

Jack Ahlen

CONSULTING GEOLOGIST
533 PETROLEUM BUILDING
ROSWELL, NEW MEXICO 88201

Proposed Tight Formation Designation,
White Ranch Area, Chaves Co. N.M.
NGPA of 1978, amended, effective March 31, 1992

Narrative to accompany evidence submitted in support of the above referenced action:

Exhibit A. Lease Map which indicates land types, amounts and percentage

Exhibit A is a copy of the Midland Map Company land map covering portions of Chaves County in T11 and 12S R28 and 29E. It shows the location of the White Ranch field and the West White Ranch field. The outline of the proposed designated area is the broad black line enclosing the central part of the map. The total proposed area encompasses approximately 11,040 acres of which 640 acres are state lands and 10,400 acres are fee lands. The relative percentage is 5.8% state and 94.2% fee. State lands are marked by the diagonal lines while the remaining lands within the proposed area are fee.

Exhibits B. Map and geographical and geological descriptions of area and formation for which designation is sought.

Exhibit B 1 is a structure contour map of the top of the Mississippian Lime formation. Contour interval is 100 feet, scale is 1"=4000'. The contours indicate the regional and local structural trends at White Ranch and West White Ranch fields as well as the fact that the structure at West White Ranch is approximately 400 feet higher than at White Ranch.

Exhibit B 2 is an isopach of Mississippian lime porosity greater than 5%. The contour interval is 5 feet and the scale is 1"=4000'. The porosity zone is widespread and is continuous between the fields. Maximum thickness is 37 feet while the average thickness in the area is about 20 feet. The designated area is based on the 15 foot contour line.

Exhibit B 3 is a north south structure cross section of the White Ranch field showing electric log sections of the lower Pennsylvanian, Mississippian and uppermost Devonian formations. The index map on the left relates the line of section to the local geography and the proposed designated area for tight formation. The logs are hung on the 4500' below sea level datum. The Mississippian and Devonian tops are labeled as well as the currently producing pay zone. The two hundred feet of structural difference of the pay zone datum does not adversely effect the presence of gas. Well tests and treatments are tabulated below each well profile.

Exhibit B 4 is a north south structure cross section through West White Ranch field which shows electric log sections and is similar to exhibit B 3 above. The datum has been changed for convenience to 4000 feet below sea level. Note that the pay zone has the same relationship to the formation boundaries. The initial test well in West White Ranch is the J.C. Williamson #1 White Ranch, the second well from the left on the section. The pay zone is illustrated in this well from 7750 to 7770 feet.

Exhibit B 5 is an east west structure cross section between the two fields. It illustrates correlations between the fields, the structural relationships and the pay zone is the same stratigraphic horizon in the two fields.

The Mississippian formation consists of from 400 to 600 feet of very fine grained tan to brown cherty limestone. The formation is shaley in the lower third with varying percentage of shale and siltstone. The Woodford shale member is the lowermost part of this section. Cores of the pay zone indicate it to be a fine grained lime pellet packstone. Porosity varies up to a maximum of 12.7% as measured in a core from the Tom L. Ingram #4 White Ranch well. Core permeabilities were measured at .4 millidarcys and less. The average permeability of the core is .098md (see attached core analysis, exhibit C1). A second core had no shows and was not analyzed.

Exhibit C. Geological and engineering data to support the application

Exhibit C 1 is the core analysis from the Tom L. Ingram #4 White Ranch for the depths 8494 to 8539. Analysis is whole core, broken into 34 segments of 1.0 to 1.8 feet. The results are tabulated showing from left to right depth, maximum permeability, permeability at 90°, porosity, fluid saturations for oil and water and at the far right a lithologic description. Permeability varies from less than .1md to .4md. The average is .0987md for the interval. Porosity ranges from .3 to 12.7% with an average of 6.5 for the interval. Oil saturation varies from zero to 12.3%.

Exhibit C 2 Core graph and CNDL of pay zone, #4 Ingram, the core variables are plotted at electric log scale of 5 inches equals 100 feet on this exhibit for correlation with open hole logs.

Exhibit C 3 is the digitized time/pressure data from the drill stem test at 8480 to 8573 of the Mississippian pay zone in the Ingram #4 White Ranch. Page 7 is a copy of the DST chart which is labeled for easy reference. The label points are used in the succeeding pages to assist in the quantitative analysis of the test. Page 8 presents a summary of laboratory corrected pressure data on the top third of the page and incremental readings of time, pressure, $T+DT/DT$, $\log T+DT/DT$, and P_w-P_f on the lower two thirds of the page. Succeeding pages 9, 10 and 11 present the remainder of the above time and pressure data which has been utilized to make a Horner Plot for interpretation of the test.

Exhibit C 4 is a Horner plot of the White Ranch #4 Mississippian drill stem test. The slope of the middle time portion of the final shut in is 4200psi per cycle. The flow rate during the test was 4.28bbbls per day. The flow rate is based on a pressure difference of 64.8psi between the initial flow pressure 215.9psi (at 2) and the final flow pressure of 280.7 psi (at 6) and a gradient of .473 psi per foot. Dividing 64.8 by the gradient of .473 gives a height of fluid of 137 feet. in the 2.25 ID drill collars. The capacity of 2.25 ID drill collars is one bbl of liquid for each 203 feet of pipe. Therefore the formation produced .675 bbls of liquid during the 227 minutes of the initial flow, initial shut in and final flow periods. The daily rate is then $.675 \times 1440/227$ or 4.28 bbls per day.

Transmissability $Kh/uB = 162.6 \text{ Q/M}$. $162.6 \times 4.28/4200 = .166\text{mdft/cp}$. $K = .166/42 = .00395\text{md}$. The assumption that $uB = 1$ is based on the recovery of liquid only. See appendix A for a more detailed treatment of the above computations.

Exhibit C 5 is a series of scout tickets for all Mississippian and deeper wells within the outlined area. The pertinent data concerning testing of the Mississippian formation is tabulated below:

Drill Stem Tests:

Ohio Oil Co. #1 State WR Sec. 36 T11S R28E

Top Miss. 7778, Top Devonian 8327

D.S.T. 7900-7947, open 120 minutes, 1000' water blanket. Recovered 1000' water blanket plus 120' slightly gas cut mud. flow pressures, initial 460#, final 460#, 30 minute shut in pressure 860#.

D.S.T.s cont.

Depco, Inc. #1 Sundance Federal "B" Sec. 11 T12S R29E

Top Miss. 8616, Top Devonian 9188

Straddle Packer D.S.T. 8765-8845, open 60 minutes

Sampler recovered 1700cc's of drilling fluid at 50#, 60 minute initial shut in pressure 131#, flow pressure 22#-22#, 180 minute final shut in pressure 283#

Republic Natural Gas and Seaboard of Delaware #1 White Ranch 1980 FNL & 660 FWL of Sec. 34 T11S R29E, Top Miss. 8120, Top Devonian 8724, D.S.T. 8340-8400, open 60 minutes, gas to surface 77 minutes at an estimated rate of 35,000CFGPD, recovered 250' of heavily gas cut mud, no pressures available.

Tom L. Ingram #4 White Ranch 660 FN&EL Sec. 33 T11S R29E Top Miss. 8313, Top Devonian not penetrated D.S.T. 8480-8573, open 120 minutes, recovered 500' of gas and distillate cut mud, sampler recovered .5 cubic feet at gas and 2240cc's condensate and gas cut mud at 240#. 90 minutes initial shut in pressure 2556#, flow pressure 256-281, 240 minute final shut in pressure 2811#, bottom hole temperature 150°F.

The Republic Natural Gas and Seaboard of Delaware #1 White Ranch drill stem test had gas to the surface in 77 minutes. The volume of 8340' of 4½ inch drill pipe is approximately 255 cubic feet. The calculated daily rate is therefore approximately 4800 cubic feet of gas per day. This rate is significantly less than the statutory limit set by the regulation.

Exhibit D. (below) A list of wells currently producing gas from the Mississippian formation.

1. C.W. Trainer #1 White Ranch (Republic Natural Gas and Seaboard of Delaware)
1980' FNL 660' FWL Sec. 34 T11S R29E
2. C.W. Trainer #2 White Ranch (Republic Natural Gas and Seaboard of Delaware)
1980' FSL & 660' FWL Sec. 34 T11S R29E
3. C.W. Trainer #3 White Ranch (Republic Natural Gas and Seaboard of Delaware)
660' FS&WL Sec. 34 T11S R29E
4. C.W. Trainer #4 White Ranch (Tom L. Ingram)
660' FN&EL Sec. 33 T11S R29E

Exhibit E is a copy of the topographic map covering the proposed area.

An inspection of the map reveals that there is one fresh water well located within the designated area and one located less than a ½ mile from the outer boundry.

One is at the Malstrom Ranch headquarters in the SE/4 SW/4 Sec. 3 T12S R29E and the other is in the NE/4 SE/4 of Sec. 30 T11S R29E. The surface is developed on and is comprised of the Dewey Lake and Rustler Formation redbeds. There are no springs. Surface runoff is retained by several stock tanks as indicated on the attached portions of the topographic maps of the "Malstrom Ranch" and "Culp Ranch". Stock tanks are located in sections 22,31,32 and 33 of T11S R29E, Sec. 36 T11S R28E, Sec. 6 and 3 of T12S R29E. All are within the boundry of the LE Ranch except for two in the SE/4 SW/4 of Sec. 3 T12S R29E which are on the Malstrom Ranch.

Existing state and federal regulations insure that developement of the Mississippian formation will not adversely affect or impair fresh water aquifers

that are currently being used or are expected to be used in the foreseeable future. Two strings of casing are usually run through the shallow redbed sequence before the 7 7/8 inch deep hole is drilled. The reservoir rocks below 7000 feet are separated from fresh water aquifers by impervious shales, limestones, dolomites and anhydrites of the Pennsylvanian, Wolfcamp, Abo, Yeso and San Andres formations. It is highly probable that the seal of these formations will not be compromised by the expected hydrolic fracturing or waste disposal operations attributable to these operations.

F. The formation has not been authorized to be developed by infill drilling. All wells which have been drilled in the area have been drilled on the normal statewide pattern established for oil wells.

G. No other information is required at present.

Par. 2. The above evidence is based on the following geologic and engineering guidelines.

A. The estimated average in situ permeability, throughout the pay section is expected to be .1 millidarcy or less. Permeability is established by core analysis and drill stem testing in the Ingram #4 White Ranch.

B. The stabilized production rate of wells completed for production in the formation, without stimulation, is not expected to exceed the production rate as determined in accordance with the depth rate chart of the special rules.

C. No well drilled in the recommended tight formation is expected to produce without stimulation more than five barrels of crude oil per day.

D. Application does meet guidelines contained in subparagraphs 2A, 2B and 2C above.

E. N/A

Appendix A

The Horner Plot (exhibit C4) of $T+DT/DT$ vs P_{ws} during the 4 hour final shut in period has a slope of 4200. The flow rate during the test was 4.28 bbl per day. Kh/uB is therefore $162.6 \times 4.28/4200 = .166$ mdft/cp. The average effective permeability is $.166 uB/42$. or approximately .0039 md for liquid. No measurable gas was recovered during the test.

- a. Recovery was reported as 500 feet of slightly gas cut mud (above the valve). An additional 93 feet of recovery was lost below the valve and above the pressure recorder. The final flow pressure was 280.7 psi. The mud column gradient is therefore $280.7/593' = .473$ psi per foot.
- b. The initial flow pressure demonstrates that part of the recovered fluids bypassed the packers before the test started, therefore by subtracting the initial flow pressure from the final flow pressures and dividing the result by the gradient it is possible to compute the fluid recovered during the test. Final flow pressure (6) 280.7 less initial flow pressure (2) 215.9 = 64.8psi. $64.8/.473 = 137'$ of fluid in DC. Drill collars ID is 2.25", 137' of liquid = $137/203'bbl = .675bbl$. Daily rate = $.675 \times 1440/227 = 4.28bbls/day$.
- c. Transmissability $Kh/uB = 162.6 Q/M = 162.6 \times 4.28/4200 = .166mdft$
 $K = .166/42 = .00395md$ assuming the product of $uB = 1$.

Recovery was of condensate cut mud therefore:

u @ 150°F is $\pm .6$ to $.7$

B for water is $1 \pm .1$

Summery #4 White Ranch core and DST

1. Daily rate of production for DST was 4.28bbls
 2. Average permeability measured from core = .0987md for the 42 feet of the core.
 3. Permeability calulated from D.S.T. is .00395md.
- Daily rate of gas production from Republic Natural Gas Co. and Seaboard #1 DST was estimated at 35,000 CFPD, a rate of 4,800 CFPD is calculated from the 77 minute displacement time.

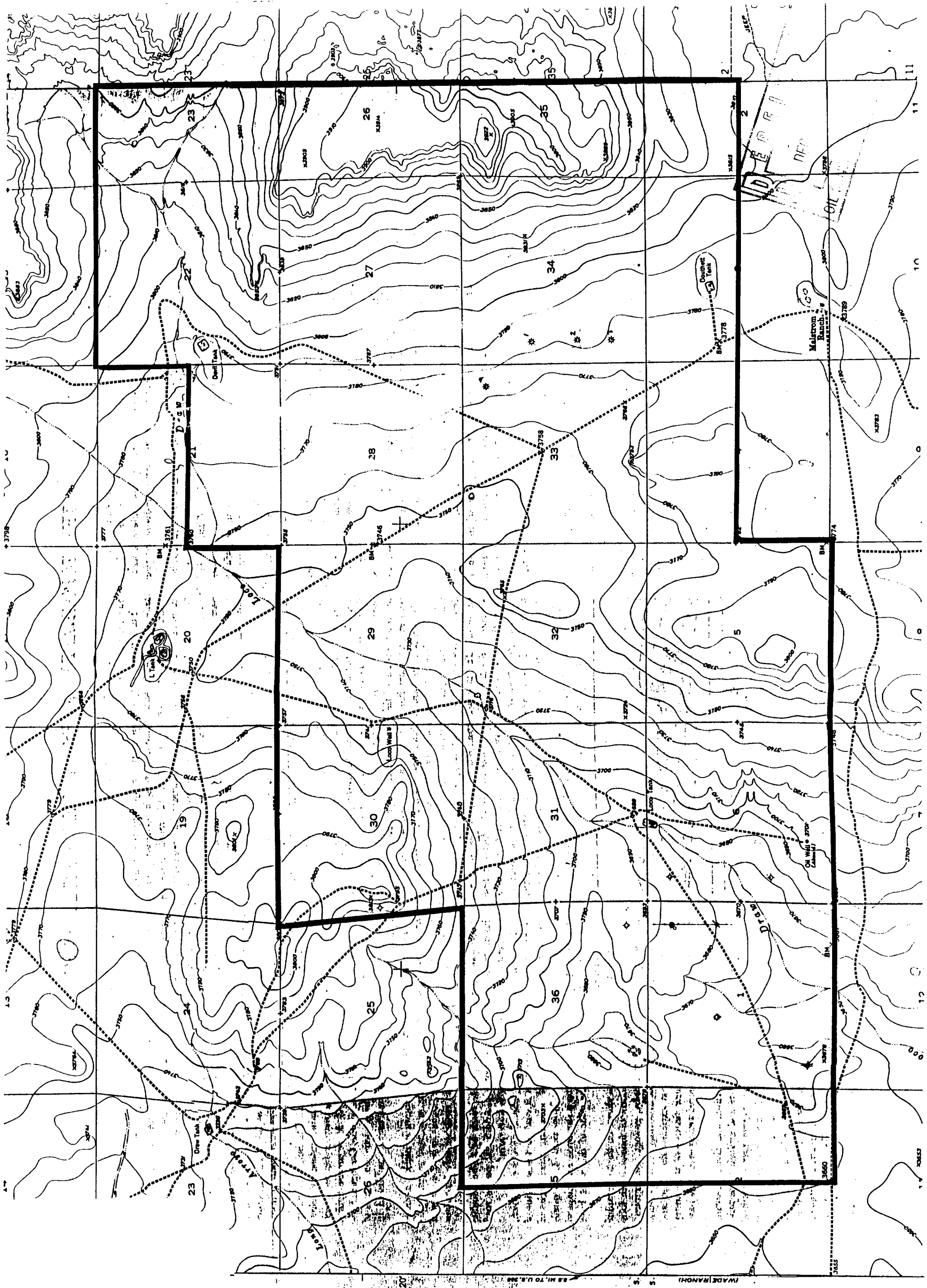
The above data meets all the guidelines as proposed in the regulation for tight formation designation.

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Case No: 10617

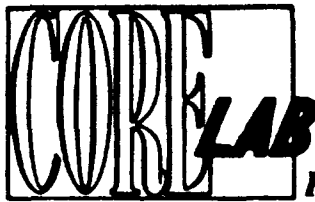
Note to File: Joel Cannon
visited me in my office about
the proposed hearing in the
matter. I advised him with a
copy of the TF plea brochure and
a copy of the oil field rules.

M.S.



(WADE RANCH)
T. 11 S.
T. 12 S.

CORE LABORATORIES, INC.



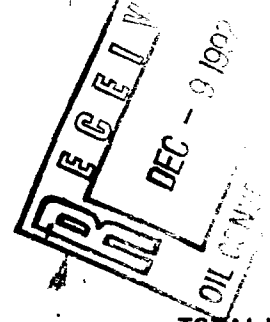
Petroleum Reservoir Engineering

COMPANY TOM L. INGRAM FIELD WILDCAT FILE 3102-10279
 WELL WHITE RANCH NO. 4 COUNTY LEA COUNTY DATE 4-25-77
 LOCATION 660 FNS&EL SEC 23 T11S R29E STATE NEW MEXICO ELEV. 3490 GL

CORE-GAMMA CORRELATION

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representation as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or land in connection with which such report is used or relied upon.

VERTICAL SCALE: 5" = 100'
 WHOLE CORE ANALYSIS



TOTAL WATER 0000
 PERCENT PORE SPACE

80 60 40 20 0

GAMMA RAY
 RADIATION INCREASE
 →

PERMEABILITY
 MILLIDARCYS

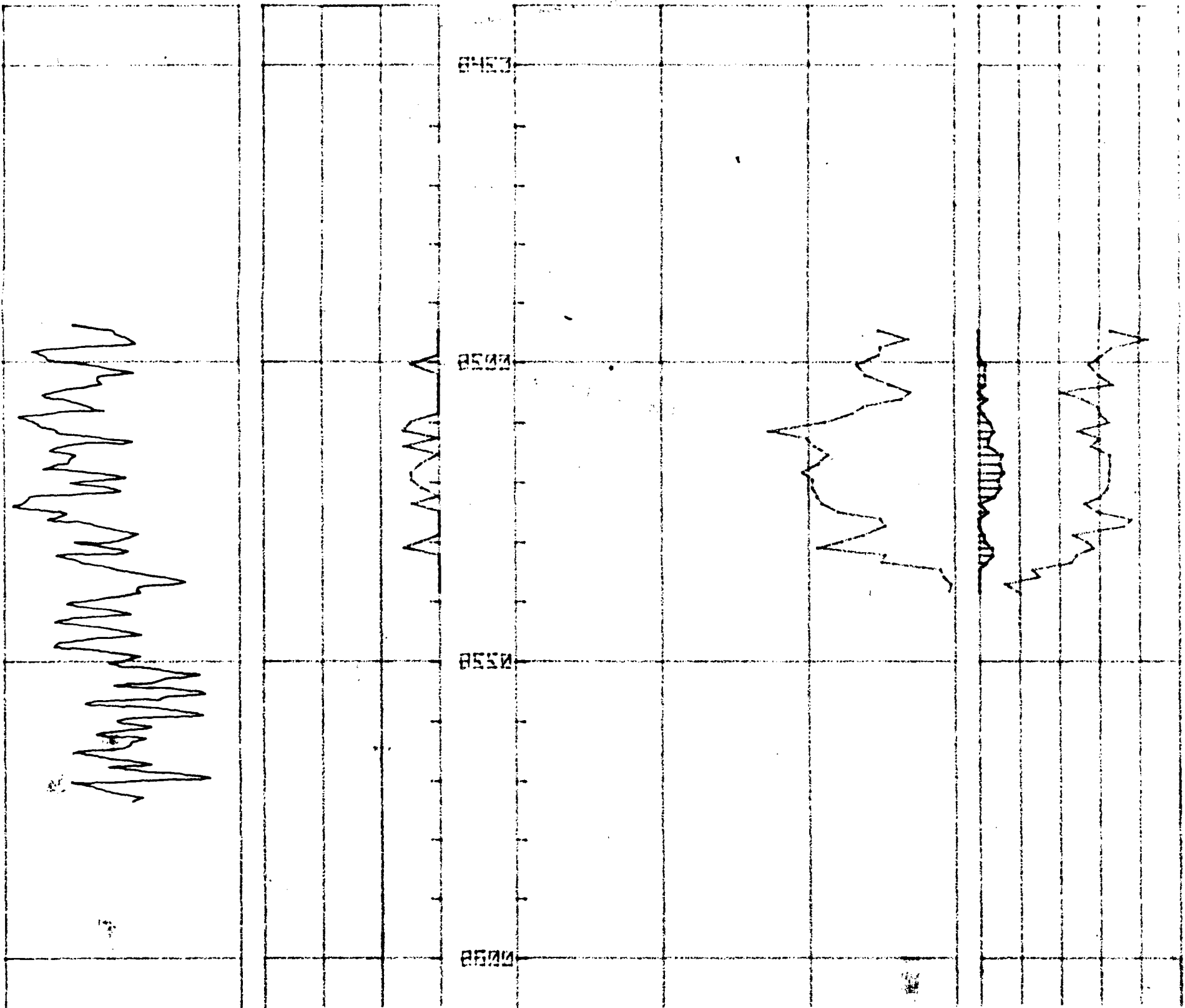
100.0 10.0 1.0 0.1

POROSITY
 PERCENT

30 20 10

OIL SATURATION XXXX
 PERCENT PORE SPACE

0 0 20 40 60 80



WM L. INGRAM
HITE RANCH NO. 4
ILOCAT
EA COUNTY, NEW MEXICO

DATE: 4-25-77
FORMATION: MIS-SIPPIAN
DRLG. FLUID: WATER BASE MUD
LOCATION: 600 FN&EL SEC 29

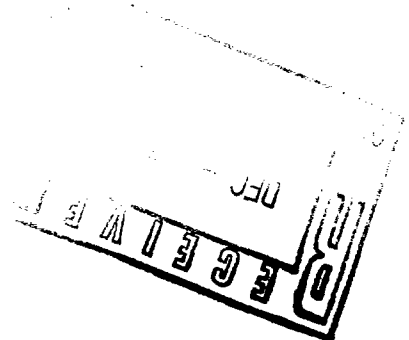
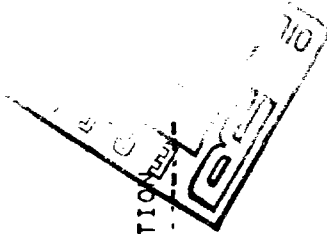
FILE NO: J102-10279
ENGINEER: NEFF
ELEVATION: 3790 GL

T11S R29E

33

* INDICATES PLUG PERM S INDICATES PRESERVED SAMPLE

W.P. C.	DEPTH	PERM. TO AIR MD. MAXIMUM 90 DEG	VERT.	POROSITY GEX, FLD.	FLUID SATS. OIL WTR.	GR. DEN.	DESCRIPTION
WHOLE CORE ANALYSIS							
1	8494.0-95.4	<0.1	<0.1	5.2	0.0	34.3	LM, STY
2	8495.4-96.9	<0.1	<0.1	3.1	0.0	15.0	LM, STY
3	8496.9-98.2	<0.1	<0.1	5.0	0.0	35.3	LM
4	8498.2-99.5	<0.1	<0.1	5.1	0.0	38.2	LM, STY
5	8499.5-01.3	0.3	<0.1	6.6	3.2	44.8	LM, FRAC
6	8501.3-03.0	<0.1	<0.1	6.1	2.8	40.2	LM
7	8503.0-04.4	<0.1	<0.1	4.5	3.1	32.3	LM
8	8504.4-05.4	<0.1	<0.1	3.0	0.0	59.3	LM, STY
9	8505.4-06.7	<0.1	<0.1	3.5	4.2	48.3	LM, STY
10	8506.7-08.0	0.1	<0.1	6.2	0.0	40.6	LM, STY
11	8508.0-09.0	<0.1	<0.1	6.9	2.3	39.4	LM, STY
12	8509.0-10.8	0.3	0.2	8.8	5.5	34.5	LM, STY
13	8510.8-12.0	0.4	0.3	12.7	7.6	51.2	LM
14	8512.0-13.2	0.1	0.1	10.1	5.0	39.5	LM
15	8513.2-14.6	0.4	0.3	9.6	4.6	44.2	LM, SL/FRAC
16	8514.6-16.1	0.1	0.1	8.6	11.4	34.8	LM
17	8516.1-17.6	0.2	0.1	9.3	10.1	34.5	LM
18	8517.6-19.0	0.3	0.2	10.4	12.3	34.9	LM, SL/FRAC
19	8519.0-20.1	0.3	0.1	9.7	9.3	34.9	LM
20	8520.1-21.6	0.2	0.1	9.7	10.6	35.6	LM
21	8521.6-23.0	0.1	0.1	9.4	7.8	38.8	LM
22	8523.0-24.1	0.3	0.3	9.1	0.0	47.9	LM
23	8524.1-25.6	0.1	<0.1	8.0	4.4	41.3	LM, SL/FRAC
24	8525.6-26.6	<0.1	<0.1	5.1	0.0	23.7	LM
25	8526.6-28.1	<0.1	<0.1	4.7	0.0	27.4	LM
26	8528.1-29.4	<0.1	<0.1	6.2	2.3	53.6	LM, VERTFRAC
27	8529.4-30.4	0.2	0.1	7.7	2.7	46.2	LM, VERTFRAC, STY
28	8530.4-31.5	0.4	0.3	9.4	6.5	42.5	LM, CHTY, VERTFRAC
29	8531.5-32.8	<0.1	<0.1	4.7	6.7	51.3	LM, CHTY
30	8532.8-34.0	<0.1	<0.1	5.0	3.6	53.6	LM, CHTY
31	8534.0-35.2	<0.1	<0.1	1.0	0.0	73.9	LM, SHY, STY
32	8535.2-36.5	<0.1	<0.1	0.8	0.0	70.0	LM, SHY, STY
33	8536.5-37.5	<0.1	<0.1	0.3	0.0	87.5	LM, SHY, CHTY, STY
34	8537.5-39.0	<0.1	<0.1	0.4	0.0	81.8	LM, SHY, STY
	8539.0-73.0						LM, SHY



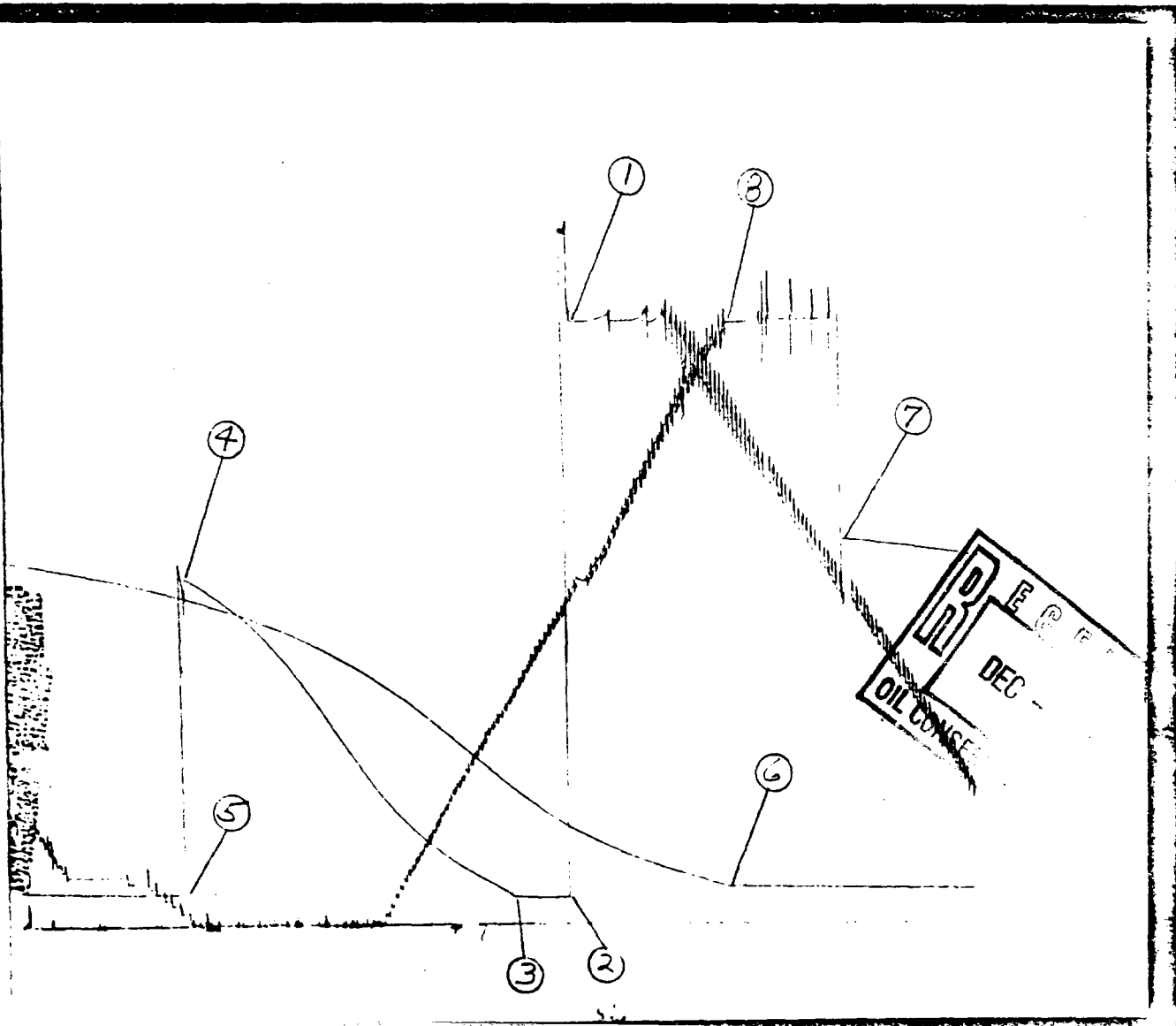
FIELD REPORT NO.: 05726 D

INSTRUMENT NO.: J-376

CAPACITY: 6400#

NO. OF REPORTS: 5-

PRESSURE DATA FROM THIS CHART IS PRESENTED ON NEXT PAGE



BOTTOM HOLE PRESSURE AND TIME DATA



INSTRUMENT NO.: J-376

CAPACITY(P.S.I.): 6400

DEPTH: 8567 FT.

PORT OPENING: OUTSIDE

BOTTOM HOLE TEMP.: 150

PAGE 1 OF 4

DESCRIPTION	LABELED POINTS	PRESSURE (P.S.I.)	GIVEN TIME	COMPUTED TIME
INITIAL HYDROSTATIC MUD	1	4407.6		
INITIAL FLOW(1)	2	215.9		
INITIAL FLOW(2)	3	219.7	15	15
INITIAL SHUT-IN	4	2544.9	90	91
FINAL FLOW(1)	5	248.9		
FINAL FLOW(2)	6	280.7	120	121
FINAL SHUT-IN	7	2804.1	241	240
FINAL HYDROSTATIC MUD	8	4394.9		

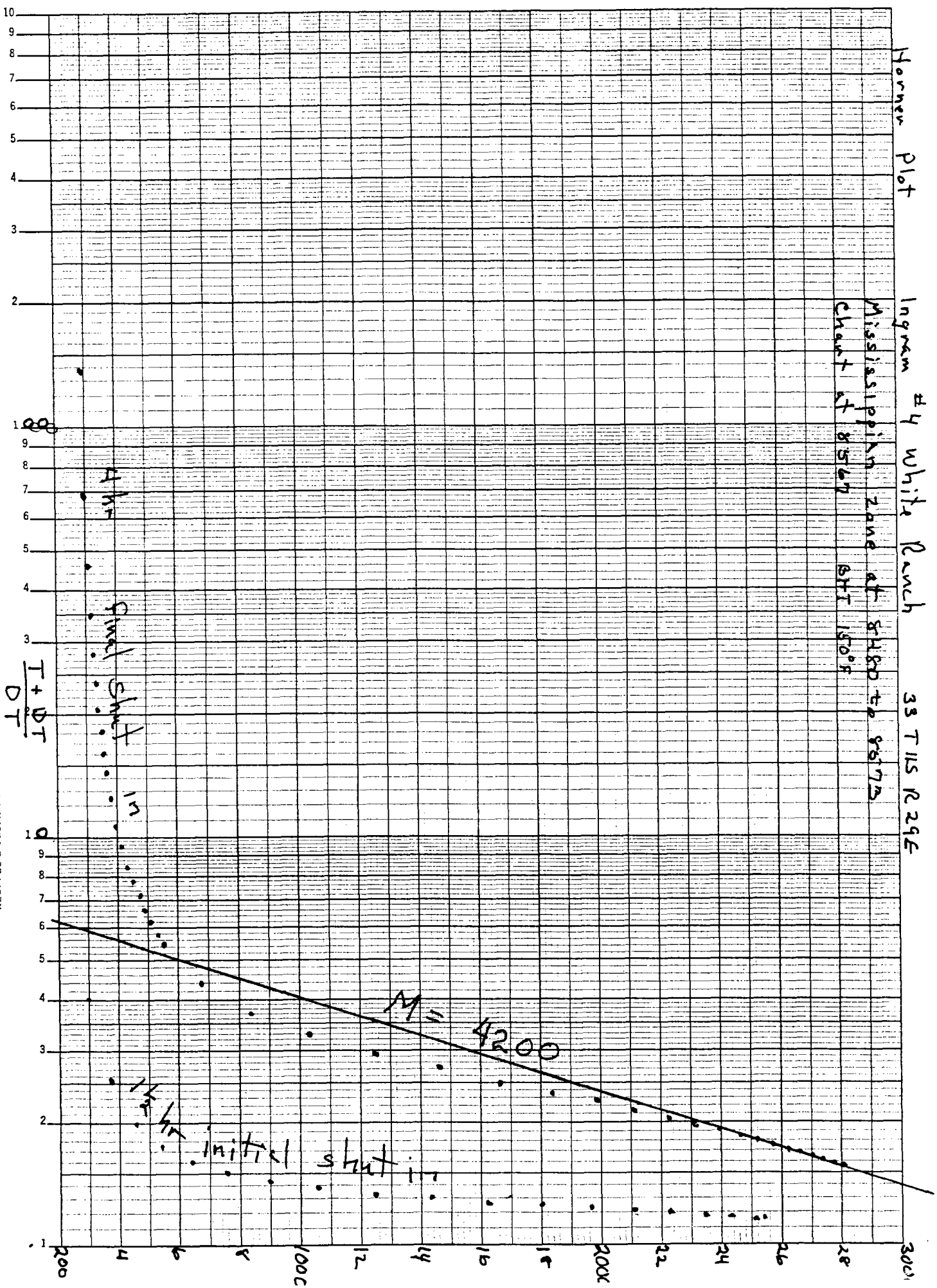
INCREMENTAL READINGS

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
1		4407.6				HYDROSTATIC MUD
2	0	215.9				INITIAL FLOW(1)
	1	215.9				
	2	215.9				
	3	215.9				
	4	213.3				
	5	213.3				
	6	213.3				
	7	214.6				
	8	214.6				
	9	214.6				
	10	215.9				
	12	217.1				
	14	219.7				
3	15	219.7				INITIAL FLOW(2)
3	0	219.7				STARTED SHUT-IN
	5	298.4	4.000	0.602	78.8	
	10	370.9	2.500	0.398	151.2	
	15	452.2	2.000	0.301	232.5	
	20	541.1	1.750	0.243	321.5	
	25	641.5	1.600	0.204	421.8	
	30	759.7	1.500	0.176	540.0	
	35	899.4	1.429	0.155	679.8	
	40	1060.8	1.375	0.138	841.1	
	45	1241.2	1.333	0.125	1021.6	
	50	1433.1	1.300	0.114	1213.4	
	55	1622.4	1.273	0.105	1402.7	
	60	1801.6	1.250	0.097	1581.9	
	65	1965.5	1.231	0.090	1745.8	
	70	2110.3	1.214	0.084	1890.7	
	75	2234.8	1.200	0.079	2015.2	
	80	2344.1	1.188	0.075	2124.4	
	85	2438.1	1.176	0.071	2218.5	
	90	2520.7	1.167	0.067	2301.1	
4	91	2544.9	1.165	0.066	2325.2	INITIAL SHUT-IN

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
5	0	248.9				FINAL FLOW(1)
	1	246.3				
	2	246.3				
	3	246.3				
	4	245.1				
	5	245.1				
	6	245.1				
	7	245.1				
	8	245.1				
	9	245.1				
	10	245.1				
	12	245.1				
	14	243.8				
	16	243.8				
	18	243.8				
	20	243.8				
	22	245.1				
	24	246.3				
	26	246.3				
	28	246.3				
	30	247.6				
	32	247.6				
	34	247.6				
	36	248.9				
	38	248.9				
	40	250.2				
	42	250.2				
	44	250.2				
	46	251.4				
	48	252.7				
	50	252.7				
	52	252.7				
	54	254.0				
	56	255.2				
	58	256.5				
	60	257.8				
	62	257.8				
	64	259.1				
	66	259.1				
	68	260.3				
	70	261.6				
	72	262.9				
	74	262.9				
	76	264.1				
	78	264.1				
	80	265.4				
	82	266.7				
	84	266.7				
	86	267.9				
	88	267.9				
	90	269.2				
	92	269.2				
	94	270.5				

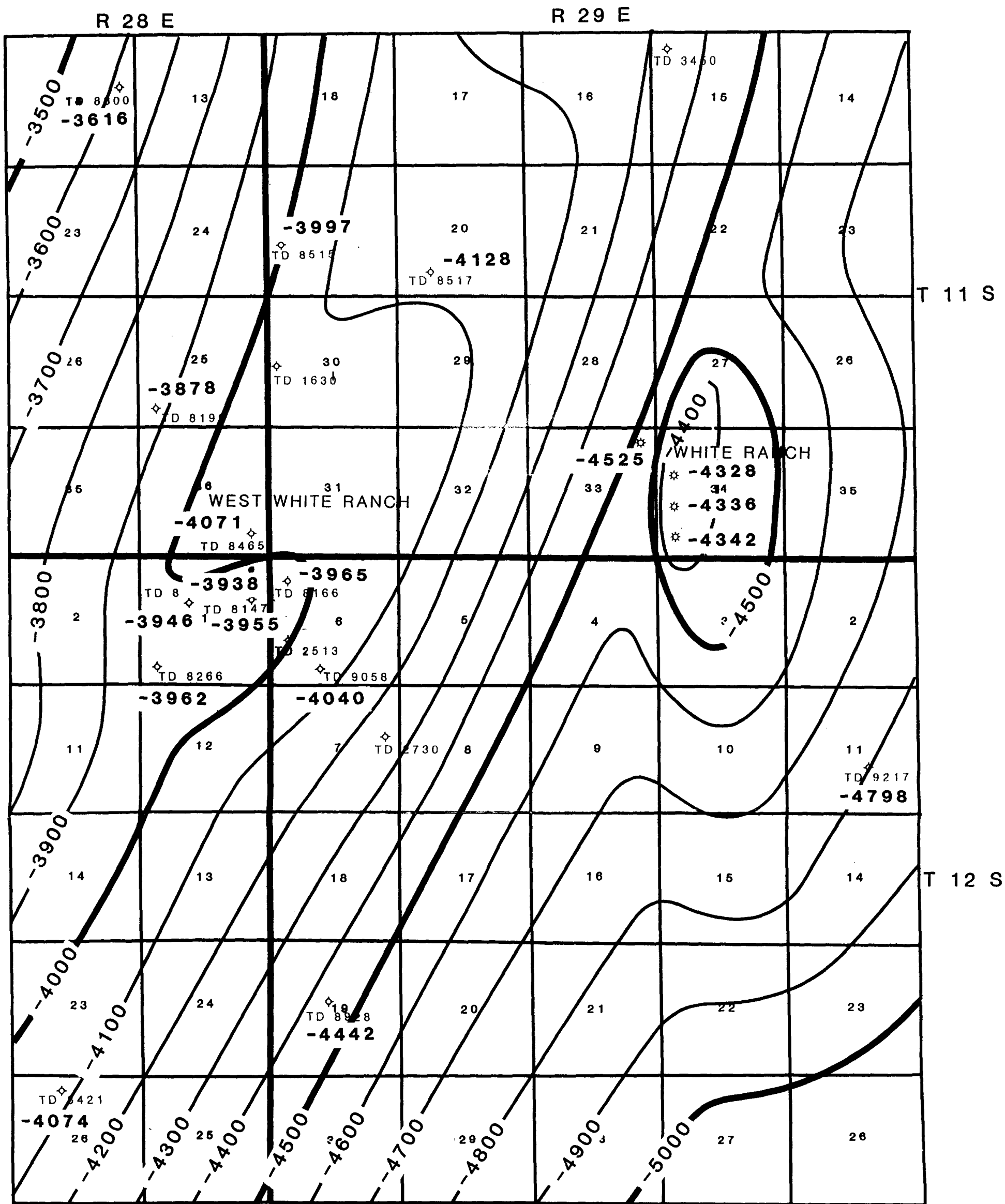
LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	96	271.8				
	98	271.8				
	100	273.0				
	102	273.0				
	104	274.3				
	106	274.3				
	108	275.6				
	110	276.8				
	112	276.8				
	114	278.1				
	116	279.4				
	118	279.4				
	120	280.7				
6	121	280.7				FINAL FLOW(2) STARTED SHUT-IN
6	0	280.7				
	1	290.8	137.000	2.137	10.2	
	2	299.7	69.000	1.839	19.1	
	3	307.3	46.333	1.666	26.7	
	4	315.0	35.000	1.544	34.3	
	5	323.9	28.200	1.450	43.2	
	6	331.5	23.667	1.374	50.8	
	7	339.1	20.429	1.310	58.4	
	8	346.7	18.000	1.255	66.1	
	9	355.6	16.111	1.207	75.0	
	10	363.2	14.600	1.164	82.6	
	12	379.8	12.333	1.091	99.1	
	14	396.3	10.714	1.030	115.6	
	16	414.1	9.500	0.978	133.4	
	18	431.9	8.556	0.932	151.2	
	20	450.9	7.800	0.892	170.3	
	22	470.0	7.182	0.856	189.3	
	24	489.0	6.667	0.824	208.4	
	26	510.6	6.231	0.795	230.0	
	28	531.0	5.857	0.768	250.3	
	30	553.8	5.533	0.743	273.2	
	40	678.4	4.400	0.643	397.7	
	50	838.4	3.720	0.571	557.8	
	60	1032.9	3.267	0.514	752.2	
	70	1247.6	2.943	0.469	966.9	
	80	1463.6	2.700	0.431	1182.9	
	90	1663.1	2.511	0.400	1382.4	
	100	1838.4	2.360	0.373	1557.8	
	110	1989.6	2.236	0.350	1709.0	
	120	2116.7	2.133	0.329	1836.0	
	130	2224.7	2.046	0.311	1944.0	
	140	2314.9	1.971	0.295	2034.2	
	150	2394.9	1.907	0.280	2114.3	
	160	2463.5	1.850	0.267	2182.9	
	170	2523.3	1.800	0.255	2242.6	
	180	2576.6	1.756	0.244	2296.0	
	190	2623.6	1.716	0.234	2343.0	
	200	2665.6	1.680	0.225	2384.9	
	210	2703.7	1.648	0.217	2423.0	

LABEL POINT	DELTA TIME	PRESSURE (P.S.I.)	T + DT/DT	LOG	PW - PF (P.S.I.)	COMMENTS
	220	2740.5	1.618	0.209	2459.9	
	230	2773.6	1.591	0.202	2492.9	
7	240	2804.1	1.567	0.195	2523.4	FINAL SHUT-IN
8		4394.9				HYDROSTATIC MUD



Horner Plot
 Ingram #4 White Ranch
 33 T115 R29E

Mississippi zone at 8480 to 8872
 Chart at 8567 DTI 150°F

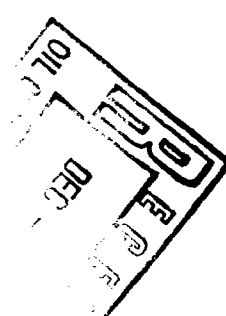


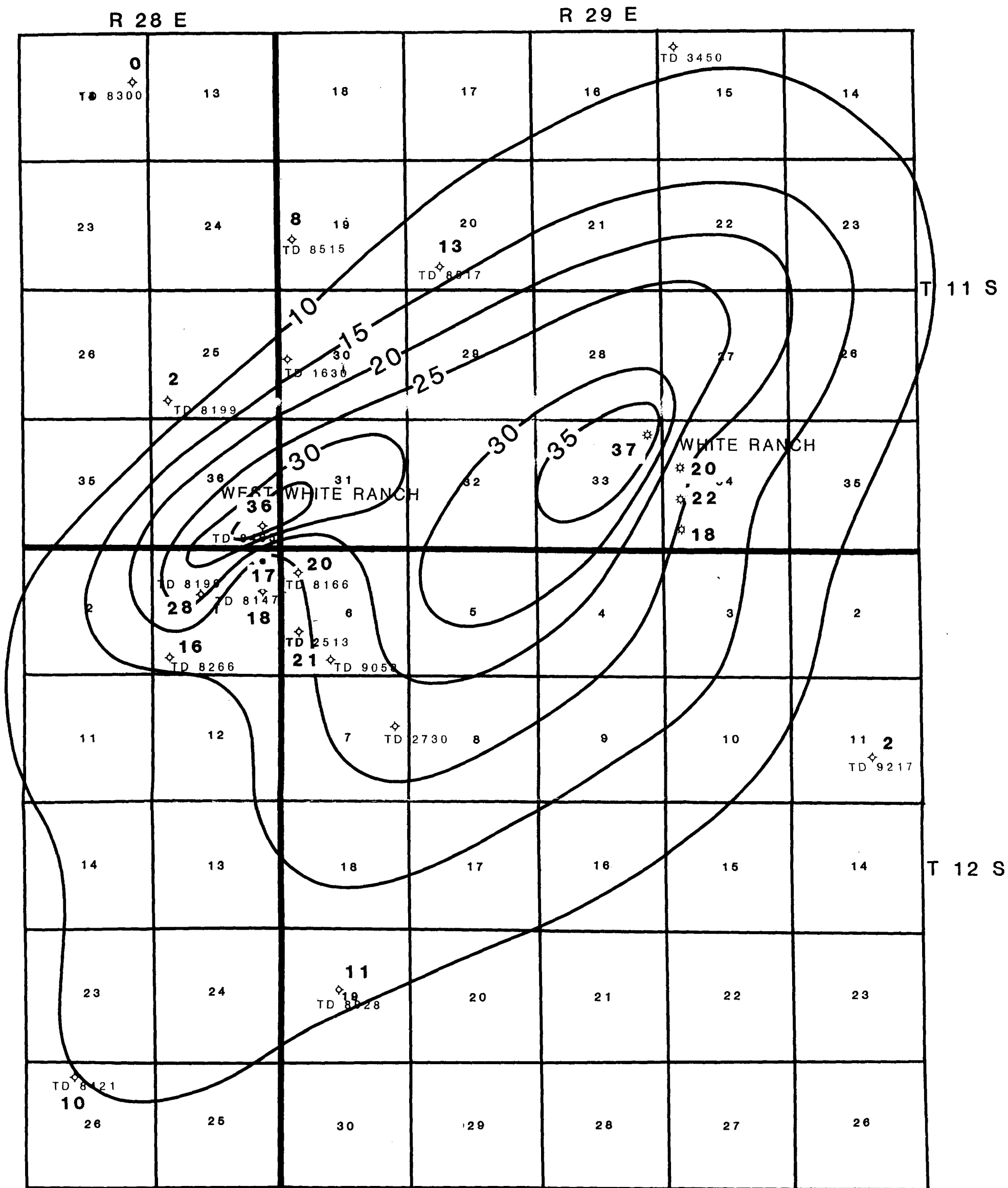
PROPOSED TIGHT FORMATION DESIGNATION UNDER SECTION 107
OF THE NGPA OF 1978, Amended March 31, 1992

WHITE RANCH AREA CHAVES CO. N.M.

Structure, Mississippian Lime

C.I. 100'





**PROPOSED TIGHT FORMATION DESIGNATION UNDER SECTION 107
OF THE NGPA OF 1978, Amended March 31, 1992**

WHITE RANCH AREA CHAVES CO. N.M.

Isopach, Mississippian Lime Porosity Greater Than 5%

C.I. 5