STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [X] yes [ ] no

II. Operator: AMOCO PRODUCTION COMPANY
Address: P. O. Box 68, Hobbs, NM 88240
Contact party: Dave Blazer Phone: (505) 393-1781

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? [X] yes [ ] no
If yes, give the Division order number authorizing the project 3456.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Cathy L. Formas Title Asst. Admin. Analyst

Signature: Cathy L. Formas Date: 12-7-81

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

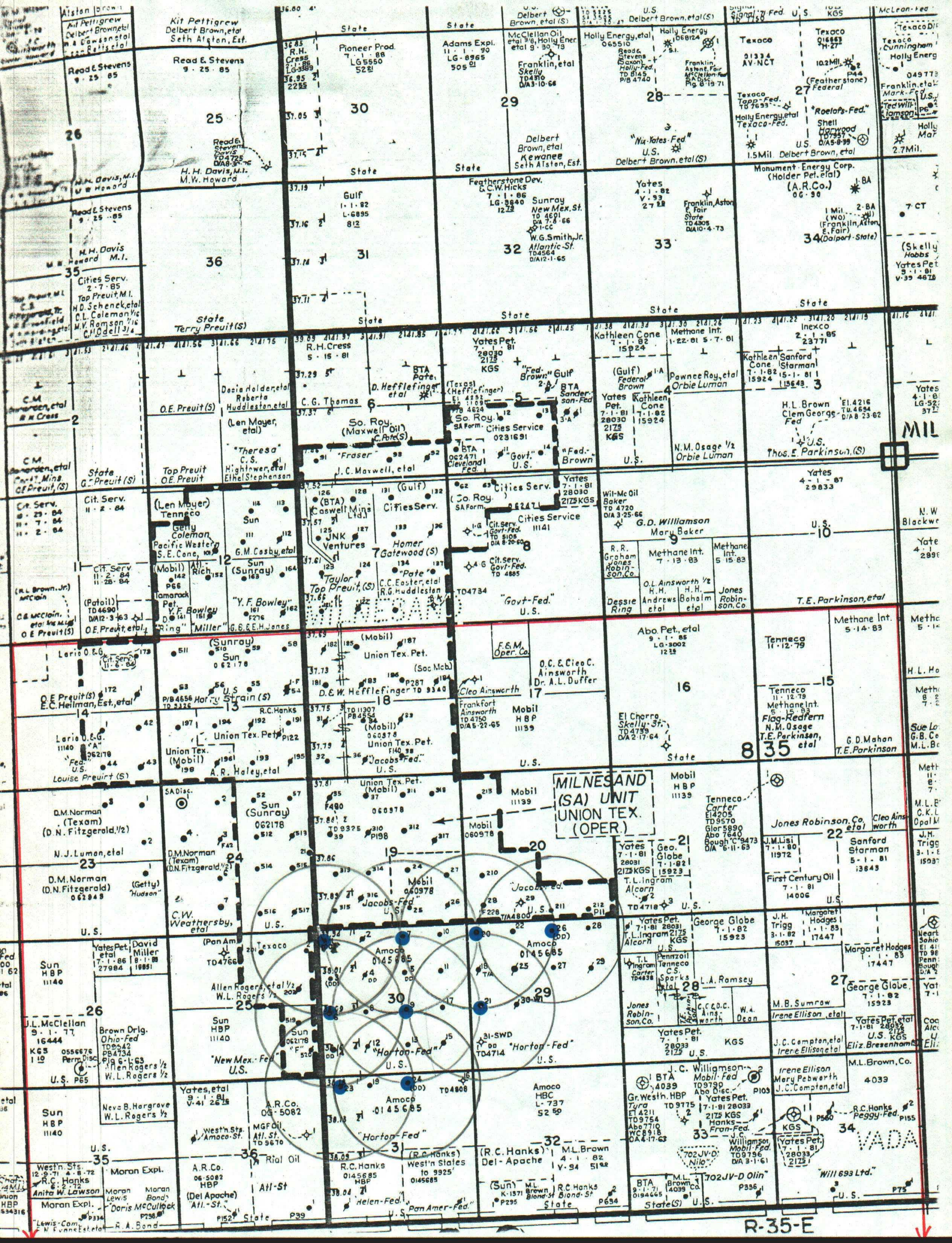
(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.



Kit Pettigrew
Delbert Brown, etal
Seth Alston, Est.
Read & Stevens
9 · 25 · 85
25
26
H. H. Davis, M.I.
M.W. Howard
36
35
Cities Serv.
2 · 7 · 85
Top Preuit, M.I.
H.D. Schenck, etal
C.L. Coleman
M.V. Ramson
C.H. Odell
State
Terry Preuit (S)
R.H. Cress
Pioneer Prod.
7 · 1 · 88
LG5550
30
Gulf
1 · 1 · 82
L-6895
31
Adams Expl.
11 · 1 · 90
LG-8965
McClellan Oil
Franklin, etal
Skelly
TD4510
D/A3-10-66
29
Delbert Brown, etal
Kewanee
Seth Alston, Est.
Featherstone Dev.
& C.W. Hicks
7 · 1 · 86
LG-3840
Sunray
New Mex. St.
W.G. Smith, Jr.
Atlantic-St.
32
Holly Energy, etal
065510
Read & Stevens (Saxon)
Holly-Fed.
TD 8145
P/B 4740
Holly Energy
068124
Franklin, Aston, E. Fair
McClellan-Fed
SA Disc.
28
"Nix-Yates-Fed"
U.S.
Delbert Brown, etal (S)
Yates
4 · 1 · 82
V · 93
Franklin, Aston
E. Fair
State
TD 4305
D/A 10 · 4 · 73
33
Texaco
01334
AV-NCT
Texaco
Tapp-Fed.
TD 7693
Holly Energy, etal
Texaco-Fed.
1.5 Mil.
27
Texaco
016863
"H-27"
10.2 Mil.
(Featherstone)
Federal
"Roelofs-Fed."
Shell
Harwood
TD7957
D/A5-8-59
U.S.
Delbert Brown, etal
Monument · Energy Corp.
(Holder Pet. etal)
(A.R.Co.)
OG · 90
1 Mil.
(WO)
(Franklin, Aston, E. Fair)
34 (Dalport-State)
Texaco
Cunningham
Holly Energ
049773
Franklin, etal
Mark-Fed
Ted Williamson
2.7 Mil.
(Skelly
Hobbs
Yates Pet.
5 · 1 · 81
V · 39
R.H. Cress
5 · 15 · 81
BTA
Pate
D. Hefflefinger
etal
C.G. Thomas
6
So. Roy.
(Maxwell Oil)
C. Pate (S)
"Fraser"
J.C. Maxwell, etal
Yates Pet.
7 · 1 · 81
28030
2175
KGS
"Fed-Brown" Gulf
BTA
Sanderson-Fed
5
(Texas)
(Hefflefinger)
So. Roy.
SA Form.
Cities Service
0231691
BTA
062471
Cleveland
Fed.
"Govt."
U.S.
"Fed.-Brown"
Kathleen Cone
7 · 1 · 82
15924
Methane Int.
1 · 22 · 81
5 · 7 · 81
(Gulf)
Federal
Brown
Yates Pet.
7 · 1 · 81
28030
2175
KGS
Kathleen Cone
7 · 1 · 82
15924
4
Pawnee Roy, etal
Orbie Luman
N.M. Osage 1/2
Orbie Luman
U.S.
Inexco
2 · 1 · 85
23771
Kathleen Cone
7 · 1 · 82
15924
Sanford Starman
5 · 1 · 81
13643
3
H.L. Brown
Clem George-Fed
EI. 4216
TD. 4694
D/A 8 · 23 · 62
U.S.
Thos. E. Parkinson, (S)
MIL
C.M. Cress
2
C.M.
O.E. Preuit (S)
State
G. Preuit (S)
Top Preuit
O.E. Preuit
Dosia Holder, etal
Roberta Huddleston, etal
(Len Mayer, etal)
"Theresa"
C.S.
Hightower, etal
Ethel Stephenson
Cit. Serv.
11 · 2 · 84
(Len Mayer)
Tenneco
Getty
Coleman
Pacific Western
S.E. Cone
(Mobil)
Atl. Rich.
Tamarack Pet.
Y.F. Bowley
"Ring"
"Miller"
Sun
G.M. Cosby, etal
12
Sun
(Sunray)
"Y. F. Bowley"
G.B. & E.H. Jones
11
Cit. Serv.
11 · 2 · 84
11 · 28 · 84
(Patoil)
TD 4690
D/A12 · 3 · 63
O.E. Preuit, etal
O.E. Preuit (S)
(BTA)
Caswell Mins Ltd.
JNK Ventures
Cities Serv.
Homer
7 Gatewood (S)
Taylor
Top Preuit, (S)
"Pate"
C.C. Easter, etal
R.G. Huddleston
TD4734
Cities Serv.
062471
Cities Service
11141
8
Cit. Serv.
Govt-Fed.
TD 5105
D/A 8-20-60
Cit. Serv.
Govt-Fed.
TD 4885
"Govt-Fed."
U.S.
Wil-Mc Oil
Baker
TD 4720
D/A 3 · 25 · 66
G.D. Williamson
Mary Baker
9
R.R. Graham
Jones Robinson, Co.
Methane Int.
7 · 13 · 83
Methane Int.
5 · 15 · 83
O.L. Ainsworth 1/2
H.H. Andrews etal
H.H. Boholm etal
Jones Robinson, Co.
Dessie Ring
Yates
4 · 1 · 87
29833
U.S.
10
T.E. Parkinson, etal
Lario O.& G.
(Cit. Serv.)
11 · 6 · 84
O.E. Preuit (S)
E.C. Heilman, Est., etal
14
Lario O.& G.
11140
"A"
062178
"Fed."
U.S.
Louise Preuirt (S)
(Sunray)
Sun
062178
P/B 4656
TD 3326
Harry Strain (S)
13
R.C. Hanks
Union Tex. Pet.
P122
Union Tex.
(Mobil)
A.R. Haley, etal
(Mobil)
Union Tex. Pet.
(Soc Mob.)
P287
D.& W. Hefflefinger TD 9340
18
TD 11307
PB 4554
(Mobil)
060378
Union Tex. Pet.
"Jacobs-Fed."
U.S.
Cleo Ainsworth
Frankfort Ainsworth
TD 4750
D/A 5 · 22 · 65
17
Mobil
HBP
11139
F.& M. Oper. Co.
O.C. & Cleo C. Ainsworth
Dr. A.L. Duffer
U.S.
Abo Pet., etal
9 · 1 · 85
LG · 3002
16
El Chorro
Skelly-St.
TD 4739
D/A 2 · 17 · 64
State
Tenneco
11 · 12 · 79
15
Tenneco
11 · 12 · 79
Methane Int.
5 · 15 · 83
Flag-Redfern
N.M. Osage
T.E. Parkinson, etal
8 35
Methane Int.
5 · 14 · 83
G.D. Mahon
T.E. Parkinson
SA Disc.
D.M. Norman
(Texam)
(D.N. Fitzgerald, 1/2)
N.J. Luman, etal
23
D.M. Norman
(D.N. Fitzgerald)
062949
(Getty)
"Hudson"
D.M. Norman
(Texam)
(D.N. Fitzgerald, 1/2)
24
C.W. Weathersby, etal
U.S.
Sun
(Sunray)
062178
Union Tex. Pet.
(Mobil)
060978
TD 9325
P198
19
Mobil
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"Jacobs-Fed."
U.S.
Mobil
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MILNESAND
(SA) UNIT
UNION TEX.
(OPER.)
Mobil
HBP
11139
Tenneco
Carter
E14205
TD9570
Glor 5890
Abo 7640
Bough "C" 9473
D/A 6 · 11 · 63
Yates
7 · 1 · 81
28031
2175 KGS
Geo. Globe
7 · 1 · 82
15923
21
T.L. Ingram
Alcorn
TD4718
U.S.
Jones Robinson, Co. etal
Cleo Ainsworth
22
J.M. Lisi
7 · 1 · 80
11972
Sanford Starman
5 · 1 · 81
13643
First Century Oil
7 · 1 · 81
14006
U.S.
Yates Pet. etal
7 · 1 · 86
27984
David Miller
8 · 1 · 89
Sun
HBP
11140
(Pan Am)
TD4766
Texaco
Allen Rogers, etal 1/2
W.L. Rogers 1/2
25
Amoco
0145685
30
T/A4800
Amoco
0145685
29
"Horton-Fed"
U.S.
31-SWD
TD4714
"Horton-Fed"
U.S.
Yates Pet.
7 · 1 · 81
28031
2175 KGS
T.L. Ingram
Alcorn
George Globe
7 · 1 · 82
15923
J.H. Trigg
3 · 1 · 82
15037
Margaret Hodges
1 · 1 · 83
17447
T.L. Ingram
Carter
TD4838
Pennzoil
Tenneco
C.S. Sparks
etal
L.A. Ramsey
28
Jones Robinson, Co.
C.C. & O.C. Ainsworth
W.A. Dean
Yates Pet.
7 · 1 · 81
28033
2175
U.S.
KGS
Margaret Hodges
1 · 1 · 83
17447
27
George Globe
7 · 1 · 82
15923
M.B. Sumrow
Irene Ellison, etal
Yates Pet. etal
7 · 1 · 81
28032
2175
U.S. KGS
Eliz. Bresenham
J.C. Compton, etal
Irene Ellison etal
26
J.L. McClellan
9 · 1 · 77
16444
KGS
Brown Drlg.
Ohio-Fed
TD9542
PB4734
Plg 6-1-63
Perm Disc.
Allen Rogers 1/2
W.L. Rogers 1/2
U.S.
P65
Sun
HBP
11140
Sun
062178
"F"
"New Mex.-Fed"
U.S.
Yates, etal
9 · 1 · 81
V · 41
Neva B. Hargrove
W.L. Rogers 1/2
A.R.Co.
OG-5082
West'n Sts.
Amoco-St.
MGF Oil
Atl. St.
TD 9670
Amoco
-0145685
"Horton-Fed"
TD4808
Amoco
HBC
L-737
Sun
HBP
11140
U.S.
35
West'n Sts.
12 · 9 · 71
4 · 8 · 72
R.C. Hanks
6 · 2 · 72
Anita W. Lawson
Moran Expl.
Moran Lewis
Moran Bond
"Doris McCullock"
Moran Expl.
"Lewis-Com"
R.A. Bond
A.R.Co.
OG-5082
HBP
(Del Apache)
"Atl.-St."
36
Rial Oil
Atl-St
State
P39
R.C. Hanks
0145685
HBP
"Helen-Fed."
(R.C. Hanks)
West'n States
to 9925'
0145685
"Pan Amer-Fed."
U.S.
3
(R.C. Hanks)
Del-Apache
32
M.L. Brown
4 · 1 · 82
V · 94
(Sun)
K-1371
M.L. Brown
Blond-St
R.C. Hanks
Blond-St
State
P654
J.C. Williamson
Mobil-Fed
TD9790
Abo Disc.
P103
BTA
4039
Gr. West'n. HBP
Tyra
EI 4211
TD9754
Abo 7710
WC8918
DA 4-17-63
TD 9775
Yates Pet.
7 · 1 · 81 28033
2175 KGS
Hanks
Fran-Fed.
33
J.C. Williamson
Mobil-Fed.
TD9796
D/A 3 · 1 · 61
"702 JV-D Nilo"
"702 JV-D Olin"
P336
BTA
9 · 1 · 71
0194665
M.L. Brown Co.
4039
State (S)
U.S.
Irene Ellison
Mary Pebworth
J.C. Compton, etal
M.L. Brown, Co.
4039
KGS
Yates Pet.
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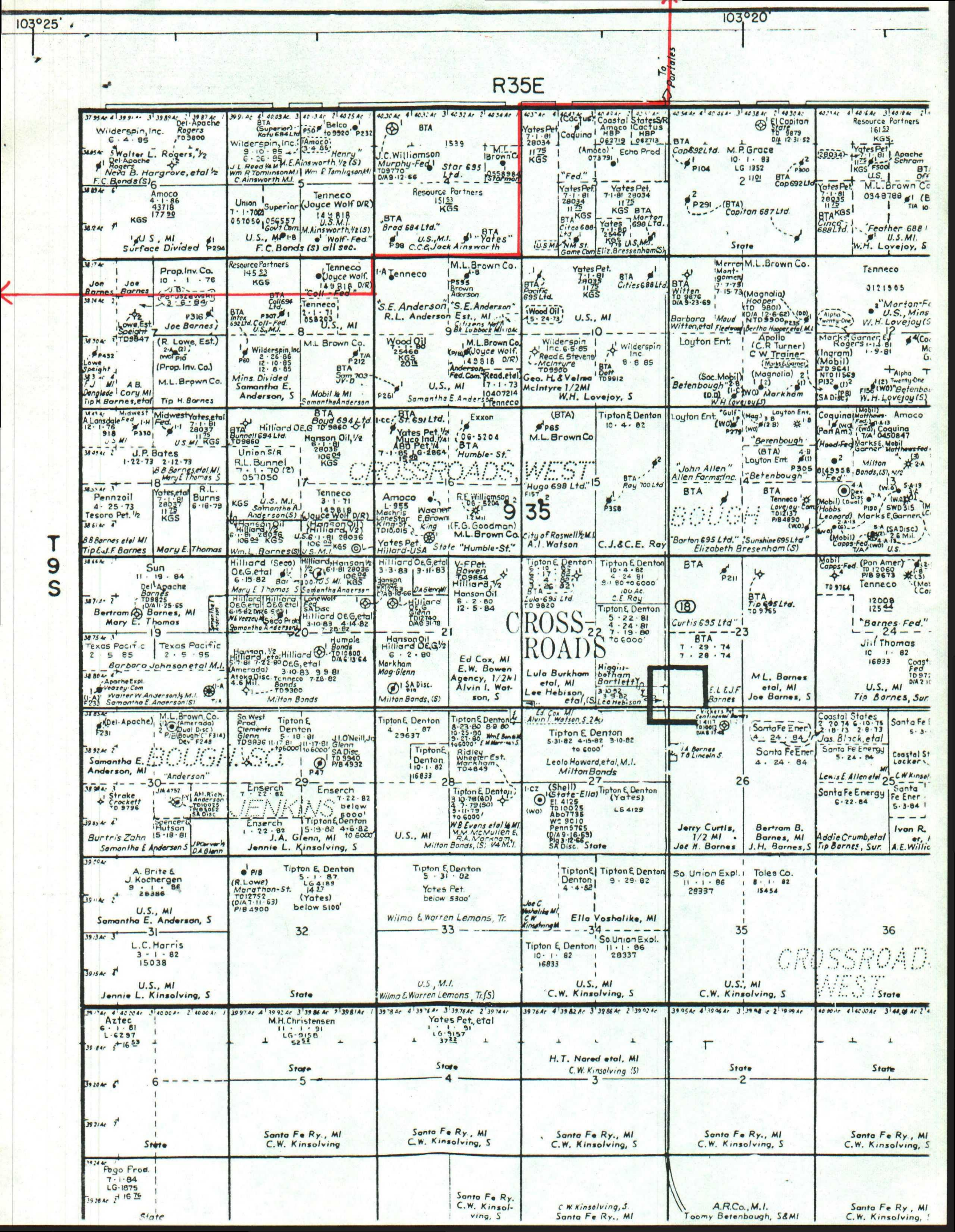
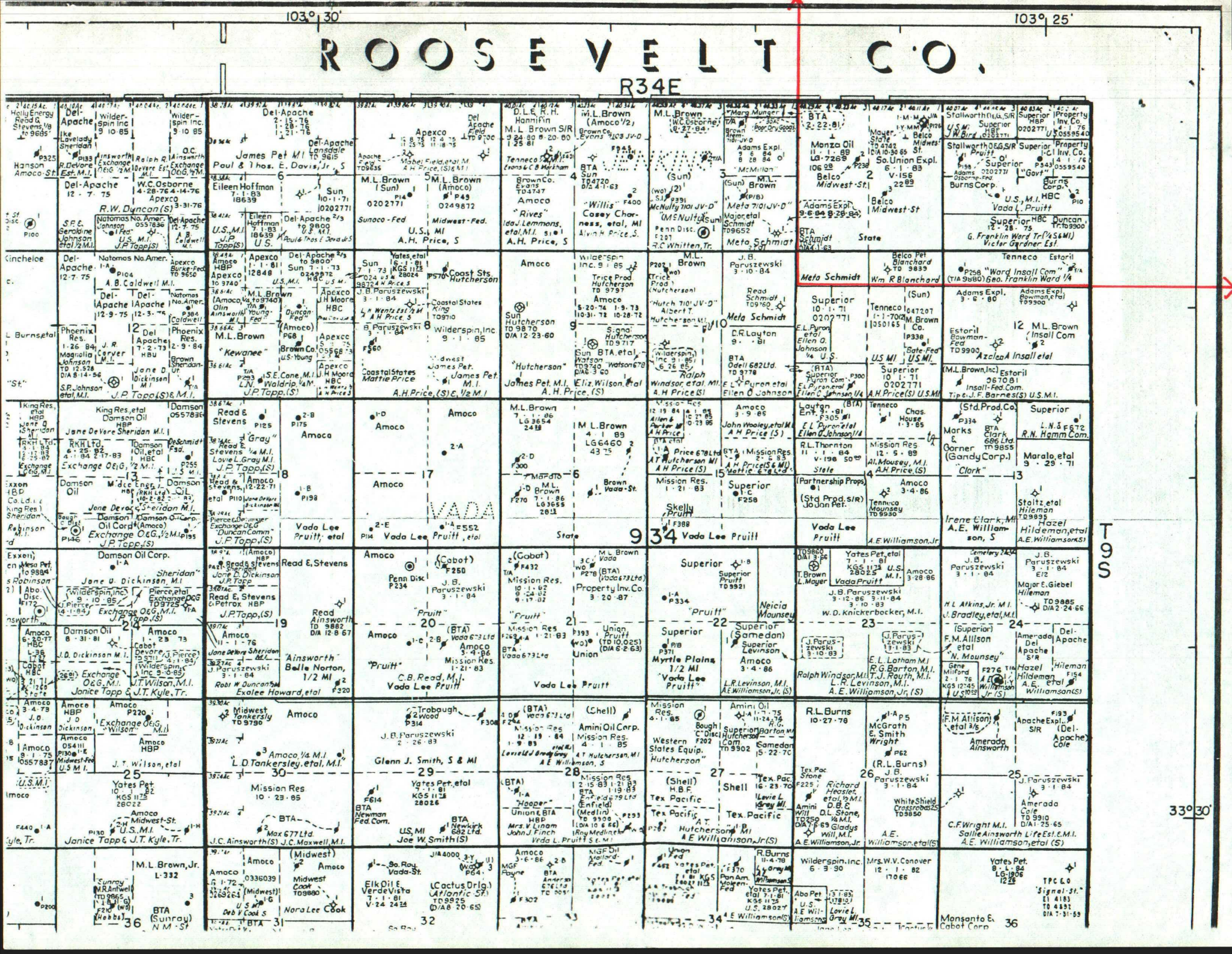
28033
2175
P560
R.C. Hanks
Peggy-Fed.
P155
34
VADA
"Will 693 Ltd."
P75
U.S.
R-35-E



103°25'
103°20'
R35E
To Portales
T9S
CROSSROADS, WEST
CROSSROADS
BOUGH
BOUGH, SO.
JENKINS
9 35
Wilderspin, Inc.
Amoco
Tenneco
Resource Partners
M.L. Brown Co.
Yates Pet.
Coastal States
El Capitan State
M.P. Grace
Capitan 687 Ltd.
Joe Barnes
Prop. Inv. Co.
Wood Oil
Wilderspin Inc.
W.H. Lovejoy, S
Layton Ent.
M.L. Brown Co.
Hilliard O.E.G
Hanson Oil
J.P. Bates
Pennzoil
Exxon
BTA
Tipton & Denton
Elizabeth Bresenham (S)
Sun
Texas Pacific
Ed Cox, MI
Lula Burkham
Lee Hebison
Jill Thomas
Santa Fe Energy
Samantha E. Anderson, MI
Ensearch
J.A. Glenn, MI
Jennie L. Kinsolving, S
Milton Bonds
Jerry Curtis
Bertram B. Barnes, MI
A. Brite & J. Kochergen
L.C. Harris
Wilma & Warren Lemons, Tr.
Ella Voshalike, MI
So. Union Expl.
Toles Co.
C.W. Kinsolving, S
State
Aztec
M.H. Christensen
Yates Pet., etal
H.T. Nared etal, MI
Santa Fe Ry., MI
Pogo Prod.
A.R.Co., M.I.
Toomy Betenbough, S&MI


103° 30'
103° 25'
ROOSEVELT CO.
R34E
T9S
33° 30'

PROOF OF NOTICE:

Daily News-Sun, Hobbs, N.M.—Fri., Sept. 11, 1981—Page 20

LEGAL NOTICE
September 11, 1981
NOTICE

To Whom It May Concern:

Amoco Production Company proposes to convert the following wells to injection:

Horton Federal Well No. 1;	Sec 30, T-8-S, R-35-E; 330' FNL x 330' FWL; TD 4761'
Horton Federal Well No. 6;	Sec 30, T-8-S, R-35-E; 2310' FSL x 330' FWL; TD 4739'
Horton Federal Well No. 7;	Sec 30, T-8-S, R-35-E; 330' FNL x 2241.3' FEL; TD 4732'
Horton Federal Well No. 9;	Sec 30, T-8-S, R-35-E; 2310' FSL x 2246' FEL; TD 4851'
Horton Federal Well No. 20;	Sec 29, T-8-S, R-35-E; 330' FNL x 330' FWL; TD 4764'
Horton Federal Well No. 21;	Sec 29, T-8-S, R-35-E; 2310' FSL x 330' FWL; TD 4775'
Horton Federal Well No. 23;	Sec 31, T-8-S, R-35-E; 330' FNL x 660' FWL; TD 4780'
Horton Federal Well No. 24;	Sec 31, T-8-S, R-35-E; 330' FNL x 2310' FEL; TD 4767'
Horton Federal Well No. 26;	Sec 29, T-8-S, R-35-E; 330' FNL x 2310' FEL; TD 4742'

The intended purpose of the injection wells is for secondary recovery to enhance oil production on the Horton Federal Lease in the San Andres formation with expected maximum injection rates of 800 BPD and pressure 800 PSIG. Interested parties must file objections or requests for hearing with the Oil Conservation Division, P.O. Box 2088, Santa Fe, New Mexico 87501 within 15 days from date of this publication.

For further information, contact Dave Blazer at Amoco Production Company, P. O. Box 68, Hobbs, New Mexico 88240, or telephone (505) 393-1781.

HORTON FEDERAL EXPANSION DATA

Packers to be used; Guiberson Unit VI

Tubing will be coated with plastic.

Geology of Injection Zone

1) Dolomitic limestone - stratigraphic trap
2) San Andreas Zones V and VI
3) Net pay thickness: Zone V = 22.5 feet
   Zone VI = 17.8 feet
4) Average depth = 4600'
5) The only known aquifer, the Ogallala, is no deeper than 400 feet in the waterflood area.

Proposed Operation Data

VII.

1. The proposed average and maximum daily rate and volume of fluids to be injected: 667 BOPD

2. The system is open.

3. The proposed average and maximum injection pressure: 800 PSIG

4. There are no sources of injection fluid other than reinjected produced water.

5. Injection is not for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well.

Post Conversion Sketches

Amoco Production Company
ENGINEERING CHART

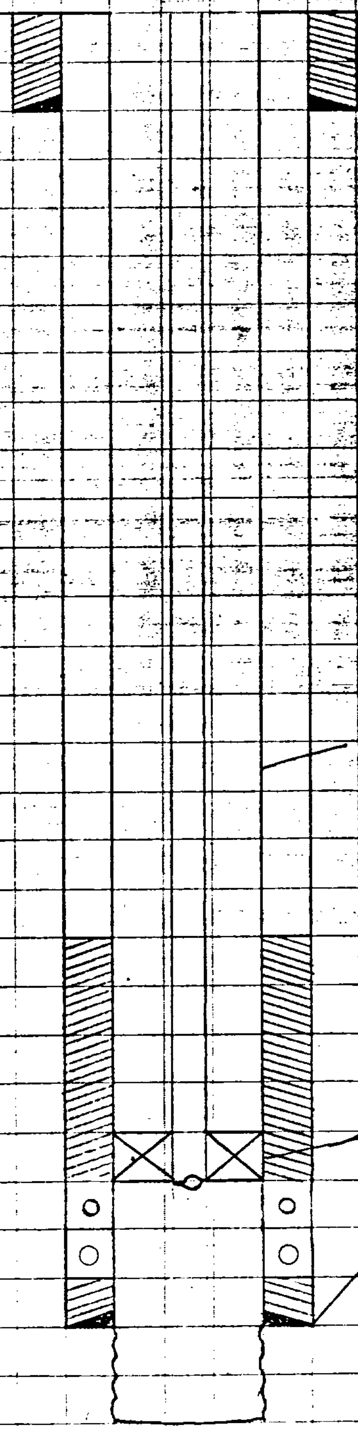
SHEET NO. OF
FILE
APPN
DATE 11-23-81
BY A.C.

SUBJECT Horton Federal #1
Milnesand - San Andres Field

330' FNL & 330' FWL, Sec. 30, T8S, R35E
Roosevelt County, New Mexico

Elev: 4233' R.D.B.
4233' G.L.

Completed: 1-27-64



9 5/8" CSA 404'
32.3# H-40 ST&C
Cmt w/200 sxs. Circ.
12 1/4" Hole

404'

2 3/8" Plastic coated tbg SA 4501'

PSA 4501

4 1/2" CASA-mgL

TOP I.P = 925

TCMT - Unknown ?

no packer @ [illegible]

4693

Perfs: 4626-34, 46-50, & 56-74 w/2 SPF
4678-4688 w/2SPF

4 1/2" CSA 4693'
9.5# J-55 CF&I
Cmt w/350 sxs.
7 7/8" Hole
TCMT - Unknown

TD 4741
Fill to 4712

Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11-23-81

BY A.C

SUBJECT Horton Federal #6

Milnesand - San Andres Field

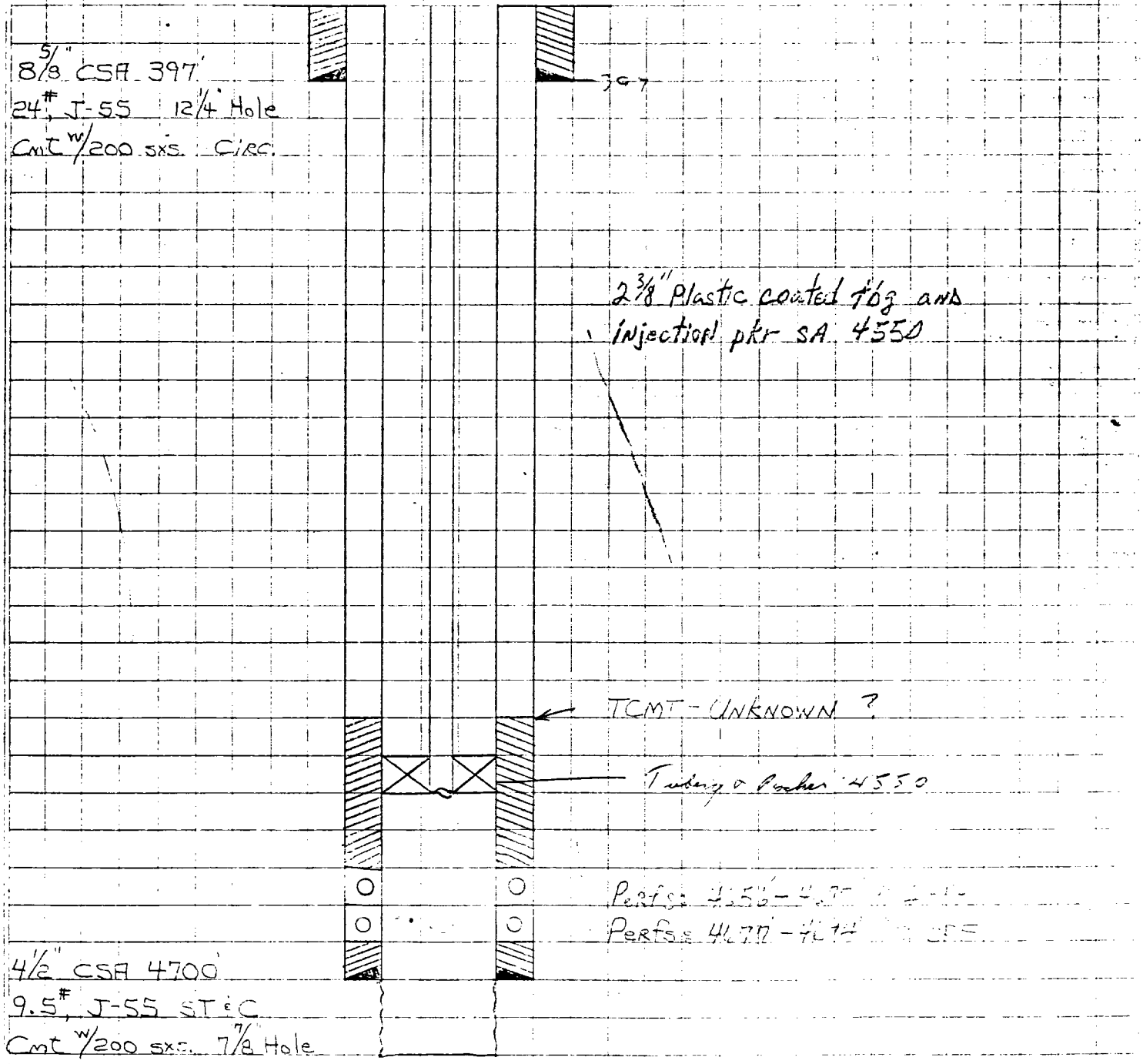
2310' FSL & 330' FWL, Sec. 30, T8S, R35E

Roosevelt County, New Mexico

ELEV: 4230' K.D.B.

4220' G.L.

Completed: 6-30-64



Form 321 2-71

AMOCO

Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11-25-81

BY A.C.

SUBJECT Horton Federal #7

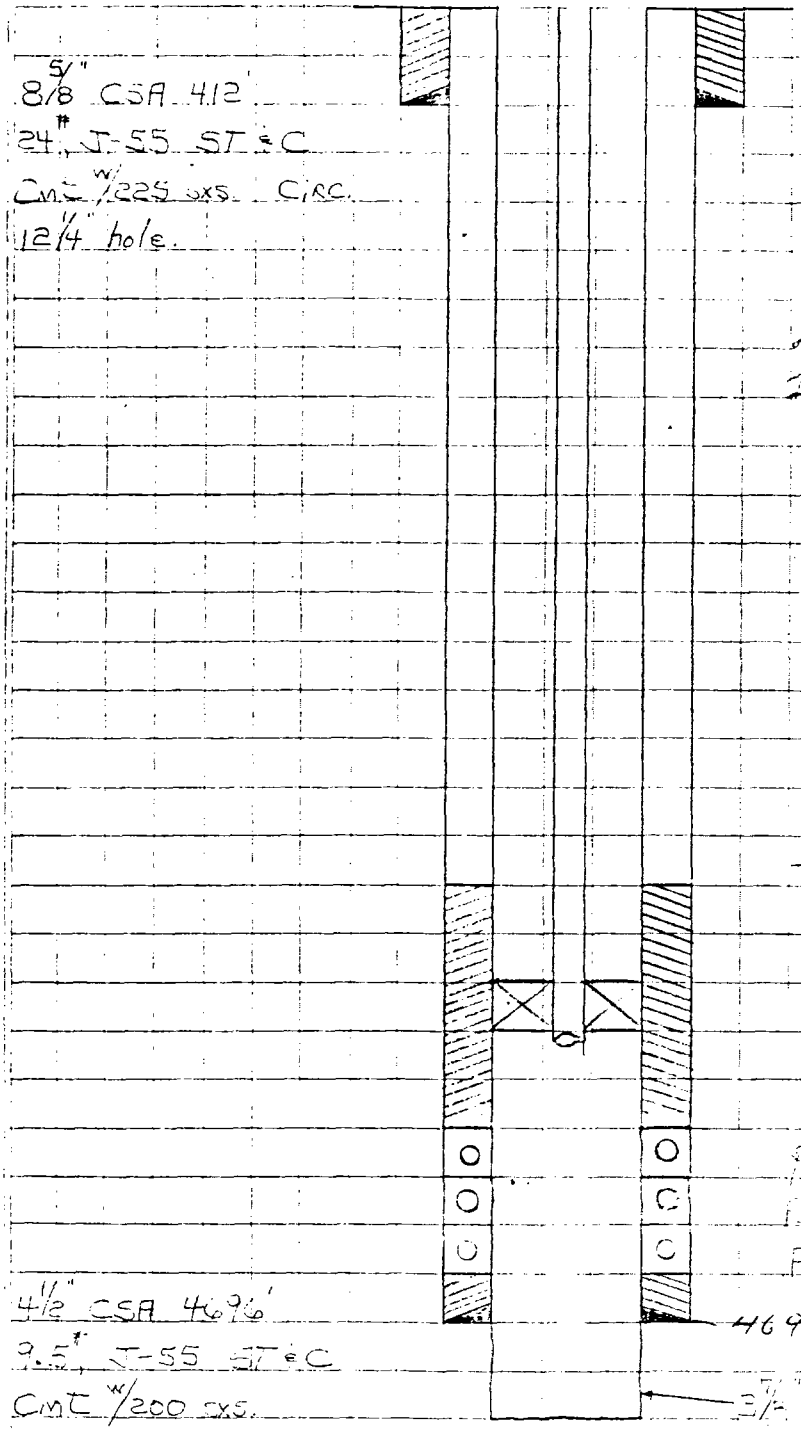
Milnesand-San Andres Field

330' FNL & 2241.3' FEL, Sec. 30, T8S, R34E

Roosevelt County, New Mexico

Elev: 4227' R.D.B.

Completed: 7-8-64



Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11-30-81

BY A. J.

SUBJECT Horton Federal #9

Milnesand - San Andres Field

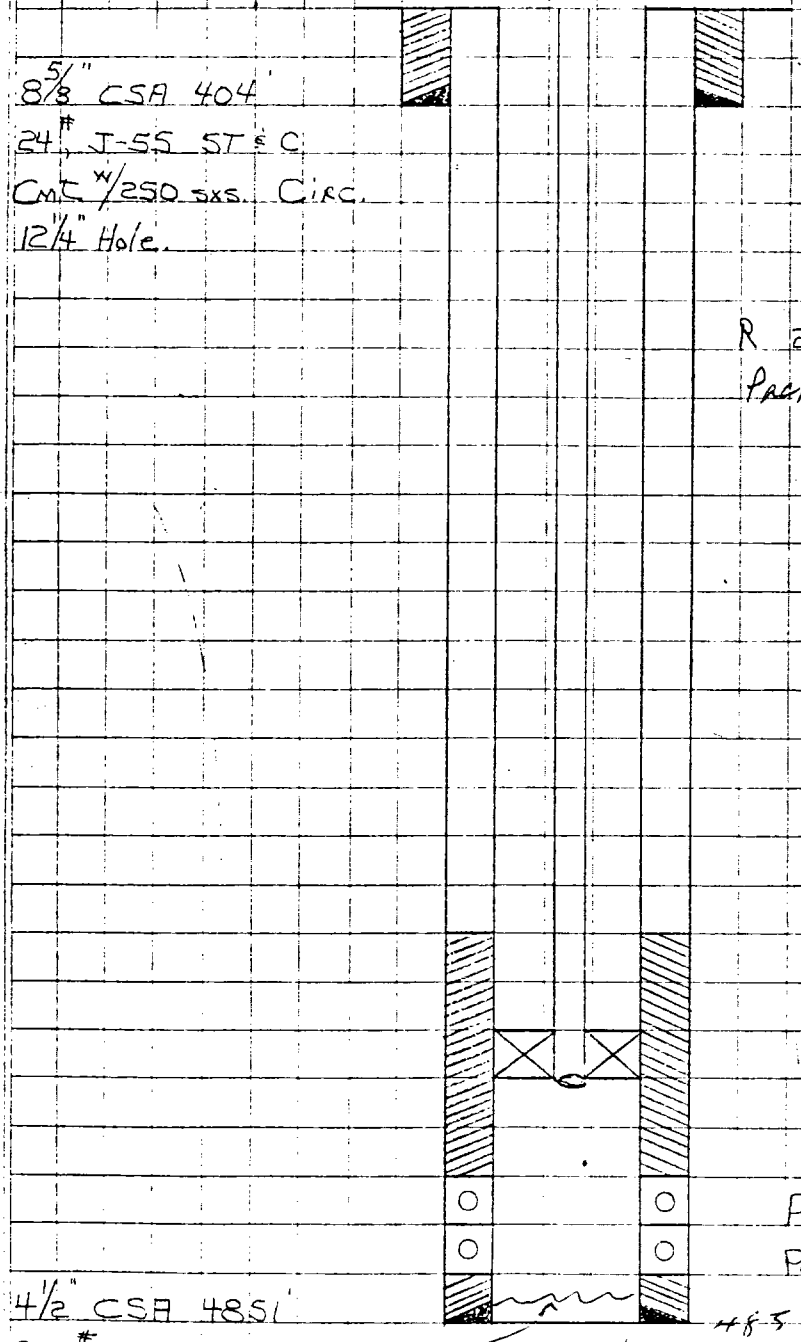
2310' FSL & 2246.3' FEL, Sec. 30, T8S, R35E

Roosevelt County, New Mexico

Elev: 4027' D.F.B.

4014' G.L.

Completed: 8-3-64



AMOCO

Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11-30-81

BY

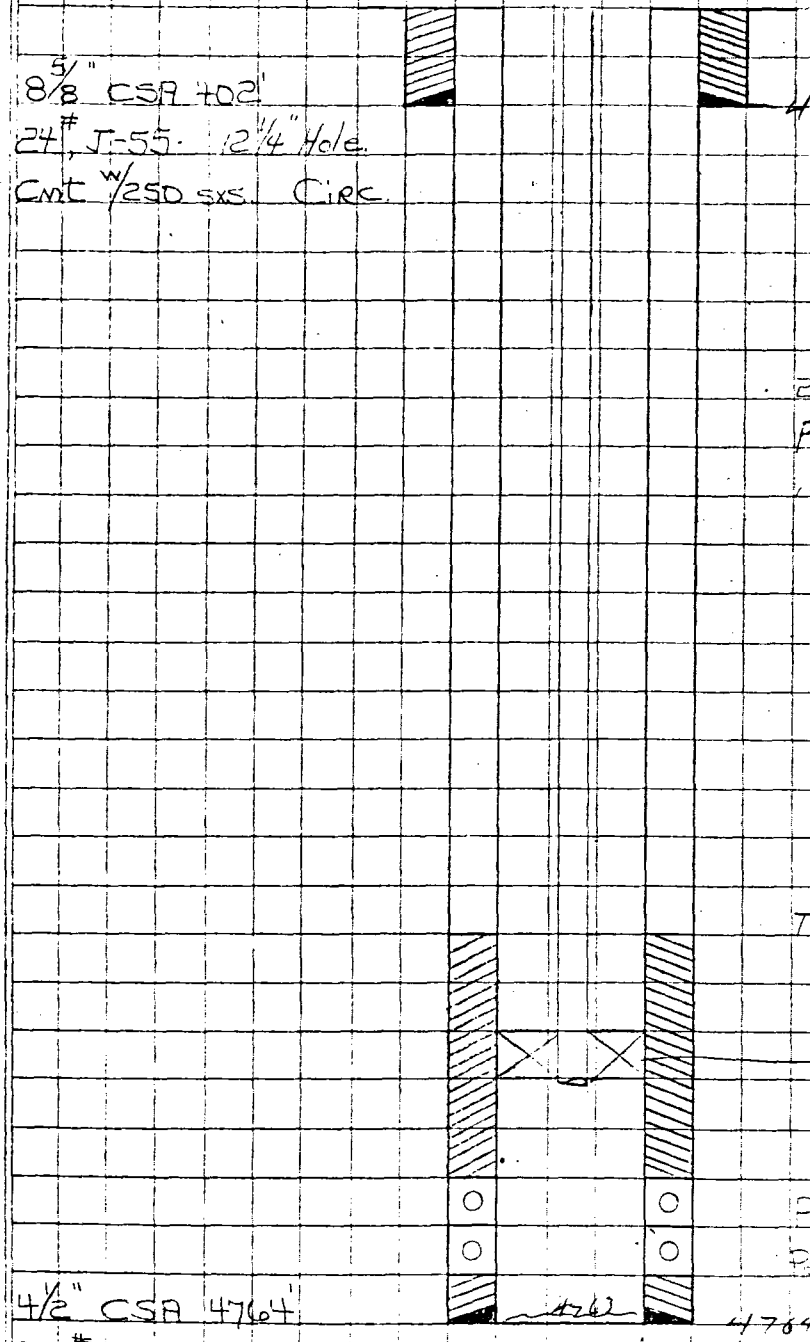
SUBJECT Horton Federal #20

Milnesand - San Andres Field

330' FNL & 330' FWL, Sec. 29, T8S, R35E
Roosevelt County, New Mexico

Elev: 4219' K.B.
4209' G.L.

Completed: 10-10-64



Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 10-9-78

BY D. W.

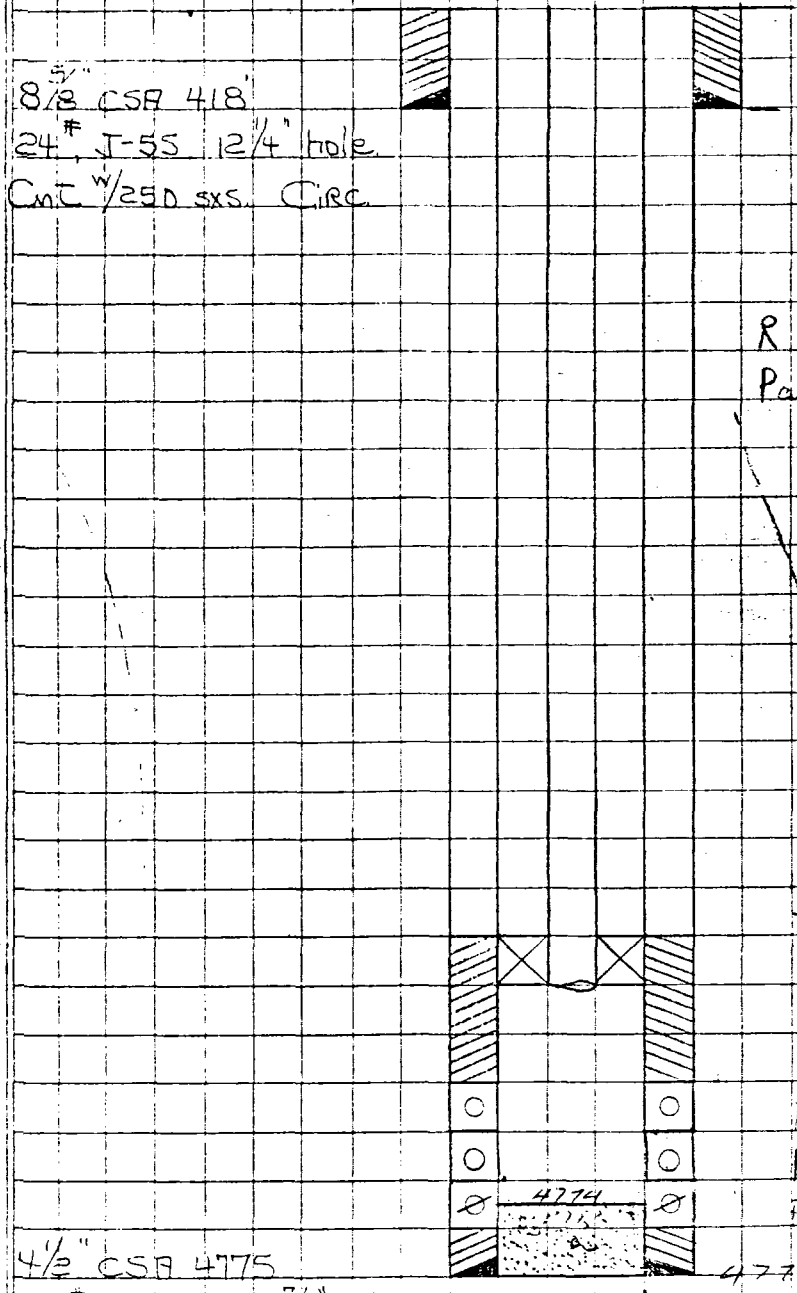
SUBJECT Horton Federal #21

Milnesand - San Andres Field

2310' FSL & 330' FWL, Sec. 29, T 8 S, R 35 E
Roosevelt County, New Mexico

Elev: 4219' K.D.B.
4209' G.L.

Completed: 10-22-64



SHEET NO. OF

FILE

APPN

DATE 11-30-81

BY A.C.

Amoco Production Company

ENGINEERING CHART

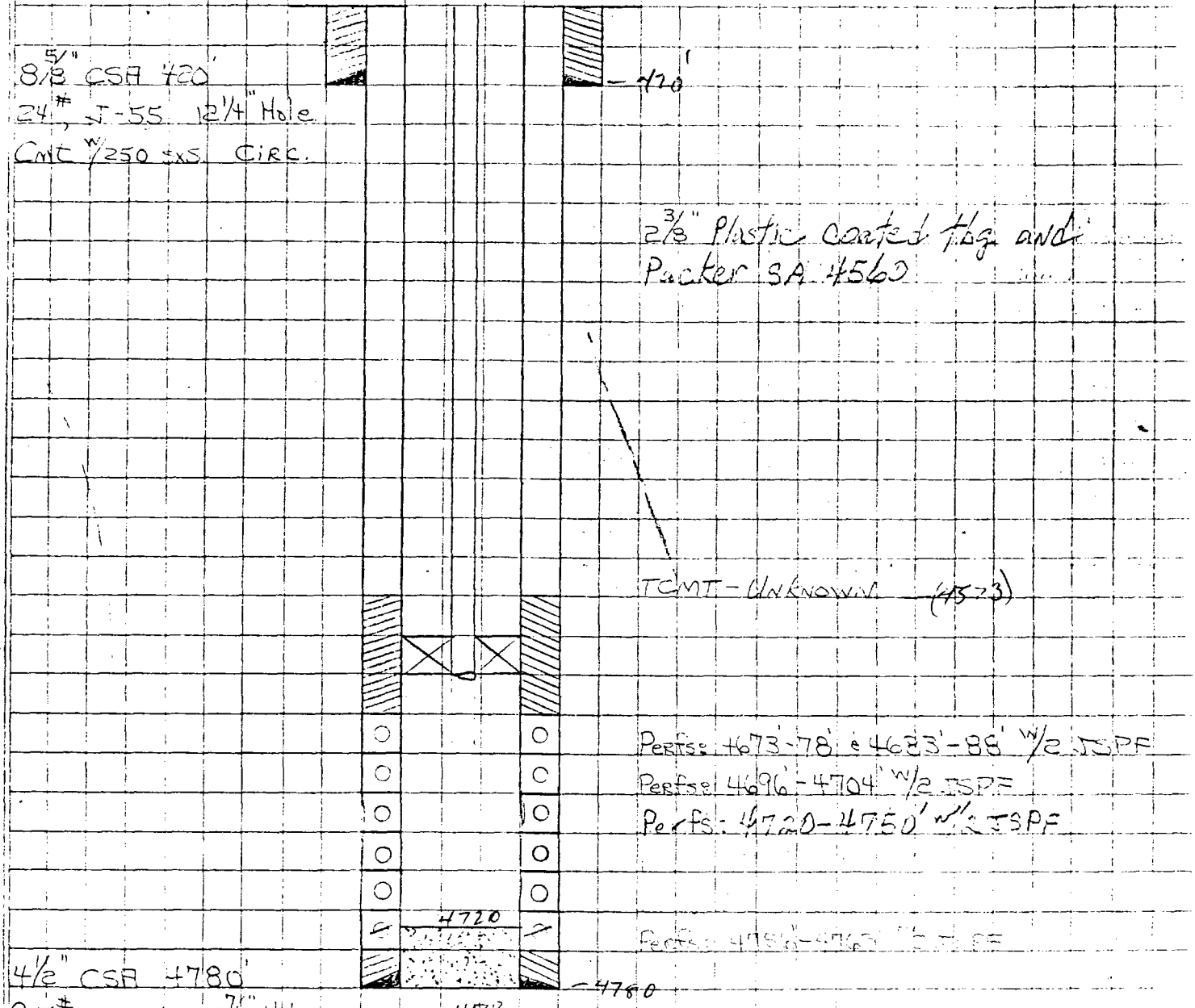
SUBJECT Horton Federal #23

Milnesand - San Andres Field

330' FNL & 660' FWL, Sec. 31, T8S, R35E
Roosevelt County, New Mexico

ELEV: 4426' R.D.B.
4416' G.L.

Completed: 2-16-65



Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11-30-81

BY A C.

SUBJECT Horton Federal #24

Milnesand - San Andres Field

330' FNL & 2310' FEL, Sec. 31, T8S, R35E

Roosevelt County, New Mexico

Elev: 4220' D.F.E.

4210' G.L.

Completed: 12-4-64

8 5/8" CSA 412'
24# J-55 12 1/4" Hole
Cmt w/225 sxs. Circ.

412'

2 3/8" Plastic coated tbg and Packer SA 4575.

TCMT- Unknown -4586

Perfs: 4636-4709 w/2 SPF

Perfs: 4718-4728 w/2 SPF

Perfs: 4750-4776 w/2 SPF

4 1/2" CSA 4730'
9.5# J-55 7 7/8" Hole
Cmt w/250 sxs.
TCMT- Unknown

4730

TD 4767

HOLE SIZE 3 7/8"

Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

APPN

DATE 11-30-81

BY A. ...

SUBJECT Horton Federal #26

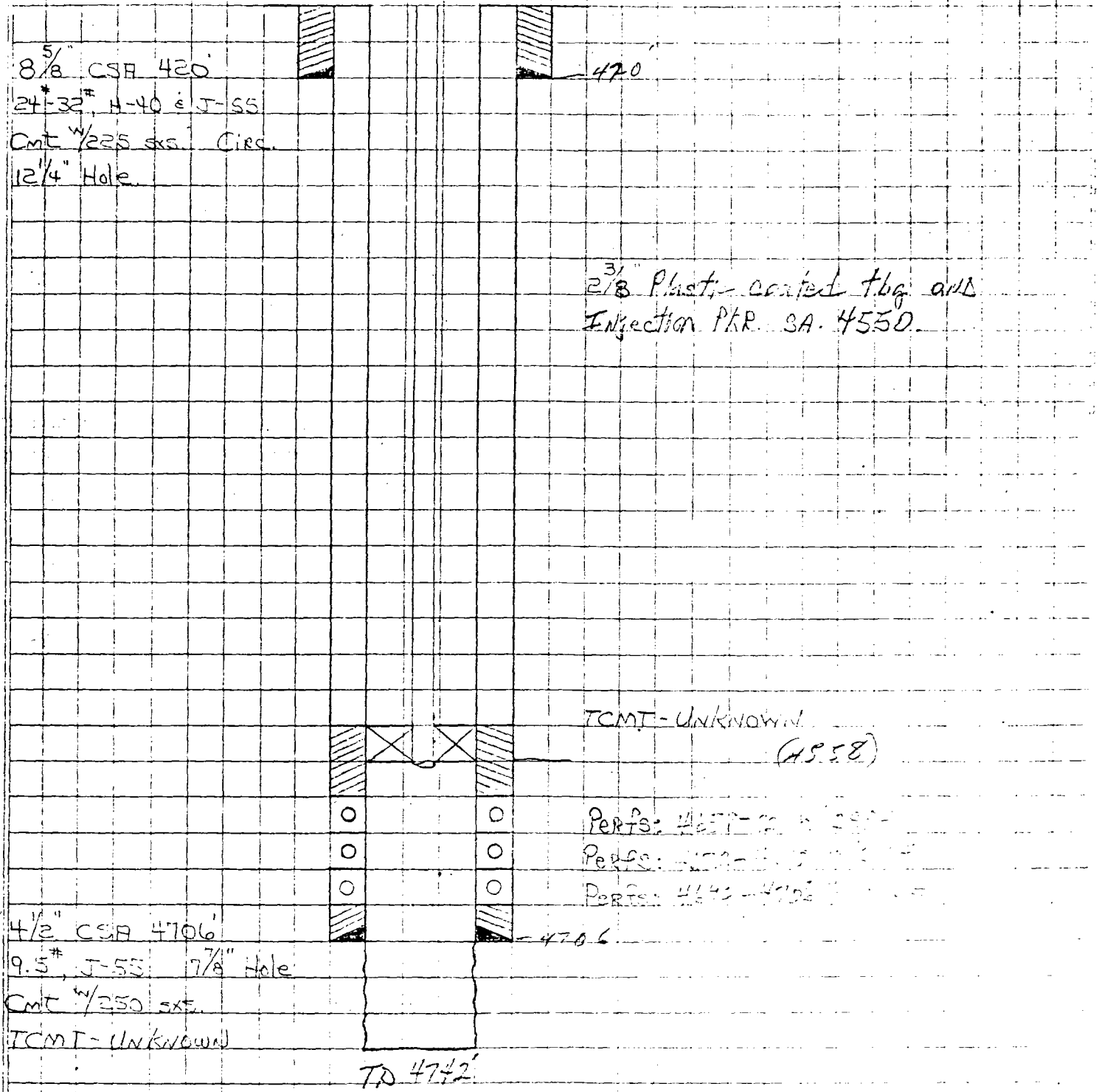
Milnesand-San Andres Field

330' FNL & 2310' FEL, Sec. 29, T8S R35E

Roosevelt County, New Mexico

Elev: 4212' R.D.B.
4202' G.L.

Completed: 12-22-64



IX. Proposed Stimulation Program:

Date: June 11, 1981

Workover: Horton Federal Well No. 1
Section 30, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well.

Procedure:

1. RUSU x pull prod. equipment. Tag bottom cleanout to 4761' if necessary.

2. Run workstring to 4580' with PSA 4550'.

3. Run base GR-Temp log.

4. Acidize with 3000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 300 gal Musol-A. Maximum surface pressure 800 psi.

   a. Pump 1500 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 150 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

   b. Flush with 23 bbls of 9#/gal brine water.

   c. Run GR-Temp survey to detect treated interval.

   d. Pump 300 gals of 9#/gal gelled brine carrying 200 lbs of graded rock salt and 100 lbs of 100 mesh salt. Follow with 23 bbls of 9#/gal brine water as a spacer.

   e. Repeat Steps a-c.

   f. Flush with 25 bbls of fresh water.

5. Pull workstring x treating pkr.

6. Run 2-3/8" plastic coated tubing and injection pkr to 4520'.

7. Rig up surface equipment.

8. Starting injection pressure not to exceed 800 psi surface pressure.

Job Requirements:

1. 3000 gals 15% NEFE acid.

2. 3 gals corrosion inhibitor.

3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 300 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $50,000

Payout: Not Required

Charge: Horton Federal Well No. 1 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals

District Section Leader_____

District Foreman_____

FD/kh

Date: June 11, 1981

Workover: Horton Federal Well No. 6
Section 30, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well.

Procedure:

1. RUSU x pull prod. equipment. Tag bottom cleanout to 4739' if necessary.

2. Run workstring to 4610' with PSA 4580'.

3. Run base GR-Temp log.

4. Acidize with 2500 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 250 gal Musol-A. Maximum surface pressure 800 psi.

   a. Pump 1250 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 125 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

   b. Flush with 22 bbls of 9#/gal brine water.

   c. Run GR-Temp survey to detect treated interval.

   d. Pump 300 gals of 9#/gal gelled brine carrying 200 lbs of graded rock salt and 100 lbs of 100 mesh salt. Follow with 22 bbls of 9#/gal brine water as a spacer. Vary block as necessary.

   e. Repeat Steps a-c.

   f. Flush with 25 bbls of fresh water.

5. Pull workstring x treating pkr.

6. Run 2-3/8" plastic coated tubing and injection pkr to 4550.

7. Rig up surface equipment.

8. Starting injection pressure not to exceed 800 psi surface pressure.

Job Requirements:

1. 2500 gals 15% NEFE acid.

2. 3 gals corrosion inhibitor.

3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 250 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $49,750

Payout: Not Required

Charge: Horton Federal Well No. 6 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals

District Section Leader

District Foreman

FD/kh

Workover Brief

Date: June 9, 1981

Workover: Horton Federal Well No. 7
Section 30, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well

Procedure:

1. RUSU x pull prod equipment. Tag bottom cleanout to 4732' if necessary.

2. Run in hole with packer and spot control valve.

3. Run packer to 4540, run tailpipe to within 5' of bottom. Do not set packer.

4. Spot 2 bbl C-Dex into annulus, set packer.

5. Displace 5 bbl C-Dex into formation. SI for 24 hours.

6. Shear spot valve.

7. Swab back 50 bbls of fluid.

8. Pull tbg x pkr.

9. Run workstring to 4570' with PSA 4540'.

10. Run base GR-Temp survey.

11. Acidize with 3000 gals 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 300 gals Musol-A. Maximum surface pressure 800 psi.

    a. Pump 1500 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 150 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

    b. Flush with 23 bbls of 9#/gal brine water.

    c. Run GR-Temp survey to detect treated interval.

    d. Block with 300 gals of 9# gelled brine carrying 200 lbs. of graded rock salt and 100 lbs. of 100 mesh salt. Follow with 23 bbls of 9#/gal brine as spacer. Vary block as necessary.

    e. Repeat steps a-c.

    f. Flush with 25 bbls of fresh water.

12. Pull workstring x trt pkr.

13. Run 2 3/8" plastic coated tbg with PSA 4550.

14. Install surface equipment.

15. Start injection at surface pressure not to exceed 800 psi.

Job Requirements:

1. 3000 gals 15% NEFE acid.

2. 3 gals corrosion inhibitor.

3. 300 gals corrosion inhibitor.

4. 200 lbs. graded rock salt.

5. 100 lbs. 100 mesh salt.

6. 300 gallons C-Dex.

7. 300 gallons Musol-A.

Note: Additional blocking agent should be on location for job modifications.

Estimated Cost: $52,000

Payout: Not required

Charge: Horton Federal Well No. 7 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals:

District Section Leader

District Foreman

FD/gg

Date: June 9, 1981

Workover: Horton Federal Well No. 9
Section 30, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well.

Procedure:

1. RUSU x pull prod. equipment.

2. Tag bottom and clean out to 4764' if necessary.

3. Run workstring set pkr @ 4570' with one joint of tailpipe.

4. Run base GR-Temp Log.

5. Acidize with 2000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 200 gals Musol-A. Maximum surface pressure 800 psi.

    a. Pump 1000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 100 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

    b. Flush with 23 bbls of 9#/gal brine water.

    c. Run GR-Temp survey to detect treated interval.

    d. Block with 200 lbs of graded rock salt and 100 lbs 100 mesh salt carried in 300 gals of 9# gelled brine. Follow with 23 bbls of 9#/gal brine water as a spacer.

    e. Repeat Steps a-c.

    f. Flush with 25 bbls of fresh water.

6. Pull workstring x trt. pkr.

7. Run 2-3/8" plastic coated tbg x pkr to 4550'.

8. Install surface equipment.

9. Start injection at surface pressure not to exceed 800 psi.

Job Requirements:

1. 2000 gals 15% NEFE acid.

2. 2 gals corrosion inhibitor.

3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 200 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $48,500

Payout: Not required

Charge: Horton Federal Well No. 9 (Lease Services)

Date Commission Approval Received:_____

S. J. JOKERSON

Approvals

District Section Leader

District Foreman

FD/kh

Date: June 10, 1981

Workover: Horton Federal Well No. 20
Section 29, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well.

Procedure:

1. RUSU x pull prod. equipment.

2. Tag bottom and clean out to 4763' if necessary.

3. Run workstring and treating packer with one joint of tailpipe. PSA 4580.

4. Run base GR-Temp Log.

5. Acidize with 2000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 200 gals Musol-A. Maximum surface pressure 800 psi.

   a. Pump 1000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 100 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

   b. Flush with 23 bbls of 9#/gal brine water.

   c. Run GR-Temp survey to detect treated interval.

   d. Block with 200 lbs of graded rock salt and 100 lbs 100 mesh salt carried in 300 gals of 9# gelled brine. Follow with 23 bbls of 9#/gal brine water as a spacer.

   e. Repeat Steps a-c.

   f. Flush with 23 bbls of fresh water.

6. Pull workstring x trt. pkr.

7. Run 2-3/8" plastic coated tbg x pkr to 4550'.

8. Install surface equipment.

9. Start injection at 800 psi maximum surface pressure.

Job Requirements:

1. 2000 gals 15% NEFE acid.

2. 2 gals corrosion inhibitor.

3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 200 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $48,500

Payout: Not required

Charge: Horton Federal Well No. 20 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals

District Section Leader

District Foreman

FD/kh

Date: June 9, 1981

Workover: Horton Federal Well No. 21
Section 29, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well

Procedure:

1. RUSU x ~~clean~~ Drill-out to depth of ≈ 4744' (-525).

2. Perforate interval from 4720 (-501) to 4740 (-521) w/2 JSPF.

3. Run workstring set trt. pkr @ 4600' with one joint of tailpipe.

4. Run base GR-Temp Log.

5. Acidize with 2000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 200 gals Musol-A. Maximum surface treating pressure 800 psi.

   a. Pump 1000 gals of 15% NEFE acid with 1 gal corrosion inhibitor and 100 gals Musol-A. Tag acid with 1 millicurie I-131 per 1000 gals of acid.

   b. Flush with 22 bbls of 9#/gal brine water.

   c. Run GR-Temp log to detect treated interval.

   d. Block with 150 lbs of graded rock salt and 75 lbs 100 mesh salt carried in 250 gals of 9# gelled brine. Follow with 22 bbls of 9#/gal brine water as a spacer.

   e. Repeat Steps a-c.

   f. Flush with 25 bbls of fresh water.

6. Pull workstring x trt pkr.

7. Run 2-3/8" plastic coated tbg and plastic coated pkr to depth of 4580'.

8. Install surface equipment.

9. Start injection at surface pressure not to exceed 800 psi.

Job Requirements:

1. 2000 gals 15% NEFE acid.

2. 2 gals corrosion inhibitor.

3. 250 gals 9# gelled brine.

4. 150 lbs graded rock salt.

5. 75 lbs 100 mesh salt.

6. 200 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $50,000

Payout: Not Required

Charge: Horton Federal Well No. 21 (Lease Services)

Date Commission Approval Received: _____

S. J. OKERSON

Approvals

District Section Leader _____

District Foreman _____

Date: June 10, 1981

Workover: Horton Federal Well No. 23
Section 31, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To expose all pay and convert to injection well.

Procedure:

1. RUSU x pull prod. equipment.
2. ~~Cleanout~~ Drl out Cement to 4756 (-530).
3. Perforate interval from 4720-4750 w/2 JSPF.
4. Run workstring to 4630 with PSA 4600.
5. Run base GR-Temp Survey.
6. Acidize with 2000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 200 gals Musol-A. Maximum surface pressure 800 psi.
   a. Pump 1000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 100 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.
   b. Flush with 23 bbls of 9#/gal brine water.
   c. Run GR-Temp survey to detect treated interval.
   d. Pump 300 gals of 9#/gal gelled brine carrying 200 lbs. of graded rock salt and 100 lbs. of 100 mesh salt. Follow with 23 bbls. of 9#/gal brine as a spacer.
   e. Repeat Steps a-c.
   f. Flush with 25 bbls of fresh water.
7. Pull workstring x trt. pkr.
8. Run 2-3/8" plastic coated tbg and injection pkr set at 4560'.
9. Rig up surface equipment.
11. Start injection at surface pressure not to exceed 800 psi.

Job Requirements:

1. 2000 gals 15% NEFE acid.
2. 2 gals corrosion inhibitor.
3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 200 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $51,000

Payout: Not required

Charge: Horton Federal Well No. 23 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals

District Section Leader

District Foreman

FD/kh

Date: June 11, 1981

Workover: Horton Federal Well No. 24
Section 31, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well.

Procedure:

1. RUSU x pull prod. equipment. Tag bottom cleanout to TD if necessary.

2. Run workstring to 4630' with PSA 4600'.

3. Run base GR-Temp log.

4. Acidize with 2000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 200 gal Musol-A. Maximum surface pressure 800 psi.

   a. Pump 1000 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor and 100 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

   b. Flush with 23 bbls of 9#/gal brine water.

   c. Run GR-Temp survey to detect treated interval.

   d. Block with 200 lbs of graded rock salt and 100 lbs 100 mesh salt carried in 300 gals of 9#/gal gelled brine water. Follow with 23 bbls of 9#/gal brine as a spacer.

   e. Repeat Steps a-c.

   f. Flush with 25 bbls of fresh water.

5. Pull workstring x treating pkr.

6. Run 2-3/8" plastic coated tubing and injection pkr to 4575.

7. Rig up surface equipment.

8 Starting injection pressure not to exceed 800 psi surface pressure.

Job Requirements:

1. 2000 gals 15% NEFE acid.

2. 2 gals corrosion inhibitor.

3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 200 gals Musol-A.

Note: Additional block should be on location for job modifications.

Estimated Cost: $48,500

Payout: Not Required

Charge: Horton Federal Well No. 24 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals

District Section Leader

District Foreman

FD/kh

Date: June 11, 1981

Workover: Horton Federal Well No. 26
Section 29, T-8-S, R-35-E
Milnesand-San Andres Field

Purpose: To convert to an injection well.

Procedure:

1. RUSU x pull prod. equipment.

2. Tag bottom if necessary clean out to 4742.

3. Run workstring with one joint of tailpipe and PSA 4580'.

4. Run base GR-Temp Log.

5. Acidize with 2200 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor. Include 220 gals Musol-A. Maximum surface pressure 800 psi.

    a. Pump 1100 gals of 15% NEFE acid with 1 gal/1000 corrosion inhibitor.and 110 gals Musol-A. Tag acid with 1 millicurie of I-131 per 1000 gals of acid.

    b. Flush with 23 bbls of 9#/gal brine water.

    c. Run GR-Temp survey to detect treated interval.

    d. Pump 300 gals of 9#/gal gelled brine carrying 200 lbs. of graded rock salt and 100 lbs. of 100 mesh salt. Follow with 23 bbls. of 9#/gal brine as a spacer.

    e. Repeat Steps a-c.

    f. Flush with 23 bbls of fresh water.

6. Pull workstring x trt. pkr.

7. Run 2-3/8" plastic coated tbg and injection pkr. PSA 4550'.

8. Rig up surface equipment.

9. Starting injection surface pressure not to exceed 800 psi.

Job Requirements:

1. 2200 gals 15% NEFE acid.

2. 3 gals corrosion inhibitor.

3. 300 gals 9#/gal gelled brine.

4. 200 lbs graded rock salt.

5. 100 lbs 100 mesh salt.

6. 220 gals Musol-A

Note: Additional block should be on location for job modifications.

Estimated Cost: $48,800

Payout: Not required

Charge: Horton Federal Well No. 26 (Lease Services)

Date Commission Approval Received:_____

S. J. OKERSON

Approvals

District Section Leader

District Foreman

FD/kh

Dresser Atlas

Compensated Neutron

work copy

FILE NO.	
COMPANY	Amoco Production Company
WELL	Horton Federal 'No. 1
FIELD	Milensand (San Andres)
COUNTY	Roosevelt
STATE	New Mexico
LOCATION:	330' FNL + 330' FWL
SEC	30
TWP	8-S
RGE	35-E
Other Services	CDL

Permanent Datum GL Elev. 4224.0
Log Measured from KB, 9.0 Ft. Above Permanent Datum
Drilling Measured from KB

Elevations: KB 4233, DF 4232, GL 4224

Date	11-12-29
Run No	ONE
Type Log	GR-CNL
Depth-Driller	4741
Depth-Logger	4742
Bottom Logged Interval	4740
Top Logged Interval	3740
Type Fluid in Hole	Salt Water
Salinity Ppm Cl.	
Density Lb./Gal.	—
Level	Full
Max. Rec. Temp. Deg. F	—
Opr. Rig Time	3.0 hrs
Equip. No. and Location	H6205 / Hobbs
Recorded By	Behrends
Witnessed By	Stubbs

FIELD PRINT

Run No.	Bore Hole Record: Bit	From	To	Casing Record: Size	Wgt.	From	To
1	3 7/8	4695	4742	4 1/2		surf	4695

FOLD HERE

Remarks: Collars recorded on repeat are 16' deep
Corrected Collars marked to the right of depth column
Collars not recorded on main log
OK'd by Mr. Stubbs

Equipment Used		
Series No.	1310	2418
Run No.	1	1
S.O.	54174	54174
Tool No.	43037	39447
Elec. No.	—	—
Panel No.	37276	70134

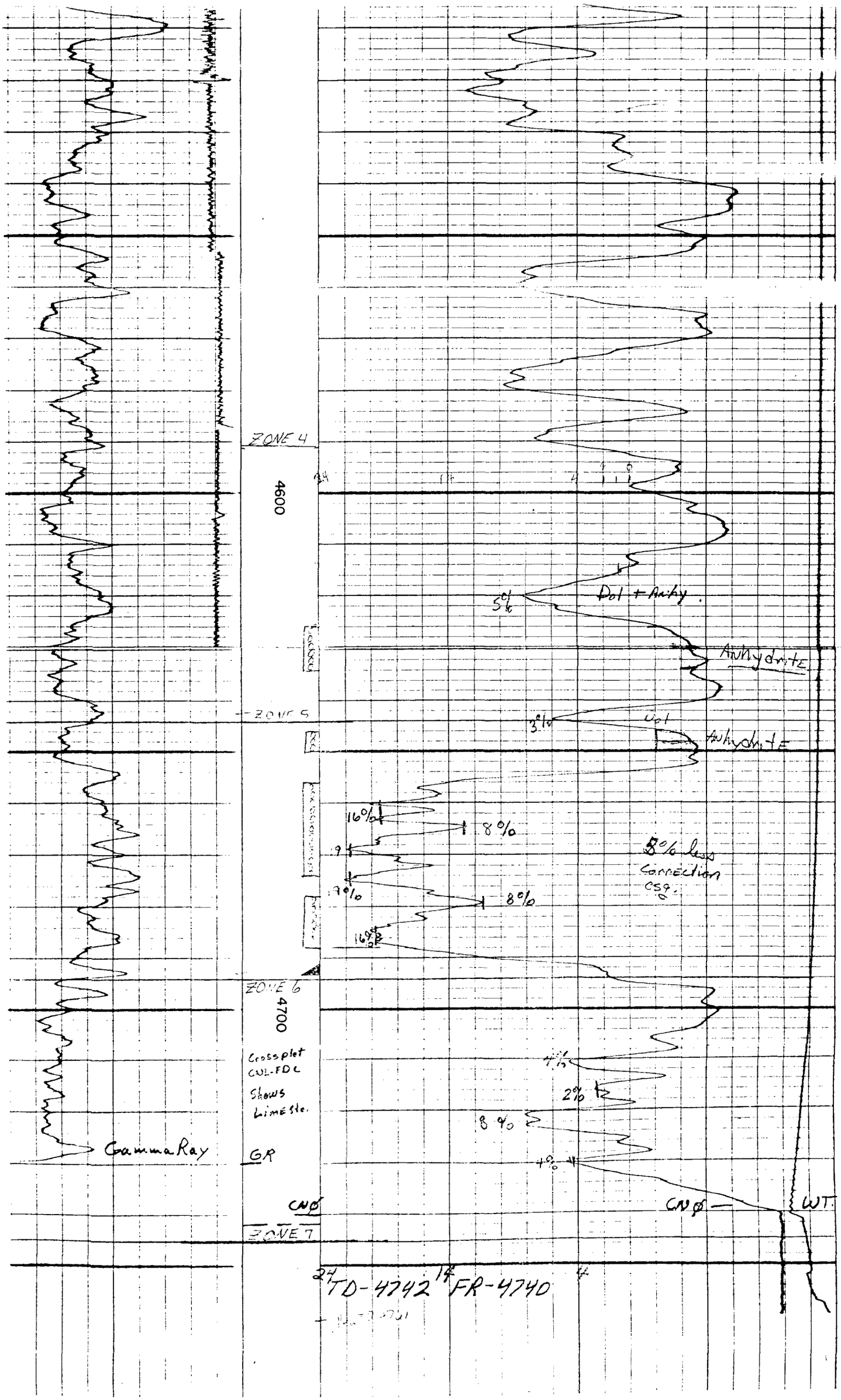
Gamma Ray — Equipment Data — Compensated Neutron

Gamma Ray		Compensated Neutron	
Run No.	ONE	Run No.	ONE
Tool Model No.	1310	Log Type	N-TN
Diam.	3"	Tool Model No.	2418
Detect. Model No.	D7G2	Serial No.	39447
Type	Scint	Diam.	3"
Length	10"	Detect. Model SS	D6N3
Dist. to N. Source	10'	Detect. Model LS	D6N3
Computer Data		Source Model No.	S17520
		Serial No.	39259
		Type	AmBe

Logging Data

Run No.	General: Depths From	To	Speed Ft./Min.	Compensated Neutron: T.C. SS	T.C. LS	Sens. SS	Sens. LS	Porosity Zero	Units Div	Scale	Gamma Ray: T.C. Sec.	Sens. Settings	Zero Div. L or R	API Units
1	4742	2242	30	2	2	150	145	845	2%	30-0	2	740	0	10

GAMMA RAY & CALIPER	DEPTH	POROSITY %
API UNITS 0 — 100		


ZONE 4
4600
5%
Dol + Anhy.
Anhydrite
ZONE 5
3%
Dol
Anhydrite
16%
8%
8%
8%
16%
8% less
Correction
Csg.
ZONE 6
4700
Crossplot
CNL-FDC
Shows
Limeste.
4%
2%
8%
4%
Gamma Ray
GR
CNØ
CNØ
WT.
ZONE 7
TD-4742
FR-4740

PGAC

Laterolog Survey

FILE NO.

COMPANY PAN AMERICAN PETROLEUM CORPORATION

WELL U S A RUSSELL E. HORTON # 1

FIELD MILNESAND (SAN ANDRES)

COUNTY ROOSEVELT STATE NEW MEXICO

LOCATION: 330 FN & WL

SEC 30 TWP 8-S RGE 35-E

Other Services: GR/A, SCOPE PICTURES, MLL

Elevations: KB 4233, DF 4232, GL 4224

Permanent Datum G.L. Elev. 4224

Log Measured from K.B. 9' Ft. Above Permanent Datum

Drilling Measured from K.B.

Date	1-13-64					
Run No.	ONE					
Depth—Driller	4688					
Depth—Logger	4694					
Bottom Logged Interval	4688					
Top Logged Interval	3900					
Casing—Driller	13 3/8 @ 405	@	@	@		
Casing—Logger	NOT DETECTED					
Bit Size	7 7/8					
Type Fluid in Hole	SALT BASE					
Density and Viscosity	10.8 | 48					
pH and Fluid Loss	6.0 | 10.1 cc	cc	cc	cc		
Source of Sample	CIRCULATED					
Rm @ Meas. Temp.	.023 @ 46 °F	@ °F	@ °F	@ °F		
Rmf @ Meas. Temp.	.018 @ 48 °F	@ °F	@ °F	@ °F		
Rmc @ Meas. Temp.	NO @CAKE °F	@ °F	@ °F	@ °F		
Source of Rmf and Rmc	MEASURED					
Rm @ BHT	@ 106 °F	@ °F	@ °F	@ °F		
Time Since Circ.	6.5 HRS.					
Max. Rec. Temp. Deg. F.	106 °F	°F	°F	°F		
Equip. No. and Location	EL-25 | HOBBS					
Recorded By	M. DAY					
Witnessed By	MR. CORRIGAN					

FOLD HERE ↓

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS LOGGING TIME - 1.5 HRS.

NOTE CONDUCTIVITY SCALE CHANGE @ 4190'

LOGGING ORDER # 22727

Changes in Mud Type or Additional Samples

Date | Sample No.				
Depth-Driller				
Type Fluid in Hole				
Dens. | Visc.				
pH | Fluid Loss	cc		cc	
Source of Sample				
Rm @ Meas. Temp.	@ °F		@ °F	
Rmf @ Meas. Temp.	@ °F		@ °F	
Rmc @ Meas. Temp.	@ °F		@ °F	
Source Rmf | Rmc				
Rm @ BHT	@ °F		@ °F	
Rmf @ BHT	@ °F		@ °F	
Rmc @ BHT	@ °F		@ °F	

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Ho

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Panel	Sonde	Ca
ONE	LL3	-	CENT.	38	1	1

GAMMA RAY	DEPTH	RESISTIVITY	RESISTIVITY
100 200		0 100 200 312 625	
API GAMMA RAY UNITS		50 150 250 415 1250	0
CONDUCTIVITY SCALE			
0 200			
0 100		COMPRESSED SCALE	
	3900		


4500
4600
470
Gamma Ray

September 21, 1981

File: SJO-020.1-1121

Re: Horton Federal Well No. 20
Horton Federal Well No. 21
Horton Federal Well No. 26

Mack Ainsworth
Ainsworth Ranches
Milnesand, NM 88125

This is notification to you, as owner of the surface land, that Amoco Production Company proposes to convert subject wells to injection. Attached are copies of the applications for authorization to inject. Any objections or requests for hearing of administrative applications must be filed with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within fifteen (15) days from the date this application was mailed to you.

ORIGINAL SIGNED BY S. J. OKERSON

S. J. OKERSON

Attachments

CLF/jar

September 21, 1981

File: SJO-020.1-1120

Re: Horton Federal Well No. 1
Horton Federal Well No. 6
Horton Federal Well No. 7
Horton Federal Well No. 9
Horton Federal Well No. 23
Horton Federal Well No. 24

Vernon Rogers
P. O. Box 908
Jal, NM 88252

This is notification to you, as owner of the surface land, that Amoco Production Company proposes to convert the subject wells to injection. Attached are copies of the applications for authorization to inject. Any objections or requests for hearing of administrative applications must be filed with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within fifteen (15) days from the date this application was mailed to you.

ORIGINAL SIGNED BY S. J. OKERSON

S. J. OKERSON

Attachments

CLF/jar

P. O. BOX 1468
MONAHANS, TEXAS 79756
PHONE 943-3234 OR 563-1040

Martin Water Laboratories, Inc

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 980346

TO: Mr. S. J. Okerson
P.O. Box 68, Hobbs, New Mexico

SAMPLE RECEIVED 9-30-80
RESULTS REPORTED 10-7-80

COMPANY Amoco Production Company LEASE Horton Federal Milnesand
FIELD OR POOL Milnesand
SECTION ___ BLOCK ___ SURVEY ___ COUNTY Roosevelt STATE New Mexico
SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Produced water - taken from Horton Federal Milnesand injection pump discharge.
NO. 2 Produced water - taken from Hood Federal "A" transfer pump. 9-30-80 BOUGH (DEV.)
NO. 3 Injection water - taken from Union Texas Petroleum's Milnesand raw water line. 9-30-80
NO. 4 Produced (Devonian) water - taken from Union Texas Petroleum's Crossroads raw water line. 9-30-80

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.1328	1.0418	1.0740	1.0459
pH When Sampled	6.6	6.6	6.7	6.6
pH When Received	5.5	6.1	5.8	5.9
Bicarbonate as HCO_3	769	622	647	561
Supersaturation as $CaCO_3$	60	40	70	80
Undersaturation as $CaCO_3$	-	-	-	-
Total Hardness as $CaCO_3$	29,500	6,900	14,400	7,800
Calcium as Ca	8,400	2,200	3,920	2,500
Magnesium as Mg	2,066	340	1,118	377
Sodium and/or Potassium	65,689	18,990	35,931	21,316
Sulfate as SO_4	1,387	1,547	1,787	1,547
Chloride as Cl	120,732	32,669	63,917	36,930
Iron as Fe	0.08	0.23	0.31	0.23
Barium as Ba	0	0	0	0
Turbidity, Electric	66	26	8	14
Color as Pt	42	44	20	10
Total Solids, Calculated	199,043	56,368	107,320	63,231
Temperature °F.	72	94	80	148
Carbon Dioxide, Calculated	315	255	213	230
Dissolved Oxygen, Winkler	0.0	0.0	0.0	0.0
Hydrogen Sulfide	525	0.0	42.0	10.5
Resistivity, ohms/m at 77° F.	0.058	0.145	0.090	0.132
Suspended Oil	1,122	50	19	12
Filtrable Solids as mg/l	47.4	9.3	3.9	14.4
Volume Filtered, ml	1,800	8,000	1,400	700
Calcium Carbonate Scaling Tendency	none	none	none	mild
Calcium Sulfate Scaling Tendency	none	none	none	none

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks

Form No. 3

By _____

P. O. BOX 1468
MONAHANS, TEXAS 79756
PHONE 943-3234 OR 563-1040

Martin Water Laboratories, Inc

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

LABORATORY NO. 980346 (page 2)

TO: Mr. S. J. Okerson
P.O. Box 68, Hobbs, New Mexico

SAMPLE RECEIVED 9-30-80

RESULTS REPORTED 10-7-80

COMPANY Amoco Production Company LEASE Horton Federal Milnesand

FIELD OR POOL Milnesand

SECTION ___ BLOCK ___ SURVEY ___ COUNTY Roosevelt STATE New Mexico

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 Mixture of 25% Horton water & 75% Hood water. 9-30-80 80416

NO. 2 Mixture of 50% Horton water & 50% Hood water. 9-30-80

NO. 3 Mixture of 75% Horton water & 25% Hood water. 9-30-80

NO. 4

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0643	1.0847	1.1110	
pH When Sampled				
pH When Received	6.0	5.9	5.7	
Bicarbonate as HCO_3	647	671	683	
Supersaturation as $CaCO_3$	20	30	25	
Undersaturation as $CaCO_3$	–	–	–	
Total Hardness as $CaCO_3$	13,800	18,800	24,500	
Calcium as Ca	3,920	5,520	6,800	
Magnesium as Mg	972	1,215	1,823	
Sodium and/or Potassium	29,682	41,146	52,321	
Sulfate as SO_4	1,627	1,494	1,440	
Chloride as Cl	53,974	75,280	96,586	
Iron as Fe	0.23	0.08	0.16	
Barium as Ba	0	0	0	
Turbidity, Electric	13	14	13	
Color as Pt	20	16	12	
Total Solids, Calculated	90,822	125,326	159,653	
Temperature °F.				
Carbon Dioxide, Calculated	1,035	1,409	2,254	
Dissolved Oxygen, Winkler	0.0	0.0	0.0	
Hydrogen Sulfide	125	175	275	
Resistivity, ohms/m at 77° F.	0.101	0.080	0.066	
Suspended Oil				
Filtrable Solids as mg/l	18.5	19.6	13.7	
Volume Filtered, ml	840	850	810	
Calcium Carbonate Scaling Tendency	none	none	none	
Calcium Sulfate Scaling Tendency	none	none	none	

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks

Form No. 3

By ___

UNICHEM
INTERNATIONAL

Home Office 707 N. Leech, P. O. Box 1499 / Hobbs, NM 88240 / Ph. 505/393-7751, TWX 910/986-0010

December 4, 1981

Amoco Production
P.O. Box 68
Hobbs, NM 88240

Attention: Walter Sajdak

Dear Mr. Sajdak:

Enclosed please find our water analyses reports on the samples from the Rogers & Ainsworth Ranches, submitted to our lab on December 3, 1981. Millipore filter analyses were also done on the samples. The results are as follow:

Rogers Ranch	2 MG/L or 100% Total Suspended Solids
	1 MG/L or 50% Hydrocarbons
	0 MG/L or 0% Iron Sulfide
	0 MG/L or 0% Calcium Carbonate
	1 MG/L or 50% Sand and Silt
Ainsworth	33 MG/L or 100% Total Suspended Solids
	1 MG/L or 3% Hydrocarbons
	26.5 MG/L or 80% Iron Sulfide
	2.5 MG/L or 8% Calcium Carbonate
	3 MG/L or 9% sand and Silt

If you have any questions or require any additional information, please do not hesitate to contact us.

Sincerely,

Linda Morgan

Linda Morgan
Lab Technician

LM/bf
cc: Cy Foster

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

COMPANY : AMOCO OIL COMPANY
DATE : DECMEBER 3 1981
FIELD,LEASE&WELL : AINSWORTH RANCH WINDMILL
SAMPLING POINT: 3100' FNL X 1000'FWL SEC 29 T85 R35E
DATE SAMPLED : 12-1-81

SPECIFIC GRAVITY = 1
TOTAL DISSOLVED SOLIDS = 1257
PH = 6.97

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	8.2	164.
MAGNESIUM	(MG)+2	7	85.0
SODIUM	(NA),CALC.	4.6	107.
ANIONS			
BICARBONATE	(HCO3)-1	3.8	231.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	7.8	379.
CHLORIDES	(CL)-1	8.1	289.
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		37.5
BARIUM	(BA)+2	0	0
STRONTIUM	(SR)+2	NOT RUN	

SCALING INDEX	TEMP
	30C 86F
CARBONATE INDEX	.769
CALCIUM CARBONATE SCALING	LIKELY
SULFATE INDEX	-1.5
CALCIUM SULFATE SCALING	UNLIKELY

UNICHEM INTERNATIONAL

601 NORTH LEECH P.O.BOX1499

HOBBS, NEW MEXICO 88240

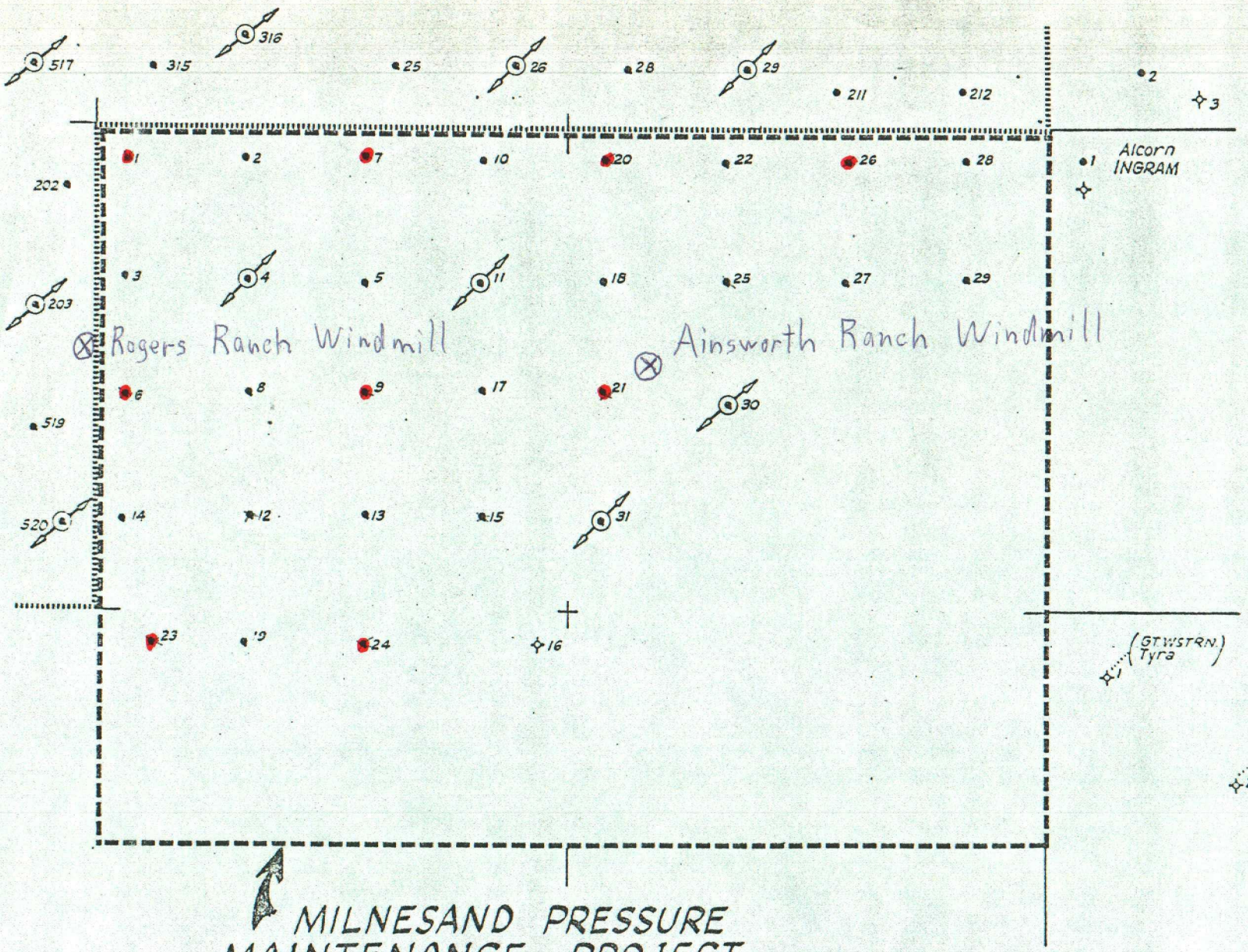
COMPANY : AMOCO OIL COMPANY
DATE : DECEMBER 3 1981
FIELD,LEASE&WELL : ROGERS RANCH WINDMILL
SAMPLING POINT: 3000' FNL X 120' FEL SEC 25 T8S R34E
DATE SAMPLED : 12-1-81

SPECIFIC GRAVITY = 1.001
TOTAL DISSOLVED SOLIDS = 1528
PH = 7.18

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	11.4	228.
MAGNESIUM	(MG)+2	9	109.
SODIUM	(NA),CALC.	3.9	90.5
ANIONS			
BICARBONATE	(HCO3)-1	5.6	341.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	7.4	358.
CHLORIDES	(CL)-1	11.2	399.
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		.5
BARIUM	(BA)+2	0	0
STRONTIUM	(SR)+2	NOT RUN	

SCALING INDEX	TEMP
	30C 86F
CARBONATE INDEX	1.09
CALCIUM CARBONATE SCALING	LIKELY
SULFATE INDEX	-1.4
CALCIUM SULFATE SCALING	UNLIKELY

MILNESAND SAN ANDRES UNIT



MILNESAND PRESSURE
MAINTENANCE PROJECT
(AMOCO OPERATED)

Water Injector

AMOCO PRODUCTION CO.
MILNESAND PRESSURE
MAINTENANCE PROJECT
Roosevelt Co, New Mexico
1" = 1000'

Gamma Ray Neutron

FILE NO.

COMPANY PAN AMERICAN PETROLEUM CORP.

WELL RUSSELL F. HORTON NO. 7

FIELD MILNESAND (SAN ANDRES)

COUNTY ROOSEVELT STATE NEW MEXICO

LOCATION: 330' FNL & 2970' FWL

SEC. 30 TWP. 8-S RGE. 35-E

Other Services

Elevations: KB 4227 DF 4224 GL 4216

Permanent Datum GROUND LEVEL Elev. 4216

Log Measured from K. B. 11 Ft. Above Permanent Datum

Drilling Measured from K. B.

Date	10-20-68
Run No.	ONE
Type Log	G/R-N/TN
Depth-Driller	4732
Depth-Logger	4735
Bottom Logged Interval	4734
Top Logged Interval	3700
Type Fluid in Hole	WATER
Salinity Ppm Cl.	
Density Lb./Gal.	
Level	
Max. Rec. Temp. Deg. F	
Opr. Rig Time	
Recorded By	WILSON
Witnessed By	MR. TAYLOR

Bore Hole Record

Run No.	Bit	From	To
1			
1	3 7/8"	4696	4735

Casing Record

Size	Wgt.	From	To
4 1/2"		SURF.	4696

FOLD HERE

Equipment Data

Gamma Ray		Neutron	
Run No.	ONE	Run No.	ONE
Tool Model No.	402	Log Type	N/TN
Diam.	3 1/2"	Tool Model No.	402
Detect. Model No.	D4G1	Diam.	3 1/2"
Type	SCINT.	Detect. Model No.	D6N1
Length	4"	Type	SCINT.
Dist. to N. Source	13'4½"	Length	4"
		Source Model No.	S16E5
General		Serial No.	3581
Hoist Truck No.	MP-4004	Spacing	18"
Inst. Truck No.	MP-4004	Type	PU BE
Tool Serial No.	24	Strength	8.73×10^6

Logging Data

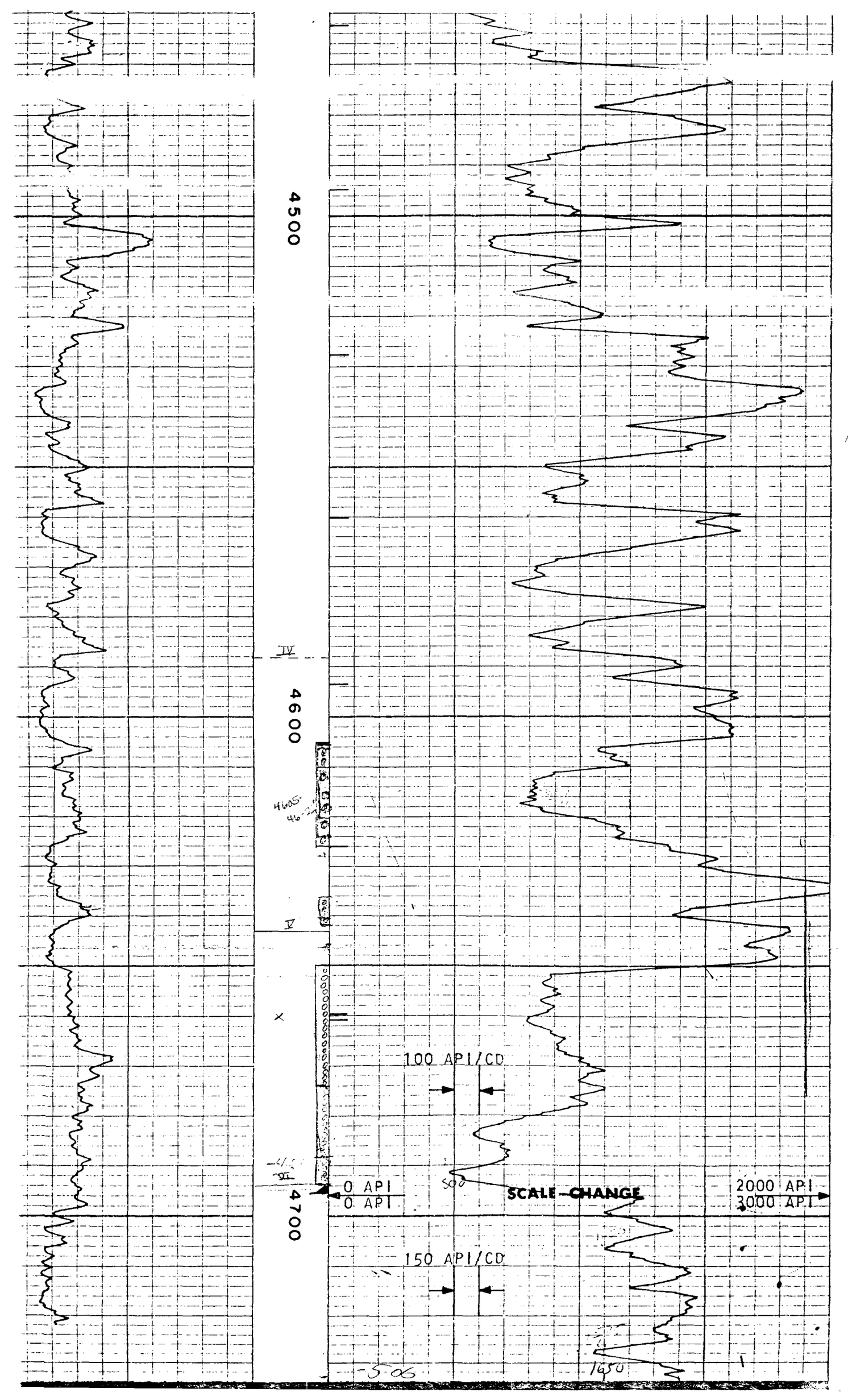
General				Gamma Ray				Neutron			
Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units Per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API N. Units Per Log Div.
1	4734	4696	30	2.0	490-X1	0	10	2.0	145-X1	0	150
1	4696	3700	30	2.0	490-X1	0	10	2.0	217-X1	0	100

Remarks:

REPEAT SECTION RECORDED ON TOP DUE TO HOLE CONDITIONS.

Reference Literature:

GAMMA RAY API UNITS	DEPTH	NEUTRON API UNITS
→ RADIATION INTENSITY INCREASES		→ RADIATION INTENSITY INCREASES


4500
IV
4600
4605
V
X
100 API/CD
0 API
0 API
500
SCALE-CHANGE
2000 API
3000 API
4700
150 API/CD
1650

Welex

RADIOACTIVITY LOG

COMPANY ____
WELL ____
FIELD ____
County ____ State ____

COMPANY Amoco Production Company
WELL Horton Federal #6
FIELD Milnesand
COUNTY Lea STATE New Mexico
Location 2310 FSL + 330 FWL
Other Services: None
Sec. 30 Twp. T-8-S Rge. 35-E

Permanent Datum G.L. Elev. 4220
Log Measured From K.B. 10 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 4230
D.F. 4229
G.L. 4220

Date	1-9-80		
Run No.	One		
Type Log	Neutron-Gamma		
Depth—Driller	4739		
Depth—Welex	4739		
Bottom Logged Interval	4738		
Top Logged Interval	2700		
Type Fluid in Hole	Water		
Salinity, PPM Cl.	NA		
Density	10.0		
Level	300'		
Max. rec. temp., deg. F.	104°		
Operating Rig time	2 hrs.		
Recorded By	Herridge		
Witnessed by	Mc.Cardwell		

RUN	BORE-HOLE RECORD			CASING RECORD			
No.	Bit	From	To	Size	Wgt.	From	To
One	3⅞	4700	4739	4½"	9.5#	0	4700

Fold Here

EQUIPMENT DATA

GAMMA RAY				NEUTRON			
Run No.	One			Run No.	One		
Tool Model No.	2000			Log Type	N-G		
Diameter	3⅞			Tool Model No.	2000		
Detector Model No.	1-E-11			Diameter	3⅞		
Type	G.M.			Detector Model No.	1-C-8		
Length	28"			Type	G.M.		
Distance to Source	228"			Length	4"		
				Source Model No.	SCW		
GENERAL				Serial No.	201		
Hoist Truck No.	1913			Spacing	13.90"		
Instrument Truck No.	1913			Type	AmBe		
Tool Serial No.	10862			Strength	1x10⁷ N/S		

LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
Run No	Depths From	Depths To	Speed Ft/Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API N. Units per Log Div.
One	4739	2739	*	2	100	0	10	2	1500	4-L	75

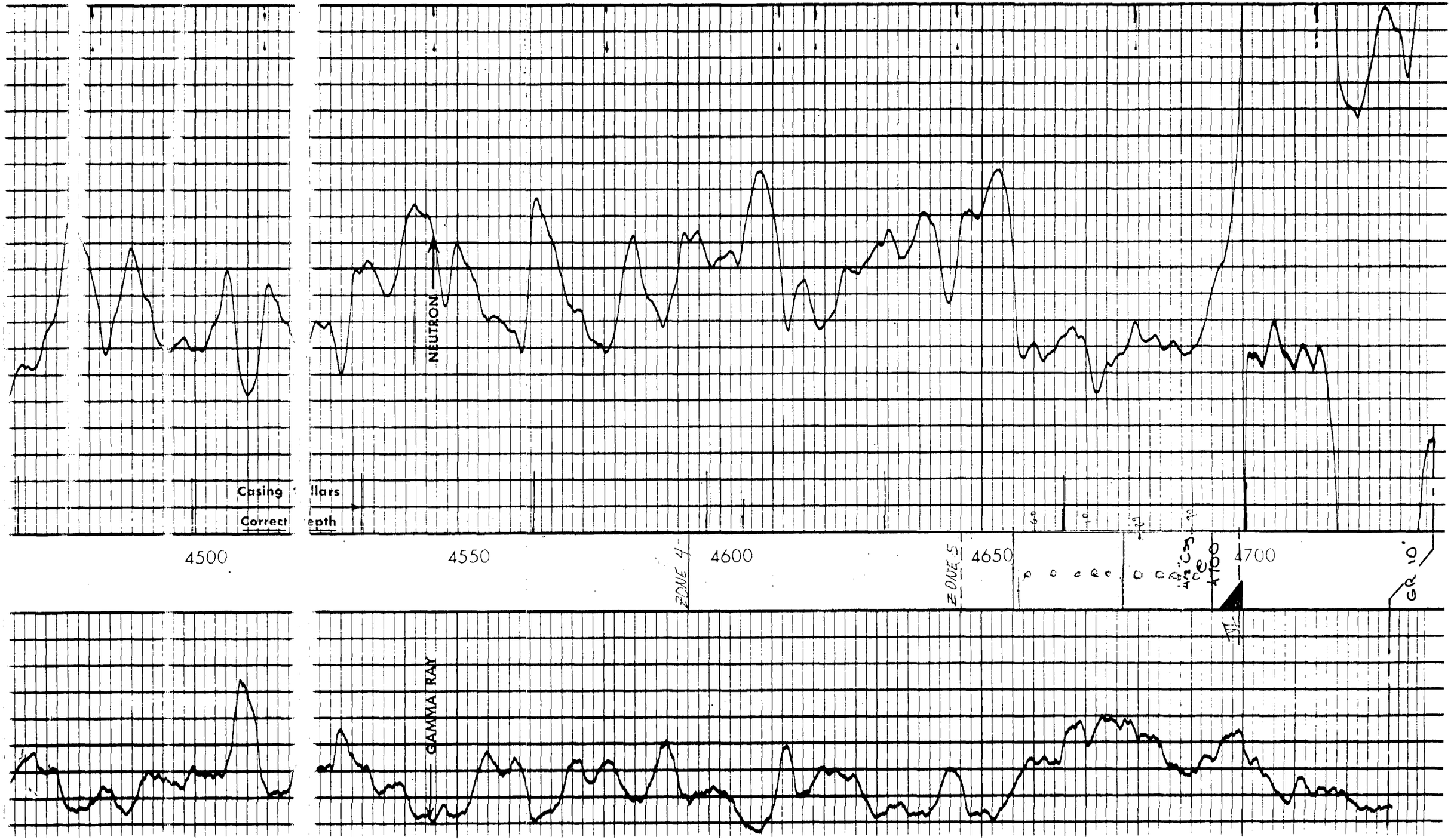
Reference Literature:

Service Ticket No. WL 036050 Remarks:

Welex does not guarantee the accuracy of any interpretation of log data, conversion of log data to physical rock parameters, or recommendations which may be given by Welex ...ch may appear on the log or in any other form. Any user of such data, interpretations, conversions or recommendations agrees that Welex is not responsible, except where due to gross negligence or wilful misconduct, for any loss, damages, or expenses resulting from the use thereof.

AHRA—AA 05847

GAMMA | **NEUTRON**


NEUTRON
Casing
Correct
4500
4550
4600
4650
4700
ZONE 4
ZONE 5
GAMMA RAY

LANE WELLS
A DIVISION OF DRESSER INDUSTRIES, INC

Acoustilog®

FILE NO.

Type Log

COMPANY PAN AMERICAN PETROLEUM CORPORATION
WELL R. E. HORTON NO. 9
FIELD MILNESAND
COUNTY ROOSEVELT STATE NEW MEXICO
LOCATION: 2310' FSL & [illegible]
SEC 30 TWP 8-S RGE 33-E

Other Services: A/L, ML/L, M.O.P.

Permanent Datum GROUND LEVEL Elev. 4214
Log Measured from K. B. 10 Ft. Above Permanent Datum
Drilling Measured from K. B.

Elevations: KB 4224, DF 4222, GL 4214

Date	7-22-64		
Run No.	ONE		
Depth—Driller	4851		
Depth—Logger	4842		
Bottom Logged Interval	4836		
Top Logged Interval	SURFACE		
Casing—Driller	8 5/8 @ 404	@	@
Casing—Logger	404		
Bit Size	7 13/16"		
Type Fluid in Hole	SALT MUD STARCH		
Density and Viscosity	10.3 36		
pH and Fluid Loss	- 8.8 cc	cc	cc
Source of Sample	CIRCULATED		
Rm @ Meas. Temp.	.055 @ 82°F	@ °F	@ °F
Rmf @ Meas. Temp.	.045 @ 82°F	@ °F	@ °F
Rmc @ Meas. Temp.	.060 @ 82°F	@ °F	@ °F
Source of Rmf and Rmc	MEAS. MEAS.		
Rm @ BHT	.038 @ 108°F	@ °F	@ °F
Time Since Circ.	-		
Max. Rec. Temp. Deg. F.	108°F	°F	°F
Equip. and Location	X-900 HOBBS		
Recorded By	SHANKS		
Witnessed By	MR. CORRIGAN		

FOLD HERE

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS

DETECTOR TYPE	D4G1 SCINT.	SENS. SETTING	1120-X1
DETECTOR LENGTH	4"	ZERO DIV. L OR R	0
TIME CONSTANT	2.0 & 0.9	LOG SPEED	30 & 60

Changes in Mud Type or Additional Samples

Date / Sample No.				
Depth-Driller				
Type Fluid in Hole				
Dens. / Visc.				
pH / Fluid Loss		cc		cc
Source of Sample				
Rm @ Meas. Temp.	@	°F	@	°F
Rmf @ Meas. Temp.	@	°F	@	°F
Rmc @ Meas. Temp.	@	°F	@	°F
Source Rmf / Rmc				
Rm @ BHT	@	°F	@	°F
Rmf @ BHT	@	°F	@	°F
Rmc @ BHT	@	°F	@	°F

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	605 A/L		FREE	

Company PAN AMERICAN PETROLEUM CORP. Drillers T.D. 4851'
Well R. E. HORTON NO. 9 Lane-Wells F.R. 4836'
Field MILNESAND
County ROOSEVELT Elevations:
State NEW MEXICO K.B. 4224 D.F. 4222 G.L. 4214

S.P. or G/R & Caliper	DEPTH	ACOUSTILOG T3 R1 1 R2 R3
10 API/CD − ⟷ +		SPECIFIC ACOUSTIC TIME


4600
4700
4800
TOP ZONE 4
TOP ZONE 5
TOP ZONE 6
TOP ZONE 7

LANE WELLS Revised Log

A DIVISION OF DRESSER INDUSTRIES, INC.

FILE NO.

COMPANY PAN AMERICAN PETROLEUM CORPORATION

WELL R. E. HORTON NO. 9

FIELD MILNESAND

COUNTY ROOSEVELT STATE NEW MEXICO

LOCATION: 2310' FSL & 2246' FEL

SEC 30 TWP 8-S RGE 35-E

Other Services: G/R-A/L, MF/L, M.O.P.

Elevations: KB 4224, DF 4222, GL 4214

Permanent Datum GROUND LEVEL Elev. 4214

Log Measured from K. B. 10 Ft. Above Permanent Datum

Drilling Measured from K. B.

Date	7-22-64			
Run No.	ONE			
Depth—Driller	4851			
Depth—Logger	4842			
Bottom Logged Interval	4834			
Top Logged Interval	3900			
Casing—Driller	8 5/8 @ 404	@	@	
Casing—Logger	404			
Bit Size	7 13/16"			
Type Fluid in Hole	SALT MUD			
	STARCH			
Density and Viscosity	10.3 36			
pH and Fluid Loss	8.8 cc	cc	cc	cc
Source of Sample	CIRCULATED			
Rm @ Meas. Temp.	.055 @ 82 °F	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	.045 @ 82 °F	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	.060 @ 82 °F	@ °F	@ °F	@ °F
Source of Rmf and Rmc	MEAS. MEAS.			
Rm @ BHT	.038 @ 108 °F	@ °F	@ °F	@ °F
Time Since Circ.				
Max. Rec. Temp. Deg. F.	108 °F	°F	°F	°F
Equip. No. and Location	X-900 HOBBS			
Recorded By	SHANKS			
Witnessed By	MR. CORRIGAN			

FOLD HERE ↓

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS

Changes in Mud Type or Additional Samples				
Date / Sample No.				
Depth-Driller				
Type Fluid in Hole				
Dens. / Visc.				
pH / Fluid Loss	cc		cc	
Source of Sample				
Rm @ Meas. Temp.	@ °F		@ °F	
Rmf @ Meas. Temp.	@ °F		@ °F	
Rmc @ Meas. Temp.	@ °F		@ °F	
Source Rmf / Rmc				
Rm @ BHT	@ °F		@ °F	
Rmf @ BHT	@ °F		@ °F	
Rmc @ BHT	@ °F		@ °F	

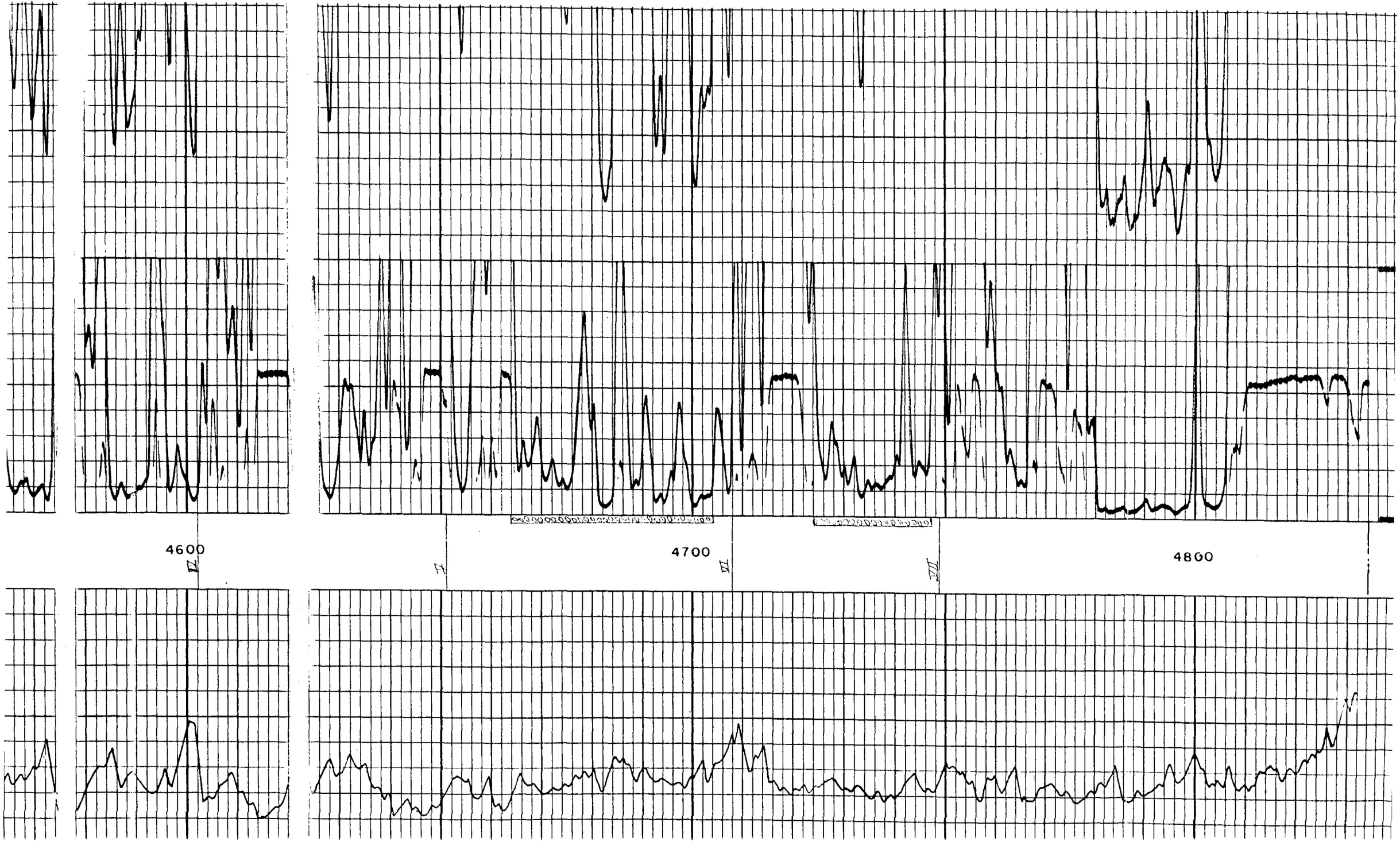
Scale Changes			
Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data				
Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	1206 F/L		FREE	

DETECTOR TYPE D4G1 SCINT. BEAM WIDTH 6"

DETECTOR LENGTH 4" GUARD LENGTH 90"

GAMMA RAY Radiation Intensity Increases	DEPTH	RESISTIVITY Ohms m²/m	RESISTIVITY Ohms m²/m
10 API UNITS		0 500	0 5
0 API 100 API	2"=100	0 5000	


4600
4700
4800

PGAC Acoustic-Gamma Ray Log

FILE NO.

COMPANY Pan American Petroleum Corp.

WELL Russell E. Horton #20

FIELD Milnesand (San Andres)

COUNTY Roosevelt STATE New Mexico

LOCATION: 330' FN & FWL

SEC 29 TWP 8-S RGE 35-E

Other Services: None

Elevations: KB 4219 DF 4217 GL 4209

Permanent Datum: Ground Level Elev.

Log Measured from K.B. Ft. Above Permanent Datum

Drilling Measured from K.B.

Date	10-4-69
Run No.	One
Total Depth Driller	4764
Total Depth PGAC	4765
Bottom Logged Interval	4759
Casing Driller	402
Casing PGAC	
Footage Logged	
Mud Type	Salt Gel
Density / Visc.	10 / 30
Max. Temp. (°F)	107°
Rec. To Rec. Spacing	1'
Trans. To Rec. Spcg.	4'
Logging Instrument	TS-130-AS-30
Equip. No.	EL-25
Recorded By	Pack-Lewis
Witnessed By	Kloar

BORE HOLE RECORD

Bit Size	From	To
7 7/8"	402	4764

CASING RECORD

Csg. Size	Csg. Wt.	From	To
8 5/8		Surf.	402

FIELD PRINT

GAMMA RAY LOGGING DATA

			Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Unit Per Log Div
Run No.	One									
Tool Model No.	TELR		1	4749	100	50	1	500	0	10
Diam.	3 5/8"									
Detect. Model No.	TELR-90									
Type	SCINT									
Length	5"									

REMARKS: Job No.

* INFORMATION NOT AVAILABLE

GAMMA RAY LOG

0 100

API GAMMA RAY UNITS

100 200

CALIPER LOG

0 7 8 9 10 11 12 13 14

HOLE SIZE - INCHES

DEPTHS

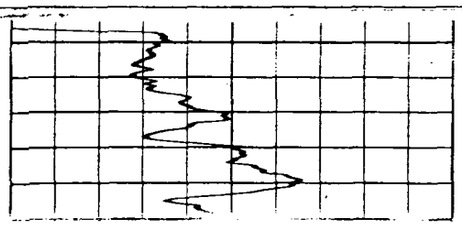
ACOUSTIC

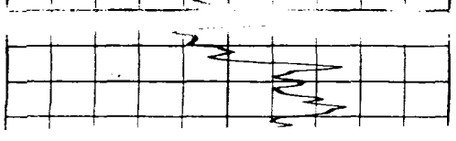
DUAL RECEIVER R_1R_2 = 1'

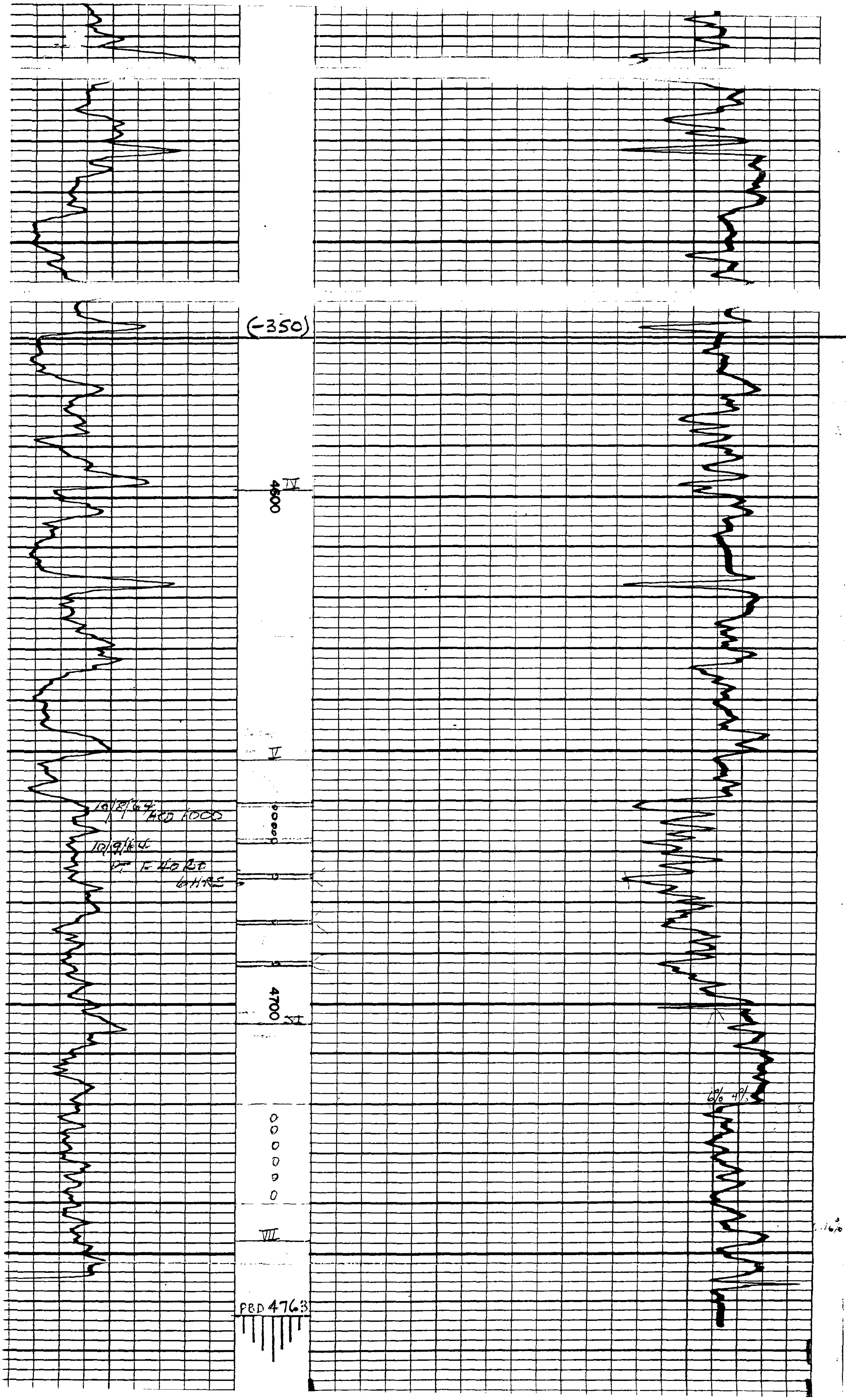
SINGLE RECEIVER TR_1 = 4'

Dual Receiver Linear Time In Microseconds Per Foot

100 70 4






(-350)
IV
4600
V
10/8/64 ACD 1000
10/9/64
6 HRS
4700
VI
6% 4%
VII
PBD 4763

PGAC Acoustic-Gamma Ray Log

FILE NO. _____

COMPANY Pan American Petroleum Corp.
WELL Russell E. Horton # 21
FIELD Milnesand (San Andres)
COUNTY Roosevelt STATE New Mexico
LOCATION: 330' FNL & FWL
SEC 29 TWP 8-S RGE 35-E

Other Services

Elevations: KB 4225 4219
DF 4225 4217
GL 4225 4209

Permanent Datum	G.L. Elev. 4225
Log Measured from	K.B. 10 Ft. Above Permanent Datum
Drilling Measured from	K.B.
Date	10-14-64
Run No.	ONE
Total Depth Driller	4775
Total Depth PGAC	4775
Bottom Logged Interval	4769
Casing Driller	400
Casing PGAC	Not Detected
Footage Logged	4369
Mud Type	Salt Gel - Oil Starch
Density / Visc.	10.6 / 38
Max. Temp. (°F)	105° F
Rec. To Rec. Spacing	1'
Trans. To Rec. Spcg.	4'
Logging Instrument	TS-130 · RX-3
Equip. No.	EL-25
Recorded By	LC Wis
Witnessed By	M. Kleer

BORE HOLE RECORD

Bit Size	From	To
7 7/8	400	T.D.

CASING RECORD

Csg. Size	Csg. Wt.	From	To
8 5/8		Surf	400

GAMMA RAY LOGGING DATA

		Run No.	Depths From	Depths To	Speed Ft./Min.	T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Unit Per Log Div.
Run No.	ONE	1	4759	Surf	45	1	702	0	10
Tool Model No.	TeLb								
Diam.	3 5/8								
Detect. Model No.	TeLb 40								
Type	Scint								
Length	5"								

REMARKS: Job No.

* INFORMATION NOT AVAILABLE

GAMMA RAY LOG | DEPTHS | ACOUSTIC

API GAMMA RAY UNITS

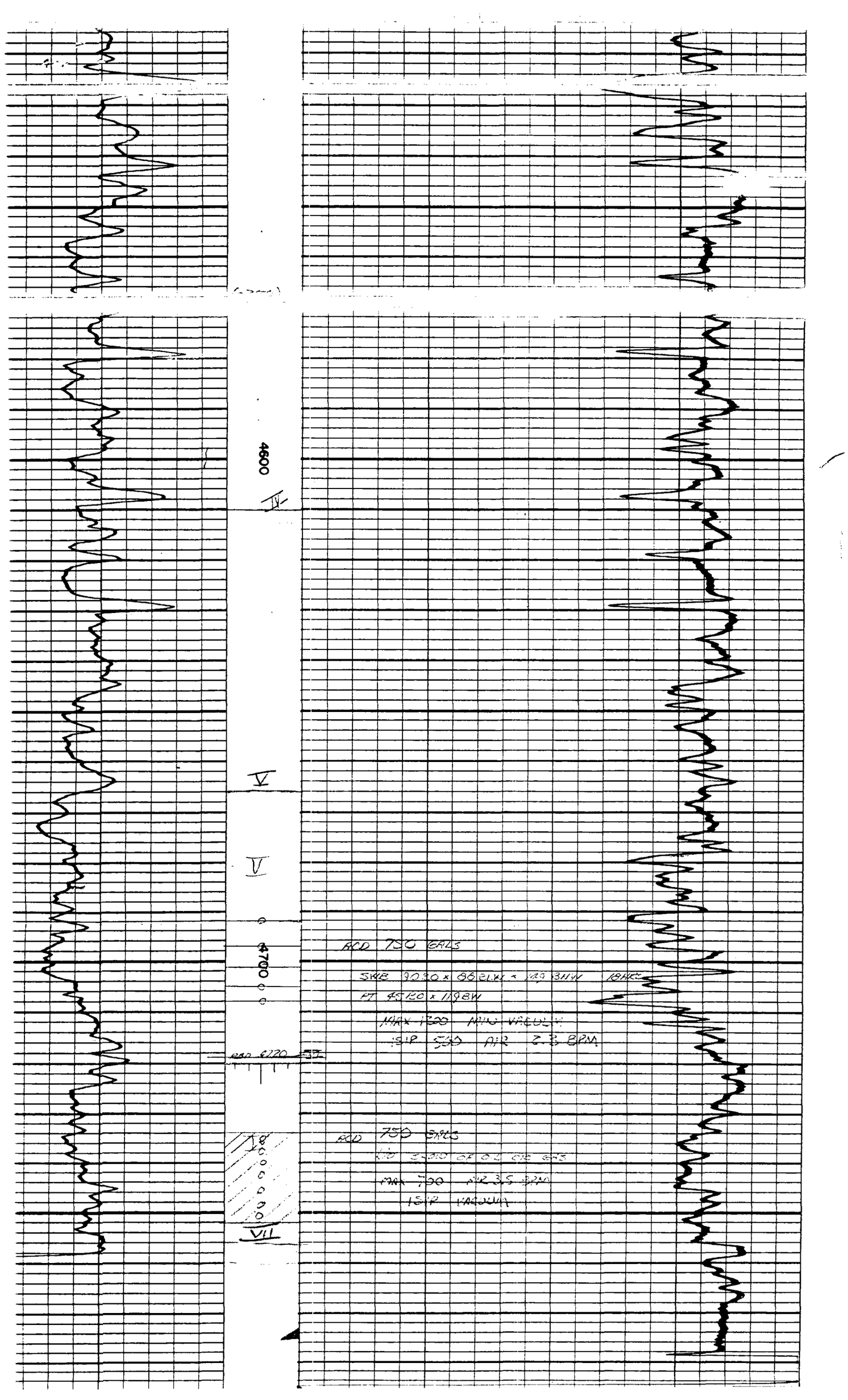
0 100
100 200

DUAL RECEIVER R_1R_2 — 1
SINGLE RECEIVER TR_1 — 4

Time in Microseconds Per Foot

100 85 70 55

0100


4600
IV
V
V
4700
RCD 750 GRLS
SWB 9030 x 88 ELW x 1/2 3HW 18AKE
HT 4510 x 1198W
MAX 1500 MWG VACUUM
ISIP 530 AIR 2.8 BPM
RCD 750 GRLS
MAX 700 AIR 3.5 BPM
ISIP VACUUM
VII

FILE NO.

LANE WELLS Acoustilog

A DIVISION OF DRESSER INDUSTRIES, INC

COMPANY	PAN AMERICAN PETROLEUM CORP.
WELL	RUSSELL E. HORTON #23
FIELD	MILNESAND-SAN ANDRES
COUNTY	ROOSEVELT STATE NEW MEXICO
LOCATION:	330' FNL & 660' FWL
Other Services	F/L
SEC	31 TWP 8-S RGE 35-E

Permanent Datum GROUND LEVEL Elev. 4215
Log Measured from K.B. 11 Ft. Above Permanent Datum
Drilling Measured from K.B.

Elevations: KB 4226, DF 4224, GL 4215

Date	10/28/64			
Run No.	ONE			
Depth—Driller	4780			
Depth—Logger	4774			
Bottom Logged Interval	4768			
Top Logged Interval	70			
Casing—Driller	8 5/8@ 420	@	@	@
Casing—Logger	420			
Bit Size	7 7/8"			
Type Fluid in Hole	SALT MUD			
Density and Viscosity	10.5 | 38			
pH and Fluid Loss	| 10 cc	cc	cc	cc
Source of Sample	CIRCULATED			
Rm @ Meas. Temp.	.09 @ 60 °F	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	.069 @ 60 °F	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	.11 @ 60 °F	@ °F	@ °F	@ °F
Source of Rmf and Rmc	MEAS. MEAS.			
Rm @ BHT	.048 @ 113 °F	@ °F	@ °F	@ °F
Time Since Circ.				
Max. Rec. Temp. Deg. F.	113 °F	°F	°F	°F
Equip. No. and Location	4596 HOBBS			
Recorded By	WASSELL			
Witnessed By	MR. KLAAR			

FOLD HERE ↓ THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP 31

REMARKS

DETECTOR TYPE	D4G1 SCINT.	SENS. SETTING	1000 X-1
DETECTOR LENGTH	4"	ZERO DIV. L OR R	-0-
T.C.	2.0 & 0.9		
LOG SPEED	30' & 60'		

Changes in Mud Type or Additional Samples

Date | Sample No.		
Depth-Driller		
Type Fluid in Hole		
Dens. | Visc.		
pH | Fluid Loss	cc	cc
Source of Sample		
Rm @ Meas. Temp.	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F
Source Rmf | Rmc		
Rm @ BHT	@ °F	@ °F
Rmf @ BHT	@ °F	@ °F
Rmc @ BHT	@ °F	@ °F

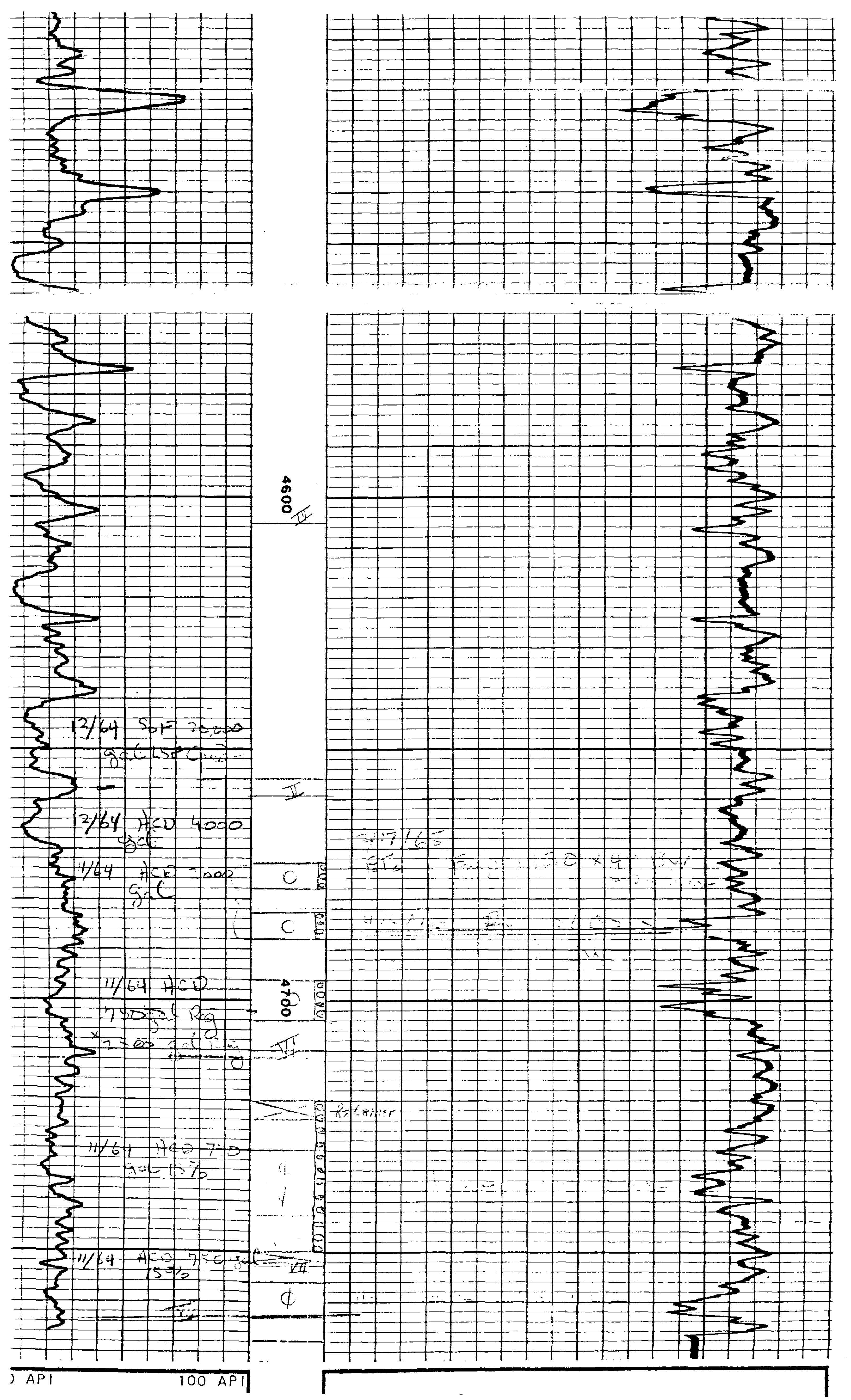
Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	SERIES 605		FREE	

S.P. or G/R & Caliper	DEPTH	ACOUSTILOG
Millivolts − |↔| + HOLE SIZE - INCHES 7 9 11 13 15 10 API/CD 0 API 100 API	2"=100' LR 70'	T 3 R 1 R P SPECIFIC ACOUSTIC TIME Micro Seconds Per Foot 100 85 70 55 1' SPACING ———



4600
4700
2/64 HCl 4000 gal
11/64 HCl 750 gal Reg
Retainer
11/64 HCl 750 gal 15%
0 API
100 API

LANE WELLS *Focused Log*

A DIVISION OF DRESSER INDUSTRIES, INC.

FILE NO.

COMPANY PAN AMERICAN PETROLEUM CORP.

WELL RUSSELL E. HORTON #23

FIELD MILNESAND-SAN ANDRES

COUNTY ROOSEVELT STATE NEW MEXICO

LOCATION: 330' FNL & 660' FWL

SEC 31 TWP 8-S RGE 35-E

Other Services: G/R-A/L

Elevations: KB 4226, DF 4224, GL 4215

Permanent Datum	GROUND LEVEL	Elev. 4215		
Log Measured from	K. B.	11 Ft. Above Permanent Datum		
Drilling Measured from	K. B.			
Date	10/28/64			
Run No.	ONE			
Depth—Driller	4780			
Depth—Logger	4774			
Bottom Logged Interval	4766			
Top Logged Interval	3900			
Casing—Driller	8 5/8@ 420	@	@	
Casing—Logger				
Bit Size	7 7/8"			
Type Fluid in Hole	SALT MUD			
Density and Viscosity	10.5 38			
pH and Fluid Loss	10 cc	cc	cc	
Source of Sample	CIRCULATED			
Rm @ Meas. Temp.	.09 @ 60°F	@ °F	@ °F	
Rmf @ Meas. Temp.	.069 @ 60°F	@ °F	@ °F	
Rmc @ Meas. Temp.	.11 @ 60°F	@ °F	@ °F	
Source of Rmf and Rmc	MEAS. MEAS.	—	—	
Rm @ BHT	.048 @ 113°F	@ °F	@ °F	
Time Since Circ.				
Max. Rec. Temp. Deg. F.	113°F	°F	°F	°F
Equip. No. and Location	4596 HOBBS			
Recorded By	WASSELL			
Witnessed By	MR. KLAAR			

FOLD HERE ↓

THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS

Changes in Mud Type or Additional Samples			
Date / Sample No.			
Depth-Driller			
Type Fluid in Hole			
Dens. / Visc.			
pH / Fluid Loss	cc	cc	
Source of Sample			
Rm @ Meas. Temp.	@ °F	@ °F	
Rmf @ Meas. Temp.	@ °F	@ °F	
Rmc @ Meas. Temp.	@ °F	@ °F	
Source Rmf / Rmc	—	—	
Rm @ BHT	@ °F	@ °F	
Rmf @ BHT	@ °F	@ °F	
Rmc @ BHT	@ °F	@ °F	

Scale Changes			
Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data				
Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	SERIES 1206		FREE	

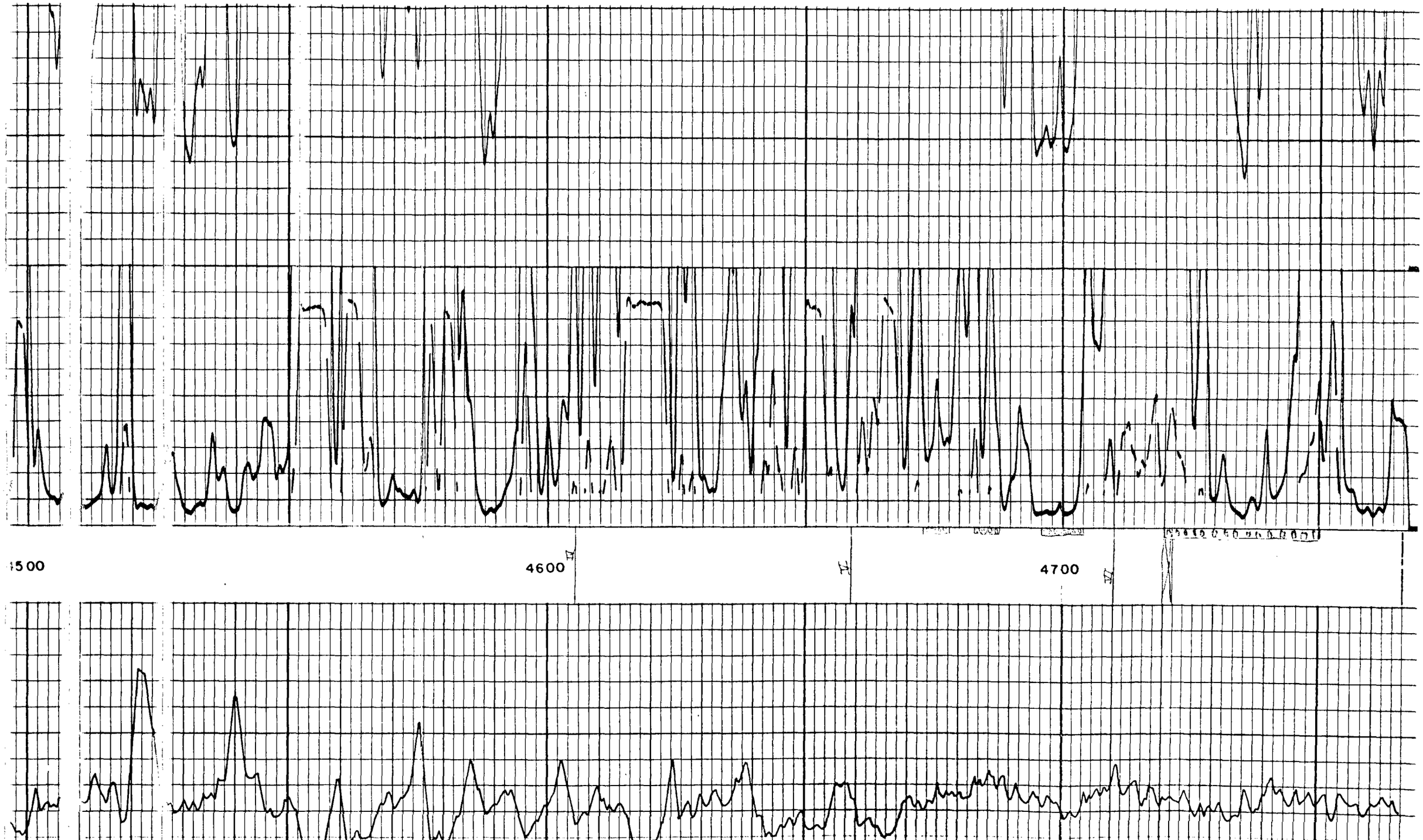
DETECTOR TYPE D4G1 SCINT.

DETECTOR LENGTH 4"

BEAM WIDTH 6"

GUARD LENGTH 90"

GAMMA RAY Radiation Intensity Increases	DEPTH	RESISTIVITY Ohms m^2/m	RESISTIVITY Ohms m^2/m
10 API/CD API UNITS	2"=100' L.R 3900'	0 500	0 5
0 API 100 API		0 5000	


4500
4600
4700

LANE WELLS — *Acoustilog*

A DIVISION OF DRESSER INDUSTRIES, INC.

FILE NO.

COMPANY	PAN AMERICAN PETROLEUM CORP.
WELL	RUSSELL E. HORTON NO. 24
FIELD	MILNESAND-SAN ANDRES
COUNTY	ROOSEVELT
STATE	NEW MEXICO

LOCATION:
330' FNL & 330' FWL OF
NW/4 OF NE/4

SEC 31 TWP 8-S RGE 35-E

Other Services

Permanent Datum GROUND LEVEL Elev. 4210
Log Measured from K. B., 10 Ft. Above Permanent Datum
Drilling Measured from K. B.

Elevations: KB 4220, DF 4218, GL 4210

Date	11/16/64			
Run No.	ONE			
Depth—Driller	4730			
Depth—Logger	4730			
Bottom Logged Interval	4724			
Top Logged Interval	65			
Casing—Driller	8 5/8@ 412	@	@	@
Casing—Logger	412			
Bit Size	7 7/8"			
Type Fluid in Hole	SALT MUD			
Density and Viscosity	10.2 / 36			
pH and Fluid Loss	9.8 cc	cc	cc	cc
Source of Sample	CIRCULATED			
Rm @ Meas. Temp.	.095 @ 51 °F	@ °F	@ °F	@ °F
Rmf @ Meas. Temp.	.072 @ 51 °F	@ °F	@ °F	@ °F
Rmc @ Meas. Temp.	.12 @ 51 °F	@ °F	@ °F	@ °F
Source of Rmf and Rmc	MEAS. / MEAS.			
Rm @ BHT	.044 @112 °F	@ °F	@ °F	@ °F
Time Since Circ.				
Max. Rec. Temp. Deg. F.	112 °F	°F	°F	°F
Equip. No. and Location	4596 / HOBBS			
Recorded By	WASSELL			
Witnessed By	MR. KLAAR			

FOLD HERE ↓ THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-31

REMARKS

DETECTOR TYPE	D4G1 SCINT.	SENS. SETTING	1000 X-1
DETECTOR LENGTH	4"	ZERO DIV. L OR R	-0-
T.C.	2.0 & 0.9		
LOG SPEED	30' & 60'		

Changes in Mud Type or Additional Samples

Date / Sample No.		
Depth-Driller		
Type Fluid in Hole		
Dens. / Visc.		
pH / Fluid Loss	cc	cc
Source of Sample		
Rm @ Meas. Temp.	@ °F	@ °F
Rmf @ Meas. Temp.	@ °F	@ °F
Rmc @ Meas. Temp.	@ °F	@ °F
Source Rmf / Rmc		
Rm @ BHT	@ °F	@ °F
Rmf @ BHT	@ °F	@ °F
Rmc @ BHT	@ °F	@ °F

Scale Changes

Type Log	Depth	Scale Up Hole	Scale Down Hole

Equipment Data

Run No.	Tool Type	Pad Type	Tool Position	Other
ONE	SERIES 605		FREE	

S.P. or G/R & Caliper	DEPTH	ACOUSTILOG
		T 3 R₁ 1 R₂ ___ R₃

Millivolts

− |↔| +

HOLE SIZE - INCHES

7 9 11 13 15

10 API/CD

0 API 100 API

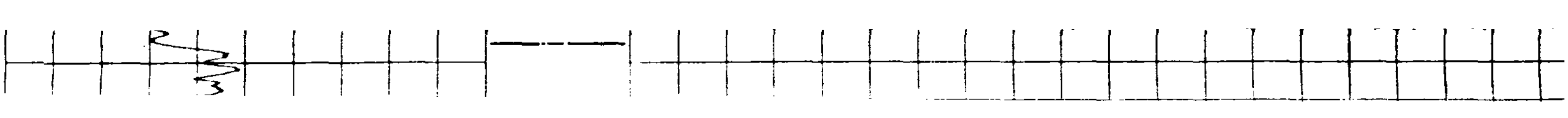
2" = 100'
LR
65'

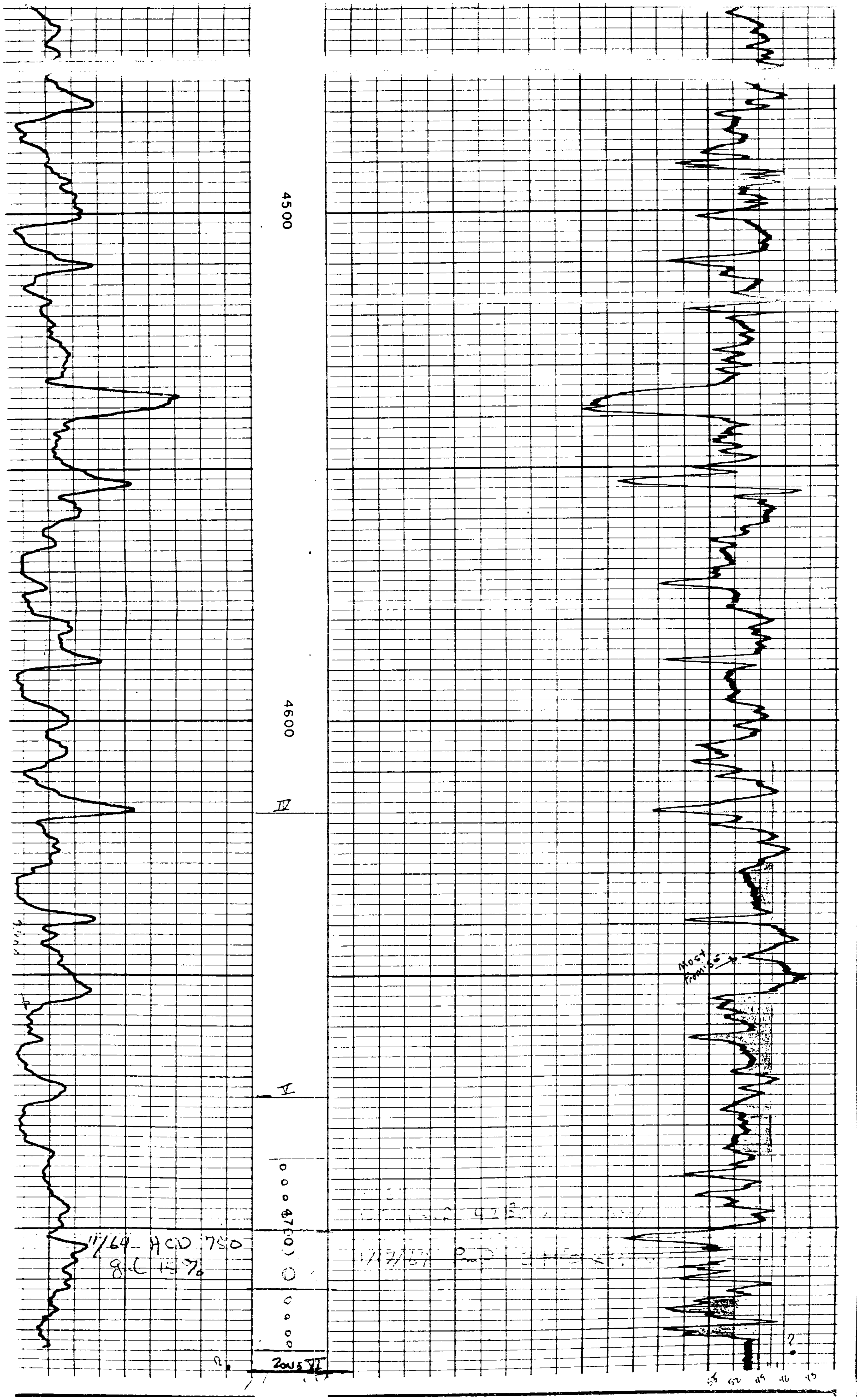
SPECIFIC ACOUSTIC TIME

Micro Seconds Per Foot

100 85 70 55 4

1' SPACING





4500
4600
IV
V
4700
ZONE VI
11/64 HCD 750
& C 15%
Most from here

LAHRA—AA. 0847

Welex

RADIOACTIVITY LOG

COMPANY Field Print

WELL

FIELD

County State

COMPANY AMOCO PRODUCTION COMPANY

WELL HORTON FEDERAL #24

FIELD San Andres (M. Inesand)

COUNTY ROOSEVELT STATE NEW MEXICO

Location

330' FNL, 2310' FEL

Sec. 31 Twp. 8-S Rge. 35-E

Other Services:

NONE

Permanent Datum Ground Level Elev. 4210

Log Measured From K.B. 10' Ft. Above Perm. Datum

Drilling Measured From K.B.

Elev.: K.B. 4220

D.F.

G.L. 4210

Date	1-4-80
Run No.	ONE
Type Log	G/R-N
Depth—Driller	4767
Depth—Welex	4766
Bottom Logged Interval	4765
Top Logged Interval	2765
Type Fluid in Hole	N.A.
Salinity, PPM Cl.	N.A.
Density	N.A.
Level	300' approx.
Max. rec. temp., deg. F.	110°
Operating Rig time	2 hrs
Recorded By	C. Campbell
Witnessed by	Mr. Caldwell

RUN No.	BORE-HOLE RECORD Bit	From	To	CASING RECORD Size	Wgt.	From	To
	3 7/8	4730	4767	4½"	9.5	surf	4730

Fold Here

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
Run No.	ONE	Run No.	ONE
Tool Model No.	2000	Log Type	N-G
Diameter	3 3/8	Tool Model No.	2000
Detector Model No.	1-E-11	Diameter	3 3/8
Type	G. M.	Detector Model No.	1-C-8
Length	28"	Type	G. M.
Distance to Source	108.9"	Length	14"
		Source Model No.	5 Cu
GENERAL		Serial No.	201
Hoist Truck No.	9937	Spacing	13.90"
Instrument Truck No.	9937	Type	Am Be
Tool Serial No.	9834	Strength	1 x 10⁶ N/S

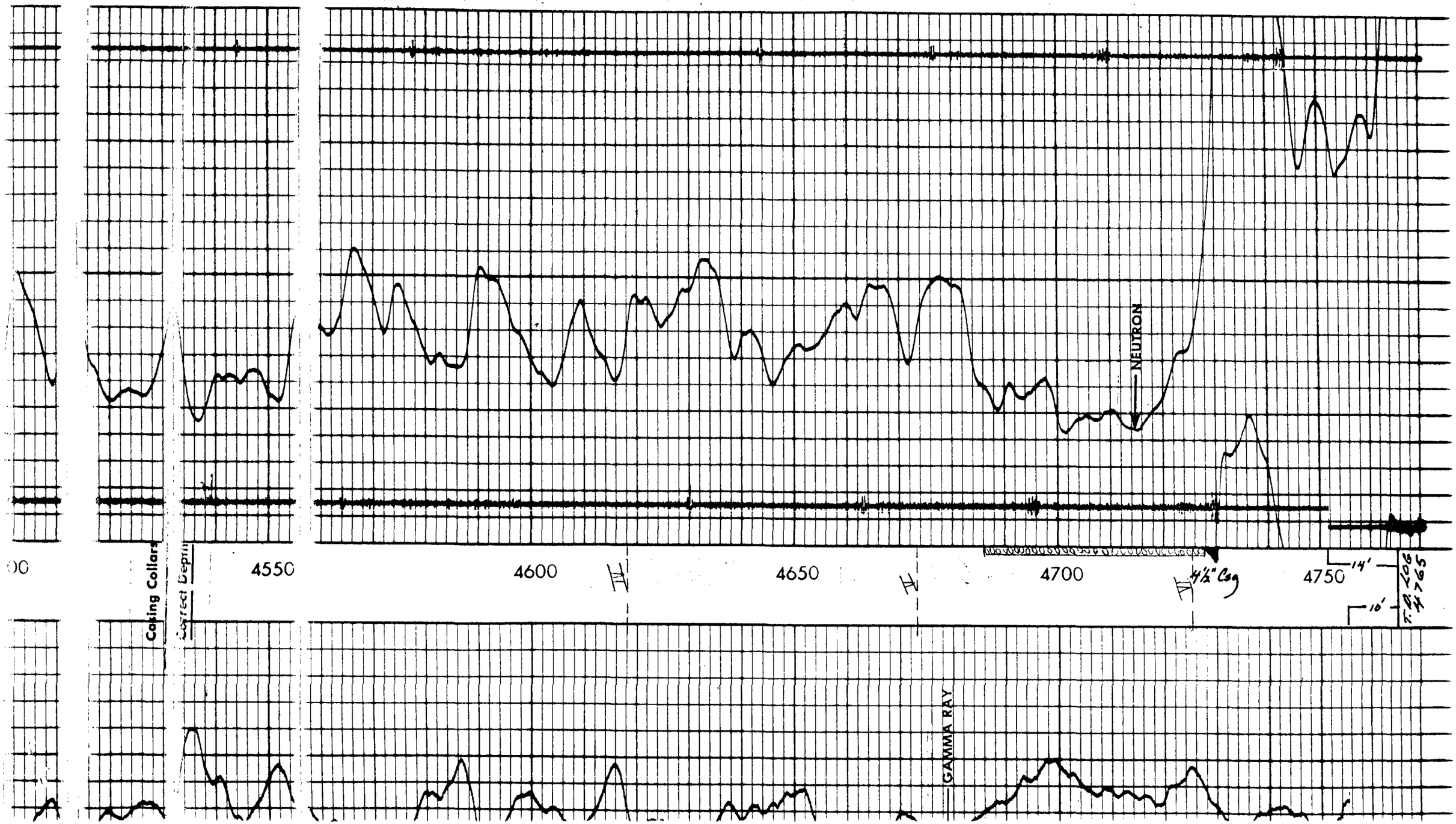
LOGGING DATA

GENERAL Run No	Depths From	Depths To	Speed Ft/Min.	GAMMA RAY T.C. Sec.	Sens. Settings	Zero Div. L or R	API G.R. Units per Log Div.	NEUTRON T.C. Sec.	Sens. Settings	Zero Div. L or R	API N. Units per Log Div.
ONE	4765	2765	30	2	100	0	10	2	1500	4L	7.5

Reference Literature:

Service Ticket No. 036677 Remarks:

NEUTRON COUNT RATE


Casing Collars
Correct Depth
4550
4600
4650
4700
4750
4½" Csg
14'
10'
NEUTRON
GAMMA RAY

SCINTILLOMETER
NUCLEAR
GAMMA RAY-NEUTRON LOG

FILING NO. W-22777

COMPANY PAN AMERICAN PETROLEUM CORPORATION

WELL R. E. HORTON # 26

FIELD MILNESAND (SAN ANDREWS)

COUNTY ROOSEVELT STATE NEW MEXICO

LOCATION:
330' FN & WL'S
NW/4, NE/4
SEC. - 29 TWP. - 8-S RGE. -35-E

OTHER SERVICES

ELEVATIONS:
KB. 4212'
DF. 4208'
GL. 4200'

PERMANENT DATUM GROUND LEVEL ELEV. 4200'
LOG MEASURED FROM 12 FT. ABOVE PERMANENT DATUM
DRILLING MEASURED FROM R.D.B.
DATE 12-21-64
RUN NO. ONE
TYPE LOG G/R-NEUTRON
DEPTH—DRILLER 4704'
DEPTH—LOGGER 4705'
BOTTOM LOGGED INTERVAL 4704'
TOP LOGGED INTERVAL 3900'
TYPE FLUID IN HOLE WATER
SALINITY PPM CL.
DENSITY LB/GAL.
LEVEL
MAX. REC. TEMP. DEG. F 110°
OPR. RIG TIME 3 HOURS
RECORDED BY McDONALD
WITNESSED BY MR. SMITH

BORE HOLE RECORD

RUN NO.	BIT	FROM	TO
			4704'

CASING RECORD

SIZE	WGT.	FROM	TO
4-1/2		0	4704'

FOLD HERE — THIS HEADING AND LOG CONFORMS TO API RECOMMENDED STANDARD PRACTICE RP-33

EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.	GN-3.5-D	LOG TYPE	IMPROVED
DIAM.	3.5"	TOOL MODEL NO.	GN-3.5-D
DETECT. MODEL NO.	131	DIAM.	3.5"
TYPE	SCINT.	DETECT MODEL NO.	232
LENGTH	3"	TYPE	SCINT.
DIST. TO N. SOURCE	7'	LENGTH	3"
		SOURCE MODEL NO.	M
GENERAL		SERIAL NO.	316
HOIST TRUCK NO.	2048	SPACING	23.5"
INST. TRUCK NO.	2048	TYPE	Pu:Be
TOOL SERIAL NO.	PDL-109	STRENGTH	9.24×10^6
LOG TICKET NO.	E-55565		

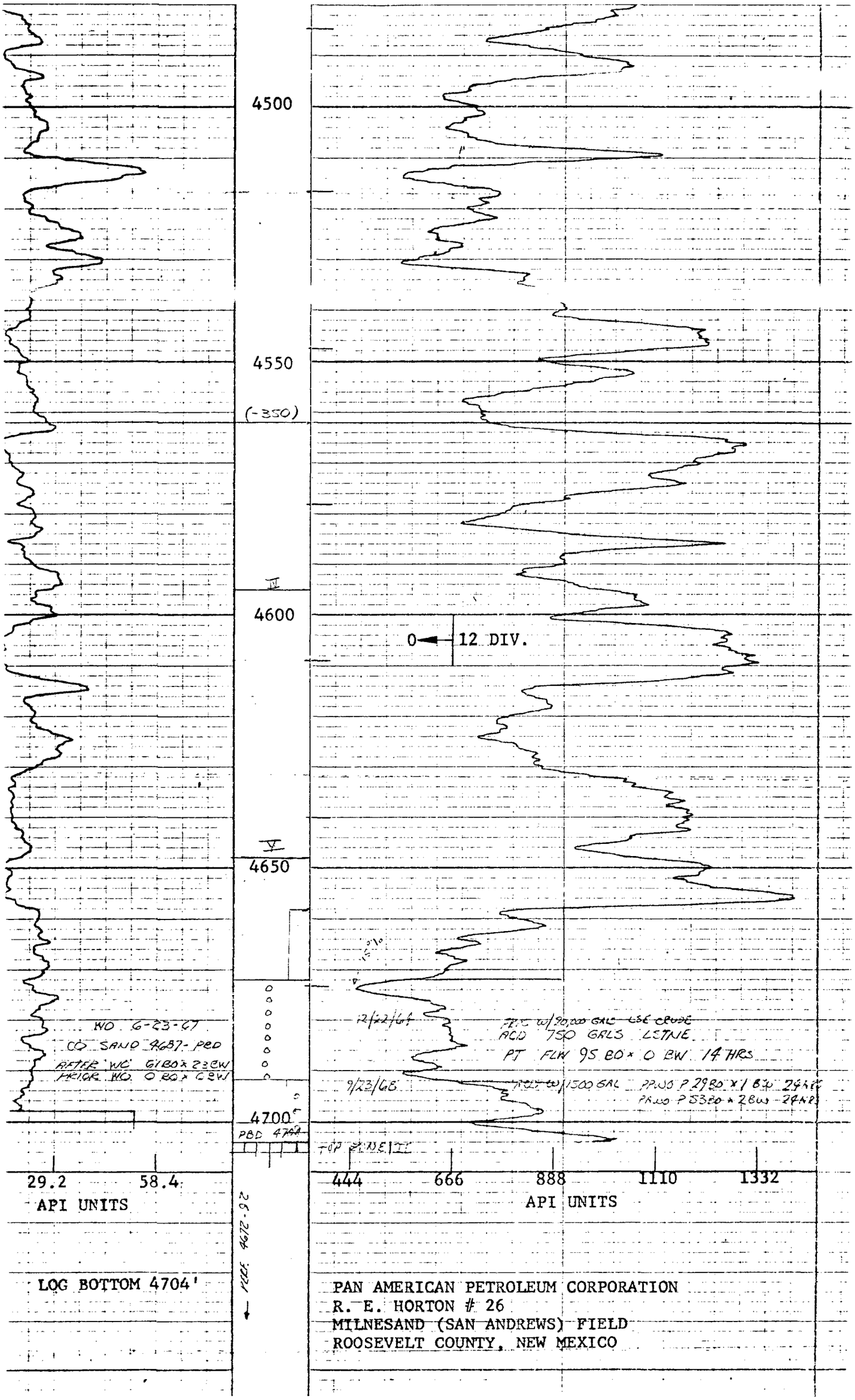
LOGGING DATA

GENERAL				GAMMA RAY				NEUTRON			
RUN NO.	DEPTHS FROM	DEPTHS TO	SPEED FT./MIN.	T.C. SEC.	SENS. SETTINGS	ZERO DIV. L. OR R.	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS. SETTINGS	ZERO DIV. L. OR R.	API PE
ONE	4704'	3900'	25'	1.8	R4A, D197, G175	SEE LOG	7.3	1.8	R6A, D200, G175	SEE LOG	
	4704'	0	35'	1.8	R4A, D197, G175	SEE LOG	7.3	1.8	R6A, D200, G175	SEE LOG	

REFERENCE LITERATURE:

REMARKS: RESET TO MATCH OPEN HOLE LOG.
MC. T.D.-4708' OPEN HOLE T.D. - 4704'

FOLD HERE


4500
4550
(-350)
4600
4650
4700
0 ← 12 DIV.
WO 6-23-67
CO SAND 4687- PBD
AFTER WO 61 BO x 23 BW
PRIOR WO 0 BO x 0 BW
12/22/64
FRAC w/ 20,000 GAL USE CRUDE
ACID 750 GALS LSTNE
PT FLW 95 BO x 0 BW 14 HRS
9/23/68
FRAC w/ 1500 GAL
PP NO P 2980 x 1 BO 24 HR
PP NO P 3320 x 28 BW 24 HR
PBD 4704
TOP ZONE II
29.2
58.4
API UNITS
444
666
888
1110
1332
API UNITS
REF: 4672-92
LOG BOTTOM 4704'
PAN AMERICAN PETROLEUM CORPORATION
R. E. HORTON # 26
MILNESAND (SAN ANDREWS) FIELD
ROOSEVELT COUNTY, NEW MEXICO

DATA ON ALL WELLS IN AREA OF REVIEW

Well-Operator-Type and Status	Construction Surf. Csg.	Set @	Sx. Cmt.	Top of Cmt.	Prod. Csg.	Set @	Sx. Cmt.	Top of Cmt.	Spud Date	Location In Sec.	S-T-R	Total Depth	Producing Interval
Wells Being Converted to Injection													
HF #1 - Amoco - San Andreas Oil Well	9-5/8"	404	200	Circ.	4½"	4693	350	Unk.	1/01/64	330NxW	30-8-35	4693	4626-4728
HF #6 - Amoco - San Andreas Oil Well	8-5/8"	397	200	Circ.	4½"	4700	200	Unk.	6/08/64	2310Sx330W	30-8-35	4739	4656-4739
HF #7 - Amoco - San Andreas Oil Well	8-5/8"	412	225	Circ.	4½"	4696	200	Unk.	12/12/68	330Nx2241E	30-8-35	4732	4605-4732
HF #9 - Amoco - San Andreas Oil Well	8-5/8"	404	250	Circ.	4½"	4851	250	Unk.	7/10/64	2310Sx2246E	30-8-35	4851	4664-4747
HF #20 - Amoco - San Andreas Oil Well	8-5/8"	402	250	Circ.	4½"	4764	250	Unk.	9/27/64	330NxW	29-8-35	4764	4661-4740
HF #21 - Amoco - SI San Andreas Oil Well	8-5/8"	418	250	Circ.	4½"	4775	250	Unk.	10/06/64	2310Sx330W	29-8-35	4775	4692-4708
HF #23 - Amoco - San Andreas Oil Well	8-5/8"	420	250	Circ.	4½"	4780	250	Unk.	10/19/64	330Nx660W	31-8-35	4780	4673-4704
HF #24 - Amoco - San Andreas Oil Well	8-5/8"	412	225	Circ.	4½"	4730	250	Unk.	11/08/64	330Nx2310E	31-8-35	4767	4686-4767
HF #26 - Amoco - San Andreas Oil Well	8-5/8"	420	225	Circ.	4½"	4706	250	Unk.	12/09/64	330Nx2310E	29-8-35	4742	4658-4742
Wells In Area Of Interest													
HF #2 - Amoco - San Andreas Oil Well	9-5/8"	407	200	Circ.	4½"	4689	200	Unk.	3/09/64	330Nx1650W	30-8-35	4737	4625-4676
HF #3 - Amoco - San Andreas Oil Well	8-5/8"	397	200	Circ.	4½"	4695	200	Unk.	3/25/64	330Wx1650N	30-8-35	4727	4650-4686
HF #4 - Amoco - San Andreas Injector	8-5/8"	397	200	Circ.	4½"	4690	200	Unk.	5/25/64	1650NxW	30-8-35	4690	4657-4671
HF #5 - Amoco - San Andreas Oil Well	8-5/8"	423	200	Circ.	4½"	4686	200	Unk.	5/27/64	1650Nx2244E	30-8-35	4738	4656-4738
HF #8 - Amoco - San Andreas Oil Well	8-5/8"	409	250	Circ.	4½"	4700	200	Unk.	6/29/64	2310Sx1650W	30-8-35	4745	4656-4745
HF #10 - Amoco - San Andreas Oil Well	8-5/8"	405	250	Circ.	4½"	4764	250	3700	7/22/64	330Nx921E	30-8-35	4764	4644-4741

Well-Operator-Type and Status	Construction Surf. Csg.	Set @	Sx. Cmt.	Top of Cmt.	Prod. Csg.	Set @	Sx. Cmt.	Top of Cmt.	Spud Date	Location In Sec.	S-T-R	Total Depth	Producing Interval
HF #11 - Amoco - San Andreas Injector	8-5/8"	410	250	Circ.	4½"	4766	250	Unk.	8/15/64	1650Nx924E	30-8-35	4766	4664-4738
HF #12 - Amoco - San Andreas Injector	8-5/8"	400	250	Circ.	4½"	4771	250	Unk.	8/04/64	990Sx1650W	30-8-35	4771	4672-4749
HF #13 - Amoco - San Andreas Oil Well	8-5/8"	417	250	Circ.	4½"	4776	250	Unk.	9/15/64	990Sx2249E	30-8-35	4776	4680-4754
HF #14 - Amoco - San Andreas Oil Well	8-5/8"	405	250	Circ.	4½"	4765	250	Unk.	8/27/64	990Sx330W	30-8-35	4765	4667-4684
HF #15 - Amoco - San Andreas Injector	8-5/8"	2202	700	Circ.	4½"	5396	450	Unk.	8/22/64	990Sx929E	30-8-35	5396	4691-4714
HF #16 - Amoco - Dry (TA) San Andreas Well	8-5/8"	410	250	Circ.	4½"	4808	250	Unk.	9/04/64	330NxE	31-8-35	4808	4676-4692
HF #17 - Amoco - San Andreas Oil Well	8-5/8"	404	250	Circ.	4½"	4774	250	Unk.	9/06/64	2310Sx929E	30-8-35	4774	4664-4746
HF #18 - Amoco - SI San Andreas Oil Well	8-5/8"	395	250	Circ.	4½"	4770	250	Unk.	9/18/64	1651Nx330W	29-8-35	4770	4718-4734
HF #19 - Amoco - San Andreas Oil Well	8-5/8"	414	250	Circ.	4½"	4780	250	Unk.	9/29/64	330Nx1650W	31-8-35	4780	4678-4754
HF #22 - Amoco - San Andreas Oil Well	8-5/8"	412	225	Circ.	4½"	4764	250	Unk.	10/28/64	330Nx1677W	29-8-35	4764	4675-4732
HF #25 - Amoco - San Andreas Injector	8-5/8"	401	225	Circ.	4½"	4716	250	Unk.	11/16/64	1650Nx1652W	29-8-35	4716	4687-4705
HF #27 - Amoco - SI San Andreas Oil Well	8-5/8"	416	225	Circ.	4½"	4718	250	Unk.	1/02/65	1650Nx2314E	29-8-35	4718	4680-4710
HF #28 - Amoco - San Andreas Oil Well	8-5/8"	423	225	Circ.	4½"	4713	250	Unk.	1/02/65	330Nx990E	29-8-35	4713	4670-4700
HF #29 - Amoco - San Andreas Injector	8-5/8"	415	225	Circ.	4½"	4732	250	Unk.	1/29/65	1650Nx990E	29-8-35	4770	4690-4728
HF #30 - Amoco - SI San Andreas Injector	8-5/8"	397	225	Circ.	4½"	4720	250	Unk.	3/07/65	2310Sx1650W	29-8-35	4734	4696-4716
HF #31 - Amoco - SI San Andreas Injector	8-5/8"	412	225	Circ.	4½"	4714	250	Unk.	3/27/65	990Sx330W	29-8-35	4714	4696-4700
MSA #24 - Union of Texas - San Andreas Oil Well	8-5/8"	378	350	Circ.	4½"	4785	1375	Unk.	5/14/64	1980SxE	19-8-35	4785	4653-4725
MSA #25 - Union of Texas - San Andreas Oil Well	8-5/8"	368	300	Circ.	4½"	4780	1760	Unk.	11/11/64	660Sx1980E	19-8-35	4780	4667-4733
MSA #26 - Union of Texas - San Andreas Injector	8-5/8"	367	300	Circ.	4½"	4800	1760	Unk.	11/20/64	660SxE	19-8-35	4800	4658-4738

Well-Operator-Type and Status	Construction Surf. Csg.	Set @	Sx. Cmt.	Top of Cmt.	Prod. Csg.	Set @	Sx. Cmt.	Top of Cmt.	Spud Date	Location In Sec.	S-T-R	Total Depth	Producing Interval
MSA #27 - Union of Texas - San Andreas Oil Well	8-5/8"	357	350	Circ.	4½"	4775	1645	Unk.	11/30/64	1720Sx660E	19-8-35	4775	4672-4740
MSA #28 - Union of Texas - San Andreas Oil Well	8-5/8"	360	360	Circ.	4½"	4795	1950	Unk.	12/11/64	660SxW	20-8-35	4795	4664-4745
MSA #29 - Union of Texas - San Andreas Injector	8-5/8"	370	350	Circ.	4½"	4800	1575	Unk.	12/31/64	660Sx1980W	20-8-35	4800	4637-4749
MSA #201 - Union of Texas - San Andreas Oil Well	7-5/8"	372	250	Circ.	4½"	4754	350	Unk.	8/07/73	660Nx1980E	25-8-34	4796	4670-4726
MSA #202 - Union of Texas - San Andreas Oil Well	8-5/8"	362	250	Circ.	4½"	4700	400	Unk.	10/04/63	660Nx330E	25-8-34	4700	4658-4685
MSA #203 - Union of Texas - San Andreas Injector	7-5/8"	365	325	Circ.	4½"	4730	400	Unk.	1/30/64	1980Nx660E	25-8-34	4730	4662-4688
MSA #210 - Union of Texas - TA San Andreas Oil Well	8-5/8"	379	350	Circ.	5½"	4775	250	Unk.	1/12/65	1720Sx660W	20-8-35	4775	4623-4730
MSA #211 - Union of Texas - San Andreas Oil Well	8-5/8"	371	300	Circ.	4½"	4710	300	Unk.	3/30/65	330Sx2310E	20-8-35	4710	4664-4687
MSA #212 - Union of Texas - San Andreas Oil Well	8-5/8"	372	300	Circ.	4½"	4674	300	Unk.	4/13/65	330Sx990E	20-8-35	4700	4660-4690
MSA #313 - Union of Texas - San Andreas Oil Well	8-5/8"	352	225	Circ.	4½"	4758	200	Unk.	9/12/63	1980Sx625W	19-8-35	4758	4660-4724
MSA #314 - Union of Texas - San Andreas Oil Well	8-5/8"	366	225	Circ.	4½"	4755	200	Unk.	11/27/63	1980Sx1909W	19-8-35	4755	4650-4724
MSA #315 - Union of Texas - San Andreas Oil Well	8-5/8"	365	225	Circ.	4½"	4724	200	Unk.	2/25/64	660Sx625W	19-8-35	4725	4640-4705
MSA #316 - Union of Texas - San Andreas Injector	8-5/8"	360	225	Circ.	4½"	4730	200	Unk.	5/20/64	990Sx1654W	19-8-35	4730	4646-4714
MSA #516 - Union of Texas - San Andreas Oil Well	8-5/8"	350	350	Circ.	4½"	4795	200	Unk.	6/29/65	660Sx1980E	24-8-34	4795	4665-4743
MSA #517 - Union of Texas - San Andreas Injector	8-5/8"	370	225	Circ.	4½"	4790	200	Unk.	1/15/64	660SxE	24-8-34	4790	4624-4676
MSA #519 - Union of Texas - San Andreas Oil Well	8-5/8"	354	250	Circ.	4½"	4900	200	Unk.	9/01/64	990Sx330E	25-8-34	4900	4665-4678
MSA #520 - Union of Texas - San Andreas Injector	8-5/8"	372	250	Circ.	4½"	4900	200	Unk.	11/16/64	1980Sx660E	25-8-34	4902	4662-4684
MGF Oil #1 - Drlg (PXA) San Andreas Well	12-3/4"/8-5/8"	387/3989	375/375	Circ./Unk.	5½"	4950	175	Unk.	8/29/71	1980Nx660E	36-8-34	9670	4673-4705

Amoco Production Company

ENGINEERING CHART

SHEET NO. OF

FILE

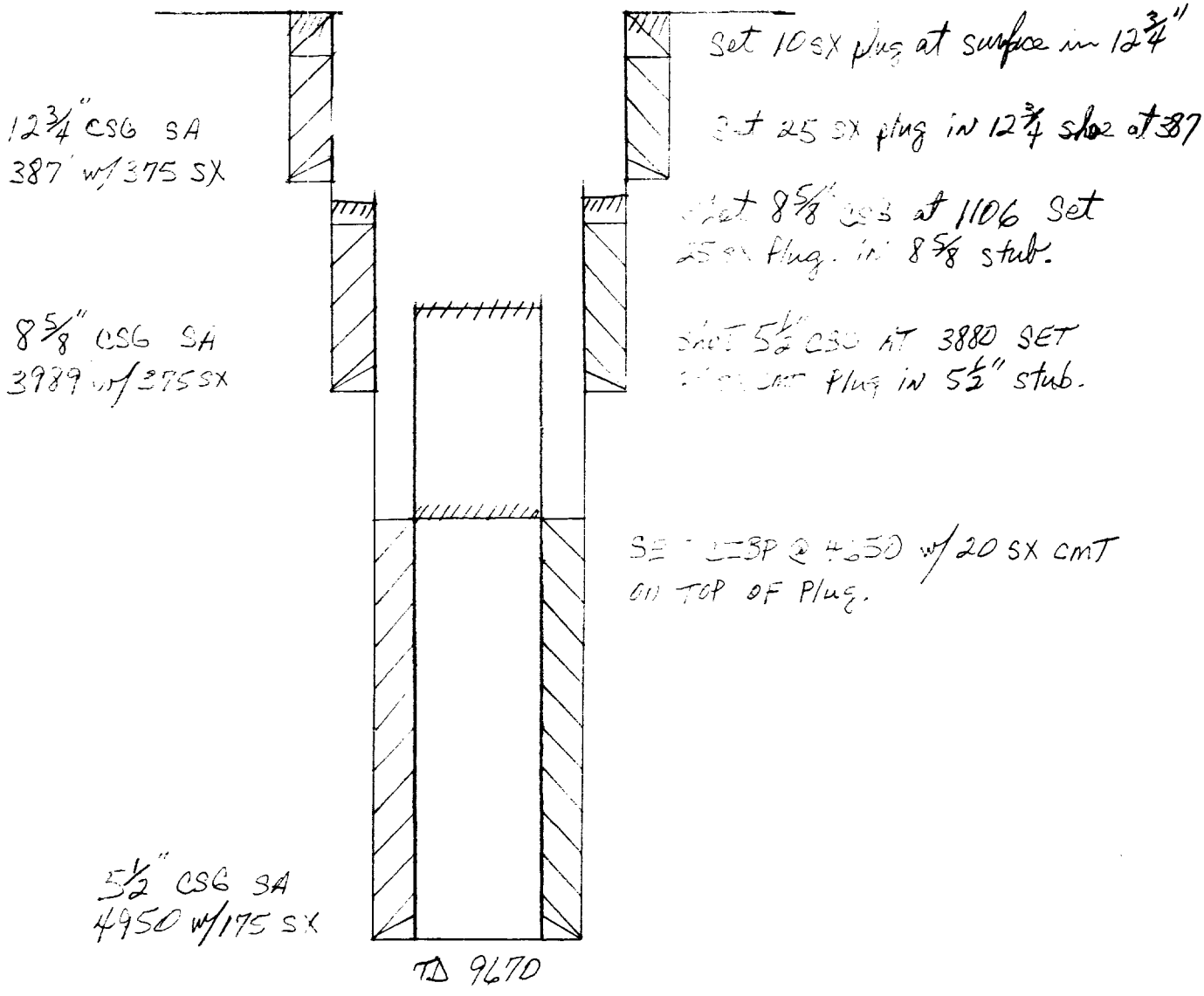
APPN

DATE 11-30-81

BY A.C.

SUBJECT MGF Oil #1

1980 FNL x 660 FEL, Sec. 36, T8S, R34E
Spud 8-29-71
P x A 1-18-72



Form 371 271