TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name ZIMMERMAN #1 Test No. 1 Date 7/24/94

Company LITTLE RIVER ENERGY COMPANY Zone MISSISSIPPI

Address PO BOX 1113 DRUMRIGHT OK 74030 Elevation 1427

Co. Rep./Geo. JEFF ZOLLER Cont. ALLEN #1 Est. Ft. of Pay

Location: Sec. 16 Twp. 32S Rge. 7W Co. HARPER State KS

Interval Tested 4391-4417 Drill Pipe Size 4.5" XH

Anchor Length 26 Wt. Pipe I.D. - 2.7 Ft. Run

Top Packer Depth 4386 Drill Collar – 2.25 Ft. Run

Bottom Packer Depth 4391 Mud Wt. 9.3 lb/Gal.

Total Depth 4417 Viscosity 47 Filtrate 9.6

Tool Open @ 1:55AM Initial Blow STRONG BLOW - GAS TO SURFACE IN 8 MINUTES

Final Blow STRONG BLOW

Recovery - Total Feet 15 Flush Tool?

Rec. 4370 Feet of GAS IN PIPE

Rec. 15 Feet of DRILLING MUD

Rec. Feet of

Rec. Feet of

Rec. Feet of

BHT 119 °F Gravity °API @ °F Corrected Gravity °API

RW @ °F Chlorides ppm Recovery Chlorides 5500 ppm System

(A) Initial Hydrostatic Mud 2136.7 PSI AK1 Recorder No. 13788 Range 4650

(B) First Initial Flow Pressure 42.4 PSI @ (depth) 4414 w / Clock No. 22993

(C) First Final Flow Pressure 49.2 PSI AK1 Recorder No. 10248 Range 4400

(D) Initial Shut-in Pressure 1606.8 PSI @ (depth) 4409 w / Clock No. 30410

(E) Second Initial Flow Pressure 41.3 PSI AK1 Recorder No. Range

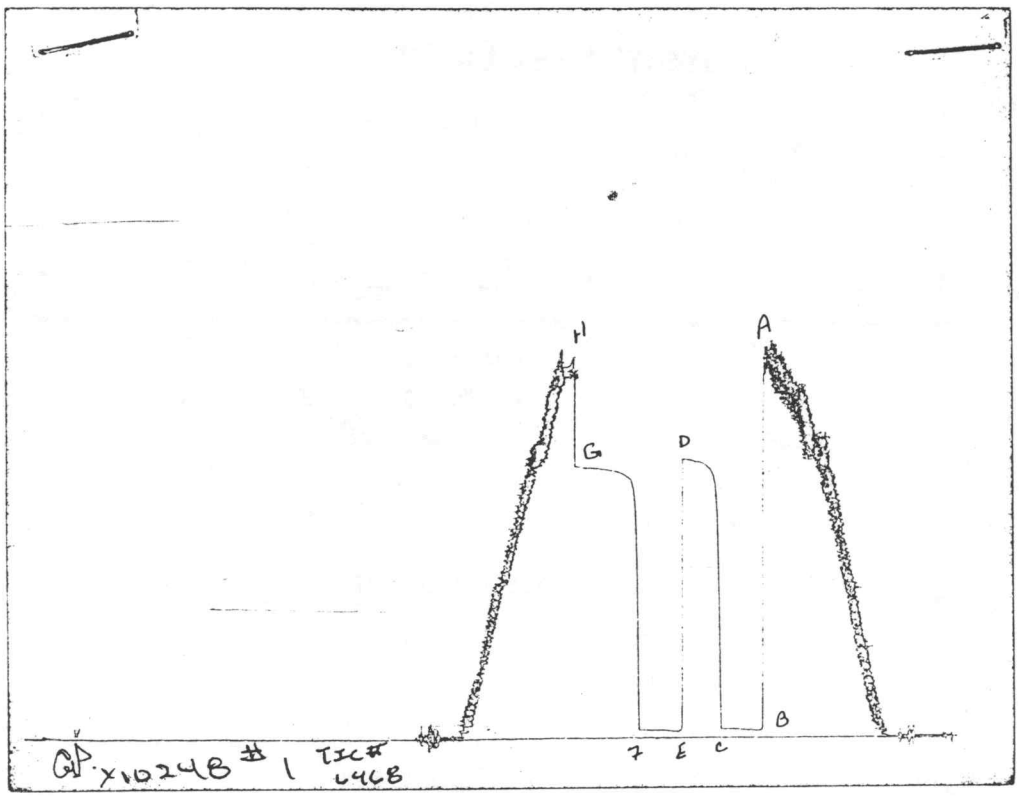
(F) Second Final Flow Pressure 41.3 PSI @ (depth) w / Clock No.

(G) Final Shut-in Pressure 1564.1 PSI Initial Opening 30 Final Flow 30

(H) Final Hydrostatic Mud 2112.4 PSI Initial Shut-in 30 Final Shut-in 45

Our Representative

CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2129	2136.7
(B) FIRST INITIAL FLOW PRESSURE	27	42.4
(C) FIRST FINAL FLOW PRESSURE	34	49.2
(D) INITIAL CLOSED-IN PRESSURE	1581	1606.8
(E) SECOND INITIAL FLOW PRESSURE	34	41.3
(F) SECOND FINAL FLOW PRESSURE	34	41.3
(G) FINAL CLOSED-IN PRESSURE	1548	1564.1
(H) FINAL HYDROSTATIC MUD	2098	2112.4

COMPUTER GAS EVALUATION BY TRILOBITE TESTING, L.L.C.

LITTLE RIVER ENERGY COMPANY

ZIMMERMAN #1 **DST 1**

16 32S 7W **HARPER** **KS**

ELEVATION:	1427 *KB*	**EST. PAY:**	9 **FT.**
DATUM:	-2983	**ZONE TESTED:**	MISSISSIPPI
TEST INTERVAL:	4391-4417	**TIME INTERVALS:**	30-30-30-45
RECORDER DEPTH:	4409	**VISCOSITY:**	0.01499 **CP**
BOTTOM HOLE TEMP:	119	**HOLE SIZE:**	7.875 **IN**
COMPRESSIBILITY:	0.9976	**GAS GRAVITY:**	0.6731

TEMPERATURE RANKINE:	579.00	**&**
TRANSMISSIBILITY:	1228.49	**Kh/%**
THEORITICAL FLOW CAPICITY:	18.41	**Kh**
AVERAGE EFFECTIVE PERMEABILITY:	2.05	**K(md.)**
RADIUS OF INVESTIGATION:	11.08	**FT.**
DAMAGE RATIO:	4.10	
ABSOLUTE OPEN FLOW(MAX)	147.10	**MCFD**
ABSOLUTE OPEN FLOW(MIN)	147.05	**MCFD**
THEORITICAL OPEN FLOW(MAX)	603.77	**MCFD**
THEORITICAL OPEN FLOW(MIN)	603.57	**MCFD**
POTENTIOMETRIC SURFACE	568.09	**(FT.)**

INITIAL SHUT-IN VALUES:

SLOPE	91698.33
THEORETICAL STATIC PRESSURE	1635.09

FINAL SHUT-IN VALUES:

SLOPE	113143.14
THEORETICAL STATIC PRESSURE	1599.86

DRAWDOWN FACTOR: 2.15 **(%)**

INITIAL FLOW

RECORDER 10248 DST # 1

TIME(MIN)	PRESSURE	<>PRESSURE
0	42.4	42.4
3	42.4	0.0
6	42.4	0.0
9	43.5	1.1
12	47.1	3.6
15	47.1	0.0
18	47.1	0.0
21	47.1	0.0
24	49.2	2.1
27	49.2	0.0
30	49.2	0.0

FINAL FLOW

RECORDER 10248 DST # 1

TIME(MIN)	PRESSURE	<> PRESSURE
0	41.3	41.3
3	41.3	0.0
6	41.3	0.0
9	41.3	0.0
12	41.3	0.0
15	41.3	0.0
18	41.3	0.0
21	41.3	0.0
24	41.3	0.0
27	41.3	0.0
30	41.3	0.0

ZIMMERMAN #1 DST #1
INITIAL SHUTIN

30 INITIAL FLOW TIME

SLOPE 91698.33 PSI/CYCLE
P* 1635.09 PSI

	TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	1131.4	1.041	1131.4	11
	6	1442.8	0.778	311.4	6
	9	1527.1	0.637	84.3	4
	12	1557.6	0.544	30.5	4
	15	1576.2	0.477	18.6	3
	18	1587.1	0.426	10.9	3
	21	1591.5	0.385	4.4	2
	24	1597.1	0.352	5.6	2
X	27	1602.4	0.325	5.3	2
	30	1604.6	0.301	2.2	2
X	33	1606.8	0.281	2.2	2

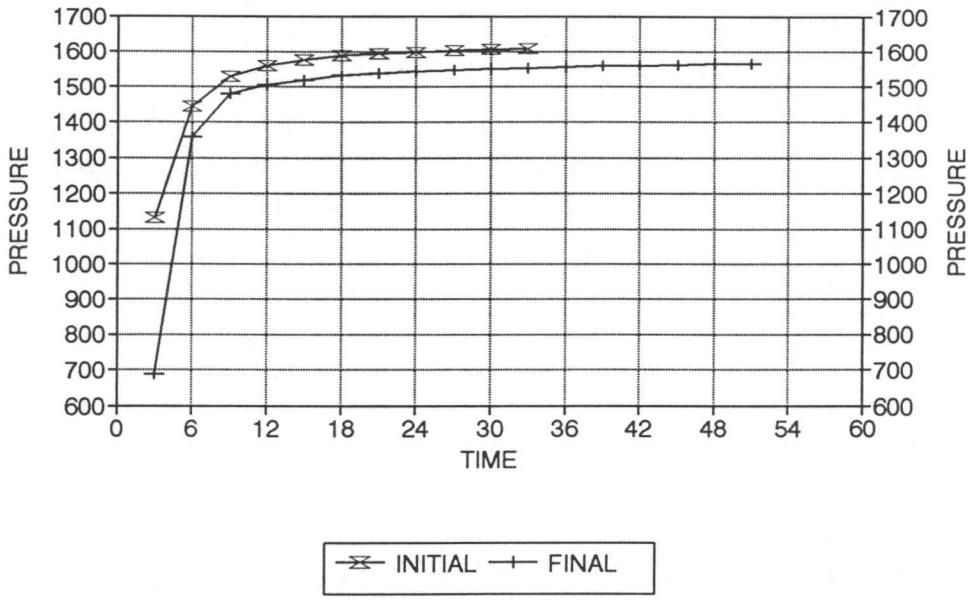
ZIMMERMAN #1 DST #1
FINAL SHUTIN

60 TOTAL FLOW TIME

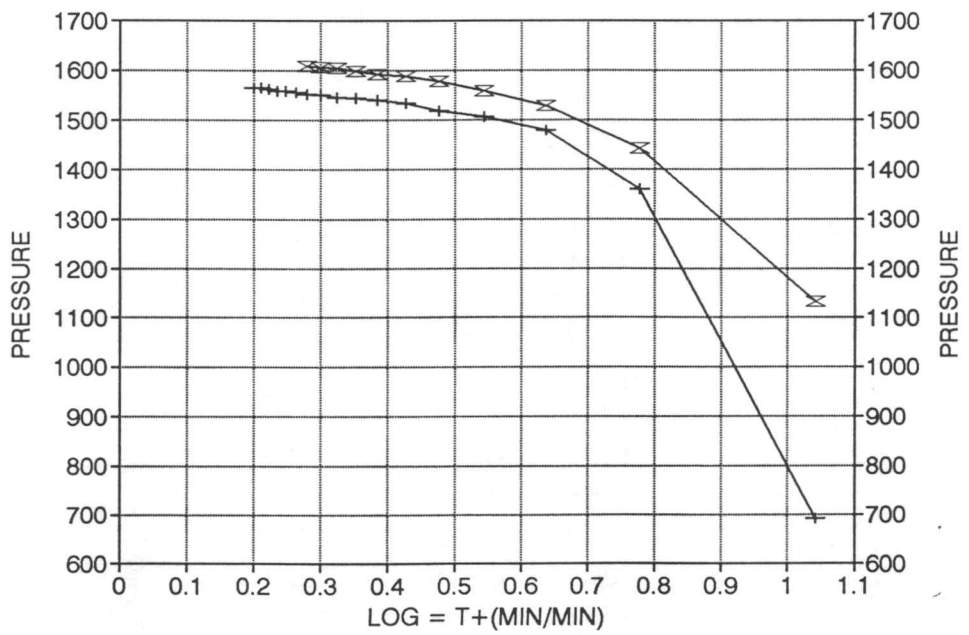
SLOPE 113143.1 PSI/CYCLE
P* 1599.9 PSI

	TIME(MIN)	Pws(psi)	Log Horn T	<> PRESSURE	Horn T
	3	689.6	1.322	689.6	21
	6	1358.7	1.041	669.1	11
	9	1478.9	0.885	120.2	8
	12	1506.2	0.778	27.3	6
	15	1517.1	0.699	10.9	5
	18	1531.3	0.637	14.2	4
	21	1537.9	0.586	6.6	4
	24	1542.3	0.544	4.4	4
	27	1545.5	0.508	3.2	3
	30	1548.8	0.477	3.3	3
	33	1551.1	0.450	2.3	3
	36	1555.4	0.426	4.3	3
	39	1558.1	0.405	2.7	3
	42	1560.6	0.385	2.5	2
X	45	1562.1	0.368	1.5	2
	48	1563.1	0.352	1.0	2
X	51	1564.1	0.338	1.0	2

ZIMMERMAN #1 / DST #1
DELTA T DELTA P



HORNER PLOT



GAS VOLUME REPORT

LITTLE RIVER ENERGY COMPANY

ZIMMERMAN #1 DST # 1

MIN	PSIG	ORIFICE	MCF/D	MIN	PSIG	ORIFICE	MCF/D
8	GAS TO SURFACE			10	13	0.5	134
10	7.5	0.5	97.5	20	15	0.5	147
20	12	0.5	129	30	15	0.5	147
30	12	0.5	129				

Remarks:

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name ZIMMERMAN #1 Test No. 2 Date 7/25/94

Company LITTLE RIVER ENERGY COMPANY Zone SIMPSON

Address PO BOX 1113 DRUMRIGHT OK 74030 Elevation 1427 KB

Co. Rep./Geo. JEFF ZOLLER Cont. ALLEN #1 Est. Ft. of Pay 5

Location: Sec. 16 Twp. 32S Rge. 7W Co. HARPER State KS

Interval Tested 4733-4740 Drill Pipe Size 4.5" XH

Anchor Length 7 Wt. Pipe I.D. - 2.7 Ft. Run

Top Packer Depth 4728 Drill Collar – 2.25 Ft. Run

Bottom Packer Depth 4733 Mud Wt. 9.3 lb/Gal.

Total Depth 4740 Viscosity 50 Filtrate 10.0

Tool Open @ 5:38 A.M. Initial Blow STRONG BLOW (GAS TO SURFACE IN 6 MIN) SEE GAS BLOW REPORT

Final Blow STRONG BLOW (SEE GAS FLOW REPORT)

Recovery - Total Feet 2400 Flush Tool? NO

Rec. 2340 Feet of GAS IN PIPE

Rec. 960 Feet of CLEAR GASSY OIL 10%GAS/90%OIL

Rec. 1440 Feet of GASSY SALT WATER 3%GAS/97%WATER

Rec. Feet of

Rec. Feet of

BHT 127 °F Gravity 47 °API @ 74 °F Corrected Gravity 46 °API

RW 0.26 @ 78 °F Chlorides 99000 ppm Recovery Chlorides 7000 ppm System

(A) Initial Hydrostatic Mud 2467.9 PSI AK1 Recorder No. 13788 Range 4650

(B) First Initial Flow Pressure 256.3 PSI @ (depth) 4737 w / Clock No. 22993

(C) First Final Flow Pressure 664.1 PSI AK1 Recorder No. 10248 Range 4400

(D) Initial Shut-in Pressure 1788.5 PSI @ (depth) 4731 w / Clock No. 30410

(E) Second Initial Flow Pressure 707.2 PSI AK1 Recorder No. Range

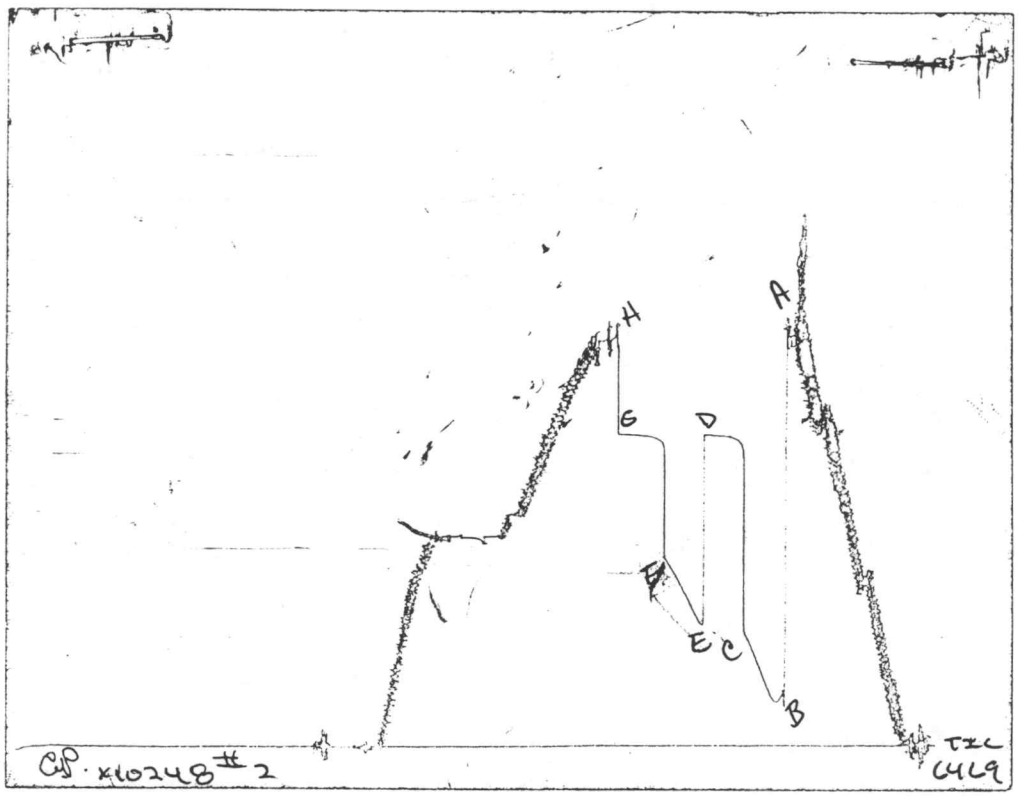
(F) Second Final Flow Pressure 1092.0 PSI @ (depth) w / Clock No.

(G) Final Shut-in Pressure 1788.4 PSI Initial Opening 30 Final Flow 30

(H) Final Hydrostatic Mud 2426.0 PSI Initial Shut-in 30 Final Shut-in 30

Our Representative GARY PEVOTEAUX

CHART PAGE



	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2369	2467.9
(B) FIRST INITIAL FLOW PRESSURE	227	256.3
(C) FIRST FINAL FLOW PRESSURE	674	664.1
(D) INITIAL CLOSED-IN PRESSURE	1797	1788.5
(E) SECOND INITIAL FLOW PRESSURE	714	707.2
(F) SECOND FINAL FLOW PRESSURE	1100	1092
(G) FINAL CLOSED-IN PRESSURE	1797	1788.4
(H) FINAL HYDROSTATIC MUD	2344	2426

COMPUTER OIL EVALUATION BY TRILOBITE TESTING, L.L.C.

LITTLE RIVER ENERGY COMPANY

ZIMMERMAN #1 DST 2

16 32S 7W HARPER KS

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ELEVATION:	1427 KB	KB	EST. PAY	5	FT
DATUM:	-4498		ZONE TESTED:	SIMPSON	
TEST INTERVAL:	4733-4740		TIME INTERVALS:	30-60-60-120	
RECORDER DEPTH:	4497		VISCOSITY:	2.95	CP
BOTTOM HOLE TEMP:	127		HOLE SIZE:	7.875	IN

****

CUBIC FEET OF GAS IN PIPE:	6			
TOTAL FEET OF RECOVERY:	1145.00	CORRECTED PIPE FILLUP:	1360.290	
TOTAL BARRELS OF RECOVERY:	16.28	CORR. BARRELS OF RECOVERY:	18.330	BBL
BARRELS IN DRILL PIPE:	16.28	API GRAVITY:	46	
BARRELS IN WEIGHT PIPE:	0.00	FLUID GRADIENT:	0.345	
BARRELS IN DRILL COLLARS:	0.00			
GAS OIL RATIO:	0.34	CU.FT/BBL		
BUBBLE POINT PRESSURE:	4			
UNCORRECTED INITIAL PRODUCTION:			260.51	BBL
INITIAL PRODUCTION CORRECTED TO FINAL FLOW PRESSURE:			293.27	BBL/DAY
INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE:			164.933	

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INITIAL SLOPE	87.28	PSI/CYCL	FINAL SLOPE	11.49	PSI/CYCLE
INITIAL P*	1016.96	PSI	FINAL P*	987.59	PSI

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TRANSMISSIBILITY	4150.06	(MD.-FT./CP.)
PERMEABILITY	2448.80	(MD.)
INDICATED FLOW CAPACITY	12244.00	(MD.FT)
PRODUCTIVITY INDEX	4.69	(BARREL/DAY/PSI)
DAMAGE RATIO	8.25	
RADIUS OF INVESTIGATION	469.46	(FT,)
POTENTIOMETRIC SURFACE	-2206.77	(FT.)
DRAWDOWN FACTOR	2.888	(%)
THEORETICAL POTENTIAL FROM FINAL FLOW PRESSURE	2420.80	
THEORETICAL POTENTIAL FROM PSEUDO STEADY FLOW STATE	1361.43	

INITIAL FLOW

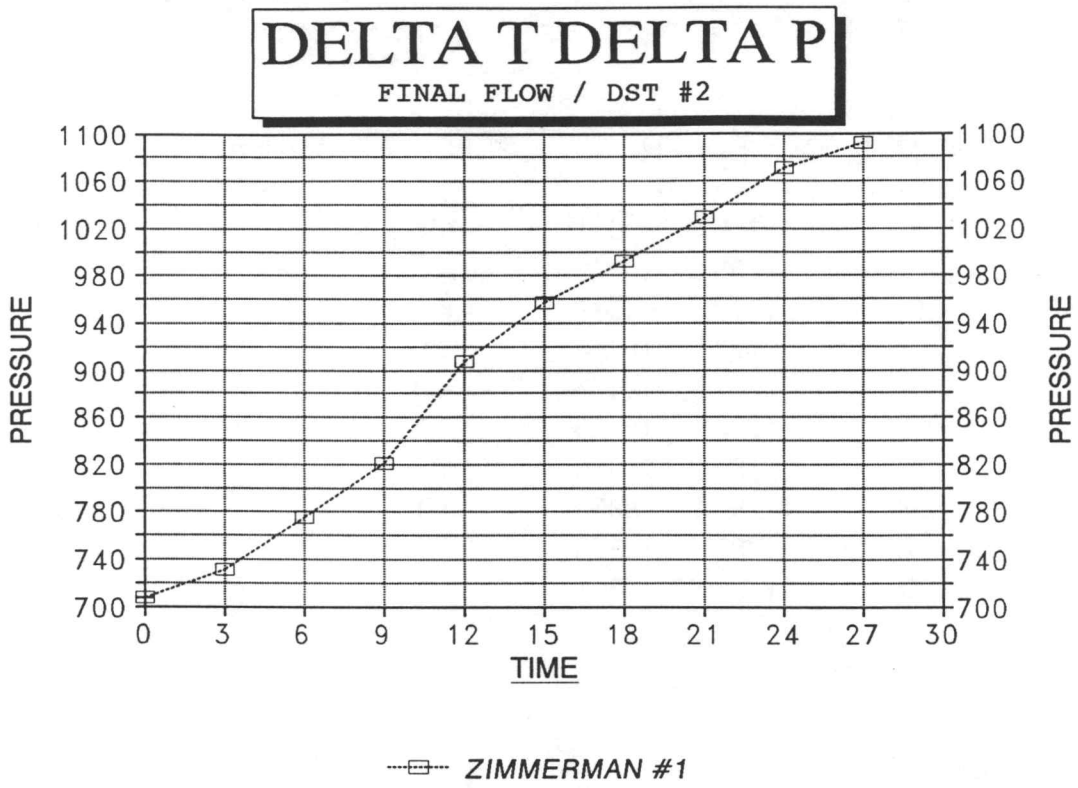
RECORDER 10248 DST # 2

TIME(MIN)	PRESSURE	<>PRESSURE
0	256.3	256.3
3	270.7	14.4
6	314.6	43.9
9	360.3	45.7
12	412.8	52.5
15	484.1	71.3
18	536.1	52.0
21	588.1	52.0
24	633.2	45.1
27	664.1	30.9
30	656.5	-7.6

FINAL FLOW

RECORDER 10248 DST # 2

TIME(MIN)	PRESSURE	<> PRESSURE
0	707.2	707.2
3	731.4	24.2
6	775.4	44.0
9	820.4	45.0
12	907.1	86.7
15	957.5	50.4
18	991.4	33.9
21	1029.7	38.3
24	1070.2	40.5
27	1092.0	21.8



INITIAL PRODUCTION CORRECTED TO PSEUDO STEADY FLOW STATE: 624.950

ZIMMERMAN #1 DST #2
INITIAL SHUTIN

30 INITIAL FLOW TIME

SLOPE 46.85 PSI/CYCLE
P* 1802.60 PSI

	TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	1755.6	1.041	1755.6	11
	6	1768.8	0.778	13.2	6
	9	1777.5	0.637	8.7	4
	12	1777.5	0.544	0.0	4
	15	1781.9	0.477	4.4	3
	18	1784.1	0.426	2.2	3
	21	1785.2	0.385	1.1	2
	24	1786.3	0.352	1.1	2
X	27	1787.4	0.325	1.1	2
X	30	1788.5	0.301	1.1	2

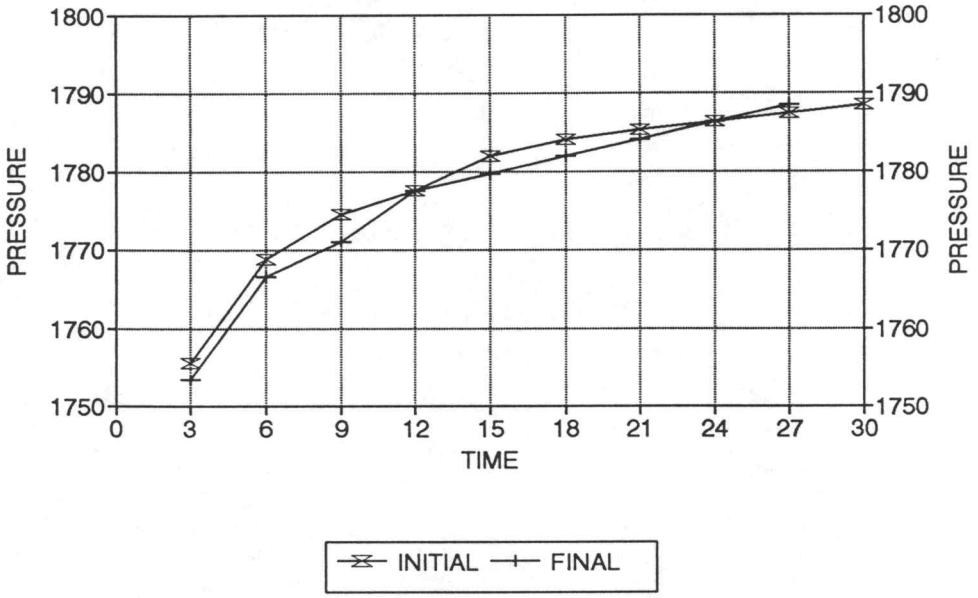
ZIMMERMAN #1 DST #2
FINAL SHUTIN

60 TOTAL FLOW TIME

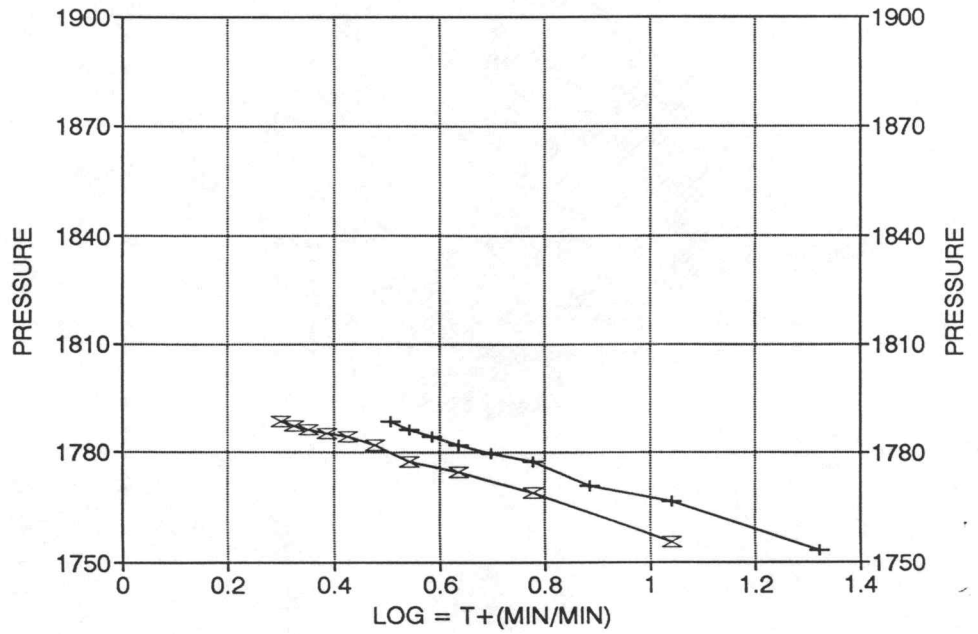
SLOPE 40.4 PSI/CYCLE
P* 1808.9 PSI

	TIME(MIN)	Pws(psi)	Log Horn T	<> PRESSURE	Horn T
	3	1753.4	1.322	1753.4	21
	6	1766.6	1.041	13.2	11
	9	1771.0	0.885	4.4	8
X	12	1777.5	0.778	6.5	6
	15	1779.7	0.699	2.2	5
	18	1781.9	0.637	2.2	4
	21	1784.1	0.586	2.2	4
	24	1786.3	0.544	2.2	4
X	27	1788.4	0.508	2.1	3

ZIMMERMAN #1 / DST #2
DELTA T DELTA P



HORNER PLOT

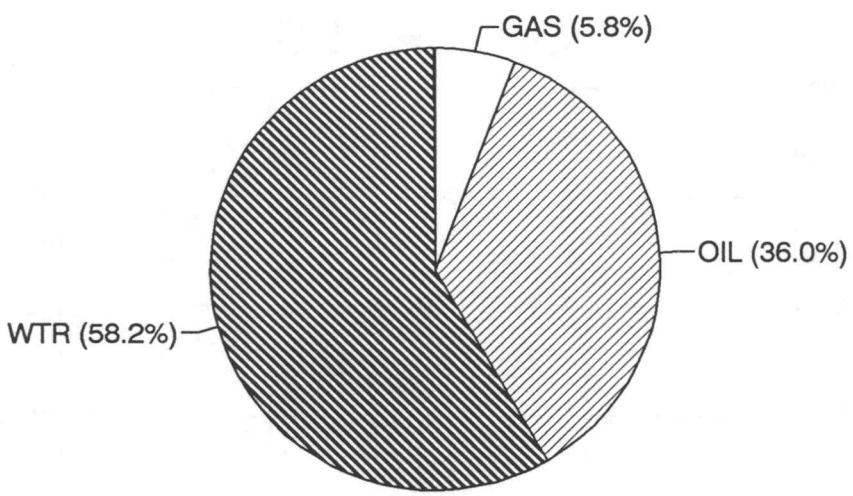


CALCULATED RECOVERY ANALYSIS DRILL PIPE

DST # 2 TICKET 6469

SAMPLE #	TOTAL FEET	GAS %	OIL FEET	OIL %	OIL FEET	WATER %	WATER FEET	MUD %	MUD FEET
1	960	10	96	90	864	0	0	0	0
2	1440	3	43.2	0	0	97	1396.8	0	0
3			0		0		0		0
4			0		0		0		0
5			0		0		0		0
6			0		0		0		0
TOTAL	2400	5.8	139.2	36	864	58.2	1396.8	0	0

			HRS	BBL/DAY
BBL OIL=	12.28608	*	1	294.87
BBL WATER=	19.862496	*		476.7
BBL MUD=	0			
BBL GAS	1.979424			



GAS VOLUME REPORT

LITTLE RIVER ENERGY COMPANY

ZIMMERMAN #1 DST # 2

MIN	PSIG	ORIFICE	MCF/D
6	GAS TO SURFACE		
10	3	0.25	15.7
20	6	0.25	22.9
30	7	0.25	25

MIN	PSIG	ORIFICE	MCF/D
10	2	0.25	12.7
20	3	0.25	15.7
30	2	0.25	12.7

Remarks:

NATURAL GAS ANALYSIS REPORT

Sampled by:
Trilobite Testing, L.L.C.
Hays, Kansas
Scott City, Kansas
Phone: 800-728-5369
Fax: 913-625-5620

Analyzed by:
Caraway Analytical, L.L.C.
728 North Roosevelt
Liberal, Kansas 67901
Phone: 316-324-5389
Fax: 316-626-7108

Lab Number:	940365	Analyzed:	07/28/94
Sample From:	Zimmerman #1 DST 1	Pressure:	
Producer:	Little River Energy Co.	Temperature:	
Date:		Location:	16-32S-7W
Time:		County:	Harper
Sampler:		State:	Kansas
Source:		Formation:	Mississippi

		Mole %	GPM
Helium	He:	0.256	0.000
Oxygen	O2:	0.000	0.000
Nitrogen	N2:	5.002	0.000
Carbon Dioxide	CO2:	0.159	0.000
Methane	C1:	82.829	0.000
Ethane	C2:	6.622	1.771
Propane	C3:	2.879	0.793
Iso Butane	iC4:	0.352	0.115
Normal Butane	nC4:	0.948	0.299
Iso Pentane	iC5:	0.172	0.063
Normal Pentane	nC5:	0.311	0.113
Hexanes Plus	C6+:	0.470	0.205
	TOTAL:	100.000	3.359
	Z Fact:	0.9973	
	SP.GR.:	0.6776	
	BTU (SAT):	1098.1 @ 14.73 psia	
	BTU (DRY):	1117.6 @ 14.73 psia	
	OCTANE RATING:	118.9	

COMMENTS: