Case No.
5587

Large Exhibits

V.R.W.G.F. MICROGRAPHICS
BEST AVAILABLE COPY

Schlumberger

BOREHOLE COMPENSATED SONIC LOG - GAMMA RAY

COUNTY EDDY
STATE NEW MEXICO
LOCATION SOUTH CARLSBAD
WELL GULF FEDERAL #2
COMPANY PENNZOIL UNITED, INC.

COMPANY PENNZOIL UNITED, INC.

WELL GULF FEDERAL #2

FIELD SOUTH CARLSBAD

COUNTY EDDY STATE NEW MEXICO

LOCATION 1980' FSL & 990' FWL

Other Services: DLL

Sec. 6 Twp. 23-S Rge. 27-E

Permanent Datum: G.L. Elev. 3212
Log Measured From K.B. 20 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 3232
D.F. 3230
G.L. 3212

Date	12-22-71	1-24-72					
Run No.	ONE	TWO					
Depth—Driller	5355	11833					
Depth—Logger	5352	11839					
Btm. Log Interval	5352	11830					
Top Log Interval	0	5357					
Casing—Driller	13 3/8@ 355	9 5/8@ 5355	@		@		
Casing—Logger							
Bit Size	12 1/4	8 1/4					
Type Fluid in Hole	SALT MUD	SALT					
Dens. | Visc.	10.0 39	9.6 36					
pH | Fluid Loss		ml 9.6 12 ml		ml			ml
Source of Sample	PIT	CIRC					
Rm @ Meas. Temp.	.057@ 76°F	.15 @ 68°F	@ °F		@ °F		
Rmf @ Meas. Temp.	.046@ 76°F	.12 @ 70°F	@ °F		@ °F		
Rmc @ Meas. Temp	@ °F	@ °F	@ °F		@ °F		
Source: Rm | Rmf	N	N					
Rm @ BHT	.038@ 95°F	.06 @ 175°F	@ °F		@ °F		
Time Since Circ.	2 HOURS						
Max. Rec. Temp.	95 °F	175 °F	°F		°F		
Equip. Location	1031 HOBBS	7646 HOBBS					
Recorded By	ALLS	WILSON					
Witnessed By	BERGER	BERGER					

REMARKS: RUN 1 - CALIPER JAMMED WITH CUTTINGS.

One owner

The well name, location and borehole reference data were furnished by the customer.

Changes in Mud Type or Additional Samples
Change in Hole Size No.
Depth—Driller
Depth—Logger
Type Fluid in Hole
Dens. | Visc.
pH | Fluid Loss
Sources of Samples
Rm @ Meas. Temp.
Rmf @ Meas. Temp.
Rmc @ Meas. Temp.
Source: Rmf | Rmc
Rm @ BHT
Time Since Circ.
Max. Rec. Temp.
Equip. Location
Recorded By
Witnessed By

Scale Changes: Type Log | Depth | Scale Up Hole | Scale Down Hole

Equipment Data: Run No. | Tool Type | Tool Pos. | Other

Run 1: 5352-1400 DLL, CALIPER
5314-1400
5314-5352
5314-1400
5314-5352
Run 2:
5357-11839 DLL, CALIPER
5357-11830
5357-11839
5357-11830

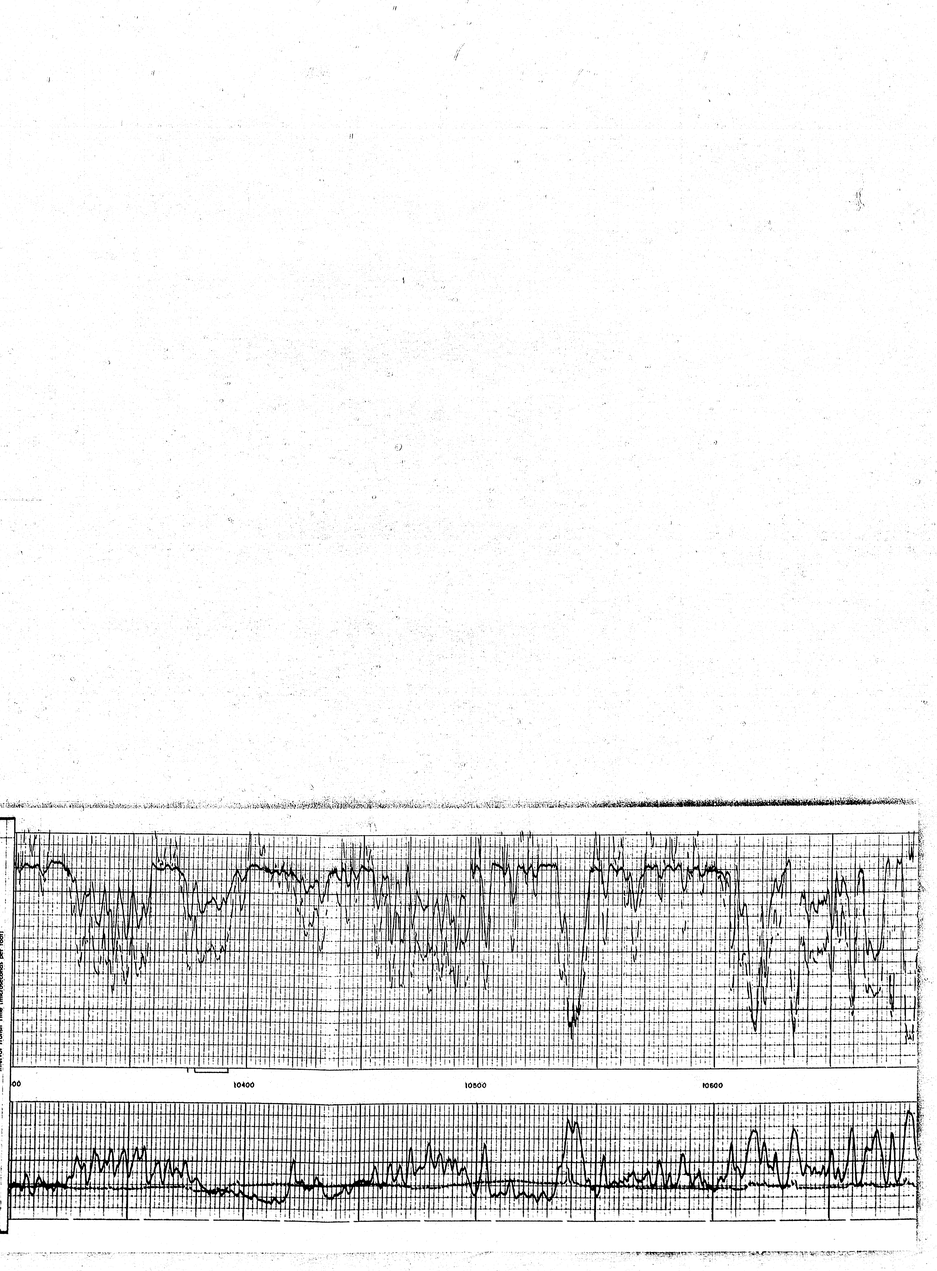
LOG: SONIC TAP (RECORD) (GAL.) 165 0-125
SONIC TAP (FOR GAL.) 165
CALIB. INCR. DIVISIONS 100
SOURCE CPS 390
RECORD. CPS 60
CALIBRATION: GAMMA RAY

RECORDING: SPEED (FT./MIN.) (1/2 IN.) 30/60 (1/4 IN.)
CONST. 2/1

"F" CURVE = RUN 1, 5" ONLY. ΔT_{ma} = 51.6 ΔT_f = 189

1,000,000

Velocity (feet per second) = Interval Transit Time (microseconds per foot)



V.K.M.C.F. MICROGRAPHICS
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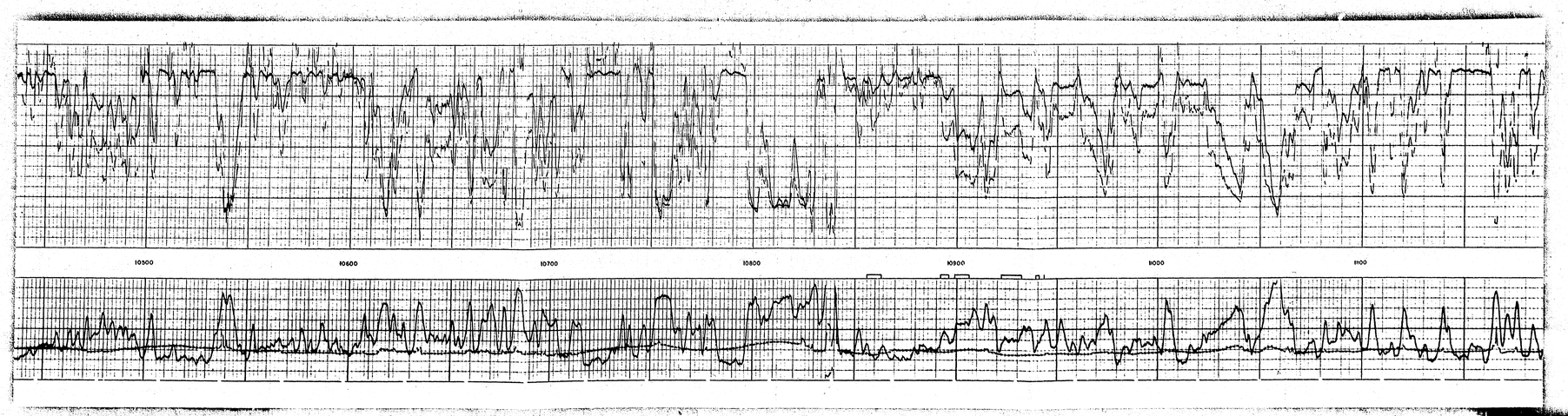
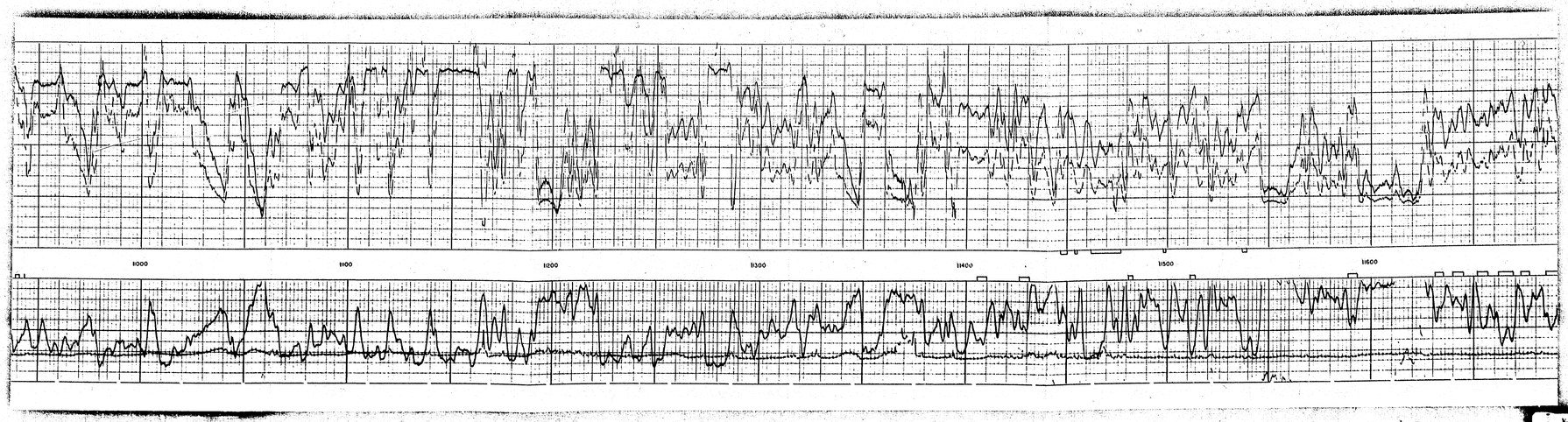


U.S.W.R.C.P. MICROGRAPHICS



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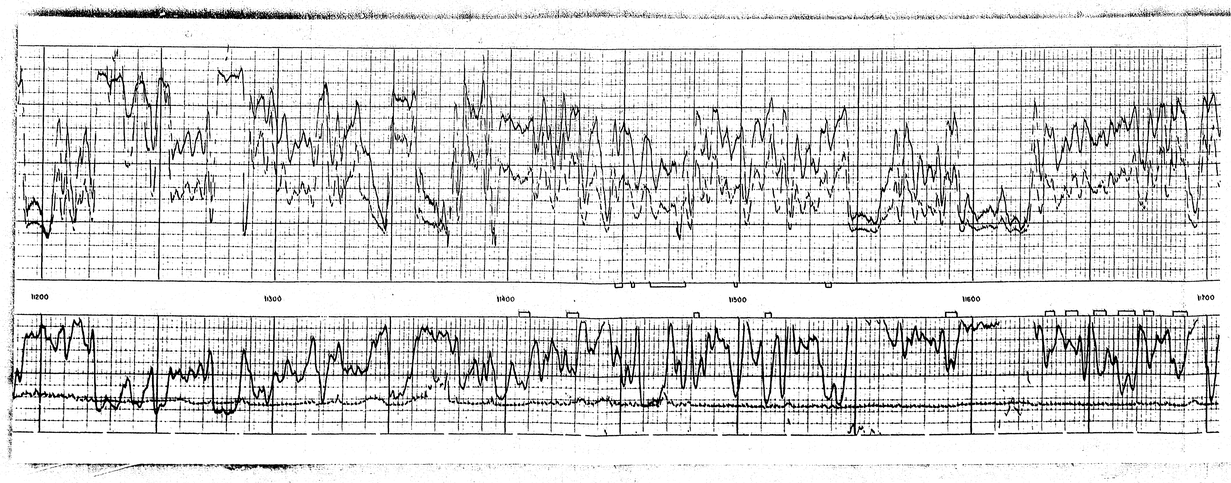


V.E.R.C.P. RICHMARTICS
NOT AVAILABLE OFF

Schlumberger

BOREHOLE COMPENSATED SONIC LOG - GAMMA RAY

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Pennzoil EXHIBIT NO. 9
CASE NO. 5587

COMPANY PENNZOIL UNITED, INC.
WELL GULF
FIELD SOUTH CARLSBAD
COUNTY EDDY STATE NEW MEXICO
LOCATION 1980' FSL & 990' FWL
Other Services: DLL
Sec. 6 Twp. 23-S Rge. 27-E

COUNTY EDDY
LOCATION SOUTH CARLSBAD
WELL GULF
COMPANY PENNZOIL UNITED

Permanent Datum G.L. Elev. 3212
Log Measured From K.B. 20 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 3232
D.F. 3230
G.L. 3212

Date	12-22-71	1-24-72				
Run No.	ONE	TWO				
Depth—Driller	5355	11833				
Depth—Logger	5354	11839				
Btm. Log Interval	5352	11830				
Top Log Interval	0	5359				
Casing—Driller	8 5/8@ 355	9 5/8@ 5355	@		@	
Casing—Logger						
Bit Size	12 1/4	8 1/4				
Type Fluid in Hole	SALT MUD	SALT				
Dens. | Visc.	10.0 | 29	9.6 | 36				
pH | Fluid Loss		mc | 5	12 ml	ml		ml
Source of Sample	PIT	CIRC				
R_m @ Meas. Temp.	.097@ 74°F	.15 @ 68°F	@ °F		@ °F	
R_mf @ Meas. Temp.	.044@ 74°F	.12 @ 70°F	@ °F		@ °F	
R_mc @ Meas. Temp.	@ °F	@ °F	@ °F		@ °F	
Source: R_m | R_mf	R_m | R_mf					
R_m @ BHT	.038@ 94°F	.06 @ 178°F	@ °F		@ °F	
Time Since Circ.	9 HOURS					
Max. Rec. Temp.	94 °F	178 °F	°F		°F	
Equip. | Location	7031 HOBBS	7646 HOBBS				
Recorded By	WALLS	WILSON				
Witnessed By	BERGER	BERGER				

Run No. | Type Log | Depth—Driller | Depth—Logger | Bottom Logged Interval | Top Logged Interval | Type Fluid in Hole | Dens. | Visc. | pH | Fluid Loss | Source of Sample | R_m @ Meas. Temp. | R_mf @ Meas. Temp. | R_mc @ Meas. Temp. | Source R_m R_mf | R_m @ BHT | Time Since Circ. | Max. Rec. Temp. | Equip. Number | Location | Recorded By | Witnessed By

REMARKS: RUN 1 - CALIPER JAMMED WITH CUTTINGS.

Scale Changes: Scale Down Hole / Scale Up Hole

Equipment No.: Other / Tool Type / Tool Pos.

Run No.	Tool Type	Tool Pos.

CNS-FE 1080 XDC-D 1080
SLH-4645
SLH-28-1973
SLS-H-1595
SLS-H-2345
SONDE No.

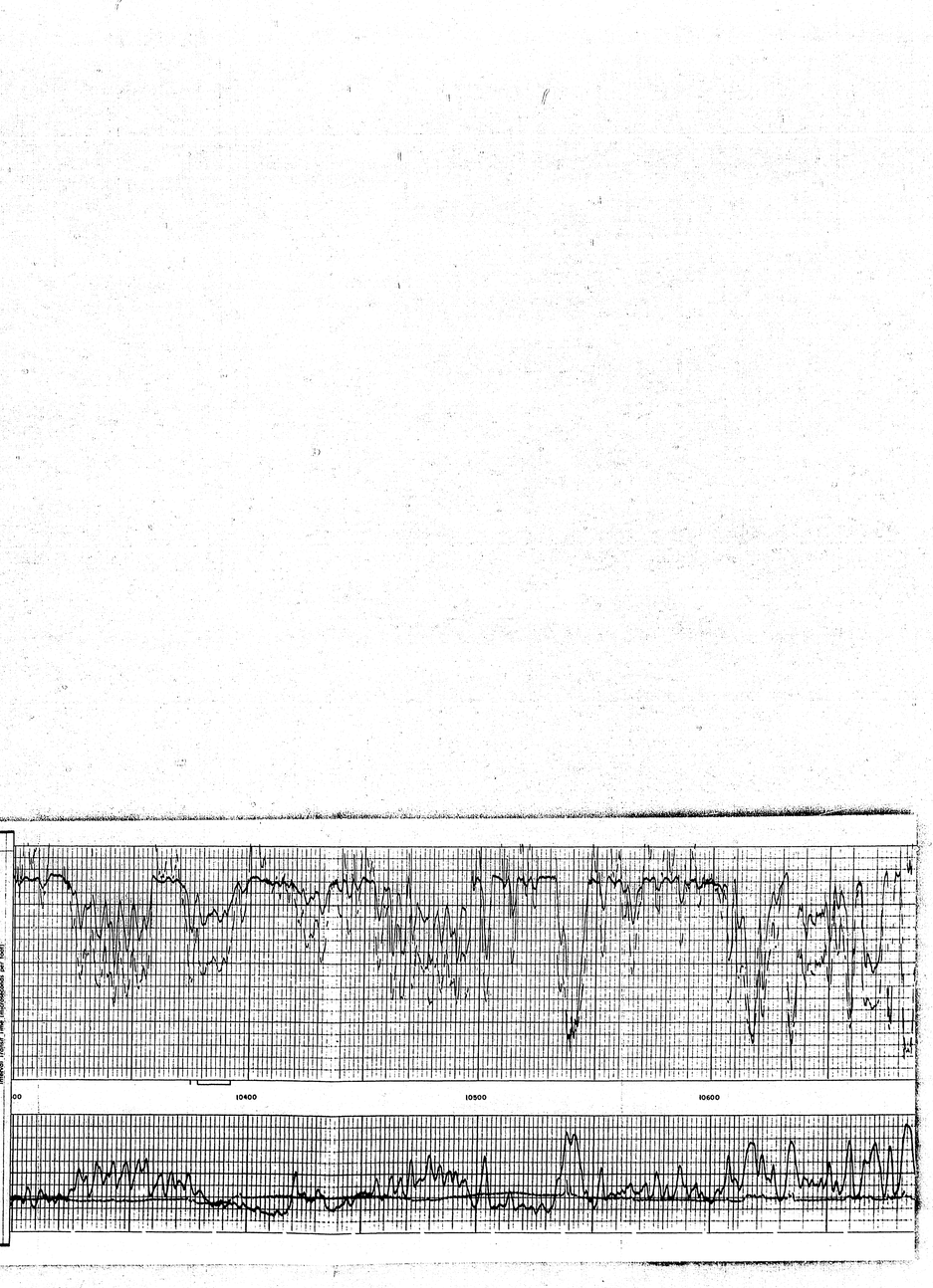
VES — SPRING 1 - CALIPER
SLH-4645
SLH-28-1973
SLS-H-1595
SLS-H-2345

CALIBRATION: RECORDING / SOURCE / GAIN / SPAC. FAC. / TIME CONSTANT / RECORDING SPEED (INCHES/HR)

	SOURCE	GAIN	SPAC. FAC.	TIME CONSTANT	RECORDING SPEED (INCHES/HR)
GAMMA RAY	SC	045	165	2	30/55 (RUN 1)
	SC	090	165	2/1	30/60 (RUN 2)
			0-100		
			0-125		

"C" CURVE = RUN 1, SC ONLY. Δt_{fw} = 52.6 1000.000 Δt_F = 189

Velocity (feet per second) = Interval Transit Time (microseconds per foot)



V.E.N.C.P. MICROGRAPHICS
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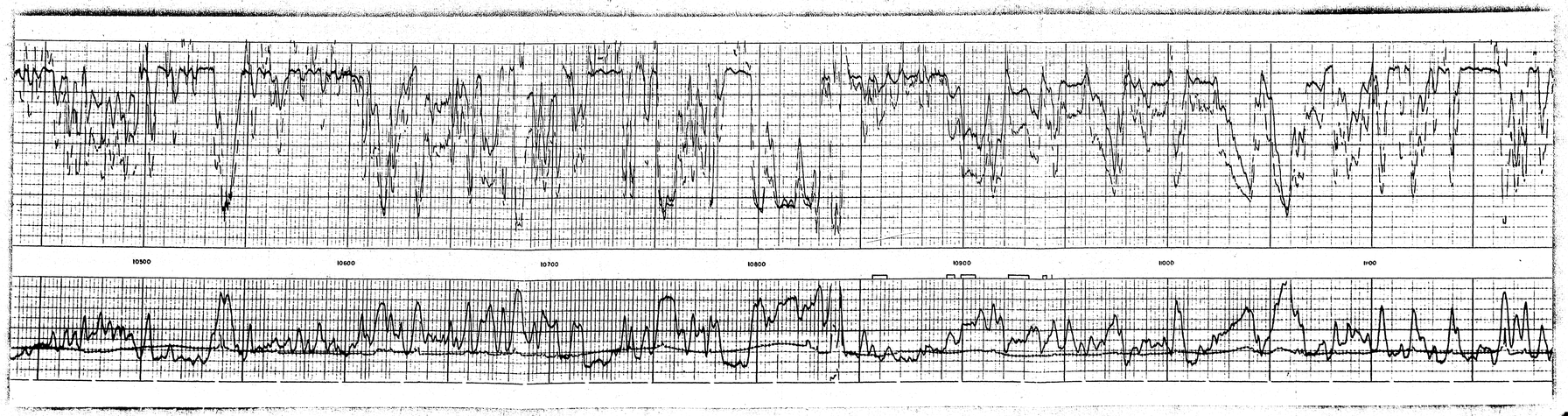

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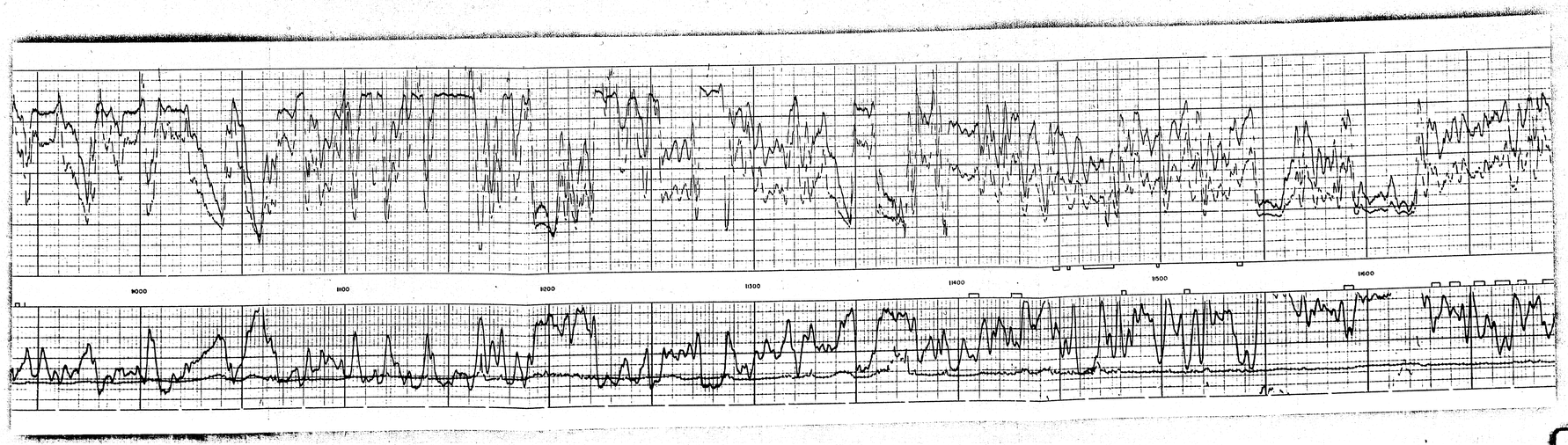

U.S.N.R.C.F. MICROGRAPHICS
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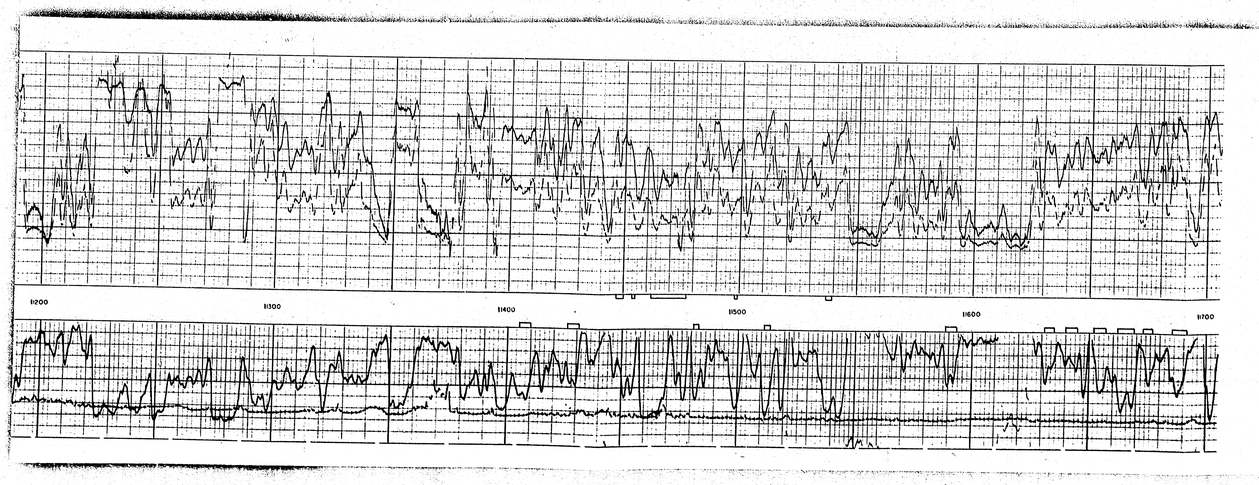

U.S.N.C.V. MICROGRAPHICS
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(9) That the reservoir characteristics of each of the subject zones are such that underground waste will not be caused.

~~by the proposed commingling provided that the well is not shut-in for an extended period.~~

~~(8) That to afford the Commission the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should notify the Artesia district office of the Commission any time the subject well is shut-in for 7 consecutive days.~~

(10) That in order to allocate the commingled production to each of the commingled zones in the subject well, the applicant should consult with the Supervisor, Artesia District Office of the Commission, and assign an allocation formula for the allocation of the production from the Morrow and Atoka commingled production to the Atoka

IT IS THEREFORE ORDERED:

(1) That the applicant, Pennzoil Company, is hereby authorized to commingle Morrow and Atoka production within the wellbore of the Gulf Federal Well No. 2, located in Unit L of Section 6, Township 23 South, Range 27 East, NMPM, Eddy County, New Mexico, and to produce said commingled zones through a single string of tubing; and to produce the Strawn zone on said well through a second string of tubing, accomplishing separation of the Strawn formation from the commingled Atoka-Morrow formations by means of a packer set at approximately 10,900 feet.

(2) That upon completion of the aforesaid work, the applicant shall consult with the Supervisor of the Artesia District Office of the Commission and arrive at an allocation formula for determining production from the Atoka zone and from the Morrow zone.

(3) That the applicant shall separately meter at the surface the production from the Strawn formation and the commingled production from the Atoka-Morrow formations.

(10) That the Strawn production and the combined Atoka-Morrow production from this well shall be allocated on the basis of the current monthly test of the Strawn zone and a monthly test of the commingled Atoka-Morrow zones.

Mailed

W.R.M.C.F. MICROGRAPHICS
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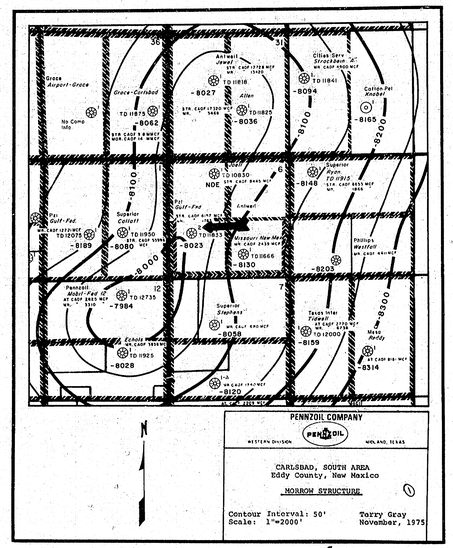

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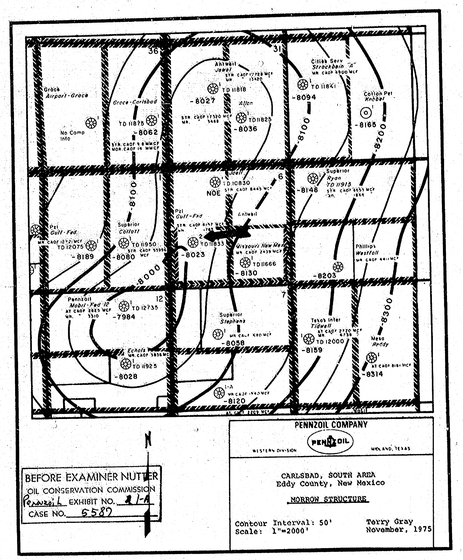

N

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Pennzoil EXHIBIT NO. 2
CASE NO. 6580

PENNZOIL COMPANY
WESTERN DIVISION — MIDLAND, TEXAS

CARLSBAD, SOUTH AREA
Eddy County, New Mexico

MORROW STRUCTURE

Contour Interval: 50'
Scale: 1"=2000'

Terry Gray
November, 1975

U.S.N.C.F. MICROGRAPHICS
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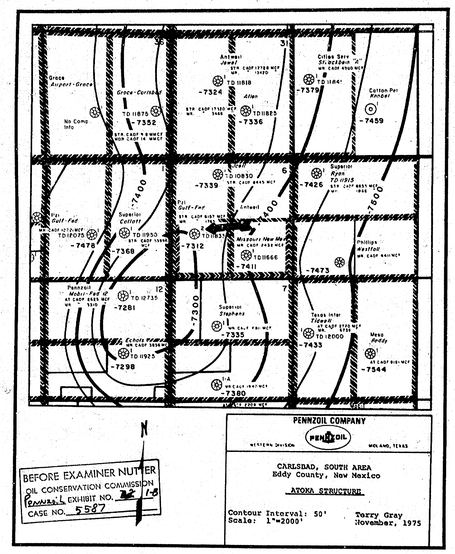
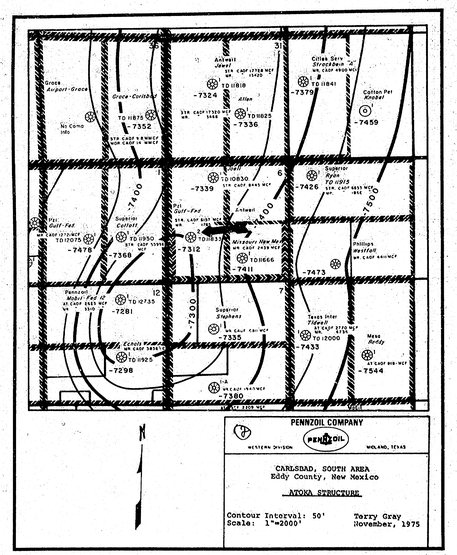


V.S.R.C.F. MICROGRAPHICS



W.N.M.G.F. MICROGRAPHICS
BEST AVAILABLE COPY

A

1 * PENNZOIL CO. *MOBIL FED. "12" #1* 12-23-26 ELEV. 3257

2 * PENNZOIL CO. *ECHOLS #1* 12-23-26 ELEV. 3252

3 * SUPERIOR *STEPHENS #1-A* 7-23-27 ELEV. 3230

4 * SUPERIOR *STEPHENS #1* 7-23-27 ELEV. 3235

5 * PENNZOIL CO. *GULF FED. #2* 6-23-27 ELEV. 3232

6 * SUPERIOR *COLLATT #1* 1-23-26 ELEV. 3245

7 * PENNZOIL CO. *GULF FED. #1* 1-23-26 ELEV. 3266

8 * GRACE *HUMBLE-GAS COM #1* 2-23-26 ELEV. 3269

9 * GRACE *PANAGRA #1* 11-23-26 ELEV. 3283

10 * TEXAS OIL *PAN AM ST. #1* 11-23-26 ELEV. 3307

A'

T/STRAWN

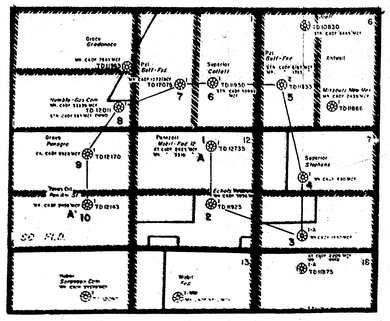
T/ATOKA

ORIGINAL T/MORROW

ORIGINAL T/L. MORROW

"X" SAND

T/MORROW CLASTICS



PENNZOIL COMPANY

WESTERN DIVISION — MIDLAND, TEXAS

CARLSBAD, SOUTH FIELD

EDDY COUNTY, NEW MEXICO

STRATIGRAPHIC CROSS SECTION A-A'

SCALE: VERT. 1"=100'
HOR. NONE

JAN., 1975
T. L. GRAY

BEFORE EXAMINER NUTTER
OIL CONSERVATION
EXHIBIT NO.
CASE NO. 5587

A

1 * PENNZOIL CO. MOBIL FED. "12" #1 12-23-26 ELEV. 3287

2 * PENNZOIL CO. ECHOLS #1 12-23-26 ELEV. 3282

3 * SUPERIOR STEPHENS #1-A 7-23-27 ELEV. 3230

4 * SUPERIOR STEPHENS #1 7-23-27 ELEV. 3235

5 * PENNZOIL CO. GULF FED. #2 6-23-27 ELEV. 3232

6 * SUPERIOR COLLATT #1 1-23-26 ELEV. 3246

7 * PENNZOIL CO. GULF FED. #1 1-23-26 ELEV. 3256

8 * GRACE HUMBLE-GAS COM #1 2-23-26 ELEV. 3269

9 * GRACE PANAGRA #1 11-23-26 ELEV. 3283

10 * TEXAS OIL PAN AM ST. #1 11-23-26 ELEV. 3307

A'

T/ STRAWN

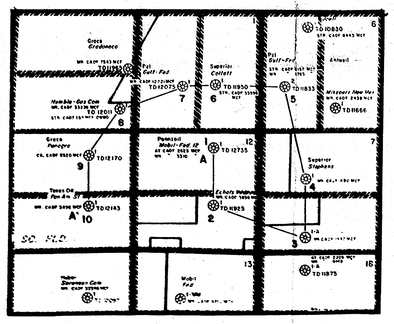
T/ATOKA

ORIGINAL T/MORROW

ORIGINAL T/L. MORROW

"X" SAND

T/MORROW CLASTICS



PENNZOIL COMPANY

WESTERN DIVISION — MIDLAND, TEXAS

CARLSBAD, SOUTH FIELD

EDDY COUNTY, NEW MEXICO

STRATIGRAPHIC CROSS SECTION A-A'

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T. L. GRAY