PARAMOUNT RESOURCES LTD.

PARA ET AL MOUNT COTY I-02

300/I-02-60-20-123-30/00
FORT LIARD AREA, N.W.T.

Décollement Consulting Ltd.
CALGARY - ALBERTA - CANADA

PARAMOUNT RESOURCES LTD.

PARA ET AL MOUNT COTY I-02

300/I-02-60-20-123-30/00
FORT LIARD AREA, N.W.T.

GEOLOGICAL REPORT

ON

PARA ET AL MOUNT COTY I-02
300/I-02-60-20-123-30/00
FORT LIARD AREA, N.W.T.

FOR

PARAMOUNT RESOURCES LTD.

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October – November, 2000

Gary Johannson, M.Sc.,
Wellsite Geologist

DECOLLEMENT CONSULTING LTD.

WELL DATA SUMMARY

WELL NAME	Para et al Mount Coty I-02
LEGAL LOCATION	I-02/60-20, 123-30
UNIQUE WELL I.D.	300/I-02-60-20-123-30/00
SURFACE LOCATION	I-02/60-20, 123-30
FIELD/REGION	Fort Liard area, N.W.T.
OPERATOR	Paramount Resources Ltd.

SITE DATA

SURFACE COORDINATES	Lat: 60 deg. 11' 34.008" N Long: 123 deg. 30' 18.797"
SEISMIC LOCATION	Seismic Line: 2-268; 128.9m N of SP 500
WELL CLASSIFICATION	Exploratory WELL LICENSE # WID 1884
AFE NUMBER	00N010052
DRILLING CONTRACTOR	Akita Drilling Rig #51

ELEVATIONS

GROUND LEVEL	367.9 (m)
KELLY BUSHING	373.0 (m)

DRILLING DATES

SPUD DATE	Oct. 16, 2000	**TIME**	22:00hrs
T.D. DATE	Nov. 25, 2000	**TIME**	22:45hrs
RIG RELEASE DATE	n/a		

HOLE SIZE & MUD TYPE

SURFACE	311mm: Gel chem
MAIN	222mm: Gel chem

CASING DATA

SURFACE	39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m
PRODUCTION	n/a

GEOLOGICAL DATA

SAMPLE INTERVAL	Surface to T.D. of 1744m
GAS DETECTION INTERVAL	Surface to T.D. of 1744m
CORES	Sidewall: 18 cores
LOGGING SUITE	HDIL-ZDL-CN-MAC-ML-GR-XYCAL-RCOR
DRILL STEM TESTS	DST #1: 1958-1068m; DST #2: 706-717m (misrun);
	DST #3:1709-1727m; DST #4: 1216-1240m;
	DST #5:1134-1140m; DST #6: 1075-1085m;
	DST #7: 708-720m

WELL STATUS

Cased Potential gas well

FORMATION TOPS

Paramount et al Mount Coty NWT I-02

.L.(m) 367.90 **K.B.(m)** 372.95

FORMATION	*SAMPLE*		*High*	*PROGNOSIS*			*LOGS*		*Isopach*
	MD(m)	*SS(m)*	*Low (-)*	*MD(m)*	*SS(m)*	*Isopach*	*MD(m)*	*SS(m)*	*(m)*
Quaternary	23.0	350.0	-23.0			92.5	-	-	
Lepine	92.5	187.2	-	92.5	280.5	284.1	-	-	284.1
Scatter	376.6	-3.7	-	376.6	-3.7	139.9	-	-	139.4
Garbutt	517.0	-144.1	-0.5	516.5	-143.6	125.0	516.0	-143.1	123.5
Garbutt Radioactive Zone	637.2	-264.3	4.3	641.5	-268.6	13.5	639.5	-266.6	10.0
Bullhead	656.5	-283.6	-1.5	655.0	-282.1	57.0	649.5	-276.6	53.0
Chinkeh Siltstone	705.5	-332.6	6.5	712.0	-339.1	3.0	702.5	-329.6	5.7
Chinkeh Sand**	**708.5**	**-335.6**	**6.5**	**715.0**	**-342.1**	**11.5**	**708.2**	**-335.3**	**14.3**
Triassic	719.0	-346.1	7.5	726.5	-353.6	63.0	722.5	-349.6	67.7
Belloy	791.0	-418.1	n/a	np	np	n/a	790.2	-417.3	46.5
Fantasque**	**839.0**	**-466.1**	**-49.5**	**789.5**	**-416.6**	**173.3**	**836.7**	**-463.8**	**82.8**
Lower Kindle	923.5	-550.6		923.5	-550.6	39.3	919.5	-546.6	44.7
Mattson*	**962.8**	**-589.9**		**962.8**	**-589.9**	**120.0**	**964.2**	**-591.3**	**111.8**
M1 Zone	**1080.0**	**-707.1**	**2.8**	**1082.8**	**-709.9**	**24.0**	**1076.0**	**-703.1**	**23.5**
M2 Zone	**1104.0**	**-731.1**	**2.8**	**1106.8**	**-733.9**	**126.0**	**1099.5**	**-726.6**	**117.5**
M3 Zone	**1219.6**	**-846.7**	**13.2**	**1232.8**	**-859.9**	**23.0**	**1217.0**	**-844.1**	**34.0**
M4 Zone	**1252.5**	**-879.6**	**3.3**	**1255.8**	**-882.9**	**30.0**	**1251.0**	**-878.1**	**20.0**
M5 Zone	**1272.8**	**-899.9**	**13.0**	**1285.8**	**-912.9**	**59.2**	**1271.0**	**-898.1**	**75.0**
M6 Zone	**1345.8**	**-972.9**	**-0.8**	**1345.0**	**-972.1**	**75.0**	**1346.0**	**-973.1**	**77.0**
M7 Zone	**1429.0**	**-1056.1**	**-9.0**	**1420.0**	**-1139.6**	**22.0**	**1423.0**	**-1050.1**	**23.0**
M8 Zone	**1448.3**	**-1075.4**	**-6.3**	**1442.0**	**-1069.1**	**70.0**	**1446.0**	**-1073.1**	**76.9**
M9 Zone	**1522.5**	**-1149.6**	**-10.5**	**1512.0**	**-1139.1**	**49.0**	**1522.9**	**-1150.0**	**25.6**
M10 Zone	**1550.0**	**-1177.1**	**11.0**	**1561.0**	**-1188.1**	**80.0**	**1548.5**	**-1175.6**	**95.3**
Golata	1644.6	-1271.7	-3.6	1641.0	-1268.1	55.0	1643.8	-1270.9	65.2
Flett/Upper Debolt**	**1709.0**	**-1336.1**	**-13.0**	**1696.0**	**-1323.1**	**40.0**	**1709.0**	**-1336.1**	**34.2**
T.D.	1744.0	-1371.1	-8.0	1736.0	-1363.0		1743.2	-1370.3	

Primary Target Zone *
Secondary Target Zone **

DEVIATION SURVEYS

Para et al Mount Coty I-02
I-02/60-20, 123-30

Depth	*Inclination*
31.0	0.750°
60.0	0.880°
88.0	1.000°
114.0	0.750°
146.0	1.000°
170.0	1.000°
199.0	1.500°
226.0	1.250°
See	attached
surveys	from United
Geocom	

Computalog Drilling Services

Client : Paramount Resources Ltd
Well : Para et al Mount Coty I-02
Location: I-02 / 60-20-123-30

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Vertical Section Calculated Along Azimuth 0.00°
GR. Elevation = 367.90m KB Elevation = 372.95m

	MD	Inc	Azi	TVD	Lat	Dep	V'Sect	D'Leg	Build	Turn
	m	deg	deg	m	m	m	m	°/30	°/30	°/30
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	71.00	.50	79.20	71.00	.06	.30	.06	.21	.21	0.00
2	145.00	.90	57.30	144.99	.43	1.11	.43	.19	.16	-8.88
3	220.00	1.50	41.00	219.98	1.49	2.25	1.49	.27	.24	-6.52
4	293.00	2.20	29.90	292.94	3.43	3.58	3.43	.32	.29	-4.56
5	315.14	2.50	24.10	315.06	4.24	3.98	4.24	.52	.41	-7.86
6	324.86	2.70	22.60	324.77	4.64	4.16	4.64	.65	.62	-4.63
7	334.24	2.20	17.90	334.14	5.02	4.30	5.02	1.72	-1.60	-15.03
8	343.96	1.60	5.00	343.86	5.33	4.37	5.33	2.26	-1.85	-39.81
9	353.41	1.10	340.60	353.30	5.55	4.35	5.55	2.38	-1.59	-77.46
10	362.72	.70	284.60	362.61	5.65	4.27	5.65	2.95	-1.29	-180.45
11	371.87	.70	241.70	371.76	5.63	4.16	5.63	1.68	0.00	-140.66
12	380.85	.80	218.10	380.74	5.56	4.07	5.56	1.08	.33	-78.84
13	390.42	.80	209.80	390.31	5.45	4.00	5.45	.36	0.00	-26.02
14	409.14	.60	197.50	409.03	5.24	3.91	5.24	.40	-.32	-19.71
15	427.44	.80	313.60	427.33	5.24	3.78	5.24	1.96	.33	190.33
16	436.93	.70	211.00	436.82	5.23	3.71	5.23	3.71	-.32	-324.34
17	455.71	1.60	187.40	455.59	4.87	3.61	4.87	1.60	1.44	-37.70
18	473.50	1.10	180.80	473.38	4.46	3.58	4.46	.88	-.84	-11.13
19	482.88	.80	173.50	482.76	4.30	3.59	4.30	1.03	-.96	-23.35
20	491.89	.40	150.10	491.77	4.21	3.61	4.21	1.54	-1.33	-77.91
21	501.17	.30	100.20	501.05	4.18	3.65	4.18	1.00	-.32	-161.31
	SURFACE CASING SET @ 514 METERS. 513.88m TVD									
22	**514.00**	**.43**	**66.53**	**513.88**	**4.19**	**3.73**	**4.19**	**.57**	**.30**	**-78.73**
23	518.72	.50	59.50	518.60	4.21	3.76	4.21	.57	.45	-44.68
24	528.25	.60	63.70	528.13	4.25	3.84	4.25	.34	.31	13.22
25	537.87	.70	64.40	537.75	4.30	3.94	4.30	.31	.31	2.18
26	547.18	.80	60.90	547.05	4.36	4.05	4.36	.35	.32	-11.28
27	556.83	.90	70.60	556.70	4.42	4.18	4.42	.54	.31	30.16
28	566.39	.90	76.00	566.26	4.46	4.32	4.46	.27	0.00	16.95
29	576.03	.90	102.50	575.90	4.46	4.47	4.46	1.28	0.00	82.47
30	584.89	1.00	113.20	584.76	4.42	4.61	4.42	.69	.34	36.23
31	594.28	1.00	137.00	594.15	4.32	4.74	4.32	1.32	0.00	76.04
32	603.99	1.20	146.60	603.86	4.18	4.85	4.18	.84	.62	29.66
33	613.51	1.10	172.50	613.37	4.00	4.92	4.00	1.65	-.32	81.62

Computalog Drilling Services

Client : Paramount Resources Ltd
Well : Para et al Mount Coty I-02
Location: I-02 / 60-20-123-30

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Vertical Section Calculated Along Azimuth 0.00°
GR. Elevation = 367.90m KB Elevation = 372.95m

	MD	Inc	Azi	TVD	Lat	Dep	V'Sect	D'Leg	Build	Turn
	m	deg	deg	m	m	m	m	°/30	°/30	°/30
34	623.13	1.20	182.20	622.99	3.81	4.93	3.81	.68	.31	30.25
35	632.78	1.10	215.00	632.64	3.63	4.87	3.63	2.04	-.31	101.97
36	642.43	1.30	238.30	642.29	3.50	4.72	3.50	1.62	.62	72.44
37	652.10	1.20	241.60	651.96	3.39	4.54	3.39	.38	-.31	10.24
38	661.13	1.00	234.00	660.99	3.30	4.39	3.30	.82	-.66	-25.25
39	670.60	.90	226.50	670.45	3.20	4.27	3.20	.50	-.32	-23.76
40	680.24	.70	217.40	680.09	3.10	4.18	3.10	.74	-.62	-28.32
41	689.81	.40	204.50	689.66	3.03	4.13	3.03	1.01	-.94	-40.44
42	699.42	.40	191.70	699.27	2.96	4.11	2.96	.28	0.00	-39.96
43	708.99	.20	184.90	708.84	2.91	4.10	2.91	.64	-.63	-21.32
44	718.13	.20	200.70	717.98	2.88	4.10	2.88	.18	0.00	51.86
45	727.07	.10	216.70	726.92	2.86	4.09	2.86	.36	-.34	53.69
46	736.41	.30	210.10	736.26	2.84	4.07	2.84	.65	.64	-21.20
47	745.88	.50	211.10	745.73	2.78	4.04	2.78	.63	.63	3.17
48	755.24	.70	214.30	755.09	2.70	3.98	2.70	.65	.64	10.26
49	764.50	.90	209.90	764.35	2.59	3.92	2.59	.68	.65	-14.25
50	773.89	1.10	176.60	773.74	2.43	3.88	2.43	1.93	.64	-106.39
51	783.51	1.20	178.30	783.36	2.24	3.89	2.24	.33	.31	5.30
52	792.99	.90	213.60	792.84	2.08	3.85	2.08	2.21	-.95	111.71
53	802.62	.60	223.80	802.46	1.98	3.78	1.98	1.02	-.93	31.78
54	812.07	.40	237.60	811.91	1.93	3.72	1.93	.74	-.63	43.81
55	821.63	.40	251.70	821.47	1.90	3.66	1.90	.31	0.00	44.25
56	830.56	.40	260.30	830.40	1.88	3.59	1.88	.20	0.00	28.89
57	839.82	.40	285.80	839.66	1.89	3.53	1.89	.57	0.00	82.61
58	849.37	.30	310.90	849.21	1.91	3.48	1.91	.57	-.31	78.85
59	858.85	.40	351.10	858.69	1.96	3.46	1.96	.82	.32	127.22
60	868.35	.60	47.40	868.19	2.03	3.49	2.03	1.59	.63	177.79
61	877.72	.90	30.10	877.56	2.12	3.56	2.12	1.19	.96	-55.39
62	896.00	1.20	359.90	895.84	2.44	3.63	2.44	1.02	.49	-49.56
63	905.41	1.40	342.60	905.25	2.65	3.60	2.65	1.40	.64	-55.15
64	915.27	1.30	289.80	915.10	2.80	3.46	2.80	3.66	-.30	-160.65
65	923.81	1.50	282.70	923.64	2.86	3.26	2.86	.93	.70	-24.94
66	933.43	1.50	278.50	933.26	2.90	3.01	2.90	.34	0.00	-13.10
67	942.97	1.20	273.40	942.80	2.93	2.79	2.93	1.02	-.94	-16.04

Computalog Drilling Services

Client : Paramount Resources Ltd
Well : Para et al Mount Coty I-02
Location: I-02 / 60-20-123-30

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Vertical Section Calculated Along Azimuth 0.00°
GR. Elevation = 367.90m KB Elevation = 372.95m

	MD	Inc	Azi	TVD	Lat	Dep	V'Sect	D'Leg	Build	Turn
	m	deg	deg	m	m	m	m	°/30	°/30	°/30
68	952.57	.80	251.70	952.39	2.91	2.62	2.91	1.70	-1.25	-67.81
69	961.68	.80	224.20	961.50	2.85	2.52	2.85	1.25	0.00	-90.56
70	971.29	.80	210.30	971.11	2.74	2.44	2.74	.60	0.00	-43.39
71	980.82	.60	208.80	980.64	2.64	2.38	2.64	.63	-.63	-4.72
72	990.46	.70	201.10	990.28	2.54	2.33	2.54	.41	.31	-23.96
73	1000.10	.60	201.20	999.92	2.44	2.29	2.44	.31	-.31	.31
74	1009.69	.70	199.40	1009.51	2.34	2.26	2.34	.32	.31	-5.63
75	1019.28	.70	188.20	1019.10	2.22	2.23	2.22	.43	0.00	-35.04
76	1028.92	.80	195.10	1028.74	2.10	2.20	2.10	.42	.31	21.47
77	1038.54	1.00	185.60	1038.36	1.95	2.18	1.95	.78	.62	-29.63
78	1047.38	.80	196.70	1047.20	1.82	2.15	1.82	.90	-.68	37.67
79	1057.00	.60	238.00	1056.82	1.73	2.09	1.73	1.65	-.62	128.79
80	1066.59	.80	265.40	1066.40	1.69	1.98	1.69	1.20	.63	85.71
81	1076.24	.90	270.40	1076.05	1.69	1.84	1.69	.39	.31	15.54
82	1087.26	.90	266.30	1087.07	1.68	1.67	1.68	.18	0.00	-11.16
83	1096.98	.90	273.10	1096.79	1.68	1.51	1.68	.33	0.00	20.99
84	1106.60	.90	271.10	1106.41	1.69	1.36	1.69	.10	0.00	-6.24
85	1116.05	.80	279.10	1115.86	1.70	1.22	1.70	.49	-.32	25.40
86	1125.36	.90	289.30	1125.17	1.73	1.09	1.73	.58	.32	32.87
87	1134.76	.60	307.30	1134.57	1.79	.98	1.79	1.21	-.96	57.45
88	1144.38	.80	330.00	1144.19	1.88	.91	1.88	1.05	.62	70.79
89	1153.88	.80	331.90	1153.69	1.99	.84	1.99	.08	0.00	6.00
90	1163.22	.90	344.20	1163.02	2.12	.79	2.12	.67	.32	39.51
91	1172.28	.80	319.90	1172.08	2.24	.73	2.24	1.23	-.33	-80.46
92	1181.81	.70	287.20	1181.61	2.31	.63	2.31	1.36	-.31	-102.94
93	1191.48	.60	203.30	1191.28	2.28	.56	2.28	2.71	-.31	-260.29
94	1233.00	.50	162.90	1232.80	1.90	.52	1.90	.28	-.07	-29.19
95	1239.20	.50	143.00	1239.00	1.86	.55	1.86	.84	0.00	-96.29
96	1248.80	.30	118.90	1248.60	1.81	.60	1.81	.80	-.63	-75.31
97	1258.37	.50	106.80	1258.17	1.79	.66	1.79	.68	.63	-37.93
98	1266.00	.40	92.70	1265.80	1.78	.72	1.78	.58	-.39	-55.44
99	1277.52	.50	87.20	1277.32	1.78	.81	1.78	.28	.26	-14.32
100	1287.14	.70	87.50	1286.94	1.78	.91	1.78	.62	.62	.94
101	1296.70	.50	59.60	1296.50	1.81	1.00	1.81	1.09	-.63	-87.55

Computalog Drilling Services

Client : Paramount Resources Ltd
Well : Para et al Mount Coty I-02
Location: I-02 / 60-20-123-30

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Date : 11/24/00
File : 11040

Vertical Section Calculated Along Azimuth 0.00°
GR. Elevation = 367.90m KB Elevation = 372.95m

	MD	Inc	Azi	TVD	Lat	Dep	V'Sect	D'Leg	Build	Turn
	m	deg	deg	m	m	m	m	°/30	°/30	°/30
102	1305.81	.40	265.00	1305.61	1.82	1.00	1.82	2.89	-.33	-509.11
103	1315.31	.90	262.50	1315.11	1.81	.90	1.81	1.58	1.58	-7.89
104	1324.84	.90	262.90	1324.64	1.79	.75	1.79	.02	0.00	1.26
105	1334.42	.70	288.40	1334.22	1.80	.62	1.80	1.26	-.63	79.85
106	1343.99	.50	290.60	1343.78	1.83	.52	1.83	.63	-.63	6.90
107	1353.06	.60	312.50	1352.85	1.88	.45	1.88	.76	.33	72.44
108	1362.62	.30	336.40	1362.41	1.94	.40	1.94	1.09	-.94	75.00
109	1372.11	.60	197.30	1371.90	1.91	.38	1.91	2.69	.95	-439.73
110	1381.26	.90	201.70	1381.05	1.80	.34	1.80	1.00	.98	14.43
111	1388.78	.90	186.10	1388.57	1.69	.31	1.69	.97	0.00	-62.23
112	1397.91	.80	206.40	1397.70	1.56	.27	1.56	1.04	-.33	66.70
113	1407.55	.40	203.00	1407.34	1.47	.23	1.47	1.25	-1.24	-10.58
114	1416.75	.40	208.10	1416.54	1.41	.20	1.41	.12	0.00	16.63
115	1426.30	.40	172.70	1426.09	1.35	.19	1.35	.76	0.00	-111.20
116	1434.24	.20	159.50	1434.03	1.30	.20	1.30	.79	-.76	-49.87
117	1443.89	.30	135.10	1443.68	1.27	.22	1.27	.45	.31	-75.85
118	1453.40	.30	107.60	1453.19	1.25	.27	1.25	.45	0.00	-86.75
119	1462.66	.40	89.90	1462.45	1.24	.32	1.24	.47	.32	-57.34
120	1472.23	.60	101.40	1472.02	1.23	.40	1.23	.70	.63	36.05
121	1481.82	1.00	97.10	1481.61	1.21	.54	1.21	1.26	1.25	-13.45
122	1491.36	1.30	99.30	1491.15	1.18	.73	1.18	.95	.94	6.92
123	1511.10	1.10	157.00	1510.88	.97	1.02	.97	1.78	-.30	87.69
124	1527.00	1.30	136.90	1526.78	.70	1.20	.70	.87	.38	-37.92
125	1539.00	1.10	113.60	1538.78	.55	1.40	.55	1.31	-.50	-58.25
126	1548.91	1.40	91.40	1548.68	.51	1.61	.51	1.71	.91	-67.20
127	1558.05	1.70	82.20	1557.82	.53	1.86	.53	1.28	.98	-30.20
128	1567.64	1.60	79.50	1567.41	.57	2.13	.57	.40	-.31	-8.45
129	1578.19	1.80	59.60	1577.95	.68	2.42	.68	1.76	.57	-56.59
130	1585.97	2.10	57.00	1585.73	.82	2.64	.82	1.21	1.16	-10.03
131	1595.55	2.90	53.10	1595.30	1.06	2.98	1.06	2.56	2.51	-12.21
132	1605.10	3.30	54.70	1604.84	1.37	3.40	1.37	1.29	1.26	5.03
133	1614.66	3.60	48.10	1614.38	1.73	3.85	1.73	1.56	.94	-20.71
134	1625.15	3.80	53.30	1624.85	2.15	4.37	2.15	1.12	.57	14.87
135	1634.78	2.30	57.60	1634.46	2.45	4.79	2.45	4.72	-4.67	13.40
136	1644.36	.90	35.60	1644.04	2.61	5.00	2.61	4.71	-4.38	-68.89

Computalog Drilling Services

Client : Paramount Resources Ltd
Well : Para et al Mount Coty I-02
Location: I-02 / 60-20-123-30

Page: 5
Date : 11/24/00
File : 11040

Vertical Section Calculated Along Azimuth 0.00°
GR. Elevation = 367.90m KB Elevation = 372.95m

	MD	Inc	Azi	TVD	Lat	Dep	V'Sect	D'Leg	Build	Turn
	m	deg	deg	m	m	m	m	°/30	°/30	°/30
137	1655.70	.50	36.00	1655.38	2.72	5.08	2.72	1.06	-1.06	1.06
138	1662.61	.20	317.80	1662.29	2.76	5.09	2.76	2.17	-1.30	-339.51
139	1672.18	.70	292.40	1671.86	2.79	5.02	2.79	1.65	1.57	-79.62
140	1681.80	1.80	297.60	1681.47	2.88	4.83	2.88	3.45	3.43	16.22
141	1691.19	2.60	285.50	1690.86	3.01	4.50	3.01	2.94	2.56	-38.66
142	1697.00	3.20	284.90	1696.66	3.09	4.21	3.09	3.10	3.10	-3.10
				EXTRAPOLATED TO THE BIT 1704.64m TVD						
EXT	**1705.00**	**4.03**	**284.07**	**1704.64**	**3.21**	**3.73**	**3.21**	**3.12**	**3.11**	**-3.11**

Bottom Hole Closure 4.92m Along Azimuth 49.24°

WELLSITE BIT RECORD

Para et al Mount Coty I-02
I-02/60-20, 123-30

SPUD DATE: Oct. 16, 2000
T.D. DATE: Nov. 25, 2000

SURFACE CASING: 39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m

BIT #	*1A*	*2A*	*3A*	*2ARR*	*3ARR*	*2ARR*
SIZE (mm)	311	311	222	311	222	311
MAKE	Western	Hughes	Hughes	Hughes	Hughes	Hughes
TYPE	GT-S1	GT-C1	GT-S1	GT-C1	GT-S1	GT-C1
SERIAL #	G277H	L71DM	K03ZJ	L71DM	K03ZJ	L71DM
JETS	3x17.5	3x17.5	3x17.5	3x17.5	3x17.5	3x17.5
DEPTH IN	23.00	232.00	257.00	257.00	330.00	330.00
DEPTH OUT	232.00	257.00	330.00	330.00	514.00	448.00
METRES	209.00	25.00	73.00	73.00	184.00	118.00
HOURS	15.25	3.75	18.75	9.00	25.75	9.25
ACC. HRS.	15.25	19.00	37.75	46.75	72.50	81.75
ROP (m/hr)	13.70	6.67	3.89	8.11	7.15	12.76
FOB	6-8daN	3-8daN	3-5daN	3-4daN	5-14daN	6-9daN
RPM	190-195	170-190	190	200	30+motor	170
PP	3000-4500	2200	2300	7100-7700	5500-7200	10900-11600
DEN	1040-1130	1080-1090	1090-1120	1085-1095	1080-1100	1080-1090
VISCOSITY	43-85	54-120	64-90	65-72	70-84	68-90
MAX DEV.°	1.250°	2.000°	3.000°	-	1.600°	-
Condition:	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*
	2-2-3-1	2-2-2-1	2-2-2-3	2-2-2-3	2-2-2-3	3-3-8-1
Condition:	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*
	B/G/O/RP	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*
REMARKS	Surface hole	Surface hole	Pilot hole	Ream pilot hole	Pilot hole / mud-motor	Ream pilot hole

WELLSITE BIT RECORD #2

Para et al Mount Coty I-02
I-02/60-20, 123-30

SPUD DATE: Oct. 16, 2000
T.D. DATE: Nov. 25, 2000

SURFACE CASING: 39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m

BIT #	*IARR*	*1*	*2*	*3*	*4*	*5*
SIZE (mm)	311	222	222	222	222	222
MAKE	Western	Hughes	Smith	Hughes	Hughes	Hughes
TYPE	GT-S1	GT-S1	F-35	ATJS44G	ATJS55RG	ATJS55RG
SERIAL #	G277H	W31ZY	LW4060	K38DK	L51DL	K78DV
JETS	3x17.5	3x15.9	3x15.9	3x15.9	3x15.9	3x15.9
DEPTH IN	448.00	514.00	720.00	876.00	923.00	1052.00
DEPTH OUT	514.00	720.00	876.00	923.00	1052.00	1091.00
METRES	66.00	206.00	156.00	47.00	129.00	39.00
HOURS	9.00	14.25	22.00	6.00	30.25	6.25
ACC. HRS.	90.75	105.00	127.00	133.00	163.25	169.50
ROP (m/hr)	7.33	14.46	7.09	7.83	4.26	6.24
FOB	6-10daN	25daN	25daN	15-20daN	20-30daN	15-30daN
RPM	170	40+motor	50+motor	50+motor	50+motor	50+motor
PP	11500	9100	9800	8700	7200	7800
DEN	1085-1120	1090	1090	1090	1110	1220
VISCOSITY	72-94	44	40	44	42	71
MAX DEV.°	-	0.400°	0.400°	1.400°	0.800°	0.900°
Condition:	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*
		7-9-3-1	8-7-6-5	4-3-2-3	7-5-2-1	7-4-2-1
Condition:	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*
	B/G/O/RP	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*
REMARKS	Ream pilot hole	Main hole	Main hole	Main hole	Main hole	Main hole

WELLSITE BIT RECORD

Para et al Mount Coty I-02
I-02/60-20, 123-30

SPUD DATE: Oct. 16, 2000
T.D. DATE: Nov. 25, 2000

SURFACE CASING: 39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m

BIT #	*6*	*7*	*8*	*9*	*10*	*11*
SIZE (mm)	222	222	222	222	222	222
MAKE	Hughes	Smith	Smith	Hughes	Hughes	Smith
TYPE	ATJS55RG	F57-OD	F7-OD	ATJ-S77D	ATJ-P88D	F-67P
SERIAL #	L50DL	LY4795	LS5686	G20ZW	Y26XB	LX1789
JETS	3x15.9	3x19.0	3x19.0	3x19.0	3x19.0	3x19.0
DEPTH IN	1091.00	1147.00	1183.00	1248.00	1281.00	1327.00
DEPTH OUT	1147.00	1183.00	1248.00	1281.00	1327.00	1349.00
METRES	56.00	36.00	65.00	33.00	46.00	22.00
HOURS	18.00	14.00	19.50	20.50	19.00	7.25
ACC. HRS.	187.50	201.50	221.00	241.50	260.50	267.75
ROP (m/hr)	3.11	2.57	3.33	1.61	2.42	3.03
FOB	30daN	30daN	30-34daN	30-33daN	30-33daN	30-33daN
RPM	50+motor	50+motor	50+motor	50+motor	50+motor	50+motor
PP	12400	13700	12500	10600	10800	10800
DEN	1290	1310	1280	1280	1270	1290
VISCOSITY	84	71	72	76	77	70
MAX DEV.°	0.900°	0.600°	0.500°	0.500°	0.500°	0.900°
Condition:	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*
	5-8-3-2	3-8-2-2	3-9-2-2	3-9-2-3	3-9-3-2	3-8-2-2
Condition:	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*
	B/G/O/RP	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*
REMARKS	Main hole	Main hole	Main hole	Main hole	Main hole	Main hole

WELLSITE BIT RECORD #3

Para et al Mount Coty I-02
I-02/60-20, 123-30

SPUD DATE: Oct. 16, 2000
T.D. DATE: Nov. 25, 2000

SURFACE CASING: 39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m

BIT #	*6*	*7*	*8*	*9*	*10*	*11*
SIZE (mm)	222	222	222	222	222	222
MAKE	Hughes	Smith	Smith	Hughes	Hughes	Smith
TYPE	ATJS55RG	F57-OD	F7-OD	ATJ-S77D	ATJ-P88D	F-67P
SERIAL #	L50DL	LY4795	LS5686	G20ZW	Y26XB	LX1789
JETS	3x15.9	3x19.0	3x19.0	3x19.0	3x19.0	3x19.0
DEPTH IN	1091.00	1147.00	1183.00	1248.00	1281.00	1327.00
DEPTH OUT	1147.00	1183.00	1248.00	1281.00	1327.00	1349.00
METRES	56.00	36.00	65.00	33.00	46.00	22.00
HOURS	18.00	14.00	19.50	20.50	19.00	7.25
ACC. HRS.	187.50	201.50	221.00	241.50	260.50	267.75
ROP (m/hr)	3.11	2.57	3.33	1.61	2.42	3.03
FOB	30daN	30daN	30-34daN	30-33daN	30-33daN	30-33daN
RPM	50+motor	50+motor	50+motor	50+motor	50+motor	50+motor
PP	12400	13700	12500	10600	10800	10800
DEN	1290	1310	1280	1280	1270	1290
VISCOSITY	84	71	72	76	77	70
MAX DEV.°	0.900°	0.600°	0.500°	0.500°	0.500°	0.900°
Condition:	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*
	5-8-3-2	3-8-2-2	3-9-2-2	3-9-2-3	3-9-3-2	3-8-2-2
Condition:	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*
	B/G/O/RP	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*
REMARKS	Main hole	Main hole	Main hole	Main hole	Main hole	Main hole

WELLSITE BIT RECORD #4

Para et al Mount Coty I-02
I-02/60-20, 123-30

SPUD DATE: Oct. 16, 2000
T.D. DATE: Nov. 25, 2000

SURFACE CASING: 39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m

BIT #	*12*	*13*	*14*	*15*	*16*	*17*
SIZE (mm)	222	222	222	222	222	222
MAKE	Smith	Smith	Hughes	Hughes	Hughes	Smith
TYPE	F67-OD	F67-OD	ATJ-S77DX	ATJ-P77DX	ATJ-P77DX	F8-ODPS
SERIAL #	MG0013	LY7913	G22ZW	G21ZW	C60ZW	LY6723
JETS	3x19.0	3x19.0	3x19.0	3x19.0	3x19.0	3x19.0
DEPTH IN	1349.00	1396.00	1428.00	1442.00	1471.00	1490.00
DEPTH OUT	1396.00	1428.00	1442.00	1471.00	1490.00	1510.00
METRES	47.00	32.00	14.00	29.00	19.00	20.00
HOURS	14.25	13.25	8.75	19.00	7.75	8.50
ACC. HRS.	282.00	295.25	304.00	323.00	330.75	339.25
ROP (m/hr)	3.30	2.42	1.60	1.53	2.45	2.35
FOB	30-33daN	30-33daN	30-33daN	32daN	32daN	30daN
RPM	50+motor	50+motor	50+motor	50+motor	50+motor	25+motor
PP	10800	10800	12500	10500	10800	11000
DEN	1280	1290	1270	1270	1270	1270
VISCOSITY	65	75	65	64	88	70
MAX DEV.°	0.600°	0.800°	0.400°	0.300°	0.600°	1.300°
Condition:	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*
	2-9-2-2	4-9-5-4	6-9-3-4	6-9-3-4	4-9-2-4	9-2-0.75
Condition:	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*
	B/G/O/RP	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*
REMARKS	Main hole	Main hole	Main hole	Main hole	Main hole	Main hole

WELLSITE BIT RECORD #5

Para et al Mount Coty I-02
I-02/60-20, 123-30

SPUD DATE: Oct. 16, 2000
T.D. DATE: Nov. 25, 2000

SURFACE CASING: 39 jts. of 244.5mm, J-55, 53.6kg/m set @ 514.0m

BIT #	*18*	*19*	*20*	*21*	*22*	*23*
SIZE (mm)	222	222	222	222	222	222
MAKE	Hughes	Hughes	Hughes	Smith	Smith	Smith
TYPE	EP4603	EP4603	EP4603	F570D	F6709	F47H
SERIAL #	D65ZB	C20ZH	C21ZH	LY4791	LY7912	LY4872
JETS	3x10.3	3x10.3	3x10.3	3x19	3x10.3	3x10.3
DEPTH IN	1510.00	1547.00	1587.00	1625.00	1663.00	1705.00
DEPTH OUT	1547.00	1587.00	1625.00	1663.00	1705.00	1744.00
METRES	37.00	40.00	38.00	38.00	42.00	39.00
HOURS	17.50	22.25	20.50	27.00	29.25	21.25
ACC. HRS.	356.75	379.00	399.50	426.50	455.75	477.00
ROP (m/hr)	2.11	1.80	1.85	1.41	1.44	1.84
FOB	20-28daN	25-28daN	25-28daN	24-30daN	28-30daN	25-28daN
RPM	50-60	55-65	55-60	30&65	55-60	55-60
PP	8500	8100	8400	9800	8200	7800-8200
DEN	1275	1275	1285	1275	1280	1270-1280
VISCOSITY	58	70	61	57	63	80
MAX DEV.°	1.300°	1.800°	3.600°	1.300°	3.200°	4.000°
Condition:	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*	*T/B/G*
	3-3-In	8-4-3-In	8-4-3-In	8-7-4-5	3-2-In	3-3-3-In
Condition:	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*	*IR/OR/D/L*
	B/G/O/RP	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*	*B/G/O/RP*
REMARKS	Main hole	Main hole	Main hole	Main hole	Main hole	Main hole

SIDEWALL CORE REPORT

PARA ET AL MOUNT CLAY I-02
300/I-02-60-20-123-30/00

Sidewall coring was conducted on November 27th, 2000. A total of 18 cores were cut: recovery was 10 cores. No cores were recovered from the M3 Zone or the M2 Zone of the Mattson Formation. Lithological descriptions are given below.

Chinkeh Formation

1) **721m** - Whole plug: SANDSTONE light grey, very fine to fine grained, quartz arenite grading to sub quartz arenite with clear quartz and trace to minor scattered dark specks and lithic grains, clean, well sorted, angular to subrounded, moderately to well indurated, common siliceous cement, trace quartz overgrowths, trace to locally minor spotty kaolin to illite, common extremely fine to fine discontinuous coaly laminations (pyritic in part), no visible porosity, no shows.
2) **715m** - Whole plug: SANDSTONE medium brown, very fine to fine grained, slightly silty, sublitharenite with abundant clear quartz & minor lithic grains, moderately glauconitic, clean, massive, well sorted, angular to subrounded, moderately well indurated, common siliceous cement, minor spotty kaolin to illite, very poor to poor visible porosity, no shows.
3) **712m** - Whole plug: SANDSTONE light grey, very fine to fine grained, slightly silty, sublitharenite with abundant clear quartz and minor dark lithic grains, moderately glauconitic, clean, well sorted, angular to subrounded, minor to common very fine planar to slightly wispy argillaceous laminations, moderately to well indurated, common siliceous cement, minor quartz overgrowths, tight to poor visible porosity, no shows.

Flett/Debolt Formation

4) **1720m** - Whole plug: DOLOMITE medium brown, slightly mottled, cryptocrystalline to very fine crystalline with minor to common variably recrystallized to dolomitized bioclasts (including crinoids), rare to trace scattered glauconite, hard, dense, minor to common stylolites, minor sub parallel very fine healed fracture with white dolomite fracture fill, no visible porosity, common to abundant dull yellow gold fluorescence.
5) **1714m** - Whole plug: DOLOMITE medium to dark brown, mottled, cryptocrystalline to very fine crystalline matrix with abundant sparry to variably recrystallized bioclasts and indeterminate allochems, (crinoidal packstone), variably moderately to very calcareous, trace pyrite, common to locally abundant stylolites with slickensides, minor to common sub-parallel healed fractures with white calcareous dolomite fracture fill (note; stylolites crosscut fracture fills), no visible porosity, common spotty to patchy dull yellow fluorescence.

Mattson Formation

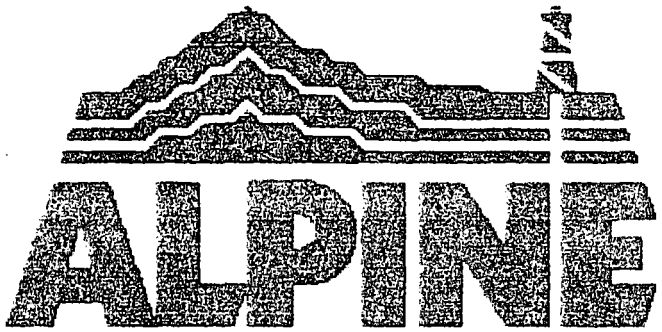
6) **1235m** - Trace rubble in mud: not examined.
7) **1233m**: No recovery.
8) **1231m**: No recovery.
9) **1229m**: No recovery.
10) **1227m**: No recovery
11) **1225m**: No recovery.

12) **1137m**: No recovery.
13) **1136m**: No recovery.

14) **1082m** - Whole plug: SANDSTONE very light grey, very fine to lower medium grained, slightly silty, quartz arenite grading to subquartzarenite, trace to minor varicolored lithic grains, clean, massive, moderately sorted, angular to subrounded, minor rounded grains, predominantly poorly indurated, abundant calcareous cement, trace quartz overgrowths, rare to trace spotty kaolin to illite, fair to poor visible porosity, minor patchy yellow fluorescence.
15) **1080m** - Whole plug: SANDSTONE light brown, very fine to fine grained, trace to minor lower medium grains, slightly silty, quartz arenite with trace scattered lithic grains, clean, massive, moderately well sorted, angular to subrounded, minor rounded grains, poorly indurated, decreasing common calcareous and minor siliceous cement, minor quartz overgrowths, rare spotty kaolin to illite, fair to poor visible porosity, faint petroliferous odor, even good yellow fluorescence, instant fair thin milky cut.

16) **1064.5m** - Whole plug: SANDSTONE light brown, very fine to fine grained, slightly silty, quartz arenite, clean, massive, well sorted, angular to subrounded, moderately indurated, common calcareous and siliceous cement, common quartz overgrowths, fair porosity, faint petroliferous odor, common spotty to patchy dull to moderate yellow fluorescence.
17) **1062m** - Whole plug: SANDSTONE light brown, very fine to fine grained, quartz arenite, clean, massive, well sorted, angular to subrounded, moderately to well indurated, common siliceous and minor calcareous cement, common quartz overgrowths, fair to poor visible porosity, common patchy dull to moderate yellow green to yellow fluorescence, instant poor to fair thin milky cut.
18) **1060m** - 5 parallel wafers 4-6mm thick: SANDSTONE light grey, very fine to fine grained, quartz arenite, clean, massive, well sorted, angular to subrounded, minor rounded grains, moderately well to well indurated, common siliceous and minor to locally common patchy calcareous cement, minor quartz overgrowths, trace interstitial pyrite, very poor to poor visible porosity, common to abundant patchy to slightly uneven dull to moderate yellow green to yellow fluorescence, instant poor to fair thin milky diffuse and streaming cut. (Note: The uniform thickness and parallel nature of the wafers more likely indicates mechanical breakage by the coring tool, rather than an evenly-spaced parallel fracture system).

A note on the porosity estimates from the sidewall cores; it is difficult to get accurate estimates because the plug sides are polished from the coring & the ends tend to be plugged with mud residue. In most cases above, there were no small fragments present that could be broken open; therefore, porosity estimates are likely to be lower than actual.



Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/01/2000**

Job Ticket #: **D2-8566** DST#: **1**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-8566 DST#: 1

Test Date: 11/01/2000 1100hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: AL IRONSIDE **Location: I-02/60-20-123-30**

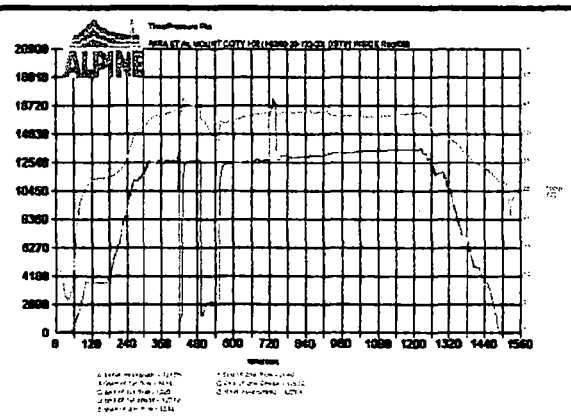
General Information:

Test Type:	INFLATE STRADDLE	Tester:	DANNY ROSS
Interval:	1058.00m - 1068.00m	Truck No.:	673 □Ÿ□
Formation:	MATTSON	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1091.00m	Hole Condition:	GOOD
Test Mode:	Gas	Bottom Hole Temperature:	41.00 C

Electronic Recorder Information:

INSIDE		Recorder #:	
Recorder #:	066		
Range:	70000 kPag	Range:	kPag
Depth:	1040.00 m	Depth:	m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	12676.1
B Start of 1st Flow	0.00	1015.1
C End of 1st Flow	8.00	1298.6
D End of 1st Shutin	56.00	12718.9
E Start of 2nd Flow	0.00	1241.9
F End of 2nd Flow	58.00	2045.2
G End of 2nd Shutin	95.00	12632.1
Q Final Hydrostatic	0.00	12764.0



Test Run Information:

Start Time:	1100hrs
Reached Test Depth:	1740hrs
Pull Out Time:	2130hrs
Tool Out Of Hole:	1200hrs
Weight set on Packers:	6000.00daN
Weight to free Packers:	8000.00daN
Initial String Weight:	39000.00daN
Unseated String Weight:	40000.00daN

Tool Chased Dist:	0.00m	Water Loss:	8.50cm³
Mud Type:	GEL CHEMICAL	Mud Drop:	NO
Mud Weight:	1220.00kg/m³	VIS:	65.00S/L
Amount of fill:	0.00m	Filter Cake:	2.00mm
Amt of cushion:	0.00	Pump Time:	30min
Type of cushion:		Reversed Out:	YES

General Remarks:

PREFLOW:STRONG BLOW IN 20 SECS, GAS TO SURFACE IN 2MIN, 45SECS. INCREASING THROUGHOUT.2.5M FLARE.
FINAL FLOW:GAS TO SURFACE IMMEDIATELY. STEADY 3M FLARE. SEE GAS CHARTS FOR RATES.

Recovery Description:

TWO SAMPLERS WERE RUN G.P.=36 AND G.P.=51. 2 GAS BOMBS WERE CAUGHT PF=AGAT-00021782 AND MF=AGAT-00021771
REVERSED OUT APPROX. 180 M OF GASIFIED SLIGHTLY OIL STAINED MUD. ONE MUD TANK SAMPLE AND 8 SAMPLES FROM REVERSING.

Gas Bomb: 2 Sampler: 2
Fluid Sample: 9 Sent to: AGAT EDMONTON

Drill Stem Testing - Gas Recovery Measurements

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-8566 DST#: 1
Test Date: 11/01/2000 1100hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: AL IRONSIDE Location: I-02/60-20-123-30

Gas Measurements for Flow # 1

Gas Recovery Measured With: Willis Choke

Time (min.)	Orifice (mm)	Pressure (kPa)	Rate (m³/d)
10	6.35	600	4278.00

Gas Measurements for Flow # 2

Gas Recovery Measured With: Willis Choke

Time (min.)	Orifice (mm)	Pressure (kPa)	Rate (m³/d)
5	6.35	750	5204.00
10	6.35	1150	7644.00
15	6.35	1400	9159.00
20	6.35	1600	10380.00
30	6.35	1700	11011.00
40	6.35	1700	11011.00
50	6.35	1700	11011.00
60	6.35	1700	11011.00

Drill Stem Testing - Tool Diagram / Description

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-8566 DST#: 1
Test Date: 11/01/2000 1100hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: AL IRONSIDE Location: I-02/60-20-123-30

Inflate Straddle

Drill Collar Stands:	0
Drill Collar Singles:	0
Drill Pipe Stands:	35
Drill Pipe Singles:	1
Heavy Wt. Pipe Stands:	20
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	1068.08m
Total Drill Pipe Above K.B.:	10.08m
Total Depth:	1091m

Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	0.00	mm
Drill Collar Length:	0.00	m
Drill Pipe Inside Diameter:	92.00	mm
Drill Pipe Length:	672.68	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	369.35	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

Tool Remarks:

WELL LIC#1884

A SUCCESSFUL REAL TIME DST ON THE "MATTSON" WAS PREFORMED.

Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
Blank Spacing	5.18
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60

26.05m

41.25m

Depth: 1058m

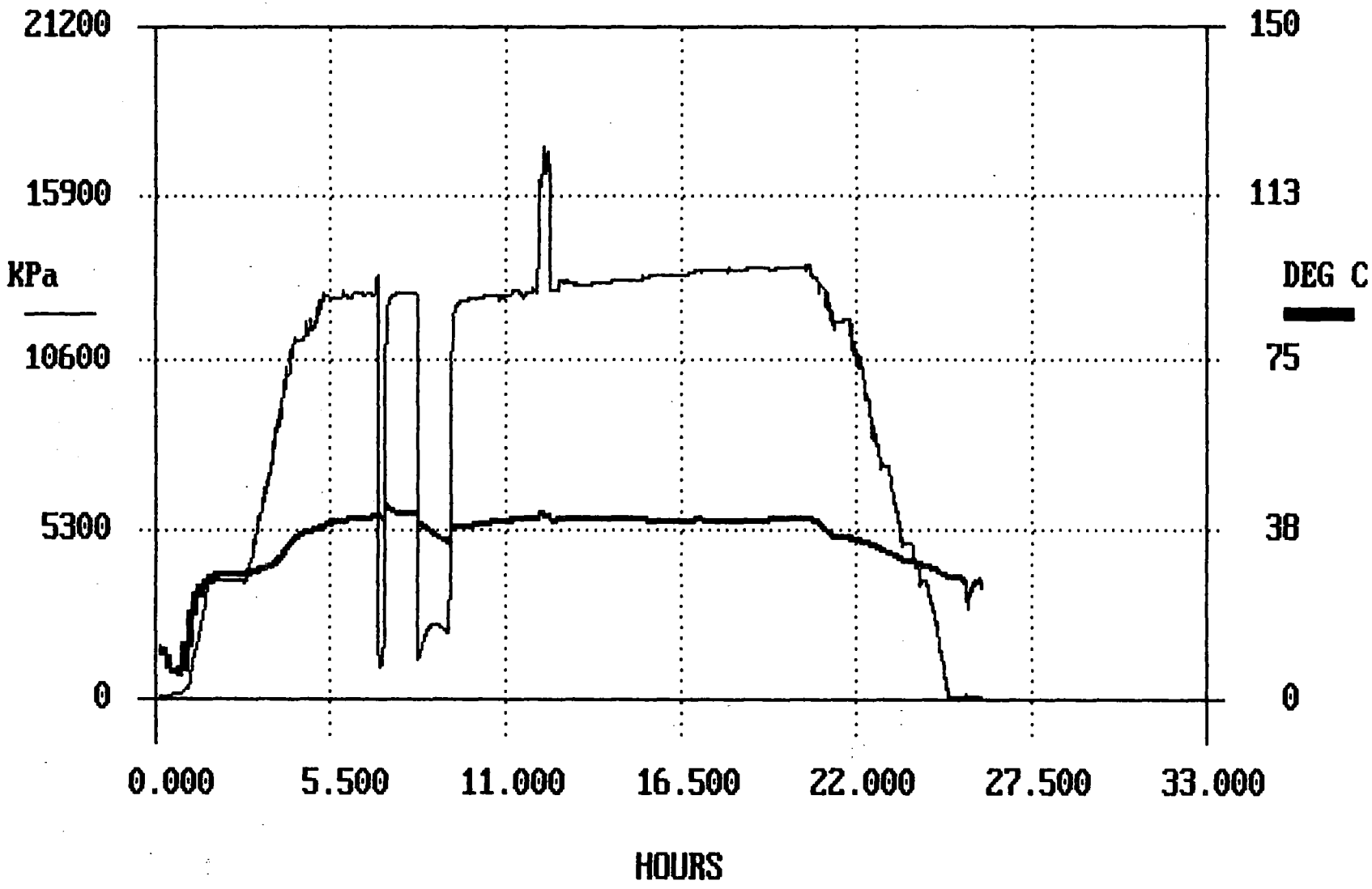
10.02m

Depth: 1068m

5.18m

Total Depth: 1091.00m

FILE: <C:\ALP_IN\A3102325.066>
s/n 66 PARA ET AL MOUNT COTY I-02 DST#1 TIC#2-8566 REC#66 INSIDE



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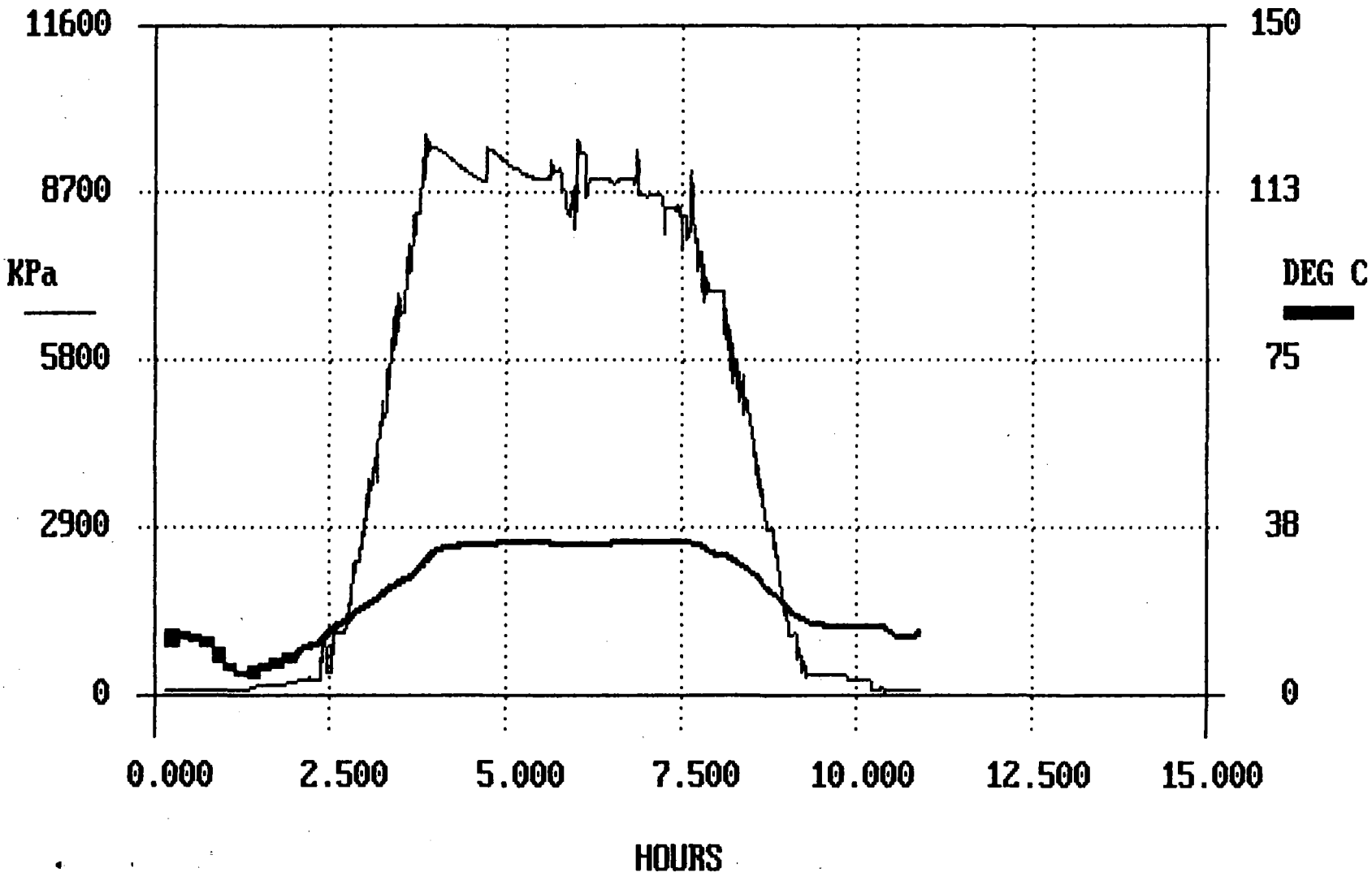
s/n 133 PARAMOUNT RES.LTD 60-20-123-30 T#2-9997 11/27/00 OUTSIDE



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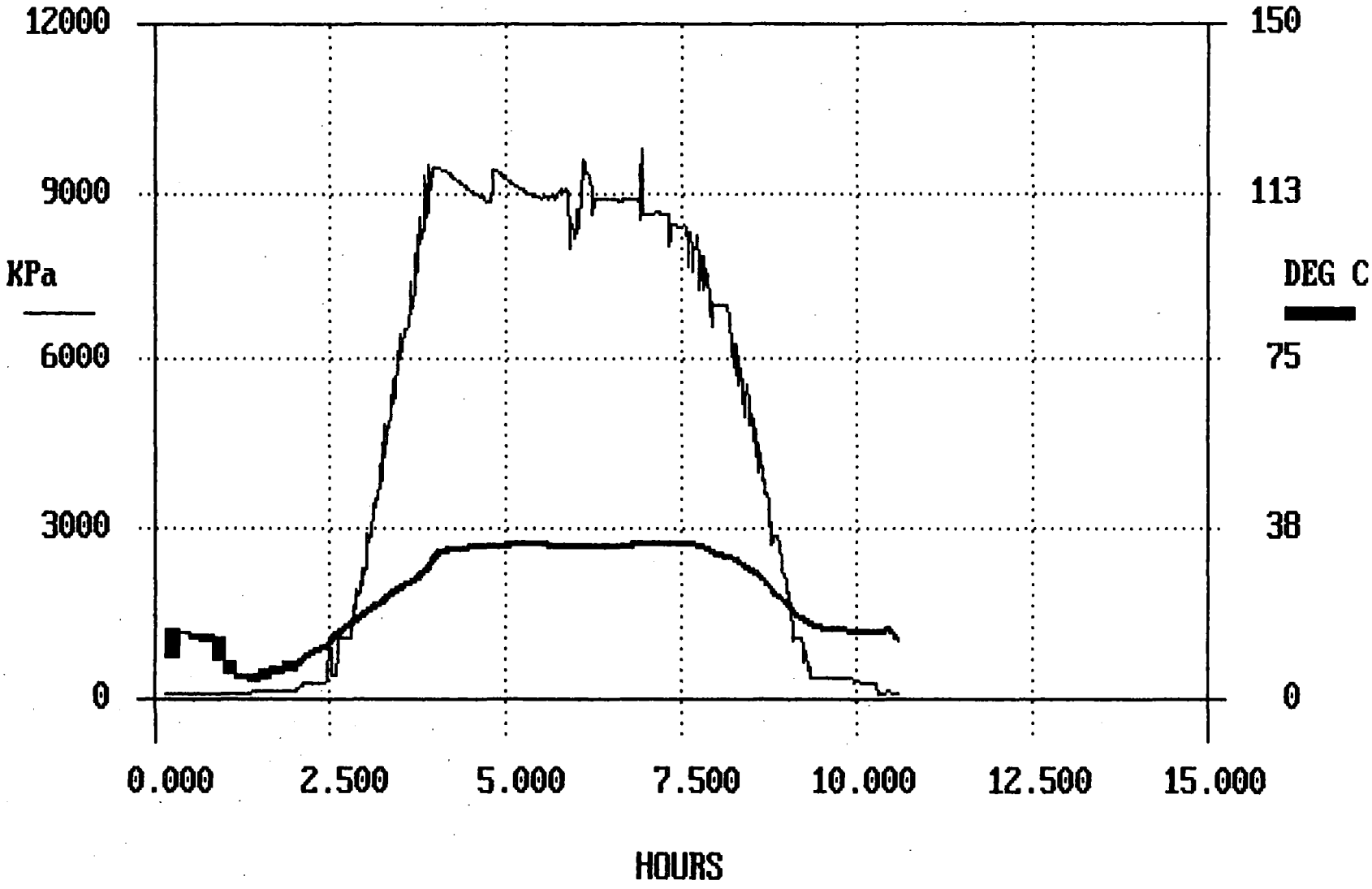

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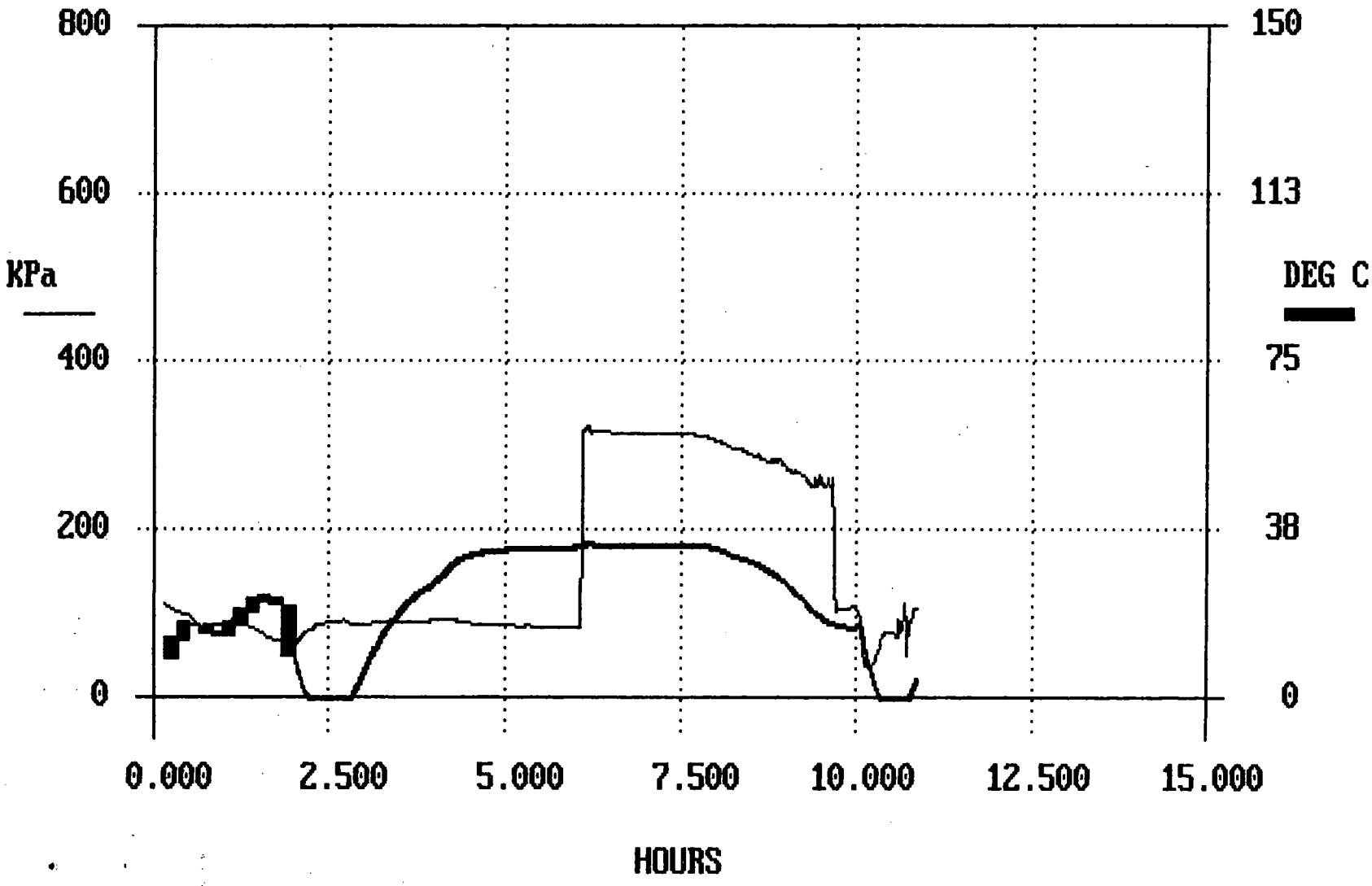
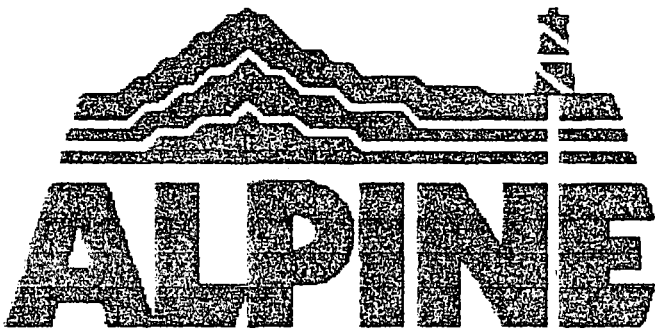
s/n 65 PARAMOUNT RES.LTD. 60-20-123-30 T#2-9997 11/27/00 FLUID E





Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/28/2000**

Job Ticket #: **D2-9997** DST#: **2**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9997 DST#: 2

Test Date: 11/28/2000 2230hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO **Location: I-02/60-20-123-30**

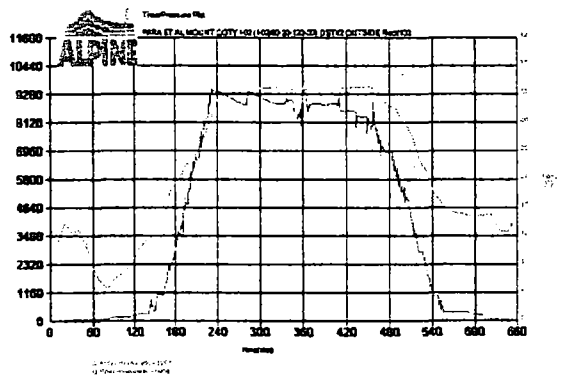
General Information:

Test Type:	INFLATE STRADDLE	Tester:	ALBERTO SCARIONE
Interval:	706.00m - 717.00m	Truck No.:	673 □Ÿ□
Formation:	CHINKEH	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	34.00 C

Electronic Recorder Information:

OUTSIDE		Recorder #:	
Recorder #:	133		
Range:	10000 kPag	Range:	kPag
Depth:	708.00 m	Depth:	m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	8907.5
Q Final Hydrostatic	0.00	8887.8



Test Run Information:

Start Time:	2230hrs
Reached Test Depth:	10hrs
Pull Out Time:	320hrs
Tool Out Of Hole:	620hrs
Weight set on Packers:	10000.00daN
Weight to free Packers:	39000.00daN
Initial String Weight:	39000.00daN
Unseated String Weight:	39000.00daN

Tool Chased Dist:	1.00m	Water Loss:	6.50cm³
Mud Type:	GEL CHEMICAL	Mud Drop:	1.00m
Mud Weight:	1270.00kg/m³	VIS:	80.00S/L
Amount of fill:	0.00m	Filter Cake:	2.00mm
Amt of cushion:	0.00	Pump Time:	60min
Type of cushion:	N/A	Reversed Out:	NO

General Remarks:

WELL LIC# 1884

MISRUN- GOT SEAT OPENED TOOL MUD DROPPED.
WORKED TOOL MOVED UP 1.5 METERS NO SEAT CAME OUT OF HOLE. PUT TEST BAR
IN AND INFLATED TOOL LOOKED GOOD.

Recovery Description:

Gas Bomb: 0 Sampler: 0

Fluid Sample: 0 Sent to: AGAT EDMONTON

Drill Stem Testing - Tool Diagram / Description

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9997 DST#: 2
Test Date: 11/28/2000 2230hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO **Location: I-02/60-20-123-30**

Inflate Straddle

Drill Collar Stands:	3
Drill Collar Singles:	0
Drill Pipe Stands:	14
Drill Pipe Singles:	0
Heavy Wt. Pipe Stands:	20
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	714.66m
Total Drill Pipe Above K.B.:	8.66m
Total Depth:	1744m

Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	67.00	mm
Drill Collar Length:	56.40	m
Drill Pipe Inside Diameter:	0.00	mm
Drill Pipe Length:	266.11	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	367.20	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

Tool Remarks:

Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
Blank Spacing	6.15
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60

24.95m

41.12m

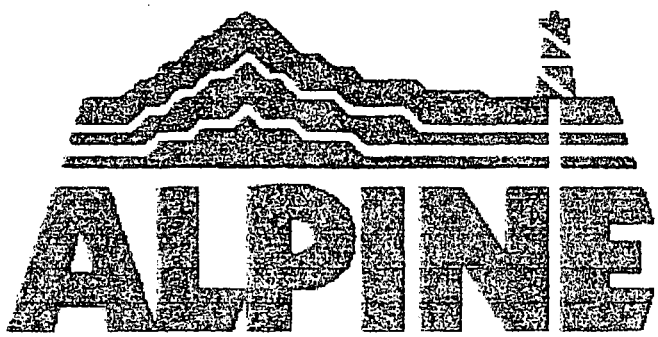
Depth: 706.0m

10.99m

Depth: 717.0m

5.18m

Total Depth: 1744.00m



Real Time Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/28/2000**

Job Ticket #: **T4-6186** DST#: **2**

Real Time Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: T4-6186 DST#: 2

Test Date: 11/28/2000 2230hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

General Information:

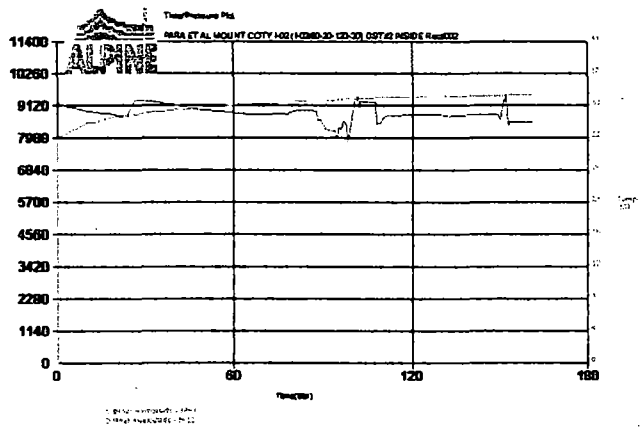
Test Type:	INFLATE STRADDLE	Tester:	KEN PEARSON
Interval:	706m -717m	Truck No.:	673 □Ÿ□
Formation:	CHINKEH	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	34.00 C

Telemetry Recorder Information:

INSIDE

Recorder #: 002 Depth: 691.00 m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	8851.3
Q Final Hydrostatic	0.00	8531.7



Test Run Information:

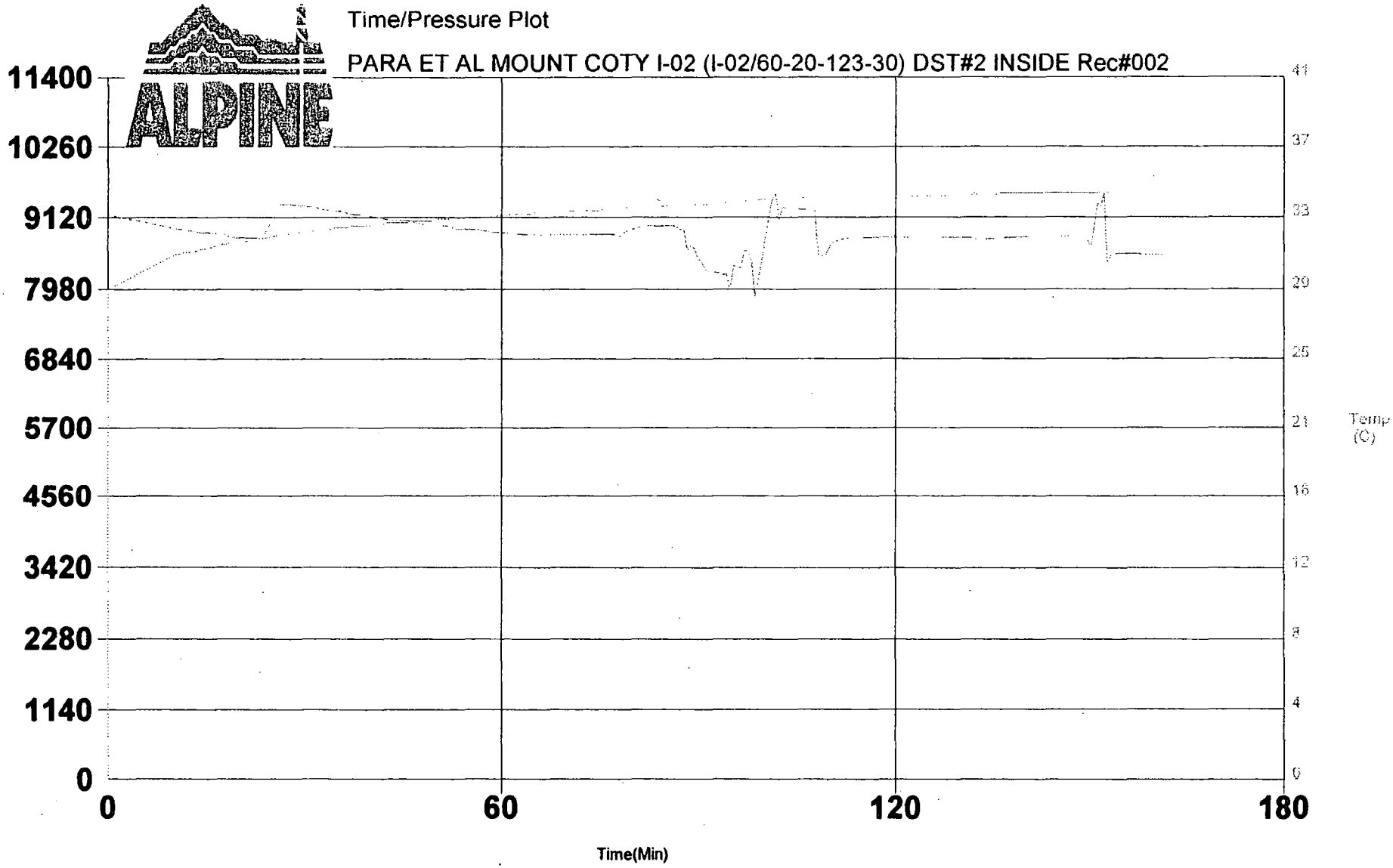
Start Time:	2230hrs
Reached Test Depth:	10hrs
Pull Out Time:	320hrs
Tool Out Of Hole:	620hrs
Water Loss:	6.50cm³
Mud Drop:	NO
VIS:	80.00S/L
Filter Cake:	0.00mm
Pump Time:	60min
Reversed Out:	NO
Mud Type:	GEL CHEMICAL
Mud Weight:	1270.00kg/m³
Amount of fill:	0.00m
Amount of cushion:	0.00
Type of cushion:	

General Remarks:

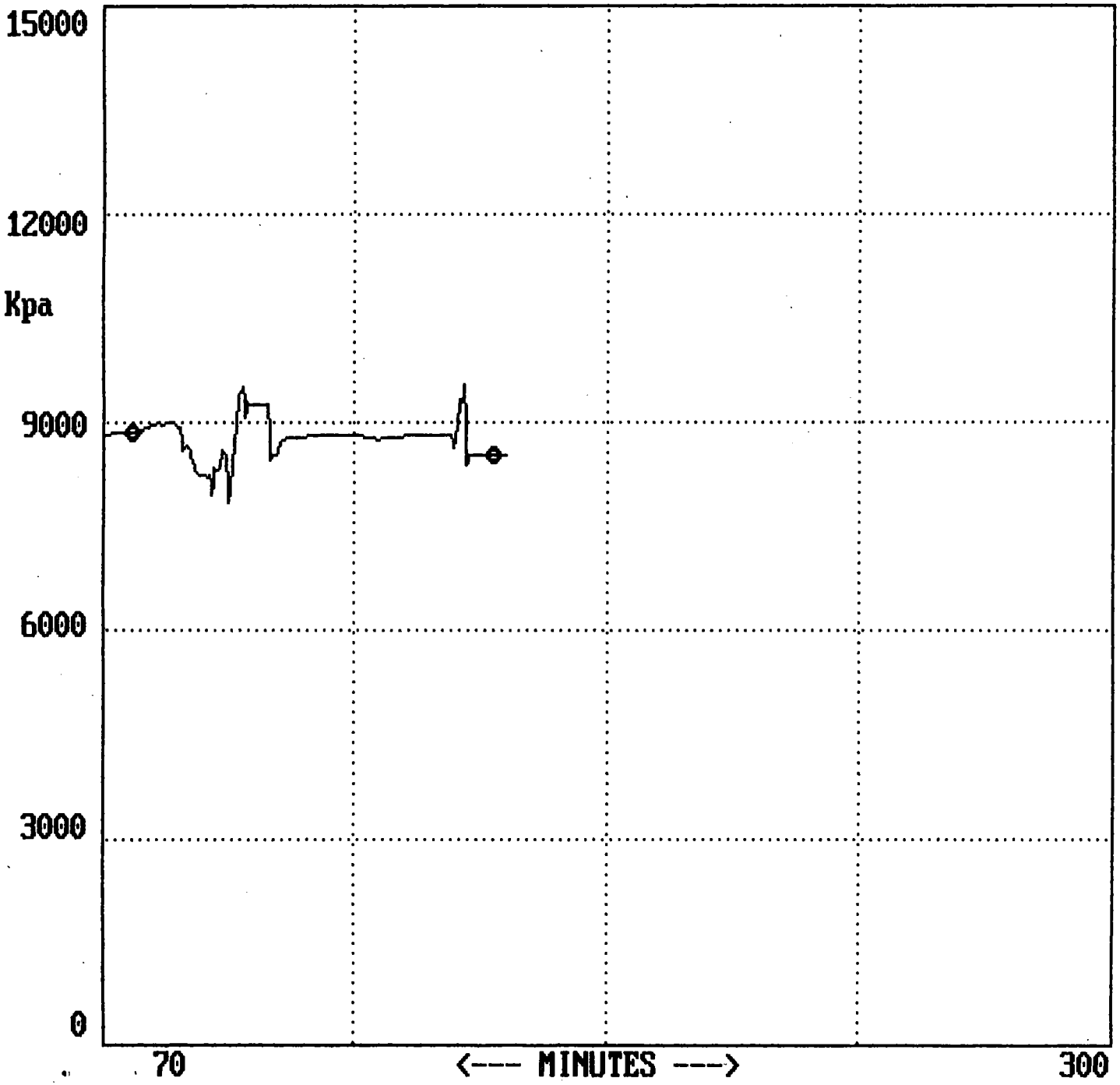
WELL LIC # 1884

MISRUN-OPEN TOOL MUD DROPPED PUMPED FOR 30 MIN MORE AND
STILL NO SEAT CAME OUT OF HOLE.

Recovery Description:


Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#2 INSIDE Rec#002
ALPINE
11400
10260
9120
7980
6840
5700
4560
3420
2280
1140
0
41
37
33
29
25
21
16
12
8
4
0
Temp (C)
0
60
120
180
Time(Min)
A Initial Hydrostatic - 8851
Q Final Hydrostatic - 8532

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30
DST# 2 CHINKEH (706.0m - 717.0m KB) NOV,28.2000



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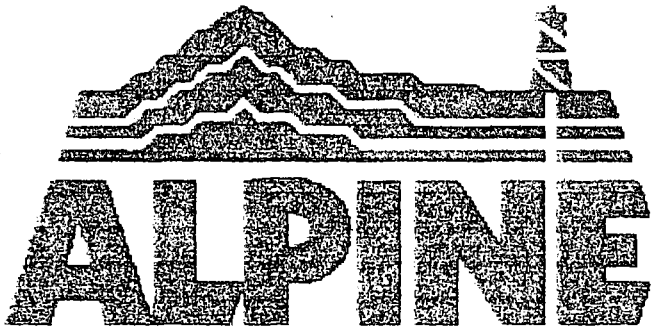
FHP = 8531.7



Real Time Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/28/2000**

Job Ticket #: **T4-6187** DST#: **3**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9998 DST#: 3

Test Date: 11/28/2000 1200hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

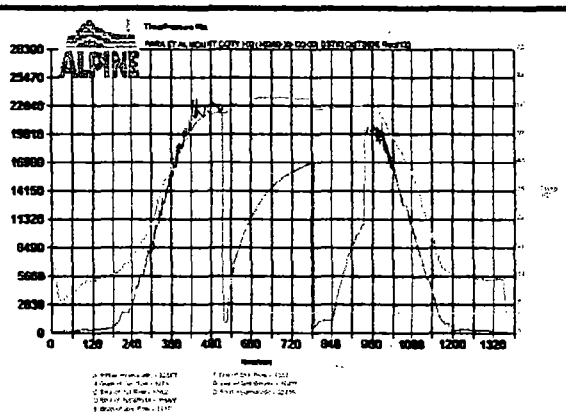
General Information:

Test Type:	INFLATE STRADDLE	Tester:	ALBERTO SCARIONE
Interval:	1709.00m - 1727.00m	Truck No.:	673 □Ÿ□
Formation:	DEBOLT	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	46.00 C

Electronic Recorder Information:

OUTSIDE		Recorder #:	
Recorder #:	133		
Range:	10000 kPag	Range:	kPag
Depth:	1711.00 m	Depth:	m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	22576.7
B Start of 1st Flow	0.00	1971.1
C End of 1st Flow	10.00	1041.7
D End of 1st Shutin	259.00	16996.7
E Start of 2nd Flow	0.00	1116.9
F End of 2nd Flow	56.00	1331.0
G End of 2nd Shutin	93.00	10974.7
Q Final Hydrostatic	0.00	20185.4



Test Run Information:

Start Time:	1200hrs
Reached Test Depth:	1530hrs
Pull Out Time:	45hrs
Tool Out Of Hole:	530hrs
Weight set on Packers:	10000.00daN
Weight to free Packers:	70000.00daN
Initial String Weight:	49000.00daN
Unseated String Weight:	55000.00daN

Tool Chased Dist:	1.00m	Water Loss:	6.50cm³
Mud Type:	GEL CHEMICAL	Mud Drop:	NO
Mud Weight:	1270.00kg/m³	VIS:	80.00S/L
Amount of fill:	0.00m	Filter Cake:	2.00mm
Amt of cushion:	180.00LTS	Pump Time:	30min
Type of cushion:	INHIBITOR & H20	Reversed Out:	NO

General Remarks:

PREFLOW: Strong air blow immediately. Gas to surface in 5 minutes. Lazy 3 meter flare.

FINAL FLOW: Gas to surface immediately.

Recovery Description:

Total fluid recovery was 102 meters, consisting of gasified drilling fluid.

GAS BOMB #VOOO5394

BOTTOM HOLE SAMPLER# GP25

Gas Bomb: 1 Sampler: 1

Fluid Sample: 4 Sent to: AGAT EDMONTON

Drill Stem Testing - Gas Recovery Measurements

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9998 DST#: 3

Test Date: 11/28/2000 1200hrs

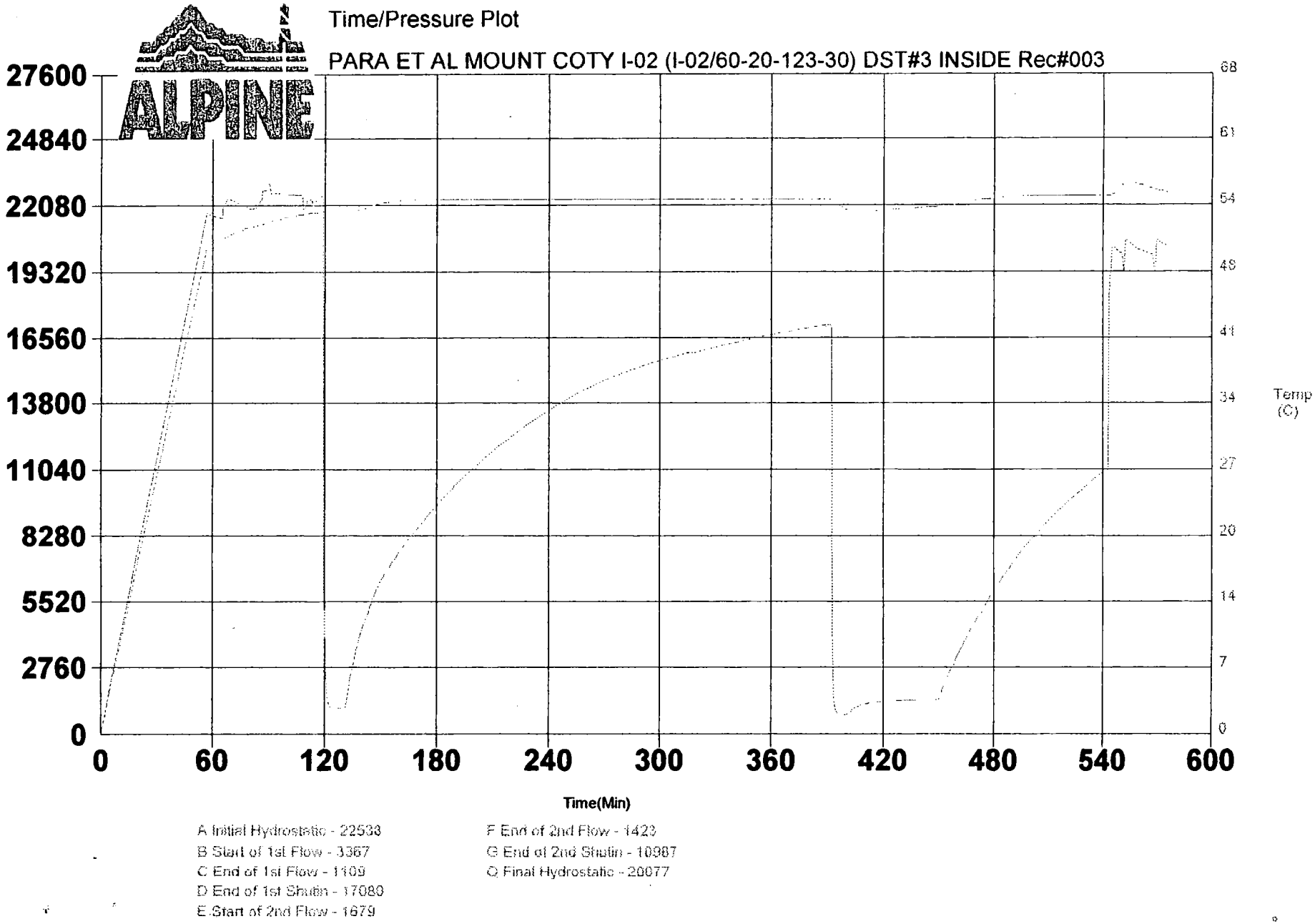
Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO **Location: I-02/60-20-123-30**

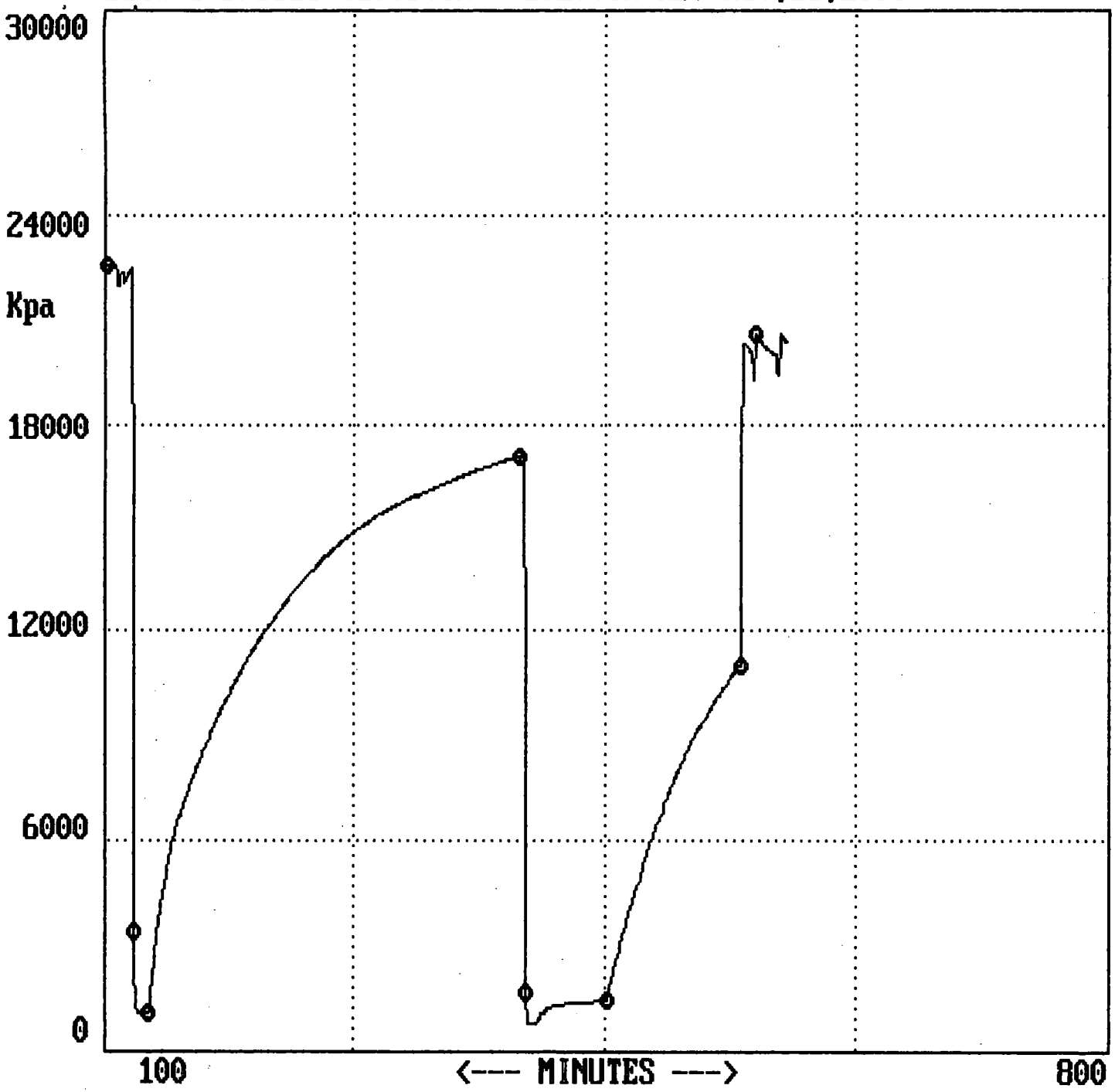
Gas Measurements for Flow # 2

Gas Recovery Measured With: **0**

Time (min.)	Orifice (mm)	Pressure(kPa)	Rate (m^3/d)
20	3.18	97	284.00
30	3.18	100	304.00
40	3.18	124	324.00
50	3.18	138	344.00
60	3.18	138	344.00


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#3 INSIDE Rec#003
27600
24840
22080
19320
16560
13800
11040
8280
5520
2760
0
68
61
54
48
41
34
27
20
14
7
0
Temp (C)
0
60
120
180
240
300
360
420
480
540
600
Time(Min)
A Initial Hydrostatic - 22533
B Start of 1st Flow - 3367
C End of 1st Flow - 1109
D End of 1st Shutin - 17080
E Start of 2nd Flow - 1679
F End of 2nd Flow - 1423
G End of 2nd Shutin - 10987
Q Final Hydrostatic - 20077

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30
DST# 3 DEBOLT (1709.0m - 1727.0m KB) NOV,28,2000



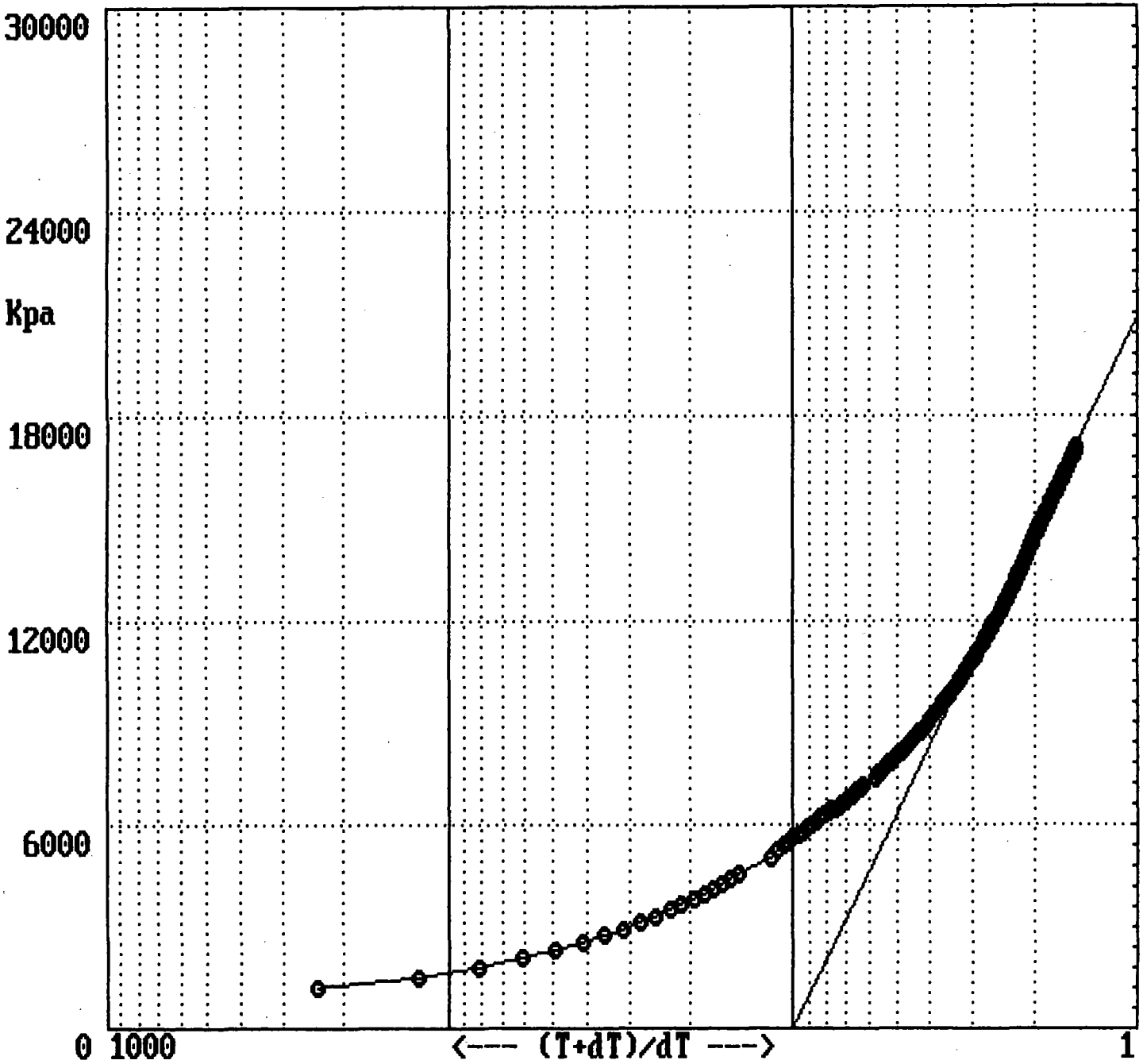
IHP = 22542.6

SF1 = 3367.1
EF1 = 1118.9
ES1 = 17080.4

SF2 = 1679.1
EF2 = 1427.3
ES2 = 10987.0

FHP = 20617.6

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30
DST# 3 DEBOLT (1709.0m - 1727.0m KB) NOV,28,2000

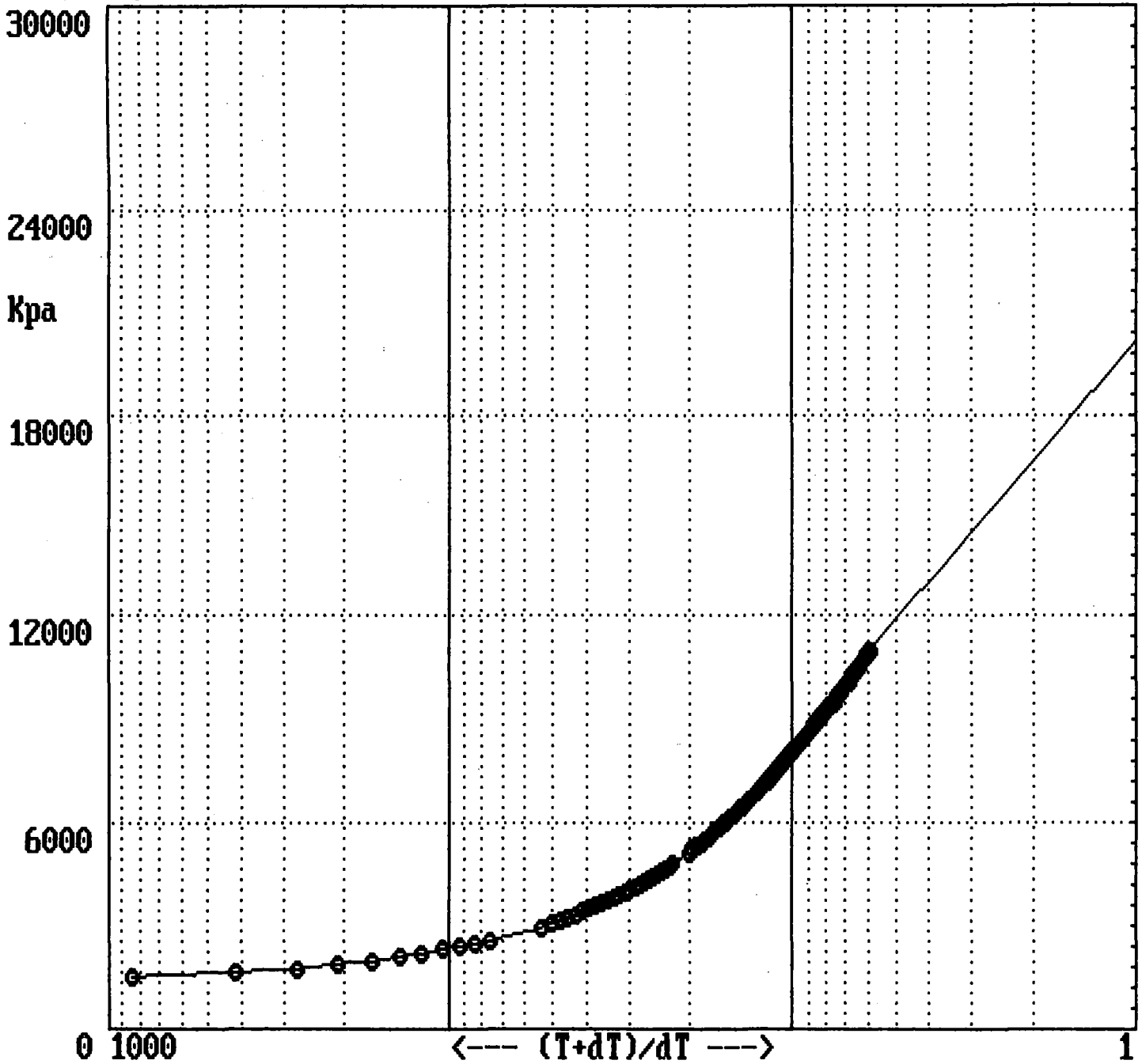


HORNER PLOT
SHUT-IN # 1

SLOPE =
20905.2
kPa/cycle

Extrapolated
Pressure =
20905.2
Kpa

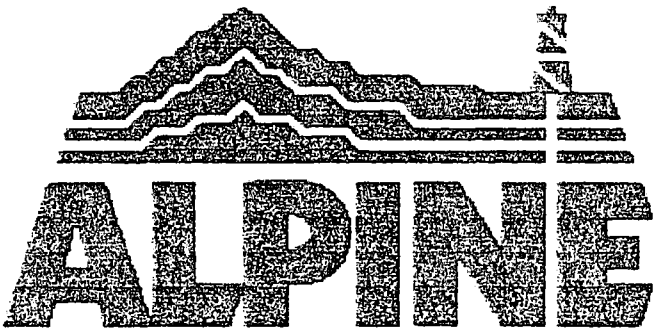
PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30
DST# 3 DEBOLT (1709.0m - 1727.0m KB) NOV,28,2000



HORNER PLOT
SHUT-IN # 2

SLOPE =
11961.0
kPa/cycle

Extrapolated
Pressure =
20203.7
Kpa



Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/28/2000**

Job Ticket #: **D2-9998** DST#: **3**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9998 DST#: 3
Test Date: 11/28/2000 1200hrs

Well Name: PARA ET AL MOUNT COTY I-02
Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

General Information:

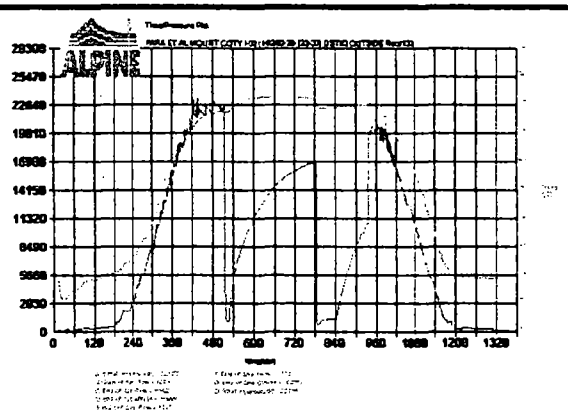
Test Type: INFLATE STRADDLE
Interval: 1709.00m - 1727.00m
Formation: DEBOLT
KB Elevation: 374.60m
Ground Elevation: 369.10m
Total Depth: 1744.00m
Test Mode: Gas

Tester: ALBERTO SCARIONE
Truck No.: 673 □Ÿ□
Contractor: AKITA DRILLING
Rig No.: 51 LIN
Hole Diameter: 222mm
Hole Condition: FAIR
Bottom Hole Temperature: 34.00 C

Electronic Recorder Information:

OUTSIDE	
Recorder #: 133	Recorder #:
Range: 10000 kPag	Range: kPag
Depth: 1711.00 m	Depth: m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	22576.7
B Start of 1st Flow	0.00	1971.1
C End of 1st Flow	10.00	1041.7
D End of 1st Shutin	259.00	16996.7
E Start of 2nd Flow	0.00	1116.9
F End of 2nd Flow	56.00	1331.0
G End of 2nd Shutin	93.00	10974.7
Q Final Hydrostatic	0.00	20185.4



Test Run Information:

Start Time: 1200hrs
Reached Test Depth: 1530hrs
Pull Out Time: 45hrs
Tool Out Of Hole: 530hrs

Weight set on Packers: 10000.00daN
Weight to free Packers: 70000.00daN
Initial String Weight: 49000.00daN
Unseated String Weight: 55000.00daN

Tool Chased Dist: 1.00m
Water Loss: 6.50cm³
Mud Type: GEL CHEMICAL
Mud Drop: NO
Mud Weight: 1270.00kg/m³
VIS: 80.00S/L
Amount of fill: 0.00m
Filter Cake: 2.00mm
Amt of cushion: 180.00LTS
Pump Time: 30min
Type of cushion: INHIBITOR & H20
Reversed Out: NO

General Remarks:

Recovery Description:

Total fluid recovery was 102 meters, consisting of gasified drilling fluid.

GAS BOMB #VOOO5394

BOTTOM HOLE SAMPLER# GP25

Gas Bomb: 1 Sampler: 1
Fluid Sample: 4 Sent to: AGAT EDMONTON

Drill Stem Testing - Gas Recovery Measurements

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9998 DST#: 3

Test Date: 11/28/2000 1200hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

Gas Measurements for Flow # 2

Gas Recovery Measured With: Willis Choke

Time (min.)	Orifice (mm)	Pressure (kPa)	Rate (m^3/d)
20	3.18	97	284.00
30	3.18	100	304.00
40	3.18	124	324.00
50	3.18	138	344.00
60	3.18	138	344.00

Drill Stem Testing - Tool Diagram / Description

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9998 DST#: 3

Test Date: 11/28/2000 1200hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

Inflate Straddle

Drill Collar Stands:	2
Drill Collar Singles:	1
Drill Pipe Stands:	65
Drill Pipe Singles:	4
Heavy Wt. Pipe Stands:	20
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	1713.02m
Total Drill Pipe Above K.B.:	4.53m
Total Depth:	1744m

Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	67.00	mm
Drill Collar Length:	47.92	m
Drill Pipe Inside Diameter:	97.00	mm
Drill Pipe Length:	1271.37	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	368.78	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

Tool Remarks:

Electronic Rec.# 160 malfunctioned.

Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
C.O. Sub	0.30
Drill Collar	9.30
C.O. Sub	0.30
Blank Spacing	4.00
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60

24.95m

48.87m

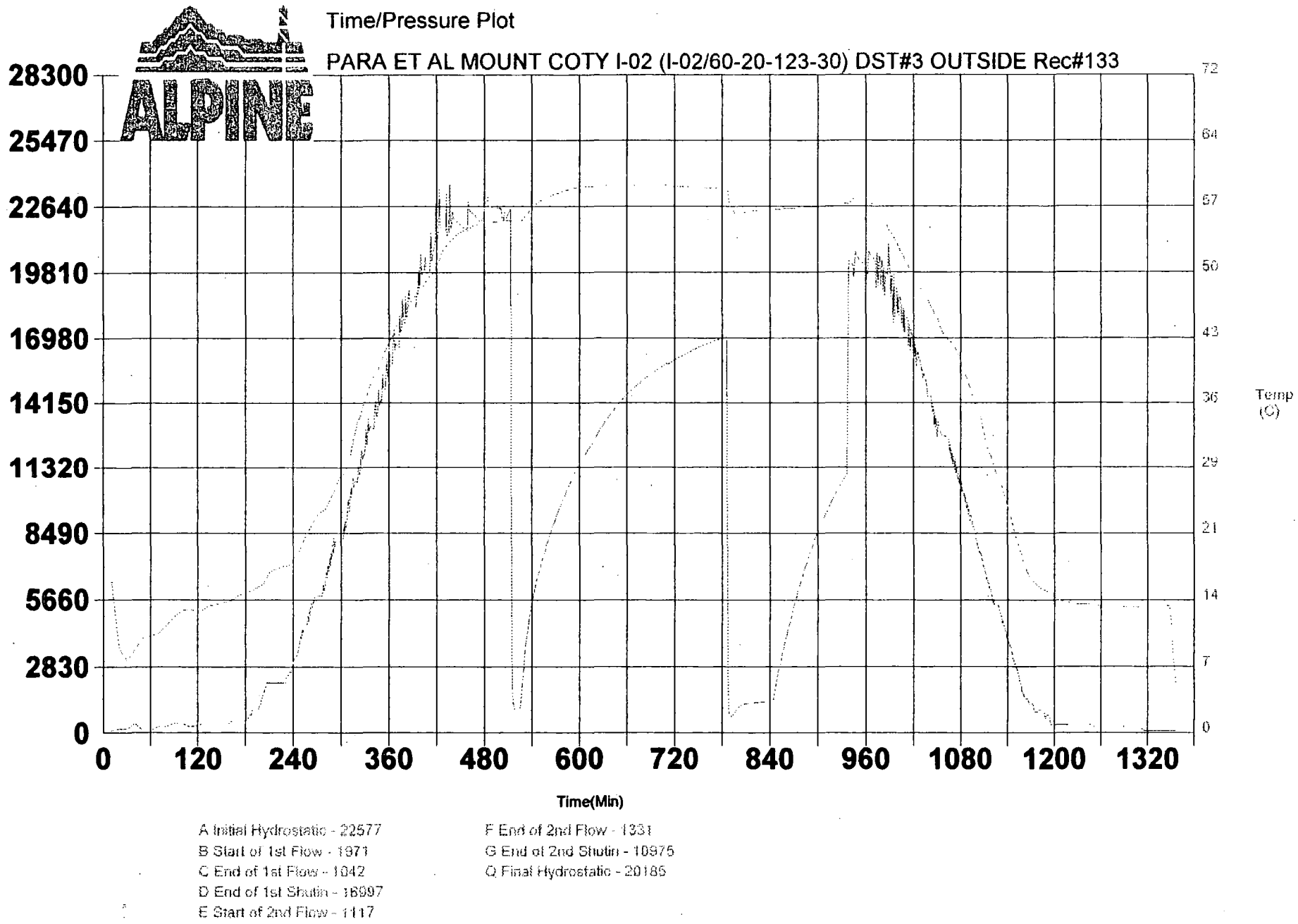
Depth: 1709m

18.74m

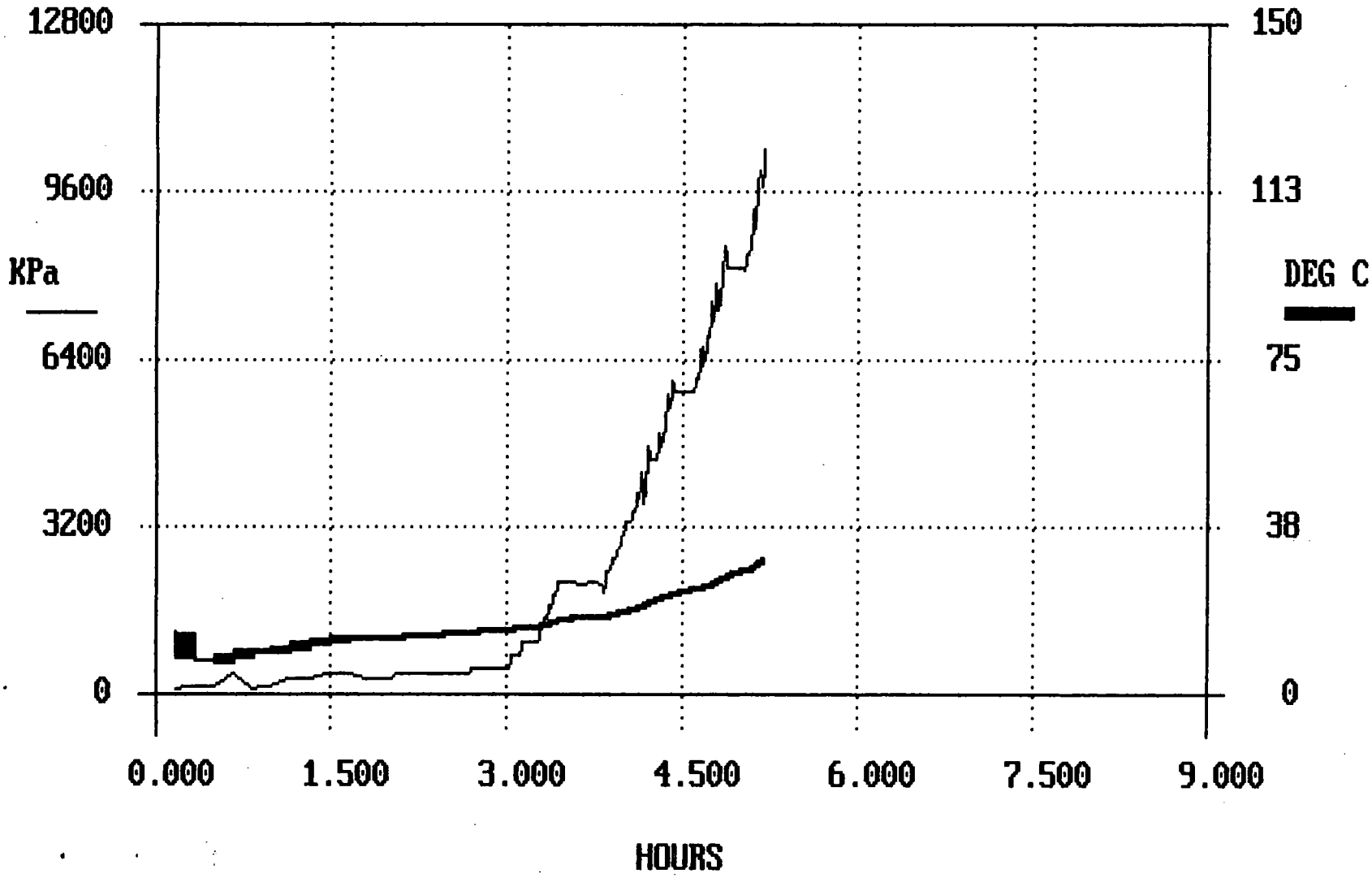
Depth: 1727m

5.18m

Total Depth: 1744.00m


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#3 OUTSIDE Rec#133
28300
25470
22640
19810
16980
14150
11320
8490
5660
2830
0
72
64
57
50
43
36
29
21
14
7
0
Temp (C)
0
120
240
360
480
600
720
840
960
1080
1200
1320
Time(Min)
A Initial Hydrostatic - 22577
B Start of 1st Flow - 1971
C End of 1st Flow - 1042
D End of 1st Shutin - 16997
E Start of 2nd Flow - 1117
F End of 2nd Flow - 1331
G End of 2nd Shutin - 10975
Q Final Hydrostatic - 20185

FILE: <C:\ALP_IN\B2800659.160>
s/n 160 PARAMOUNT RES.LTD 60-20-123-30 T#2-9998 11/28/00 OUTSIDE



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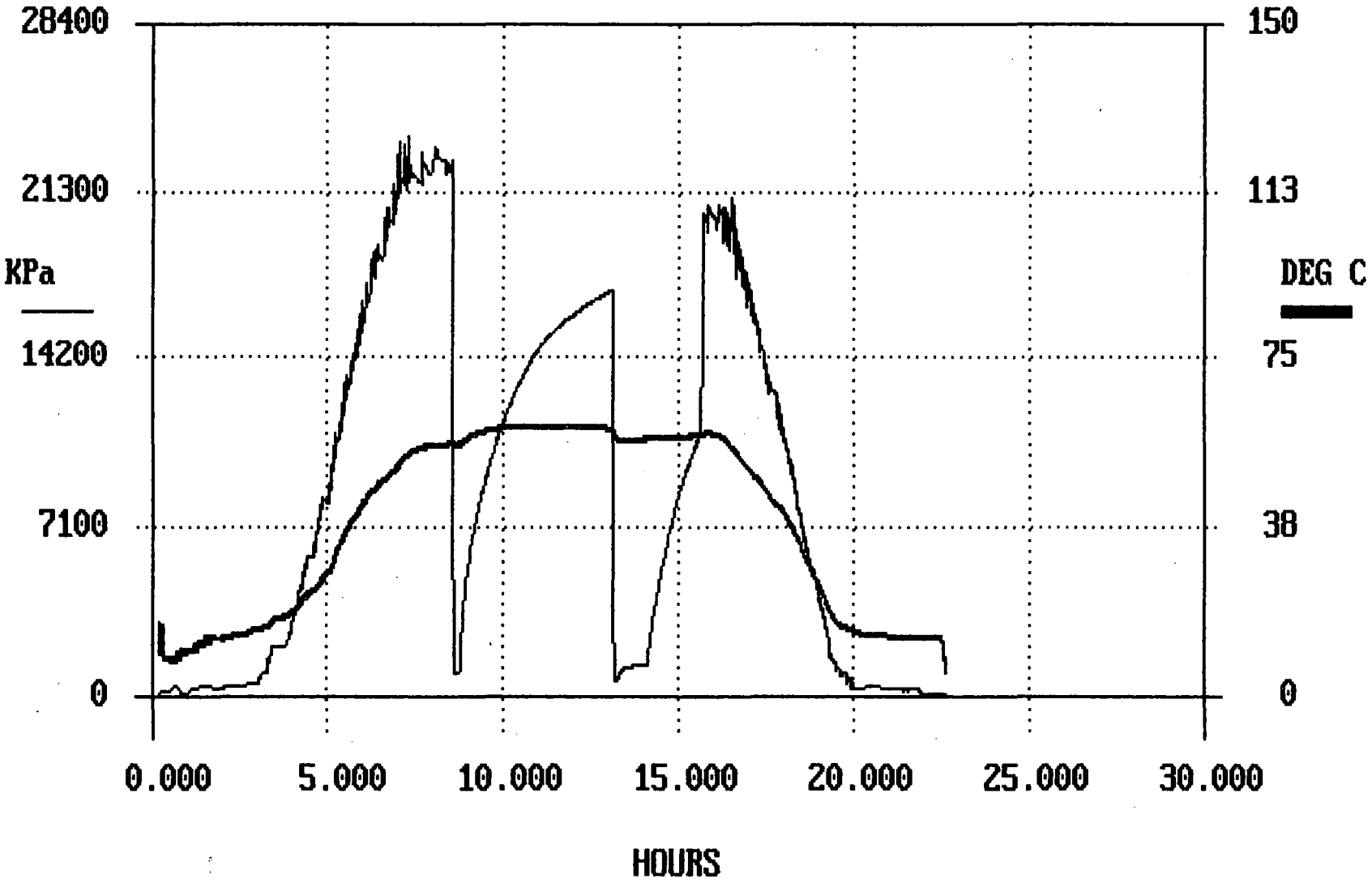
s/n 133 PARAMOUNT RES. LTD 60-20-123-30 T#2-9998 11/28/00 OUTSIDE



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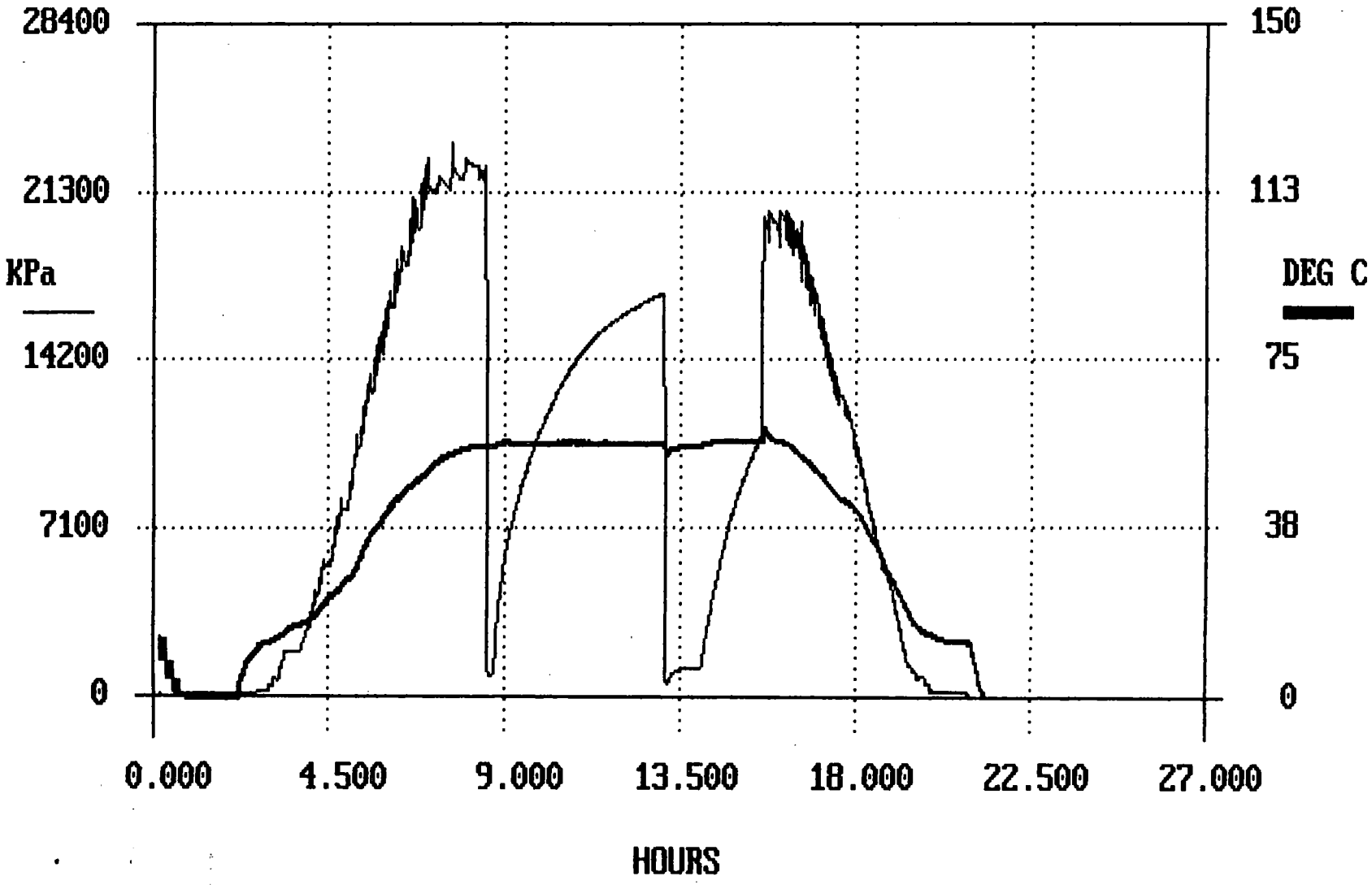
s/n 65 PARAMOUNT RES.LTD 60-20-123-30 T#2-9998 11/28/00 INSIDE



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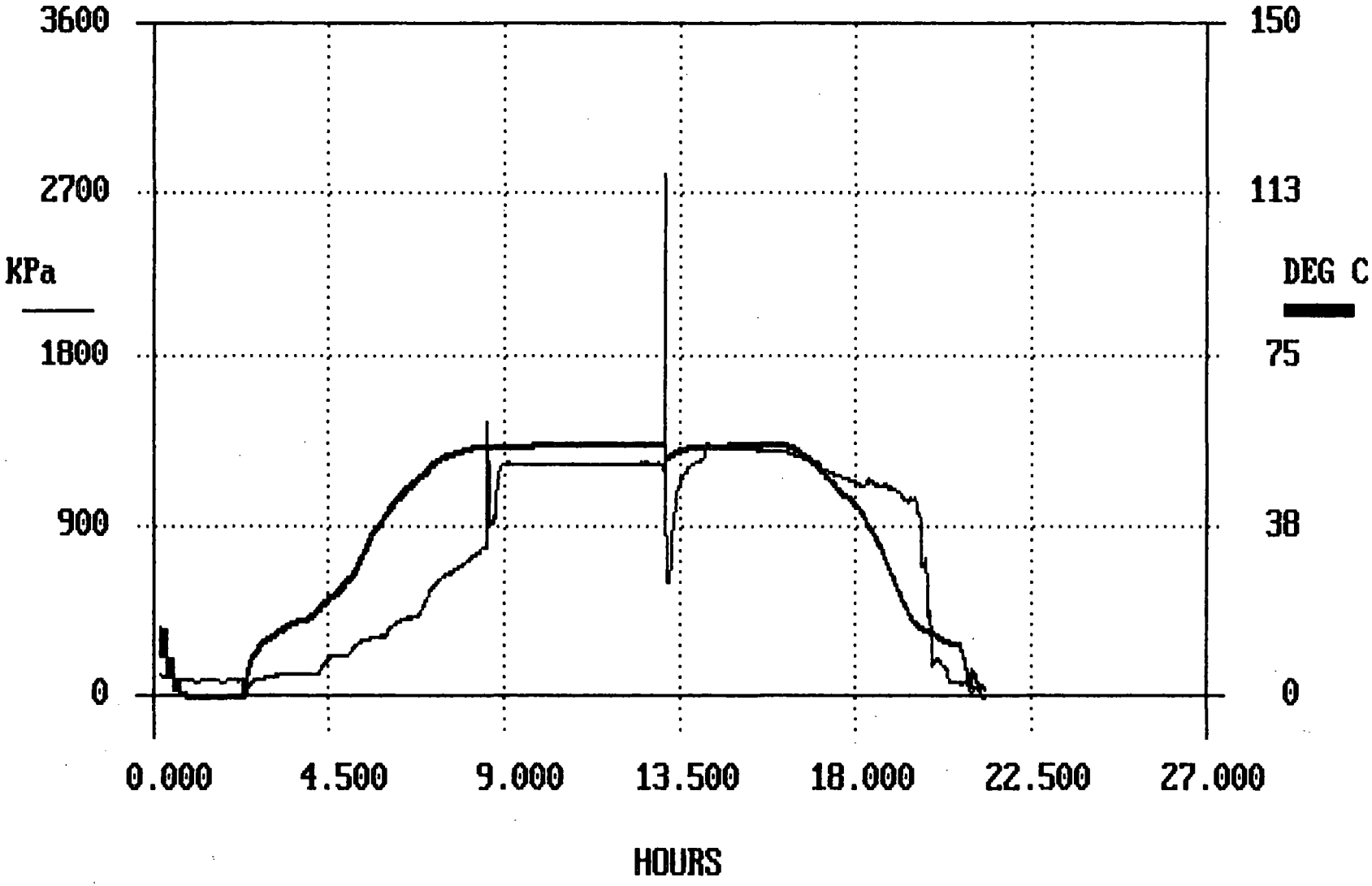
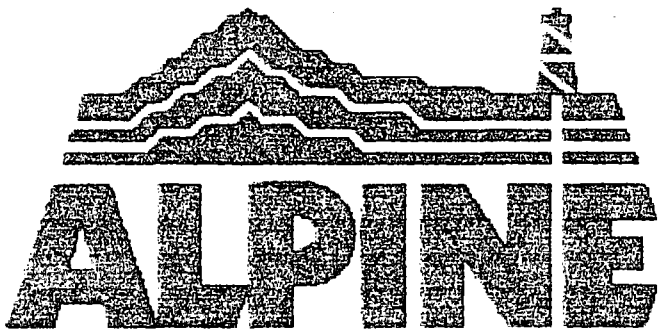
s/n 66 PARAMOUNT RES.LTD T#2-9998 60-20-123-30 11/28/00 FLUID





Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/30/2000**

Job Ticket #: **D2-9999** DST#: **4**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9999 DST#: 4
Test Date: 11/30/2000 400hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

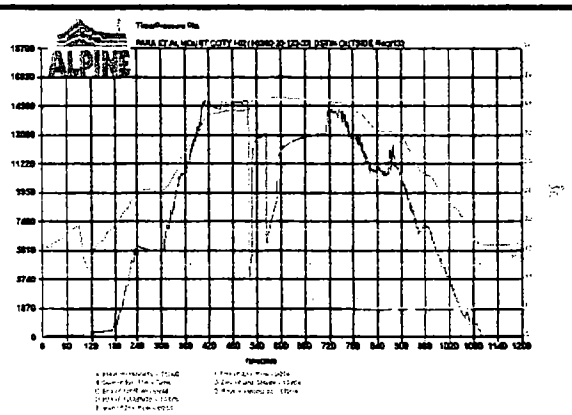
General Information:

Test Type:	INFLATE STRADDLE	Tester:	ALBERTO SCARIONE
Interval:	1216.00m - 1240.00m	Truck No.:	673 □Ÿ□
Formation:	MATTSON	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	44.00 C

Electronic Recorder Information:

OUTSIDE		Recorder #:	
Recorder #:	133		
Range:	10000 kPag	Range:	kPag
Depth:	1218.00 m	Depth:	m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	15390.2
B Start of 1st Flow	0.00	3986.2
C End of 1st Flow	6.00	5588.0
D End of 1st Shutin	35.00	13176.1
E Start of 2nd Flow	0.00	6031.3
F End of 2nd Flow	28.00	9003.6
G End of 2nd Shutin	122.00	13184.2
Q Final Hydrostatic	0.00	14904.1



Test Run Information:

Start Time:	400hrs
Reached Test Depth:	830hrs
Pull Out Time:	1316hrs
Tool Out Of Hole:	2000hrs
Weight set on Packers:	10000.00daN
Weight to free Packers:	62000.00daN
Initial String Weight:	49000.00daN
Unseated String Weight:	52000.00daN

Tool Chased Dist:	0.00m	Water Loss:	6.50cm³
Mud Type:	GEL CHEMICAL	Mud Drop:	NO
Mud Weight:	1240.00kg/m³	VIS:	61.00S/L
Amount of fill:	0.00m	Filter Cake:	2.00mm
Amt of cushion:	0.00	Pump Time:	30min
Type of cushion:		Reversed Out:	YES

General Remarks:

PREFLOW: Weak air blow increasing to strong in 20 seconds. Dead in 6 min.

FINAL FLOW: Strong air blow immediately. Decreasing throughout to Very weak air blow. No gas to surface.

Recovery Description:

well lic# 1884

Total fluid recovery was 711 meters, consisting of fresh water. refractometer reading 1.4

Gas Bomb: 0 Sampler: 1
Fluid Sample: 6 Sent to: AGAT EDMONTON

Drill Stem Testing - Tool Diagram / Description

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-9999 DST#: 4
Test Date: 11/30/2000 400hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

Inflate Straddle

Drill Collar Stands:	2
Drill Collar Singles:	1
Drill Pipe Stands:	41
Drill Pipe Singles:	1
Heavy Wt. Pipe Stands:	20
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	1220.95m
Total Drill Pipe Above K.B.:	3.95m
Total Depth:	1744m

Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	67.00	mm
Drill Collar Length:	38.57	m
Drill Pipe Inside Diameter:	97.00	mm
Drill Pipe Length:	789.52	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	367.91	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

Tool Remarks:

Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
C.O. Sub	0.30
Drill Collar	18.70
C.O. Sub	0.30
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60

24.95m

54.27m

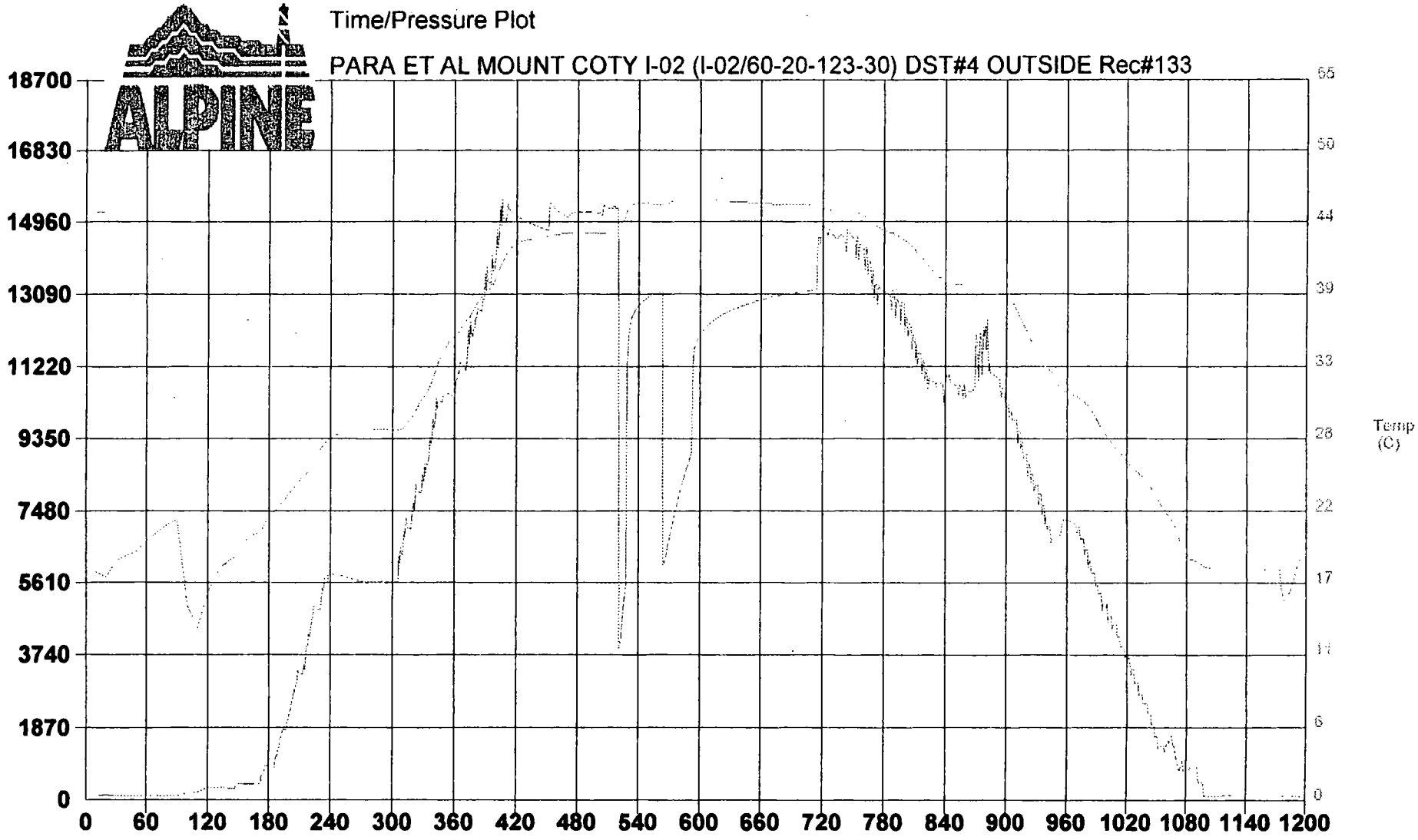
Depth: 1216m

24.14m

Depth: 1240m

5.18m

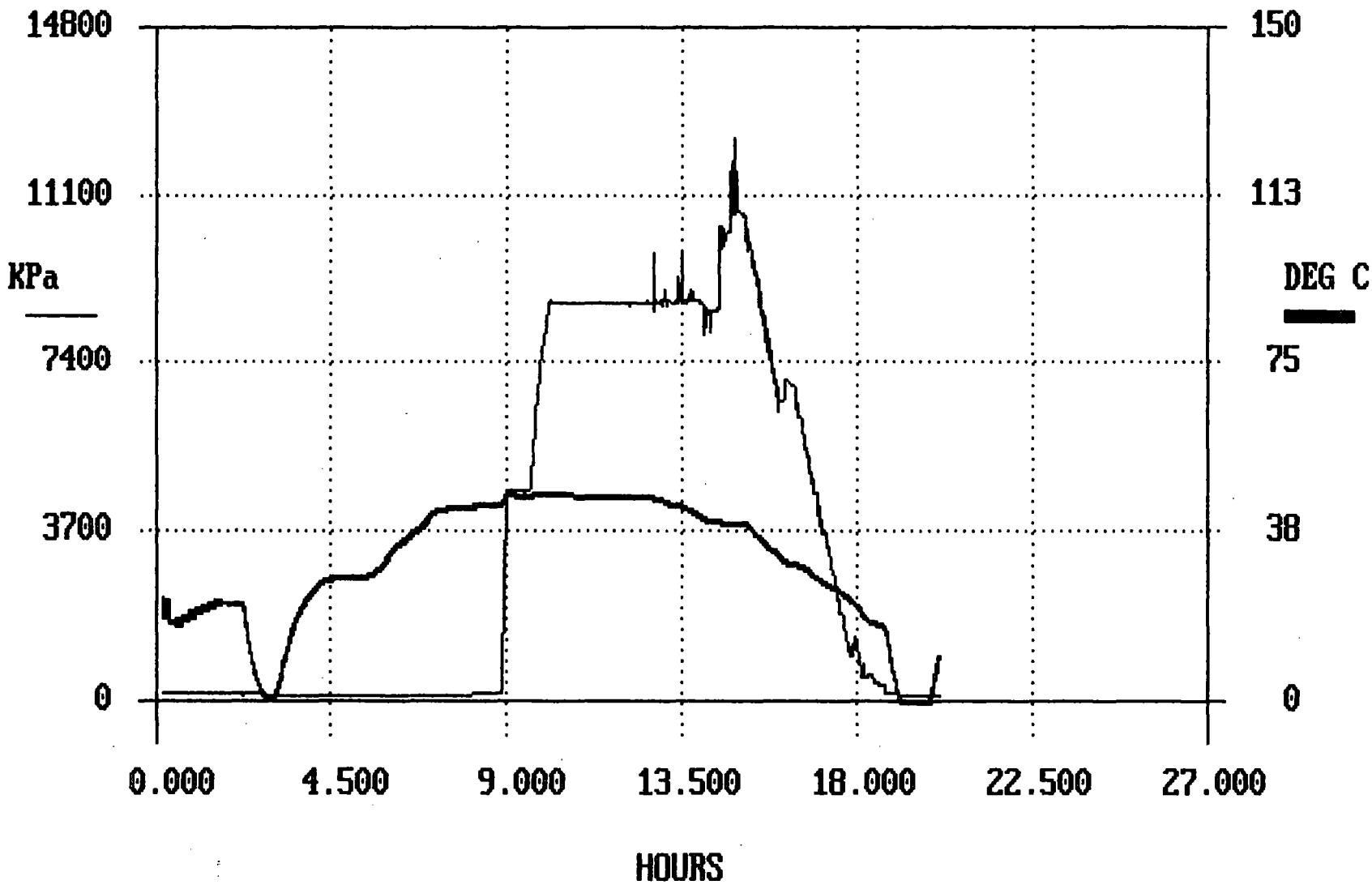
Total Depth: 1744.00m


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#4 OUTSIDE Rec#133
18700
16830
14960
13090
11220
9350
7480
5610
3740
1870
0
55
50
44
39
33
28
22
17
11
6
0
Temp (C)
0 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200
Time(Min)
A Initial Hydrostatic - 15390
B Start of 1st Flow - 3986
C End of 1st Flow - 5588
D End of 1st Shutin - 13176
E Start of 2nd Flow - 6031
F End of 2nd Flow - 9004
G End of 2nd Shutin - 13184
Q Final Hydrostatic - 14904

FILE: <C:\ALP_IN\B2900641.066>

FLUID

s/n 66 PARAMOUNT RES.LTD T#2-9999 60-20-123-30 11/30/00 [redacted]DE



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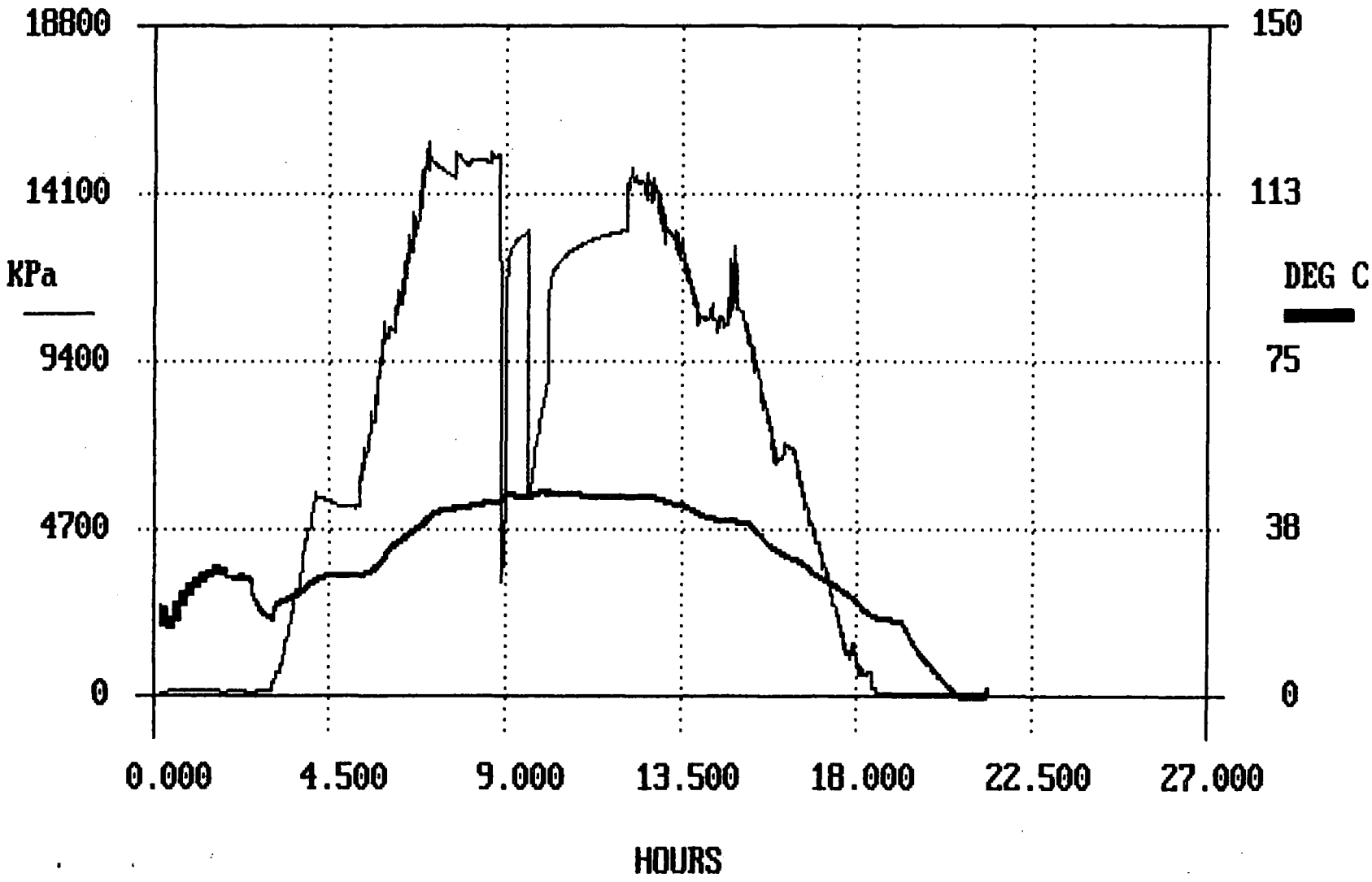
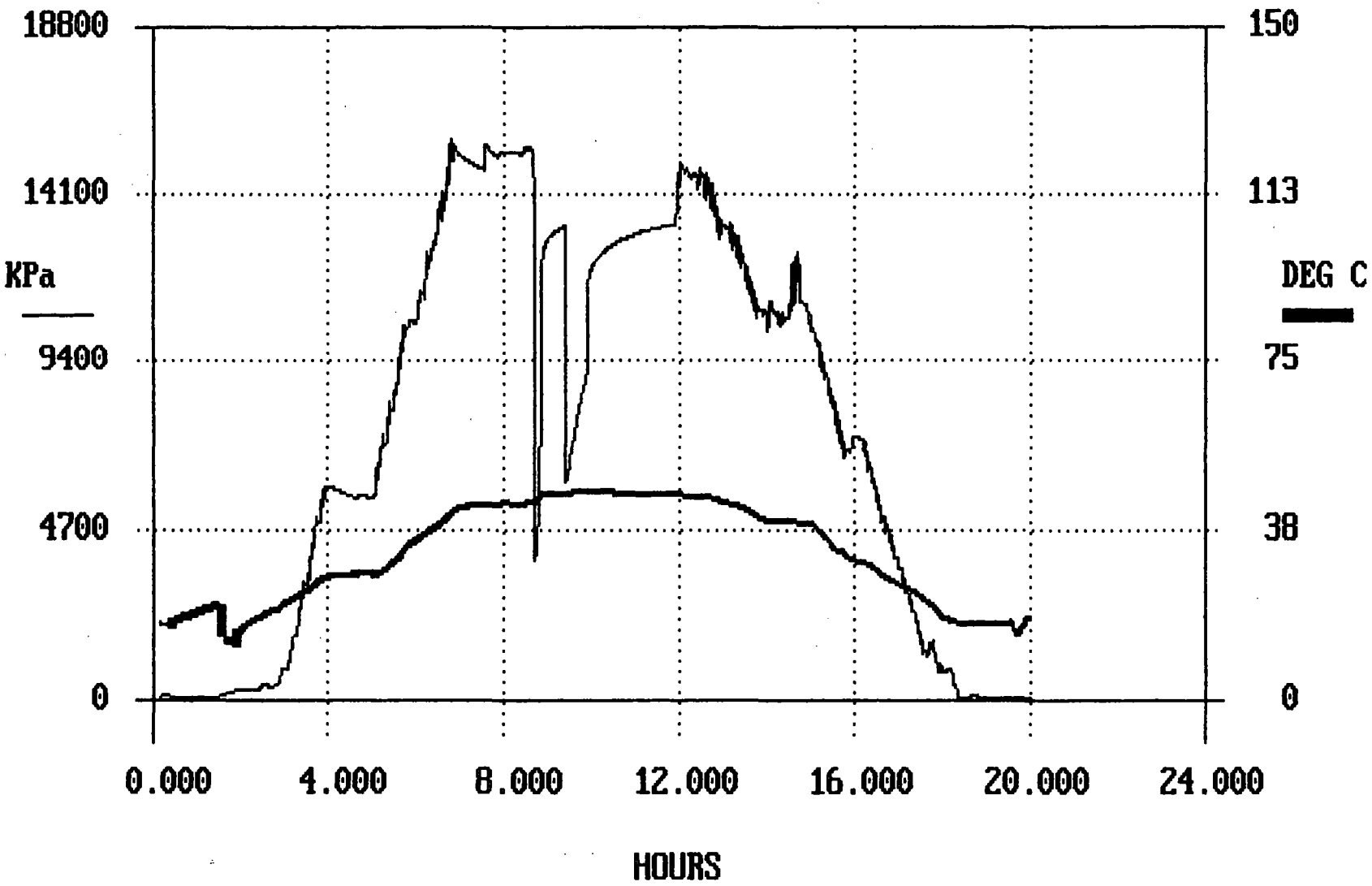
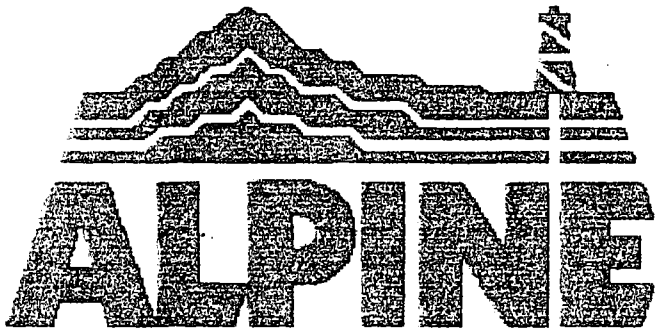
s/n 65 PARAMOUNT RES.LTD 60-20-123-30 T#2-9999 11/30/00 INSIDE



FILE: <C:\ALP_IN\B2900802.133>
s/n 133 PARAMOUNT RES.LTD 60-20-123-30 T#2-9999 11/30/00 OUTSIDE





Real Time Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **11/30/2000**

Job Ticket #: **T4-6188** DST#: **4**

Real Time Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: T4-6188 DST#: 4

Test Date: 11/30/2000 400hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

General Information:

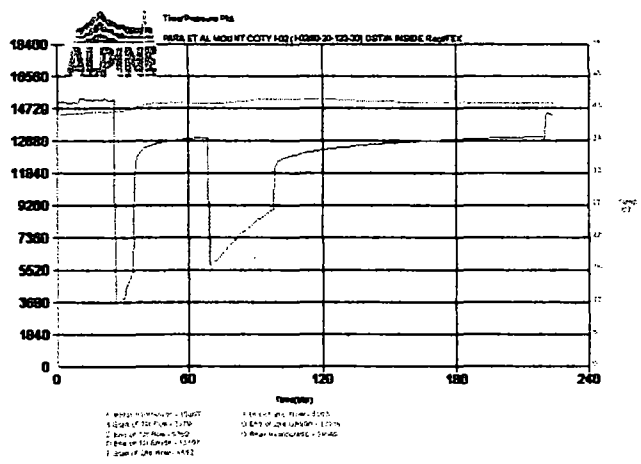
Test Type:	INFLATE STRADDLE	Tester:	KEN PEARSON
Interval:	1216m -1240m	Truck No.:	673 □Ŷ□
Formation:	MATTSON	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	44.00 C

Telemetry Recorder Information:

INSIDE

Recorder #: FEK Depth: 1201.00 m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	15206.6
B Start of 1st Flow	0.00	3570.0
C End of 1st Flow	7.44	5359.3
D End of 1st Shutin	34.08	13107.1
E Start of 2nd Flow	0.00	5811.9
F End of 2nd Flow	28.02	8903.4
G End of 2nd Shutin	122.04	13016.4
Q Final Hydrostatic	0.00	14549.1



Test Run Information:

Start Time:	400hrs
Reached Test Depth:	830hrs
Pull Out Time:	1316hrs
Tool Out Of Hole:	2000hrs
Water Loss:	6.50cm³
Mud Drop:	NO
VIS:	61.00S/L
Filter Cake:	0.00mm
Pump Time:	0min
Reversed Out:	NO
Mud Type:	GEL CHEMICAL
Mud Weight:	1240.00kg/m³
Amount of fill:	0.00m
Amount of cushion:	0.00
Type of cushion:	

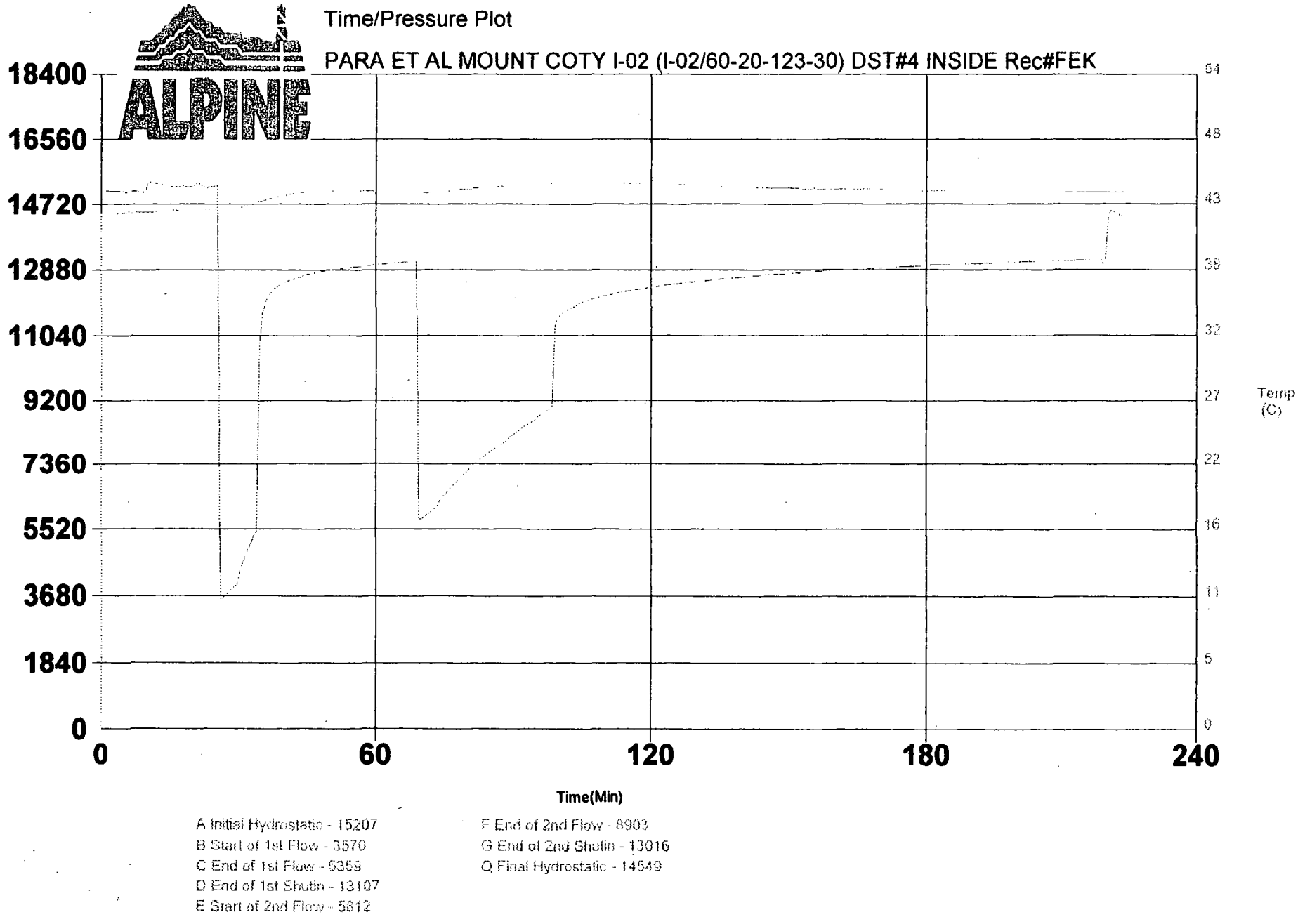
General Remarks:

PREFLOW: Open tool at 10:09 to 10:16 weak air blow increasing to strong in 20 seconds. Dead in 6 min.

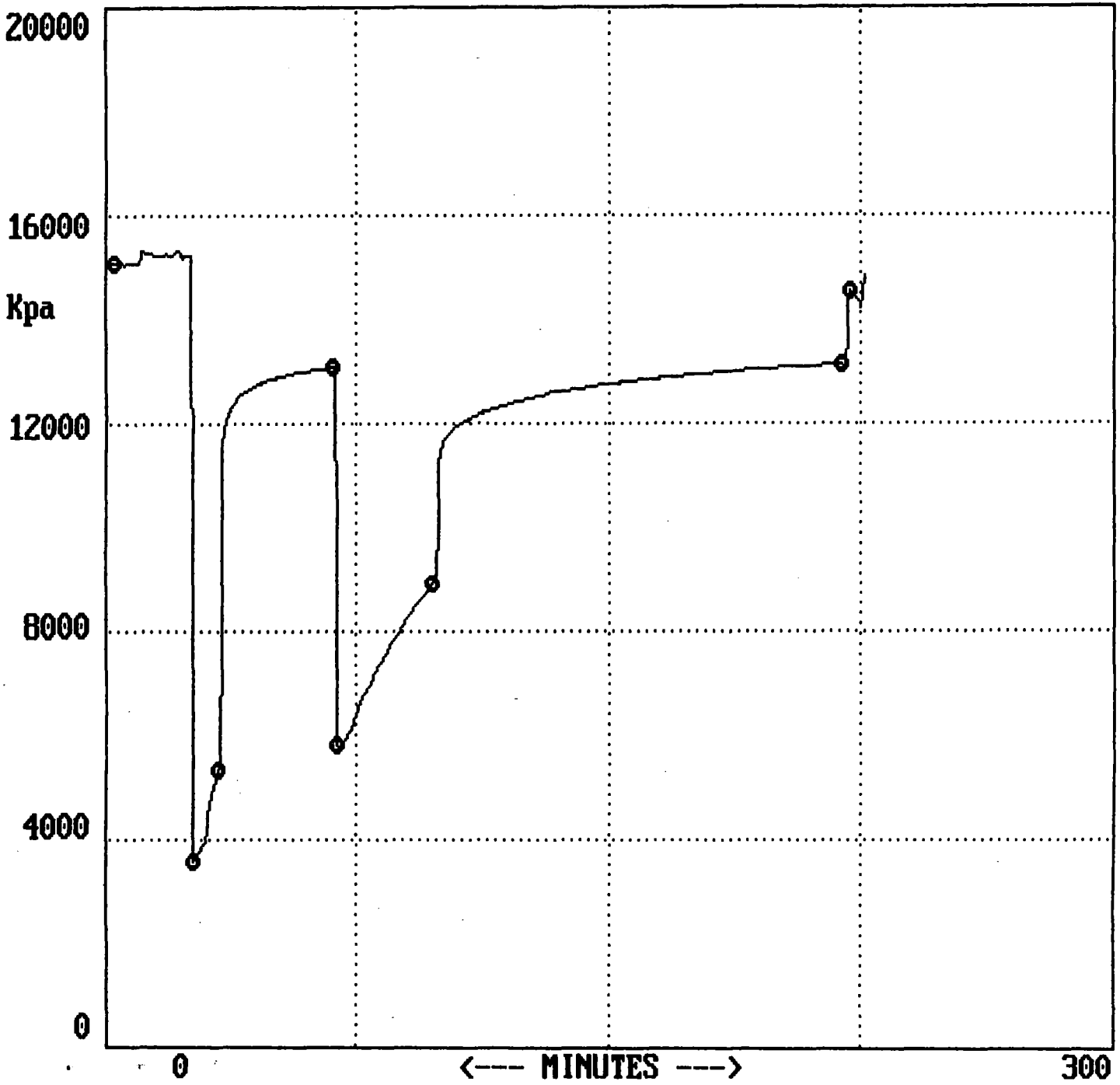
FINAL FLOW:Open tool at 10:53 to 11:23 Strong air blow in 4 min. Very weak air blow. No gas to surface.

Recovery Description:

Total fluid recovery was 711 meters, consisting of fresh water.


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#4 INSIDE Rec#FEK
18400
16560
14720
12880
11040
9200
7360
5520
3680
1840
0
54
48
43
38
32
27
22
16
11
5
0
Temp (C)
0
60
120
180
240
Time(Min)
A Initial Hydrostatic - 15207
B Start of 1st Flow - 3570
C End of 1st Flow - 5359
D End of 1st Shutin - 13107
E Start of 2nd Flow - 5812
F End of 2nd Flow - 8903
G End of 2nd Shutin - 13016
Q Final Hydrostatic - 14549

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 4 MATTSON (1216.0m - 1240.0m KB) NOV,30,2000



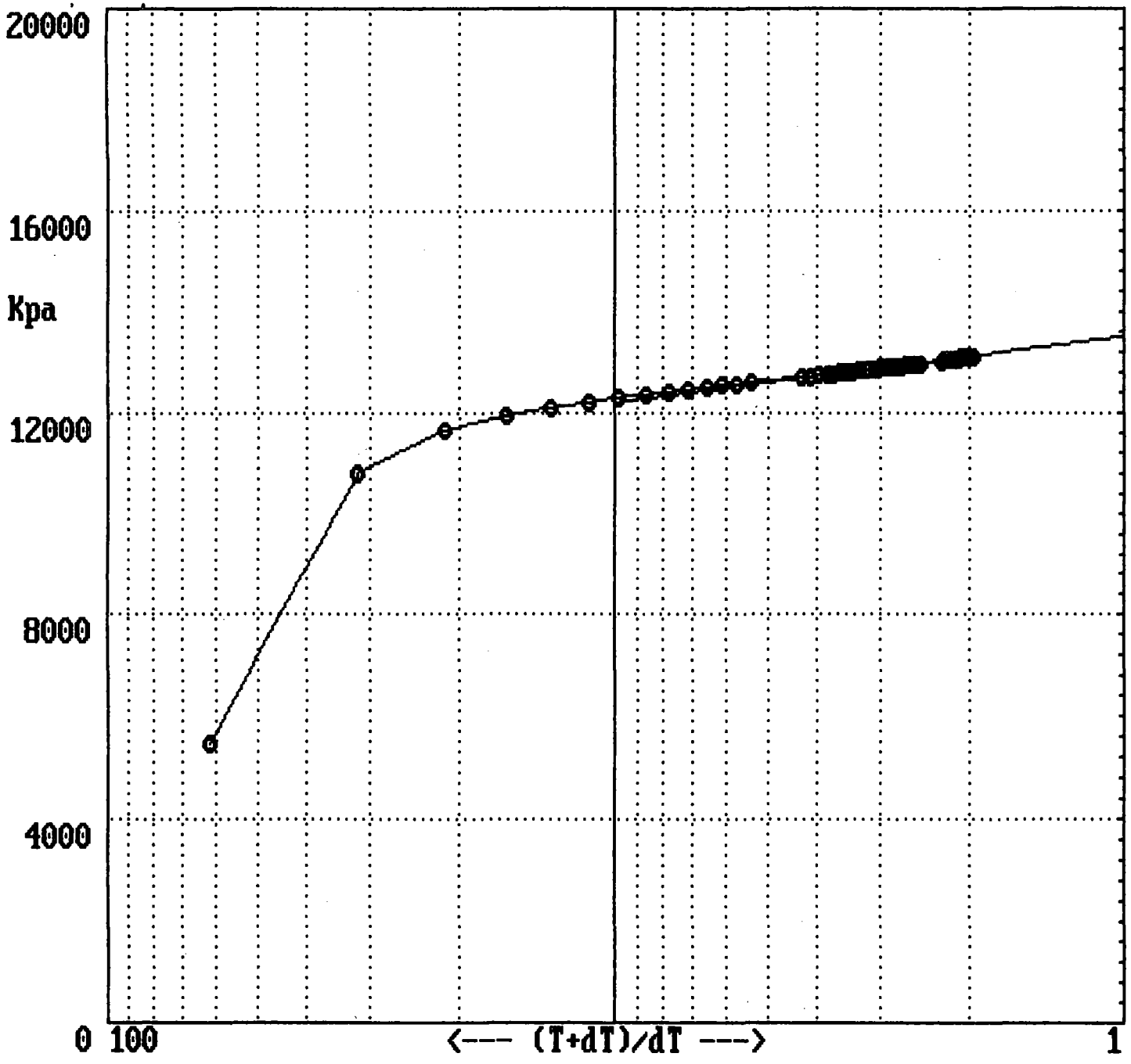
IHP = 15101.6

SF1 = 3570.0
EF1 = 5359.3
ES1 = 13109.5

SF2 = 5811.9
EF2 = 8903.4
ES2 = 13154.8

FHP = 14549.1

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 4 MATTSON (1216.0m - 1240.0m KB) NOV,30,2000

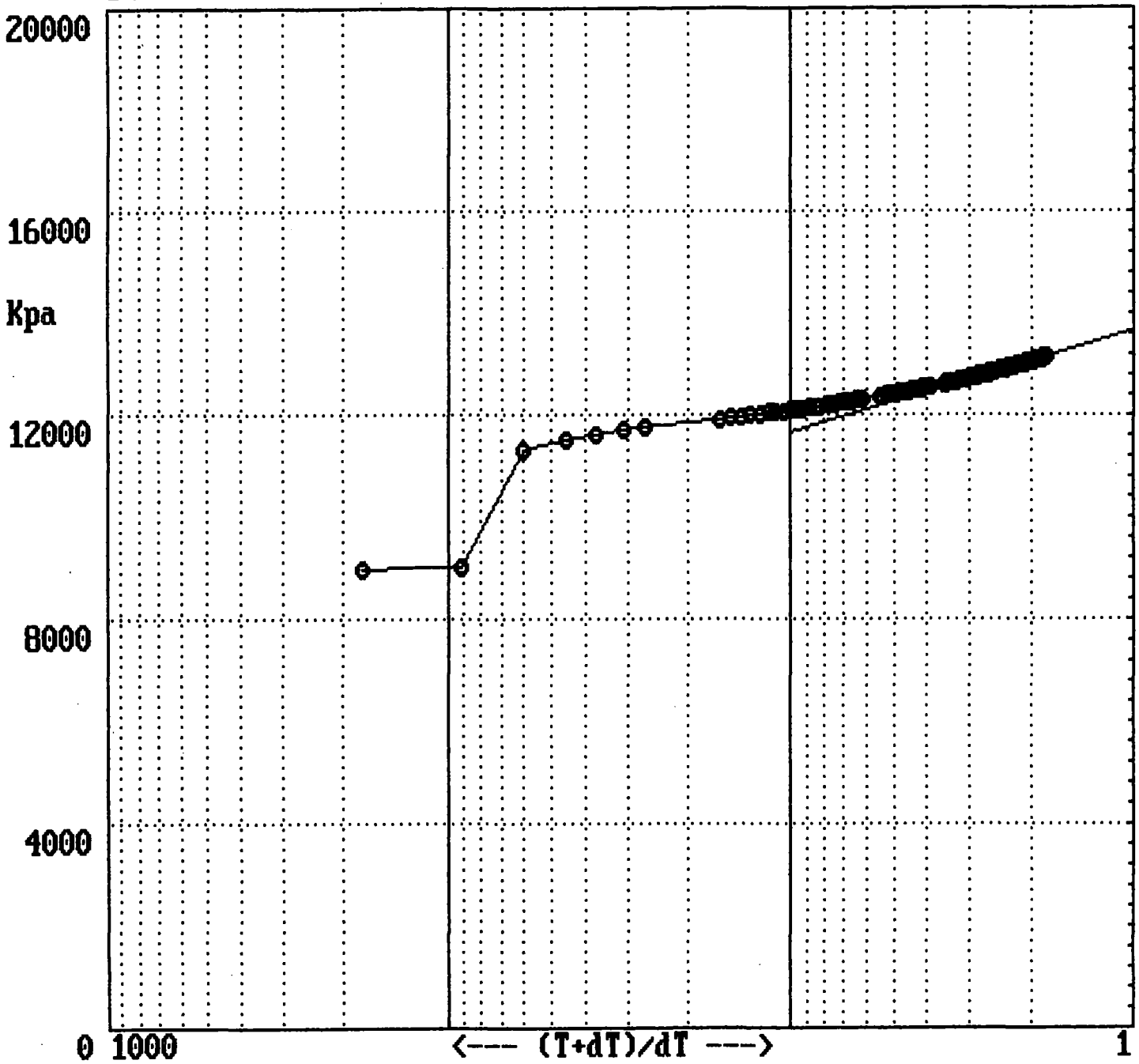


HORNER PLOT
SHUT-IN # 1

SLOPE =
1291.7
kPa/cycle

Extrapolated
Pressure =
13489.4
Kpa

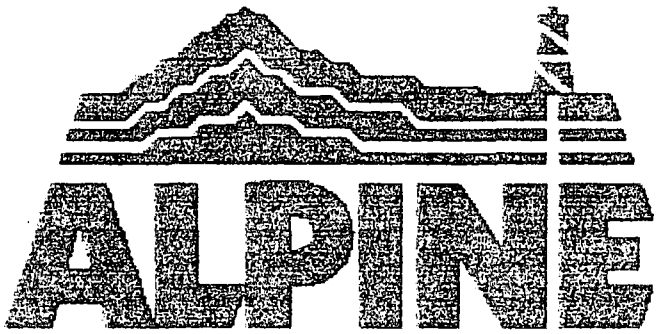
PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 4 MATTSON (1216.0m - 1240.0m KB) NOV,30,2000



HORNER PLOT
SHUT-IN # 2

SLOPE =
2018.8
kPa/cycle

Extrapolated
Pressure =
13669.1
Kpa



Real Time Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **12/01/2000**

Job Ticket #: **T4-6189** DST#: **5**

Real Time Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: T4-6189 DST#: 5

Test Date: 12/01/2000 2300hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

General Information:

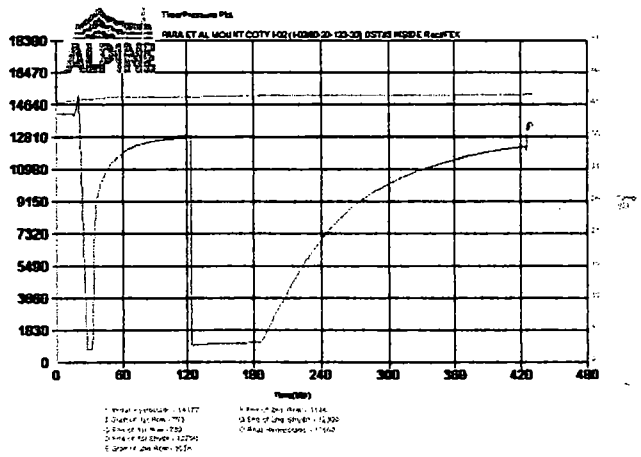
Test Type:	INFLATE STRADDLE	Tester:	KEN PEARSON
Interval:	1134m -1140m	Truck No.:	673 □Ÿ□
Formation:	MATTSON	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	43.00 C

Telemetry Recorder Information:

INSIDE

Recorder #: FEK Depth: 1119.00 m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	14177.3
B Start of 1st Flow	0.00	752.8
C End of 1st Flow	3.30	788.6
D End of 1st Shutin	88.50	12789.5
E Start of 2nd Flow	0.00	1035.6
F End of 2nd Flow	60.96	1145.7
G End of 2nd Shutin	239.64	12300.1
Q Final Hydrostatic	0.00	13568.0



Test Run Information:

Start Time:	2300hrs
Reached Test Depth:	210hrs
Pull Out Time:	1020hrs
Tool Out Of Hole:	1430hrs
Water Loss:	6.50cm³
Mud Drop:	NO
VIS:	61.00S/L
Filter Cake:	0.00mm
Pump Time:	30min
Reversed Out:	NO
Mud Type:	GEL CHEMICAL
Mud Weight:	1240.00kg/m³
Amount of fill:	0.00m
Amount of cushion:	0.00
Type of cushion:	

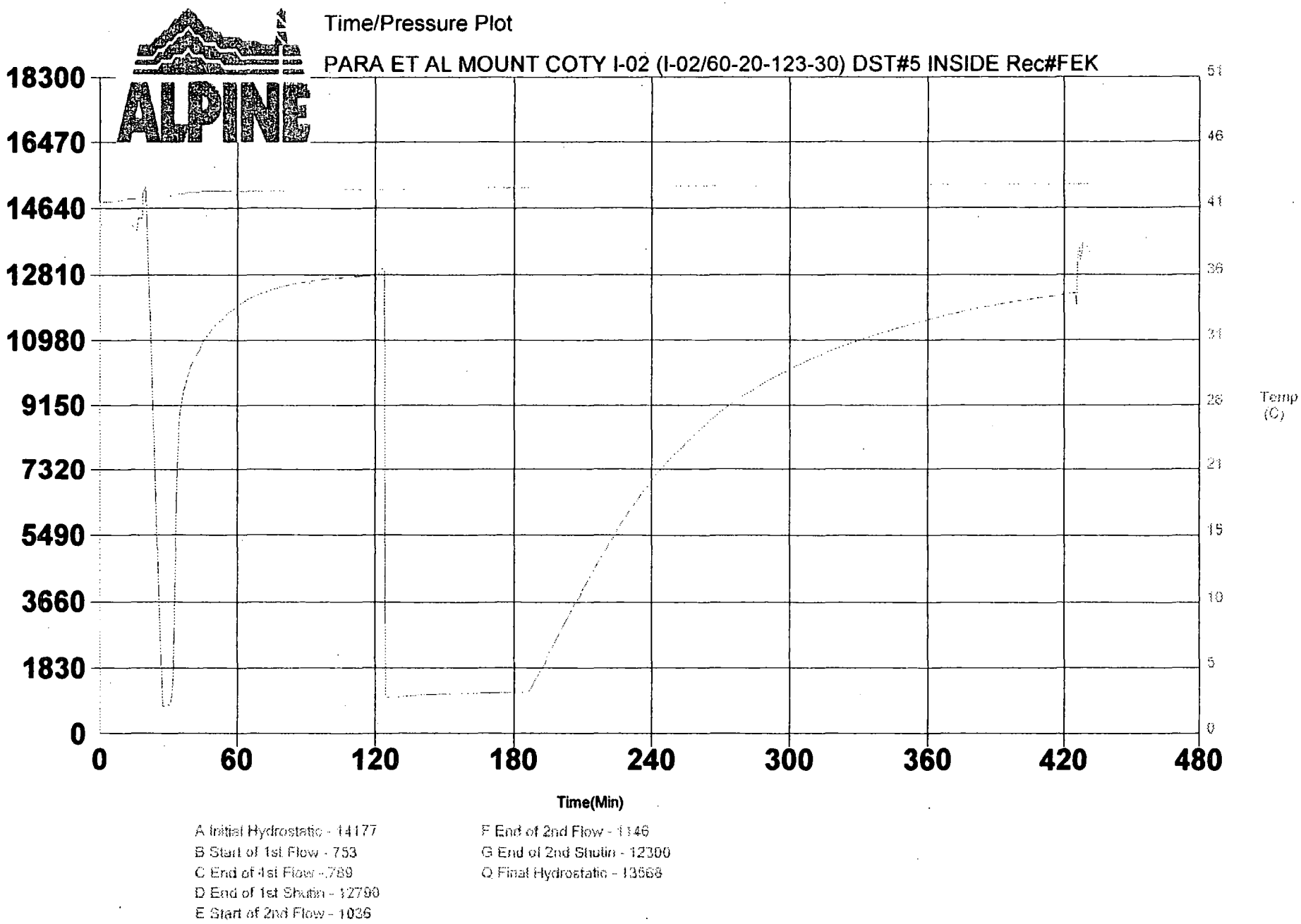
General Remarks:

PREFLOW: START 03:33 TO 03:43 Weak air blow 3 inches in pail No gas to surface.

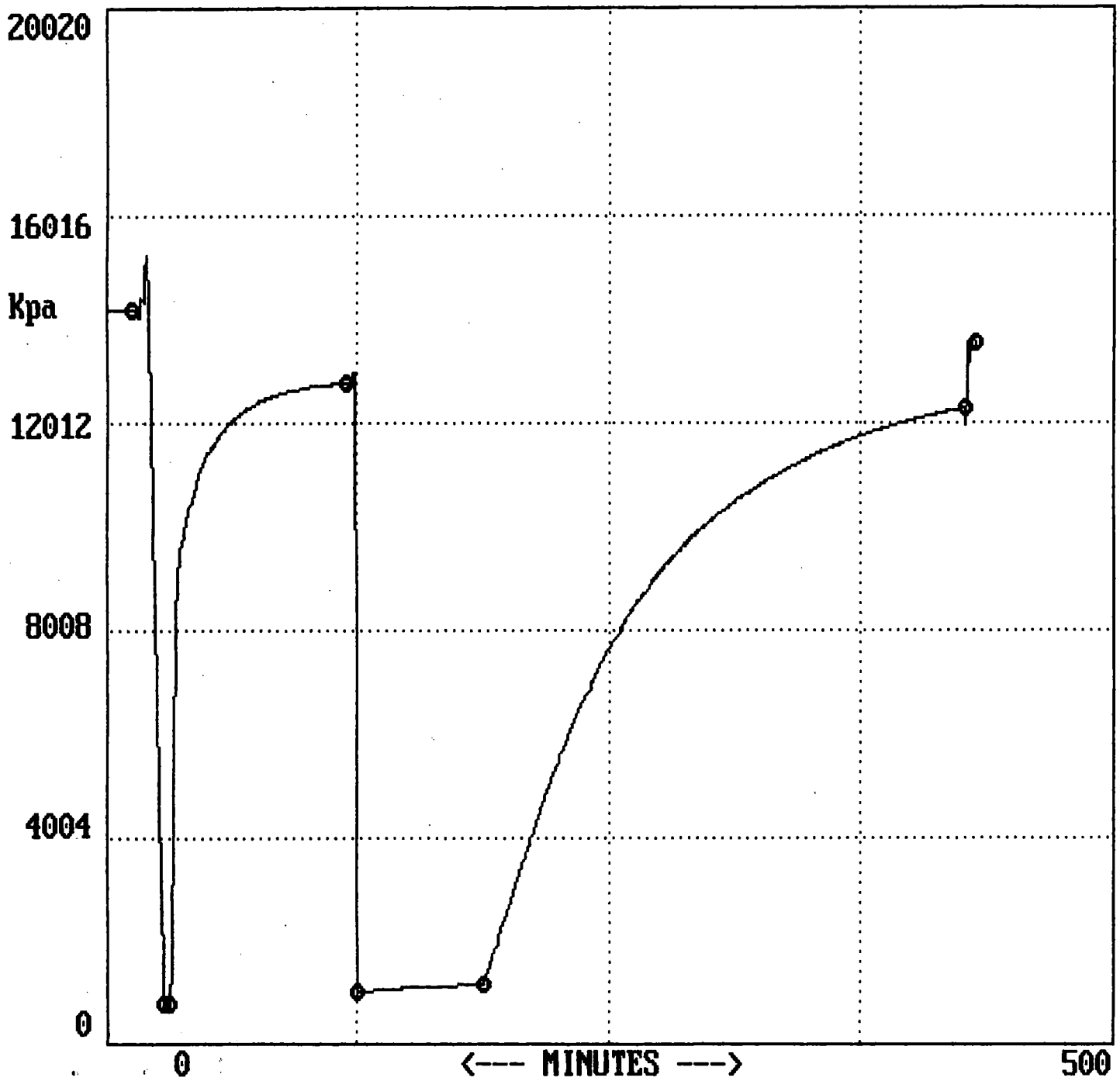
FINAL FLOW: START 05:15 TO 06:15 Weak air blow. Bottom of pail in 6 minutes. No gas to surface.

Recovery Description:

WELL LIC# 1884


Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#5 INSIDE Rec#FEK
ALPINE
18300
16470
14640
12810
10980
9150
7320
5490
3660
1830
0
51
46
41
36
31
26
21
15
10
5
0
Temp (C)
0
60
120
180
240
300
360
420
480
Time(Min)
A Initial Hydrostatic - 14177
B Start of 1st Flow - 753
C End of 1st Flow - 789
D End of 1st Shutin - 12790
E Start of 2nd Flow - 1036
F End of 2nd Flow - 1146
G End of 2nd Shutin - 12300
Q Final Hydrostatic - 13668

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 5 MATTSON (1134.0m - 1140.0m KB) DEC,01,2000



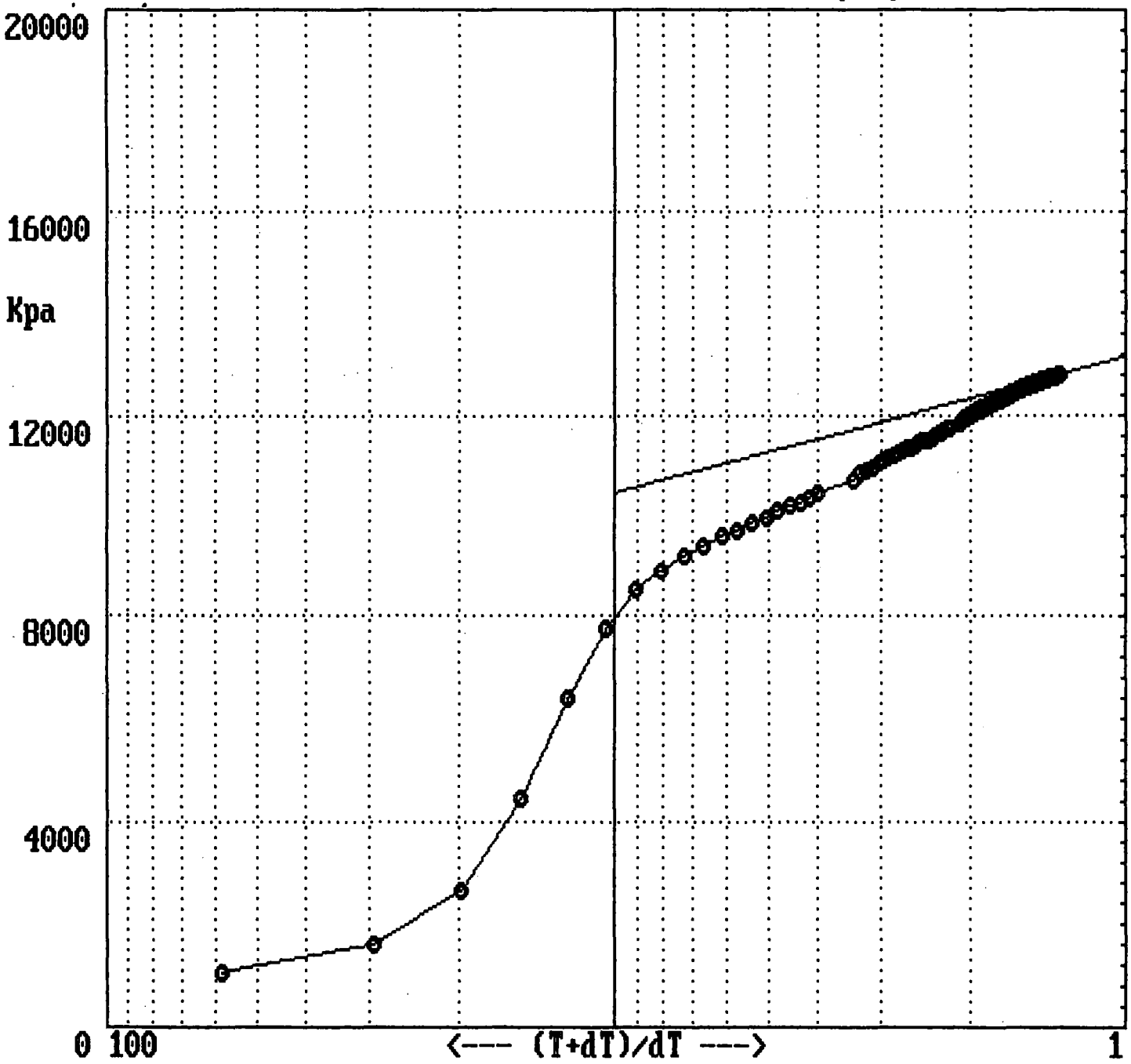
IHP = 14177.3

SF1 = 752.8
EF1 = 788.6
ES1 = 12789.5

SF2 = 1035.6
EF2 = 1145.8
ES2 = 12300.1

FHP = 13534.5

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 5 MATTSON (1134.0m - 1140.0m KB) DEC,01,2000

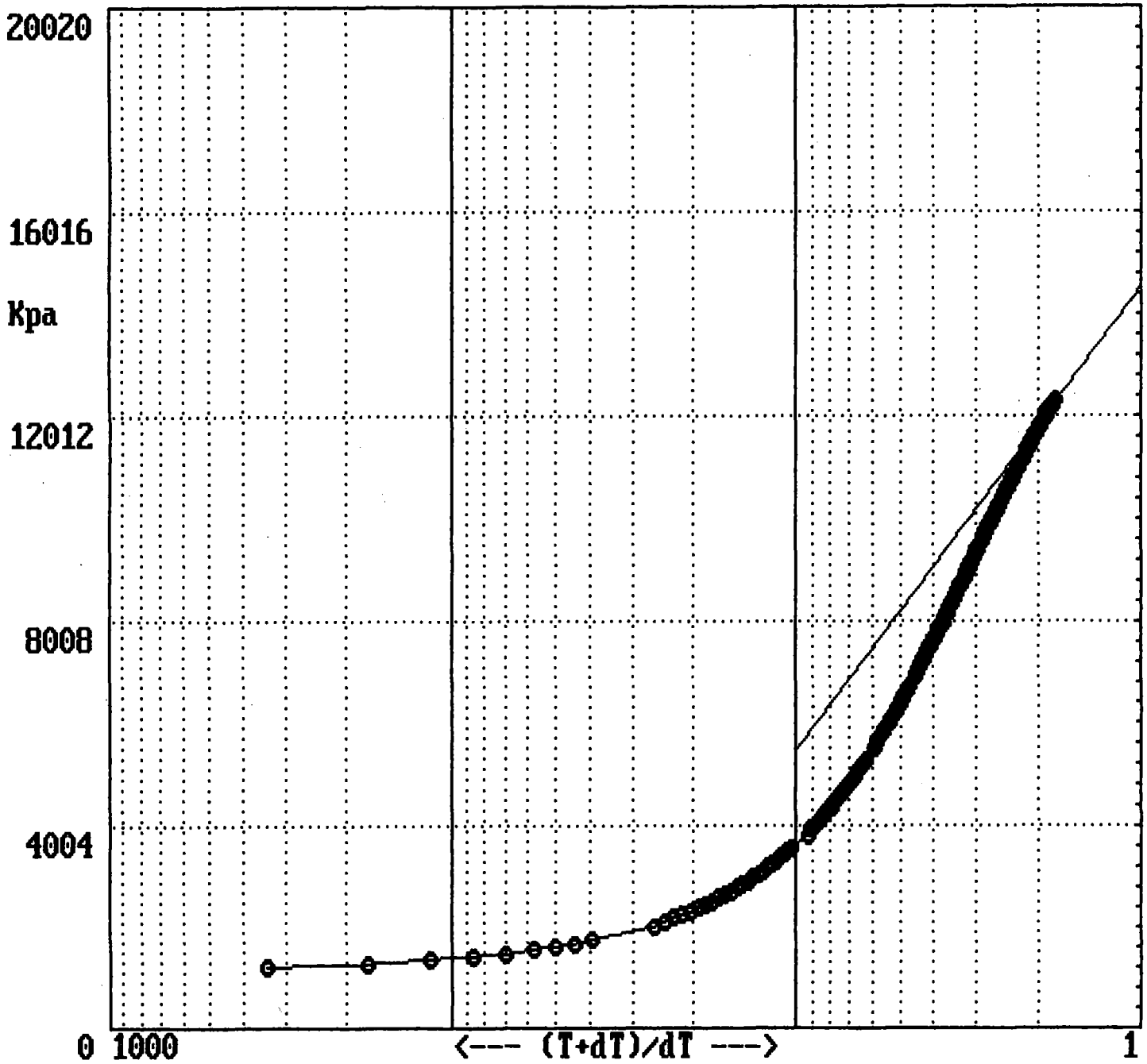


HORNER PLOT
SHUT-IN # 1

SLOPE =
2661.0
kPa/cycle

Extrapolated
Pressure =
13133.8
Kpa

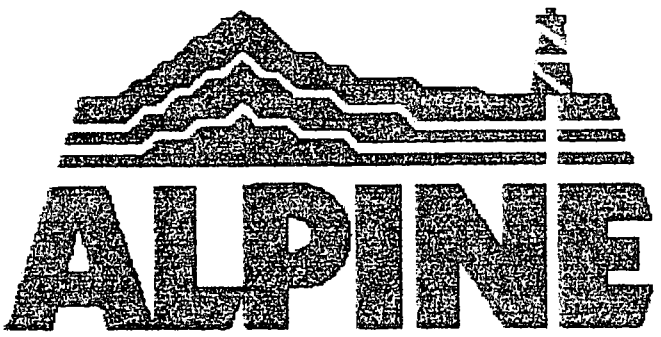
PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 5 MATTSON (1134.0m - 1140.0m KB) DEC,01,2000



HORNER PLOT
SHUT-IN # 2

SLOPE =
9135.7
kPa/cycle

Extrapolated
Pressure =
14589.4
Kpa



Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **12/01/2000**

Job Ticket #: **D2-10000** DST#: **5**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-10000 DST#: 5
Test Date: 12/01/2000 2300hrs

Well Name: PARA ET AL MOUNT COTY I-02
Location: I-02/60-20-123-30

Contact: WILBERT CALLIHOO

General Information:

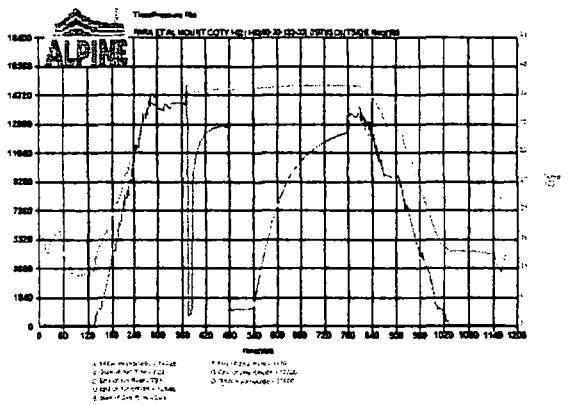
Test Type: INFLATE STRADDLE
Interval: 1134.00m - 1140.00m
Formation: MATTSON
KB Elevation: 374.60m
Ground Elevation: 369.10m
Total Depth: 1744.00m
Test Mode: Gas

Tester: ALBERTO SCARIONE
Truck No.: 673 □Ÿ□
Contractor: AKITA DRILLING
Rig No.: 51 LIN
Hole Diameter: 222mm
Hole Condition: FAIR
Bottom Hole Temperature: 43.00 C

Electronic Recorder Information:

OUTSIDE	OUTSIDE
Recorder #: 160	Recorder #: 066
Range: 10000 kPag	Range: 10000 kPag
Depth: 1136.00 m	Depth: 1136.00 m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	14226.4
B Start of 1st Flow	0.00	721.6
C End of 1st Flow	7.00	781.2
D End of 1st Shutin	90.00	12846.3
E Start of 2nd Flow	0.00	994.1
F End of 2nd Flow	60.00	1109.9
G End of 2nd Shutin	240.00	12326.1
Q Final Hydrostatic	0.00	13599.7



Test Run Information:

Start Time: 2300hrs
Reached Test Depth: 210hrs
Pull Out Time: 1020hrs
Tool Out Of Hole: 1430hrs

Weight set on Packers: 10000.00daN
Weight to free Packers: 56000.00daN
Initial String Weight: 45000.00daN
Unseated String Weight: 46000.00daN

Tool Chased Dist: 0.00m
Water Loss: 6.50cm³
Mud Type: GEL CHEMICAL
Mud Drop: NO
Mud Weight: 1240.00kg/m³
VIS: 61.00S/L
Amount of fill: 0.00m
Filter Cake: 2.00mm
Amt of cushion: 0.00
Pump Time: 30min
Type of cushion:
Reversed Out: NO

General Remarks:

PREFLOW: Weak air blow 3 in pail no gas to surface.

FINAL FLOW: Weak air blow. Bottom of pail in 6 minutes. No gas to surface.

Recovery Description:

WELL LIC# 1884

Total fluid recovery was 56 meters, consisting of fresh water and drill mud.

Gas Bomb: 0 Sampler: 1
Fluid Sample: 3 Sent to: AGAT EDMONTON

Drill Stem Testing - Tool Diagram / Description

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-10000 DST#: 5
Test Date: 12/01/2000 2300hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

Inflate Straddle

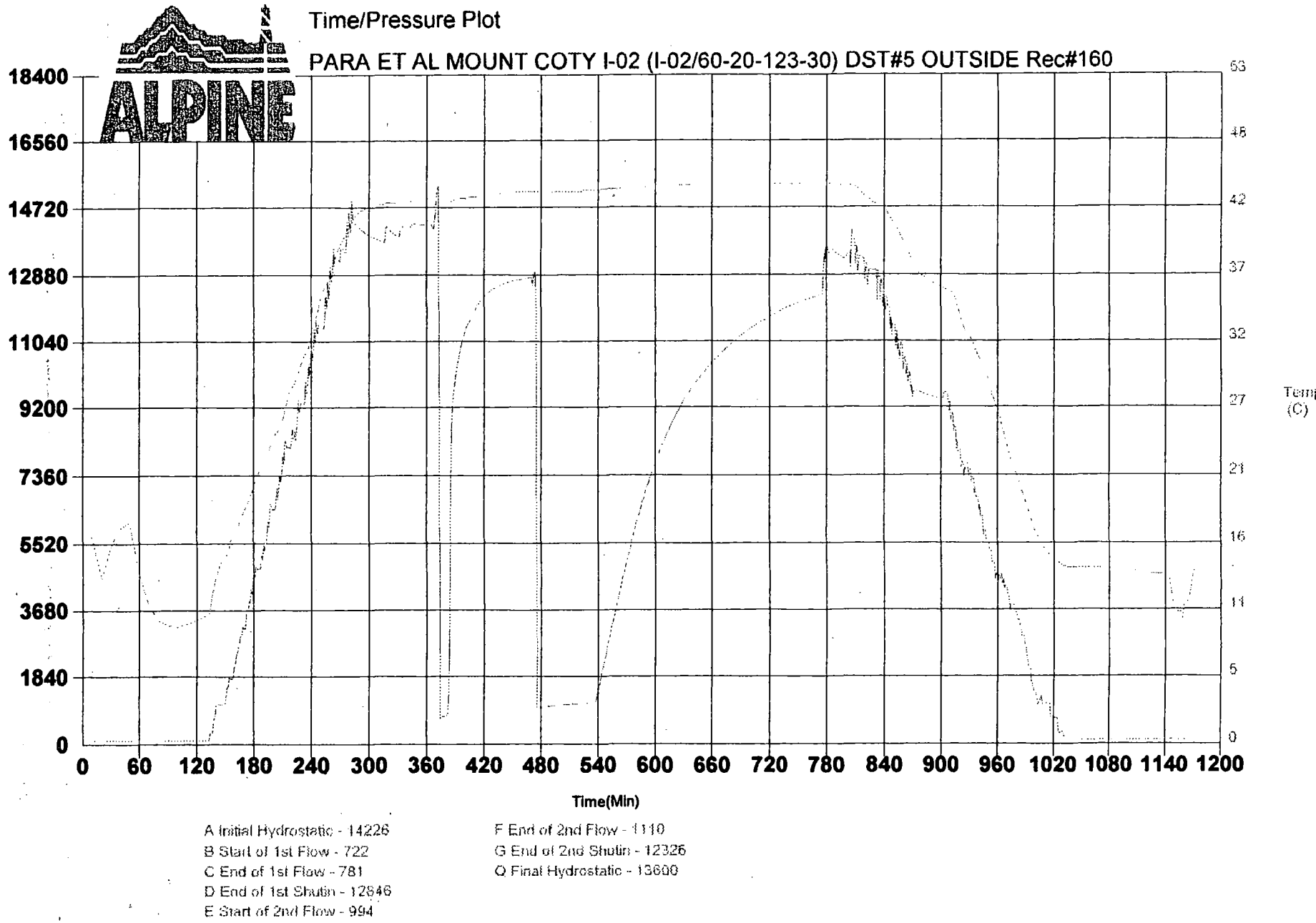
Drill Collar Stands:	3
Drill Collar Singles:	0
Drill Pipe Stands:	36
Drill Pipe Singles:	0
Heavy Wt. Pipe Stands:	20
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	1134.81m
Total Drill Pipe Above K.B.:	0.72m
Total Depth:	1744m

Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	67.00	mm
Drill Collar Length:	56.40	m
Drill Pipe Inside Diameter:	97.00	mm
Drill Pipe Length:	685.65	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	367.81	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

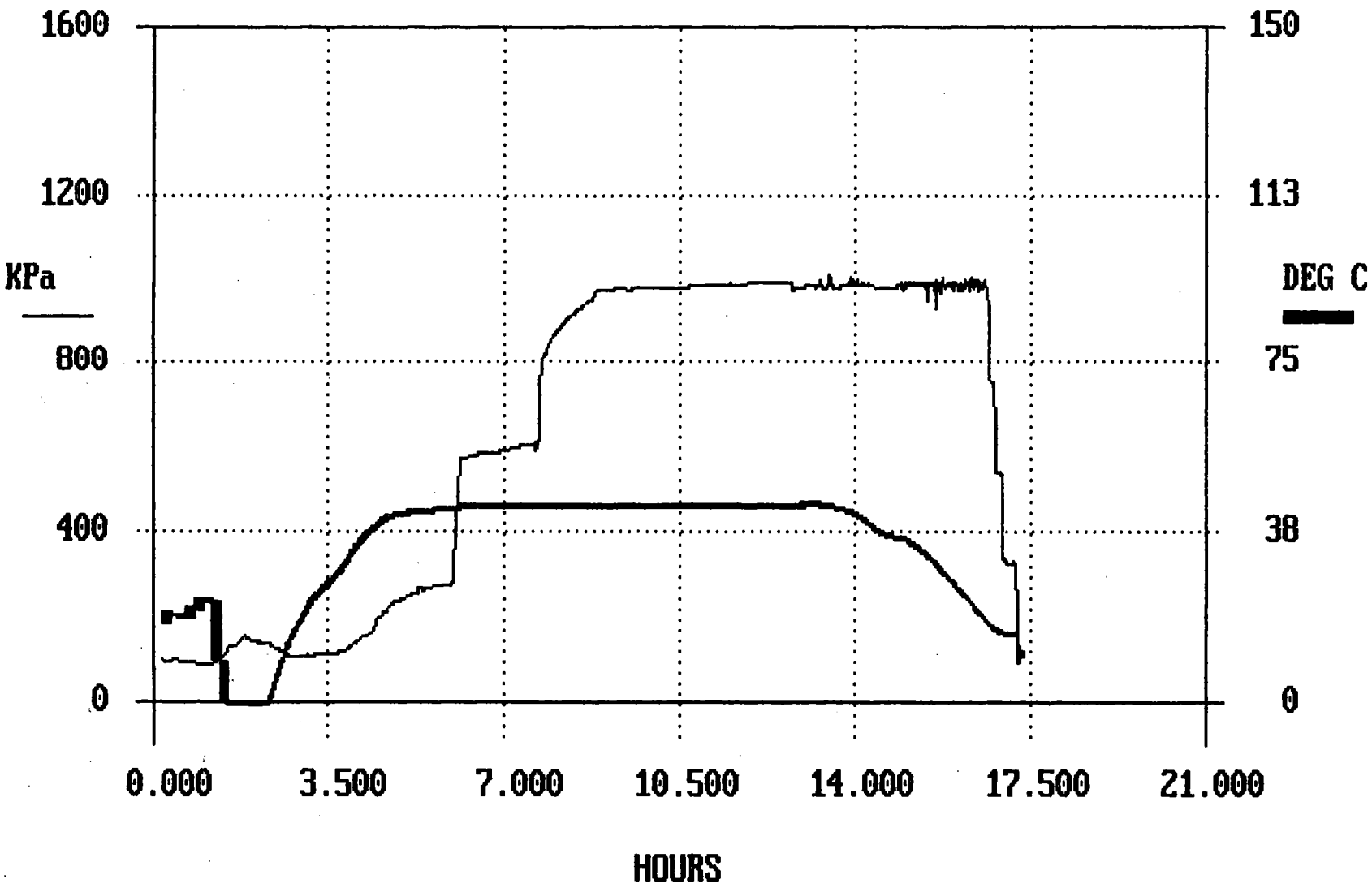
Tool Remarks:

Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
Blank Spacing	1.52
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60

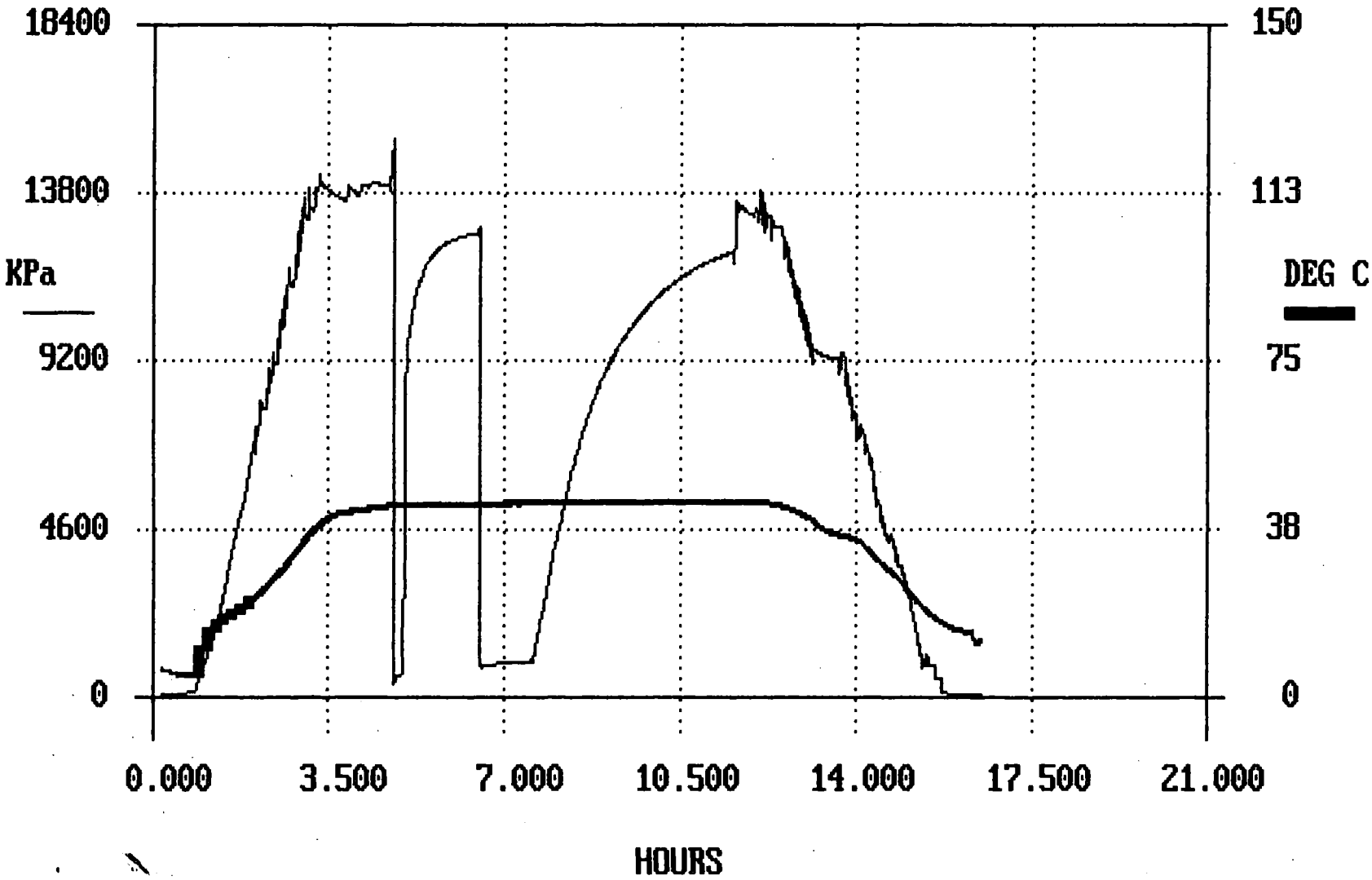

ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#5 OUTSIDE Rec#160
18400
16560
14720
12880
11040
9200
7360
5520
3680
1840
0
53
48
42
37
32
27
21
16
11
5
0
Temp (C)
0 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200
Time(Min)
A Initial Hydrostatic - 14226
B Start of 1st Flow - 722
C End of 1st Flow - 781
D End of 1st Shutin - 12646
E Start of 2nd Flow - 994
F End of 2nd Flow - 1110
G End of 2nd Shutin - 12326
O Final Hydrostatic - 13600

FILE: <C:\ALP_IN\B3002136.133>

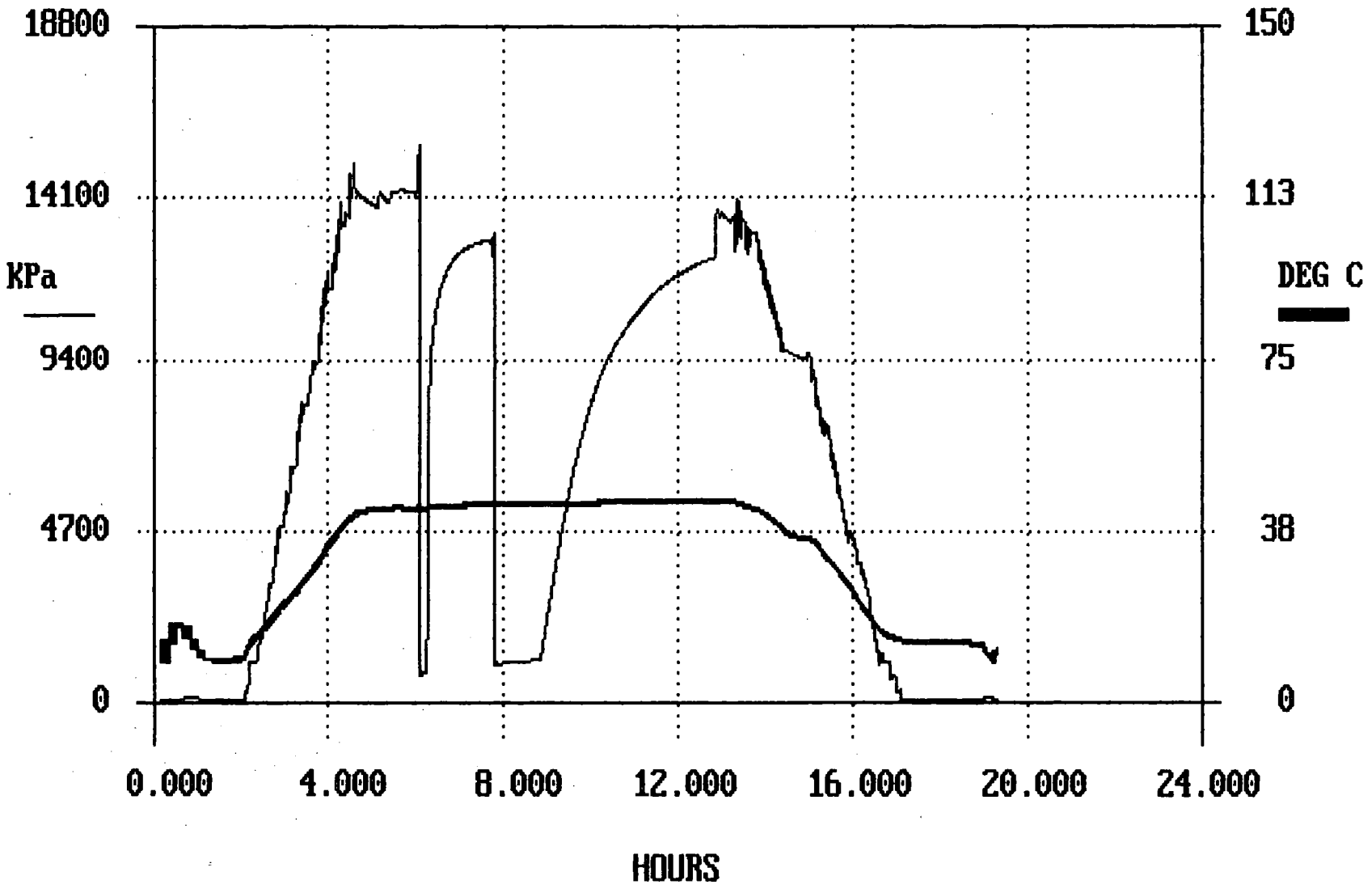
s/n 133 PARAMOUNT RES.LTD 60-20-123-30 T#2-10000 11/30/00 FLUID [redacted]



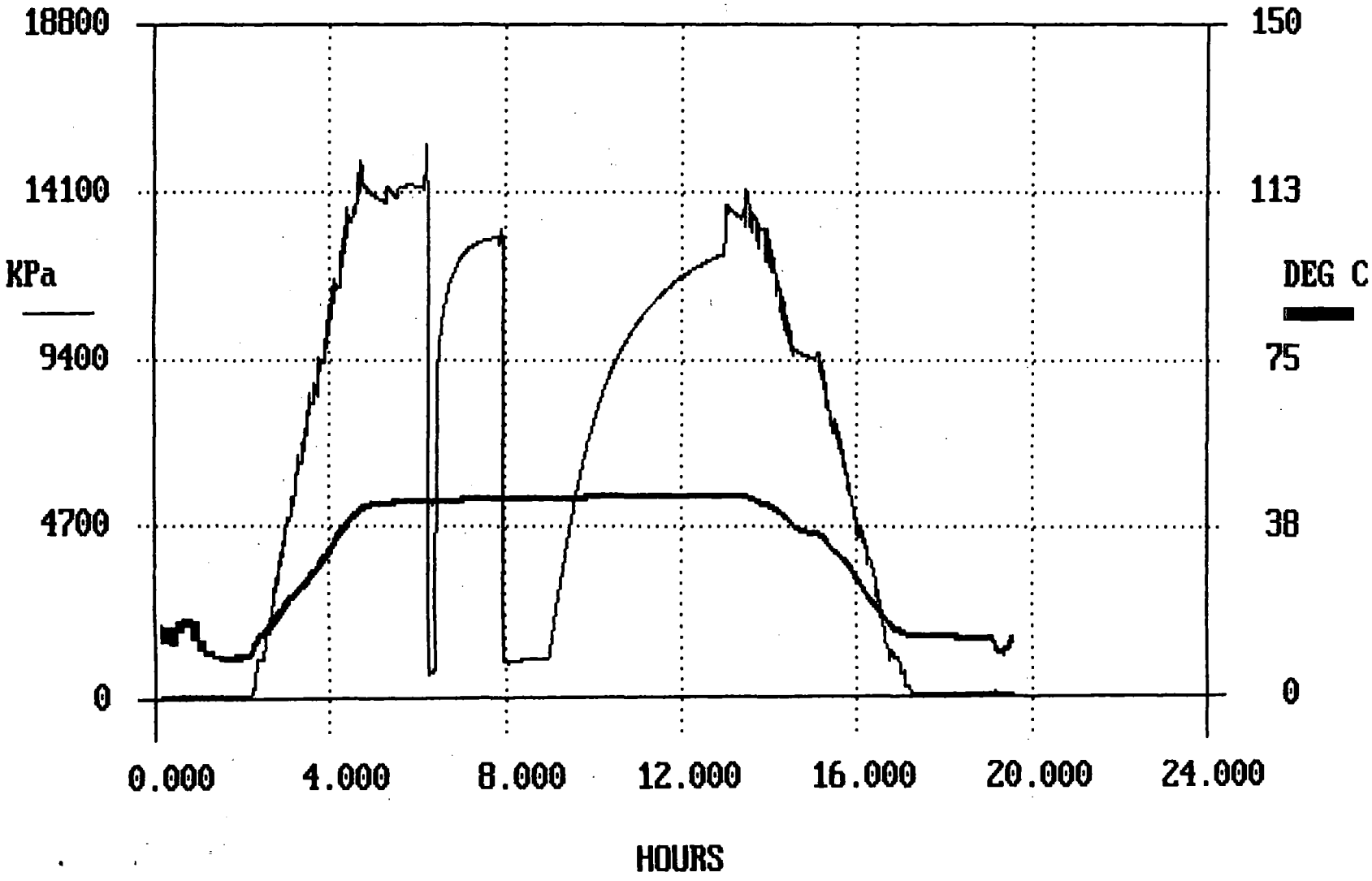
FILE: <C:\ALP_IN\B3002247.065>
s/n 65 PARAMOUNT RES.LTD 60-20-123-30 T#2-10000 11/30/00 INSIDE

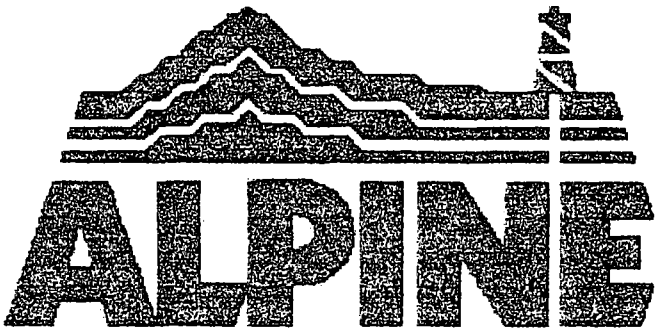


FILE: <C:\ALP_IN\B3002130.066>
s/n 66 PARAMOUNT RES.LTD 60-20-123-30 T#2-10000 11/30/00 OUTSIDE



FILE: <C:\ALP_IN\B3002122.160>
s/n 160 PARAMOUNT RES.LTD 60-20-123-30 T#2-10000 11/30/00 OUTSIDE





Real Time Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **12/01/2000**

Job Ticket #: **T4-6190** DST#: **6**

Real Time Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: T4-6190 DST#: 6

Test Date: 12/01/2000 1800hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO **Location: I-02/60-20-123-30**

General Information:

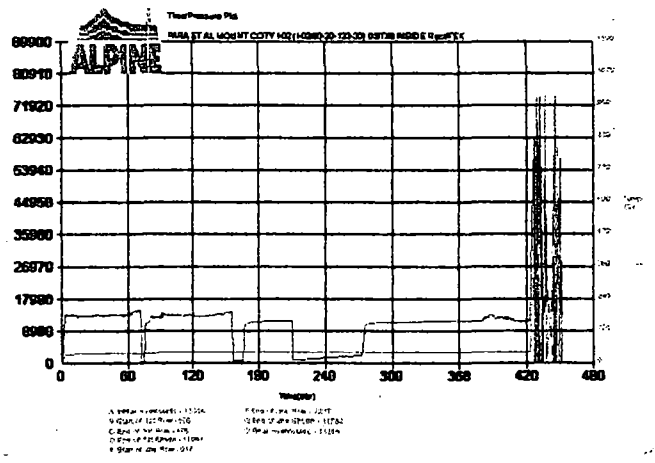
Test Type:	INFLATE STRADDLE	Tester:	KEN PEARSON
Interval:	1075m -1085m	Truck No.:	673 □Ÿ□
Formation:	MATTSON	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	41.00 C

Telemetry Recorder Information:

INSIDE

Recorder #: FEK Depth: 1060.00 m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	13305.9
B Start of 1st Flow	0.00	575.9
C End of 1st Flow	9.24	876.2
D End of 1st Shutin	42.66	11901.0
E Start of 2nd Flow	0.00	936.5
F End of 2nd Flow	62.10	2216.9
G End of 2nd Shutin	105.24	11781.7
Q Final Hydrostatic	0.00	13365.1



Test Run Information:

Start Time:	1800hrs
Reached Test Depth:	2130hrs
Pull Out Time:	350hrs
Tool Out Of Hole:	800hrs
Water Loss:	6.50cm³
Mud Drop:	NO
VIS:	61.00S/L
Filter Cake:	0.00mm
Pump Time:	0min
Reversed Out:	NO
Mud Type:	GEL CHEMICAL
Mud Weight:	1240.00kg/m³
Amount of fill:	0.00m
Amount of cushion:	0.00
Type of cushion:	

General Remarks:

PREFLOW:Start 00:08 to 00:17 Very weak air blow. Remained throughout.

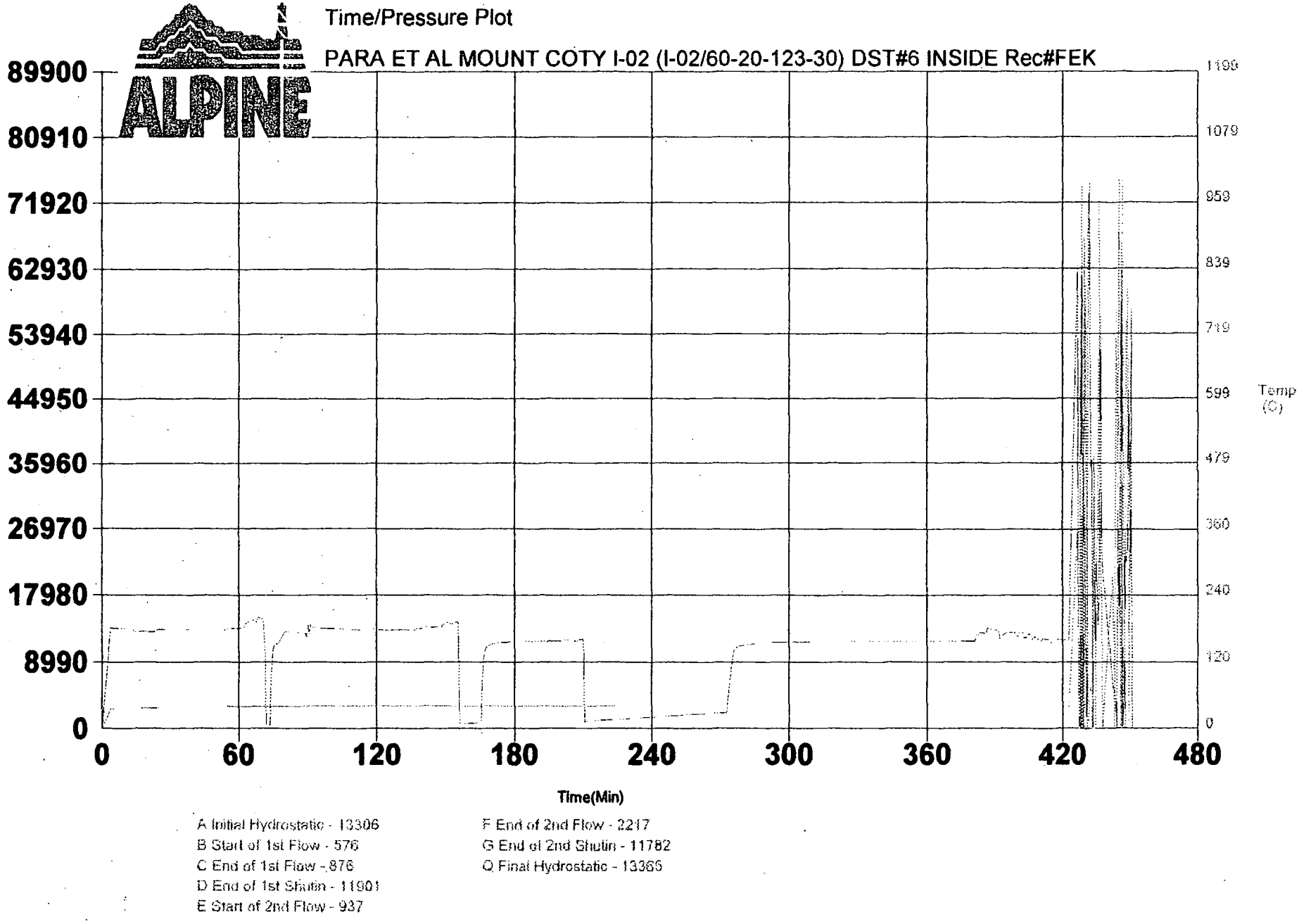
FINAL FLOW: Very weak air blow. Bottom of pail in 15 minutes. No gas to surface.

Note: We first set and opened tool at zone. When opening tool it was skidding so unseat packers and worked pipe and set again did test.

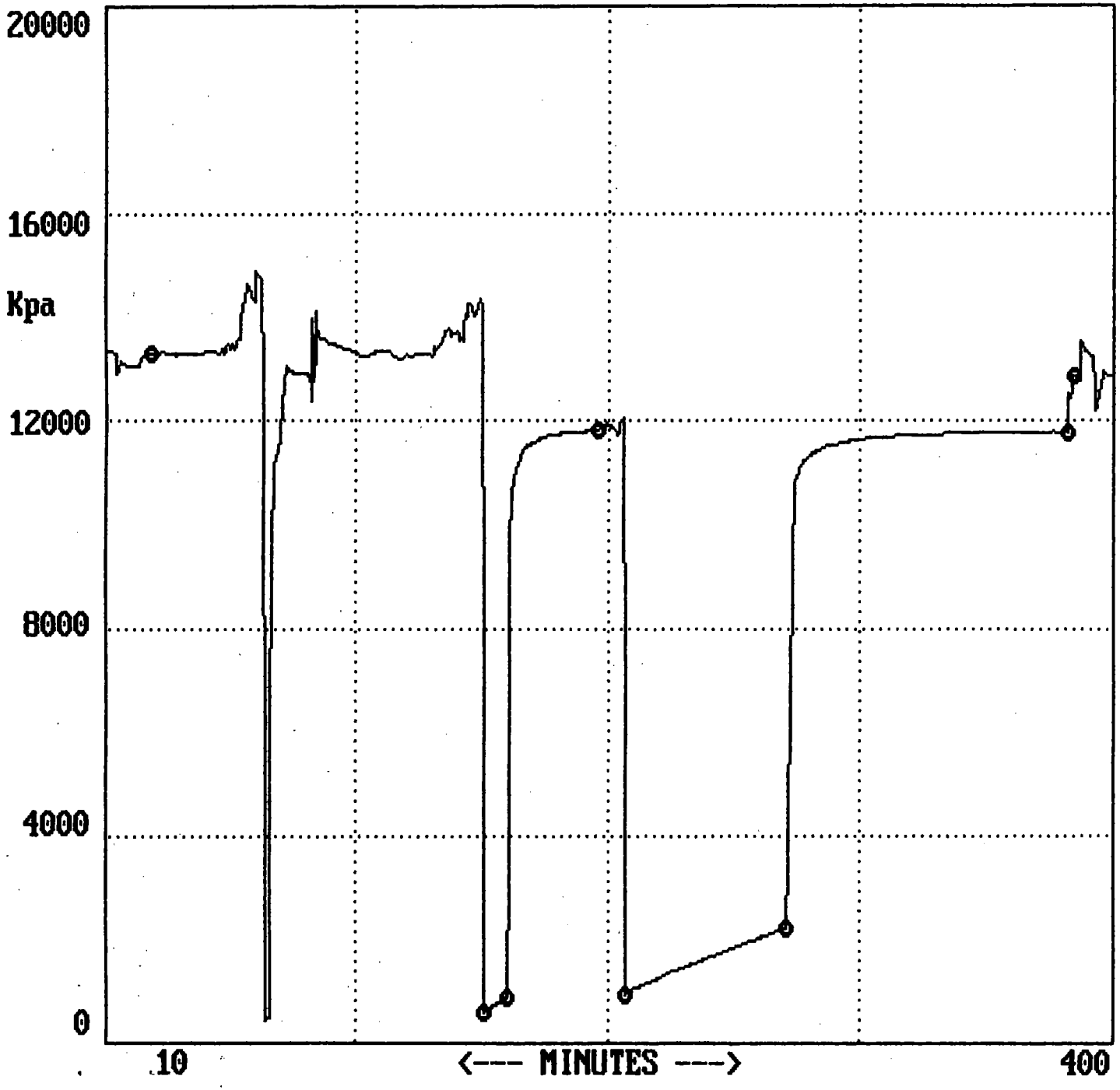
Recovery Description:

WELL LIC# 1884

Total fluid recovery was 197 meters, consisting of fresh water.


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#6 INSIDE Rec#FEK
89900
80910
71920
62930
53940
44950
35960
26970
17980
8990
0
1199
1079
959
839
719
599
479
360
240
120
0
Temp (C)
0
60
120
180
240
300
360
420
480
Time(Min)
A Initial Hydrostatic - 13306
B Start of 1st Flow - 576
C End of 1st Flow - 876
D End of 1st Shutin - 11901
E Start of 2nd Flow - 937
F End of 2nd Flow - 2217
G End of 2nd Shutin - 11782
Q Final Hydrostatic - 13365

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 6 MATTSON (1075.0m - 1085.0m KB) DEC



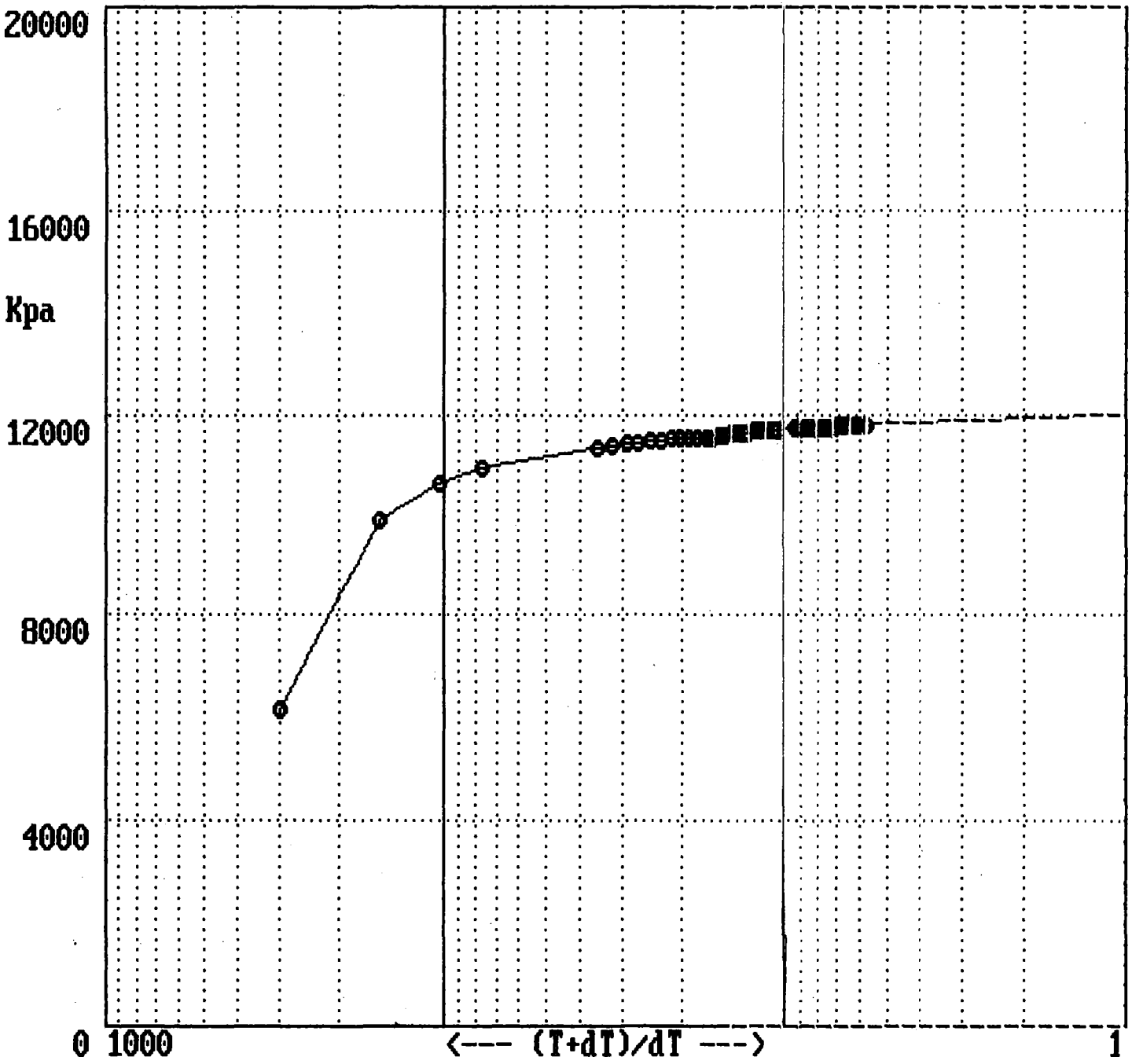
IHP = 13303.6

SF1 = 575.9
EF1 = 876.2
ES1 = 11795.9

SF2 = 936.5
EF2 = 2216.9
ES2 = 11781.7

FHP = 12870.7

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 6 MATTSON (1075.0m - 1085.0m KB) DEC,01,2000

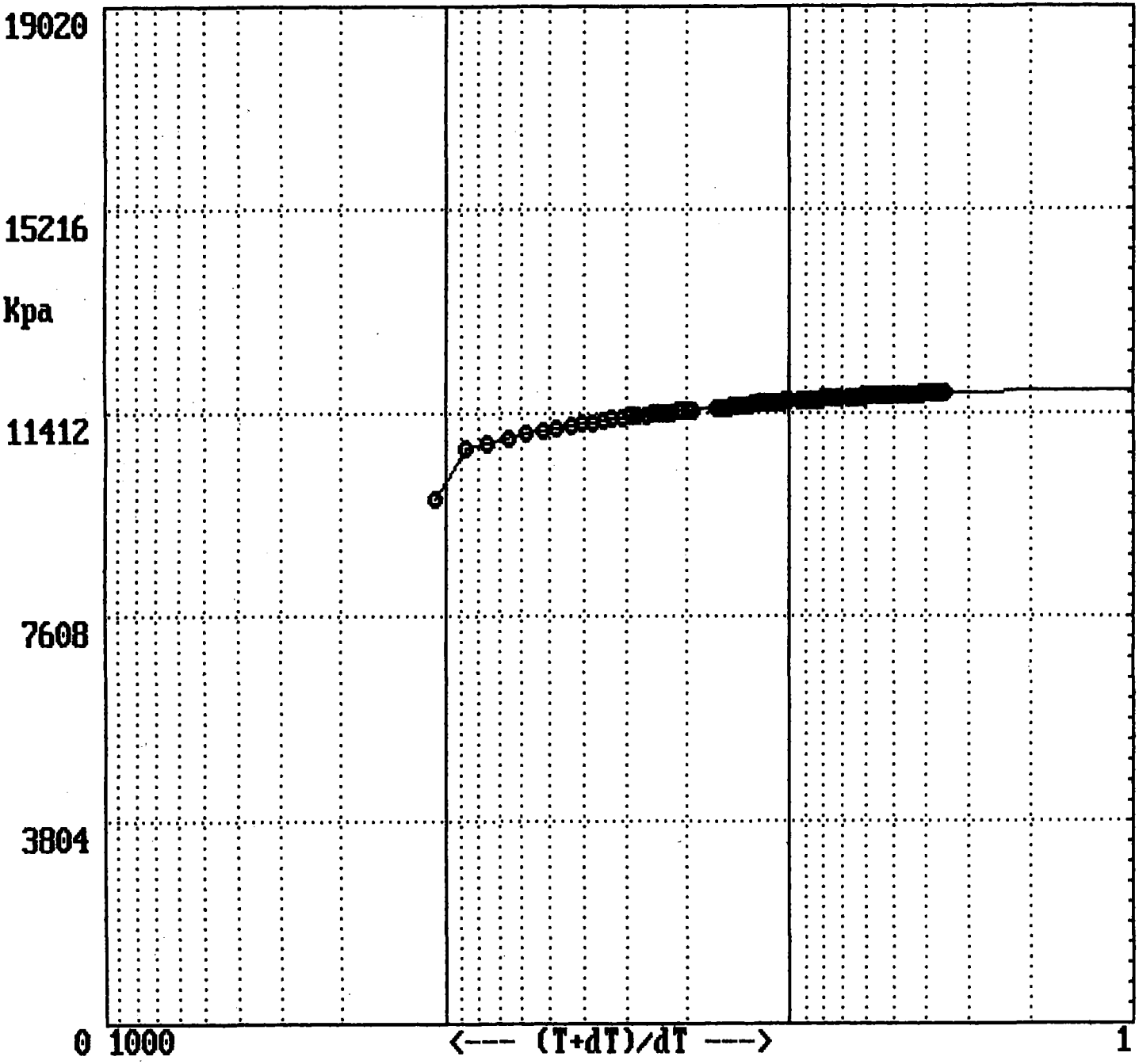


HORNER PLOT
SHUT-IN # 1

SLOPE =
252.6
kPa/cycle

Extrapolated
Pressure =
11988.7
Kpa

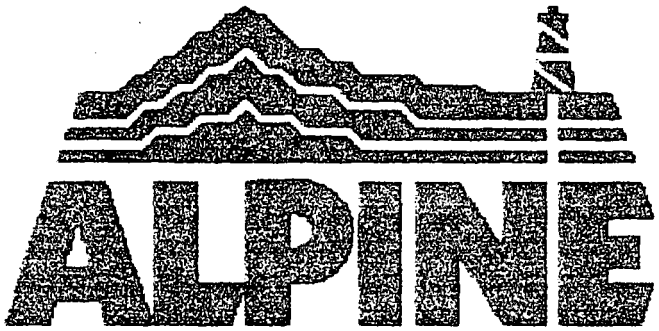
PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 6 MATTSON (1075.0m - 1085.0m KB) DEC,01,2000



HORNER PLOT
SHUT-IN # 2

SLOPE =
123.8
kPa/cycle

Extrapolated
Pressure =
11850.9
Kpa



Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **12/01/2000**

Job Ticket #: **D2-08778** DST#: **6**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-08778 DST#: 6
Test Date: 12/01/2000 1800hrs

Well Name: PARA ET AL MOUNT COTY I-02
Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

General Information:

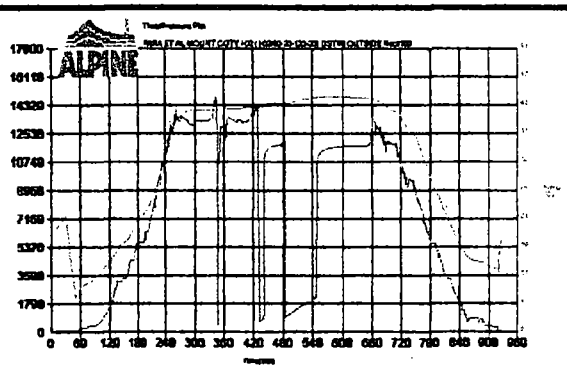
Test Type: INFLATE STRADDLE
Interval: 1075.00m - 1085.00m
Formation: MATTSON
KB Elevation: 374.60m
Ground Elevation: 369.10m
Total Depth: 1744.00m
Test Mode: Gas

Tester: ALBERTO SCARIONE
Truck No.: 673 □Ÿ□
Contractor: AKITA DRILLING
Rig No.: 51 LIN
Hole Diameter: 222mm
Hole Condition: FAIR
Bottom Hole Temperature: 41.00 C

Electronic Recorder Information:

OUTSIDE			
Recorder #:	160	Recorder #:	
Range:	10000 kPag	Range:	kPag
Depth:	1077.00 m	Depth:	m

Flag Points: Time: Pressure:



Test Run Information:

Start Time: 1800hrs
Reached Test Depth: 2130hrs
Pull Out Time: 350hrs
Tool Out Of Hole: 800hrs

Weight set on Packers: 10000.00daN
Weight to free Packers: 53000.00daN
Initial String Weight: 39000.00daN
Unseated String Weight: 43000.00daN

Tool Chased Dist: 0.00m
Mud Type: GEL CHEMICAL
Mud Weight: 1240.00kg/m³
Amount of fill: 0.00m
Amt of cushion: 0.00
Type of cushion:

Water Loss: 6.50cm³
Mud Drop: NO
VIS: 61.00S/L
Filter Cake: 2.00mm
Pump Time: 60min
Reversed Out: NO

General Remarks:

PREFLOW: Very weak air blow. Remained throughout.

FINAL FLOW: Very weak air blow. Bottom of pail in 15 minutes. No gas to surface.

Note: We first seat and opened tool at zone. When opening tool it was skidding so unseat packers and worked pipe and set again did test.

Recovery Description:

WELL LIC# 1884

Total fluid recovery was 197 meters, consisting of fresh water.

Gas Bomb: 0 Sampler: 1
Fluid Sample: 3 Sent to: AGAT EDMONTON

Drill Stem Testing - Tool Diagram / Description

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-08778 DST#: 6
Test Date: 12/01/2000 1800hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

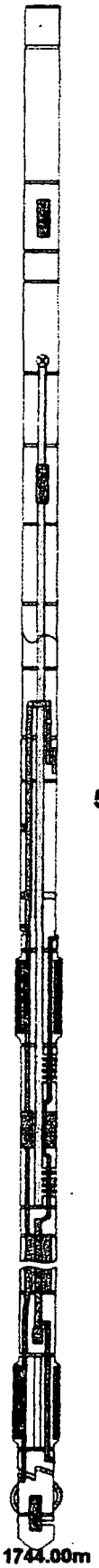
Inflate Straddle

Drill Collar Stands:	3
Drill Collar Singles:	0
Drill Pipe Stands:	33
Drill Pipe Singles:	0
Heavy Wt. Pipe Stands:	20
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	1077.85m
Total Drill Pipe Above K.B.:	2.85m
Total Depth:	1744m

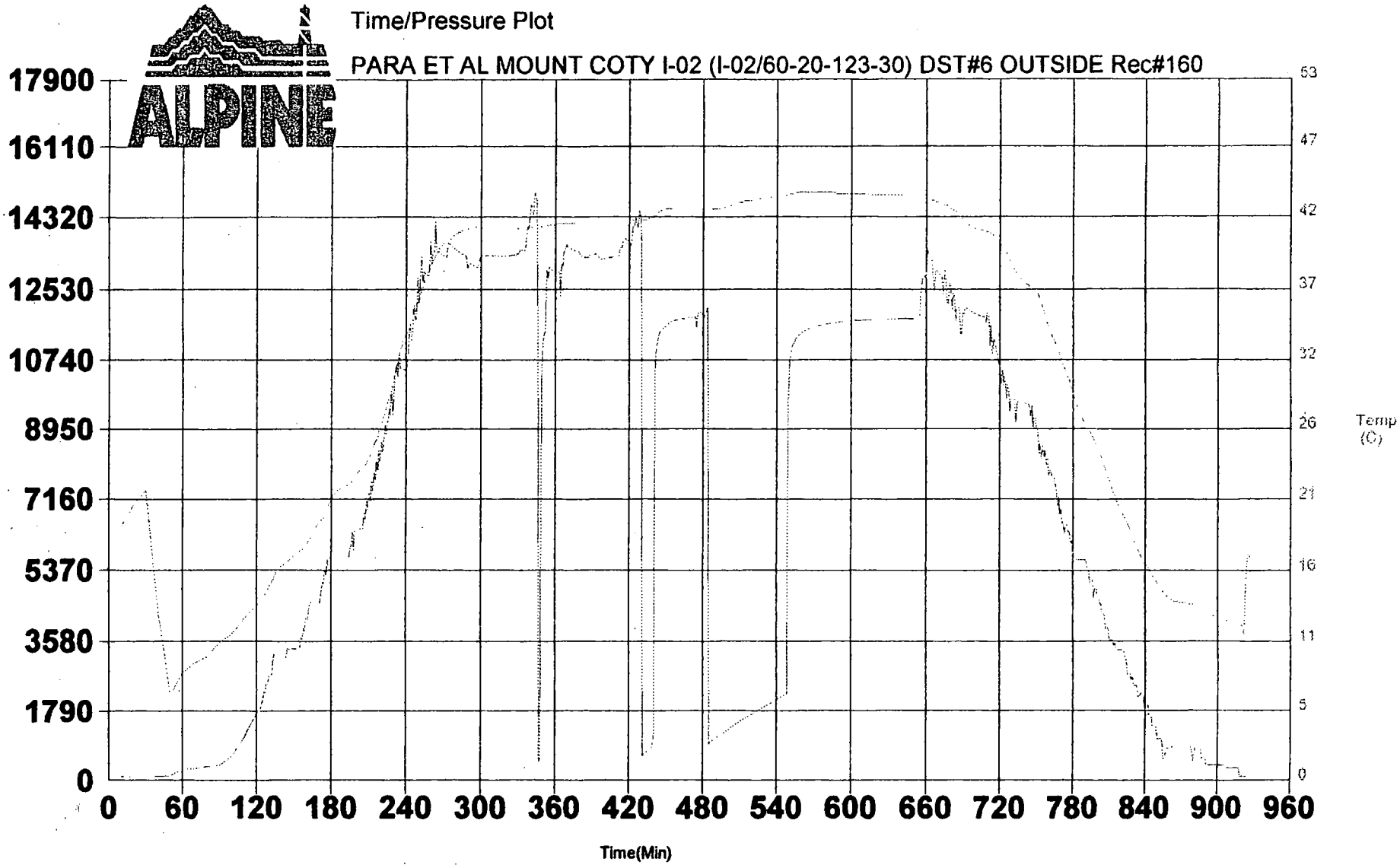
Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	67.00	mm
Drill Collar Length:	55.93	m
Drill Pipe Inside Diameter:	97.00	mm
Drill Pipe Length:	629.06	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	367.91	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

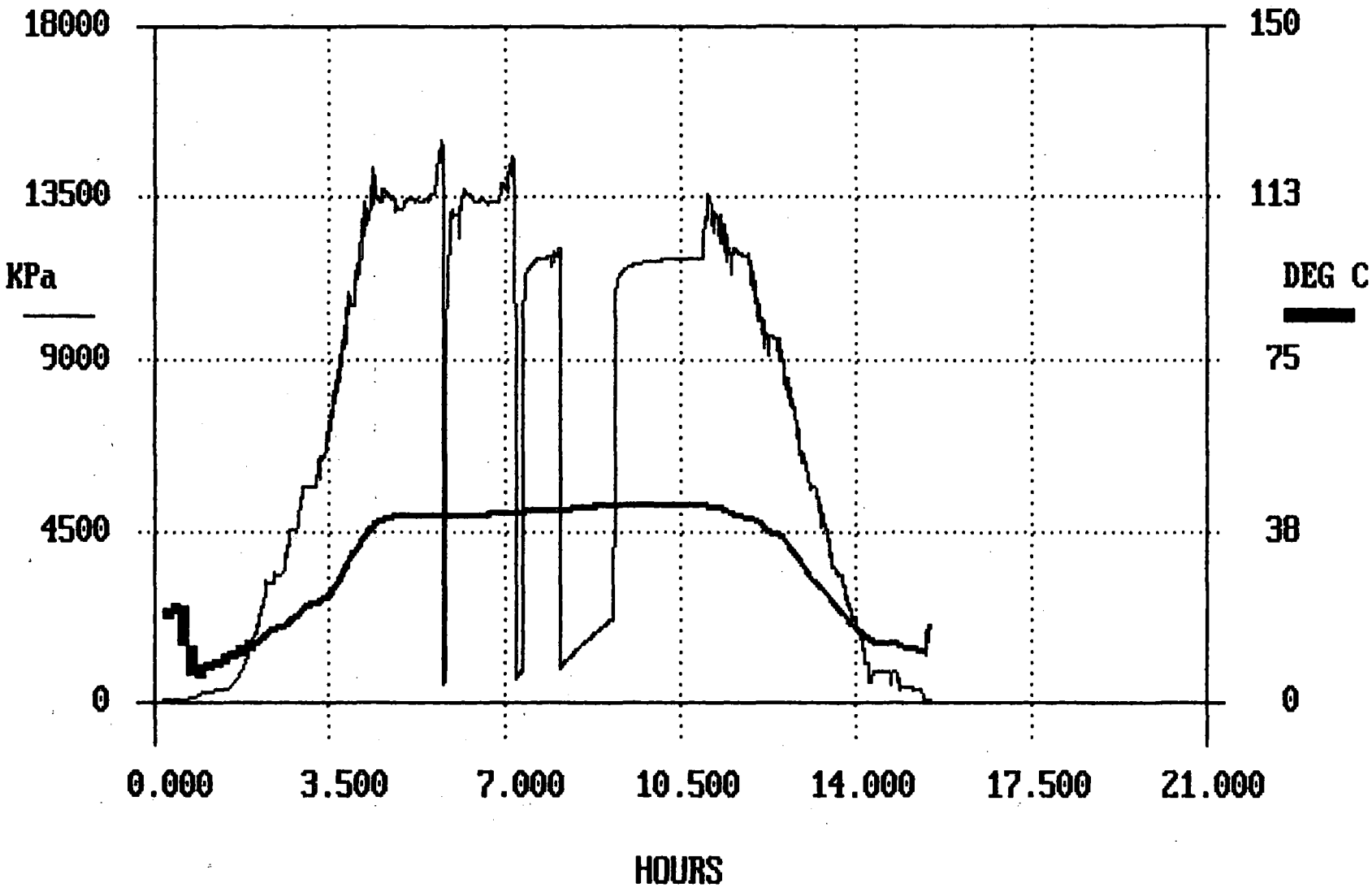
Tool Remarks:



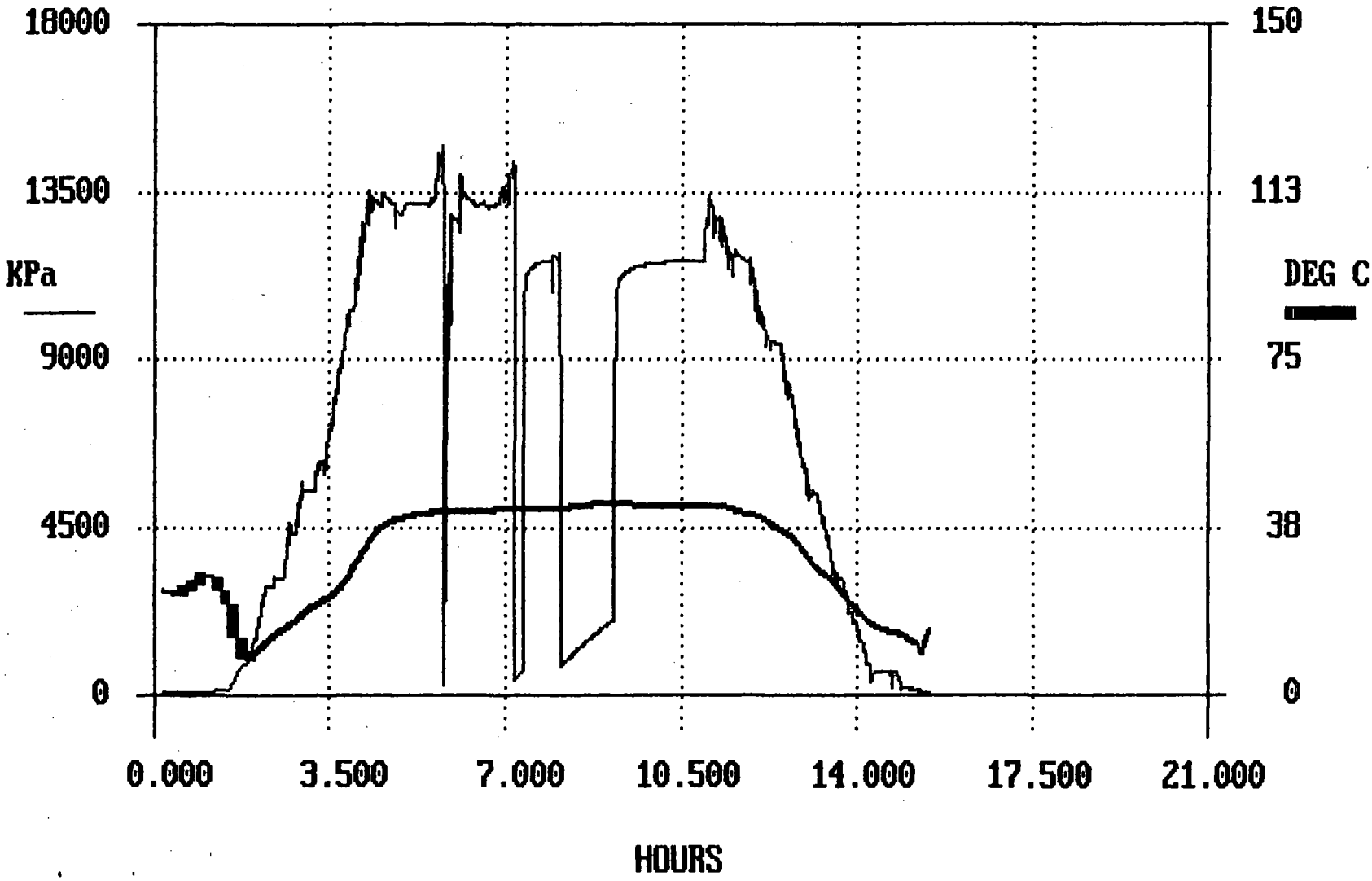
Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
C.O. Sub	0.30
Drill Collar	18.70
C.O. Sub	0.30
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#6 OUTSIDE Rec#160
17900
16110
14320
12530
10740
8950
7160
5370
3580
1790
0
53
47
42
37
32
26
21
16
11
5
0
Temp (C)
0 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960
Time(Min)

FILE: <C:\ALP_IN\C0101700.160>
s/n 160 PARAMOUNT RES.LTD 60-20-123-30 T#2-8778 12/01/00 OUTSIDE



FILE: <C:\ALP_IN\C0101503.133>
s/n 133 PARAMOUNT RES.LTD 60-20-123-30 T#2-8778 12/01/00 INSIDE



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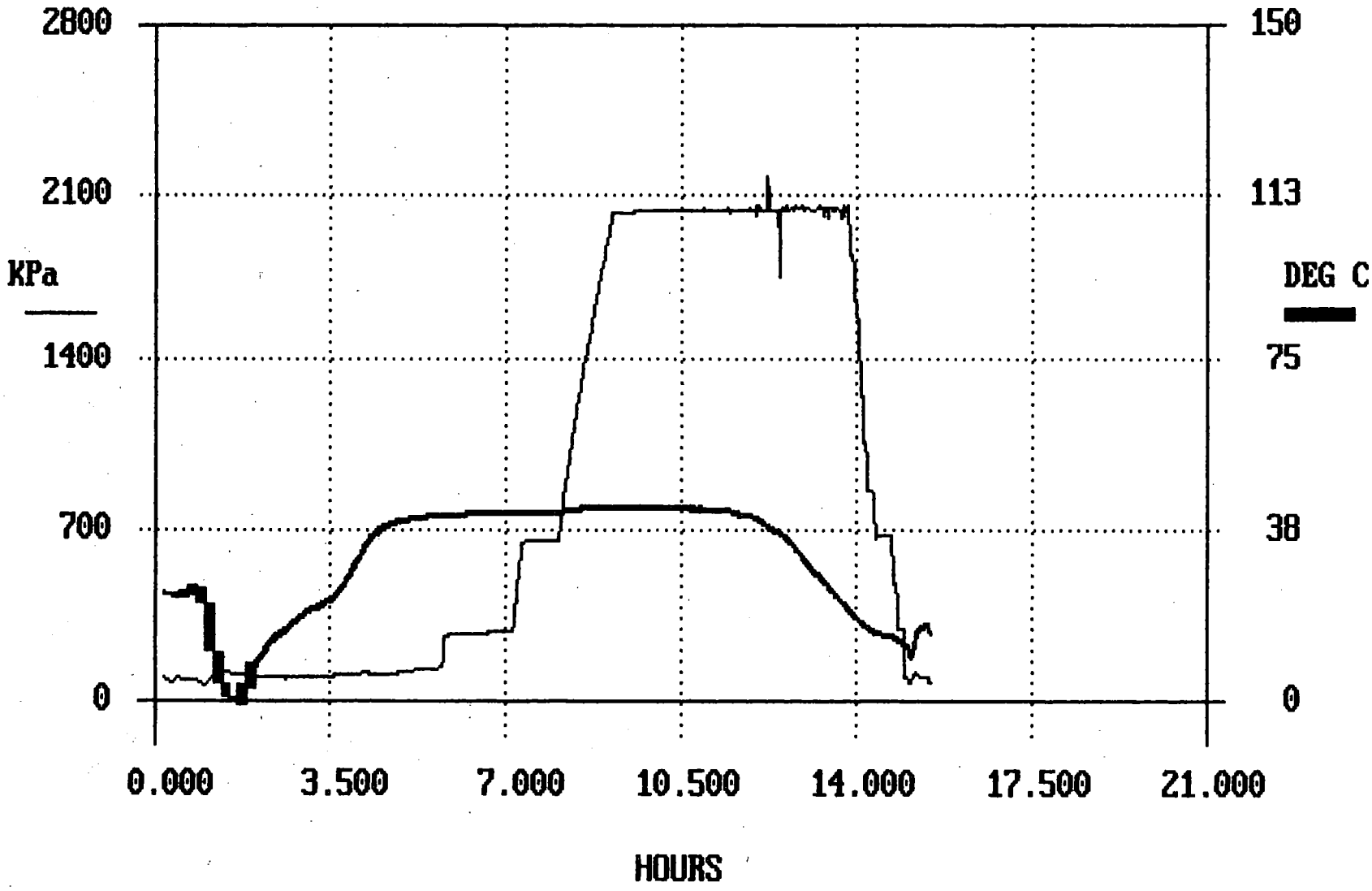

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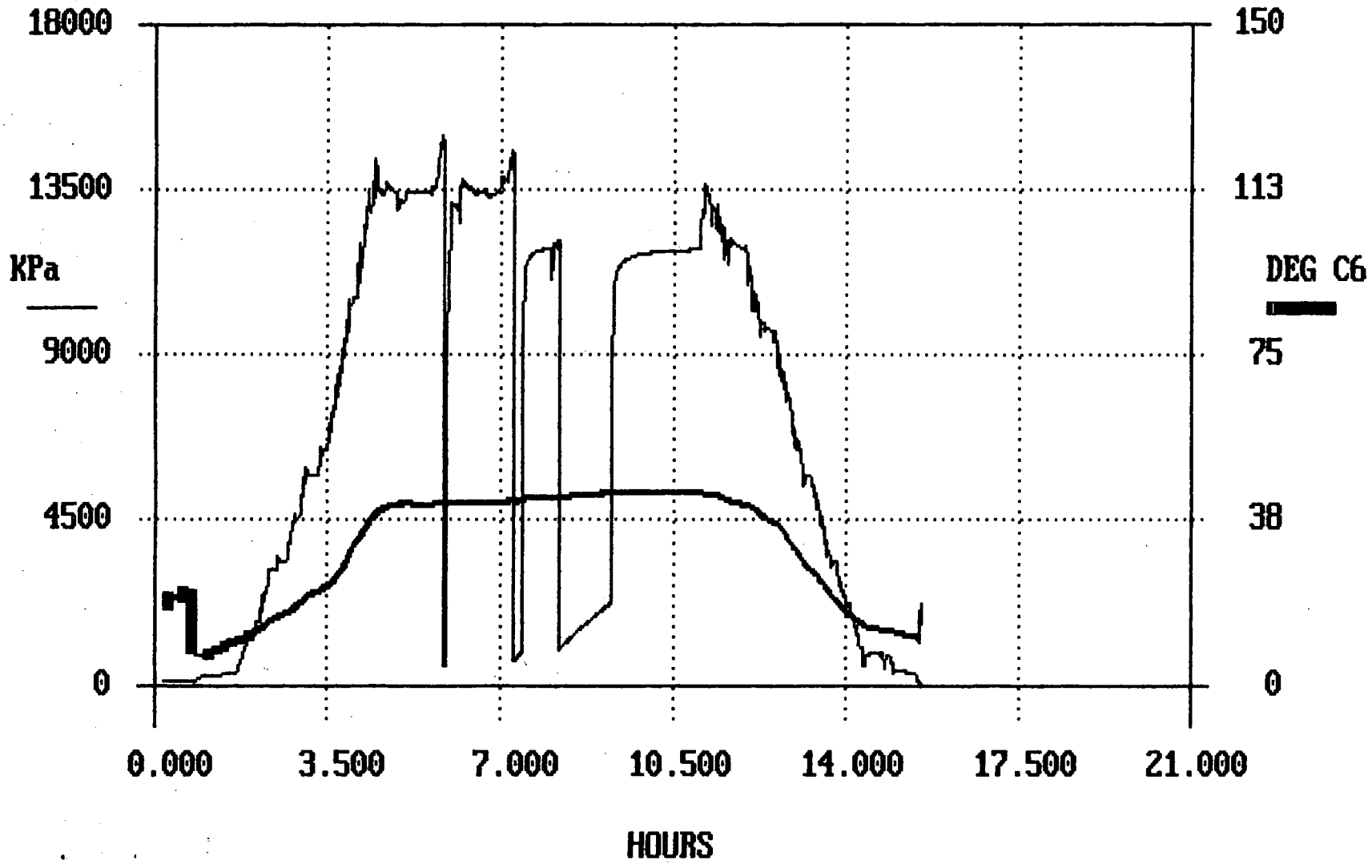
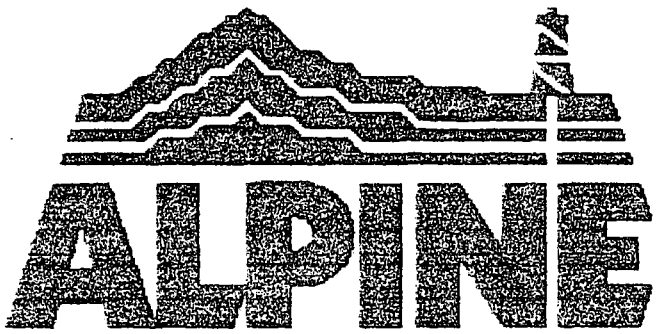
s/n 66 PARAMOUNT RES.LTD 60-20-123-30 T#2-8778 12/01/00 OUTSIDE





Real Time Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **12/02/2000**

Job Ticket #: **T4-6191** DST#: **7**

Real Time Testing Report

ALPINE TELEMETRY SERVICES

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: T4-6191 DST#: 7

Test Date: 12/02/2000 1030hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO **Location: I-02/60-20-123-30**

General Information:

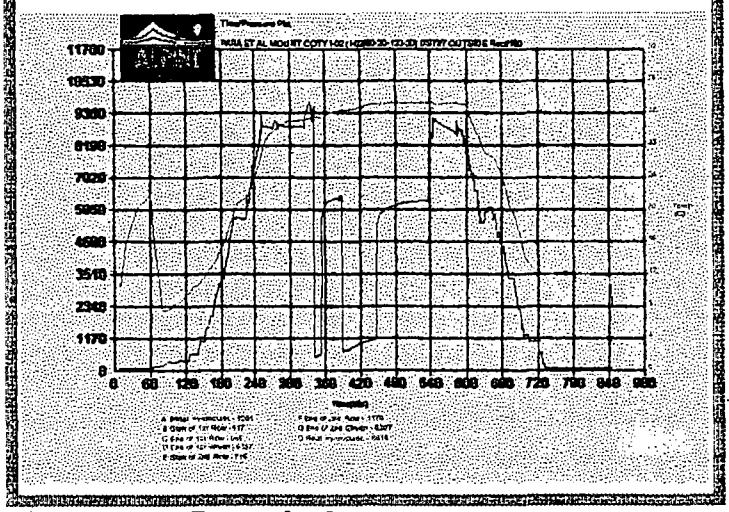
Test Type:	INFLATE STRADDLE	Tester:	KEN PEARSON
Interval:	708m -720m	Truck No.:	673 □Ÿ□
Formation:	CHINKEH	Contractor:	AKITA DRILLING
KB Elevation:	374.60m	Rig No.:	51 LIN
Ground Elevation:	369.10m	Hole Diameter:	222mm
Total Depth:	1744.00m	Hole Condition:	FAIR
Test Mode:	Gas	Bottom Hole Temperature:	34.00 C

Telemetry Recorder Information:

INSIDE

Recorder #: FEK Depth: 693.00 m

Flag Points: Time: Pressure:



Test Run Information:

Start Time:	1030hrs
Reached Test Depth:	1330hrs
Pull Out Time:	1745hrs
Tool Out Of Hole:	2130hrs
Water Loss:	6.50cm³
Mud Drop:	NO
VIS:	61.00S/L
Filter Cake:	0.00mm
Pump Time:	0min
Reversed Out:	NO
Mud Type:	GEL CHEMICAL
Mud Weight:	1240.00kg/m³
Amount of fill:	0.00m
Amount of cushion:	0.00
Type of cushion:	

General Remarks:

PREFLOW: Weak air blow. No gas to surface.Start 14:28 to 14:38

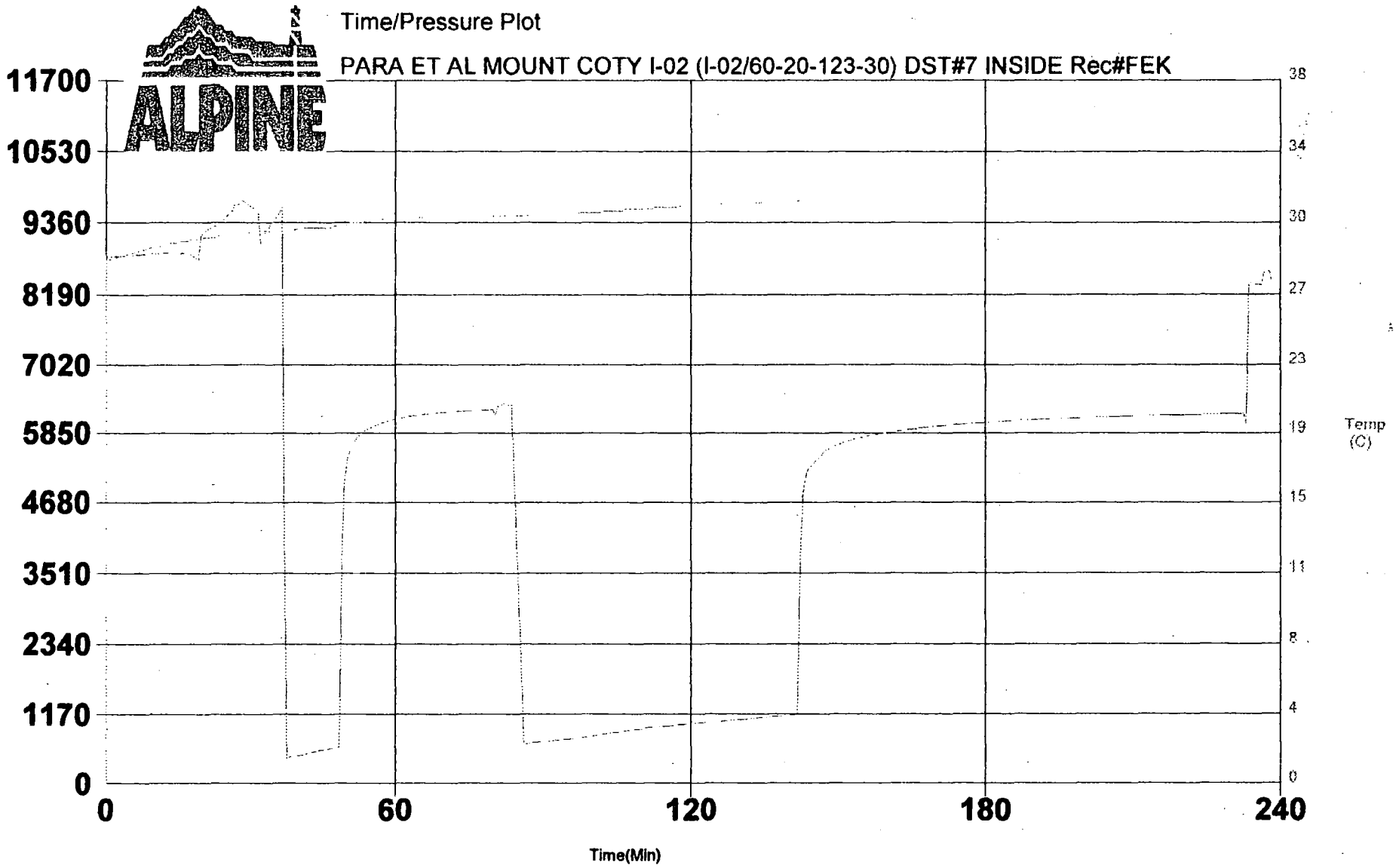
□

FINAL FLOW: Weak air blow. No gas to surface. Start 15:08 to 16:08

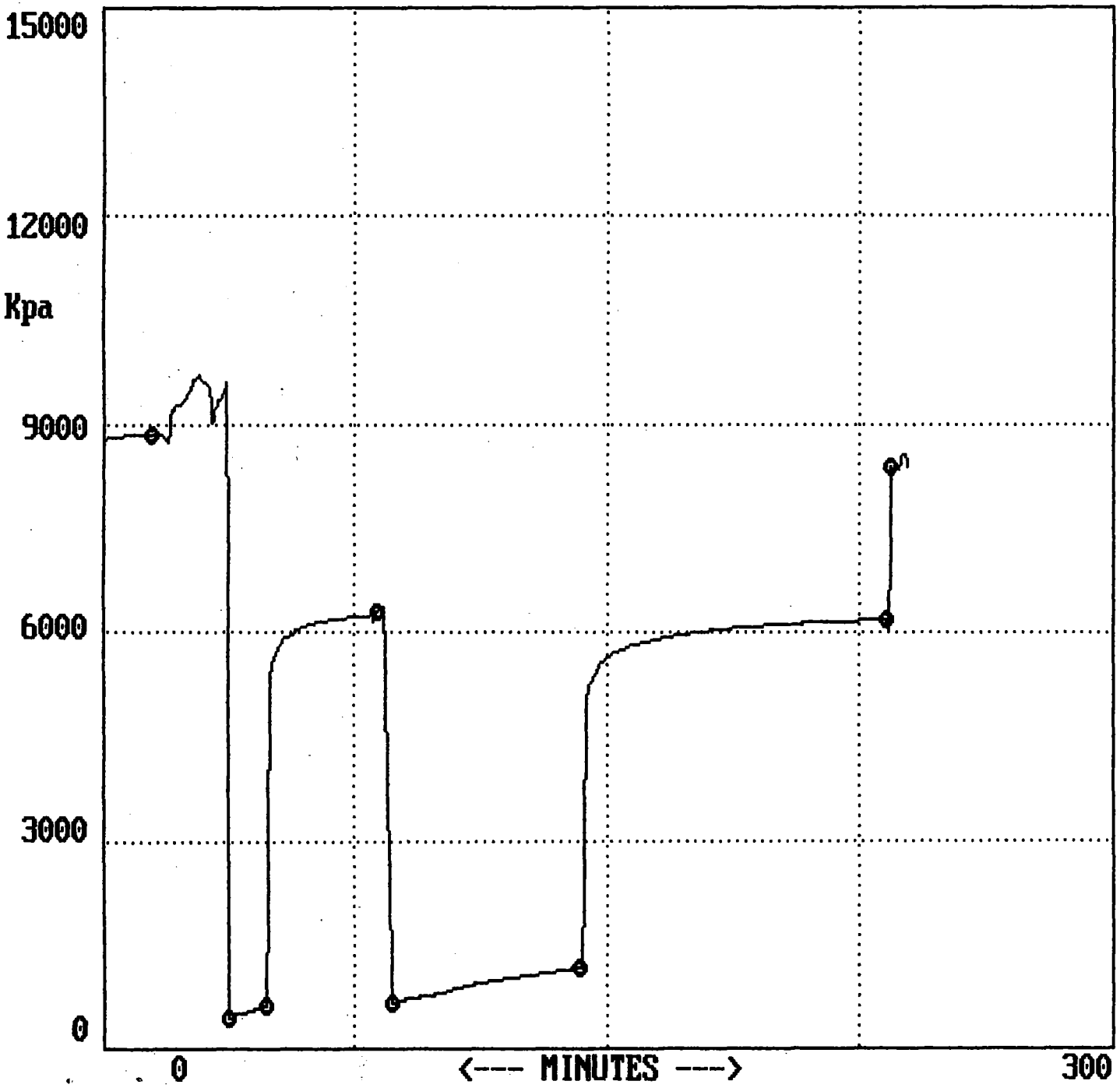
Recovery Description:

WELL LIC# 1884

Total fluid recovery was meters, consisting of fresh water.


ALPINE
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#7 INSIDE Rec#FEK
11700
10530
9360
8190
7020
5850
4680
3510
2340
1170
0
38
34
30
27
23
19
15
11
8
4
0
Temp (C)
0
60
120
180
240
Time(Min)
A Initial Hydrostatic - 8860
B Start of 1st Flow - 431
C End of 1st Flow - 616
D End of 1st Shutin - 6293
E Start of 2nd Flow - 650
F End of 2nd Flow - 1155
G End of 2nd Shutin - 6179
Q Final Hydrostatic - 8371

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 7 CHINKEH (708.0m - 720.0m KB) DEC ,02,2000



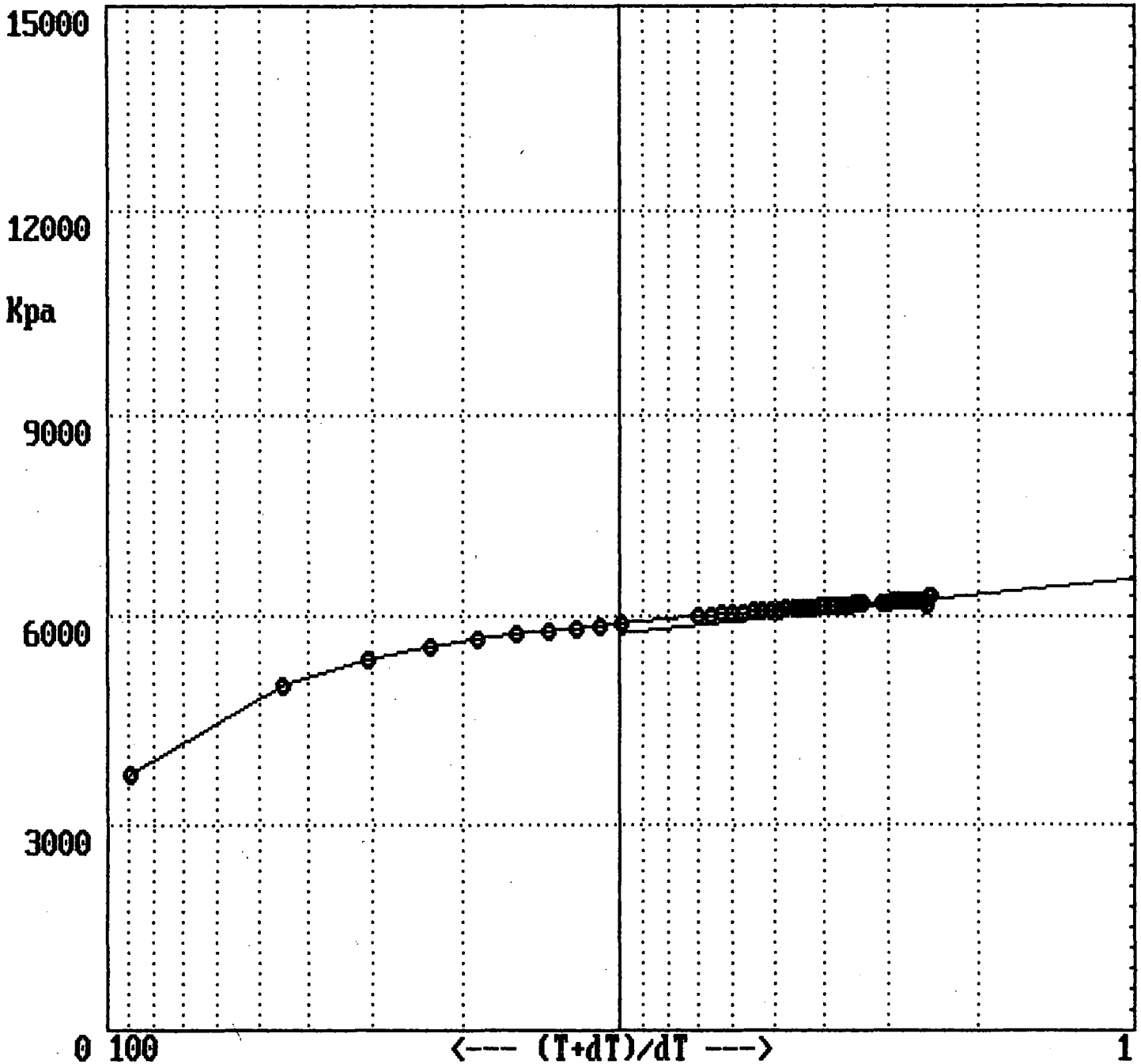
IHP = 8860.3

SF1 = 430.6
EF1 = 615.5
ES1 = 6293.0

SF2 = 650.3
EF2 = 1154.6
ES2 = 6179.4

FHP = 8371.3

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 7 CHINKEH (708.0m - 720.0m KB) DEC ,02,2000

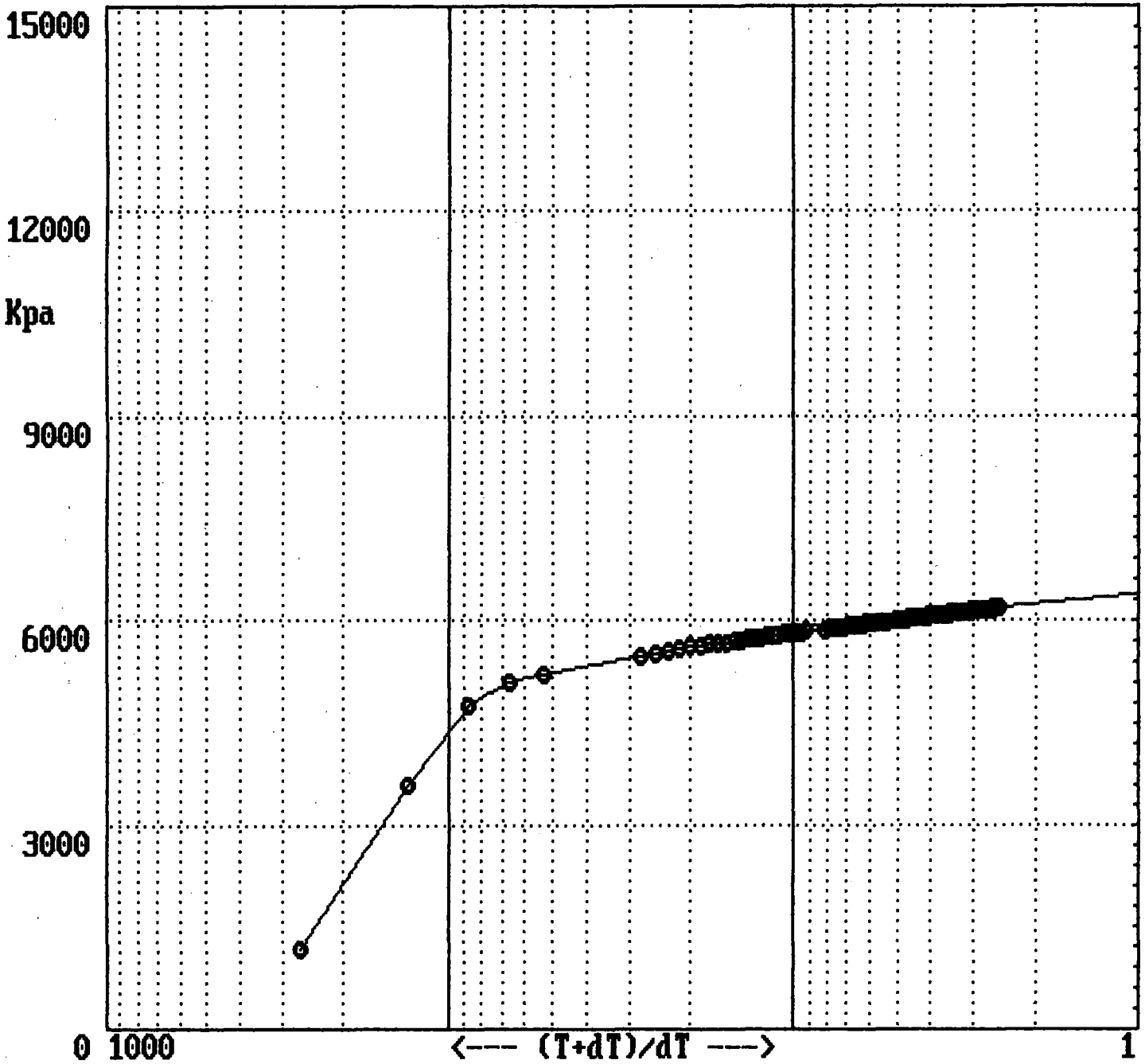


HORNER PLOT
SHUT-IN # 1

SLOPE =
840.5
kPa/cycle

Extrapolated
Pressure =
6579.2
Kpa

PARA ET AL MOUNT COTY 60-20-123-30 LSD 1-02/60-20-123-30/0
DST# 7 CHINKEH (708.0m - 720.0m KB) DEC ,02,2000



HORNER PLOT
SHUT-IN # 2

SLOPE =
496.5
kPa/cycle

Extrapolated
Pressure =
6379.5
Kpa

Drill Stem Test Report

Prepared for: **PARAMOUNT RESOURCES**

Well Name: **PARA ET AL MOUNT COTY I-02**
Location: **I-02/60-20-123-30**

Test Date: **12/02/2000**

Job Ticket #: **D2-08779** DST#: **7**

Drill Stem Testing Report

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-08779 DST#: 7

Test Date: 12/02/2000 1030hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

General Information:

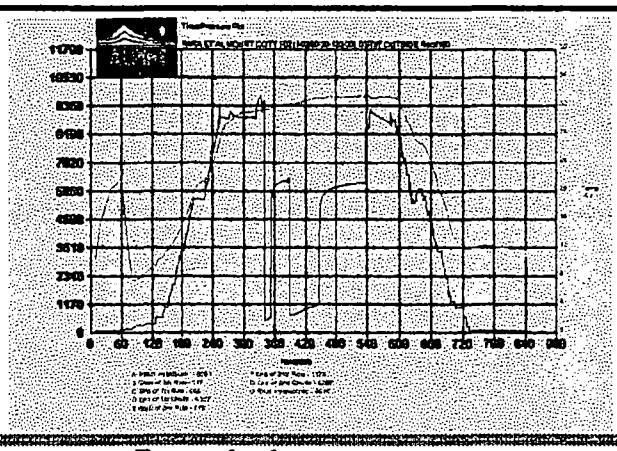
Test Type: INFLATE STRADDLE
Interval: 708.00m - 720.00m
Formation: CHINKEH
KB Elevation: 374.60m
Ground Elevation: 369.10m
Total Depth: 1744.00m
Test Mode: Gas

Tester: ALBERTO SCARIONE
Truck No.: 673 □Ÿ□
Contractor: AKITA DRILLING
Rig No.: 51 LIN
Hole Diameter: 222mm
Hole Condition: FAIR
Bottom Hole Temperature: 33.00 C

Electronic Recorder Information:

OUTSIDE		Recorder #:	
Recorder #:	160		
Range:	10000 kPag	Range:	kPag
Depth:	710.00 m	Depth:	m

Flag Points:	Time:	Pressure:
A Initial Hydrostatic	0.00	8901.0
B Start of 1st Flow	0.00	516.7
C End of 1st Flow	11.00	655.0
D End of 1st Shutin	36.00	6386.7
E Start of 2nd Flow	0.00	714.6
F End of 2nd Flow	56.00	1173.5
G End of 2nd Shutin	91.00	6206.7
Q Final Hydrostatic	0.00	8616.3



Test Run Information:

Start Time: 1030hrs
Reached Test Depth: 1330hrs
Pull Out Time: 1745hrs
Tool Out Of Hole: 2130hrs

Weight set on Packers: 10000.00daN
Weight to free Packers: 55000.00daN
Initial String Weight: 45000.00daN
Unseated String Weight: 46000.00daN

Tool Chased Dist: 0.00m
Mud Type: GEL CHEMICAL
Mud Weight: 1240.00kg/m³
Amount of fill: 0.00m
Amt of cushion: 0.00
Type of cushion:

Water Loss: 6.50cm³
Mud Drop: NO
VIS: 61.00S/L
Filter Cake: 2.00mm
Pump Time: 30min
Reversed Out: NO

General Remarks:

PREFLOW: Weak air blow. No gas to surface.

FINAL FLOW: Very weak air blow. No gas to surface.

Recovery Description:

WELL LIC# 1884

Total fluid recovery was 75 meters, consisting of fresh water.

Gas Bomb: 0 Sampler: 1
Fluid Sample: 3 Sent to: AGAT EDMONTON

Drill Stem Testing - Tool Diagram / Description

ALPINE TESTERS

Company: PARAMOUNT RESOURCES LTD. Job Ticket #: D2-08779 DST#: 7
Test Date: 12/02/2000 1030hrs

Well Name: PARA ET AL MOUNT COTY I-02

Contact: WILBERT CALLIHOO Location: I-02/60-20-123-30

Inflate Straddle

Drill Collar Stands:	3
Drill Collar Singles:	0
Drill Pipe Stands:	23
Drill Pipe Singles:	1
Heavy Wt. Pipe Stands:	10
Heavy Wt. Pipe Singles:	0
Total Drill Collars/Pipe and Tools:	710.51m
Total Drill Pipe Above K.B.:	2.51m
Total Depth:	1744m

Tool / Drill Stem Information:

Tool Weight:	2000.00	daN
Drill Collar Inside Diameter:	67.00	mm
Drill Collar Length:	55.62	m
Drill Pipe Inside Diameter:	97.00	mm
Drill Pipe Length:	446.32	m
Heavy Weight Pipe Diameter:	69.80	mm
Heavy Weight Pipe Length:	183.62	m
Bottom Choke Diameter:	12.70	mm
Number of Packers: 2 Dia.:	197.00	mm

Tool Remarks:

24.95m

Depth: 708.0m

12.29m

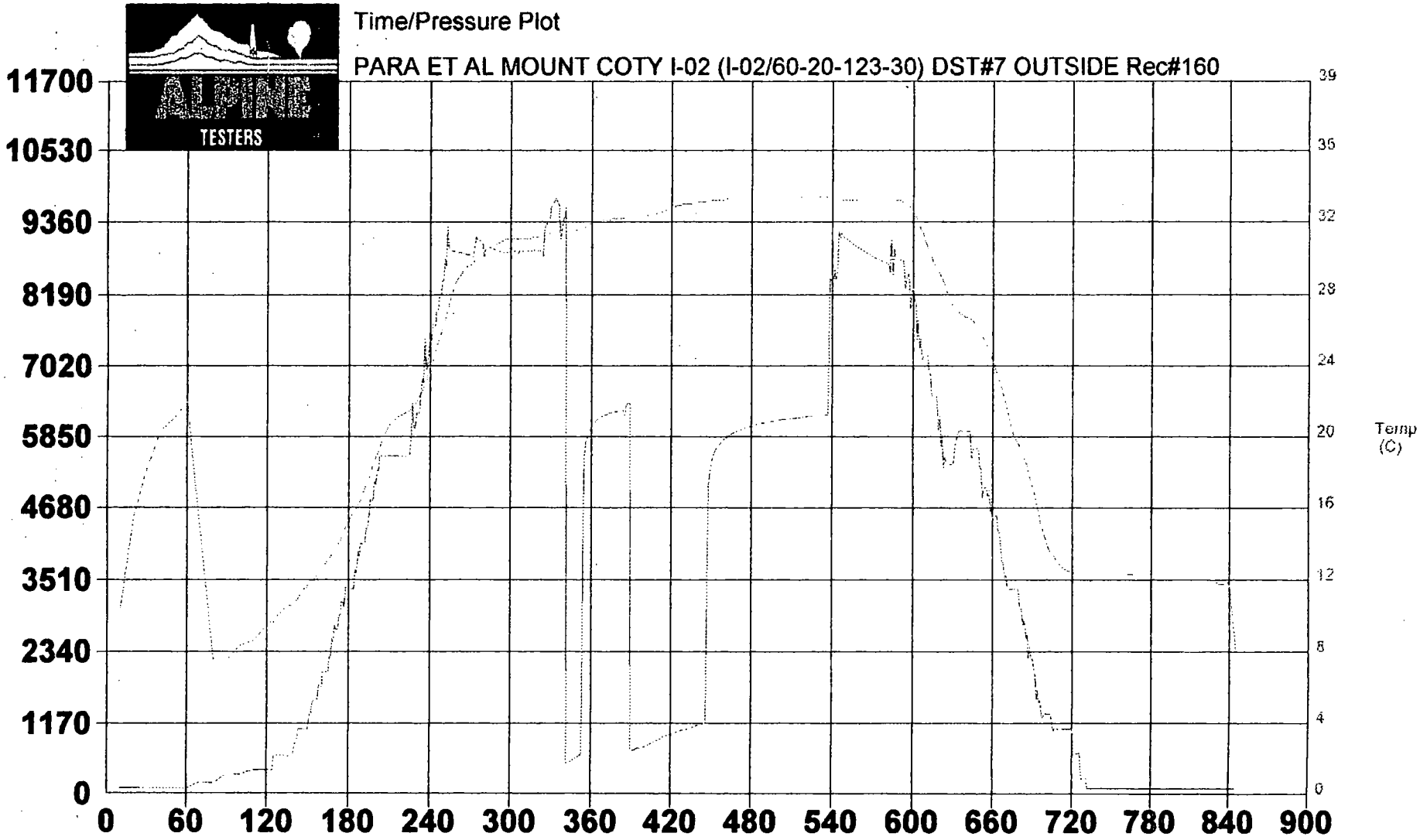
Depth: 720.0m

5.18m

42.42m

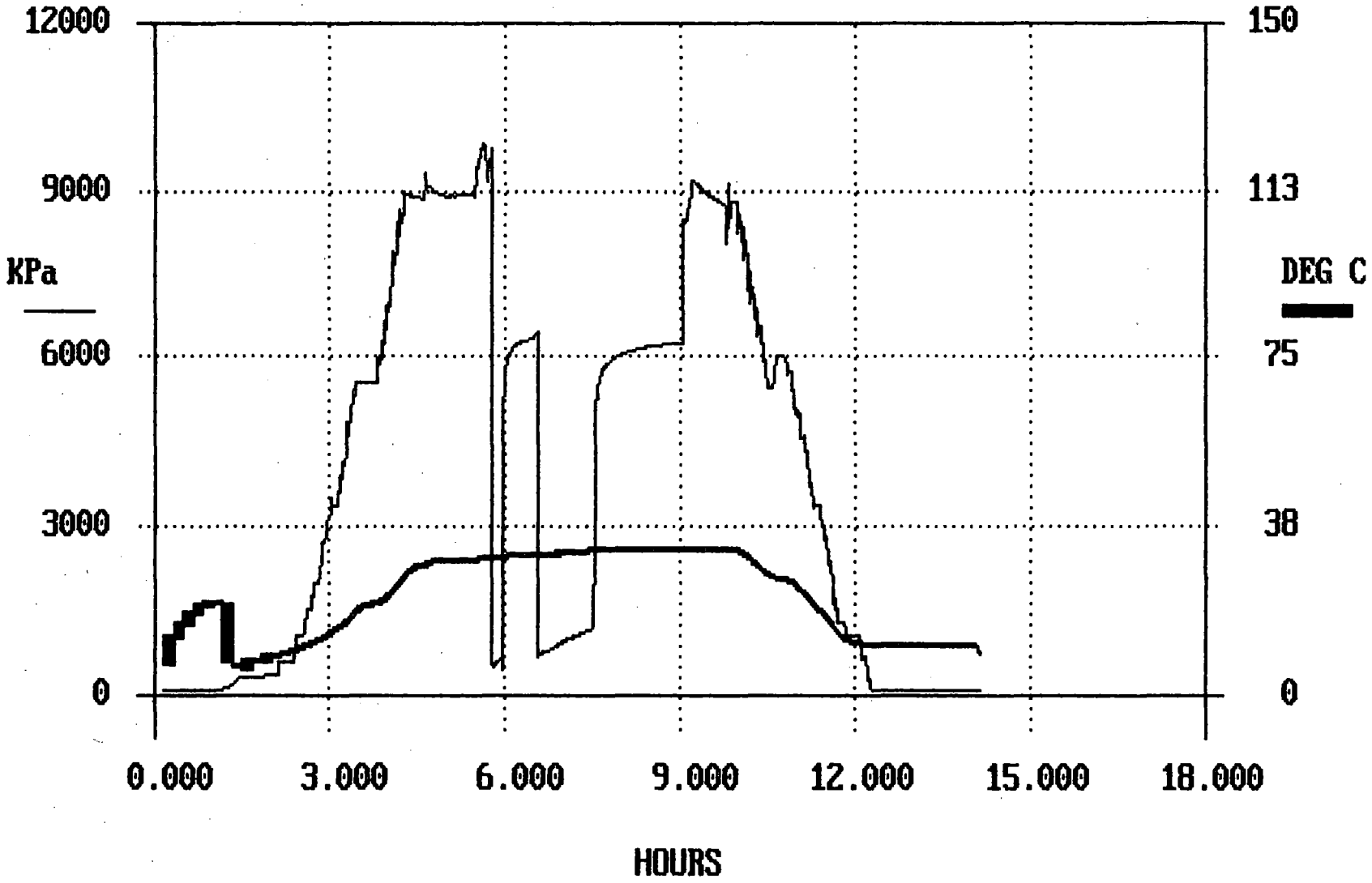
Total Depth: 1744.00m

Item	Length
P.O. Sub	0.31
C.O. Sub	0.30
P.O. Sub	0.31
REC FLUID#65	1.80
HMV Stroke	2.39
Sampler	1.10
REC INSIDE#66	1.80
Telemetry Tool	6.10
Jars	2.10
Safety Joint	0.65
Pump	2.05
Screen	1.18
Valve	2.23
Deflate	0.85
Packer	1.78
T.C.	0.72
K-3 Carrier	2.20
Bypass Hanger	0.42
Blank Spacing	7.45
Bypass Receiver	0.78
Stubb	0.72
Packer	1.78
Extension Sub	0.72
Drag Spring	2.08
Bullnose	0.60


ALPINE
TESTERS
Time/Pressure Plot
PARA ET AL MOUNT COTY I-02 (I-02/60-20-123-30) DST#7 OUTSIDE Rec#160
11700
10530
9360
8190
7020
5850
4680
3510
2340
1170
0
39
35
32
28
24
20
16
12
8
4
0
Temp (C)
0 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900
Time(Min)
A Initial Hydrostatic - 3901
B Start of 1st Flow - 517
C End of 1st Flow - 655
D End of 1st Shutin - 6387
E Start of 2nd Flow - 715
F End of 2nd Flow - 1174
G End of 2nd Shutin - 6207
Q Final Hydrostatic - 8616

FILE: <C:\ALP_IN\C0200845.065>

s/n 65 PARAMOUNT RES.LTD 60-20-123-30 T#2-8779 12/02/00 [redacted]



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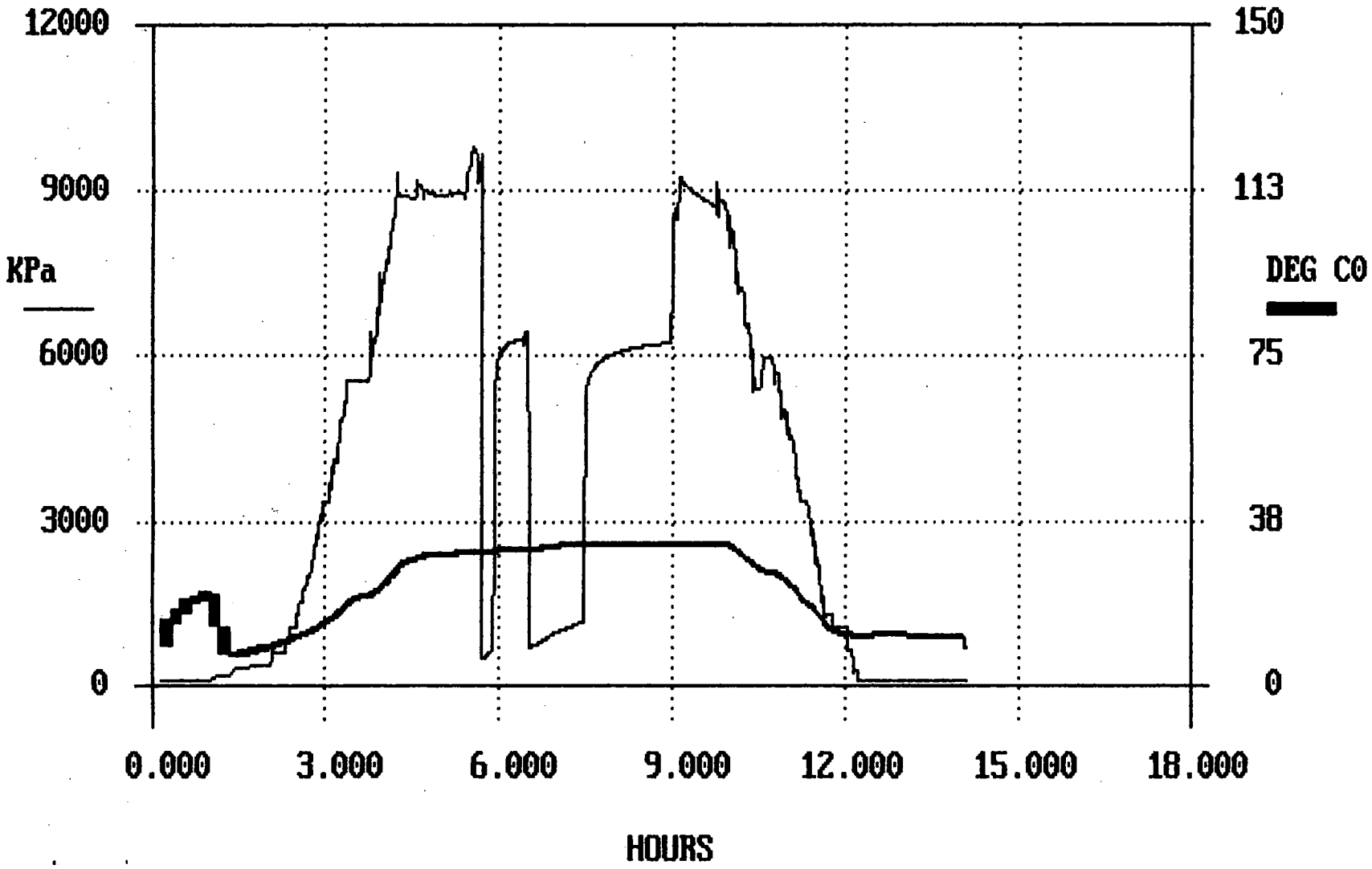
s/n 160 PARAMOUNT RES.LTD 60-20-123-30 T@-8779 12/02/00 OUTSIDE



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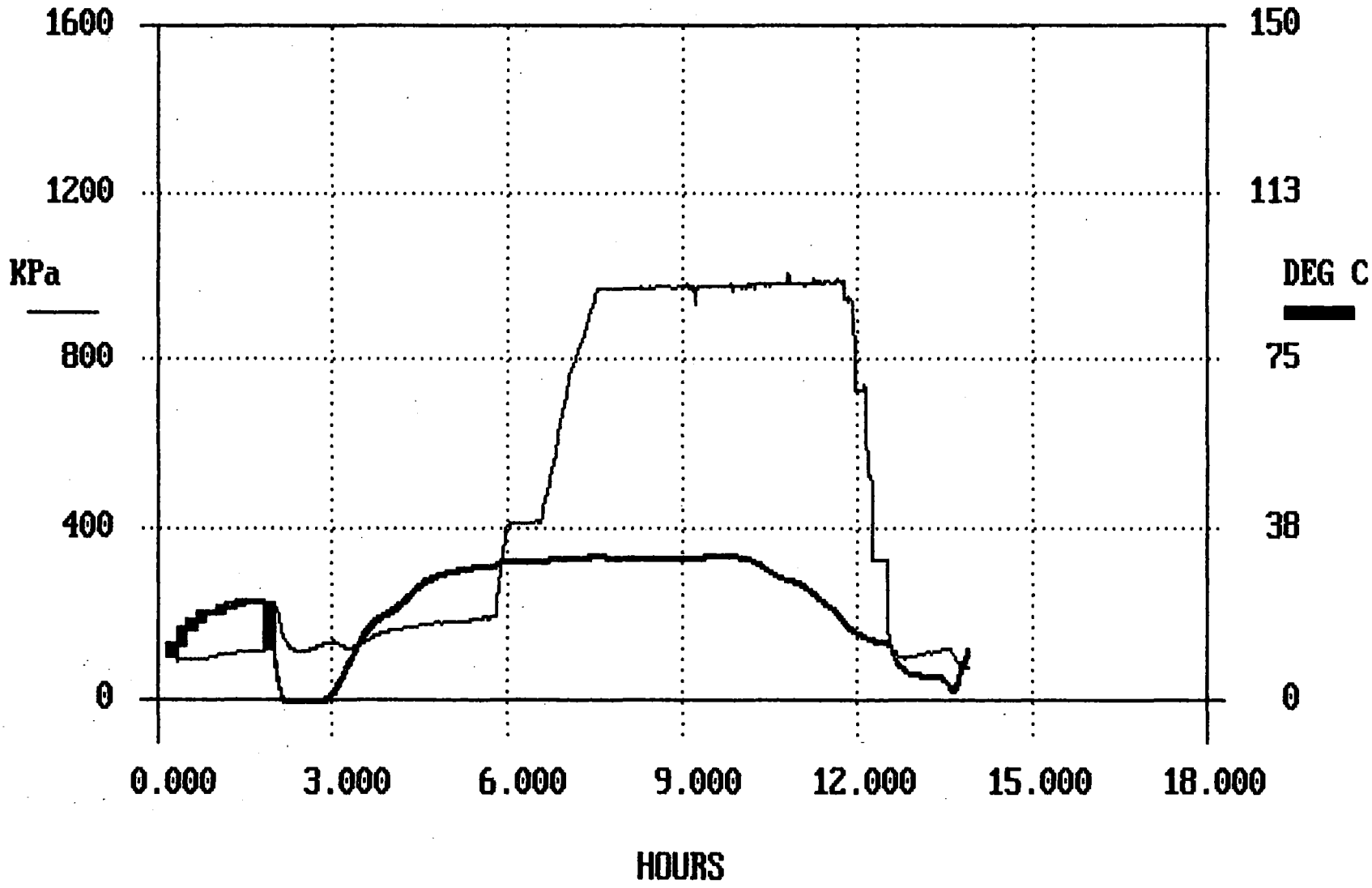
s/n 66 PARAMOUNT RES.LTD 60-20-123-30 T#2-8779 12/02/00 FLUID E



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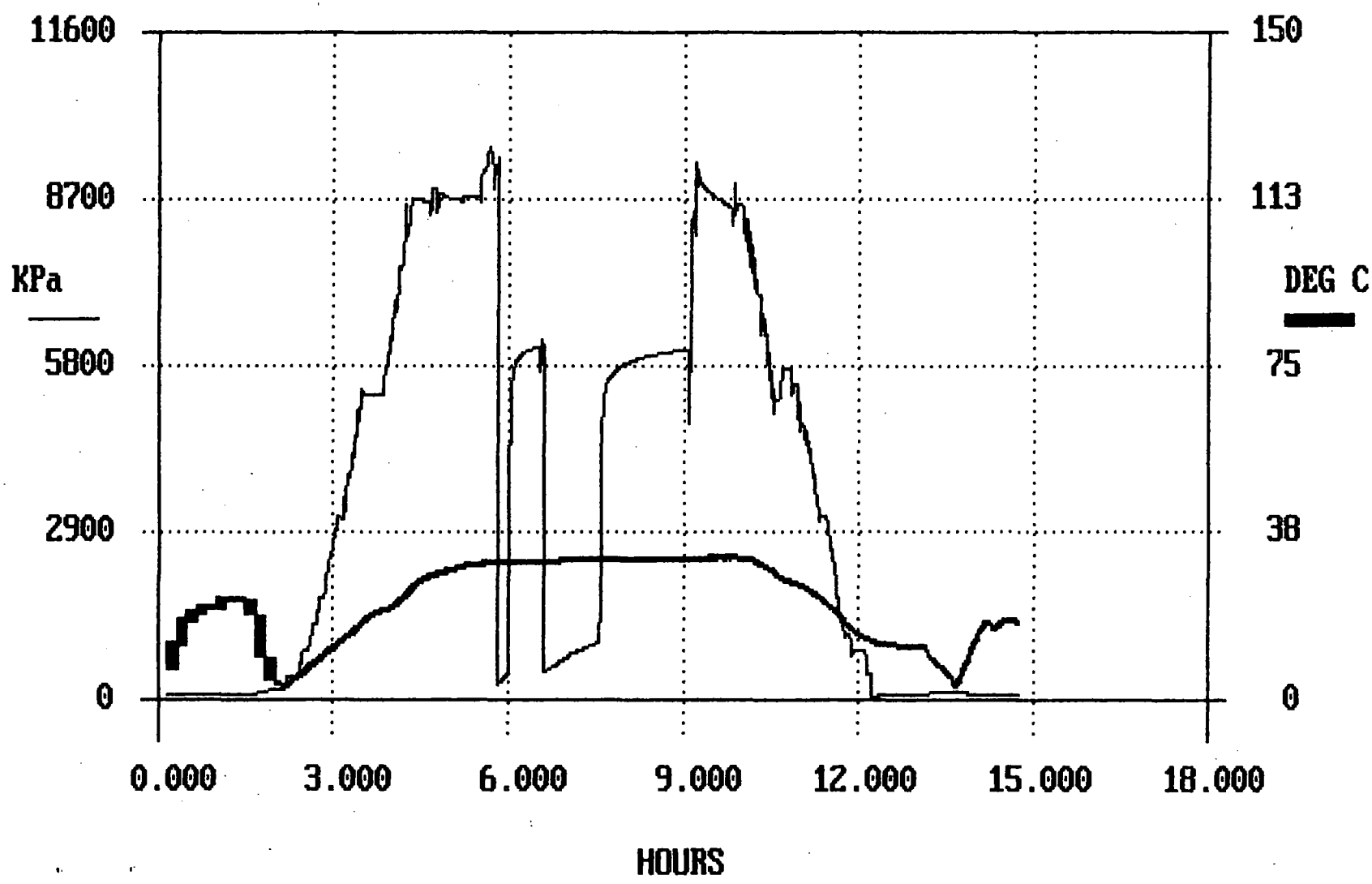
s/n 133 PARAMOUNT RES.LTD 60-20-123-30 T#2-8779 12/02/00 INSIDE



DAILY DRILLING SUMMARY

Para et al Mount Coty I-02

I-02/60-20, 123-30

Date	Depth	Drillin rogres	Drillin Hours	ROP (m/hr)	Mud Properties Density	Vis	WL	pH	Operations Summary
00-Oct-16	53	30	1.50	20.00	1060	43	-	8.5	Wait on water, rig in Continental mud-logging equipment, spud well @ 22:00hrs, drill 23-53m.
00-Oct-17	195	142	9.75	14.56	110-113	22-33	5.4-6.3	9.0-10.0	Drill 53-132m, circ. & cond. mud, drill 132-154m, lose circulation, cond. mud, mix & pump LCM pill, drill 154 164m, cond. mud & circ., POOH, mix LCM, RIH, drill 164-195m.
00-Oct-18	257	62	7.75	8.00	070-113	78-85	-	9.5-10.5	Drill from 195-208m, mix & pump LCM, drill from 208 232m, POOH for bit, RIH with Bit #2A, drill from 232-235m, trip for mud-ring, condition mud & circulate, drill from 235-257, run survey.
00-Oct-19	315	58	7.75	7.48	090-111	63-84	-	8.5-9.5	POOH for 222mm bit (pilot hole), RIH, drill 257-315m.
00-Oct-20	330	15	5.25	2.86	1070	75	-	9.0	Drill from 315-330m, POOH to pick up 311mm bit, RIH, ream pilot hole from 257-330m, POOH to pick-up directional tools.
00-Oct-21	453	123	16.25	7.57	080-109	74-78	-	8.5-9.0	Pick-up directional tools, RIH & test MWD tool, drill from 330-453m.
00-Oct-22	514	61	9.50	6.42	095-110	70-78	-	9.0-9.5	Drill 453m to sfc. csg. pt. @ 514m, POOH, lay down directional tools, pick up 311mm bit, RIH, ream pilot hole from 330-423m.
00-Oct-23	514	0	0.00		-	-	-	-	Ream from 423-448m, POOH for bit, RIH, ream 448-514m, wiper trip, circulate & condition mud, POOH to run surface casing.
00-Oct-24	514	0	0.00		-	-	-	-	Run surface casing, cond. mud & circ., cement casing, WOC, tear out diverter, cut casing & conductor, cement casing, cut casing, weld on bowl.
00-Oct-25	516	2	0.50	4.00	-	-	-	-	Nipple up BOP, pressure test, pick up dir. tools, RIH, drill out cement, drill 514-516m.
00-Oct-26	720	204	13.75	14.84	000-105	28-42	11.0	8.0-10.5	Drill from 516-523m, LOT, drill from 523-720m, POOH for bit, RIH.
00-Oct-27	858	138	19.50	7.08	070-110	36-43	7.5-8.5	9.5-10.0	RIH, drill from 720-858m.
00-Oct-28	923	65	8.50	7.65	090-109	39-46	8.5	9.0-9.5	Drill from 858-876m, POOH for bit, RIH, ream 860-876m, drill from 876-923m, POOH for bit.
00-Oct-29	1007	84	17.25	4.87	080-110	41-51	.0-11.	8.5-10.0	Change bit, RIH, ream 910-923m, drill from 923-
00-Oct-30	1052	45	13.00	3.46	090-111	48-51	7.5-8.0	10.0	Drill from 1007-1052m, POOH for bit, change out bit, test MWD tool.
00-Oct-31	1091	39	6.25	6.24	110-119	42-69	6.5-7.5	10.0	RIH, ream, drill 1052-1066, shut in well & circulate out gas kick, build mud wt., drill 1066-1069, shut in well, circ. out gas, build mud wt., drill 1069-1091m, commence POOH for DST, well flowing - return to bottom, build mud wt., POOH.

00-Nov-01	1091	0	0.00	-	1230	95	6.0	9.0	POOH, well flowing, build mud wt., POOH for DST, lay down tools, make up DST tool, RIH, run DST #1 (1058-1068m), circulate & condition mud (build wt.).
00-Nov-02	1091	0	0.00	-	1260	90	6.5	10.0	Circ. & cond. mud (build wt.) POOH, recorders not recovered, RIH & attempt to screw onto fish, POOH - no recovery, RIH with bit, circulate & WO fisherman.
00-Nov-03	1091	0	0.00	-	-	-	-	-	Circulate & condition mud while WO fisherman, POOH, pick up fishing tools, RIH, recover fish, POOH, lay down fish, pick up bit & directional tools, RIH.
00-Nov-04	1142	51	15.75	3.24	1300	82	5.5	10.5	RIH, work on directional tools, RIH, condition mud & circulate, RIH, drill from 1091-1142m.
00-Nov-05	1173	31	10.75	2.88	1300	73	6.0	10.5	Drill 1142-1147m, POOH for bit, RIH, slip & cut, RIH, break circulation & clean to bottom, drill 1147-1173m.
00-Nov-06	1207	34	14.00	2.43	1300	72-75	6.0	10-10.5	Drill 1173-1183, POOH for bit, RIH, break circultion & clean to bottom, drill 1183-1207m.
00-Nov-07	1254	47	14.25	3.30	300-132	70-75	6.0-6.2	10.5	Drill 1207-1248m, POOH for bit, RIH, break circulation & clean to bottom, drill 1248-1254m.
00-Nov-08	1281	27	17.25	1.57	290-134	75	6.0-6.5	9.5-10.5	Drill 1254-1281m, cond. mud & circ., POOH for bit.
00-Nov-09	1320	39	15.75	2.48	285-129	75	7.0-8.0	10-10.5	Change bit, RIH, slip & cut, RIH, ream to bottom, drill from 1281-1320m.
00-Nov-10	1350	30	10.50	2.86	270-128	73	7.5	10.0	Drill 1320-1327m, POOH for bit, RIH, break circulation & wash to bottom, drill 1327-1350m, POOH for bit.
00-Nov-11	1396	46	14.25	3.23	280-130	69-73	6.9-8.2	10.0	POOH for bit, change bit, RIH, break circulation & wash to bottom, drill 1350-1396m, run survey.
00-Nov-12	1428	32	12.75	2.51	280-130	74	7.0-7.5	10-10.5	POOH for bit, change bit, RIH, break circulation & wash to bottom, drill 1396-1428m.
00-Nov-13	1442	14	8.75	1.60	1280	75	7.5	10.0	Drill 1428-1428.8m, POOH for bit, change bit, RIH, slip & cut, RIH, break circulation & wash to bottom, drill 1428.8-1442m, POOH for bit.
00-Nov-14	1467	25	15.75	1.59	270-127	60-65	7.5-7.9	10.0	Change bit, RIH, cond. mud & circ., drill 1442-1467m.
00-Nov-15	1490	23	11.25	2.04	1270	80-11	8.0	10.0	Drill 1467-1471m, POOH for bit, change bit, RIH, ream 1448-1471m, drill 1471-1490m.
00-Nov-16	1510	20	8.50	2.35	260-128	65-70	8.0	10.0	POOH for bit, change bit, RIH, ream 1479-1490m, drill from 1490-1510m, cond. mud & circ., POOH for bit.
00-Nov-17	1535	25	14.00	1.79	260-127	60-70	7.5	10.0	Change bit, RIH, cond. mud & circ., drill 1510-1535 m
00-Nov-18	1556	21	6.50	3.23	260-127	57-60	7.5	10.0	RIH, drill from 1547-1556 m
00-Nov-19	1587	31	17.50	1.77	270-127	65-70	7.4	10.5	Change bit, RIH, cond. mud & circ., drill 11556-1587 m
00-Nov-20	1625	38	20.50	1.85	280-128	61-62	7.7	10.0	Drill 1587-1625m, cond. mud & circ., POOH for bit.
00-Nov-21	1640	15	9.00	1.67	270-127	57-60	7.2	10.5	POOH for bit, change bit, RIH, break circulation & wash to bottom, drill 1625-1640 m.
00-Nov-22	1663	23	20.00	1.15	275-128	57-59	7.0	9.5	Drill from 1640-1663m. POOH for bit.
00-Nov-23	1689	26	17.50	1.49	1280	68-69	7.0	10.5	Change bit, RIH, cond. mud & circ., drill 1663-1689 m.
00-Nov-24	1705	16	12.50	1.28	1280	63-66	7.0	10.5	Drill 1689-1705m, POOH for bit, lay down MWD tools, rig repair, RIH, slip & cut, RIH.
00-Nov-25	1744	39	20.75	1.88	270-128	80	6.0-6.5	10.5	RIH, drill from 1705 to FTD of 1744m, circulate bottoms up, condition mud.
00-Nov-26	1744	0	0.00	n/a	1275	80	6.5	10.5	Wiper trip to sfc. csg., condition mud & circulate, POOH, rig to & log Run #1, commence Run #2.

00-Nov-27	1744	0	0.00	n/a	-	-	-	-	Complete Run #2, log Run #3 (RCOR), make up DST tool, RIH to run DST #2 (706-717m).
00-Nov-28	1744	0	0.00	n/a	-	-	-	-	RIH to run DST #2 - misrun, POOH, breakdown tool, makeup DST #3, RIH, run DST #3.
00-Nov-29	1744	0	0.00	n/a	1270	65	7.0	10.5	Run DST #3, POOH, breakdown & layout test tool, RIH with bit, break circulation, cond. mud & circ., RIH to bottom, cond. mud & circ., POOH.
00-Nov-30	1744	0	0.00	n/a	-	-	-	-	POOH, make up test tool, RIH, slip & cut, RIH, run DST#4, hoist DST #4, reverse circulate, POOH, lay down recorders, make up DST #5, RIH.
00-Dec-01	1744	0	0.00	n/a	-	-	-	-	RIH, run DST#5, POOH, make up DST #6, RIH. commence DST #6.
00-Dec-02	1744	0	0.00	n/a	-	-	-	-	Run DST#6, POOH, make up DST #7, RIH, run DST #7, POOH, handle test tool.
00-Dec-03	1744	0	0.00	n/a	-	-	-	-	Lay down test tool, RIH, condition mud & circulate, POOH sideways, rig to & run casing.
00-Dec-04	1744	0	0.00	n/a	-	-	-	-	Run casing, circ. & cond. mud, rig to & cmt. casing, geologist released and off location @ 1400hrs.

WELLSITE LOGGING REPORT

Para et al Mount Coty I-02
I-02/60-20, 123-30

HOLE DATA		*MUD DATA*		*LOGGING COMPANY*	
Hole Size:	222mm			**Logging Co.:**	Baker Hughes
TD Driller:	1744.0m	**Type:**	Gel-chem	**Engineer:**	C. Butler
Strap:	1744.8m	**Density:**	1275	**Truck No.:**	HL6577
TD Logger:	1743.2m	**Viscosity:**	80	**Start Date:**	Nov. 26, 2000
Casing Driller:	514.0m	**W.L.:**	6.5	**Start Time:**	12:45hrs
Casing Logger:	512.0m	**pH:**	10.5	**End Date:**	Nov. 27, 2000
Hole Condition:	Good			**End Time:**	18:00hrs

LOGGING SEQUENCE

Run Number	Logged Interval From	To	Hours	Logs	Remarks
1	TD	Sfc. Csg.	8.25	HDIL-ZDL-CN-GR-XYCAL	
2	TD	Sfc. Csg.	5.5	ML-MAC-GR-XYCAL	
3	1720	712	15.5	RCOR	18 plugs
		Total Hours:	29.25		

LOGGING OPERATIONS SUMMARY

Date	From	To	Description of Operation
26 Nov 00	1245	2100	HDIL-ZDL-CN-GR-XYCAL
26 Nov 00	2100	0230	ML-MAC-GR-XYCAL
27 Nov 00	0230	1800	RCOR

REMARKS & COMMENTS

No problems on Runs #1 & 2 though there were some problems with repeatibility on the SP curve in the bottom ~100m. This was likely due to poor or no filtercake on this section with some flow from the formatio There were 18 sidewall cores cut with 10 recovered.

INTRODUCTION

The Paramount et al Mount Coty I-02 well is located approximately 6 kilometres from the village of Fort Liard. This vertical exploration well was spudded on October 16, 2000 by Akita Drilling Rig #51 @ 22:00 hours. A Continental total gas detector and chromatograph was rigged up and running from surface to T.D. Samples were collected in 5 metre intervals from surface to F.T.D. The well reached F.T.D. at 1744 metres in carbonate of the Flett/Debolt November 25, 2000 at 22:45 hours. Sample quality was variable, ranging from generally adequate to periodically poor, due to a combination of factors which includes some inconsistent and improper sample-catching by rig personnel, as well as occasional problems with the mud-system and shakers.

The primary zone of interest was the Mississippian Mattson Formation, a predominantly clastic succession representing 5 different depositional environments of near shore marine to coastal plain systems. There were multiple zones within the succession occurring primarily in the coastal dune complex. Secondary targets in the well were the basal Cretaceous Chinkeh Formation, the Permian Fantasque Formation, and the Mississippian Flett/Debolt Formation. All zones of interest were gas targets.

A number of operational difficulties were encountered during the drilling of this well. Problems with hole deviation on the 311mm surface section necessitated drilling with relatively low FOB, slowing the progress of the well. At 257m a decision was taken to come out of the hole to change bits to 222mm in order to drill pilot hole to surface casing TD @ 514 metres. Initially the pilot hole was rotary-drilled but increasing deviation problems necessitated bringing in directional personnel. Directional tools were picked up at 330m and the remainder of the surface section was drilled with a mud-motor. Two days of reaming with the 311mm bit were required to complete the surface section which was completed on November 18. The main section from 514m to 1510m was drilled with a mud-motor to ensure control of potential deviation problems. At ~1510m a decision was taken to lay down the mud-motor and rotary-drill to FTD, which was completed with no problems on November 25.

One intermediate DST in the upper Mattson (i.e., DST #1: 1058-1068m) was conducted by Weatherford/Alpine Testing, commencing on November 1st and completed on November 2nd. Problems were encountered on this DST run. Upon pulling out of the hole after a successful test, it was discovered that part of the DST had been left in the hole (i.e., ~24m of the test tool from the safety joint down). An attempt to screw onto the safety joint was unsuccessful and a fishing operation was successfully conducted the following day.

A significant portion of the middle and lower sections of the Mattson Formation proved to be very hard drilling and resulted in extreme wear and short bit life. A total of 18 bits were required to drill ~681m of the Mattson, some of which were badly worn after as little as 8 hours of drilling. Problematically, the rocks in samples often did not appear hard enough to produce such extreme wear. The higher RPM involved with drilling with a mud-motor is one factor which likely contributed to shorter bit life. This theory appears to be supported by a significant increase in bit hours over the last few bits run in the lower Mattson after laying down the mud-motor and rotary-drilling to FTD.

Three logging runs were conducted upon reaching FTD, commencing on November 26th and completed on November 27th. The first two logging runs were conventional (i.e., #1: HDIL-ZDL-CN-GR-XYCAL; #2: ML-MAC-GR-XYCAL) and the third run was a sidewall core (i.e., #3: RCOR). A total of 18 sidewall cores were cut in three formations (i.e., 2 in the Flett/Debolt; 13 in the Mattson; 3 in the Chinkeh) with 10 cores recovered; 8 of the 13 cut in the Mattson were not recovered (see sidewall core report for details). After completion of logging a total of six DST's were run, commencing on November 27th and completed on December 2nd. Two DSTs were run in the Chinkeh (i.e., DST #2 (mis-run) & DST #7), three in the Mattson (i.e., DSTs #4-6) and one in the Flett/Debolt (i.e., DST #3). There were no significant problems encountered on the DST runs, excepting the mis-run on DST #2 when no packer seat was obtained (see attached DST reports for details). Production casing was run upon completion of the testing program.

FORMATION EVALUATIONS

PARAMOUNT ET AL MOUNT COTY I-02
300/I-02-60-20-123-30/00

LEPINE FORMATION

An erosionally-truncated Lepine Formation, overlain by ~92 metres of Quaternary glacial sands, comprises 284 metres of shale and siltstone at this locality. Two informal subdivisions are apparent; 1) an upper section ~177 metres thick consisting of shale with interbedded siltstone, and, 2) a lower section ~107 metres thick consisting of predominantly shale with minor interbedded siltstone. The upper shale is typically dark grey, firm, sub-blocky to sub-platy, sub-fissile, variably silty in part, and contains trace to minor glauconite. The lower shale is similar to that upsection but also contains trace to minor sideritic siltstone and siderite stringers. The siltstone is typically light to dark grey, very quartzose with trace to minor glauconite, trace to minor dark specks and rare to trace mica flakes. The siltstone is predominantly variably argillaceous with common to locally abundant silty argillaceous laminations and very thinly interbedded shale. The siltstone is variably indurated, ranging from poorly to very well indurated; however, they are typically moderately indurated. The predominant cement is silica with trace to minor locally abundant streaky calcareous cement. The siltstone is tight and without hydrocarbon shows. There are no rocks of economic interest in this formation.

CONCLUSION: The Lepine Formation has no economic potential at this locality.

SCATTER FORMATION

The Scatter at this locality comprises ~140 metres of sandstone with minor interbedded shale and siltstone. The shales are typically dark grey, firm to very firm, sub-blocky to sub-platy, commonly variably silty grading to argillaceous siltstone in part, and generally slightly glauconitic. The sandstone is typically light to medium grey, very fine grained & silty, quartzose, variably glauconitic, and commonly variably argillaceous to locally clean. Trace to minor siderite and sideritic-siliceous sandstone laminations are scattered through most of the section. The sandstone is typically moderately to well indurated with siliceous cement. These rocks are generally tight with minor streaky poor to occasionally fair porosity, which increases downsection.

Hydrocarbon shows were generally absent with the exception of the basal section from ~478-516m where shows consisted of slightly patchy to even, partly dead oil staining, minor spotty to patchy very dull fluorescence, and common poor to locally fair thin streaming and diffuse cut. There was minor gas response through this section but there is insufficient reservoir quality present to be of interest.

CONCLUSION: The Scatter Formation has no economic potential at this locality.

GARBUTT FORMATION

The Garbutt at this locality comprises ~145 metres of shale with interbedded siltstone & minor sandstone. Two basic divisions are apparent at this locality; an upper ~90 metre section which is dominated by siltstone with interbedded shale and minor sandstone, and the lower ~40m of the formation which comprises shale with minor interbedded siltstone.

The siltstone is very similar to the overlying basal Scatter sandstone. The siltstone is typically dark to medium brown, predominantly variably argillaceous to locally clean with abundant quartz, trace to minor glauconite and minor dark lithic grains. There are common to abundant argillaceous partings and laminations and it is variably sandy in part locally grading to silty sandstone. The rocks are moderately to well indurated with siliceous cement. There was predominantly no visible porosity in these rocks. Minor streaky poor porosity was occasionally observed. Hydrocarbon shows were generally very poor and consisted of minor to locally common poor slow streaming and diffuse cut with no fluorescence in the uppermost ~10 metres decreasing to trace in the underlying ~20 metres. There were no significant gas shows in this section.

The shale is typically dark grey, platy to sub-platy, fissile and commonly brittle. The shale is slightly to moderately silty in part with siltstone laminations and locally variably carbonaceous. The Radioactive Zone is not well-developed at this locality; bentonite is rare in samples and the strong radioactive kick that is characteristic of the zone on e-logs is absent, suggesting that this locality is at or near the limit of regional correlation for this unit. The shale through the Radioactive Zone is very similar to the overlying shale but becomes predominantly non-silty.

CONCLUSION: The Garbutt Formation has no economic potential.

BULLHEAD FORMATION

The Bullhead consists of ~53m of shale. The shale is quite similar to the overlying Garbutt shales but becomes carbonaceous in minor part. Bentonite increases slightly to a trace occurrence and is dominantly white to cream coloured and slightly tuffaceous. Trace to minor siltstone laminations/stringers were observed and trace siderite & sideritic siltstone occur in the basal section.

CONCLUSION: The Bullhead has no economic potential.

CHINKEH FORMATION

The Chinkeh Sand at this locality comprises ~14 metres of sandstone with minor interbedded shale. There is a thin Chinkeh Silt zone (i.e., ~2.5 metres) at the top of the section. The sandstone is typically light grey to light brown, very fine to fine-grained, clean and variably silty in part. The composition is very quartzose with trace dark lithic grains and ranges from non-glauconitic to moderately glauconitic, comprising sublitharenite to quartzarenite. The rocks are variably indurated, ranging from commonly poorly indurated and crumbly to moderately to locally well indurated. Cements consist of common siliceous, minor dolomitic cement and trace to minor spotty kaolin/illite. Subhedral quartz overgrowths range from minor to common. Visible porosity was variable in samples; typically fair to good with tight streaks in the upper section with minor to common poor to marginally fair porosity (i.e., 4-7%). Hydrocarbon shows were generally absent and consisted of traces of spotty dead oil stain. There was no gas response in this formation.

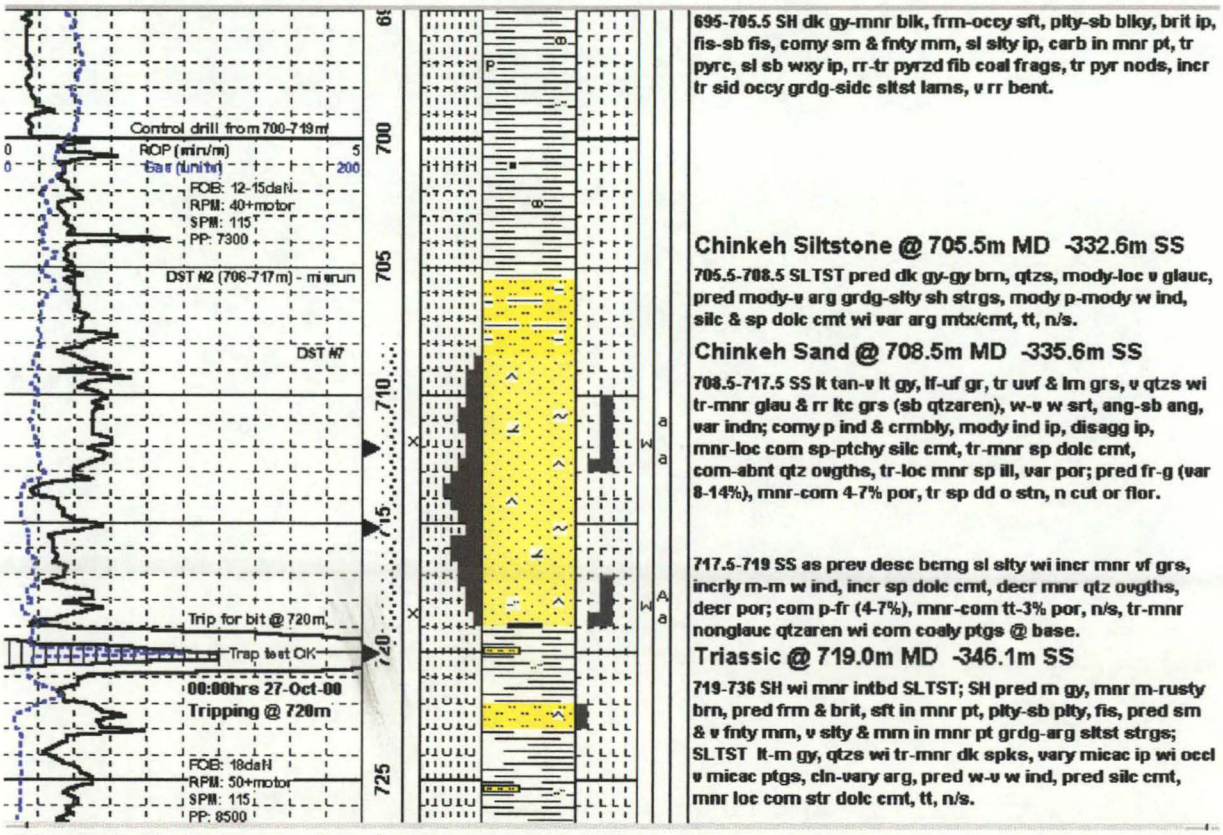


Figure 1. Strip-log section showing the Chinkeh Formation and upper section of the Triassic. Note the absence of gas response.

CONCLUSION: The Chinkeh Sand has some fair to good reservoir-quality intervals at this locality; however, hydrocarbon shows & gas response were absent and indicate that the zone is

CONCLUSION: The Chinkeh Sand has some fair to good reservoir-quality intervals at this locality; however, hydrocarbon shows & gas response were absent and indicate that the zone is wet, confirmed by induction logs and DST #7. This interval has no economic potential at this locality.

TRIASSIC (TOAD/GRAYLING FORMATIONS)

The Triassic comprises ~67 metres of shale with minor interbedded siltstone. The siltstone occurs mainly in the upper section (i.e., 719-740m MD) and is light to medium grey, quartzose, and variably micaceous. The rocks are predominantly well indurated with common siliceous and locally common dolomitic cement. There was no visible porosity or hydrocarbon shows in these rocks.

The shales consist of two basic types; 1) medium to dark grey, and 2) maroon to rusty red. These two types are interbedded with the minor interbedded siltstone more common in the grey shale sections. The grey shale is typically firm to hard, sub-fissile and variably silty with minor argillaceous siltstone laminations and stringers. This shale becomes slightly to moderately dolomitic from about 740m downsection. The maroon to red shale is typically firm to hard (becoming locally soft in the basal section), fissile and significantly less silty than the grey variety. This shale is variably dolomitic except in the basal section where it becomes non-dolomitic. A particular feature of note in the oxidized shale units is the variable content of 'bentonitic' clays (i.e., smectitic swelling clays) which increase downsection, as manifested by common to abundant red clay in the wash with a significant loss of sample volume.

Both these shales are thinly interbedded and interlaminated in part, most likely at the transitions between the two facies which appear to represent subaqueous (grey shale & minor siltstone) and periodically or wholly subaerial (oxidized shale) depositional environments.

CONCLUSION: The Triassic has no economic potential at this locality.

BELLOY FORMATION

The Belloy Formation comprises ~47 metres of predominantly chert with interbedded sandstone and minor thin shale. This formation was interpreted to be absent at this locality. Three informal subdivisions can be made at this locality; 1) an upper division from ~791-806m consisting of predominantly chert with minor interbedded sandstone, 2) a middle division from ~806-825m comprised of argillaceous to slightly phosphatic lithic wacke with interbedded glauconitic chert and variably phosphatic to cherty to hematitic mudstone, and 3) a lower division from ~825-839 consisting of sublitharenite to subwacke with a basal chert unit.

The chert ranges in colour from very pale to dark brown & brownish grey. The chert is typically moderately to very glauconitic and commonly variably sandy to silty locally grading to cherty sandstone. The upper chert is characterized by a common granular texture on cuttings, locally crumbly nature and a variable argillaceous content that locally grades to minor cherty glauconitic mudstone with trace pyritized spicules and worm burrows. The chert is generally tight with trace to minor poor to rarely fair microvug to vug porosity. There is inferred local fair fracture porosity in the upper section. The lower chert is similar in many respects but is generally very glauconitic and includes an unusual hematitic component that grades to cherty mudstone.

The sandstone consists of two basic types; 1) upper sand - dark grey, quartzose lithic wacke composed of common to abundant clear to varicoloured quartz, minor to common varicoloured lithic grains. Texturally, the sandstone is moderately poorly sorted, upper very fine to lower medium grained with common to abundant argillaceous to slightly phosphatic matrix and locally grades to sandy mudstone. The sandstone is variably silicified in part and contains unusual common to locally abundant apatite (?) blebs and rare crystals. The rock is tight with no shows, 2) lower sand – predominantly well-sorted, fine grained sublitharenite locally grading to quartzose lithic wacke and has a similar composition to the overlying sand with the addition of trace to minor glauconite. The sandstone is predominantly disaggregated with minor consolidated cutting with tight siliceous cement and minor to common dolomitic cement. Unusual minor spotty to patchy limonitic(?) cement/matrix was observed. Common poor to fair porosity was inferred. There were no hydrocarbon shows in these rocks.

There was a significant increase in gas readings upon penetration of the formation and a few minor thin gas shows in the section; however, the gas response is generally poor. Other hydrocarbon shows consist of minor to common dull to moderate yellow green fluorescence with common poor slow streaming and very thin diffuse cut in the upper chert section (i.e., ~791-805m).

CONCLUSION: There is some localized fair fracture porosity in the upper Belloy and common fair to poor porosity in the lower sand; however, poor hydrocarbon shows & gas response indicate the Belloy has no economic potential at this location. The Belloy is of potential economic interest in the area if fracture systems and/or sandstone porosity are sufficiently developed and gas-charged.

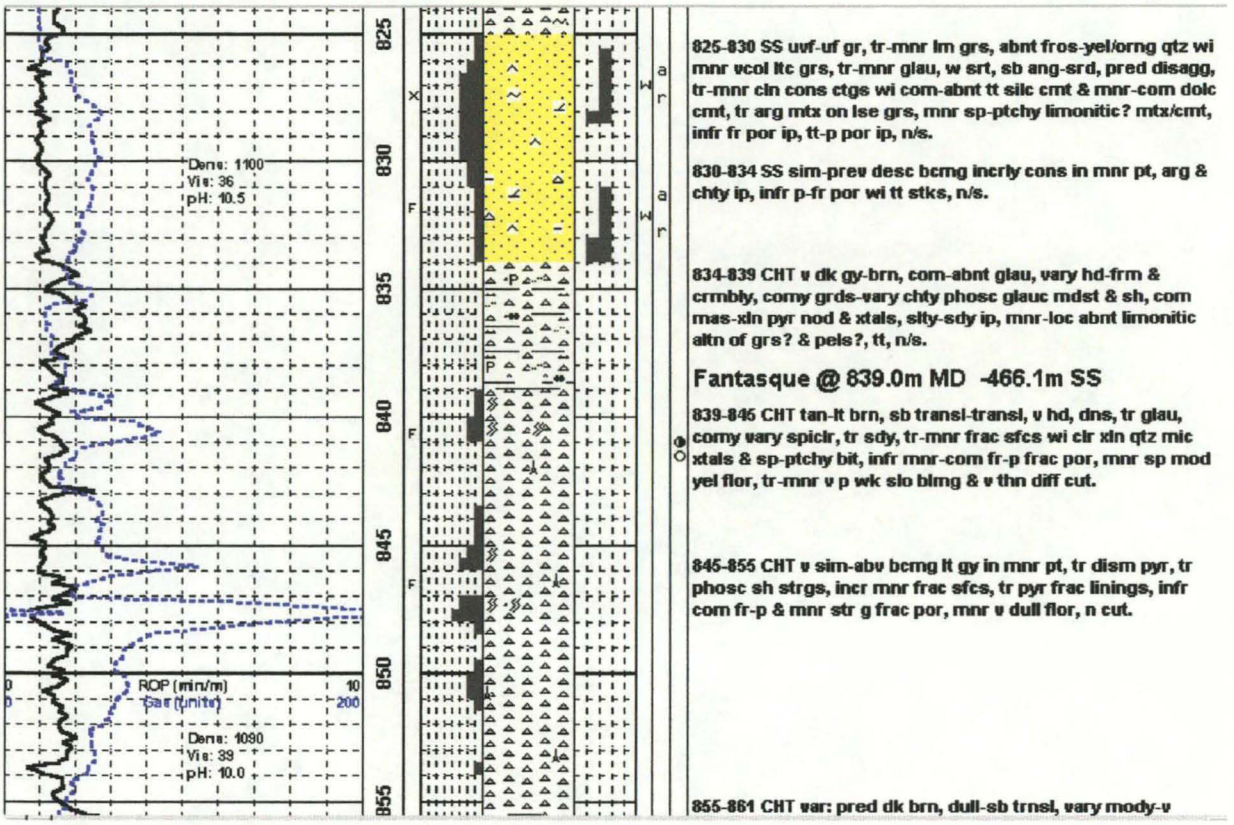
FANTASQUE FORMATION

The Fantasque Formation consists of ~83 metres of bedded chert with very minor shale. The chert is variable with three basic types apparent. The first type (from ~837-855m) is generally light brown to light grey, commonly translucent, very hard & dense, and commonly variably spicular. The second variety (from ~855-864m) is commonly dark brown, sub-translucent to non-translucent, variably glauconitic and ranges from hard & dense to variably firm & crumbly with a common granular texture. This chert variety is commonly argillaceous and locally grades to cherty phosphatic mudstone. The third and most uniform variety (from ~894-920m) is typically light grey to pale brown, translucent, and commonly pelletal to mottled. It is distinct by virtue of the common dark brown pellets and mottles which are ubiquitous. This chert shows the most evidence of hydrothermal silicification (discussed below) and fracturing which increases downsection. The section from ~864-894m is comprised of variable amounts of all three varieties.

Planar fracture surfaces are ubiquitous throughout the section, though generally minor except in the basal Fantasque, and are often lined with different varieties of quartz, discussed below. Locally, pyrite was also observed coating fracture surfaces. Porosity consists of localized fractures which are inferred to range from good to poor and increase downsection to become common in the basal section. There is rare to trace scattered poor moldic & microvug porosity.

The chert has numerous fractures throughout the section and there are a number of features related to the fractures that are worthy of note. Silica-saturated hydrothermal fluids have moved through the fracture systems in at least two stages. The first and primary episode of silica precipitation is manifested in the form of locally common finely laminated chalcedonic and milky quartz fracture linings and 'heals'. The chalcedony occasionally has a colloform habit. The second, apparently minor, stage takes the form of clear subhedral to euhedral quartz crystal linings that are often precipitated on top of chalcedonic or milky quartz fracture linings. The chalcedonic and milky quartz become increasingly common downsection (i.e., ~898-920m) where the chert shows evidence of variable degrees of hydrothermal silicification, manifested by the ubiquitous presence of random to localized chalcedonic to milky quartz mottles and 'blebs' in addition to the fracture heals, fillings and linings by the same material. The boundaries are typically diffuse, even with the obvious fracture-related fills, underlining the locally pervasive nature of the alteration. This diagenetic artifact in the lower Fantasque was also noted on the I-46/60-10-123-15 and b-43-K/94-O-14 wells and confirms the regional scale of this hydrothermal event.

Figure 2. Strip-log section showing lower Belloy & upper Fantasque Formations. Note fracture zone in upper Fantasque with gas show.



Hydrocarbon shows were typically absent to locally very poor and consisted of rare to trace spotty oil stain or bitumen, trace to minor spotty dull fluorescence with traces of questionable cut, excepting the uppermost interval where there was minor spotty moderate yellow fluorescence with trace to minor very poor, slow blooming and very thin diffuse cut. There was a fair thin gas show at the top of the formation and some minor gas response scattered throughout the section; however, there was no gas crossover on logs.

CONCLUSION: The Fantasque at this locality has some fair localized fracture porosity; however, poor gas response & e-log characteristics indicate that the Fantasque has no economic potential at this location but is of economic interest in the area.

KINDLE FORMATION

The Kindle Formation comprises ~45 metres of siltstone with minor interbedded limestone & dolomite at this locality. The siltstone is typically medium to dark brown, quartzose, and slightly to locally moderately argillaceous with trace argillaceous partings. The siltstone is generally very dolomitic locally grading to very silty dolostone. The rocks are generally moderately to well indurated and tight with abundant dolomitic cement upsection grading downsection to abundant calcareous cement. The basal Kindle grades to silty limestone. The limestone is very dark brown to grey, cryptocrystalline to microcrystalline, variably dolomitic, and very silty and argillaceous grading to calcareous siltstone.

Hydrocarbon shows generally consisted of locally common very dull yellow green fluorescence with variably minor to common poor thin yellow white streaming and diffuse cut which decreases downsection. An unusual hydrocarbon show consisted of condensate and minor light oil over the shaker in the basal section which appears to be derived from a fracture zone at 953m. There is a minor lithological change at ~945m to a very quartzose, very well indurated, dense siltstone. Rare to trace fracture surfaces and sparry calcite fracture-fill were observed in this interval.

CONCLUSION: The Kindle Formation has no reservoir-quality intervals and hence, no economic potential at this locality.

MATTSON FORMATION

The Mattson Formation comprises 681m of sandstone with minor interbedded shale and carbonate. The section is strongly sand-dominated with generally minor carbonate & shale. Locally, carbonate becomes an important subordinate to dominant lithology (i.e., 1150-1205m). There are two basic types of sandstone in the Mattson succession that are generally representative of their respective environments; 1) very fine to fine grained quartzarenite to minor sublitharenite of shoreface affinity, 2) upper very fine to lower medium grained quartzarenite to sublitharenite of eolian origin. A third variable type of sandstone consists of very fine to medium grained quartzarenite to quartzose subwackes of transitional facies but are generally of no economic interest. It seems reasonable to assume various degrees of reworking of both eolian and shoreface deposits during subsequent transgressions and regressions, making distinction between the two types sometimes unclear.

Five separate lithofacies have been identified in the Mattson succession in this area; 1) storm-reworked shoreface, 2) muddy shoreface or lagoon & tidal flat, 3)) wave-reworked shoreface, foreshore and backshore, 4) coastal dune complex, and 5) interdune swamp & paleosoil. All five of these lithofacies appear to be represented at this location. The Mattson Formation at this locality correlates well with the UCEL Liard K-02 well, although some degree of stratigraphic thinning is apparent at I-02.

The Mattson succession can be broadly subdivided into two lithostratigraphic 'megasequences' at this locality; 1) a mixed marginal-marine/eolian section, generally dominated by shoreface deposits of Lithofacies #1 and Lithofacies #3 from 963-1423m (i.e., middle & upper Mattson), and 2) a terrestrial section dominated by eolian deposits and associated lithofacies from 1423-1644m (i.e., lower Mattson).

Shoreface Sandstone

The shoreface sandstone represents two different depositional controls in similar environments; 1) storm-reworked shoreface with associated minor carbonate interbeds, and 2) wave-reworked shoreface, foreshore and backshore. The primary distinction between the two appears to be the presence or absence of minor carbonate interbeds.

The shoreface sandstone is a typically very light grey to light brown, well-sorted quartzarenite with trace amounts of dark lithic grains which can occasionally be identified as chert. The quartz is predominantly clear and angular to sub-rounded. Variable degrees of reworking and input from eolian sources is apparent where there is a minor frosted quartz component. These sandstones are predominantly very fine to fine grained with the very fine grained fraction typically dominant. The sandstones are generally variably silty, ranging from trace to common, and locally grade to sandy siltstone in minor part. Argillaceous content is typically nil in these clean quartzarenites. Locally, the sandstone becomes slightly to moderately argillaceous and usually has argillaceous partings and laminae associated with it. Upsection (i.e., ~1273-1290m), some sandstone has a variably trace to minor component of outsized (i.e., medium to fine) unusual blue, partly tripolitic chert grains and grades to sublitharenite. This appears to be a regional provenance marker, as noted on previous wells (i.e., I-46/60-20-123-15 & b-43-K/94-O-14). Locally, the sandstone becomes a sublitharenite with an added minor component of carbonate grains and skeletal debris.

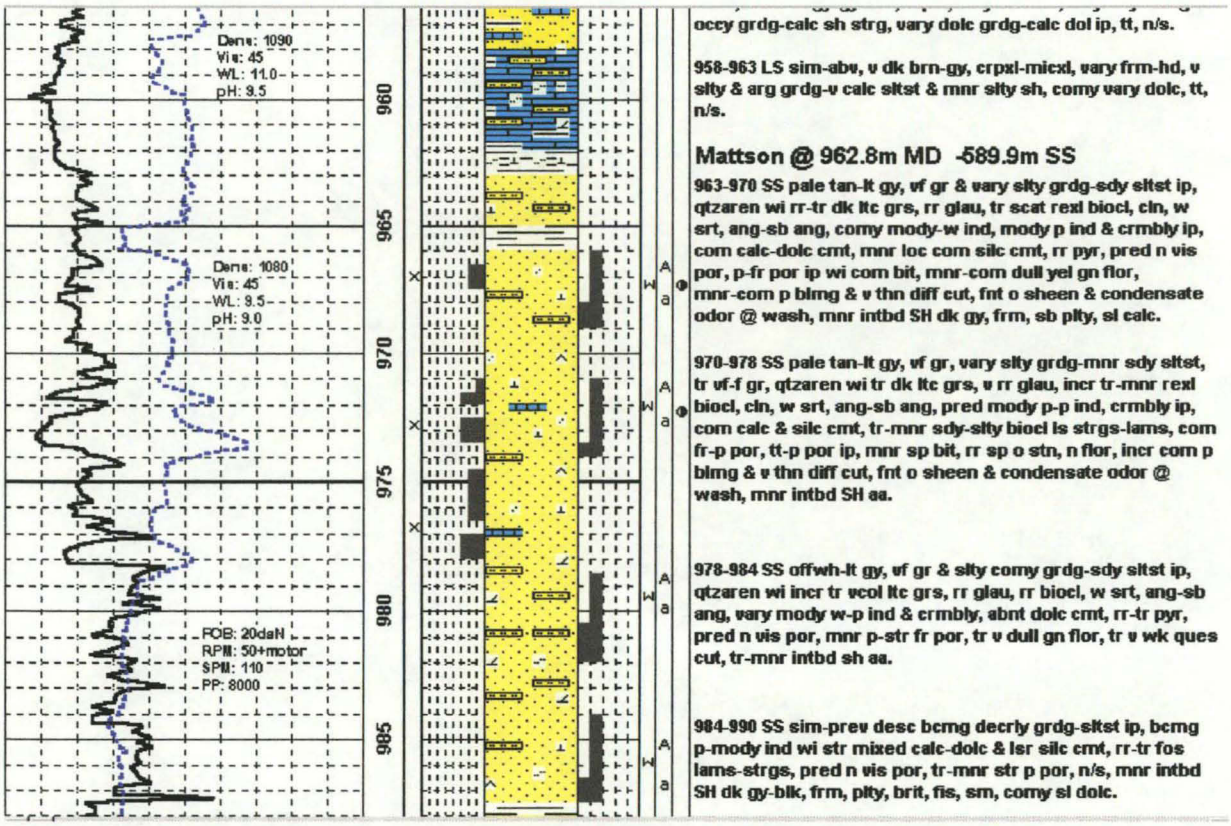


Figure 3. Striplog section showing typical Lithofacies #1 interval (shoreface) in the upper Mattson Formation. Note minor thin gas shows between 971-979 metres.

The shoreface sandstone is variably indurated throughout the succession, ranging from moderately well to poorly indurated & friable to crumbly. Visible porosity was commonly poor (i.e., tight to 3%), even in some poorly indurated sandstone where matrix porosity is likely to be at least a few percent. Sections with poor to fair and occasionally good porosity were observed; however, this better porosity was a generally minor component in consolidated cuttings. Samples often contained a variable disaggregated fraction, including sandstone that is generally tight in the writer's opinion, making porosity estimates somewhat problematic. To some degree at least, porosity distribution appears to be of a streaky to patchy nature, given the variability of visible porosity in cutting of the same sandstone. Cements are generally of mixed carbonate-siliceous type and locally wholly carbonate; upsection the carbonate cement is entirely calcareous (with one exception @ 978-984m) and is replaced by dolomitic cement at ~1140m. Permeability is estimated to be generally poor in much of this lithofacies, given the very fine-grained, silty nature of the sandstone and the typically common to abundant cements.

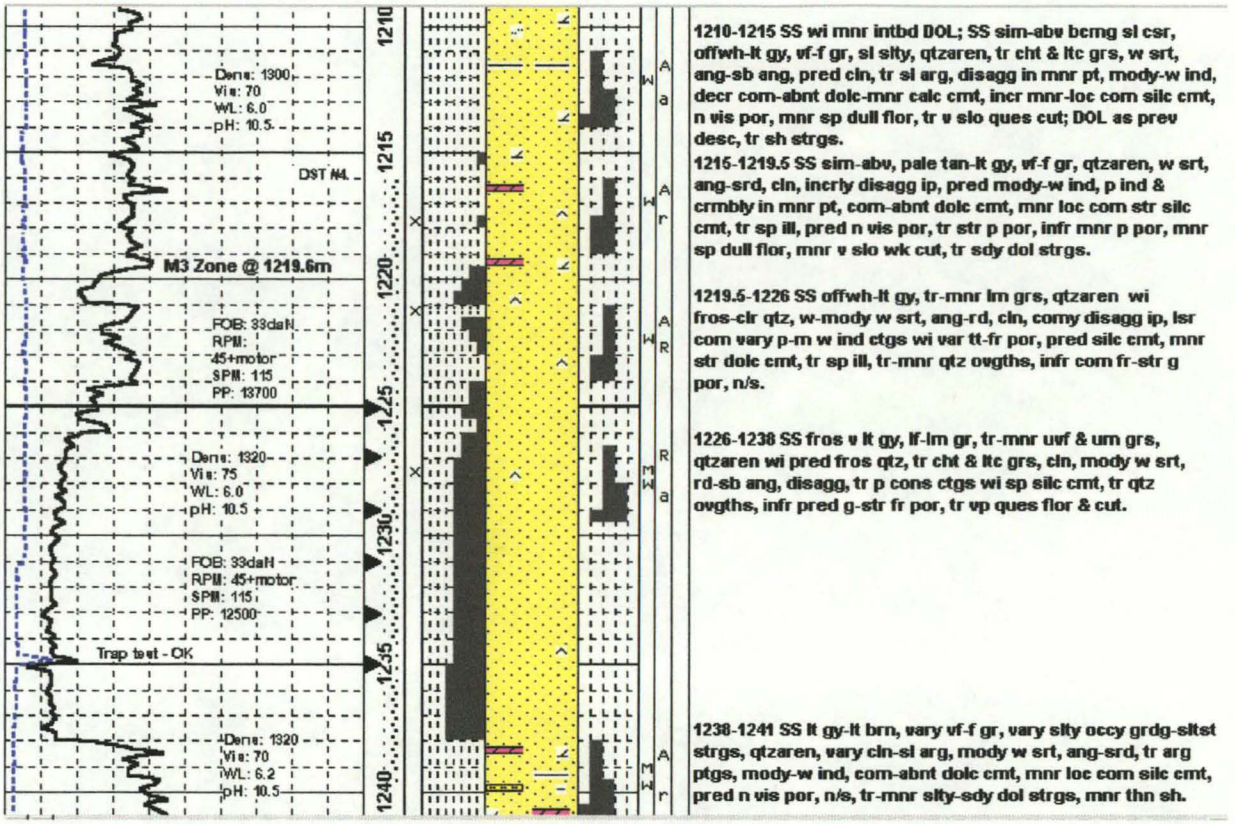


Figure 4. Striplog section showing typical Lithofacies #4 in the Mattson Formation. The eolian facies is overlain & underlain by shoreface sandstone & minor carbonate of Lithofacies #1.

Eolian Sandstone

Eolian sandstone can be usually distinguished from the shoreface quartzarenite by virtue of its coarser grain size and the presence of frosted quartz grains. The sandstone is typically very light grey to light brown, moderately to moderately well sorted with angular to rounded grains. A much greater degree of rounding than is seen in shoreface sandstone is apparent where grain surfaces have not been modified by quartz overgrowths. These sandstones tend to have less compositional maturity than shoreface sandstone due to a generally higher minor chert fraction. Compositionally, the sandstone consists of abundant quartz with a variably minor to common frosted component and trace to minor predominantly dark varicoloured chert and lithic grains, comprising quartzarenite to minor sublitharenite. These sandstones are typically very fine to lower medium grained with a fine median grain size. Trace to minor coarse grains are often present. The eolian sandstone tends to be poorly to very poorly indurated and very friable. They are commonly variably to wholly disaggregated in samples. Cements are generally minor and typically siliceous with a spotty to patchy distribution. Locally, spotty to patchy calcareous/dolomitic cement is a minor occurrence. Quartz overgrowths range from minor to common to locally abundant. Rare to trace interstitial pyrite was also commonly observed.

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The best porosity in the Mattson appears to be largely lithofacies-dependant and typically confined to eolian deposits. Porosity was variable in the generally minor consolidated fraction and ranged from typically fair to locally poor to good. Porosity was inferred to be predominantly fair to good in most eolian sandstone.

Diagenesis

Some general diagenetic associations are apparent with regard to the different lithofacies and are as follows; 1) Siliceous cementation is wholly or strongly dominant in eolian and related depositional environments (i.e., transitional sandstone in interdune swamp & paleosol environments), 2) Dolomitic-calcareous cementation appears to be largely confined to shoreface environments. Mixed siliceous-carbonate cements appears to be more common in shoreface environments downsection than purely carbonate cements which dominate the upper Mattson, indicating at least two stages of authigenic cementation.

There is a significant change in cement type at ~1423m, where dolomitic cement becomes a trace to minor component of the cements. This corresponds to the top of the M7 Zone which is an eolian deposit. Some of the very-fine to fine grained quartzarenite of apparent shoreface origin likely represents coastal plain environments for part or all of its depositional and diagenetic history, given the frequency of transgressive/regressive episodes. Consequently, some of the shoreface sandstone has likely had a mixed marine-terrestrial early diagenetic history which may account for the different diagenetic associations observed downsection (i.e., ~1423m onward), where sandstone is predominantly to wholly silica-cemented.

Common to locally abundant subhedral to euhedral quartz overgrowths are typically associated with the best porosity, primarily in eolian deposits. Traces of spotty kaolin/illite were observed in predominantly terrestrial deposits. Pyrite cements and nodules are commonly associated with Lithofacies #5 (terrestrial) where it occurs in massive, crystalline and disseminated forms. The presence of unusual very bituminous claystone and coaly to bituminous shale is a typical co-association.

Stylolitic networks observed in quartzarenite in the lower Mattson on the b-43-K/94-O-14 well (i.e., ~2250-2255m) were also found to occur at this locality. Traces of possible stylolites were first observed at ~1460m and common unequivocal stylolites were noted in the 1510m sample. The stylolites appear to occur sporadically throughout the remainder of the section.

Hydrocarbon Shows & DST Results

Hydrocarbon shows were generally very poor, typically consisting of variably minor to abundant, patchy to even, dull to bright yellow to yellow white to yellow green fluorescence and trace to minor thin, faint yellow white diffuse to streaming cut to questionable or no cut. Exceptions to the above occur in a number of intervals in the upper and middle Mattson, where shows were poor to fair; 1) 1015-1035m: minor to common oil at the wash, minor to common spotty to patchy dull yellow green fluorescence, minor to common poor slow streaming & thin diffuse cut; 2) 1059-1065m: common to abundant slightly patchy pale green to yellow green fluorescence, common fair, milky diffuse & streaming cut (minor oil sheen and strong condensate odour noted at wash); 3) 1080-1085m: traces of spotty bitumen, abundant moderate to bright pale yellow green fluorescence, common poor, thin diffuse cut; 4) 1275-1280m: minor to locally common spotty bitumen, common dull green fluorescence, common slow blooming & diffuse cut; 5) 1300-1305m: common dull green fluorescence with common poor thin diffuse & streaming cut (in a tight dolomite); and 6) 1383-1390m: common to abundant bitumen, common spotty dull to moderate fluorescence, common poor to fair streaming & diffuse cut.

A number of fair to good gas shows were recorded during the drilling of the Mattson; however, all of these were thin (i.e., 1-3 metres) An intermediate DST (#1) was run on the 1058-1068m interval; the preflow produced a strong air blow in 20 seconds with gas to surface in 2.75 minutes increasing throughout with a 2.5m flare. The VO had GTS immediately with a steady 3m flare. Flow rates indicate ~11,011 m^3/day from this zone. Liquid recovery was 180 metres of slightly oil-stained gasified mud. Three other DSTs were run in the Mattson with poor results; 1) DST #4 (1216-1240m – M3 Zone): weak air blow increasing to strong in 20 seconds becoming dead in 6 minutes (no GTS). The final flow had a strong blow immediately decreasing throughout to very weak air blow with no GTS. The liquid recovery was 711 metres of fresh water; 2) DST #5 (1134-1140m – M2 Zone): weak air blow 8cm into pail with no GTS. The final flow had a weak air blow to the bottom of the pail in 6 minutes with no GTS. The liquid recovery was 56 metres of fresh water; and 3) DST #6 (1075-1085m – M1 Zone): very weak air blow which remained throughout and no GTS. The final flow had a very weak air blow to the bottom of the pail in 15 minutes with no GTS. The liquid recovery was 197 metres of fresh water.

CONCLUSION: The Mattson has numerous fair to good reservoir-quality intervals at this locality and a number fair gas responses; however, most of the significant reservoir intervals either appear wet on induction logs or lack significant gas crossover. DSTs #4-6 showed the M1, M2 & M3 Zones (respectively) to be water-bearing. Despite these negative indicators, there are still some gas-bearing intervals present of commercial interest. This formation has fair economic potential at this location and good to excellent potential in the region.

GOLATA FORMATION

The Golata consists of ~65 metres of interbedded shale, sandstone and dolomite at this locality. The shales are varicoloured and range from black to very dark brown to rusty red/brown to grey green. The shale is typically platy and fissile and is variably dolomitic/calcareous in part to bituminous to carbonaceous in part. The dolomite is tight and ranges from very sandy to silty grading to dolomitic sand/siltstone to cryptocrystalline and variably cherty. Most of the sandstone consists of thin very fine grained & silty, tight subquartzarenite to quartzarenite that locally grades to siltstone. Downsection, the sandstone grades to sublitharenite with an added minor component of dolomitic grains. An unusually thick sandstone unit for the Golata in this region is found in the 1656-1664m interval. This unit had common poor to marginally fair porosity in the lower section of the unit. There were no hydrocarbon shows or significant gas response in the formation.

CONCLUSION: The Golata has no economic potential at this locality. The presence of a thick clastic unit with marginally fair reservoir characteristics suggests possible economic potential in the region.

DEBOLT FORMATION

Approximately 34 metres of the upper Debolt were penetrated at this location. The carbonate consisted of interbedded limestone and dolomite which are gradational in part. Textures are dominantly bioclastic packstone locally gradational to wackestone with some interbedded dolomite of indeterminate texture. Much of the calcareous dolomite has preserved a packstone to wackestone texture. Crinoid ossicles are the most common identifiable bioclast in both carbonate types and, locally at least, form the dominant bioclast (i.e., crinoidal packstone). Other minor to rare bioclasts include ostracodes & fusulinids.

Visible porosity was predominantly nil in these rocks; however, some fracture porosity was encountered in this section. Hydrocarbon shows in the section were typically very poor, consisting of minor to common dull yellow fluorescence with traces of very weak cut. One exception occurred in the ~1730-1740m interval where shows were slightly better with increasing minor poor thin diffuse cut. A DST (i.e., #3: 1709-1727m) was run across a fractured interval that had a very good, thin gas show of 3287 units. The preflow had a strong air blow immediately with GTS in 5 minutes and a lazy 3m flare. The VO had GTS immediately. Liquid recovery was 102m of gasified mud. Measured flow rates were low; 344m^3/day.

CONCLUSION: The upper Debolt has no commercial reservoir at this locality. The fractured gas unit is considered to have low potential for commercial production and is a poor candidate for reservoir enhancement.

LITHOLOGICAL DESCRIPTIONS

PARAMOUNT ET AL MOUNT COTY I-02
NWT I-02-60-20-123-30

311mm Surface Section

23-31	**TILL:** unconsolidated sand, very fine to lower medium grained, trace to minor upper medium grains, clear to frosted quartz with minor varicolored lithic grains, minor rusty quartz and K-spar grains, moderately well sorted, angular to subrounded, clean, **infer good porosity.**
31-40	**TILL:** unconsolidated sand, fine to coarse grained, trace to minor very coarse grains, quartzose as above with increasing common to abundant varicolored lithic grains (i.e., heterolithic grains including common granite), trace shale grains, moderately sorted, sub angular to rounded, clean, **infer good porosity.**
40-45	**TILL:** unconsolidated sand as previously described with increasing minor upper very coarse grains and occasional fine pebbles.
45-55	**TILL:** unconsolidated sand, predominantly fine to upper coarse grained, common very coarse grains and fine pebbles, pebbly to conglomeratic in part, quartzose as above, pebbles increasingly very heterolithic (including common granite), poorly sorted, sub angular to rounded, clean, **infer good porosity.**
55-63	**TILL:** unconsolidated sand, as previously described becoming slightly coarser, quartzose as above, pebbly to conglomeratic in part, trace argillaceous matrix, **infer decreasing good to streaky fair porosity.**
63-75	**TILL:** unconsolidated sand, upper fine to very coarse grained, trace fine pebbles, frosted to clear quartz (+ minor feldspar) with common varicolored lithic grains as above, moderately to moderately poorly sorted, angular to rounded, predominantly clean, trace argillaceous matrix, **infer predominantly good porosity.**
75-85	**TILL:** unconsolidated sand, medium to very coarse grained, minor fine grains, increasing common pebbles, conglomeratic, quartzose as above with polymict lithic clasts, poorly sorted, angular to rounded, predominantly clean, trace argillaceous matrix, **infer good to fair porosity.**

85-90.5 **TILL:** unconsolidated gravel, fine pebble, clast supported, medium to coarse grained sand matrix as above, very polymictic (abundant granitoid clasts, common siliciclastics, minor carbonates), poorly sorted, sub angular to rounded, **infer good to fair porosity.**

90.5-92.5 **TILL:** unconsolidated sand, fine to very coarse grained, frosted to clear quartz (+ minor feldspar) with common varicolored lithic grains as above, moderately to moderately poorly sorted, angular to rounded, **infer good porosity.**

LEPINE 92.5 m MD 280.5 m SS

92.5-102 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: light to medium grey, quartzose with minor scattered glauconite, trace dark specks, sandy in part occasionally grading to very fine sandstone laminations, **predominantly no visible porosity, trace scattered poor to rare fair porosity, rare to trace dead oil stain, minor oil sheen in wash, no fluorescence or cut;**

SHALE: dark grey, variably firm, sub blocky, minor sub platy, faintly micromicaceous, predominantly variably silty, common argillaceous to locally clean siltstone laminations and stringers, trace to locally minor glauconite.

102-110 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: as previously described;

SILTSTONE: medium to light grey, quartzose, variably glauconitic, trace dark specks, predominantly variably argillaceous, clean in minor part, well indurated with predominantly siliceous cement, minor streaky calcareous cement, common argillaceous partings, locally variably sandy occasionally grading to very fine sandstone laminations, **predominantly no visible porosity, no shows.**

110-115 **SHALE:** dark grey, variably firm, sub blocky, minor sub platy, faintly micromicaceous, predominantly variably silty, common argillaceous to locally clean siltstone laminations and stringers, trace to locally minor glauconite.

115-127 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: as previously described, medium to light grey, quartzose, variably glauconitic, trace dark specks, predominantly variably argillaceous, clean in minor part, well indurated with predominantly siliceous cement, minor streaky calcareous cement, common argillaceous partings, locally variably sandy occasionally grading to very fine sandstone laminations, **predominantly no visible porosity, no shows;**

SHALE: as previously described.

127-138 **SHALE WITH MINOR INTERBEDDED SILTSTONE:**

SHALE: dark grey, very firm to locally hard, sub blocky to sub platy, sub fissile in part, faintly micromicaceous, predominantly slightly to moderate silty, locally very silty in part grading to argillaceous siltstone laminations and stringers;

SILTSTONE: as previously described.

138-146 **SHALE:** dark grey, very firm to locally hard, sub blocky to sub platy, sub fissile in part, faintly micromicaceous, predominantly slightly to moderate silty, locally very silty in part grading to argillaceous siltstone laminations and stringers, minor interbedded siltstone as previously described.

146-151 **SHALE:** dark grey, moderately to very firm, sub blocky, minor sub platy, sub fissile in part, micromicaceous, commonly slightly to moderately silty, locally very silty with argillaceous siltstone laminations, trace scattered glauconite.

151-160 **SILTSTONE:** light to dark grey, quartzose, variably glauconitic, trace to minor scattered dark specks, occasional mica flake, moderately to well indurated, common siliceous cement, minor spotty to patchy calcareous cement, clean in part, commonly variably argillaceous, minor to common argillaceous partings and laminations, slightly sandy in part, predominantly no visible porosity, no shows, minor thin shale interbeds and stringers as above.

160-165 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: similar to previously described becoming predominantly variably argillaceous, clean in minor part, **no visible porosity, no shows;**

SHALE: as previously described becoming increasingly silty.

Shaker bypassed from 164 to 184m; samples of suspect quality.

165-180 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: dark grey, moderately to very firm, sub blocky, minor sub platy, sub fissile in part, micromicaceous, predominantly moderately silty, locally very silty with argillaceous siltstone laminations, trace scattered glauconite;

SILTSTONE: very similar to previously described, dark to light grey, quartzose, variably glauconitic, trace to minor scattered dark specks, moderately to well indurated, common siliceous cement, minor spotty calcareous cement, predominantly variably argillaceous, common argillaceous partings and laminations, clean in minor part, **no visible porosity, no shows.**

180-195 **SHALE AND SILTSTONE:** Inferred lithology, >95% Quaternary sand cavings in samples 185, 190 and 195m.

195-203 **SHALE:** dark grey, very firm to locally hard, sub blocky to sub platy, sub fissile in part, micromicaceous, predominantly moderately to very silty grading to argillaceous siltstone laminations and stringers in part, trace to minor scattered glauconite; minor very thin siltstone interbeds and stringers, dark to light grey, quartzose, variably glauconitic, trace to minor scattered dark specks, moderately to well indurated, common siliceous cement, minor spotty calcareous cement, predominantly variably argillaceous, common argillaceous partings and laminations, clean in minor part, **no visible porosity, no shows,** abundant Quaternary sand cavings in sample.

203-210 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: as previously described;

SILTSTONE: similar to previously described, light to dark grey, quartzose with minor dark specks, predominantly slightly to moderately glauconitic, moderately to well indurated, common streaky to patchy siliceous and lesser calcareous cement, predominantly variably argillaceous, clean in minor part, common argillaceous partings and laminations, rare to trace pyrite, **predominantly no visible porosity, no shows.**

210-221 **SHALE:** as previously described, dark grey, very firm to locally hard, sub blocky to sub platy, sub fissile in part, micromicaceous, predominantly moderately to very silty grading to argillaceous siltstone laminations and stringers in part, trace to minor scattered glauconite, minor thin siltstone interbeds and stringers as above.

221-225 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: as previously described;

SILTSTONE: as previously described becoming increasingly clean in part with decreasing trace to minor scattered glauconite, **no visible porosity, no shows.**

225-240 **SHALE WITH MINOR INTERBEDDED SILTSTONE:**

SHALE: very similar to previously described becoming increasingly very silty in part, dark grey, very firm to locally hard, sub blocky to sub platy, sub fissile in part, micromicaceous, predominantly moderately to very silty increasingly grading to argillaceous siltstone laminations and stringers in part, trace to minor scattered glauconite;

SILTSTONE: dark to light grey, quartzose with minor dark specks, predominantly slightly to moderately glauconitic, moderately to well indurated, common siliceous and lesser streaky to patchy calcareous cement, predominantly variably argillaceous, clean in minor part, common argillaceous partings and laminations, **predominantly no visible porosity, no shows.**

Shaker bypassed from 235 to 248m; samples of suspect quality.

240-247 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: dark grey, very firm to locally hard, sub blocky, minor sub platy, micromicaceous, variably silty, commonly variably silty grading to argillaceous siltstone, trace scattered glauconite;

SILTSTONE: light to dark grey, quartzose with trace dark specks, slightly to moderately glauconite, occasional mica flake, predominantly variably argillaceous grading from above in part, clean in minor part, trace slightly sandy, moderately to well indurated, common siliceous and minor to locally common streaky calcareous cement, **no visible porosity, no shows.**

247-255 **SHALE:** dark grey, very firm to hard, sub blocky to sub platy, micromicaceous, moderately to very silty with minor to common argillaceous to occasionally clean siltstone laminations and stringers, trace scattered glauconite, rare sideritic siltstone laminations.

255-270 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: dark grey, moderately to very firm, sub blocky to sub platy, micromicaceous, predominantly moderately to very silty grading to argillaceous siltstone in part, common argillaceous to occasionally clean siltstone laminations and stringers, trace to minor scattered glauconite;

SILTSTONE: dark to light grey, commonly grading from shale above, quartzose with trace dark specks, variably glauconitic, occasional mica flake, predominantly variably argillaceous, common argillaceous partings, moderately to well indurated with common siliceous and minor calcareous cement, **no visible porosity, no shows.**

270-275 **SHALE:** dark grey, variably firm, sub platy to sub blocky, sub fissile, faintly micromicaceous, commonly slightly silty, variably moderately to very silty in part with minor argillaceous to occasionally clean siltstone laminations and stringers, decreasing trace scattered glauconite.

275-285 **SHALE:** dark grey, variably firm, sub blocky to sub platy, sub fissile in part, micromicaceous, commonly moderately to very silty grading to argillaceous siltstone laminations and stringers in part, slightly silty in minor part, trace scattered glauconite, trace siderite stringers; minor very thin siltstone interbeds and stringers, commonly variably argillaceous grading from shale above, light to medium grey to brown in part and clean with abundant tight calcareous cement, quartzose and variably glauconitic as above, **tight, no shows.**

285-295 **SHALE WITH MINOR INTERBEDDED SILTSTONE:**

SHALE: as previously described with minor siderite medium to dark brown, very hard, dense, slightly silty in part, fractured with calcite fracture fill;

SILTSTONE: very similar to above, dark to light grey, commonly grading from shale above, quartzose with trace dark specks, variably glauconitic, occasional mica flake, predominantly variably argillaceous, clean in minor part, common argillaceous partings, moderately to well indurated with siliceous and minor spotty to streaky calcareous cement, **no visible porosity, no shows.**

295-300 **SHALE:** dark grey, variably firm to locally hard, sub blocky to sub platy, sub fissile in part, faintly to moderately micromicaceous, brittle in part, variably silty with minor argillaceous siltstone laminations and stringers, slightly silty in minor part, decreasing trace scattered glauconite, decreasing rare to trace siderite stringers.

300-310 **SHALE:** very similar to previously described, dark grey, variably firm to locally hard, sub platy to sub blocky, sub fissile, micromicaceous, brittle in part, predominantly variably moderate to very silty with common argillaceous to occasionally clean siltstone laminations and stringers, slightly silty in part, trace scattered glauconite, slightly increasing trace siderite as above.

310-317 **SHALE:** as previously described with increasing trace to minor fractured Siderite as described above.

317-330 **SHALE:** similar to previous description, dark grey, variably firm to locally hard, sub platy to sub blocky, sub fissile, micromicaceous, brittle in part, predominantly variably moderately to very silty with common argillaceous to occasionally clean siltstone laminations and stringers, slightly silty in part, decreasing trace scattered glauconite, decreasing trace siderite as above becoming increasingly silty and rarely fractured, grades to sideritic siltstone laminations to stringers, rare ferruginous laminations.

330-340 **SHALE:** dark grey, variably firm, sub platy to sub blocky, brittle in part, sub fissile, micromicaceous, predominantly slightly to moderately silty, locally very silty in minor part, trace to minor argillaceous siltstone laminations, decreasing rare to trace glauconite, rare framboidal pyrite.

340-350 **SHALE:** as previously described with slightly increasing argillaceous siltstone laminations, dark grey, variably firm, sub platy to sub blocky, brittle in part, sub fissile, micromicaceous, predominantly slightly to moderately silty, locally very silty in minor part, slightly increasing trace to minor argillaceous siltstone laminations, rare to trace glauconite.

350-357 **SHALE:** dark grey to black, variably firm, sub platy to sub blocky, brittle in part, sub fissile to fissile, micromicaceous, predominantly slightly to moderately silty, decreasing trace to minor variably argillaceous siltstone laminations, variably carbonaceous in part, decreasing rare scattered glauconite.

357-365 **SHALE:** dark grey, firm, predominantly sub platy, minor sub blocky, commonly brittle, sub fissile to fissile, faintly to moderately micromicaceous, commonly slightly silty, moderately to very silty in part with increasing minor variably argillaceous slightly glauconitic siltstone laminations and stringers, rare glauconite.

365-376.6 **SHALE:** as previously described, dark grey, firm, predominantly sub platy, minor sub blocky, commonly brittle, sub fissile to fissile, faintly to moderately micromicaceous, commonly slightly silty, moderately to very silty in part with increasing minor variably argillaceous slightly glauconitic siltstone laminations and stringers, rare glauconite.

SCATTER 376.6 m MD (-3.7 m SS)

376.6-390 **SANDSTONE:** light grey, very fine grained and variably silty grading to siltstone in part, quartzose with common black and dark brown specks, moderately glauconitic, well sorted, angular to sub angular, predominantly clean, variably argillaceous in minor part, minor to locally common argillaceous laminations and partings, predominantly moderately to moderately well indurated, moderately poorly indurated in part, predominantly siliceous cement, trace spotty calcareous cement, **predominantly no visible porosity, no shows;** minor very thin shale interbeds and stringers, dark grey variably firm to occasionally soft, sub platy to platy, brittle in part, fissile to sub fissile, faintly to moderately micromicaceous, predominantly slightly silty.

390-400 **SANDSTONE:** light grey, very fine grained, quartzose with minor to common black to brown specks and lithic grains, moderately glauconitic, trace mica flake, well sorted, angular to sub angular, predominantly moderately to moderately well indurated, poorly to moderately poorly indurated and crumbly in part, siliceous and trace spotty calcareous cement, trace quartz overgrowths, variably silty occasionally grading to sandy siltstone laminations to stringers, predominantly clean, slightly to moderately argillaceous in part, minor argillaceous laminations and partings, **common tight to 2% porosity, minor to common scattered 3 to 5% porosity, no shows, trace medium brown very fine sandstone with tight siliceous cement and very dull fluorescence with rare spotty streaming cut,** trace shale stringers as above.

400-405 **SANDSTONE:** similar to previous description, **predominantly tight to 2% porosity, trace very well indurated brown sandstone stringers with abundant tight siliceous cement and trace dull fluorescence, no cut.**

405-415 No samples caught.

415-420 **SANDSTONE:** very similar to above, light grey, quartzose with minor to common dark specks and lithic grains, moderately glauconitic, rare to trace mica flakes, well sorted, angular to sub angular, predominantly moderately indurated, variably moderately poorly to moderately well indurated in part, variably crumbly in minor part, siliceous and trace spotty to patchy calcareous cement, trace quartz overgrowths, predominantly clean, variably silty, slightly to moderately argillaceous in part, minor argillaceous laminations and partings, **predominantly tight to 2% porosity, minor scattered 3 to 5% porosity, no shows,** trace shale laminations to stringers as above.

420-428 **SANDSTONE:** as previously described becoming increasingly argillaceous in minor part, increasing minor argillaceous laminations, **predominantly tight to 2% porosity, rare very dull fluorescence, no cut,** trace to minor medium brown very fine grained tight sandstone with abundant siliceous to sideritic cement, trace medium brown hard dense siderite.

428-438 **SANDSTONE:** predominantly light grey, trace to minor light brown, quartzose with minor to common dark specks and lithic grains, moderately glauconitic, rare mica flake, well sorted, angular to sub angular, commonly moderately to moderately well indurated, moderately poorly indurated in part, siliceous and trace spotty calcareous cement, rare quartz overgrowths, predominantly clean, slightly to moderately silty, occasional siltstone laminations, slightly to moderately argillaceous in minor part, increasing minor argillaceous laminations and partings, **predominantly tight to 2% porosity, minor scattered 3 to 5% porosity, rare to trace very dull fluorescence, trace very weak very questionable cut,** increasing minor medium brown very fine grained tight sandstone with abundant siliceous to sideritic cement, increasing trace to minor hard dense siderite with rare fracture, trace shale laminations to stringers as above.

438-445 **SANDSTONE:** very similar to previous description becoming increasingly silty grading to siltstone in part, increasingly variably argillaceous in part, increasing minor siliceous to sideritic sandstone and siderite as above, **predominantly tight to 2% porosity, no shows,** minor thin interbedded shale dark grey, platy, fissile, brittle, slightly silty and faintly micromicaceous.

445-450 **SANDSTONE:** light grey, trace light brown, quartzose and moderately glauconitic as above, rare mica flake, well sorted, angular to sub angular, commonly moderately to moderately well indurated, moderately poorly indurated in part, siliceous and trace spotty calcareous cement, predominantly clean, slightly to moderately silty locally grading to minor siltstone, slightly to moderately argillaceous in minor part, increasing minor argillaceous laminations and partings, **predominantly tight to 2% porosity, trace scattered 3 to 5% porosity, no shows,** decreasing trace medium brown siliceous to sideritic sandstone and siderite as above, trace shale laminations to stringers as above.

450-466 **SANDSTONE:** predominantly light grey, medium grey and variably argillaceous in part, trace light brown, quartzose with minor to common dark specks and lithic grains, moderately glauconitic, rare to trace mica flakes, well sorted, angular to sub angular, slightly to moderately silty, occasional silty laminations, increasing minor argillaceous partings and laminations, commonly moderately to moderately well indurated, moderately poorly indurated and variably crumbly in part, siliceous cement, decreasing rare to trace spotty calcareous cement, **tight to 2% porosity,** decreasing trace siliceous to sideritic sandstone and siderite laminations to stringers, trace to minor shale as above.

466-478 **SANDSTONE WITH MINOR INTERBEDDED SHALE:**

SANDSTONE: medium to light grey, very fine grained and variably silty grading to siltstone in part, quartzose as above, moderately to locally very glauconitic, well sorted, angular to sub angular, commonly variably argillaceous, clean in minor part, common to abundant argillaceous partings and laminations, predominantly moderately to moderately well indurated, siliceous cement, **tight to 2% porosity, rare to trace scattered poor porosity, no shows,** increasing trace siliceous to sideritic sandstone and siderite laminations to stringers as above;

SHALE: dark grey, firm, sub platy to sub blocky, faintly to moderately micromicaceous, slightly to very silty grading to very argillaceous siltstone stringers, trace to locally abundant glauconite.

478-486 **SANDSTONE WITH MINOR INTERBEDDED SHALE:**

SANDSTONE: as previously described becoming light brown in minor part with slightly patchy commonly dead oil stain, no to trace very dull fluorescence with minor poor slow blooming and very thin diffuse cut, predominantly tight to 2% porosity, trace to minor scattered poor porosity, increasing trace to minor siliceous to sideritic sandstone and siderite stringers as above;

SHALE: as previously described.

486-500 **SANDSTONE:** light to medium brown, very fine grained, quartzose with minor dark specks and lithic grains, moderately glauconitic, rare to trace mica flakes, well sorted, angular to sub angular, variably silty, occasional silty laminations, predominantly clean, slightly to moderately argillaceous in minor part, predominantly moderately to moderately poorly indurated, commonly variably crumbly, siliceous cement and trace spotty calcareous cement, **predominantly tight to 2% porosity, trace to minor scattered 3 to 5% porosity, slightly patchy to even partly dead oil stain, minor spotty to patchy very dull fluorescence, common poor thin yellow white streaming and very thin diffuse cut,** decreasing trace siliceous to sideritic sandstone and siderite laminations as above, minor thin interbedded shale as above.

500-508 **SANDSTONE: as previously described with increasing minor scattered 3 to 5% porosity, rare cutting with 5 to 7% porosity and spotty bitumen, oil stain and fluorescence as above,** slightly increasing common cut as above, minor interbedded shale, as above.

508-514 **SANDSTONE:** light to medium brown, very fine grained, quartzose with minor dark specks and lithic grains, moderately glauconitic, rare to trace mica flakes, well sorted, angular to sub angular, variably silty, occasional silty laminations, predominantly clean, slightly to moderately argillaceous in minor part, predominantly moderately to moderately poorly indurated, commonly variably crumbly, siliceous cement and trace spotty calcareous cement, trace interstitial pyrite, trace quartz overgrowths, **common tight to 2% porosity, minor to common scattered 3 to 5% porosity, increasing trace 5 to 7% porosity, slightly patchy to even partly dead oil stain, minor to locally common spotty bitumen, common dull yellow to yellow green fluorescence, common to abundant poor to fair yellow streaming and diffuse cut,** decreasing minor thin interbedded shale as above.

222mm Main Section

514-517 **SANDSTONE:** as previously described.

GARBUTT 517.0 m MD (-144.1 m SS)

517-526 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: medium to dark grey brown, quartzose with common dark specks, rare to trace glauconite, predominantly variably argillaceous, common argillaceous partings, trace sandy, moderately to well indurated, siliceous cement with variable argillaceous matrix, **tight to 2% porosity, no fluorescence, common poor slow streaming and diffuse cut;**

SHALE: dark grey, very firm, blocky to sub platy, sub fissile in part, variably silty and micromicaceous, rare framboidal pyrite.

526-533 **SILTSTONE:** similar to above, medium to dark grey brown, quartzose with minor to common dark specks, slightly to moderately glauconitic, trace mica flakes, rare to trace carbonaceous debris, predominantly variably slightly to very argillaceous occasionally grading to very silty shale laminations and stringers, clean in minor part, minor argillaceous partings, locally sandy grading to minor silty sandstone stringers to laminations, moderately to well indurated, siliceous cement and argillaceous matrix/cement, **predominantly tight to 2% porosity, minor streaky 2 to 5% porosity, rare spotty bitumen, no fluorescence, trace to minor very poor slow streaming and diffuse cut,** trace to minor shale stringers as above.

533-539 **SILTSTONE: as previously described with decreasing trace 2 to 5% porosity and decreasing trace cut as above,** increasing minor thin shale interbeds and stringers to laminations as above.

539-548 **SILTSTONE WITH MINOR INTERBEDDED SHALE:**

SILTSTONE: similar to above, medium to dark grey brown, quartzose with minor to common dark specks, slightly to moderately glauconitic, trace mica flakes, rare to trace carbonaceous debris, predominantly variably slightly to very argillaceous occasionally grading to very silty shale laminations and stringers, common argillaceous partings, decreasingly trace to minor sandy, moderately to well indurated, siliceous cement and argillaceous matrix/cement, **predominantly tight to 2% porosity, no fluorescence, decreasing trace very poor slow cut as above;**

SHALE: dark grey, sub blocky to sub platy, variably silty and micromicaceous, sub fissile.

548-561 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: similar to above, medium to dark grey brown, quartzose with minor to common dark specks, slightly to moderately glauconitic, trace mica flakes, rare to trace carbonaceous debris, predominantly variably argillaceous occasionally grading to very silty shale laminations and stringers, common to abundant argillaceous partings, trace sandy, moderately to well indurated, siliceous cement and argillaceous matrix/cement, **predominantly tight to 2% porosity, no fluorescence, decreasing rare very poor slow cut as above;**

SHALE: as previously described.

561-570 **SILTSTONE AND SHALE:**

SILTSTONE: dark to medium grey and grey brown, quartzose with minor to common dark specks, decreasingly slightly to moderately glauconitic, trace mica flakes, rare carbonaceous debris, predominantly variably argillaceous, trace clean, common to abundant argillaceous partings and laminations, moderately to well indurated, siliceous cement and argillaceous matrix/cement, **tight to 2% porosity, no shows;**

interbedded and interlaminated SHALE: similar to above, dark grey, variably firm, sub platy to platy, minor sub blocky, fissile to sub fissile, variably silty and micromicaceous grading to very argillaceous siltstone in part.

570-580 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: as previously described, dark to medium grey and grey brown, quartzose with minor to common dark specks, decreasingly slightly to moderately glauconitic, trace mica flakes, rare carbonaceous debris, predominantly variably argillaceous, trace clean, common to abundant argillaceous partings and laminations, moderately to well indurated, siliceous cement and argillaceous matrix/cement, **tight to 2% porosity, no shows;**

interbedded and interlaminated SHALE: as above.

580-586 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: similar to above, dark grey, variably firm, sub platy to platy, fissile to sub fissile, micromicaceous, slightly to very silty commonly grading to and interlaminated with argillaceous siltstone;

SILTSTONE: predominantly dark grey, quartzose, minor dark specks, predominantly slightly glauconitic, variably slightly to very argillaceous grading from shale in part, abundant argillaceous partings and laminations, moderately to well indurated, siliceous and argillaceous matrix to cement, rare spotty calcareous cement, **tight to 2% porosity, no shows.**

586-595 **SILTSTONE WITH INTERBEDDED SHALE:**

SILTSTONE: as previously described becoming decreasingly argillaceous in part, **tight to 2% porosity, no shows;**

SHALE: as previously described.

595-604 **SHALE WITH INTERBEDDED SILTSTONE:**

SHALE: dark grey, variably firm to locally hard, brittle in part, platy to sub platy, micromicaceous, fissile to sub fissile, smooth and non-silty in part, slightly to very silty in part with argillaceous siltstone laminations, rare framboidal pyrite;

SILTSTONE: dark to medium grey and grey brown, quartzose with minor to common dark specks, predominantly slightly glauconitic, trace mica flakes, predominantly slightly to moderately argillaceous, abundant argillaceous partings, trace sandy, variably moderately poor to very well indurated, predominantly siliceous and variable argillaceous matrix/cement, trace to locally minor streaky calcareous cement, **tight with streaky poor porosity, no fluorescence, trace to minor very poor slow blooming cut.**

604-616 **SHALE WITH MINOR INTERBEDDED SILTSTONE:**

SHALE: as previously described;

SILTSTONE: as previously described becoming tight with no shows.

616-625 **SHALE:** dark grey, variably firm, brittle in part, platy to sub platy, fissile, commonly smooth and faintly micromicaceous, variably silty in part with minor siltstone laminations, minor thin siltstone interbeds and stringers to laminations as above.

625-637 **SHALE:** as previously described, dark grey, variably firm, brittle in part, platy to sub platy, fissile, commonly smooth and faintly micromicaceous, variably silty in part with minor siltstone laminations, minor thin siltstone interbeds and stringers to laminations as above.

GARBUTT RADIOACTIVE ZONE 537.2 m MD (-264.3 m SS)

637-656 **SHALE:** dark grey, firm, brittle in part, platy to sub platy, minor sub blocky, fissile to sub fissile, predominantly smooth and faintly micromicaceous, slightly to moderately silty in minor part, trace siltstone laminations and stringers, rare cream to light grey slightly tuffaceous bentonite.

BULLHEAD 656.5 m MD (-283.6 m SS)

656-666 **SHALE:** similar to above, dark grey, minor black, variably firm to locally soft, platy, brittle in part, fissile, predominantly smooth and faintly micromicaceous, slightly silty in minor part with trace argillaceous siltstone laminations, carbonaceous in part, rare to trace carbonaceous to coaly debris, very rare root cast, increasing rare to trace cream to tan bentonite, slightly tuffaceous in part.

666-675 **SHALE:** dark grey, firm to locally soft, platy to sub platy, minor sub blocky, brittle in part, fissile to sub fissile, predominantly smooth and faintly micromicaceous, slightly silty in minor part with trace argillaceous siltstone laminations, decreasingly carbonaceous in minor part, decreasing rare bentonite as above.

675-683 **SHALE:** similar to above, dark grey, variably firm to locally soft, platy to sub platy, minor sub blocky, brittle in minor part, fissile to sub fissile, commonly smooth and faintly micromicaceous, slightly silty in part, increasing trace argillaceous siltstone laminations, increasingly variably carbonaceous in minor part, increasing trace cream to light grey slightly tuffaceous bentonite as above, rare pyrite, rare to trace siderite.

683-695 **SHALE:** dark grey to black, variably firm to occasionally soft, commonly brittle, platy to sub platy, fissile, predominantly smooth and faintly micromicaceous, slightly silty in part, variably carbonaceous in part, trace scattered carbonaceous to coaly debris, trace pyrite nodules, trace bentonite as above, increasing rare to trace siderite.

695-705.5 **SHALE:** dark grey to minor black, firm to occasionally soft, platy to sub blocky, brittle in part, fissile to sub fissile, commonly smooth and faintly micromicaceous, slightly silty in part, carbonaceous in minor part, trace pyritic, slightly sub waxy in part, rare to trace pyritized fibrous coal fragments, trace pyrite nodules, increasing trace siderite occasionally grading to sideritic siltstone laminations, very rare bentonite.

CHINKEH SILTSTONE 705.5 m MD (-332.6 m SS)

705.5-708.5 **SILTSTONE:** predominantly dark grey to grey brown, quartzose, moderately to locally very glauconitic, predominantly moderately to very argillaceous grading to silty shale stringers, moderately poor to moderately well indurated, siliceous and spotty dolomitic cement with variable argillaceous matrix/cement, **tight, no shows.**

CHINKEH SAND 708.5 m MD (-335.6 m SS)

708.5-717.5 **SANDSTONE:** light tan to very light grey, lower fine to upper fine grained, trace upper very fine and lower medium grains, very quartzose with trace to minor glauconite and rare lithic grains (sub-quartzarenite), well to very well sorted, angular to sub angular, variable induration; commonly poor indurated and crumbly, moderately indurated in part, disaggregated in part, minor to locally common spotty to patchy siliceous cement, trace to minor spotty dolomitic cement, common to abundant quartz overgrowths, trace to locally minor spotty illite, **variable porosity; predominantly fair to good (variable 8 to 14%), minor to common 4 to 7% porosity, trace spotty dead oil stain, no cut or fluorescence.**

717.5-719 **SANDSTONE:** as previously described becoming slightly silty with increasing minor very fine grains, increasingly moderately to moderately well indurated, increasing spotty dolomitic cement, decreasing minor quartz overgrowths, **decreasing porosity; common poor to fair (4 to 7%), minor to common tight to 3% porosity, no shows,** trace to minor non-glauconitic quartzarenite with common coaly partings at base.

TRIASSIC 719.0 m MD (-346.1 m SS)

719-736 **SHALE WITH MINOR INTERBEDDED SILTSTONE:**

SHALE: predominantly medium grey, minor medium to rusty brown, predominantly firm and brittle, soft in minor part, platy to sub platy, fissile, predominantly smooth and very faintly micromicaceous, very silty and micromicaceous in minor part grading to argillaceous siltstone stringers;

SILTSTONE: light to medium grey, quartzose with trace to minor dark specks, variably micaceous in part with occasional very micaceous partings, clean to variably argillaceous, predominantly well to very well indurated, predominantly siliceous cement, minor locally common streaky dolomitic cement, **tight, no shows.**

736-741 **SHALE:** medium grey, variably hard to soft, platy to sub platy, fissile, brittle in part, predominantly smooth and faintly micromicaceous, locally variably silty with argillaceous siltstone laminations and stringers, slightly sub waxy in part, trace scattered carbonaceous debris;

minor interbedded SILTSTONE: light to medium grey, quartzose with trace to minor carbonaceous specks, slightly to moderately micaceous, occasional very micaceous partings, predominantly moderately to very well indurated, common to abundant dolomitic cement, minor siliceous cement, **tight/no shows.**

741-750 **SHALE:** mixed; common medium grey as above becoming slightly dolomitic in minor part, interbedded and interlaminated with common red brown to maroon shale firm, locally hard to soft, platy to sub blocky, commonly fissile to sub fissile, brittle in part, predominantly smooth and faintly micromicaceous, slightly to moderately silty in minor part, slightly sub waxy, slightly bentonitic in part, commonly slightly to moderately dolomitic.

750-757 **SHALE:** predominantly medium to dark grey to brown grey, minor red brown as above, predominantly firm, locally hard to soft, variably platy to sub blocky, brittle in part, commonly fissile to sub fissile, carbonaceous in part, smooth and sub waxy in part, commonly variably silty in part with increasing minor to common argillaceous siltstone stringers, variably faintly to moderately micromicaceous, trace to minor slightly dolomitic, trace to minor siltstone as above.

757-770 **SHALE:** mixed; rusty red to brown, maroon, commonly firm to hard, slightly to moderately soft in part, brittle in part, commonly platy to sub platy and fissile, predominantly smooth and faintly micromicaceous, variably silty in minor part, commonly moderately to very dolomitic, variably bentonitic in part with common red clay at wash, interbedded and interlaminated with ~25% light to medium grey shale firm to hard, platy to sub blocky, commonly brittle, commonly fissile, commonly variably silty with common argillaceous to clean siltstone stringers as above, smooth and faintly micromicaceous in part, slightly to locally moderately dolomitic in part.

770-780 **SHALE:** very similar to above becoming 90% rusty red to brown, decreasingly dolomitic in part and commonly non-dolomitic, increasingly variably bentonitic in part with abundant red clay at wash, decreasing minor light to medium grey shale interbeds as above.

780-785 **SHALE:** rusty red to brown, maroon, commonly firm to hard, slightly to moderately soft in part, brittle in part, commonly platy to sub platy and fissile, predominantly smooth and faintly micromicaceous, variably silty in minor part, predominantly non-dolomitic, variably bentonitic in part with common red clay at wash, rare to trace variably tuffaceous cream bentonite, trace to minor medium grey shale stringers as above.

785-791 **SHALE:** mixed; predominantly as previously described with ~20% medium grey shale similar to above, firm to hard, platy, commonly brittle, fissile, predominantly smooth and faintly micromicaceous, slightly sub waxy, very rare slickensides.

BELLOY 791.0 m MD (-418.1 m SS)

791-800 **CHERT:** predominantly dark brown to brown grey, commonly hard and dense, variably firm to soft and crumbly in part, trace translucent, slightly to moderately glauconitic, faintly spicular in minor part, variably silty to sandy in part occasionally grading to very cherty sandstone, common granular texture on cuttings, variably argillaceous in part grading to cherty glauconitic to slightly phosphatic shale, slightly dolomitic in part, trace soft black phosphatic glauconitic shale stringers, trace locally abundant pyritized spicules and worm burrows, rare to trace sandy pyrite nodules, infer minor poor to fair locally fracture porosity, trace fracture surfaces with bitumen linings, rare to trace poor micro vugs with spotty bitumen, **trace to minor dull yellow fluorescence, minor to common poor slow yellow white streaming cut.**

800-806 **CHERT:** tan to light grey, predominantly variably silicified siltstone and very fine grained sandstone, slightly to moderately glauconitic, very hard dense and translucent in part, commonly variably hard to firm and slightly crumbly, locally slightly to moderately spicular in minor part, predominantly very silty to sandy grading to very cherty siltstone to sandstone, common granular texture, slightly dolomitic in part, moderately to very dolomitic in minor part, increasing trace fracture surfaces with bitumen linings, **minor poor microvug porosity with common bitumen, common moderate yellow green fluorescence, common weak slow streaming and very thin diffuse cut.**

806-810 **SANDSTONE:** dark grey, lower fine to lower medium grained, trace upper very fine grains, lithic wacke with common clear to yellow to orange quartz and minor to common varicolored lithic grains, common to abundant argillaceous to slightly phosphatic matrix, grades to variably sandy slightly to moderately phosphatic to cherty mudstone in part, moderately poorly sorted, sub angular to sub rounded, variably disaggregated in part, very well to moderately poorly indurated, variably silicified in part, siliceous cement, minor dolomitic cement, common to locally abundant epidote? blebs to microvug linings and rare crystals, **predominantly tight, minor locally poor to fair predominantly ineffective microvug porosity, rare to trace fracture, no shows.**

810-815 **SANDSTONE:** predominantly as above increasingly grading to minor to common variably cherty mudstone and chert, slightly increasing glauconitic and decreasing epidote?, trace to minor dark grey to black platy phosphatic to bituminous shale stringers, **predominantly tight, no shows.**

815-820 **CHERT:** variable: dark brown to grey, rusty red/orange, common to very abundant glauconite, commonly variably hard to slightly soft, crumbly in part, hard and dense in minor part, common granular texture, commonly silty to locally sandy in part, variably silicified in part grading to variably cherty phosphatic and hematitic mudstone, variably dolomitic in part with minor locally common dolomite rhombs, trace to minor black variably phosphate shale, **tight, no shows.**

820-825 **CHERT:** predominantly as above with decreasing trace to minor hematitic mudstone to chert, minor light grey dense silty to sandy chert grading to cherty siltstone to sandstone, minor medium to dark grey variably silicified fine grained glauconitic lithic wacke grading to sandy chert in part, rare to trace fracture surfaces with bitumen, rare sparry calcite fracture fill, **no shows.**

825-830 **SANDSTONE:** upper very fine to upper fine grained, trace to minor lower medium grains, abundant frosted to yellow/orange quartz with minor varicolored lithic grains, trace to minor glauconite, well sorted, sub angular to subrounded, predominantly disaggregated, trace to minor clean consolidated cuttings with common to abundant tight siliceous cement and minor to common dolomitic cement, trace argillaceous matrix on loose grains, minor spotty to patchy limonitic? matrix/cement, **infer fair porosity in part, tight to poor porosity in part, no shows.**

830-834 **SANDSTONE:** similar to previously described becoming increasingly consolidated in minor part, argillaceous and cherty in part, **infer poor to fair porosity with tight streaks, no shows.**

834-839 **CHERT:** very dark grey to brown, common to abundant glauconite, variably hard to firm and crumbly, commonly grades to variably cherty phosphatic glauconitic mudstone and shale, common massive to crystalline pyrite nodules and crystals, silty to sandy in part, minor to locally abundant limonitic alteration of grains? and pellets?, **tight, no shows.**

FANTASQUE 839.0 m MD (-466.1 m SS)

839-845 **CHERT:** tan to light brown, sub translucent to translucent, very hard, dense, trace glauconite, commonly variably spicular, trace sandy, trace to minor fracture surfaces with clear crystalline quartz micro crystals and spotty to patchy bitumen, **infer minor to common fair to poor fracture porosity, minor spotty moderate yellow fluorescence, trace to minor very poor weak slow blooming and very thin diffuse cut.**

845-855 **CHERT:** very similar to above becoming light grey in minor part, trace disseminated pyrite, trace phosphatic shale stringers, increasing minor fracture surfaces, trace pyrite fracture linings, **infer common fair to poor and minor streaky good fracture porosity, minor very dull fluorescence, no cut.**

855-861 **CHERT:** variable: predominantly dark brown, dull to sub translucent, variably moderately to very glauconitic, commonly variably hard and dense, variably firm and crumbly in part, minor to common granular texture, argillaceous locally grading to cherty phosphatic mudstone and trace shale in part, variably sandy to silty in part, trace to locally minor disseminated pyrite, minor light to dark brown translucent to sub translucent chert with slightly resinous lustre, rare to trace fracture surfaces with crystalline quartz and pyrite linings, rare bitumen, **infer trace poor fracture porosity, no shows.**

861-868.5 **CHERT:** predominantly as above becoming decreasingly slightly to moderately glauconitic, predominantly dull and variably hard to firm with common granular texture, very hard and dense in part, crumbly in part, slightly silty to occasionally sandy in part, argillaceous as above, rare fracture surfaces as above, **rare to trace poor fracture porosity, no shows.**

868.5-875 **CHERT:** tan to light grey, slightly mottled in minor part, predominantly very hard and dense, translucent to sub translucent, variably spicular in part, trace to locally minor scattered glauconite, variably silty in part, trace disseminated pyrite, rare fracture surfaces as previously described, rare bitumen, **predominantly tight, infer trace to minor poor fracture porosity, trace spotty moderate to dull yellow fluorescence with very weak questionable cut.**

875-880 **CHERT:** predominantly as above becoming increasingly silty and slightly argillaceous in part, increasing trace fracture surfaces with occasional quartz crystals and bitumen, trace massive pyrite nodules, increasing trace to minor phosphatic to variably cherty glauconitic shale stringers, minor medium to dark brown variably glauconitic argillaceous chert with dull lustre and common granular texture, trace to minor thin clean to argillaceous variably cherty fine grained sandstone as above, trace quartzose glauconitic siltstone stringers, **infer trace to minor poor fracture porosity, trace spotty dull fluorescence, no shows.**

880-888 **CHERT:** light to medium brown, predominantly translucent to sub translucent, very hard and dense, slightly mottled in minor part, trace to locally minor pellet, slightly to moderately spicular in part, decreasing trace disseminated pyrite, decreasing trace shale laminations to stringers as above, rare to trace milky to occasionally chalcedonic quartz blebs to mottles and fracture heals, increasing trace to minor fracture surfaces with crystalline quartz and spotty oil stain and bitumen, rare micro vugs, **infer increasing minor to common poor to fair fracture porosity, minor spotty dull fluorescence, trace poor thin diffuse and streaming cut.**

888-898.5 **CHERT:** predominantly medium to dark brown with dull to resinous lustre, minor medium to light brown to brown grey and sub translucent in minor part, predominantly hard and dense, slightly mottled in part, predominantly argillaceous grading to trace cherty mudstone, trace milky to occasionally chalcedonic quartz blebs to mottles and fracture heals, decreasing trace fracture surfaces as above, very rare micro vugs, **infer trace to minor poor fracture porosity, no shows.**

898.5-905 **CHERT:** variably light to medium brown and light grey, common brown pellet and minor mottles, variably slightly to locally very spicular in part, very hard and dense, sub translucent to translucent, variably silicified in part with increasing minor milky to occasionally chalcedonic quartz blebs to mottles and fracture heals, infer commonly variably fractured, increasing common planar fracture surfaces with drusy quartz crystals and **rare spotty to patchy oil stain and bitumen, infer common variable poor to streaky good fracture porosity, trace spotty fluorescence, rare poor blooming and diffuse cut.**

905-910 **CHERT:** similar to above becoming predominantly light to medium grey, common brown pellet and minor mottles, very hard and dense, sub translucent, variably spicular in part, variably silicified with minor milky quartz as above, increasing common to abundant planar fracture surface with decreasing minor drusy quartz, **infer common to abundant variable poor to locally good fracture porosity, trace spotty poor shows as above.**

910-915 **CHERT:** as previously described becoming predominantly light to very light grey, pelletal and mottled as above, increasingly silicified in part with minor to common milky to occasionally chalcedonic quartz blebs to mottles and fracture heals, decreasing minor to common fracture surfaces with minor drusy quartz, **infer decreasing common variably poor to locally good fracture porosity, rare spotty bitumen and oil stain, minor spotty very dull fluorescence, trace to minor very poor weak cut,** trace dark grey brown argillaceous dolomitic siltstone stringers.

915-919 **CHERT:** similar to above becoming darker with increasingly abundant brown pellet and common mottles, variably silicified with milky to chalcedonic quartz as above, increasing common fracture surfaces with increasing drusy quartz, **infer increasing common to abundant variable fracture porosity as above, rare spotty fluorescence, rare to trace very weak questionable cut.**

919-923.5 **CHERT:** as above becoming mottled dark grey to brown in part, increasingly silicified with common milky quartz blebs to mottles and occasional fracture heals, **increasing common fracture surfaces with drusy quartz and minor oil stain, minor to locally common poor to fair micro vug porosity, infer common poor to fair fracture porosity, minor dull yellow fluorescence, common poor to fair milky cut.**

KINDLE 923.5 m MD (-550.6 m SS)

923.5-930 **SILTSTONE:** predominantly medium to dark brown, quartzose, predominantly moderate to slightly argillaceous, trace slightly sandy, variably poorly to well indurated, very dolomitic locally grading to silty dolostone, trace spotty to patchy pyrite, **no visible porosity, rare spotty bitumen, no fluorescence, trace very weak questionable cut,** minor shale, black, soft to firm, sub platy, phosphatic, glauconitic in part, silty.

930-937 **SILTSTONE:** medium to dark brown, quartzose, rare glauconite, decreasingly slightly to moderately argillaceous, trace argillaceous partings, variably moderately to well indurated, poorly indurated and crumbly in minor part, abundant dolomitic cement and common scattered rhombs, increasingly grading to silty dolostone stringers in minor part, trace slightly cherty, **no visible porosity, common to abundant very dull green fluorescence, minor to common poor thin yellow white streaming and diffuse cut.**

937-945 **SILTSTONE:** similar to above, dark to medium brown, quartzose, decreasing very rare glauconite, increasingly moderately to slightly argillaceous, commonly moderately well to well indurated, moderately to poorly indurated and crumbly in minor part, abundant calcareous to dolomitic cement, locally grades to silty dolostone to limestone stringers, very argillaceous in minor part grading to minor very calcareous to dolomitic shale stringers, **no visible porosity, no fluorescence, minor very weak very thin diffuse and trace streaming cut.**

945-952 **SILTSTONE:** medium to dark brown, very quartzose with rare dark specks and scattered glauconite, predominantly clean, predominantly well to very well indurated, moderately to occasionally poorly indurated and crumbly in part, abundant calcareous to dolomitic cement, occasional sparry inclusion (recrystallized bioclast?), occasionally grades to very silty limestone to dolomite stringers, slightly argillaceous in minor part, trace argillaceous partings, **no visible porosity, rare to trace spotty bitumen, trace very dull questionable fluorescence, common poor thin yellow white streaming and diffuse cut.**

952-958 **SILTSTONE WITH MINOR INTERBEDDED LIMESTONE:**

SILTSTONE: light to medium grey, quartzose with trace dark specks, clean, commonly dense and very well indurated, poorly indurated and crumbly in minor part, abundant calcareous cement, occasionally grades to silty limestone stringers, trace very silty marly laminations to stringers, rare to trace fracture surfaces, rare sparry calcite fracture fill, **no visible porosity, infer locally fair to good fracture porosity, no fluorescence, rare questionable cut, faint oil sheen at wash, condensate odor;** limestone very dark grey to grey brown, cryptocrystalline, variably firm to hard, variably silty and argillaceous occasionally grading to calcareous shale stringers, variably dolomitic grading to calcareous dolomite in part, **tight, no shows.**

958-963 **LIMESTONE:** similar to above, very dark brown to grey, cryptocrystalline to microcrystalline, variably firm to hard, very silty and argillaceous grading to very calcareous siltstone and minor silty shale, commonly variably dolomitic, **tight, no shows.**

MATTSON 962.8 m MD (-589.9 m SS)

963-970 **SANDSTONE:** pale tan to light grey, very fine grained and variably silty grading to sandy siltstone in part, quartz arenite with rare to trace dark lithic grains, rare glauconite, trace scattered recrystallized bioclasts, clean, well sorted, angular to sub angular, commonly moderately to well indurated, moderately poor indurated and crumbly in part, common calcareous to dolomitic cement, minor locally common siliceous cement, rare pyrite, **predominantly no visible porosity, poor to fair porosity in part with common bitumen, minor to common dull yellow green fluorescence, minor to common poor blooming and very thin diffuse cut, faint oil sheen and condensate odor at wash,** minor interbedded shale dark grey, firm, sub platy, slightly calcareous.

970-978 **SANDSTONE:** pale tan to light grey, very fine grained, variably silty grading to minor sandy siltstone, trace very fine to fine grained, quartz arenite with trace dark lithic grains, very rare glauconite, increasing trace to minor recrystallized bioclasts, clean, well sorted, angular to sub angular, predominantly moderately poorly to poorly indurated, crumbly in part, common calcareous and siliceous cement, trace to minor sandy to silty bioclastic limestone stringers to laminations, **common fair to poor porosity, tight to poor porosity in part, minor spotty bitumen, rare spotty oil stain, no fluorescence, increasing common poor blooming and very thin diffuse cut, faint oil sheen and condensate odor at wash,** minor interbedded shale, as above.

978-984 **SANDSTONE:** off-white to light grey, very fine grained and silty commonly grading to sandy siltstone in part, quartz arenite with increasing trace varicolored lithic grains, rare glauconite, rare bioclasts, well sorted, angular to sub angular, variably moderately well to poor indurated and crumbly, abundant dolomitic cement, rare to trace pyrite, **predominantly no visible porosity, minor poor to streaky fair porosity, trace very dull green fluorescence, trace very weak questionable cut,** trace to minor interbedded shale as above.

984-990 **SANDSTONE:** similar to previously described becoming decreasingly grading to siltstone in part, becoming poor to moderately indurated with streaky mixed calcareous to dolomitic and lesser siliceous cement, rare to trace fossiliferous laminations to stringers, **predominantly no visible porosity, trace to minor streaky poor porosity, no shows,** minor interbedded shale, dark grey to black, firm, platy, brittle, fissile, smooth, commonly slightly dolomitic.

990-1002 **SANDSTONE WITH MINOR INTERBEDDED SILTSTONE AND SHALE:**

SANDSTONE: similar to above, predominantly off-white to light grey, light tan in part, very fine grained, variably silty in part grading to sandy siltstone, quartz arenite with trace varicolored lithic grains, rare bioclasts, well sorted, angular to sub angular, commonly variably disaggregated in part with inferred very poor to poor induration, moderately to poorly indurated in part, abundant calcareous cement, rare to trace pyrite, **predominantly no visible porosity in consolidated cuttings, infer poor to fair porosity in part, no fluorescence, rare to trace very weak questionable cut;**

SILTSTONE: medium brown to grey, quartzose, variably argillaceous in part, very calcareous to dolomitic grading to silty limestone and dolomite stringers, **tight, no shows;**

SHALE: black, soft to firm, sub platy to platy, fissile, very carbonaceous to bituminous.

1002-1009 **SANDSTONE:** pale brown to light grey, very fine grained and variably silty grading to minor siltstone, medium brown and very silty in minor part commonly grading to siltstone, quartz arenite, trace lithic grains, rare recrystallized bioclast, well sorted, angular to sub angular, predominantly clean, minor slightly to moderately argillaceous, predominantly poorly to moderately indurated, well to very well indurated in minor part, abundant calcareous cement, minor patchy to streaky siliceous cement, **predominantly no visible porosity, trace to minor poor to rarely fair porosity, rare to trace spotty fluorescence, minor poor slow streaming and blooming cut,** minor interbedded shale and siltstone as above.

1009-1014 **SANDSTONE WITH INTERBEDDED SHALE:**

SANDSTONE: as above becoming increasingly medium to dark brown and silty to argillaceous commonly grading to siltstone, **predominantly tight, decreasing shows as above;**

SHALE: as above becoming brittle in part and locally silty.

1014-1019 **SANDSTONE:** light tan, very fine grained, predominantly variably silty locally grading to sandy siltstone, trace to minor very fine to fine grained, quartz arenite, trace dark lithic grains, rare glauconite, rare to trace recrystallized bioclasts, clean, well sorted, angular to sub angular, poor to moderately indurated, commonly variably crumbly, abundant calcareous cement, **commonly no visible porosity, minor to common variable poor 2 to 5% porosity, trace bitumen, rare oil stain, minor to common spotty dull fluorescence, minor to common poor slow streaming and thin diffuse cut, minor to common oil at wash,** minor interbedded shale and argillaceous siltstone as above.

1019-1026 **SHALE WITH INTERBEDDED SANDSTONE AND LIMESTONE:**

SHALE: black, soft to firm, sub platy to platy, fissile, carbonaceous to phosphatic/bitumen, locally glauconitic in minor part, increasingly silty in part grading to argillaceous siltstone stringers;

SANDSTONE: as above becoming increasingly calcareous occasionally grading to limestone, buff, variably firm to soft, cryptocrystalline to microcrystalline, commonly bioclastic wackestone grading to packstone, variably chalky micritic matrix, commonly variably sandy, **no visible porosity, common dull spotty fluorescence, minor to common very poor slow streaming cut, minor to common oil at wash.**

1026-1029 **SANDSTONE:** light tan to brown, very fine grained, silty in part, very quartzose with trace to locally minor lithic grains, trace to minor limestone grains, quartz arenite to sublitharenite, well sorted, angular to subrounded, predominantly poorly indurated and crumbly, predominantly very calcareous grading to sandy limestone in part, **no visible porosity, minor to common dull yellow green fluorescence, minor to common poor very slow streaming and diffuse cut;** decreasing minor limestone as above becoming decreasingly bioclastic in minor part and predominantly variably sandy grading from sandstone above, **porosity and shows as above.**

1029-1035 **SHALE WITH INTERBEDDED SANDSTONE:**

SHALE: black, firm to soft, sub platy to platy, fissile to sub fissile, faintly micromicaceous and slightly silty in part, phosphatic to bituminous with **poor cut;**

SANDSTONE: as above with minor variably argillaceous siltstone as above.

1035-1039 **SANDSTONE:** off-white to light grey, very fine grained, predominantly variably silty grading to minor sandy siltstone, quartz arenite, well sorted, angular to sub angular, clean, trace slightly argillaceous, predominantly poorly to moderately indurated and crumbly, decreasing common to abundant calcareous cement, trace siliceous cement, **predominantly no visible porosity, minor streaky poor porosity, no fluorescence, trace very poor questionable cut.**

1039-1046 **SANDSTONE:** off-white to light grey, lower very fine to lower fine grained, slightly to moderately silty, quartz arenite with clear to frosted quartz, well sorted, angular to subrounded, rare well rounded blue grey tripolitic chert grains, clean, commonly variably disaggregated, **common poorly consolidated cuttings with tight to poor porosity and variably minor to abundant calcareous cement, minor siliceous cement, minor quartz overgrowths, infer common fair to poor porosity, minor very dull fluorescence, minor to common weak streaming and very thin diffuse cut,** trace to minor shale stringers as above.

1046-1052 **SANDSTONE WITH MINOR INTERBEDDED SHAL:**

SANDSTONE: very similar to above, off-white to light grey, predominantly very fine grained, minor fine grains, increasingly silty in part, quartz arenite as above, clean, well sorted, angular to sub angular, minor subrounded grains, predominantly moderately to poorly indurated, variably crumbly in part, variably disaggregated in minor part, decreasing common calcareous cement, minor siliceous cement, minor quartz overgrowths, **predominantly no visible porosity, minor streaky poor porosity, no fluorescence, trace very weak questionable cut;**

SHALE: black, variably firm to locally soft, commonly brittle, platy, fissile, carbonaceous to slightly phosphatic/bituminous.

1052-1059 **SHALE WITH MINOR INTERBEDDED SANDSTONE AND SILTSTONE:**

SHALE: very dark brown to black, dark grey in part, variably firm to slightly soft, variably platy to sub blocky, commonly fissile to sub fissile, smooth and faintly micromicaceous in part, commonly sub waxy, commonly very slightly dolomitic, variably silty in part locally grading to minor argillaceous siltstone laminations, variably bituminous to slightly phosphatic with common **very poor cut,** trace pyrite nodules;

SANDSTONE AND SILTSTONE: dark brown to grey, argillaceous, siliceous to calcareous, **tight, no shows.**

1059-1065 **SANDSTONE:** pale tan to very light grey, fine to very fine grained, quartz arenite with clear to frosted quartz, trace to minor yellow quartz grains, well sorted, angular to subrounded, minor rounded grains, clean, commonly disaggregated in part, common consolidated cuttings with variably very poor to moderate induration, minor spotty to patchy siliceous and calcareous cement, trace interstitial pyrite, rare to trace spotty illite, common quartz overgrowths, **consolidated cuttings with variable streaky fair to poor porosity, occasional good and tight streaks, infer common fair to good porosity, very faint oil stain, common to abundant pale green to yellow green fluorescence, common fair milky streaming and diffuse cut,** minor oil sheen at wash, strong condensate odor.

1065-1070 **SANDSTONE:** predominantly disaggregated as above becoming slightly finer, slightly silty in part, infer fair to good porosity, ~20% consolidated cuttings: poor to moderately indurated and crumbly to friable, abundant calcareous cement, minor siliceous cement, **predominantly no visible porosity with minor streaky poor to fair porosity, trace spotty fluorescence, trace to minor very poor cut,** minor dark grey to black platy fissile, slightly bituminous shale.

1070-1075 **SANDSTONE:** very light grey to pale tan, very fine grained, trace fine grains, variably silty in part, quartz arenite with trace lithic grains, very rare recrystallized bioclast, well sorted, angular to sub angular, trace rounded grains, predominantly clean, trace slightly argillaceous, rare to trace argillaceous partings, predominantly poorly to moderately indurated and crumbly to variably friable, well indurated in part, abundant calcareous cement, minor to locally common streaky to patchy siliceous cement, **predominantly no visible porosity, no shows.**

1075-1080 **SHALE WITH INTERBEDDED SANDSTONE AND MINOR SILTSTONE:**

SHALE: similar to above, very dark brown to dark grey, variably firm to slightly soft, platy to sub blocky, fissile to sub fissile, smooth and slightly sub waxy in part, slightly silty and faintly micromicaceous in part, **slightly bituminous with very poor cut;**

SILTSTONE: medium to dark brown, quartzose, moderately to well indurated, common to abundant calcareous to dolomitic cement, argillaceous in part, variably sandy in part grading to silty sandstone stringers, **tight, no fluorescence, minor very slow blooming and streaming cut;**

SANDSTONE: predominantly as previously described.

1080-1085 **SANDSTONE:** predominantly disaggregated, fine to very fine grained, trace to minor lower medium grains, quartz arenite with predominantly frosted quartz, well to moderately well sorted, sub angular to rounded, clean, **infer fair to good porosity, no shows, ~20% consolidated cuttings:** pale brown to light grey, well sorted, angular to subrounded, minor rounded, poorly to very poorly indurated and moderately to very friable, minor calcareous and siliceous cement, **predominantly fair to poor porosity,** trace spotty bitumen, **abundant slightly patchy very faint oil stain, abundant moderate to bright pale yellow green fluorescence, common poor thin diffuse cut,** minor thin shale interbeds and stringers as above.

1085-1092 **SANDSTONE:** very similar to above, disaggregated, fine to very fine grained, quartz arenite with predominantly frosted quartz, well to moderately well sorted, sub angular to rounded, **trace very friable consolidated cuttings with predominantly fair porosity and decreasing cements as above, infer fair to good porosity, no shows.**

1092-1095 Trip sample with abundant cavings.

1095-1098 **SANDSTONE WITH INTERBEDDED SHALE:**

SANDSTONE: off-white to light grey, predominantly very fine to fine grained and slightly silty, very fine grained and silty in part occasionally grading to siltstone, quartz arenite with trace to minor dark lithic grains, well sorted, angular to subrounded, poorly to moderately indurated, crumbly to friable in part, abundant calcareous cement, commonly disaggregated, **predominantly no visible porosity in consolidated cuttings, infer streaky poor to fair porosity in part, no shows.**

1098-1104 **SANDSTONE WITH INTERBEDDED SHALE:**

SANDSTONE: predominantly light brown, very fine to fine grained, slightly to moderately silty, quartz arenite with trace dark lithic grains, well sorted, angular to subrounded, poorly to moderately indurated, crumbly to friable in part, predominantly clean, slightly argillaceous in part, abundant calcareous cement, **no visible porosity, minor very dull fluorescence, minor to common poor thin diffuse cut;**

SHALE: black to dark grey, firm to locally hard, brittle in part, sub platy to sub fissile, smooth in part, variably silty in part with trace argillaceous siltstone laminations, **variably bituminous with poor cut.**

1104-1109 **SANDSTONE:** pale tan to very light grey, predominantly very fine to fine grained, trace lower medium grains, slightly silty, quartz arenite with frosted to clear quartz and trace dark lithic grains, well sorted, angular to subrounded, minor rounded grains, clean, trace slightly argillaceous, rare argillaceous partings, variably poorly to well indurated, crumbly to friable in part, decreasing common calcareous cement, minor siliceous cement, commonly variably disaggregated, **variable tight to streaky fair porosity in consolidated cuttings, infer common poor to fair porosity, minor spotty yellow green fluorescence, minor very weak cut.**

1109-1113.5 **SANDSTONE WITH INTERBEDDED SHALE:**

SANDSTONE: light to medium brown, very fine grained and variably silty grading to sandy siltstone in part, very quartzose, trace to minor dark lithic grains, clean to variably argillaceous, minor argillaceous partings and laminations, well sorted, angular to sub angular, commonly moderately to well indurated, poorly indurated and crumbly in part, common to abundant calcareous cement, minor siliceous cement, variable argillaceous matrix/cement, **no visible porosity, no shows;**

SHALE: as above.

1113.5-1120 **SANDSTONE:** offwhite to very pale tan, very fine to fine grained, trace lower medium grains, slightly to moderately silty, quartz arenite, trace to minor dark lithic grains, rare recrystallized bioclast, well sorted, angular to subrounded, clean, predominantly poorly to moderately indurated and variably crumbly to friable, abundant calcareous cement, disaggregated in minor part, predominantly no visible porosity with minor streaky poor to fair porosity in consolidated cuttings, **infer minor poor to fair porosity, trace to minor dull fluorescence, minor weak thin streaming and diffuse cut,** trace to minor thin shale interbeds as above.

1120-1131 **SANDSTONE:** very similar to above, offwhite to very pale tan, very fine to fine grained, trace lower medium grains, slightly to moderately silty, quartz arenite, trace to minor dark lithic grains, rare recrystallized bioclast, well sorted, angular to sub-angular, clean, predominantly poorly to moderately indurated and variably crumbly to friable, abundant calcareous cement, decreasingly disaggregated in minor part, **predominantly no visible porosity, infer minor streaky poor to fair porosity, no shows,** decreasing trace thin shale interbeds as above.

1131-1136 **INTERBEDDED SANDSTONE, SILTSTONE AND SHALE:** very poor quality sample with common to abundant cavings;

SANDSTONE: as above, siltstone, medium to dark brown, quartzose, calcareous to dolomitic, **tight,** shale as above.

1136-1139 **SANDSTONE:** offwhite to pale brown, predominantly lower fine to upper medium grained, minor upper very fine and lower coarse grains, quartz arenite with predominantly frosted quartz, increasing minor chert and lithic grains, moderately sorted, sub angular to rounded, clean, commonly disaggregated, common poorly to moderately consolidated cuttings with common siliceous and minor spotty calcareous cement, trace spotty illite, trace to minor quartz overgrowths, **variably fair to very poor porosity in consolidated cuttings, infer predominantly fair porosity, trace spotty bitumen, no fluorescence, minor to common weak slow cut.**

1139-1145 **SANDSTONE:** mixed; as above in part, predominantly **SANDSTONE:** #2 offwhite, very fine grained and variably silty occasionally grading to siltstone stringers, trace to minor fine grains, quartz arenite, well sorted, angular to subrounded, clean, predominantly moderately to well indurated, abundant calcareous to dolomitic cement, no visible porosity, no shows, trace light brown to grey cryptocrystalline limestone stringers variably bioclast to sandy, **tight, no shows.**

1145-1150 **SANDSTONE:** similar to above, offwhite to light grey, very fine to fine grained, slightly to moderately silty, quartz arenite with trace chert and lithic grains, well sorted, angular to subrounded, predominantly clean, slightly argillaceous in part, trace argillaceous partings, poorly indurated and crumbly to friable in part, medium to well indurated in part, abundant dolomitic to calcareous cement, **predominantly no visible porosity, no shows;**

minor interbedded SILTSTONE: medium brown, quartzose, well indurated, abundant calcareous to dolomitic cement, sandy occasionally grading to sandstone, **tight, no shows.**

1150-1155 **DOLOMITE WITH INTERBEDDED CHERT:**

DOLOMITE: buff, commonly cryptocrystalline to microcrystalline, locally microcrystalline to very fine crystalline and slightly microsucrosic, predominantly firm to hard and variably dense, variably cherty in part occasionally grading to dolomitic chert stringers to nodules, locally silty to sandy in minor part, **tight, trace to minor dull yellow fluorescence, no cut;**

CHERT: light to medium grey, predominantly hard and dense, opaque to sub translucent, commonly variably dolomitic occasionally grading to cherty dolomite stringers, rare to trace fracture surfaces, **infer locally poor to fair fracture porosity, no shows,** minor thin sandstone stringers as above.

1155-1161 **DOLOMITE:** similar to above, buff to light brown, cryptocrystalline to microcrystalline, predominantly hard and dense, predominantly variably cherty grading to minor chert stringers and nodules, silty to sandy in minor part, slightly calcareous in part, **tight, questionable shows as above;**

minor interbedded SILTSTONE: medium to dark brown, quartzose, slightly to moderately argillaceous, well indurated, abundant dolomitic to calcareous cement, variably sandy occasionally grading to sandstone stringers, **tight, no fluorescence, minor very weak thin cut,** trace sandstone and shale stringers.

1161-1165 **SANDSTONE:** buff to pale tan, very fine to fine grained, slightly silty, quartz arenite with trace chert and lithic grains, well sorted, angular to subrounded, clean, moderately to poor indurated, abundant dolomitic cement, trace quartz overgrowths, disaggregated in part, **no visible porosity in consolidated cuttings, infer minor fair porosity, trace to minor very dull fluorescence, no cut.**

1165-1170 **SANDSTONE:** very similar to above becoming slightly coarser, fine to very fine grained, quartz arenite with predominantly frosted quartz, trace chert and lithic grains, well sorted, angular to rounded, clean, commonly poorly to moderately indurated and variably crumbly to friable, well indurated in part, abundant dolomitic to calcareous cement, minor locally siliceous cement, trace quartz overgrowths, disaggregated in minor part, **predominantly no visible porosity, no shows.**

1170-1173 **SANDSTONE:** as above becoming slightly coarser, predominantly fine grained, quartz arenite as above, sub angular to rounded, commonly disaggregated, common variably poorly to well consolidated cuttings with abundant dolomitic cement, minor locally common streaky siliceous cement, **trace to minor streaky poor porosity in consolidated cuttings, infer minor poor to fair porosity, trace spotty bitumen, trace to minor spotty dull fluorescence, trace to minor poor slow streaming cut.**

1173-1179 **DOLOMITE:** dark brown, cryptocrystalline to microcrystalline, hard, dense, variably cherty with minor chert nodules and stringers, locally silty to sandy in part, argillaceous in part, **tight, no shows.**

1179-1183 **SANDSTONE WITH INTERBEDDED DOLOMITE:**

SANDSTONE: buff to light grey, fine to very fine grained, quartz arenite, well sorted, angular to rounded, clean, moderately to well indurated, abundant dolomitic cement, minor siliceous cement, disaggregated in minor part, rare fracture surfaces with pyrobituminous to pyritic residue, **no visible porosity, no shows;**

DOLOMITE: medium brown to grey, slightly mottled, cryptocrystalline to microcrystalline, hard, common recrystallized bioclasts, variably sandy in part occasionally grading to dolomitic sandstone, cherty in part, rare fracture surfaces as above, very rare slickensides, **tight, no shows.**

1183-1191.5 **DOLOMITE WITH INTERBEDDED SANDSTONE:**

DOLOMITE: light to medium grey and buff brown, mottled in part, bioclastic in part, predominantly variably sandy grading to dolomitic sandstone in part, variably silicified in part with trace to minor milky quartz blebs to mottles, common disseminated and nodular pyrite, cherty in part, trace chert nodules, increasing trace to minor fracture surfaces as above, **predominantly tight, infer minor poor fracture porosity, no shows;**

SANDSTONE: buff to light grey, predominantly fine to very fine grained, minor medium grains, quartz arenite locally grading to sub litharenite, abundant clear to frosted quartz, locally minor dolomite grains, moderately to well indurated, abundant dolomitic cement, minor siliceous cement, **no visible porosity, minor to common very dull fluorescence, trace questionable cut.**

1191.5-1199 **SANDSTONE WITH INTERBEDDED DOLOMITE:**

DOLOMITE: as previously described becoming variably sandy commonly grading to sandstone buff to light brown, variably very fine to fine grained, minor medium grains, sublitharenite locally grading to quartz arenite, abundant clear to frosted quartz with minor to locally common dolomite grains, trace chert and lithic grains, clean, well to moderately well sorted, angular to subrounded, disaggregated in minor part, predominantly well to very well indurated, abundant dolomitic to minor calcareous cement, minor siliceous cement, **no visible porosity, common dull yellow green fluorescence, minor very weak very thin cut.**

1199-1205 **DOLOMITE WITH INTERBEDDED SANDSTONE AND MINOR SILTSTONE:**

DOLOMITE: as previously described commonly grading to dolomitic sandstone as above;

SANDSTONE #2: offwhite to light grey, very fine to fine grained, slightly silty, quartz arenite, trace chert and lithic grains, well sorted, angular to sub angular, clean, moderately to well indurated, abundant dolomitic cement, minor siliceous cement, **no visible porosity, no shows;**

SILTSTONE: medium brown, very quartzose, moderately to poorly indurated, abundant dolomitic cement, **no visible porosity, minor very dull fluorescence, minor weak slow cut.**

1205-1215 m **SANDSTONE WITH MINOR DOLOMITE:**

SANDSTONE: similar to above becoming slightly coarser, offwhite to light grey, very fine to fine grained, slightly silty, quartz arenite, trace chert and lithic grains, well sorted, angular to sub angular, predominantly clean, trace slightly argillaceous, disaggregated in minor part, moderately to well indurated, decreasing common to abundant dolomitic to minor calcareous cement, increasing minor to locally common siliceous cement, **no visible porosity, minor spotty dull fluorescence, trace very slow questionable cut;**

DOLOMITE: as previously described, trace shale stringers.

1215-1219.5 **SANDSTONE:** similar to above, pale tan to light grey, very fine to fine grained, quartz arenite, well sorted, angular to subrounded, clean, increasingly disaggregated in part, predominantly moderately to well indurated, poorly indurated and crumbly in minor part, common to abundant dolomitic cement, minor locally common streaky siliceous cement, trace spotty illite, **predominantly no visible porosity, trace streaky poor porosity, infer minor poor porosity, minor spotty dull fluorescence, minor very slow weak cut,** trace sandy dolomite stringers.

1219.5-1226 **SANDSTONE:** offwhite to light grey, trace to minor lower medium grains, quartz arenite with frosted to clear quartz, well to moderately well sorted, angular to rounded, clean, commonly disaggregated in part, lesser common variably poorly to moderately well indurated cuttings with variable tight to fair porosity, predominantly siliceous cement, minor streaky dolomitic cement, trace spotty illite, trace to minor quartz overgrowths, **infer common fair to streaky good porosity, no shows.**

1226-1238 **SANDSTONE:** frosted very light grey, lower fine to lower medium grained, trace to minor upper very fine and upper medium grains, quartz arenite with predominantly frosted quartz, trace chert and lithic grains, clean, moderately well sorted, rounded to sub angular, disaggregated, trace poorly consolidated cuttings with spotty siliceous cement, trace quartz overgrowths, **infer predominantly good to streaky fair porosity, trace very poor questionable fluorescence and cut.**

1238-1241 **SANDSTONE:** light grey to light brown, variably very fine to fine grained, variably silty occasionally grading to siltstone stringers, quartz arenite, variably clean to slightly argillaceous, moderately well sorted, angular to subrounded, trace argillaceous partings, moderately to well indurated, common to abundant dolomitic cement, minor locally common siliceous cement, **predominantly no visible porosity, no shows,** trace to minor silty to sandy dolomite stringers, minor thin shale.

1241-1245 **SANDSTONE:** light grey to pale tan, very fine to fine grained, variably silty in part, quartz arenite, well to moderately well sorted, angular to subrounded, predominantly clean, slightly argillaceous in part with trace argillaceous partings, predominantly well to moderately indurated, predominantly abundant dolomitic cement, minor siliceous cement, **no visible porosity, common very dull questionable fluorescence, trace questionable cut;** trace to minor thin shale interbeds to stringers, trace silty to sandy dolomite stringers.

1245-1252.5 **SANDSTONE:** predominantly as above becoming slightly finer in part, disaggregated in minor part, **infer minor poor to fair porosity, no shows;** minor thin shale interbeds to stringers dark grey, firm, brittle, sub platy, fissile, slightly sub waxy in part, variably silty in part, trace silty to sandy dolomite stringers, trace light grey bentonitic claystone stringers.

1252.5-1259 **SANDSTONE:** offwhite to light grey, fine to very fine grained, trace to minor lower medium grains, slightly silty, quartz arenite with predominantly frosted quartz, well sorted, sub angular to rounded, clean, commonly variably disaggregated, common poorly to moderately indurated variably friable consolidated cuttings with predominantly siliceous cement, trace to minor quartz overgrowths, **variable tight to minor fair porosity in consolidated cuttings, infer common fair porosity, no shows.**

1259-1264 **SANDSTONE:** offwhite to light grey, light brown in part, very fine to fine grained, slightly to moderately silty, quartz arenite, well sorted, angular to subrounded, clean, commonly moderately to well indurated, poorly indurated and crumbly to friable in part, predominantly siliceous cement, **increasing minor to locally common streaky dolomitic cement, predominantly no visible porosity, minor streaky poor to fair porosity, trace spotty dull fluorescence, trace questionable cut;**

minor interbedded SHALE: dark grey to black, firm, brittle, platy to sub platy, fissile, slightly silty, carbonaceous to bituminous, trace dolomite stringers.

1264-1273 **SANDSTONE WITH MINOR INTERBEDDED SHALE AND SILTSTONE:**

SANDSTONE: as above in part, predominantly tan to light grey, very fine grained, minor fine grains, variably silty occasionally grading to siltstone, quartz arenite, well sorted, angular to sub angular, predominantly clean to slightly argillaceous, trace argillaceous partings, variably poorly to well indurated, siliceous and minor dolomitic cement, **no visible porosity, no shows;**

SILTSTONE: medium to dark brown, quartzose, poorly to moderately indurated, abundant dolomitic cement and minor to locally abundant dolomite rhombs, grades to dolsiltite in part, variably sandy in part, slightly to moderately argillaceous, **no visible porosity,** minor to locally common bitumen, **minor to common weak thin cut,** trace dolomite stringers; **SHALE:** as above with minor soft light brown faintly laminated marl stringers.

1273-1281 **SANDSTONE:** mixed;

SANDSTONE #1: tan to light grey, very fine to fine grained, quartz arenite, well sorted, angular to sub angular, clean, abundant dolomitic cement, **tight, no shows;**

SANDSTONE #2: light grey, lower fine to upper coarse grained, trace to minor upper very fine and very coarse grains, litharenite grading to sub litharenite, abundant frosted to clear quartz, common blue grey to minor light to dark varicolored chert grains, moderately poorly sorted, rounded to sub angular, clean, commonly variably disaggregated, common consolidated cuttings with siliceous and minor dolomitic cement, trace to minor quartz overgrowths, **variable tight to fair porosity in consolidated cuttings, infer common fair porosity, minor locally common spotty bitumen, common dull green fluorescence, common slow blooming and diffuse cut.**

1281-1290 **SANDSTONE:** mixed similar to above; predominantly **SANDSTONE:** #2 light grey, upper very fine to upper medium grained, trace to minor lower coarse grains, sub litharenite locally grading to litharenite, abundant frosted to minor clear quartz with common dark to light varicolored chert and lithic grains, moderately poorly to poorly sorted, rounded to sub angular, clean, predominantly disaggregated, minor consolidated cuttings with mixed dolomitic and siliceous cement, trace to minor quartz overgrowths, **infer common poor to fair porosity, minor spotty bitumen, trace spotty fluorescence, trace poor cut; SANDSTONE:** #1 light grey to tan, fine to very fine grained, quartz arenite, trace to locally minor chert and lithic grains, moderately well to well sorted, angular to subrounded, clean, poorly to moderately indurated, common siliceous and dolomitic cement, **variable tight to minor streaky fair porosity, no fluorescence, trace poor slow cut.**

1290-1295 **SANDSTONE:** light grey, fine to very fine grained, slightly to moderately silty, quartz arenite, trace chert and lithic grains, well sorted, angular to subrounded, clean, predominantly poorly to moderately indurated and crumbly to friable, predominantly siliceous and minor dolomitic cement, trace quartz overgrowths, trace pyrite, **predominantly no visible porosity, trace spotty very dull fluorescence, trace very weak questionable cut.**

1295-1300 **SANDSTONE:** offwhite to light grey, fine to very fine grained, minor scattered medium and trace lower coarse grains, silty in part, quartz arenite, well to moderately well sorted, angular to subrounded, clean to trace slightly argillaceous, very silty in minor part grading to siltstone laminations to stringers with common argillaceous partings, well indurated in part, poorly to moderately indurated and crumbly to friable in part, predominantly siliceous with minor dolomitic cement, trace pyrite, **minor streaky poor porosity, trace spotty bitumen, common very dull green fluorescence, no cut,** minor shale stringers to thin interbeds.

1300-1303.5 **DOLOMITE:** variable: dark to light brown, predominantly common to very abundant very fine rhombs in variable trace to abundant argillaceous matrix, grades to dolarenite in part, trace to minor recrystallized allochems, silty to sandy in part grading to dolomitic sandstone, **hard dense and cryptocrystalline to microcrystalline in minor part, no visible porosity, common very dull green fluorescence, common poor thin diffuse and streaming cut.**

1303.5-1306 **SANDSTONE:** tan to light grey, predominantly fine grained, quartz arenite, frosted to minor clear quartz, predominantly disaggregated, minor poorly to moderately consolidated cuttings with siliceous and lesser dolomitic cement, **tight to poor porosity in consolidated cuttings, infer common poor to fair porosity, no fluorescence, trace questionable cut.**

1306-1314 **SANDSTONE:** offwhite to light grey, very fine to fine grained, quartz arenite, trace dark lithic grains, well sorted, angular to subrounded, clean, moderately to poorly indurated, variably crumbly to slightly friable, siliceous cement, trace quartz overgrowths, disaggregated in minor part, **tight to streaky poor porosity, minor dull fluorescence, minor weak thin slow cut,** trace shale stringers.

1314-1316 **DOLOMITE:** very similar to above, common to very abundant very fine rhombs in variable trace to abundant argillaceous matrix, grades to dolarenite in part, commonly soft to firm and crumbly, silty to sandy in part grading to dolomitic sandstone stringers, **no visible porosity, minor very dull green fluorescence, minor poor thin diffuse and streaming cut.**

1316-1323.5 **SANDSTONE:** as above in minor part, predominantly upper very fine to lower medium grained, quartz arenite with abundant frosted quartz, trace chert and lithic grains, moderately well sorted, sub angular to rounded, predominantly disaggregated, minor poorly consolidated cuttings with dolomitic and minor siliceous cement, trace quartz overgrowths, trace pyrite, **tight to streaky fair porosity in consolidated cuttings, infer common poor to streaky fair porosity, trace spotty bitumen, minor to common fair spotty yellow green fluorescence, minor to common poor to fair streaming and diffuse cut.**

1323.5-1329 **SANDSTONE:** offwhite to light grey, fine to very fine grained, slightly silty, quartz arenite, well sorted, angular to subrounded, clean, predominantly poor to moderately indurated with common to abundant dolomitic and lesser siliceous cement, disaggregated in minor part, **predominantly no visible porosity, trace questionable cut and fluorescence.**

1329-1334 **SANDSTONE:** pale tan to light grey, fine to very fine grained, trace lower medium grains, quartz arenite, rare dolomitic grains, moderately well sorted, sub angular to rounded, clean, disaggregated in part, poor to moderately indurated, common to abundant dolomitic to minor calcareous cement, minor siliceous cement, trace interstitial pyrite, **predominantly no visible porosity, no shows,** trace buff cryptocrystalline dolomite stringers, rare to trace ironstone laminations, trace variably argillaceous siltstone laminations to stringers.

1334-1346 **SANDSTONE:** similar to above, pale tan to light grey, fine to very fine grained, trace lower medium grains, quartz arenite, increasing rare to trace dolomitic grains, moderately well sorted, sub angular to rounded, clean, commonly variably disaggregated, poorly to moderately indurated, common to abundant dolomitic to minor calcareous cement, minor siliceous cement, trace to locally minor quartz overgrowths, trace interstitial pyrite, **commonly no visible porosity in consolidated cuttings, minor to locally common streaky poor to fair porosity with common spotty bitumen, minor to locally common spotty yellow fluorescence, minor poor to fair streaming and diffuse cut,** minor buff to brown cryptocrystalline to microcrystalline dolomite stringers.

1346-1350 **SANDSTONE:** frosted light grey, predominantly fine grained, trace to minor upper very fine and lower medium grains, quartz arenite, predominantly frosted to minor clear quartz, well sorted, sub angular to rounded, clean, predominantly disaggregated, trace consolidated cuttings with dolomitic and siliceous cement, trace quartz overgrowths, **infer common fair to good porosity, minor dull fluorescence, trace questionable cut,** trace to minor dolomite stringers as above.

1350-1356 **SANDSTONE WITH MINOR INTERBEDDED DOLOMITE AND SHALE:**

SANDSTONE: light grey to minor tan, fine to very fine grained, increasing minor lower medium grains, quartz arenite, predominantly frosted quartz, clean, trace argillaceous partings, moderately well sorted, sub angular to rounded, commonly disaggregated, common poorly to moderately consolidated cuttings with common to abundant dolomitic cement, minor siliceous cement, **predominantly no visible porosity in consolidated cuttings, infer minor to common poor to fair porosity, trace dull fluorescence and questionable cut;**

DOLOMITE: medium to dark brown, predominantly cryptocrystalline to microcrystalline, hard dense and variably cherty grading to chert, **tight, no shows;**

SHALE: very dark brown, slightly to very silty and micromicaceous, slightly phosphatic to bituminous.

1356-1365 **SANDSTONE:** very pale tan to light grey, upper very fine to upper fine grained, trace lower medium grains, quartz arenite with frosted to clear quartz, rare bioclastic grains, well sorted, angular to rounded, clean, predominantly disaggregated, minor to common poorly to moderately consolidated cuttings with common to abundant dolomitic cement in part, common to abundant siliceous cement in part, trace to minor quartz overgrowths, **predominantly tight to poor porosity with minor streaky poor to fair porosity in consolidated cuttings, infer common fair porosity, trace to minor spotty bitumen, minor to common spotty dull yellow green fluorescence, minor very poor very slow cut,** trace dolomite stringers.

1365-1370 **SANDSTONE:** offwhite to light grey, very fine to fine grained, slightly silty in part, quartz arenite, frosted to clear quartz, well sorted, angular to rounded, clean, disaggregated in part, commonly moderately to well indurated, poorly indurated in part, predominantly common to abundant dolomitic cement, minor siliceous cement, trace interstitial pyrite, **predominantly no visible porosity, trace streaky poor porosity, infer minor poor to fair porosity, no shows.**

1370-1377 **SANDSTONE:** very similar to above becoming slightly coarser, decreasingly indurated, commonly to predominantly disaggregated, minor to common poorly to moderately indurated and crumbly to friable consolidated cuttings, cements as above, trace quartz overgrowths, trace interstitial pyrite, **predominantly no visible porosity in consolidated cuttings, infer common poor to streaky fair porosity, trace dull fluorescence, no cut.**

1377-1383 **SANDSTONE:** pale brown to light grey, very fine to fine grained, variably silty in part, quartz arenite, frosted to clear quartz, well sorted, angular to rounded, clean, disaggregated in minor part, predominantly moderately to well indurated, abundant dolomitic cement, minor siliceous cement, trace interstitial pyrite, **predominantly no visible porosity, trace streaky poor porosity, no shows,** minor interbedded shale.

1383-1390 **SANDSTONE:** mixed; predominantly **SANDSTONE:** #1 lower fine to upper medium grained, quartz arenite with predominantly frosted quartz, moderately to moderately well sorted, rounded to sub angular, disaggregated, trace consolidated cuttings with spotty dolomitic and siliceous cement, minor patchy pyrite, **infer predominantly fair to streaky good porosity, trace to minor spotty bitumen, minor fluorescence and cut as below; SANDSTONE:** #2 very fine to fine grained, quartz arenite, well sorted, angular to rounded, disaggregated in part, poorly to moderately indurated with spotty siliceous and dolomitic cement, trace pyrite, **variable very poor to fair porosity with common to abundant bitumen, common spotty dull to moderate fluorescence, common poor to fair streaming and diffuse cut.**

1390-1395.5 **SANDSTONE:** offwhite to light grey, predominantly fine grained, minor upper very fine and lower medium grains, quartz arenite with frosted to minor clear quartz, well sorted, angular to rounded, slightly silty, predominantly poorly indurated and variably crumbly to friable, moderately indurated in part, predominantly siliceous cement, minor dolomitic cement, trace spotty illite, trace to minor quartz overgrowths, decreasing trace pyrite, disaggregated in part, **predominantly poor to streaky fair porosity with tight streaks, trace dull fluorescence, trace weak questionable cut.**

1395.5-1400 **INTERBEDDED DOLOMITE, SHALE AND SANDSTONE:**

DOLOMITE: light to dark brown, mottled in part, cryptocrystalline, hard, dense, variably cherty with common chert nodules, clean to argillaceous, silty in part, **tight, no shows;**

SHALE: medium to dark green in part, platy sub platy, fissile, sub waxy, locally silty with siltstone stringers, trace anhydrite stringers;

SANDSTONE: light grey, fine to very fine grained, quartz arenite, well sorted, angular to subrounded, variably silty in part, clean to trace argillaceous, trace argillaceous partings, disaggregated in part, poorly to moderately indurated, common to abundant dolomitic cement, **predominantly no visible porosity, infer minor poor to fair porosity, no shows.**

1400-1405 **SANDSTONE:** pale buff to light grey, predominantly lower fine to lower medium grained, trace upper very fine grains, quartz arenite, predominantly frosted quartz, well sorted, rounded to sub angular, clean, predominantly disaggregated, minor poorly consolidated cuttings with siliceous and dolomitic cement, well indurated in part with locally common patchy pyrite, **tight to poor porosity in consolidated cuttings, infer predominantly fair to good porosity, no shows.**

1405-1408 **SANDSTONE:** light grey, very fine to fine grained, slightly silty, quartz arenite, well sorted, angular to subrounded, clean to trace argillaceous, trace argillaceous partings, variably poorly to well indurated, common to abundant dolomitic cement, minor streaky siliceous cement, trace spotty to patchy pyrite, **predominantly no visible porosity, no shows,** trace to minor cryptocrystalline to sandy dolomite stringers, trace light grey marl stringers.

1408-1412 **SANDSTONE:** light grey, predominantly lower fine to lower medium grained, trace upper very fine and upper medium grains, quartz arenite, predominantly frosted quartz, well sorted, rounded to sub angular, clean, predominantly disaggregated, minor poorly consolidated cuttings with siliceous and dolomitic cement, well indurated in part with locally common patchy pyrite, **tight to poor porosity in consolidated cuttings infer predominantly fair to good porosity, no shows.**

1412-1415 **SANDSTONE:** light grey to light brown, very fine to fine grained, slightly silty, quartz arenite, well sorted, angular to subrounded, clean to trace argillaceous, trace argillaceous partings, variably poorly to well indurated, common to abundant dolomitic cement, minor streaky siliceous cement, trace spotty to patchy pyrite, **predominantly no visible porosity, no shows.**

1415-1420.5 **SANDSTONE WITH INTERBEDDED DOLOMITE AND SILTSTONE:**

SANDSTONE: buff to light grey, very fine to fine grained, variably silty occasionally grading to siltstone laminations, quartz arenite, well sorted, angular to sub angular, clean to slightly argillaceous, moderately to well indurated, predominantly siliceous cement, minor dolomitic cement, **no visible porosity, no shows;**

DOLOMITE: buff to medium brown, cryptocrystalline to microcrystalline, hard dense and variably cherty in part, very silty in part grading to siltstone, light brown, quartzose, poorly to well indurated, abundant dolomitic cement, sandy in part occasionally grading to silty sandstone, **common poor to fair yellow fluorescence, no cut.**

1420.5-1425 **SANDSTONE:** light grey, upper very fine to lower medium grained, trace upper medium grains, quartz arenite with predominantly frosted quartz, moderately well sorted, angular to rounded, clean, commonly poorly to moderately indurated and variably crumbly to friable, well indurated in part, predominantly siliceous cement, minor to locally common quartz overgrowths, trace interstitial pyrite, disaggregated in part, **common tight to 2% porosity, minor to common streaky 4 to 7% porosity, no shows.**

1425-1429 **SANDSTONE:** as above with increasing trace spotty to patchy pyrite, increasing minor to common poor to fair porosity locally with common to abundant bitumen, **minor poor to fair fluorescence and cut.**

1429-1436 **SANDSTONE:** pale buff to light grey, upper very fine to lower medium grained, quartz arenite with predominantly frosted quartz, moderately well sorted, rounded to sub angular, clean, commonly disaggregated, minor poorly to moderately consolidated cuttings, variably crumbly to friable, predominantly siliceous cement with minor spotty to streaky dolomitic cement, increasing minor quartz overgrowths, **common poor to fair porosity with tight streaks in consolidated cuttings, infer common poor to fair porosity, no shows.**

1436-1441.5 **SANDSTONE:** offwhite to light grey, predominantly fine grained, minor upper very fine and lower medium grains, quartz arenite with clear to frosted quartz, well sorted, angular to subrounded, minor rounded grains, clean, commonly poorly indurated and crumbly to friable, moderately to occasionally well indurated in part, siliceous cement, increasing minor to common quartz overgrowths, commonly variably disaggregated in part, **common tight to 3% porosity, minor streaky 4 to 6% porosity, no shows.**

1441.5-1448 **SHALE WITH INTERBEDDED SANDSTONE AND MINOR DOLOMITE:**

SHALE: mixed: predominantly #1 black to very dark brown, firm, blocky to sub platy, predominantly variably silty to locally very sandy with minor variably dolomitic sandstone laminations to stringers, commonly sub waxy to waxy, phosphatic to bituminous with poor cut, trace slickensides, #2 medium green to green grey, platy to sub blocky, sub waxy, pyritic in part with trace to locally abundant disseminated pyrite, minor to common massive to crystalline pyrite nodules;

SANDSTONE: buff to tan, very fine grained and variably silty, very fine to fine grained in part, quartz arenite, angular to sub angular, poorly to moderately indurated, abundant dolomitic cement, **no visible porosity, no shows;**

DOLOMITE: medium to dark brown, cryptocrystalline, hard, cherty in part, argillaceous, silty to sandy in part grading to dolomitic sandstone, **tight, no shows.**

1448-1454.5 **SANDSTONE:** pale buff, fine to very fine grained, trace lower medium grains, quartz arenite with frosted to clear quartz, moderately well sorted, angular to rounded, clean, predominantly poorly indurated and crumbly to friable, moderate to occasionally well indurated in minor part, siliceous cement, minor to common quartz overgrowths, disaggregated in part, **variable porosity in consolidated cuttings: common tight to 3%, less common 4 to 7% porosity, infer common poor to fair porosity, rare spotty pyrobitumen to bitumen, trace very dull questionable fluorescence and cut.**

1454.5-1459 **SANDSTONE:** variable: light brown to light grey, very fine grained and silty in part occasionally grading to siltstone stringers, variably fine to very fine grained in part, moderately well to well sorted, angular to subrounded, predominantly clean, slightly argillaceous in part, trace argillaceous partings, moderately to well indurated, predominantly siliceous cement, minor streaky dolomitic cement, disaggregated in part, **no visible porosity, infer minor poor to fair porosity, rare to trace pyrobitumen, no fluorescence or cut,** minor thin shale stringers.

1459-1466.5 **SANDSTONE:** offwhite to light grey, fine to very fine grained, slightly silty in part, quartz arenite with clear to frosted quartz, well sorted, angular to subrounded, minor rounded grains, clean, poorly indurated and crumbly to friable in part, moderately to well indurated in part, disaggregated in part, predominantly siliceous cement, minor streaky dolomitic cement, minor to locally common quartz overgrowths, rare fracture surface and trace stylolites?, **variable porosity in consolidated cuttings: common tight to 3%, less common 4 to 8%, no shows.**

1466.5-1472 **SANDSTONE:** buff commonly very fine grained and variably silty occasionally grading to siltstone laminations, variably very fine to fine grained in part, well to moderately well sorted, angular to subrounded, clean to slightly argillaceous, predominantly moderately to well indurated, predominantly common to abundant siliceous cement, minor locally common dolomitic cement, minor to locally common argillaceous partings, pyrobituminous to bituminous to occasionally pyritic partings in part (possible stylolites to fractures), trace to minor pyrite nodules, **trace to minor poor porosity, predominantly no visible porosity, no fluorescence, trace to minor very poor cut;**

MINOR SHALE: black to very dark brown, platy to sub blocky, micromicaceous in part, slightly to moderately silty, fissile in part, very carbonaceous to bituminous with poor cut, trace soft very bituminous claystone stringers.

1472-1478 **SANDSTONE:** pale buff, upper very fine to upper fine grained, trace to minor lower medium grains, quartz arenite with frosted to clear quartz, moderately well sorted, angular to subrounded, minor rounded grains, predominantly disaggregated, minor to common poorly to moderately consolidated cuttings with siliceous and trace spotty dolomitic cement, common to abundant quartz overgrowths, **common variable 4 to 9% porosity with tight streaks in consolidated cuttings, infer predominantly fair to poor porosity, no shows,** minor interbedded shale as above becoming very carbonaceous to coaly, very micaceous in part, trace to minor anhydrite stringers to laminations.

1478-1485 **SANDSTONE WITH MINOR INTERBEDDED SHALE:**

SANDSTONE: buff to light grey, very fine grained and silty in part grading to minor to common tight siliceous siltstone laminations with common argillaceous partings, quartz arenite, well sorted, angular to subrounded, clean to slightly argillaceous, moderately to well indurated, siliceous cement, **predominantly no visible porosity, no shows;**

SHALE: dark grey to black, firm to locally soft, platy to sub blocky, commonly fissile, smooth and faintly and micromicaceous, variably silty in part, predominantly variably carbonaceous, locally very coaly to bituminous, minor grey green sub waxy shale stringers.

1485-1490 **SANDSTONE:** pale buff, predominantly fine grained, minor lower medium and trace upper very fine grains, quartz arenite with clear to frosted quartz, well sorted, angular to subrounded, minor rounded grains, predominantly disaggregated, minor to common poorly to moderately consolidated cuttings with siliceous cement, common quartz overgrowths, trace spotty to streaky dolomitic cement, **variable tight to streaky fair porosity in consolidated cuttings, infer common fair to poor porosity, no shows.**

1490-1495.5 **SANDSTONE:** pale buff to light grey, variably fine to very fine grained, slightly silty in part, quartz arenite with clear to frosted quartz, rare coaly grains, well sorted, angular to subrounded, minor rounded grains, clean, trace argillaceous partings, poorly indurated and crumbly to friable in part, moderately to very well indurated in part, predominantly siliceous cement, minor locally common streaky dolomitic cement, minor quartz overgrowths, disaggregated in part, **predominantly tight to 3% with minor streaky 4 to 7% porosity in consolidated cuttings, infer common poor to streaky fair porosity, no shows,** trace black platy very carbonaceous to bituminous shale stringers.

1495.5-1500 **SANDSTONE:** similar to above becoming coarser, pale buff, predominantly fine grained, minor lower medium grains, quartz arenite with frosted to clear quartz, moderately well sorted, angular to subrounded, increasing minor rounded grains, clean, predominantly disaggregated, minor poorly to moderately indurated and crumbly to friable consolidated cuttings with siliceous cement, increasing minor to common quartz overgrowths, **predominantly variable poor to streaky fair porosity with tight streaks in consolidated cuttings, infer increasing common fair to poor porosity, minor spotty dull yellow green fluorescence, no cut.**

1500-1505 **SANDSTONE:** similar to above becoming slightly finer, pale buff, fine to very fine grained, trace to minor lower medium grains, quartz arenite with clear to minor frosted quartz, moderately well sorted, angular to subrounded, clean, predominantly disaggregated, minor poorly to moderately consolidated cuttings with siliceous cement, minor to common quartz overgrowths, trace interstitial pyrite, **tight to minor streaky poor porosity in consolidated cuttings, infer comp to streaky fair porosity, no shows.**

1505-1510 **SANDSTONE:** buff, fine to very fine grained, variably silty in part, quartz arenite, well sorted, angular to sub angular, minor subrounded grains, clean, predominantly moderately to very well indurated, poorly indurated in minor part, disaggregated in part, common to abundant siliceous cement, trace quartz overgrowths, minor to common stylolite surfaces with pyrobituminous residue, **no visible porosity, no shows,** trace shale stringers.

1510-1515 **SANDSTONE:** white to light brown, part consolidated, increasingly unconsolidated, frosted quartz grains, minor clear grains, quartz arenite, fine grained, occasional medium grains, well sorted, sub rounded to sub angular, minor rounded grains, moderately cemented, siliceous cement, rare stylolite surfaces with pyrobituminous residue, trace shale stringers, **poor to streaky fair visible porosity, no shows.**

1515-1520 **SANDSTONE:** white to light brown, part consolidated, increasingly unconsolidated, frosted quartz grains, minor clear grains, quartz arenite, fine grained, occasional medium grains, well sorted, sub rounded to sub angular, minor rounded grained, trace pyrite, moderately cemented, siliceous cement, rare stylolite surfaces with pyrobituminous residue, spotted light brown oil stain, trace shale stringers, **poor visible porosity, minor spotty dull yellow green fluorescence, no shows.**

1520-1525 **SANDSTONE:** white to light brown, part consolidated, increasingly unconsolidated, frosted quartz grains, minor clear grains, quartz arenite, very fine to fine grained, well sorted, sub rounded to sub angular, minor rounded grains, trace pyrite, moderately cemented, siliceous cement, rare stylolite surfaces with pyrobituminous residue, **spotted light brown oil stain, trace shale stringers, poor visible porosity, minor spotty dull yellow green fluorescence, no shows.**

1525-1530 **SANDSTONE:** similar to above becoming coarser, pale buff, predominantly fine grained, minor lower medium grains, quartz arenite with frosted to clear quartz, moderately well sorted, angular to subrounded, increasing minor rounded grains, clean, predominantly disaggregated, minor poorly to moderately indurated and crumbly to friable consolidated cuttings with siliceous cement, increasing minor to common quartz overgrowths, **predominantly variable poor to streaky fair porosity with tight streaks in consolidated cuttings, infer increasing common fair to poor porosity, minor spotty dull yellow green fluorescence, no shows.**

1530-1535 **SANDSTONE:** similar to above becoming slightly finer, pale buff, fine to very fine grained, trace to minor lower medium grains, quartz arenite with clear to minor frosted quartz, moderately well sorted, angular to subrounded, clean, predominantly disaggregated, minor poorly to moderately consolidated cuttings with siliceous cement, minor to common quartz overgrowths, trace interstitial pyrite, **tight to minor streaky poor porosity in consolidated cuttings, infer common poor to streaky fair porosity, no shows.**

1535-1540 **SANDSTONE:** white to light brown, part consolidated, increasingly unconsolidated, frosted quartz grains, minor clear grains, quartz arenite, very fine to fine grained, well sorted, sub rounded to sub angular, minor rounded grains, trace pyrite, moderately cemented, siliceous cement, rare stylolite surfaces with pyrobituminous residue, spotted light brown oil stain, trace shale stringers, **poor visible porosity, minor spotty dull yellow green fluorescence, no shows.**

1540-1545 **SANDSTONE:** white to light brown, part consolidated, increasingly unconsolidated, frosted quartz grains, minor clear grains, quartz arenite, fine grained, occasional medium grains, well sorted, sub rounded to sub angular, minor rounded grains, moderately cemented, siliceous cement, rare stylolite surfaces with pyrobituminous residue, trace shale stringers, **poor visible porosity, no shows.**

1545-1550 **SANDSTONE:** light to medium brown, predominantly very fine grained, minor fine grains, moderately to locally very silty grading to occasional siltstone stringers, minor very fine to fine grained slightly silty sandstone with poor to fair porosity, quartz arenite, predominantly clear quartz, moderately well sorted, angular to subrounded, predominantly clean, locally slightly to moderately argillaceous, increasing minor to common argillaceous partings and laminations, predominantly moderately to well indurated, common to abundant siliceous cement, minor spotty kaolin to illite, trace to locally minor quartz overgrowths, **predominantly tight to 3% porosity, minor streaky poor porosity, minor very dull fluorescence, trace very faint questionable cut;** minor interbedded very coaly to bituminous shale.

1550-1553 **SANDSTONE:** light grey to light brown, predominantly very fine to fine grained, very fine grained and silty in part occasionally grading to siltstone stringers, predominantly clean to locally slightly argillaceous quartz arenite, well sorted, angular to subrounded, trace to minor argillaceous partings and laminations, predominantly poorly to moderately indurated and variably crumbly to friable, disaggregated in minor part, common siliceous cement, trace pyrite, rare to trace spotty kaolin to illite, **predominantly tight, minor streaky poor to fair porosity, trace to minor very dull fluorescence, trace very faint questionable cut;** minor interbedded shale as above.

1553-1566 **SANDSTONE:** offwhite to very light grey, very fine to lower medium grained, quartz arenite with clear to frosted quartz, clean, moderately well sorted, angular to subrounded, predominantly disaggregated, trace to minor poorly consolidated and friable cuttings with spotty to patchy siliceous cement, increasing common to abundant quartz overgrowths, **predominantly fair to streaky poor porosity in consolidated cuttings, infer predominantly fair to streaky good porosity, shows as above.**

1566-1575 **SANDSTONE:** light to medium brown, predominantly very fine grained and moderately silty, minor very fine to fine grained, quartz arenite, predominantly clear quartz, well to moderately well sorted, angular to subrounded, predominantly clean, minor slightly argillaceous, minor argillaceous partings, variably very well to moderately poorly indurated, common to abundant siliceous cement, trace quartz overgrowths, **predominantly tight to 3% porosity, minor streaky 4 to 8% porosity, minor dull to moderate fluorescence, no cut;**

CLAYSTONE AND SHALE: as above, trace pyrite nodules.

1575-1587 **SANDSTONE:** similar to above, light to medium brown, very fine grained with trace to minor fine grains, moderately silty, locally very fine to fine grained in minor part, predominantly clean quartz arenite, variably argillaceous in part occasionally grading to wacke, well sorted, angular to subrounded, common argillaceous partings and laminations, trace siltstone stringers, predominantly very well to moderately indurated, poorly indurated in minor part, common to abundant siliceous cement, trace spotty kaolin to illite, trace patchy pyrite, trace locally minor quartz overgrowths, **predominantly tight to 2% porosity, minor streaky poor to fair porosity, common to abundant very dull yellow green fluorescence, trace very faint questionable cut;**

minor interbedded CLAYSTONE: as above with increasing minor anhydritic mottles and laminations becoming predominantly very bituminous, increasing trace to minor siderite stringers, trace slightly bentonitic, trace shale, as above.

1587-1595 **SANDSTONE WITH INTERBEDDED CLAYSTONE AND SHALE:**

SANDSTONE: as above in part becoming increasingly argillaceous in part grading to minor wacke, very fine to fine grained in part, slightly to moderately silty, quartz arenite as above, moderately well sorted, angular to subrounded to minor rounded, predominantly clean, variably disaggregated in part, poorly to moderately indurated, crumbly to slightly friable, increasing minor to locally common quartz overgrowths, decreasing minor spotty kaolin to illite, **minor to common variable poor to trace streaky fair porosity, shows as above;** increasing claystone and decreasing shale as above.

1595-1600 **SANDSTONE:** light to medium brown to grey brown, predominantly very fine grained with trace to minor fine grains, moderately to locally very silty occasionally grading to siltstone stringers, minor very fine to fine grained, predominantly clean to slightly argillaceous quartz arenite, locally moderately argillaceous grading to wacke, common argillaceous partings and laminations, commonly well to very well indurated, moderately to poorly indurated in minor part, common to abundant siliceous cement, increasing trace to minor spotty to patchy pyrite, decreasing trace spotty kaolin/illite, **predominantly tight, minor streaky poor to fair porosity, minor very dull fluorescence, trace very faint questionable cut;** minor interbedded claystone and shale as above.

1600-1605 **SANDSTONE:** as previously described with slightly increasing fine grains becoming commonly poorly to moderately indurated, variably disaggregated in minor part, decreasing common to abundant siliceous cement, increasing trace spotty kaolin/illite, increasing trace to minor quartz overgrowths, decreasing minor to common argillaceous partings, **increasing minor to common poor to streaky fair porosity, shows as above;** minor claystone and shale as above.

1605-1615 **SANDSTONE:**, as previously described with slightly increasing minor fine grains, trace lower medium frosted quartz grains, predominantly poorly to moderately indurated, **commonly tight to 3% porosity, minor to common poor to increasing streaky fair porosity, shows as above;**

minor interbedded CLAYSTONE: similar to above becoming commonly variably bentonitic, trace slightly marly, increasing pyritic in minor part, trace siderite stringers, decreasing trace to minor shale as above.

1615-1625 **SANDSTONE WITH INTERBEDDED CLAYSTONE AND SHALE:**

SANDSTONE: light to medium brown, predominantly very fine grained, trace to locally minor fine grains, moderately to very silty, predominantly clean to slightly argillaceous quartz arenite, increasingly moderately to very argillaceous wacke in part, common argillaceous partings, predominantly well to very well indurated, moderately to moderately poorly indurated in part, increasing common to abundant siliceous cement, increasing trace spotty kaolin/illite, trace spotty to patchy pyrite, **predominantly tight to 2% porosity, minor streaky poor to trace fair porosity, common to abundant dull yellow green fluorescence, minor poor slow streaming and thin diffuse cut;**

CLAYSTONE: similar to above, medium to dark brown and brown grey, soft, trace white anhydritic mottles and streaky laminations, variably moderately to very bituminous, commonly slightly to moderately bentonitic, increasing minor siderite stringers, minor interbedded shale as above.

1625-1635 **SANDSTONE:** light to medium brown, very fine grained with trace to minor fine grains, moderately silty, locally very fine to fine grained in minor part, predominantly quartz arenite, commonly clean to variably argillaceous in part grading to minor wacke, well to moderately well sorted, angular to subrounded, common argillaceous partings, variably poorly to well indurated, common to locally abundant siliceous cement, minor streaky to spotty dolomitic cement, trace spotty kaolin/illite, trace patchy pyrite, trace quartz overgrowths, **predominantly tight to 3% porosity, minor streaky poor to fair porosity, minor to common very dull fluorescence, trace faint questionable cut;**

INTERBEDDED CLAYSTONE: medium brown to grey, soft, trace anhydritic to dolomitic mottles to streaks, variably bituminous in part, slightly to moderately bentonitic in part, trace siderite nodules, locally very pyritic, minor black coaly shale grading to bituminous coal.

1635-1644.6 **SANDSTONE:** similar to above, light to medium brown, very fine grained with trace to minor fine grains, moderately silty, locally very fine to fine grained in minor part, predominantly clean quartz arenite, variably argillaceous in part occasionally grading to wacke, well sorted, angular to subrounded, common argillaceous partings and laminations, trace siltstone stringers, predominantly very well to moderately indurated, poorly indurated in minor part, common to abundant siliceous cement, trace spotty kaolin/illite, trace patchy pyrite, trace locally minor quartz overgrowths, **predominantly tight to 2% porosity, minor streaky poor to fair porosity, common to abundant very dull yellow green fluorescence, trace very faint questionable cut;**

minor interbedded CLAYSTONE: as above with increasing minor anhydritic mottles and laminations becoming predominantly very bituminous, increasing trace to minor siderite stringers, trace slightly bentonitic, trace shale as above.

GOLATA 1644.6 m MD (-1271.7 m SS)

1644.6-1660 **SHALE WITH MINOR INTERBEDDED DOLOMITE:**

SHALE: black to very dark brown, rusty red to brown, minor grey green, firm, brittle, locally variably hard to soft, brittle in part, platy to sub platy, fissile to sub fissile, slightly sub waxy in part, variably silty and dolomitic in minor part, slightly to moderately micromicaceous, variably carbonaceous to bituminous in part, slightly dolomitic to calcareous in part, minor quartzose argillaceous variably sandy tight siltstone stringers;

DOLOMITE: light to medium brown, slightly mottled, cryptocrystalline to microcrystalline, firm to hard, predominantly dense, variably cherty in minor part, trace to minor scattered sparry inclusions, rare to trace scattered glauconite, **tight, no shows.**

1660-1665 **SANDSTONE WITH MINOR INTERBEDDED SHALE:**

SANDSTONE: as above in part becoming increasingly argillaceous in part grading to minor wacke, very fine to fine grained in part, slightly to moderately silty, quartz arenite as above, moderately well sorted, angular to subrounded to minor rounded, predominantly clean, variably disaggregated in part, poorly to moderately indurated, crumbly to slightly friable, increasing minor to locally common quartz overgrowths, decreasing minor spotty kaolin/illite, **minor to common variable poor to trace streaky fair porosity, shows as above;**

SHALE: as above.

1665-1670 **SHALE:** dark grey to very dark brown, minor black, predominantly variably firm, locally slightly soft to hard, platy to sub blocky, brittle in part, fissile to sub fissile, commonly smooth and faintly micromicaceous, sandstone stringers as above, slightly to moderately silty in part, commonly slightly sub waxy, minor pyrite nodules, slightly bituminous, trace marly bituminous claystone stringers.

1670-1675 **SHALE WITH INTERBEDDED SANDSTONE:**

SHALE: very dark brown, firm to soft, sub platy to sub blocky, sub fissile, very faintly micromicaceous, slightly to very silty grading to very argillaceous siltstone in part, slightly to moderately dolomitic, quartzose, very hard, dense, slightly to moderately argillaceous, slightly sandy, moderately to very dolomitic grading to silty dolomite stringers in part, **tight, no shows.**

1675-1685 **SHALE:** dark grey to very dark brown, minor black, predominantly variably firm, locally slightly soft to hard, platy to sub blocky, brittle in part, fissile to sub fissile, commonly smooth and faintly micromicaceous, slightly to moderately silty in part, commonly slightly sub waxy, minor pyrite nodules, slightly bituminous, trace marly bituminous claystone stringers, sandstone stringers as above, minor thin dolomite as above.

1685-1693 **SHALE WITH INTERBEDDED SANDSTONE:**

SHALE: very dark brown, firm to soft, sub platy to sub blocky, sub fissile, very faintly micromicaceous, slightly to very silty grading to very argillaceous siltstone in part, slightly to moderately dolomitic, quartzose, very hard, dense, slightly to moderately argillaceous, slightly sandy, moderately to very dolomitic grading to silty dolomite in part, **tight, no shows.**

1693-1698.5 **INTERBEDDED SANDSTONE, DOLOMITE AND SHALE:**

DOLOMITE: medium brown, cryptocrystalline to microcrystalline, variably glauconitic, predominantly variably silty grading to dolomitic siltstone stringers, minor sparry inclusions, variably calcareous grading to dolomitic limestone in part, minor ostracodes and rare crinoids, **no visible porosity, common dull yellow fluorescence, trace questionable cut;**

SANDSTONE: off white to medium grey, predominantly very fine grained and variably silty, very quartzose with variable dolomitic grains (sub litharenite), clean to variably argillaceous, moderately well sorted, angular to subrounded, commonly disaggregated, variably poorly to well indurated, common siliceous cement, minor streaky dolomitic cement, **trace poor porosity, minor spotty fluorescence, no cut;**

SHALE: dark grey to black, platy to sub blocky, variably carbonaceous to coaly, minor framboidal pyrite.

1698.5-1705 **SANDSTONE WITH MINOR INTERBEDDED SHALE:**

SANDSTONE: predominantly light to medium brown, minor light grey, predominantly very fine to fine grained, very fine grained and silty in part, sub-quartzarenite with variable trace to minor dolomitic grains locally grading to sub litharenite, moderately well sorted, angular to rounded, clean to slightly argillaceous, variably well to moderately poorly indurated, disaggregated in part, common siliceous and minor to common spotty to streaky dolomitic cement, **predominantly tight to 2% porosity, minor to common variable poor to trace streaky fair intergranular to trace dissolution porosity, common patchy bitumen to oil stain, common spotty to patchy dull to moderate yellow fluorescence, minor thin poor to fair milky cut;**

SHALE: as above, trace to minor dolomite stringers as above.

1705-1709 **SHALE WITH INTERBEDDED SANDSTONE:**

SHALE: dark grey to black, variably firm, platy to sub platy, fissile, variably silty and micromicaceous in part, variably carbonaceous to coaly with minor coaly laminations, trace marl stringers;

SANDSTONE: light grey to light brown, predominantly very fine grained and silty, very quartzose grading to quartz arenite, clean to variably argillaceous, minor argillaceous partings, well sorted, angular to subrounded, moderately to well indurated, abundant dolomitic to calcareous cement, **no visible porosity, minor to common spotty fluorescence, no cut.**

FLETT/DEBOLT 1709 m MD (-1336.1 m SS)

1709-1714 **LIMESTONE:** variable: medium to dark brown, light to medium grey in part, mottled in part, cryptocrystalline to microcrystalline and dense in part (mudstone), microcrystalline with common to abundant sparry bioclasts to allochems (common crinoid, rare to trace fusulinids)(packstone to wackestone), locally variably dolomitic, argillaceous in part, **no visible porosity, minor to common dull yellow fluorescence, trace weak questionable cut;**

DOLOMITE: predominantly as above, trace to minor recrystallized bioclast **packstone to wackestone, tight, no shows,** minor thin shale stringers.

1714-1719 **LIMESTONE:** light to medium brown, minor brown grey, slightly mottled in part, predominantly packstone to wackestone with micro to extremely fine crystalline matrix and common to abundant recrystallized sparry to micritized indeterminate bioclasts to allochems (minor crinoid, rare ostracodes), commonly variably dolomitic grading to calcareous dolomite in part, **no visible porosity, trace clear to white calcite spar fracture fill, infer minor poor fracture porosity, common dull yellow fluorescence, trace very weak very thin cut.**

1719-1725 **DOLOMITE:** light brown, slightly mottled, predominantly firm to hard and brittle, indeterminate texture (probably recrystallized packstone to wackestone), cryptocrystalline to extremely fine crystalline, common sparry bioclasts to allochems (crinoidal in part), trace micro sucrosic, variably calcareous grading to minor dolomitic limestone, common fracture surfaces with white calcite spar and dolomite fracture fill, trace stylolites, **infer common poor to fair fracture porosity, abundant dull to moderate yellow fluorescence, trace very weak cut.**

1725-1730.5 **DOLOMITE:** as previously described becoming medium to dark brown and argillaceous in minor part, increasingly grading to dolomitic limestone stringers in minor part, trace buff to light grey bioclastic limestone stringers, trace fracture surfaces with calcite to dolomite fill as above, **no visible porosity, infer trace to minor poor fracture porosity, fluorescence and cut as above.**

1730.5-1740 **LIMESTONE WITH INTERBEDDED DOLOMITE:**

LIMESTONE: predominantly buff to light brown, medium to dark brown to grey in part, mottled in part, predominantly packstone with microcrystalline matrix and abundant sparry to micritized bioclasts to allochems, common crinoids and indeterminate bioclasts, locally grades to wackestone, commonly variably firm to locally crumbly, hard dense and variably cherty in part with minor chert nodules, variably dolomitic in part grading to minor calcareous dolomite, **no visible porosity, common dull to moderate yellow fluorescence, minor poor very thin diffuse cut;**

DOLOMITE: light grey to light brown, predominantly cryptocrystalline to microcrystalline, micro to very fine crystalline and slightly micro sucrosic in minor part, predominantly indeterminate texture, minor locally common sparry inclusions, variably calcareous grading to dolomitic limestone in part, **no visible porosity, minor to common fluorescence and trace weak cut.**

1740-1744 **LIMESTONE WITH INTERBEDDED DOLOMITE: as above with decreasing minor to common fluorescence and decreasing trace weak cut.**

Décollement

Scale 1:240 (5"=100') Metric

Well Name:	Paramount et al Mount Coty I-02		
Location:	I-02/60-20, 123-30		
Licence Number:	WID 1884	Region:	Fort Liard, N.W.T.
Spud Date:	16-Oct-00: 2200hrs	Drilling Completed:	25-Nov-00 2245hrs
Surface Coordinates:	Lat: 60 deg. 11' 34.008" N Long: 123 deg. 30' 18.797"		
Bottom Hole Coordinates:			
Ground Elevation (m):	367.90m	K.B. Elevation (m):	372.95m
Logged Interval (m):	23m To: 1744m	Total Depth (m):	1744m
Formation:	Flett/Debolt		
Type of Drilling Fluid:	Gel-chem		

OPERATOR

Company:	Paramount Resources Ltd.
Address:	4700 888-3rd St. S.W. Calgary, Alberta T2P 5C5

GEOLOGIST

Name:	Gary Johannson
Company:	Decollement Consulting Ltd.
Address:	Suite 200, 1009 - 7th Avenue S.W. Calgary, Alberta T2P 1A8

DSTs

DST #1: 1058-1068m; DST #2: 1058-1065m; DST #3: 1075-1085m

ROCK TYPES

Anhy	Congl	Mrlst	Ss
Bent	Dol	Salt	Till
Brec	Gyp	Shale	Blank
Cht	Igne	Shcol	Nosample
Clyst	Lmst	Shgy	Siderite
Coal	Meta	Sltst	

ACCESSORIES

MINERAL		FOSSIL	STRINGER	TEXTURE
Anhy	Sandy	Algae	Anhy	Boundst
Arggrn	Silt	Amph	Arg	Chalky
Arg	Sil	Belm	Bent	Cryxln
Bent	Sulphur	Bioclst	Coal	Earthy
Bit	Tuff	Brach	Dol	Finexln
Brecfrag	anhy-nod	Bryozoa	Gyp	Grainst
Calc	cht-nod	Cephal	Ls	Lithogr
Carb	bitumen	Coral	Mrst	Microxln
Chtdk	Rhombs	Crin	Sltstrg	Mudst
Chtlt		Echin	Ssstrg	Packst
Dol		Fish	Chert	Wackest
Feldspar		Foram	clystn	Arg lamn
Ferrpel		Fossil	sidstrg	climb-rip
Ferr		Gastro	hematite	convlam
Glau		Oolite		cross la
Gyp		Ostra		hummk-xs
Hvymin		Pelec		wvy par
Kaol		Pellet		Tab-plnr
Marl		Pisolite		xbed-trg
Minxl		Plant		bioturb
Nodule		Strom		thrust fault
Phos		spics		fracture
Pyr		calcisph		slickens
Salt		coral		
		inoceram		

OTHER SYMBOLS

POROSITY TYPE	SORTING	ROUNDING	OIL SHOWS	EVENTS
Earthy	Well	Rounded	Even	Rft
Fenest	Moderate	Subrnd	Spotted	Sidewall
Fracture	Poor	Subang	Ques	casing
Inter		Angular	Dead	Slidebar
Moldic				None
Organic				Core
Pinpoint				Dst
Vuggy				

INTERVALS

Curve Track 1: ROP (min/m), Gas (units) | Depth | Porosity Type | Porosity | Lithology | Grain Size | Sorting | Rounding | Oil Shows | Geological Descriptions

Paramount et al Mount Coty I-02
NWT I-02-60-20-123-30

23-31 TILL uncons sand, vf-lm gr, tr-mnr um grs, clr-fros qtz wl mnr vcol ltc grs, mnr rusty qtz & K-spar grs, mody w srt, ang-srd, cln, infr g por.

31-40 TILL uncons sand, f-c gr, tr-mnr vc grs, qtzs as wl incr com-abnt vcol ltc grs (i.e., heterolithic grs incl com gran), tr sh grs, mody srt, sb ang-rd, cln, infr g por.

40-45 TILL uncons sand as prev desc wl incr mnr uvc grs & occl f pbl.

45-55 TILL uncons sand, pred f-uc gr, com vc grs & f pbls, pbly-cglic lp, qtzs as, pbls incrly v heterolithic (incl com gran), p srt, sb ang-rd, cln, infr g por.

55-63 TILL uncons sand, as prev desc bcmg sl csr, qtzs as, pbly-cglic lp, tr arg mtx, infr decr g-str fr por.

63-75 TILL uncons sand, uf-vc gr, tr f pbls, fros-clr qtz (+ mnr fld) wl com vcol ltc grs as, mody-mody p srt, ang-rd, pred cln, tr arg mtx, infr pred g por.

75-85 TILL uncons sand, m-vc gr, mnr f grs, incr com pbls, cglic, qtzs as wl polymict ltc clsts, p srt, ang-rd, pred cln, tr arg mtx, infr g-fr por.

85-90.5 TILL uncons gravel, f pbl, clst supp, m-c gr sand mtx as, v polymict (abnt granitoid clsts, com siliciclastics, mnr carbonates), p srt, sb ang-rd, cln, infr g-fr por.

90.5-92.5 TILL uncons sand, f-vc gr, fros-clr qtz (+ mnr fld) wl com vcol ltc grs as, mody-mody p srt, ang-rd, pred cln, tr arg mtx, infr g-fr por.

Lepine @ 92.5m MD 280.5m SS