TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name WOODWARD A - #1 Test No. 1 Date 10/24/92

Company HELMERICH & PAYNE Zone UPR MORROW

Address BOX 558 GARDEN CITY KS 67846 Elevation 2850

Co. Rep./Geo. KEN JEHLICH Cont. CHEYENNE DRLG #4 Est. Ft. of Pay 6

Location: Sec. 35 Twp. 31S Rge. 32W Co. SEWARD State KS

Interval Tested 5502-5540

Anchor Length 38

Top Packer Depth 5497

Bottom Packer Depth 5502

Total Depth 5540

Drill Pipe Size 4.5" FH

Wt. Pipe I.D. - 2.7 Ft. Run

Drill Collar – 2.25 Ft. Run 726

Mud Wt. 8.9 lb/Gal.

Viscosity 45 Filtrate 10.4

Tool Open @ 5:05 PM Initial Blow 2" BLOW - BUILT TO BOTTOM OF BUCKET IN 4 MINUTES

ISI:BLED OFF BLOW-NO BLOW BACK

Final Blow BOTTOM OF BUCKET SOON AS TOOL OPENED-GAS TO SURFACE

IN 58 MINUTES / GAUGED @5.86 MCF/DAY

Recovery - Total Feet 20 Flush Tool? NO

Rec. 20 Feet of DRILLING MUD

Rec. Feet of

Rec. Feet of

Rec. Feet of

Rec. Feet of

BHT 124 °F Gravity °API @ °F Corrected Gravity °API

RW @ °F Chlorides ppm Recovery Chlorides 2500 ppm System

(A) Initial Hydrostatic Mud 2688.9 PSI AK1 Recorder No. 13277 Range 4125

(B) First Initial Flow Pressure 41.4 PSI @ (depth) 5505 w / Clock No. 27594

(C) First Final Flow Pressure 38.7 PSI AK1 Recorder No. 11038 Range 5075

(D) Initial Shut-in Pressure 1597.2 PSI @ (depth) 5537 w / Clock No. 30418

(E) Second Initial Flow Pressure 33.2 PSI AK1 Recorder No. Range

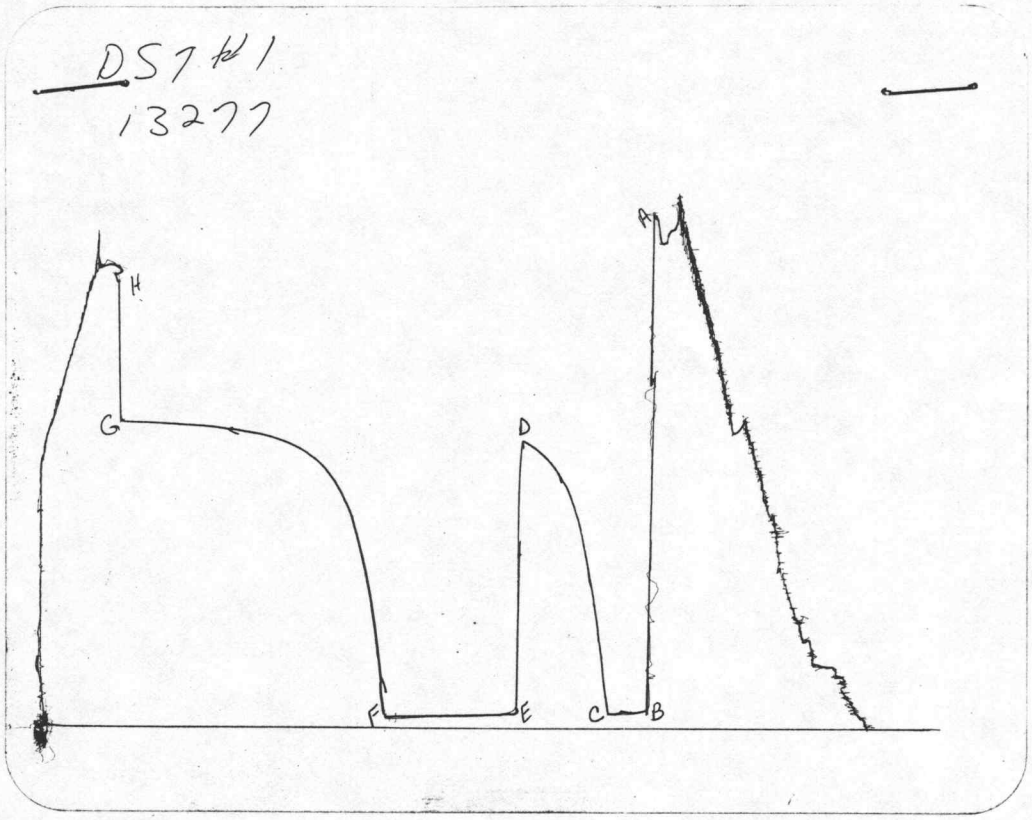
(F) Second Final Flow Pressure 19.6 PSI @ (depth) w / Clock No.

(G) Final Shut-in Pressure 1655.1 PSI Initial Opening 30 Final Flow 90

(H) Final Hydrostatic Mud 2555.7 PSI Initial Shut-in 60 Final Shut-in 180

Our Representative TOM HORACEK

CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2683	2688.9
(B) FIRST INITIAL FLOW PRESSURE	41	41.4
(C) FIRST FINAL FLOW PRESSURE	41	38.7
(D) INITIAL CLOSED-IN PRESSURE	1587	1597.2
(E) SECOND INITIAL FLOW PRESSURE	27	33.2
(F) SECOND FINAL FLOW PRESSURE	27	19.6
(G) FINAL CLOSED-IN PRESSURE	1662	1655.1
(H) FINAL HYDROSTATIC MUD	2554	2555.7

GAS VOLUME REPORT

HELMERICH & PAYNE

WOODWARD A - #1 DST # 1

MIN	PSIG	ORIFICE	MCF/D	MIN	PSIG	ORIFICE	MCF/D
5				60	10	0.375	5.32
				70	12	0.375	5.86
				80	12	0.375	5.86
				90	12	0.375	5.86

Remarks: GAS TO SURFACE IN 58 MIN 2ND OPENING/GAS WILL BURN

FLUID SAMPLER DATA

Ticket No.: 4842 Date: 10/24/92

Company: HELMERICH & PAYNE

Lease: WOODWARD A - #1 Test No.: 1

County: SEWARD Sec.: 35 Twp.: 31S Rng.: 32W

SAMPLER RECOVERY

Gas 3500

Oil

Mud

Water

Other 31 cu ft

Pressure 1350

TOTAL 3500

SAMPLER ANALYSIS

Resistivity ohms@ F

Chlorides ppm.

Gravity corrected @60F

PIT MUD ANALYSIS

Chlorides 2500

Resistivity ohms@ F

Viscosity 45

Mud Wt. 8.9

Filtrate 10.4

Other

PIPE RECOVERY

TOP

Resistivity ohms@ F

Chlorides ppm

MIDDLE

Resistivity ohms@ F

Chlorides ppm

BOTTOM

Resistivity ohms@ F

Chlorides ppm

WOODWARD A-# DST #1

INITIAL		SHUTIN				
	30	TOTAL FLOW TIME		Slope	2335677.65	psi/cycle
				P *	2211	psi

	TIME(MIN)	Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	3	247.7	1.041	247.7	11
	6	452.9	0.778	205.2	6
	9	642.8	0.637	189.9	4
	12	804.7	0.544	161.9	4
	15	937.1	0.477	132.4	3
	18	1030.8	0.426	93.7	3
	21	1134.4	0.385	103.6	2
	24	1199.9	0.352	65.5	2
	27	1262.8	0.325	62.9	2
	30	1314.3	0.301	51.5	2
	33	1365.9	0.281	51.6	2
	36	1394.7	0.263	28.8	2
	39	1432.4	0.248	37.7	2
	42	1463.9	0.234	31.5	2
	45	1487.8	0.222	23.9	2
	48	1511.6	0.211	23.8	2
	51	1531.7	0.201	20.1	2
	54	1551.8	0.192	20.1	2
	57	1563.2	0.184	11.4	2
X	60	1572.0	0.176	8.8	2
X	63	1597.2	0.169	25.2	1

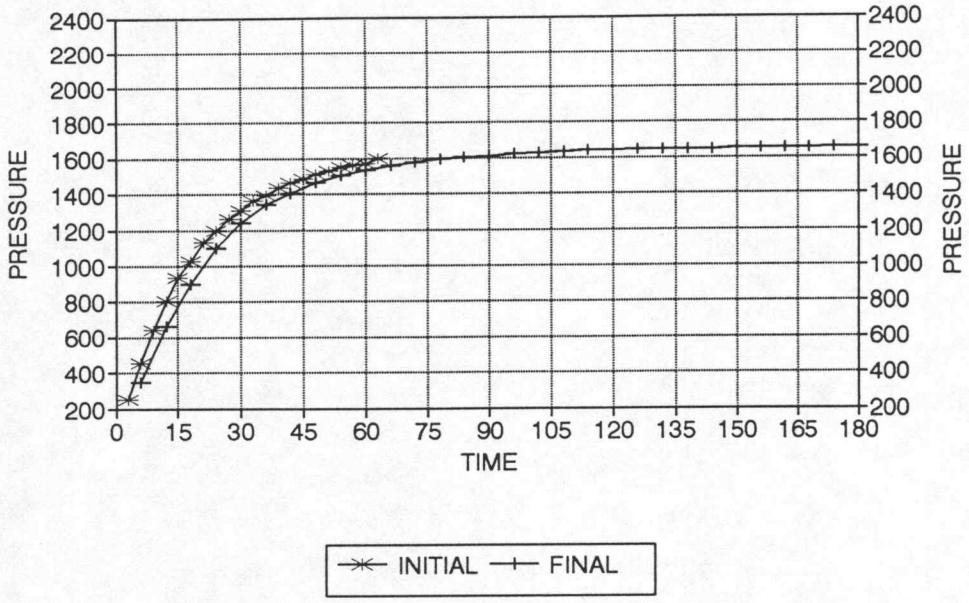
WOODWARD A-# DST #1
FINAL SHUTIN

120 TOTAL FLOW TIME

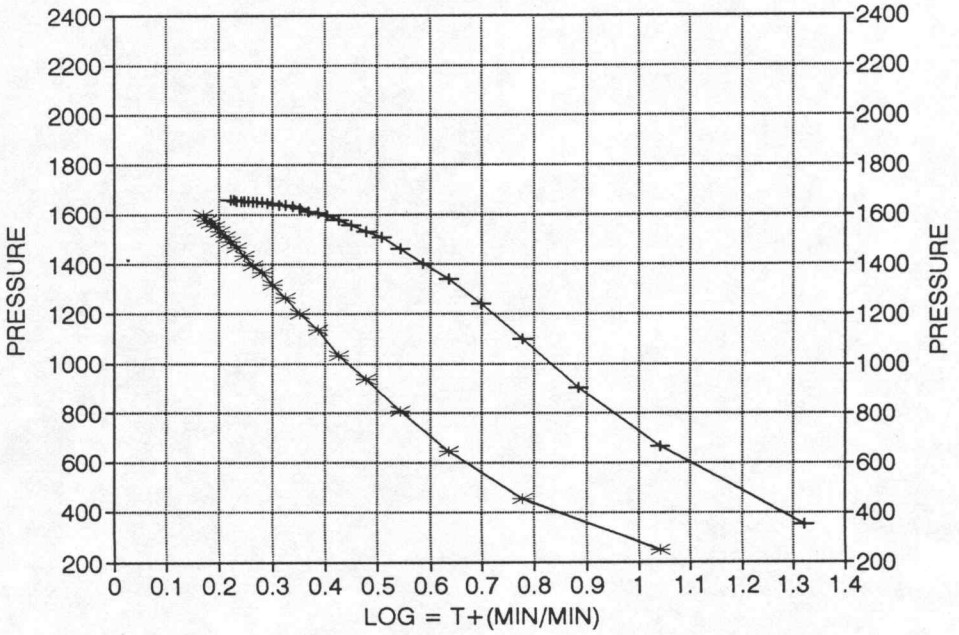
Slope	109001.65	psi/cycle			
P *	1688	psi			

		Pws (psi)	Log Horn T	<> PRESSURE	Horn T
	6	350.1	1.322	350.1	21
	12	666.0	1.041	315.9	11
	18	901.5	0.885	235.5	8
	24	1099.1	0.778	197.6	6
	30	1238.9	0.699	139.8	5
	36	1338.2	0.637	99.3	4
	42	1403.5	0.586	65.3	4
	48	1461.4	0.544	57.9	4
	54	1507.9	0.508	46.5	3
	60	1533.0	0.477	25.1	3
	66	1558.1	0.450	25.1	3
	72	1578.3	0.426	20.2	3
	78	1593.4	0.405	15.1	3
	84	1606.0	0.385	12.6	2
	90	1612.3	0.368	6.3	2
	96	1621.1	0.352	8.8	2
	102	1629.9	0.338	8.8	2
	108	1633.7	0.325	3.8	2
	114	1637.5	0.312	3.8	2
	120	1642.5	0.301	5.0	2
X	126	1645.0	0.291	2.5	2
	132	1646.3	0.281	1.3	2
	138	1647.6	0.272	1.3	2
	144	1648.8	0.263	1.2	2
	150	1650.1	0.255	1.3	2
	156	1651.3	0.248	1.2	2
	162	1652.6	0.241	1.3	2
	168	1653.8	0.234	1.2	2
	174	1655.1	0.228	1.3	2
X	180	1655.1	0.222	0.0	2

WOODWARD A-#1 / DST #1
DELTA T DELTA P



HORNER PLOT



TRILOBITE TESTING

P.O. Box 362 • Hays, Kansas 67601 • (913) 625-4778

GAS VOLUME REPORT

Helmerich & Payne INC. (OPERATOR) | Woodward A #1 (WELL NAME AND NO.) | #1 (DST NO.)

2nd open

Min.	Ins. of Water PSIG	Orifice Size	MCF/D	Min.	Ins. of Water PSIG	Orifice Size	MCF/D
				60	10	3/8	5.32
				70	12	3/8	5.86
				80	12	3/8	5.86
				90	12	3/8	5.86

Remarks: GTS in 58 min. 2nd opening.

Gas will burn.

TRILOBITE TESTING COMPANY

P.O. Box 362 - Hays, Kansas 67601

FLUID SAMPLER DATA

Ticket No. 4842 Date 10-24-92

Company Name Helmerich & Payne Inc.

Lease Woodward A-#1 Test No. #1

County Seward Ks. Sec. 35 Twp. 31 Rng. 32

SAMPLER RECOVERY

Gas 3500 ML

Oil ML

Mud ML

Water ML

Other 31 cubic Ft. ML

Pressure 1350 PSI

Total 3500 ML

PIT MUD ANALYSIS

Chlorides ppm.

Resistivity ohms @ F

Viscosity 45

Mud Weight 8.9

Filtrate 10.4

Other

SAMPLER ANALYSIS

Resistivity ohms @ F

Chlorides ppm.

Gravity corrected @ 60 F

PIPE RECOVERY

TOP

Resistivity ohms @ F

Chlorides ppm.

MIDDLE

Resistivity ohms @ F

Chlorides ppm.

BOTTOM

Resistivity ohms @ F

Chlorides ppm.

0.028	~~38.7184~~
0.183	247.7984
0.338	452.9227
0.484	642.8802
0.61	804.7216
0.714	937.154
0.788	1030.881
0.87	1134.419
0.922	1199.902
0.972	1262.815
1.013	1314.33
1.054	1365.905
1.077	1394.782
1.107	1432.44
1.132	1463.917
1.151	1487.814
1.17	1511.689
1.186	1531.776
1.202	1551.863
1.211	1563.215
1.218	1572.042
1.238	1597.247

3mm

0.014	~~19.6784~~
0.26	350.1836
0.502	666.0922
0.686	901.5882
0.842	1099.12
0.953	1238.935
1.032	1338.246
1.084	1403.563
1.13	1461.401
1.167	1507.921
1.187	1533.031
1.207	1558.17
1.223	1578.345
1.235	1593.468
1.245	1606.065
1.25	1612.361
1.257	1621.175
1.264	1629.985
1.267	1633.761
1.27	1637.536
1.274	1642.568
1.276	1645.084
1.277	1646.342
1.278	1647.6
1.279	1648.858
1.28	1650.115
1.281	1651.373
1.282	1652.631
1.283	1653.888
1.284	1655.146

6mm

0.024	33.2736
0.024	33.2736
0.024	33.2736
0.024	33.2736
0.022	30.5404
0.021	29.1711
0.02	27.8
0.02	27.8
0.02	27.8
0.019	26.4594
0.017	23.7626
0.015	21.045
0.014	19.6784
0.014	19.6784
0.014	19.6784
0.014	19.6784

WELL NAME Westland #1 DST # [illegible] RECORDER # 11038

INITIAL HYD. MUD 2187 FINAL HYD. MUD 1981

FINAL SHUTIN 180

6

41.4

40.0

38.7

37.3

38.7

19.6

1597.2

1655.1

TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

Test Ticket

№ 4842

Well Name & No. Woodward A-#1 Test No. #1 Date 10-24-92

Company Helmerich & Payne Inc. Zone Tested Upper Morrow

Address Box 558 Garden City Ks. 67846 Elevation 2850 (KB)

Co. Rep./Geo. Ken Sehlich Cont. Cheyenne Drlg #4 Est. Ft. of Pay 6'

Location: Sec. 35 Twp. 31 Rge. 32 Co. Seward State Ks.

No. of Copies 5 Distribution Sheet X Yes ____ No Turnkey ____ Yes ____ No ____ Evaluation

Interval Tested 5502-5540 Drill Pipe Size 4.5 X-Hole

Anchor Length 38' Top Choke — 1" ____ Bottom Choke — ¾" ____

Top Packer Depth 5497 Hole Size — 7⅞" ____ Rubber Size — 6¾" ____

Bottom Packer Depth 5502 Wt. Pipe I.D. — 2.7 Ft. Run —

Total Depth 5540 Drill Collar — 2.25 Ft. Run 726'

Mud Wt. 8.9 lb/gal. Viscosity 45 Filtrate 10.4

Tool Open @ 5:05 pm Initial Blow 2 in blow - Built to bottom of bucket in 4 min.
ISI - Bled off blow - NO blow back

Final Blow Bottom of bucket as tool opened. {GTS in 58 min.}
Gauged @ 5,86 MCF

Recovery — Total Feet 20' Feet of Gas in Pipe ____ Flush Tool? NO

Rec.	Feet Of		%gas	%oil	%water	%mud
Rec.	Feet Of		%gas	%oil	%water	%mud
Rec. 20'	Feet Of	Drlg mud	%gas	%oil	%water	%mud
Rec.	Feet Of		%gas	%oil	%water	%mud
Rec.	Feet Of		%gas	%oil	%water	%mud

BHT 124° °F Gravity ____ °API @ ____ °F Corrected Gravity ____ °API

RW ____ @ ____ °F Chlorides ____ ppm Recovery Chlorides 2,500 ppm System

(A) Initial Hydrostatic Mud	2683 PSI	AK1 Recorder No.	13277	Range	4125
(B) First Initial Flow Pressure	41 PSI	@ (depth)	5505	w/Clock No.	27594
(C) First Final Flow Pressure	41 PSI	AK1 Recorder No.	11038	Range	5075
(D) Initial Shut-In Pressure	1587 PSI	@ (depth)	5537	w/Clock No.	30418
(E) Second Initial Flow Pressure	27 PSI	AK1 Recorder No.		Range	
(F) Second Final Flow Pressure	27 PSI	@ (depth)		w/Clock No.	
(G) Final Shut-In Pressure	1662 PSI	Initial Opening	30	Test	X
(H) Final Hydrostatic Mud	2554 PSI	Initial Shut-In	60	Jars	X
		Final Flow	90	Safety Joint	X
		Final Shut-In	180	Straddle	
				Circ. Sub	
				Sampler	X
				Extra Packer	
				Other	partial eval
				TOTAL PRICE $	

Approved By Bob Owens

Our Representative Tom Heracek

Printcraft Printers - Hays, KS

TRILOBITE TESTING, L.L.C.

P.O. Box 362 • Hays, Kansas 67601

Drill-Stem Test Data

Well Name: WOODWARD A - #1 | Test No.: 2 | Date: 10/26/92

Company: HELMERICH & PAYNE | Zone: ATOKA

Address: BOX 558 GARDEN CITY KS 67846 | Elevation: 2850

Co. Rep./Geo.: KEN JEHLICH | Cont.: CHEYENNE DRLG #4 | Est. Ft. of Pay:

Location: Sec.: 35 | Twp.: 31S | Rge.: 32W | Co.: SEWARD | State: KS

Interval Tested: 5423-5934 | Drill Pipe Size: 4.5" FH

Anchor Length: 511 | Wt. Pipe I.D. - 2.7 Ft. Run:

Top Packer Depth: 5418 | Drill Collar – 2.25 Ft. Run: 210

Bottom Packer Depth: 5423 | Mud Wt.: 8.8 lb/Gal.

Total Depth: 5934 | Viscosity: 50 | Filtrate: 10.4

Tool Open @: 10:38 PM | Initial Blow: 2" BLOW-BUILT TO BOTTOM OF BUCKET IN 13 MINUTES

ISI:BLED OFF BLOW-NO BLOW BACK

Final Blow: 1/2" BLOW-BUILT TO BOTTOM OF BUCKET IN 70 MINUTES

FSI:BLED OFF BLOW-NO BLOW BACK

Recovery - Total Feet: 340 | Flush Tool?: NO

Rec. 240 | Feet of GAS IN PIPE

Rec. 340 | Feet of GASSY DRILLING MUD

Rec. | Feet of

Rec. | Feet of

Rec. | Feet of

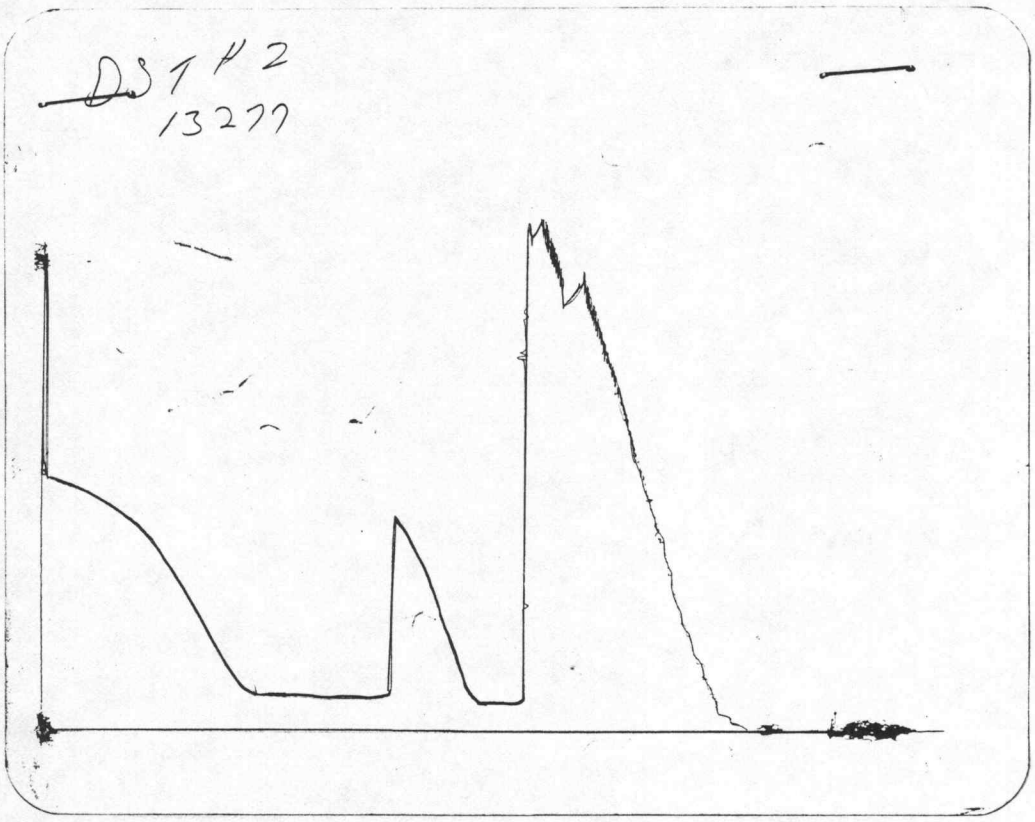
BHT: 123 °F | Gravity: °API | @ °F | Corrected Gravity: °API

RW: @ °F | Chlorides: ppm Recovery | Chlorides: 4200 ppm System

(A) Initial Hydrostatic Mud	2723.6 PSI	AK1 Recorder No.	13277	Range	4125
(B) First Initial Flow Pressure	164.7 PSI	@ (depth)	5424	w / Clock No.	27594
(C) First Final Flow Pressure	165.8 PSI	AK1 Recorder No.	11038	Range	5075
(D) Initial Shut-in Pressure	1163.9 PSI	@ (depth)	5931	w / Clock No.	17639
(E) Second Initial Flow Pressure	192.5 PSI	AK1 Recorder No.		Range	
(F) Second Final Flow Pressure	195.2 PSI	@ (depth)		w / Clock No.	
(G) Final Shut-in Pressure	1380.4 PSI	Initial Opening	30	Final Flow	90
(H) Final Hydrostatic Mud	2633.9 PSI	Initial Shut-in	60	Final Shut-in	180

Our Representative: TOM HORACEK

CHART PAGE



This is an actual photograph of recorder chart

	FIELD READING	OFFICE READING
(A) INITIAL HYDROSTATIC MUD	2718	2723.6
(B) FIRST INITIAL FLOW PRESSURE	162	164.7
(C) FIRST FINAL FLOW PRESSURE	162	165.8
(D) INITIAL CLOSED-IN PRESSURE	1162	1163.9
(E) SECOND INITIAL FLOW PRESSURE	194	192.5
(F) SECOND FINAL FLOW PRESSURE	194	195.2
(G) FINAL CLOSED-IN PRESSURE	1377	1380.4
(H) FINAL HYDROSTATIC MUD	2627	2633.9

FLUID SAMPLER DATA

Ticket No.: 4843 Date: 10/26/92

Company: HELMERICH & PAYNE

Lease: WOODWARD A - #1 Test No.: 2

County: SEWARD Sec.: 35 Twp.: 31S Rng.: 32W

SAMPLER RECOVERY

Gas 2500

Oil

Mud 1000

Water

Other

Pressure 1300

TOTAL 3500

SAMPLER ANALYSIS

Resistivity ohms@ F

Chlorides ppm.

Gravity corrected @60F

PIT MUD ANALYSIS

Chlorides 4200

Resistivity ohms@ F

Viscosity 50

Mud Wt. 8.8

Filtrate 10.4

Other

PIPE RECOVERY

TOP

Resistivity ohms@ F

Chlorides ppm

MIDDLE

Resistivity ohms@ F

Chlorides ppm

BOTTOM

Resistivity ohms@ F

Chlorides ppm

TRILOBITE TESTING COMPANY

P.O. Box 362 - Hays, Kansas 67601

FLUID SAMPLER DATA

Ticket No. 4843 Date 10-26-92

Company Name Helmerich & Payne

Lease Woodward A-#1 Test No. #2

County Seward Ks. Sec. 35 Twp. 31 Rng. 32

SAMPLER RECOVERY

Gas 2500 ML

Oil ML

Mud 1000 ML

Water ML

Other ML

Pressure 1300 PSI

Total 3500 ML

PIT MUD ANALYSIS

Chlorides ppm.

Resistivity ohms @ F

Viscosity 50

Mud Weight 8.8

Filtrate 10.4

Other

SAMPLER ANALYSIS

Resistivity ohms @ F

Chlorides ppm.

Gravity corrected @ 60 F

PIPE RECOVERY

TOP

Resistivity ohms @ F

Chlorides ppm.

MIDDLE

Resistivity ohms @ F

Chlorides ppm.

BOTTOM

Resistivity ohms @ F

Chlorides ppm.

TRILOBITE TESTING COMPANY

P.O. Box 362 • Hays, Kansas 67601

Test Ticket

No. 4843

Well Name & No. Woodward A-#1 Test No. #2 Date 10-26-92

Company Helmerich & Payne Inc. Zone Tested Atoka

Address Box 558 Garden City Ks. 67846 Elevation 2850 (KB)

Co. Rep./Geo. Larry Seigrist Cont. Cheyenne Drlg #4 Est. Ft. of Pay

Location: Sec. 35 Twp. 31 Rge. 32 Co. Seward State Ks.

No. of Copies 5 Distribution Sheet X Yes ____ No Turnkey ____ Yes ____ No ____ Evaluation

Interval Tested 5423-5934 Drill Pipe Size 4.5 F-Hole

Anchor Length 511' Top Choke — 1" ____ Bottom Choke — ¾" ____

Top Packer Depth 5418 Hole Size — 7⅞" ____ Rubber Size — 6¾" ____

Bottom Packer Depth 5423 Wt. Pipe I.D. — 2.7 Ft. Run —

Total Depth 5934 Drill Collar — 2.25 Ft. Run 210

Mud Wt. 8.8 lb/gal. Viscosity 50 Filtrate 10.4

Tool Open @ 10:38 pm Initial Blow 2in blow-built to bottom of bucket 13 min.
ESI-Bled off blow-No blow back

Final Blow ½ blow-built to bottom of bucket in 70 min.
FSI-Bled off blow-NO blow back

Recovery — Total Feet 340' Feet of Gas in Pipe 240' Flush Tool? NO

Rec.	Feet Of		%gas	%oil	%water	%mud
Rec.	Feet Of		%gas	%oil	%water	%mud
Rec. 340'	Feet Of	Gassy Drlg mud	%gas	%oil	%water	%mud
Rec.	Feet Of		%gas	%oil	%water	%mud
Rec.	Feet Of		%gas	%oil	%water	%mud

BHT 123 °F Gravity ____ °API @ ____ °F Corrected Gravity ____ °API

RW ____ @ ____ °F Chlorides ____ ppm Recovery Chlorides 4200 ppm System

(A) Initial Hydrostatic Mud	2718 PSI	AK1 Recorder No.	13277	Range	4125
(B) First Initial Flow Pressure	162 PSI	@ (depth)	5424	w/Clock No.	27594
(C) First Final Flow Pressure	162 PSI	AK1 Recorder No.	11038	Range	5075
(D) Initial Shut-In Pressure	1162 PSI	@ (depth)	5931	w/Clock No.	17639
(E) Second Initial Flow Pressure	194 PSI	AK1 Recorder No.		Range	
(F) Second Final Flow Pressure	194 PSI	@ (depth)		w/Clock No.	
(G) Final Shut-In Pressure	1377 PSI	Initial Opening	30	Test	X
(H) Final Hydrostatic Mud	2627 PSI	Initial Shut-In	60	Jars	X
		Final Flow	90	Safety Joint	X
		Final Shut-In	180	Straddle	
				Circ. Sub	
				Sampler	X
				Extra Packer	
				Other	
				TOTAL PRICE $	1100.00

TRILOBITE TESTING COMPANY SHALL NOT BE LIABLE FOR DAMAGE OF ANY KIND OF THE PROPERTY OR PERSONNEL OF THE ONE FOR WHOM A TEST IS MADE, OR FOR ANY LOSS SUFFERED OR SUBSTAINED, DIRECTLY OR INDIRECTLY, THROUGH THE USE OF ITS EQUIPMENT, OR ITS STATEMENTS OR OPINION CONCERNING THE RESULTS OF ANY TEST. TOOLS LOST OR DAMAGED IN THE HOLE SHALL BE PAID FOR AT COST BY THE PARTY FOR WHOM THE TEST IS MADE.

Approved By Larry Seigrist

Our Representative Tom Hodgek

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