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April 6, 1992

William J. LeMay, Director
Oil Conservation Division
New Mexico Department of Energy, Minerals
and Natural Resources
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Re: Tight Formation Determination
New Mexico - 37
Mississippian Formation
FERC No. JD93-04112I

Dear Mr. LeMay,

In response to FERC's letter dated March 19, 1993, we submit the following information and comments. This information should complete the subject application.

A computer run was made to estimate the etched frac length and production increase expected from a moderate sized acid stimulation treatment. The model uses a gross interval of 40 feet with net pay of 30 feet, 150 gallons per foot of frac height. The model indicates an etched frac length of 130 feet and a production increase of 3.28 folds. Thus, an acid treatment of only 150 gallons per foot results in a stimulated well. A copy of the computer run is enclosed for your review.

This type of stimulation treatment is reflected in the production characteristics of this zone as depicted in the production decline curve. The response of a tight formation to stimulation would be high initial production rates decreasing at a high decline rate until the pressure transient introduced by flow reaches the well drainage radius. Before flow stabilization, the observed stimulation ratio will exceed the stabilized ratio by a factor of 4 to 6. The stabilization time indicated by the decline curves on the White Ranch # 1, 2, 3 and 4, is approximately one year.

The White Ranch wells # 1, 2 and 3 were drilled in 1953 and 1954 as Devonian producers. The Mississippian formation was Drill Stem Tested in the # 1 well, indicating a flow rate of 35 MCFGD. Because, these wells were drilled 40 years ago and have changed hands many times, the well files have been lost and this DST is not available for review. But, because this is a limestone formation and is not easily damaged by fluids, the assumption is made that this is true natural flow capacity of this well.

The # 4 well was drilled as a Mississippian test and the Producing interval was drill stem tested. The test recovered gas cut drilling fluid with a show of condensate. No measurable gas rate was observed. The test does indicate a formation with approximately .1 md permeability and no damage. A copy of the entire report is attached for your review.

As can be seen in the DST report the assumed fluid viscosity is 1 cp, if a lower viscosity is used a lower permeability would be calculated. The .1 md calculated from the DST agrees closely with the average relative permeability obtained from the core analysis of this interval of .0755 md.

Therefore, we believe the DSTs on the #1 and #4 wells reflect an unstimulated flow rate from this formation and the before stimulation rate on the Williamson White Ranch #1 well, recently completed in this interval is characteristic of the unstimulated production capacity of this formation. A BHP build-up, on the Williamson White Ranch #1, prior to stimulation, was not possible because of the slow build-up and large wellbore storage. A copy of the 4 point test and post stimulation build-up on the Williamson White Ranch #1, is attached for your review.

The BHP build up performed on the West White Ranch # 1 (Williamson White Ranch # 1) indicates a formation with low permeability. The slope of the build up curve is 6,509,000 PSI^2/cycle and a calculated permeability is .08 md. The production rate used in the Horner analysis is not a semi-steady state flow rate and the actual rate would be less, resulting in a lower calculated permeability. A copy of the test and Horner analysis are attached for your review.

Exhibit #17 is a summary of the maximum daily producing rates after the wells were put on production. The maximum monthly volume reported to the State was divided by the number of producing days in the month to obtain a daily volume. This value was exhibited to show that the wells had low production rates even after stimulation. These rates differ from the CAOF rate because the wells are producing against line pressure and the "flush" production rates decline rapidly. A CAOF rate could be calculated using this production rate as a one point test and assuming the well was producing at line pressure of 300 to 400 PSI.

If you require additional information concerning this area please let me know.

Sincerely,

Bruce A. Stubbs, P.E.

xc: Joel Carson
C.W. Trainer
Jack Ahlen

MISSISSIPPIAN WELL COMPLETION DATA

WELL NAME	ORIGINAL COMPLETION DATE	MISSISSIPPIAN COMPLETION DATE	MISSISSIPPIAN CALCULATED ABSOLUTE OPEN FLOW (CAOF) - MCFGD	STIMULATION
WHITE RANCH #1	4-7-53 (DEVONIAN)	3-19-77	3215 8320'-49', 29' Hg	6000 GALS. ACID.
WHITE RANCH #2	7-17-53 (DEVONIAN)	5-2-64	2069 8302'-10', 8320'-28', 8332'-44', 42' Hg	5000 GALS. ACID AND FRAC WITH 15,000 GALS. AND 29,000 LBS. SAND.
WHITE RANCH #3	1-25-54 (DEVONIAN)	3-4-80	560 8340'-60', 8365'-70', 30' Hg	2500 GALS. ACID WITH NITROGEN.
WHITE RANCH #4	8-19-77 (MISS.)	8-19-77	2073 8502'-06', 8510'-13', 8518'-24', 8528'-35', 33' Hg	6000 GALS. ACID AND FRAC WITH 25,000 GALS. 7 1/2 % ACID WITH 36,000 LBS. 20-40 SAND AND 4,000 LBS. 100 MESH SAND.

ADP
Halliburton Services' Acidizing Design Program

CW Trainor
Chaves County

Fracture Acidizing Design for Conventional Treatment

Well and Formation Data

Tubing ID	2.00	in.
Tubing OD	2.37	in.
Casing ID	4.90	in.
Casing OD	5.50	in.
Depth	8300.	ft
Formation temperature	145.	F
Formation thickness	30.	ft
Gross height	40.	ft
Modulus of elasticity	6.00E+06	psi
Well spacing	160.	acres
Drainage radius	1320.	ft
Reservoir pressure	2000.	psi
Closure pressure	5000.	psi
Reservoir fluid viscosity	0.20	cp
Reservoir fluid compressibility	2.50E-05	1/psi
Porosity	5.0	percent
Initial permeability	0.10	md

ADP
Halliburton Services' Acidizing Design Program

CW Trainor
Chaves County

Treating Information
==========

Treatment Down Tubing
Acid type----15% NeFe

HCl concentration.....	15.0	percent
Activation energy.....	15.6	kCal/GMol
Reaction rate constant	8.47E-04	at 145.F
Order of reaction.....	0.23	
Bottom hole treating pressure.....	7000.	psi
Acid temperature.....	60.00	F
Average injection rate.....	4.00	bpm
Damage ratio.....	1.00	

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Halliburton Services' Acidizing Design Program

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Chaves County

Fluid Data

	N'	K'	Cw (pay)	Viscosity At Avg Width	Cw (non-pay)
Plain Acid	1.00	0.000033	0.0010	1.6	0.00010

K' - lb-sec**N'/sqft
Cw - ft/sqrt(min)
Viscosity - cp

Treatment Schedule

6000. Gallons of Plain HCl

Kristianovich-Zheltov Geometry Profile

Stages	Created Width (in)	Created Length (ft)	Leading Edges Preflush (ft)	Leading Edges Gel (ft)	Leading Edges Acid (ft)	Leading Edges Overflush (ft)	Fingering (%)
Acid	0.11	501.					

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Halliburton Services' Acidizing Design Program

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Etching Pattern

Distance (ft)	Temperature (F)	Etched Width (in)	Flow Capacity (Darcy-ft)	Acid Conc (%)
0.	93.	0.400	13.32	14.41
20.	110.	0.222	3.11	10.19
40.	122.	0.136	1.30	6.84
60.	130.	0.098	0.42	4.45
80.	135.	0.060	0.12	2.89
100.	139.	0.034	0.03	1.89
120.	141.	0.014	0.00	1.24
130.	142.	0.004	0.00	1.00

Temperature Profile After Acid Stages

Distance (ft)	Center Temperature (F)	Wall Temperature (F)	Acid Conc (%)
0.	93.	98.	14.41
20.	110.	120.	10.19
40.	122.	129.	6.84
60.	130.	135.	4.45
80.	135.	138.	2.89
100.	139.	141.	1.89
120.	141.	143.	1.24
130.	142.	143.	1.00

ADP
Halliburton Services' Acidizing Design Program

CW Trainor
Chaves County

Summary Of Results

Total volume pumped	6000.	(gal)
Created maximum fracture width	0.11	(in)
Created fracture length(half wing)	501.	(ft)
Fluid efficiency	45.5	(%)
Acid penetration	501.	(ft)
Live acid distance	130.	(ft)
Etched length	130.	(ft)
Rock dissolved	8254.	(lb)
Rock dissolving efficiency	75.	(%)
Production increase	3.28	

The above report is based on sound engineering practices, but because of variable well conditions and other information which must be relied upon, Halliburton makes no warranty, express or implied, as to the accuracy of the data or of any calculations or opinions expressed herein. You agree that Halliburton shall not be liable for any loss or damage whether due to negligence or otherwise arising out of or in connection with such data calculations or opinions.

JOHNSTON

Schlumberger

computerized data analysis

F. R. #05726 D

COMPANY TOM L. INGRAM WELL WHITE RANCH #4 TEST NO. 4 COUNTY CHAVES STATE NEW MEXICO

JOHNSTON
Schlumberger

COMPUTERIZED DATA ANALYSIS

MAY 6, 1977

GENTLEMEN:

THE ENCLOSED TEST APPEARS TO BE A GOOD MECHANICAL DRILL STEM TEST DURING WHICH THE TOOLS DID FUNCTION PROPERLY. THE FORMATION PRODUCED ENOUGH RESERVOIR FLUID FOR PROPER IDENTIFICATION. RESERVOIR PRESSURE DRAWDOWN WAS SUFFICIENT BUT ADEQUATE SHUT-IN BUILD-UPS DID NOT OCCUR FOR RELIABLE QUANTITATIVE ANALYSIS BY THE HORNER METHOD. AFTERFLOW WAS STILL IN EFFECT ON THE INITIAL AND FINAL SHUT-IN BUILD-UPS TO THE EXTENT THAT THE PLOTS ARE CONSIDERED UNRELIABLE FOR EXTRAPOLATING MAXIMUM RESERVOIR PRESSURE. THE MCKINLEY METHOD WAS USED TO CALCULATE RESERVOIR PARAMETERS.

1. FLOW RATE: A FLOW RATE OF 26 BBLS./DAY OF LIQUID WAS NOTED DURING THIS TEST.

2. RESERVOIR PRESSURE: A MAXIMUM RESERVOIR PRESSURE OF 3425 P.S.I.G. AT RECORDER DEPTH WAS ESTIMATED FOR THIS ANALYSIS.

3. PERMEABILITY: THE CALCULATED TRANSMISSIBILITY FACTOR OF 4.22 MD.-FT./CP. INDICATES AN AVERAGE EFFECTIVE PERMEABILITY TO LIQUID OF 0.11 MD. FOR THE REPORTED 40 FOOT NET INTERVAL. THE CALCULATIONS WERE BASED ON A MCKINLEY SLOPE OF 961 P.S.I./LOG CYCLE OBTAINED FROM THE FINAL SHUT-IN BUILD-UP PLOT. IT WAS ASSUMED FOR THESE CALCULATIONS THE PRODUCT OF THE LIQUID VISCOSITY AND FORMATION VOLUME FACTOR TO BE 1.0.

4. WELL BORE DAMAGE: THE CALCULATED DAMAGE RATIO OF 0.88 INDICATES THAT NO WELL BORE DAMAGE IS PRESENT AT THE TIME AND CONDITIONS OF THIS TEST.

5. RADIUS OF INVESTIGATION: THE CALCULATED RADIUS OF INVESTIGATION OF THIS TEST IS 31 FEET BASED ON AN ASSUMED POROSITY OF 8%, COMPRESSIBILITY OF 3.3×10^{-6}, AND OTHER ASSUMPTIONS MADE IN NUMBER 3 ABOVE.

6. GENERAL COMMENTS: THE FORMATION EXHIBITS THE CHARACTERISTICS OF RELATIVELY LOW PERMEABILITY EFFECTIVE TO THE RESERVOIR FLUID AND INDICATES THE ABSENCE OF WELL BORE DAMAGE. AS PREVIOUSLY NOTED, THE SHUT-IN TIMES WERE INSUFFICIENT AND THE STRAIGHT LINE PORTION OF THE HORNER PLOT HAD NOT BEEN REACHED. THE CONTOUR OF THE BUILD-UP CURVES AND THE VOLUME OF MUD PRODUCED ON THIS TEST SUGGESTS A TIGHT FORMATION.

Kent Arceneaux

KENT ARCENEAUX
RESERVOIR EVALUATION
DEPARTMENT

TOM L. INGRAM
WHITE RANCH #4; CHAVES COUNTY, NEW MEXICO
TEST #4; 8480' TO 8573'

FIELD REPORT # 05726 D

Reservoir Engineering Data

JOHNSTON

Recorder No. J-376 Field Report No. 05726 D

Damage Ratio	DR	0.88		Effective Transmissibility LIQUID	$\frac{Kh}{\mu B}$	4.22	$\frac{Md\text{-}ft.}{Cp.}$
Maximum Reservoir Pressure CALCULATED	P_o	3425	P.S.I.G.	Effective Transmissability	$\frac{Kh}{\mu B}$	-	$\frac{Md\text{-}ft.}{Cp.}$
Slope of Shut-in Curve CALCULATED	M	961	PSI/log cycle	Flow Rate LIQUID	Q	26	Bbl./day
Potentiometric Surface (Datum Plane, Sea Level)	PS	-	ft.	Pressure Gradient ESTIMATED		.400	PSI./ft.
Productivity Index	PI	0.008	Bbl./day/PSI	Gas Oil Ratio	GOR	-	CF/Bbl.
Radius of Investigation		31	ft.	K (Effective to LIQUID)		0.11	Md.

Assumptions made for Calculations for Liquid Recoveries

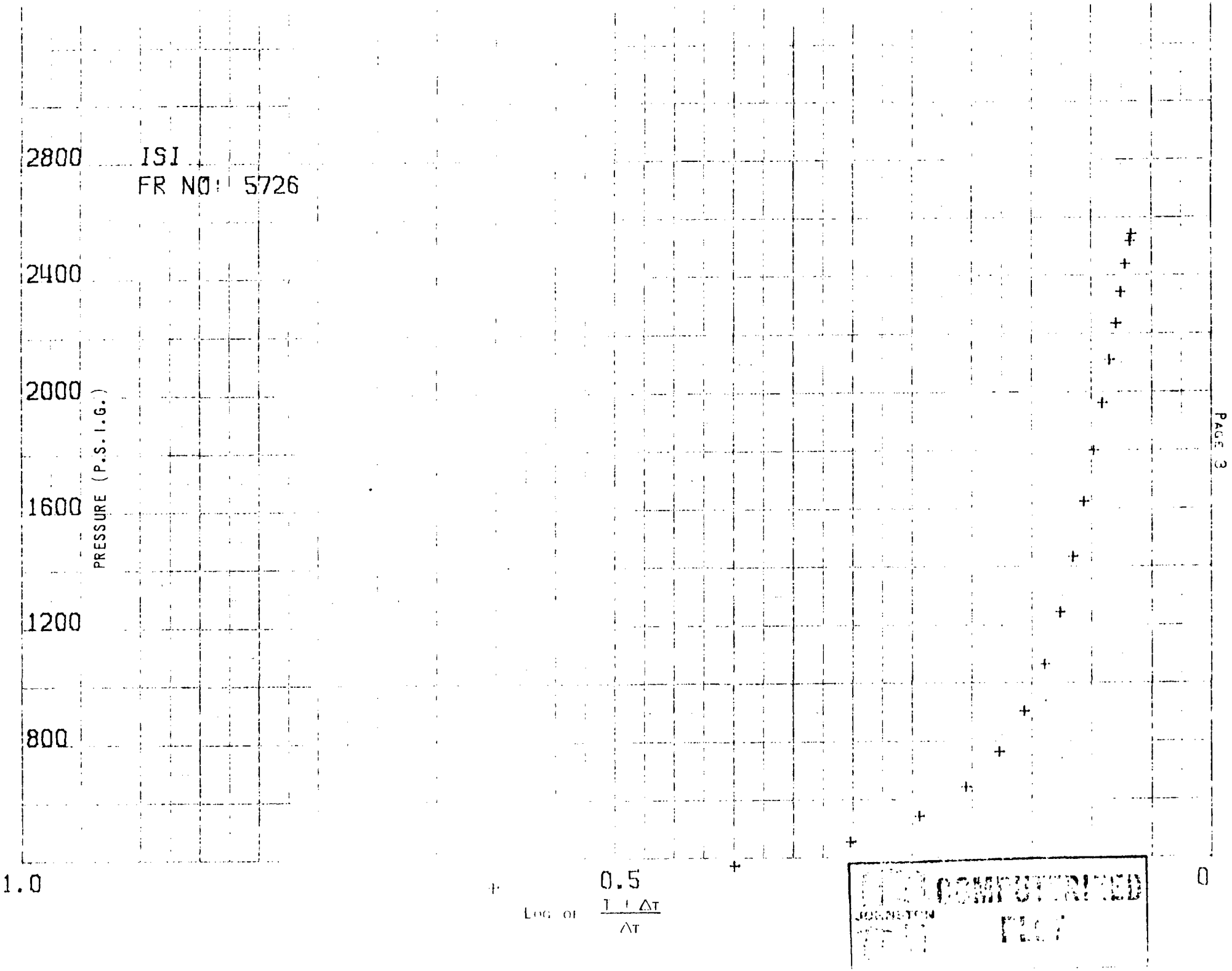
1. Q is averaged at a constant rate.
2. P_f is formation flowing pressure at a constant rate.
3. Formation flow is taken as single phase flow.
   If gas is produced at surface, phase separation is assumed to have occurred in drill pipe.
4. Radial flow is assumed.
5. For the purpose of calculating EDR where specific reservoir parameters are not available it is assumed that:

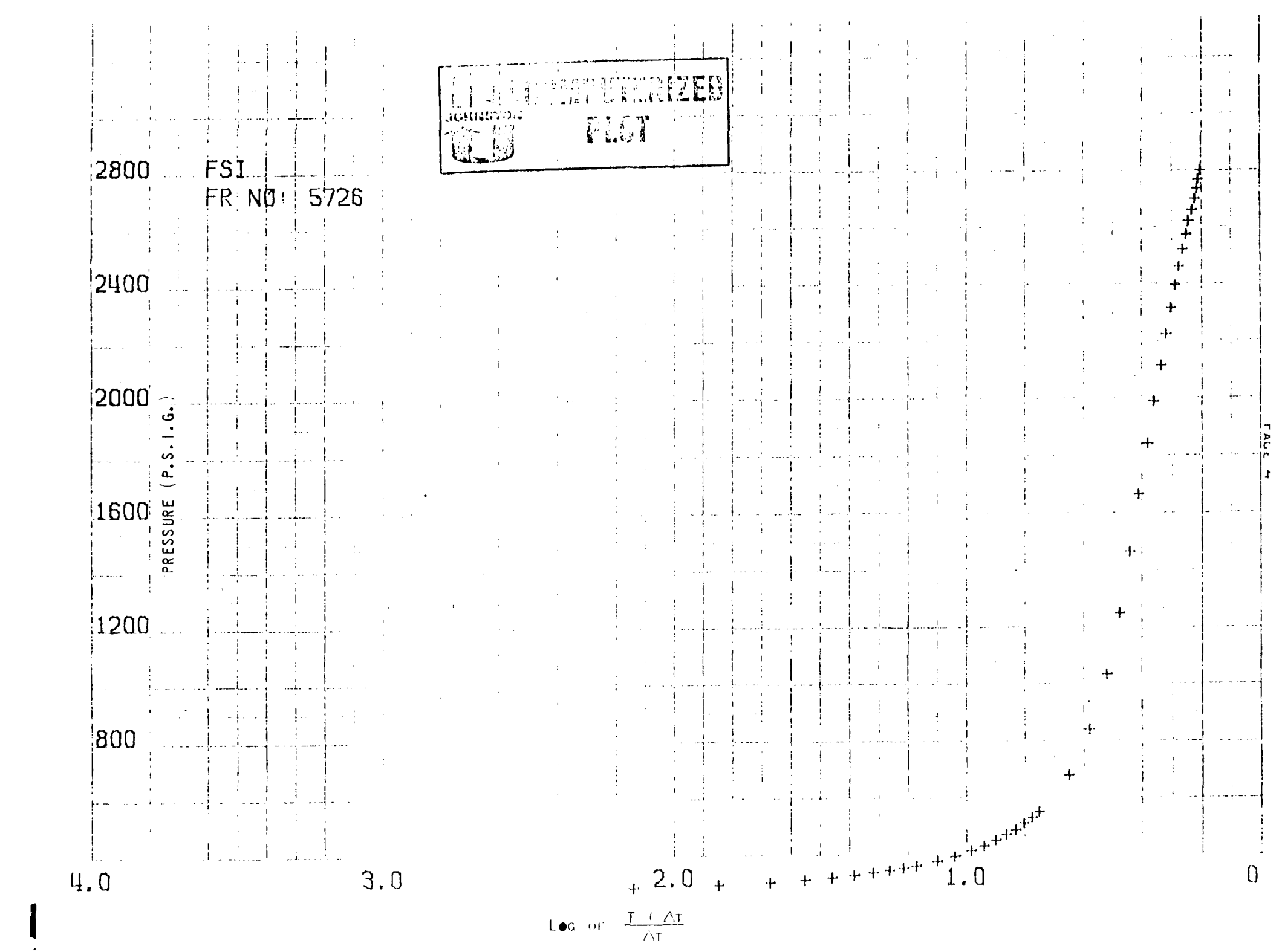
Effective permeability, K, will fall between	1 to 200 md
Formation porosity, ϕ, will fall between	0.1 to 0.3
Fluid compressibility, c, will fall between	10^{-4} to 10^{-5}
Fluid viscosity, μ, will fall between	0.05 to 50 cp.
Well bore radius, r_w, will fall between	$3'_8"$ to $4'_8"$
Which gives an average value for the function log $\frac{K}{\phi\mu c r_w^2}$ of	5.5

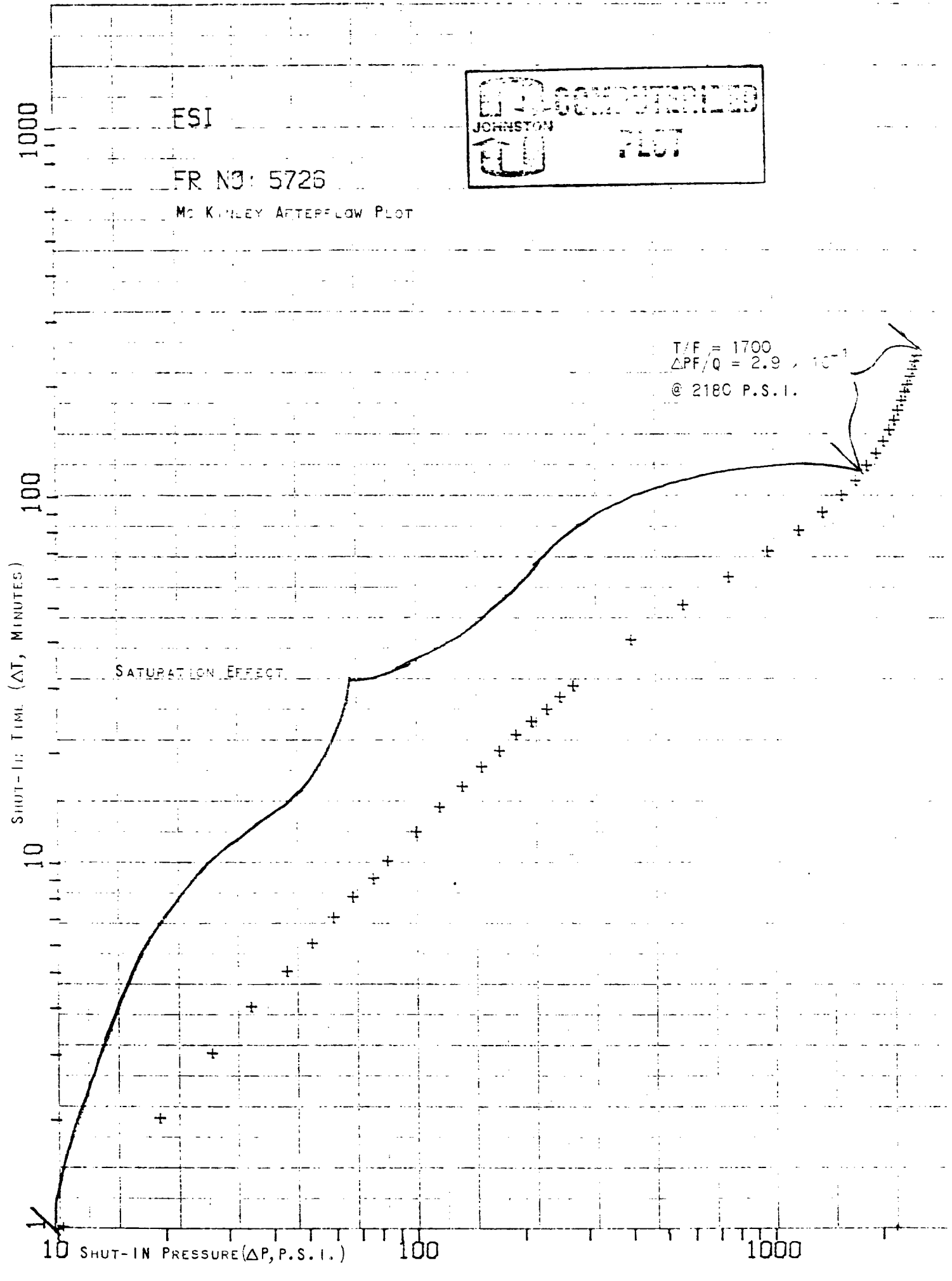
6. Other standard radial flow, equilibrium assumptions.

Empirical Equations:

1. $EDR = \frac{P_o - P_f}{M(\log T + 2.65)}$ where $M = \frac{P_1 - P_{10}}{\text{Log Cycle}}$
2. Transmissibility $\frac{Kh}{\mu\beta} = \frac{162.6\,Q}{M}$
3. DST J $\frac{Q}{P_o - P_f}$ Theoretical J $= \frac{7.08 \times 10^{-3}\,Kh}{\mu\beta \ln (r_e/r_w)}$ Assumed $\ln (r_e/r_w) = 7.60$
4. P.S. $= \left[P_o \times 2.309 \text{ ft./PSI}\right] - \left[\text{Recorder depth to sea level.}\right]$
5. Radius of investigation, $r_i = \sqrt{\frac{Kt}{40\phi\mu c}}$ where t = time in days




FSI
FR NO: 5726
2800
2400
2000
1600
1200
800
PRESSURE (P.S.I.G.)
4.0
3.0
2.0
1.0
0
Log of $\frac{T + \Delta T}{\Delta T}$


ESI
FR NO: 5726
MC KINLEY AFTERFLOW PLOT
COMPUTERIZED
JOHNSTON
PLOT
T/F = 1700
ΔPF/Q = 2.9 , 10⁻¹
@ 2180 P.S.I.
SATURATION EFFECT
SHUT-IN TIME (ΔT, MINUTES)
SHUT-IN PRESSURE (ΔP, P.S.I.)
1000
100
10
1
10
100
1000

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SURFACE INFORMATION

Description (Rate of Flow)	Time	Pressure (P.S.I.G.)	Surface Choke
Opened Tool (4-27-77)	2155	-	CLOSED
CLOSED FOR INITIAL SHUT-IN	2210	-	"
FINISHED SHUT-IN	2340	-	"
RE-OPENED TOOL	2343	-	"
(4-28-77)			
CLOSED FOR FINAL SHUT-IN	0143	-	"
FINISHED SHUT-IN	0544	-	-
PULLED PACKER LOOSE	0545	-	-

Cushion Type	Amount	Pressure	Bottom Choke
	-		Size 5/8"

MUD DATA

Mud Type: BRINE GEL & STARCH Wt.: 9.8
Viscosity: 41 Water Loss: 9.6 C.C.
Resist. of Mud: - @ - °F; of Filtrate: - @ - °F
Chloride Content: 63,000 PPM

EQUIPMENT & HOLE DATA

Type Test: M. F. E. OPEN HOLE
Formation Tested: MISSISSIPPIAN
Elevation: - Ft.
Net Productive Interval: 40 Ft.
Estimated Porosity: 8 %
All Depths Measured From: KELLY BUSHING
Total Depth: 8573 Ft.
Main Hole/Casing Size: 7 7/8"
Rat Hole/Liner Size: -
Drill Collar Length: 537' I.D. 2.25"
Drill Pipe Length: 7900' I.D. 3.826"
Packer Depth(s): 8474 & 8480 Ft.

MULTI-FLOW EVALUATOR FLUID SAMPLE DATA

Sampler Pressure: 250 P.S.I.G. at Surface
Recovery: Cu. Ft. Gas: -
cc. Oil: -
cc. Water: -
cc. Mud: 2240
Tot. Liquid cc.: 2240
Gravity: - °API @ - °F.
Gas/Oil Ratio: - cu. ft./bbl.

	RESISTIVITY	CHLORIDE CONTENT
Recovery Water	- @ - °F.	- ppm
Recovery Mud	- @ - °F.	
Recovery Mud Filtrate	- @ - °F.	- ppm
Mud Pit Sample	- @ - °F.	
Mud Pit Sample Filtrate	- @ - °F.	63,000 ppm

RECOVERY DESCRIPTION	FEET	BARRELS	% OIL	% WATER	% OTHERS	API GRAVITY	RESISTIVITY	CHL. PPM
SLIGHTLY GAS CUT MUD	500	2.45				@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	
						@ °F.	@ °F.	

Remarks: "TELEFLOW TEST SYSTEM"

Address: P. O. BOX 1757; ROSWELL, NEW MEXICO 88201

Company: TOM L. INGRAM Field: -
Well: WHITE RANCH #4 Location: -
Test Interval: 8480' TO 8573' Test #: 4 Date: 4-28-77

County: CHAVES State: NEW MEXICO Field Report No.: 05726 D
Technician: HART(HOBBS) Test Approved By: - No. Reports Requested: 5

BOTTOM HOLE PRESSURE AND TIME DATA

JOHNSTON Schlumberger

INSTRUMENT NO.: J-376 CAPACITY(P.S.I.): 6400 DEPTH: 8567 FT.

PORT OPENING: OUTSIDE BOTTOM HOLE TEMP.: 150

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)
6	0	280.7				STARTED SHUT-IN
	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

C.W. TRAINER
WILLIAMSON - WHITE RANCH # 1
SEC. 1-T12S-R28E
CHAVES COUNTY, N.M.

T= 98.25 Hrs. Rate= 735 MCFD @ 270 PSI FTP

Shut-in Time, Hrs.	T+Θ/Θ	Log T+Θ/Θ	Pressure PSI
55.924	2.76	0.440	1498.33
59.617	2.65	0.423	1514.10
65.023	2.51	0.400	1538.89
70.533	2.39	0.379	1561.68
74.045	2.33	0.367	1577.21
80.097	2.23	0.348	1601.00
84.366	2.16	0.335	1614.53
89.666	2.10	0.321	1633.31
95.210	2.03	0.308	1650.35
101.260	1.97	0.295	1670.89
103.237	1.95	0.290	1677.66
105.267	1.93	0.286	1684.42
107.310	1.92	0.282	1689.18
109.568	1.90	0.278	1698.70
111.688	1.88	0.274	1704.72
112.522	1.87	0.273	1708.47

C.W. TRAINER Williamson W. White RANCH #1

$P^* = 2565$ psi

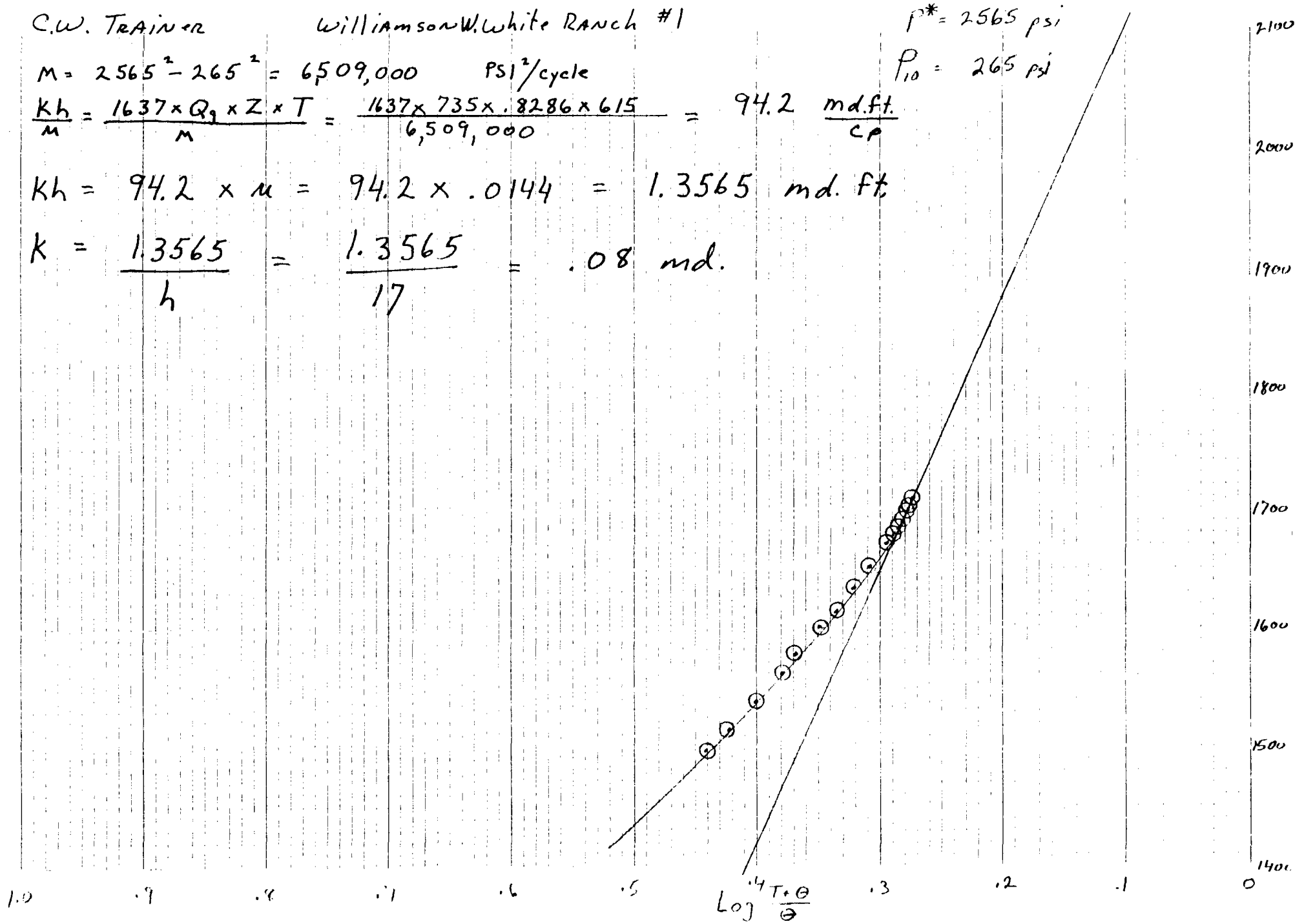
$P_{10} = 265$ psi

$m = 2565^2 - 265^2 = 6{,}509{,}000$ PSI^2/cycle

$$\frac{kh}{\mu} = \frac{1637 \times Q_g \times Z \times T}{m} = \frac{1637 \times 735 \times .8286 \times 615}{6{,}509{,}000} = 94.2 \ \frac{md.ft.}{cp}$$

$$kh = 94.2 \times \mu = 94.2 \times .0144 = 1.3565 \text{ md. ft.}$$

$$k = \frac{1.3565}{h} = \frac{1.3565}{17} = .08 \text{ md.}$$



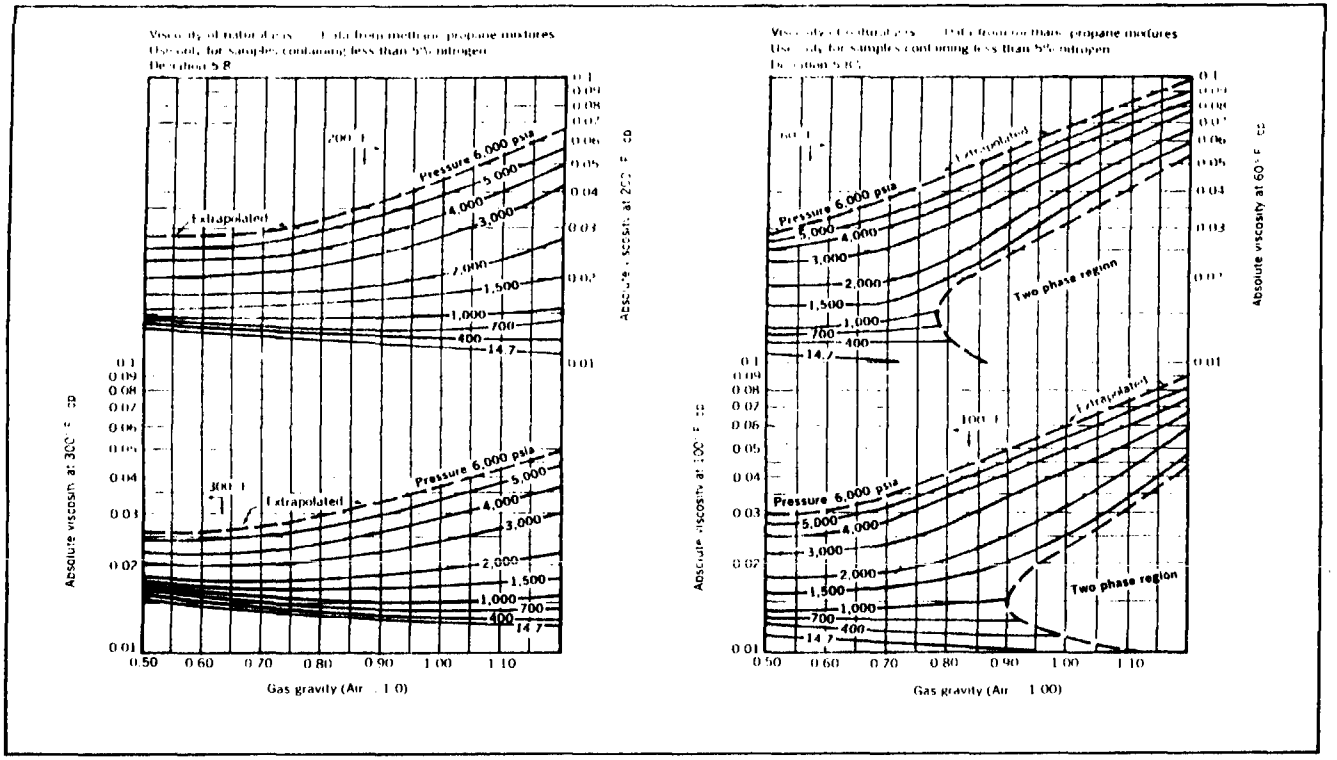


FIG. B.14 Viscosity of natural gas (From Bicher & Katz, Viscosity of Natural Gases, *AIME Transactions*, 155, 246, 1944)

Viscosity @ 100°F = .0137 cp

@ 200°F = .0150 cp

@ 155°F = .0144 cp

Flowing BHP = 878 psi

------ Gas Well ------
-- Four point test ---

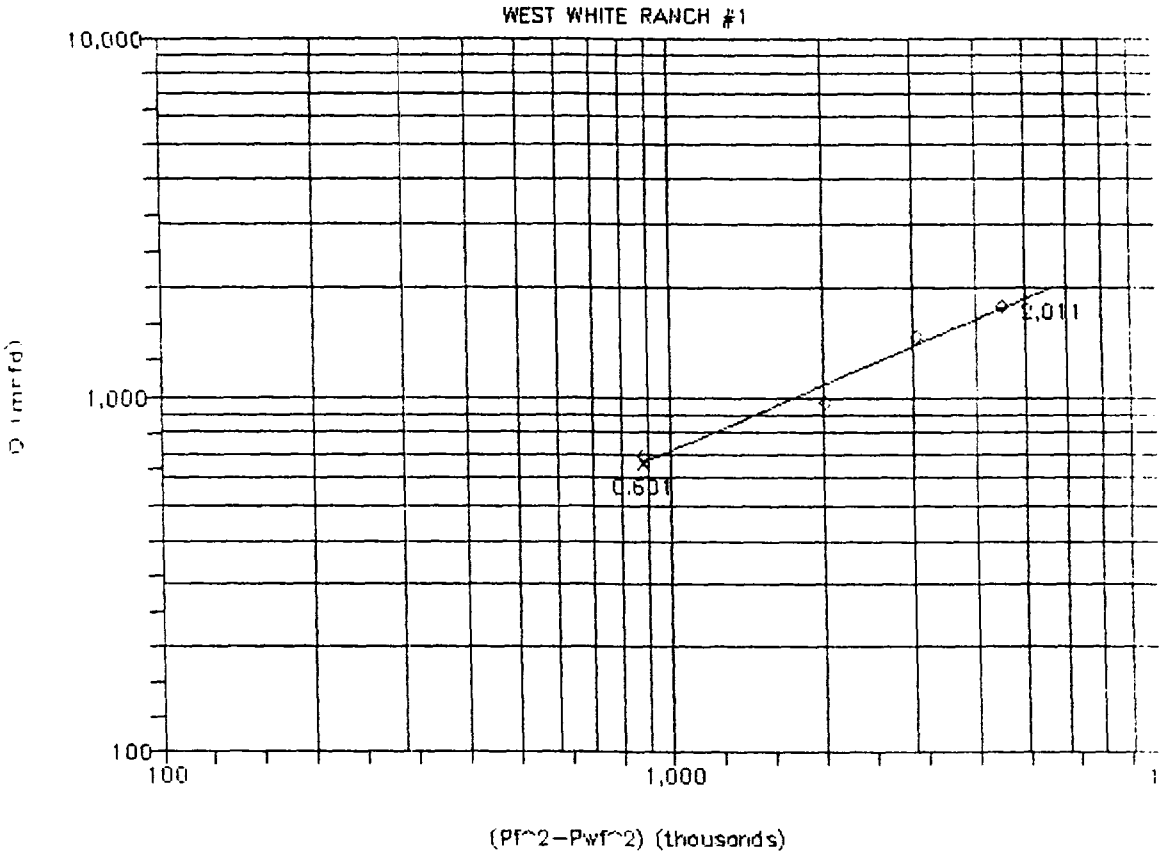
Well Name	WEST WHITE RANCH #1		
Field Name		06-Jan-93	
Gas Gravity	0.690	% N2	0.00 %
Cond. (yes=1)	1	% CO2	0.00 %
Depth of Zone	7,760 feet	% H2S	0.00 %
Tubing ID	1.995 inch.	TEMP-res	155 'F
Reservoir Pres	2,375 psia	TEMP-surf	65 'F
AOF	2,011 mcfd	Pc	665.04
N slope	0.601	Tc	380.66

Pwf measured psia	FTP psia	Rate mcfd	Pwf psia	Z	BHP/Z psia
0	1,730	687	2,182	0.8304	2,628
0	1,510	967	1,906	0.8361	2,279
0	1,265	1,462	1,611	0.8484	1,899
0	800	1,789	1,064	0.8871	1,199

24 hour
735 mcf
270 FTP?

0951@@
3@@@

Four Point Delivery Plot



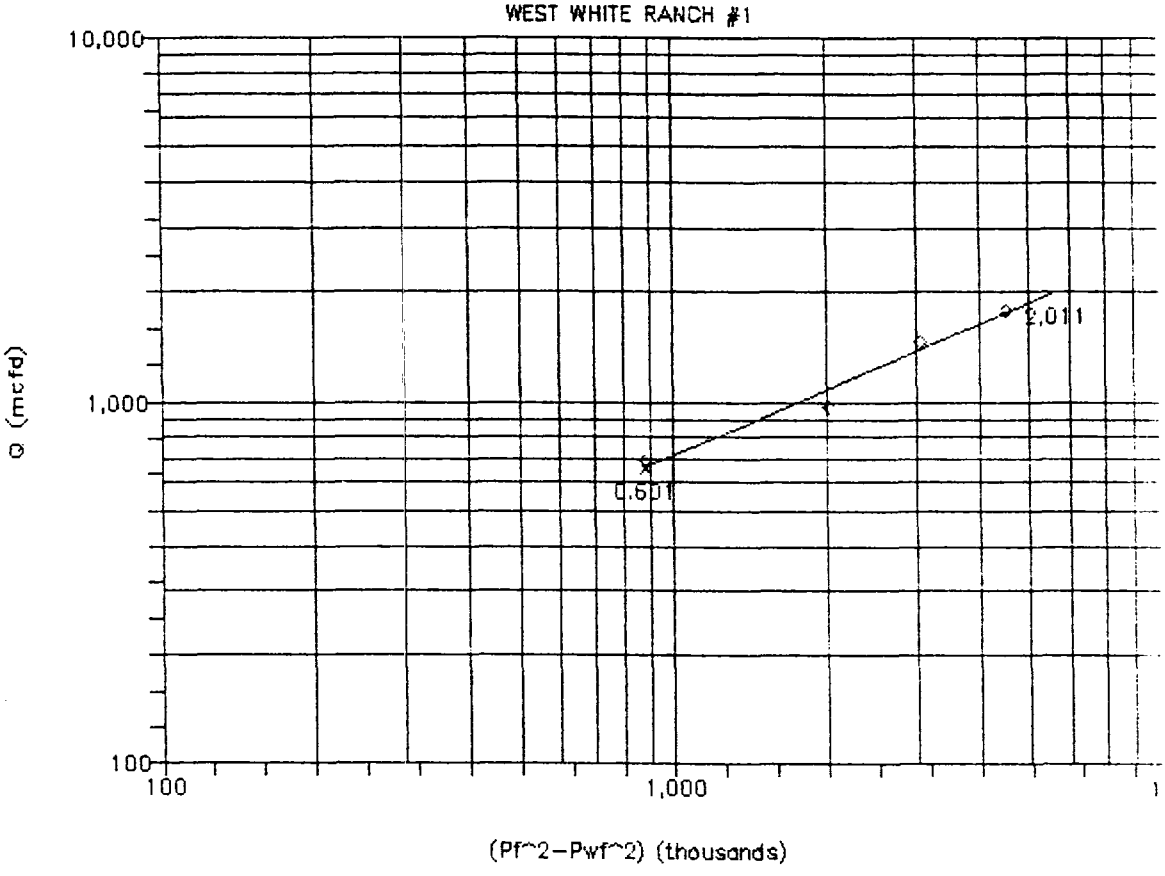
-- BHP or Pwf Calculation --

Well Name:	TEST WELL			
Gas Gravity:	0.69	% N2	1.42	
Condensate (yes=1):	1	% CO2	0.44	%
Reservoir Temp:	150 'F	% H2S	0.00	%
Surface Temp:	60 'F	Pc =	664.89	%
Depth of Zone:	7,760 feet	Tc =	377.46	
Tubing Diameter:	1.995 inches			

SITP psia	Rate Mcfd	BHP psia	Z	BHP/Z psia
1,882	0	2,375	0.831	2,856

Four Point Delivery Plot

WEST WHITE RANCH #1



COMPANY:	KELTIC SERVICES
CLIENT:	C.W. TRAINER
GAUGE NUMBER:	28033
WELL NAME:	WEST WHITE RANCH
WELL NUMBER:	#1
TEST NUMBER:	1
LOCATION:	N/A
TEST OPERATOR:	LARRY MOSSBARGER
COMMENTS:	4 pt. W/ EXTENDED FLOW AND BUILD-UP.

PAGE START DATE: 1/ 5/92 GAUGE S/N: 23914

DATA FILE: 3

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
1	9:45: 0	0.000	0.8979	2229.65	BOMBS @ 7761 FT
2	10: 3:39	0.311	0.8979	2229.65	
3	10:24:56	0.666	0.8979	2229.65	
4	10:40:24	0.923	0.8979	2229.65	
5	10:56:43	1.195	0.8979	2229.65	
6	11:12:54	1.465	0.8979	2229.65	
7	11:17:34	1.543	0.8982	2230.40	START 4 pt.
8	11:30:33	1.759	0.8736	2168.65	
9	11:46:44	2.029	0.8634	2143.05	
10	12: 6:42	2.362	0.8590	2132.01	
11	12:20:42	2.595	0.8412	2087.35	END FIRST RATE
12	12:36: 9	2.852	0.8156	2023.12	
13	12:47: 5	3.035	0.8018	1988.50	
14	13: 0:47	3.263	0.7894	1957.40	
15	13:14:30	3.492	0.7748	1920.79	
16	13:16:58	3.533	0.7681	1903.99	END SECOND RATE
17	13:28:21	3.722	0.7557	1872.90	
18	13:41:19	3.939	0.7282	1803.96	
19	13:47:44	4.046	0.6978	1727.77	
20	13:55: 1	4.167	0.6640	1643.08	
21	14: 4:21	4.323	0.6500	1608.02	
22	14:12:57	4.466	0.6402	1583.47	
23	14:23:45	4.646	0.6302	1558.43	END THIRD RATE
24	14:30:36	4.760	0.5894	1456.27	
25	14:40:57	4.933	0.5427	1339.39	
26	14:52:10	5.119	0.5028	1239.56	
27	15: 3:50	5.314	0.4592	1130.52	
28	15:12:18	5.455	0.4436	1091.52	
29	15:21:55	5.615	0.4195	1031.27	
30	15:26:35	5.693	0.4110	1010.03	END FOURTH RATE
31	15:32: 7	5.785	0.3758	922.07	
32	15:42:46	5.963	0.3218	787.18	
33	15:53:16	6.138	0.2951	720.51	
34	16: 4:12	6.320	0.2734	666.34	
35	16:15:43	6.512	0.2548	619.92	
36	16:26:48	6.697	0.2428	589.97	
37	16:37:44	6.879	0.2299	557.78	
38	16:49:23	7.073	0.2181	528.34	
39	17: 3:23	7.306	0.2059	497.90	
40	17:18:15	7.554	0.1968	475.20	
41	17:42:36	7.960	0.1919	462.98	
42	18: 9:26	8.407	0.1860	448.27	
43	18:57:59	9.216	0.1861	448.52	
44	20: 4:36	10.327	0.1861	448.52	
45	20:54:54	11.165	0.1861	448.52	
46	21:39:13	11.904	0.1879	453.01	
47	22:49:12	13.070	0.1884	454.25	
48	23:54:57	14.166	0.1905	459.49	
49	0:43:13	14.970	0.1917	462.48	
50	1: 7:42	15.378	0.1923	463.98	

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DATA FILE: 3

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
51	1:36:26	15.857	0.1956	472.21	
52	2:10: 6	16.418	0.2002	483.69	
53	2:47:52	17.048	0.2040	493.16	
54	3:27:22	17.706	0.2086	504.64	
55	3:58:52	18.231	0.2128	515.12	
56	4:38:14	18.887	0.2193	531.33	
57	5:19:29	19.575	0.2240	543.06	
58	6: 0:18	20.255	0.2299	557.78	
59	6:36:19	20.855	0.2345	569.26	
60	7:13:38	21.477	0.2387	579.74	
61	8: 0:35	22.260	0.2431	590.72	
62	8:49:34	23.076	0.2476	601.95	
63	9:41:37	23.944	0.2531	615.68	
64	10:30:36	24.760	0.2579	627.65	
65	11:22:13	25.620	0.2623	638.64	
66	12:14:42	26.495	0.2671	650.62	
67	13:16:48	27.530	0.2725	664.10	
68	14:16:26	28.524	0.2771	675.58	
69	15:22: 3	29.617	0.2822	688.31	
70	16:36:50	30.864	0.2854	696.30	
71	17:52: 4	32.118	0.2888	704.79	
72	19:13: 7	33.469	0.2943	718.52	
73	20:24:34	34.659	0.2987	729.50	
74	21:37:54	35.882	0.3020	737.74	
75	23:15:34	37.509	0.3058	747.23	
76	0:30:57	38.766	0.3101	757.97	
77	1:49:49	40.080	0.3154	771.20	
78	2:58:38	41.227	0.3195	781.44	
79	4:21:44	42.612	0.3233	790.93	
80	5:52: 7	44.119	0.3266	799.17	
81	7:13:29	45.475	0.3306	809.16	
82	8:34:58	46.833	0.3356	821.65	
83	10: 1:43	48.279	0.3418	837.13	
84	11:24:32	49.659	0.3470	850.12	
85	12:49:23	51.073	0.3525	863.86	
86	14:21:57	52.616	0.3570	875.10	
87	15:56:43	54.195	0.3616	886.59	
88	16:24:52	54.664	0.3634	891.09	
89	16:38: 8	54.886	0.3535	866.36	
90	16:50: 5	55.085	0.3418	837.13	
91	17: 1:27	55.274	0.3433	840.88	
92	17: 8: 1	55.384	0.3253	795.92	
93	17:20:59	55.600	0.3071	750.48	
94	17:36:35	55.860	0.2934	716.27	
95	17:55:24	56.173	0.2678	652.36	
96	18:15:13	56.504	0.2434	591.47	
97	18:27: 2	56.701	0.2330	565.52	
98	18:49:47	57.080	0.2307	559.78	
99	19:15:35	57.510	0.2273	551.29	
100	19:22:43	57.629	0.2211	535.82	

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DATA FILE: 3

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
101	19:37: 1	57.867	0.2179	527.84	
102	20: 2: 5	58.285	0.2173	526.34	
103	20:33:43	58.812	0.2201	533.33	
104	21:18:11	59.553	0.2255	546.80	
105	21:59:45	60.246	0.2315	561.77	
106	22:37:30	60.875	0.2353	571.26	
107	23:22:59	61.633	0.2424	588.97	
108	0:26:42	62.695	0.2461	598.21	
109	1:25:10	63.669	0.2501	608.19	
110	2:41:33	64.942	0.2557	622.16	
111	3:54:27	66.157	0.2600	632.90	
112	4:51:45	67.113	0.2636	641.88	
113	6: 6:59	68.366	0.2690	655.36	
114	7:38:23	69.890	0.2744	668.84	
115	8:50: 7	71.085	0.2830	690.31	
116	10:18:19	72.555	0.2886	704.29	
117	11:42:27	73.958	0.2934	716.27	
118	13:18:40	75.561	0.2994	731.25	
119	14:51:23	77.106	0.3045	743.98	
120	16:36:56	78.866	0.3096	756.72	
121	18:10:59	80.433	0.3146	769.20	
122	19:39:46	81.913	0.3192	780.69	
123	20:48:52	83.064	0.3223	788.43	
124	22:19: 7	84.569	0.3272	800.67	
125	0: 1:54	86.262	0.3328	814.65	
126	1:38: 7	87.885	0.3362	823.15	
127	3:16: 5	89.518	0.3412	835.63	
128	4:52:45	91.129	0.3456	846.62	
129	6:43:51	92.981	0.3506	859.11	
130	8:28:31	94.725	0.3562	873.10	
131	9:23:29	95.641	0.3585	878.85	
132	12: 0: 0	98.250	0.3633	890.84	WELL SHUT-IN
133	12:16: 7	98.519	0.3675	901.33	
134	12:38:28	98.891	0.3712	910.58	
135	13: 1: 7	99.269	0.3749	919.82	
136	13:33:47	99.813	0.3802	933.06	
137	14: 1:40	100.278	0.3846	944.06	
138	14:40:18	100.922	0.3912	960.55	
139	15:18:11	101.553	0.3988	979.54	
140	15:57:50	102.214	0.4063	998.28	
141	16:43: 8	102.969	0.4142	1018.03	
142	17:21:28	103.608	0.4215	1036.27	
143	18: 7:32	104.377	0.4286	1054.02	
144	18:57:18	105.205	0.4350	1070.02	
145	19:40:43	105.929	0.4417	1086.77	
146	20:31:32	106.776	0.4469	1099.77	
147	21:35:25	107.840	0.4541	1117.77	
148	22:33:21	108.806	0.4607	1134.27	
149	23:29:59	109.750	0.4657	1146.78	
150	0:27:29	110.708	0.4709	1159.78	

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DATA FILE: 3

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
151	1:13: 4	111.468	0.4755	1171.28	
152	2: 5:47	112.346	0.4803	1183.29	
153	3: 6:11	113.353	0.4847	1194.29	
154	4: 7:10	114.369	0.4894	1206.04	
155	5:13: 5	115.468	0.4943	1218.30	
156	6:17: 7	116.535	0.4997	1231.81	
157	7:22:45	117.629	0.5044	1243.56	
158	8:22:43	118.629	0.5088	1254.57	
159	9:38:31	119.892	0.5132	1265.58	
160	10:59:24	121.240	0.5191	1280.34	
161	12: 2:59	122.300	0.5229	1289.84	
162	13:27:56	123.716	0.5278	1302.10	
163	14:39:22	124.906	0.5318	1312.11	
164	16: 1:24	126.273	0.5366	1324.12	
165	17:17:47	127.545	0.5400	1332.63	
166	18:33: 0	128.800	0.5440	1342.64	
167	20: 3:27	130.307	0.5491	1355.40	
168	21:23: 2	131.634	0.5524	1363.66	
169	22:52:46	133.129	0.5569	1374.92	
170	0:40:12	134.920	0.5614	1386.18	
171	2:11:32	136.442	0.5659	1397.45	
172	3:41:42	137.945	0.5691	1405.45	
173	5:17:24	139.540	0.5739	1417.47	
174	6:44:31	140.992	0.5779	1427.48	
175	8:13:57	142.483	0.5832	1440.75	
176	9:37:36	143.877	0.5840	1442.75	
177	11:24:10	145.653	0.5878	1452.26	
178	13:11:28	147.441	0.5916	1461.78	
179	14:49:12	149.070	0.5956	1471.79	
180	16:38:14	150.887	0.5992	1480.80	
181	18:20:10	152.586	0.6026	1489.31	
182	19:55:25	154.174	0.6062	1498.33	
183	21:47:48	156.047	0.6089	1505.09	
184	23:37: 0	157.867	0.6125	1514.10	
185	1:21:41	159.611	0.6159	1522.62	
186	3:14:39	161.494	0.6193	1531.13	
187	5: 1:22	163.273	0.6224	1538.89	
188	6:51: 0	165.100	0.6265	1549.16	
189	8:32:12	166.787	0.6285	1554.17	
190	10:31:59	168.783	0.6315	1561.68	
191	11:59:59	170.250	0.6347	1569.69	
192	14: 2:41	172.295	0.6377	1577.21	
193	15:53:19	174.139	0.6403	1583.72	
194	18: 0:13	176.254	0.6440	1592.99	
195	20: 5:49	178.347	0.6472	1601.00	
196	21:57:11	180.203	0.6502	1608.52	
197	0:21:57	182.616	0.6526	1614.53	
198	2: 8: 6	184.385	0.6556	1622.04	
199	3:47:51	186.047	0.6583	1628.81	
200	5:39:57	187.916	0.6601	1633.31	

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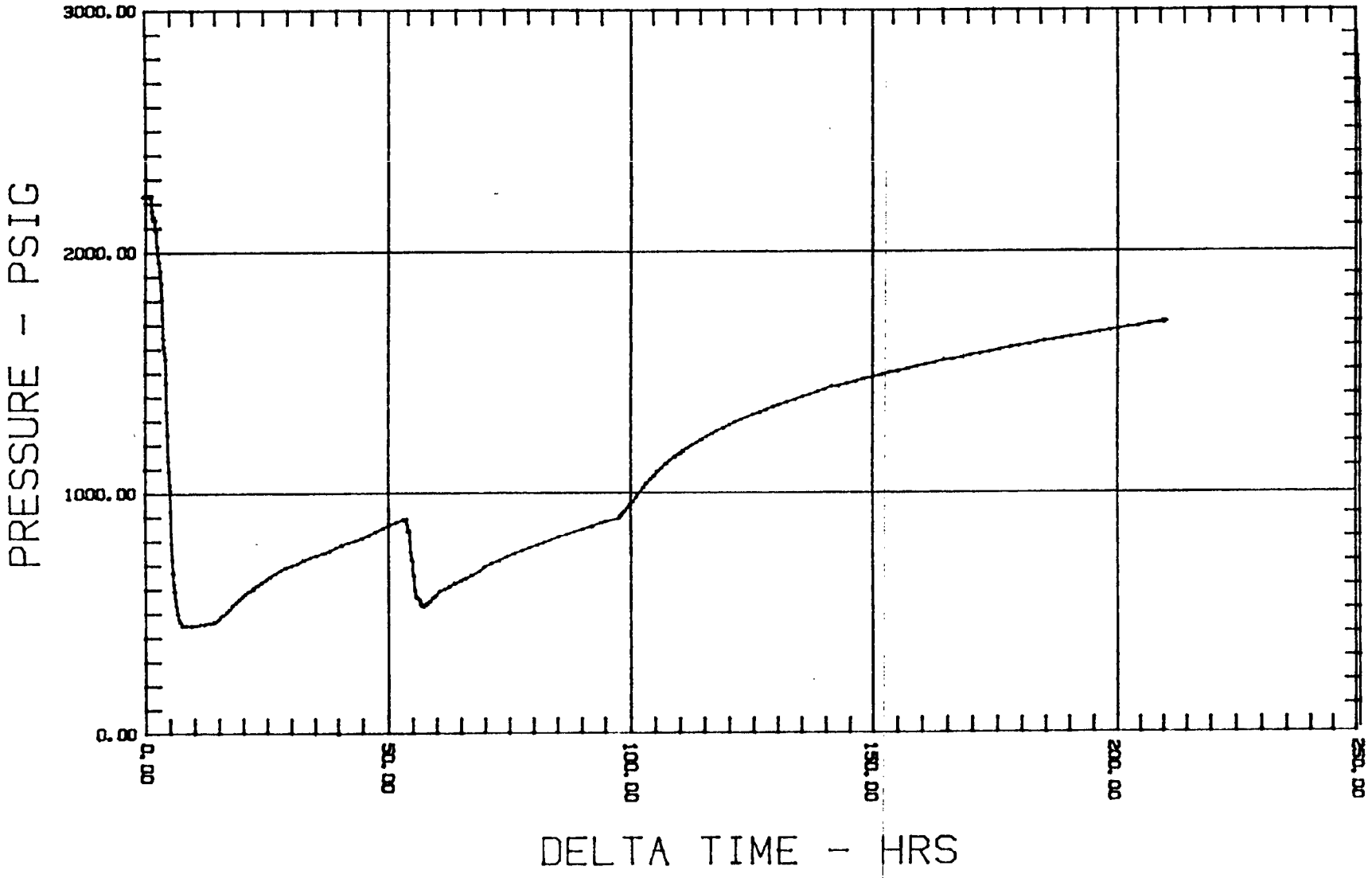
DATA FILE: 3

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
201	7:27: 6	189.702	0.6622	1638.58	
202	9:13:41	191.478	0.6651	1645.84	
203	11:12:36	193.460	0.6669	1650.35	
204	13: 7:27	195.374	0.6696	1657.11	
205	15:12: 2	197.451	0.6728	1665.13	
206	17:15:36	199.510	0.6751	1670.89	
207	19:14:13	201.487	0.6778	1677.66	
208	21:16: 3	203.517	0.6805	1684.42	
209	23:18:36	205.560	0.6824	1689.18	
210	1:34: 4	207.218	0.6862	1698.70	
211	3:41:16	209.938	0.6886	1704.72	
212	4:31:21	210.772	0.6901	1708.47	

Plot starting date: 1/ 5/92
time: 9: 45: 0
Gauge S/N 23914

Company: KELTIC SERVICES
Client: C.W. TRAINER
Well name: WEST WHITE RANCH
Well #: #1
Test #: 1

Location: N/A
Operator: LARRY MOSSBARGER
Comments: 4 pt. W/ EXTENDED FLOW AND BUILD-UP.



COMPANY:	KELTIC SERVICES
CLIENT:	C.W. TRAINER
GAUGE NUMBER:	23914
WELL NAME:	WEST WHITE RANCH
WELL NUMBER:	#1
TEST NUMBER:	1
LOCATION:	N/A
TEST OPERATOR:	LARRY MOSSBARGER
COMMENTS:	BUILD-UP AFTER 4 pt. FLOWING PRESS = 120 psig.

PAGE START DATE: 1/ 9/92 GAUGE S/N: 23914

DATA FILE: 2

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
1	12: 0: 0	0.000	0.3633	890.84	WELL SHUT-IN
2	12:16: 7	0.269	0.3675	901.33	
3	12:38:28	0.641	0.3712	910.58	
4	13: 1: 7	1.019	0.3749	919.82	
5	13:33:47	1.563	0.3802	933.06	
6	14: 1:40	2.028	0.3846	944.06	
7	14:40:18	2.672	0.3912	960.55	
8	15:18:11	3.303	0.3988	979.54	
9	15:57:50	3.964	0.4063	998.28	
10	16:43: 8	4.719	0.4142	1018.03	
11	17:21:28	5.358	0.4215	1036.27	
12	18: 7:38	6.127	0.4286	1054.02	
13	18:57:18	6.955	0.4350	1070.02	
14	19:40:43	7.679	0.4417	1086.77	
15	20:31:32	8.526	0.4469	1099.77	
16	21:35:25	9.590	0.4541	1117.77	
17	22:33:21	10.556	0.4607	1134.27	
18	23:29:59	11.500	0.4657	1146.78	
19	0:27:29	12.458	0.4709	1159.78	
20	1:13: 4	13.218	0.4755	1171.28	
21	2: 5:47	14.096	0.4803	1183.29	
22	3: 6:11	15.103	0.4847	1194.29	
23	4: 7:10	16.119	0.4894	1206.04	
24	5:13: 5	17.218	0.4943	1218.30	
25	6:17: 7	18.285	0.4997	1231.81	
26	7:22:45	19.379	0.5044	1243.56	
27	8:22:43	20.379	0.5088	1254.57	
28	9:38:31	21.642	0.5132	1265.58	
29	10:59:24	22.990	0.5191	1280.34	
30	12: 2:59	24.050	0.5229	1289.84	
31	13:27:56	25.466	0.5278	1302.10	
32	14:39:22	26.656	0.5318	1312.11	
33	16: 1:24	28.023	0.5366	1324.12	
34	17:17:47	29.296	0.5400	1332.63	
35	18:33: 0	30.550	0.5440	1342.64	
36	20: 3:27	32.057	0.5491	1355.40	
37	21:23: 2	33.384	0.5524	1363.66	
38	22:52:46	34.879	0.5569	1374.92	
39	0:40:12	36.670	0.5614	1386.18	
40	2:11:32	38.192	0.5659	1397.45	
41	3:41:42	39.695	0.5691	1405.45	
42	5:17:24	41.290	0.5739	1417.47	
43	6:44:31	42.742	0.5779	1427.48	
44	8:13:57	44.233	0.5832	1440.75	
45	9:37:36	45.627	0.5840	1442.75	
46	11:24:10	47.403	0.5878	1452.26	
47	13:11:28	49.191	0.5916	1461.78	
48	14:49:12	50.820	0.5956	1471.79	
49	16:38:14	52.637	0.5992	1480.80	
50	18:20:10	54.336	0.6026	1489.31	

PAGE START DATE: 1/11/92 GAUGE S/N: 23914

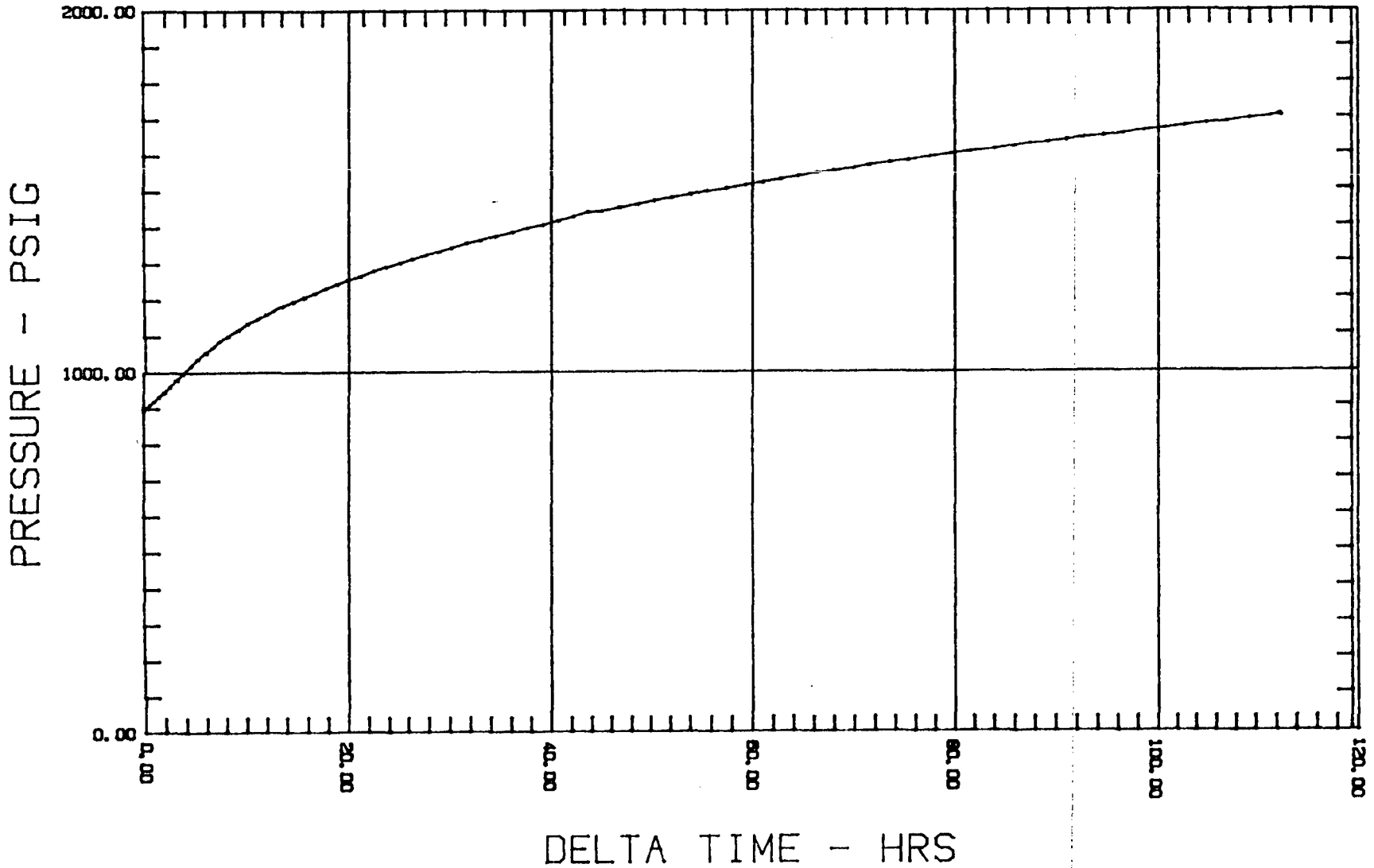
DATA FILE: 2

DATA POINT	REAL TIME	DELTA TIME HRS	DEFLECTION IN	PRESSURE PSIG	COMMENTS
51	19:55:25	55.924	0.6062	1498.33	
52	21:47:48	57.797	0.6089	1505.09	
53	23:37: 0	59.617	0.6125	1514.10	
54	1:21:41	61.361	0.6159	1522.62	
55	3:14:39	63.244	0.6193	1531.13	
56	5: 1:22	65.023	0.6224	1538.89	
57	6:51: 0	66.850	0.6265	1549.16	
58	8:32:12	68.537	0.6285	1554.17	
59	10:31:59	70.533	0.6315	1561.68	
60	11:59:59	72.000	0.6347	1569.69	
61	14: 2:41	74.045	0.6377	1577.21	
62	15:53:19	75.889	0.6403	1583.72	
63	18: 0:13	78.004	0.6440	1592.99	
64	20: 5:49	80.097	0.6472	1601.00	
65	21:57:11	81.953	0.6502	1608.52	
66	0:21:57	84.366	0.6526	1614.53	
67	2: 8: 6	86.135	0.6556	1622.04	
68	3:47:51	87.797	0.6583	1628.81	
69	5:39:57	89.666	0.6601	1633.31	
70	7:27: 6	91.452	0.6622	1638.58	
71	9:13:41	93.228	0.6651	1645.84	
72	11:12:36	95.210	0.6669	1650.35	
73	13: 7:27	97.124	0.6696	1657.11	
74	15:12: 2	99.201	0.6728	1665.13	
75	17:15:36	101.260	0.6751	1670.89	
76	19:14:13	103.237	0.6778	1677.66	
77	21:16: 3	105.267	0.6805	1684.42	
78	23:18:36	107.310	0.6824	1689.18	
79	1:34: 4	109.568	0.6862	1698.70	
80	3:41:16	111.688	0.6886	1704.72	
81	4:31:21	112.522	0.6901	1708.47	

Plot starting date: 1/ 9/92
time: 12: 0: 0
Gauge S/N 23914

Company: KELTIC SERVICES
Client: C.W. TRAINER
Well name: WEST WHITE RANCH
Well #: #1
Test #: 1

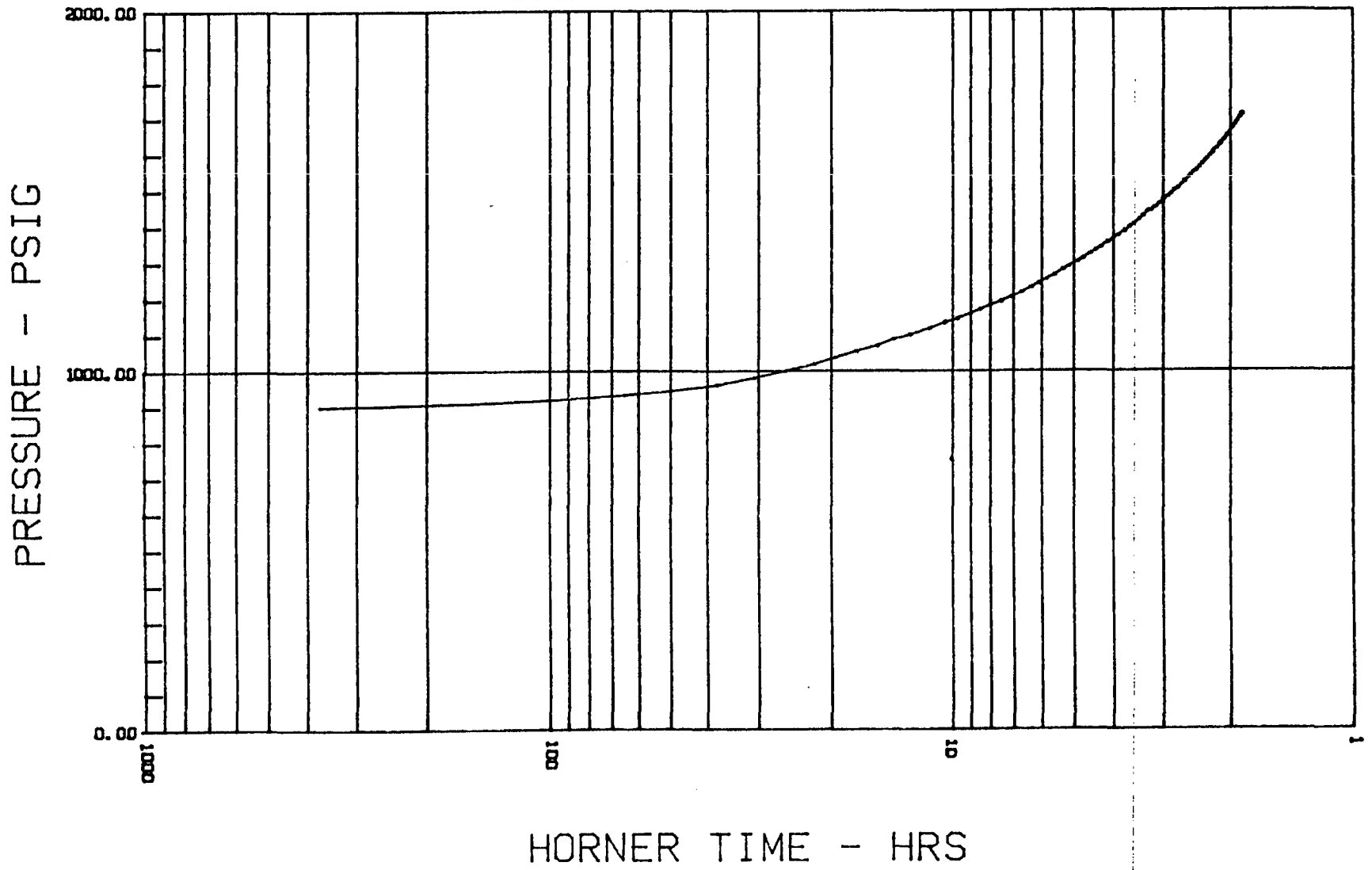
Location: N/A
Operator: LARRY MOSSBARGER
Comments: BUILD-UP AFTER 4 pt.
FLOWING PRESS = 120 psig.



Plot starting date: 1/ 9/92
time: 12: 0: 0
Gauge S/N 23914
Flow time: 96.700 HRS

Company: KELTIC SERVICES
Client: C.W. TRAINER
Well name: WEST WHITE RANCH
Well #: #1
Test #: 1

Location: N/A
Operator: LARRY MOSSBARGER
Comments: BUILD-UP AFTER 4 pt.
FLOWING PRESS = 120 psig.



COMPANY:	KELTIC SERVICES
CLIENT:	C.W. TRAINER
GAUGE NUMBER:	28033
WELL NAME:	WEST WHITE RANCH
WELL NUMBER:	#1
TEST NUMBER:	1
LOCATION:	N/A
TEST OPERATOR:	LARRY MOSSBARGER
COMMENTS:	STATIC W/ GRADIENT STOPS RUN AFTER B.U., PRESS = 1290 psig

PAGE START DATE: 1/14/92 GAUGE S/N: 28033

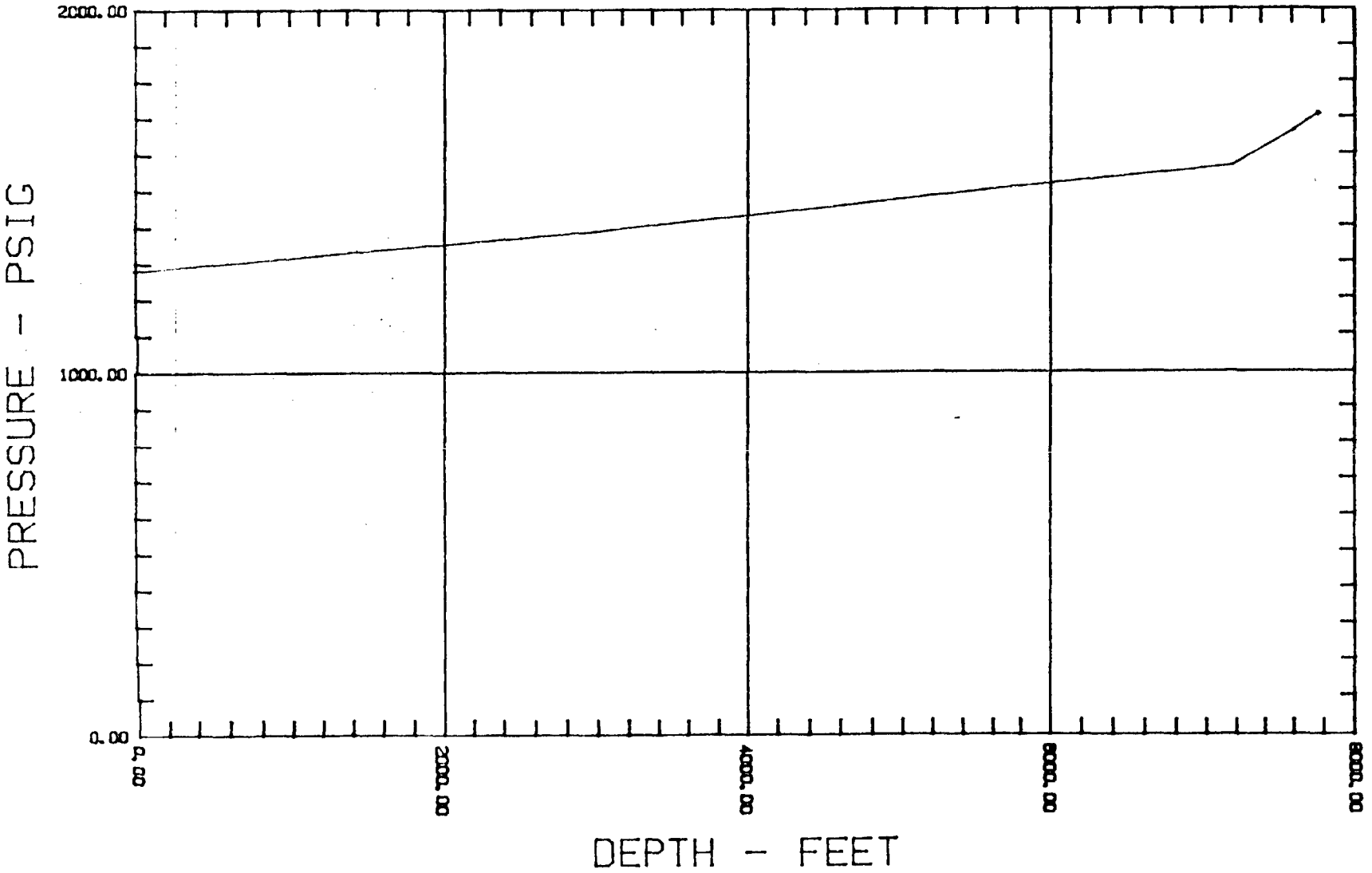
DATA FILE: 3

TIME	DELTA TIME HRS	DEPTH FEET	DEFLECTION IN	PRESSURE PSIG	COMMENTS
12: 0: 8	0.000	0.00	0.5170	1282.03	
12:23:19	0.386	3000.00	0.5590	1388.67	-0.036 PSI/FT
12:54: 8	0.900	6000.00	0.6110	1521.08	0.044 PSI/FT
13:18:28	1.306	7200.00	0.6300	1569.27	0.040 PSI/FT
13:38:38	1.642	7600.00	0.6730	1665.77	0.241 PSI/FT
14: 2: 6	2.033	7761.00	0.6870	1712.12	0.288 PSI/FT

Plot starting date: 1/14/92
time: 12: 0: 8
Gauge S/N 28033

Company: KELTIC SERVICES
Client: C.W. TRAINER
Well name: WEST WHITE RANCH
Well #: #1
Test #: 1

Location: N/A
Operator: LARRY MOSSBARGER
Comments: STATIC W/ GRADIENT STOPS RUN
AFTER B.U., PRESS = 1290 psig



LAW OFFICES
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ERNEST L. CARROLL
JOEL M. CARSON
JAMES E. HAAS
A. J. LOSEE
DEAN B. CROSS
MARY LYNN BOGLE

November 10, 1992

Case 10617

VIA FACSIMILE AND FIRST CLASS MAIL

Mr. William J. LeMay, Director
New Mexico Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87501

Re: Application of C. W. Trainer for a Tight Formation Designation Under Section 107 of the Natural Gas Policy Act of 1978, Chaves County, New Mexico

Dear Mr. LeMay:

Enclosed please find for filing an original and two copies of C. W. Trainer's Application as captioned above, with Exhibit "A" attached.

Please return a copy to me, endorsed, for my records. Thank you for your assistance.

Very truly yours,

LOSEE, CARSON, HAAS & CARROLL, P.A.

Ernest L. Carroll

Ernest L. Carroll

ELC:kth
Enclosures

xc: C. W. Trainer

BEFORE THE OIL CONSERVATION DIVISION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF C. W. TRAINER FOR A TIGHT FORMATION DESIGNATION UNDER SECTION 107 OF THE NATURAL GAS POLICY ACT OF 1978, CHAVES COUNTY, NEW MEXICO

CASE NO. 10617

APPLICATION

COMES NOW C. W. TRAINER, by his attorneys, Losee, Carson, Haas & Carroll, P. A., and in support hereof respectfully states:

1. Applicant hereby makes application for designation of the Mississippian formation as a "tight formation" pursuant to the regulations of the Federal Energy Regulatory Commission ("FERC"), and Section 107 of the Natural Gas Policy Act of 1878 ("NGPA"), under the following described lands in Chaves County, New Mexico:

Township 11 South, Range 28 East, N.M.P.M.

Section 35: E/2

Section 36: All

Township 11 South, Range 29 East, N.M.P.M.

Section 21: S/2

Section 22: All

Section 23: W/2

Section 26: W/2

Section 27: All

Section 28: All

Section 29: All

Section 30: All

Section 31: All

Section 32: All

Section 33: All

Section 34: All

Section 35: W/2

Township 12 South, Range 28 East, N.M.P.M.

Section 1: All

Section 2: E/2

Township 12 South, Range 29 East, N.M.P.M.

Section 2: NW/4

Section 3: N/2

Section 4: N/2

Section 5: All

Section 6: All

2. Applicant is an operator and owner of substantial mineral interest in and to some of the above described lands.

3. The above described lands have not been designated as a gas pool with respect to the Mississippian formation by the Oil Conservation Division of New Mexico.

4. The Mississippian formation is defined as that formation occurring between the base of the Pennsylvanian formation and the top of the Devonian formation which begins 8,120' below the surface and terminates 8,724' below the surface as defined on the logs of the Republic Natural Gas and Seaboard Oil Co. #1 White Ranch Well located 1,980' from the North line and 660' from the West line of Section 34, Township 11 South and Range 29 East, Chaves County, New Mexico. Said formation underlies the subject lands and is reasonably believed to be productive of gas and associated hydrocarbons. Completion in and

testing of the Mississippian formation has not occurred heretofore due to the extraordinary risks and costs associated with such production.

5. The estimated average in situ gas permeability of the Mississippian formation under the above-described lands is expected to be 0.1 millidarcy or less. It is anticipated that the stabilized production rate, against atmospheric pressure, of wells completed for production in the Mississippian formation, without stimulation, is not expected to exceed the maximum production rate prescribed by FERC regulations.

6. No well completed in the Mississippian formation is expected to produce, without stimulation, more than 5 barrels of crude oil per day.

7. Development of the Mississippian formation will not adversely affect freshwater aquifers that may be used as domestic and agricultural water supplies.

8. To avoid the drilling of unnecessary wells, to protect correlative rights, to prevent waste, and to afford the owner of each interest in the above described lands the opportunity to recover the gas and associated hydrocarbons underlying said lands within the Mississippian formation, the incentive price as determined in Section 107 of the NGPA is necessary to provide reasonable incentive for production of natural gas from the Mississippian formation underlying the above described lands.

9. Applicant will cause to be published notice of this application once in the Roswell Daily Record, a newspaper of general circulation in Chaves County, New Mexico, in the format attached hereto as

Exhibit "A". Proof of publication will be submitted to the Division upon completion of publication.

WHEREFORE, Applicant prays that:

A. This application be set for hearing before an Examiner and that notice of said hearing be given as required by law;

B. Upon hearing the Division enter its order designating the Mississippian formation, defined as that formation occurring between the base of the Pennsylvanian formation and the top of the Devonian formation which begins 8,120' below the surface and terminates 8,724' below the surface as defined on the logs of the Republic Natural Gas and Seaboard Oil Co. #1 White Ranch Well located 1,980' from the North line and 660' from the West line of Section 34, Township 11 South and Range 29 East, Chaves County, New Mexico, as a formation pursuant to the regulations of FERC;

C. And for such other relief as may be just in the premises.

C. W. TRAINER

By: Ernest L. Carroll

Ernest L. Carroll
Losee, Carson, Haas & Carroll, P. A.
P. O. Drawer 239
Artesia, New Mexico 88211-0239
(505)746-3505

Attorneys for Applicant

LEGAL NOTICE

C. W. TRAINER, P. O. Box 755, Hobbs, New Mexico, 88241, Phone (505)393-2727

Attn: C. W. Trainer hereby provides Notice of Application for Designation as a Tight Formation by the Federal Energy Regulatory Commission for the Mississippian Formation underlying the following described lands:

Township 11 South, Range 28 East, N.M.P.M.

Section 35: E/2

Section 36: All

Township 11 South, Range 29 East, N.M.P.M.

Section 21: S/2

Section 22: All

Section 23: W/2

Section 26: W/2

Section 27: All

Section 28: All

Section 29: All

Section 30: All

Section 31: All

Section 32: All

Section 33: All

Section 34: All

Section 35: W/2

EXHIBIT "A"

Township 12 South, Range 28 East, N.M.P.M.

Section 1: All

Section 2: E/2

Township 12 South, Range 29 East, N.M.P.M.

Section 2: NW/4

Section 3: N/2

Section 4: N/2

Section 5: All

Section 6: All

containing 11,040 acres more or less with the approximate percentages of land types as follows:

94.2% Fee, 5.8% State of New Mexico.

Any interested party must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico, 87504 within fifteen (15) days from this date of publication.

BEFORE THE OIL CONSERVATION DIVISION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF C. W. TRAINER FOR A TIGHT FORMATION DESIGNATION UNDER SECTION 107 OF THE NATURAL GAS POLICY ACT OF 1978, CHAVES COUNTY, NEW MEXICO

CASE NO. 10670

APPLICATION

COMES NOW C. W. TRAINER, by his attorneys, Losee, Carson, Haas & Carroll, P. A., and in support hereof respectfully states:

1. Applicant hereby makes application for designation of the Mississippian formation as a "tight formation" pursuant to the regulations of the Federal Energy Regulatory Commission ("FERC"), and Section 107 of the Natural Gas Policy Act of 1878 ("NGPA"), under the following described lands in Chaves County, New Mexico:

Township 11 South, Range 28 East, N.M.P.M.

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Section 36: All

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Section 22: All

Section 23: W/2

Section 26: W/2

Section 27: All

Section 28: All

Section 29: All

Section 30: All

Section 31: All

Section 32: All

Section 33: All

Section 34: All

Section 35: W/2

Township 12 South, Range 28 East, N.M.P.M.

Section 1: All

Section 2: E/2

Township 12 South, Range 29 East, N.M.P.M.

Section 2: NW/4

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Section 4: N/2

Section 5: All

Section 6: All

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testing of the Mississippian formation has not occurred heretofore due to the extraordinary risks and costs associated with such production.

5. The estimated average in situ gas permeability of the Mississippian formation under the above-described lands is expected to be 0.1 millidarcy or less. It is anticipated that the stabilized production rate, against atmospheric pressure, of wells completed for production in the Mississippian formation, without stimulation, is not expected to exceed the maximum production rate prescribed by FERC regulations.

6. No well completed in the Mississippian formation is expected to produce, without stimulation, more than 5 barrels of crude oil per day.

7. Development of the Mississippian formation will not adversely affect freshwater aquifers that may be used as domestic and agricultural water supplies.

8. To avoid the drilling of unnecessary wells, to protect correlative rights, to prevent waste, and to afford the owner of each interest in the above described lands the opportunity to recover the gas and associated hydrocarbons underlying said lands within the Mississippian formation, the incentive price as determined in Section 107 of the NGPA is necessary to provide reasonable incentive for production of natural gas from the Mississippian formation underlying the above described lands.

9. Applicant will cause to be published notice of this application once in the Roswell Daily Record, a newspaper of general circulation in Chaves County, New Mexico, in the format attached hereto as

Exhibit "A". Proof of publication will be submitted to the Division upon completion of publication.

WHEREFORE, Applicant prays that:

A. This application be set for hearing before an Examiner and that notice of said hearing be given as required by law;

B. Upon hearing the Division enter its order designating the Mississippian formation, defined as that formation occurring between the base of the Pennsylvanian formation and the top of the Devonian formation which begins 8,120' below the surface and terminates 8,724' below the surface as defined on the logs of the Republic Natural Gas and Seaboard Oil Co. #1 White Ranch Well located 1,980' from the North line and 660' from the West line of Section 34, Township 11 South and Range 29 East, Chaves County, New Mexico, as a formation pursuant to the regulations of FERC;

C. And for such other relief as may be just in the premises.

C. W. TRAINER

By: 

Ernest L. Carroll
Losee, Carson, Haas & Carroll, P. A.
P. O. Drawer 239
Artesia, New Mexico 88211-0239
(505)746-3505

Attorneys for Applicant

LEGAL NOTICE

C. W. TRAINER, P. O. Box 755, Hobbs, New Mexico, 88241, Phone (505)393-2727

Attn: C. W. Trainer hereby provides Notice of Application for Designation as a Tight Formation by the Federal Energy Regulatory Commission for the Mississippian Formation underlying the following described lands:

Township 11 South, Range 28 East, N.M.P.M.

Section 35: E/2

Section 36: All

Township 11 South, Range 29 East, N.M.P.M.

Section 21: S/2

Section 22: All

Section 23: W/2

Section 26: W/2

Section 27: All

Section 28: All

Section 29: All

Section 30: All

Section 31: All

Section 32: All

Section 33: All

Section 34: All

Section 35: W/2

EXHIBIT "A"

Township 12 South, Range 28 East, N.M.P.M.

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Township 12 South, Range 29 East, N.M.P.M.

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Section 4: N/2

Section 5: All

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containing 11,040 acres more or less with the approximate percentages of land types as follows:

94.2% Fee, 5.8% State of New Mexico.

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