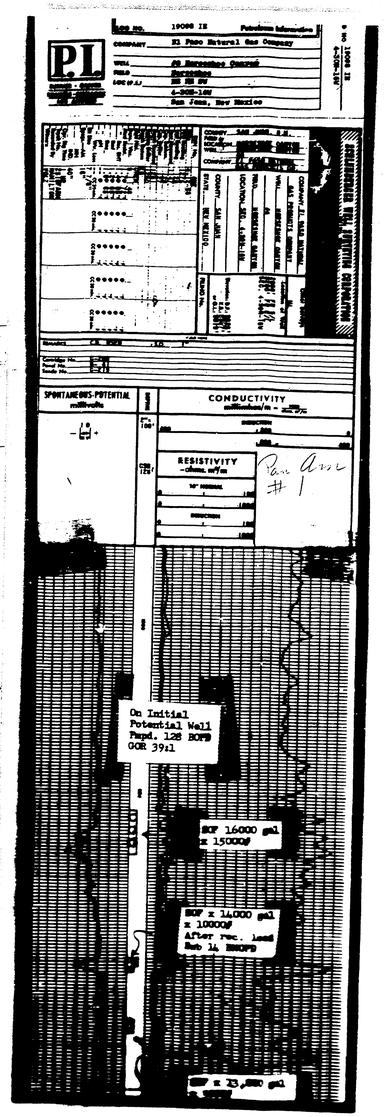
Horizontal Scale: None
Vertical: Vscale1" = 200'
Geology By: G. Jessup — Jan 1959
Drafted By: J. Irvin & K. Williams

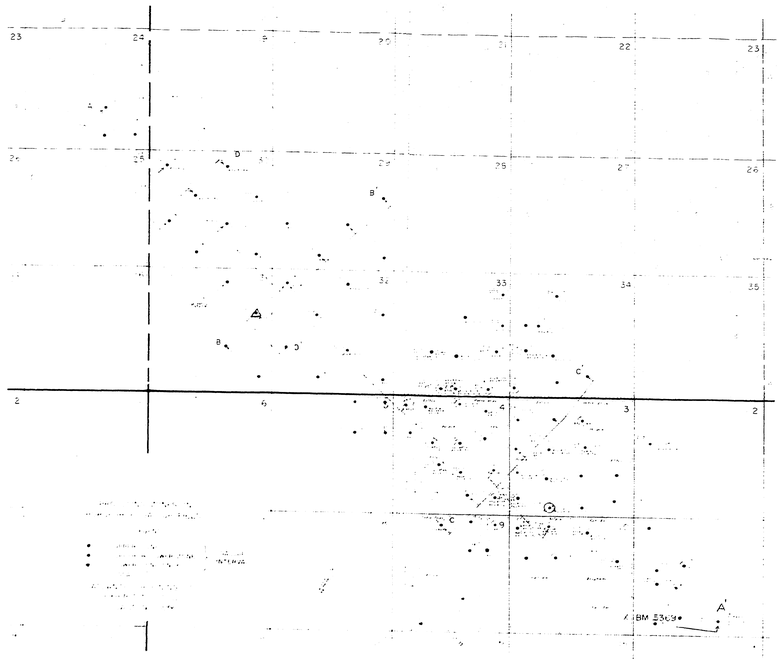
THE ATLANTIC REFINING CO.
EXHIBIT NO. —
CASE NO. 1597

139

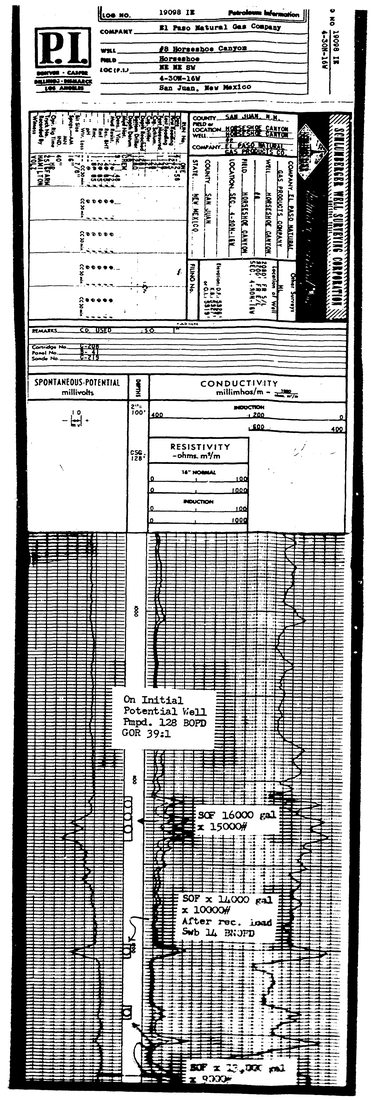

PRODUCING ZONES IN
HORSESHOE-GALLUP FIELD
LEGEND
UPPER ZONE
UPPER & LOWER ZONE
LOWER ZONE ONLY
GALLUP INTERVAL
SCALE 1"=2000'
ATLANTIC REFINING CO
EXHIBIT NO. 1
CASE NO. 1676
ARROYO
BM 5369
Kgllv

140


P.I.
Log No. 19098 IE Petroleum Information
COMPANY El Paso Natural Gas Company
WELL #8 Horseshoe Gallup
FIELD Horseshoe
SEC TWP RGE
LOC OF W.I. 4-30N-16W
San Juan, New Mexico
SPONTANEOUS POTENTIAL millivolts
CONDUCTIVITY millimhos/m
RESISTIVITY ohms, m²/m
Para #1
On Initial Potential Well Pmpd. 128 BOPD GOR 39:1
BOP & 16000 gal
& 15000#
BOP & 14000 gal
& 10000#
After rec. load
Feb 14 BBOPD
BOP & 23,000 gal


23
24
19
20
21
22
23
24
25
27
26
A
B
C
D
33
34
35
32
2
6
4
3
2
9
A
ABM 5369

140


Log No. 19098 IE
Petroleum Information
P.I.
COMPANY El Paso Natural Gas Company
WELL #8 Horseshoe Canyon
FIELD Horseshoe
LOC (F,L) NE NE SW
4-30N-16W
San Juan, New Mexico
4-30N-16W
9 NO 19098 IE
SCHLUMBERGER WELL SURVEYING CORPORATION
COUNTY SAN JUAN N.M.
FIELD or LOCATION HORSESHOE CANYON
WELL #8
COMPANY EL PASO NATURAL GAS PRODUCTS CO.
STATE NEW MEXICO
COUNTY SAN JUAN
FIELD HORSESHOE CANYON
LOCATION SEC. 4-30N-16W
REMARKS C.O. USED 3.0
SPONTANEOUS-POTENTIAL millivolts
CONDUCTIVITY millimhos/m
RESISTIVITY - ohms. m²/m
16" NORMAL
INDUCTION
On Initial Potential Well Pmpd. 128 BOPD GOR 39:1
80F 16000 gal x 15000#
80F x 14,000 gal x 10000# After rec. load Swb 14 BNJFD
80F x 15,00C gal x 9000#

Ex. 5
Ran Am

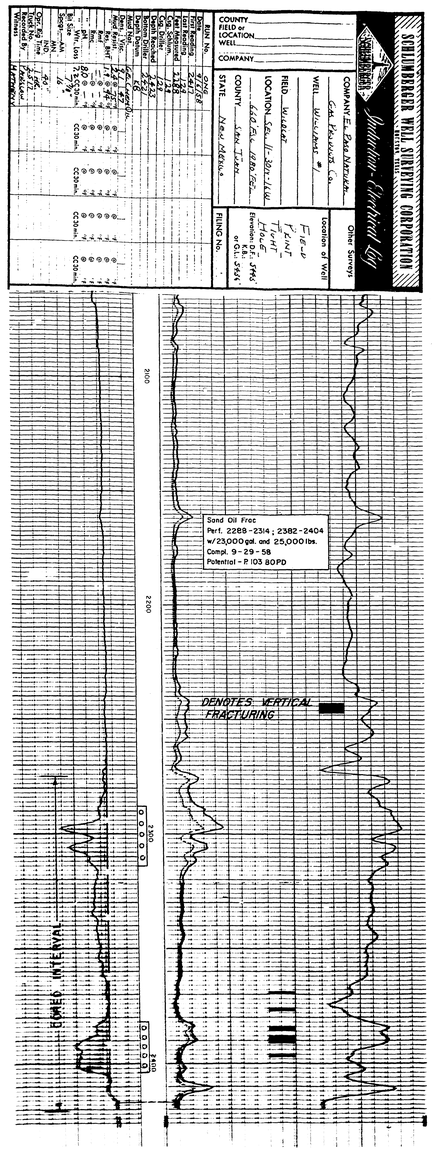
INDUCTION - ELECTRIC LOG

EL PASO NATURAL GAS PRODUCTS CO.

WILLIAMS NO. 1

T-30-N, R-16-W

SW/4 SE/4 SEC. 11



CORE DESCRIPTION

El Paso Natural Gas Products Company's #1 Williams, Section 11, T-30-N, R-16-W

Core #1: 2275-2311', Recovered 36'
2' sh, dk gy, hd, calc; w/thin stks & blebs lt gy, fn glauc ss
1' Ss, lt gy, fn, hd, calc cmtd, blauc; w/stks sh as above
4' Sh, as above; w/thin stks & blebs ss as above
2' Sh as above; w/thicker ss stks, med-coe, more glauc, w/sh pellets
2' Sh as above; w/v/thin stks fn, hd, glauc ss as before, no pellets
7' Ss, wh, med-coe, glauc, tgt, calc cmtd to shly, w/thin sh stks & blebs, occas. sh pellets & sh matrix inclus.
4' Ss, as above, clean, por, oil sat, w/sl/bldg, few sh blebs
5' Ss, as above, tgt, calc cmtd to shly matrix; w/interbeds dk gy sh
4' Ss, as above, clean, por, sat as above - (sl/less por?)
5' Ss. as above, tgt, calc cmtd to shly matrix; w/interbeed dk gy sh

Core #2: 2311-2369, Recovered 58'
2' Ss, gy, fn-coe, glauc, tgt, shly; w/stks clean cmtd ss & dk gy sh.
1' Sh, dk gy, hd; w/v/thin stks, fn, glauc ss
3' Sh, dk gy, sdy & glauc
3' Sh, dk gy, v/sdy - almost shly ss.
3' Sh, dk gy, sdy
2' Sh, dk gy, v/sdy - almost shly ss.
8' Sh, dk gy, sdy
2' Sh, dk gy, hd; w/thin stks fn glauc ss
11' Sh, dk gy, hd; sdy & glauc
3' Sh, dk cy, hd; w/thin stks fn glauc ss
11' Sh, dk gy, hd; sl/sdy & glauc
6' Sh, dk gy, hd; w/v/thin stks fn glauc ss
1' Sh, dk gy, hd; sl/sdy

Core #3: 2369-2407', Recovered 33'
10' Sh, dk gy, hd, sl/sdy & glauc; w/few w/thin stks & blebs glauc ss; vert frac 4m-70 & 76-77
1' Ss and sh as above, interbedded
2' Ss, med-coe, wh-gy, tgt., calc, cmtd., flacc; w/thin stks dk gy sh
1' Ss & sh, as above, interbedded; ss has vert?. fiber
3' Ss as above; w/sl/por stks fiber ss; w/dk. v/thin sh stks; vert frac w/fiber 4m-86
9' Ss as above; clean, por, oil sat, fiber; w/occasional 1ft shly stks 1"-4" thick; vert frac w/fiber 86-97
3' Ss as above, tgt, shly; fiber in por. clean blebs ss; vert/frac w/fiber 96-97
2' Ss as above, clean, hd, sl/por, calc cmtd, fair fiber
7' No recovery

Core #4: 2407-2431, Recovered 18.5'
4' Ss, fn-coe, glauc shly
4'6" Sh, dk gy, hd, foss; w/v/thin stks dk brn, fr sltn, dk br
5' Ss, dk brn, fr sltn, dk w/v/thin sh stks
4'6" Sh, as above; w/v/thin Ss stks
0' No recovery

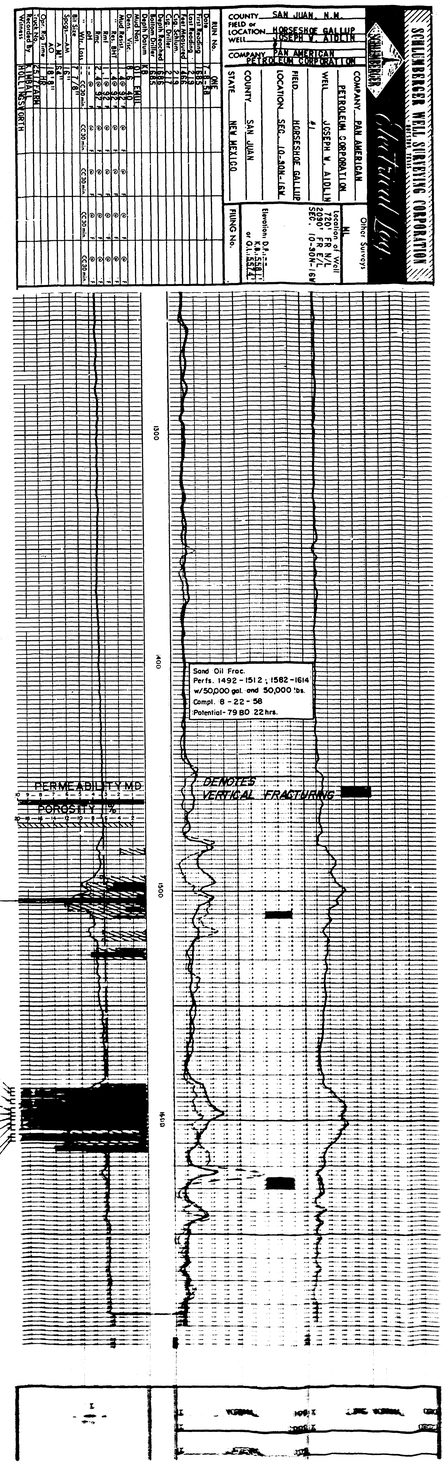
141

EX. 4

LOG - CORE CORRELATION

PAN AMERICAN
JOSEPH W. AIDLIN "A" NO. 1

T-30-N, R-16-W
NW/4 NE/4 SEC. 10



PERMEABILITY MD
POROSITY %

CORE DESCRIPTION

1480-83 TIGHT SAND W/SHALE LAMINATIONS

1483-93 SHALE W/SCATTERED SAND LAMINATIONS

1493-97 TIGHT TO MED GRAINED SAND W/SCATTERED SHALE LAMINATIONS
1497-99 MED GRAINED SAND W/SHALE INTRUSIONS
1499-1502 TIGHT TO MED GRAINED SAND W/SHALE LAMINATIONS
1502-06 MED GRAINED SAND W/SHALE INTRUSIONS & LAMINATIONS
1506-09 TIGHT TO MED SAND W/SHALE LAMINATIONS
1509-12 TIGHT GRAINED SAND W/SHALE LAMINATIONS & VERTICAL FRACTURES
1512-19 SHALE W/TIGHT SAND LAMINATIONS
1519-21 SHALE TIGHT GRAINED SAND.
1521-30 SHALE W/THIN SCATTERED SAND LAMINATIONS

1576-81 SHALE, SLIGHTLY CALCAREOUS, VERY SLIGHT SAND INCLUSIONS & LAMINATIONS

1581-96 TIGHT SAND W/GRAVY SHALE LAMINATIONS. BLEEDING GAS & OIL

1596-1605 MED GRAINED SAND W/SHALE LAMINATIONS (SCATTERED) BLEEDING GAS & OIL

1605-11 TIGHT SAND W/SHALE LAMINATIONS (SCATTERED)

1611-29 SHALE W/SCATTERED THIN SAND LAMINATIONS
1629-35 TIGHT SAND W/SHALE LAMINATIONS
1635-50 SHALE W/SCATTERED THIN SAND LAMINATIONS W/VERTICAL FRACTURES
1650-56 POWER CHIP SHALE, VERY FOSSILIFEROUS

142

Y-4

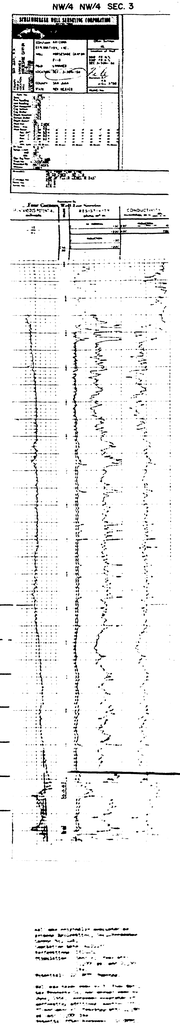
Tom Olson
EX. 3

CROSS SECTION A-A'

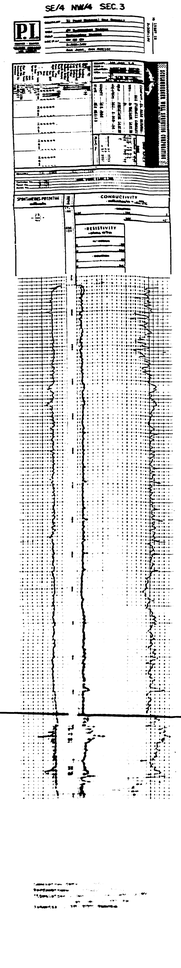
HORSESHOE GALLUP FIELD

SAN JUAN CO., NEW MEXICO

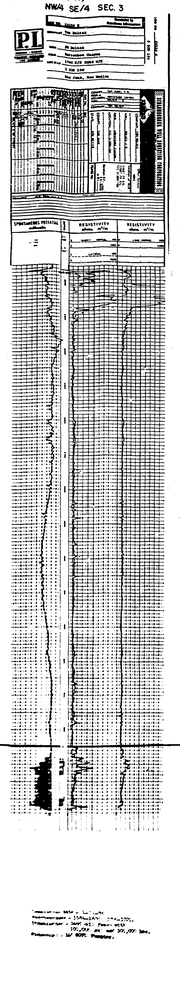
EL PASO NATURAL GAS PRODUCTS CO.
HORSESHOE CANYON NO. 1-B
T-30-N, R-16-W
NW/4 NW/4 SEC. 3



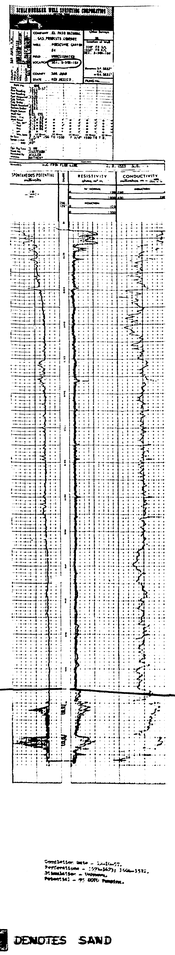
EL PASO NATURAL GAS PRODUCTS CO.
HORSESHOE CANYON NO. 9
T-30-N, R-16-W
SE/4 NW/4 SEC. 3



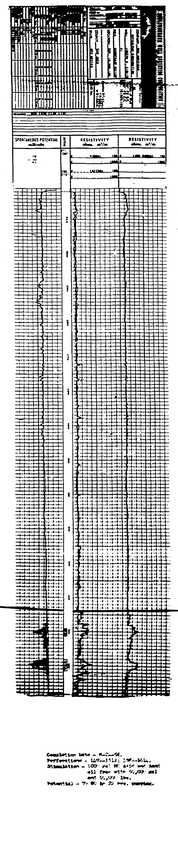
TOM BOLACK
BOLACK NO. 8
T-30-N, R-16-W
NW/4 SE/4 SEC. 3



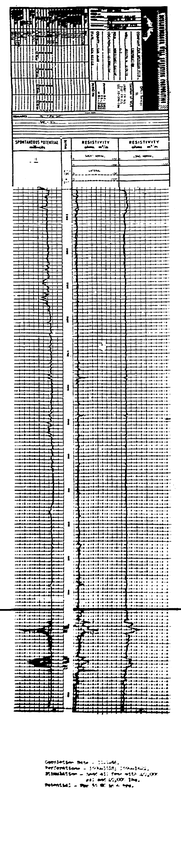
EL PASO NATURAL GAS PRODUCTS CO.
HORSESHOE CANYON NO. 4
T-30-N, R-16-W
SE/4 SW/4 SEC. 3



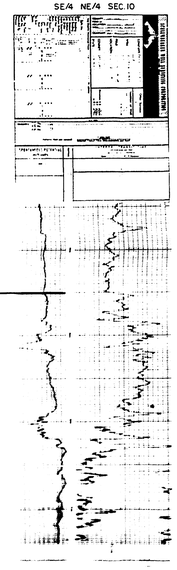
PAN AMERICAN
JOSEPH W. AIDLIN "A" NO. 1
T-30-N, R-16-W
NW/4 NE/4 SEC. 10



PAN AMERICAN
JOSEPH W. AIDLIN "A" NO. 2
T-30-N, R-16-W
SE/4 NE/4 SEC. 10



PAN AMERICAN
JOSEPH W. AIDLIN "A" NO. 2
T-30-N, R-16-W
SE/4 NE/4 SEC. 10



+4700
+4600
+4500
+4400
+4300
+4200
+4100

T. GALLUP

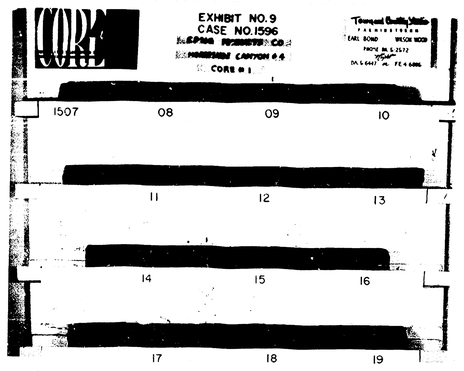
T. GALLUP

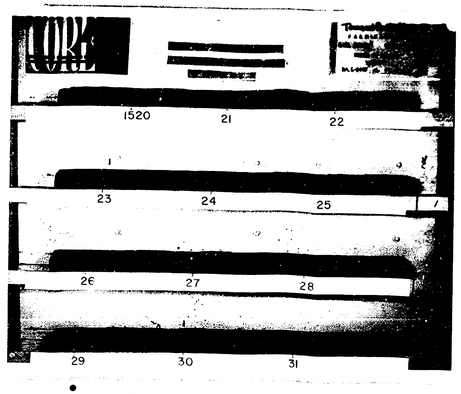
CHANGE IN VERTICAL SCALE

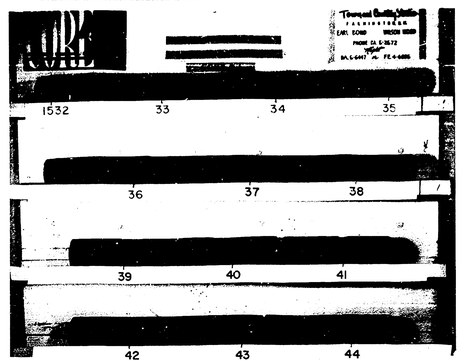
DENOTES SAND

143

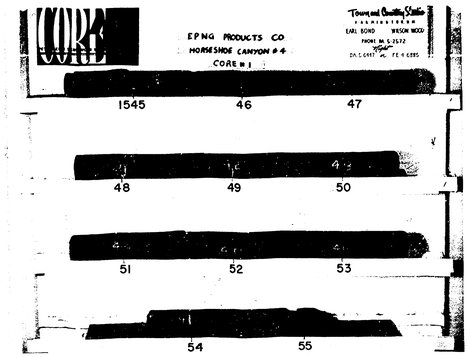
EXHIBIT NO. 9
CASE NO. 1596
EPNG PRODUCTS CO
HORSESHOE CANYON # 4
CORE # 1



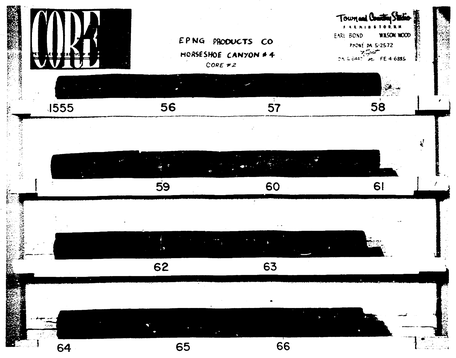




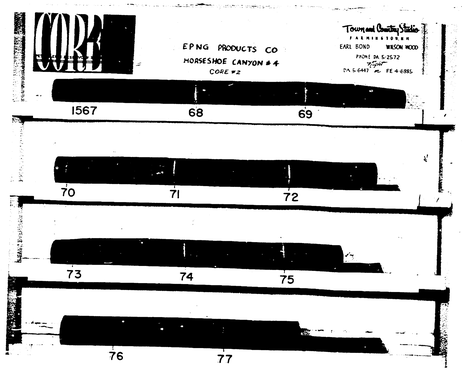
EPNG PRODUCTS CO
HORSESHOE CANYON # 4
CORE # 1



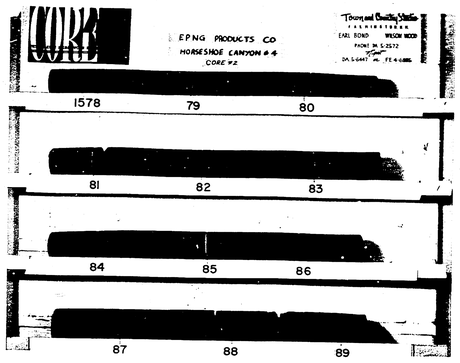
EPNG PRODUCTS CO
HORSESHOE CANYON # 4
CORE # 2



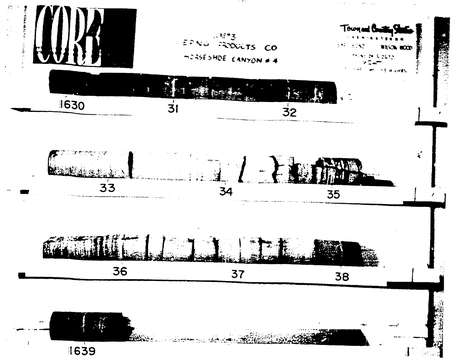
EPNG PRODUCTS CO
HORSESHOE CANYON # 4
CORE # 2



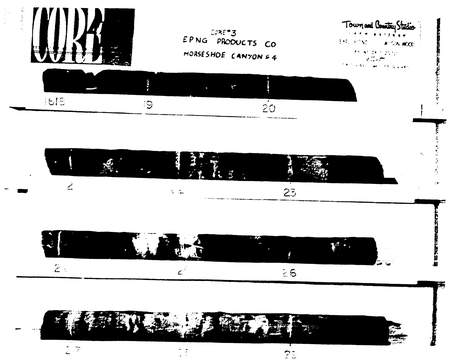
EPNG PRODUCTS CO
HORSESHOE CANYON # 4
CORE # 2



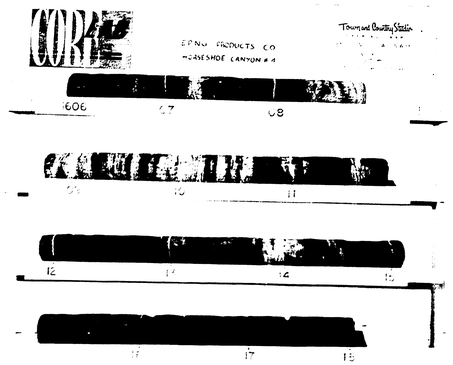
EPNG PRODUCTS CO
HORSESHOE CANYON # 4



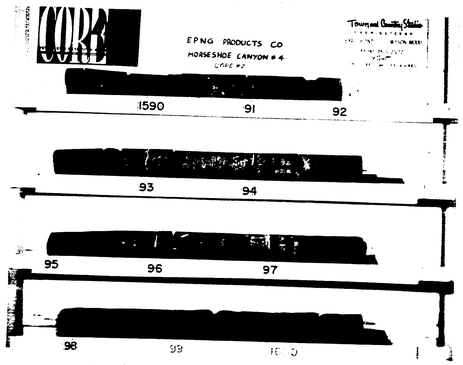
EPNG PRODUCTS CO
HORSESHOE CANYON # 4



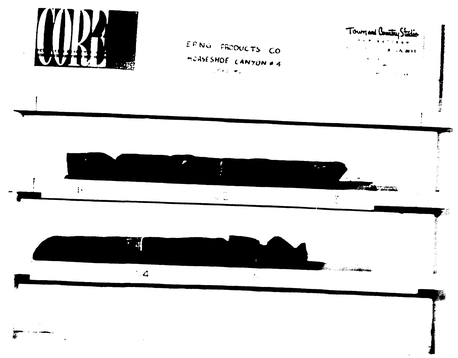
EPNG PRODUCTS CO
HORSESHOE CANYON # 4



EPNG PRODUCTS CO
HORSESHOE CANYON # 4
CORE # 2



EPNG PRODUCTS CO
HORSESHOE CANYON # 4



144

CASE NO. 1596
THE ATLANTIC REFINING CO.
EXHIBIT NO. 2

145

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 1

CORE ANALYSIS RESULTS

Company THE ATLANTIC REFINING COMPANY — Formation UPPER & LOWER TOCITO — File RP-3-922
Well NAVAJO NO.29 — Core Type DIAMOND CONV. — Date Report 2-11-59
Field HOSKINSON GALLUP — Drilling Fluid OIL EMULSION MUD — Analyst CLIFFORD
County SAN JUAN — State NEW MEX. — Elev. 5554 GR — Location SEC 31 31N 16W

Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MAXIMUM hor	PERMEABILITY MAXIMUM vert	POROSITY %	FLUID SATURATIONS % OF PORE SPACE OIL	FLUID SATURATIONS % OF PORE SPACE WATER	RESIDUAL FLUID SATURATIONS % OF PORE SPACE OIL	RESIDUAL FLUID SATURATIONS % OF PORE SPACE WATER	SAMPLE DESCRIPTION AND REMARKS
1	1221-22	0.06	0.02	2.6	7.7	50.0			
2	22-23	0.06	0.02	6.3	11.1	73.0			
3	23-24	0.08	0.02	8.7	33.3	51.7			
4	24-25	0.06	0.04	13.0	19.1	69.1			
5	25-26	0.06	0.03	7.2	11.1	79.2			
6	26-27	1.6	1.1	8.1	14.8	59.3			
7	27-28	0.96	0.04	13.2	21.2	75.8			
8	28-29	0.60	0.02	10.6	13.2	79.2			
9	29-30	0.54	0.09	9.2	13.0	75.0			
10	30-31	0.35	0.04	11.3	24.8	63.7			
11	31-32	0.06	0.04	11.3	12.4	65.5			
12	32-33	443	269	20.2	14.9	32.2			
13	33-34	258	111	20.6	18.0	36.9			
14	34-35	0.16	0.13	17.4	7.5	48.4			
15	35-36	0.17	0.09	9.2	16.3	51.1			
16	36-37	0.26	0.09	8.8	15.9	39.1			
17	37-38	87	41	16.6	15.7	28.3			
18	38-39	0.70	0.41	20.7	12.1	21.7			
19	39-40	100	49	17.8	14.6	37.6			
20	40-41	6.8	4.5	16.7	16.8	44.3			
21	41-42	155	39	18.8	13.4	41.5			
22	42-43	212	12	25.1	12.4	35.9			
23	43-44	278	171	24.8	13.7	34.7			
24	44-45	49	26	21.4	19.6	31.3			
25	45-46	58	35	14.3	18.9	32.4			
26	46-47	17	3.9	18.3	6.0	42.4			
27	47-48	0.70	0.26	13.2	8.9	68.1			
28	48-49	134	77	25.6	12.9	30.9			
29	49-50	372	1.0	17.0	11.2	21.8			
30	50-51	0.43	0.14	7.7	9.1	53.2			
31	51-52	19	4.4	19.0	13.2	29.5			
32	52-53	12	1.0	11.9	23.5	29.3			
33	53-54	0.70	0.41	15.8	12.7	31.3			
34	54-55	0.55	0.26	12.6	19.8	31.0			
35	55-56	0.42	0.09	8.3	15.7	39.8			
36	56-57	0.26	0.20	14.0	17.9	48.4			
37	57-58	0.13	0.06	6.4	7.8	67.2			
38	58-59	0.17	0.06	10.7	4.7	68.5			
39	59-60	0.25	0.08	11.5	4.3	61.7			
40	60-61	0.14	0.05	10.8	6.6	75.5			
41	61-62	0.11	0.07	10.8	6.2	74.2			
42	1262-63	0.07	0.03	11.0	6.4	76.6			

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 2

CORE ANALYSIS RESULTS

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Lithological Abbreviations

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MAXIMUM hor	PERMEABILITY MAXIMUM vert	POROSITY %	FLUID SATURATIONS % OF PORE SPACE OIL	FLUID SATURATIONS % OF PORE SPACE WATER	RESIDUAL FLUID SATURATIONS % OF PORE SPACE OIL	RESIDUAL FLUID SATURATIONS % OF PORE SPACE WATER	SAMPLE DESCRIPTION AND REMARKS
43	126)-64	0.08	0.06	11.2	4.5	76.8			
44	64-65	0.06	0.05	13.8	4.6	75.9			
45	65-66	0.06	0.02	9.4	5.3	73.4			
46	66-67	0.03	0.02	10.1	5.0	79.2			
47	67-68	0.04	0.02	9.5	5.3	81.2			
48	68-69	0.06	0.03	10.3	6.8	79.6			
49	69-70	0.11	0.04	9.4	5.4	80.2			
50	70-71	0.12	0.03	9.4	5.2	89.4			
51	71-72	0.06	0.02	9.2	5.4	89.1			UPPER TOCITO
52	72-73	0.41	0.07	10.8	4.6	85.2			LOWER TOCITO
53	73-74	0.09	0.08	10.4	6.7	82.7			
54	74-75	0.07	0.04	10.5	4.8	81.9			
55	75-76	0.21	0.09	10.4	6.7	86.5			
56	76-77	0.20	0.06	10.4	6.7	86.5			
57	77-78	0.36	0.10	11.5	7.8	85.5			
58	78-79	0.06	0.05	11.1	4.5	79.3			
59	79-80	0.12	0.10	8.3	6.0	79.5			
60	80-81	0.33	0.09	11.5	4.3	80.0			
61	81-82	0.06	0.04	8.3	6.5	81.9			
62	82-83	0.10	0.08	9.3	5.3	80.0			
63	83-84	0.38	0.07	10.1	6.9	81.2			
64	84-85	0.17	0.03	11.8	4.3	85.7			
65	85-86	0.19	0.09	9.2	9.7	74.2			
66	86-87	0.32	0.06	5.1	0.0	60.8			
67	87-88	0.47	0.09	11.5	6.2	89.3			
68	88-89	0.12	0.10	10.4	6.7	82.6			
69	89-90	0.04	0.02	2.7	0.0	70.4			
70	90-91	0.16	0.06	8.4	8.1	84.9			
71	91-92	0.29	0.13	9.9	5.1	86.9			
72	92-93	1.0	0.11	8.0	6.3	78.8			
73	93-94	0.07	0.05	6.8	0.0	67.6			
74	94-95	0.52	0.10	10.0	7.0	80.0			
75	95-96	0.26	0.13	6.4	7.8	78.1			
76	96-97	0.04	0.02	6.5	10.1	79.7			
77	97-98	0.80	0.16	15.2	13.1	30.2			
78	98-99	1.0	0.19	10.6	7.8	32.1			
79	1299-00	4.2	1.0	11.4	13.0	32.4			
80	1300-01	63	2.5	19.0	20.5	28.4			
81	01-02	0.17	0.04	4.7	10.4	72.6			
82	02-03	0.39	0.08	7.2	9.3	46.7			
83	03-04	0.45	0.16	12.1	14.9	37.9			
84	1304-05	0.62	0.13	11.2	14.3	39.2			

CORE LABORATORIES, INC.
Petroleum Reservoir Engineering
DALLAS, TEXAS

Page No. 3

CORE ANALYSIS RESULTS

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85	1399-00	0.80	0.67	12.5	9.6	60.8			
86	06-07	1.0	0.16	11.3	12.4	67.3			
87	07-08	0.34	0.27	10.8	11.1	63.9			
88	08-09	0.65	0.25	11.1	7.2	63.1			
89	09-10	0.12	0.04	11.7	6.0	75.2			
90	1310-11	0.04	0.01	10.1	6.9	87.1			

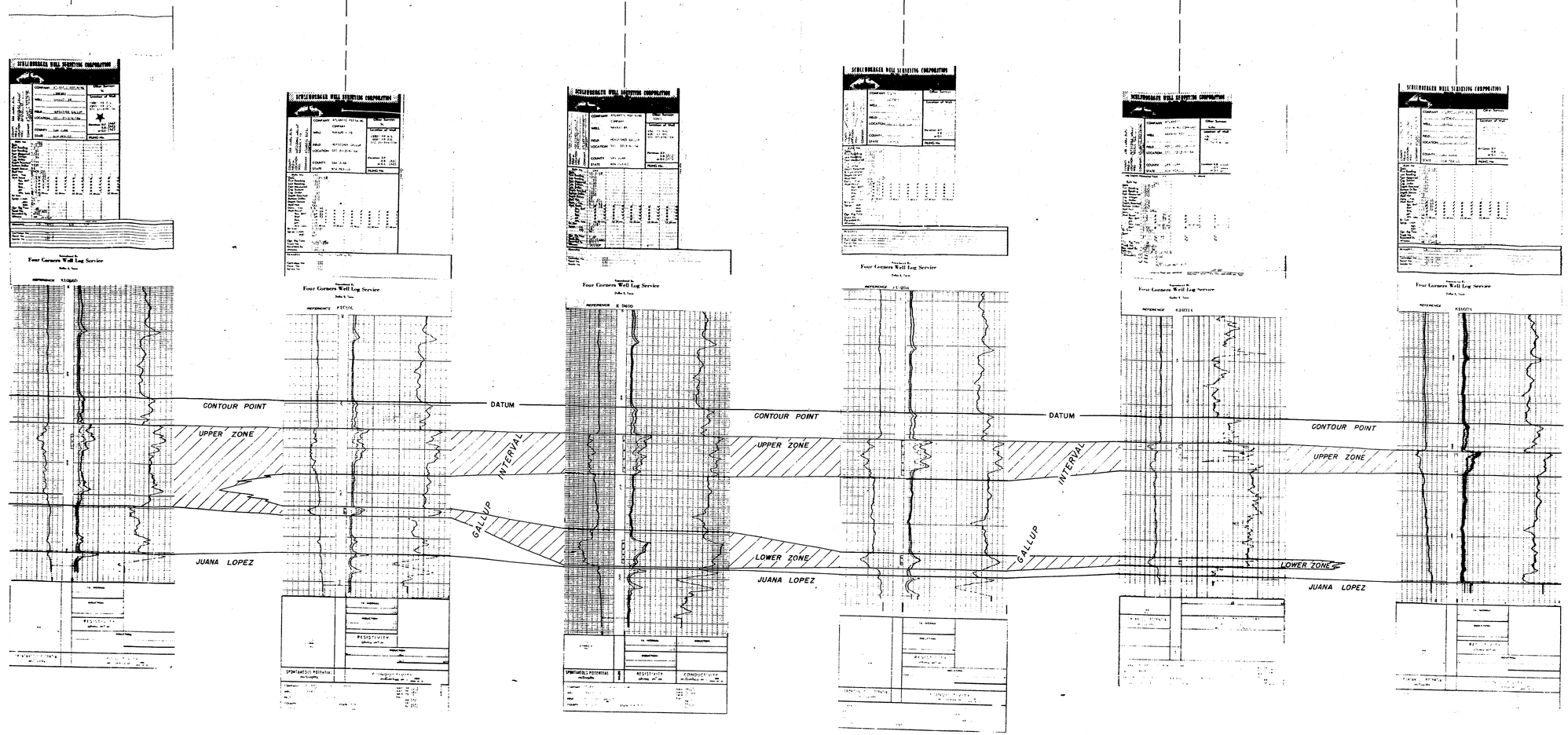
B

SW

1 — 80 Ac. — 2 — 80 Ac. — 3 — 80 Ac. — 4 — 80 Ac. — 5 — 80 Ac. — 6

B'

NE



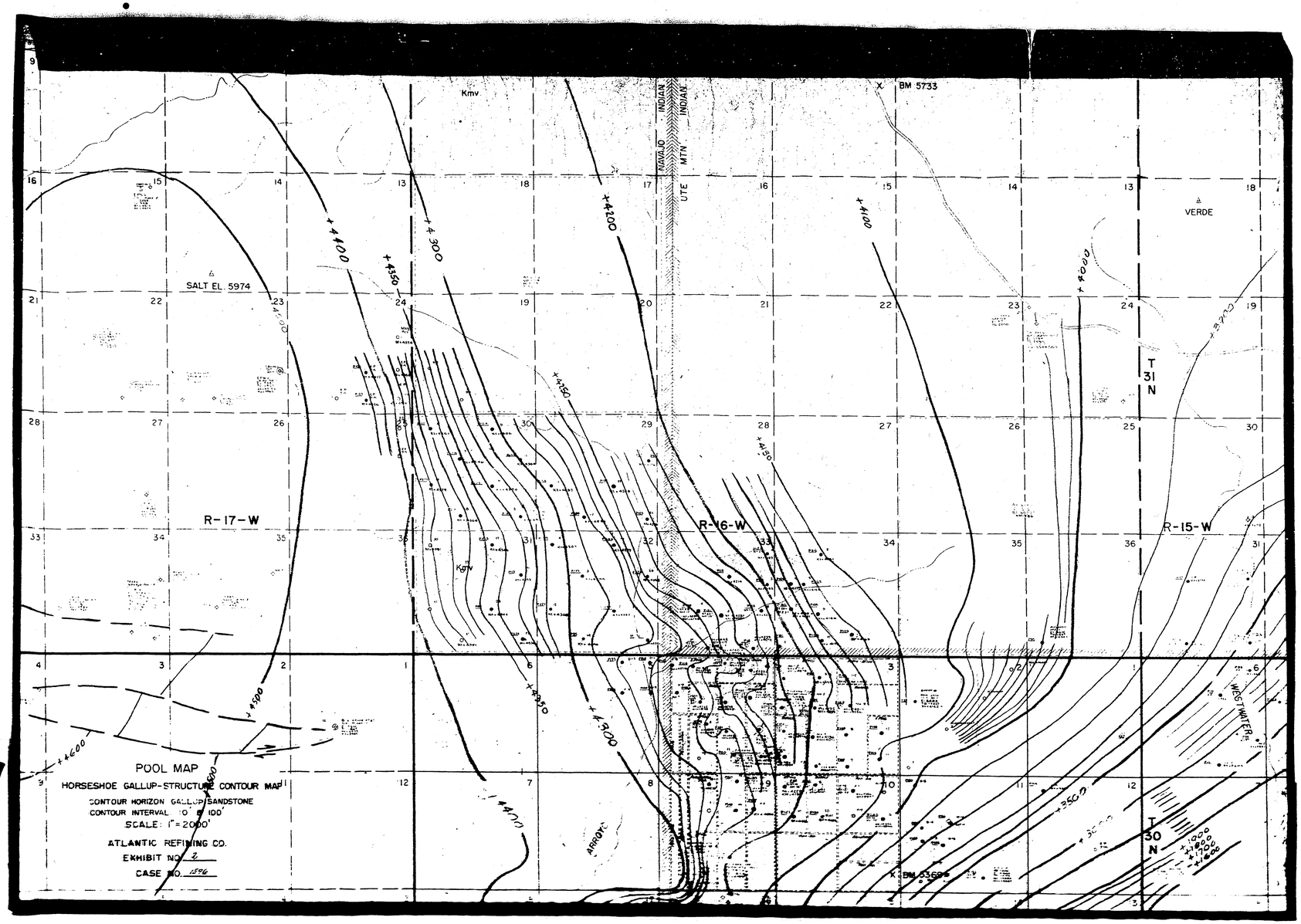
CROSS SECTION B — B'

[illegible]
OF THE GALLUP INTERVAL
San Juan Co., New Mexico

Horizontal Scale: None
Vertical Scale: 50' = 100'
Geology By: D. Jasmon - Jan 1980
Drafted By: J. Ireton & E. Williams

[illegible]
EXHIBIT NO. _____
CASE NO. _____

146



POOL MAP

HORSESHOE GALLUP-STRUCTURE CONTOUR MAP

CONTOUR HORIZON GALLUP SANDSTONE

CONTOUR INTERVAL 10' & 100'

SCALE: 1" = 2000'

ATLANTIC REFINING CO.

EXHIBIT NO. 2

CASE NO. 1296

147

SW

C

C'

NE

80 ac.

40 ac.

40 ac.

80 ac

80 ac

1

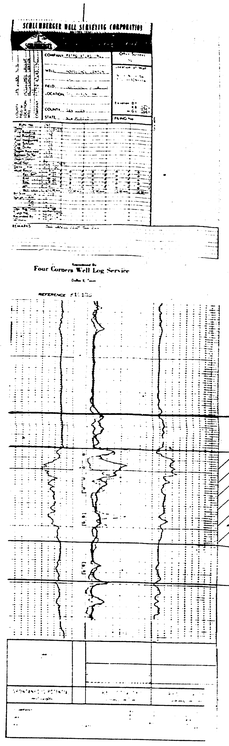
2

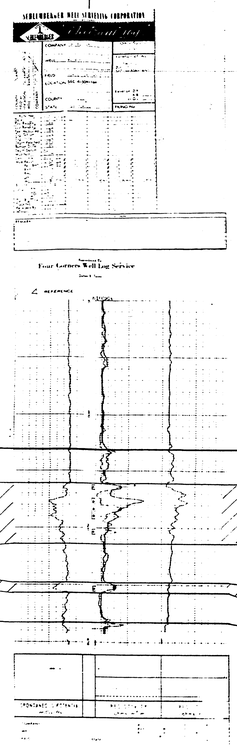
3

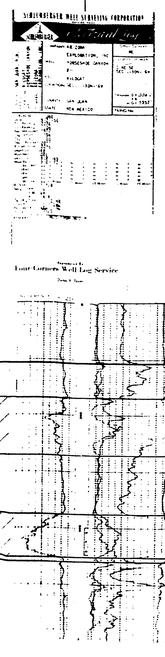
4

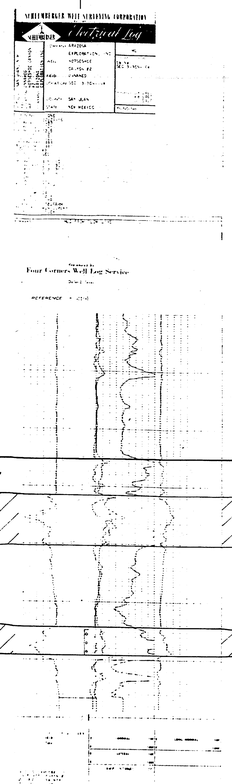
5

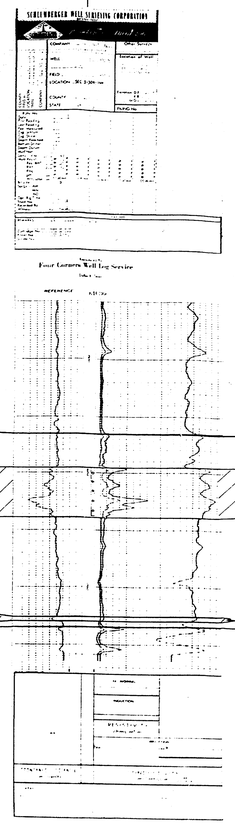
6

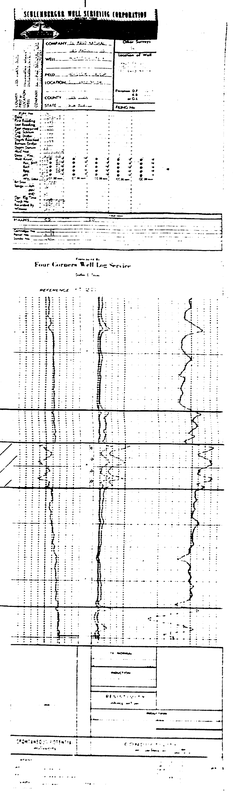












DATUM

DATUM

INTERVAL

UPPER ZONE

INTERVAL

UPPER ZONE

INTERVAL

GALLUP

LOWER ZONE

JUANA LOPEZ

GALLUP

LOWER ZONE

JUANA LOPEZ

GALLUP

CROSS SECTION C – C'
SCHLUMBERGER WELL SURVEYING CORP.
IN THE GREATER PORTION
OF THE GALLUP RESERVOIR
San Juan Co., New Mexico

Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 200'
Geology By: D. Jessup – Jan 1959
Drafted By: J. Jones & K. Williams

THE ATLANTIC REFINING CO
EXHIBIT NO. ____
CASE NO. ____

148

NE D

SW

D' SE

① Appx 1/3 Mi ② Appx 1/3 Mi ③ Appx 1/3 Mi ④ Appx 1/3 Mi ⑤ Appx 1/3 Mi ⑥

DATUM

CONTOUR POINT

INTERVAL

UPPER ZONE

LOWER ZONE

GALLUP

JUANA LOPEZ

CROSS SECTION D—D'

NORTHWEST-GALLUP POOL

SHOWING CROSS SECTION OF THE GALLUP INTERVAL

San Juan Co., New Mexico

Horizontal Scale: 1" = 1000'

Vertical Scale: 1" = 100'

Drawn By: D. Jones - Jan 1990

Checked By: J. Jones & K. Williams

THE ATLANTIC REFINING CO

EXHIBIT NO. ____

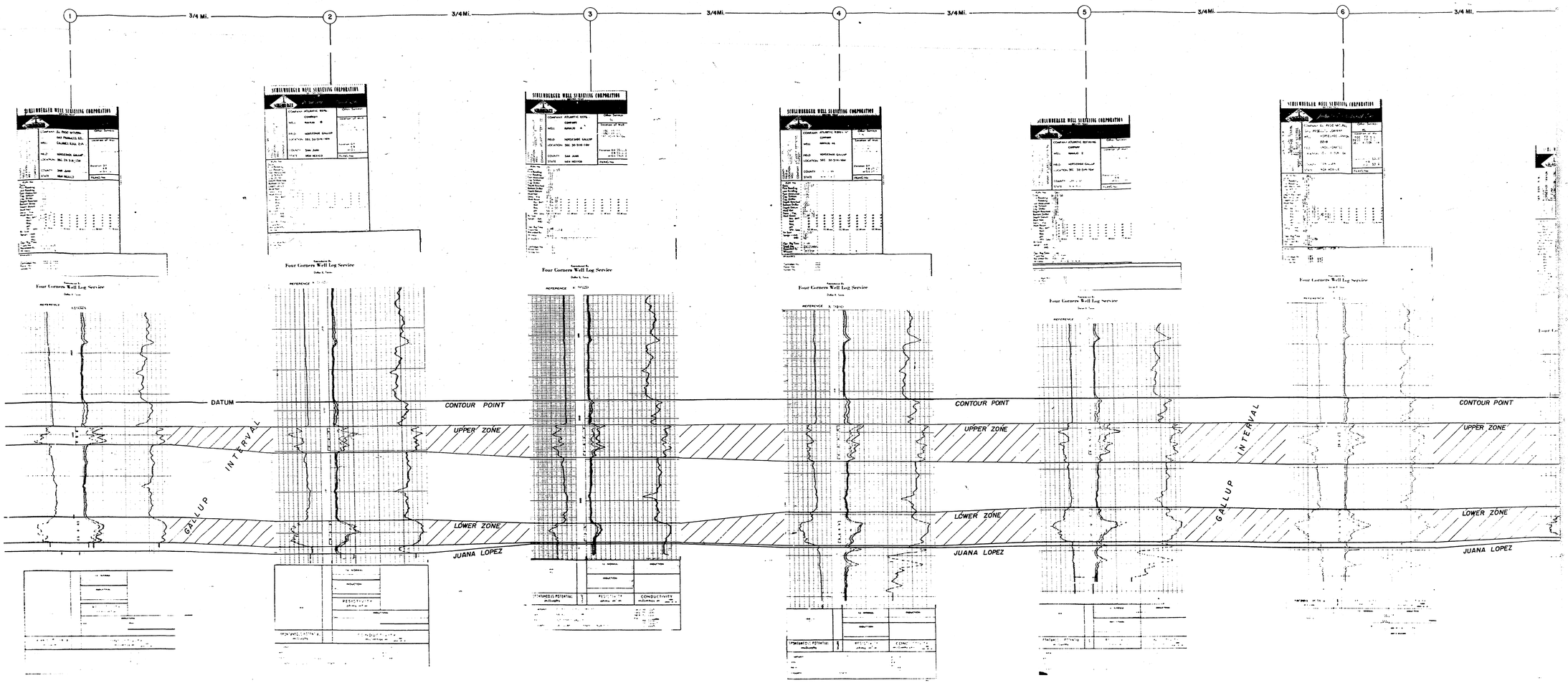
CASE NO. ____

149

A

NW

1 — 3/4 Mi. — 2 — 3/4 Mi. — 3 — 3/4 Mi. — 4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi.

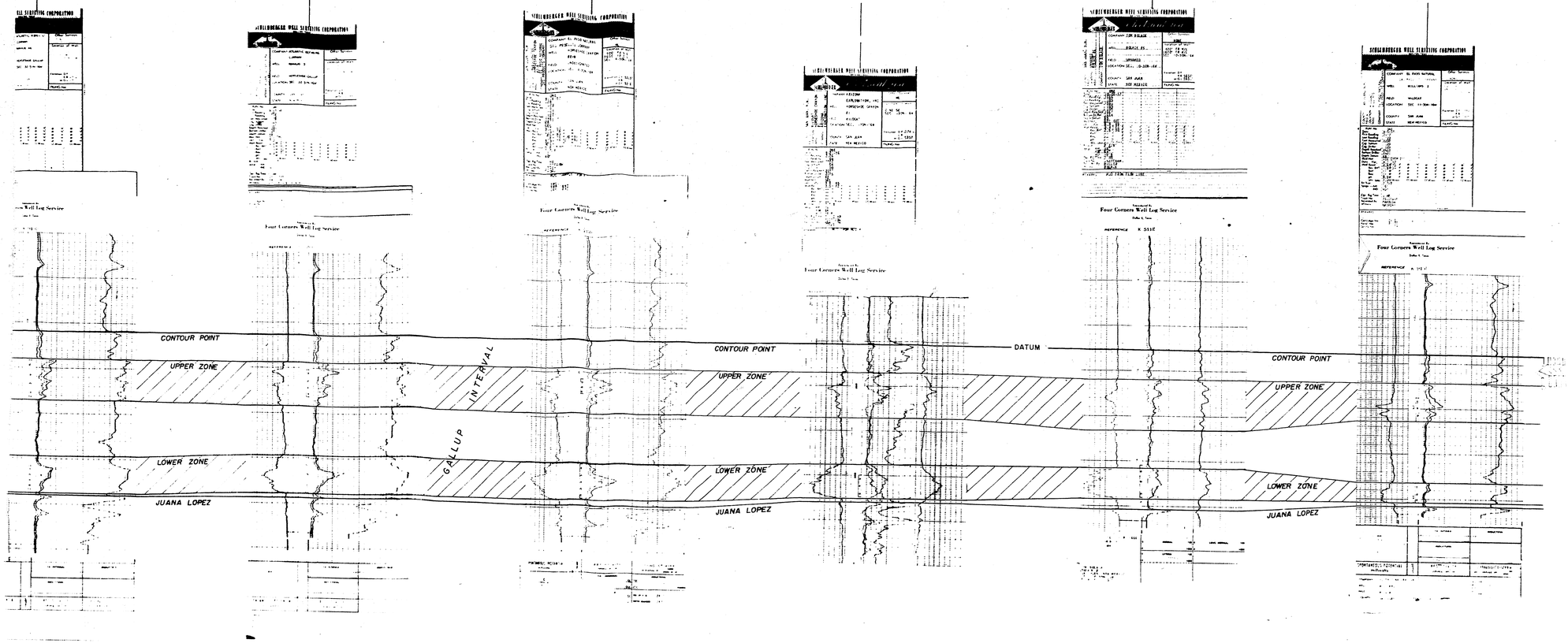


150

A'

SE

4 — 3/4 Mi. — 5 — 3/4 Mi. — 6 — 3/4 Mi. — 7 — 3/4 Mi. — 8 — 1 1/3 Mi. — 9



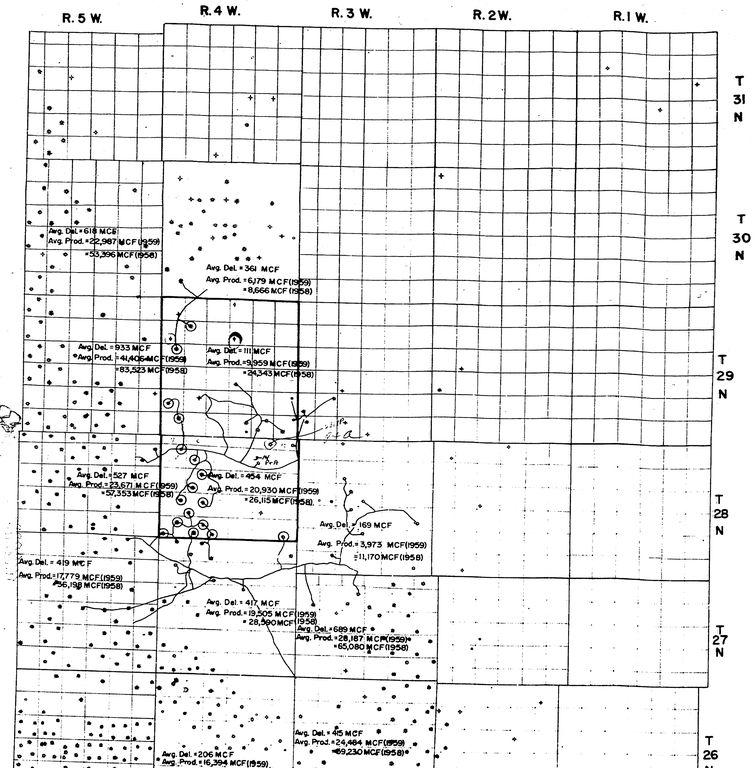
CROSS SECTION A - A'

THE ATLANTIC REFINING CO

EXHIBIT NO. _____

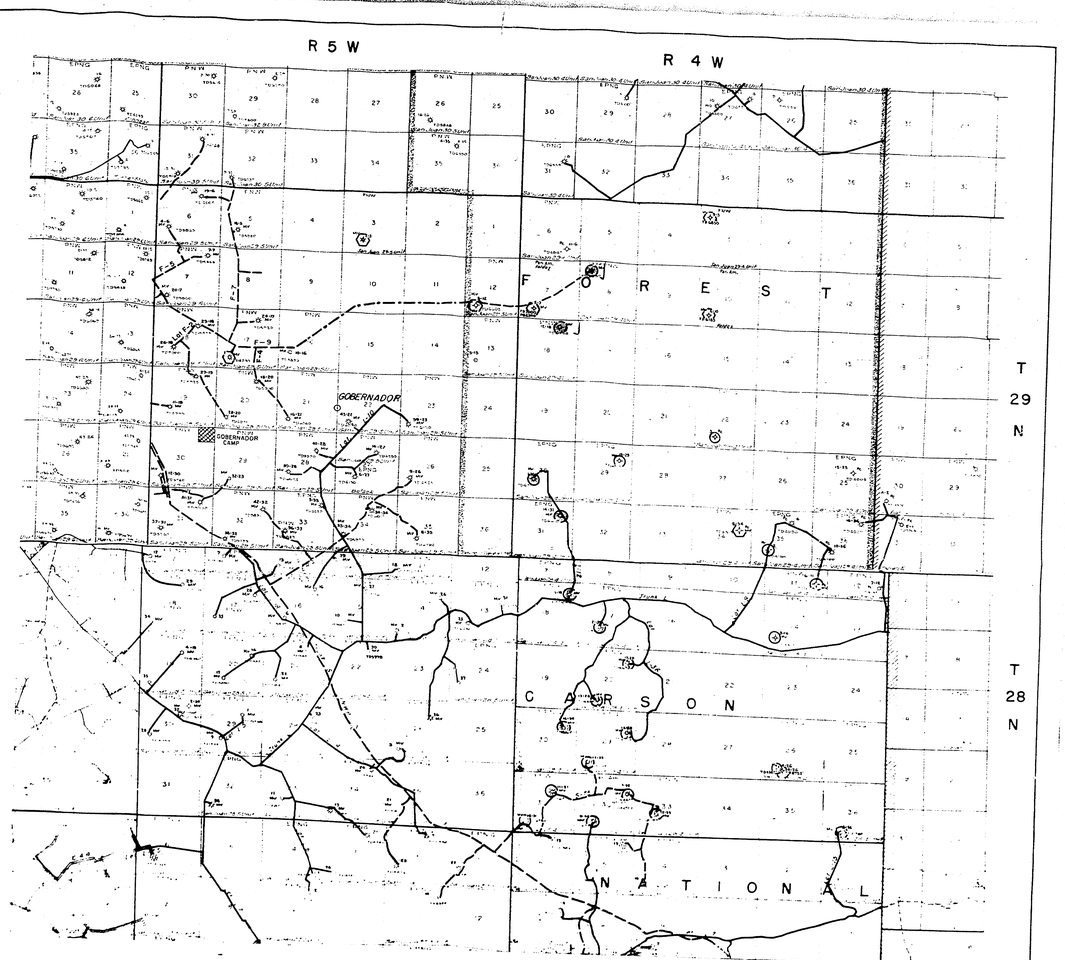
CASE NO. _____

151



WELL LOCATION MAP
of
A Portion of Eastern San Juan Basin

Showing Average Deliverabilities and Average Production per Mesaverde Well. Jan.—May, 1959
& Year 1958.



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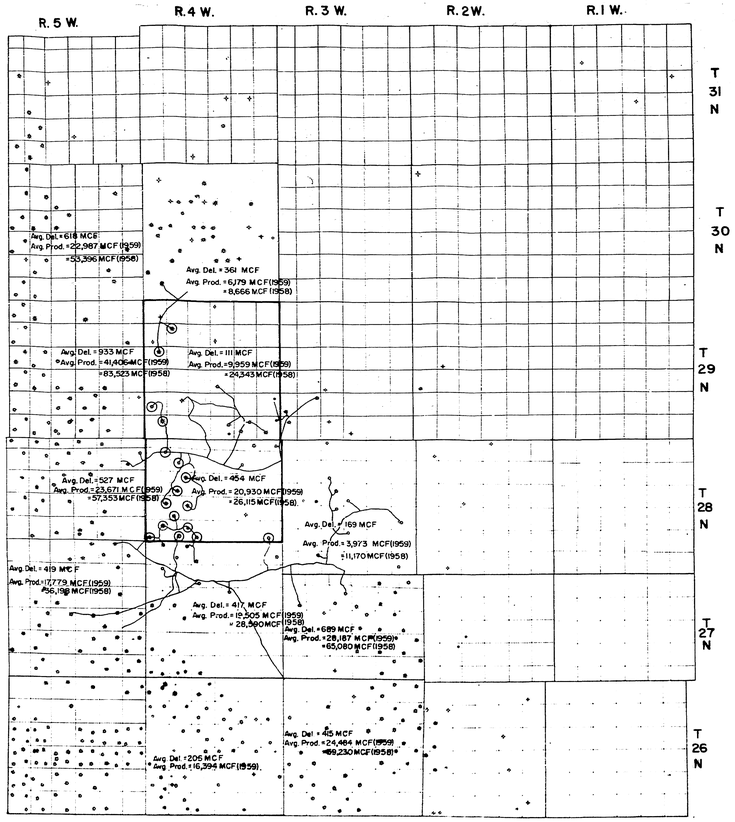
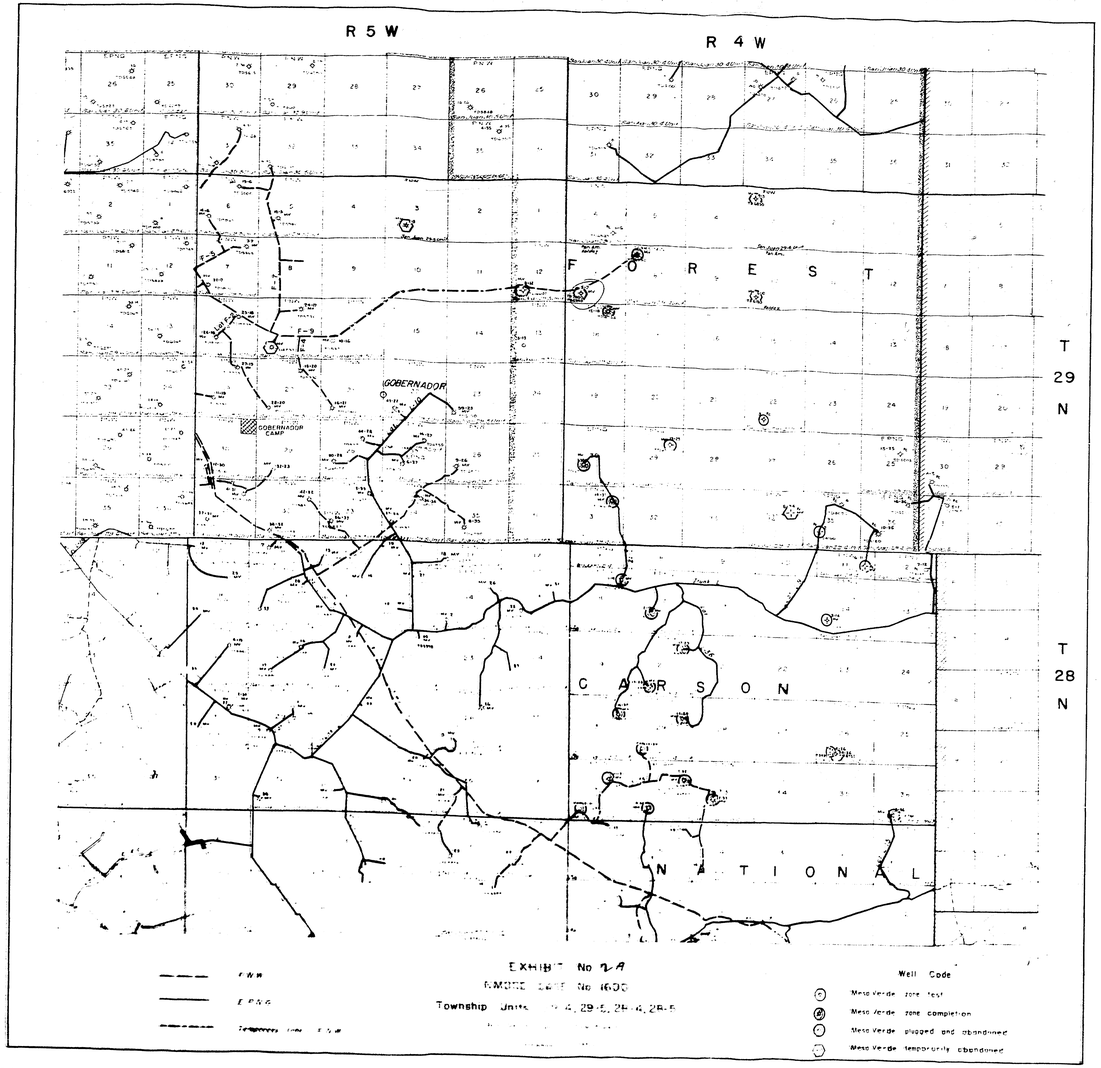


WELL LOCATION MAP
of
A Portion of Eastern San Juan Basin

Showing Average Deliverabilities and Average Production per Mesaverde Well. Jan.—May, 1959
& Year 1958.



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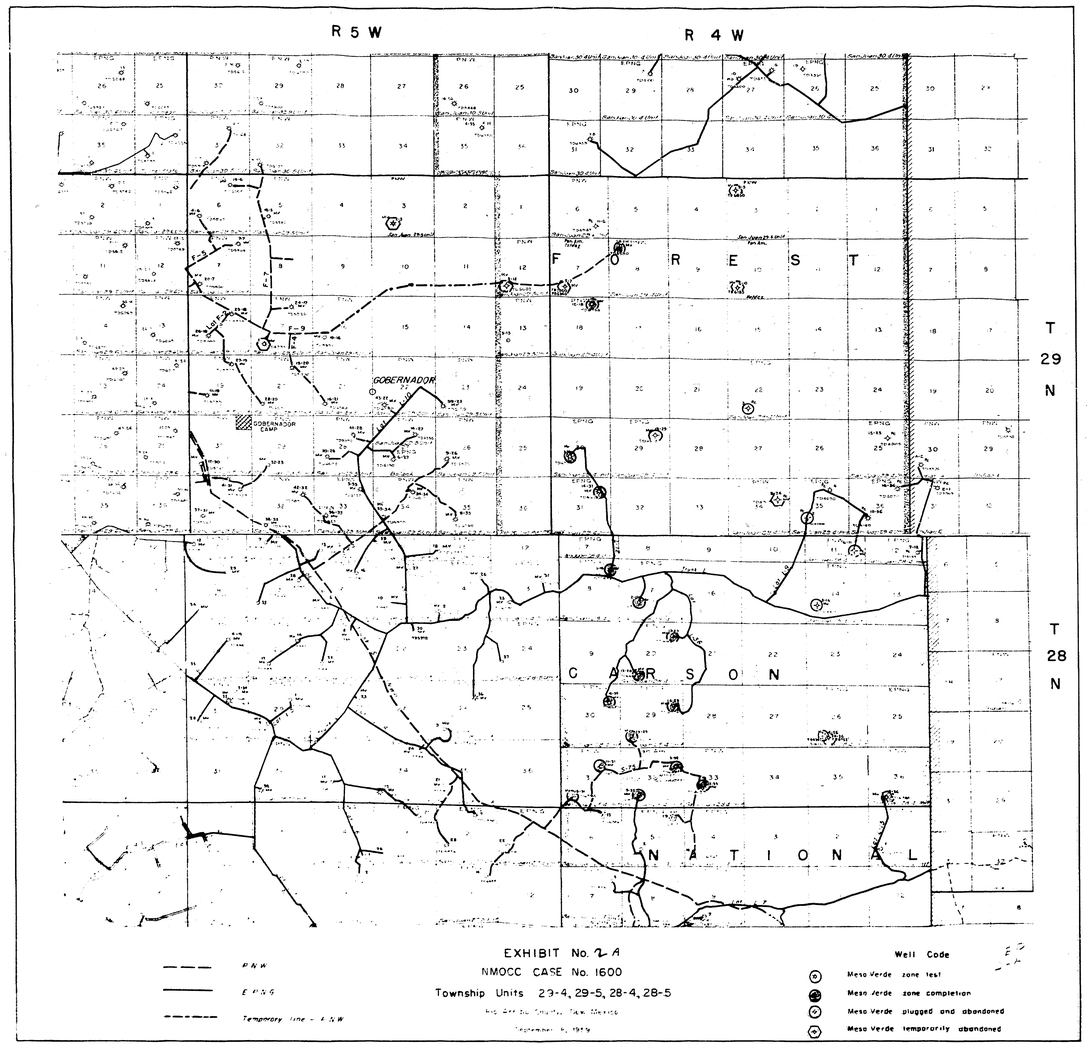
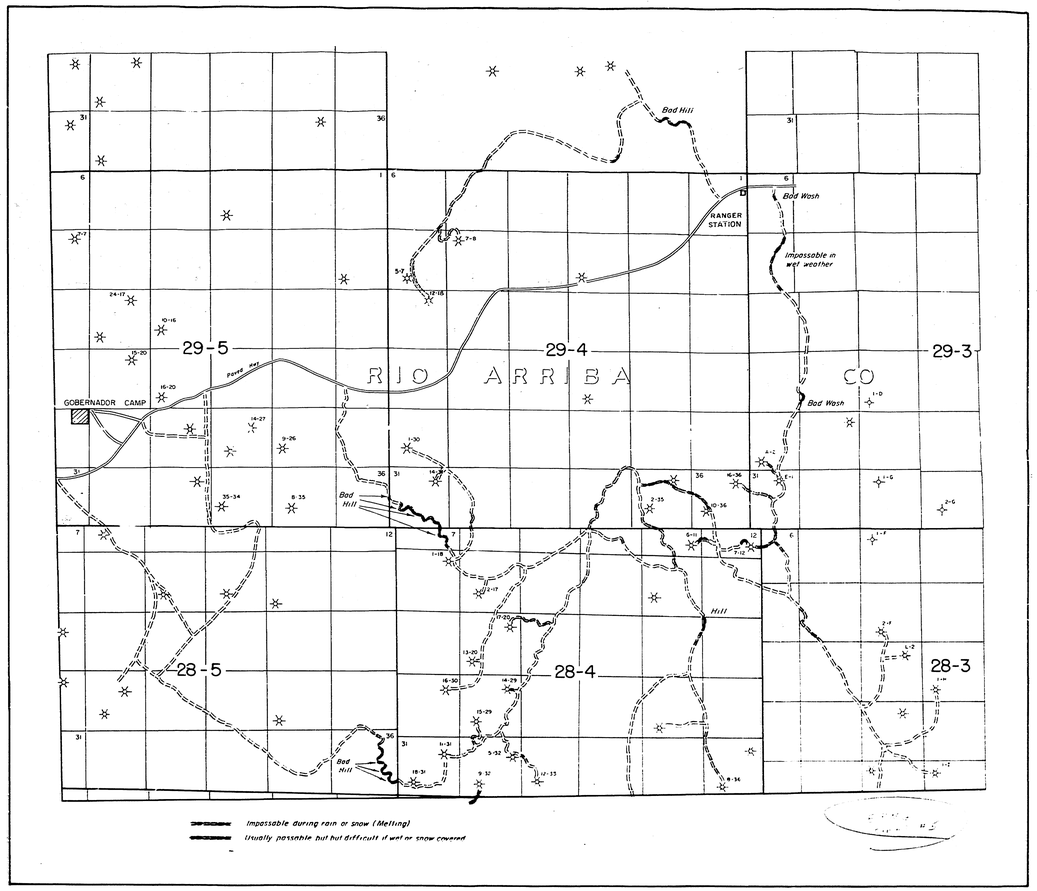


EXHIBIT No. 2A
NMOCC CASE No. 1600
Township Units 29-4, 29-5, 28-4, 28-5



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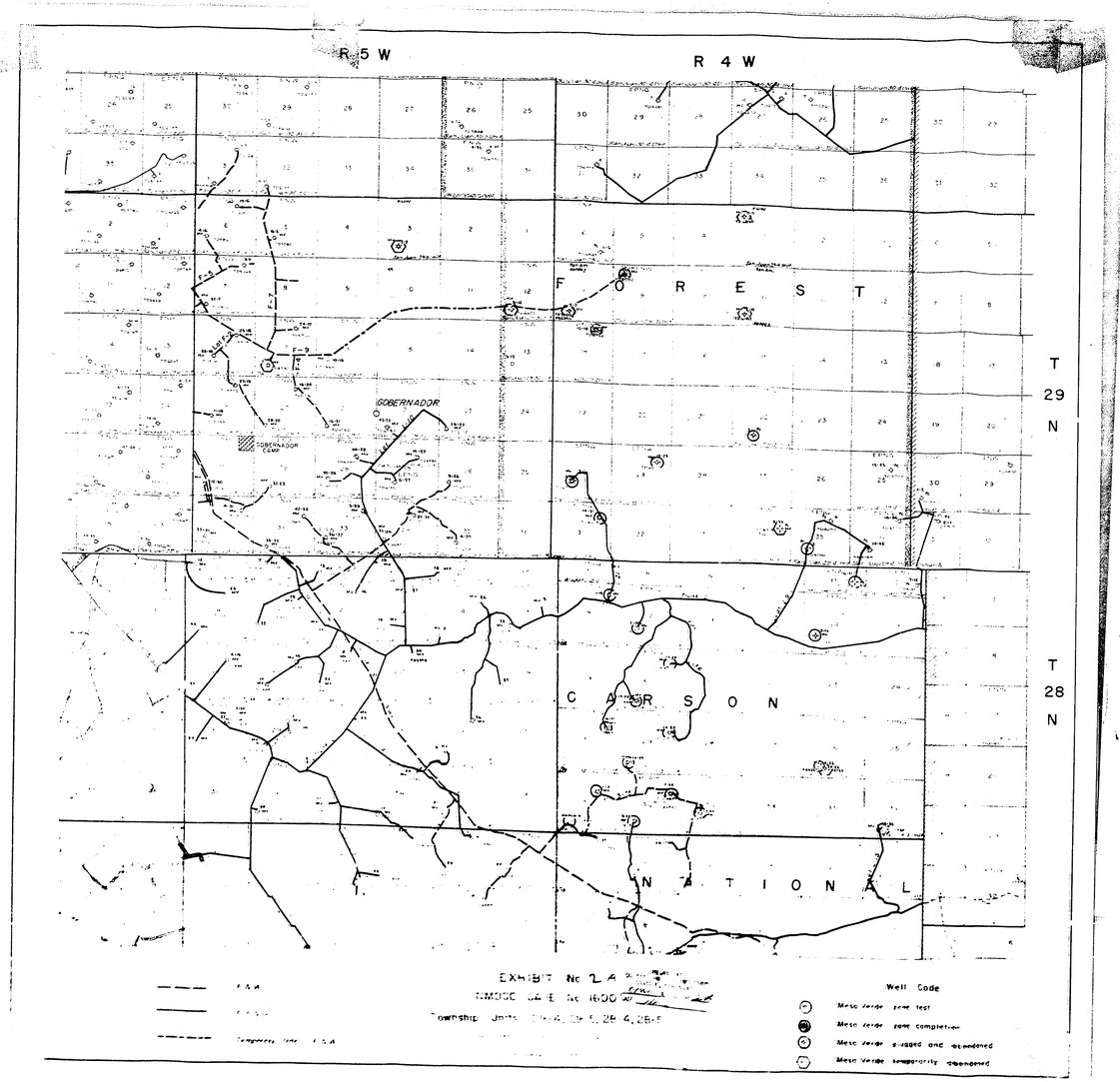
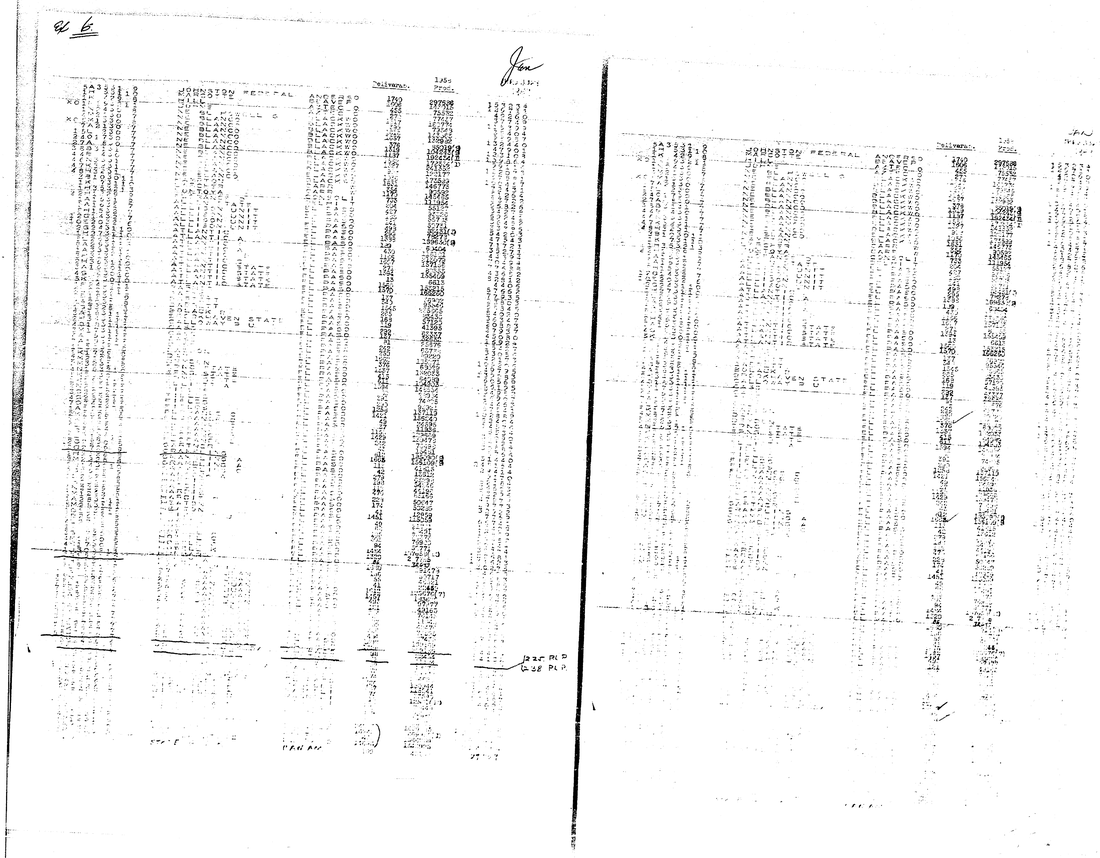

R 5 W
R 4 W
T 29 N
T 28 N
F O R E S T
C A R S O N
N A T I O N A L
GOBERNADOR
GOBERNADOR CAMP
EXHIBIT No 2A
Well Code
Mesa Verde zone test
Mesa Verde zone completion
Mesa Verde plugged and abandoned
Mesa Verde temporarily abandoned



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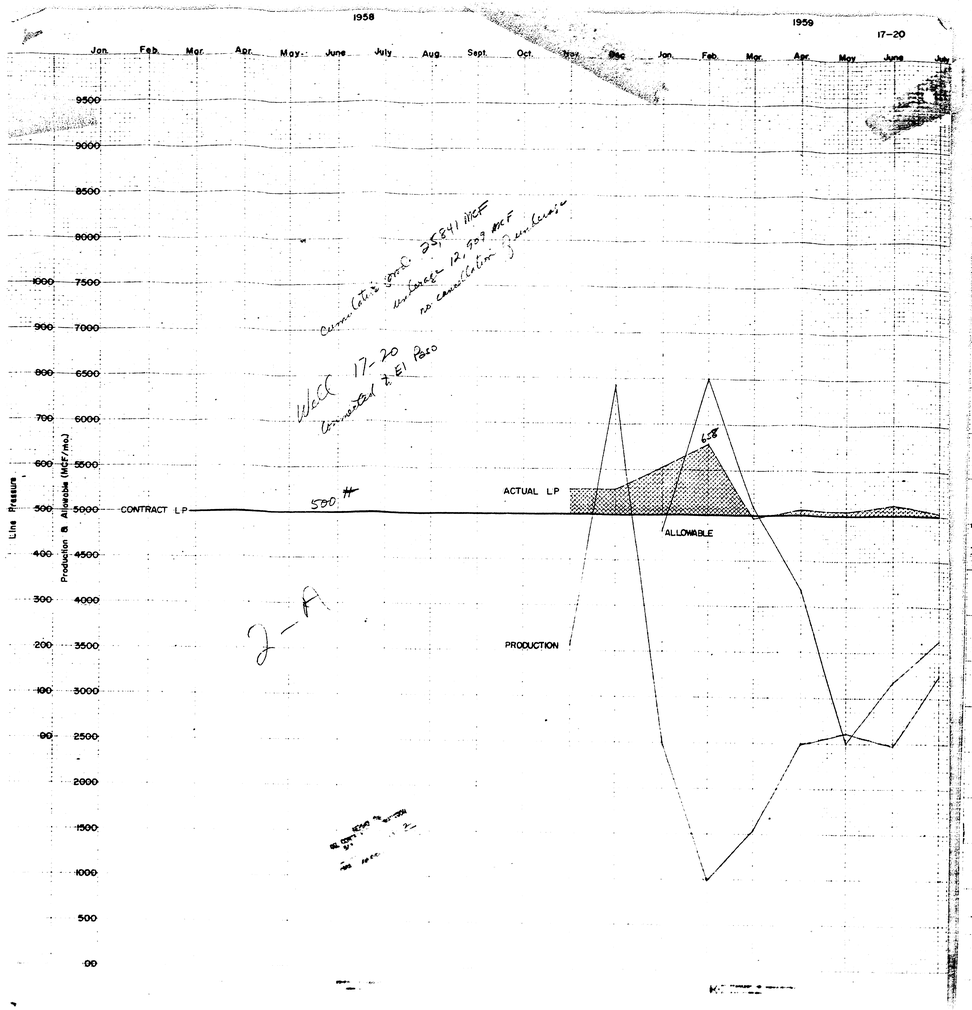
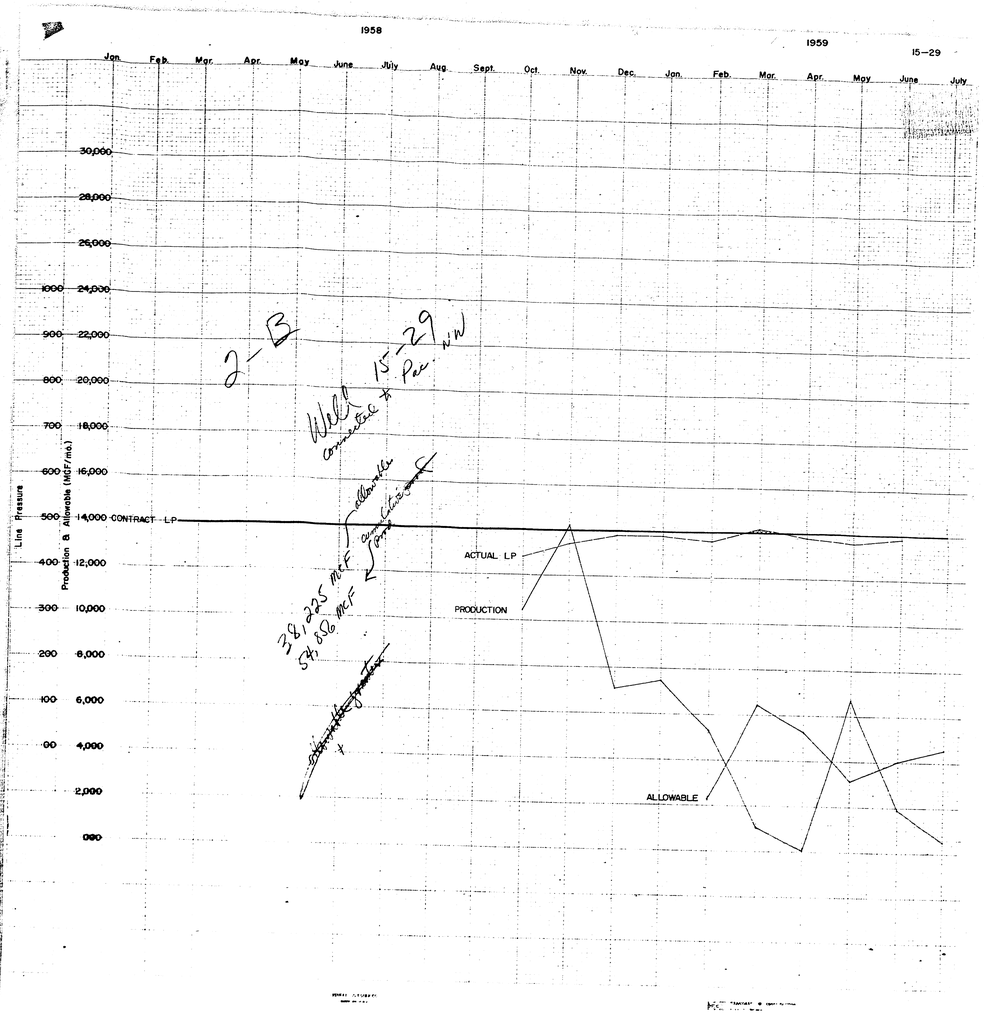
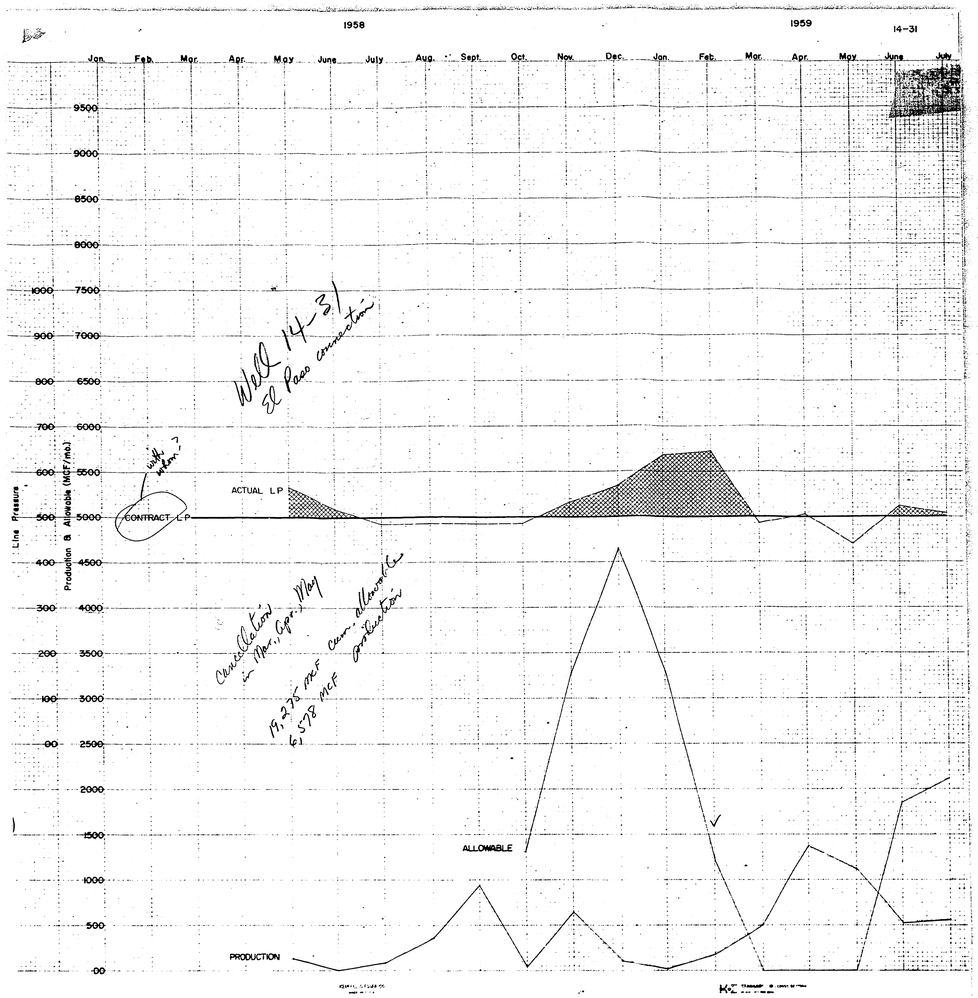
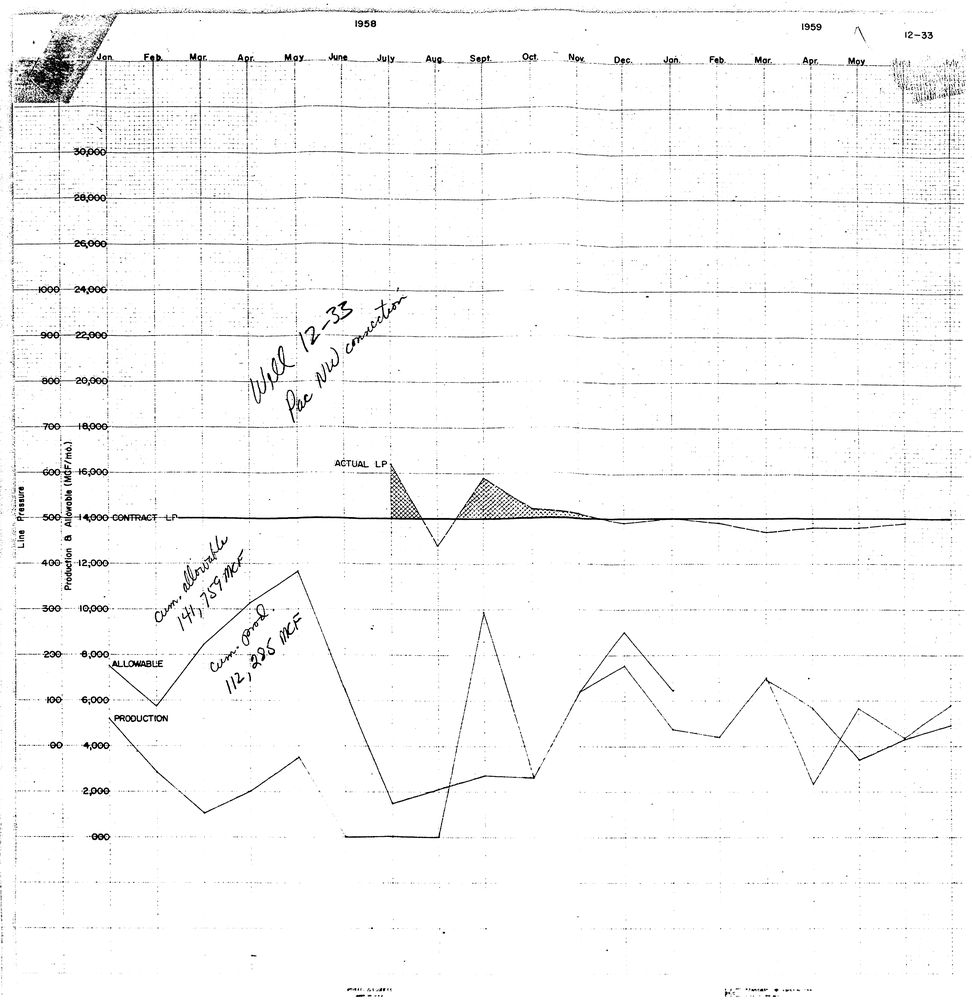

1958
1959
17-20
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
CONTRACT LP
500 #
ACTUAL LP
ALLOWABLE
PRODUCTION
Current Cat's Gross 25841 MCF
Anticipate 12,000 MCF
no cancellation
Well 17-20
connected to El Paso
2-A

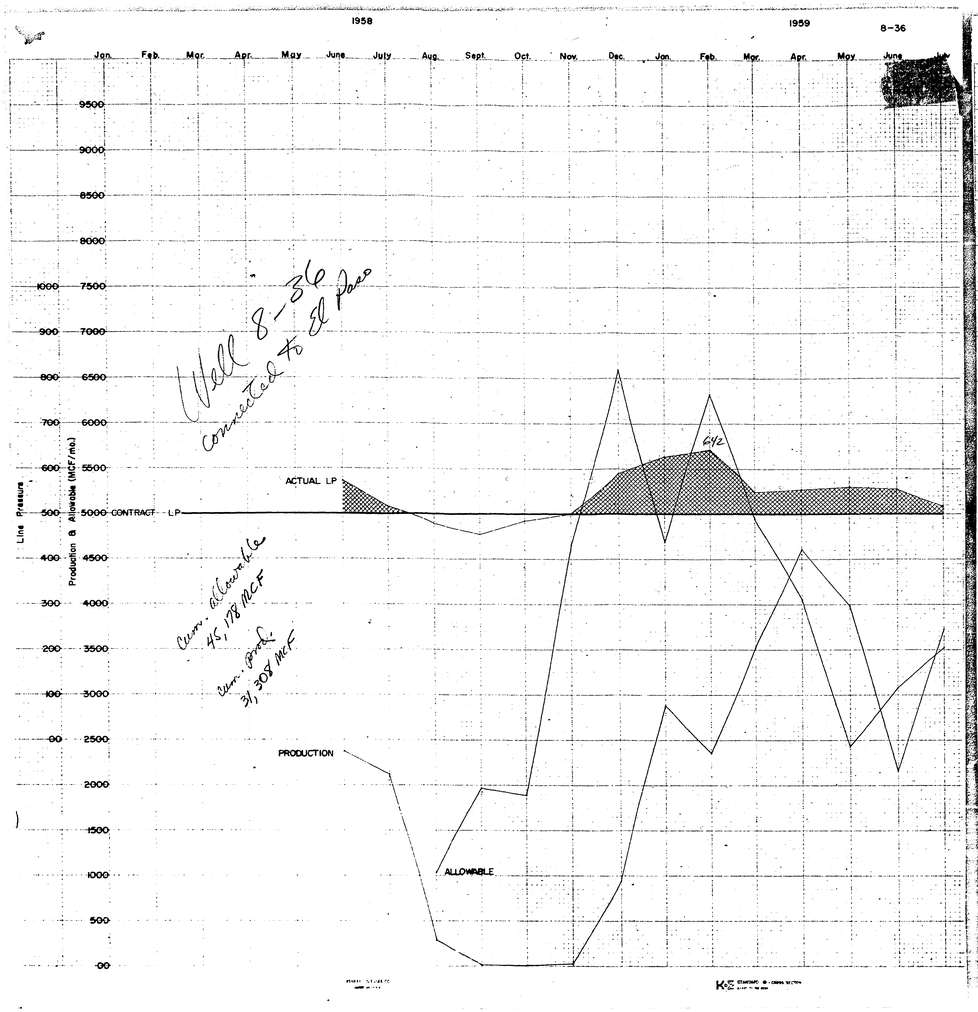

1958
1959
15-29
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
CONTRACT LP
ACTUAL LP
PRODUCTION
ALLOWABLE
2-B
Well 15-29 Pet. NW
connected
38,235 MCF
54,886 MCF

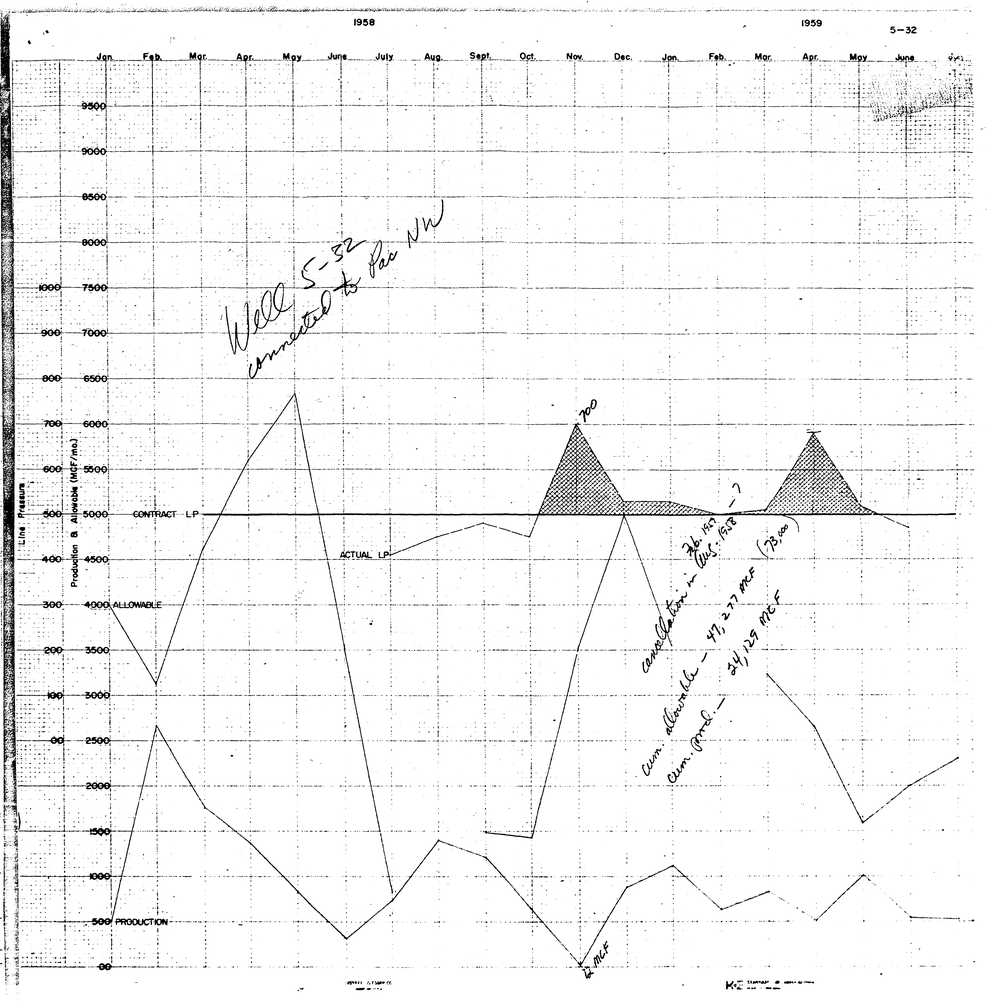
156


1958
1959
14-31
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
1000
900
800
700
600
500
400
300
200
100
90
ACTUAL L.P.
CONTRACT L.P.
ALLOWABLE
PRODUCTION
Well 14-31
El Paso connection
with whom?
Cancellation
in Mar., Apr., May
Cum. allowable
19,275 MCF
Cum. production
6,578 MCF
61

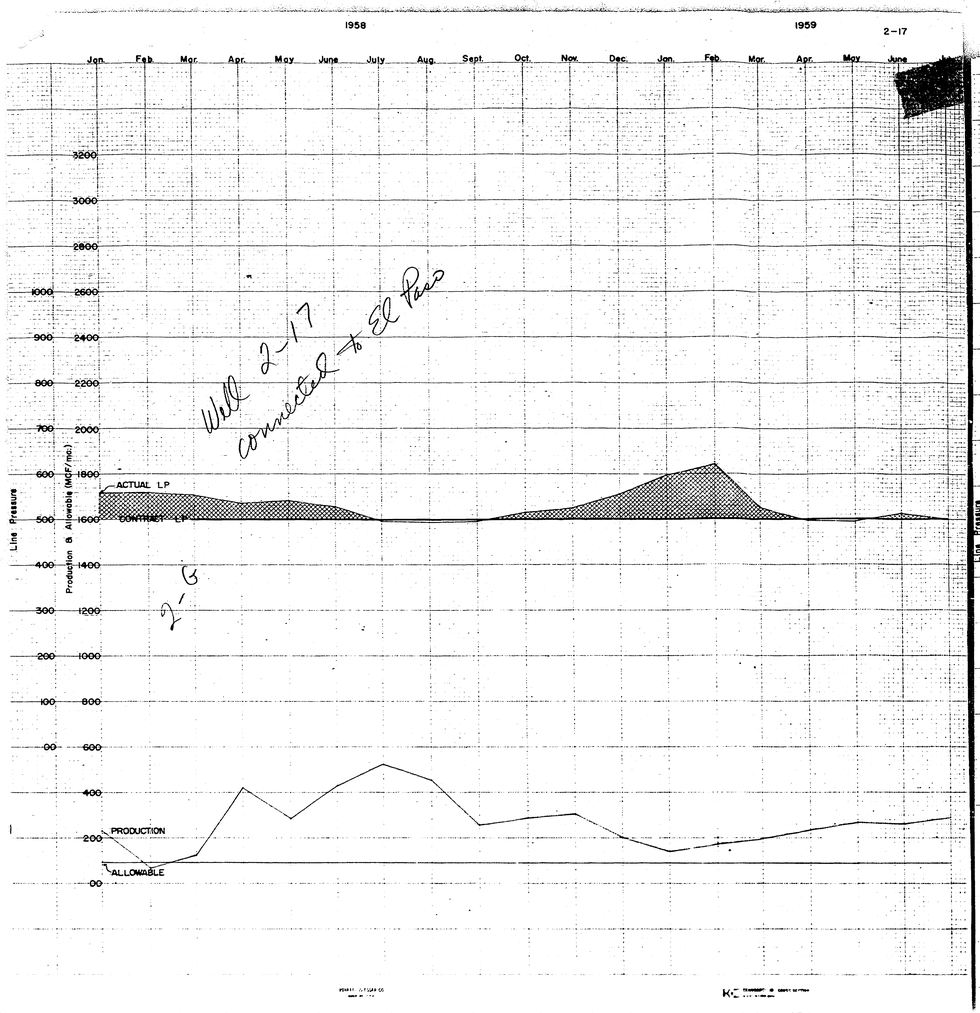

1958
1959
12-33
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
1000
900
800
700
600
500
400
300
200
100
90
ACTUAL L.P.
CONTRACT L.P.
ALLOWABLE
PRODUCTION
Well 12-33
Pan NW connection
Cum. allowable
141,735 MCF
Cum. prod.
112,285 MCF

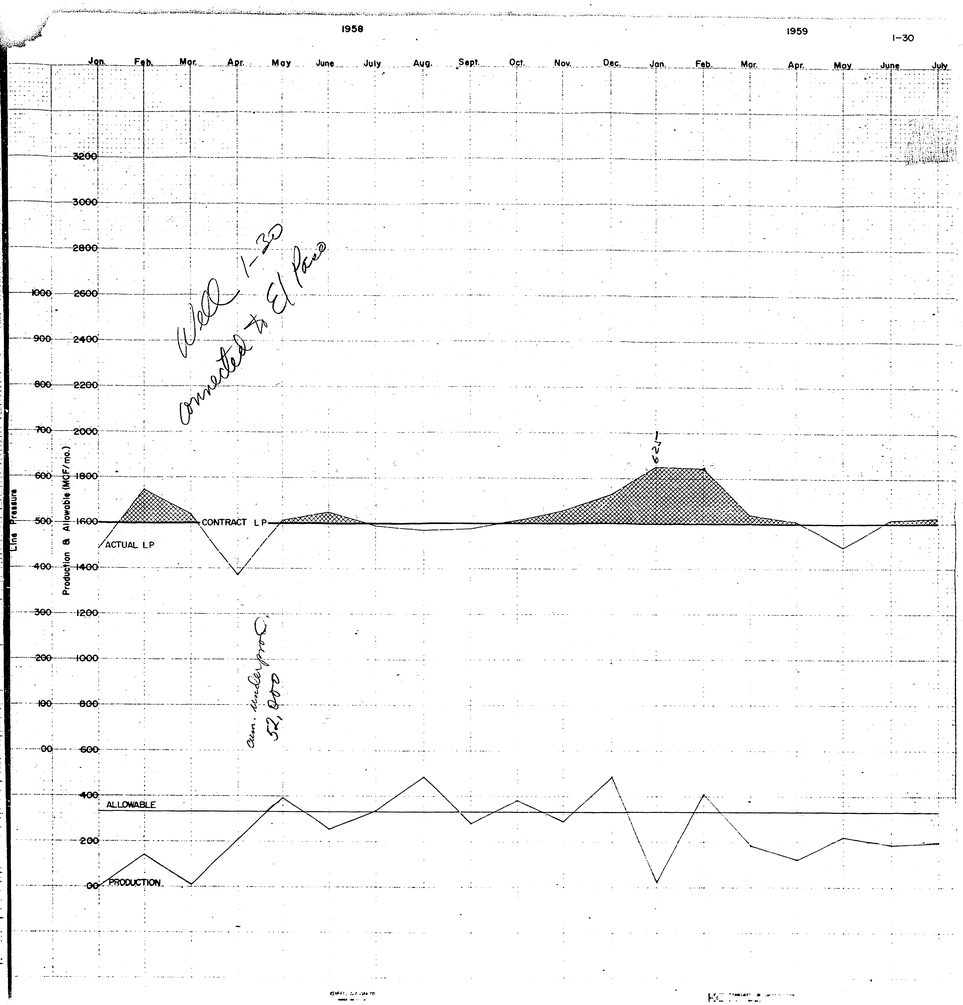
157


8-36
1958
1959
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Well 8-36 connected to El Paso
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
1000
900
800
700
600
500
400
300
200
100
00
ACTUAL LP
CONTRACT LP
PRODUCTION
ALLOWABLE
642
Cum. Allowable 45,178 MCF
Cum. Prod. 31,308 MCF

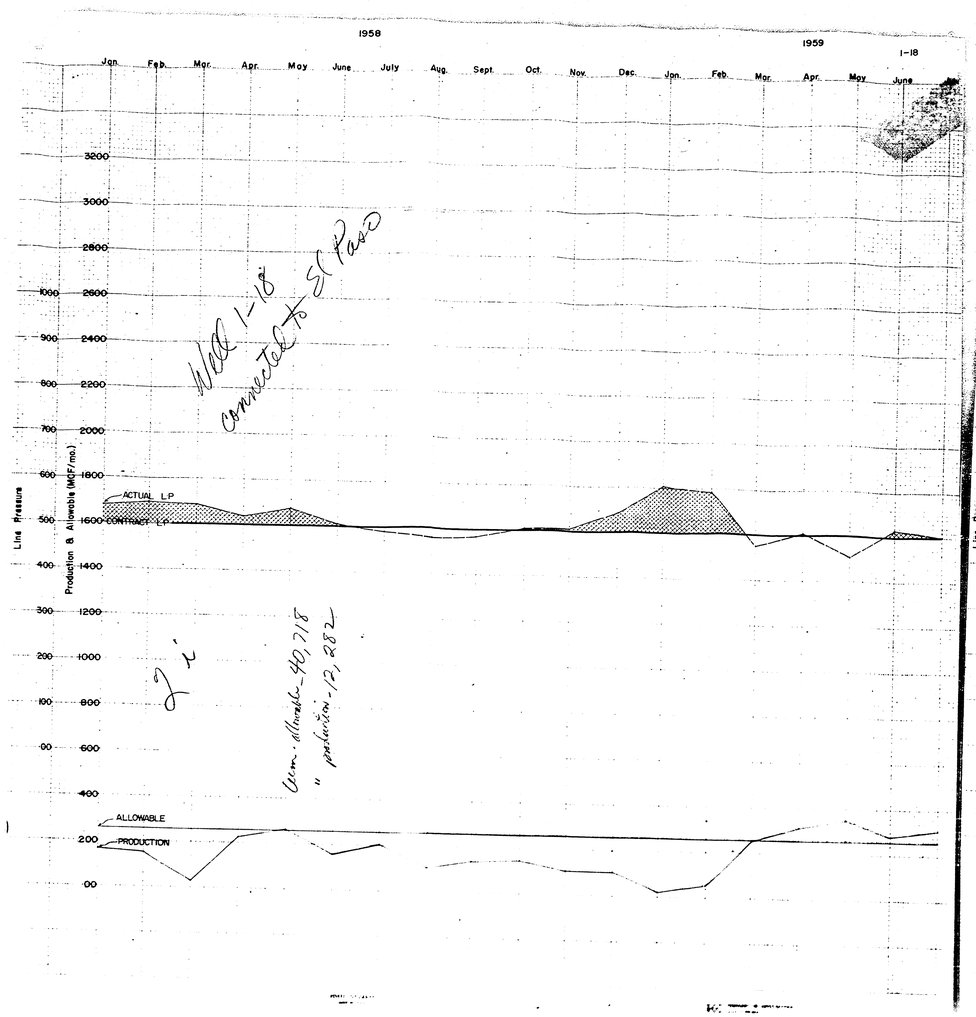

5-32
1958
1959
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
Well 5-32 connected to El Paso NW
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
1000
900
800
700
600
500
400
300
200
100
00
CONTRACT LP
ACTUAL LP
ALLOWABLE
PRODUCTION
700
Feb. 1959 – 7 connections in Dec. 1958 (78,000)
Cum. Allowable – 41,227 MCF
Cum. Prod. – 34,129 MCF
2 MCF

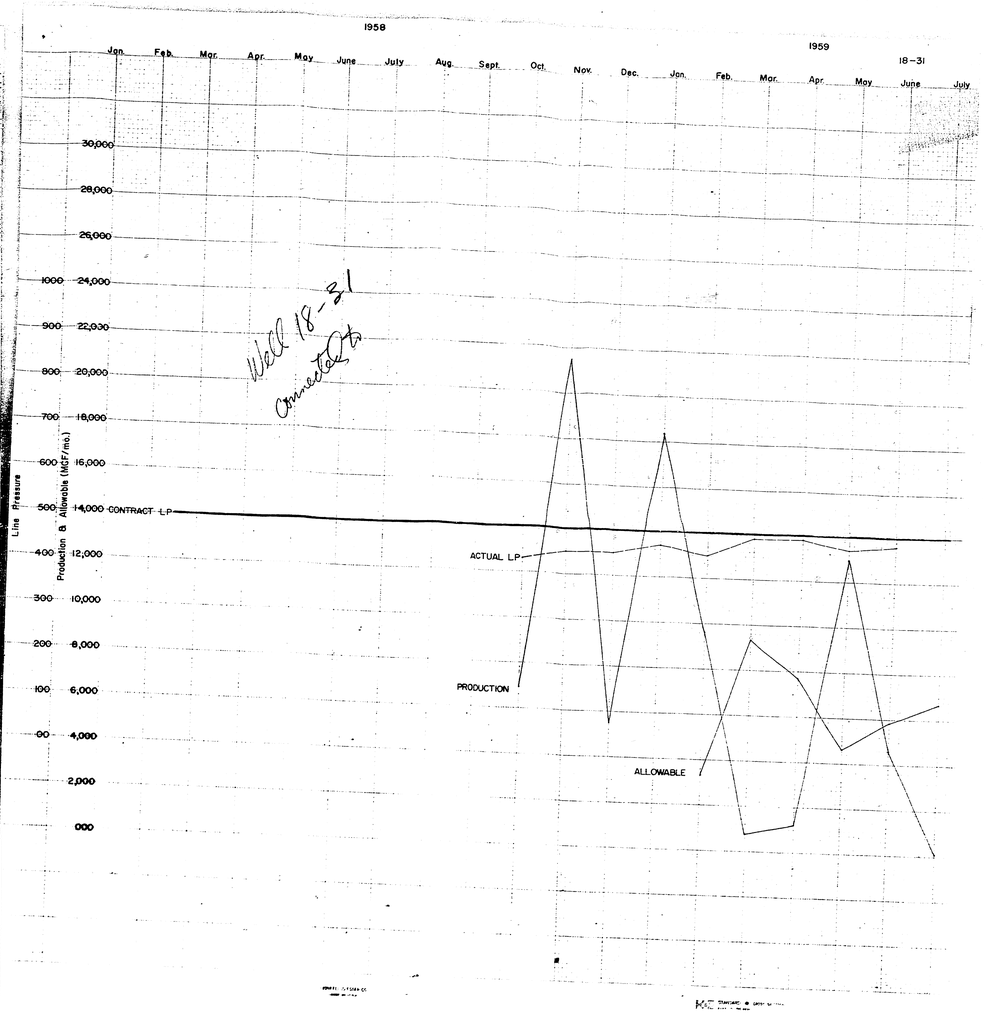
158

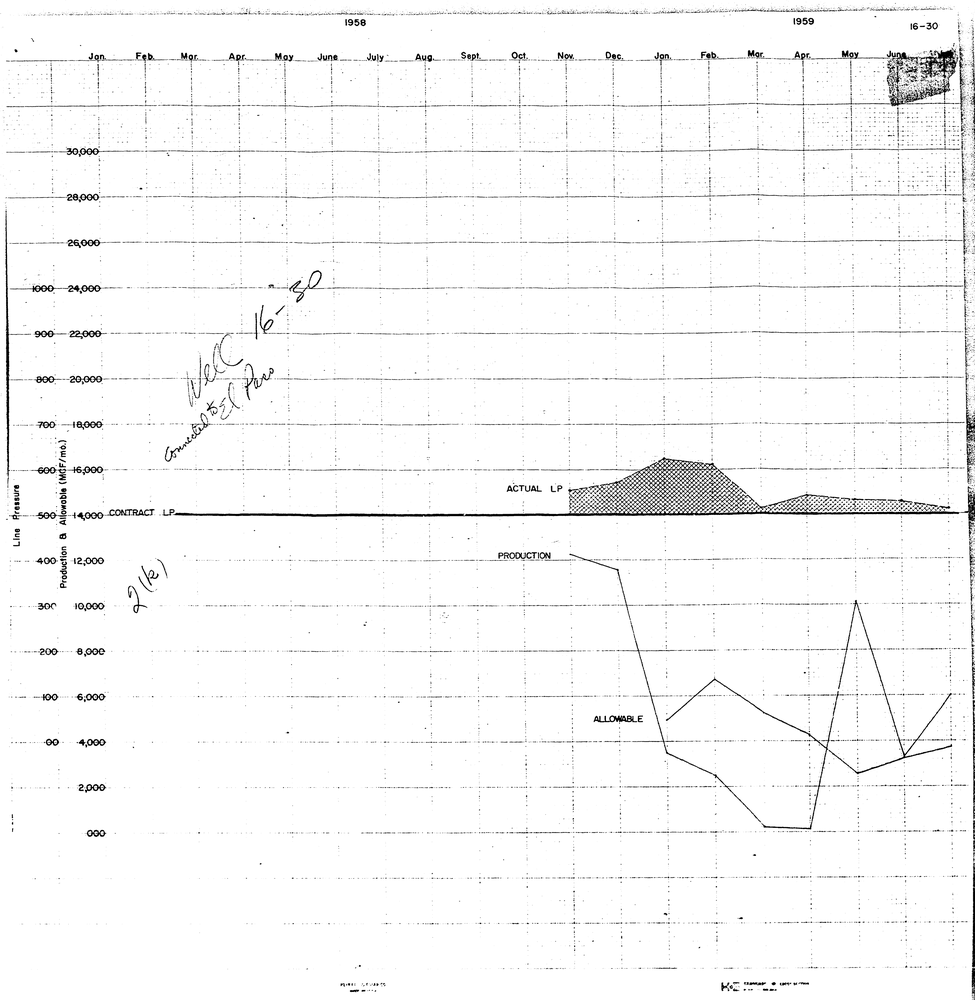

1958
1959
2-17
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Well 2-17 connected to El Paso
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL LP
CONTRACT LP
PRODUCTION
ALLOWABLE
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
00

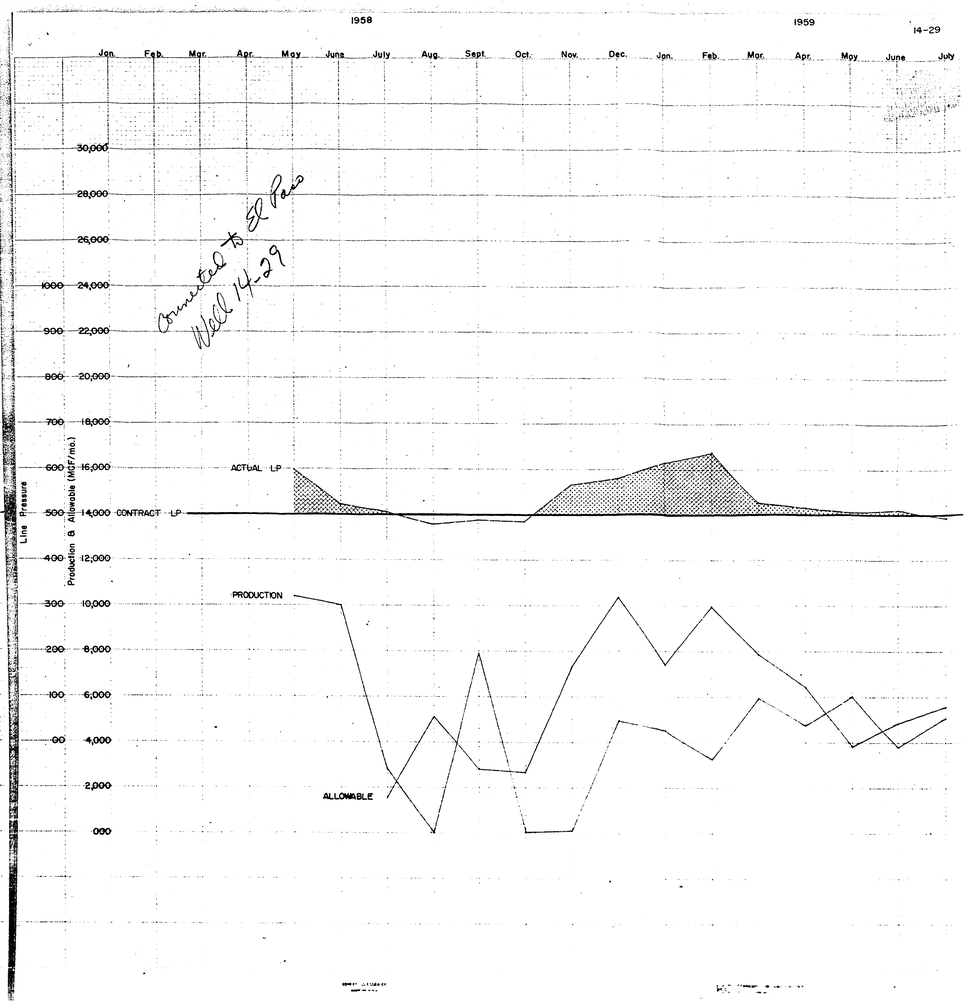

1958
1959
1-30
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Well 1-30 connected to El Paso
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL LP
CONTRACT LP
PRODUCTION
ALLOWABLE
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
00

159

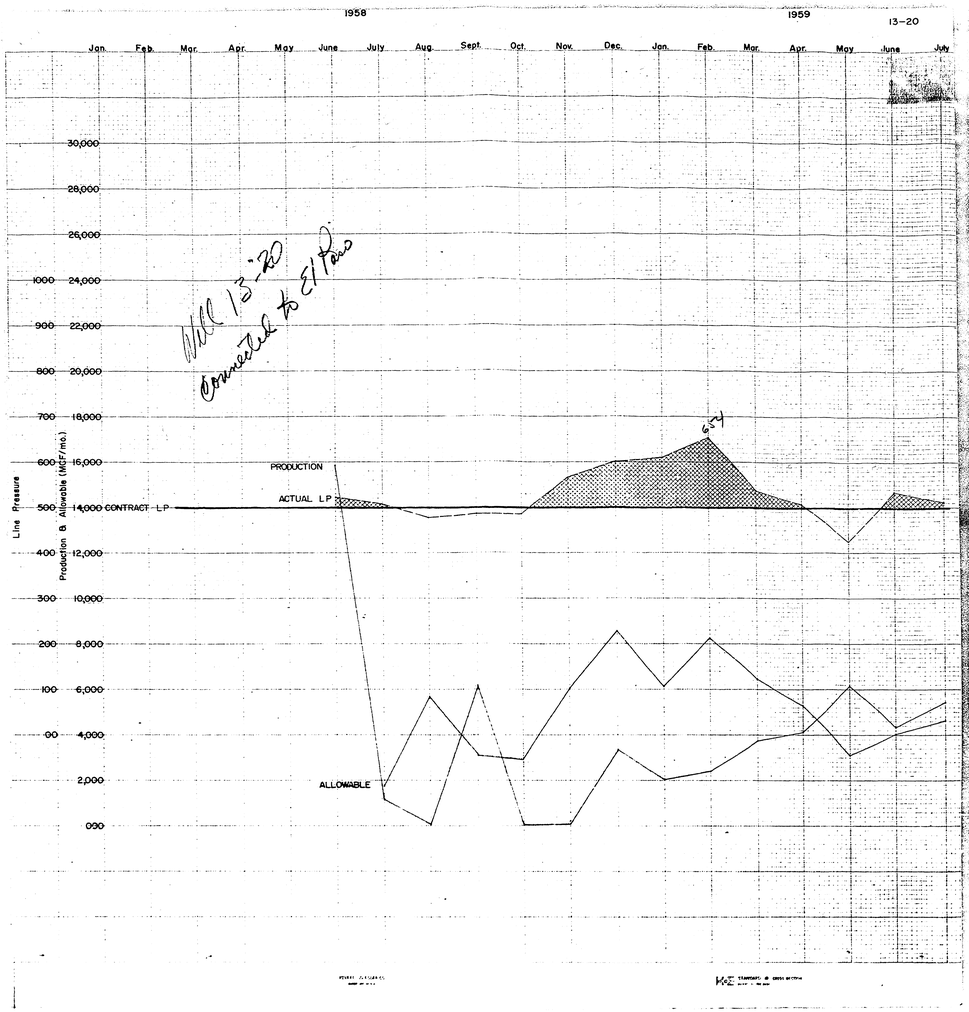

1958
1959
1-18
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
Line Pressure
Production & Allowable (MCF/mo.)
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
00
ACTUAL LP
CONTRACT LP
ALLOWABLE
PRODUCTION
Well 1-18 connected to El Paso
Cum. allowable 40,718
" production 12,282

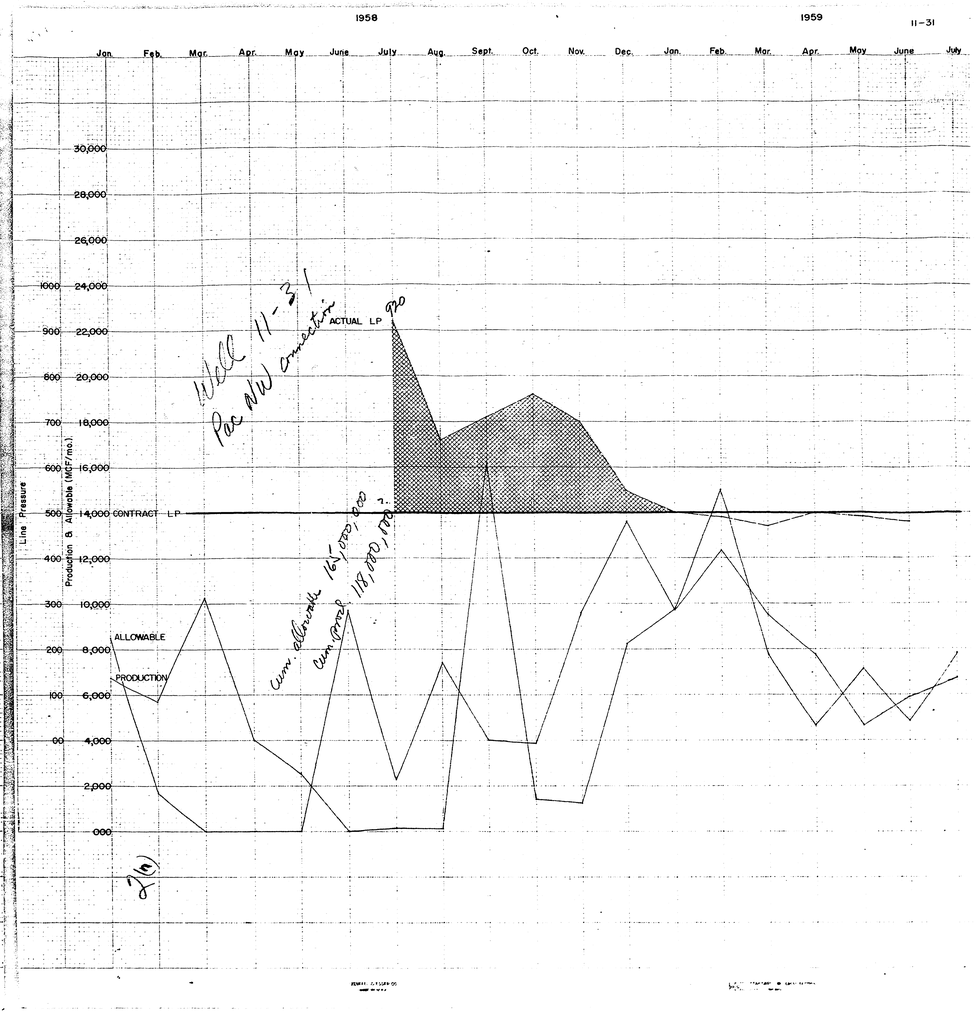

1958
1959
18-31
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
CONTRACT LP
ACTUAL LP
PRODUCTION
ALLOWABLE
Well 18-31 connected

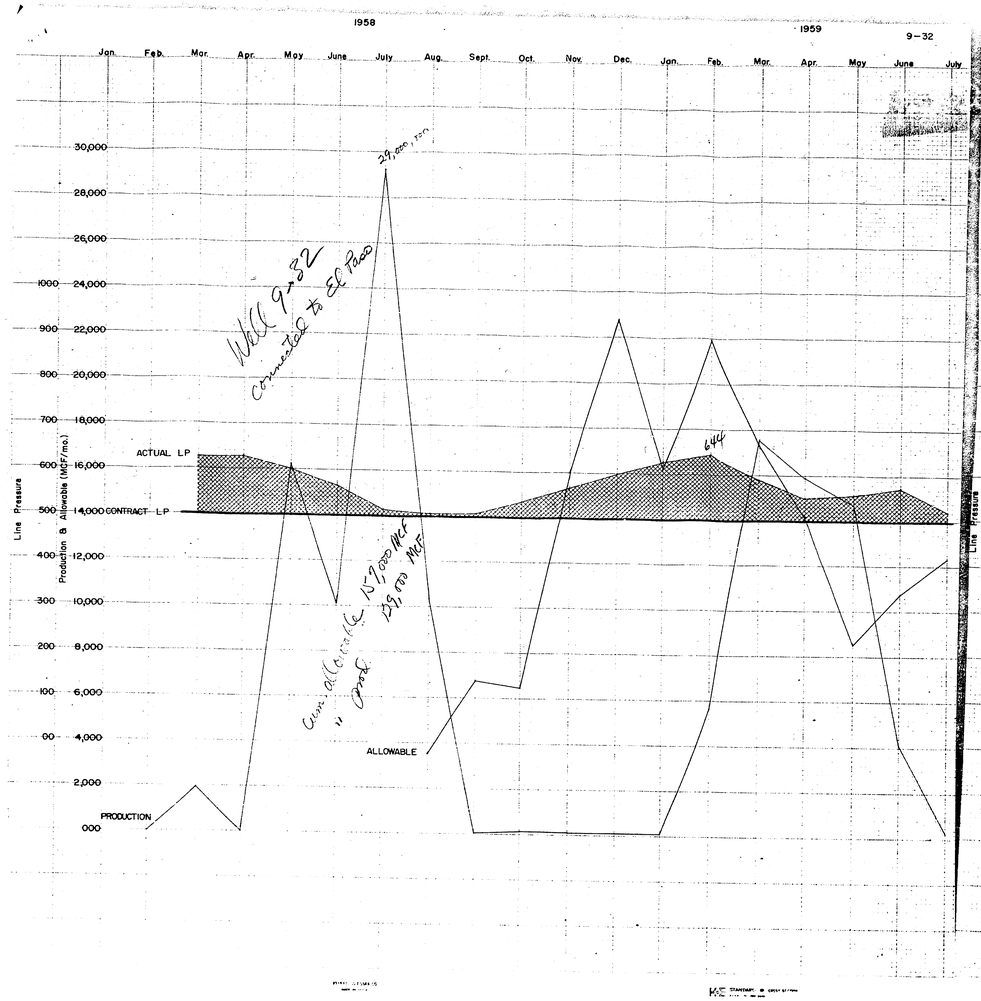

1958
1959
16-30
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
Well 16-30 Connected to El Paso
ACTUAL LP
CONTRACT LP
PRODUCTION
ALLOWABLE
Line Pressure
Production & Allowable (Mcf/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
1000
900
800
700
600
500
400
300
200
100
00
000

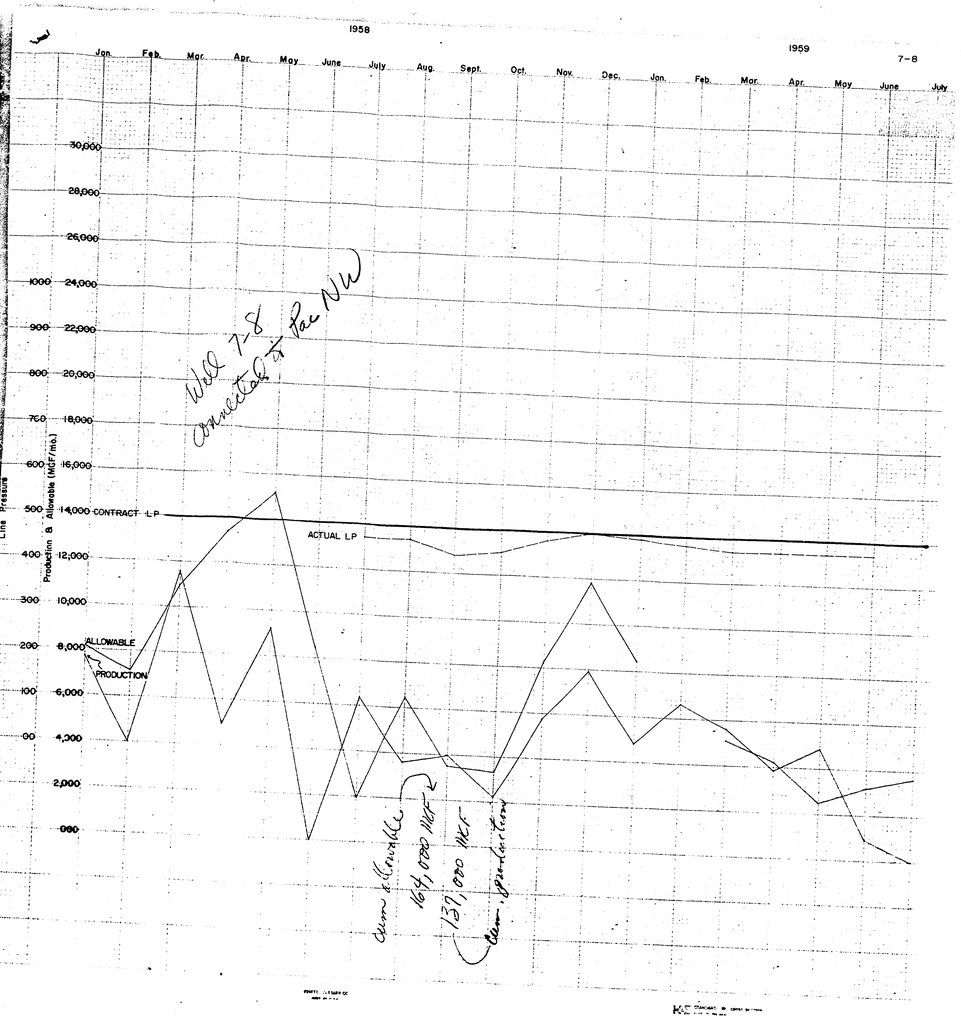

1958
1959
14-29
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Connected to El Paso Well 14-29
ACTUAL LP
CONTRACT LP
PRODUCTION
ALLOWABLE
Line Pressure
Production & Allowable (Mcf/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
1000
900
800
700
600
500
400
300
200
100
00
000

161


1958
1959
13-20
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
1000
900
800
700
600
500
400
300
200
100
00
CONTRACT L.P.
PRODUCTION
ACTUAL L.P.
ALLOWABLE
WCC 13-20 connected to El Paso


1958
1959
11-31
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
1000
900
800
700
600
500
400
300
200
100
00
CONTRACT L.P.
ACTUAL L.P.
ALLOWABLE
PRODUCTION
WCC 11-31 Pac NW connection
cum. allowable 16,000,000
cum. prod. 11,800,000


1958
1959
9-32
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000 CONTRACT LP
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
ACTUAL LP
PRODUCTION
ALLOWABLE
Well 9-32 connected to El Paso
29,000 MCF
Cum. Allowable 159,000 MCF
Cum. Production 139,000 MCF
644


1958
1959
7-8
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000 CONTRACT LP
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
ACTUAL LP
ALLOWABLE
PRODUCTION
Well 7-8 connected to Van NW
Cum. Allowable 164,000 MCF
139,000 MCF
Cum. Production

163

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Induction-Electrical Log

COMPANY EL PASO NATURAL GAS COMPANY
WELL HUERFANO UNIT
104
FIELD WILDCAT
LOCATION SEC. 17-26N-10W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Surveys
ML

Location of Well
990' FR S/L
990' FR E/L
SEC. 17-26N-10W

Elevation: D.F. 6543
K.B.
or G.L. 6534

FILING No.

COUNTY SAN JUAN FIELD or LOCATION WILDCAT WELL HUERFANO UNIT # 104
COMPANY EL PASO NATURAL GAS COMPANY

RUN No.	ONE
Date	11-13-58
First Reading	6737
Last Reading	362
Feet Measured	6375
Csg. Schlum.	362
Csg. Driller	363
Depth Reached	6741
Bottom Driller	6742
Depth Datum	KB
Mud Mat.	GEL CHEM OIL
Dens. Visc.	8.5 35
Mud Resist.	1.04 @ 62 °F
Res. BHT	1.40 @ 158 °F
Rmf	1.20 @ 158 °F
Rmc	1.40 @ 158 °F
pH	8.5
Wtr. Loss	6.0CC 30 min. CC 30 min. CC 30 min. CC 30 min.
Bit Size	Csg. TO 5129 - 9 5/8"; 5129 TO TD - 8 3/4"
Spcgs.—AM	16'
IND	4m
Opr. Rig Time	2 HRS.
Truck No.	22 / 1 AM.
Recorded By	R.BELL-SUM
Witness	MR. BRITT

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
EL PASO NATURAL GAS CO.
CASE 1640

REMARKS
Run No. ONE
Depth Driller 6742
Depth Logger 6741
Btm. Csg. Shoe 5129
Type Fluid in Hole GEL CHEM OIL
Max. Rec. Temp. 158°F
Equip. No. 1220
Location 5-D-1-E

CONDUCTIVITY millimhos/m — 1000 — 0 — 400 — 0
INDUCTION 1200 600

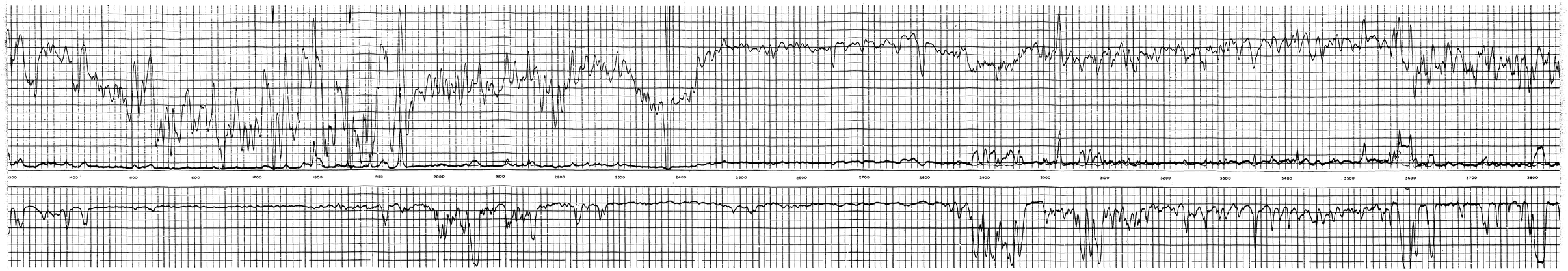
RESISTIVITY ohms. m²/m
16" NORMAL .10 1000
INDUCTION .10 1000

DEPTHS 2"=100' 1"=100'

SPONTANEOUS-POTENTIAL millivolts 10 / 1 MV

0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900

164


1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
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3000
3100
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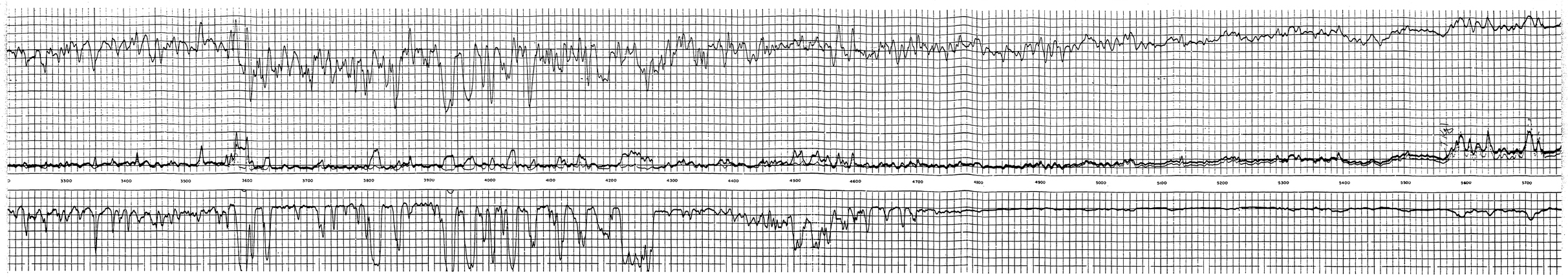
3400
3500
3600
3700
3800


3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
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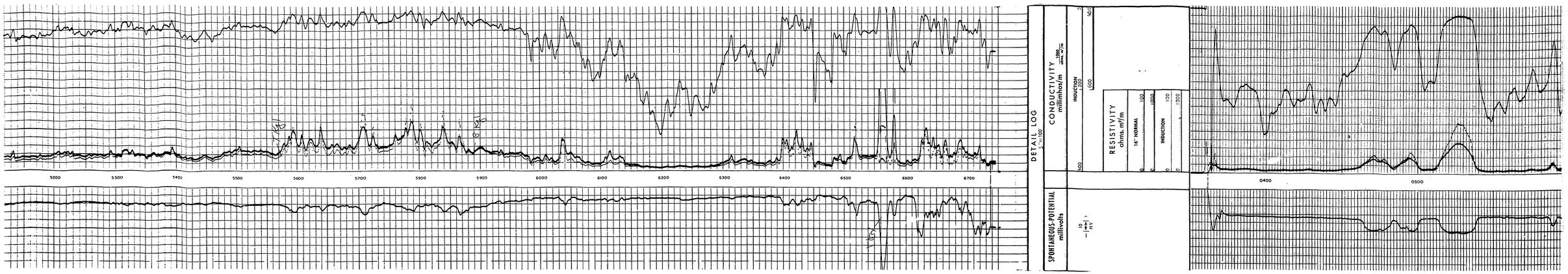
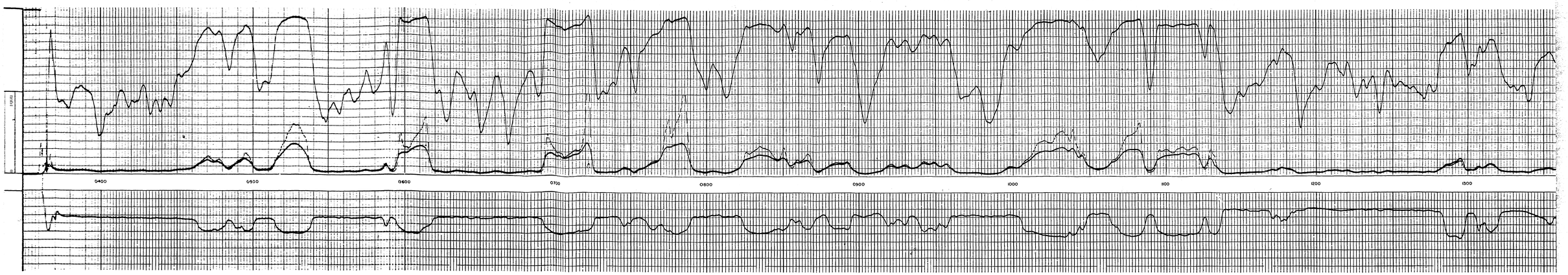
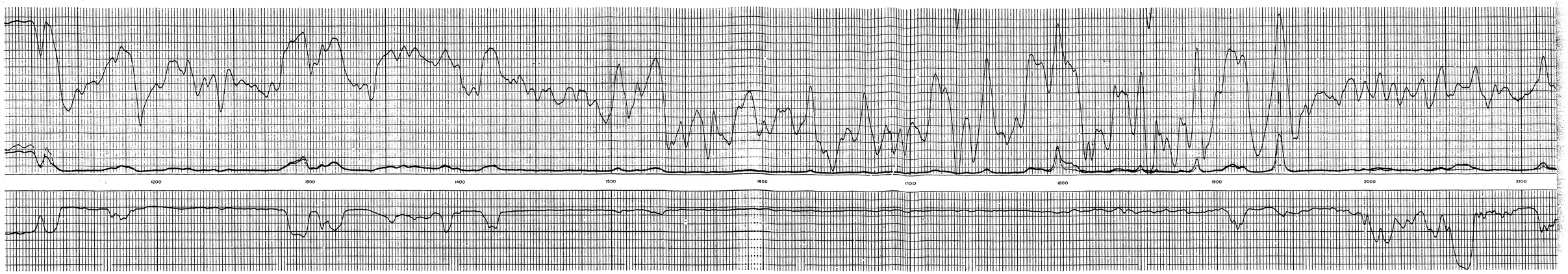
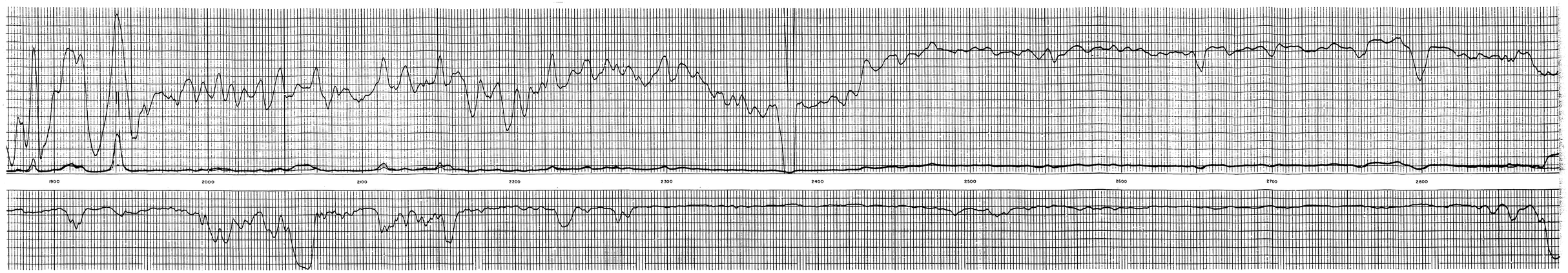
5200
5300
5400
5500
5600
5700


DETAIL LOG
1" = 100'
CONDUCTIVITY
millimhos/m
INDUCTION
RESISTIVITY
ohms.m²/m
16" NORMAL
INDUCTION
SPONTANEOUS-POTENTIAL
millivolts
5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
6300
6400
6500
6600
6700
0400
0500

167


0400
0500
0600
0700
0800
0900
1000
1100
1200
1300

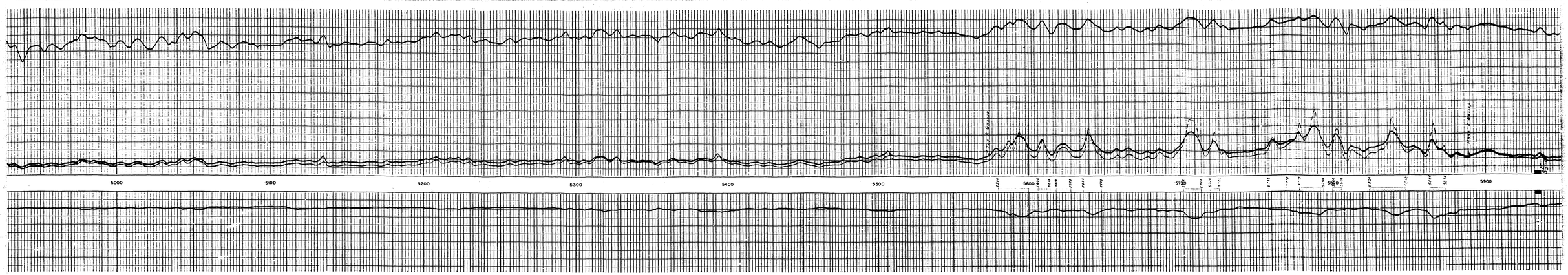

1200
1300
1400
1500
1600
1700
1800
1900
2000
2100

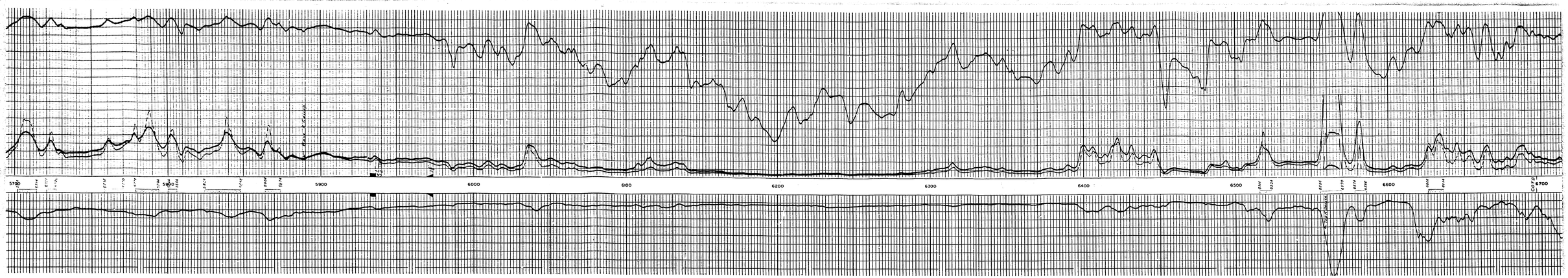

1900
2000
2100
2200
2300
2400
2500
2600
2700
2800

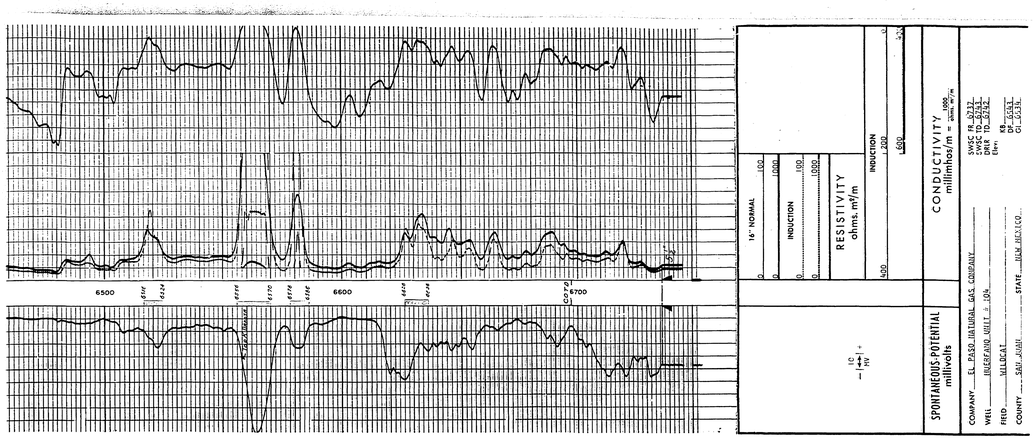
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600

172

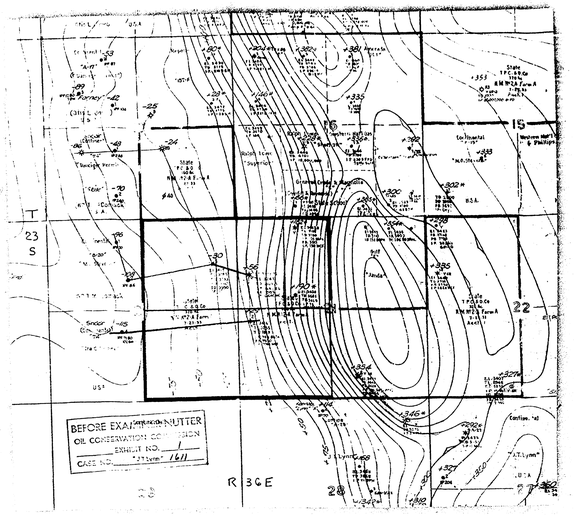
4200
4300
4400
4500
4600
4700
4800
4900
5000
5100

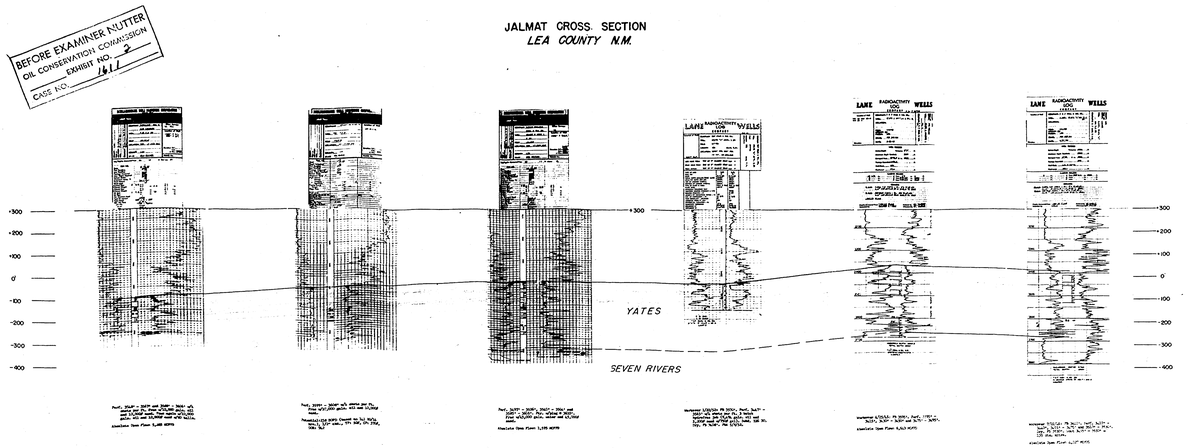

5000
5100
5200
5300
5400
5500
5600
5700
5800
5900

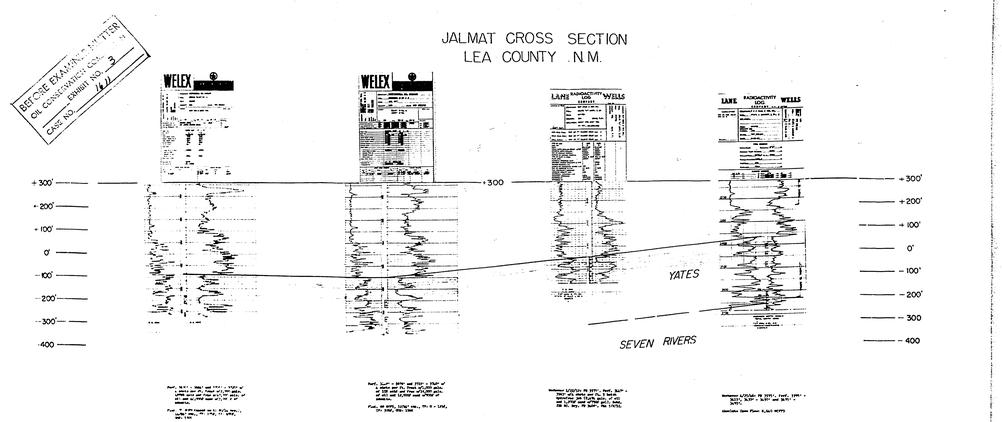

5700
5800
5900
6000
6100
6200
6300
6400
6500
6600
6700
Core

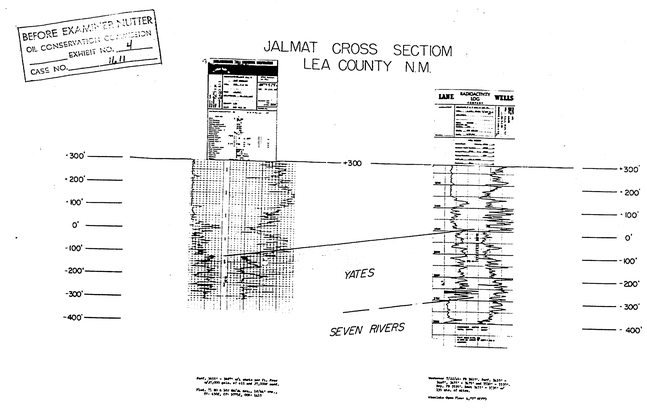

6500
6600
6700
16" NORMAL
INDUCTION
RESISTIVITY
ohms, m²/m
INDUCTION
CONDUCTIVITY
millimhos/m
SPONTANEOUS-POTENTIAL
millivolts
COMPANY EL PASO NATURAL GAS COMPANY
WELL UNDESIGNATED WELL # 104
FIELD WILDCAT
COUNTY SAN JUAN
STATE NEW MEXICO

176

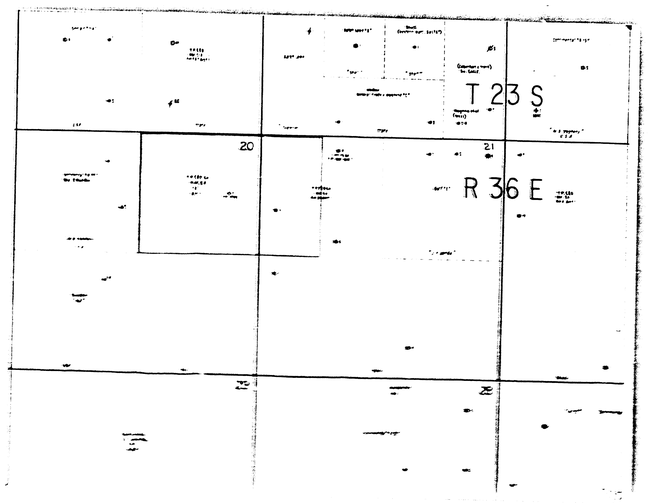

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE NO. 1611
T 23 S
R 36 E
15
22
26
27
28

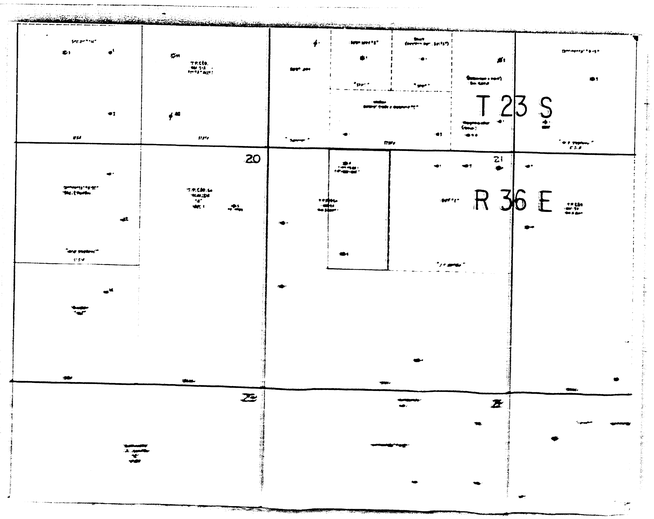

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 1611
JALMAT CROSS. SECTION
LEA COUNTY N.M.
YATES
SEVEN RIVERS
+300
+200
+100
0
-100
-200
-300
-400

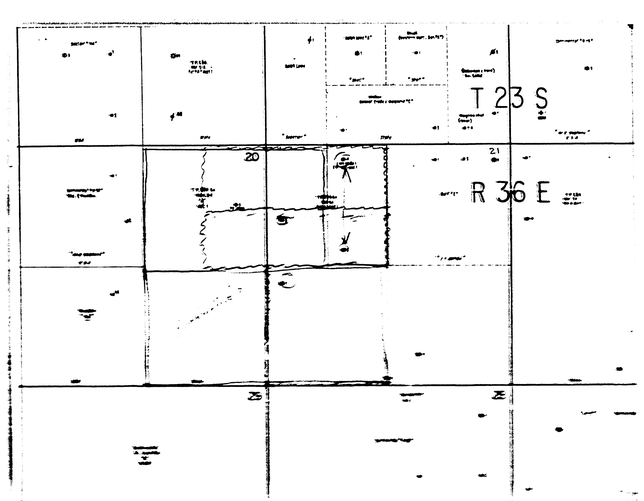

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 1611
JALMAT CROSS SECTION
LEA COUNTY . N.M.
WELEX
LANE RADIOACTIVITY WELLS
YATES
SEVEN RIVERS
+300'
+200'
+100'
0'
-100'
-200'
-300'
-400'

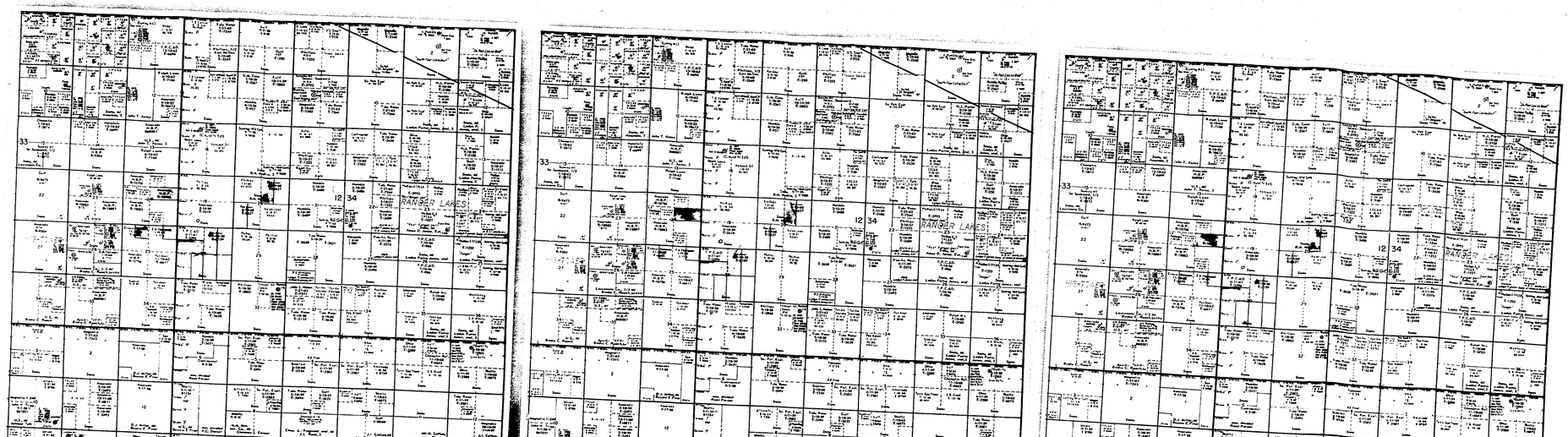

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 1611
JALMAT CROSS SECTIOM
LEA COUNTY N.M.
LANE RADIOACTIVITY WELLS
YATES
SEVEN RIVERS
+300'
+200'
+100'
0'
-100'
-200'
-300'
-400'

177


T 23 S
R 36 E
20
21
25


T 23 S
R 36 E
20
21
25


T 23 S
R 36 E
20
21
25



178

SCHLUMBERGER WELL SURVEYING CORPORATION

MICROLATEROLOG

COMPANY SANTIAGO OIL AND GAS COMPANY

WELL STATE 1-30 NO.1

FIELD WILDCAT

LOCATION SEC 30-12S-34E

COUNTY LEA

STATE NEW MEXICO

Other Surveys L-GR

Location of Well 1980 'From E/L 660 'From N/L

Elevation D.F. 4214 K.B. 4215 or G.L. 4203

Log Depths Measured From KB 12 Ft. above GL

RUN No.	1	2
Date	12-16-58	2-3-59
First Reading	11091	13100
Last Reading	5500	11200
Feet Measured	5591	1900
Depth Reached	11092	1310
Bottom Driller	11092	13103
Mud Mat.	SALT-GEL	SALT
Dens. Visc.	9.8 I 43	9.8 I 49
Mud Resis.	.088 @ 70 F	.066 @ 63 F
" Res. BHT	.043 @ 149 F	.032 @ 159 F
" pH	8	8
" Wtr. Loss	20 CC 30 min	8 CC 30 min
" Rmf	.03 @ 149 F	.022 @ 159 F
" Rmc		
Bit Size	9 3/4"	8 3/4"
Sonde Type	POWERED	POWERED
Pad Type	HYDRAULIC	HYDRAULIC
Oper. Rig Time	4 HOURS	2 HOURS
Truck No.	2527 HOBBS	2526 HOBBS
Recorded By	HOWE	GEESEY
Witness	BASHAM	GEORGE

RESISTIVITY ohms. m²/m — 0 1 5 10 15 21 26 32 38 43 45

RESISTIVITY ohms. m²/m — 0 67 100 150 233 400 900

DEPTHS — 5500 5600 5700 5800 5900 6000 6100

MICROCALIPER — Hole Diameter in Inches — 6 7 8 9 10 11 12 13 14 15 16

REMARKS — RUN 1 — RUN 2

SCHLUMBERGER WELL SURVEYING CORPORATION

Laterolog WITH GAMMA RAY

COMPANY SANTIAGO OIL AND GAS COMPANY

WELL STATE 1-30 NO.1

FIELD WILDCAT

LOCATION SEC 30-12S-34E

COUNTY LEA

STATE NEW MEXICO

Other Surveys MLL GR

Location of Well 1980 'From E/L 660 'From N/L

Ex 3 1612

Elevation K.B. 4215 D.F. 4214 or G.L. 4203

Log Depths Measured From KB 12 Ft. above GL

RUN No.	1	2
Date	12-16-58	2-3-59
First Reading	11089	13097
Last Reading	4130	11089
Feet Measured	5958	2003
Csg. Schlum.	4130	4130
Csg. Driller	4130	4130
Depth Reached	11092	13101
Bottom Driller	11092	13103
Mud Mat.	SALT-GEL	SALT
Dens. Visc.	9.8 - 43	9.8 - 49
Mud Resis.	.088 70	.066 63
" Res. BHT	.043 149	.032 159
" pH	8	8
" Wtr. Loss	20 CC 30 min	8 CC 30 min
" Rmf	.03 149	.022 158
" Rmc		
Bit Size	9 3/4"	9 3/4"
Laterolog 3	"	"
Laterolog 7	16 - 2 1/2	"
Oper. Rig Time	4 HOURS	2 HOURS
Truck No.	2527 HOBBS	2526 HOBBS
Recorded By	HOWE	GEESEY
Witness	BASHAM	TENDRE

Affidavit Ex 3 Case 1612

RESISTIVITY ohms. m²/m — 0 5 10 15 21 26 32 38 43 45

RESISTIVITY ohms. m²/m — 0 55 125 214 333 500 750 1167 2000 4500

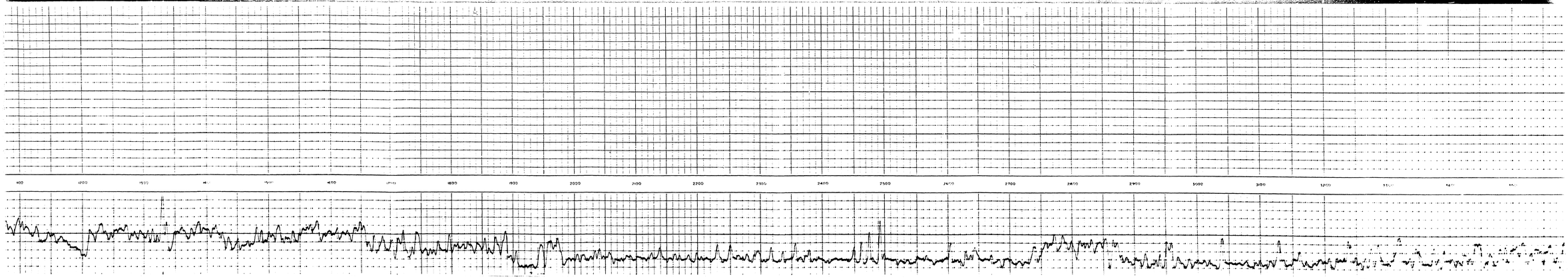
DEPTHS — 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600

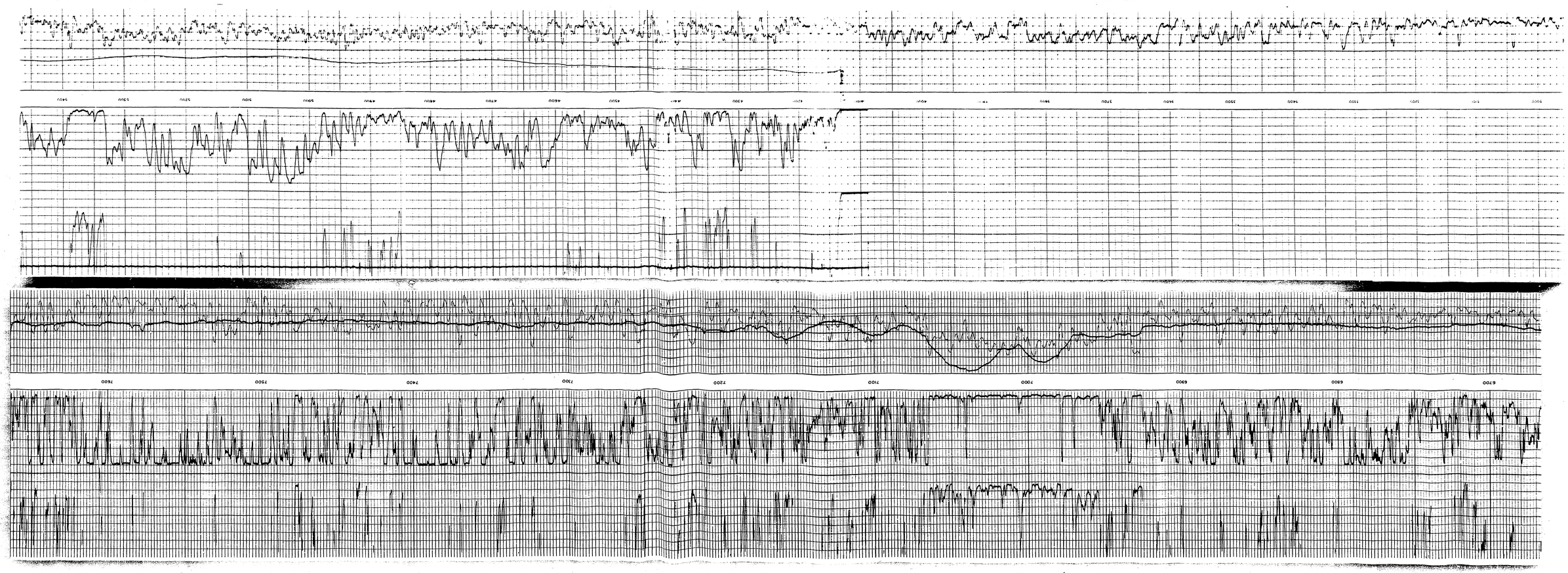
GAMMA RAY — MICROROENTGENS RA.EQ. TON — SP — 0 7.5 15 20

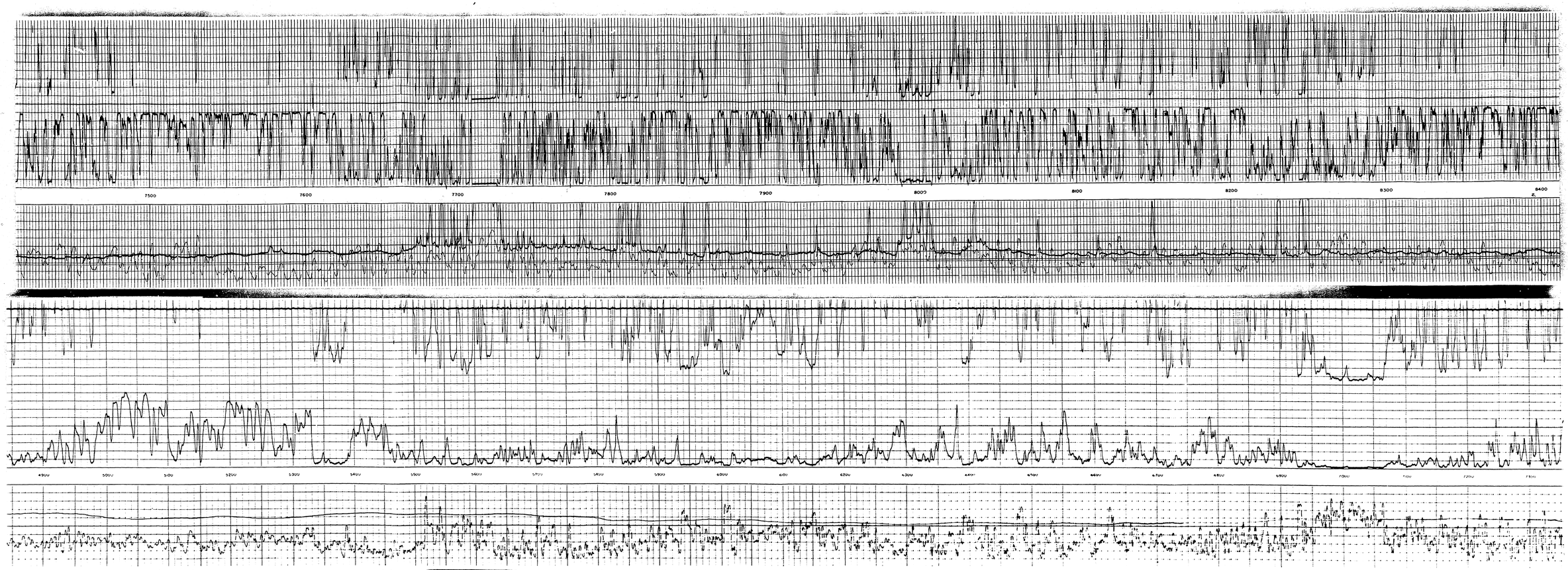
REMARKS — RUN 2

179

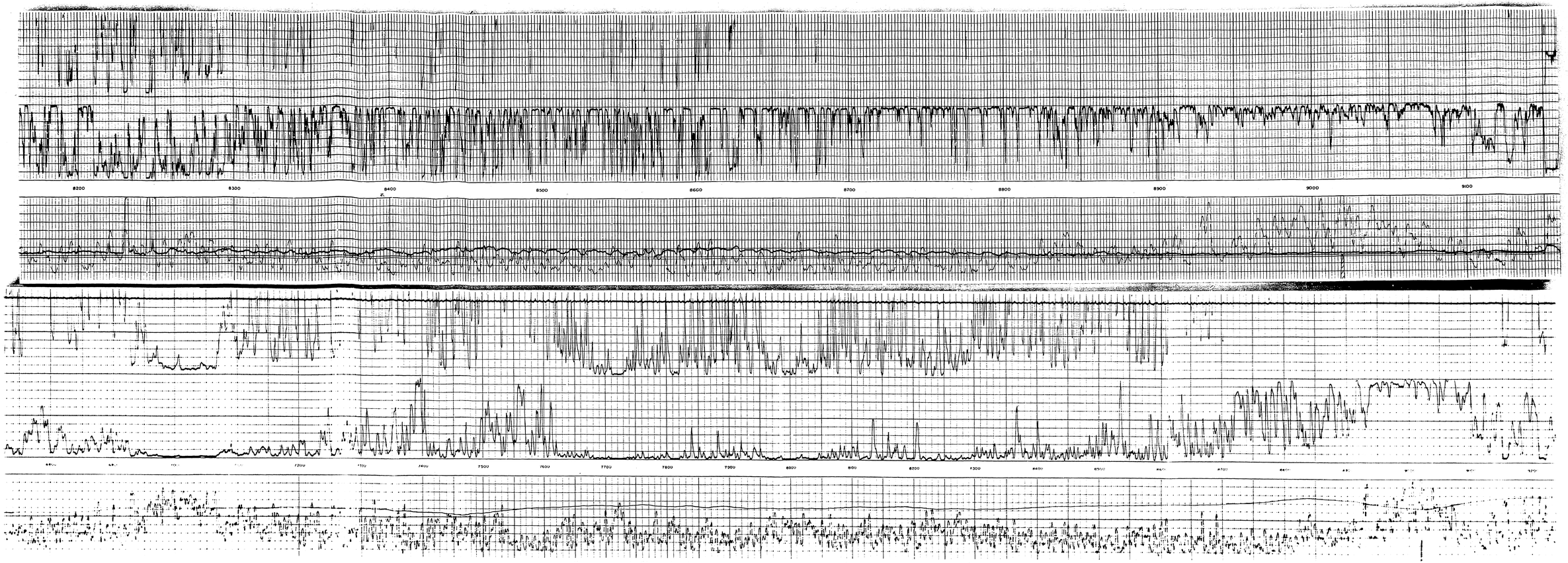
6000
6100
6200
6300
6400
6500
6600
6700
6800
6900
Caliper
Gamma Ray
Resistivity

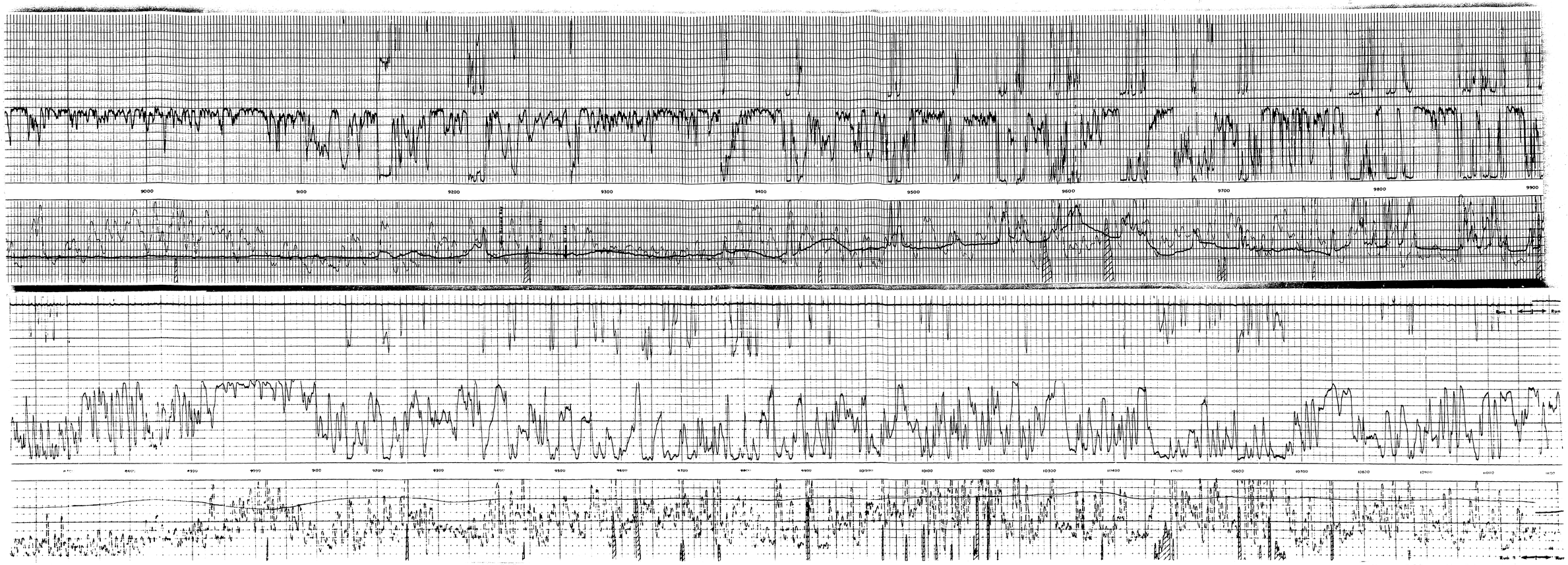

600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200

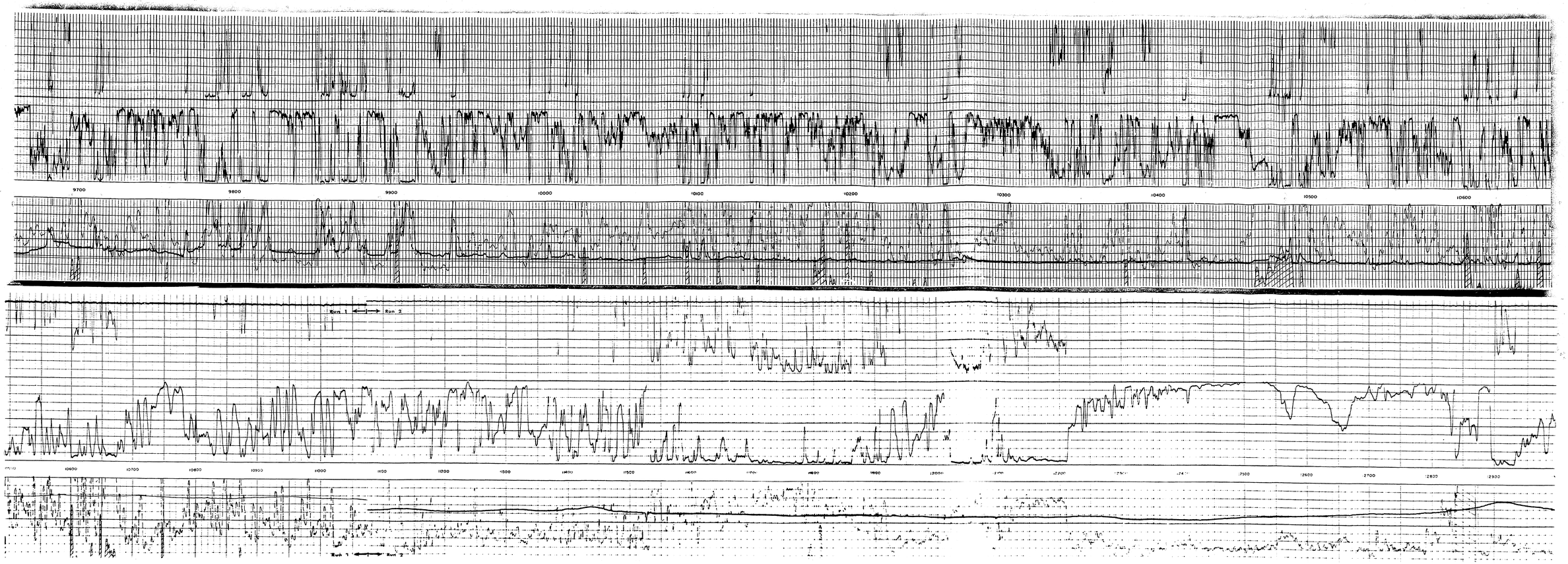


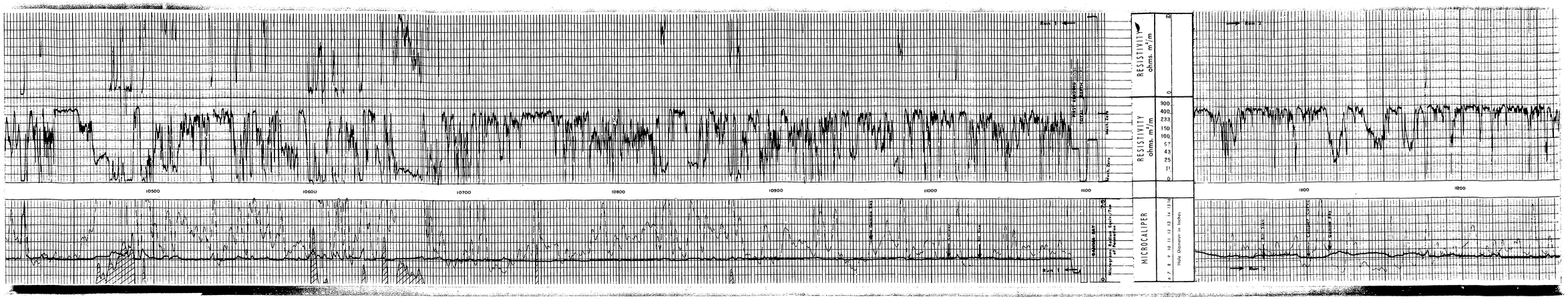

7500
7600
7700
7800
7900
8000
8100
8200
8300
8400
ft.
4900
5000
5100
5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
6300
6400
6500
6600
6700
6800
6900
7000
7100
7200
7300

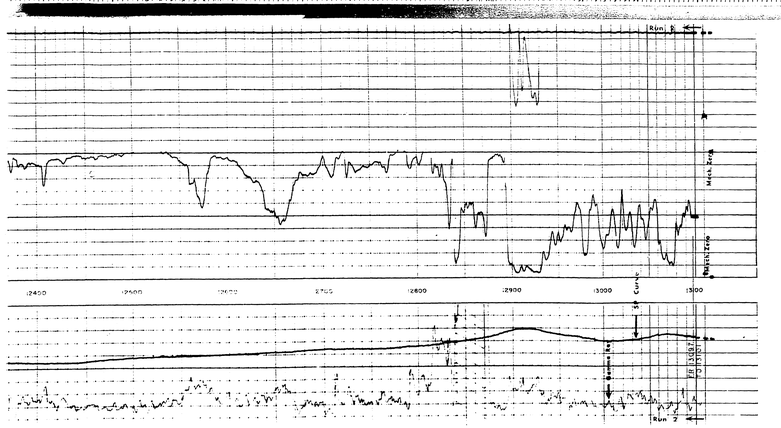
182


8200
8300
8400
8500
8600
8700
8800
8900
9000
9100


9000
9100
9200
9300
9400
9500
9600
9700
9800
9900
Run 1
Run

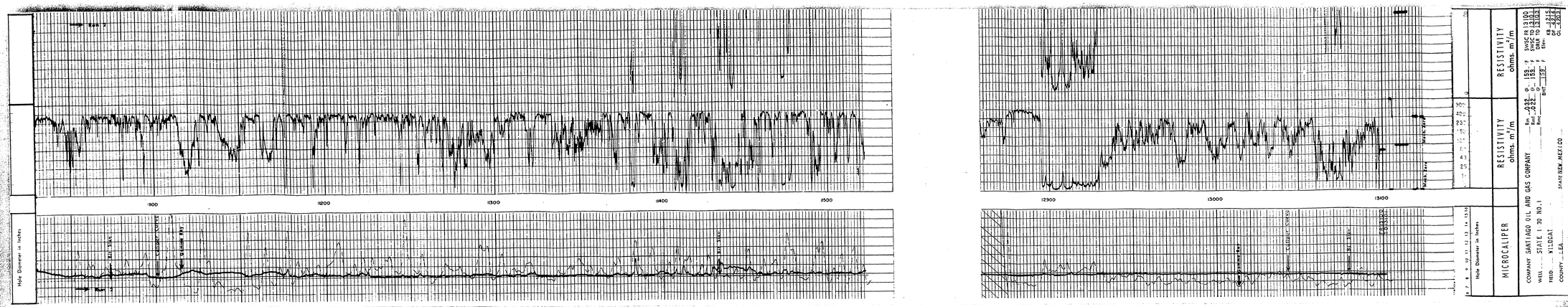

9700
9800
9900
10000
10100
10200
10300
10400
10500
10600
Run 1
Run 2
10600
10700
10800
10900
11000
11100
11200
11300
11400
11500
11600
11700
11800
11900
12000
12100
12200
12300
12400
12500
12600
12700
12800
12900
Run 1
Run 2

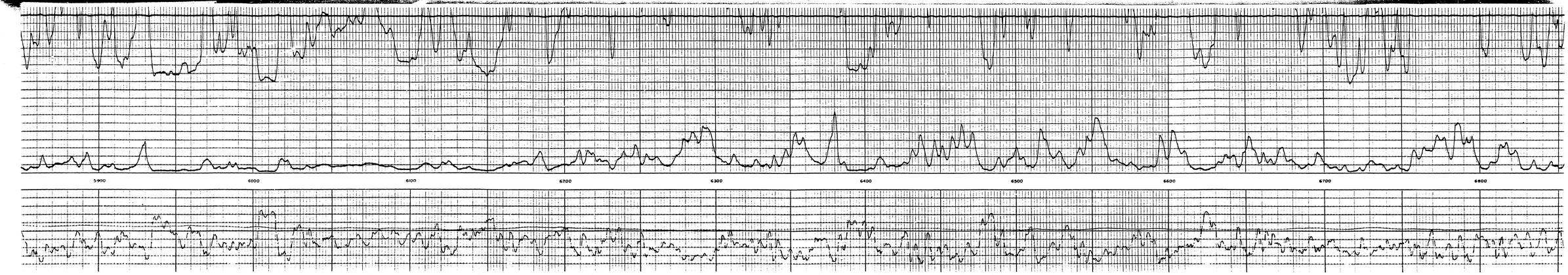

RESISTIVITY
ohms. m²/m
MICROCALLIPER
Hole Diameter in Inches
Run 1
Run 2
10500
10600
10700
10800
10900
11000
11100
11200
Micrologs Indicated Equiv/Ton
Mech. Zero
Elec. Zero


Run 2
12400
12500
12600
12700
12800
12900
13000
13100
SP Curve
Mech. Zero
Elec. Zero
Run 2

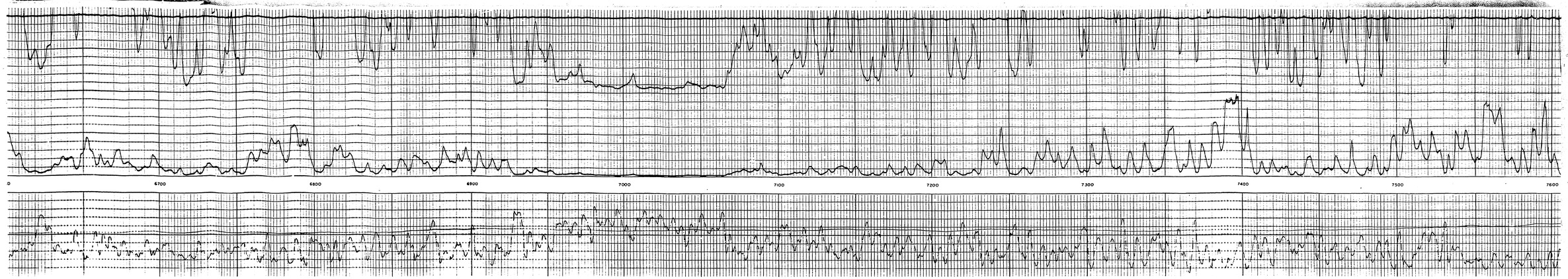
DETAIL
RESISTIVITY
ohms. m²/m
DEPTHS
GAMMA RAY
MICROLOGS Ag-Cl ION
SP
Run 1
5500
5600
5700
5800
5900
6000
SP Curve
Mech. Zero

186


Hole Diameter in Inches
MICROCALIPER
RESISTIVITY
ohms. m²/m
COMPANY SANTIAGO OIL AND GAS COMPANY
WELL STATE I 30 NO.1
FIELD WILDCAT
COUNTY LEA STATE NEW MEXICO
Rm .032 @ 159 F
Rmf .022 @ 159 F
Rmc @ BHT 159 F
SWSCP 13100
SWS 13100
SWS TD 13100
Elev.: KB 4215
DF 4214
GL 4204
Caliper Curve
Bit Size
Mud Resistivity
Mud Filtrate Resistivity
Mud Cake Resistivity
Static SP
Resistivity Curve
1800
1200
1300
1400
1500
12900
13000
13100

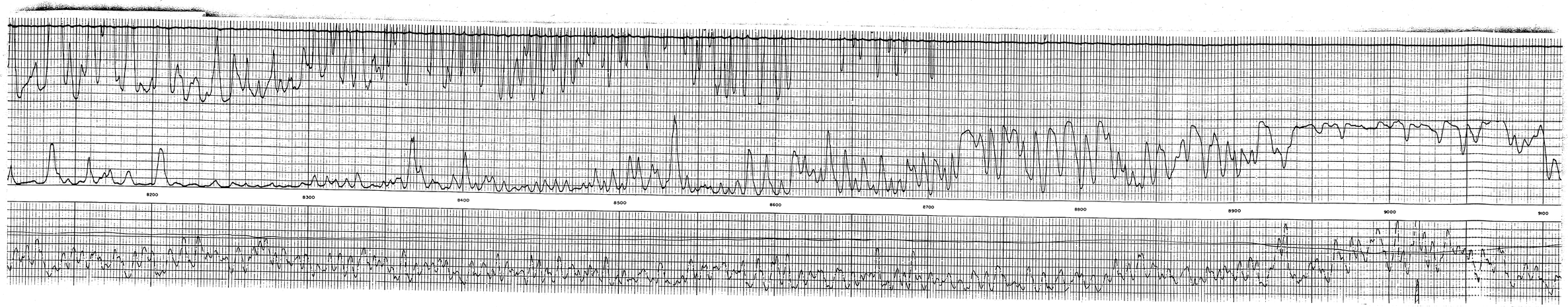

5900
6000
6100
6200
6300
6400
6500
6600
6700
6800

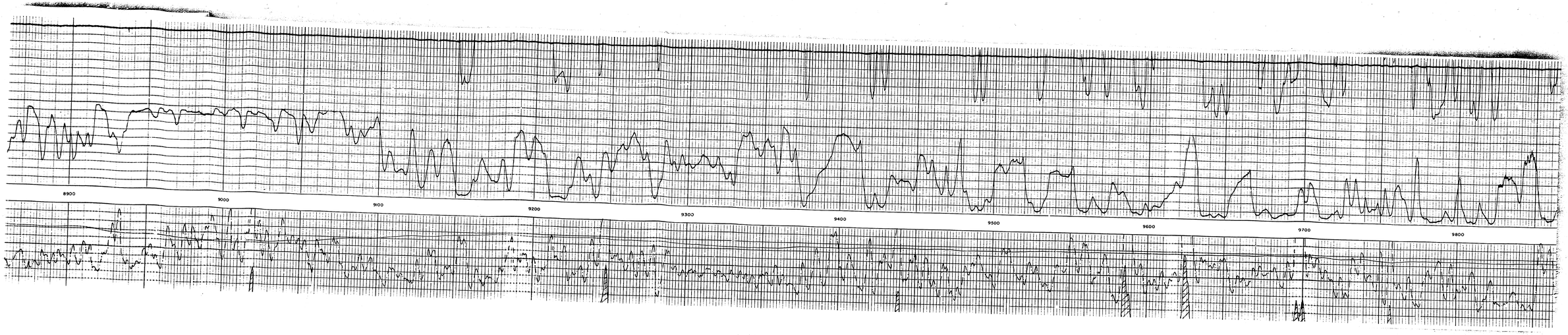
187

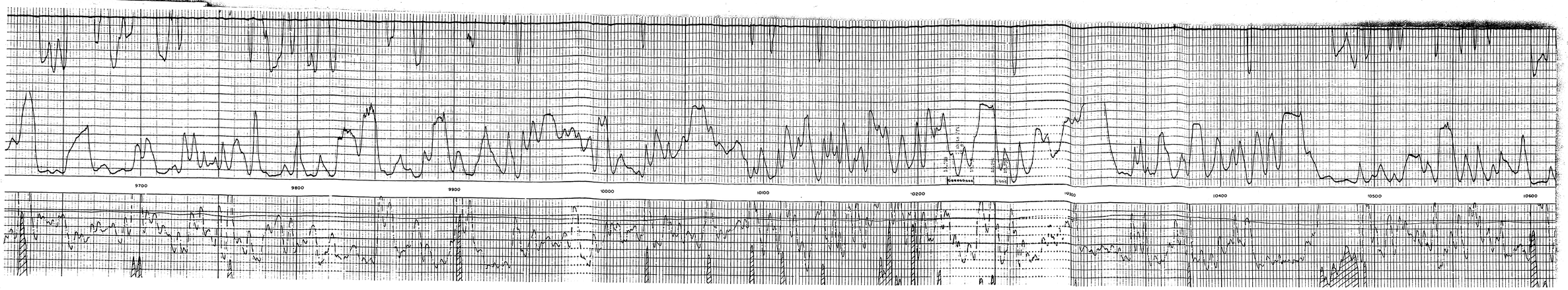


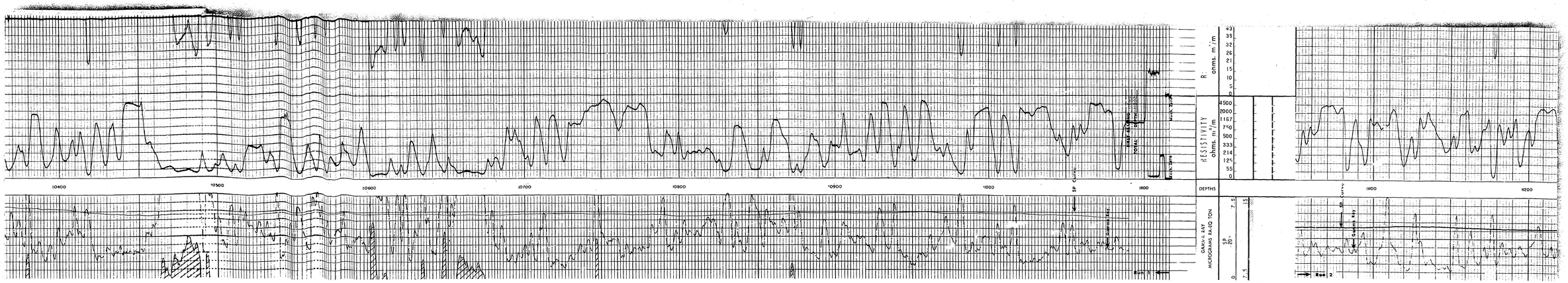
188

7400
7500
7600
7700
7800
7900
8000
8100
8200
8300

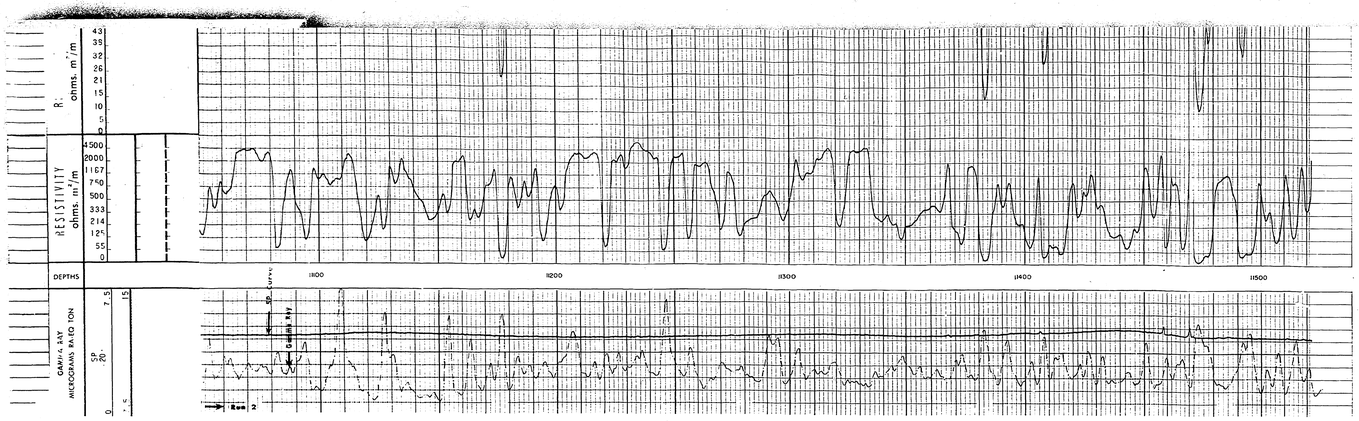

8200
8300
8400
8500
8600
8700
8800
8900
9000
9100

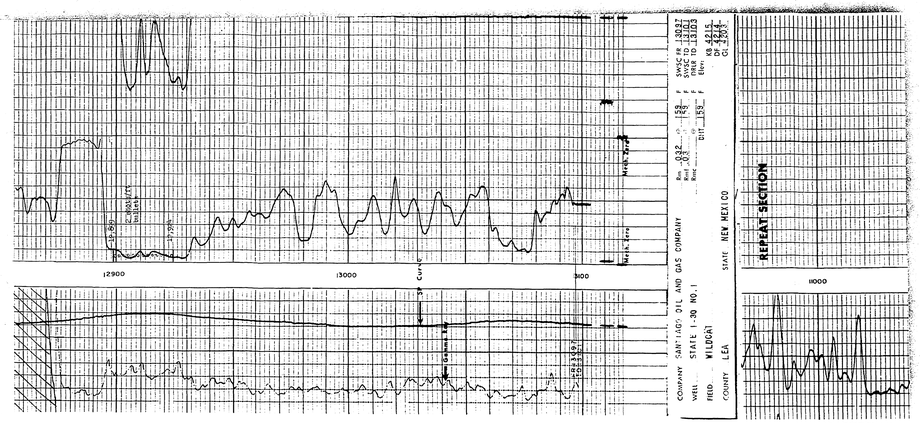

8900
9000
9100
9200
9300
9400
9500
9600
9700
9800


9700
9800
9900
10000
10100
10200
10300
10400
10500
10600

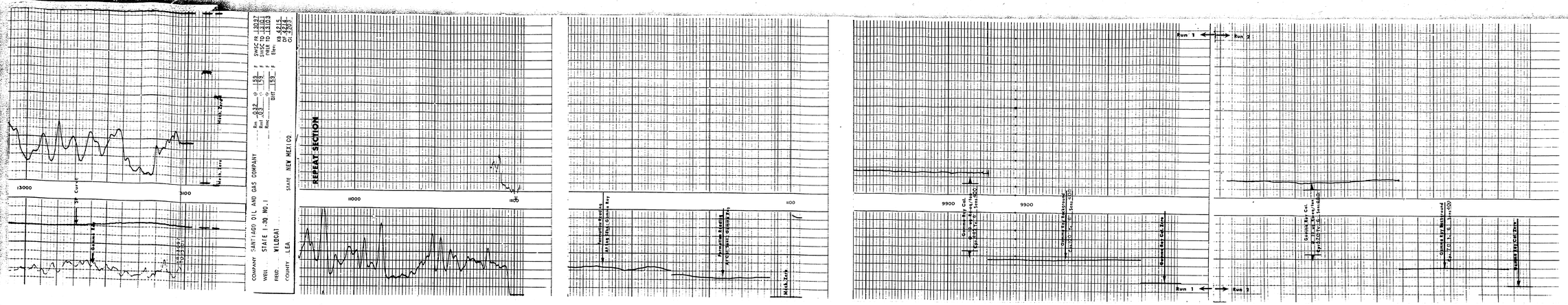

10400
10500
10600
10700
10800
10900
11000
11100
11200
SP Curve
Caliper Key
Rt
onms. m²/m
RESISTIVITY
ohms. m²/m
DEPTHS
GAMMA RAY
MICROGRAMS RA-EQ TON
SP
-20
7.5
15
0
Scale 2

193

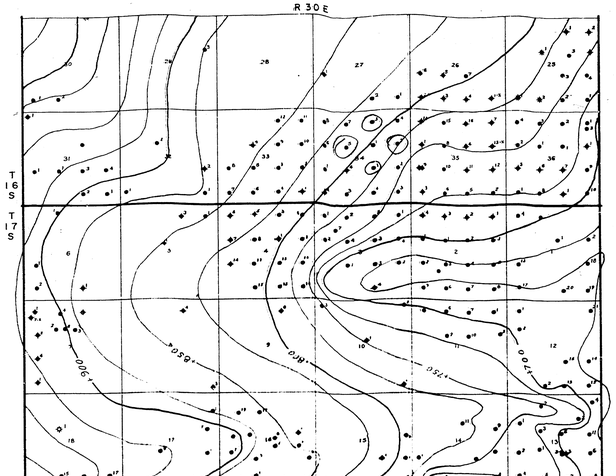

R:
ohms m²/m
43
35
26
21
15
10
7.5
5
0
RESISTIVITY
ohms m²/m
4500
2000
1167
750
500
333
214
125
55
0
DEPTHS
11100
11200
11300
11400
11500
GAMMA RAY
MICROGRAMS RA EQ TON
SP
20
0
7.5
15
5
SP Curve
Gamma Ray
Res 2


12900
13000
13100
Main Zone
Gamma Ray
SP Curve
SWC'S FR 13037
CORES FR 13037
DRLR TD 13103
KB 4215
DF 4214
GL 4204
Run 032
Bit 158
Bit 158
COMPANY SANTA FE OIL AND GAS COMPANY
WELL STATE 1-30 NO. 1
FIELD WILDCAT
COUNTY LEA
STATE NEW MEXICO
REPEAT SECTION
11000

194


COMPANY SANTIAGO OIL AND GAS COMPANY
WELL STATE I-30 NO. 1
FIELD WILDCAT
COUNTY LEA
STATE NEW MEXICO
Run 032 @ 158 F SWSC FR 13027
Run 033 @ 150 F SWSC TD 13003
Run @ F
Dist 158 F
Elev. KB 4015
DF 4014
GL 3989
REPEAT SECTION
Gamma Ray
Neut. Poro.
Miss. Zone
Formation Density
Gamma Ray Caliper
Gamma Ray Cal. Zero
Gamma Ray Neutron
Gamma Ray Background
Run 1
Run 2

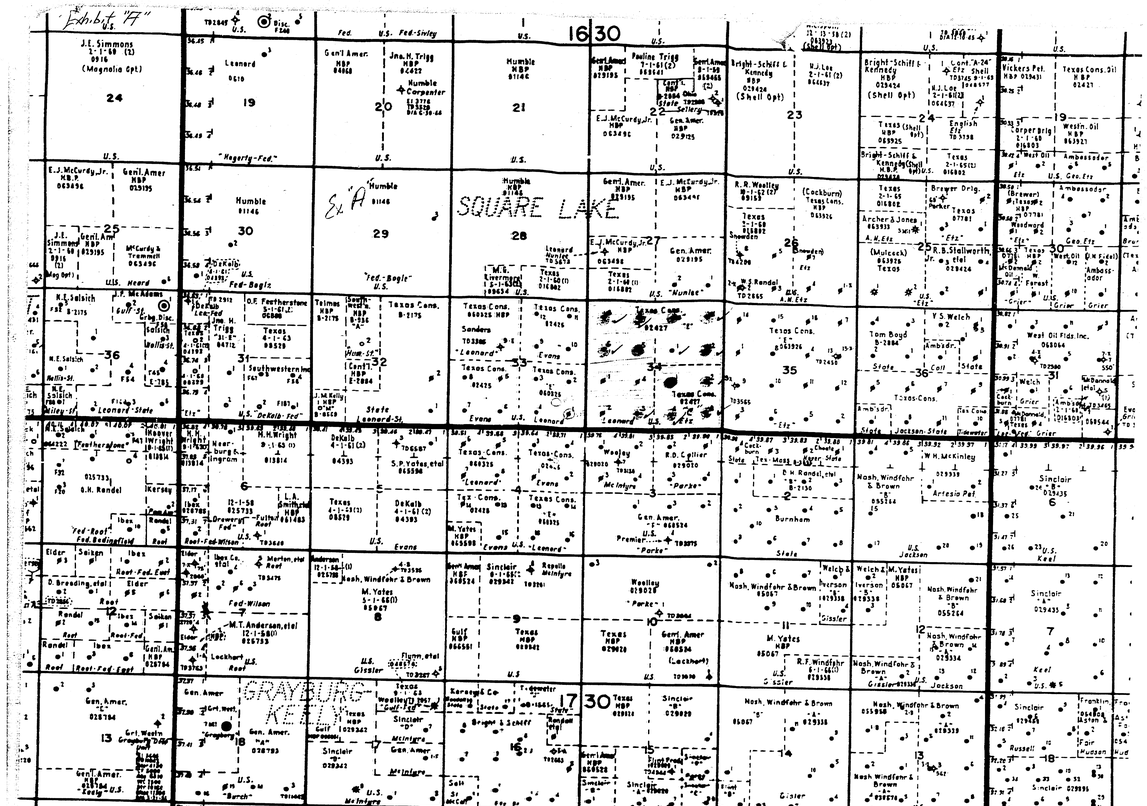
195



BEFORE EXAMINER HUTTER
Exhibit No. 4
Case No. 1196

PORTION SQUARE LAKE
CONTOURED ON TOP SAN ANDRES
COUNTOUR INTERVAL = 25'
SCALE 2" = 1 MILE
A.D. FRYMAN FEB. 2, 1959

196



R 13 W | R 12 W | R 11 W | R 10 W | R 9 W | R 8 W

T 32 N

T 31 N

T 30 N

T 29 N

T 28 N

Aztec

Farmington

ANGELS PEAK—DK

197

R9W R8W R7W R6W R5W R4W R3W R2W R1W

T 32 N

T 31 N

T 30 N

T 29 N

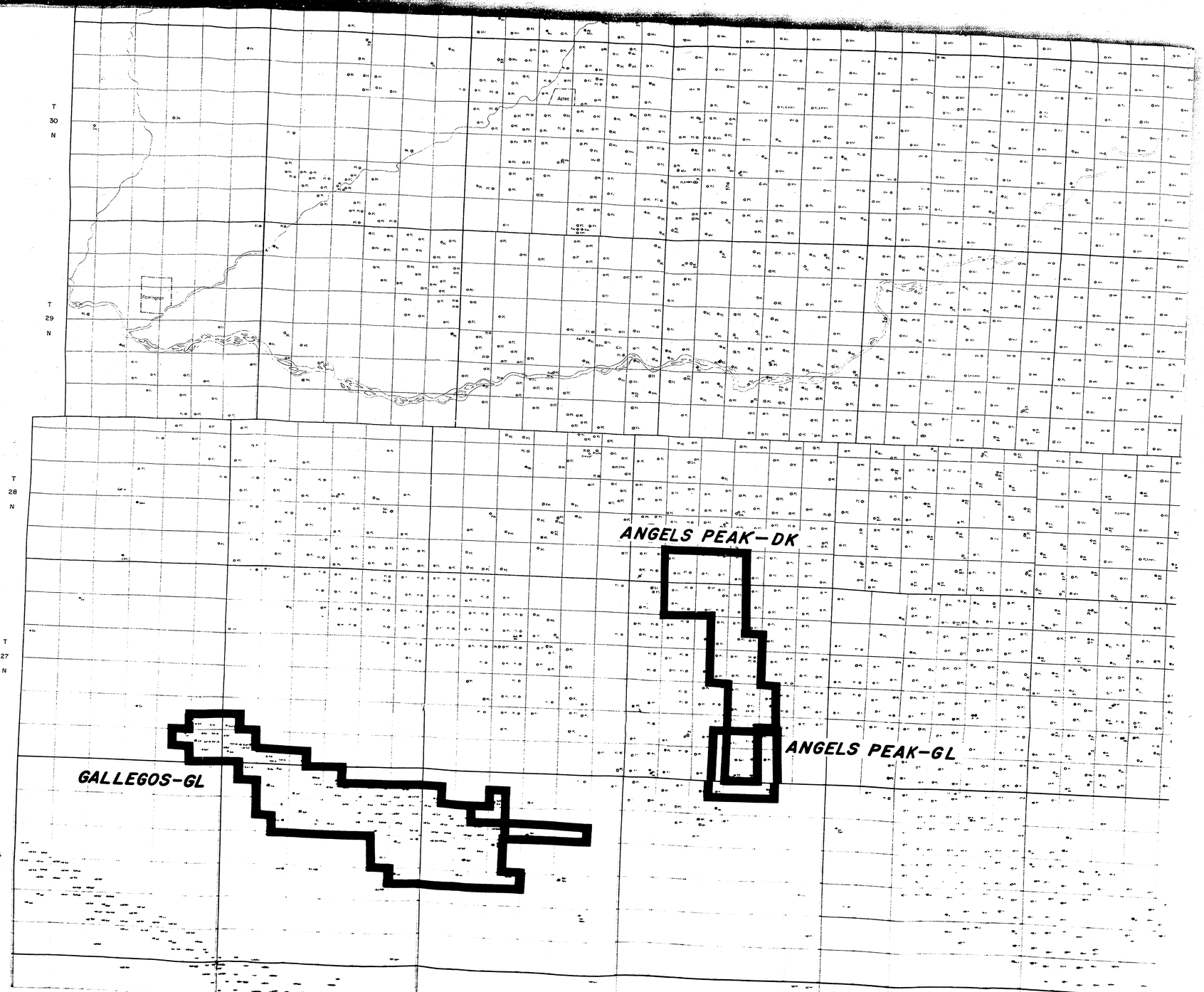
Gobernador

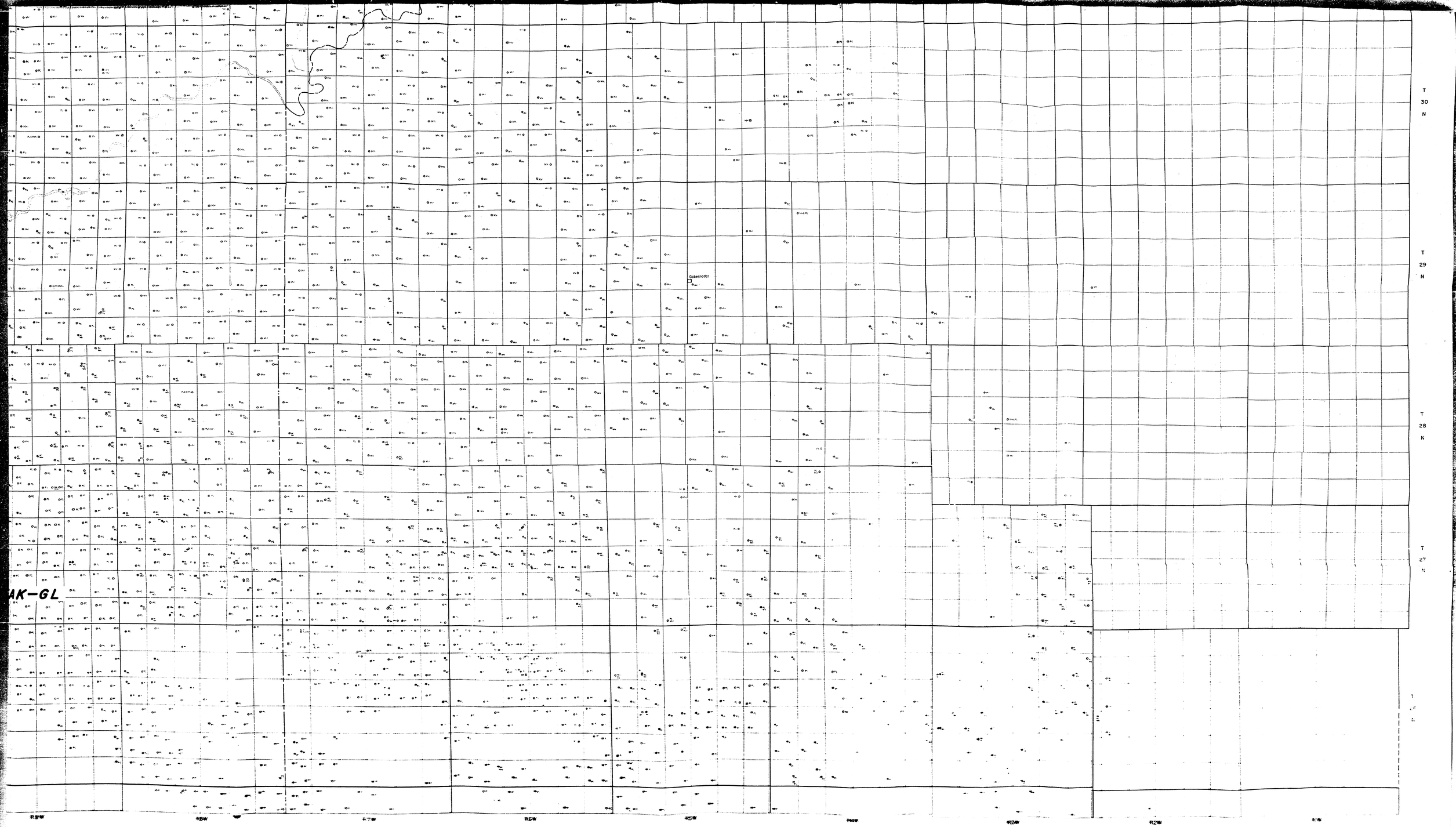
198

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 1
CASE 1616

MAP SHOWING
PRODUCING WELLS
SAN JUAN BASIN NEW MEXICO

199




Gobernador
T 30 N
T 29 N
T 28 N
T 27 N
R9W
R8W
R7W
R6W
R5W
R4W
R3W
R2W
R1W

AK-GL

200

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

A

EL PASO
HUERFANO UNIT NO. 104
SE/4 SEC. 17-26-10

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO. 4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO. 3
SE/4 SEC. 28-27-10

P.
C. A

+700

+600

+500

+400

+300

ESTIMATED LIMIT OF
COMMERCIAL PRODUCTION

MAIN GALLUP SAND

GAS - OIL CONTACT (+420)

MAIN GALLUP SAND

201

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO.4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO.3
SE/4 SEC. 28-27-10

PAN AMERICAN
C. A. Mc ADAMS "B" NO.1
SE/4 SEC. 28-27-10

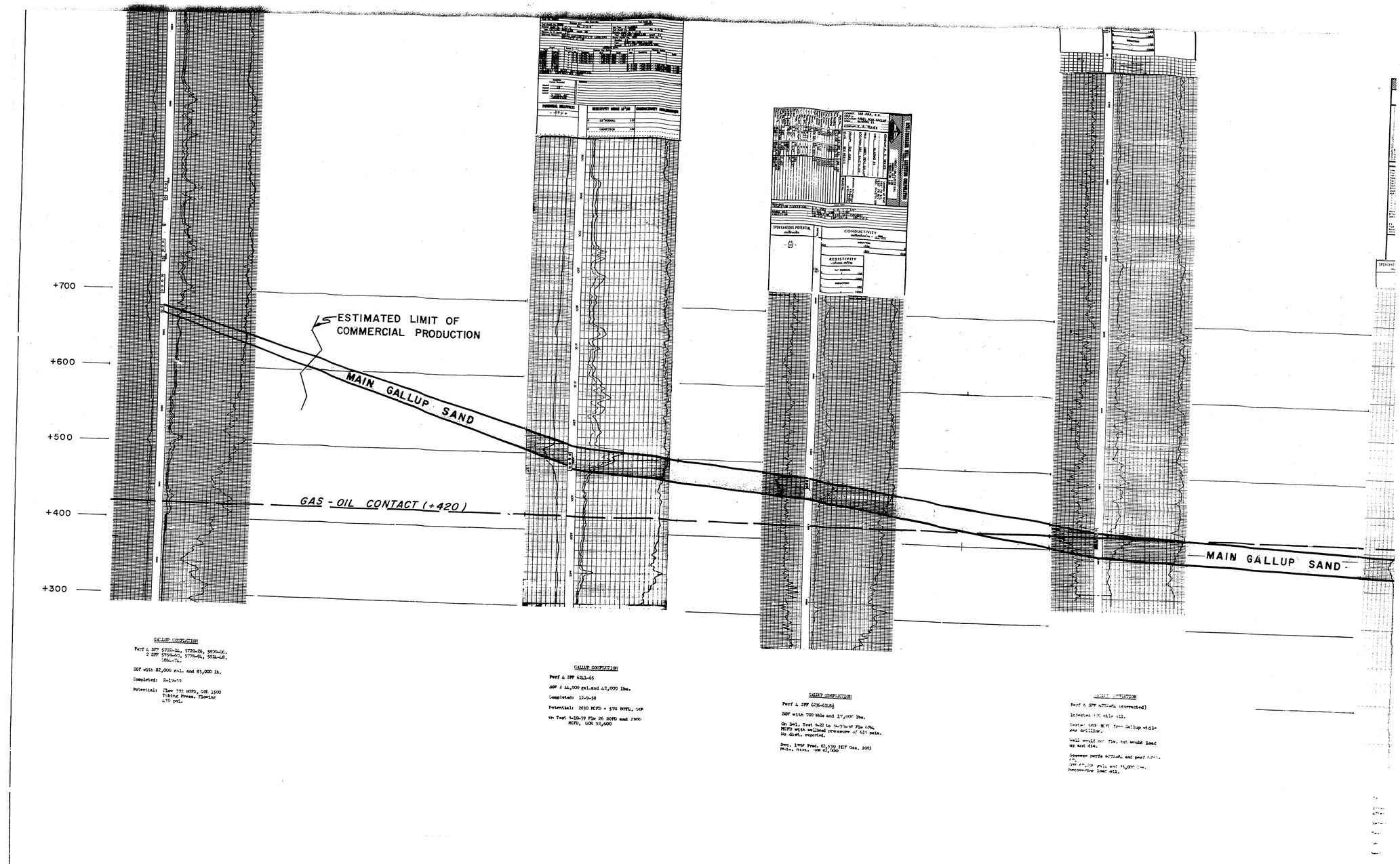
A'

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10

+700
+600
+500
GAS - OIL CONTACT (+420)
+400
+300
ESTIMATED LIMIT OF COMMERCIAL PRODUCTION
+200

MAIN GALLUP SAND

202



GALLUP COMPLETION

Perf & SPF 5720-32, 5720-26, 5830-06, 2 SPF 5778-87, 5778-84, 5824-28, 5864-74.

SOF with 82,000 gal. and 85,000 lb.

Completed: 2-14-59

Potential: Flow 393 BOPD, GOR 1500 Tubing Press. Flowing 450 psi.

GALLUP COMPLETION

Perf & SPF 6021-65

SOF & 44,000 gal.and 42,000 lbs.

Completed: 12-9-58

Potential: 2830 MCFD + 570 BOPD, GOR

On Test 4-10-59 Flw 26 BOPD and 2900 MCFD, GOR 92,600

GALLUP COMPLETION

Perf & SPF 6234-6288

SOF with 700 bbls and 27,000 lbs.

On Del. Test 4-22 to 4-27-59 Flw 4764 MCFD with wellhead pressure of 615 psia. No dist. reported.

Dec. 1958 Prod. 67,539 MCF Gas, 1001 Wtr. Bbls. GOR 65,930

GALLUP COMPLETION

Perf & SPF 6272-84 (corrected)

Intersel 1% cable oil.

Tested 1200 MCFD from Gallup while was drilling.

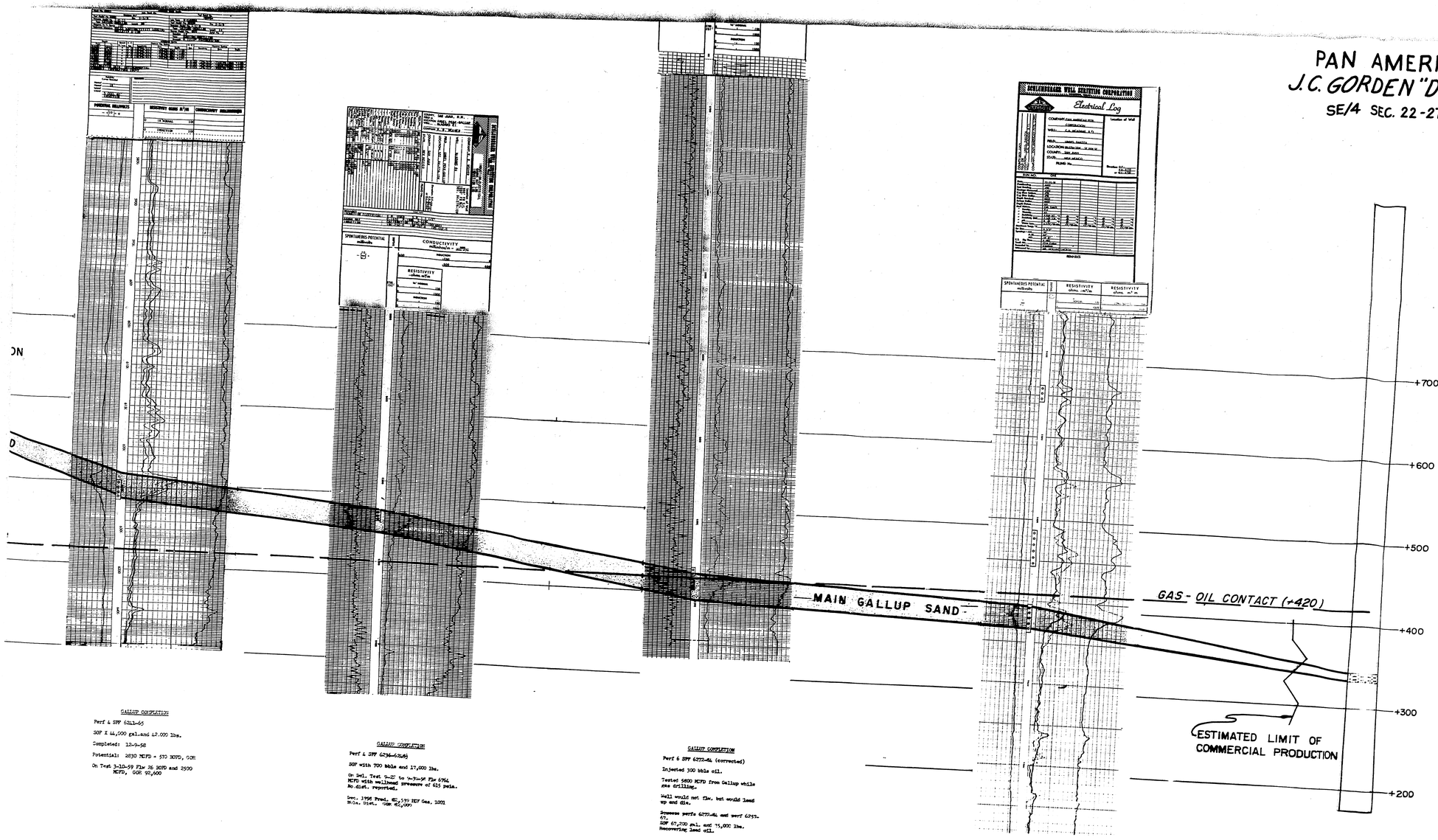
Well would not flw. but would load up and die.

Squeeze perfs 6272-84 and perf [illegible]

SPF [illegible] gals and 44,000 lbs. Recovering load oil.

203

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10



GALLUP COMPLETION

Perf 4 SPF 6241-65

SOF X 44,000 gal. and 42.000 lbs.

Completed: 12-9-58

Potential: 2830 MCFD + 570 BOPD, GOR

On Test 3-10-59 Flw 26 BOPD and 2500 MCFD, GOR 97,000

GALLUP COMPLETION

Perf 4 SPF 6234-6248

SOF with 700 bbls and 17,000 lbs.

On Del. Test 9-27 to 9-30-59 Flw 6764 MCFD with wellhead pressure of 615 psia. No dist. reported.

Dec. 1956 Prod. 62,539 MCF Gas, 1021 Bbls. Dist. GOR 65,000

GALLUP COMPLETION

Perf 6 SPF 6272-84 (corrected)

Injected 300 bbls oil.

Tested 5820 MCFD from Gallup while rew drilling.

Well would not flw, but would head up and die.

Squeeze perfs 6272-84 and perf 6252-62.

SOF 67,200 gal. and 75,000 lbs. Recovering load oil.

GALLUP COMPLETION

Perf 4 SPF 7704-36.

Attempt SOF 75,000 lbs. sander off after 900 lbs. in formation.

Refrac with 71,000 gal. 2,000 lbs.

Test [illegible] BOPD GOR 795

Set CP above perf.

Perf 4 SPF 6196-96, 6194-88, 2 SPF 6031-57.

SOF 54,000 gal., 46,000 lbs.

Now recovering load oil.

PAN AMERICAN
EXHIBIT No. 2

204

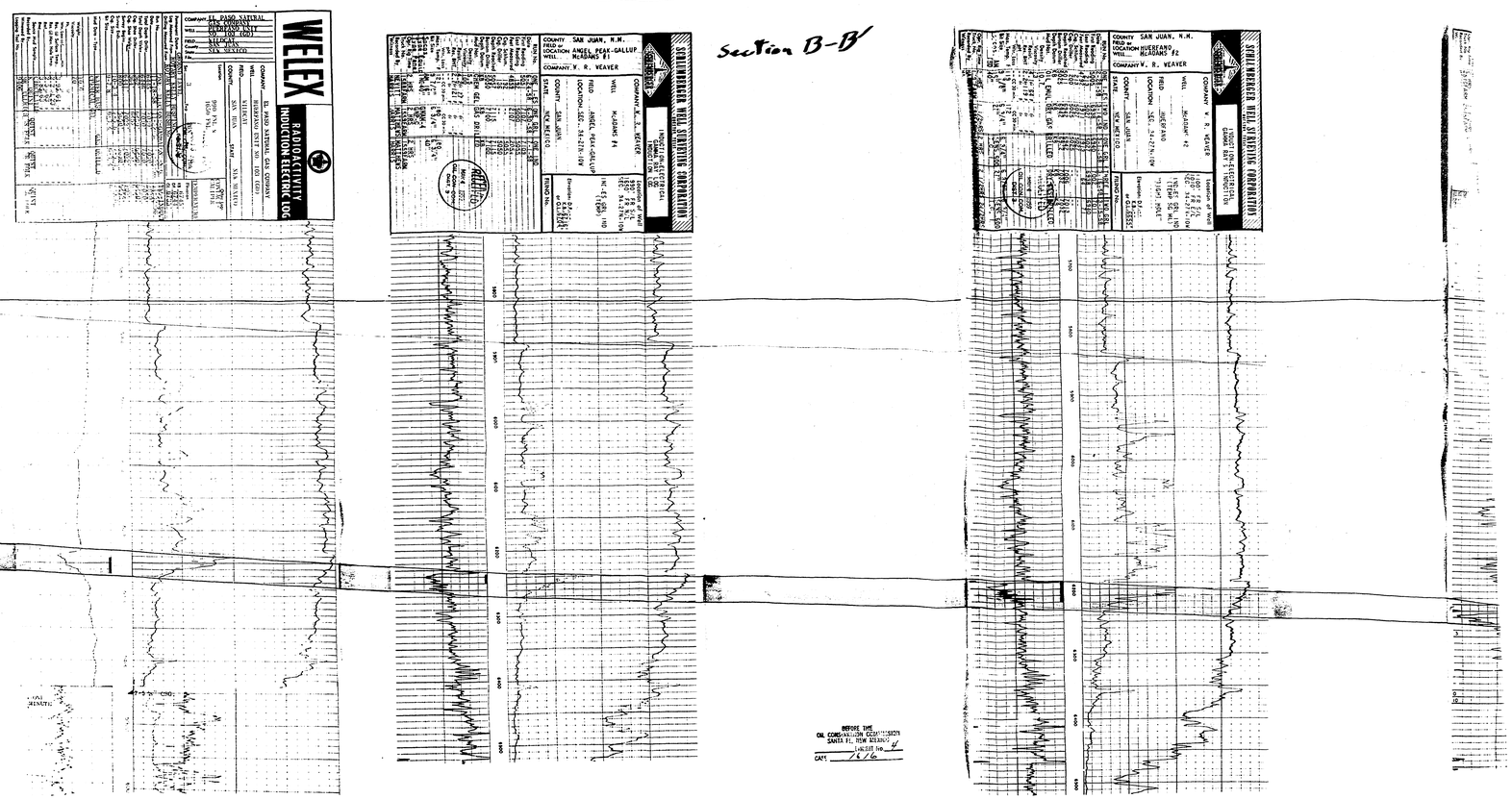
PAN AMERICAN PETROLEUM CORPORATION

EXHIBITS

NMOCC CASE NO. 1616

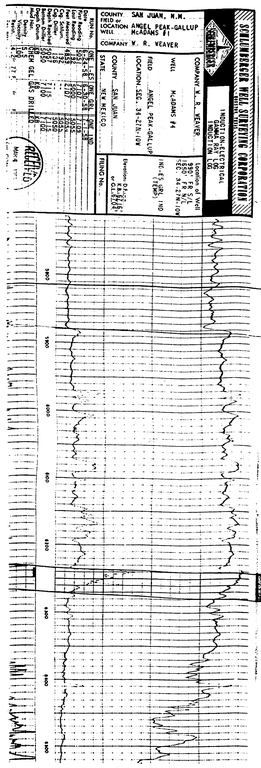
205

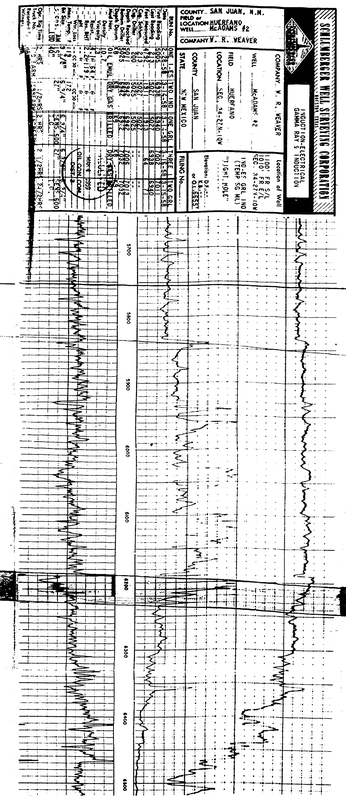
Section B-B'



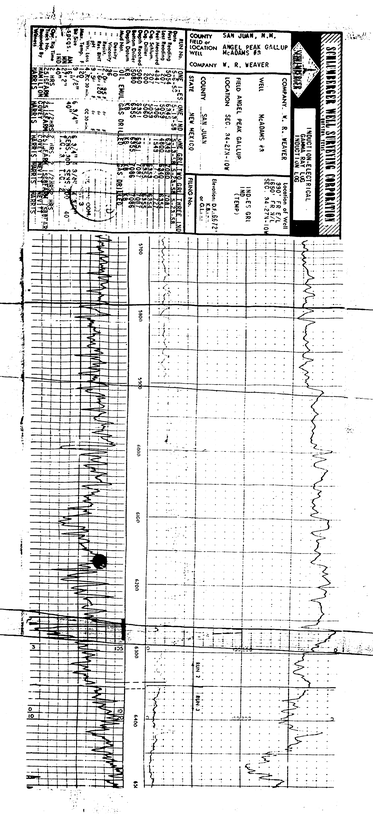
206

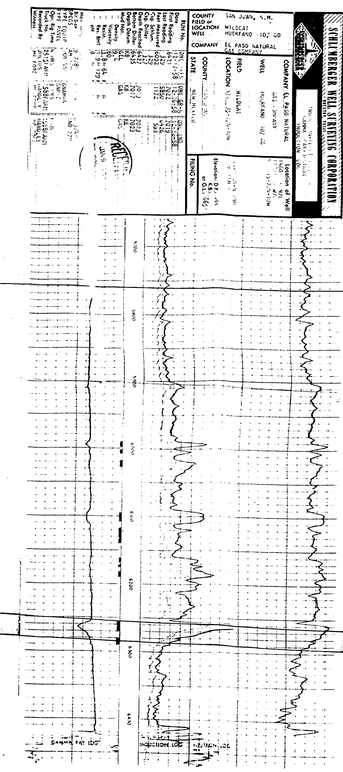
Section B-B'





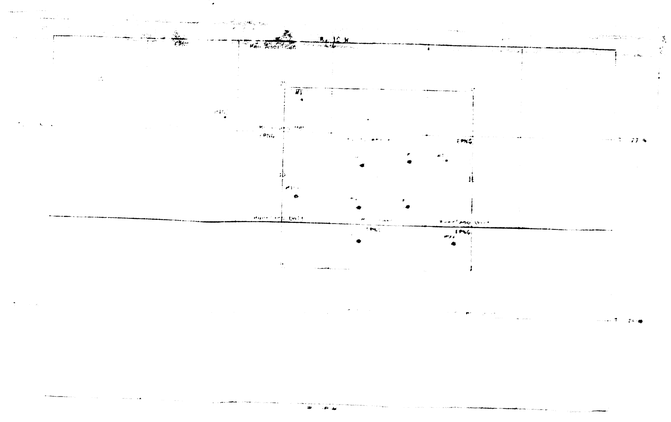
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 4
CASE 1616





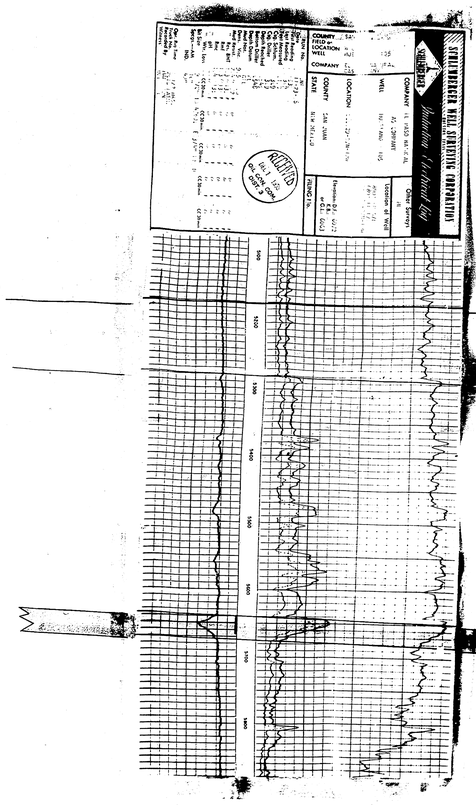
+900'

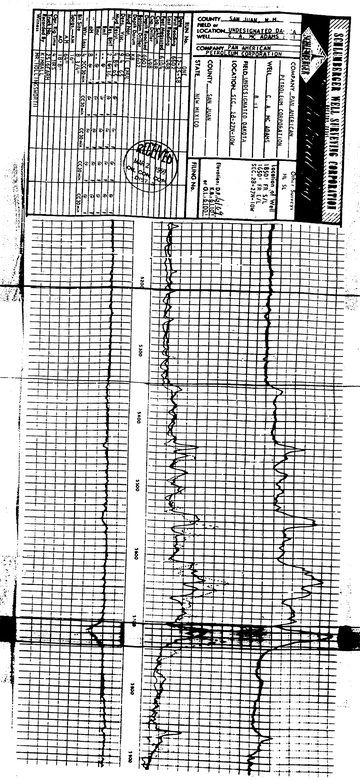
207



SECTION A

+900'

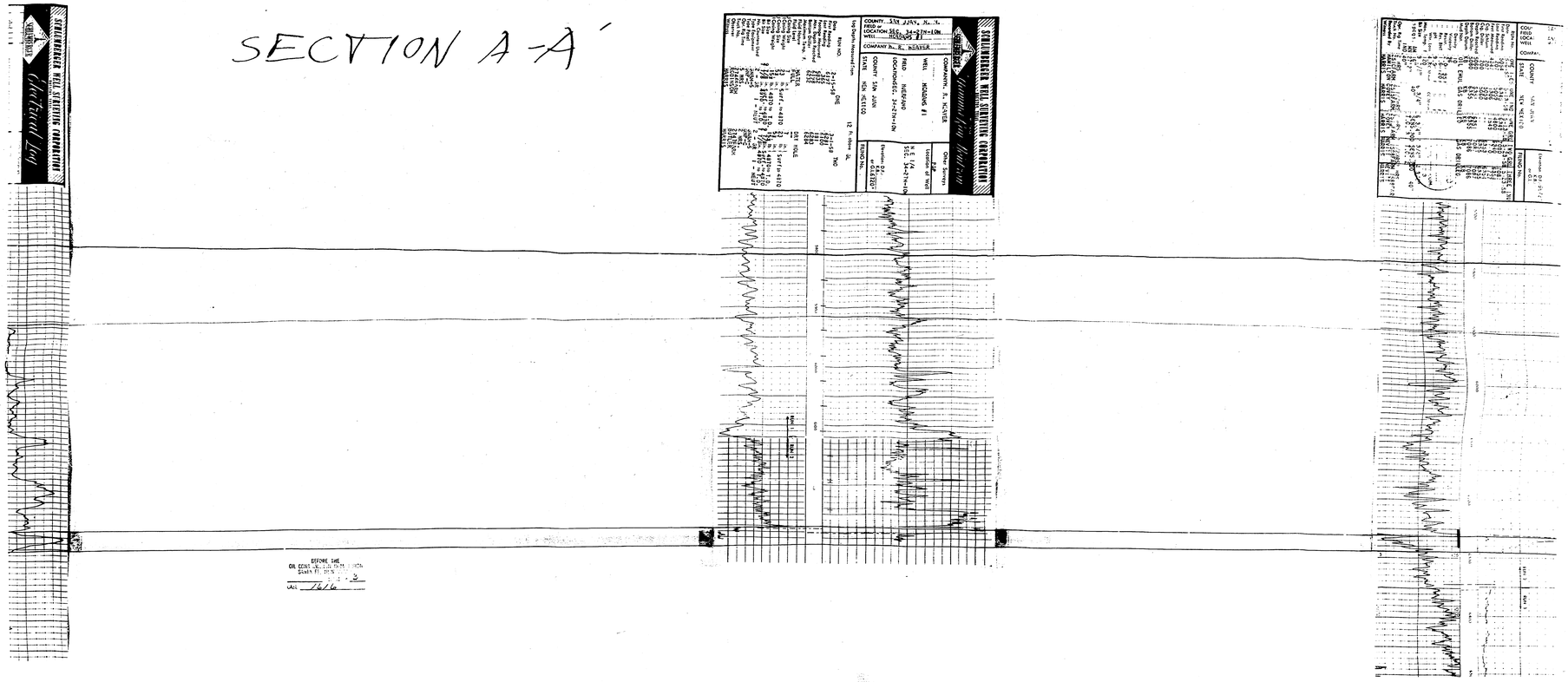




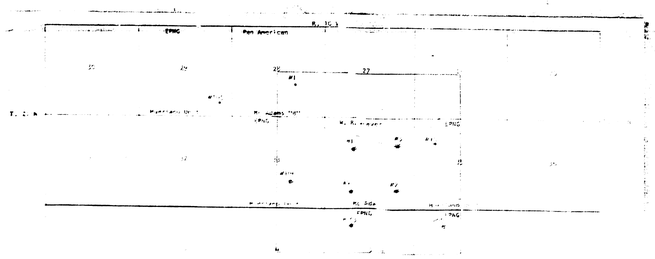
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT 3
CASE 7616

208

SECTION A-A'



BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
CASE 1616 EXHIBIT NO. 3



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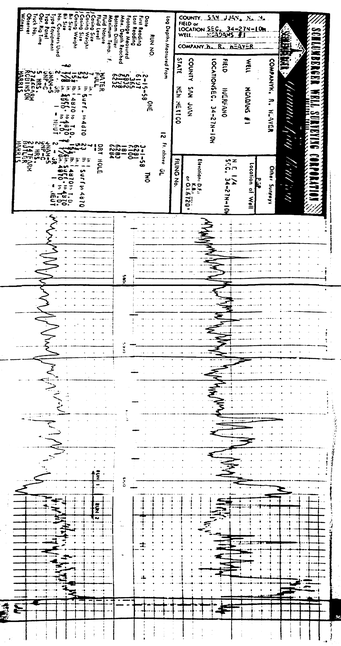
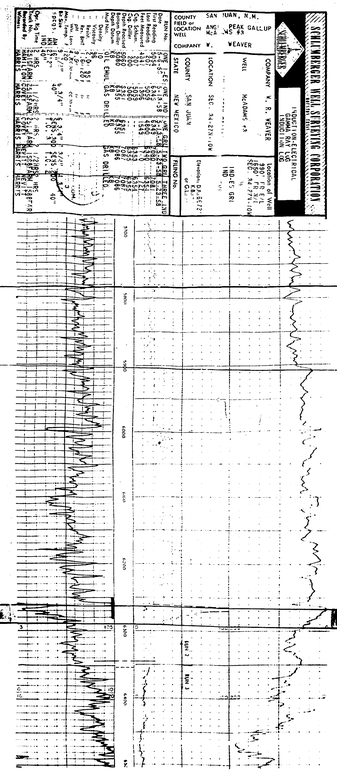
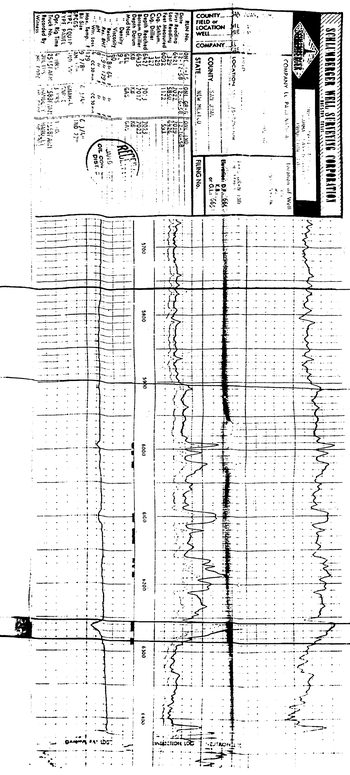
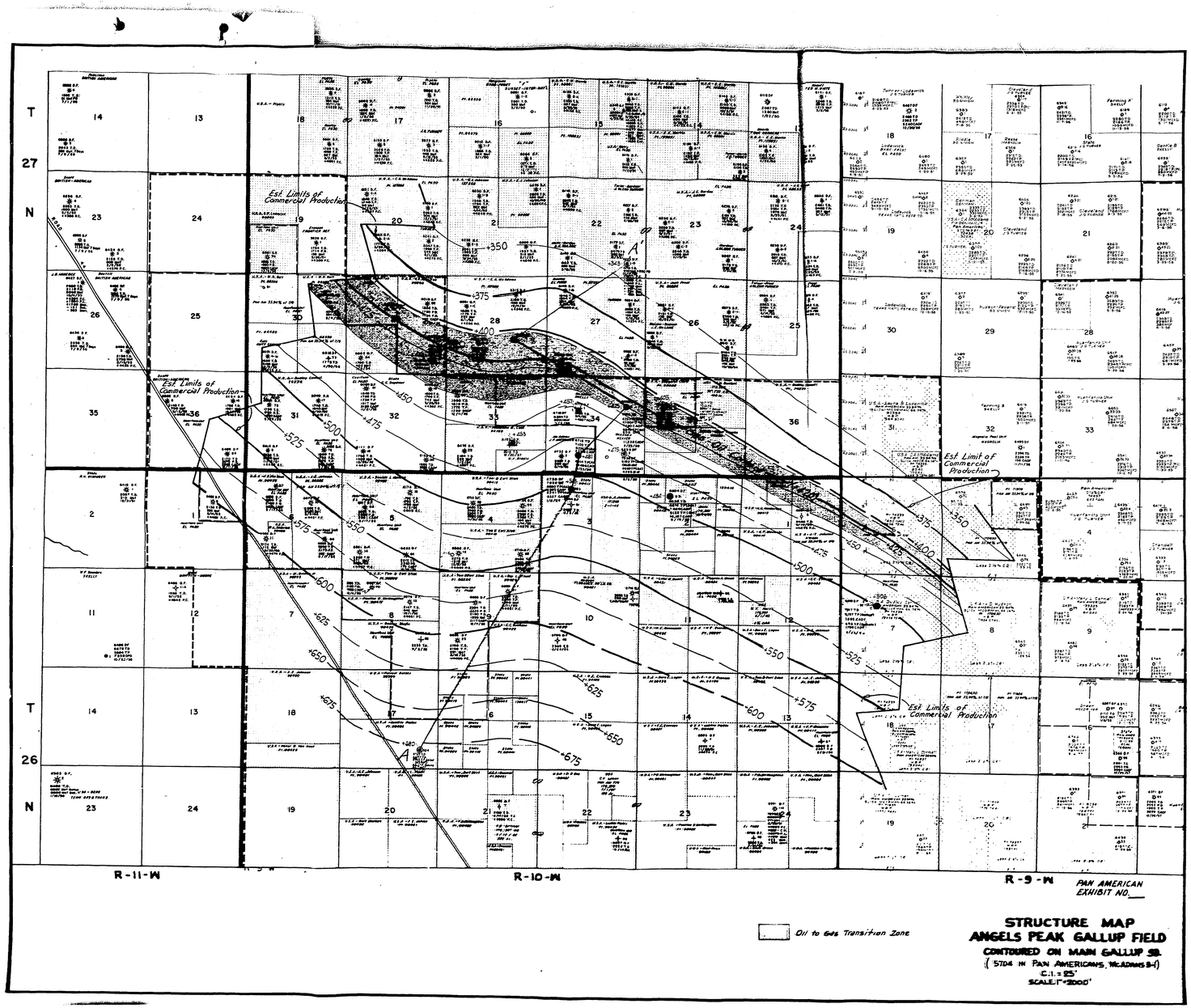

SCHLUMBERGER WELL SURVEYING CORPORATION
COMPANY N. B. WEAVER
WELL MCADAMS #1
FIELD WILDCAT
LOCATION SEC. 34-27N-10W
COUNTY SAN JUAN
STATE NEW MEXICO


SCHLUMBERGER WELL SURVEYING CORPORATION
COMPANY N. B. WEAVER
WELL MCADAMS #1
FIELD WILDCAT
LOCATION SEC. 34-27N-10W
COUNTY SAN JUAN
STATE NEW MEXICO


SCHLUMBERGER WELL SURVEYING CORPORATION
COUNTY SAN JUAN
STATE NEW MEXICO

+900'

210


T 27 N
T 26 N
R-11-W
R-10-W
R-9-W
Est. Limits of Commercial Production
Est. Limits of Commercial Production
Est Limit of Commercial Production
Est. Limits of Commercial Production
Oil to Gas Transition Zone
PAN AMERICAN EXHIBIT NO.
STRUCTURE MAP
ANGELS PEAK GALLUP FIELD
CONTOURED ON MAIN GALLUP SD.
(5704 IN PAN AMERICAN'S, W.C. ADAMS 8-1)
C.I. = 25'
SCALE 1" = 2000'

211

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

A

EL PASO
HUERFANO UNIT NO. 104
SE/4 SEC. 17-26-10

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO. 4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO. 3
SE/4 SEC. 28-27-10

PAN AMERICAN
C. A. Mc ADAMS 'B' NO. 1
SE/4 SEC. 28-27-10

A'

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10

+700
+600
+500
+400
+300

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

GAS - OIL CONTACT (+420)

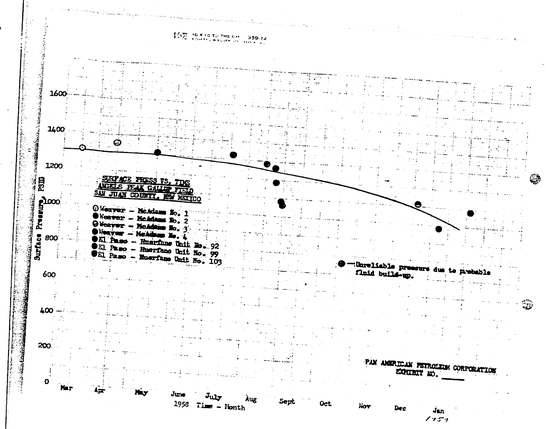
ANGELS PEAK GALLUP SAND

GAS - OIL CONTACT (+420)

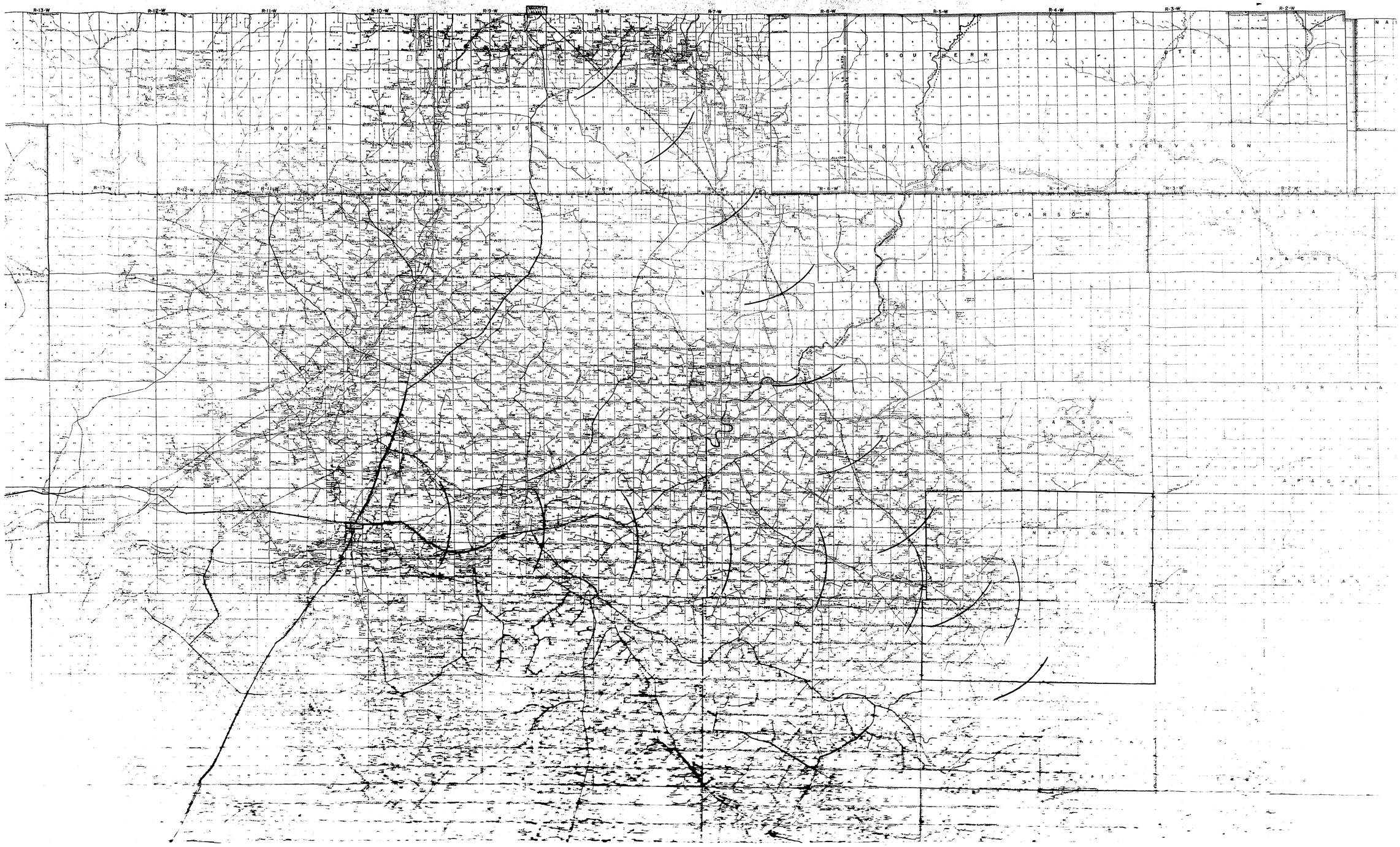
ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

+700
+600
+500
+400
+300
+200

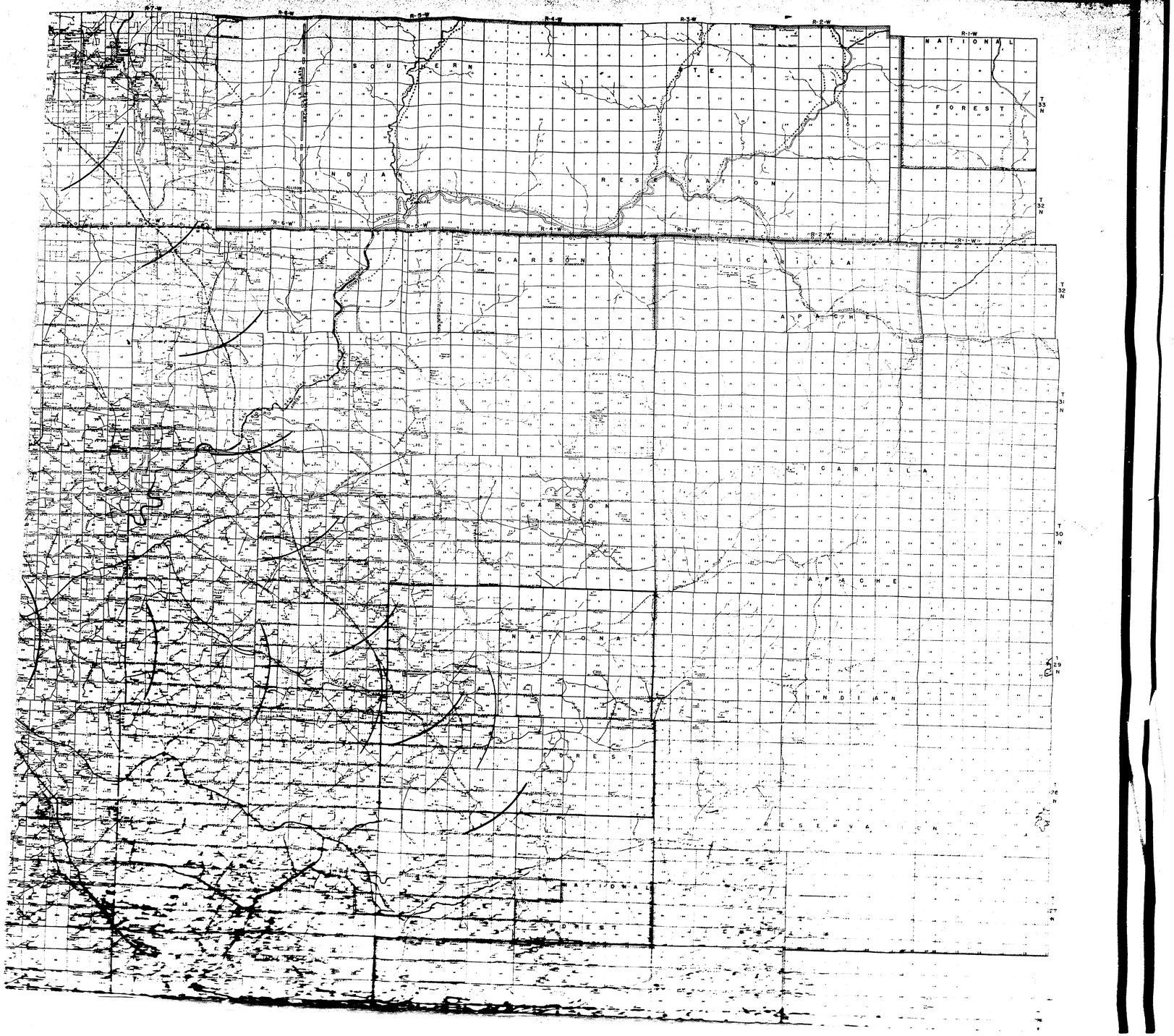
PAN AMERICAN
EXHIBIT No.



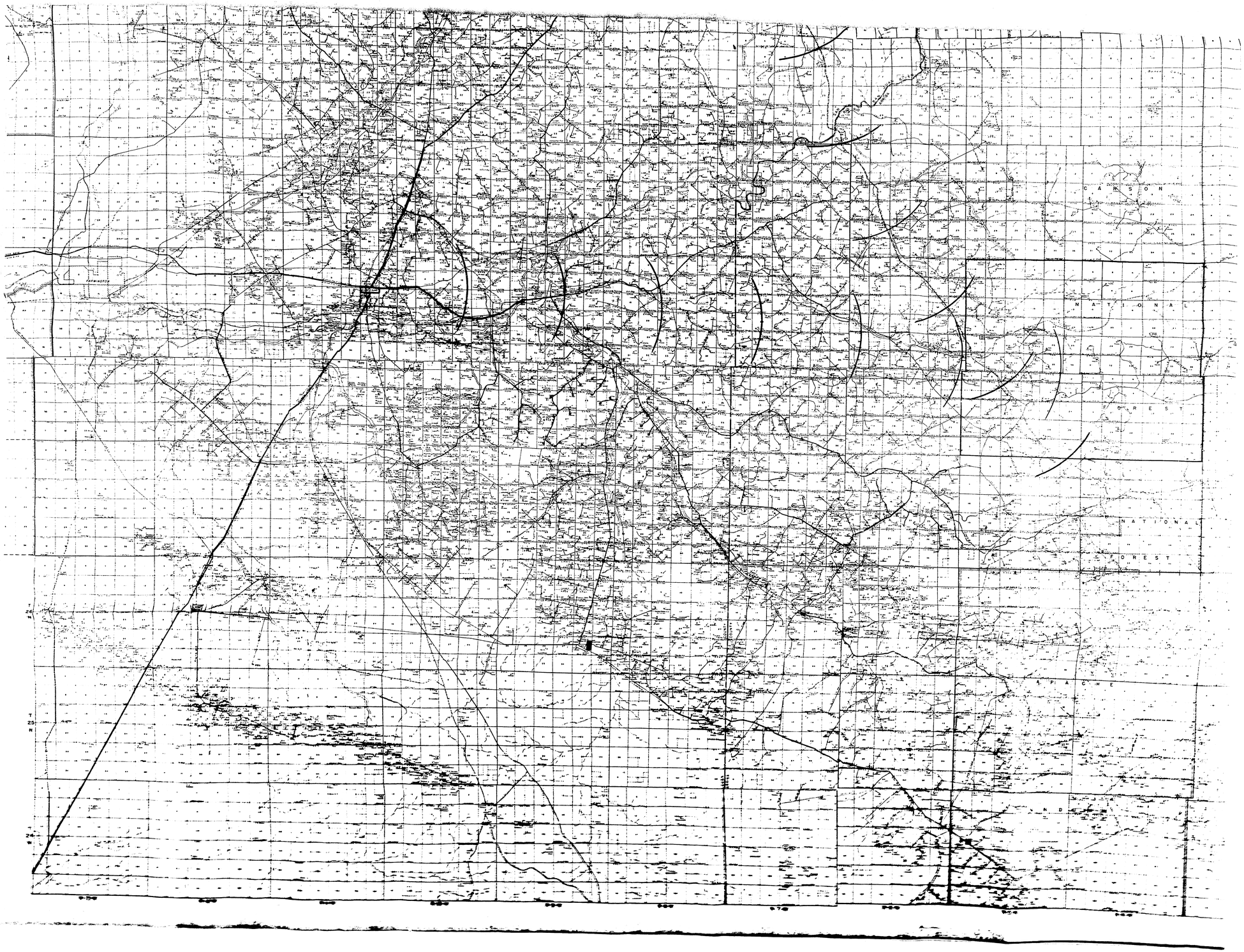
212


R-13-W
R-12-W
R-11-W
R-10-W
R-9-W
R-8-W
R-7-W
R-6-W
R-5-W
R-4-W
R-3-W
R-2-W
INDIAN RESERVATION
SOUTHERN UTE
INDIAN RESERVATION
CARSON
CARLLA
APACHE
NATIONAL

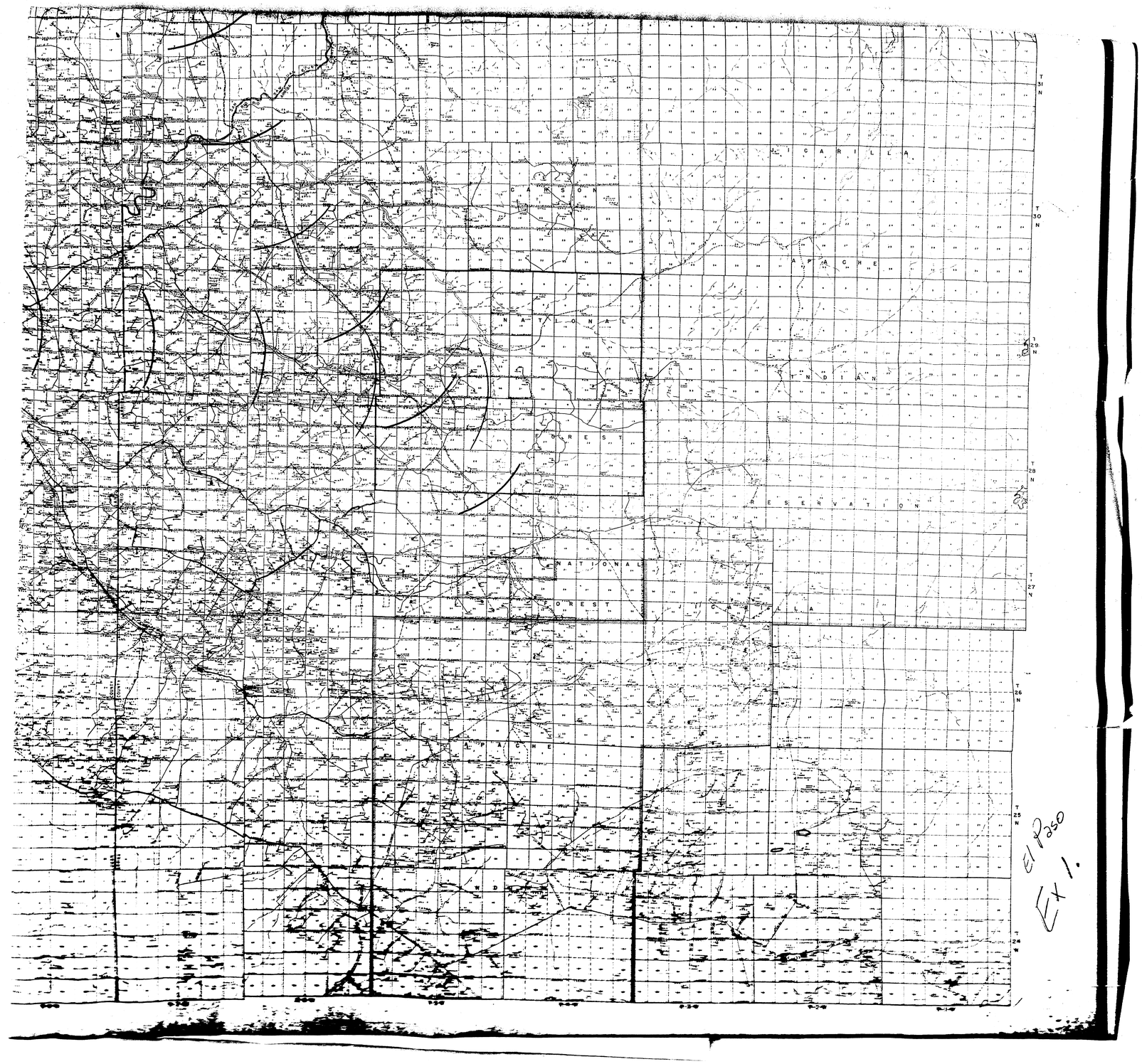
213


SOUTHERN UTE INDIAN RESERVATION
NATIONAL FOREST
CARSON NATIONAL FOREST
JICARILLA APACHE INDIAN RESERVATION
R-7-W
R-6-W
R-5-W
R-4-W
R-3-W
R-2-W
R-1-W
T 33 N
T 32 N
T 31 N
T 30 N
T 29 N
T 28 N
T 27 N

214


FARMINGTON
CARSON
NATIONAL
FOREST
APACHE
NATIONAL
FOREST
T
25
N

215

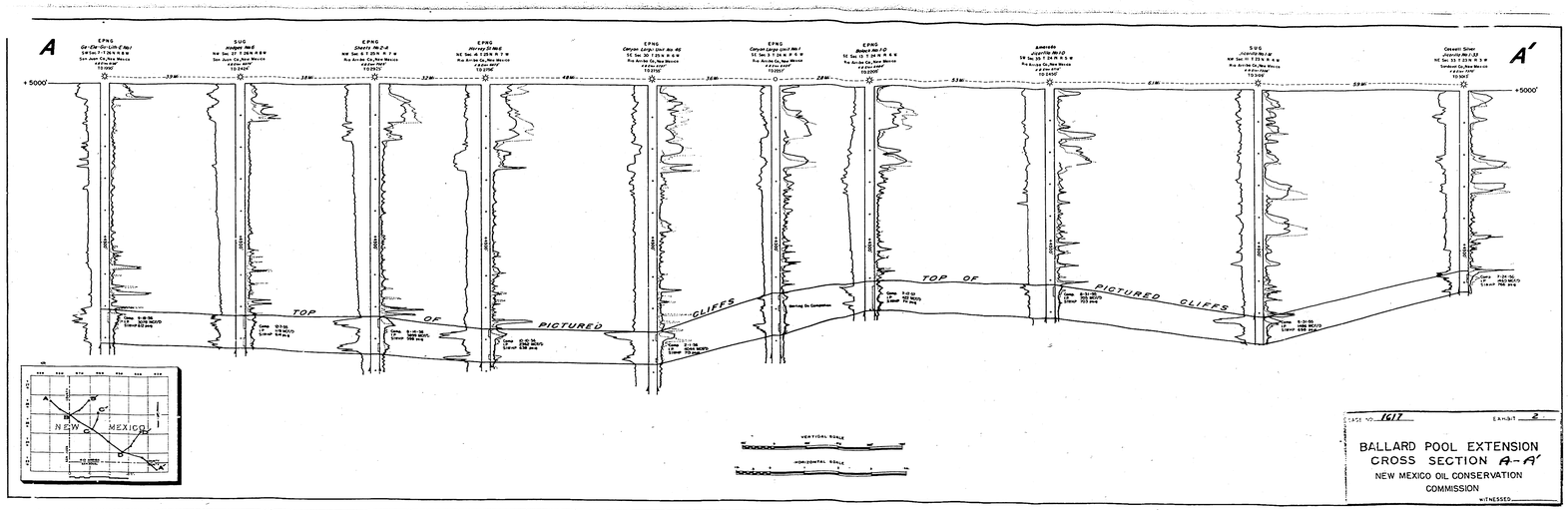


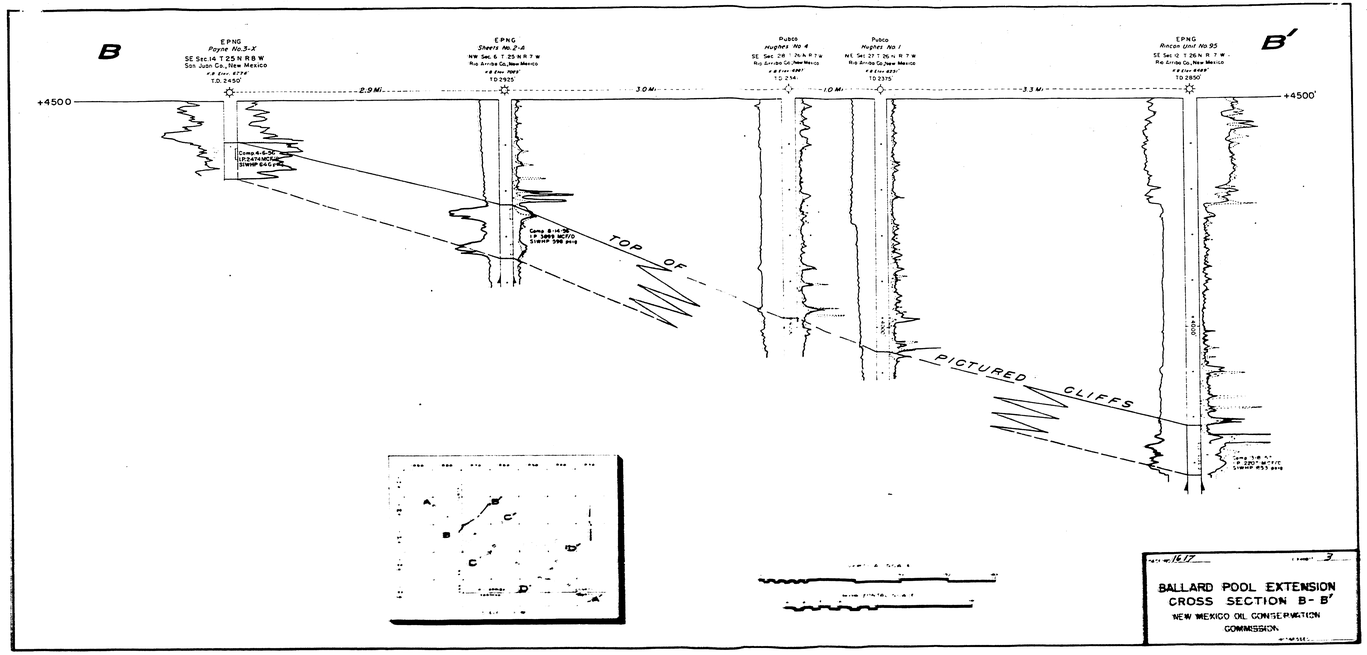
216

El Paso
Ex 1.

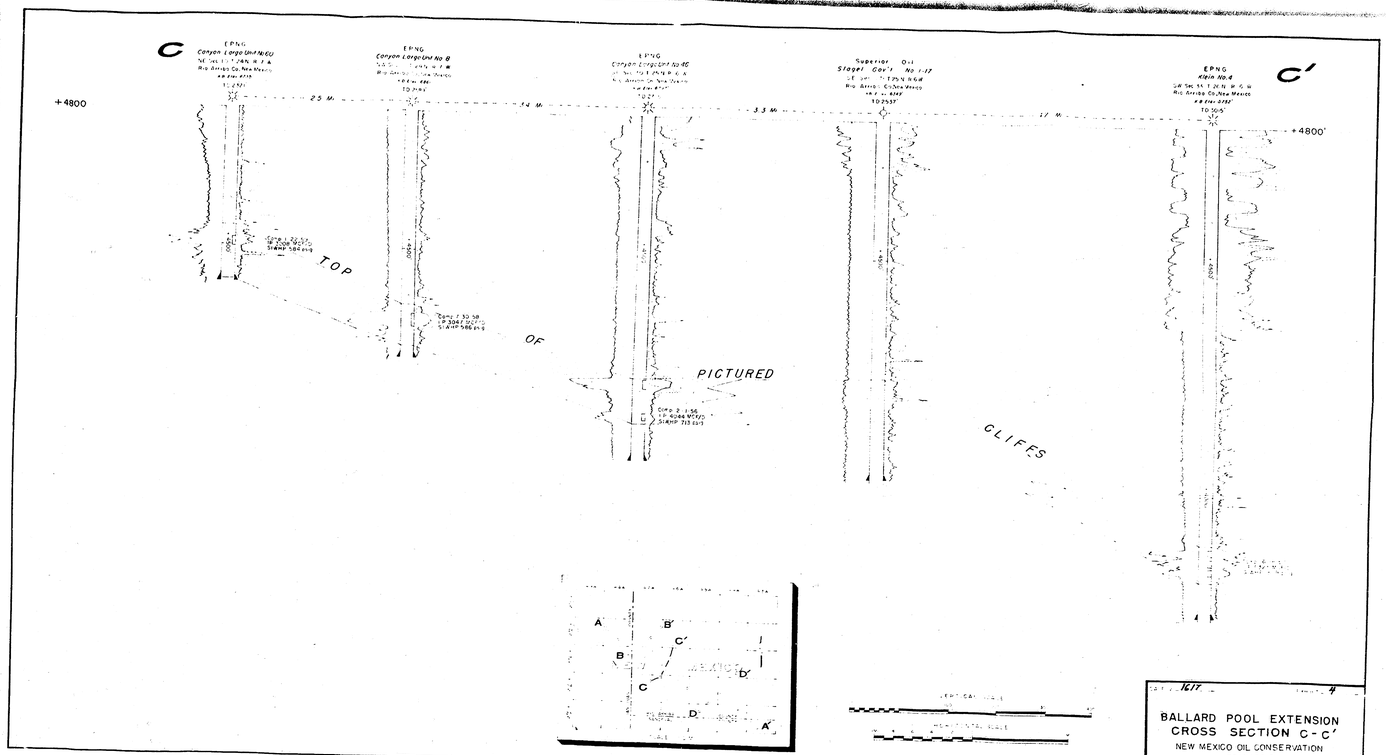
R 5 W
R 4 W
F O R E S T
C A R S O N
N A T I O N A L
T 29 N
T 28 N
GOBERNADOR
GOBERNADOR CAMP
F-5
F-7
F-9
EXHIBIT No 2A
NMOCC CASE No 1600
Township Units 29-4, 29-5, 28-4, 28-5
Well Code
Mesa verde zone test
Mesa verde zone completed
Mesa verde plugged and abandoned
Mesa verde temporarily abandoned
PNW
ENG
Temporary line - PNW

217

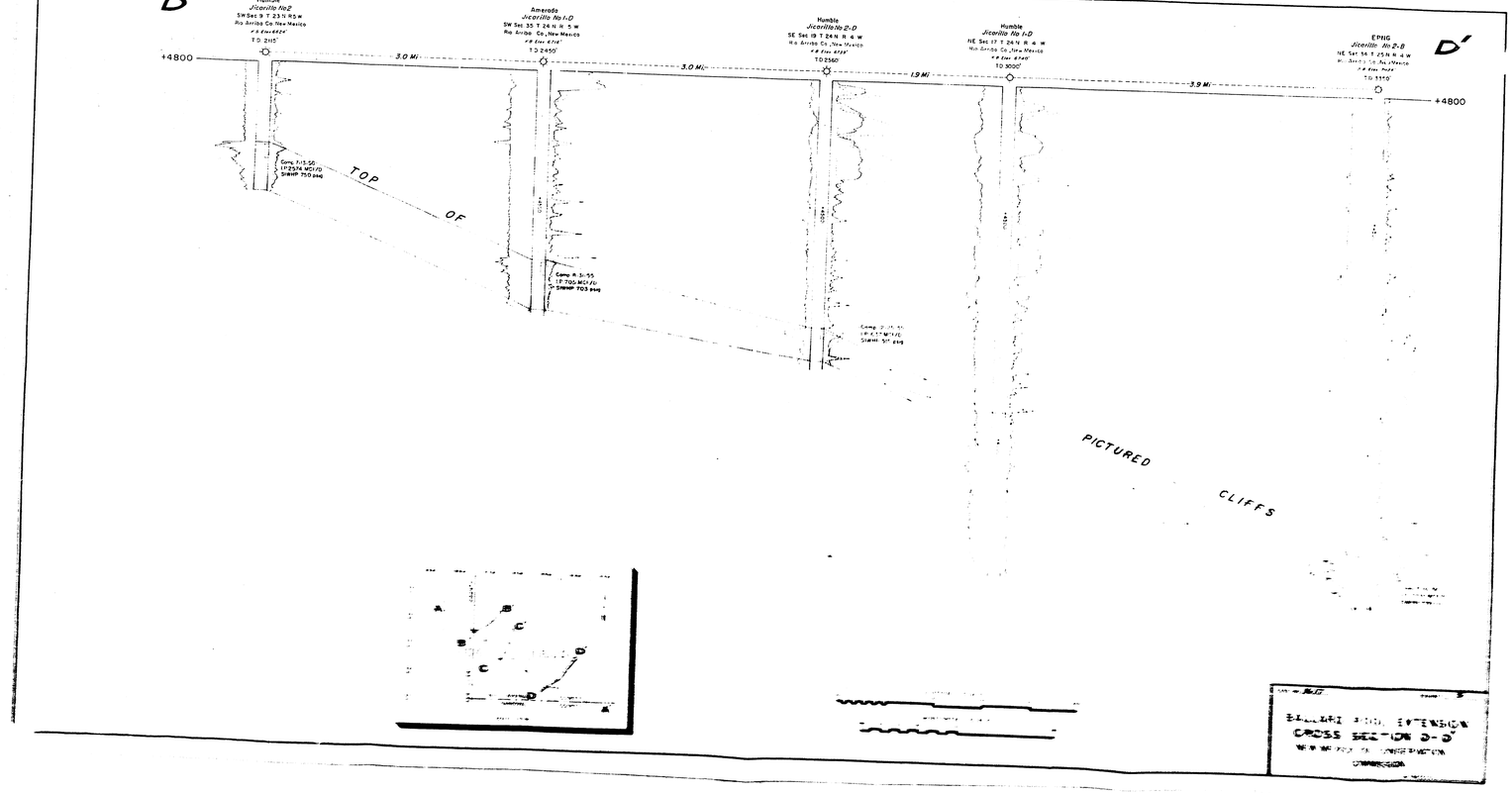

A
A'
+5000'
TOP OF PICTURED CLIFFS
NEW MEXICO
VERTICAL SCALE
HORIZONTAL SCALE
CASE NO. 1617
EXHIBIT 2
BALLARD POOL EXTENSION
CROSS SECTION A-A'
NEW MEXICO OIL CONSERVATION COMMISSION
WITNESSED


B
B'
+4500'
TOP OF PICTURED CLIFFS
CASE NO. 1617
EXHIBIT 3
BALLARD POOL EXTENSION
CROSS SECTION B-B'
NEW MEXICO OIL CONSERVATION COMMISSION

218

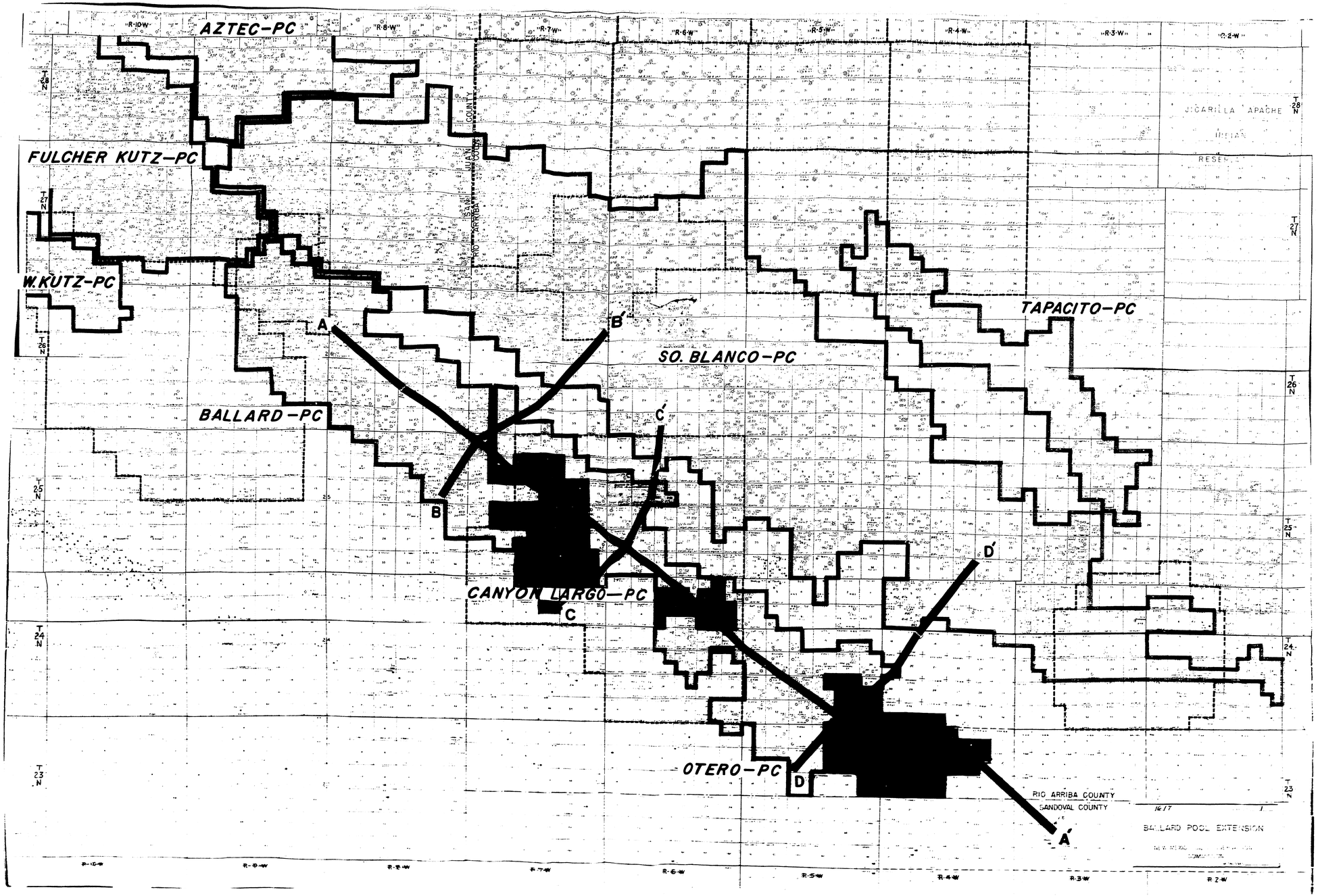


BALLARD POOL EXTENSION
CROSS SECTION C-C'
NEW MEXICO OIL CONSERVATION COMMISSION

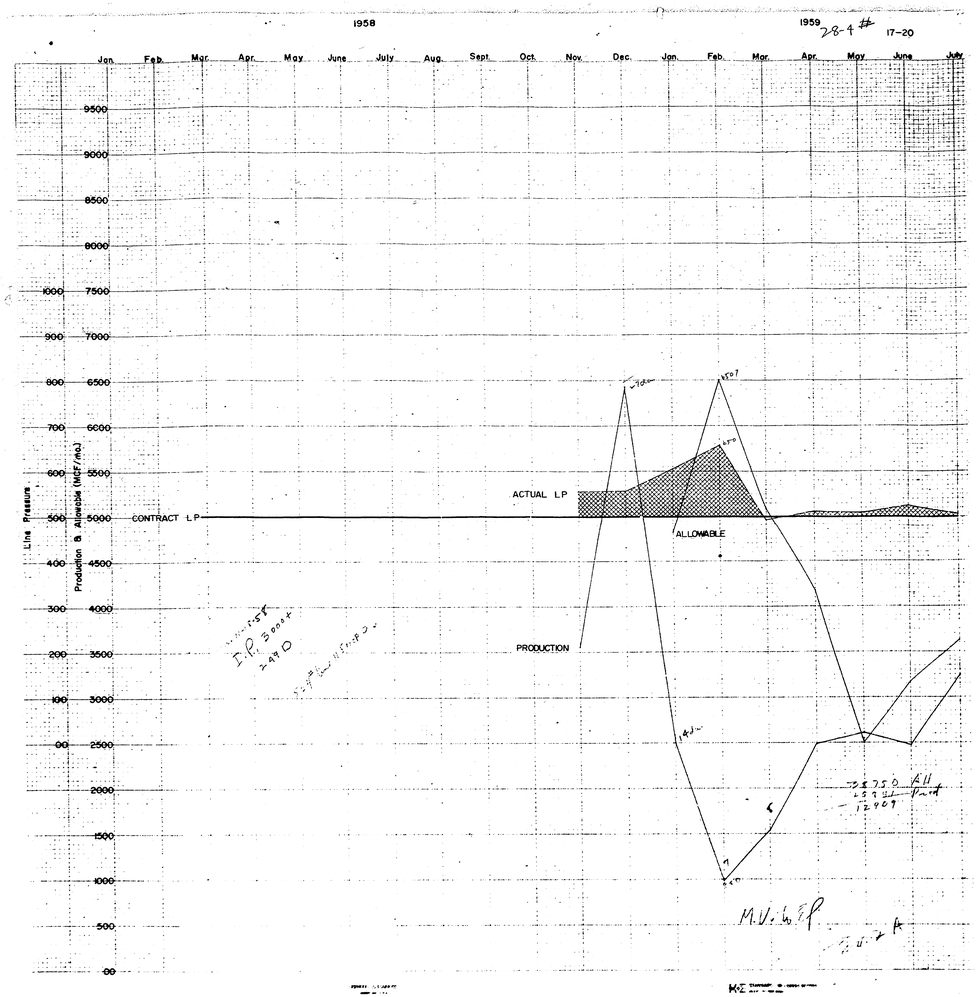


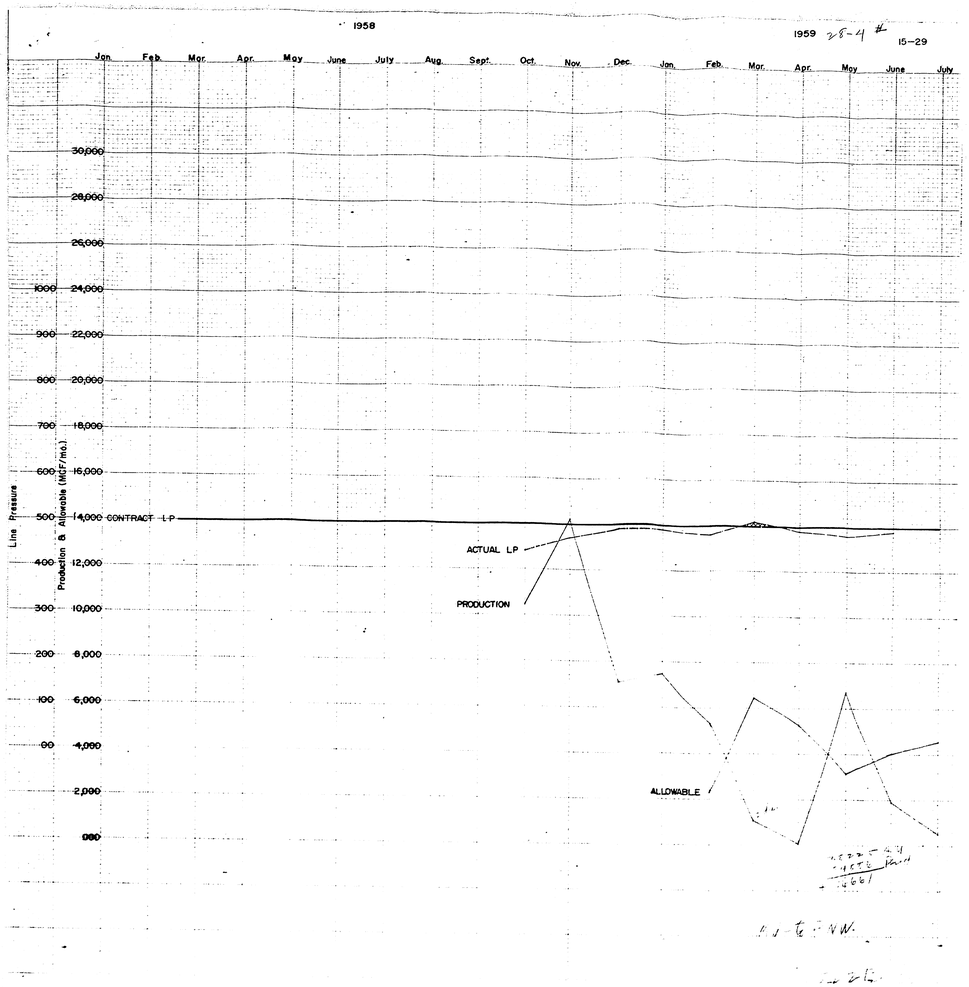
BALLARD POOL EXTENSION
CROSS SECTION D-D'

219

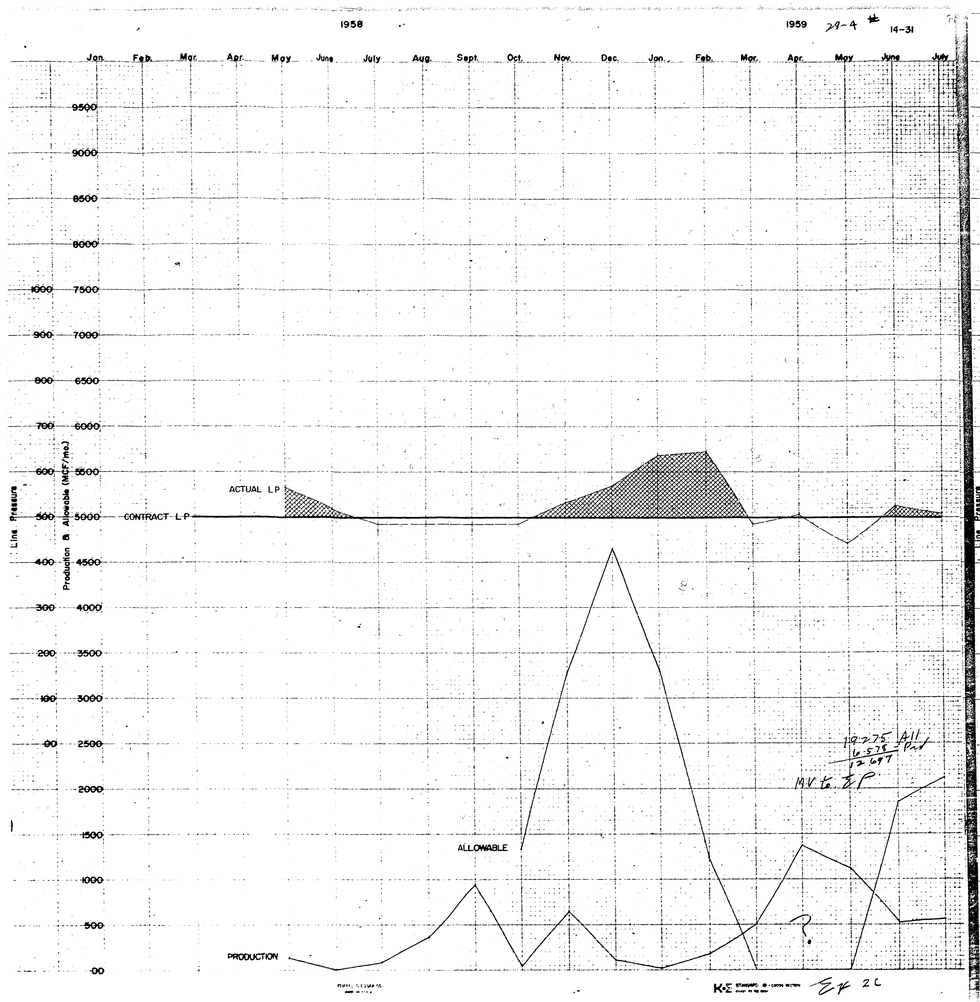

AZTEC-PC
FULCHER KUTZ-PC
W. KUTZ-PC
BALLARD-PC
CANYON LARGO-PC
OTERO-PC
SO. BLANCO-PC
TAPACITO-PC
A
A'
B
B'
C
C'
D
D'
SAN JUAN COUNTY
RIO ARRIBA COUNTY
SANDOVAL COUNTY
JICARILLA APACHE INDIAN RESERVATION
BALLARD POOL EXTENSION
R-10-W
R-9-W
R-8-W
R-7-W
R-6-W
R-5-W
R-4-W
R-3-W
R-2-W
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N

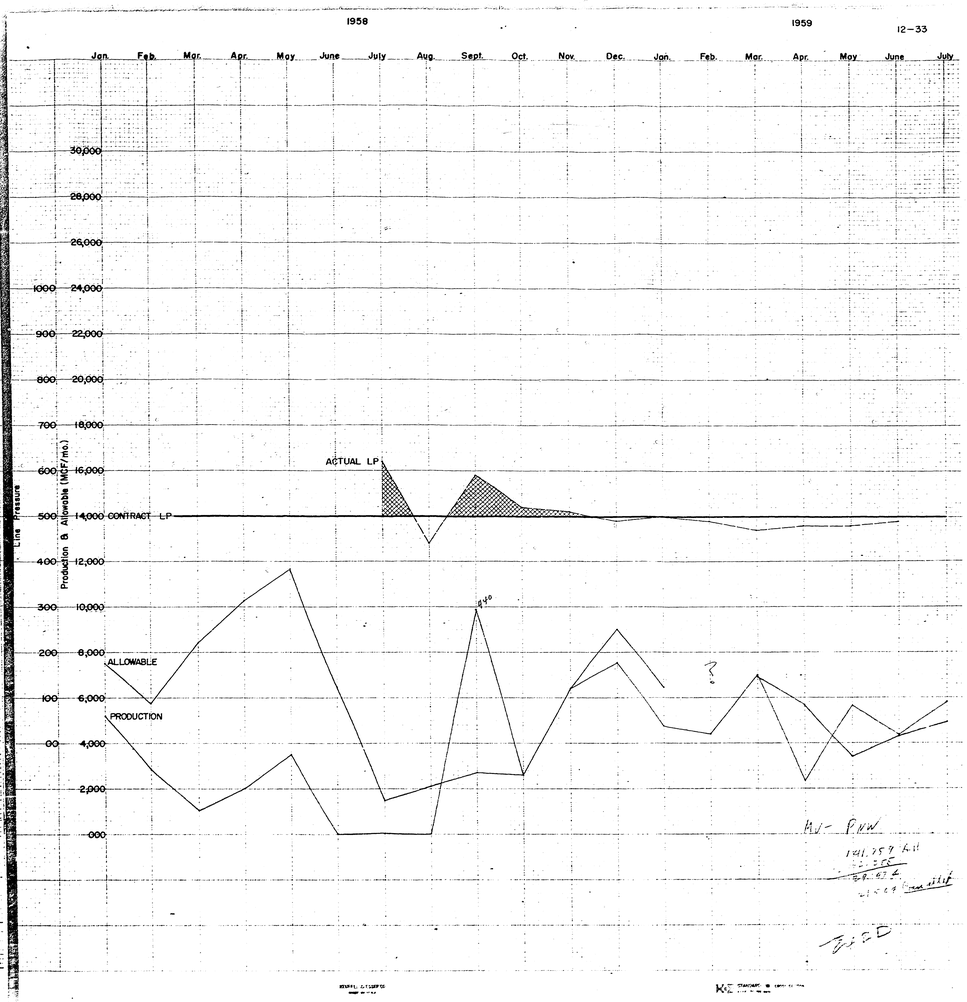
220


1958
1959
28-4 #
17-20
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (Mcf/mo.)
CONTRACT L.P
ACTUAL L.P
ALLOWABLE
PRODUCTION

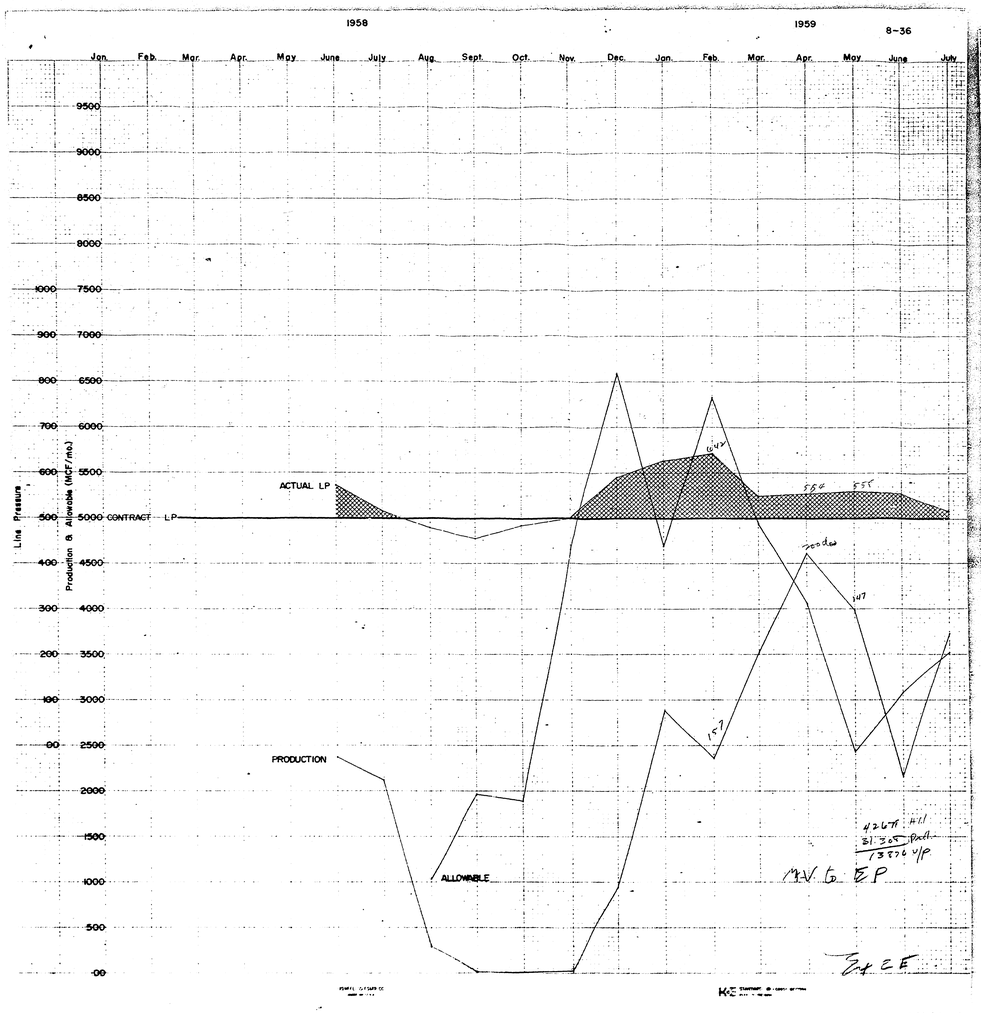

1958
1959
28-4 #
15-29
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (Mcf/mo.)
CONTRACT L.P
ACTUAL L.P
ALLOWABLE
PRODUCTION

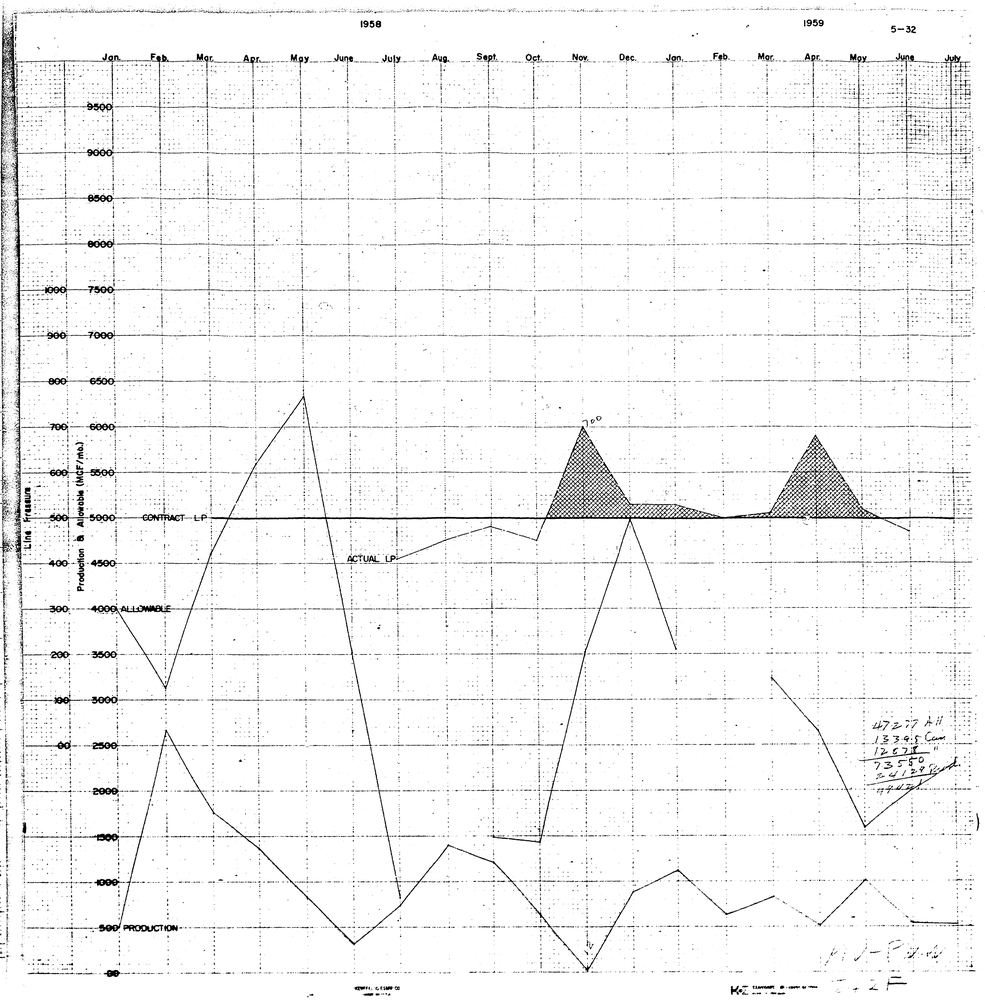
221


1958
1959
14-31
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
700
600
500
400
300
200
100
900
800
1000
ACTUAL LP
CONTRACT LP
ALLOWABLE
PRODUCTION
KE STANDARD

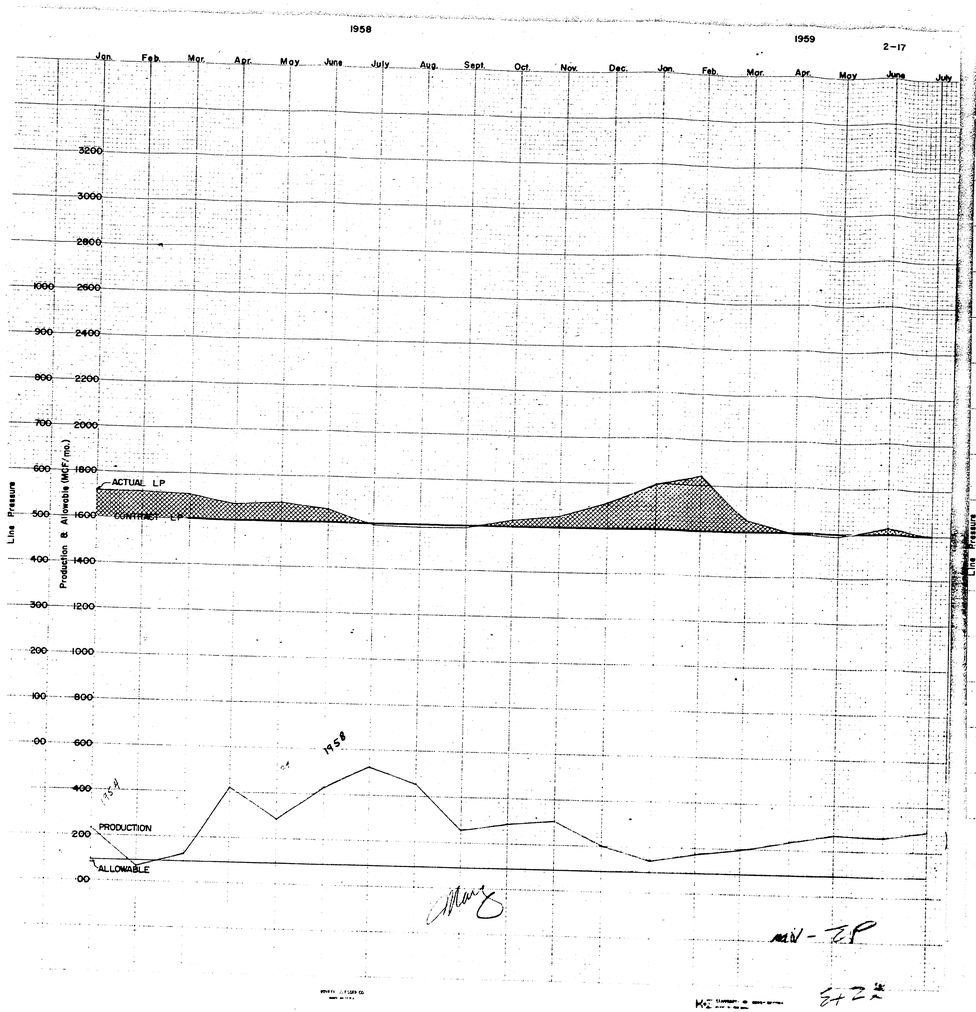

1958
1959
12-33
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
700
600
500
400
300
200
100
900
800
1000
ACTUAL LP
CONTRACT LP
ALLOWABLE
PRODUCTION
KE STANDARD

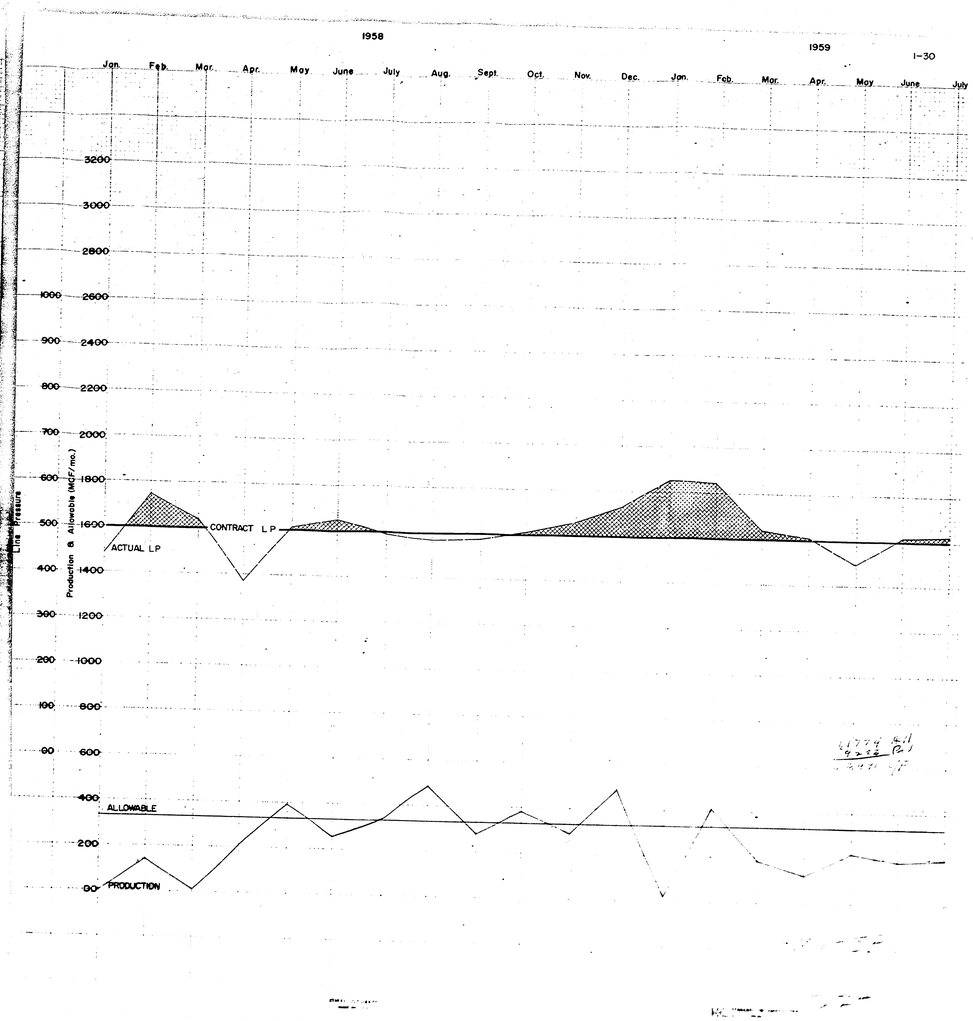
222


1958
1959
8-36
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
1000
900
800
700
600
500
400
300
200
100
90
CONTRACT LP
ACTUAL LP
PRODUCTION
ALLOWABLE
1642
550
555
700 dec
147
167
42677 Hll
31305 Prod.
13372 W/P
MV & EP
Ent EE

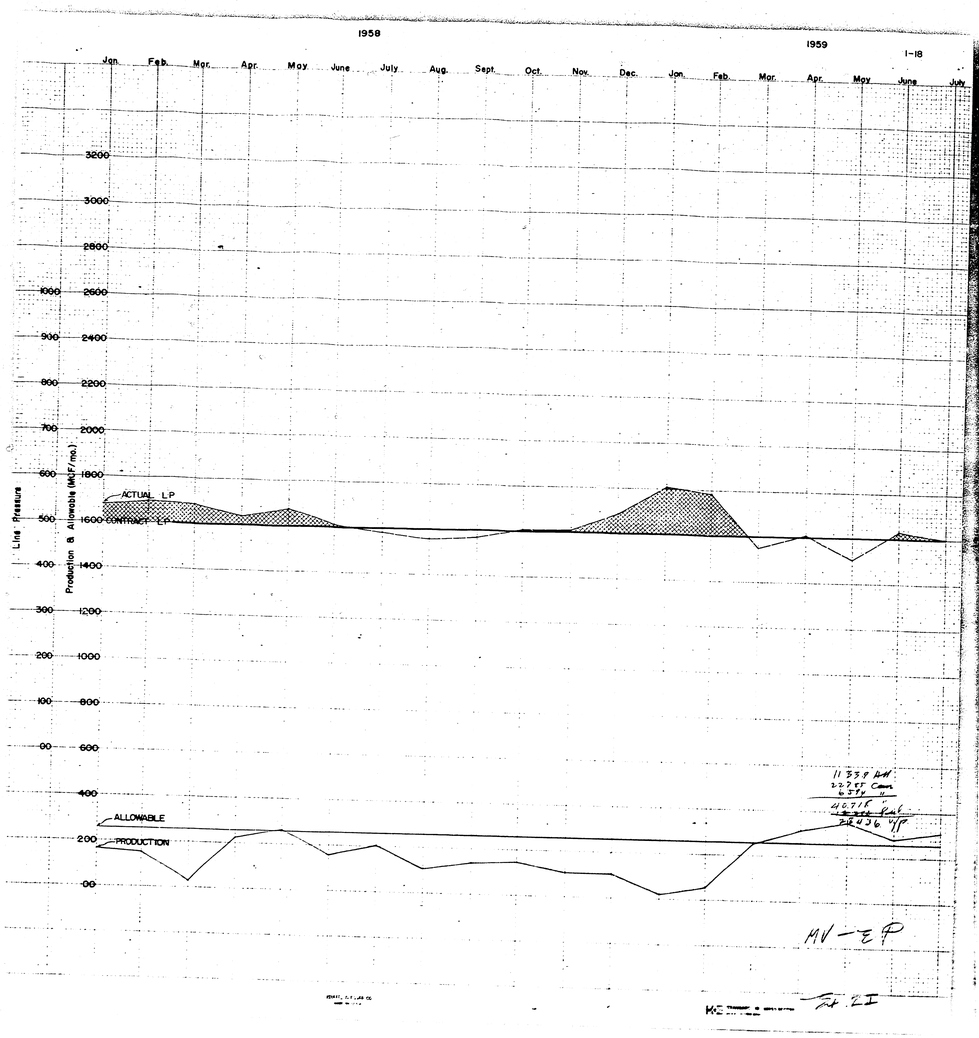

1958
1959
5-32
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
00
1000
900
800
700
600
500
400
300
200
100
90
CONTRACT LP
ACTUAL LP
ALLOWABLE
PRODUCTION
700
47277 Hll
13345 Comm
12678 "
7355
2-41-29 Prod.
47277
MV-P W/O
T-2-F

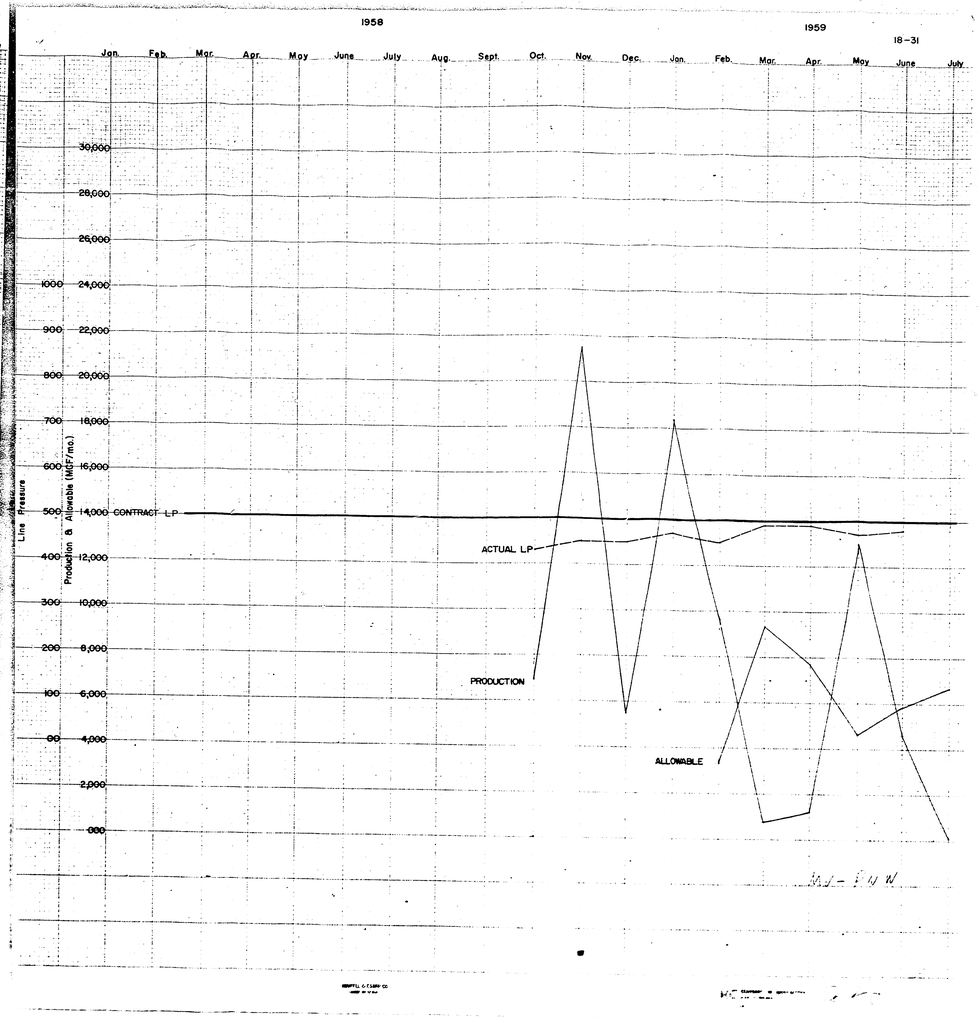
223


1958
1959
2-17
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL L.P
CONTRACT L.P
PRODUCTION
ALLOWABLE
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200

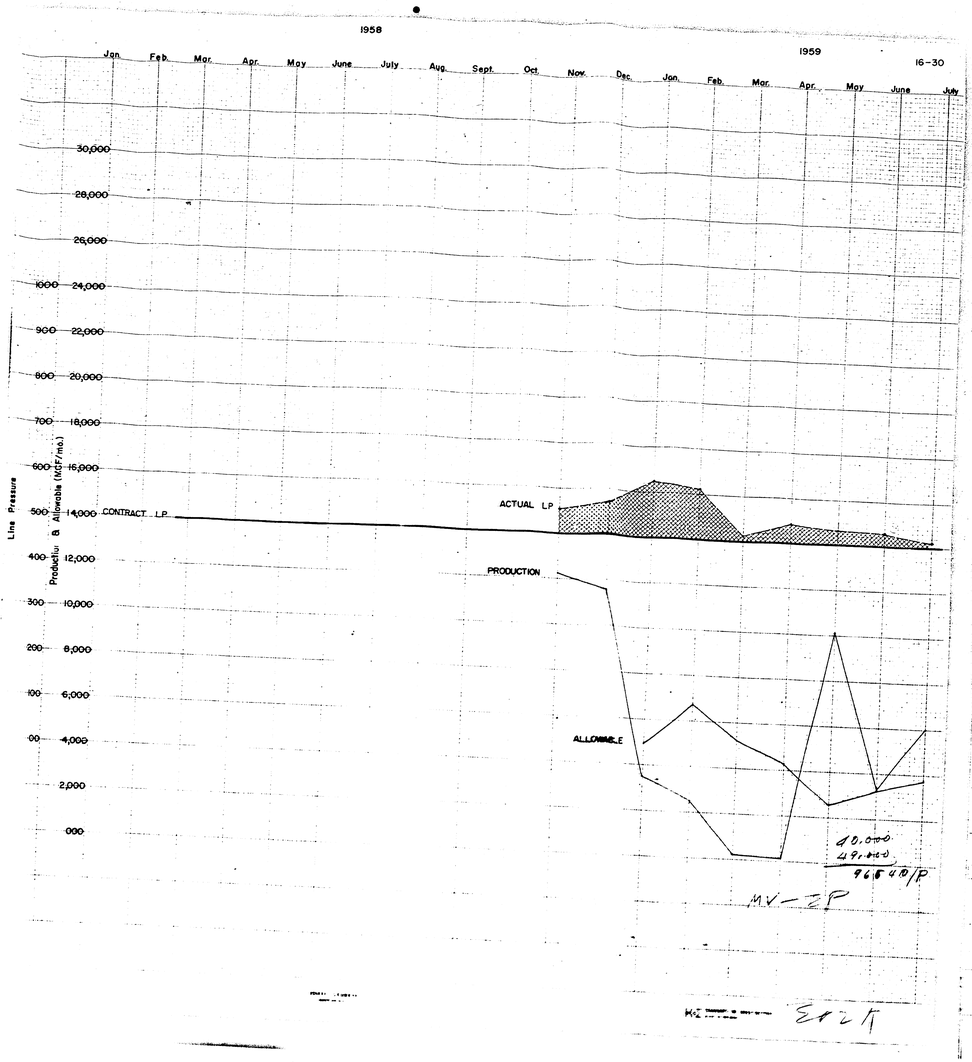

1958
1959
1-30
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL L.P
CONTRACT L.P
ALLOWABLE
PRODUCTION
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200

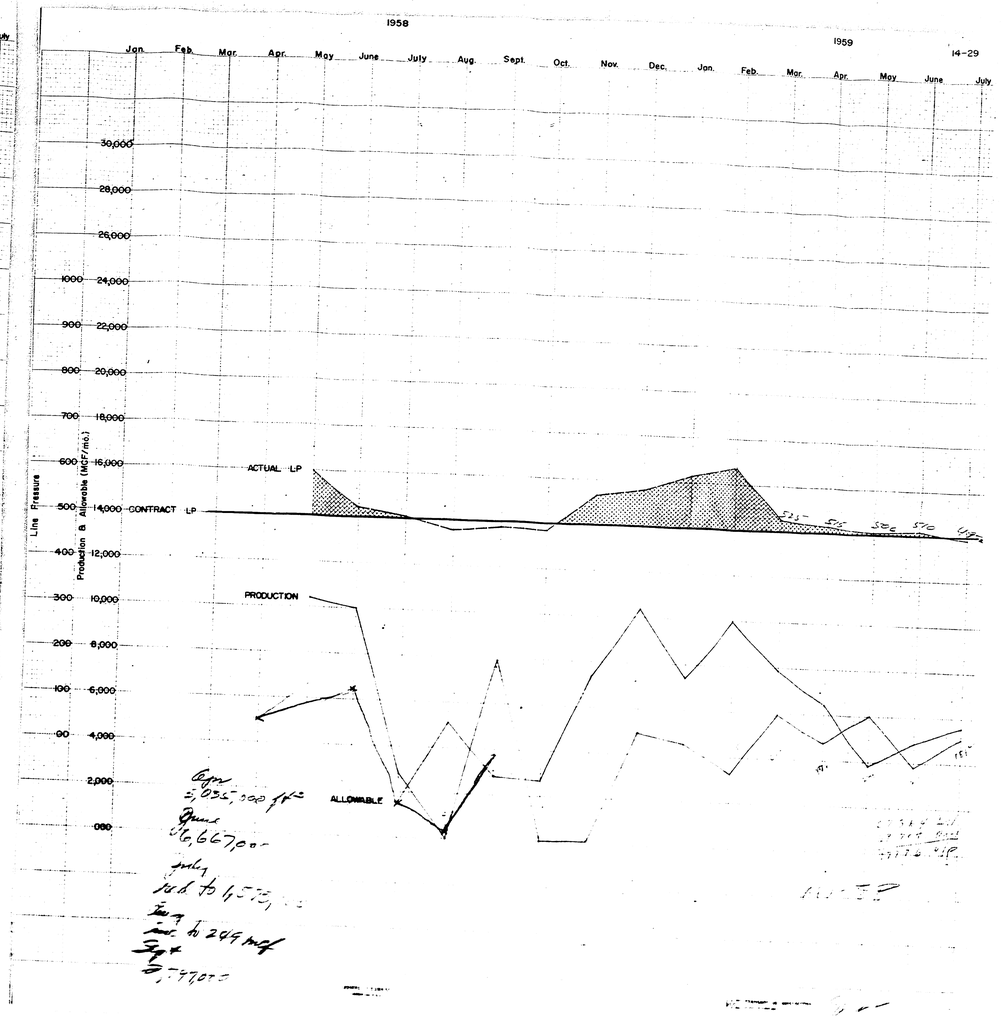
224


1958
1959
1-18
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (Mcf/mo.)
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
1000
900
800
700
600
500
400
300
200
100
00
ACTUAL L.P.
CONTRACT L.P.
ALLOWABLE
PRODUCTION
11338 MM
22,955 Comm
6,374 "
40718 "
3446 Pool
24436 W/P
MV-EP

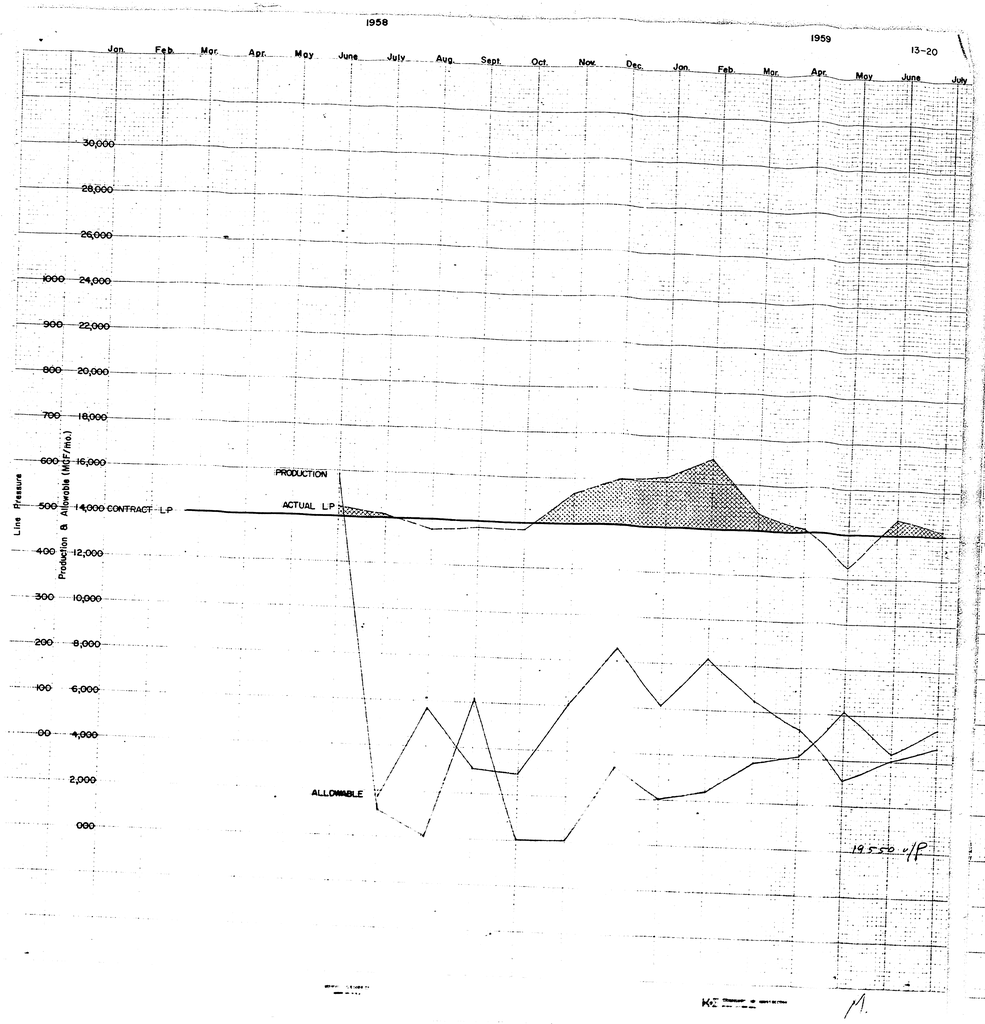

1958
1959
18-31
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
Line Pressure
Production & Allowable (Mcf/mo.)
30,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
000
1000
900
800
700
600
500
400
300
200
100
00
CONTRACT L.P.
ACTUAL L.P.
PRODUCTION
ALLOWABLE
MV-PNW

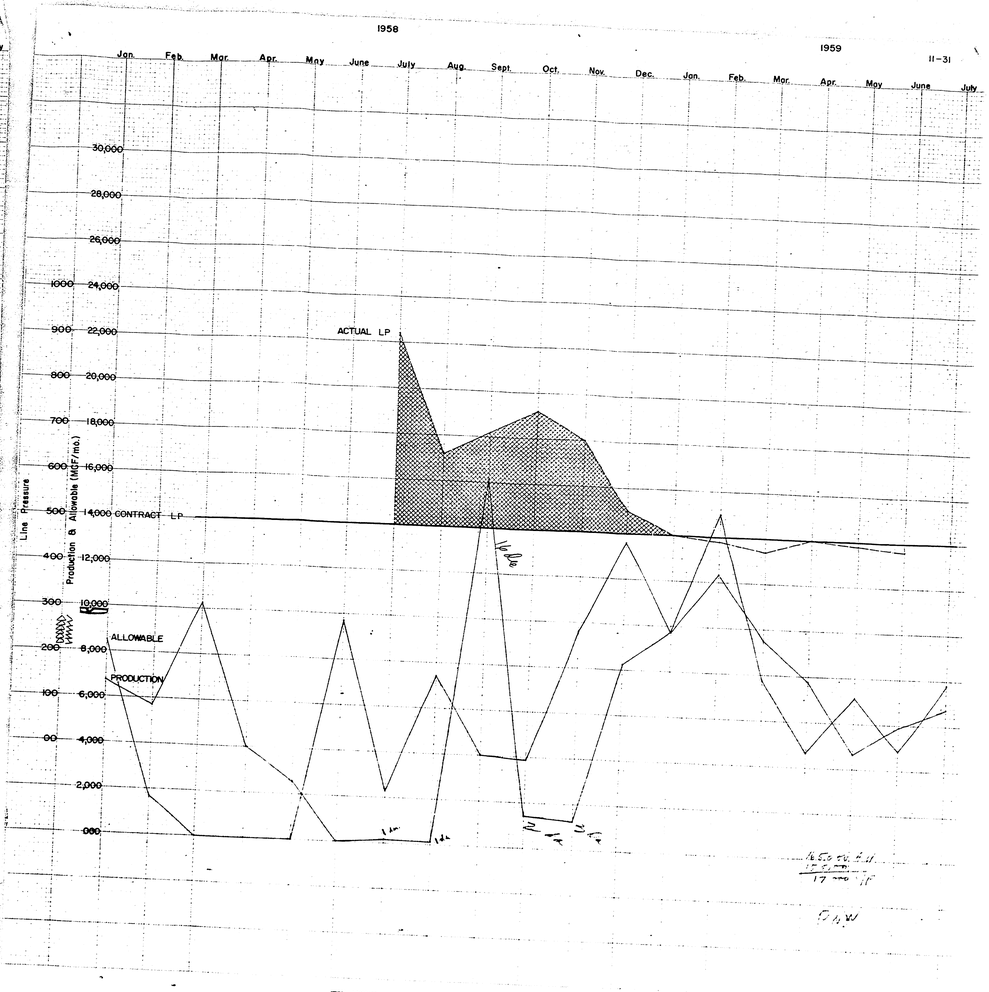
225


1958
1959
16-30
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000 CONTRACT L.P.
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL L.P.
PRODUCTION
ALLOWABLE
40,000
49,040
96840/P
M.V.—ZP

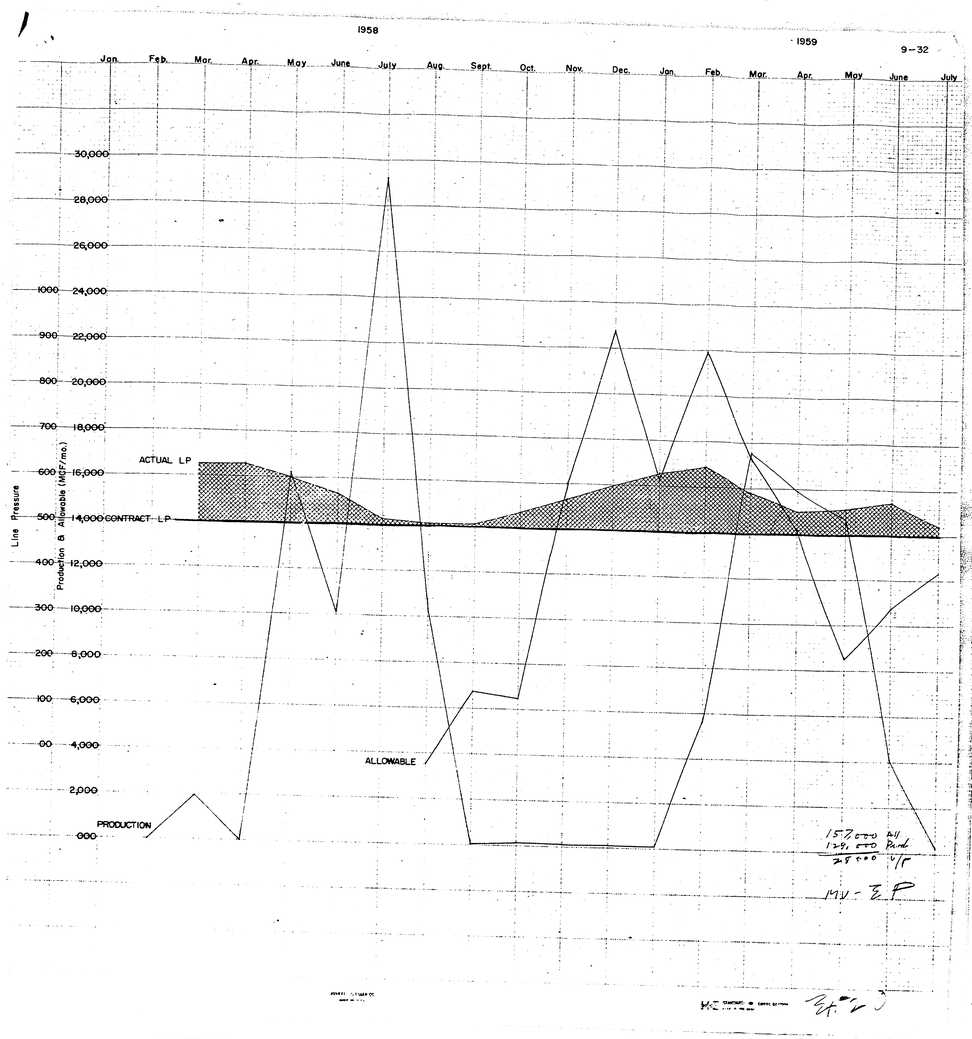

1958
1959
14-29
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000 CONTRACT L.P.
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL L.P.
PRODUCTION
ALLOWABLE
Capac
5,035,200 gpd
Gross
16,667,00
Gathering
Tot to 1,575,
Tbg
Line to 245 psig
Sep
5,477,07
A.V.—ZP

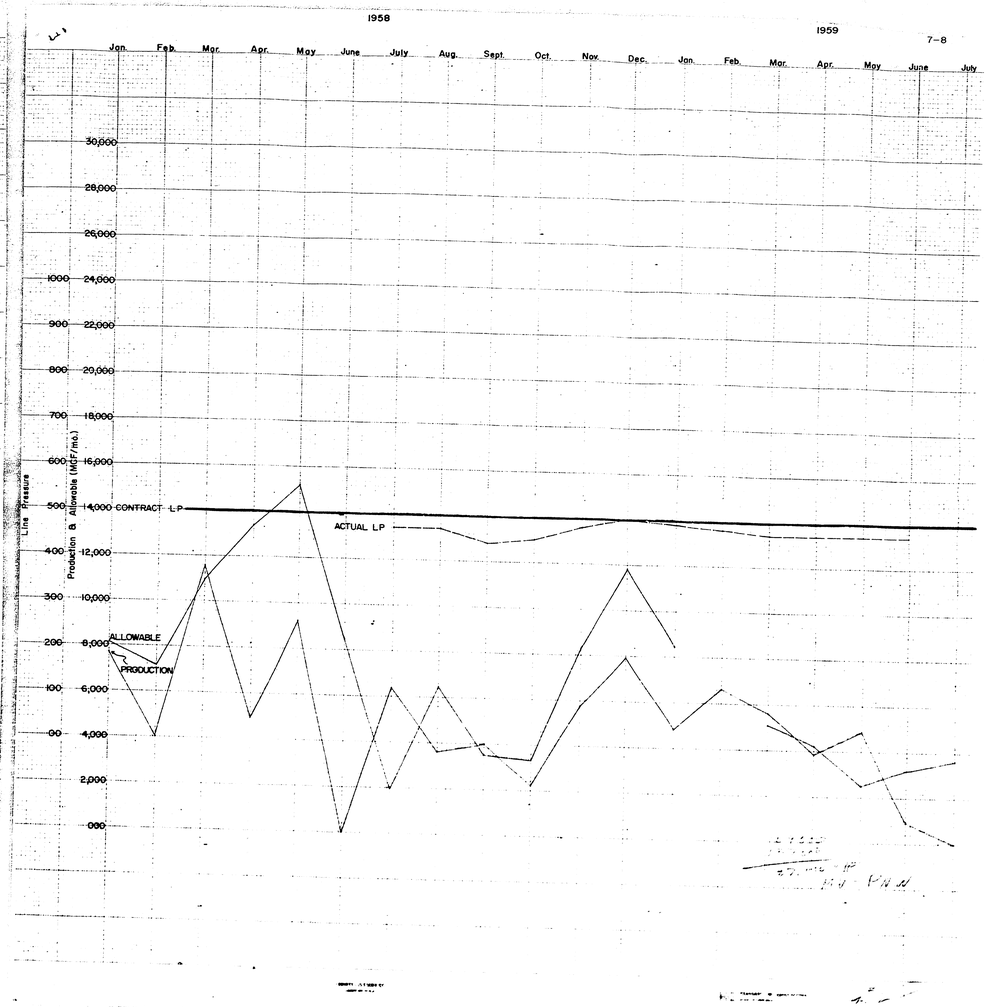
226


1958
1959
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
13-20
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000 CONTRACT LP
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
Line Pressure
Production & Allowable (Mcf/mo.)
PRODUCTION
ACTUAL LP
ALLOWABLE
1955 4P


1958
1959
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
11-31
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000 CONTRACT LP
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
Line Pressure
Production & Allowable (Mcf/mo.)
ACTUAL LP
ALLOWABLE
PRODUCTION

227


1958
1959
9-32
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
Line Pressure
Production & Allowable (MCF/mo.)
ACTUAL LP
CONTRACT LP
ALLOWABLE
PRODUCTION


1958
1959
7-8
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July
30,000
28,000
26,000
1000 24,000
900 22,000
800 20,000
700 18,000
600 16,000
500 14,000
400 12,000
300 10,000
200 8,000
100 6,000
00 4,000
2,000
000
Line Pressure
Production & Allowable (MCF/mo.)
CONTRACT LP
ACTUAL LP
ALLOWABLE
PRODUCTION

228

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Induction-Electrical Log

COMPANY SUNSET INTERNATIONAL PETROLEUM CORPORATION
WELL KUTZ FEDERAL #1-A
FIELD UNDESIGNATED
LOCATION SEC. 32-28N-10W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Surveys: SL ML

Location of Well: 1773' FR S/L, 1842' FR W/L, SEC. 32-28N-10W

Elevation: D.F. 5040', K.B. 5051', or G.L. 5039'

FILING No.

RUN No.	ONE	TWO
Date	12-4-58	12-22-58
First Reading	4463	6500
Last Reading	244	4467
Feet Measured	4219	2123
Csg. Schlum.	244	4472
Csg. Driller	245	4465
Depth Reached	4469	6596
Bottom Driller	4460	6600
Depth Datum	KB	KB
Mud Mat.	GEL DIL	GEL
Dens. | Visc.	10.2 | 80	8.8 | 155
Mud Resist.	3.1@64 °F	2.1@ 68 °F
" Res. BHT	1.2@115 °F	1.0@140 °F
Rmf	1.4@115 °F	0.7@140 °F
" Rmc	-- @ °F	-- @ °F
" pH	8.5@ °F	7 @ °F
" Wtr. Loss	9.8CC 30 min.	3.2CC 30 min.
Bit Size	9 7/8"	6 3/4"
Spcgs.—AM	16"	16"
MN		
IND.	40"	40"
Opr. Rig Time	11 HRS	15 HRS
Truck No.	2515FA8H	2515FA8M
Recorded By	JULIUS	JULIUS
Witness	POPP	GASCH

REMARKS: CO. SUNSET INTERNATIONAL PETROLEUM CORPORATION WELL KUTZ FEDERAL #1-A FIELD UNDESIGNATED LOCATION SEC. 32-28N-10W COUNTY SAN JUAN STATE NEW MEXICO

Cartridge No. IDC-C-155
Panel No. IDP-B-1-EA
Serial No. ID-C-1-EA

CONDUCTIVITY millimhos/m — 1000/ohms m²/m
INDUCTION 0 200 400 600 400

RESISTIVITY — ohms. m²/m
16" NORMAL 0 100 1000
INDUCTION 0 100 1000

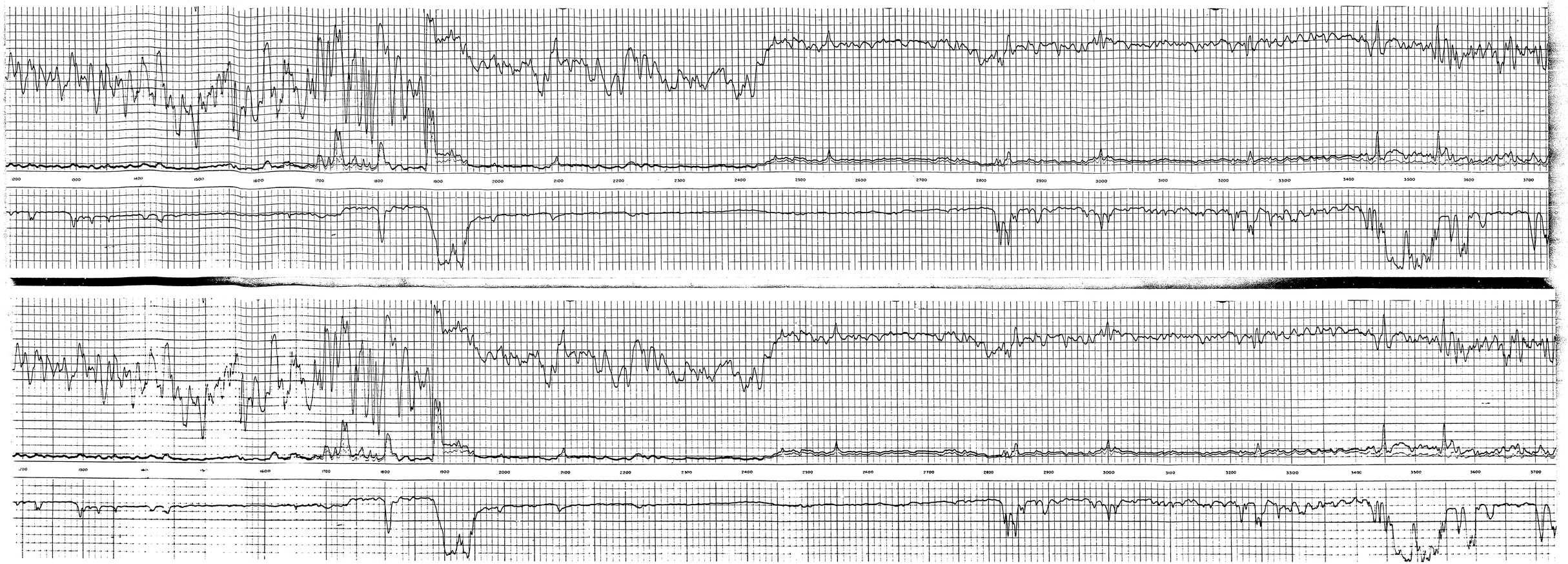
DEPTHS 2"=100'

SPONTANEOUS-POTENTIAL millivolts 10 0 +

0300 0400 0500 0600 0700 0800 0900 1000 100 1200 1300 1400 1500 1600 1700 1800

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS
Induction-Electrical Log
COMPANY SUNSET INTERNATIONAL PETROLEUM CORPORATION
WELL KUTZ FEDERAL #1-A
FIELD UNDESIGNATED
LOCATION SEC. 32-28N-10W
COUNTY SAN JUAN
STATE NEW MEXICO
Other Surveys: SL ML
Location of Well: 1773' FR S/L, 1842' FR W/L, SEC. 32-28N-10W
FILING No.
CONDUCTIVITY millimhos/m — 1000/ohms m²/m
RESISTIVITY — ohms. m²/m
DEPTHS
SPONTANEOUS-POTENTIAL millivolts
0300 0400 0500 0600 0700 0800 0900 1000 100 1200 1300 1400 1500 1600 1700 1800

229


1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700

3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
5100
5200
5300
5400
5500
5600
RUN 1
RUN 2

DETAIL LOG
5" = 100'

CONDUCTIVITY
millimhos/m
1000/ohms/m

INDUCTION
0
400
640

RESISTIVITY
ohms. m²/m

16" NORMAL
100
1000

INDUCTION
100
1000

SPONTANEOUS POTENTIAL
millivolts

10

RUN 1

5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600

1800 1900 2000

DETAIL LOG
5" = 100'

CONDUCTIVITY
millimhos/m
1000/ohms/m

INDUCTION
0
400
640

RESISTIVITY
ohms. m²/m

16" NORMAL
100
1000

INDUCTION
100
1000

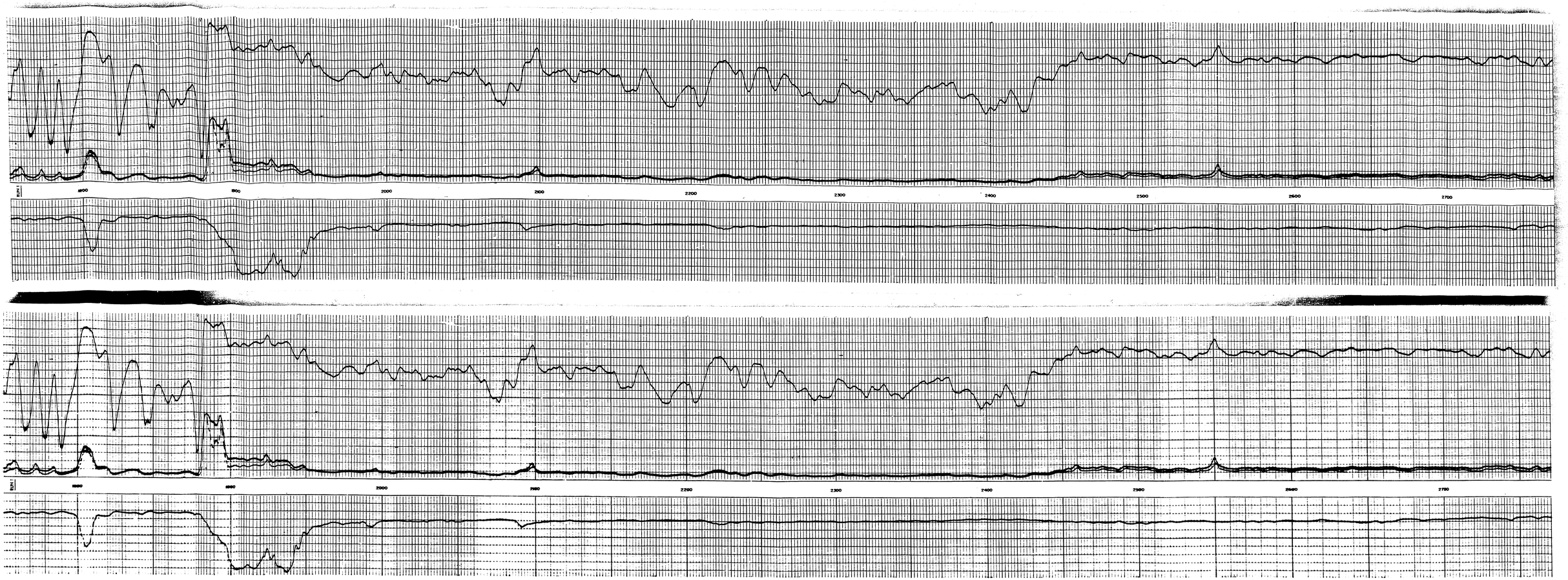
SPONTANEOUS POTENTIAL
millivolts

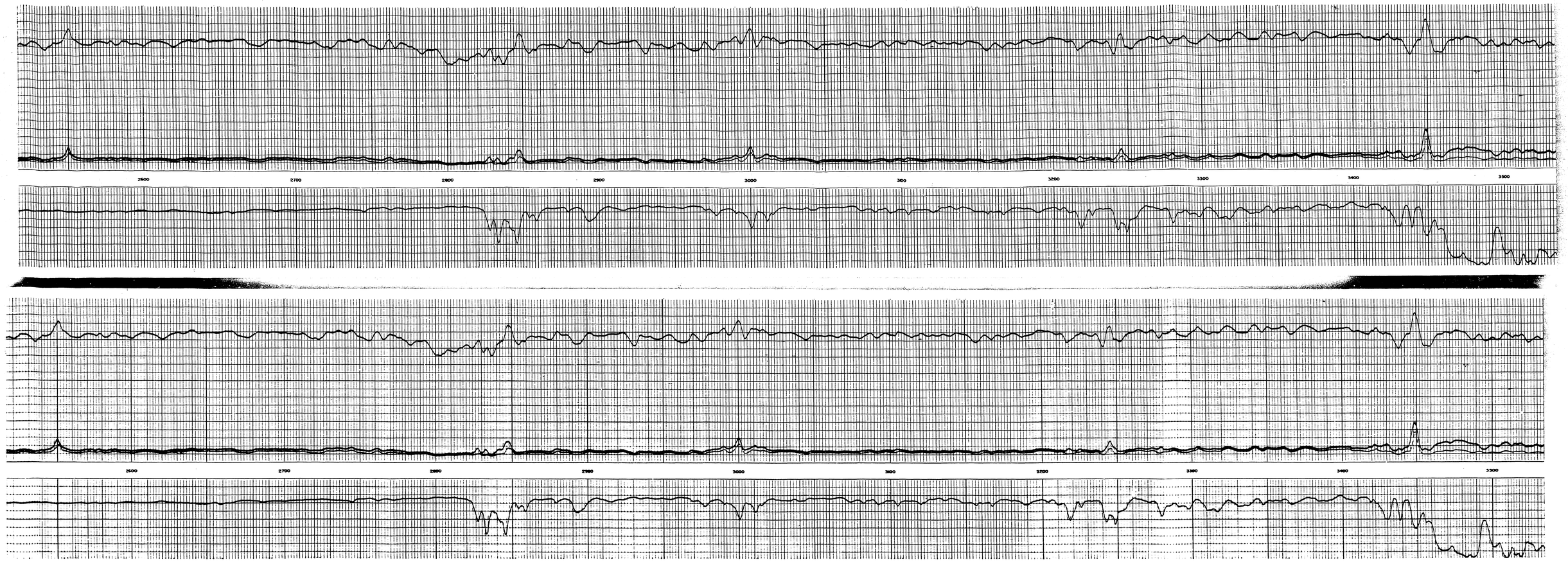
10

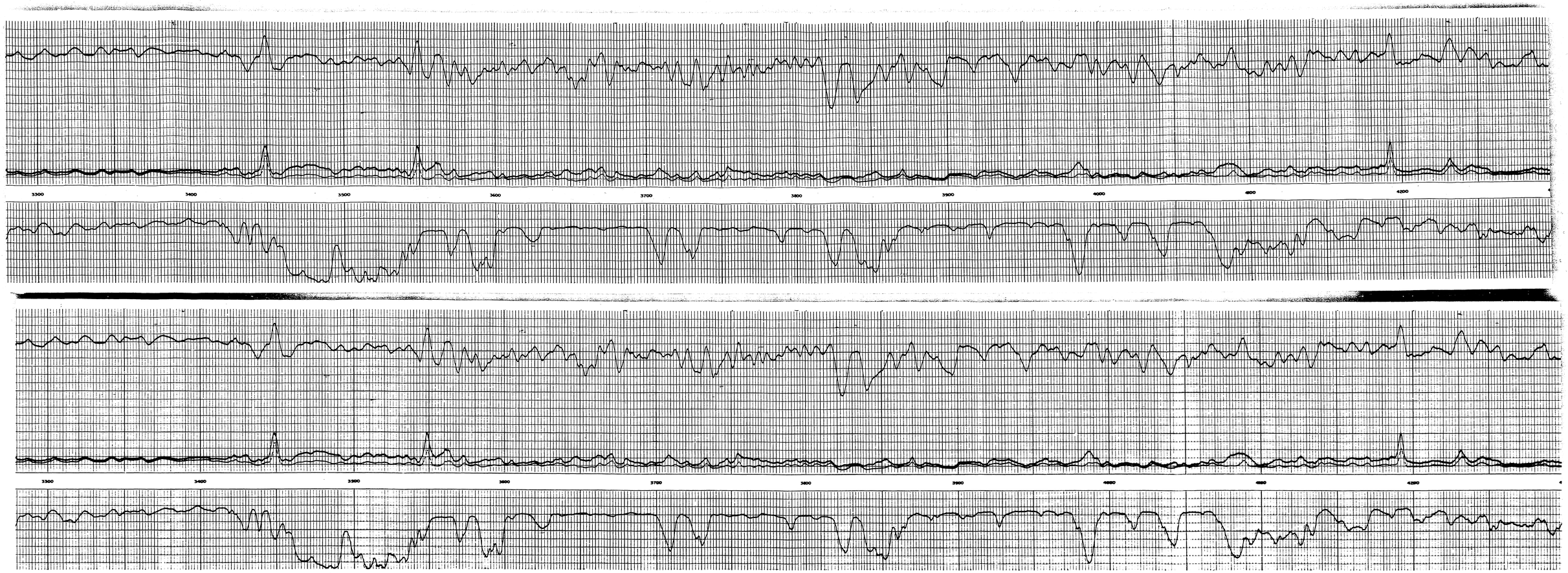
RUN 1

5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600

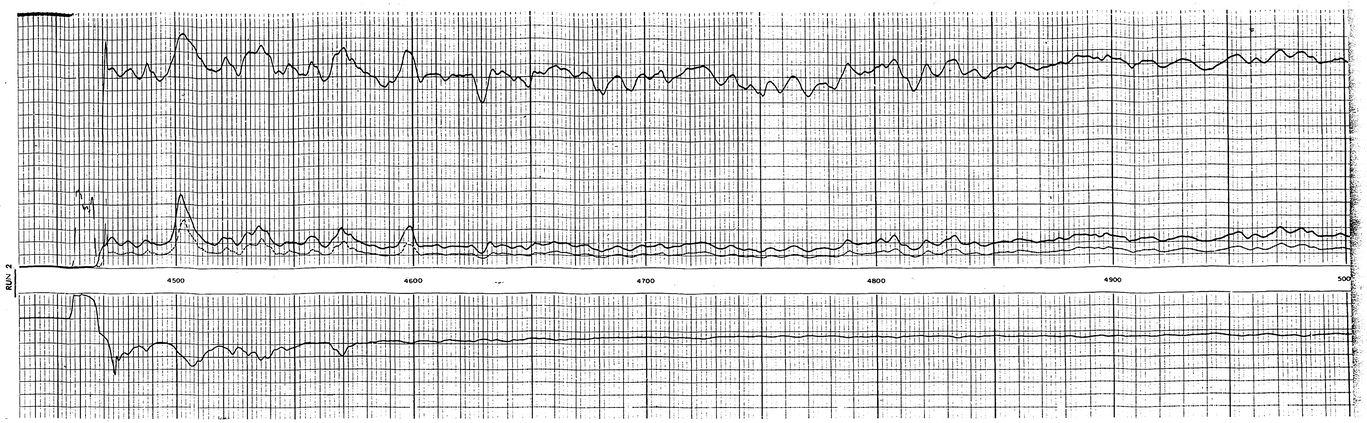
1800 1900 2000


1800
1900
2000
2100
2200
2300
2400
2500
2600
2700

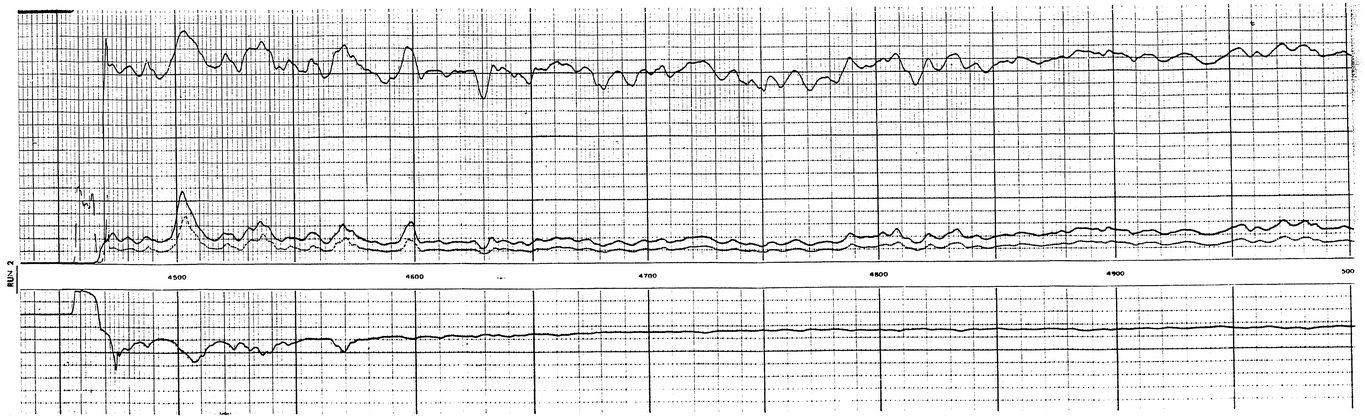

2600
2700
2800
2900
3000
300
3200
3300
3400
3500


3300
3400
3500
3600
3700
3800
3900
4000
4100
4200

4200
4300
4400


RUN 2
4500
4600
4700
4800
4900

4200
4300
4400

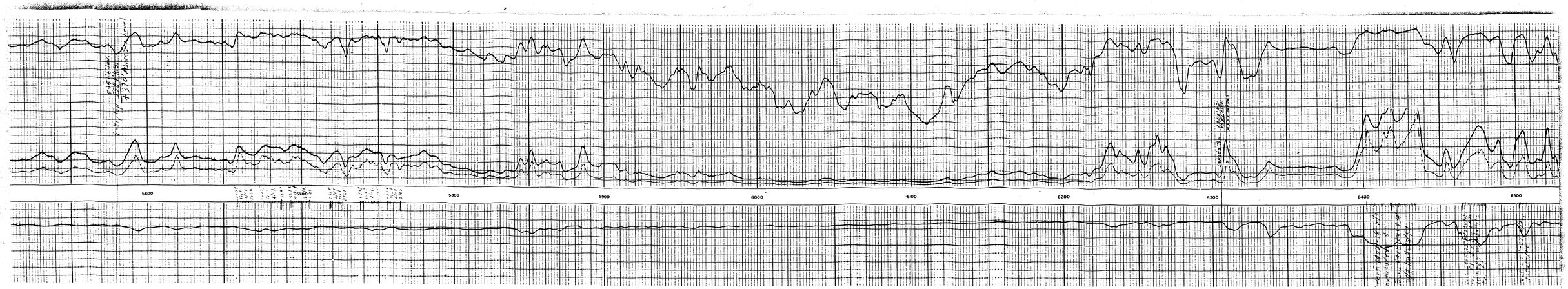

RUN 2
4500
4600
4700
4800
4900

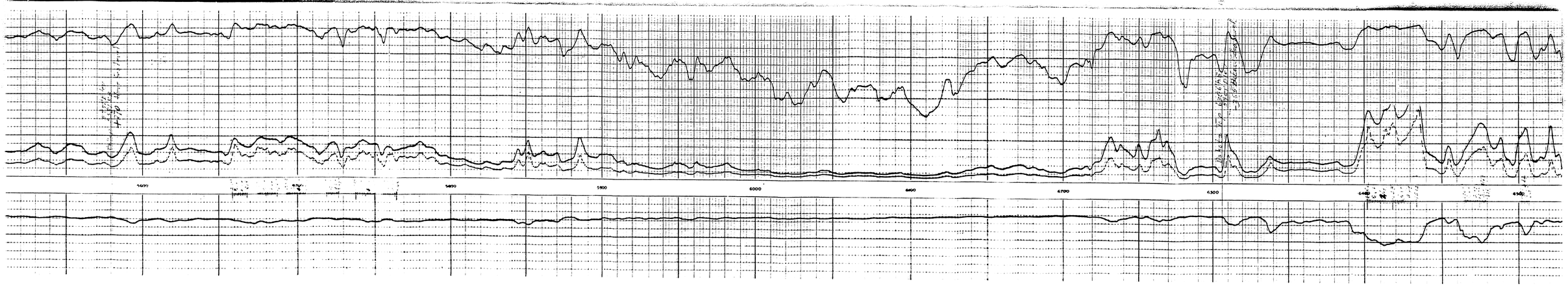
236

4800
4900
5000
5100
5200
5300
5400
5500
5600
5700

4800
4900
5000
5100
5200
5300
5400
5500
5600
5700

237


5600
5700
5800
5900
6000
6100
6200
6300
6400
6500


5600
5700
5800
5900
6000
6100
6200
6300
6400
6500

6300
6400
6500
6600
16" NORMAL
INDUCTION
RESISTIVITY
ohms. m²/m
INDUCTION
CONDUCTIVITY
millimhos/m = 1000 ohm-m²/m
SPONTANEOUS-POTENTIAL
millivolts
COMPANY SUNSET INTERNATIONAL PETROLEUM CORPORATION
WELL SANTA FEDERAL 1-A
FIELD UNDESIGNATED
COUNTY SAN JUAN
STATE NEW MEXICO
SWSC FR 6580'
SWSC TD 6580'
DWG TD 6580'
Elev. KB 4961'
DF 4960'
GL 4932'

6300
6400
6500
6600
16" NORMAL
INDUCTION
RESISTIVITY
ohms. m²/m
INDUCTION
CONDUCTIVITY
millimhos/m = 1000 ohm-m²/m
SPONTANEOUS-POTENTIAL
millivolts
COMPANY SUNSET INTERNATIONAL PETROLEUM CORPORATION
WELL SANTA FEDERAL 1-A
FIELD UNDESIGNATED
COUNTY SAN JUAN
STATE NEW MEXICO
SWSC FR 6580'
SWSC TD 6580'
DWG TD 6580'
Elev. KB 4961'
DF 4960'
GL 4932'

239

Gulf Oil Corporation
Case No. 1622
Exhibit No. 5
March 25, 1959

WELEX RADIOACTIVITY LOG

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. ____
CASE NO. ____

Gulf Oil Corporation
Case No. 1622
Exhibit No. 5
March 25, 1959

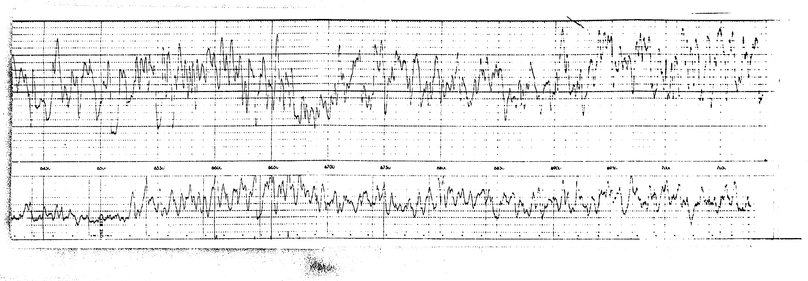
WELEX RADIOACTIVITY LOG

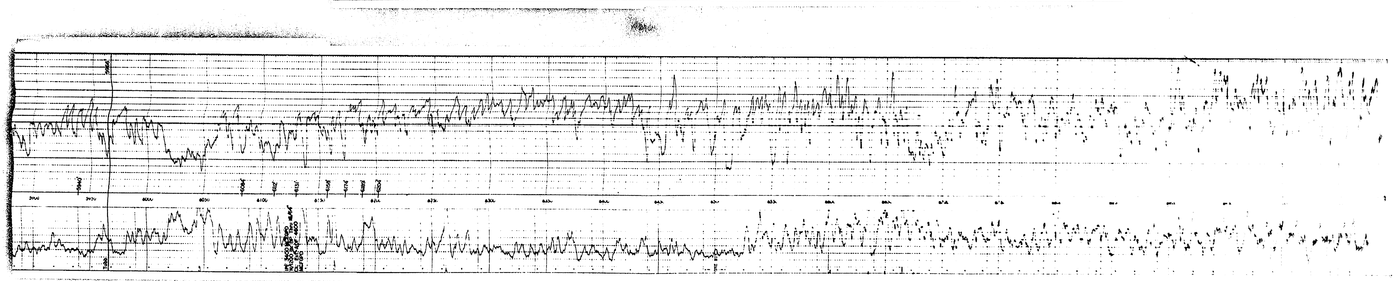
Gulf Oil Corporation
Case No. 1622
Exhibit No. 5
March 25, 1959

Gulf Oil Corporation
Case No. 1622
Exhibit No. 5
March 25, 1959

240

241





242

WELEX

RADIOACTIVITY INDUCTION-ELECTRIC LOG

COMPANY EL PASO NATURAL GAS COMPANY
WELL HUERFANO UNIT NO. 103 (GD)
FIELD WILDCAT
COUNTY SAN JUAN STATE NEW MEXICO
Location 990 FNL & 1650 FWL
Other Services CONTACT CALIPER
Sec. 3 Twp. 26N Rge. 10W

Permanent Datum GROUND LEVEL Elev. 6735
Log Measured From KB 9' ABOVE GL
Drilling Measured From ROTARY KELLY BUSHING

TEMPERATURE
Elevation
KB. 6745'
DF. 6744'
GL. 6735'

Run No.	ONE	TWO	THREE	
Date	11-28-58	11-29-58	11-29-58	
Total Depth Driller	6445'	7050'	7050'	
Total Depth Wireline	6446'	7050'	7050'	
Csg. Shoe Driller	6450'	6450'	6450'	
Csg. Shoe Wireline	6452'	6452'	6452'	
Survey Begins	6451'	7022'	7022'	
Survey Ends	1800'	2520'	1820'	
Csg. Size	10-3/4	7-5/8	7-5/8	
Bit Size	9-7/8	6-3/4	6-3/4	
Mud Data — Type	WATER BASE CHEMICAL GEL		GAS DRILLED	
Weight	10.0			
Viscosity	70			
Ph				
Wtr. Loss cc/				
Res. @ Surface Temp.	1.05 @ 64°F	@ °F	@ °F	@ °F
Res. @ Max. Hole Temp.	1.22 @ 122°F	@ °F	@ °F	@ °F
Res.	1.85 @ 62°F	@ °F	@ °F	@ °F
Res.	1.85 @ 62°F	@ °F	@ °F	@ °F
Source Mud Sample	CIRCULATED			
Recorded By	R. QUINT	QUINT	QUINT	QUINT
Witnessed By	MR. ULRICH	MR. POLK	MR. POLK	MR. POLK
Logging Tool No.	29100			

CASING RECORD

	Size	Wgt.	Grade	Type Joint	Top	Bottom
Surface String	10-3/4	32.75	H-40		0	1800'
Prod. String	7-5/8	26.40	J-55		0	6450'
Liner						
Liner						

DRILLING TOOL DATA

Last Tool No.	3-5/8
Gamma Ray	3-5/8
Gamma Ray Length	28
Induction Conductivity Focusing	Yes
Induction K-factor	10

Last Tool No. 3-5/8
Gamma Ray Model No. 29000
Gamma Ray Length 28'
Induction Conductivity Focusing YES
Induction K-factor 10

Type Log: GAMMA RAY - NEUTRON
Interval Measured: FROM 6450 TO 1800
Scale: 5" = 100'
Source: Model No. 29100 Serial No. 14
Spacing 6.1X10 VOLTRONS SEC.
Detector 6.1X10 VOLTRONS SEC.

Run	Type	Scale	Sensitivity	Reading	Time Constant
1	G	100	100	0-100	
1	N	100	100	0-100	
2	G	100	100	0-100	
2	N	100	100	0-100	
3	G	100	100	0-100	
3	N	100	100	0-100	
4	G	100	100	0-100	
4	N	100	100	0-100	
5	G	100	100	0-100	
5	N	100	100	0-100	
6	G	100	100	0-100	
6	N	100	100	0-100	
7	G	100	100	0-100	
7	N	100	100	0-100	

RECORDS

	Normal Spacing	Reading	Time Constant
1	2.0	2-100	1.0
2	2.0	2-100	1.0
3	2.0	2-100	1.0
4	2.0	2-100	1.0
5	2.0	2-100	1.0
6	2.0	2-100	1.0
7	2.0	2-100	1.0

Recorded By R. QUINT
Witnessed By MR. ULRICH

Run 1 2 3 4 5 6 7
Normal Spacing 18
Lateral
Lateral
Focusing 6 COIL 40
Induction INDUCTION

RESISTIVITY OHMS M²/M — CONDUCTIVITY MILLIMHOS

0 — 18" NORMAL — 100 — CONDUCTIVITY — 0
0 — INDUCTION — 100 — CONDUCTIVITY — 500

NEUTRON — RADIATION INTENSITY INCREASES — 1250 — 750

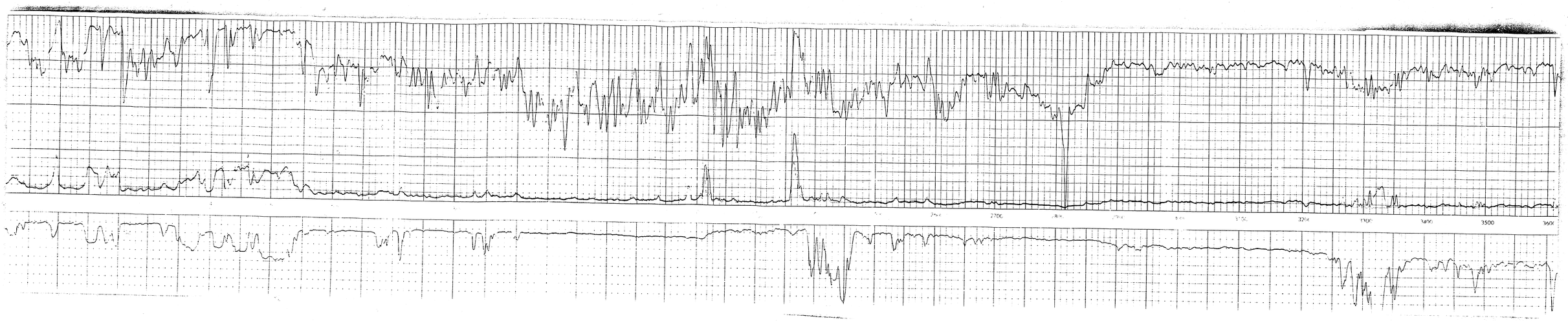
CASING & COLLAR LOG DEPTH

10-3/4 CSG. @ 364'

POTENTIAL MILLIVOLTS — −10 − + —

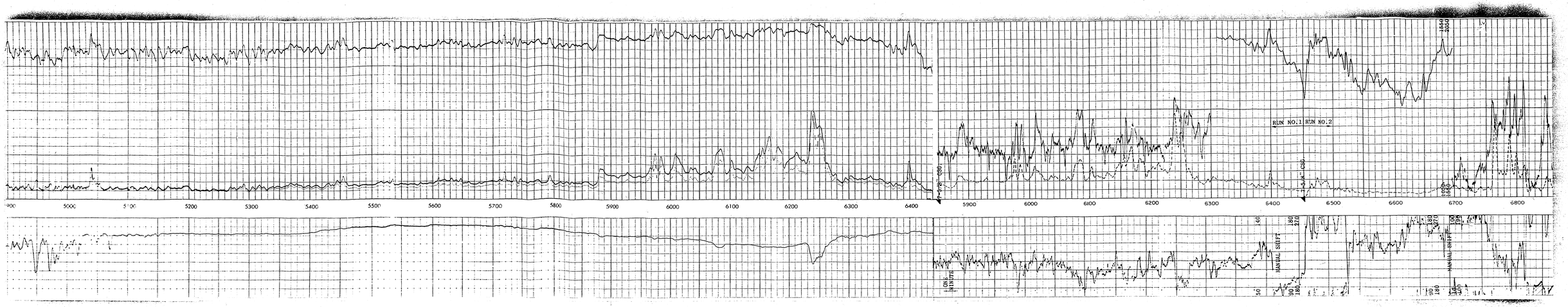
GAMMA RAY — RADIATION INTENSITY INCREASES — 140 — 50

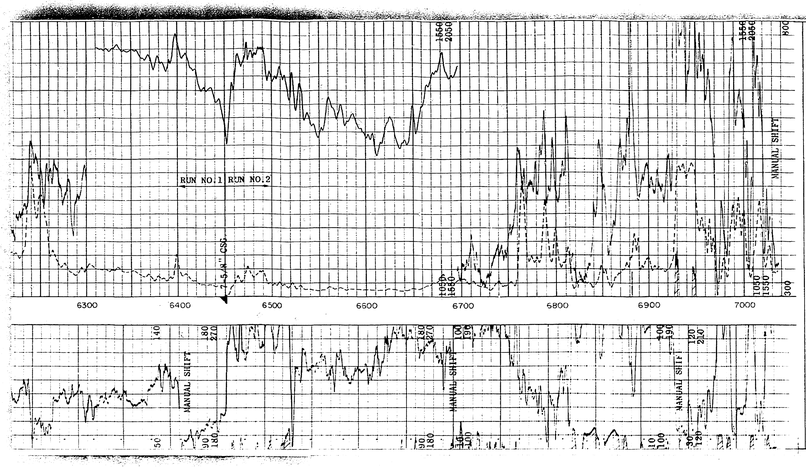
243



244

3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
5100
5200
5300
5400
5500


5000
5100
5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
6300
6400
5900
6000
6100
6200
6300
6400
6500
6600
6700
6800
RUN NO.1
RUN NO.2
1050
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
ON INTVL
MANUAL SHIFT
MANUAL SHIFT



5" = 100'

NEUTRON

RADIATION INTENSITY INCREASES

CASING & COLLAR LOG DEPTH

GAMMA RAY

RADIATION INTENSITY INCREASES

EL PASO NATURAL GAS COMPANY
HUBBARD UNIT NO. 103 (GD)
WILDCAT FIELD
SAN JUAN COUNTY, NEW MEXICO

T.D. LOGGED 6441'
T.D. DRILLER 6445'
T.D. REACHED 6446'

5" = 100'

RESISTIVITY OHMS M²/M

16" NORMAL 100

INDUCTION 100

CONDUCTIVITY MILLIMHOS/M

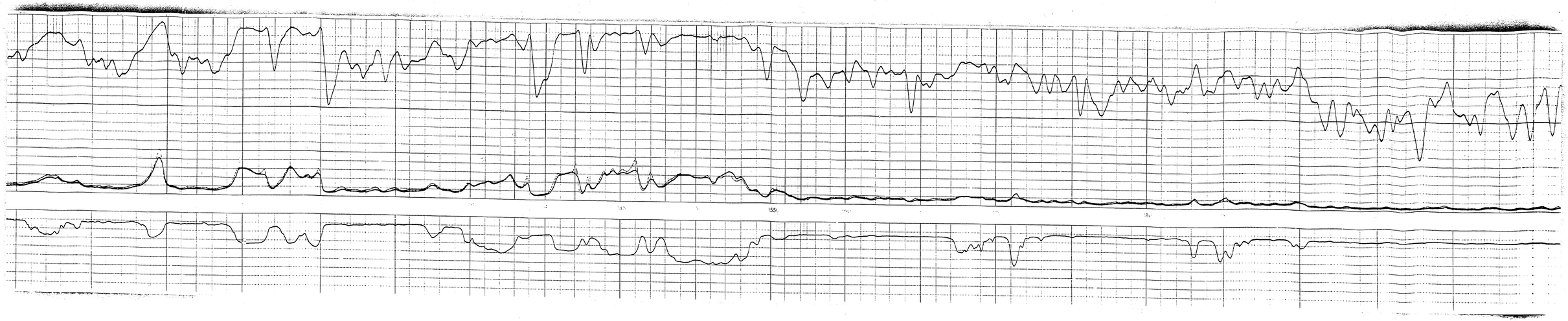
CONDUCTIVITY 0 500

POTENTIAL MILLIVOLTS

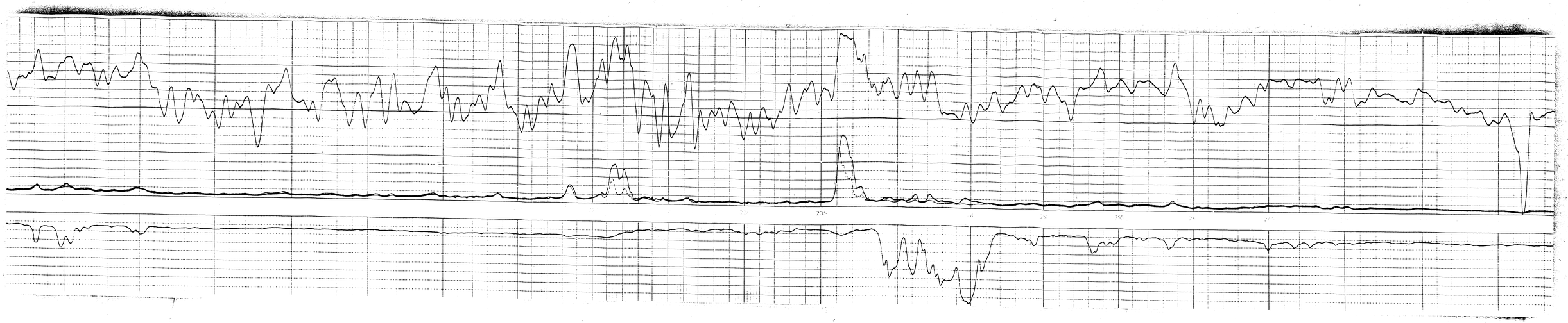
-10 +

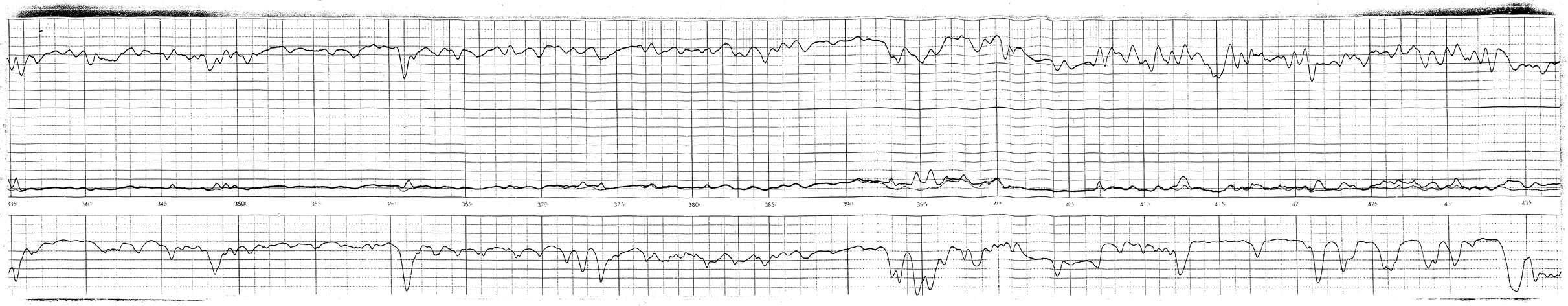
Rm 2.2 at 123 F.

247

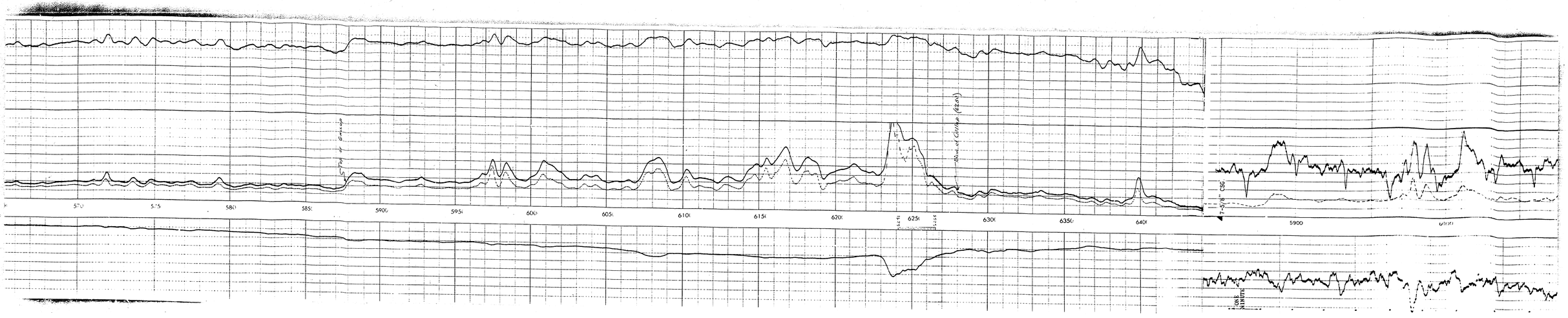


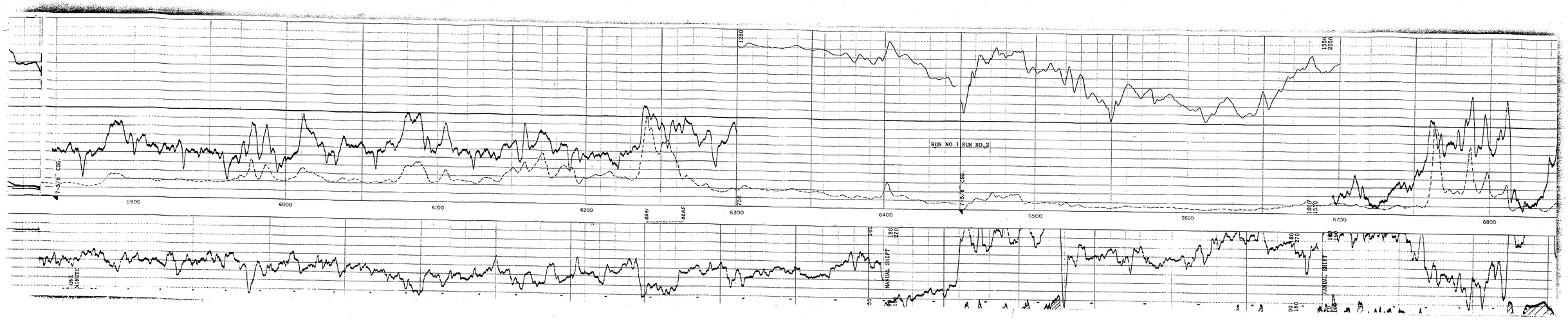
248



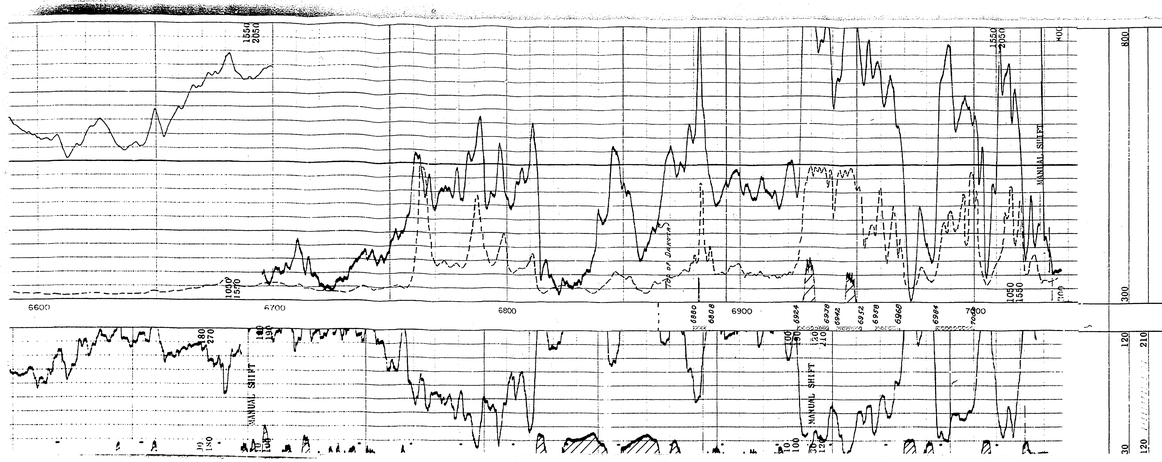


490
495
500
505
515
520
525
530
535
545
550
555
560
565
570
575
580
585
590

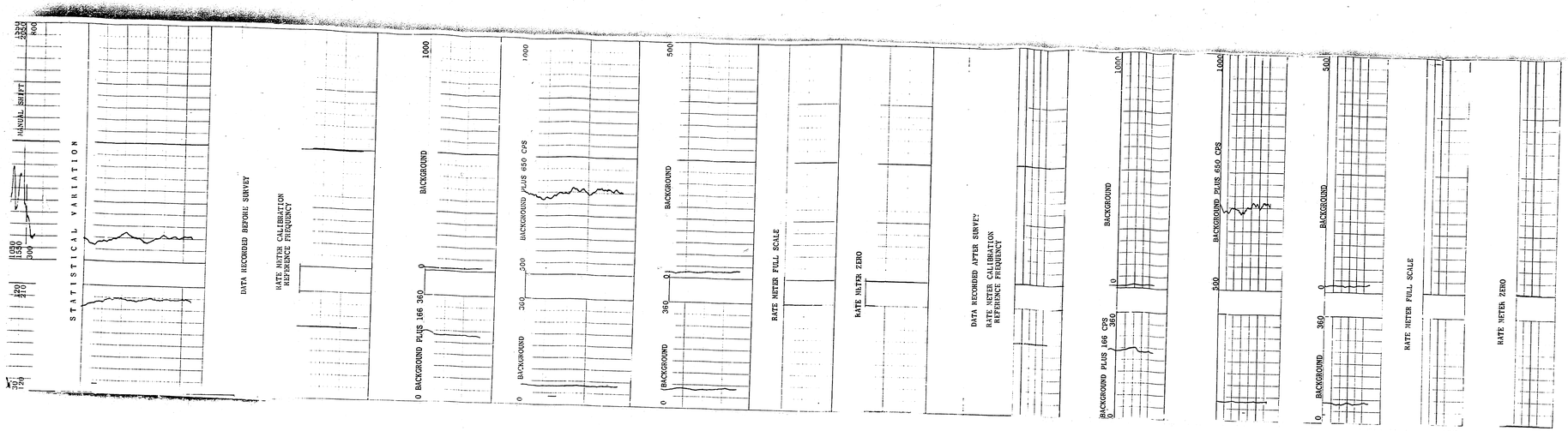

570
575
580
585
5900
595
600
605
610
615
620
625
630
635
640
5900
LONG MINUTE


4-5/8" CSG.
5900
6000
6100
6200
6300
6400
6500
6600
6700
6800
RUN NO.1 RUN NO.2
7-5/8" CSG.
MANUAL SHIFT
MANUAL SHIFT

255


5600
6700
6800
6900
7000
MANUAL SHIFT
REPEAT SECTION
RESISTIVITY OHMS M²/M
CONDUCTIVITY MILLIMHOS/M
NORMAL
INDUCTION
CONDUCTIVITY
POTENTIAL MILLIVOLTS
EL PASO NATURAL GAS COMPANY
HUBBARD UNIT NO. 103 (GD)
WILDCAT FIELD
SAN JUAN COUNTY, NEW MEXICO
T.D. LOGGED 6941'
T.D. DRILLER 6945'
T.D. REACHED 6946'
STATISTICAL VARIATION
DATA RECORDED BEFORE SURVEY
RATE METER CALIBRATION
REFERENCE FREQUENCY
BACKGROUND
BACKGROUND PLUS 650 CPS

256


STATISTICAL VARIATION
MANUAL SHIFT
DATA RECORDED BEFORE SURVEY
RATE METER CALIBRATION REFERENCE FREQUENCY
BACKGROUND
BACKGROUND PLUS 650 CPS
BACKGROUND PLUS 166 CPS
RATE METER FULL SCALE
RATE METER ZERO
DATA RECORDED AFTER SURVEY
RATE METER CALIBRATION REFERENCE FREQUENCY
CPS

257

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Induction-Electrical Log

COMPANY EL PASO NATURAL GAS COMPANY
WELL HUERFANO # 105
FIELD WILDCAT
LOCATION SEC. 29-27N-10W
COUNTY SAN JUAN
STATE NEW MEXICO

Other Surveys
NL

Location of Well
800' FR S/L
680' FR E/L
SEC. 29-27N-10W

Elevation: D.F.: 6072
K.B.:
or G.L.: 6063

FILING No.

COUNTY SAN JUAN STATE NEW MEXICO
FIELD WILDCAT LOCATION HUERFANO # 105 WELL
COMPANY EL PASO NATURAL GAS COMPANY

RUN No.											
Date	1-23-58										
First Reading	6360										
Last Reading	0										
Feet Measured	6360										
Csg. Schlum.	9 5/8"										
Csg. Driller	9 5/8"										
Depth Reached	6360										
Bottom Driller	6362										
Depth Datum	GL										
Mud Hol.	CHEM										
Dens. Visc.	9.2	42									
Mud Resist.	1.74	72	F	@	F	@	F	@	F	@	
" Res. BHT	1.36	135	F	@	F	@	F	@	F	@	
Rmf	1.17	85	F	@	F	@	F	@	F	@	
Rmc	1.74	72	F	@	F	@	F	@	F	@	
" pH	9			@	F	@	F	@	F	@	
" Wtr. Loss	--	CC 30 min		CC 30 min		CC 30 min		CC 30 min		CC 30 min	
Bit Size	9 7/8"	TO 6763	8 3/4"	TO							
Spcgs —AM	16"										
IND.	40"										
Opr. Rig Time	22 1/2 HRS.										
Truck No.	2216 1231										
Recorded By	HAY DR										
Witness											

EDNG-D
BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
EXHIBIT No. 3
Case No. 1766

REMARKS
1400' FROM PIT.

Cont'dge No.
Rmf @ Rmc
Sonde No.

CONDUCTIVITY millimhos/m
INDUCTION 0 400 800 1200 1600

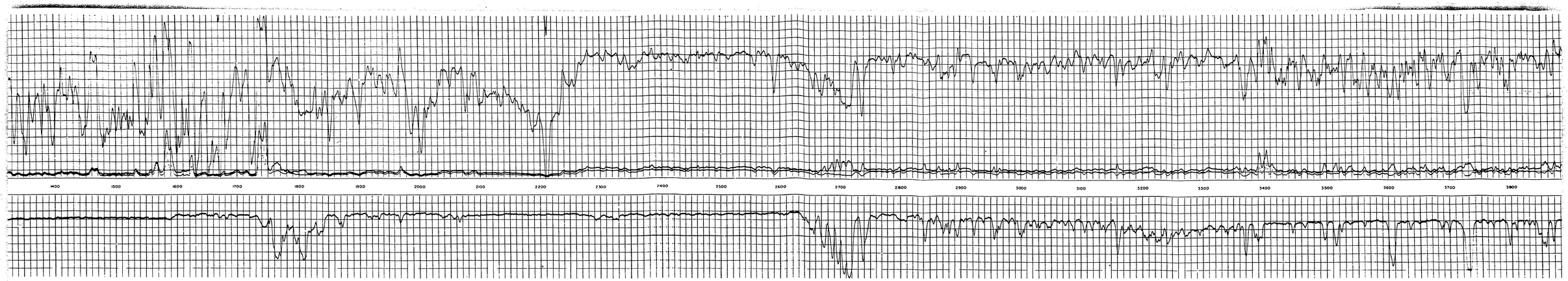
RESISTIVITY -ohms. m²/m
16" NORMAL 0 100 1000
INDUCTION 0 100 1000 1200

DEPTHS 1" = 100' L.R. 3601'

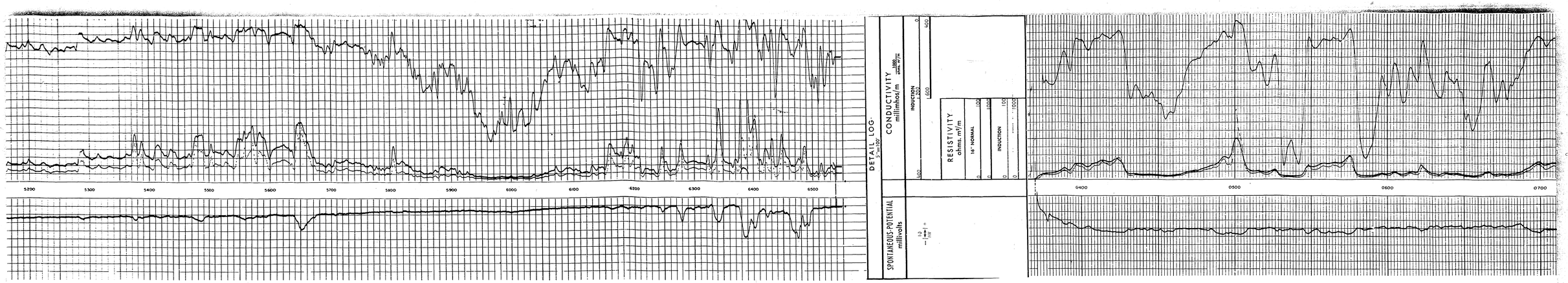
SPONTANEOUS POTENTIAL millivolts

0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900

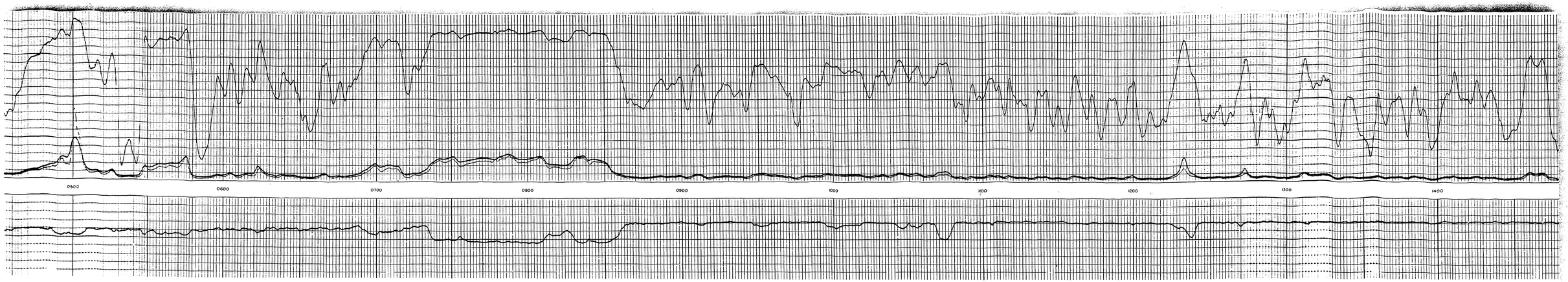
258

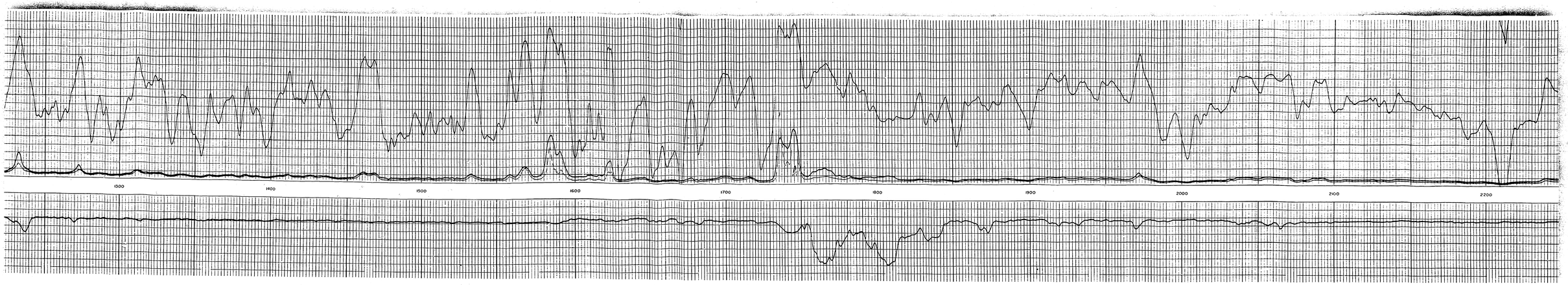

1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800

3300
1400
3530
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
5100
5200
5300
5400
5500
5600
5700

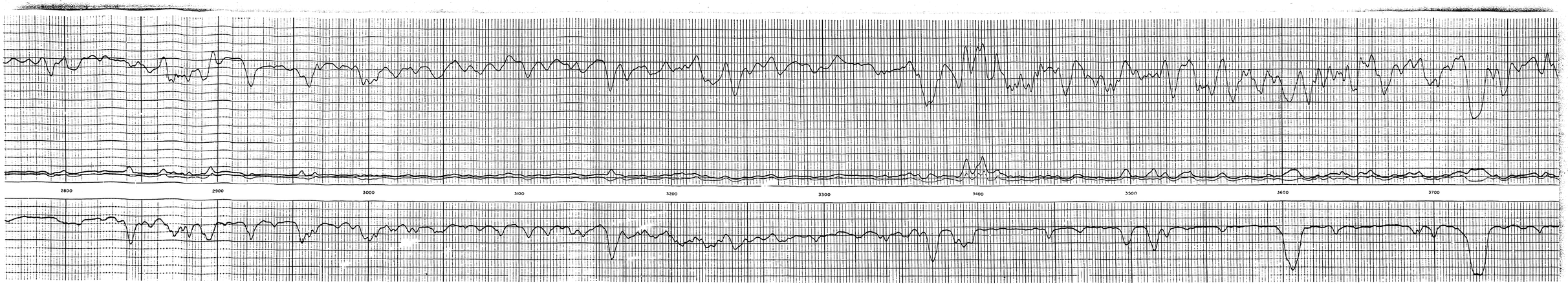

5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
6300
6400
6500
DETAIL LOG
CONDUCTIVITY
millimhos/m
1000
ohms m²/m
INDUCTION
0
400
1200
600
RESISTIVITY
ohms, m²/m
16" NORMAL
0
100
1000
INDUCTION
0
100
1000
SPONTANEOUS POTENTIAL
millivolts
0400
0500
0600
0700

261

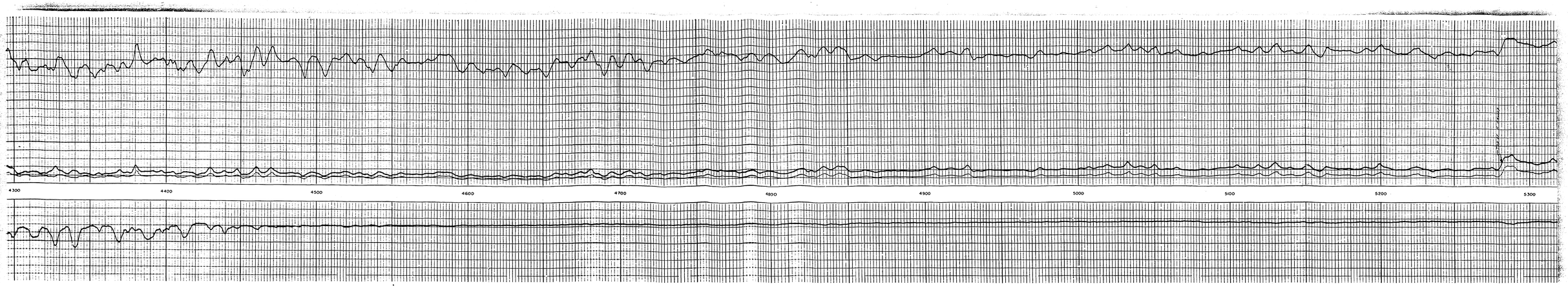

0500
0600
0700
0800
0900
1000
1100
1200
1300
1400

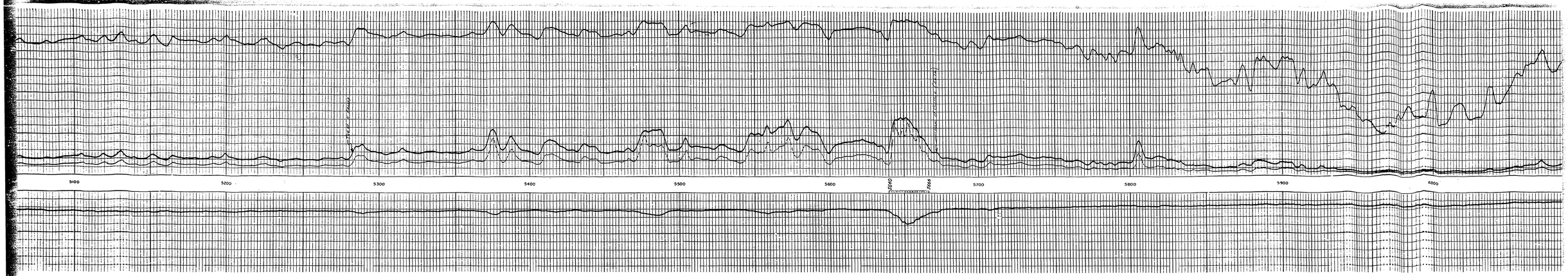

1300
1400
1500
1600
1700
1800
1900
2000
2100
2200

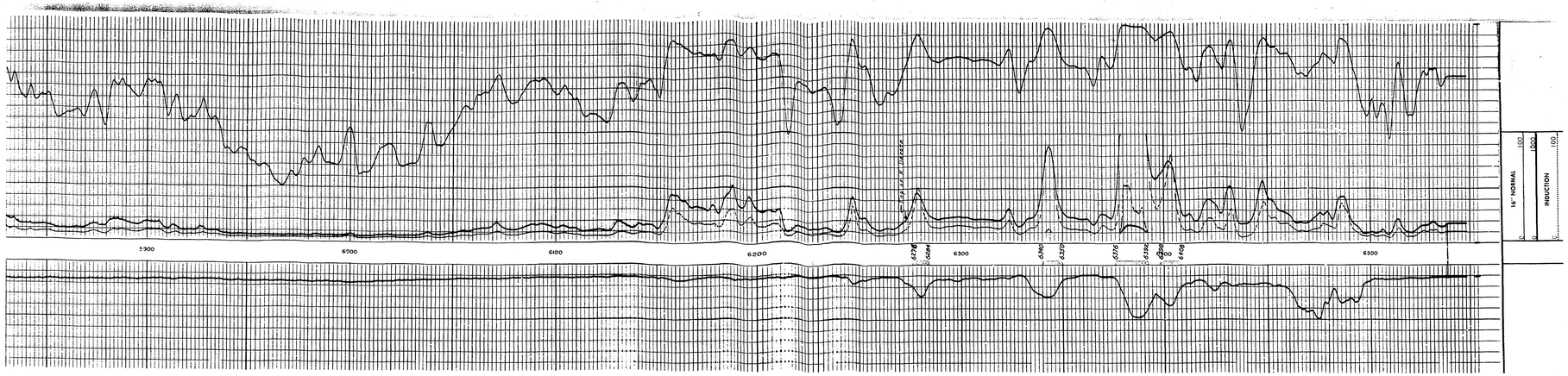
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000


2800
2900
3000
3100
3200
3300
3400
3500
3600
3700

3600
3700
3800
3900
4000
4100
4200
4300
4400
4500


4300
4400
4500
4600
4700
4800
4900
5000
5100
5200
5300


5100
5200
5300
5400
5500
5600
5640
5664
5700
5800
5900
6000


5900
6000
6100
6200
6300
6500
16" NORMAL
INDUCTION
100
0

6100
6200
6300
6400
6500
16" NORMAL
INDUCTION
RESISTIVITY
ohms, m²/m
INDUCTION
CONDUCTIVITY
millimhos/m = 1000/ohm-m²/m
SPONTANEOUS POTENTIAL
millivolts
COMPANY EL PASO NATURAL GAS COMPANY
WELL INDEPAND # 105
FIELD WILDCAT
COUNTY SAN JUAN
STATE NEW MEXICO

270

R 13 W

R 12 W

T

28

N

BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
Exhibit No. 1
Case No. 1626

PORTION OF GALLEGOS CANYON UNIT

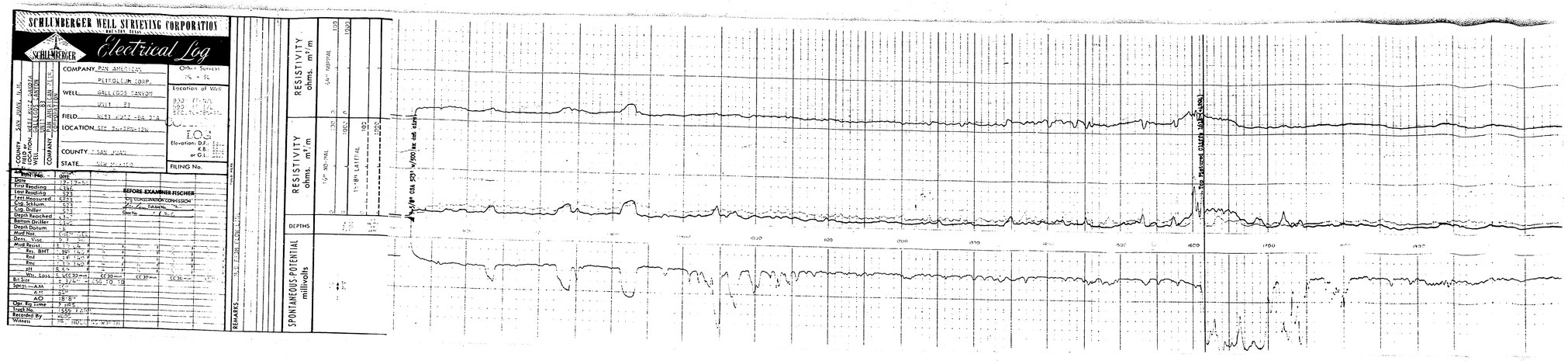
Showing Pan American Petroleum Corporation's
Gallegos Canyon Unit No. 83 & 84
Dakota - Gallup Dual Completions

Pan American Petroleum Corp. Exhibit No. 1
NMOCC Case No's 1626 and 1627
April 8, 1959

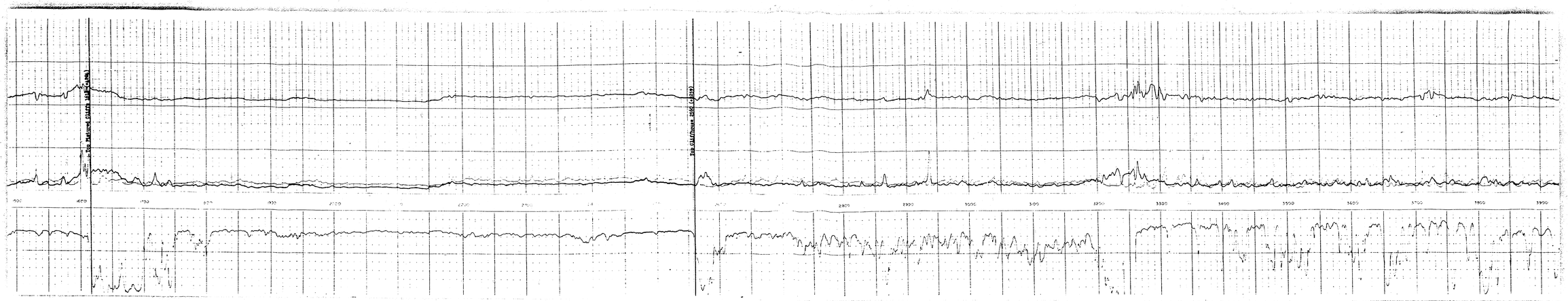
Participating Area
Gallegos Canyon

GALLEGOS CANYON UNIT
105655 - 43,146.82 Ac.

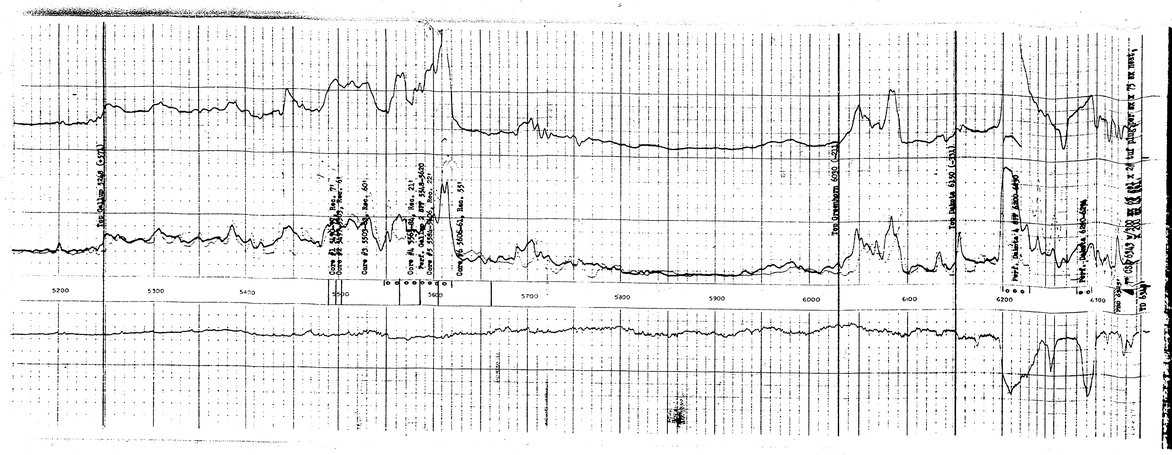
271


SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS
SCHLUMBERGER
Electrical Log
COMPANY PAN AMERICAN PETROLEUM CORP.
WELL GALLEGOS CANYON UNIT #3
FIELD WEST KUTZ-DA 21A
LOCATION SEC 2 T29N-R12W
COUNTY SAN JUAN
STATE NEW MEXICO
FILING No.
Other Services
IES - SL
Location of Well
930 FT N/SL
990 FT E/WL
SEC 2 T29N R12W
Elevation: D.F.
K.B.
or G.L.
Run No. ONE
Date
First Reading
Last Reading
Feet Measured
Csg. Schlum.
Csg. Driller
Depth Reached
Bottom Driller
Depth Datum
Mud Net
Dens. Visc.
Mud Resist.
Res. BHT
Rmf
Rmc
pH
Wtr. Loss
Bit Size
Spcs.—AM
AO
Opr. Rig time
Truck No.
Recorded By
Witness
BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
EXHIBIT No.
CASE No.
REMARKS
RESISTIVITY ohms, m²/m
16" NORMAL
64" NORMAL
18'8" LATERAL
DEPTHS
SPONTANEOUS POTENTIAL millivolts
Run 1 Dated March 30 1956
Run 2 Dated March 30 1956

272


Tip Pressure (Left) 30 (cm H2O)
Tip Pressure (Left) 30 (cm H2O)

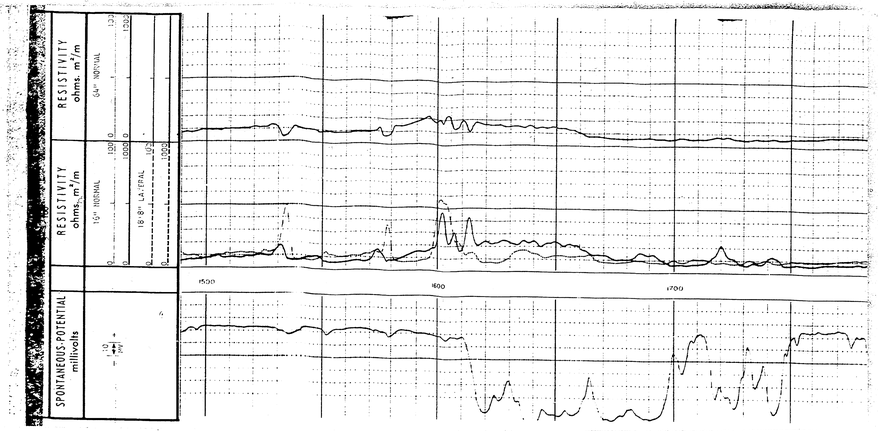
Top Miss Ass (Cont)
Top Miss Ass (Cont)
Top Miss Ass (Cont)



Gulf Oil Corp. Well No. 49
Jicarilla Apache "F"
Lindrith
Rio Arriba County, New Mexico

Gallup & Dakota
TD 6341', PBD 6325'
Elev. 7,142' Gr., 7,157' DF, 7,160' KB
13-3/8" csg. @ 320' w/ 350 sx. Circ.
8-5/8" csg. @ 3,000' w/ 1,000 sx. TOC @ 1,500' (Calc.)
4½" csg. @ 6,340' w/ 1,000 sx. TOC @ 3,000' (Calc.)
Gallup perf. 5,664-5,680' w/ 4 SPF
Dakota perf. 6,200-6,207' w/ 6 SPF
Natural completion
Gallup (Calc.) IP 1,000 MCFD
Dakota (Calc.) IP 2,000 MCFD

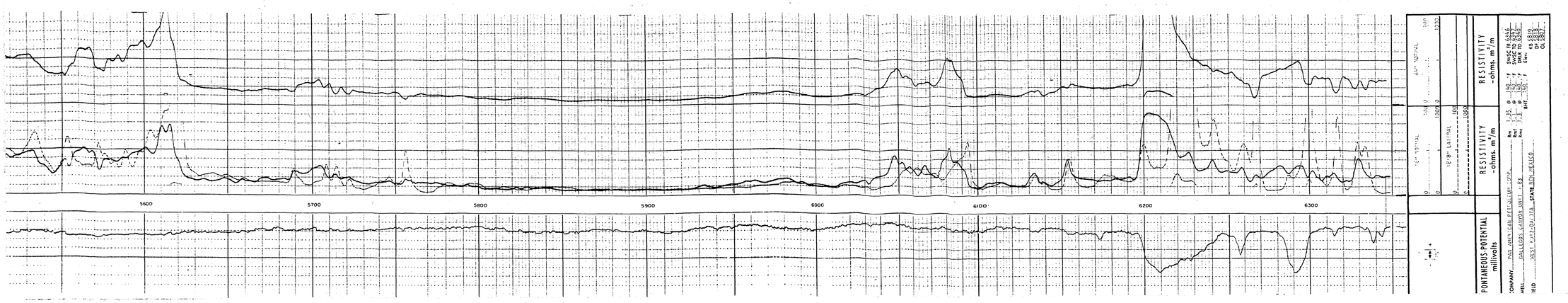
Date of Well: 12-15-59
Date Completed: 1-26-60
Name of Log Operator: Schlumberger Well Surveying Corp.
Depth Driller's (Log Meas. Depth): 6341'
Depth Logger's (Log Meas. Depth): 6341'
Bottom Log Interval: 6341'
Top Log Interval: 1500'
Type Log: Induction-Electrical
Log Run on Well: One
Remarks:



275

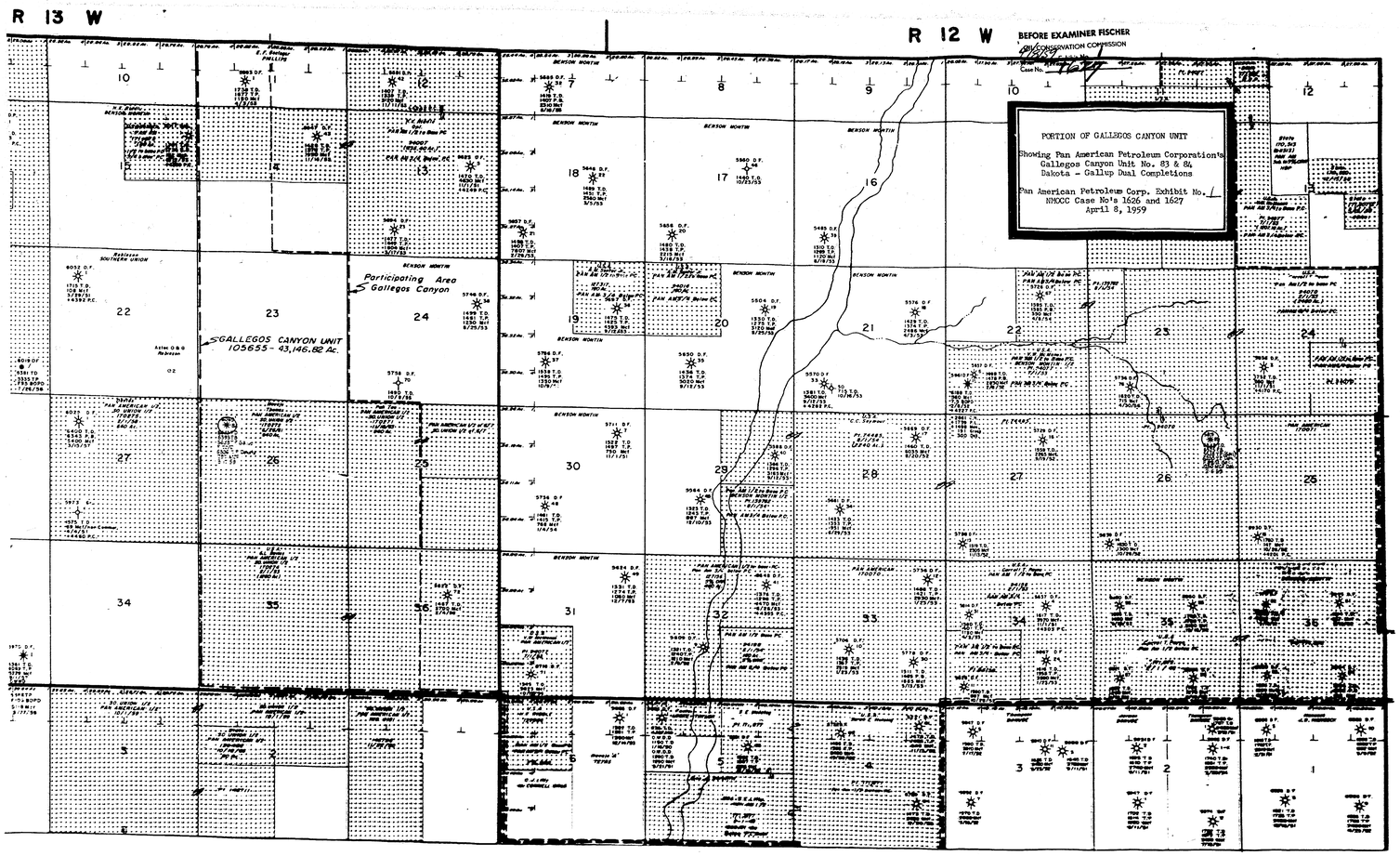
1600
1700
1800
1900

5300
5400
5500
5600
5700


5600
5700
5800
5900
6000
6100
6200
6300
RESISTIVITY
-ohms. m²/m
RESISTIVITY
-ohms. m²/m
SPONTANEOUS-POTENTIAL
millivolts
COMPANY PAN AMERICAN PETROLEUM CO.
WELL GAVILLEROS CANYON UNIT - #3
FIELD WILDCAT STATE NEVADA

217

BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
Case No. 1627



278

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

SCHLUMBERGER

Electrical Log

COMPANY PAN AMERICAN PETROLEUM CORP.

WELL GALLEGOS CANYON UNIT - 84

FIELD UNDESIGNATED DAKOTA

LOCATION SEC. 26-28N-13W

COUNTY SAN JUAN

STATE NEW MEXICO

Other Services: GRN, IN

Location of Well: 990' FNL & 990' FEL SEC. 26-28N-13W

COMPANY LOG

Elevation: D.F. 6062 K.B. 6062 or G.L. 6052

FILING No.

Run No.	ONE
Date	12-3-58
Depth-Driller	6420
Depth-Logger	6402
Bottom Logged Interval	5918
Top Logged Interval	5902
Type Fluid in Hole	GEL-CHEM
Salinity, P.P.M. Cl	1600
Fluid Level	FULL
Max. Rec. Temperature	132°F
Equipment Location	60 132°F
Recorded By	S. O.
Witnessed By	MATTHEWS

Source of Sample	FLOWLINE		
R @ Meas. Temp.	2.25 @ 132°F	@ °F	@ °F
R_mf @ Meas. Temp.	2.30 @ 132°F	@ °F	@ °F
R_mf @ Rec. Temp.	1.60 @ 132°F	@ °F	@ °F
Source: R_mf R_mc	S O		
R_m @ Meas. Temp.	3.20 @ 132°F	@ °F	@ °F
R_mf @ Meas. Temp.	2.30 @ 132°F	@ °F	@ °F
R_mc @ Meas. Temp.	4.20 @ 132°F	@ °F	@ °F
Source of R_w	CALC		
R_w @ Meas. Temp.	1.00 @ 132°F	@ °F	@ °F
R_w @ 77°F	2.90		
Chlorides	1600		
Calcium			
Resistivity	1.60 @ 132°F	@ °F	@ °F
Density	9.2		
Viscosity	44		
pH	10		
Fluid Loss	8.2 cc 30 min	cc 30 min	cc 30 min
Mud Cake	2/32"		
Source	FAR		
R_m @ BHT	1.60 @ 132°F	@ °F	@ °F
Time Since Circ.	1 HR		
Max. Rec. Temp.	132		
Equipment No.	2527 FAR		
Location	MATTHEWS		
Recorded By	BANKS		
Witnessed By			

BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
Exhibit No. 3
Case No. 1632
4/8/59

REMARKS: MUD SAMPLE FROM MUD PIT

RESISTIVITY ohms. m²/m — 64" NORMAL — 16" NORMAL — 18'8" LATERAL

DEPTHS

SPONTANEOUS POTENTIAL millivolts

0578' - 0584' 5902 x 1000 ohms. m²/m

0500 0600 0700 0800 0900 100 1200 300 1400 500 1600 1700 1800 1900 2000

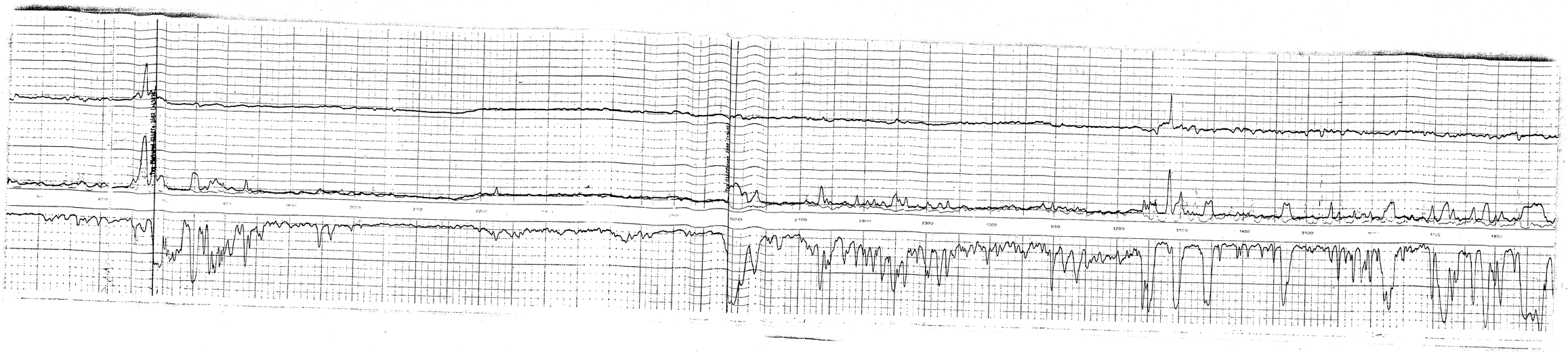
Run No. ONE Date 12-3-58 Depth-Driller 6420 Depth-Logger 6402 Bottom Logged Interval 5918 Top Logged Interval 5902 Type Fluid in Hole GEL-CHEM Salinity, P.P.M. Cl 1600 Fluid Level FULL Max. Rec. Temperature 132°F Equipment Location 60 132°F Recorded By S. O. Witnessed By MATTHEWS

279

Top Offshore 2588 (-3431)
2600
2700
2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
1800

SCHLUMBERGER WELL SURVEYING CORPORATION
SCHLUMBERGER
Electrical Log
COMPANY PAN AMERICAN PETROLEUM CORP.
WELL GALLEGOS CANYON UNIT 84
FIELD UNDESIGNATED PC
LOCATION SEC. 26-T32N-R13W
COUNTY SAN JUAN
STATE NEW MEXICO
LOG
Elevation: D.F.
K.B.
or G.L.
FILING No.
RUN No. ONE
Date 11-3-58
Depth Reached 6521
Depth Driller 6521
Depth Datum KB
Bit Size 8 3/4"
Csgs.—Am 7"
Am 6521
AO 5"
Opr. Rig Time
Truck No.
Recorded By
Witness
BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
Case No. 1132
Exhibit No. 2
3/10/59
REMARKS
RESISTIVITY ohms. m²/m
SPONTANEOUS POTENTIAL millivolts
DEPTHS
2 X 500 MILLIVOLTS
6500
6600
6700

279



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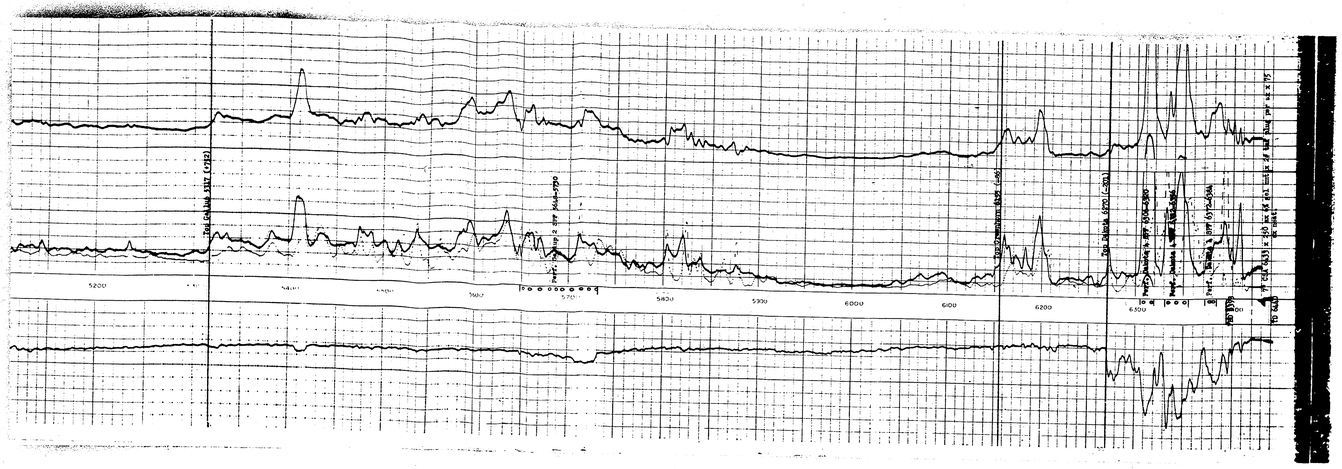
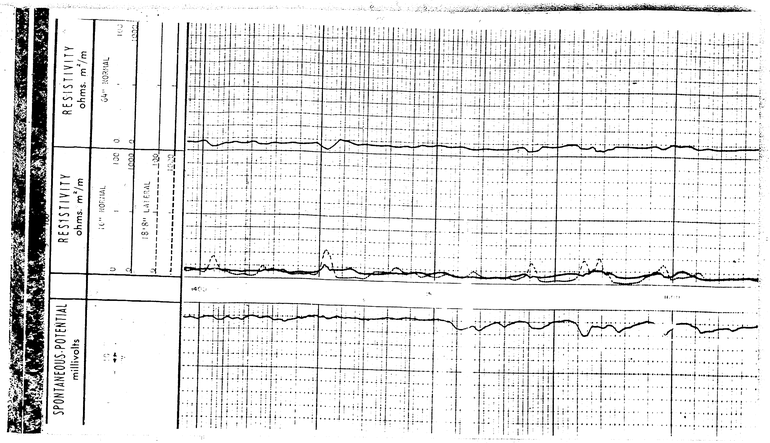


Gallegos Canyon Unit No. 4A
Dresser Atlas
Induction Electrical Log
Run One
Date 12-6-68
Gallup & Dakota
TD 6401, PBD 6398
Csg 7" @ 6399 w/ 650 sx. 2 Per Gallup
5848 & Dakota 6301, 17 Gallup .34"-99 Neg
Tbg 2 3/8" @ 6255 w/ Otis "XA" SSD @ 6247
Dakota Perf 2 SPF 6302'-6316', 6330'-6344'
Frac 250,000 gals. 2 gpm slick water & 250,000#
sand. Flush w/ 6000 gals. 2 gpm slick water.
Gallup Perf 2 SPF 5848'-5856', 5866'-5874'
Frac 100,000 gals. 30# gel water w/100,000 gal. x 40,000
Ottawa sand & 100,000 gal. x 60,000 Ottawa sand
Flush 120 bbls. 2 gpm slick water.
Dakota IP 3 MMCFGPD, SIP 1825 psig, Calc. AOF 5 MMCFGPD
Gallup IP 1.5 MMCFGPD, SIP 1825 psig, Calc. AOF 3 MMCFGPD
(Gas Analysis on press. AOF's are Abs.)

Name of Well: Gallegos Canyon Unit No. 4A
Operator: Dresser Atlas
Date Standardized: 12-6-68
Name of Log Station: Farmington, New Mexico
Potential Tool Used: Induction Electrical Log

Logs Run on Well: Induction Electrical
Remarks:



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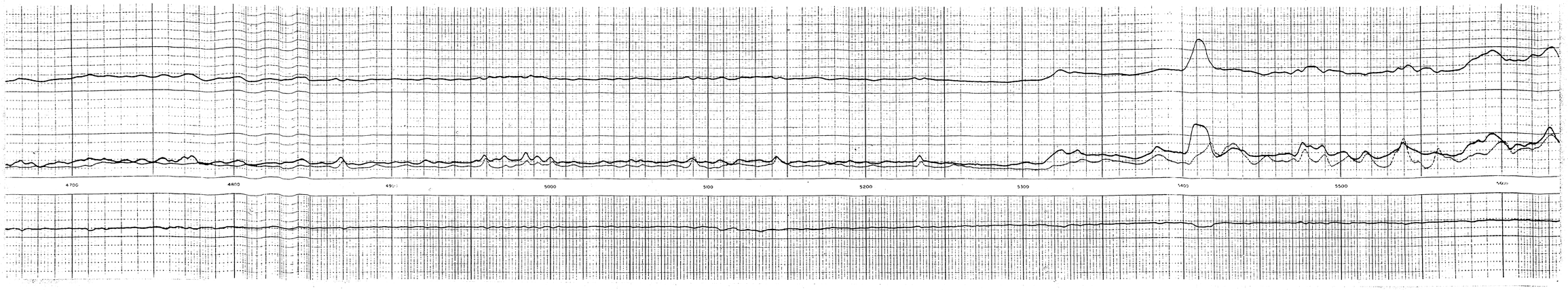
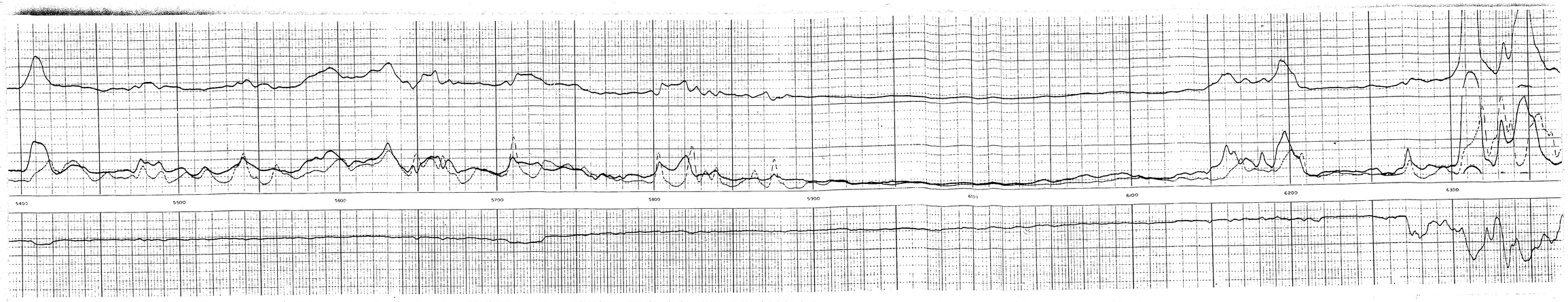
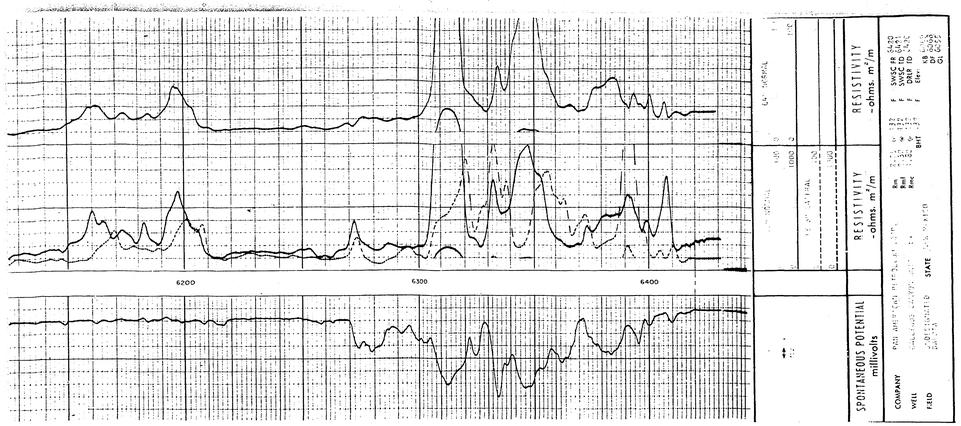
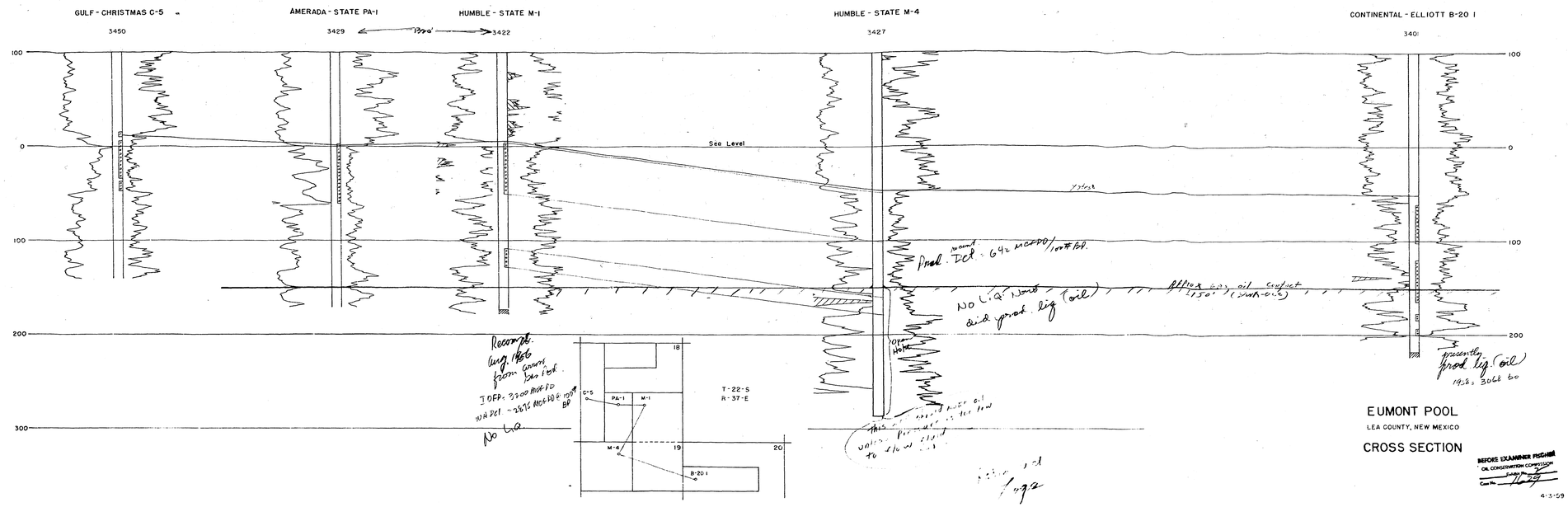

4700
4800
5000
5100
5200
5300
5400
5500


5400
5500
5600
5700
5800
5900
6000
6100
6200
6300


6200
6300
6400
RESISTIVITY
-ohms. m²/m
RESISTIVITY
-ohms. m²/m
SPONTANEOUS POTENTIAL
millivolts
COMPANY
WELL
FIELD
STATE



EUMONT POOL

LEA COUNTY, NEW MEXICO

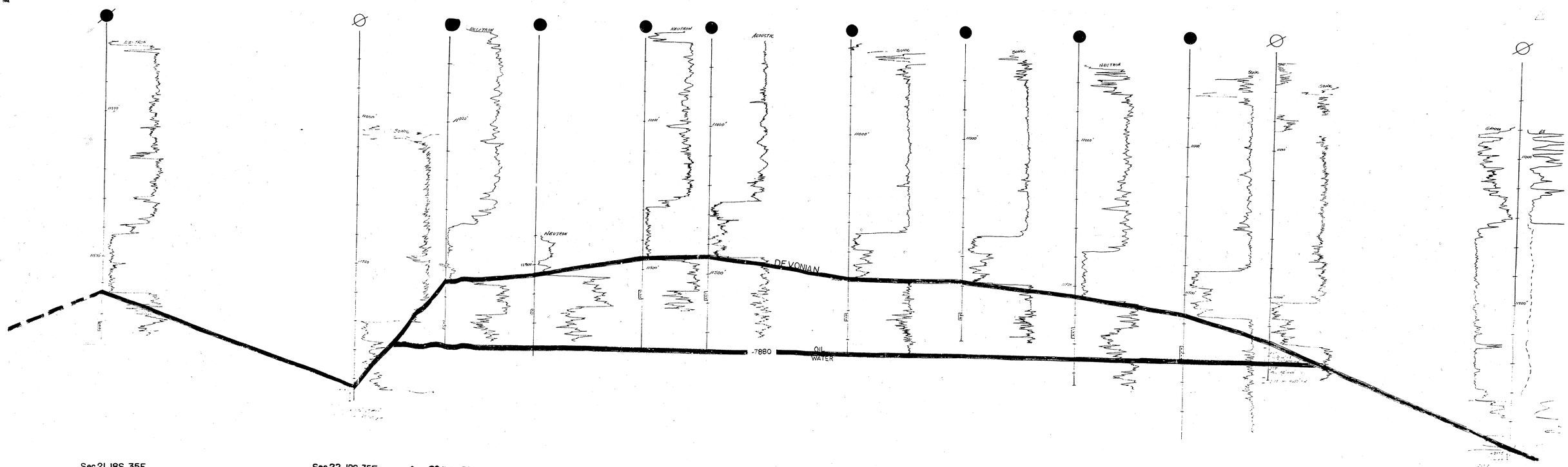
CROSS SECTION

BEFORE EXAMINER FISCHER
OIL CONSERVATION COMMISSION
Exhibit No. 2
Case No. 1729

4-3-59

287

A



Sec 21-18S-35E
Sinclair 2-401

Sec 22-18S-35E
Sinclair 2-403

Sec 22-18S-35E
Sinclair 3-403

Sec 27-18S-35E
Mobil 1-27

Sec 27-18S-35E
Mobil 2-27

Sec 26-18S-35E
Pure 1-26 St "J"

Sec 26-18S-35E
So. Vacuum Unit 1-26

Sec 35-18S-35E
So. Vacuum Unit 3-35

Sec 35-18S-35E
So. Vacuum Unit 1-35

Sec 35-18S-35E
So. Vacuum Unit 2-35

Sec 36-18S-35E
Pure 1-36 St. "I"

Sec 1-19S-35E
Ralph Lowe 1 Ohio State

2.

CROSS-SECTION
SOUTH VACUUM POOL
LEA CO. NEW MEXICO
SCALE: VERTICAL 1" = 100'
HORIZONTAL 1" = 500'
BY G. E. FISH

RECEIVED THE
OIL CONSERVATION
DIVISION
DATE 7-6-71
CASE 4537

288

T-18S R-35E

T-18S R-36E

T-19S R-35E

South Vacuum Unit

(7800)

The Pure Oil Company
Texas Producing Division

Map of
South Vacuum-Devonian
Lea County, New Mexico

CONTOURED ON TOP OF

Scale: 1"=1000' C.I.= 100'

Strategic Development Department
Fort Worth, Texas

First Issue Revised to

289

No. 10

T-18S R-35E

T-18S R-36E

T-19S R-35E

South Vacuum Unit

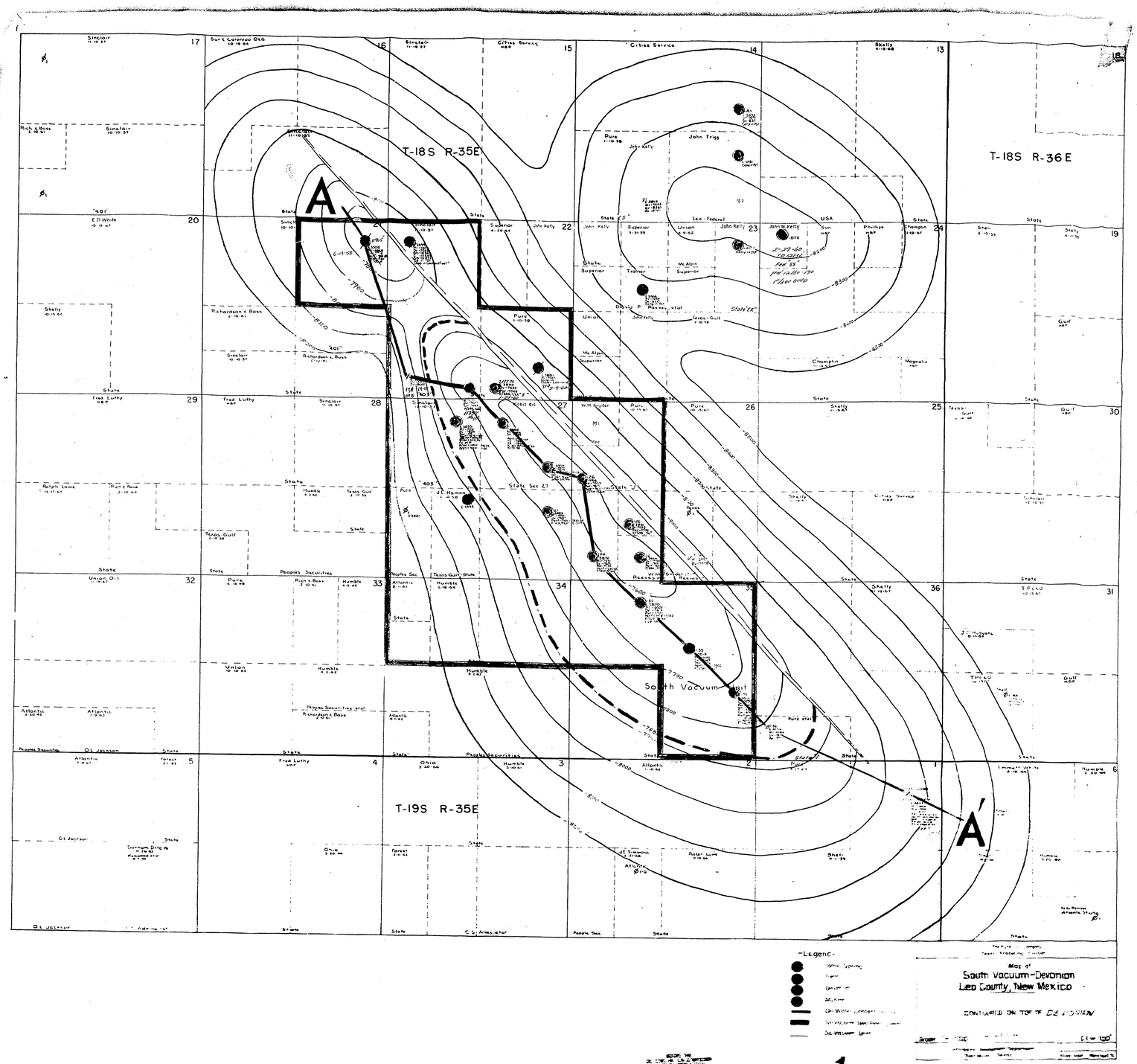
Map of
South Vacuum-Devonian
Lea County, New Mexico

CONTOURED ON TOP OF

Scale 1"=1000'

290

No. 20


T-18S R-35E
T-18S R-36E
T-19S R-35E
A
A'
South Vacuum
-7800
-8000
-8200
-8400
-8500
-8600
-8700
-8800
-8900
-Legend-
Map of
South Vacuum-Devonian
Lea County, New Mexico
CONTOURED ON TOP OF DEVONIAN

291

1.

T-18S R-35E

T-18S R-36E

T-19S R-35E

South Vacuum Unit

-Legend-

- Bone Spring
- Penn
- Devonian
- McKee
- Oil-Water Contact
- So. Vacuum Bone Spring Pool
- So. Vacuum Unit

The Pure Oil Company
Texas Producing Division

Map of
South Vacuum-Devonian
Lea County, New Mexico

CONTOURED ON TOP OF DEVONIAN

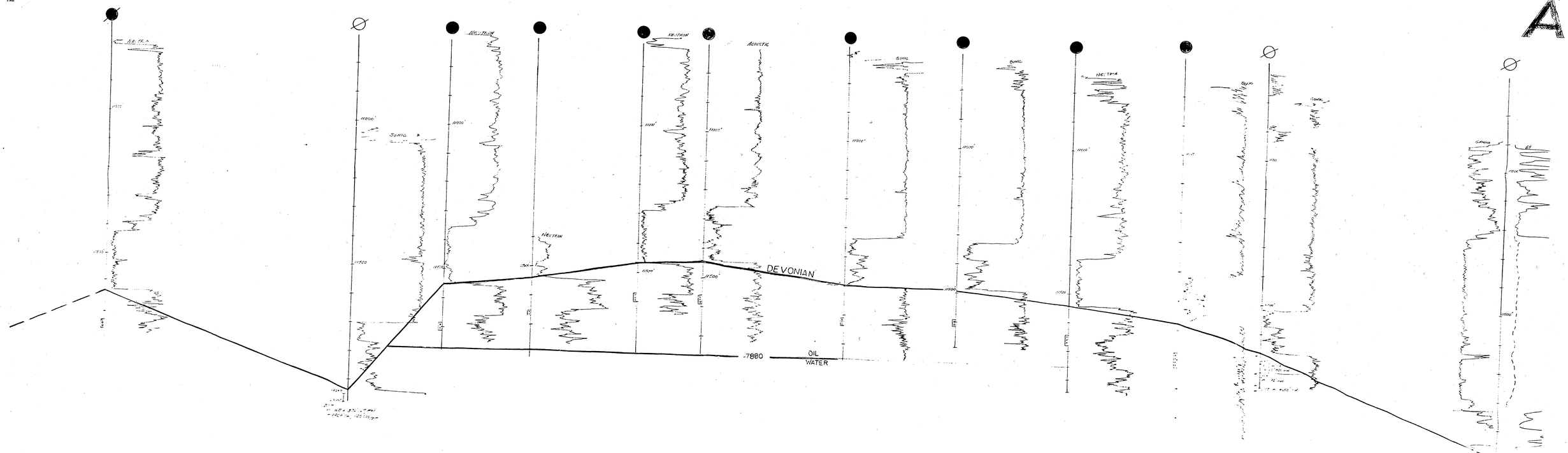
Scale 1"=1000' By G.E. Rice C.I.=100'

292

1.

A

A'



Sec 21-18S-35E
Sinclair 2-401

Sec 22-18S-35E
Sinclair #2-403

Sec 22-18S-35E
Sinclair #3-403

Sec 27-18S-35E
Mobil #1-27

Sec 27-18S-35E
Mobil #2-27

Sec 26-18S-35E
Pure #1-26 St "J"

Sec 26-18S-35E
So. Vacuum Unit #1-26

Sec 35-18S-35E
So. Vacuum Unit #3-35

Sec 35-18S-35E
So. Vacuum Unit #1-35

Sec 35-18S-35E
So. Vacuum Unit #2-35

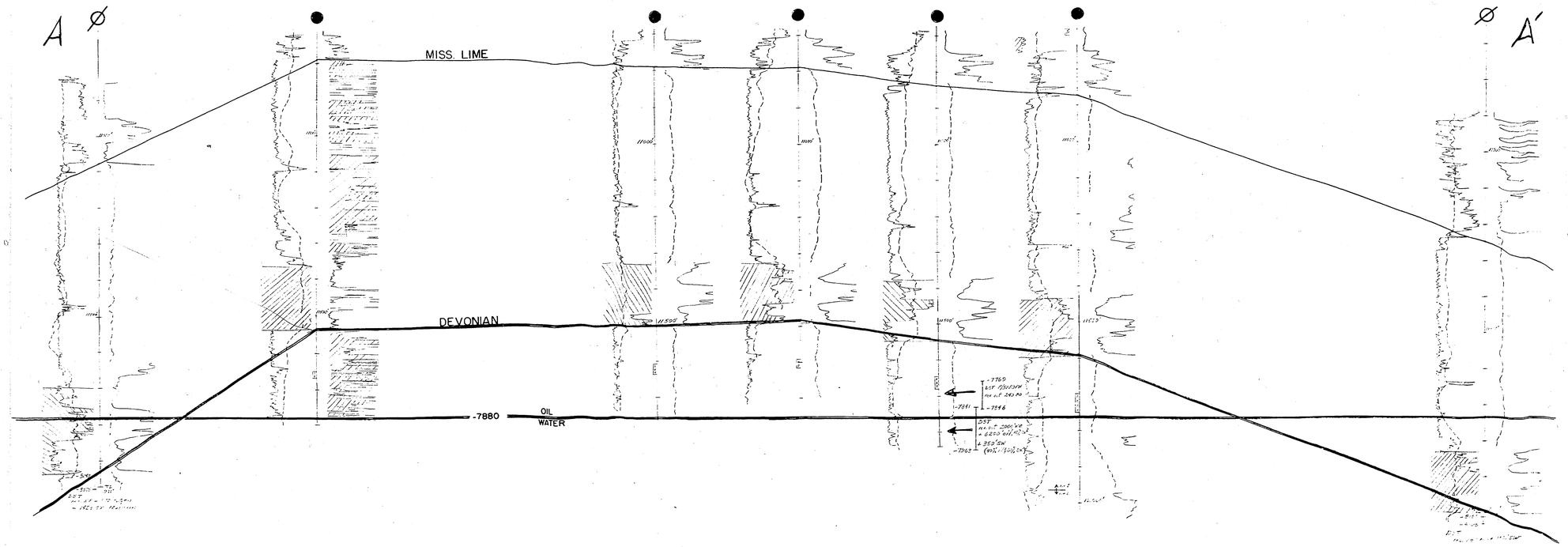
Sec 36-18S-35E
Pure 1-36 St. "I"

Sec 1-19S-35E
Ralph Lowe #1 Ohio State

2.

CROSS-SECTION
SOUTH VACUUM POOL
LEA CO. NEW MEXICO
SCALE: VERTICAL 1" = 100'
HORIZONTAL 1" = 500'
BY G. E. FISH

293



Sec.22-18S-35E
Sinclair "2-403

Sec.27-18S-35E
Magnolia "1-27

Sec.26-18S-35E
So.Vacuum Unit "1-26

Sec.35-18S-35E
So.Vacuum Unit "3-35

Sec.35-18S-35E
So.Vacuum Unit "1-35

Sec.35-18S-35E
So.Vacuum Unit "2-35

Sec.1-19S-35E
Ralph Lowe "1 Ohio State

CROSS-SECTION
SOUTH VACUUM POOL
LEA CO NEW MEXICO
SCALE: VERTICAL 1"=100'
HORIZONTAL 1"=500'
BY: G.E.FISH

294

T-18S R-35E

T-18S R-36E

T-19S R-35E

South Vacuum Unit

Possible Fault

-8500
-8400
-8300
-8200
-8100
-8000
-7900
-7800
-7700
-7600

-Legend-

Brown — Bone Spring
Red — Penn
Green — Devonian
Blue — McKee
Oil-Water Contact, 1-1-59
So Vacuum Dev Field Limits
So Vacuum Unit

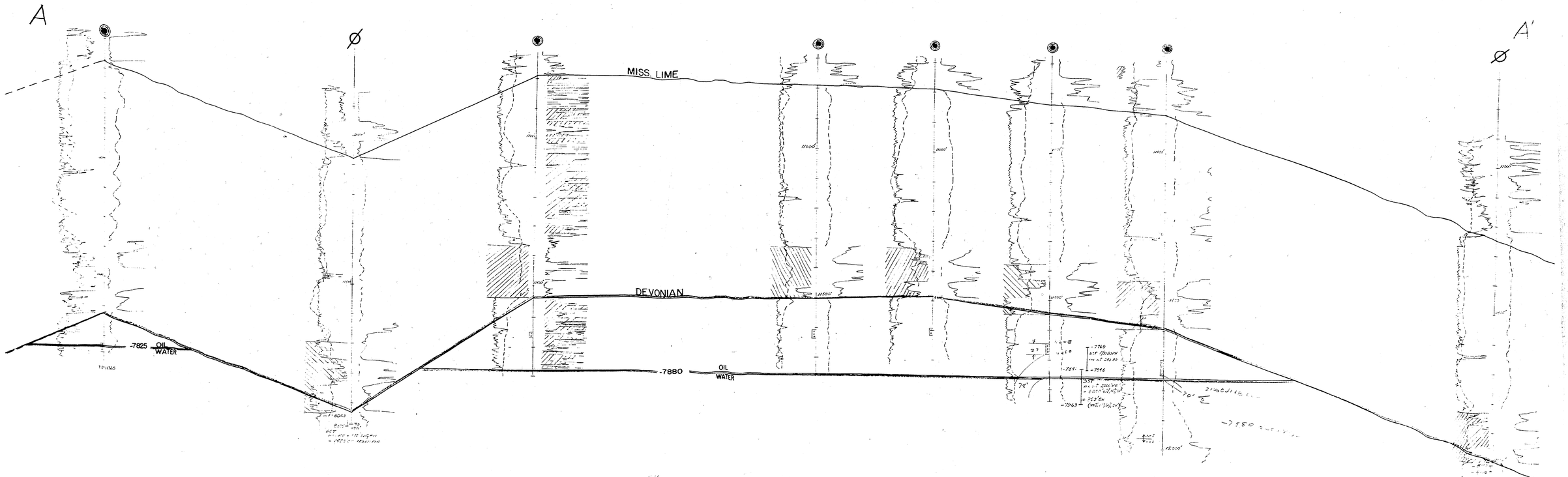
Map of
South Vacuum-Devonian
Lea County, New Mexico

Top of Devonian Structure

Scale 1" = 3000' By: G.E. Fish

295

PURE
EXHIBIT 11



Sec.21-18S-35E
Sinclair #2-401

Sec.22-18S-35E
Sinclair #2-403

Sec.27-18S-35E
Magnolia #1-27

Sec.26-18S-35E
So.Vacuum Unit #1-26

Sec.35-18S-35E
So.Vacuum Unit #3-35

Sec.35-18S-35E
So.Vacuum Unit #1-35

Sec.35-18S-35E
So.Vacuum Unit #2-35

Sec.1-19S-35E
Ralph Lowe #1 Ohio State

CROSS-SECTION
SOUTH VACUUM POOL
LEA CO NEW MEXICO
SCALE: VERTICAL 1"=100'
HORIZONTAL 1"=500'
BY GE FISH

PURE

Ex. 21

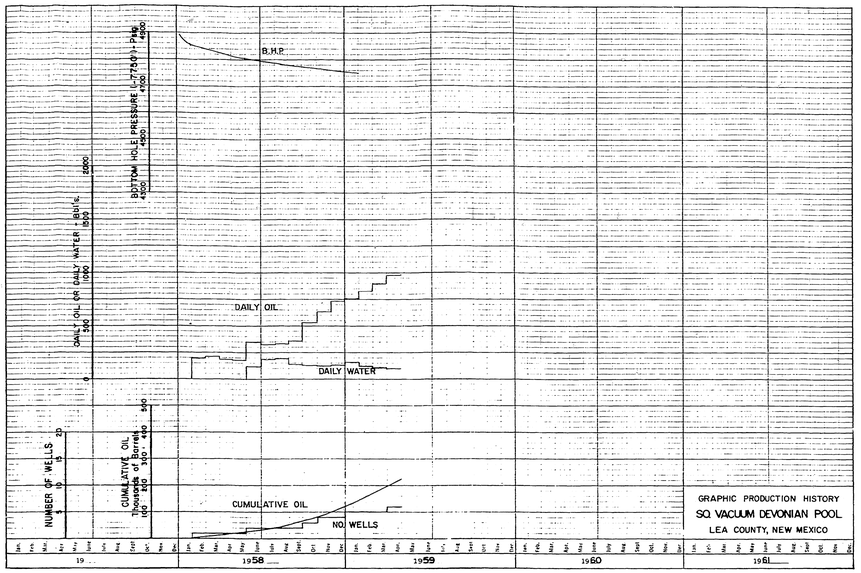
29

SOUTH VACUUM-DEVONIAN POOL PRODUCTION HISTORY
LEA COUNTY, NEW MEXICO
(EXCLUDING SINCLAIR 401 #2)

MONTHLY PRODUCTION

Year	Month	No. Wells	Oil-Bbls.	Water-Bbls.	Gas-MCF	GOR CF/B	BHP(-7750) Psig
1958	January	1	862	0	69	80	4495
	February	1	5,953	0	476		4438
	March	1	6,182	0	495		
	April	1	5,748	0	460		
	May	1	5,691	0	452		4402
	June	2	10,499	3,510	846		
	July	2	9,715	5,580	777		
	August	2	9,873	5,890	790		4388
	September	2	10,601	4,200	859		
	October	3	15,863	4,092	1,269		
	November	4	19,028	3,900	1,282		4376
	December	4	22,064	4,030	1,765		
	Total		122,062	31,202	9,525		
	Cumulative		122,062	31,202	9,525		
1959	January	5	22,865	4,526	1,829		
	February	5	23,129	3,472	1,850		4366
	March	5	28,037	3,413	2,243		
	April	6	29,263	3,049	2,339		

297



3R

3R

T-18S R-35E

T-18S R-36E

T-19S R-35E

Possible Fault

A

A'

South Vacuum Unit

WO Cont. -7880

-7700 -7800 -7900 -8000 -8100 -8200 -8300 -8400 -8500 -8600 -8700

-Legend-

Brown — Bone Spring
Red — Penn
Green — Devonian
Blue — Mc. Kee

Dr. Water Contact, 11-58
Dr. Vacuum Dev. Field Limits
Dr. Vacuum Unit

Map of
South Vacuum-Devonian
Lea County, New Mexico

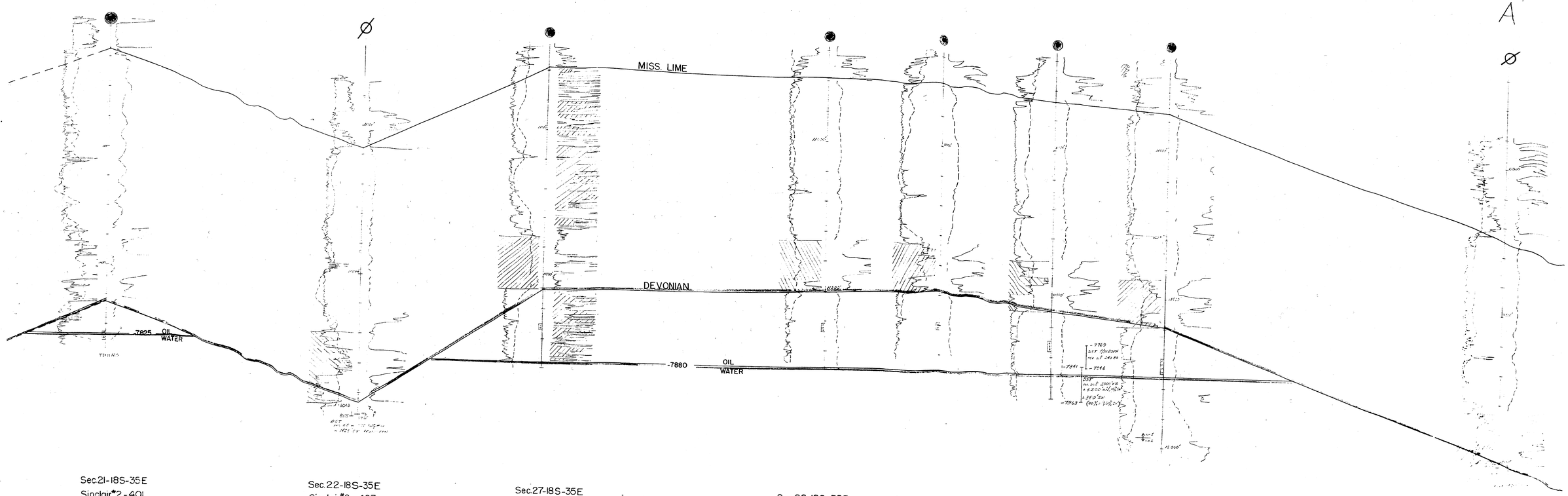
Top of Devonian Structure

Scale 1" = 1000' By S.E. Fitch Date 6-10-58

PURE
EXHIBIT 1.

Case 1134

298

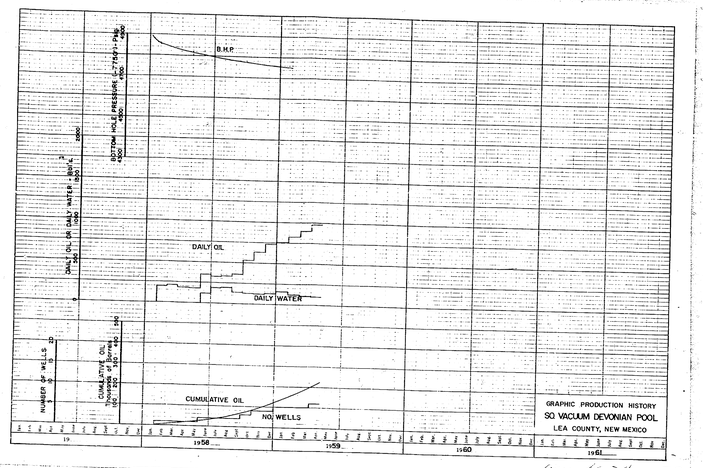


CROSS-SECTION
SOUTH VACUUM POOL
LEA CO. NEW MEXICO
SCALE: VERTICAL 1"=100'
HORIZONTAL 1"=500'
BY: G.E. FISH

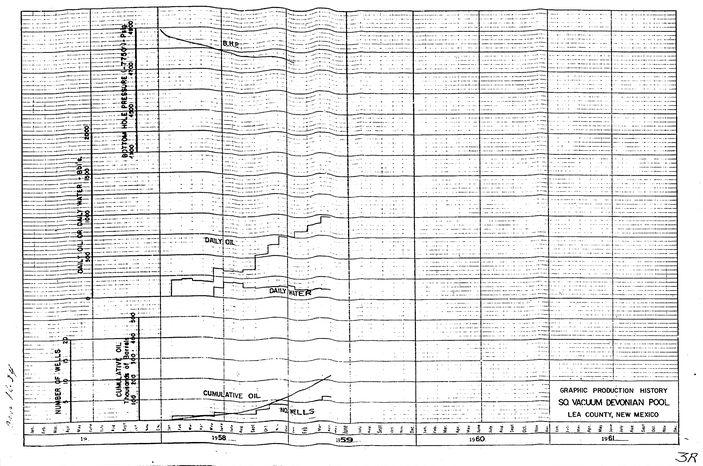
P.R.E

Ex. 2

299



Case 1634 3R



3R

SOUTH VACUUM-DEVONIAN POOL PRODUCTION HISTORY
LEA COUNTY, NEW MEXICO
(EXCLUDING SINCLAIR UNIT #2)

Year	Month	No. Wells	MONTHLY PRODUCTION Oil-Bbls.	Water-Bbls.	Gas-MCF	GOR CF/B	BHP(-7750) Psig.
1958	January	1	862	0	69	80	1895
	February	1	5,553	0	476		1838
	March	1	9,182	0	695		
	April	1	5,748	0	460		
	May	1	9,651	0	652		1802
	June	2	10,479	3,510	840		
	July	2	9,715	5,580	777		
	August	2	9,873	5,890	790		1788
	September	2	10,501	4,200	850		
	October	3	15,853	4,092	1,269		
	November	4	17,408	3,992	1,282		1776
	December	4	22,064	4,630	1,765		
	Total		127,062	31,202	9,525		
	Cumulative		127,062	31,202	9,525		
1959	January	5	22,865	4,526	1,329		
	February	5	23,179	3,679	1,890		1766
	March	5	26,037	3,413	2,763		
	April	6	29,243	3,049	2,339		

BEFORE THE
OIL CONSERVATION COMMISSION
CASE 1634 3R

3R

SOUTH VACUUM UNIT - WELL DATA
LEA COUNTY, NEW MEXICO

	South Vacuum Unit Well No. 1-35	Well No. 2-35	Well No. 3-35	Well No. 1-26
1. Gross Feet of Pay	214	166	203 *	256
2. Net Feet of Pay (Log)	68	43	73	76
3. Avg. Wt'd Porosity Above O/W Contact (Log); Percent	8.0	6.6	6.7	7.7
4. Avg. Wt'd Permeability (Core Analysis); md.	388	178	184	Not Cored
5. From Cored Section Footage w/Greater Than 4% Porosity & 0.1 md.	60	44	26	

Devonian

1. Top of pay to water oil contact @ -7880'.

* Did not penetrate to water oil contact - 58' from TD to WOC - 2' net pay credited below TD.

2,4,3. Picked from Neutron derived or Sonic Log derived porosity curve - 4% or greater porosity.

4. From available core analysis.

5. Net feet from core analysis.

4R

SOUTH VACUUM UNIT - WELL DATA
LEA COUNTY, NEW MEXICO

	South Vacuum Unit Well No. 1-35	Well No. 2-35	Well No. 3-35	Well No. 1-26
1. Gross Feet of Pay	214	166	203 *	256
2. Net Feet of Pay (Log)	68	43	73	76
3. Avg. Wt'd Porosity Above O/W Contact (Log); Percent	8.0	6.6	6.7	7.7
4. Avg. Wt'd Permeability (Core Analysis); md.	388	178	184	Not Cored
5. From Cored Section Footage w/Greater Than 4% Porosity & 0.1 md.	60	44	26	

Devonian

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2,4,3. Picked from Neutron derived or Sonic Log derived porosity curve - 4% or greater porosity.

4. From available core analysis.

5. Net feet from core analysis.

BEFORE THE
OIL CONSERVATION COMMISSION
CASE 1634

4R

PROCEDURE
SOUTH VACUUM UNIT INTERFERENCE TEST
SOUTH VACUUM-DEVONIAN POOL

1. Run 48 hour shut-in bottom hole pressure survey on all wells.

2. Open all wells on normal producing rate except for following:
   a. South Vacuum Unit #2-35 - Leave shut-in.
   b. South Vacuum Unit #3-35 - Produce at twice the normal allowable.

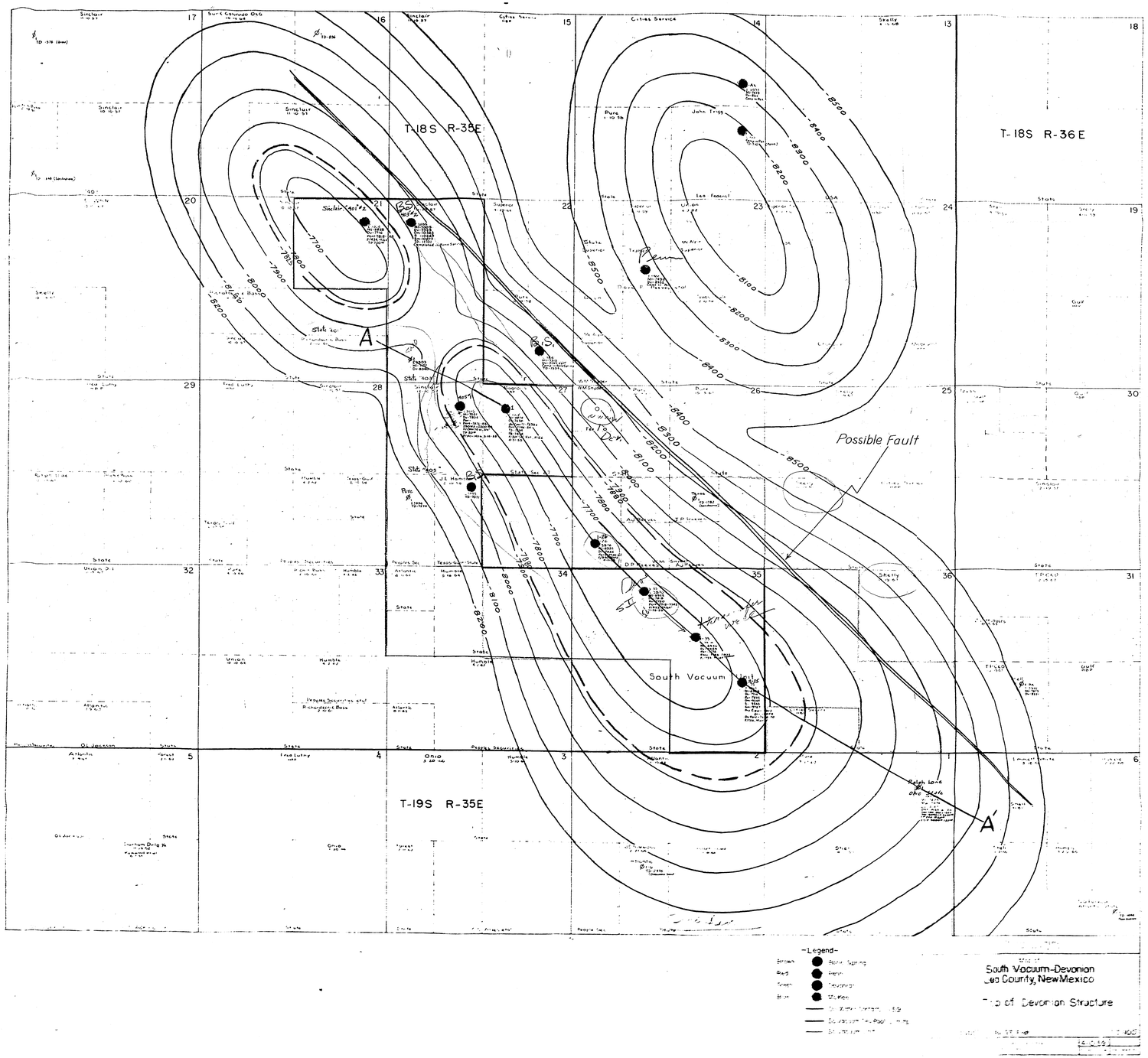
3. Record daily bottom hole pressure on #2-35 for several days.

4. Run static bottom hole pressure survey on all wells at monthly intervals for approximately three months. Run subsequent surveys at three month intervals for remainder of year.

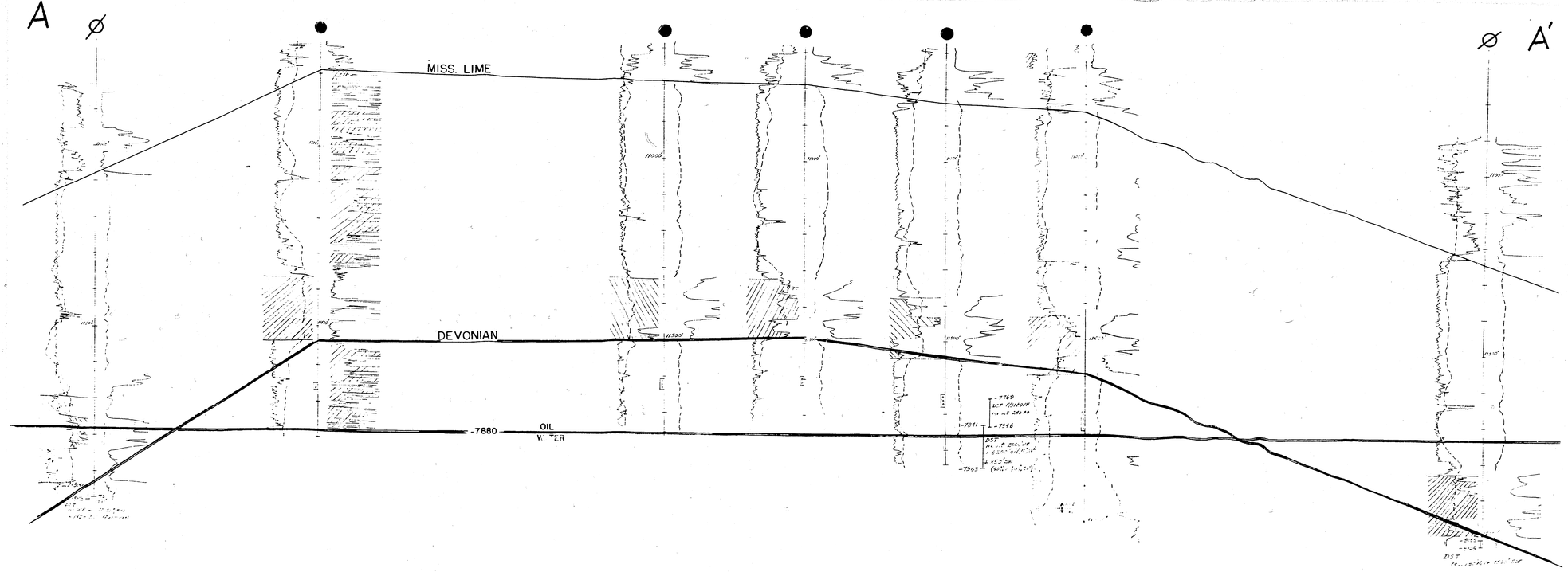
BEFORE THE
OIL CONSERVATION COMMISSION
CASE 1634

5R

300


T-18S R-35E
T-18S R-36E
T-19S R-35E
Possible Fault
South Vacuum Unit
A
A'
-8500
-8400
-8300
-8200
-8100
-8000
-7900
-7800
-7700
-Legend-
Brown
Red
Green
Blue
Rone Spring
Penn
Devonian
Ellenburger
South Vacuum-Devonian
Lea County, New Mexico
Top of Devonian Structure

301



CROSS-SECTION
SOUTH VACUUM POOL
LEA CO. NEW MEXICO
SCALE: VERTICAL 1"=100'
HORIZONTAL 1'=500'
BY: G.E. FISH

2.

3021

RESERVOIR DATA
SOUTH VACUUM (DEVONIAN) POOL
LEA COUNTY, NEW MEXICO

1. PHYSICAL PROPERTIES OF RESERVOIR ROCK

(Based on Core Analysis)

a. Average Porosity - 7.1%

b. Average Permeability - 225 Millidarcys

c. Average Interstitial Water Saturation - 32.5%

d. Net Thickness - 75 feet (Maximum)

2. LITHOLOGY

Grey dense to finely crystalline dolomite with pin-point to large vugs, inter-crystalline porosity, and fracturing.

3. STRUCTURAL FEATURES OF RESERVOIR

Northwest-southeast trending anticline bounded on the northeast flank by steep dip or possible faulting. No original gas cap. Oil-water contact 7880' Sub-sea.

4. CHARACTERISTICS OF RESERVOIR FLUIDS

a. Gravity of Stock Tank Oil - 40° API

b. Saturation Pressure - 382 PSIG

c. Formation Volume Factor - Barrels Reservoir Oil per Barrel Stock Tank Oil

At Original Pressure - 1.051

At Saturation Pressure - 1.088

d. Viscosity of Reservoir Oil - Centipoise

At Original Pressure - .884

At Saturation Pressure - .588

e. Dissolved Gas-Oil Ratio - Cubic Feet per Barrel Stock Tank Oil

At Saturation Pressure - 96

Case 1634 3

South Vacuum (Devonian) Pool
Reservoir Data
Page 2

5. RESERVOIR PRESSURES AND TEMPERATURE

a. Datum Depth - 7750' Sub-sea

b. Original Reservoir Pressure - 4895 PSI

(From drill stem test South Vacuum #1-35 on 1-11-58)

c. Estimated Average Reservoir Pressure 4-15-59 4758 PSI

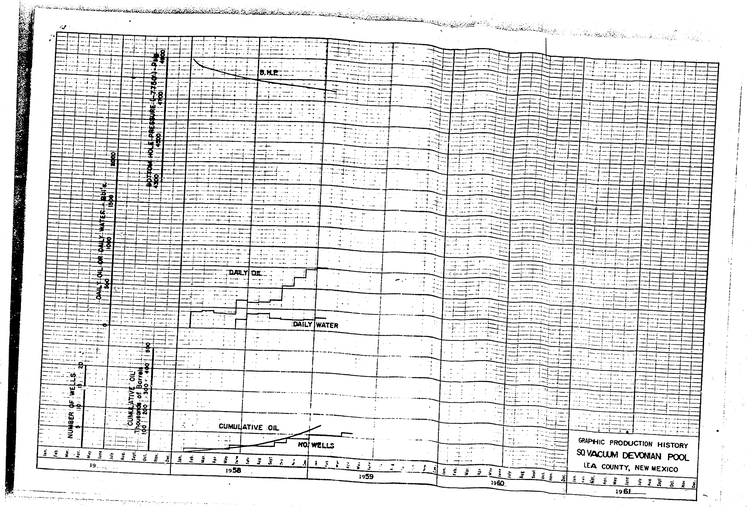
d. Reservoir Temperature - 118° F

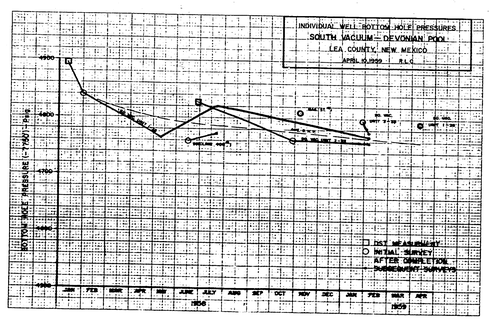
e. Productivity Index - Barrels per Day per PSI Pressure Drop - 4.4

Case 1634 4

SOUTH VACUUM-DEVONIAN POOL PRODUCTION HISTORY
LEA COUNTY, NEW MEXICO
(EXCLUDING SINCLAIR L01 #2)

Year	Month	No. Wells	MONTHLY PRODUCTION Oil-Bbls.	Water-Bbls.	Gas-MCF	GOR CF/B	BHP(-7750) Pres.
1958	January	1	862	0	69	80	4895
	February	1	5,953	0	476		4838
	March	1	5,812	0	465		
	April	1	5,748	0	460		
	May	1	5,651	0	452		4802
	June	2	10,499	3,520	840		
	July	2	9,715	5,580	777		
	August	2	9,873	5,890	790		4788
	September	2	10,621	4,200	850		
	October	3	15,863	4,092	1,269		
	November	4	19,028	3,992	1,522		4776
	December	4	22,064	4,930	1,765		
	Total		122,062	31,202	9,525		
	Cumulative		122,062	31,202	9,525		
1959	January	5	22,855	4,526	1,829		
	February	5					4766





Case 1634 5

INDIVIDUAL WELL BOTTOM HOLE PRESSURES @ 7750' SUB-SEA
SOUTH VACUUM-DEVONIAN POOL
LEA COUNTY, NEW MEXICO

DATE	SO VAC UNIT 1-35 BHP	SO VAC UNIT 1-35 BBLS	SINCLAIR L05 #1 BHP	SINCLAIR L05 #1 BBLS	SO VAC UNIT 2-35 BHP	SO VAC UNIT 2-35 BBLS	MAGNOLIA STATE #1 BHP	MAGNOLIA STATE #1 BBLS	SO. VAC. UNIT 3-35 BHP	SO. VAC. UNIT 3-35 BBLS	SO. VAC UNIT 1-26 BHP	SO. VAC UNIT 1-26 BBLS
1-11-58	4895*	0										
2-1-58	4838	802										
5-9-58	4755	20,441										
6-25-58			4759	4,276								
6-27-58					4828*	0						
7-21-58	4819	33,815	4773	15,301								
10-07-58					4762	5,283						
11-7-58							4810	1,065				
1-28-59									4796	734		
2-3-59									4783	1,704		
2-6-59	4767	73,690			4757	24,788			4775	1,627		
4-13-59											4797	735

* DST Measurements

Note: BBL figures represent cumulative oil and water production from well to date of survey

303

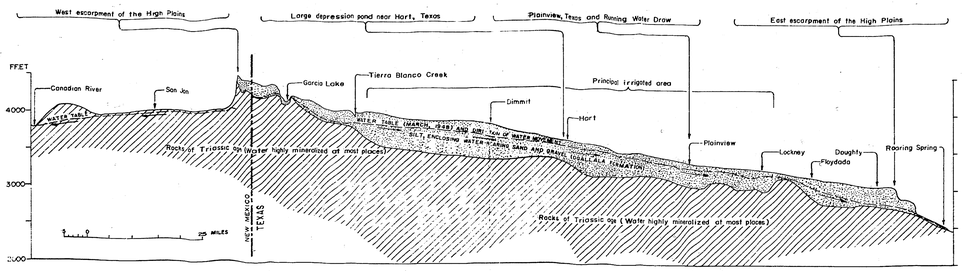


FIGURE 6.8. Crosssection southeastward across the Llano Estacado, New Mexico-Texas*

The dominant water-bearing formation, the Ogallala formation, is a completely isolated reservoir—it terminates at an escarpment on all sides and it is underlain by relatively impermeable rocks (chiefly of Triassic age).

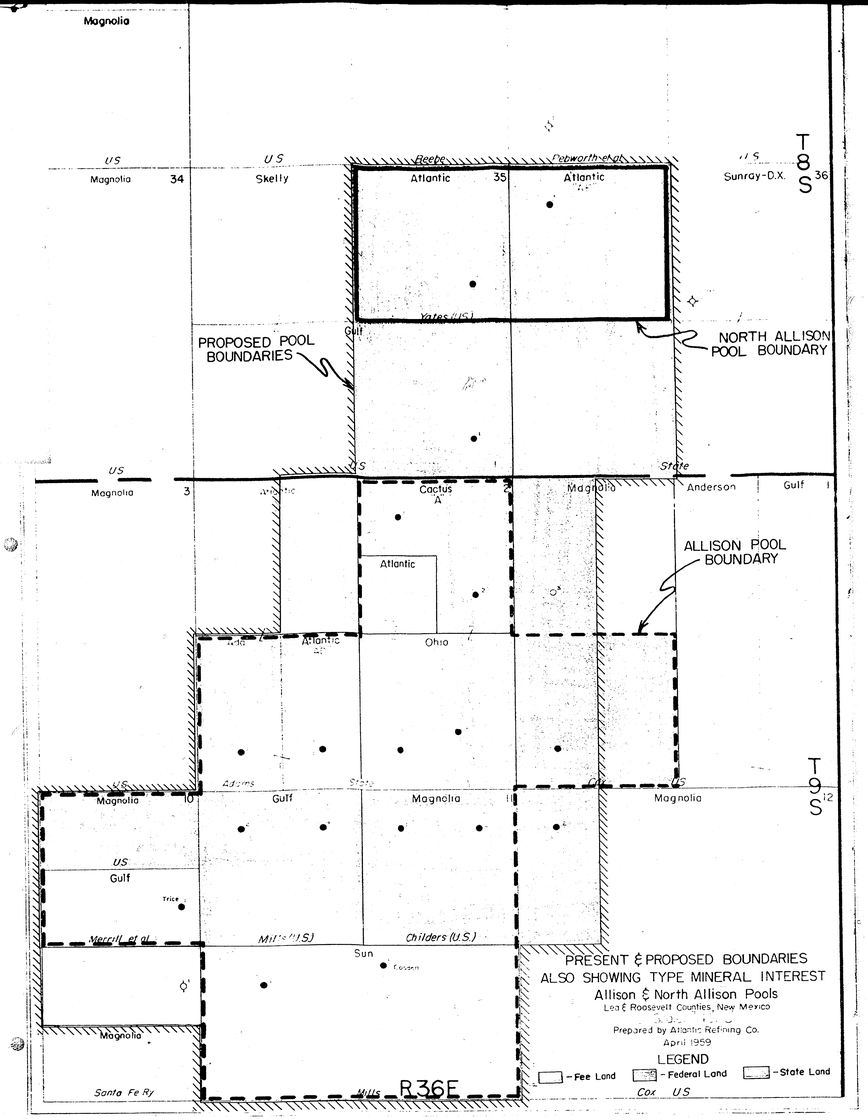
* Copied from pages 100 and 101, "High Plains, or Llano Estacado, Texas-New Mexico" by Carl Gaum; The Physical and Economic Foundation of Natural Resources, Vol. 4, Subsurface Facilities of Water Management and Patterns of Supply -- Type Area Studies.

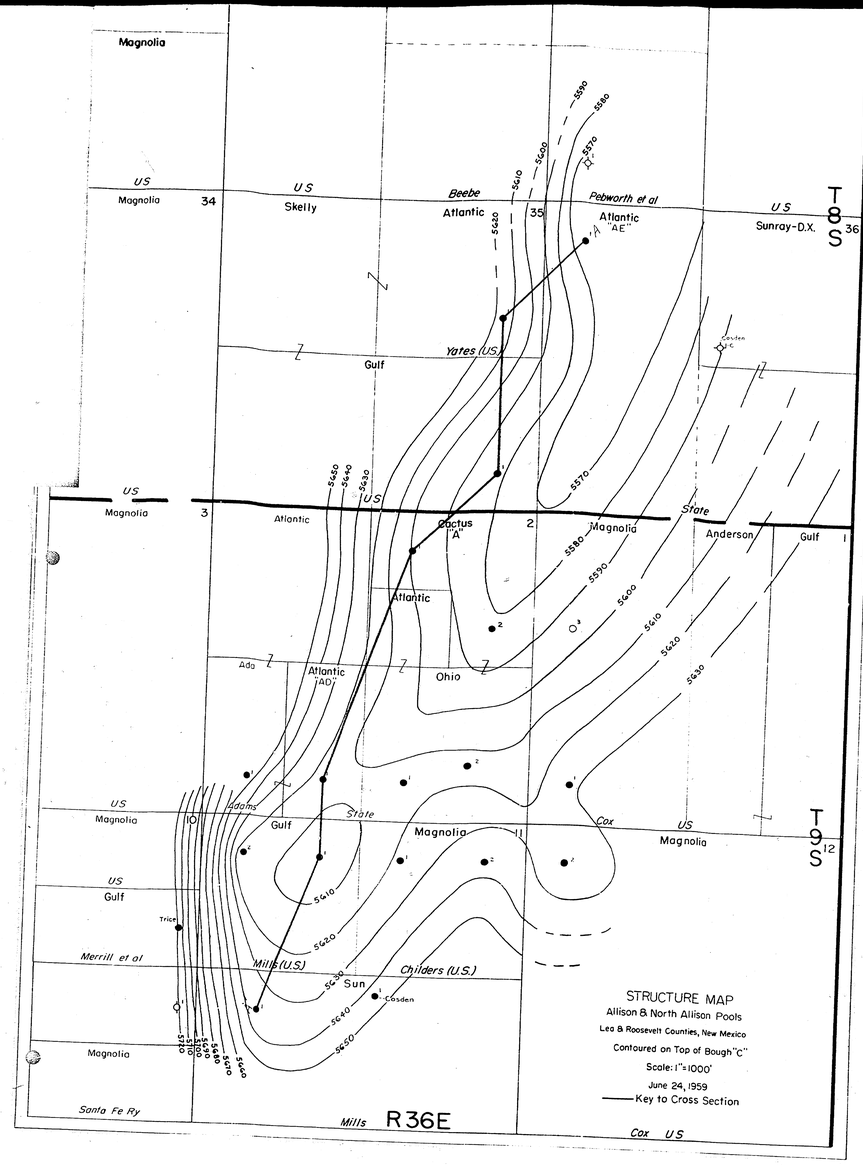
EXHIBITS FOR CASE 1637

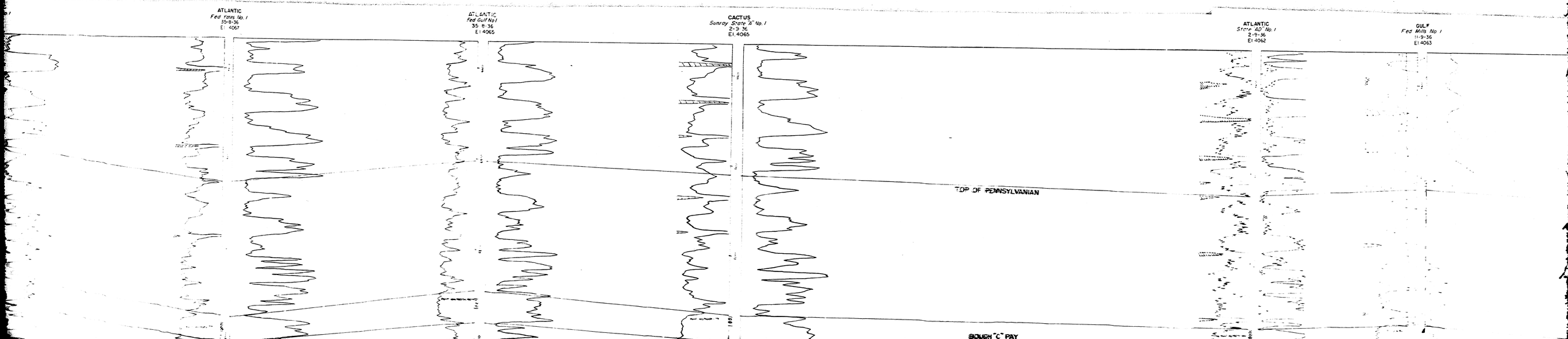
REHEARING OF ATLANTIC'S APPLICATION FOR 80-ACRE SPACING IN ALLISON AND NORTH ALLISON POOLS

July 15, 1959, Regular Statewide Hearing

25





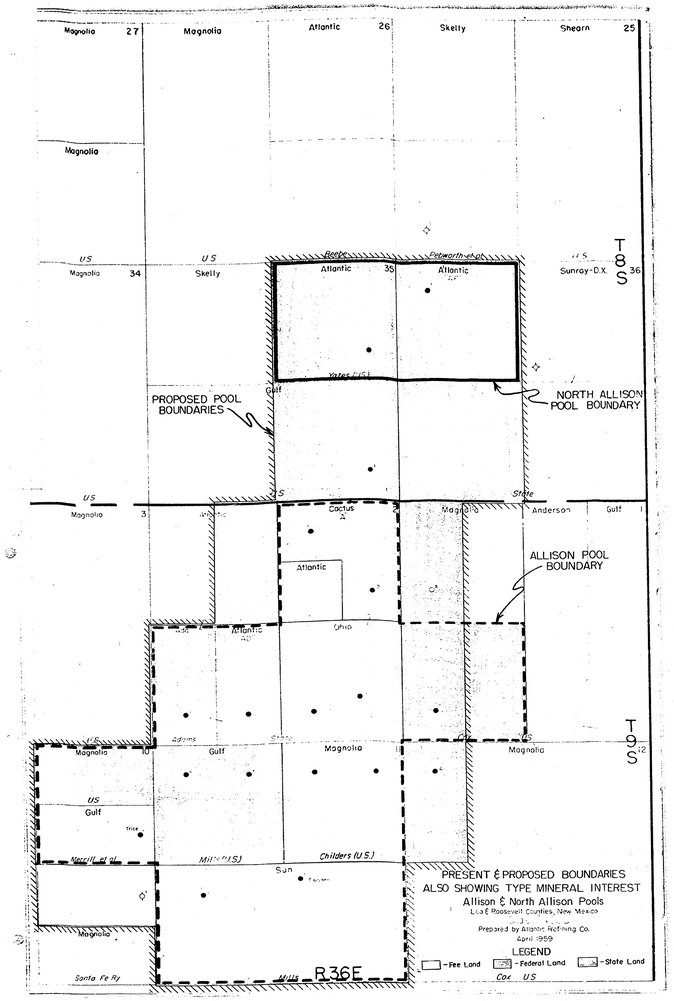


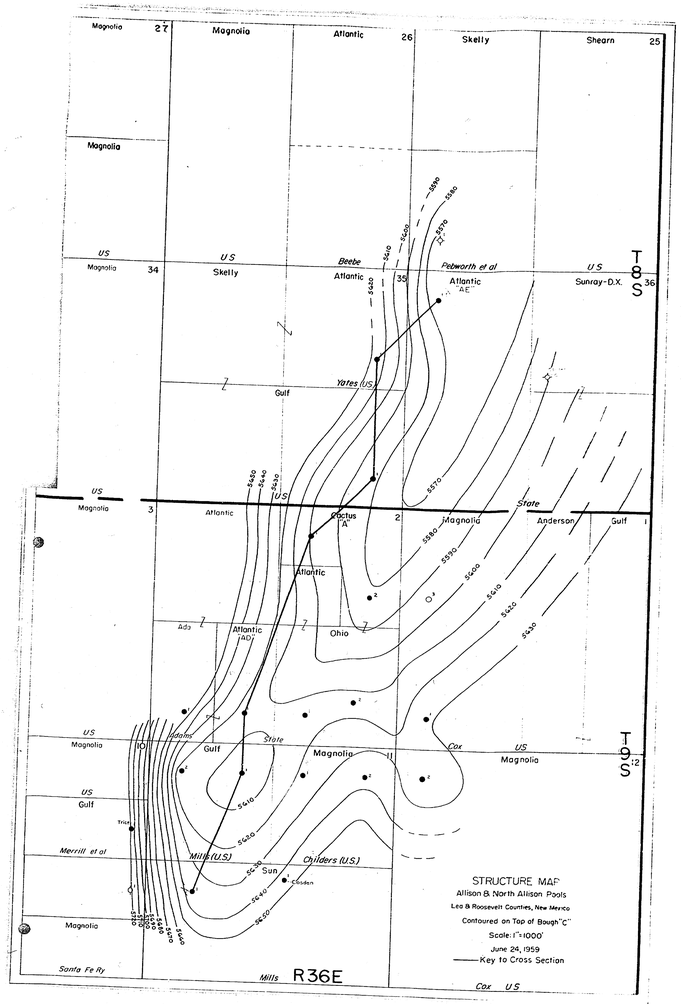
EXHIBITS FOR CASE 1637

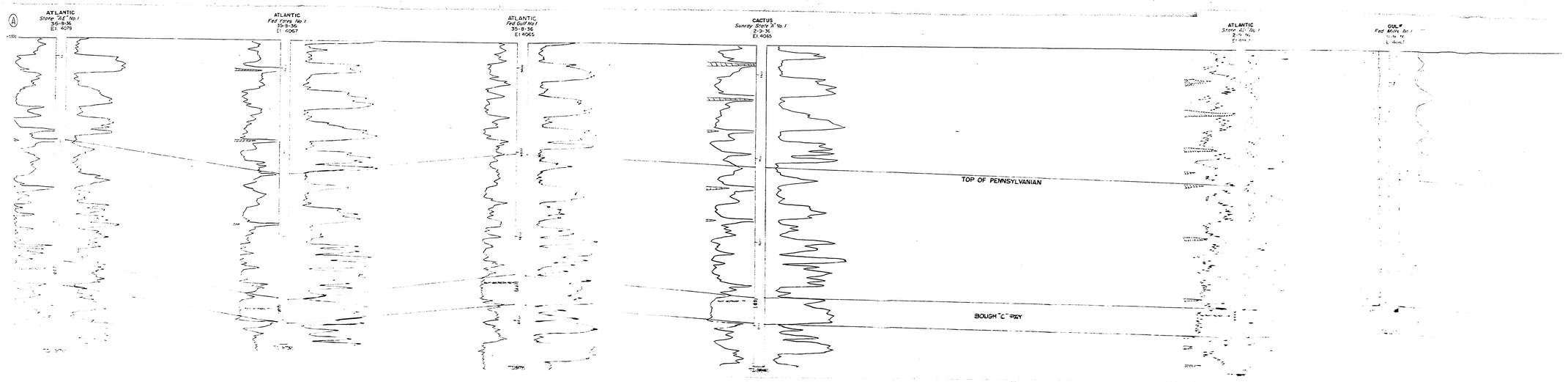
REHEARING OF ATLANTIC'S
APPLICATION FOR 80-ACRE
SPACING IN ALLISON
AND NORTH ALLISON POOLS

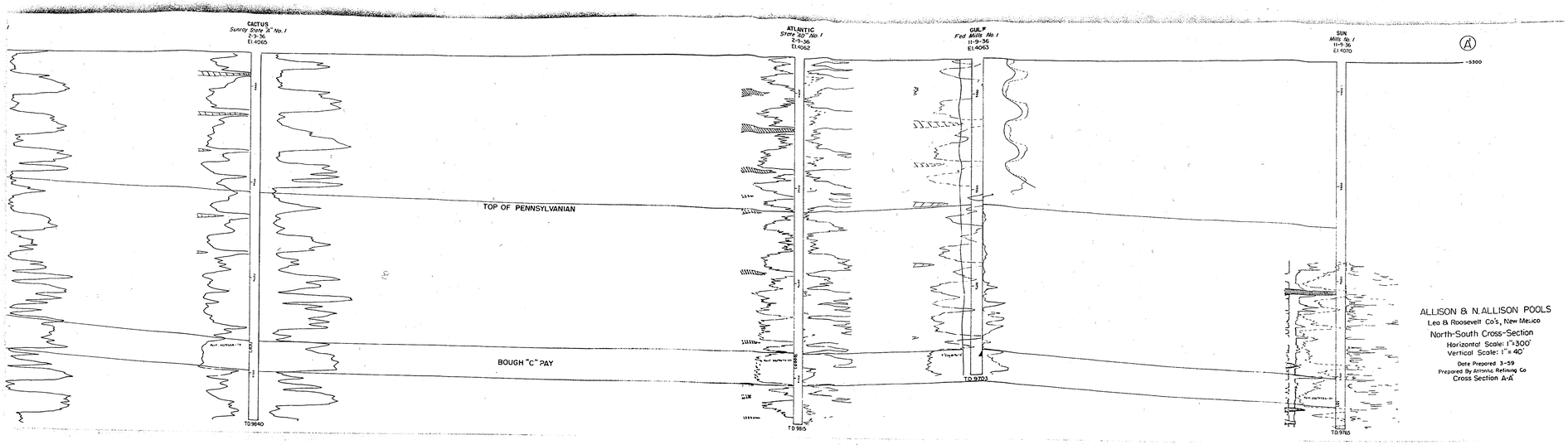
July 15, 1959, Regular Statewide Hearing

305



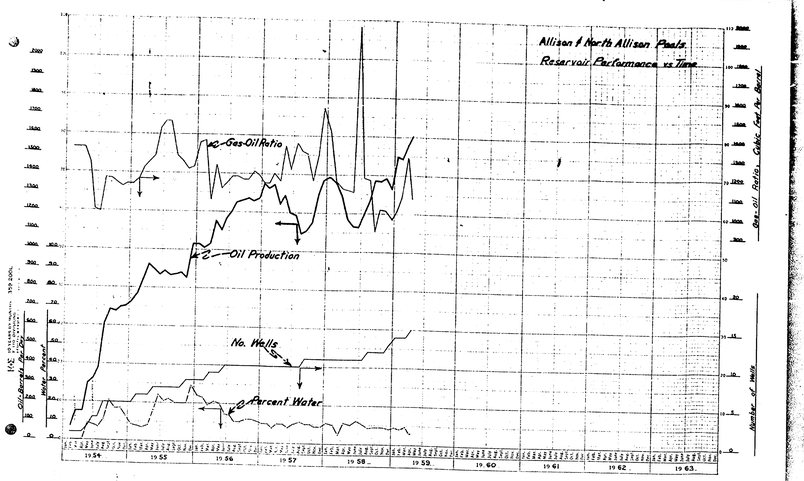


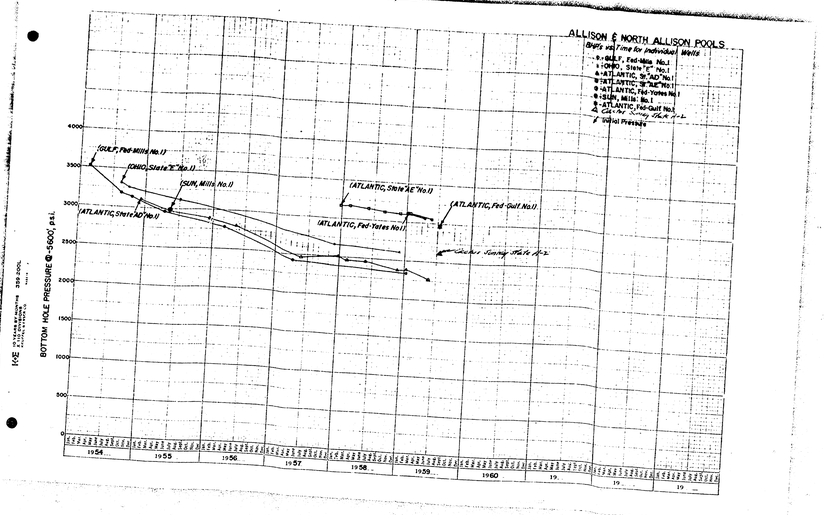




ALLISON & N. ALLISON POOLS
Lea & Roosevelt Co's, New Mexico
North-South Cross-Section
Horizontal Scale: 1"=300'
Vertical Scale: 1"= 40'
Date Prepared 3-59
Prepared By Atlantic Refining Co
Cross Section A-A'

306





BASIC DATA
ALLISON AND NORTH ALLISON POOLS

1. Physical Properties of Reservoir Rock
   - A. Porosity - 5.15% (Avg. of 5 cores)
   - B. Permeability - 107.2 md. (Avg. of 5 cores)
   - C. Saturation - estimated 75% oil, 25% water
   - D. Type of porosity - matrix and vugular
2. Structural Features
   - A. DOC - undetermined
   - B. GOC - none observed
   - C. Gross pay thickness - Bough "C" - 30-50'
   - D. Arithmetic avg. net pay thickness - 8.94'
   - E. Dip - gentle, 100' to 150' per mile
   - F. Anticlinal structure - limits undefined
3. Fluid Characteristics
   - A. Average oil gravity - 45° API
   - B. Salinity of water - 107,316 ppm, NaCl
   - C. Saturation pressure - 3150 psia
   - D. Solution gas-oil ratio - 1517 CF/B at 3150 psia
   - E. Formation volume factor - 1.822 at 3518 psi
   - F. Viscosity of oil - .19 cp at 3150 psi
   - G. Compressibility of saturated oil at 156°F - from 3150 psi to 5000 psi - 23.09 x 10^{-6} vol/vol/psi
4. Pressures And Temperatures
   - A. Original pressure - 3518 psig
   - B. Reservoir temperature - 156°F
   - C. January, 1959, weighted average pressure at -5600' - 2734 psig (Shut-in from 72 hours to 168 hours prior to test.)
   - D. Average productivity index - 5.01 (Ranges 2.22 - 11.08)
5. Statistical Data
   - A. Oil production rate - 47,447 barrels for April, 1959
   - B. Cumulative oil production to 5-1-59 - 1,998,553 barrels
   - C. Average GOR - see graph
   - D. Water production - see graph
   - E. Well count - 15 producing, 1 drilling, 2 dry
6. Well Completion Methods - Casing Perforations Most Common
7. Area Within Recommended Boundary - 2320 Acres
8. Average Well Density - 80 Ac/Well
9. Disposition of Gas for Month of April, 1959
   - A. Vent - FELD ECP
   - B. Lease - 33% ECP
   - C. Sold - 47,182 MCF (Sinclair, Magnolia, Phillips)

ALLISON POOL
LEA COUNTY, NEW MEXICO
SUMMARY OF CORE ANALYSES

OPERATOR:	Gulf	Gulf	Magnolia	Magnolia	Magnolia	Average
LEASE and WELL:	Fed. Mills #1	Fed. Mills #2	Fed. Childers #1	Fed. Childers #2	Fed. Cox #2	-
PAY INTERVAL FROM CORE:	9677-9695'	9694-9705.3'	9687-9704'	9692-9717'	9708-9711.2'	-
NET PAY FROM CORE:	11.0'	9.4'	1.5'	10.4'	3.2'	7.7'
WEIGHTED AVERAGE POROSITY:	6.7%	8.1%	1.8%	3.5%	1.3%	5.15%
WEIGHTED AVERAGE PERMEABILITY:	301 md.	80.6 md.	.7 md.	6.0 md.	.3 md.	107.2 md.

307

NET PAY BY WELLS
ALLISON AND NORTH ALLISON POOLS

OPERATOR, LEASE & WELL	NET PAY, FT.
Ada Oil Co.	
Adams St. No. 1	6
Atlantic Refining Co.	
Federal-Gulf No. 1	20
Federal-Yates No. 1	9
State "AD" No. 1	4
State "AE" No. 1	13
Cactus Drilling Co.	
Survey State "A" No. 1	10
Survey State "A" No. 2	4
Gulf Oil Corp.	
Mills (Fed.) No. 1	11
Mills (Fed.) No. 2	9
Magnolia Petroleum Co.	
Childers (Federal) No. 1	7
Childers (Federal) No. 2	12
Cox (Federal) No. 1	7
Cox (Federal) No. 2	3
Ohio Oil Co.	
State "A" No. 1	5
State "A" No. 2	10
Sun Oil Co.	
R. G. Mills No. 1	9
Price Production Co.	
Merrill No. 1	13

Arithmetic Average Thickness - 8.94'

VOLUMETRIC CALCULATION
FOR OIL IN PLACE - 40 ACRE TRACT
ALLISON AND NORTH ALLISON POOLS
LEA AND ROOSEVELT COUNTIES, NEW MEXICO

$$N_1 = \frac{7758 \times \phi \times (1 - Sw) \times h \times A}{B_o}$$

$$= \frac{7758 \times .0515 \times (1 - .25) \times 8.94 \times 40}{1.822}$$

$$= 58,814 \text{ barrels}$$

A recovery factor of 30% is believed to be reasonable for the Allison and North Allison Pools. Recoverable oil per 40-acre location would therefore be:

Recoverable oil = .30 x N_1

= .30 x 58,814 barrels

= 17,662 barrels

Definition of Symbols:

N_1 = Original oil in place per 40 acre tract, stock tank barrels

ϕ = Porosity as a fraction, .0515

Sw = Interstitial water saturation, fraction of pore space = .25

h = Net pay thickness, feet - 8.94

A = Area for which oil in place is being calculated - 40 acres

B_o = Original oil formation volume factor, barrels of reservoir space per barrel of stock tank oil - 1.822

7758 = Number of barrels per acre-foot

VARIATIONS REQUIRED IN APPLIED DATA TO ACCOUNT FOR OIL PRODUCED
GULF MILLS NO. 1 WELL
ALLISON POOL

Estimated Recoverable Oil For 40 Acre Tract Assigned To Gulf's Federal Mills No. 1 is:

Recoverable Oil = $\frac{7758 \times \phi \times A \times h \times (1-Sw) \times R.F.}{B_o}$

= $\frac{7758 \times .067 \times 40 \times 11 \times (1-.25) \times .30}{1.091}$

= 28,258 STB

RF is the recovery factor and is estimated to be 30%. Other symbols in the above equation are defined on the Exhibit showing volumetric calculations for oil in place.

The measured oil production from Gulf's Federal Mills No. 1 was 273,437 barrels as of May 1, 1959. The tabulation below shows what each variable in the above equation would have to be to account for the volume of oil actually produced from the tract as of May 1, 1959, if all variables but one are equal to their applied values. In reviewing this Table, it should be remembered that 28,258 STB is the estimated ultimate recovery of oil that was originally situated beneath the 40-acre tract. The 273,437 barrel figure is what the well has actually produced and of course the well is still producing. An even greater variation in the applied values and required values would exist if the required values were based on actual ultimate recovery.

	Applied Values	Required Values
Net Pay	11 Feet	100.2 Feet
Porosity	6.7%	61.8%
Recovery Factor	30%	299.3%
Water Saturation	25%	*0%
Formation Volume Factor	1.821	0.188

All applied values are measured except water saturation and recovery factor. Water saturation usually occurs between 15% and 40% but cannot be less than 0%. Recovery Factor will occur normally between 15% and 50%.

ECONOMICS OF DRILLING ONE WELL PER 40 ACRES
IN ALLISON AND NORTH ALLISON POOLS

REVENUE	
Oil	
(17,662) (1.0 - .125) (2.95) =	$ 45,566
Less Severance Taxes At 7.2369/30 =	5,116
Gross Oil Revenue Less Severance Taxes =	$ 40,451
Gas	
(17,662) (1.0 - .125) (3.540) (*0.08) =	$ 4,374
Less Severance Taxes At 0.026¢ Of Value =	115
Gross Gas Revenue Less Severance Taxes =	$ 4,259
Total Gross Revenue Less Severance Taxes =	$ 47,710
COSTS	
Development	
Drilling =	$ 125,000
Pumping Equipment =	30,000
Flow Lines =	1,000
Total Development Costs =	$ 156,000
Operating	
(*0.08) (17,662) =	$ 1,412
Total Costs =	$ 157,412
Loss Per 40-Acre Well =	$ 160,302

CONDITIONS	
Recoverable Oil In Place Per 40 Acres =	17,662 barrels
Average Gas-Oil Ratio Throughout Life =	3,540 cubic feet per bbl.
Oil Price =	$ 2.95 per barrel
Casinghead Gas Price =	$ 0.08 per MCF
Operating Cost =	$ 0.08 per barrel
Royalty =	1/8
All Wells Completed At Same Time	

RESULTS OF INVESTIGATION OF DRAINAGE
ALLISON AND NORTH ALLISON POOLS

CASE	I	II	III
OPERATOR	Atlantic	Ohio	Cactus
WELL	Fed. Yates #1	State B-6859"A"#2	Survey St. "A" #1
LOCATION	26 FE Sec. 35	SE SE Sec. 2	NW NE Sec. 2
	T-8S, R-36E	T-9S, R-36E	T-9S, R-36E
OIL IN PLACE BY VOLUMETRIC CALCULA-TION 80 AC., STB	118,470	122,959	112,959
CALCULATED PENETRATION BY EXPANSION OF RESERVOIR FLUIDS & ROCK ABOVE BUBBLE POINT, FEET (3321-3150 psi), STB	1,111	1,588	1,588
CALCULATED PENETRATION BY EXPANSION OF RESERVOIR FLUIDS BELOW BUBBLE POINT, STB	1,815	12,204	6,131
DEPTH TO BOTTOM OF OIL COLUMN, FEET, SUBSEA	3150-3159	3150-2602	3150-2803
TOTAL PENETRATION OF OIL COLUMN BY DRAINAGE, STB	3,225	13,792	7,719
PENETRATION BY DRAINAGE, % OF TOTAL OIL IN PLACE	11.953	121,397	29,453
PENETRATION BY DRAINAGE, ACRES	11.82	111,607	12.334
DEPTH OF PENETRATION, FEET	385	725	230

SAMPLE CALCULATION
FOR PRODUCTION DUE TO EXPANSION OF RESERVOIR FLUID & ROCK--80 ACRE TRACT SITUATED ABOUT ATLANTIC'S FEDERAL YATES NO. 1

Calculation of original oil-in-places

$$N_1 = \frac{7758 \times \phi \times h \times (1-Sw) \times A}{B_o}$$

$$= \frac{7758 \times .0515 \times 9 \times (1-.25) \times 80}{1.822}$$

= 118,470 Stock Tank Barrels

Calculation of production due to expansion of reservoir fluids and rock above the bubble points:

Pressure increased is from 3518 psi down to 3150 psi.

$$\Delta N = \frac{N_{f1} B_{o_1} \left[(C_{om} - C_{wm}) - \left(\frac{S_{wm}}{S_{om}} \right) C_f \right] \Delta P \times 10^{-6} - B_o \Delta S_o}{B_{o_2}}$$

$$= \frac{118,470 \times 1.822 \left[(23.09 - 3.1) + \left(\frac{2.2 + 6.6}{.75} \right) 3 \right] 368 \times 10^{-6} - 0}{1.837}$$

= 1134 STB

Calculation of production due to reservoir fluid expansion below the bubble points:

Pressure increased is from 3150 psi down to 3059 psi. The latter pressure was measured on April 21, 1959.

OCI in place at bubble point is 122,959 bbls - 1134 bbls = 121,825 STB

Since gas liberation in the reservoir is a differential process, the barrels of stock tank oil-in-place must be changed to residual differential barrels. This is done as follows:

$$N_2 = N_1 \frac{B_{od}}{B_{ob}}$$

$$= 122,956 \left(\frac{1.588}{1.822} \right)$$

= 115,404 Residual Differential Barrels

Page 2

Differential reservoir production below the bubble point is as follows:

$$\Delta N_2 = N_{f1} \left[\frac{B_{od}(R_{sd_1} - R_{sd_2}) + B_{g_2}\left(\frac{S_{gr}}{S_{or}}\right)(R_{sd_1} - R_{sd_2}) - (R_{sd_1} - R_{sd_2})}{(R_{sd_1} - R_{sd_2} + \frac{B_{o_2}}{B_{g_2}}\left(\frac{S_{or}}{S_{gr}}\right))} \right] - B_{o_2} \Delta S_o$$

$$= 115,404 \left[\frac{.826 (1.595 - 1.485) + 0 - (1.860 - 1.831)}{(1.831 - .826 \times 1.105 + .826 \times 1.860)} \right] - 0$$

= 1790 RDB

The above differential production can be converted to flash production as follows:

$$\Delta N_f = \Delta N_2 \left(\frac{B_{od}}{B_{ob}} \right)_2 = 1790 \left(\frac{1.588}{1.837} \right) = 1815 \text{ STB}$$

Note: Flash production is considered to be equivalent to stock tank production.

Total calculated production from original reservoir pressure to 3059 psi is:

1134 STB + 1815 STB = 2949 STB

Nomenclature for Material Balance Calculations

- a = $P_{sc}T/Z \cdot P_{sc}$ (RVB)/(PSIA)/(DEGF)
- B_{od} = Flash PVT basis, oil formation volume factor, RVB/STB
- B_{ob} = Differential PVT basis, oil formation volume factor, RVB/RDB
- B_g = Gas formation volume factor, RVB/MSCF
- B_w = Water formation volume factor, RVB/STB
- c_o = Oil compressibility, RVB per MMRVB per PSI
- c_w = Water compressibility, RVB per MMRVB per PSI
- c_f = Formation (rock) compressibility, RVB per MMRVB per PSI
- c_t = Total (average) compressibility of fluid-rock system, RVB per MMRVB per PSI
- G_{fi} = Total reservoir gas in-place (differential PVT basis) at pressure P_i, MSCF (In retrograde systems below the dew point this is the gas equivalent of both the gas and liquid phases in the reservoir; total cubic in-place times conversion factor from mols to standard cubic feet.) (In oil reservoirs this is the sum of the free gas and the gas in solution.)
- ΔG_p = Decrease in total (differential) gas in-place over interval, MSCF
- G_{fp} = Reservoir free gas in-place at pressure P_p, MSCF
- ΔG_p = Reservoir free gas produced over an interval, MSCF
- ΔG_{pc} = Reservoir gas production over interval, MSCF (For non-volatile oil reservoirs and gas reservoirs, this is the actual reservoir gas produced. For volatile oil reservoirs, this is the reservoir gas which would be obtained if there were no liquid condensing out from the reservoir free gas produced.)
- ΔG_s = Total surface gas production over interval, MSCF
- ΔG_f = Natural reservoir gas produced over interval (for volatile oil systems), MSCF
- $\left(\frac{G}{N}\right)_R$ = Total reservoir free gas production to yield one stock tank barrel of condensate (for volatile oil systems), MSCF/STB.
- $\left(\frac{G}{N}\right)_p$ = Reservoir gas obtained from a unit of total reservoir free gas produced (for volatile oil systems), SCF/RDF

Page 2

- ΔG_{fi} = Reservoir gas equivalent of separator liquid (for gas reservoirs), MSCF
- $(GE)_{fi}$ = Equivalent "reservoir gas" of separator liquid per stock tank barrel of oil production (for gas reservoirs), MSCF/STB. (This is the mols factor from mols to standard cubic feet. This is usually for the high pressure separator liquid. If the reporter has included the low pressure separator gas, this is for the low pressure separator liquid.)
- N_{fi} = Flash oil in-place at pressure P_i, STB (Reservoir oil volume in-place divided by flash formation volume factor.)
- ΔN_f = Decrease in flash oil in-place over interval, STB
- N_{di} = Differential oil in-place at pressure P_i, RDB (Reservoir oil volume in-place divided by differential formation volume factor.
- ΔN_d = Decrease in differential oil in-place over interval, RDB
- ΔN_p = Surface oil production over interval, STB For volatile oil reservoirs this is the oil condensed out from the reservoir free gas produced. For non-volatile oil reservoirs and for gas reservoirs this is the total stock tank oil production.
- ΔN_c = Oil which condenses out of reservoir free gas production (for volatile oil systems), STB
- ΔN_o = Actual oil production over interval (for volatile oil systems), STB ($\Delta N_o = \Delta N_p - \Delta N_c$)
- n = No.-mols of hydrocarbons in-place in reservoir
- P = Average reservoir pressure, PSIA (for oil reservoirs, this is the bubble point pressure)
- Δp = Reservoir pressure decrease during interval, PSI
- P_{sc} = Standard pressure, PSIA (14.7 for most states in southwest - 15.025 PSIA)
- R_{sd} = Flash PVT basis, solution gas-oil ratio, MSCF/STB
- R = Gas constant (for gas reservoirs = 10.73 (cu.ft.)(PSIA) per mol (deg. abs.))
- S_{gr}/S_{or} = Gas in solution to separator liquid, MSCF/STB
- R_{sd} = Differential PVT basis, solution gas-oil ratio, MSCF/STB

Page 3

S_o = Oil saturation, fraction of total pore space

S_w = Water saturation, fraction of total pore space

T = Reservoir temperature, °R = (°F plus 460)

T_{sc} = Standard temperature, °R (T_{sc} = 520 °R)

V = Volume, ft^3

V_p = Total pore space in reservoir, MMRB

V_g = Reservoir hydrocarbon volume (for gas reservoirs), MMRB

W_{i1} = Water in place at pressure p_1, MMRB

ΔW_e = Water influx (encroachment) over interval, MMRB

ΔW_p = Water production over interval, MMRB

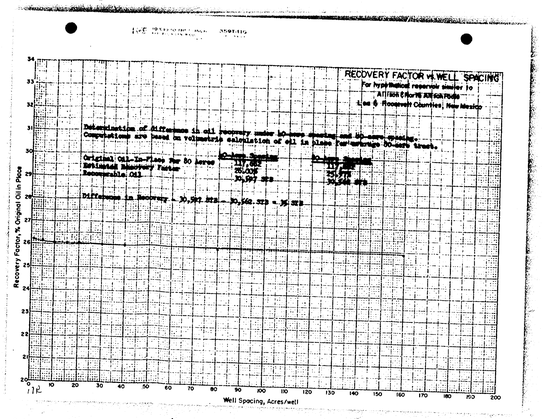
z = Compressibility factor in pV = nzRT, gas equation (For retrograde systems below the dew point this is for the average hydrocarbons in place, gas plus liquid phases.)

sub m = To refer to average pressure over an interval or to value of a PVT factor at average pressure over an interval.

sub b = To refer to bubble point pressure.

sub 1 = To refer to pressure, in-place values, and PVT factors, at start of an interval.

sub 2 = To refer to pressure, in-place values, and PVT factors, at end of an interval.



ADDITIONAL COST TO DEVELOP
ALLISON AND NORTH ALLISON POOL
ON 80 ACRES

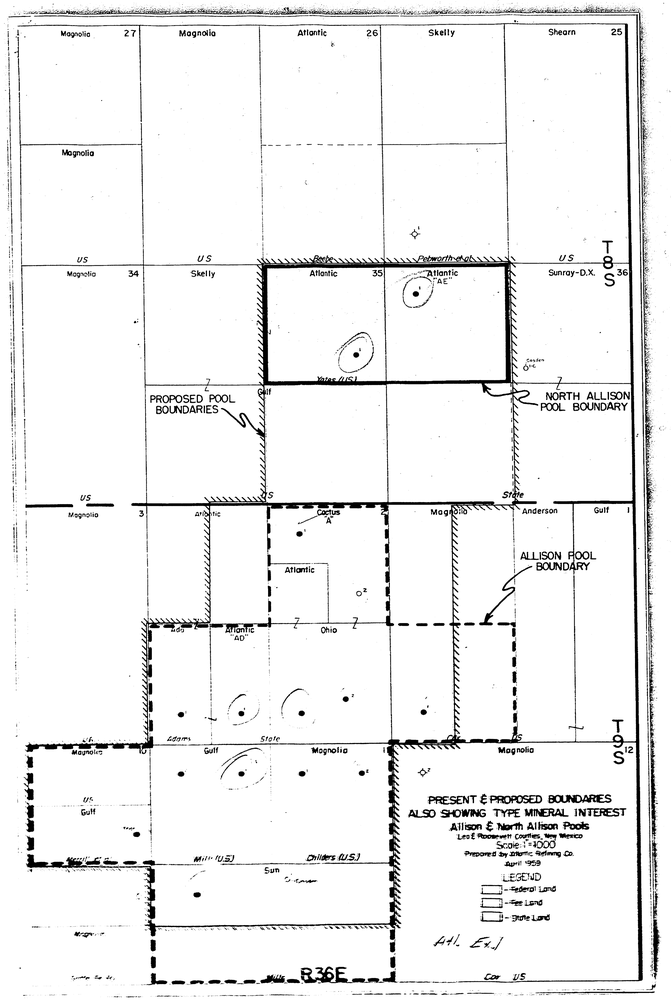
29 Additional Wells on 80-Acre Spacing.

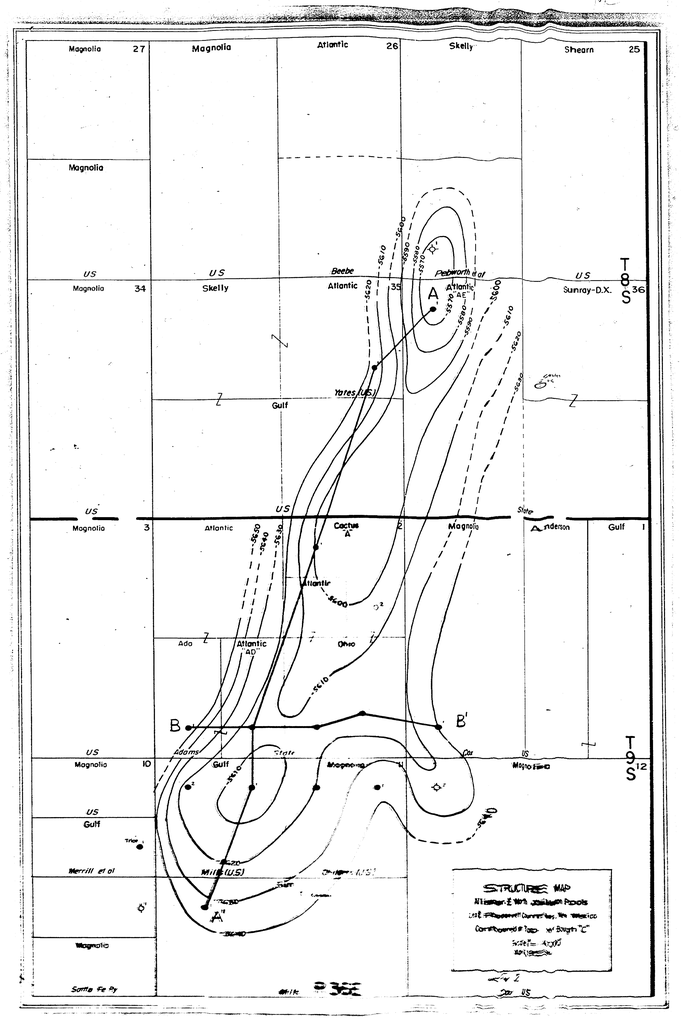
Each costs $175,000 to drill
Flow lines 5,600
Pumps 30,000
$210,600

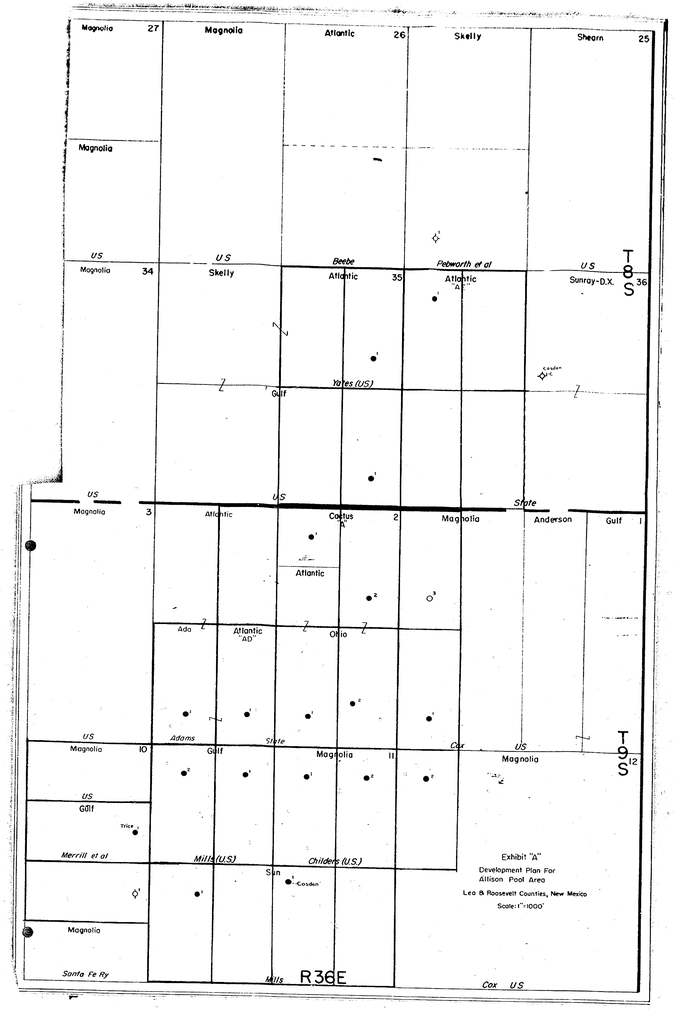
29 x 210,600 = $6,107,400

Additional Pool Recovery on 80-Acre Spacing:

29 wells x 35 bbls/well = 1015 STB additional recovery for pool







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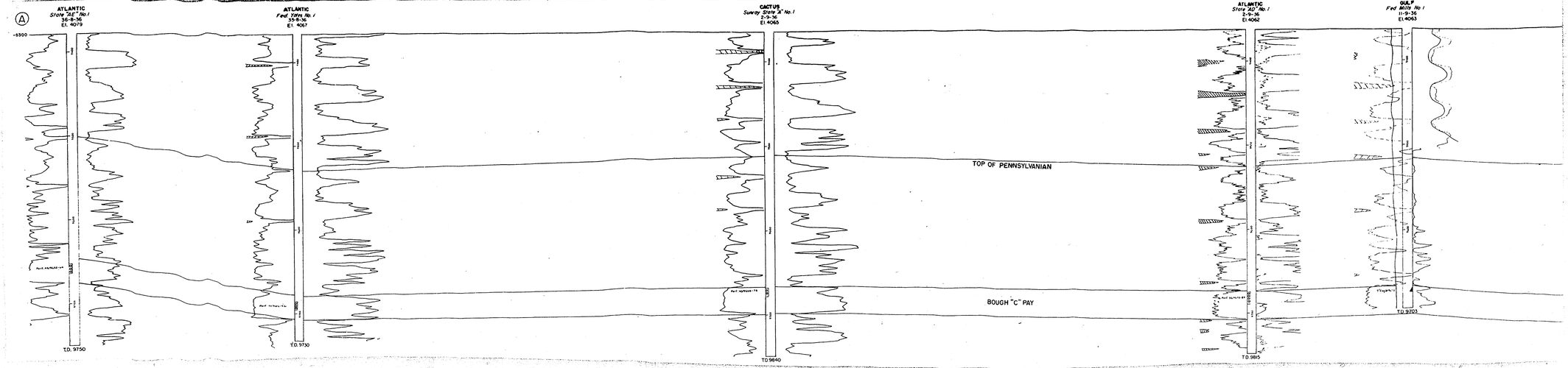
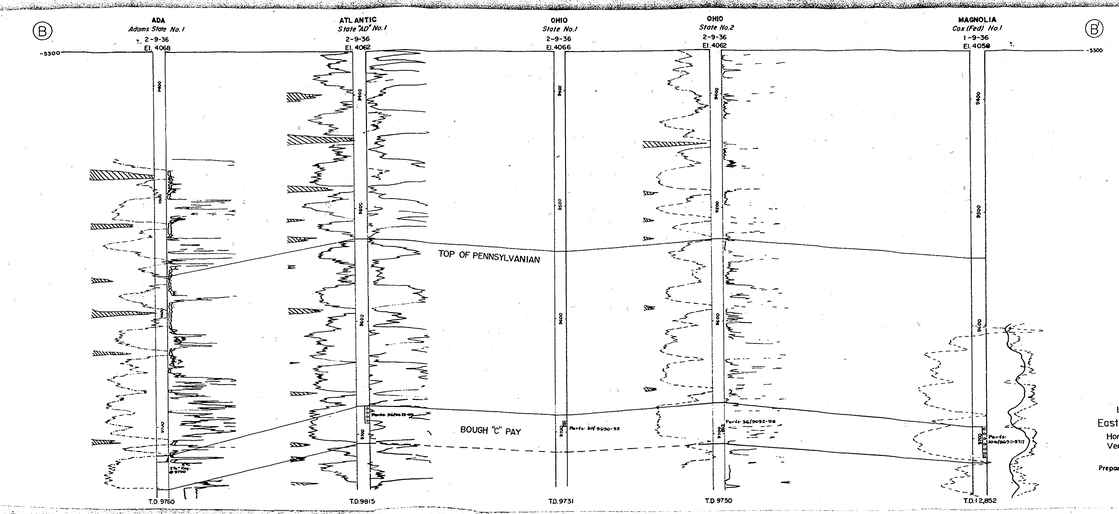
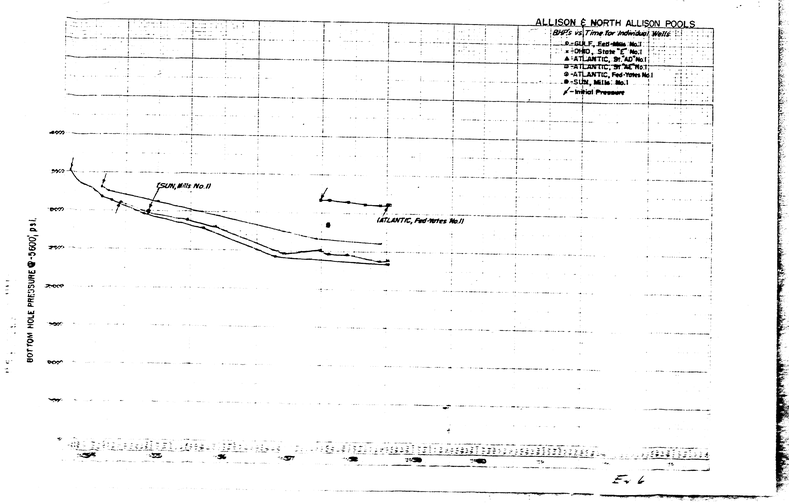




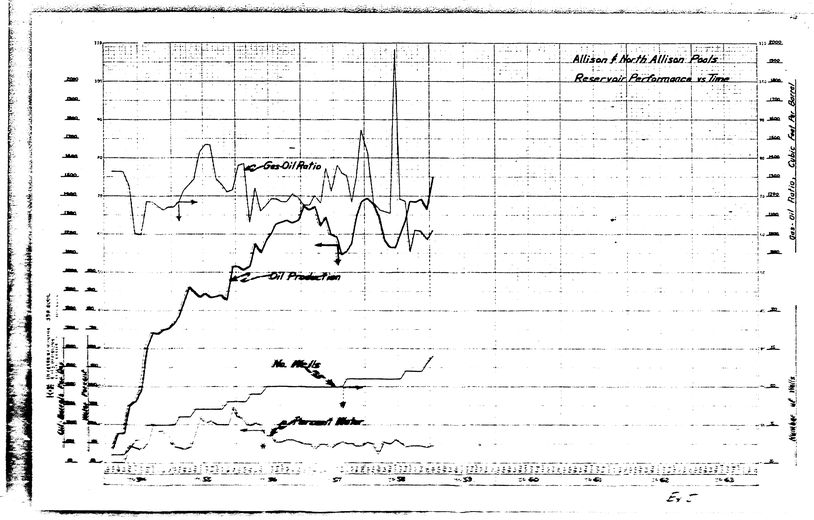
ALLISON POOL
Lea County, New Mexico
East-West Cross-Section
Horizontal Scale: 1" = 300'
Vertical Scale: 1" = 40'
Date Prepared 3-59
Prepared By Atlantic Refining Co.
Cross Section B-B'

Ex. 4

309



Ex. 6



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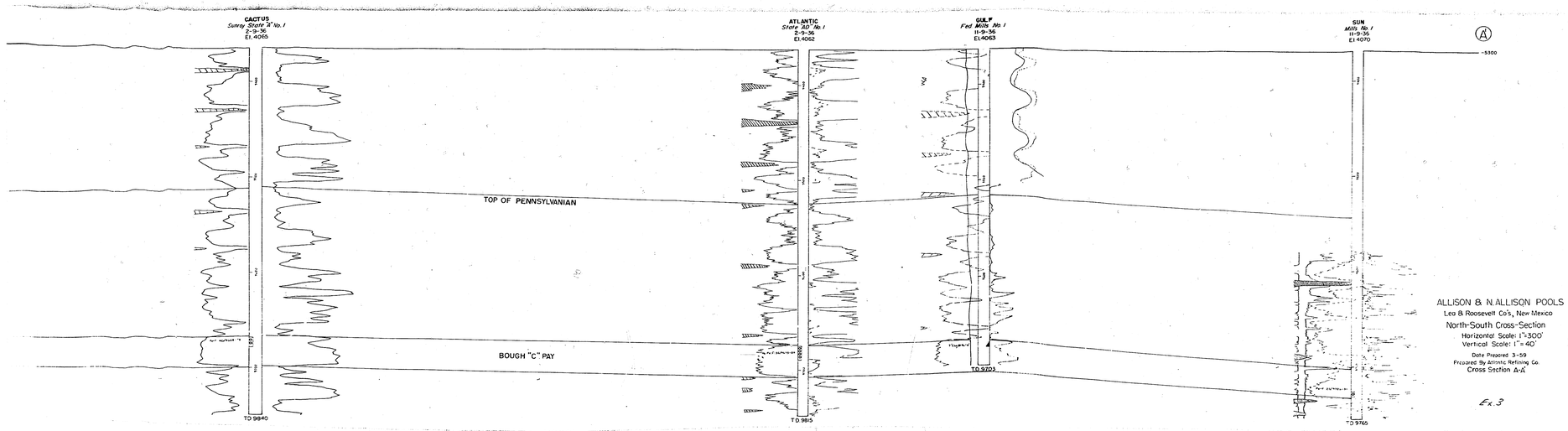


ALLISON & N. ALLISON POOLS
Lea & Roosevelt Co's, New Mexico
North-South Cross-Section
Horizontal Scale: 1"=300'
Vertical Scale: 1"=40'
Date Prepared 3-59
Prepared By Atlantic Refining Co.
Cross Section A-A'

Ex 3

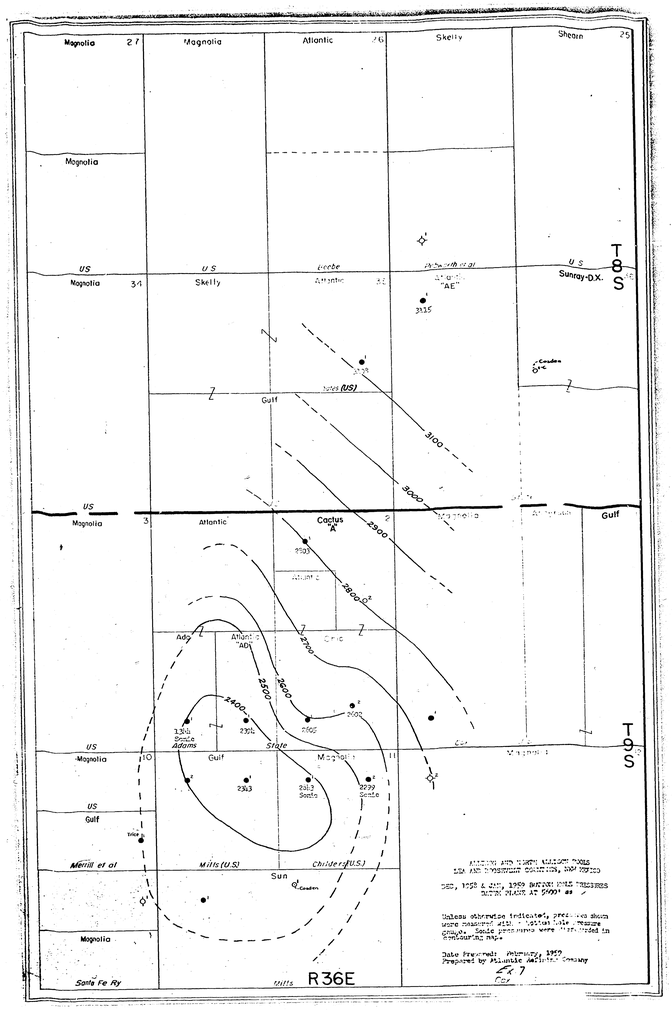
310

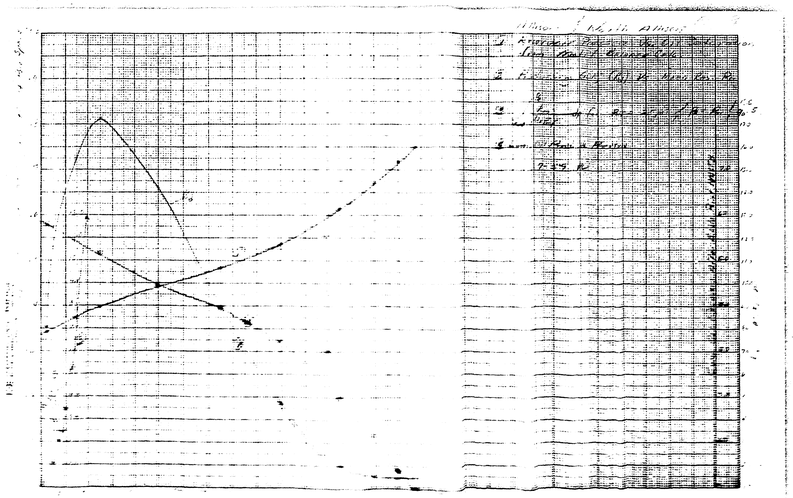
RECOMMENDS OF DRILLING ONE WELL PER 40 ACRES IN ALLISON AND NORTH ALLISON POOLS

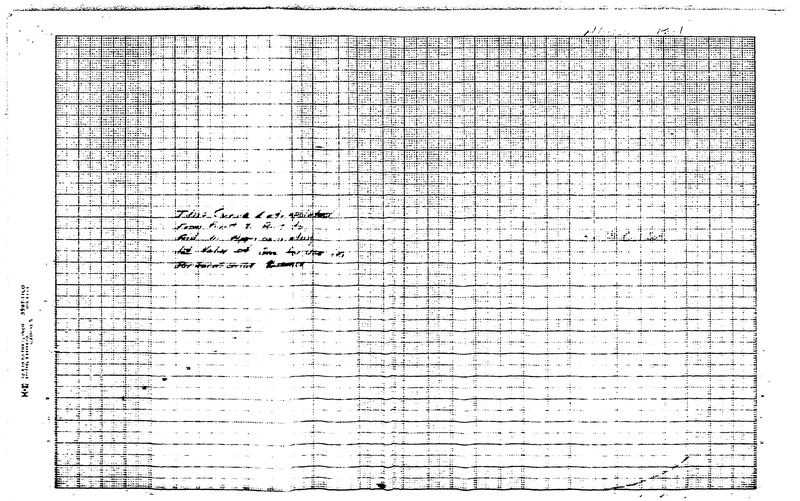
REVENUE	
Oil	
(70,000) (1.0 - .125) ($2.95)	$180,688
Less Severance Taxes At $0.1369/Bbl.	-9,625
Gross Oil Revenue Less Severance Taxes	171,063
Gas	
(70,000) (1.0 - .125) (1.517) ($0.08)	7,133
Less Severance Taxes At 0.0688 Of Value	-496
Gross Gas Revenue Less Severance Taxes	17,637
=	
Total Gross Revenue Less Severance Taxes	179,520
COST	
Drilling	135,000
Pumping Equipment	30,000
Flow Lines	12,000
Total Cost	177,000
Less - 40 Acre Well	27,000

CONDITIONS	
Oil In Place Per 40 Acres	70,000 barrels
Gas-Oil Ratio	1517 cubic feet per barrel
Oil Price	$2.95 per barrel
Casinghead Gas Price	$0.08 per MCF

Recovery factor has been used as 1.0. In practice, recovery factor will range between 0.2 and 0.5. Oil and gas recovery and revenue will be reduced proportionately. Operating expenses, which were neglected, will increase total costs.







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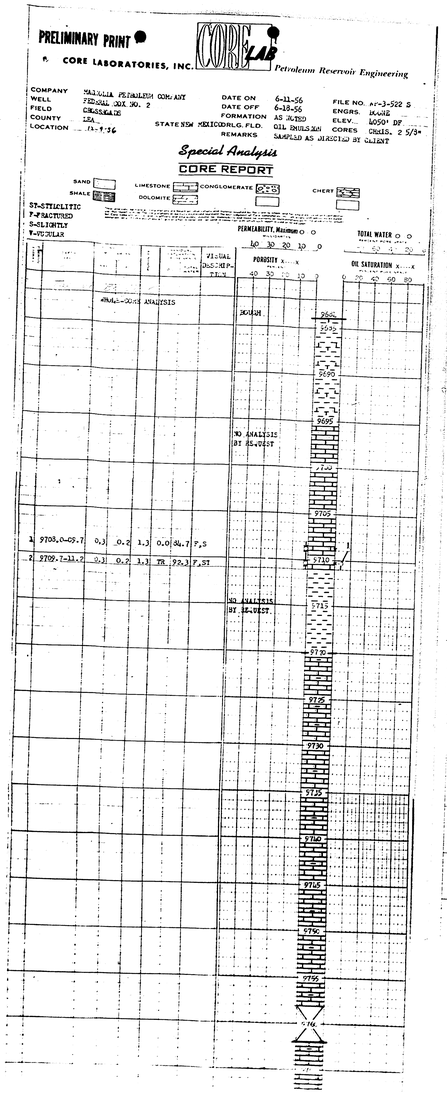

PRELIMINARY PRINT

CORE LABORATORIES, INC. — Petroleum Reservoir Engineering

COMPANY MAGNOLIA PETROLEUM COMPANY
WELL FEDERAL JOY 30, 2
FIELD CHARRASCO
COUNTY LEA
LOCATION 13-9-36

DATE ON 6-11-56
DATE OFF 6-18-56
FORMATION AS RCVD
STATE NEW MEXICO DRLG FLD. OIL ENGLAND
REMARKS SAMPLED AS DIRECTED BY CLIENT

FILE NO. RP-3-522 S
ENGRS. HOWE
ELEV. 4050' DF
CORES DRILL 2 5/8"

Special Analysis
CORE REPORT

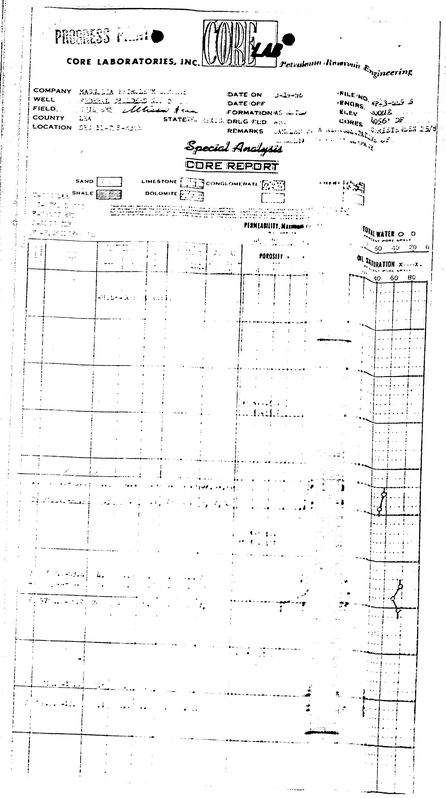
SAND LIMESTONE CONGLOMERATE CHERT
SHALE DOLOMITE

ST-STILICITIC
F-FRACTURED
S-SLIGHTLY
V-VUGULAR

PERMEABILITY, Maximum
POROSITY
TOTAL WATER
OIL SATURATION

CORE ANALYSIS
RO ANALYSIS BY REVERT

1	9703.0-05.7	0.3	0.2	1.3	0.0	84.7	F,S	
2	9709.7-11.7	0.3	0.2	1.3	TR	92.3	F,ST	


PROGRESS PRINT

CORE LABORATORIES, INC. — Petroleum Reservoir Engineering

COMPANY MAGNOLIA PETROLEUM COMPANY
WELL FEDERAL JOY 30 NO. 2
FIELD CHARRASCO
COUNTY LEA
LOCATION SEC 30-T-9-S R-36-E

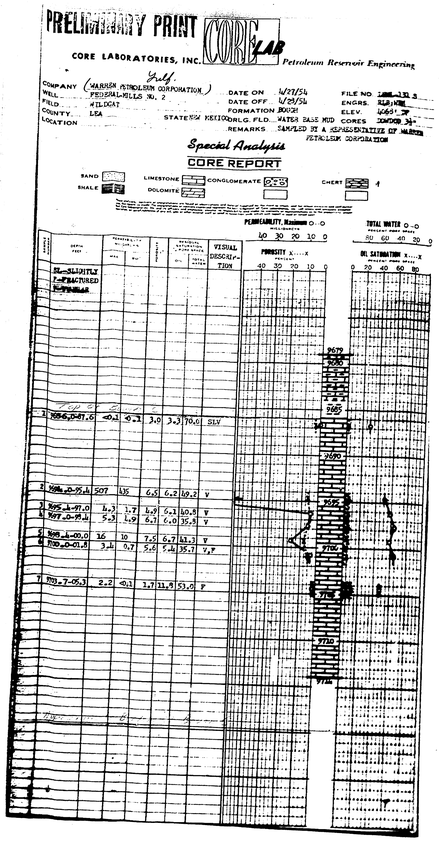
DATE ON 5-13-56
DATE OFF
FORMATION AS RCVD
STATE N. MEX. DRLG FLD
REMARKS CORES: DRILL 2 5/8" CORES

FILE NO. RP-3-522 S
ENGRS. HOWE
ELEV. 4050' DF

Special Analysis
CORE REPORT

SAND LIMESTONE CONGLOMERATE CHERT
SHALE DOLOMITE

PERMEABILITY, Maximum
POROSITY
TOTAL WATER
OIL SATURATION


PRELIMINARY PRINT

CORE LABORATORIES, INC. — Petroleum Reservoir Engineering

COMPANY (MARRON PETROLEUM CORPORATION) Gulf
WELL FEDERAL-WILLS NO. 2
FIELD WILDCAT
COUNTY LEA
LOCATION

DATE ON 4/27/54
DATE OFF 4/29/54
FORMATION MORROW
STATE NEW MEXICO DRLG FLD. WATER BASE MUD
REMARKS SAMPLED BY A REPRESENTATIVE OF MARRON PETROLEUM CORPORATION

FILE NO. LCL-31 S
ENGRS. KLEINER
ELEV. 4065' DF
CORES DIAMOND 3½"

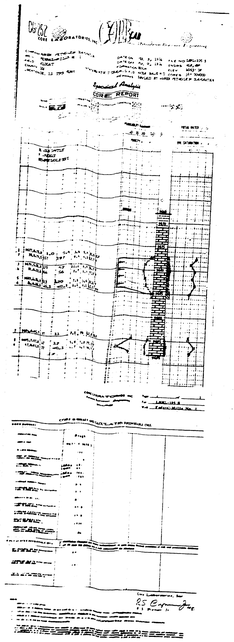
Special Analysis
CORE REPORT

SAND LIMESTONE CONGLOMERATE CHERT
SHALE DOLOMITE

PERMEABILITY, Maximum
POROSITY
TOTAL WATER
OIL SATURATION

S-SLIGHTLY
F-FRACTURED
V-VUGULAR

1	9686.0-87.6	<0.1	<0.1	3.0	3.3	70.6	SLV	
2	9694.0-95.4	207	135	6.5	6.2	40.2	V	
3	9695.4-97.0	4.3	1.7	4.9	5.3	40.8	V	
4	9697.0-98.4	5.3	1.9	6.1	6.0	35.9	V	
5	9698.4-00.0	16	10	7.5	6.7	41.3	V	
6	9700.0-01.8	3.6	0.7	5.6	5.4	35.7	V,F	
7	9703.7-05.3	2.2	<0.1	3.7	11.6	53.0	F	



312

SCHLUMBERGER WELL SURVEYING CORPORATION

MICROLOGGING

COMPANY MARREN PETROLEUM CORPORATION	Location of Well 660' FNL & 1980' FWL SEC. 11-9S-36E
WELL FEDERAL MILLS #1	
FIELD WILDCAT	ML, GRL (ES, LL, MLL)
LOCATION SEC. 11-9S-36E	Elevation: D.F. 4063' K.B. or G.L.
COUNTY LEA	FILING No.
STATE NEW MEXICO	

COUNTY LEA — FIELD or WELL WILDCAT — FEDERAL MILLS #1 — COMPANY WARREN PETR. CORP.

RUN No.	1
Date	2-9-54
First Reading	9682
Last Reading	4800
Feet Measured	1096
Csg. Schlum.	4209
Csg. Driller	4210
Depth Reached	9697
Bottom Driller	9701
Depth Datum	KB 17' ABV. GL
Mud Mat.	SALT GEL
Density	10.1
Viscosity	42
Resist.	0.786@65 F @ F @ F @ F @ F
Res. BHT	0.632@136F @ F @ F @ F @ F
pH	@ F @ F @ F @ F @ F
Wtr. loss	cc 30 min cc 30 min cc 30 min cc 30 min cc 30 min
Max. Temp.	136
Bit Size	9 7/8" 4209' to 9668'; 6 1/8" 9668' to T.D.
Spmg.	
DIRECTION	S.W.
RECORD	1/2
Opr. Rig Time	3 hrs.
Truck No.	
Recorded By	
Witness By	

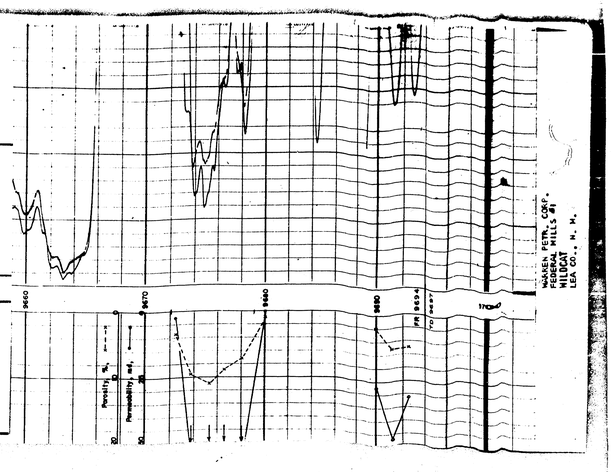
RESISTIVITY -ohms. m²/m — 0 Micro Inverse 9/8x9/16 — 0 Micro Normal 27/16 — Kn - G - NC

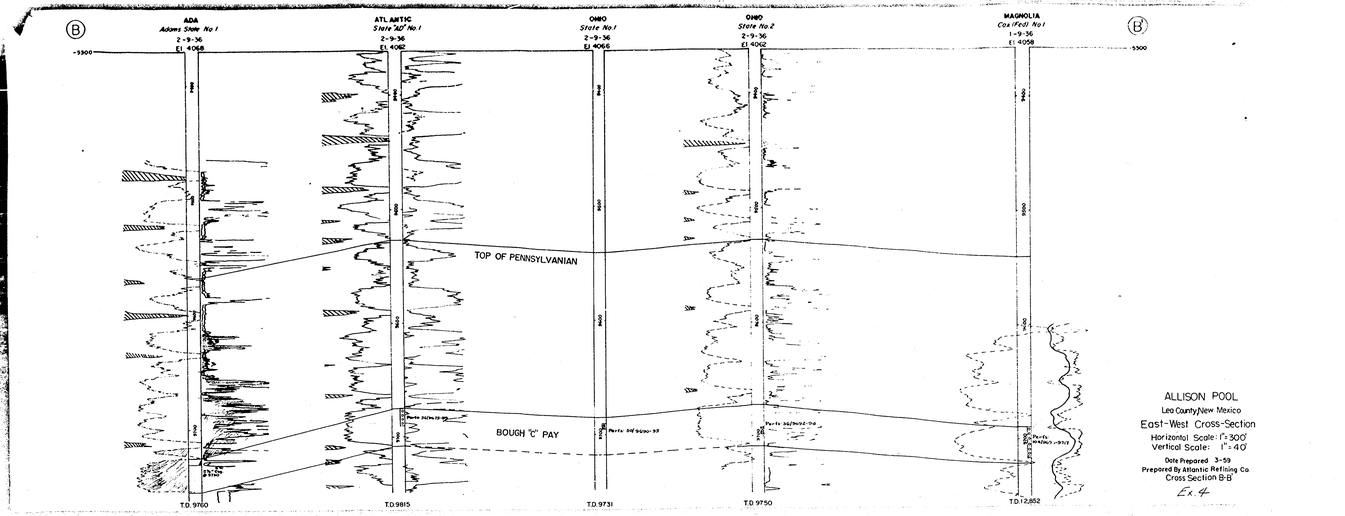
DEPTHS — 5"/100

SPONTANEOUS-POTENTIAL millivolts — MUD-FILTRATE INDICATES

REMARKS: HYDROLOGIC MICROLOGGING RUN JOB TO PROPER MICRONOR. 50' recorded with Laterolog with ascending into hole.

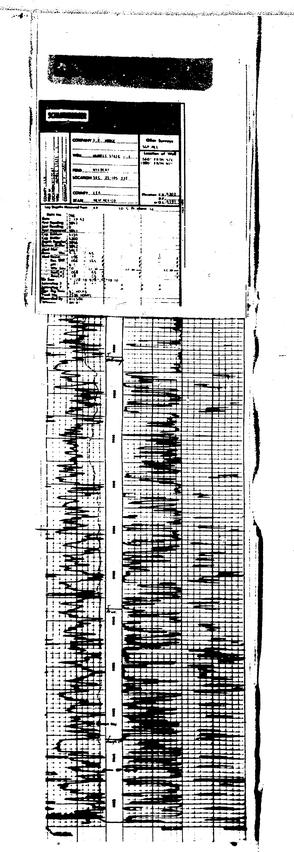
WARREN PETR. CORP. FEDERAL MILLS #1 WILDCAT LEA CO., N. M.

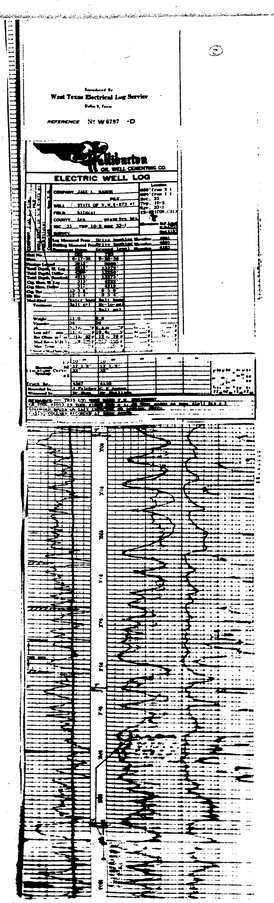




ALLISON POOL
Lea County, New Mexico
East-West Cross-Section
Horizontal Scale: 1"=300'
Vertical Scale: 1"=40'
Date Prepared 3-59
Prepared By Atlantic Refining Co.
Cross Section B-B

Ex. 4



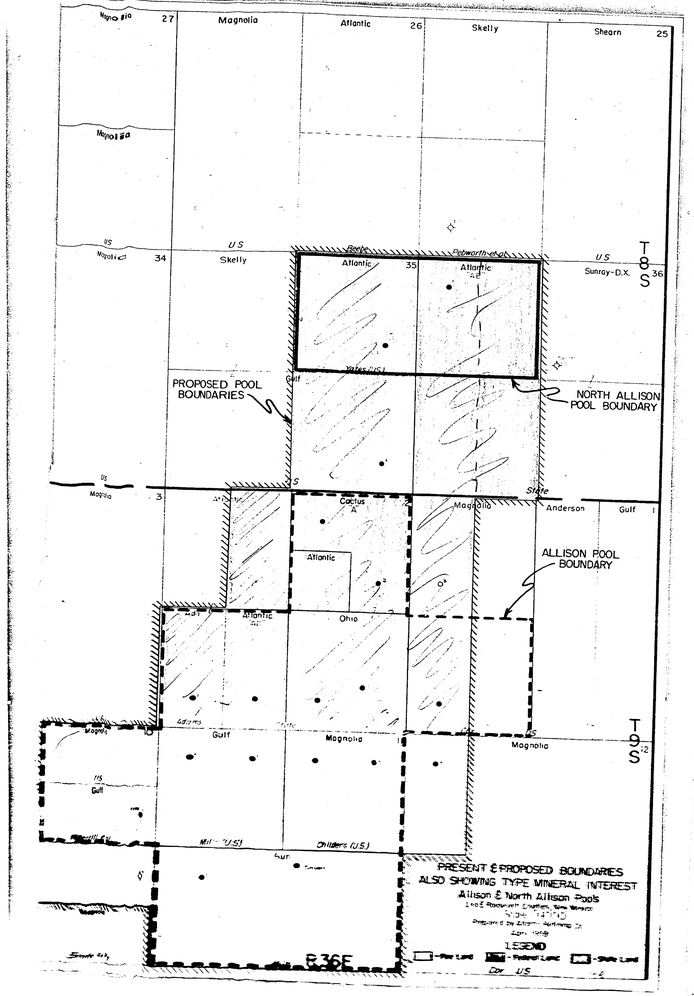


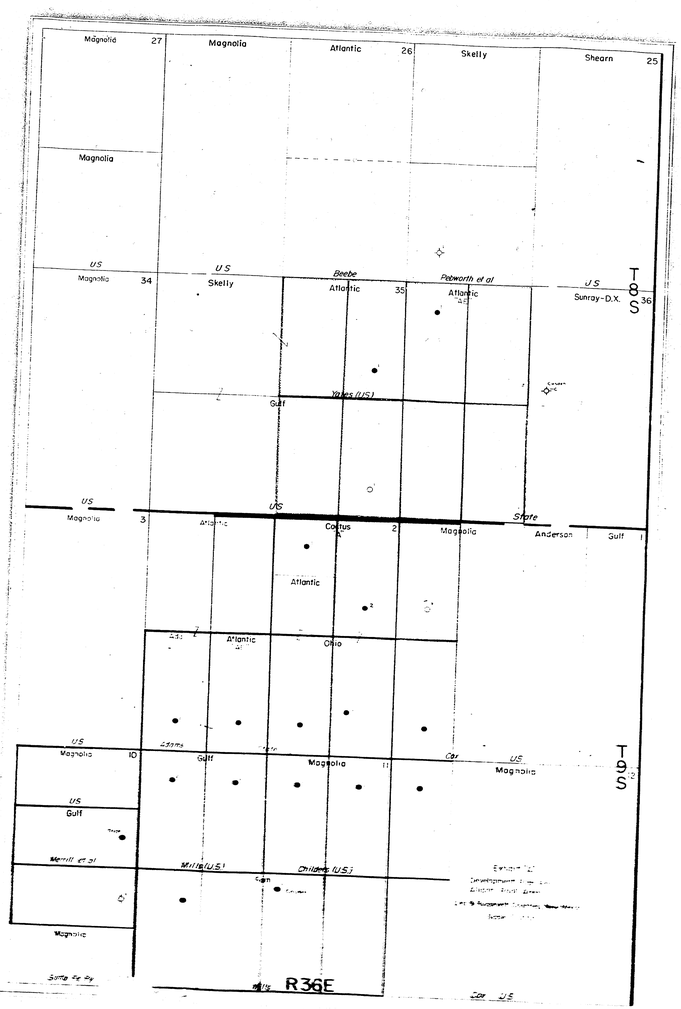
Reproduced By
West Texas Electrical Log Service
Hobbs, N. Mexico

REFERENCE No. W 6787 -D

Halliburton
OIL WELL CEMENTING CO.

ELECTRIC WELL LOG





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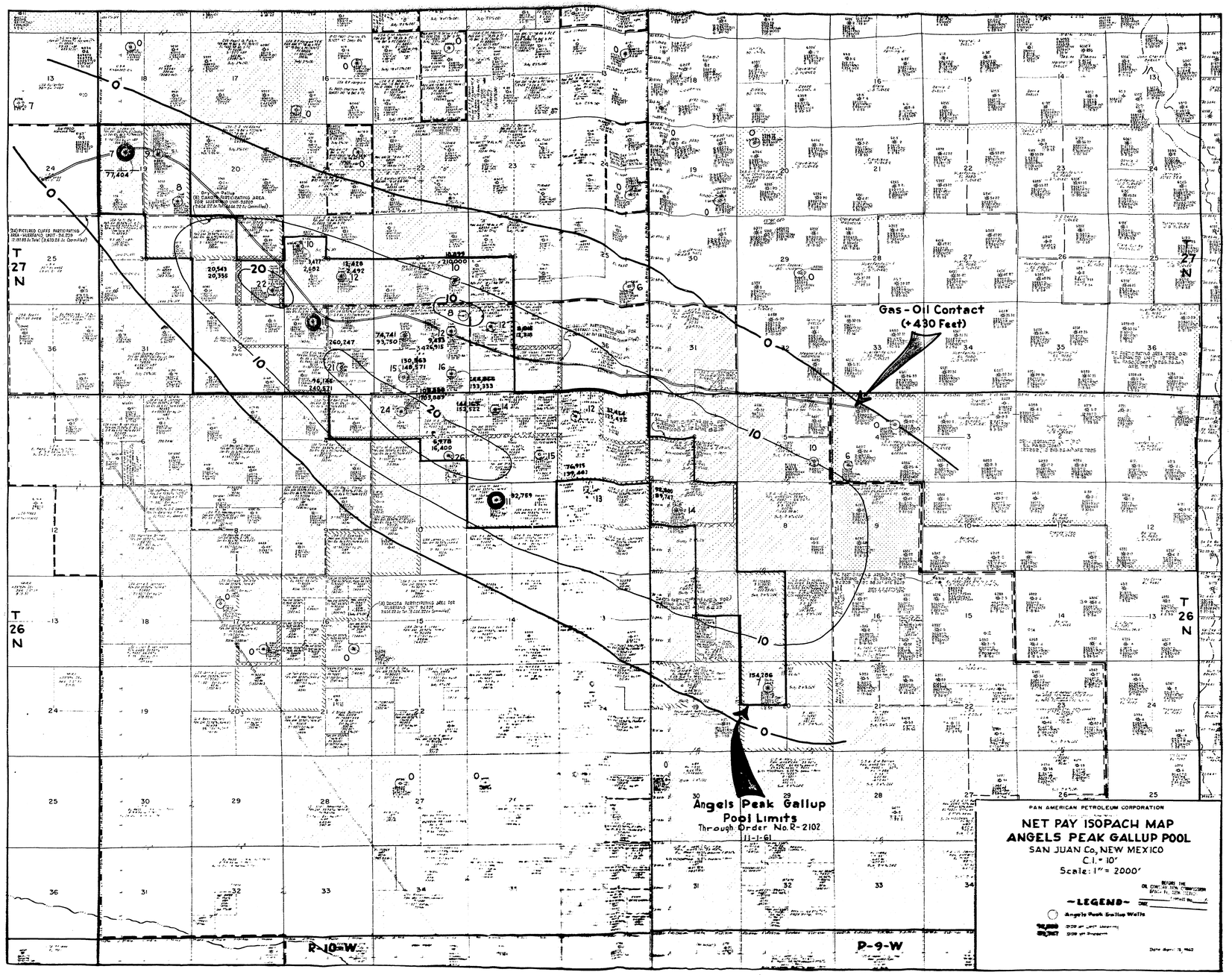
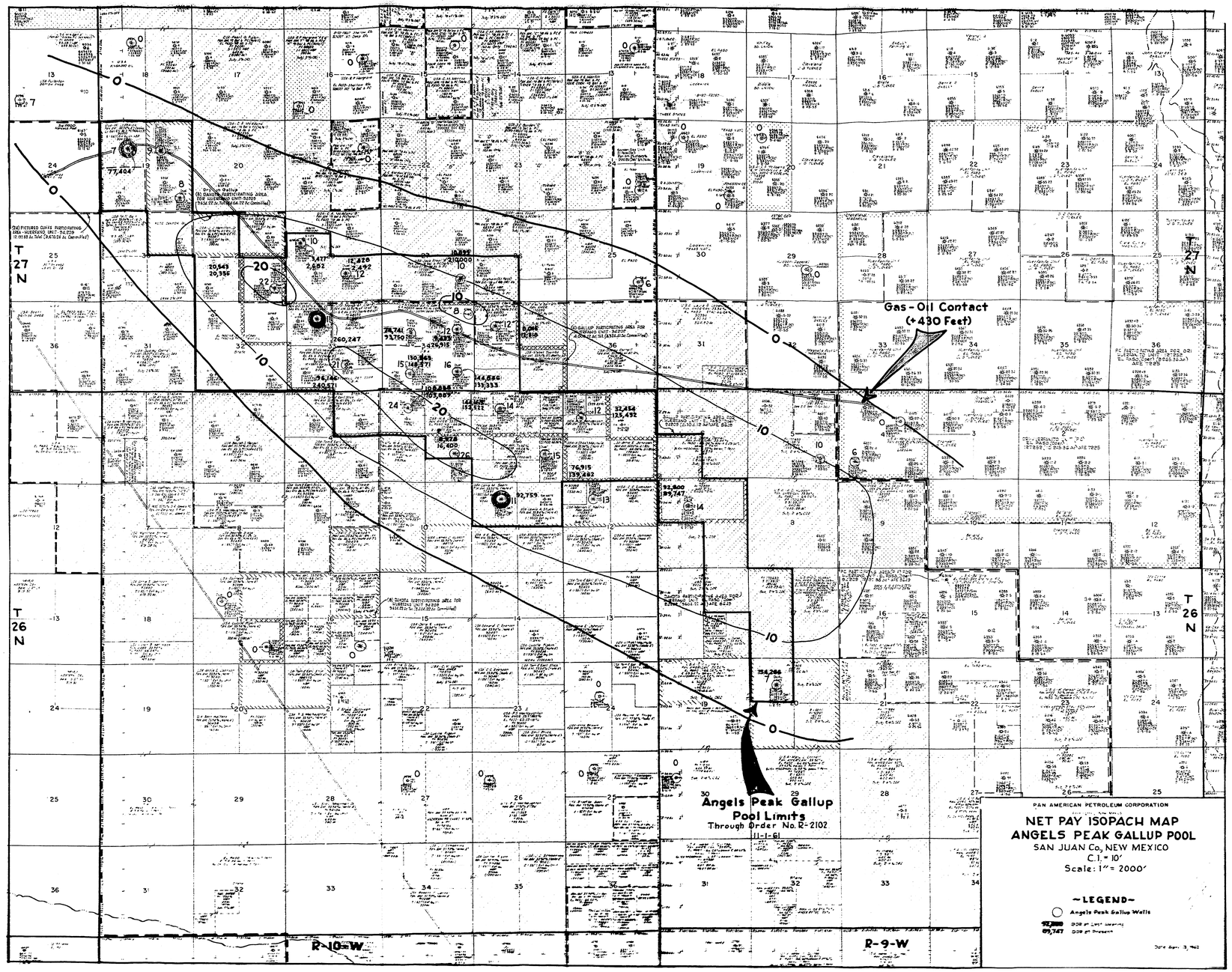
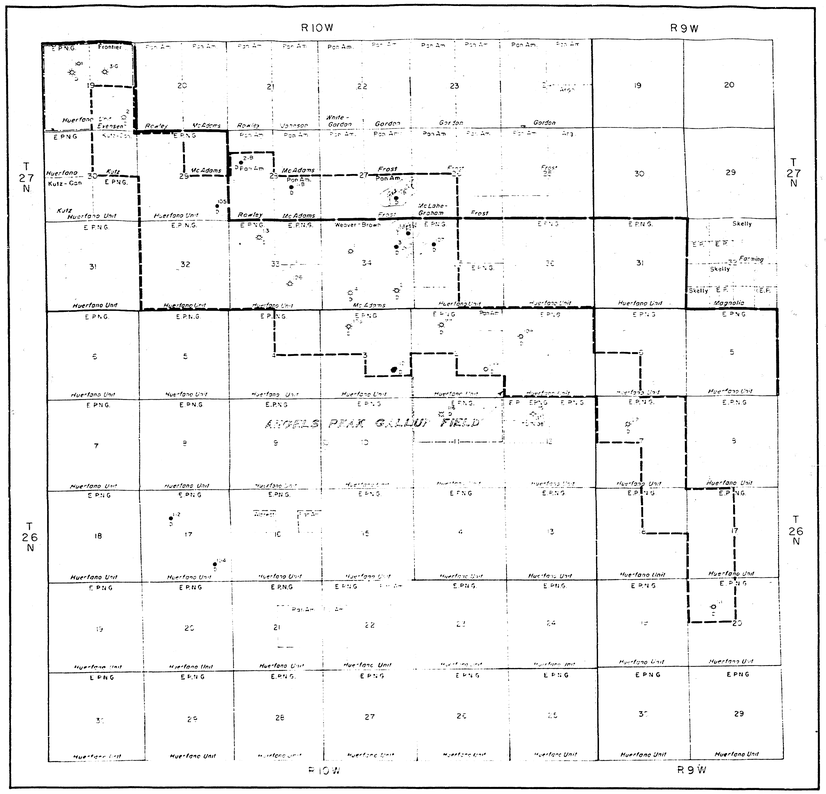

Gas - Oil Contact
(+430 Feet)
Angels Peak Gallup
Pool Limits
Through Order No. R-2102
11-1-61
T 27 N
T 26 N
R-10-W
P-9-W
PAN AMERICAN PETROLEUM CORPORATION
NET PAY ISOPACH MAP
ANGELS PEAK GALLUP POOL
SAN JUAN Co, NEW MEXICO
C.I. = 10'
Scale: 1" = 2000'
-LEGEND-
Angels Peak Gallup Wells

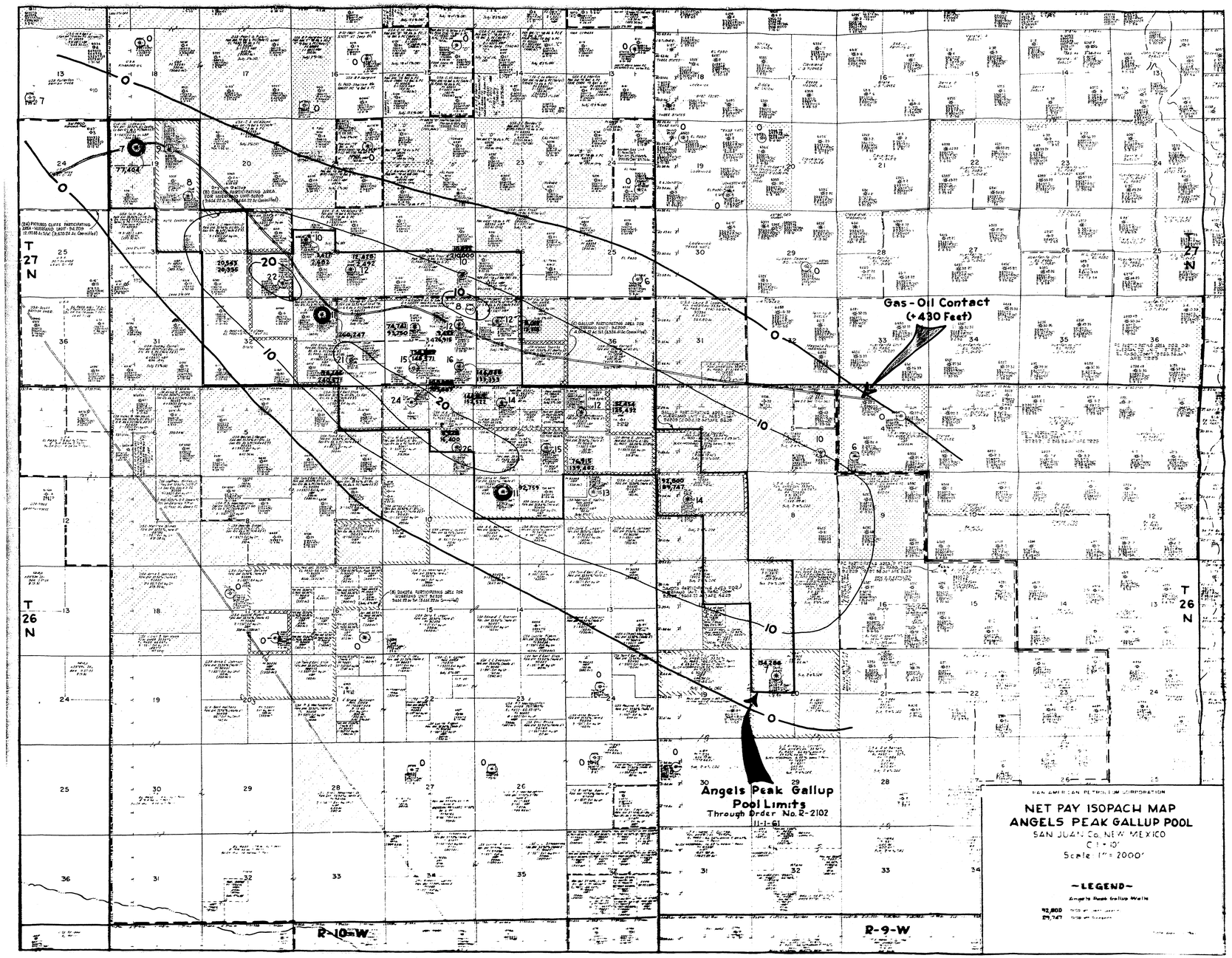
315

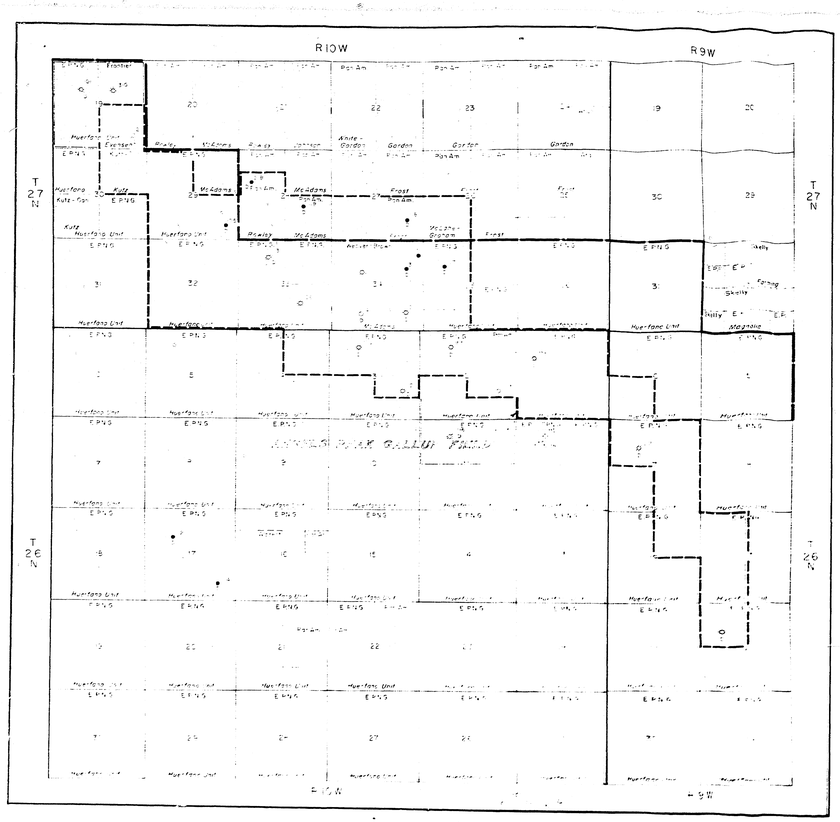

Gas - Oil Contact
(+430 Feet)
Angels Peak Gallup
Pool Limits
Through Order No. R-2102
11-1-61
T 27 N
T 26 N
R-10-W
R-9-W
PAN AMERICAN PETROLEUM CORPORATION
NET PAY ISOPACH MAP
ANGELS PEAK GALLUP POOL
SAN JUAN Co, NEW MEXICO
C.I. = 10'
Scale: 1" = 2000'
~LEGEND~
Angels Peak Gallup Wells
77,404 GOR at Last Reading
69,747 GOR at Present

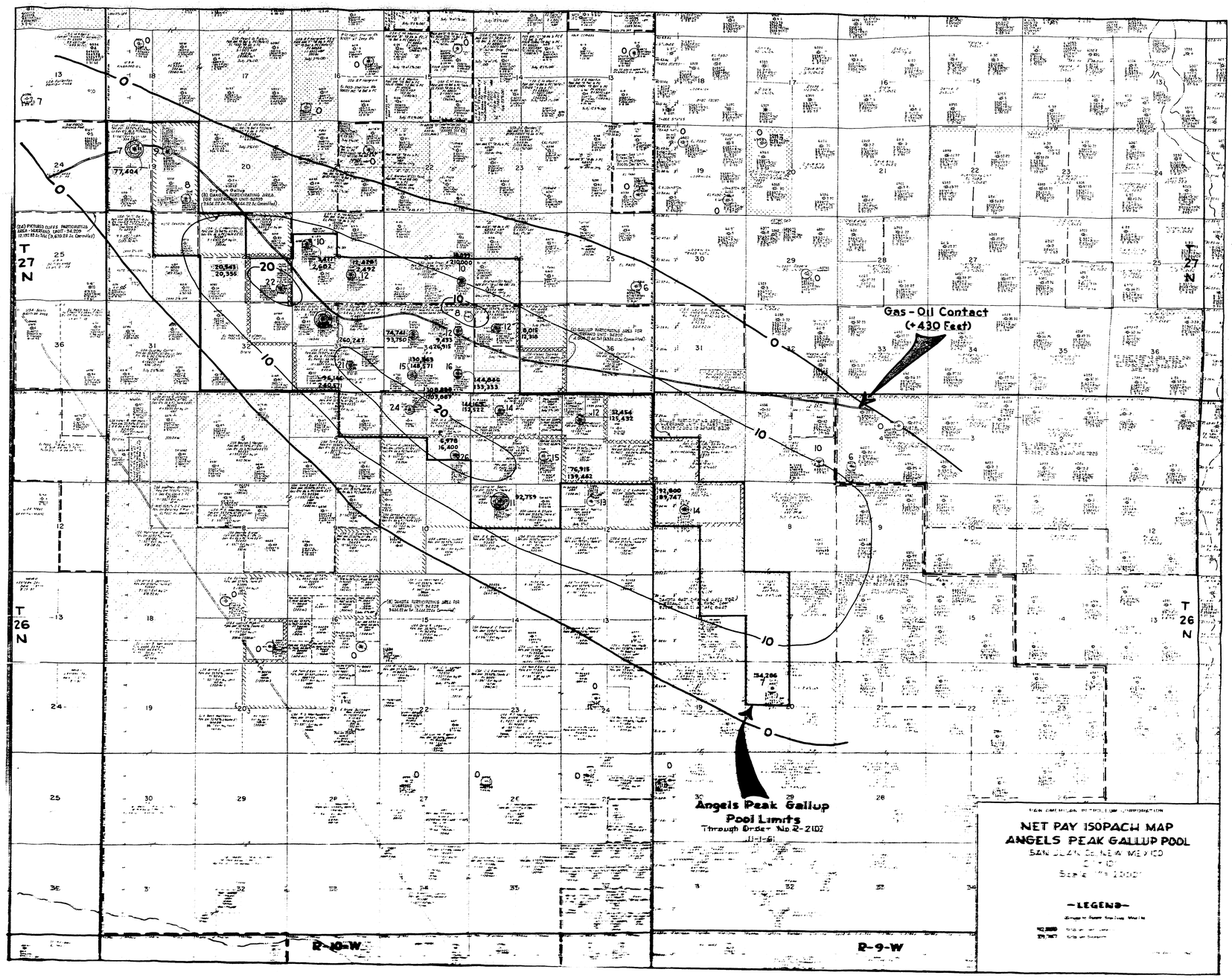
316


R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD

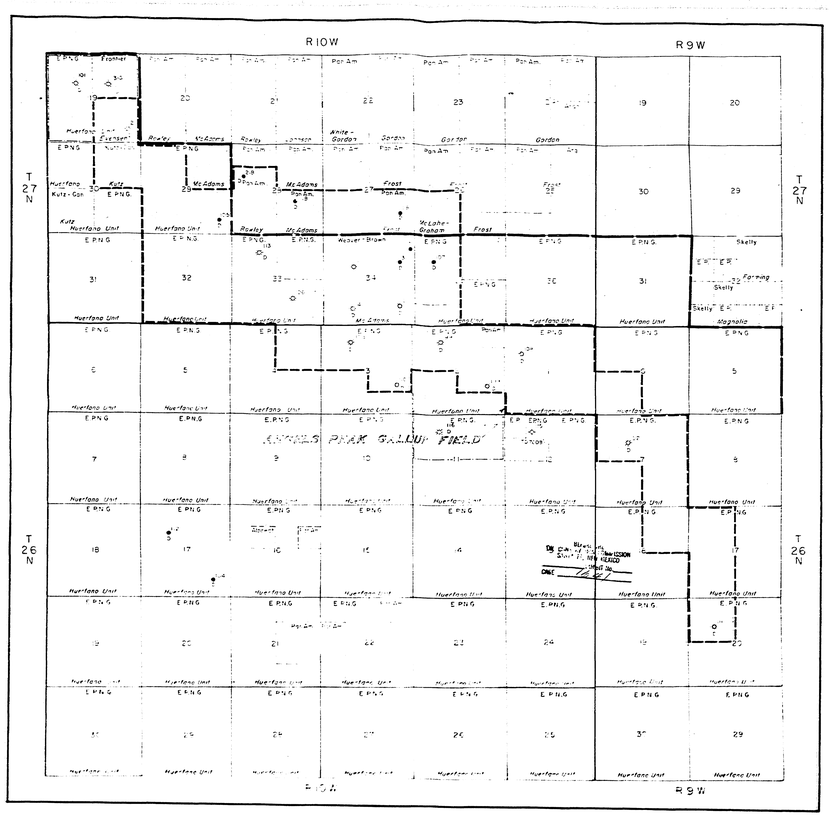
317

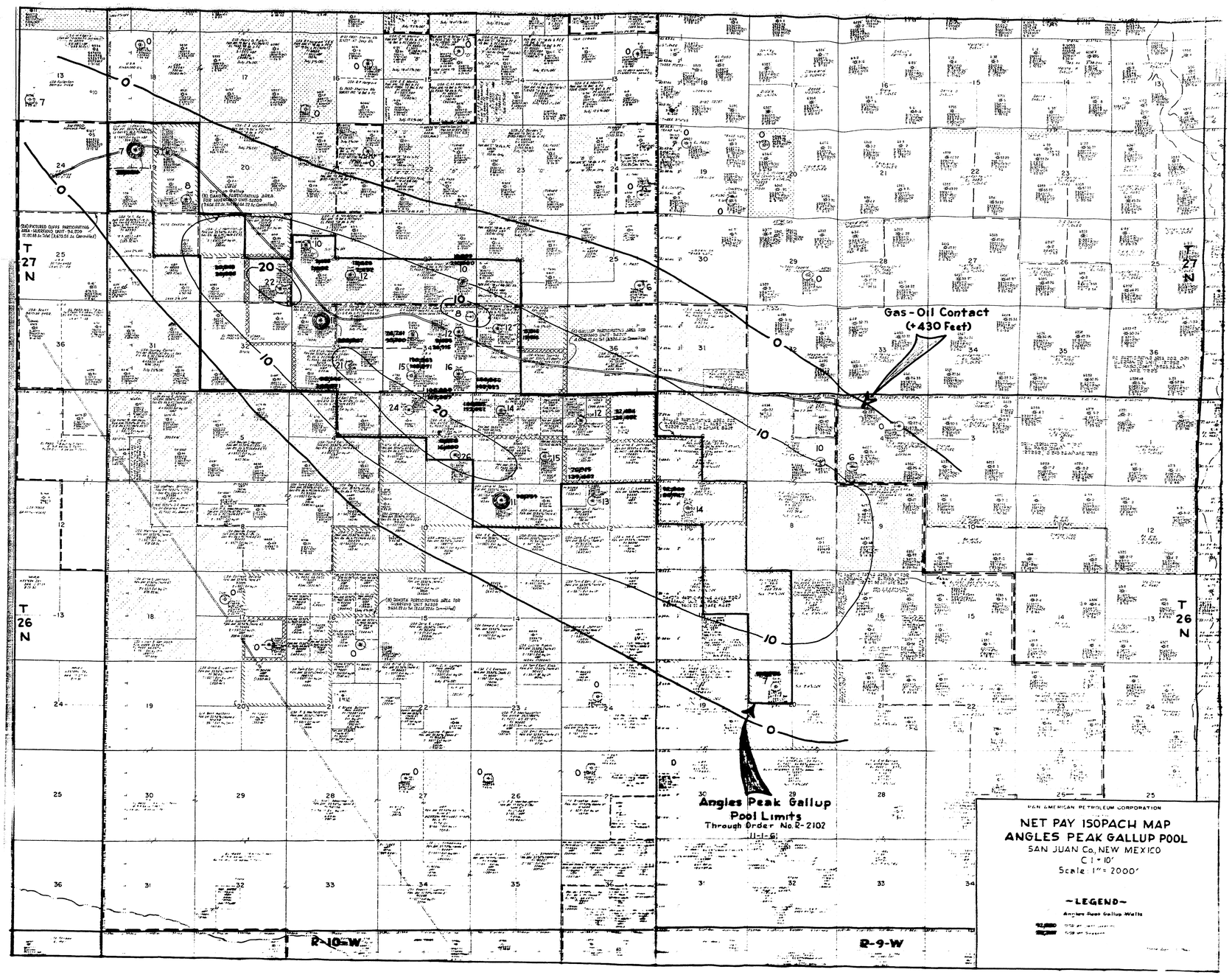

Gas - Oil Contact
(+430 Feet)
Angels Peak Gallup
Pool Limits
Through Order No. R-2102
11-1-61
R-10-W
R-9-W
T 27 N
T 26 N
BEN AMERICAN PETROLEUM CORPORATION
NET PAY ISOPACH MAP
ANGELS PEAK GALLUP POOL
SAN JUAN Co. NEW MEXICO
C.I. = 10'
Scale 1" = 2000'
—LEGEND—


R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD

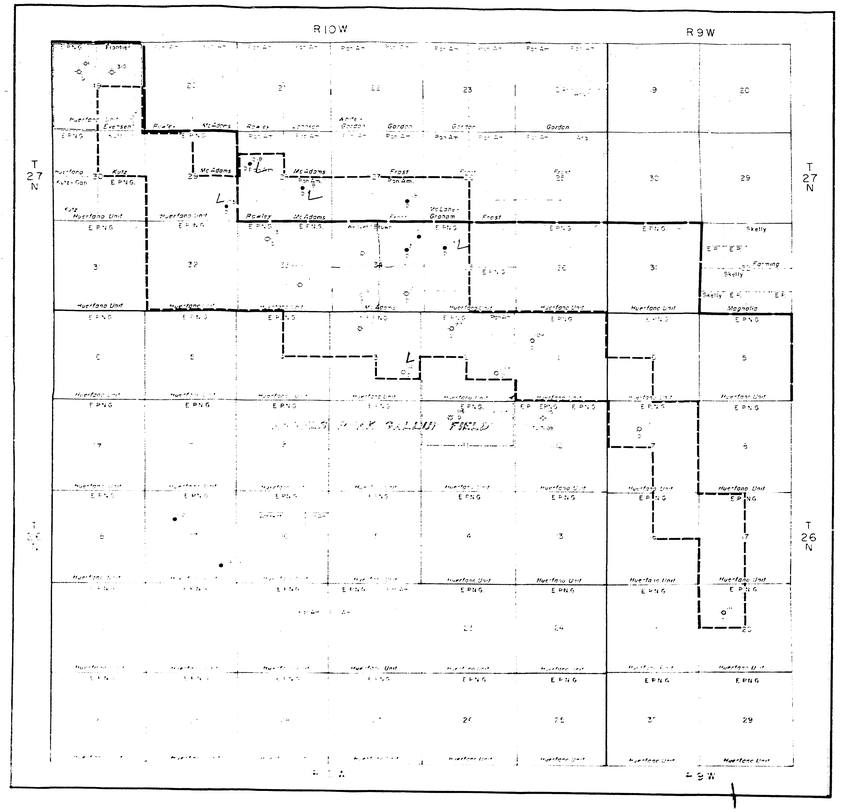

T 27 N
T 26 N
Gas - Oil Contact
(+430 Feet)
Angels Peak Gallup
Pool Limits
Through Order No R-2102
R-10-W
R-9-W
NET PAY ISOPACH MAP
ANGELS PEAK GALLUP POOL
SAN JUAN CO. NEW MEXICO
—LEGEND—

318

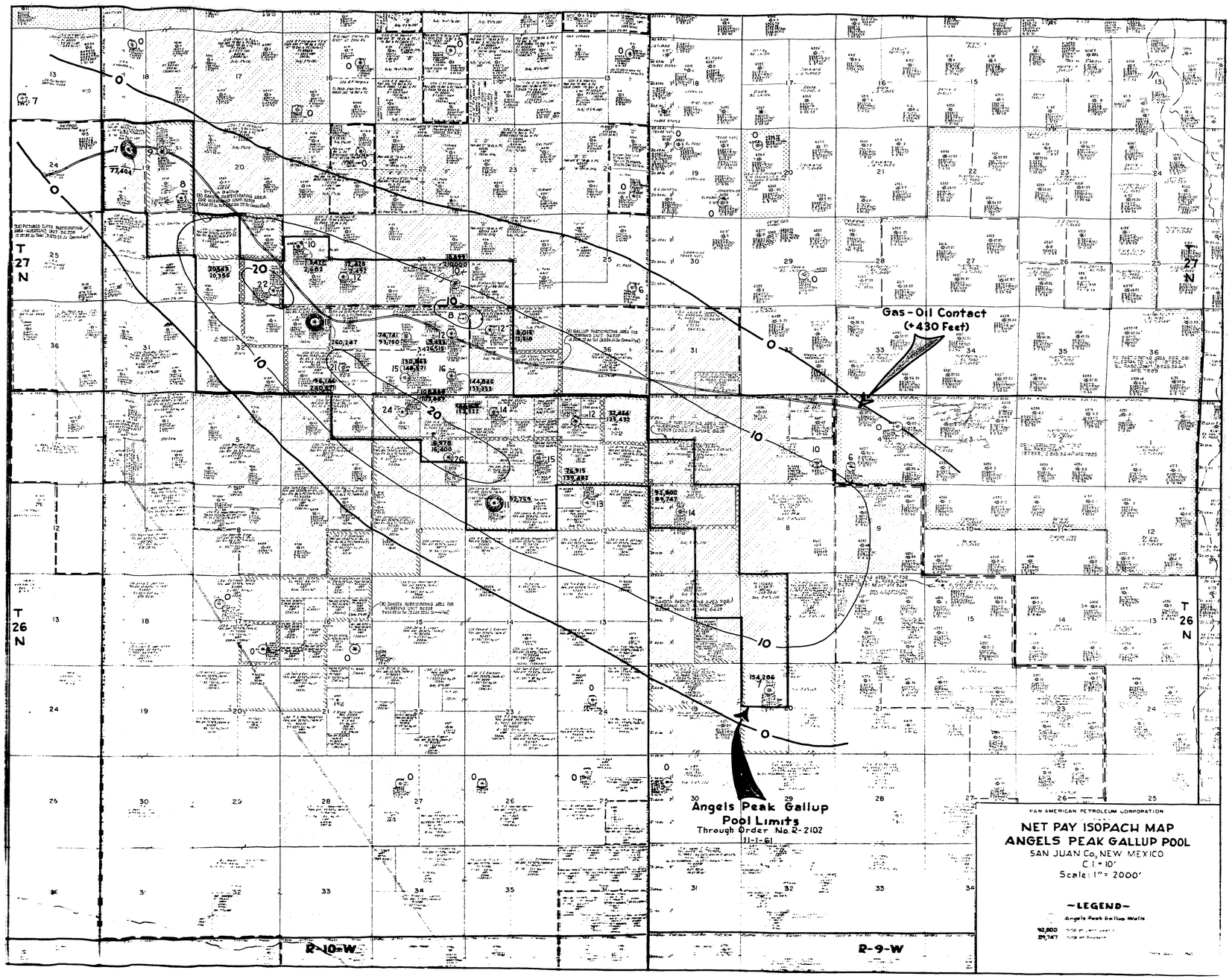

R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD
R10W
R9W


T 27 N
T 26 N
Gas - Oil Contact (+430 Feet)
Angles Peak Gallup Pool Limits Through Order No. R-2102
R-10-W
R-9-W
PAN AMERICAN PETROLEUM CORPORATION
NET PAY ISOPACH MAP
ANGLES PEAK GALLUP POOL
SAN JUAN Co., NEW MEXICO
C.I. = 10'
Scale: 1" = 2000'
-LEGEND-
Angles Peak Gallup Wells

319


R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD
E.P.N.G.
Huerfano Unit
Kutz-Fulcher
Rowley
McAdams
Graham
Frost
Skelly
Farming
Stagnaro

320


Gas - Oil Contact
(+430 Feet)
Angels Peak Gallup
Pool Limits
Through Order No. R-2102
11-1-61
T 27 N
T 26 N
R-10-W
R-9-W
PAN AMERICAN PETROLEUM CORPORATION
NET PAY ISOPACH MAP
ANGELS PEAK GALLUP POOL
SAN JUAN Co, NEW MEXICO
C.I. = 10'
Scale: 1" = 2000'
-LEGEND-
Angels Peak Gallup Wells

R-10-W

R-9-W

T 27 N

T 26 N

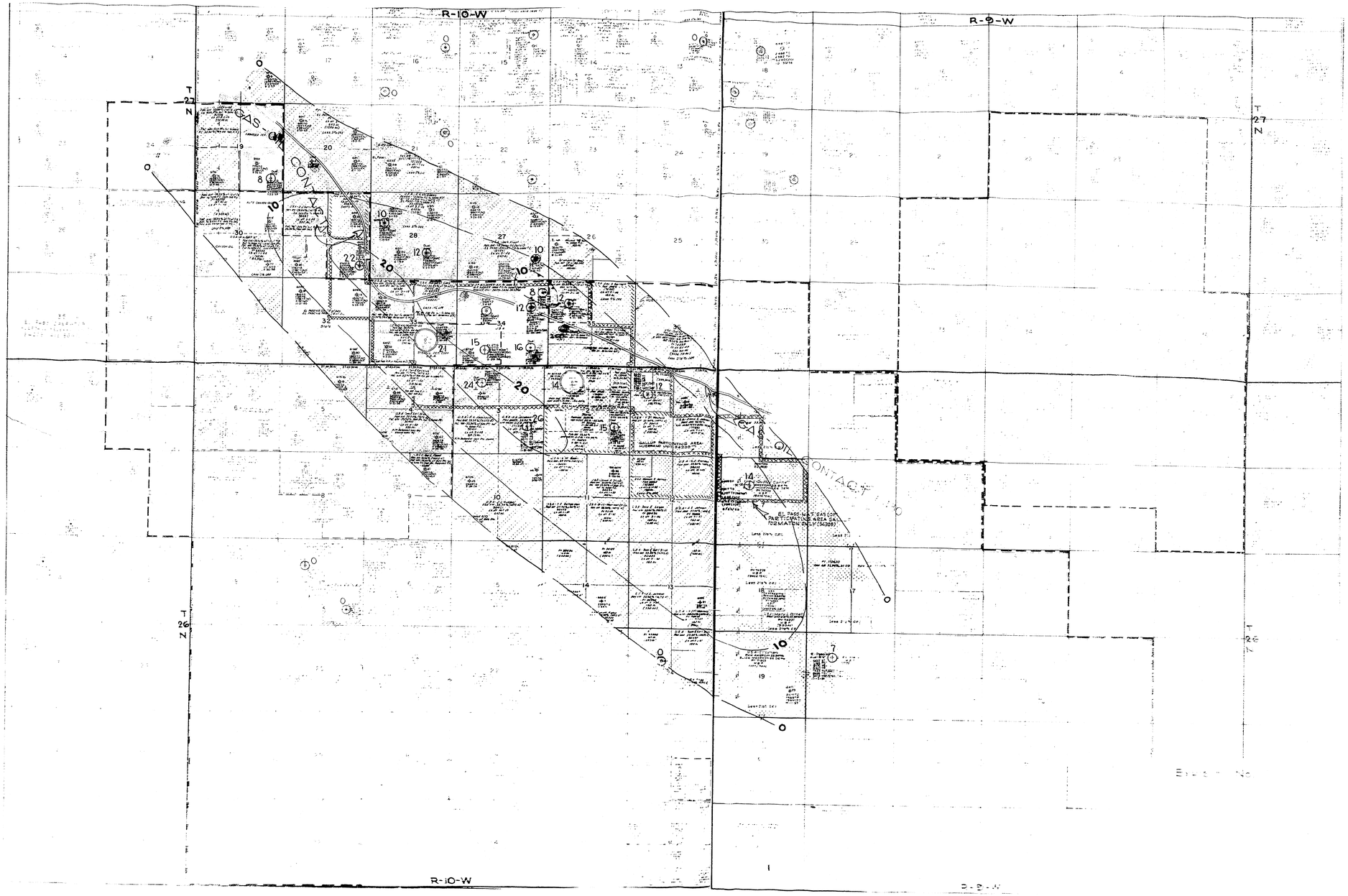
GAS OIL CONTACT

OIL CONTACT

EL PASO NAT. GAS CO. PARTICIPATING AREA "A" (FORMATION ONLY SHOWN)

R-10-W

R-9-W


R-10-W
R-9-W
T 27 N
T 26 N
GAS-OIL CONTACT
EL PASO NAT GAS CO PATTERSON AREA (AL FORMATION ONLY (SC09))
0
10
20
12
15
16
21
24
26
14
18
19
7
1

R-10-W

R-9-W

T 27 N

T 26 N

EL PASO NAT. GAS CO.
PARTICIPATING AREA GAS
CREATION ONLY 4-2-58

R-10-W

R-9-W

R-10-W

R-9-W

T 27 N

T 26 N

GAS-OIL CONTACT

GAS-OIL

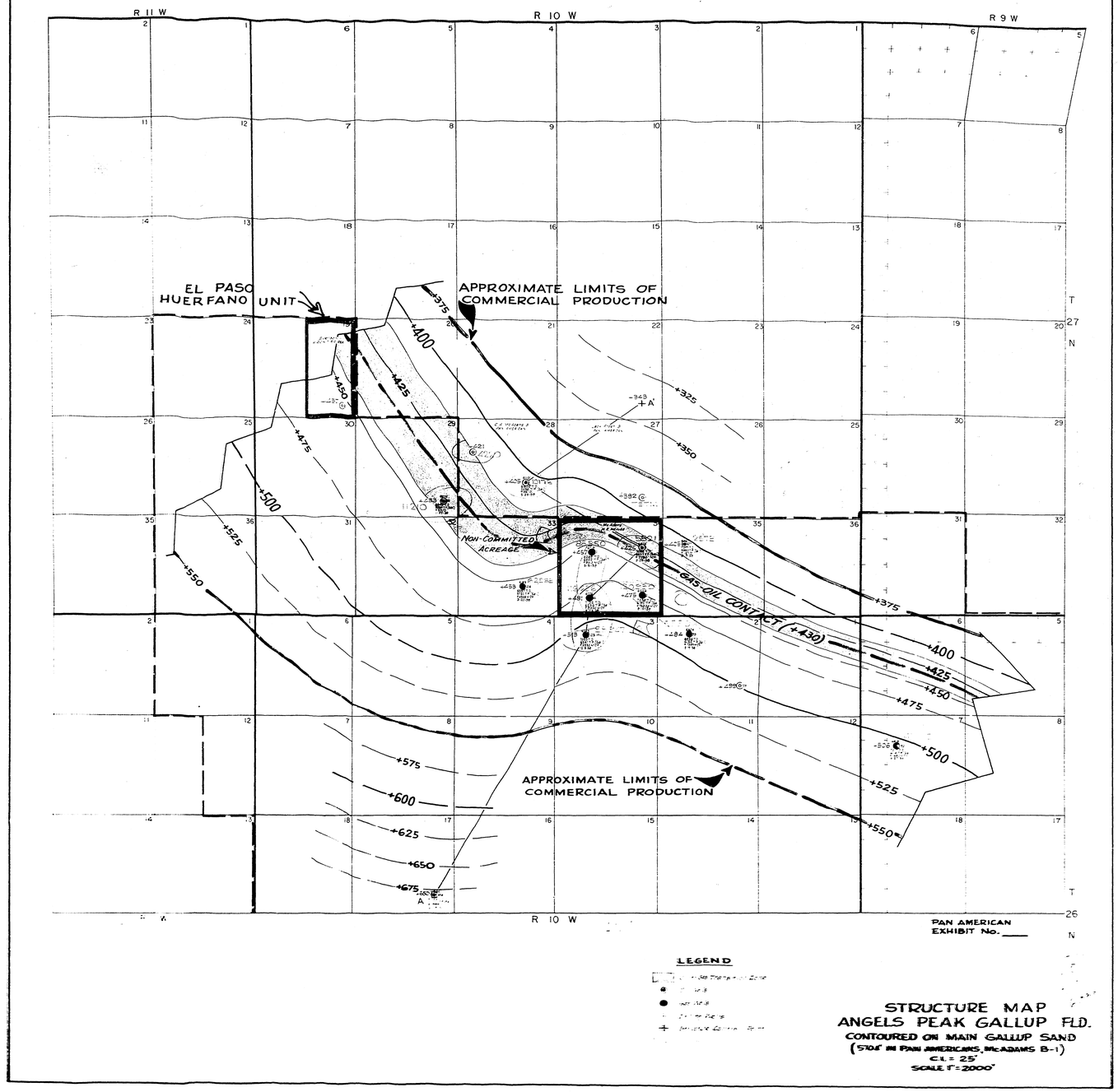
0

10

20

EL PASO NAT GAS CO
PARTICIPATING AREA OF
FORMATION ONLY (PROPOSED)

R-10-W


R 11 W
R 10 W
R 9 W
T 27 N
T 26 N
EL PASO HUERFANO UNIT
APPROXIMATE LIMITS OF COMMERCIAL PRODUCTION
NON-COMMITTED ACREAGE
645 OIL CONTACT (+430)
APPROXIMATE LIMITS OF COMMERCIAL PRODUCTION
+375
+400
+425
+450
+475
+500
+525
+550
+575
+600
+625
+650
+675
+325
+350
PAN AMERICAN EXHIBIT No. ____
LEGEND
STRUCTURE MAP
ANGELS PEAK GALLUP FLD.
CONTOURED ON MAIN GALLUP SAND
(STOF IN PAN AMERICANS, McADAMS B-1)
C.I. = 25'
SCALE 1" = 2000'

325

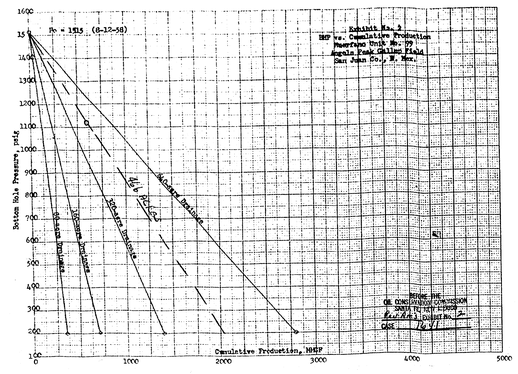


Exhibit No. 2
HEP vs. Cumulative Production
Huerfano Unit No. 99
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 1515 (8-12-58)
Bottom Hole Pressure, psig
Cumulative Production, MMCF
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Case No. 1241

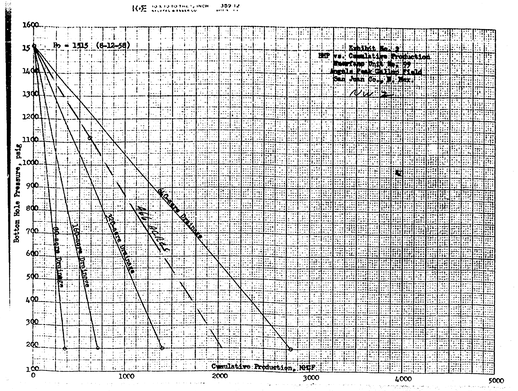


Exhibit No. 2
HEP vs. Cumulative Production
Huerfano Unit No. 99
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 1515 (8-12-58)
Bottom Hole Pressure, psig
Cumulative Production, MMCF

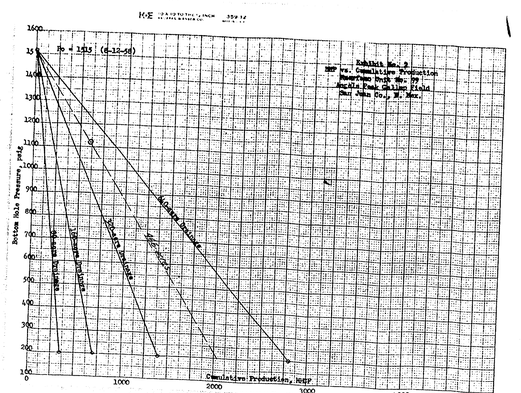


Exhibit No. 2
HEP vs. Cumulative Production
Huerfano Unit No. 99
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 1515 (8-12-58)
Bottom Hole Pressure, psig
Cumulative Production, MMCF

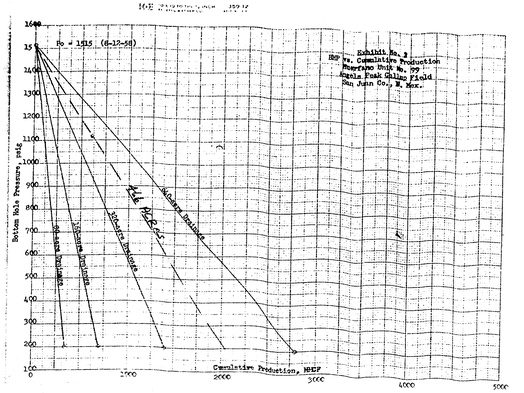


Exhibit No. 2
HEP vs. Cumulative Production
Huerfano Unit No. 99
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 1515 (8-12-58)
Bottom Hole Pressure, psig
Cumulative Production, MMCF

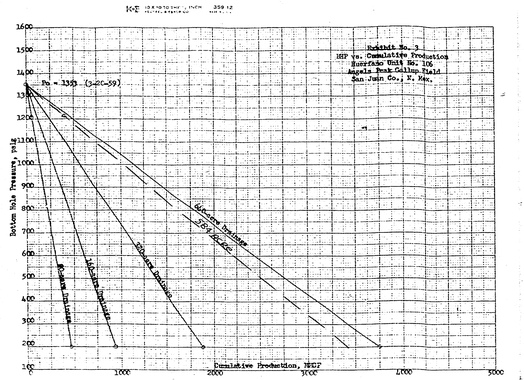


Exhibit No. 3
HEP vs. Cumulative Production
Huerfano Unit No. 106
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 3355 (3-20-59)
Bottom Hole Pressure, psig
Cumulative Production, MMCF

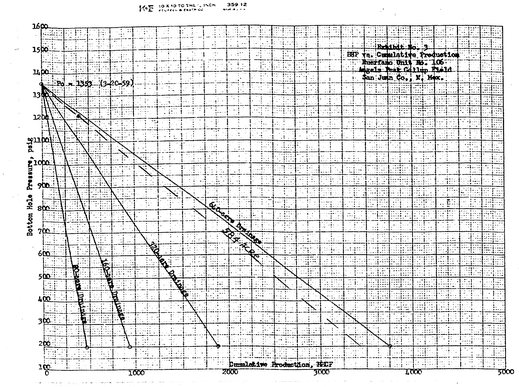


Exhibit No. 3
HEP vs. Cumulative Production
Huerfano Unit No. 106
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 3355 (3-20-59)
Bottom Hole Pressure, psig
Cumulative Production, MMCF

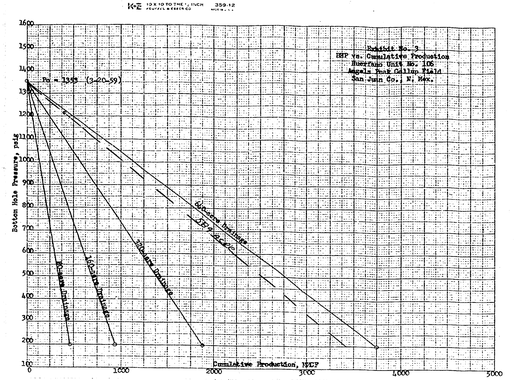


Exhibit No. 3
HEP vs. Cumulative Production
Huerfano Unit No. 106
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 3355 (3-20-59)
Bottom Hole Pressure, psig
Cumulative Production, MMCF

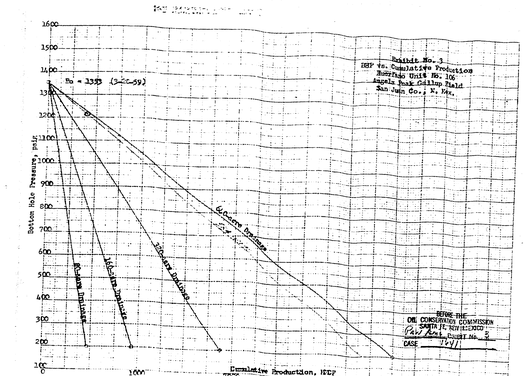
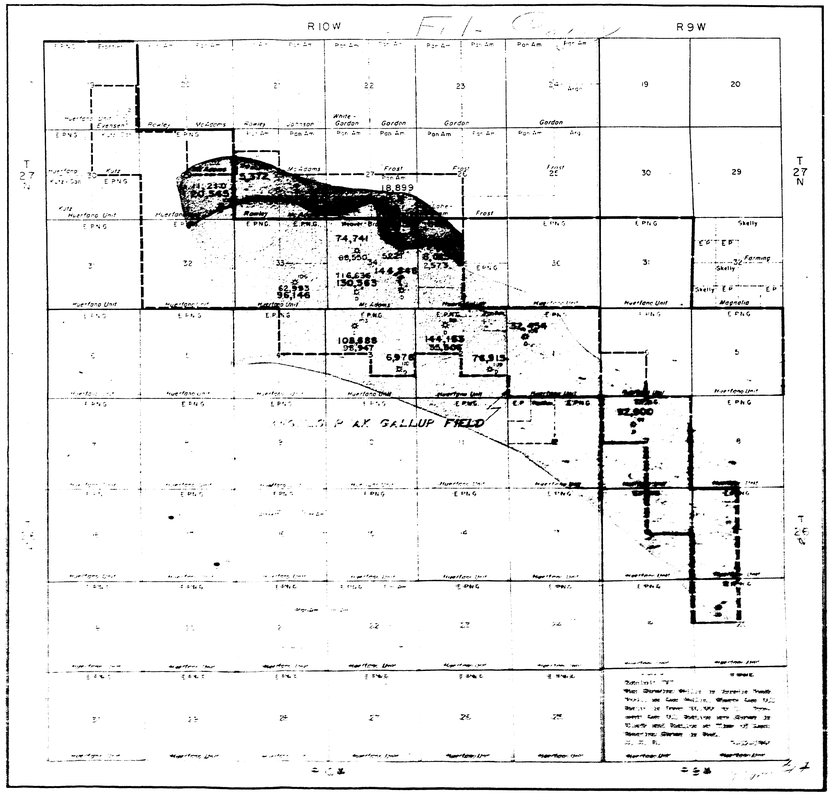
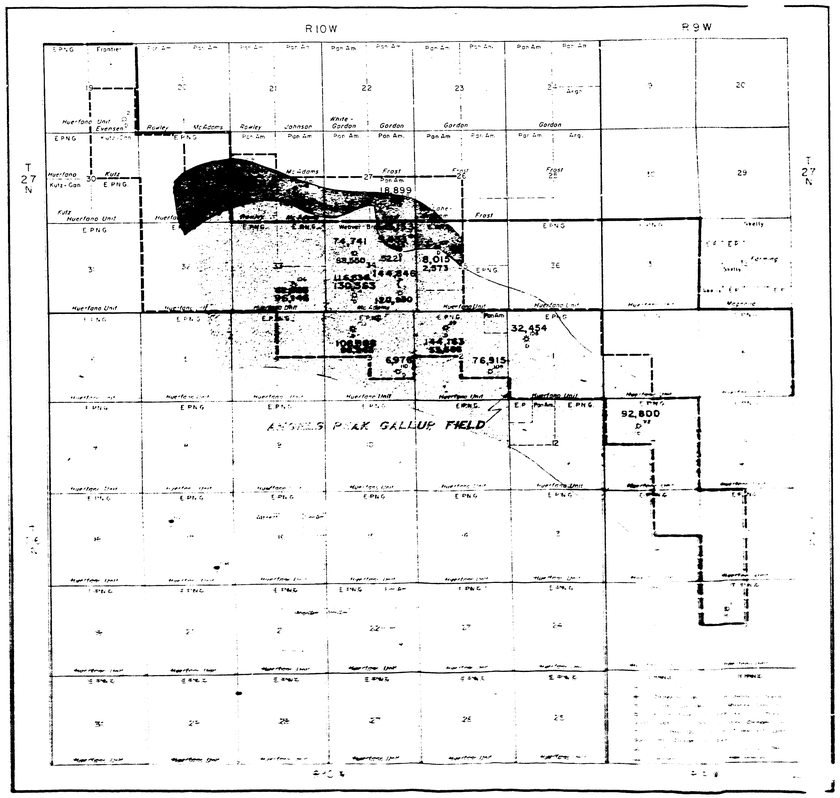
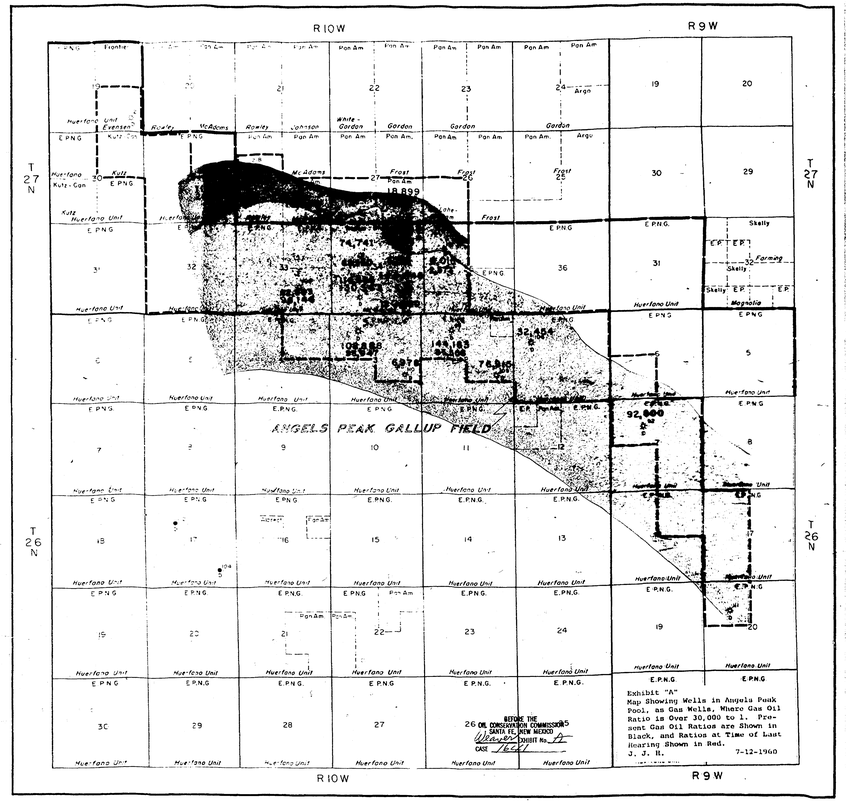


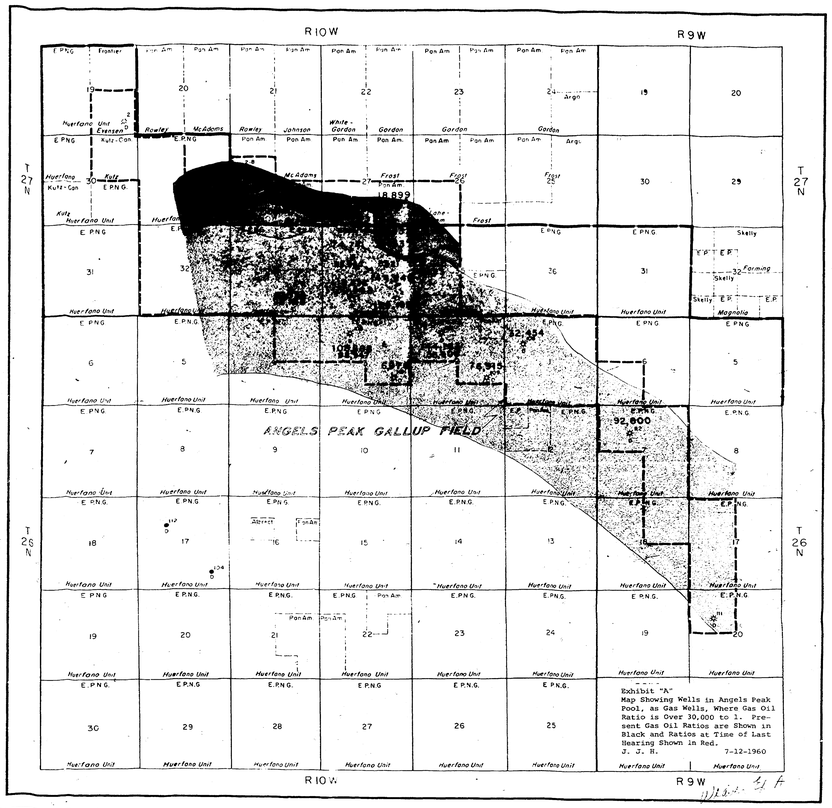
Exhibit No. 3
HEP vs. Cumulative Production
Huerfano Unit No. 106
Angels Peak Gallup Field
San Juan Co., N. Mex.
Pc = 3355 (3-20-59)
Bottom Hole Pressure, psig
Cumulative Production, MMCF
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Case No. 1241

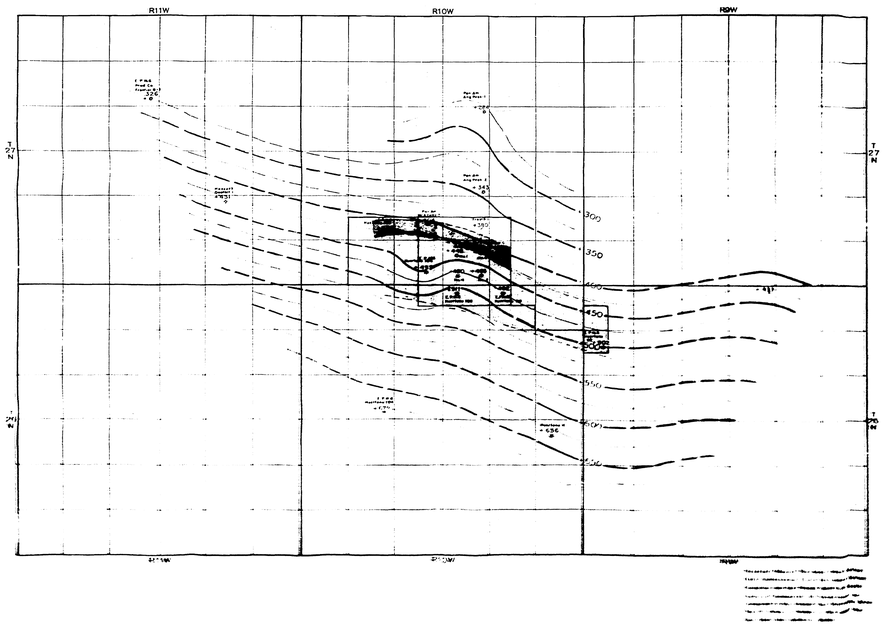

R10W
R9W
T 27 N
ANGELS PEAK GALLUP FIELD

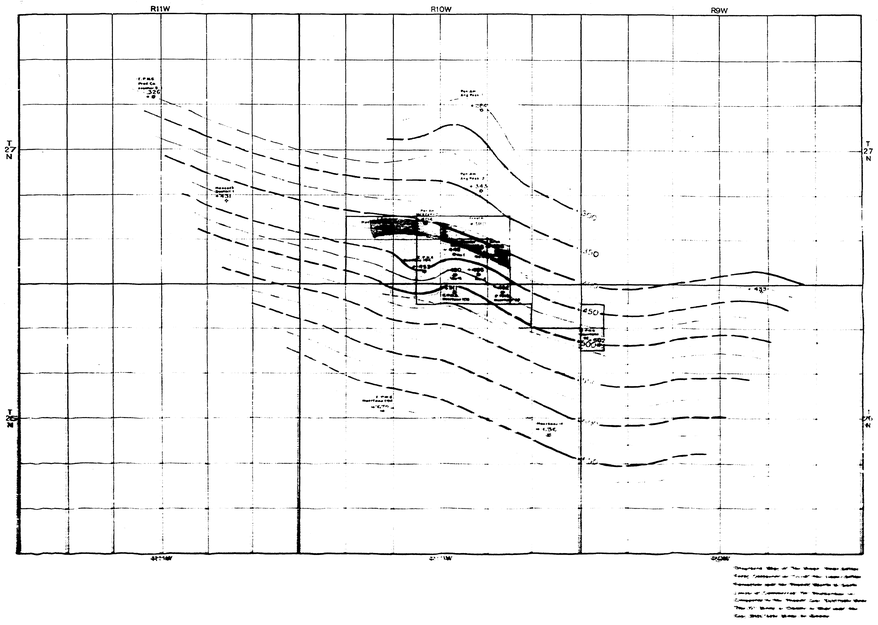

R10W
R9W
T 27 N
ANGELS PEAK GALLUP FIELD

326

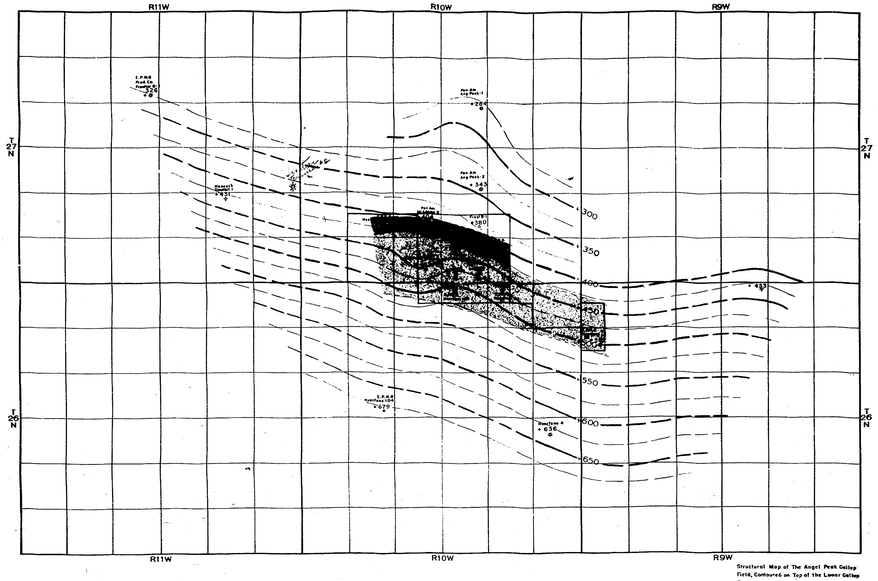

R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD
Huerfano Unit
E P N G
Pan Am
Frost
McAdams
Rowley
Johnson
White-Gordon
Gordon
Argo
Kutz
Kutz-Con
Skelly
Farmington
Magnolia
74,741
18,899
92,600
76,515
32,454
Exhibit "A"
Map Showing Wells in Angels Peak Pool, as Gas Wells, Where Gas Oil Ratio is Over 30,000 to 1. Present Gas Oil Ratios are Shown in Black, and Ratios at Time of Last Hearing Shown in Red.
J. J. H. 7-12-1960
BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
EXHIBIT No. 11
CASE 1691


R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD
Huerfano Unit
E P N G
Pan Am
Frost
McAdams
Rowley
Johnson
White-Gordon
Gordon
Argo
Kutz
Kutz-Con
Skelly
Farmington
Magnolia
74,741
18,899
92,600
76,515
32,454
Exhibit "A"
Map Showing Wells in Angels Peak Pool, as Gas Wells, Where Gas Oil Ratio is Over 30,000 to 1. Present Gas Oil Ratios are Shown in Black and Ratios at Time of Last Hearing Shown in Red.
J. J. H. 7-12-1960


R11W
R10W
R9W
T 27 N
T 26 N
300
350
400
450
500
550
600
650

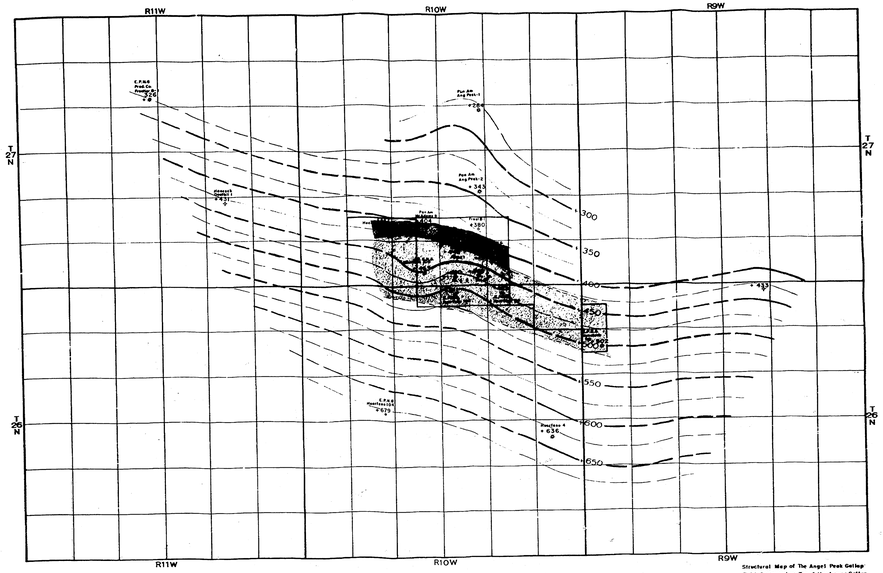

R11W
R10W
R9W
T 27 N
T 26 N
300
350
400
450
500
550
600
650

327



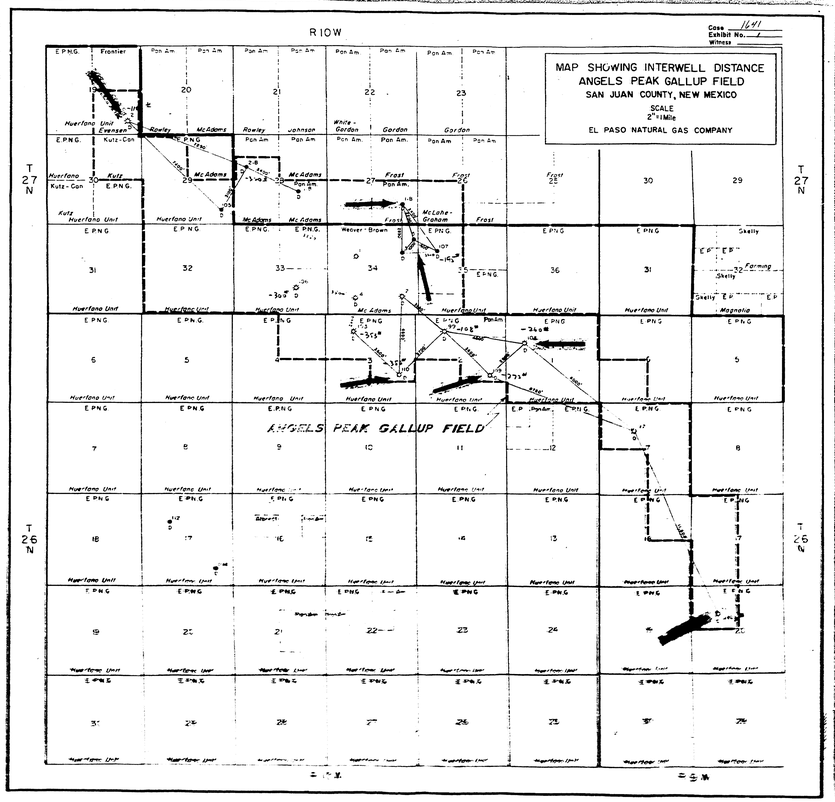
Structural Map of The Angel Peak Gallup Field, Contoured on Top of the Lower Gallup Formation and the Proved North & South Limits of Commercial Oil Production as Compared to the Proved Gas Distillate Area The Oil Area is Shown in Red and the Gas Distillate Area in Green.

Exhibit B

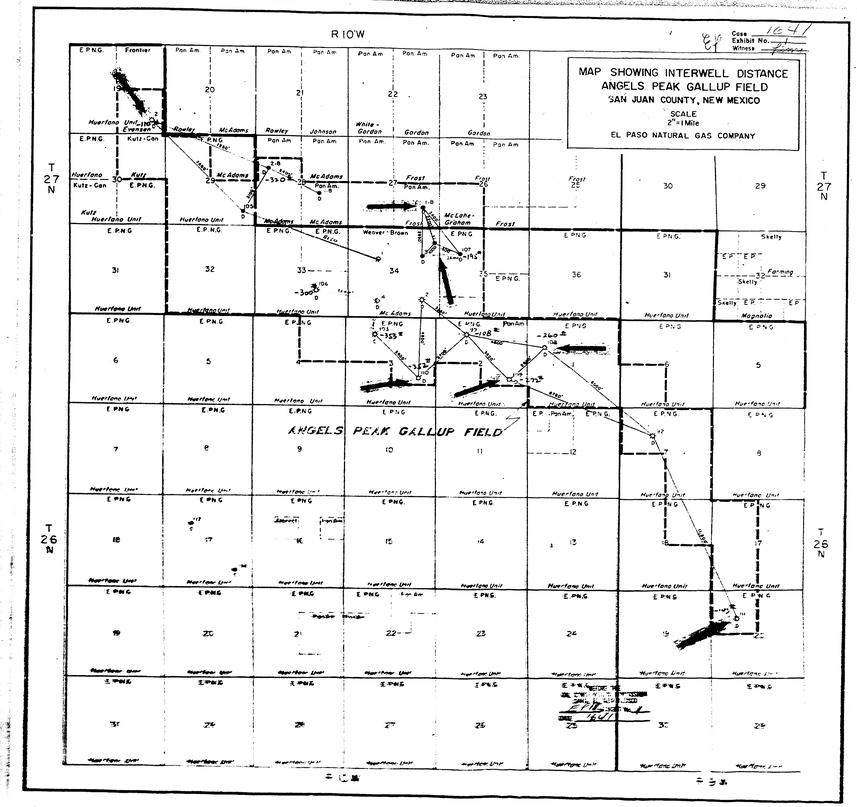


BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO Exhibit No. B CASE 1641

Structural Map of The Angel Peak Gallup Field, Contoured on Top of the Lower Gallup Formation and the Proved North & South Limits of Commercial Oil Production as Compared to the Proved Gas Distillate Area The Oil Area is Shown in Red and the Gas Distillate Area is Green.

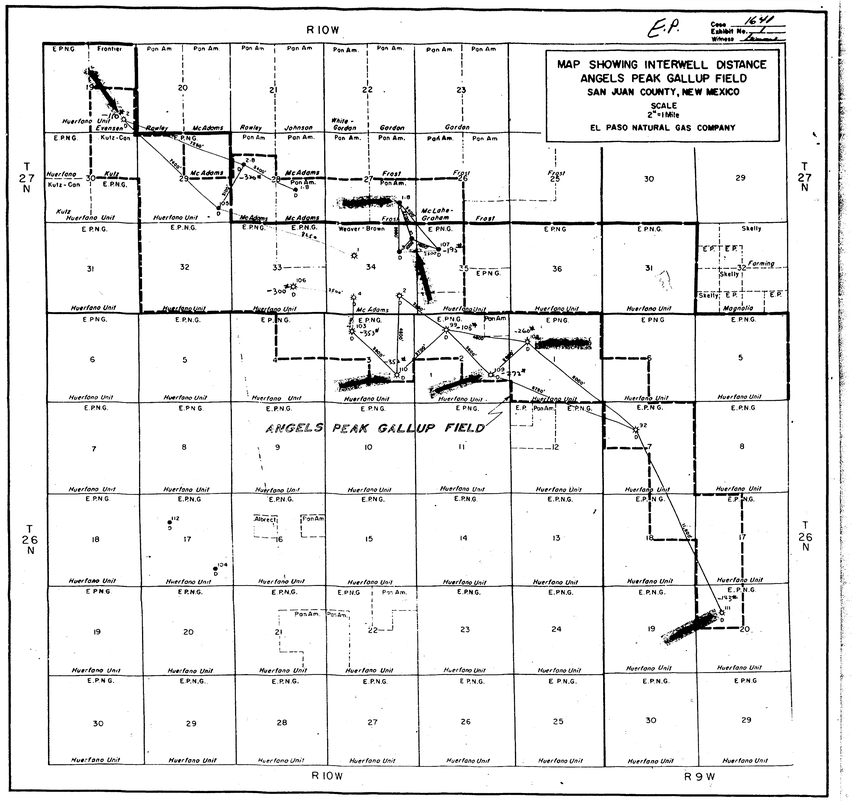


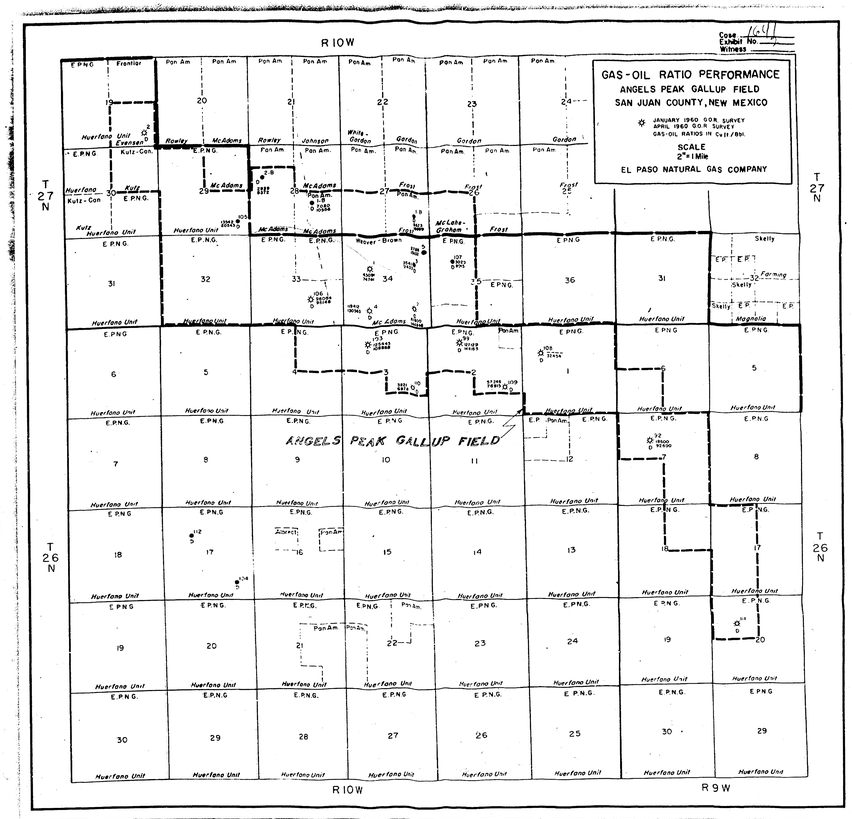
Case 1641 Exhibit No. 1 Witness

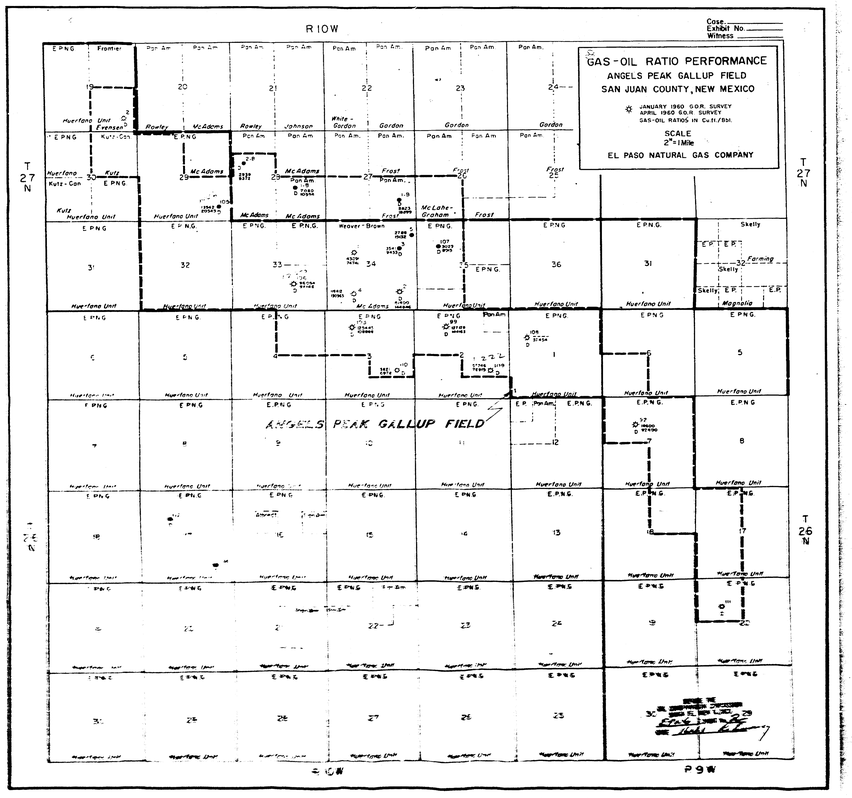


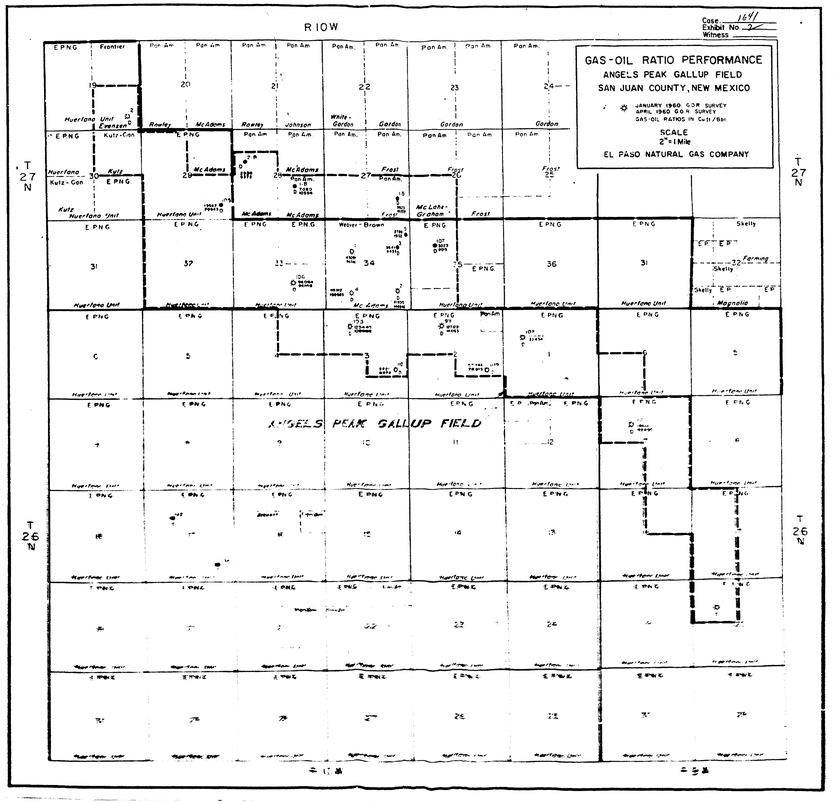
Case 1641 Exhibit No. 1 Witness

328


MAP SHOWING INTERWELL DISTANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO
SCALE
2"=1Mile
EL PASO NATURAL GAS COMPANY
E.P.
Case 1641
Exhibit No. 1
Witness
R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD


GAS-OIL RATIO PERFORMANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO
JANUARY 1960 G.O.R. SURVEY
APRIL 1960 G.O.R. SURVEY
GAS-OIL RATIOS IN Cu.Ft./Bbl.
SCALE
2"=1Mile
EL PASO NATURAL GAS COMPANY
Case 1641
Exhibit No
Witness
R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD


GAS-OIL RATIO PERFORMANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO
JANUARY 1960 G.O.R. SURVEY
APRIL 1960 G.O.R. SURVEY
GAS-OIL RATIOS IN Cu.Ft./Bbl.
SCALE
2"=1Mile
EL PASO NATURAL GAS COMPANY
Case
Exhibit No.
Witness
R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD


GAS-OIL RATIO PERFORMANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO
JANUARY 1960 G.O.R. SURVEY
APRIL 1960 G.O.R. SURVEY
GAS-OIL RATIOS IN Cu.Ft./Bbl.
SCALE
2"=1Mile
EL PASO NATURAL GAS COMPANY
Case 1641
Exhibit No 2
Witness
R10W
R9W
T 27 N
T 26 N
ANGELS PEAK GALLUP FIELD

329

MAP SHOWING INTERWELL DISTANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

SCALE
2"=1Mile

EL PASO NATURAL GAS COMPANY

Case
Exhibit No.
Witness

R10W R9W

T 27 N T 26 N

ANGELS PEAK GALLUP FIELD

GAS-OIL RATIO PERFORMANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

* JANUARY 1960 G.O.R. SURVEY
APRIL 1960 G.O.R. SURVEY
GAS-OIL RATIOS IN Cu.Ft./Bbl.

SCALE
2"=1Mile

EL PASO NATURAL GAS COMPANY

Case 47-11-61
Exhibit No. 9
Witness

R10W R9W

T 27 N T 26 N

ANGELS PEAK GALLUP FIELD

330

MAP SHOWING INTERWELL DISTANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

SCALE
2"=1Mile

EL PASO NATURAL GAS COMPANY

Case
Exhibit No.
Witness

R10W R9W

T 27 N T 26 N

ANGELS PEAK GALLUP FIELD

GAS-OIL RATIO PERFORMANCE
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

* JANUARY 1960 G.O.R. SURVEY
APRIL 1960 G.O.R. SURVEY
GAS-OIL RATIOS IN Cu.Ft./Bbl.

SCALE
2"=1Mile

EL PASO NATURAL GAS COMPANY

Case
Exhibit No.
Witness

R10W R9W

T 27 N T 26 N

ANGELS PEAK GALLUP FIELD

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

A

EL PASO
HUERFANO UNIT NO. 104
SE/4 SEC. 17-26-10

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO. 4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO. 3
SE/4 SEC. 28-27-10

PAN AMERICAN
C. A. Mc ADAMS "B" NO. 1
SE/4 SEC. 28-27-10

A'

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10

+700
+600
+500
+400
+300

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

GAS - OIL CONTACT (+430)

GAS - OIL CONTACT (+430)

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

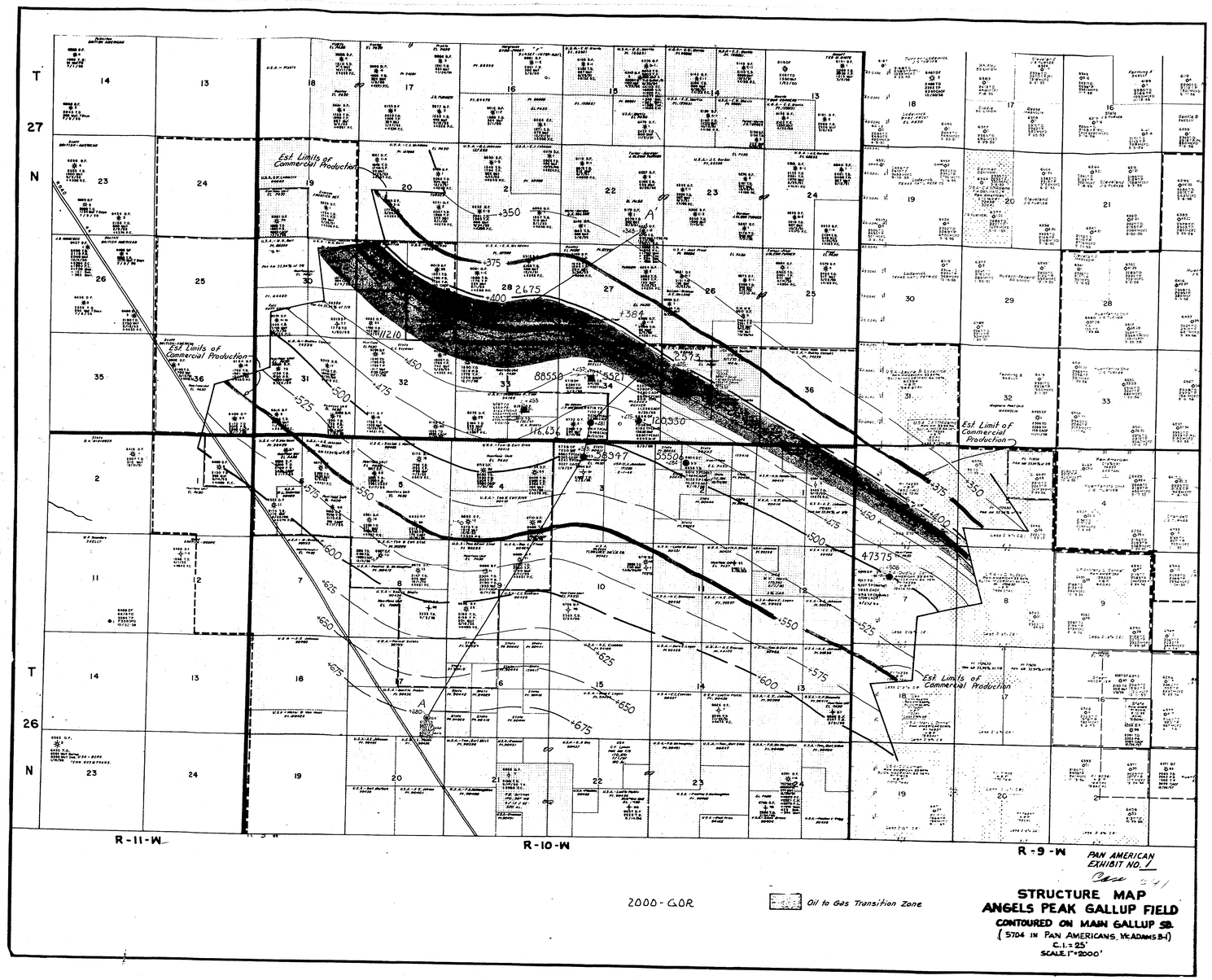
+700
+600
+500
+400
+300
+200

PAN AMERICAN EXHIBIT No. 4

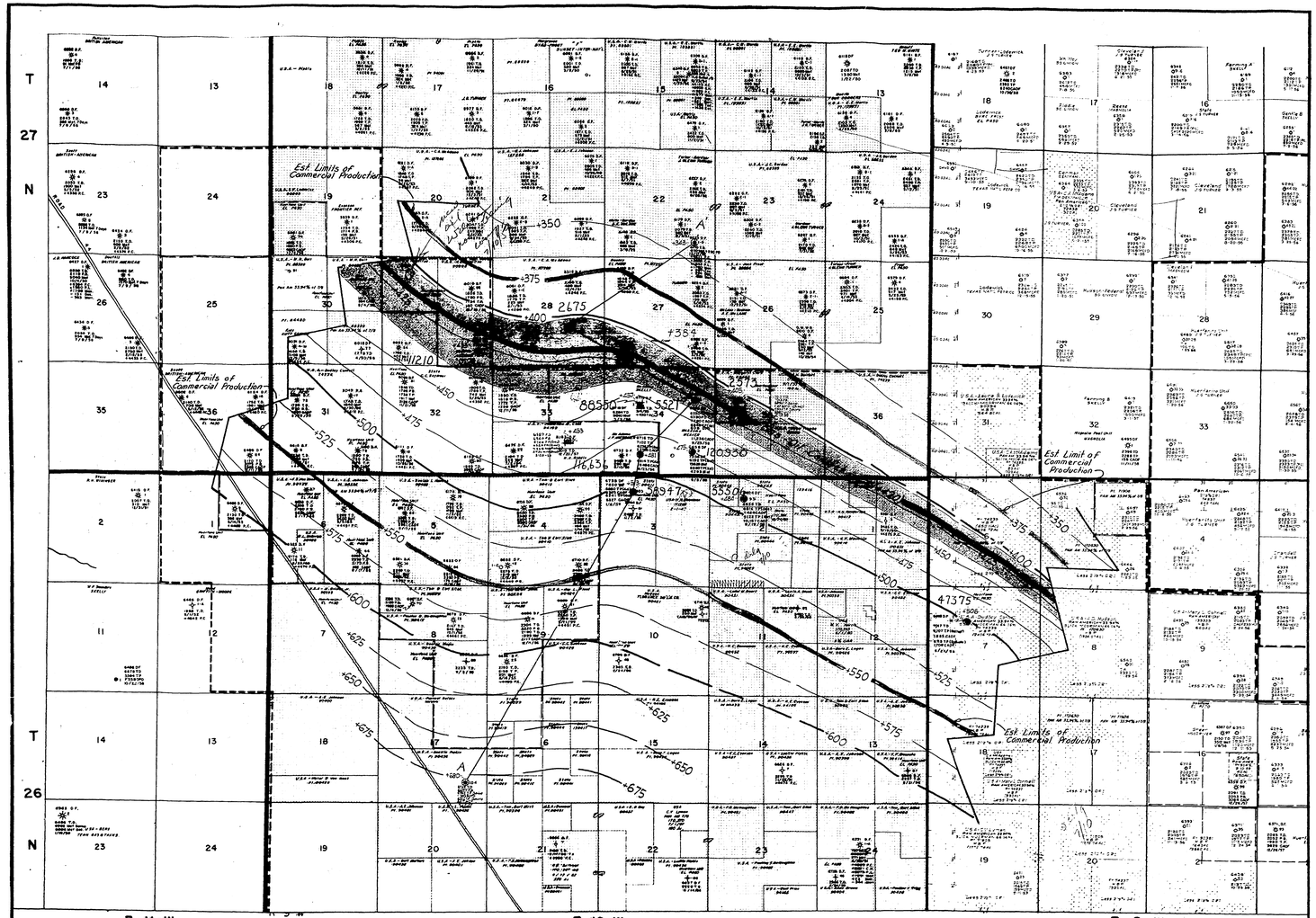
JACK FROST B-1

HUERFANO UNIT 107

331


T 27 N
T 26 N
R-11-W
R-10-W
R-9-W
Est. Limits of Commercial Production
Est. Limits of Commercial Production
Est. Limit of Commercial Production
Est. Limits of Commercial Production
A
A'
+350
+375
+400
+384
+425
+450
+475
+500
+525
+550
+575
+600
+625
+650
+675
+680
2675
11210
2573
88550
5521
46.63
120330
8347
5550
47375
2000-GOR
Oil to Gas Transition Zone
PAN AMERICAN EXHIBIT NO. 1
Case 671
STRUCTURE MAP
ANGELS PEAK GALLUP FIELD
CONTOURED ON MAIN GALLUP SD.
(5704 IN PAN AMERICANS, McADAMS B-1)
C.I. = 25'
SCALE 1" = 2000'

332



BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE NO. 1141

PAN AMERICAN EXHIBIT NO.___

STRUCTURE MAP
ANGELS PEAK GALLUP FIELD
CONTOURED ON MAIN GALLUP SD.
(5704 IN PAN AMERICANS, Mc ADAMS B-1)
C.I. = 25'
SCALE 1" = 2000'

333

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

A

EL PASO
HUERFANO UNIT NO. 104
SE/4 SEC. 17-26-10

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO. 4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO. 3
SE/4 SEC. 28-27-10

PAN AMERICAN
C. A. Mc ADAMS "B" NO. 1
SE/4 SEC. 28-27-10

A'

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10

+700
+600
+500
+400
+300
+200

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

GALLUP SAND

GAS - OIL CONTACT (+420)

MAIN GALLUP SAND

GAS - OIL CONTACT (+420)

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 1641

334

PAN AMERICAN
EXHIBIT No.

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

A

EL PASO
HUERFANO UNIT NO. 104
SE/4 SEC. 17-26-10

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO. 4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO. 3
SE/4 SEC. 28-27-10

PAN AMERICAN
C. A. Mc ADAMS "B" NO. 1
SE/4 SEC. 28-27-10

A'

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10

+700
+600
+530
+400
+300

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

GAS - OIL CONTACT (+420)

MAIN GALLUP SAND

+700
+600
+500
+400
+300
+200

GAS - OIL CONTACT (+420)

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

335

PAN AMERICAN EXHIBIT No. 2

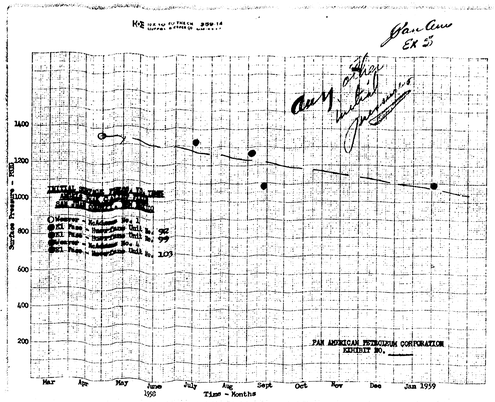
GAS-OIL RATIO TEST
AMERADA PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Test Date	Oil Prod. BOPD	GOR Cu. Ft./Bbl.
W. R. Weaver McAdams No. 1	3-28-59	23	68,590
McAdams No. 2	3-28-59	28	120,930
McAdams No. 3	3-28-59	104	5,221
McAdams No. 4	3-28-59	28	116,696
El Paso Natural Gas Huerfano Unit No. 99	3-26-59	43	55,506
Huerfano Unit No. 103	3-25-59	23	98,947
Huerfano Unit No. 105	3-28-59	87	11,210
Huerfano Unit No. 107	3-29-59	290	2,973
Huerfano Unit No. 92	4-13-59	8	47,375
Pan American Petroleum Corp. McAdams "B" No. 1	3-8-59	43	2,675

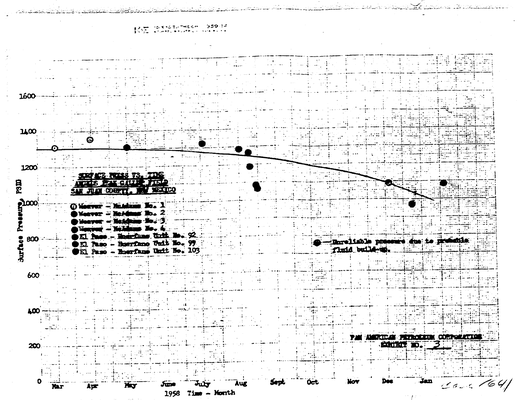
SURFACE PRESSURE DATA
AMERADA PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

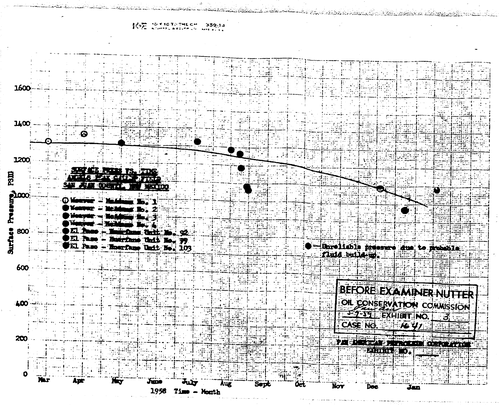
Operator Lease & Well	Shut-In Surface Pressure PSIG	Shut-In Time - Days	Date of Shut-In Pressure	Type Test	Date of First Prod. (MMDDYY)	Cum. Prod. To Test Date-MCF (MMDDYY)
W. R. Weaver McAdams No. 1	1310		March, 1958	(Rep. on USGS Final Log)	Apr. 1958	0
	1356	7	Apr. 29, 1958	Del. Test		1,486
	1090	7	Dec. 6, 1958	Del. Test		350,903
McAdams No. 2	1310		May, 1958	(Rep. on USGS Final Log)	May, 1958	0
	1187	7	Aug. 20, 1958	Del. Test		169,847
	1094	7	Dec. 6, 1958	Del. Test		354,231
McAdams No. 3	757	7	Oct. 23, 1958	Pkr. leakage	Nov. 1958	0
McAdams No. 4	1081	7	Aug. 27, 1958	Pkr. leakage	Sept. 1958	0
	1068	7	Aug. 30, 1958	Del. Test		0
	976	7	Dec. 22, 1958	Del. Test		475,182
El Paso Natural Gas Co. Huerfano Unit 92	1325	7	July 3, 1958	Pkr. leakage		0
	1289		Aug. 1958	(Rep. on USGS Final Log)		0
Huerfano Unit 99	1269	7	Aug. 19, 1958	Open Flw Test	Dec. 1958	0
Huerfano Unit 103	1088	9	Jan. 17, 1959	Open Flw Test		0

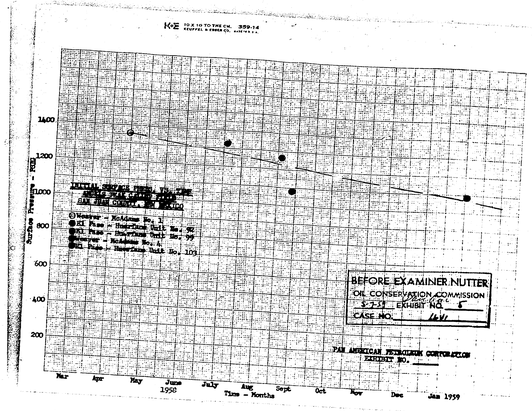
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
5-7-59 EXHIBIT NO. 4
CASE NO. 1641



Gas Conv. Ex 5







SURFACE PRESSURE DATA
AMERADA PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Date of Press. Meas.	Shut-In Time - Days	Initial Shut-In Pressure (PSIG)	Distance To Nearest Producing Well - Ft.	Pressure Draw Down PSIG	Minimum Drainage Area Acres
W. R. Weaver McAdams No. 1	Apr. 29,1958	7	1356	—	—	—
El Paso Natural Gas Co. Huerfano Unit 92	July 3,1958	7	1325	15,500	31	17,300
Huerfano Unit 99	Aug.19,1958	7	1269	3,350	87	810
W. R. Weaver McAdams No. 4	Aug. 27,1958	7	1081	2,550	275	480
El Paso Natural Gas Co. Huerfano Unit 103	Jan.17, 1959	9	1088	1,900	268	260

336

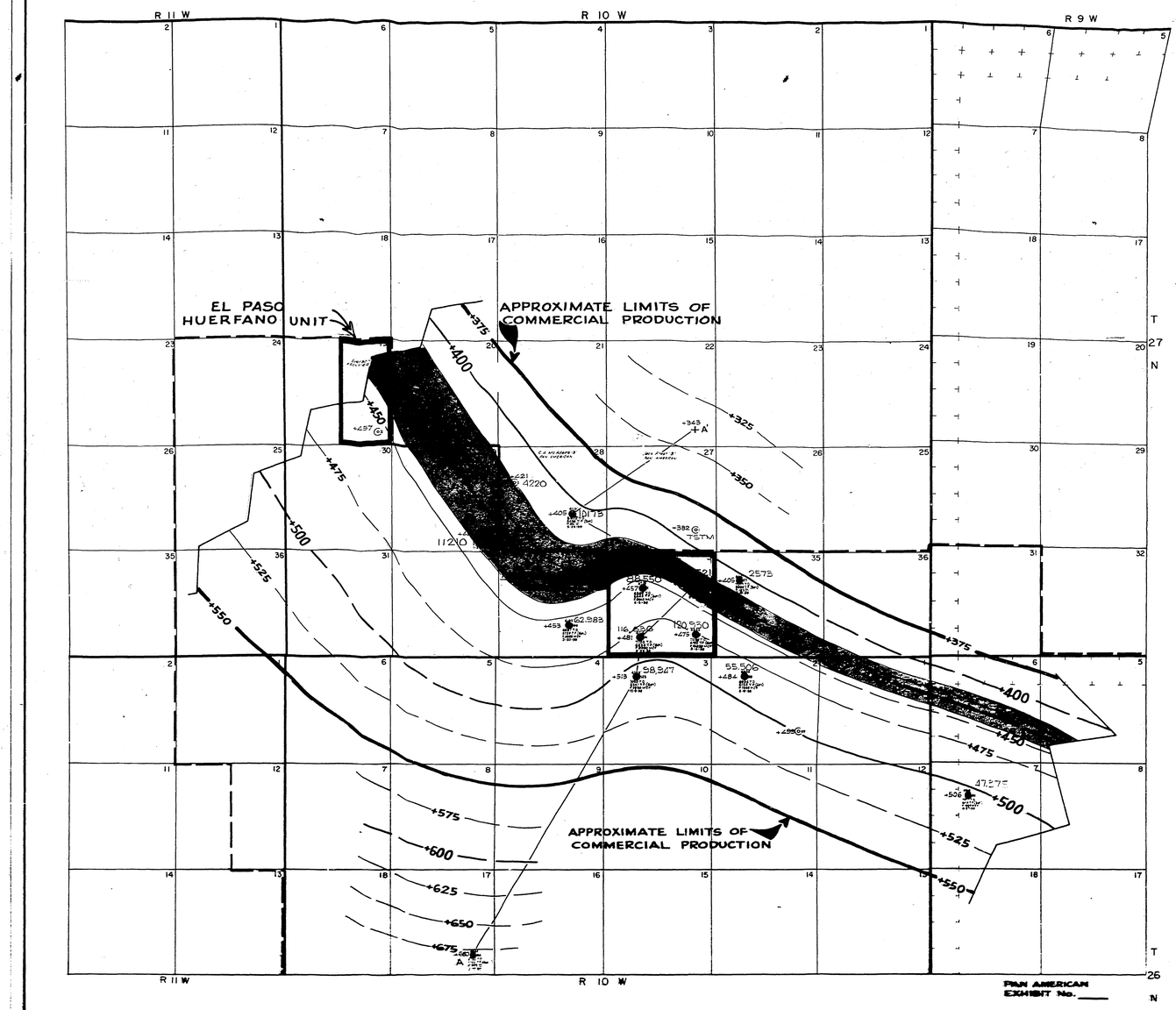
SURFACE PRESSURE DATA
AMERADA PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Date of Press. Meas.	Shut-In Time - Days	Initial Shut-In Pressure (PSIG)	Distance To Nearest Producing Well - Ft.	Pressure Draw Down PSIG	Minimum Drainage Area Acres
W. R. Weaver McAdams No. 1	Apr. 29,1958	7	1356	—	—	—
El Paso Natural Gas Co. Huerfano Unit 92	July 3,1958	7	1325	15,500	31	17,300
Huerfano Unit 99	Aug.19, 1958	7	1269	3,350	87	810
W. R. Weaver McAdams No. 4	Aug. 27,1958	7	1081	2,550	275	480
El Paso Natural Gas Co. Huerfano Unit 103	Jan.17, 1959	9	1088	1,900	268	260

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
5-7-59 EXHIBIT NO. 5
CASE NO. 1641

GAS-OIL RATIO TEST
AMERADA PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Test Date	Oil Prod. BOPD	GOR Cu. Ft./Bbl.
W. R. Weaver McAdams No. 1	3-28-59	23	68,590
McAdams No. 2	3-28-59	28	120,930
McAdams No. 3	3-28-59	104	5,221
McAdams No. 4	3-28-59	28	116,696
El Paso Natural Gas Huerfano Unit No. 99	3-26-59	43	55,506
Huerfano Unit No. 103	3-25-59	23	98,947
Huerfano Unit No. 105	3-28-59	87	11,210
Huerfano Unit No. 107	3-29-59	290	2,973
Huerfano Unit No. 92	4-13-59	8	47,375
Pan American Petroleum Corp. McAdams "B" No. 1	3-8-59	43	2,675



LEGEND

- Gallup Participating Area
- Oil Wells
- Gas Wells
- Drilling Wells
- Structure Control Point

STRUCTURE MAP
ANGELS PEAK GALLUP FLD.
CONTOURED ON MAIN GALLUP SAND
(Shale in Pan American No. Hubbard B-1)
C.I. = 25'
SCALE 1"=2000'

337

CROSS SECTION A-A'
ANGELS PEAK GALLUP FLD.

A

EL PASO
HUERFANO UNIT NO. 104
SE/4 SEC. 17-26-10

EL PASO
HUERFANO UNIT NO. 103
NW/4 SEC. 3-26-10

W. R. WEAVER
Mc ADAMS NO. 4
SW/4 SEC. 34-27-10

W. R. WEAVER
Mc ADAMS NO. 3
SE/4 SEC. 28-27-10

PAN AMERICAN
C. A. Mc ADAMS "B" NO. 1
SE/4 SEC. 28-27-10

A'

PAN AMERICAN
J.C. GORDEN "D" NO. 1
SE/4 SEC. 22-27-10

+700
+600
+500
+400
+300
+200

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

GAS - OIL CONTACT (+430)

MAIN GALLUP SAND

ESTIMATED LIMIT OF COMMERCIAL PRODUCTION

GAS - OIL CONTACT (+430)

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
CASE 1641 EXHIBIT No. 3-A

PAN AMERICAN
EXHIBIT No. 2

338

GAS-OIL RATIO TEST
AZTEC-PICTURED CLIFFS FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Test Date	Oil Prod. BOPD	GOR Cu. Ft./Bbl.
U. R. Weaver			
McAdams No. 1	3-28-59	23	89,550
McAdams No. 2	3-28-59	28	120,930
McAdams No. 3	3-28-59	104	5,221
McAdams No. 4	3-28-59	28	116,636
El Paso Natural Gas			
Huerfano Unit No. 99	3-26-59	43	55,506
Huerfano Unit No. 103	3-15-59	23	98,947
Huerfano Unit No. 105	3-20-59	67	11,210
Huerfano Unit No. 106	4-30-59	59	62,983
Huerfano Unit No. 107	3-29-59	290	2,573
Huerfano Unit No. 92	4-11-59	8	47,375
Pan American Petroleum Corp.			
McAdams "B" No. 1	6-30-59	28	10,173
McAdams "B" No. 2	7-5-59	112	4,220

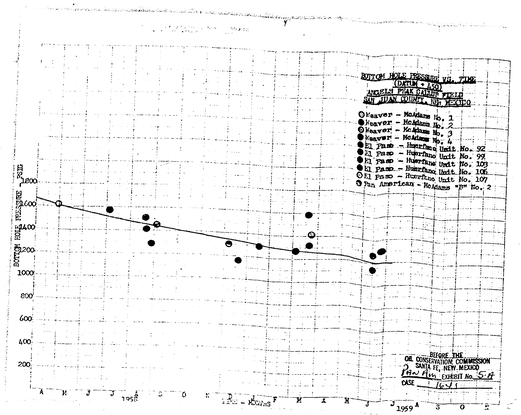
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Pan Am EXHIBIT No. 3-A
CASE No. 1641

PRESSURE DATA
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Shut-In Surface Pressure PSIG(Quad Mt. Meas.)	Shut-In Time-Days	Date Pressure Measured	Date of First Prod. (MMDDYR)	Cum. to Test Date - MCF (MMCFGR)	Calculated BHP - PSIG (Datum +4500)	Bomb Meas. BHP - PSIG (Datum +4500)
U. R. Weaver							
McAdams No. 1	1356	7	4-29-58	April, 1958	1,486	1620	
	1090	7	12-6-58		350,903	1300	
McAdams No. 2	1187	7	8-20-58	May, 1958	169,847	1410	
	1094	7	12-6-58		354,231	1303	
	1066	7	6-15-59		522,700	1268	
McAdams No. 3	1218	7	9-3-58	Nov., 1958	0	1450	
	757	7	10-23-58		0	Non-representative Surf. Press.	
McAdams No. 4	1081	7	8-27-58	Sept.,1958	0	1290	
	916	7	12-22-58		175,200	1162	
	956	7	6-15-59		765,200	1140	
El Paso Natural Gas Co.							
Huerfano Unit No. 92	1325	7	7-3-58	April,1959	0	1575	
	1333	7	3-20-59		0	1585	
Huerfano Unit No. 99	1269	7	8-19-58	Feb., 1959	0	1512	
Huerfano Unit No. 103	1088	9	1-19-59	March,1959	0	1295	
	1066	42	3-4-59		0	1270	1267
Huerfano Unit No. 105	1123	7	3-20-59	April,1959	0	1320	
Huerfano Unit No. 107	1182	33	3-25-59	April,1959	0	1412	1425
Pan American McAdams "B" No. 2		3	6-26-59		0		1300

NOTE: May and June, 1959, Production estimated to be equal to allowable.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Pan Am EXHIBIT No. 4
CASE No. 1641

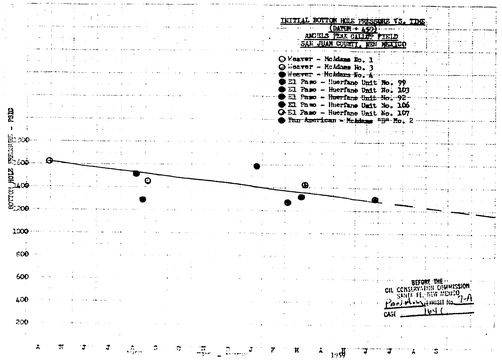


INITIAL BOTTOM HOLE PRESSURE DATA
ANGELS PEAK GALLUP FIELD
SAN JUAN COUNTY, NEW MEXICO

Operator Lease & Well	Date of Press. Meas.	Shut-In Time - Days	Initial BHP-PSIG (Datum +4500)	Distance To Nearest Producing Well - Ft.	Pressure Draw Down PSIG	Minimum Drainage Area-Acres	Pressure Draw Down % of Orig Pressure
U. R. Weaver							
McAdams No. 1	Apr. 29,1958	7	1620	Original Reservoir Pressure			
El Paso Natural Gas Co.							
Huerfano Unit 99	Aug. 19,1958	7	1512	3,100	108	693	6.7
McAdams No. 4	Aug. 27,1958	7	1290	2,450	330	433	20.4
McAdams No. 3	Sept. 3,1958	7	1450	2,600	170	488	11.5
El Paso Natural Gas Co.							
Huerfano Unit No. 103	Jan. 17,1959	9	1295	1,980	325	283	20.0
	Mar. 4, 1959	42	1270*	1,980	350	283	21.6
Huerfano Unit No. 92	Jan. 22,1959	7	1585	15,500	35	17,300	2.6
Huerfano Unit No. 106	Mar. 20,1959	7	1320	3,550	300	909	18.5
Huerfano Unit No. 107	Mar. 25,1959	33	1425*	2,175	195	341	12.0
Pan American							
McAdams "B" No. 2	June 26,1959	3	1300*	3,100	320	693	19.8

* BHP measured with BHP Bomb.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Pan Am EXHIBIT No. 6-A
CASE No. 1641



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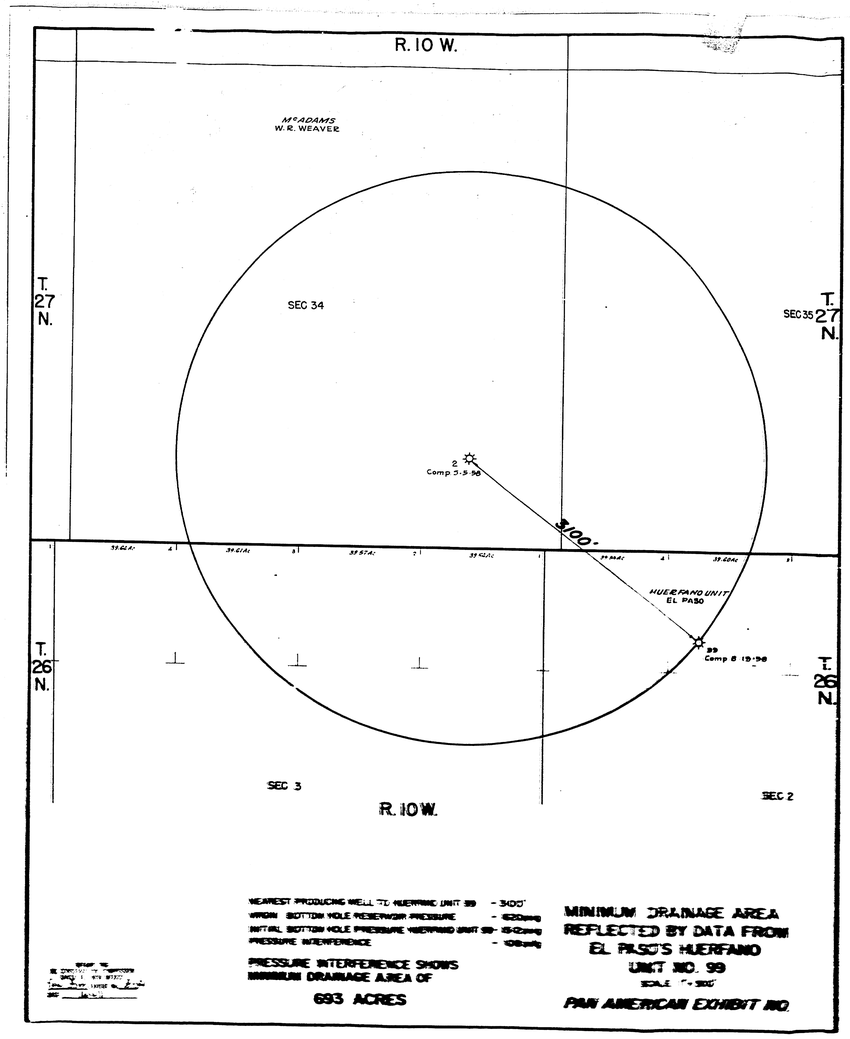
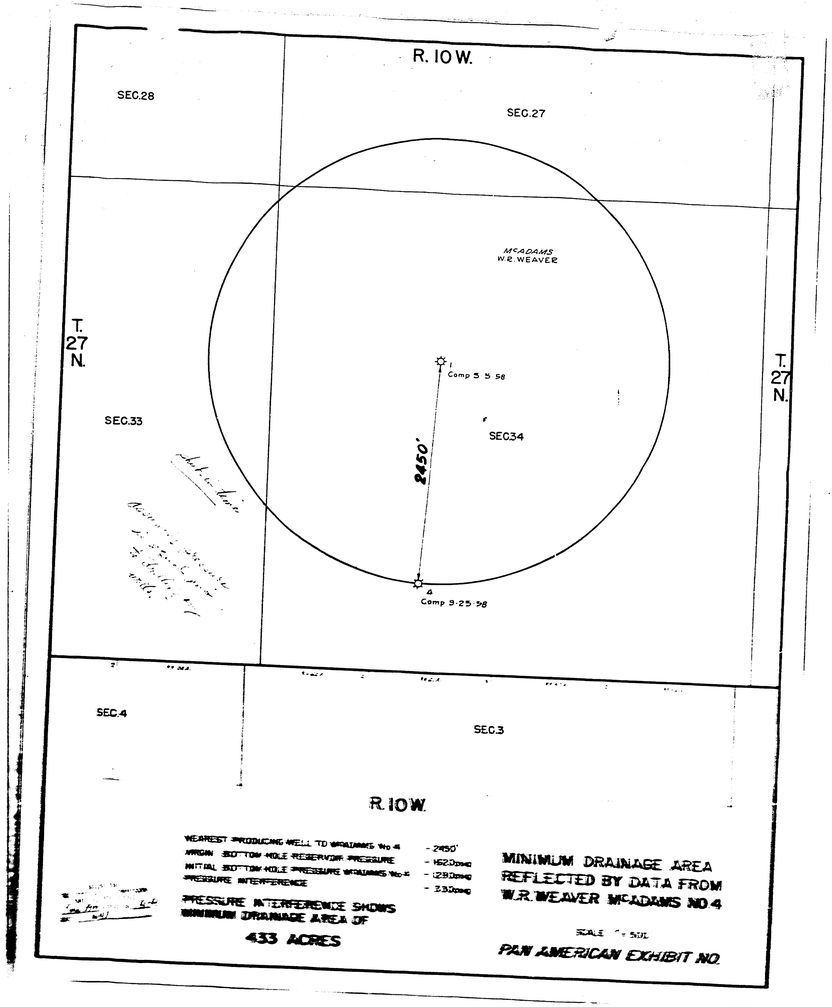
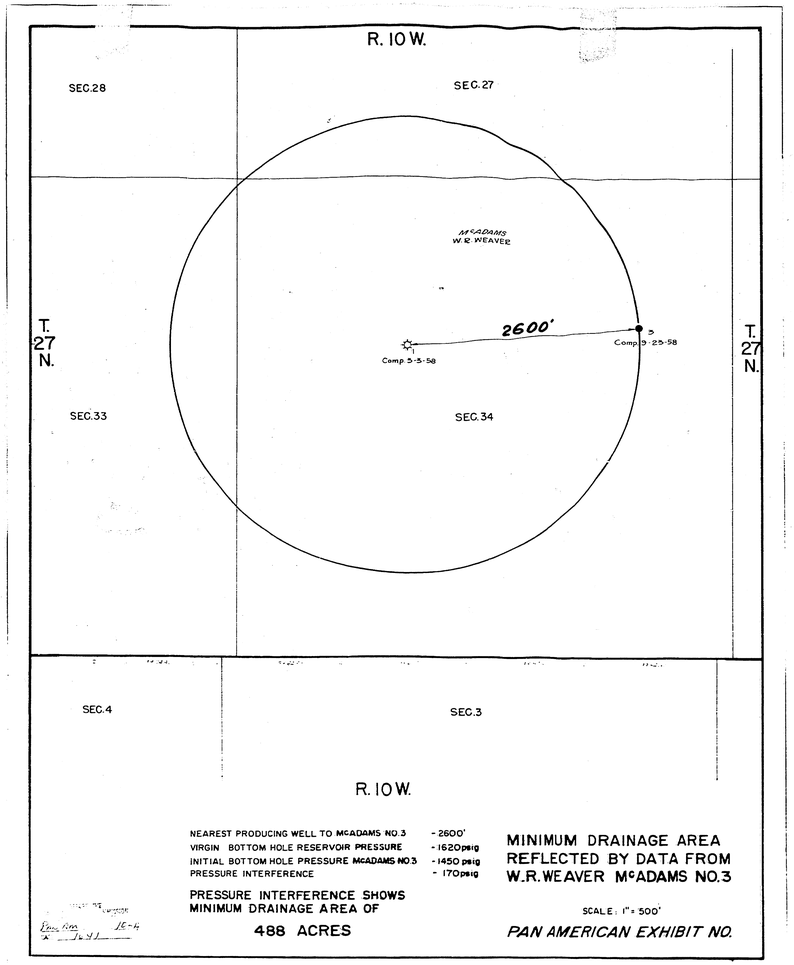
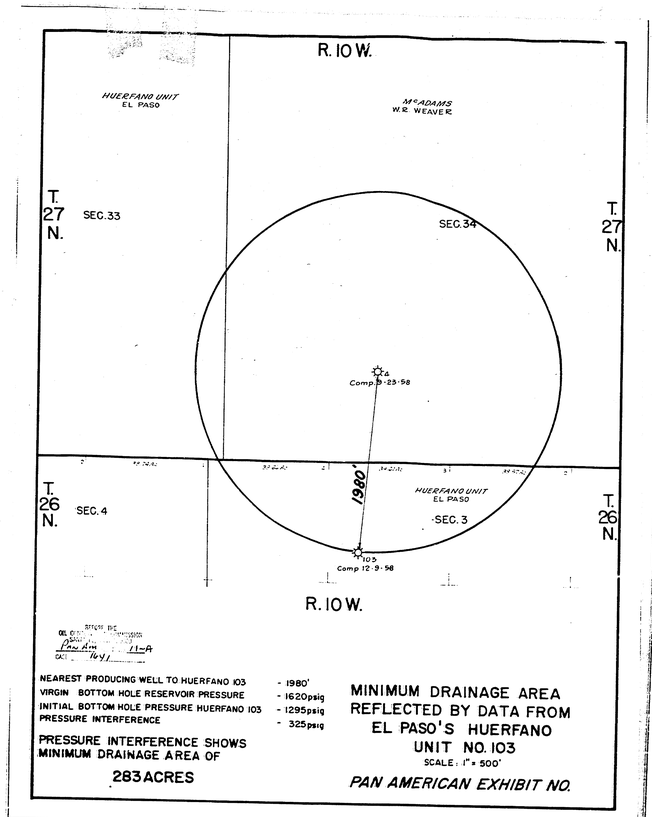
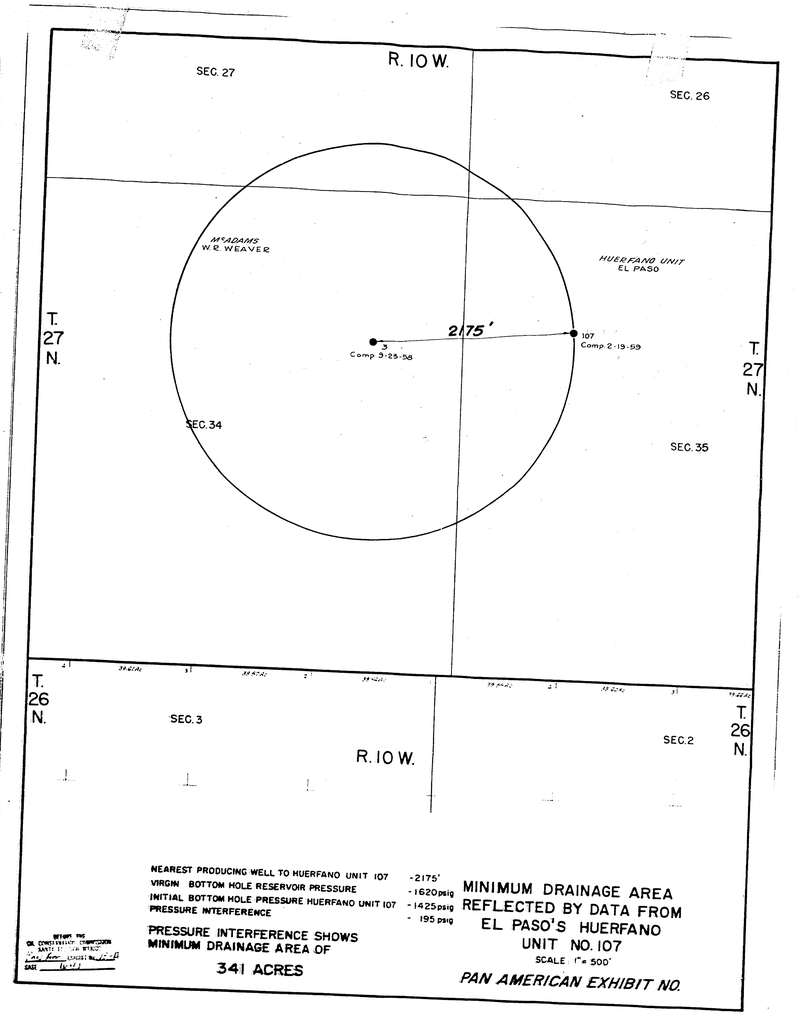


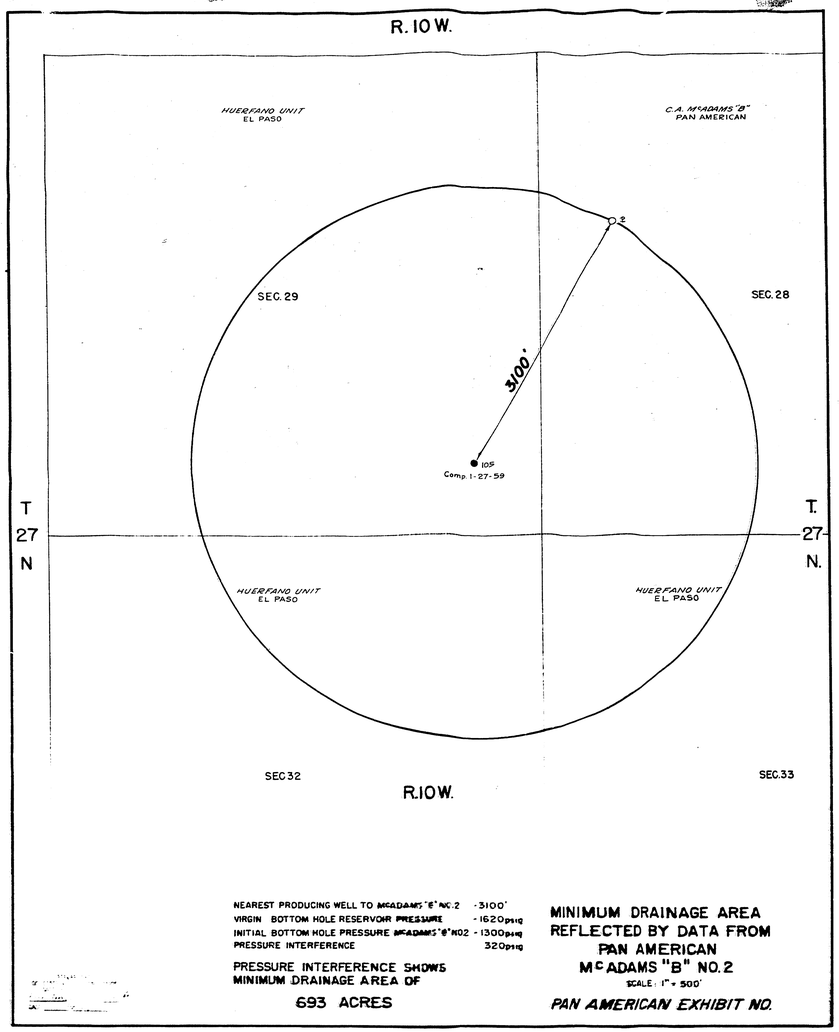



R. 10 W.
SEC. 28
SEC. 27
McADAMS
W.R. WEAVER
T.
27
N.
2600'
1
Comp 5-5-58
2
Comp 3-25-58
T.
27
N.
SEC. 33
SEC. 34
SEC. 4
SEC. 3
R. 10 W.
NEAREST PRODUCING WELL TO McADAMS NO. 3 - 2600'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE McADAMS NO. 3 - 1450 psig
PRESSURE INTERFERENCE - 170psig
PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
488 ACRES
MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
W.R. WEAVER McADAMS NO. 3
SCALE: 1" = 500'
PAN AMERICAN EXHIBIT NO.


R. 10 W.
HUERFANO UNIT
EL PASO
McADAMS
W.R. WEAVER
T.
27
N.
SEC. 33
SEC. 34
4
Comp 3-23-58
1980'
HUERFANO UNIT
EL PASO
T.
26
N.
SEC. 4
SEC. 3
105
Comp 12-9-58
R. 10 W.
NEAREST PRODUCING WELL TO HUERFANO 103 - 1980'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO 103 - 1295psig
PRESSURE INTERFERENCE - 325psig
PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
283 ACRES
MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 103
SCALE: 1" = 500'
PAN AMERICAN EXHIBIT NO.


SEC. 27
R. 10 W.
SEC. 26
McADAMS
W.R. WEAVER
HUERFANO UNIT
EL PASO
T.
27
N.
2175'
3
Comp 3-25-58
107
Comp 2-19-59
T.
27
N.
SEC. 34
SEC. 35
T.
26
N.
SEC. 3
SEC. 2
R. 10 W.
NEAREST PRODUCING WELL TO HUERFANO UNIT 107 - 2175'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO UNIT 107 - 1425psig
PRESSURE INTERFERENCE - 195 psig
PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
341 ACRES
MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 107
SCALE: 1" = 500'
PAN AMERICAN EXHIBIT NO.

340

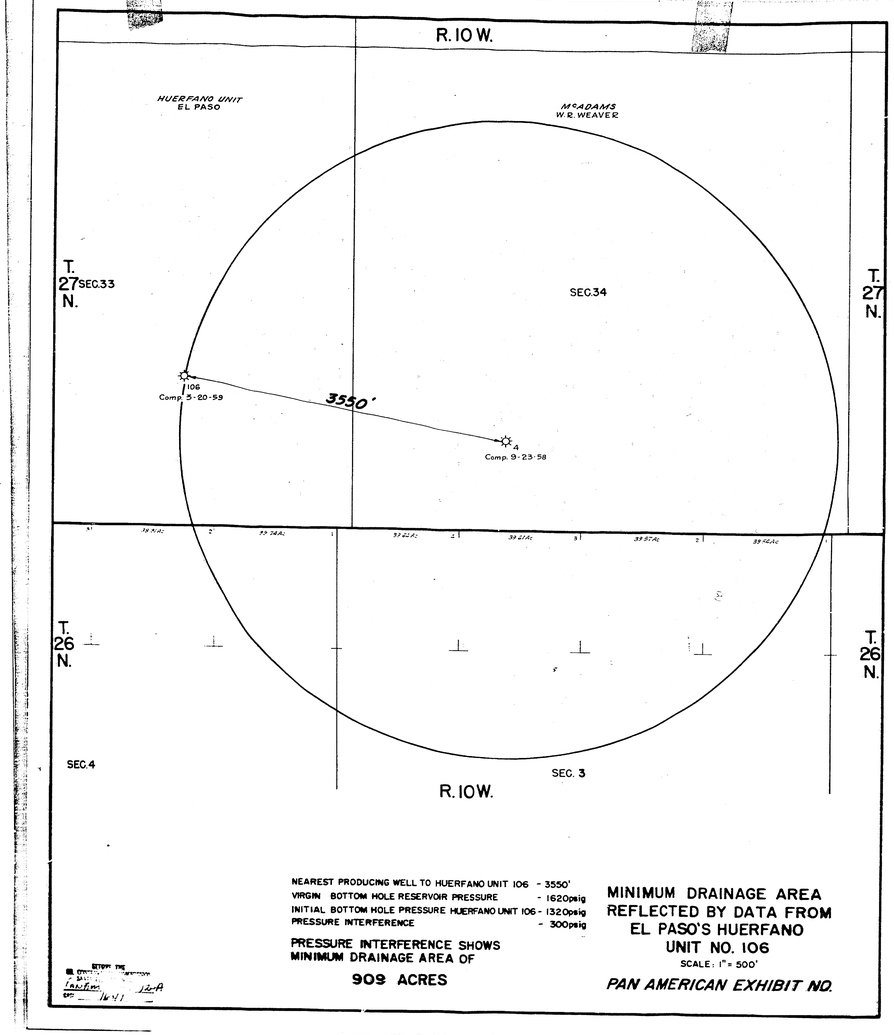


NEAREST PRODUCING WELL TO McADAMS "B" NO. 2 - 3100'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620 psig
INITIAL BOTTOM HOLE PRESSURE McADAMS "B" NO2 - 1300 psig
PRESSURE INTERFERENCE 320 psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
693 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
PAN AMERICAN
McADAMS "B" NO. 2
SCALE: 1" = 500'

PAN AMERICAN EXHIBIT NO.

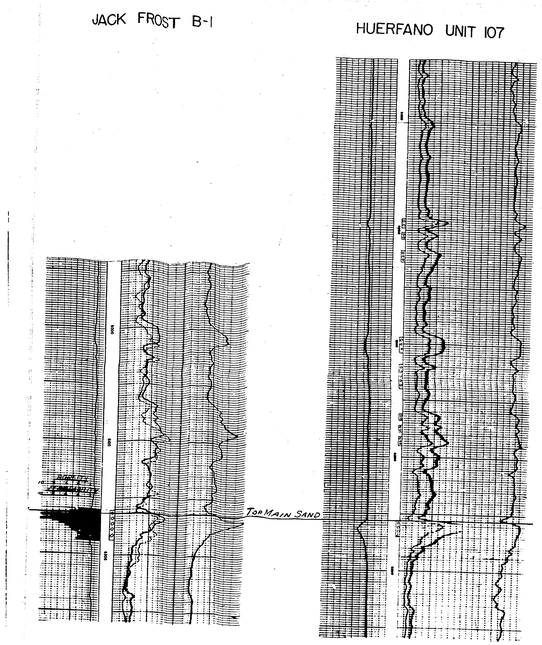


NEAREST PRODUCING WELL TO HUERFANO UNIT 106 - 3550'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620 psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO UNIT 106 - 1320 psig
PRESSURE INTERFERENCE - 300 psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
909 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 106
SCALE: 1" = 500'

PAN AMERICAN EXHIBIT NO.



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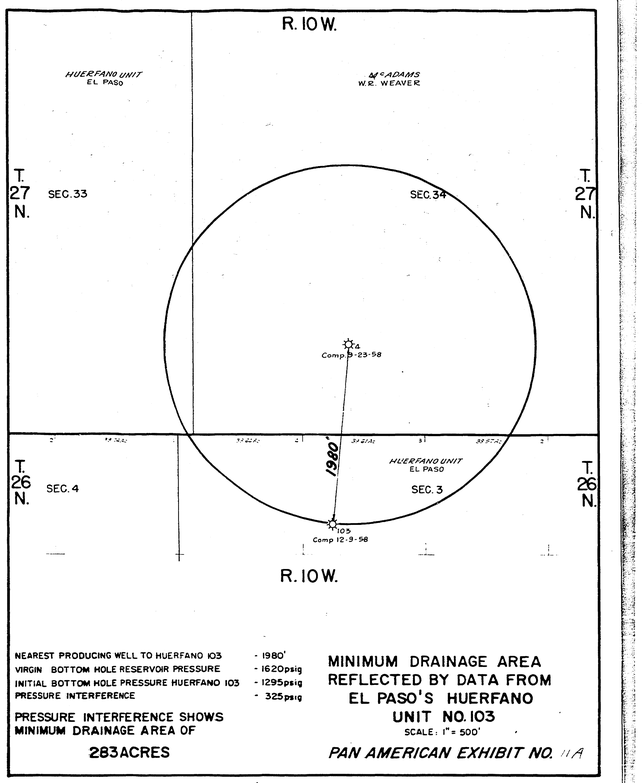


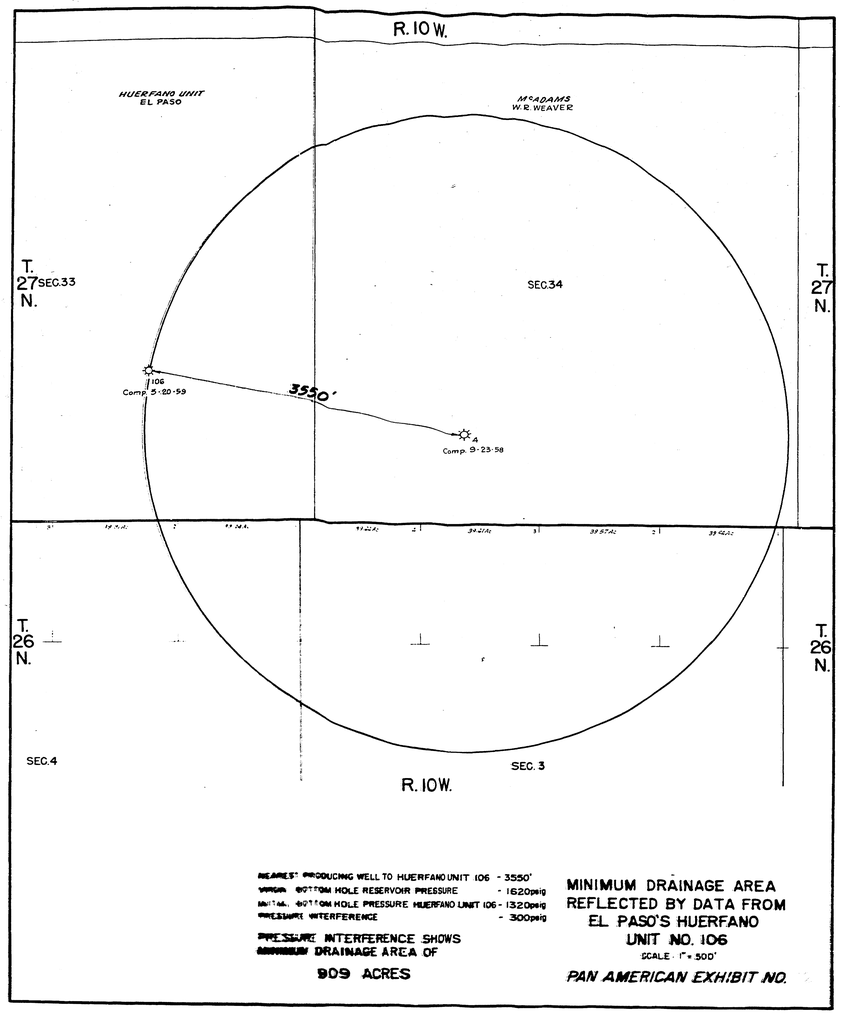
NEAREST PRODUCING WELL TO HUERFANO 103 - 1980'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO 103 - 1295psig
PRESSURE INTERFERENCE - 325psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
283 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 103
SCALE: 1" = 500'

PAN AMERICAN EXHIBIT NO. 11A

342

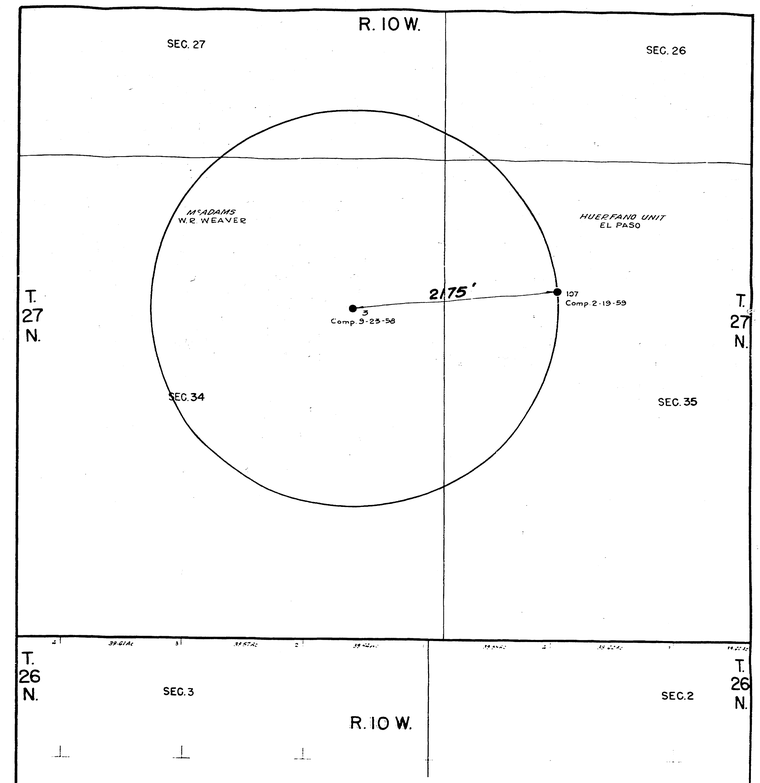


NEAREST PRODUCING WELL TO HUERFANO UNIT 106 - 3550'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO UNIT 106 - 1320psig
PRESSURE INTERFERENCE - 300psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
909 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 106
SCALE: 1" = 500'

PAN AMERICAN EXHIBIT NO.

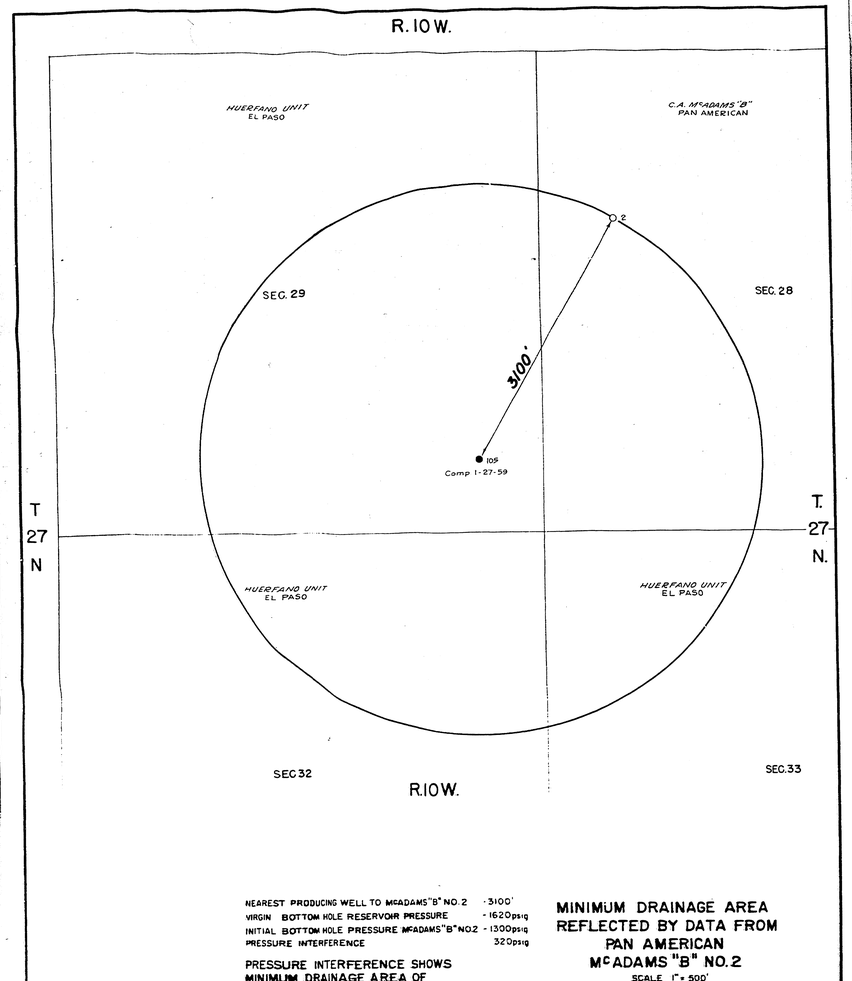


NEAREST PRODUCING WELL TO HUERFANO UNIT 107 - 2175'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO UNIT 107 - 1425psig
PRESSURE INTERFERENCE - 195psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
341 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 107
SCALE 1" = 500'

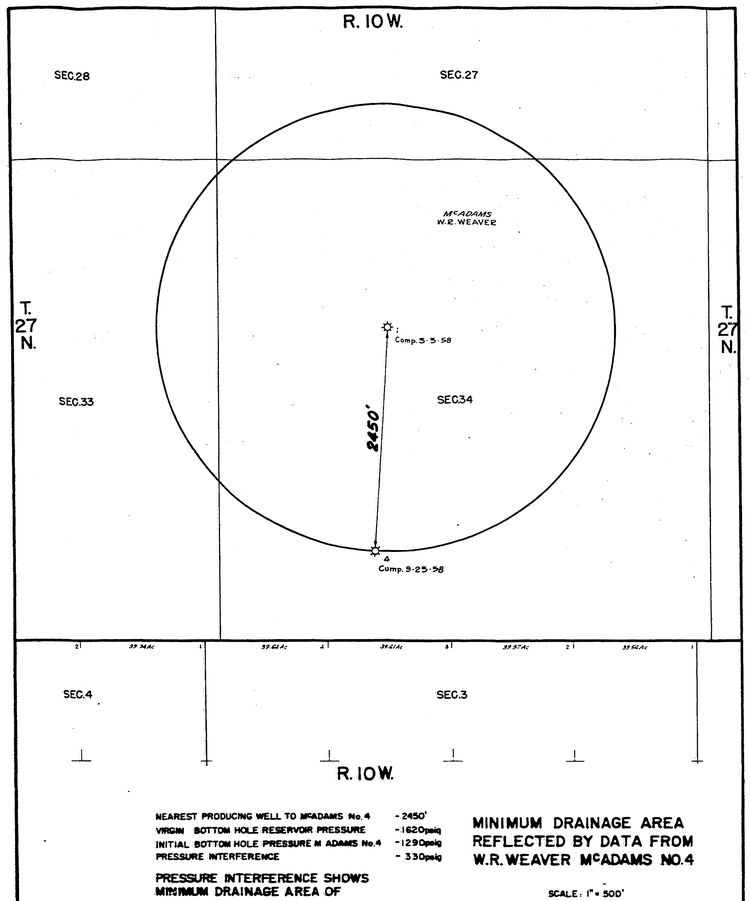
PAN AMERICAN EXHIBIT NO.



NEAREST PRODUCING WELL TO McADAMS "B" NO. 2 - 3100'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620 psig
INITIAL BOTTOM HOLE PRESSURE McADAMS "B" NO. 2 - 1300 psig
PRESSURE INTERFERENCE 320 psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
693 ACRES

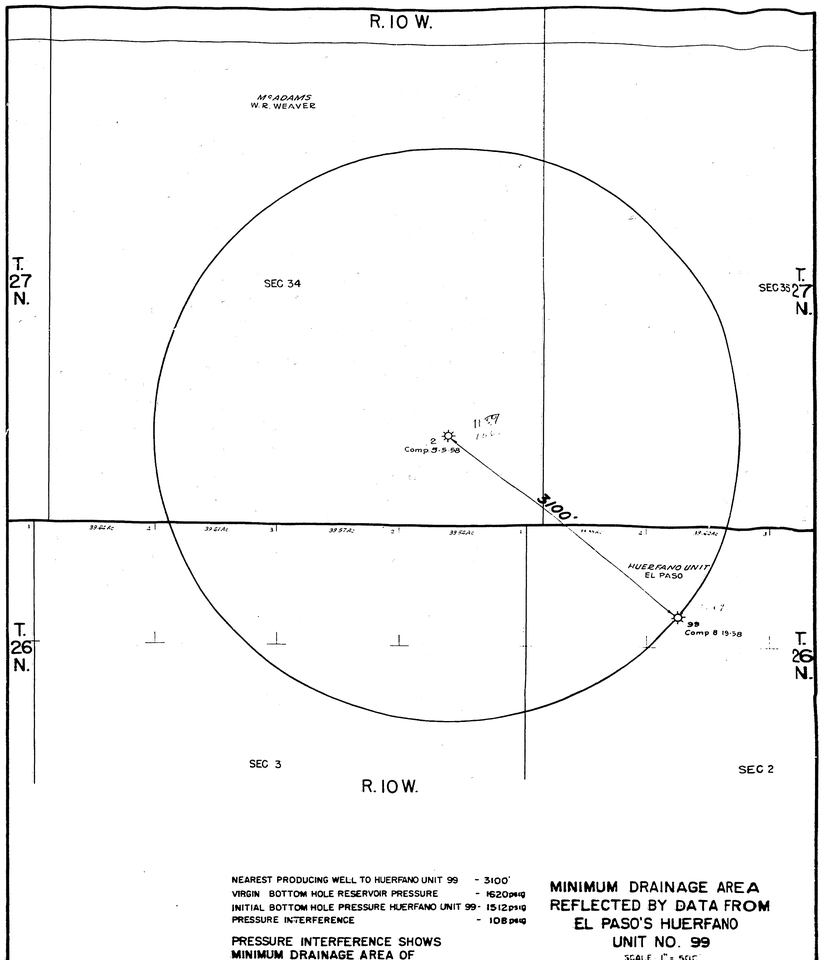
MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
PAN AMERICAN
McADAMS "B" NO. 2
SCALE 1" = 500'
PAN AMERICAN EXHIBIT NO.



NEAREST PRODUCING WELL TO McADAMS No. 4 - 2450'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620 psig
INITIAL BOTTOM HOLE PRESSURE IN ADAMS No. 4 - 1290 psig
PRESSURE INTERFERENCE - 330 psig

PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
433 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
W.R. WEAVER McADAMS NO. 4
SCALE: 1" = 500'
PAN AMERICAN EXHIBIT NO. 14

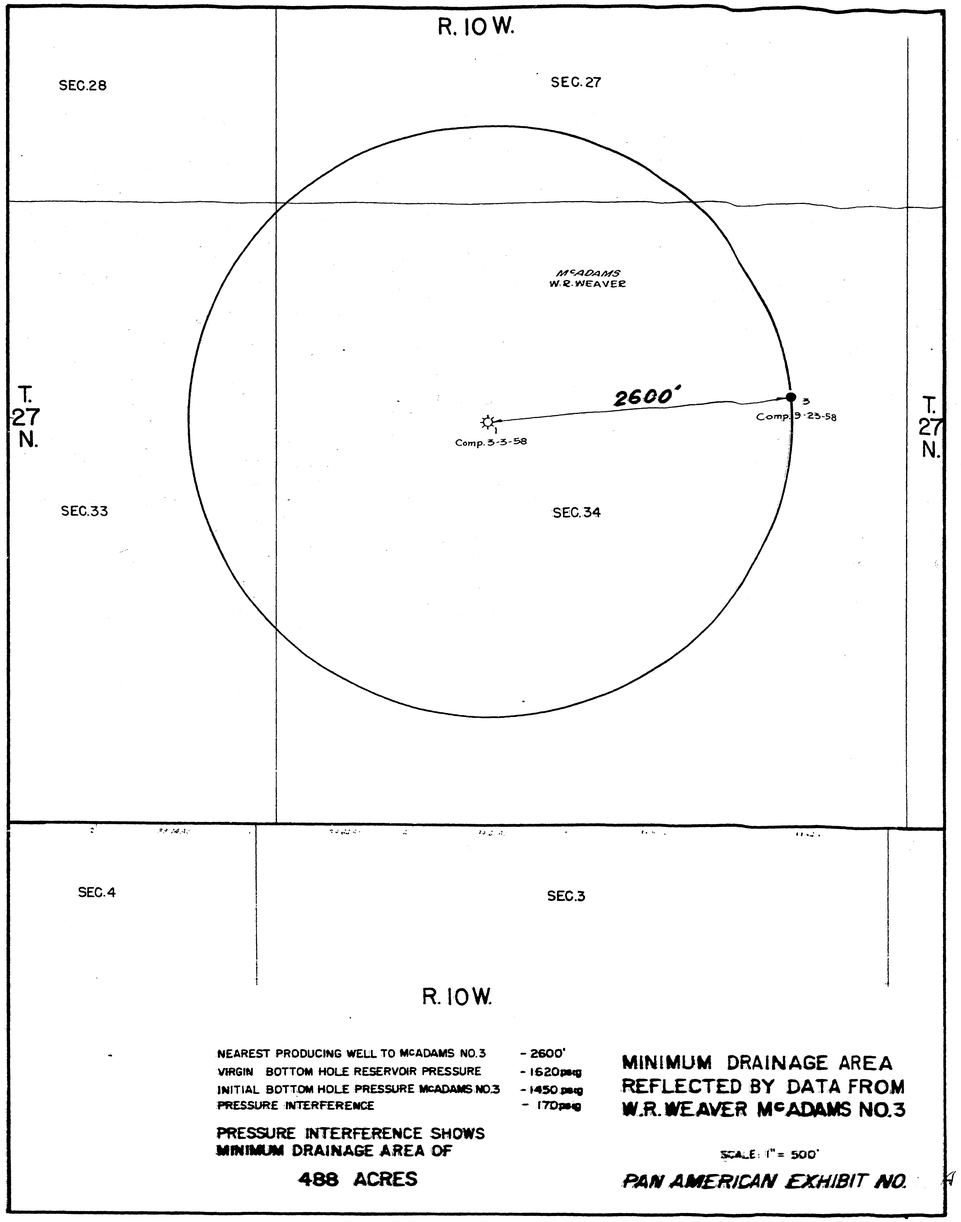


NEAREST PRODUCING WELL TO HUERFANO UNIT 99 - 3100'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620 psig
INITIAL BOTTOM HOLE PRESSURE HUERFANO UNIT 99 - 1512 psig
PRESSURE INTERFERENCE - 108 psig

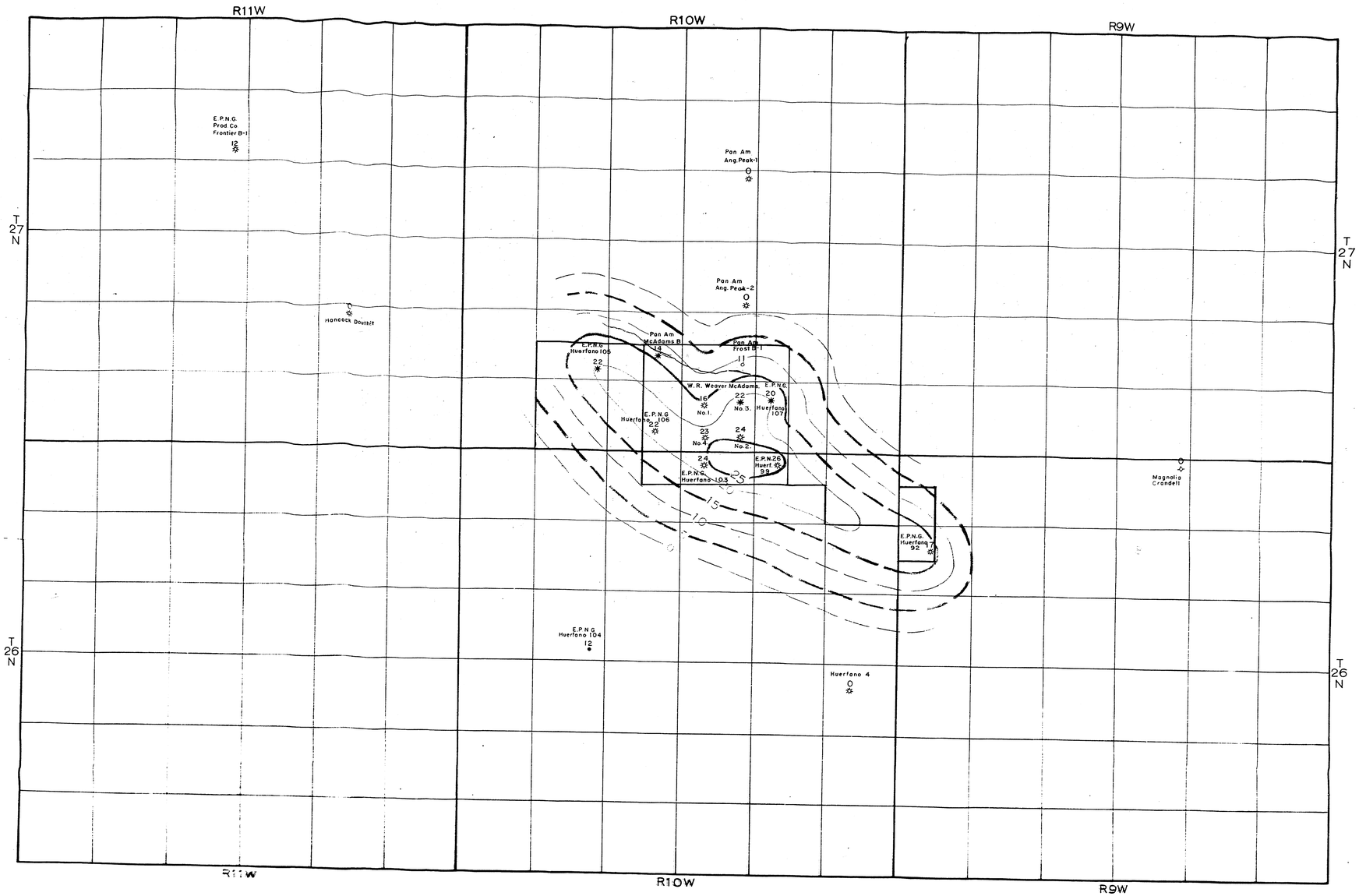
PRESSURE INTERFERENCE SHOWS
MINIMUM DRAINAGE AREA OF
693 ACRES

MINIMUM DRAINAGE AREA
REFLECTED BY DATA FROM
EL PASO'S HUERFANO
UNIT NO. 99
SCALE 1" = 500'
PAN AMERICAN EXHIBIT NO.

343

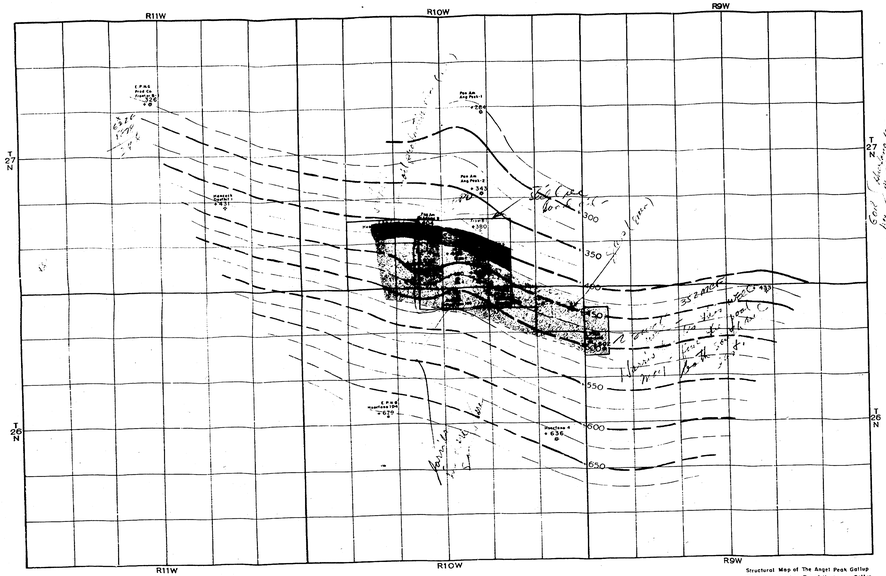

R. 10 W.
SEC. 28
SEC. 27
McADAMS
W.R. WEAVER
2600'
1
Comp. 5-3-58
3
Comp. 9-25-58
T. 27 N.
T. 27 N.
SEC. 33
SEC. 34
SEC. 4
SEC. 3
R. 10 W.
NEAREST PRODUCING WELL TO McADAMS NO. 3 - 2600'
VIRGIN BOTTOM HOLE RESERVOIR PRESSURE - 1620psig
INITIAL BOTTOM HOLE PRESSURE McADAMS NO.3 - 1450 psig
PRESSURE INTERFERENCE - 170psig
PRESSURE INTERFERENCE SHOWS MINIMUM DRAINAGE AREA OF
488 ACRES
MINIMUM DRAINAGE AREA REFLECTED BY DATA FROM W.R. WEAVER McADAMS NO.3
SCALE: 1" = 500'
PAN AMERICAN EXHIBIT NO. A

344



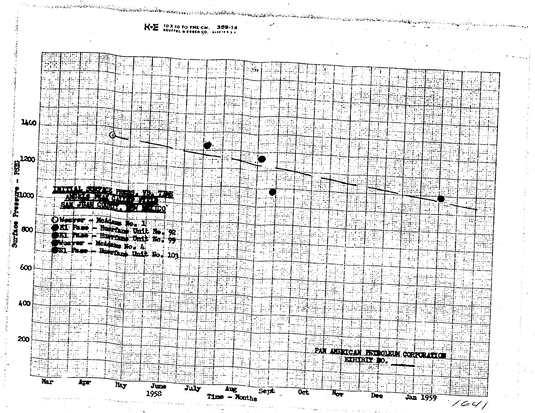
Isopach Map of the Upper Peak Gallup Field, Contoured on the Lower Gallup, Showing Proposed Extension of Pay Section to the North

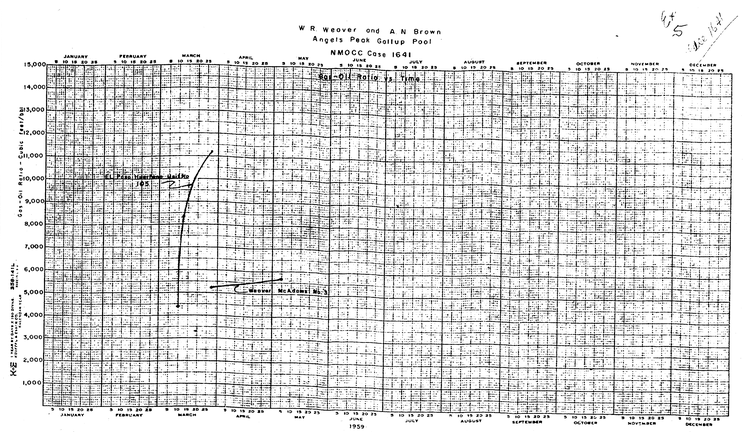
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO.

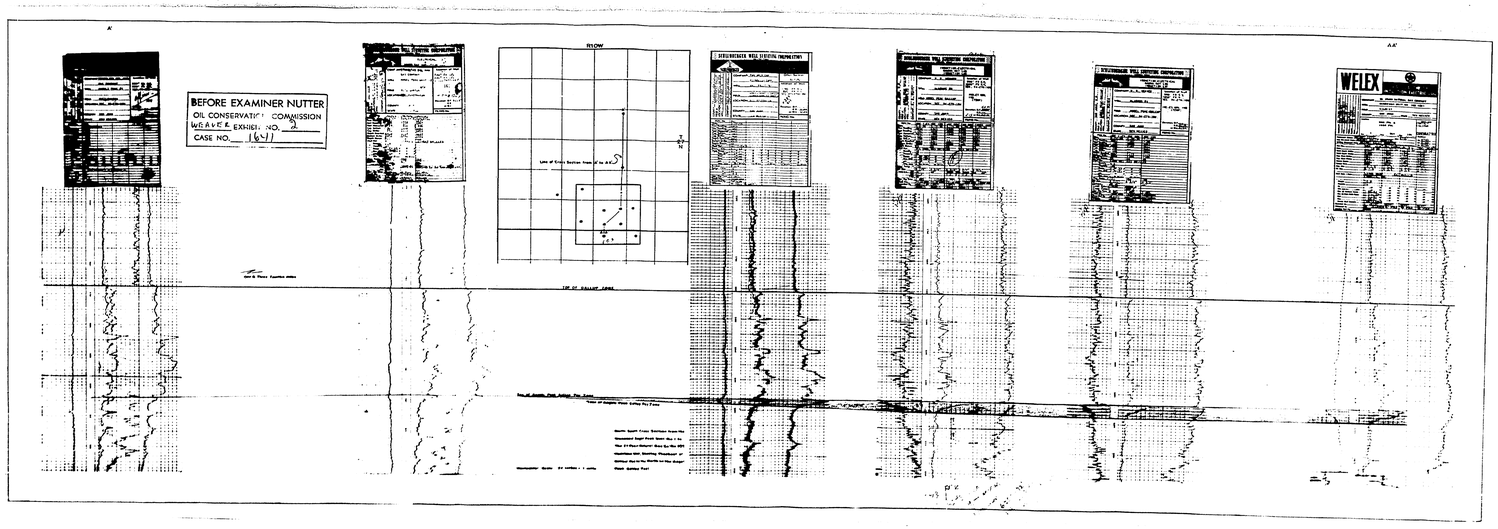


Structural Map of The Angel Peak Gallup Field. Contoured on Top of the Lower Gallup Formation and the Proved North & South Limits of Commercial Oil Production as Compared to the Proved Gas Distillate Area. The Oil Area is Shown in Red and the Gas Distillate Area in Green.

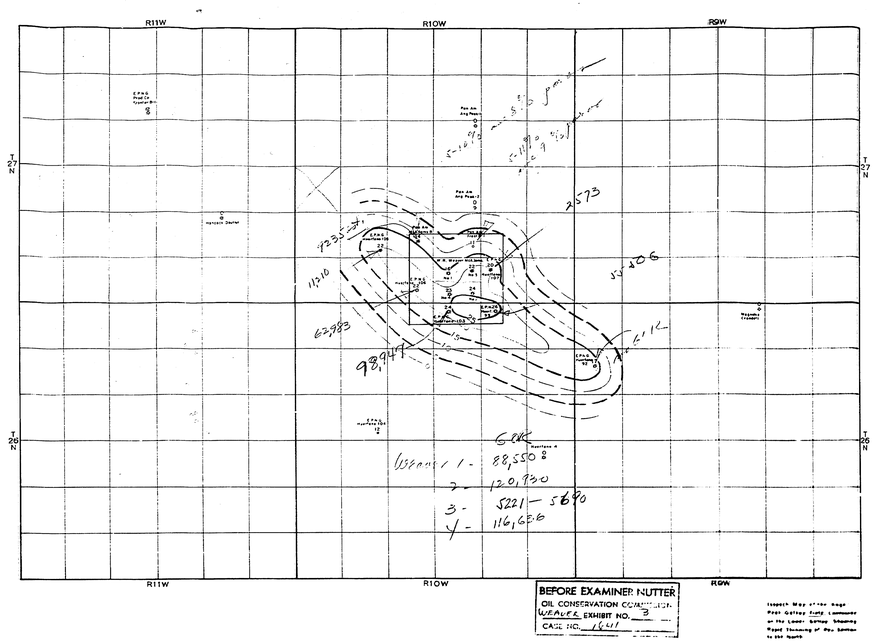
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 1
CASE NO. 1641



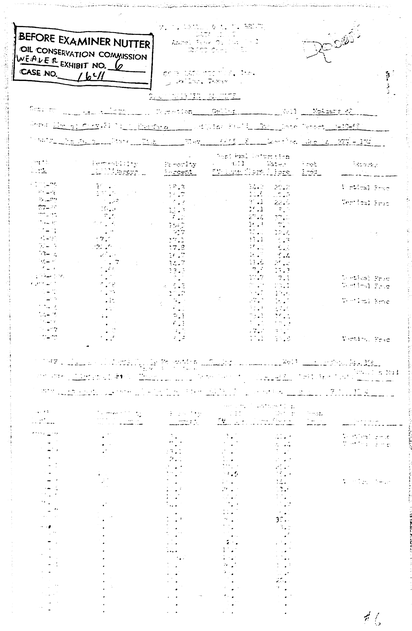


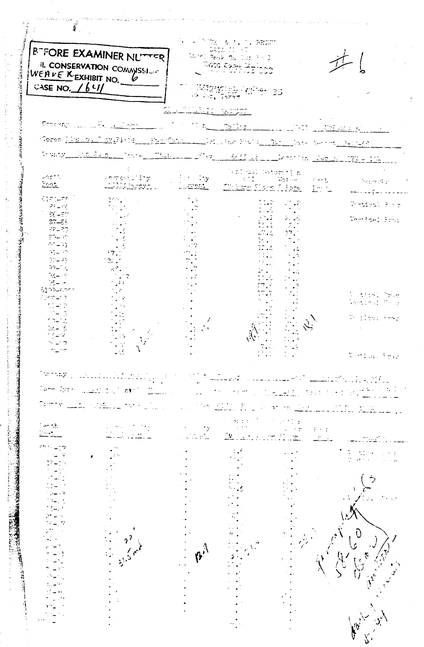


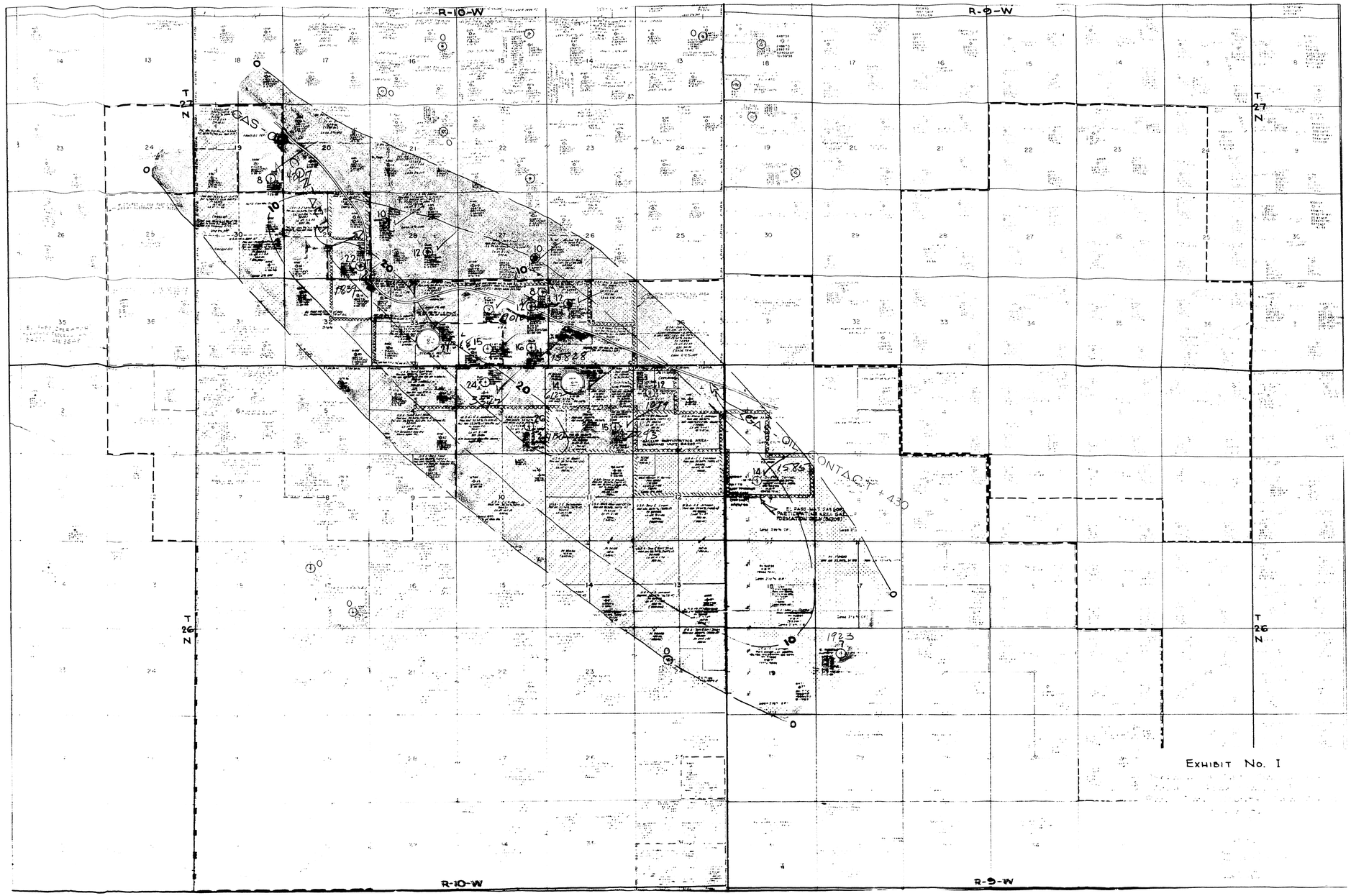
346

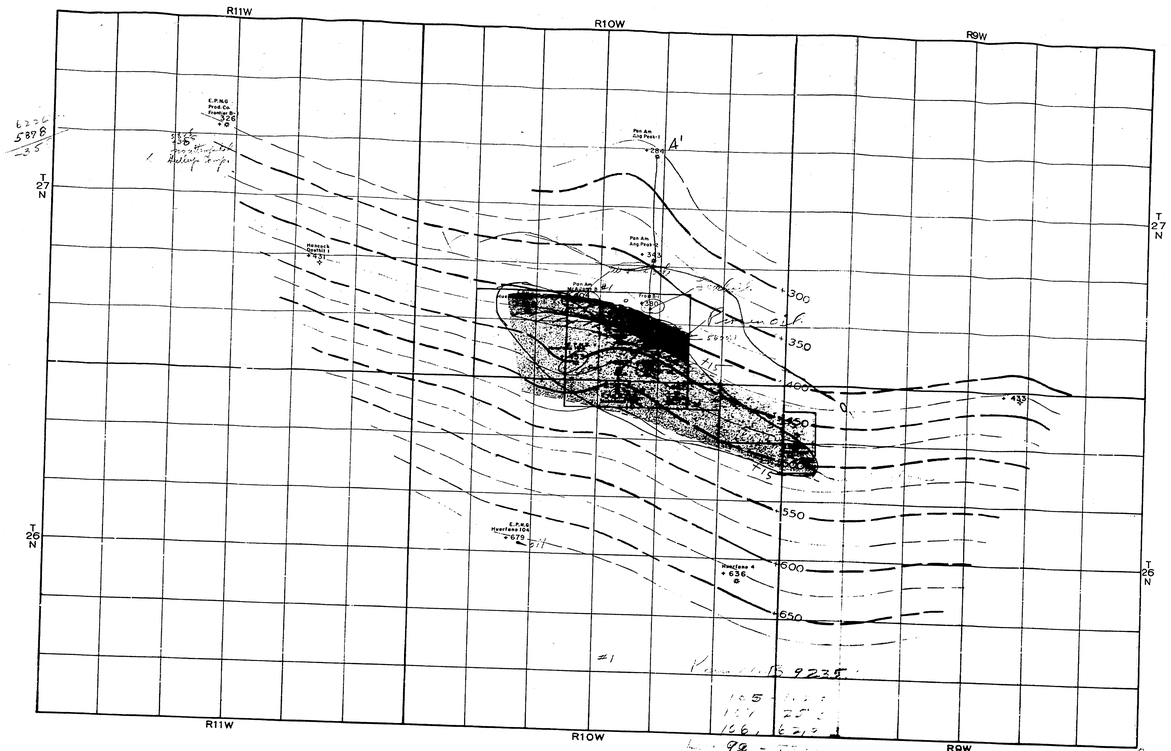

R11W
R10W
R9W
T 27 N
T 26 N
3573
3406
7235
11,210
62,983
98,944
6,112
Wasatch 1 - 88,550
2 - 120,930
3 - 5221 - 5690
4 - 116,686
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEALEE EXHIBIT NO. 3
CASE NO. 1641

347


BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEALEE EXHIBIT NO. 6
CASE NO. 1641


BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEALEE EXHIBIT NO. 6
CASE NO. 1641
#6


R-10-W
R-9-W
T 27 N
T 26 N
GAS-OIL CONTACT +430
EXHIBIT No. I



Structural Map of The Angel Peak Gallup Field, Contoured on Top of the Lower Gallup Formation and the Proved North & South Limits of Commercial Oil Production as Compared to the Proved Gas Distillate Area The Oil Area is Shown in Red and the Gas Distillate Area in Green.

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE NO. 1647

349

R11W R10W R9W

T 27 N

T 26 N

E. P. N. G Prod. Co. Frontier B-1 +326

Pan Am Ang Peak-1 +284

Pan Am Ang Peak-2 +343

Hancock Douthit 1 +431

Pan Am McAdams B +404

Frost B-1 +380

E. P. N. G Huerfano 104 +675

Huerfano 4 +636

+300

+350

+433

+500

R11W R10W R9W

Structure Map of The Ange Sage Gallup Sand, Contour on Top of the Lower Gallup Formation and the Proved North & South Limits of Commercial Oil Production as Compared to the Proved Gas Institute Area. The Oil Area is Shown in Red and the Gas Institute Area in Green

BEFORE EXAMINER UTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO.
CASE NO.

350

North

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 2
CASE NO. 1641

R10W

Line of Cross Section from A to A'

T 19 N

AA'

WELEX

One & Three fourths miles

TOP OF GALLUP ZONE

Top of Angels Peak Gallup Pay Zone

Base of Angels Peak Gallup Pay Zone

North-South Cross Section from the Amerada Angel Peak Unit No.1 to The El Paso Natural Gas Co No 109 Hoorfono Unit, Showing Pinchout of Gallup Pay to the North in the Angel Peak Gallup Pool

Horizontal Scale - 2½ inches = 1 mile

351

5446-66

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 4
CASE NO. 1641

#4

5446-66

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 4
CASE NO. 1641

5446-66

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 5
CASE NO. 1641

#5

W R Weaver and A N Brown
Angels Peak Gallup Pool
NMOCC Case 1641

Gas-Oil Ratio vs Time

Gas-Oil Ratio - Cubic feet/bbl

1959

El Paso Hoerham No. 1-E

Weaver McAdams No. 3

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 5
CASE NO. 1641

W R Weaver and A N Brown
Angels Peak Gallup Pool
NMOCC Case 1641

Gas-Oil Ratio vs Time

Gas-Oil Ratio - Cubic feet/bbl

1959

El Paso Hoerham No. 1-E

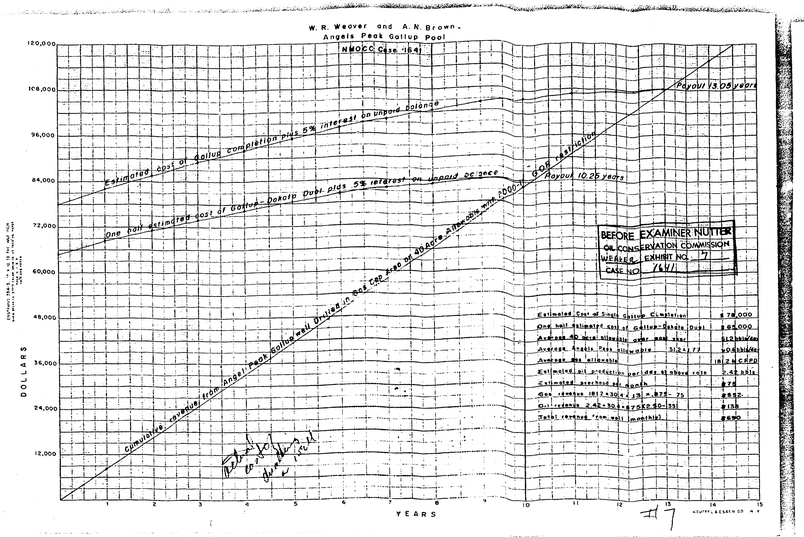
Weaver McAdams No. 3

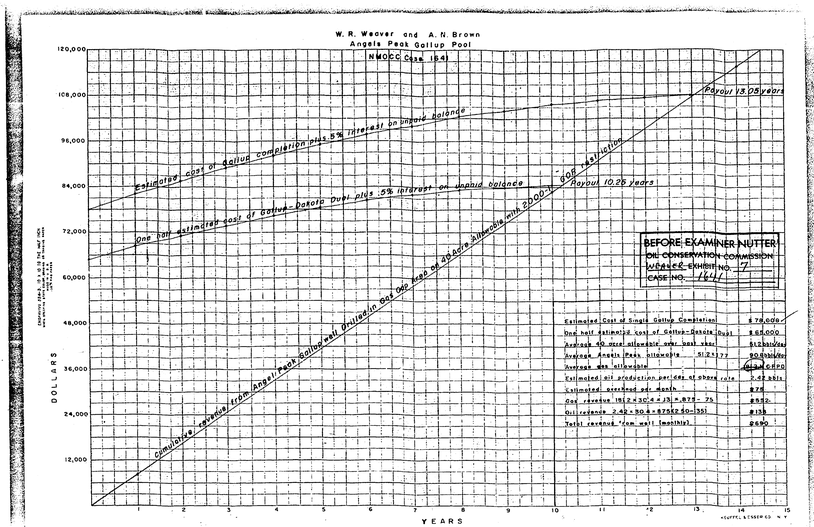
352

W R Weaver and A N Brown
Angels Peak Gallup Pool
NMOCC Case 1641

Payout 13.05 years

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 7
CASE NO. 1641


W. R. Weaver and A. N. Brown
Angels Peak Gallup Pool
NMOCC Case 1641
Payout 13.05 years
Estimated cost of Gallup completion plus 5% interest on unpaid balance
One half estimated cost of Gallup-Dakota Dual plus 5% interest on unpaid balance
Payout 10.25 years
Cumulative revenue from Angels Peak Gallup well Devised in Dec cap base on 40 acre allowable with 2000:1 GOR restriction
DOLLARS
YEARS
Estimated Cost of Single Gallup Completion $ 79,000
One half estimated cost of Gallup-Dakota Dual $ 85,000
Average 40 acre allowable over past year 513 bbl/day
Average Angels Peak allowable 51 21 77 90 bbl/day
Average gas allowable 180 MCFPD
Estimated oil production per day at above rate 2.42 bbls
Estimated overhead per month $ 75
Gas revenue 180 x 30 x .10 = $ 135
Oil revenue 2.42 x 30 x $ 2.75 x (.50-.125) $ 75
Total revenue from well (monthly) $ 210
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 7
CASE NO. 1641
47
KEUFFEL & ESSER CO. N. Y.


W. R. Weaver and A. N. Brown
Angels Peak Gallup Pool
NMOCC Case 1641
Payout 13.05 years
Estimated cost of Gallup completion plus 5% interest on unpaid balance
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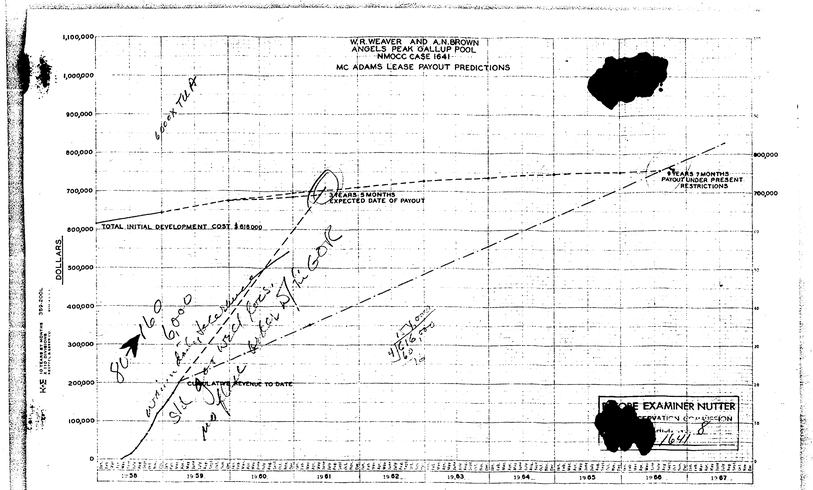
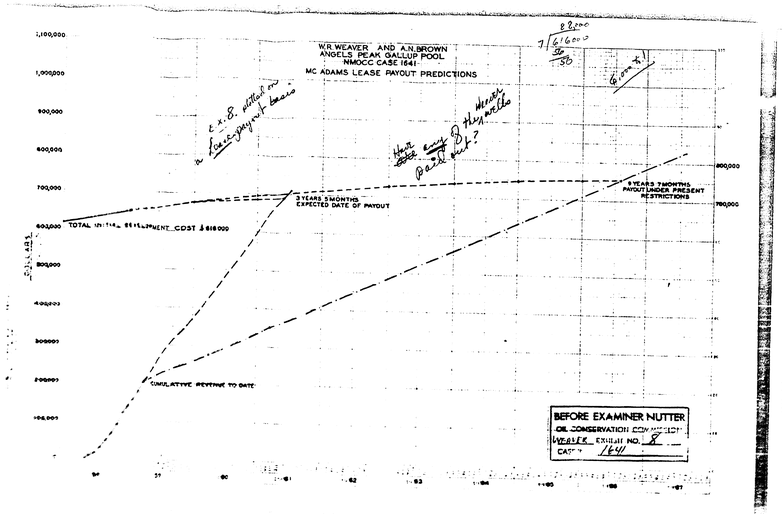
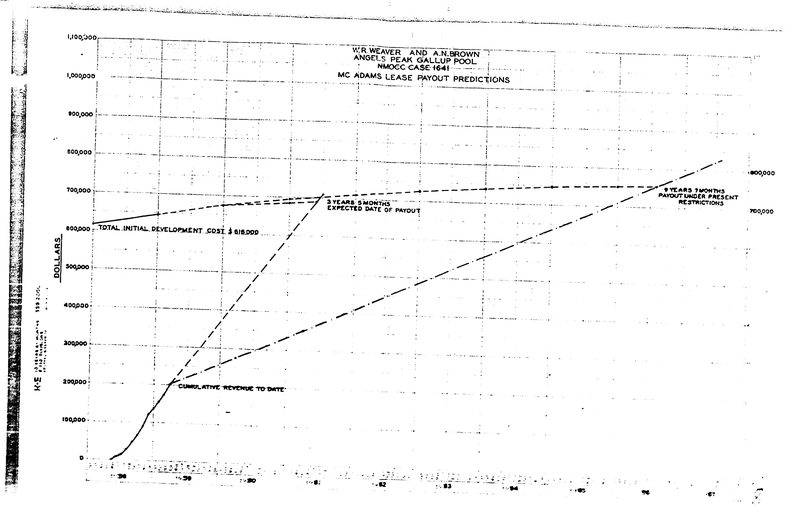
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
WEAVER EXHIBIT NO. 7
CASE NO. 1641
KEUFFEL & ESSER CO. N. Y.

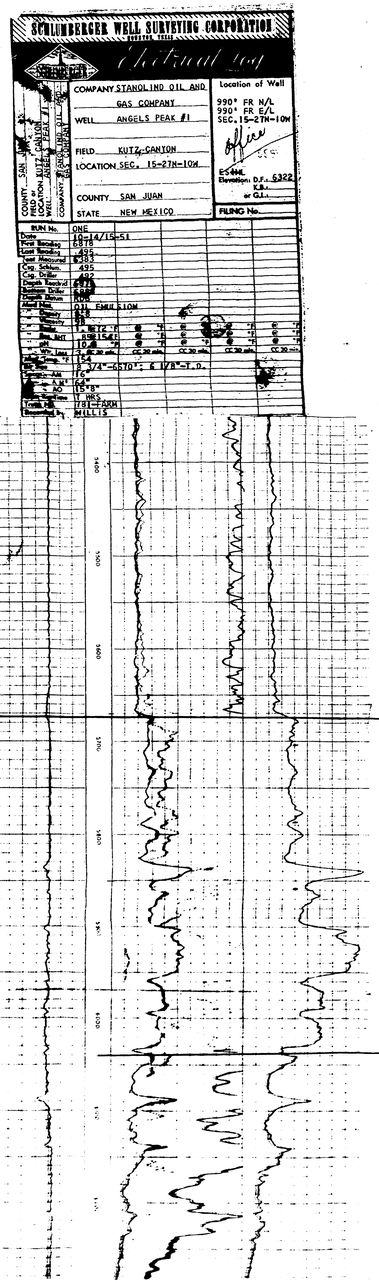

W.R. WEAVER AND A.N. BROWN
ANGELS PEAK GALLUP POOL
NMOCC CASE 1641
MC ADAMS LEASE PAYOUT PREDICTIONS
DOLLARS
TOTAL INITIAL DEVELOPMENT COST $ 818,000
3 YEARS 5 MONTHS EXPECTED DATE OF PAYOUT
9 YEARS 7 MONTHS PAYOUT UNDER PRESENT RESTRICTIONS
CUMULATIVE REVENUE TO DATE
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
CASE NO. 1641
KE


W.R. WEAVER AND A.N. BROWN
ANGELS PEAK GALLUP POOL
NMOCC CASE 1641
MC ADAMS LEASE PAYOUT PREDICTIONS
DOLLARS
TOTAL INITIAL DEVELOPMENT COST $ 818,000
3 YEARS 5 MONTHS EXPECTED DATE OF PAYOUT
9 YEARS 7 MONTHS PAYOUT UNDER PRESENT RESTRICTIONS
CUMULATIVE REVENUE TO DATE
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
CASE NO. 1641

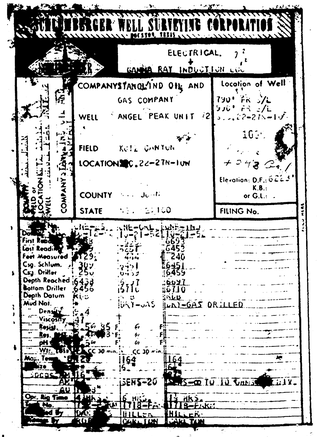

W.R. WEAVER AND A.N. BROWN
ANGELS PEAK GALLUP POOL
NMOCC CASE 1641
MC ADAMS LEASE PAYOUT PREDICTIONS
DOLLARS
TOTAL INITIAL DEVELOPMENT COST $ 818,000
3 YEARS 5 MONTHS EXPECTED DATE OF PAYOUT
9 YEARS 7 MONTHS PAYOUT UNDER PRESENT RESTRICTIONS
CUMULATIVE REVENUE TO DATE

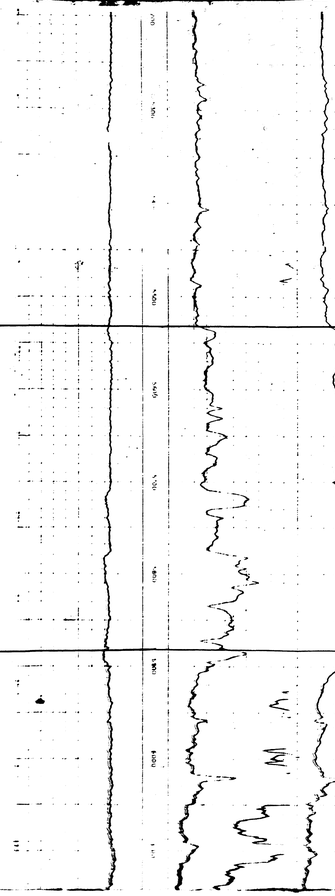
353

A'

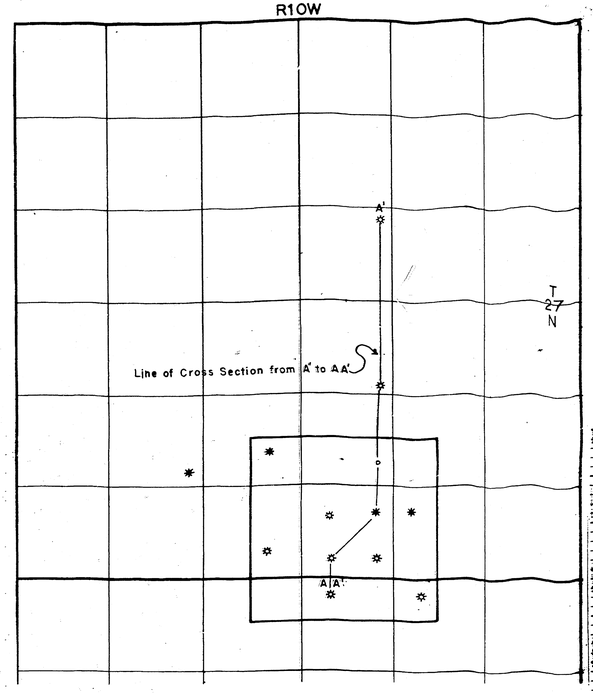


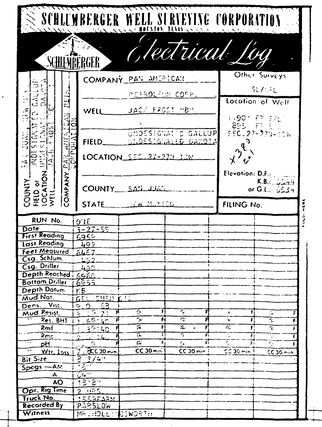
One & Three fourths miles

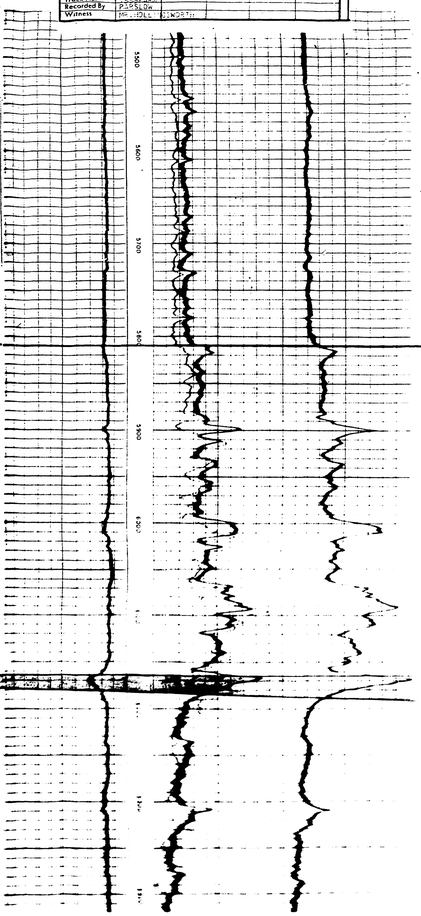




R10W







TOP OF GALLUP ZONE

Top of Angels Peak Gallup Pay Zone

Base of Angels Peak Gallup Pay Zone

North-South Cross Section from the Stanolind Angel Peak Unit No. 1 to The El Paso Natural Gas Co. No. 103 Huerfano Unit, Showing Extension of Gallup Pay to the North of the Angel Peak Gallup Pool

Horizontal Scale - 24 inches = 1 mile

354

AA'

T
27
N

SCHLUMBERGER WELL SURVEYING CORPORATION

SCHLUMBERGER — *Electrical Log*

COMPANY PAN AMERICAN PETROLEUM CORP.
WELL JAY FROST "B"
FIELD UNDESIGNATED GALLUP-UNDESIGNATED DAKOTA
LOCATION 990' FS & EL SEC. 27-27N-10W
COUNTY SAN JUAN
STATE N. M.

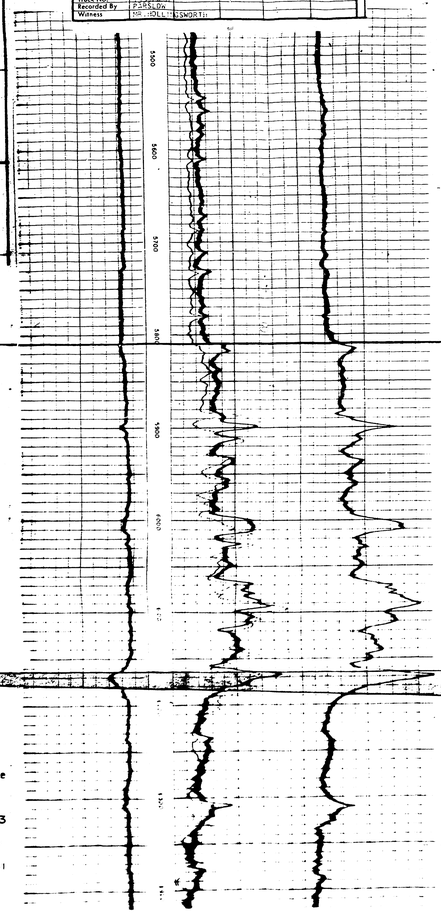
Other Surveys: SL / FL

Location of Well: 990' FS & EL SEC. 27-27N-10W

Elevation: D.F. ____ K.B. 6054 or G.L. 6034

FILING No.

RUN No.	ONE
Date	11-27-58
First Reading	7950
Last Reading	4951
Feet Measured	2667
Cog. Schlum.	+32
Cog. Driller	+40
Depth Reached	7960
Bottom Driller	7955
Depth Datum	KB
Mud Not.	GEL EMULSION
Dens. Visc.	9.0 58
Mud Resist.	.77 @ °F
Res. Bht	1.68 @ 120 °F
Rmf	1.30 @ 70 °F
Rmc	.76 @ °F
pH	9 @ °F
Wtr. loss	4 cc/30 min.
Bit Size	7 7/8"
Spcgs — AM	NM 127"2"
A	IND 146"
AO	
Opr. Rig Time	3 HRS
Truck No.	1558FARM
Recorded By	P.SIBLOW
Witness	MR. HOLLINGSWORTH



SCHLUMBERGER WELL SURVEYING CORPORATION

INDUCTION-ELECTRICAL
GAMMA RAY LOG
INDUCTION LOG

COMPANY W. R. WEAVER
WELL McADAMS #3
FIELD ANGEL PEAK GALLUP
LOCATION SEC. 34-27N-10W
COUNTY SAN JUAN
STATE NEW MEXICO

Location of Well: 990' FR E/L, 1650' FR N/L SEC. 34-27N-10W

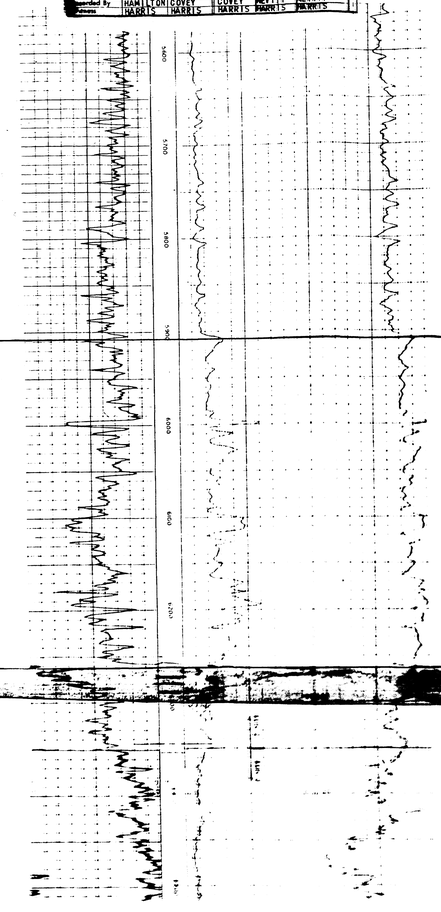
IND-ES GRL IND (TEMP)

Elevation: D.F. 6066 K.B. 6077 or G.L. 6057

FILING No.

COMPANY W. R. WEAVER
WELL McADAMS #3
FIELD ANGEL PEAK GALLUP
COUNTY SAN JUAN N.M.

RUN No.	ONE I-ES	ONE IND	ONE GRL	TWO GRL	THREE IND
Date	6-6-58	6-18-58	6-18-58	6-24-58	6-25-58
First Reading	8054	8045	8045	7060	7061
Last Reading	7067	6043	4800	4340	4354
Feet Measured	4847	1305	3245	2720	2707
Cog. Schlum.	+37	5058	--	5353	5354
Cog. Driller	200	5060	--	5355	5355
Depth Reached	8060	8051	8051	7087	7087
Bottom Driller	8060	8055	8055	7085	7085
Depth Datum	KB	KB	KB	KB	KB
Mud Not.	OIL EMUL	GAS DRILLED		GAS DRILLED	
Density	10				
Viscosity	38				
Resist.	1.06 @ 85°F	@ °F			
Res. Bht	1.06 @ 120°F	@ °F			
pH	9 @ °F	@ °F			
Wtr. loss	4 cc/30 min.	CC 30 min.			
Temp. °F	120				
Bit Size	7 7/8"	6 3/4"	6 3/4"	6 3/4"	6 3/4"
Spcgs — AM	16"	40"	SERS 300	SERS 200	40"
A			SERS 300	SERS 200	
Opr. Rig Time	12 HRS	1 1/2 HRS	2 HRS	2 1/2 HRS	2 HRS
Truck No.	2558FARM	2558FARM	2558FARM	1558FARM	1558FARM
Recorded By	HAMILTON	COVEY	COVEY	HARRIS	HARRIS
Witness	HARRIS	HARRIS	HARRIS	HARRIS	HARRIS



SCHLUMBERGER WELL SURVEYING CORPORATION

INDUCTION-ELECTRICAL
GAMMA RAY LOG
INDUCTION LOG

COMPANY W. R. WEAVER
WELL McADAMS #4
FIELD ANGEL PEAK-GALLUP
LOCATION SEC. 34-27N-10W
COUNTY SAN JUAN
STATE NEW MEXICO

Location of Well: 990' FR S/L, 1650' FR W/L SEC. 34-27N-10W

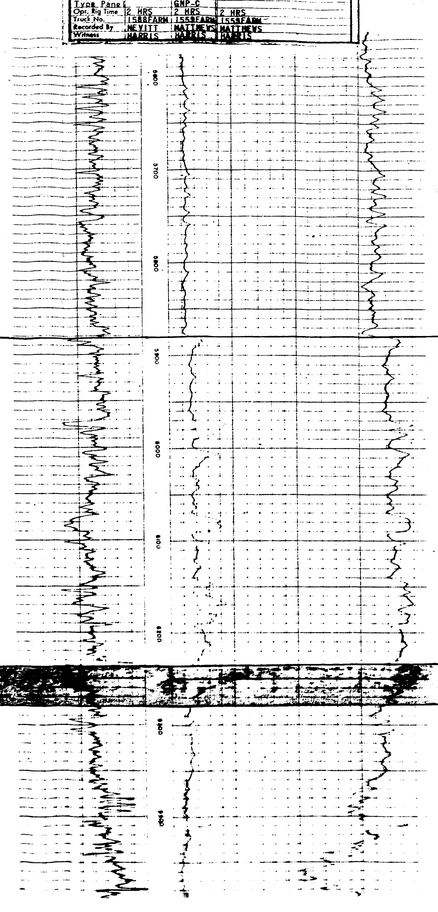
IND-ES GRL IND (TEMP)

Elevation: D.F. ____ K.B. 6077 or G.L. 6057

FILING No.

COMPANY W. R. WEAVER
WELL McADAMS #4
FIELD ANGEL PEAK-GALLUP
COUNTY SAN JUAN N.M.

RUN No.	ONE I-ES	ONE GRL	ONE IND
Date	6-24-58	6-30-58	7-1-58
First Reading	5051	7100	7100
Last Reading	182	5000	5055
Feet Measured	4869	2107	2054
Cog. Schlum.	+32	--	5055
Cog. Driller	186	--	5050
Depth Reached	5057	7115	7115
Bottom Driller	5050	7100	7100
Depth Datum	KB	KB	KB
Mud Not.	CHEM GEL	GAS DRILLED	
Density	9.6		
Viscosity	100		
Resist.	4.26 @ 77 °F	@ °F	
Res. Bht	2.76 @ 121 °F	@ °F	
pH	@ °F	@ °F	
Wtr. loss	12 cc/30 min.	CC 30 min.	
Max. Temp. °F	121	130	130
Bit Size	9 7/8"	6 3/4"	6 3/4"
Spcgs	OA 16"		40"
Type Equip.	NG40"	1SNAM-4	
Type Pads		SNP-5C	
Opr. Rig Time	12 HRS	2 HRS	2 HRS
Truck No.	1558FARM	1558FARM	1558FARM
Recorded By	MEYITT	MEYITT	MEYITT
Witness	HARRIS	HARRIS	HARRIS



WELEX

RADIOACTIVITY
INDUCTION-ELECTRIC LOG

COMPANY EL PASO NATURAL GAS COMPANY
WELL HUERFANO UNIT NO. 103 (GD)
FIELD WILDCAT
COUNTY SAN JUAN STATE NEW MEXICO

Location: 990 FNL & 1650 FWL

Other Services: CONTAK CALIPER

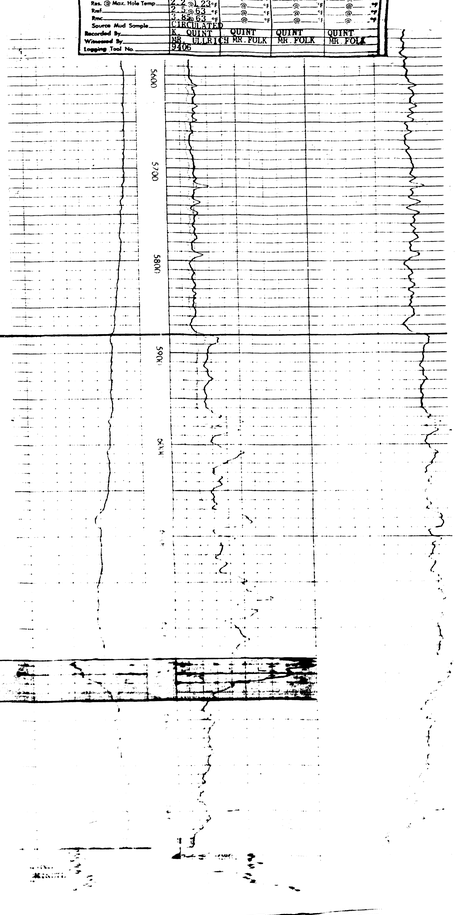
Sec. 3 Twp. 26N Rge. 10W

Permanent Datum	GROUND LEVEL Elev. 6735'
Log Measured From	ROTARY KELLY BUSHING 12 Ft. Above Perm. Datum
Drilling Measured From	ROTARY KELLY BUSHING

Elevation	
KB	6745'
DF	6744'
GL	6735'

Run No.	ONE	ELEC. LOG	GAMMA RAY	ONE	IND. INDUCTION
Date	11-18-58	11-22-58	11-22-58	11-22-58	
Total Depth Driller	6410	7050'	7050'	7050'	
Total Depth Welex	6446	7050'	7050'	7050'	
Csg. Shoe Driller	362	6490'	6490'	6490'	
Csg. Shoe Welex	364	6492'	6492'	6492'	
Survey Begins	6441'	7026'	7022'	7022'	
Survey Ends	800'	6930'	6930'	6926'	
Csg. Size	10-3/4	7-5/8	7-5/8	7-5/8	
Bit Size	9-7/8	6-3/4	6-3/4	6-3/4	

Mud Data — Type	WATER BASE CHEMICAL GEL		GAS DRILLED	
Weight	10.0			
Viscosity	70			
Ph				
Wtr. Loss or Cake				
Res. @ Surface Temp.	4.95@64 °F	@ °F	@ °F	@ °F
Res. @ Max. Hole Temp.	2.23@120 °F	@ °F	@ °F	@ °F
Source	2.23@84 °F	@ °F	@ °F	@ °F
Rmf	1.84@65 °F	@ °F	@ °F	@ °F
Rmc	7.58@65 °F	@ °F	@ °F	@ °F
Source Mud Sample	CIRCULATED			
Recorded By	K. QUINT	QUINT	QUINT	QUINT
Witnessed By	MR. HOLLIS	MR. FOLK	MR. FOLK	MR. FOLK
Logging Tool No.	9106			



y Zone

Section from the
eak Unit No 1 to
ral Gas Co No 103
owing Pinchout of
orth in the Angel

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO.
CASE NO.

355

356

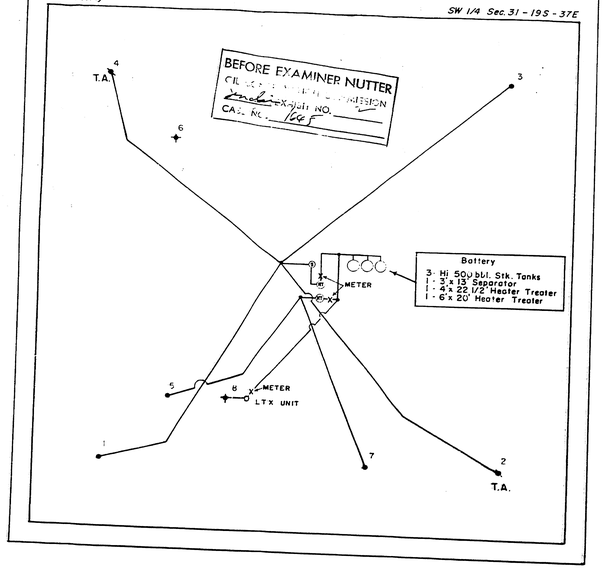
SINCLAIR OIL & GAS CO.

J.R. PHILLIPS "A" LEASE

PROPOSED TANK BATTERY
AFTER CONSOLIDATION

MONUMENT McKEE DISTILATE – WELL No. 8
MONUMENT BLINEBRY OIL – WELLS No. 5&7
EUNICE-MONUMENT OIL – WELLS No. 1 2 3&4

Lea County — SW 1/4 Sec. 31 - 19S - 37E



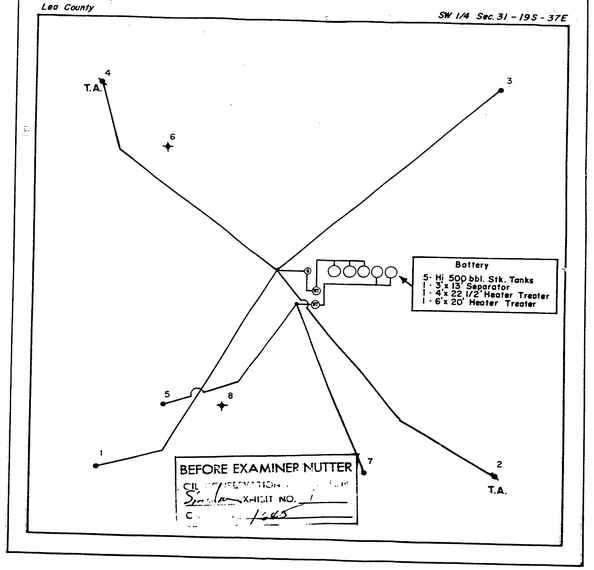
SINCLAIR OIL & GAS CO.

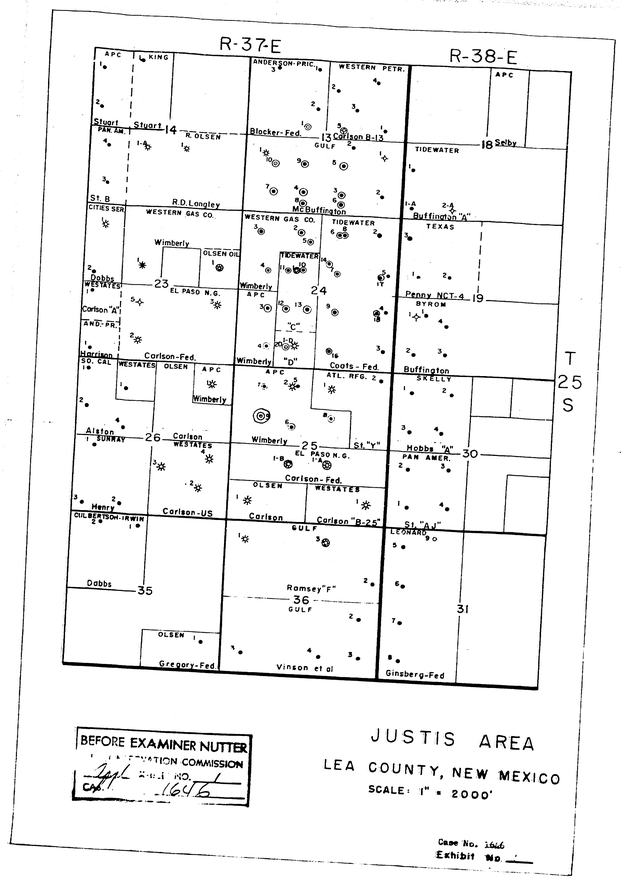
J.R. PHILLIPS "A" LEASE

PRESENT TANK BATTERY
BEFORE CONSOLIDATION

MONUMENT McKEE DISTILATE – WELL No. 8
MONUMENT BLINEBRY OIL – WELLS No. 5&7
EUNICE-MONUMENT OIL – WELLS No. 1 2 3&4

Lea County — SW 1/4 Sec. 31 - 19S - 37E





357

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Appl. No.
Case 1646

JUSTIS AREA
LEA COUNTY, NEW MEXICO
SCALE: 1" = 2000'

Case No. 1646
Exhibit No.

SCHLUMBERGER WELL SURVEYING CORPORATION
HOUSTON, TEXAS

Induction-Electrical Log

COMPANY AMERADA PETROLEUM CORPORATION
WELL UDA WIMBERLY NO. 9
FIELD UNDESIGNATED
LOCATION SEC 21-25S-37E
COUNTY LEA
STATE NEW MEXICO

Other Surveys: GRL ML
Location of Well: 1650'From N/L, 990'From W/L
Elevation: D.F. 3071, K.B., or G.L.: KB
FILING No.

COUNTY LEA FIELD UNDESIGNATED WELL UDA WIMBERLY NO. 9 LOCATION SEC 21-25S-37E COMPANY AMERADA PETROLEUM CORPORATION REMARKS

RUN No.	1				
Date	3-3-59				
First Reading	7048				
Last Reading	3275				
Feet Measured	3773				
Csg. Schlum.	3274				
Csg. Driller	3270				
Depth Reached	7054				
Bottom Driller	7048				
Depth Datum	KB 12 ABOVE GL				
Mud Hot.	CHEM				
Dens. / Visc.	9.6 / 38				
Mud Resist.	1.8@ 75 F				
" Res. BHT	1.2@ 112 F				
Rmf	83 @ 112 F				
Rmc	1.4 @ 112 F				
pH					
" Wtr. Loss	14 CC30 min.	CC30 min.	CC30 min.	CC30 min.	CC30 min.
Bit Size	8 3/4"				
Specs—AM	16"NORMAL				
AM					
IND.	40" INDUCTION				
Opr. Rig Time	2 HOURS				
Truck No.	2-22 7008				
Recorded By	BOESH				
Witness	MOORE				

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 1121

CASING RECORD: 10 @ 1750 | 7 @ 7048 | 430 | 100 | 400 | SENS.: 300 | TC: | SPEED: 50/60 MIN

Carriage No.	2015	
Panel No.	1845-A	119
Serial No.		

CONDUCTIVITY millimhos/m = 1000/ohms-m
INDUCTION 0 1200

RESISTIVITY ohms-m/m
16" NORMAL 100 0 1000
INDUCTION 100 0 1000

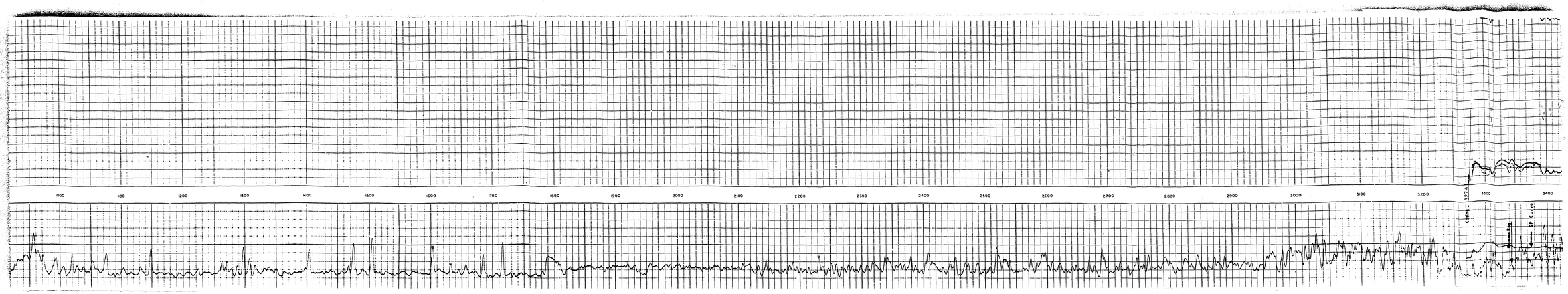
DEPTHS

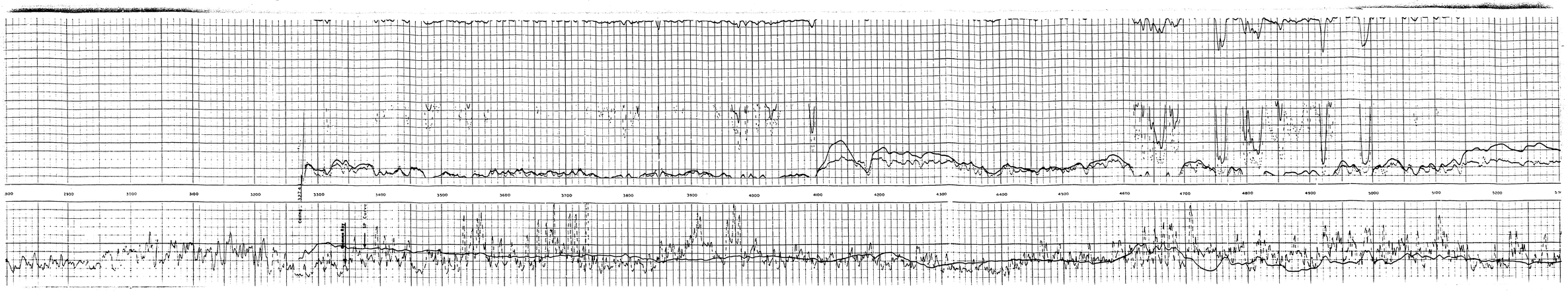
SPONTANEOUS POTENTIAL millivolts
80 | 0 | +

GAMMA RAY 0 — 7.5" Microroentgen Radium Equiv./Hr. in Formation

0000 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 1300 1400 1500

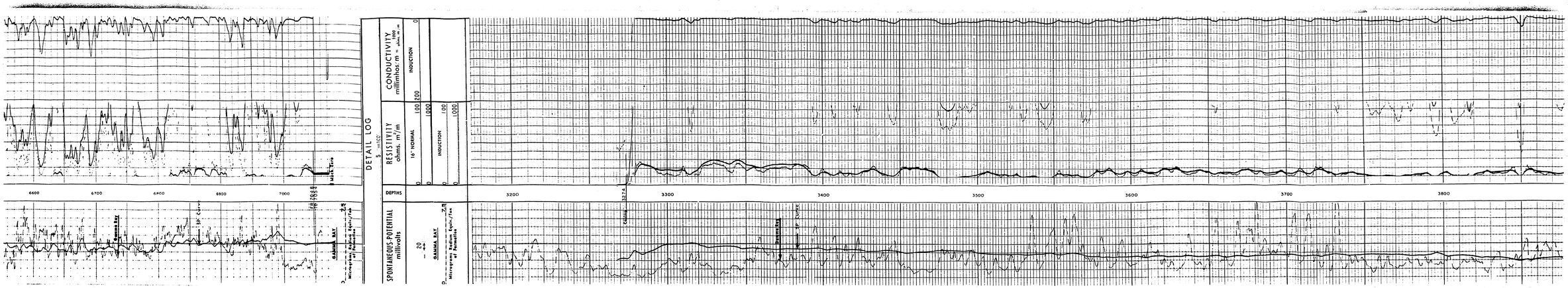
358


1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
3400
Curve - 127.5
SP Curve

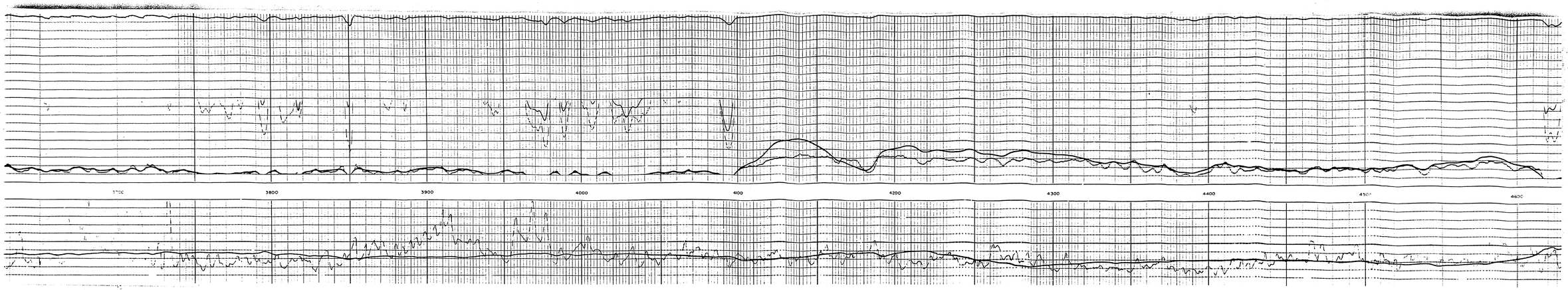

2800
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
4600
4700
4800
4900
5000
5100
5200
3274
Comm Rly
SP Curve

360

DETAIL LOG
5 in=100'
CONDUCTIVITY
RESISTIVITY
SPONTANEOUS-POTENTIAL
4700
4800
4900
5000
5100
5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
6330
6400
6500
6600
6700
6800
6900
7000

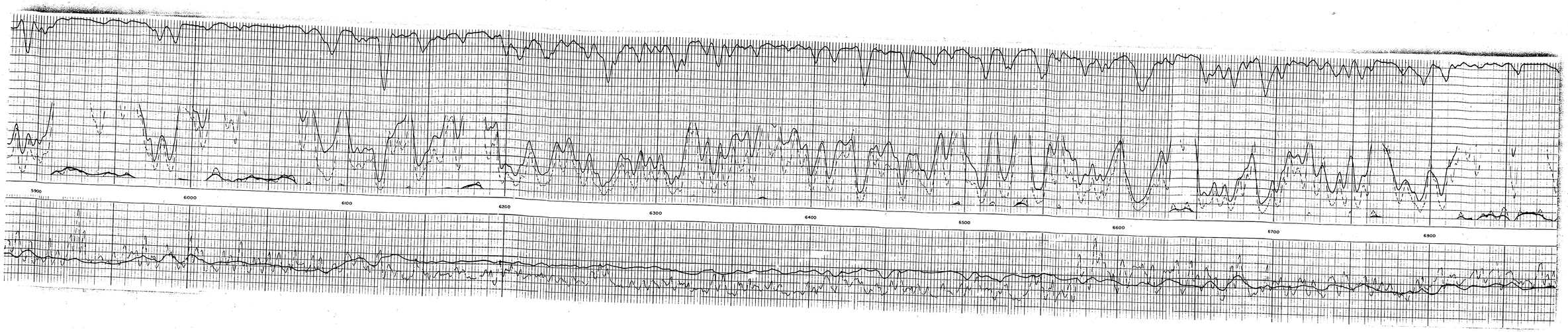

DETAIL LOG
5 in/100
CONDUCTIVITY millimhos/m = 1000/ohms-m
INDUCTION
RESISTIVITY ohms-m²/m
16" NORMAL
INDUCTION
DEPTHS
SPONTANEOUS POTENTIAL millivolts
GAMMA RAY
Micrograms Radium Equiv./Ton of Formation
SP Curve
Caliper
6600
6700
6800
6900
7000
3200
3300
3400
3500
3600
3700
3800

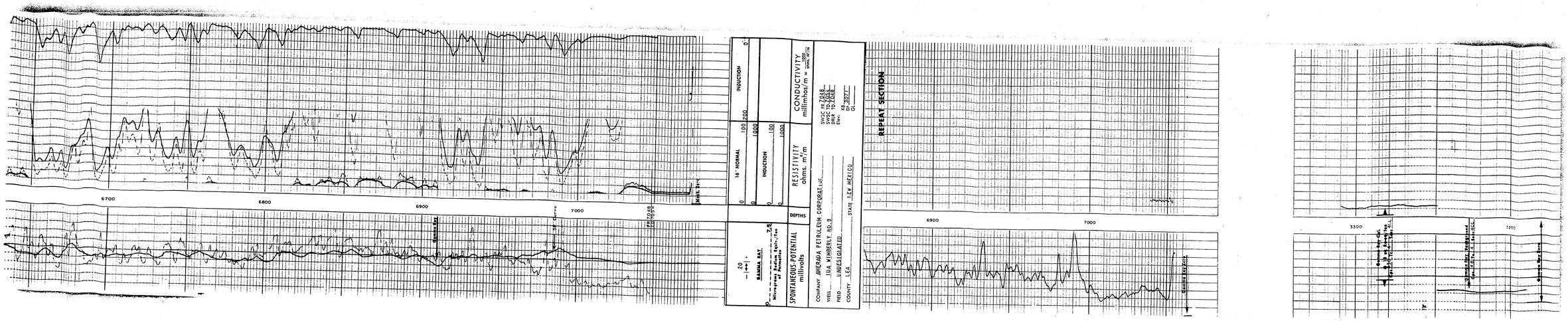
362


3700
3800
3900
4000
4100
4200
4300
4400
4500
4600

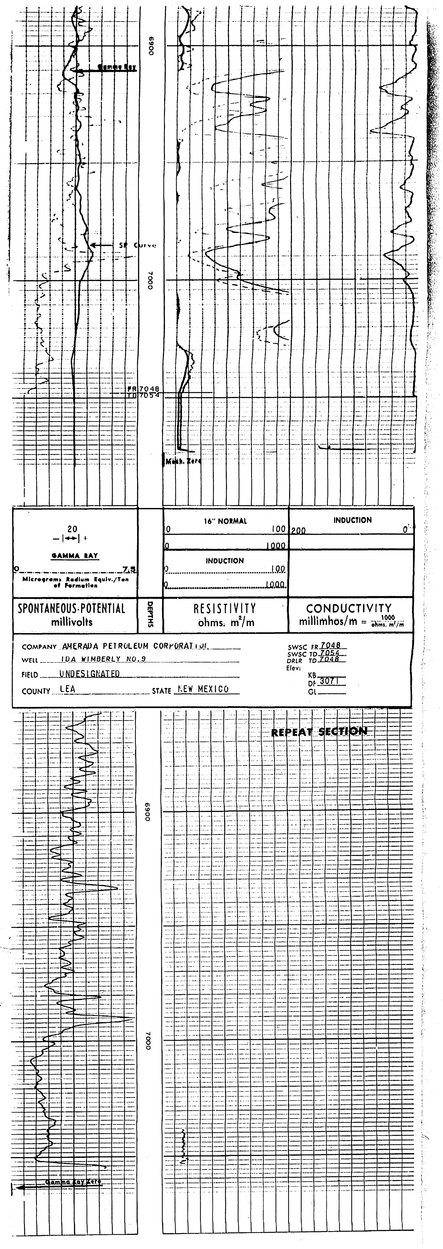
364

5200
5300
5400
5500
5600
5700
5800
5900
6000
6100

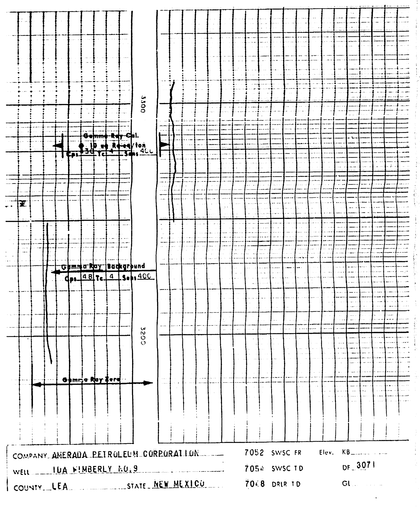

5900
6000
6100
6250
6300
6400
6500
6600
6700
6900


6700
6800
6900
7000
7048
7094
INDUCTION
0
16" NORMAL
100
200
INDUCTION
0
1000
INDUCTION
0
100
1000
RESISTIVITY
ohms. m²/m
CONDUCTIVITY
millimhos/m = 1000/ohms. m²/m
DEPTHS
20
GAMMA RAY
0
Micrograms Radium Equiv./Ton of Formation
SPONTANEOUS POTENTIAL
millivolts
COMPANY AMERADA PETROLEUM CORPORAT
WELL JUA KIMBERLY NO. 9
FIELD UNDESIGNATED
COUNTY LEA
STATE NEW MEXICO
SWGC re 7048
SWGC TD 7094
Date
Elev.
KB
DF 3927
GL
REPEAT SECTION
6900
7000
3300
3200

367



28



CASE NO. 1614
EXHIBIT NO. 3

THE WESTERN COMPANY

GAMMATRON

Simultaneous Radioactivity Log

COMPANY: [illegible]

WELL: [illegible]

FIELD: [illegible]

COUNTY: [illegible] STATE: [illegible]

LOCATION: [illegible]

LOCATION: [illegible]

FILE NO.:

LOG NO.: 12

LOG MEAS. FROM: [illegible] ROTARY TABLE ELEV.:

DRIG. MEAS. FROM: [illegible] ROTARY TABLE ELEV.:

PERM. DATUM: [illegible] ELEV.:

REMARKS

Case 1647

CASING RECORD

NEUTRON

ENVIRONMENTAL UNITS

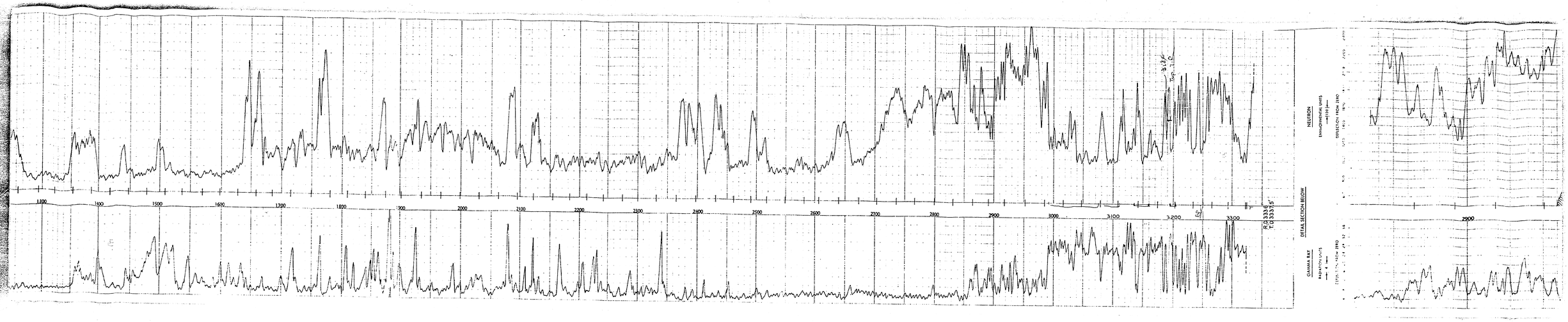
FLUID LEVEL

GAMMA RAY

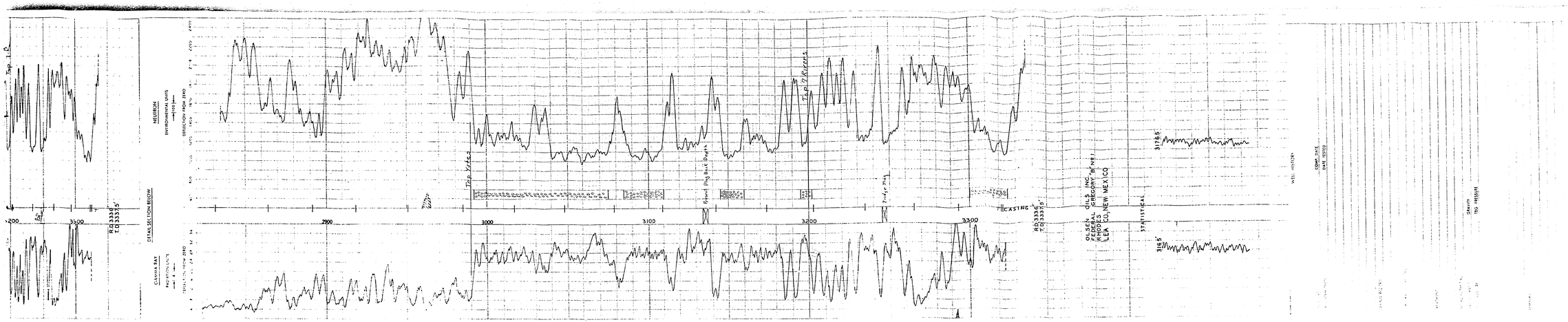
RADIATION UNITS

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800

369


1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
R.D.3334'
T.D.3333'5"
DETAIL SECTION BELOW
NEUTRON
GAMMA RAY
2900

370


NEUTRON
ENVIRONMENTAL UNITS
DEFLECTION FROM ZERO
CASING
OLSEN OILS INC
FEDERAL "A" NO.1
RHODES
LEA CO, NEW MEXICO
3165'
3176.5'
3200
3300
3100
3000
2900

371