

**NATIONAL ENERGY BOARD
ENGINEERING BRANCH**

OCT 19 1993

**PRODUCTIVITY AND BUILDUP TEST REPORT
ON WELL**

PARAMOUNT ET AL CAMERON

M - 73

SULPHUR POINT: 1415.5 - 1420.5 m KB

93/03/24 TO 93/05/11

Prepared for:

PARAMOUNT RESOURCES LIMITED

Prepared by:

FEKETE ASSOCIATES INC.



Reservoir Engineering & Geology — Oil & Gas Property Evaluation — Well Test Interpretation — Software Development

October 14, 1993

Paramount Resources Limited
4000 First Canadian Centre
350 - 7th Avenue S.W.
Calgary, Alberta
T2P 3W5

ATTENTION: JOHN GEE

**RE: PRODUCTIVITY AND BUILDUP TEST REPORT
PARAMOUNT ET AL CAMERON M - 73
SULPHUR POINT: 1415.5 - 1420.5 m KB**

Production from the subject well commenced on January 2, 1993. On March 24, 1993, electronic pressure recorders were set down hole and production was resumed for 83 hours. The well was then shut-in, and the subsequent pressure buildup was monitored for 1071 hours. As requested, we have analyzed the buildup data and present our findings in this report.

In summary, our analysis suggested that there is a 50% reduction in kh about 184 meters away from the well, and that very little pressure loss occurred as a result of the oil and gas produced during the 81 days of production.

The test results are summarized as follows:

Initial Reservoir Pressure	9765	kPa	(1416	psia)
Current Reservoir Pressure	9602	kPa	(1393	psia)
Total Oil Produced	1940.1	m ³	(12203	bbl)
Total Free Gas Produced	1749	10 ³ m ³	(62	MMscf)
Maximum Oil Productivity	54.8	m ³ /d	(345	bbl/d)
Average GOR	979	m ³ /m ³	(5525	scf/bbl)

Near-Wellbore Flow Characteristics

Flow Capacity (Oil)	404	mD.m	(1343	md.ft)
Permeability (Oil)	81	mD	(82	md)
Skin	+ 4			
Radius	184	m	(604	ft)

Flow Characteristics Beyond 184 Meters

Flow Capacity (Oil)	209	mD.m	(695	md.ft)
Permeability (Oil)	42	mD	(42.6	md)
Radius	1650	m	(5413	ft)

An indepth discussion of our interpretation and the test results follows in this report. If you should have any further questions please do not hesitate to contact the undersigned.

Yours truly,
FEKETE ASSOCIATES INC.

(ORIGINAL SIGNED BY)

M.S. Santo
Senior Staff Technologist

(ORIGINAL SIGNED BY)

L. Mattar, P. Eng.
Vice-President, Engineering

MSS/md

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**PRODUCTIVITY AND BUILDUP TEST REPORT
PARAMOUNT ET AL CAMERON M - 73
SULPHUR POINT: 1415.5 - 1420.5 m KB**

Background

The subject well was completed to produce from the above captioned Sulphur Point interval in March, 1991. A flow and buildup test was performed from March 15 to May 27, 1991, and the well has remained shut-in since then. The results from the initial production test were documented in a Fekete report dated August, 1991.

On January 2, 1993, a long term production test commenced. The well was produced continuously until March 27, 1993. A relatively steady production rate was maintained, with an average oil rate of 23.9 m³/d and an average GOR of 979 m³/m³. Total water production amounted to 3.6 m³.

On March 24, 1993, two electronic pressure recorders were set down hole to monitor the bottom hole flowing pressure during the last 83 hours of production. The recorders were then left in the well to monitor the subsequent pressure buildup. On May 11, 1993 (after 1071 hours of buildup), the recorders were recovered, and a static gradient survey was conducted to complete the test.

Pressure Transient Analysis

The pressure transient analysis was complicated by three events that occurred near the time of shut-in. Immediately prior to shut-in, there was a sudden increase in the rate that was not recorded. To perform the pressure transient analysis, a rate was estimated based on the IPR curve included in this report. The second and third disturbances occurred within the first 10.5 hours of shut-in. These apparently corresponded to the de-waxing operations.

Fortunately, these disturbances did not alter the overall buildup trend significantly, however, the pressure behaviour during the first day of shut-in was difficult to diagnose. This is quite evident from the type curve and pressure derivative plot, which exhibits

erratic behaviour during the first 24 hours of shut-in. In any case, wellbore storage is well defined, as demonstrated from the unit slope formed in the early-time region.

The first disturbance during the buildup is shown to occur just at the end of the wellbore storage period. The derivative then exhibits a brief flattening trend before the second disturbance occurred. The derivative then appears to return to the previously established horizontal slope, suggesting that radial flow was developed.

As shown from the semi-log (Superposition) buildup plot, an acceptable straight line relationship was offered prior to, and immediately after the final disturbance. Semilog analysis of these data indicated the following:

Semilog Analysis

$$kh = 401 \text{ mD.m}$$

$$k = 80 \text{ mD}$$

$$s = +3.8$$

At about 24 hours of shut-in, the data are shown to deviate upward from the radial flow trend, which corresponds to a radius of 183 meters. Then, at about 150 hours, the buildup trend exhibits a decreasing slope that continues until the end of the test. This pressure behaviour exhibited after 24 hours of shut-in could be due to the influence of nearby reservoir boundaries and/or a change in the reservoir flow characteristics. These possibilities were further investigated through the use of history matching (synthesis).

SYNthesis

To simulate a change in reservoir flow characteristics (kh/μ), a composite model was used. In this case, the pressure behaviour reflected a degradation of (kh/μ). In the composite model, the pay (h) and viscosity (μ) are assumed to be constant, hence, the simulation was performed by reducing the permeability. Although it is possible for a reduction in pay to be influencing the pressure behaviour, an increase in viscosity (which should be required to cause a decrease in kh/μ) would not be expected. Therefore, a reduction in permeability is considered to be a realistic model. As shown

from the synthesis plots included in this report, a reasonable match was obtained with the buildup data (geometric symbols) by using the following parameters:

	<u>Zone 1 (Near Wellbore)</u>	<u>Zone 2</u>
kh =	404 mD.m	209 mD.m
k =	81 mD	42 mD
s =	+4.0	N/A
r _e =	184 m	1650 m

The initial pressure determined from this analysis (9826 kPa) is very close to the reservoir pressure established in 1991 (9765 kPa). Therefore, a complete history match was obtained, indicating this to be a credible model for this reservoir. The results indicate that there is a 50% reduction in kh about 184 meters from the well, and that the reservoir could be as large as 855 hectares (3.3 sections).

Near-wellbore damage has also been identified (s = +4). Calculations indicate that a 25% increase in deliverability would be obtained at a skin of zero.

A second history match was performed by including boundaries near the well. A very good match of the buildup was obtained by placing the well in the center of an elongated reservoir with the following parameters:

<u>Boundaries Model</u>	
	kh = 419 mD.m
	k = 84 mD
	s = +4.4
Reservoir Length	x _e = 2627 m
Reservoir Width	y _e = 346 m

Although a good match of the buildup was obtained with this model, the calculated initial reservoir pressure (11677 kPa) greatly exceeded the actual initial reservoir pressure of 9765 kPa. Therefore, a complete history match was not obtained with the boundaries model, and it is not considered to be representative of this reservoir.

Reservoir Pressure

The initial reservoir pressure was determined to be 9765 kPa in 1991. Based on the synthesis of the composite model, the current pressure was determined to be 9602 kPa. This represents a 1.7% pressure loss after producing 1940 m³ of oil and 1749 10³m³ of "free gas", which tends to support a sizeable reservoir volume.

Due to the apparent existence of a gas cap, the oil reserves are difficult to determine from material balance. To do so, the size of the gas cap must be known.

Productivity

Based on the synthesis of the composite model, the flow time prior to this test was indicated to be close to the time to stabilization ($t_s = 2548$ hr). Therefore, an I.P.R. curve was constructed based on the final flow point (before the rate increase immediately prior to shut-in) to illustrate the productivity at different flowing pressures.

The I.P.R. curve was constructed by applying a quadratic curve factor of 0.2, and indicated that this zone would be capable of producing 54.8 m³/d of oil at 100% drawdown.

OPERATIONS SUMMARY

<u>DATE</u>	<u>TIME</u>	<u>OPERATION</u>
January 2, 1993	-	Commenced production.
March 24, 1993	0902 Hours	Set two electronic pressure and temperature recorders at 1396 and 1398 m CF.
	1100 Hours	Resumed production.
March 27, 1993	2200 Hours	Shut-in for buildup test.
May 11, 1993	1425 Hours	Recovered recorders.
	1830 Hours	Completed static gradient survey to 1497.5 m CF.

-END OF TEST-

DATA VALIDATION

Subsurface Pressure And Temperature

The subsurface pressure and temperature were measured using two Starburst electronic recorders set at 1396.0 and 1398.0 m CF. Figures 1 - 10 show different views of the pressure and temperature data, which were used to confirm the integrity of the recorders. Examination of these figures revealed that both recorders behaved similarly, and operated within their published specifications.

The magnified view of the flow period and initial shut-in of Figure 2 shows three downward pressure spikes that occurred immediately prior to shut-in, and within the first 10.5 hours of shut-in. Immediately prior to shut-in, it appears that the well was blown down. The daily well completion reports indicated that the other two downward pressure spikes were the result of blow downs corresponding to dewaxing operations.

Since there was no obvious differences between the two recorders, pressure transient analysis of either data set would yield the same results. In this report, the data obtained from the bottom recorder (#1) were used.

The bottom recorder resided 16.4 meters above MPP (1414.4 m CF). Therefore, a depth correction was necessary to establish the sandface pressure. The final static gradient survey indicated an oil-water interface at about 1377 m CF. Therefore, the measured water gradient of 9.82 kPa/m was used to calculate the increment, as follows:

$$\text{INCREMENT} = 16.4 \times 9.82 = 161 \text{ kPa}$$

All measured pressures were converted to absolute values by adding 90 kPa.

The raw data set contained 23418 pressure readings. For pressure transient analysis, these data were filtered to obtain a final working data set that contained 367 pressure readings (Figure 11).

Flow Volumes

The oil and gas production volumes were obtained from the daily production summary provided from Paramount Resources Ltd. (January 2/93 to March 27/93).

Fluid Properties

The fluid properties required for the pressure transient analysis were determined based on the results of the reservoir fluid study performed on oil and gas samples obtained from the subject well in 1991.

Petrophysical Parameters

The net pay, porosity and water saturation values were provided from Paramount Resources Ltd. In view of the high producing GOR, a gas saturation of 5% was assigned.

$$h = 5 \text{ m}$$

$$\phi = 8 \%$$

$$s_w = 40 \%$$

$$s_o = 55 \%$$

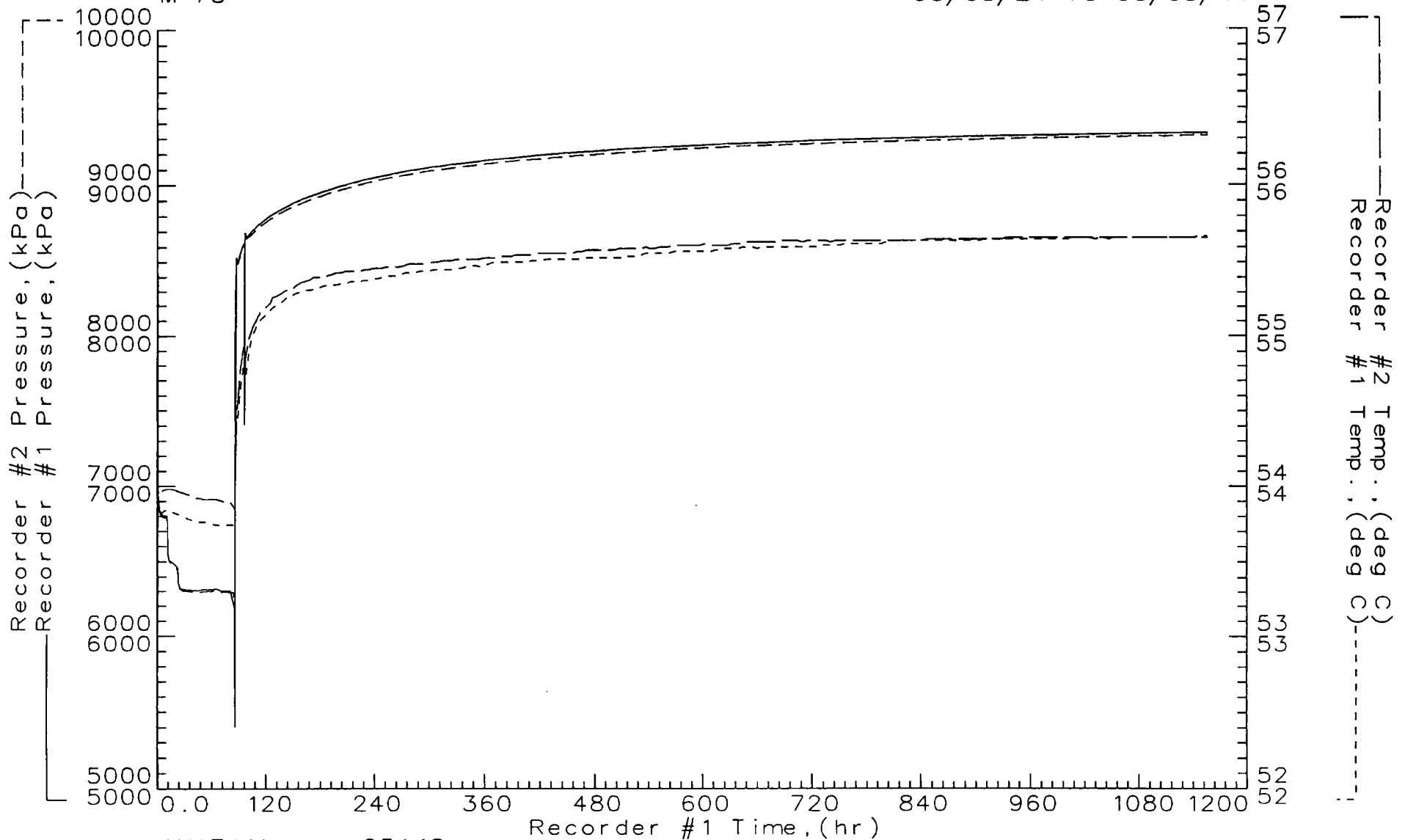
$$s_g = 5 \%$$

The above saturation profiles were used to determine the total system compressibility.

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



INITIAL = 234 18
DELETED = 0
REMAINING = 234 18

Figure 1

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

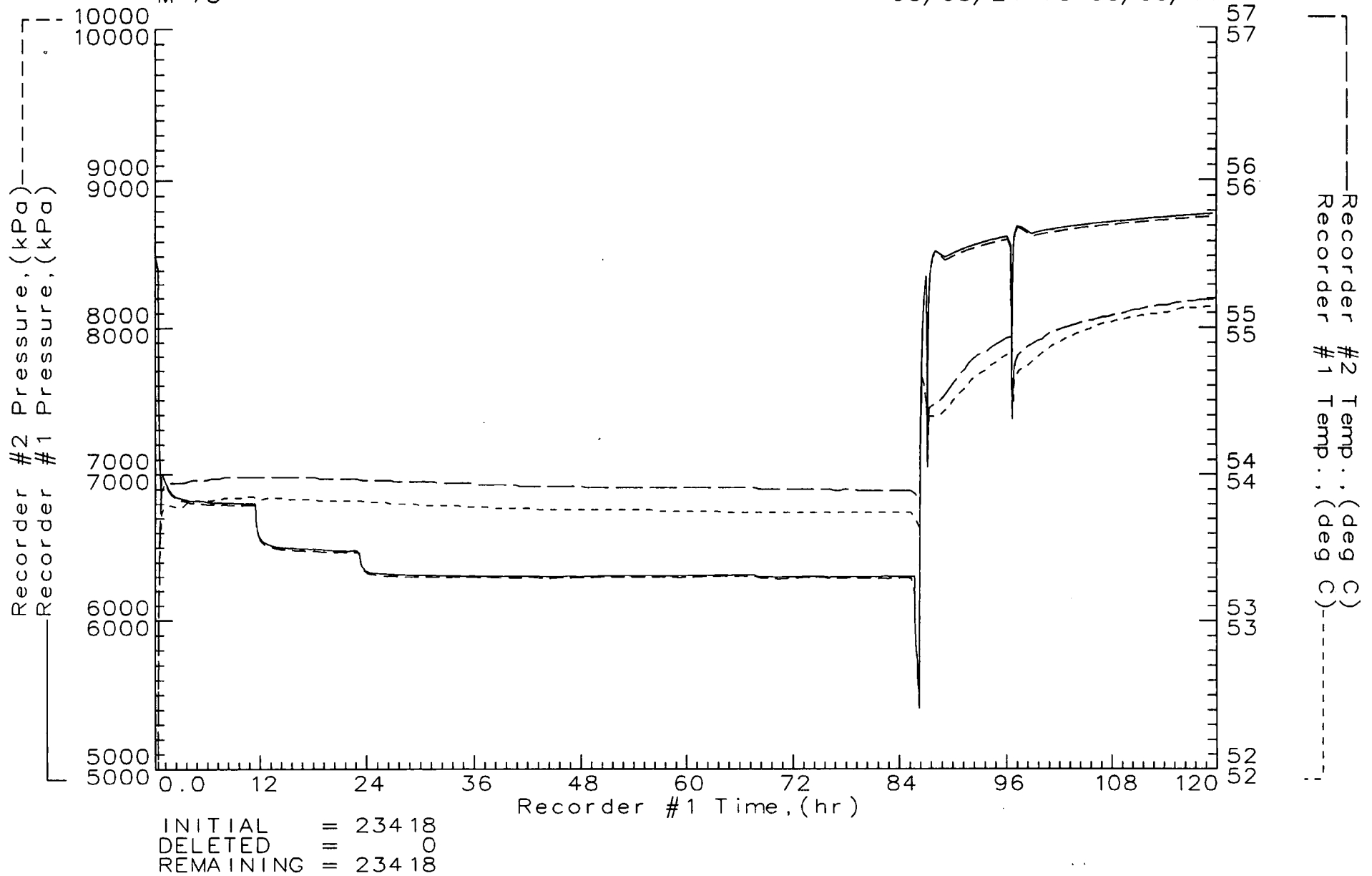


Figure 2

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

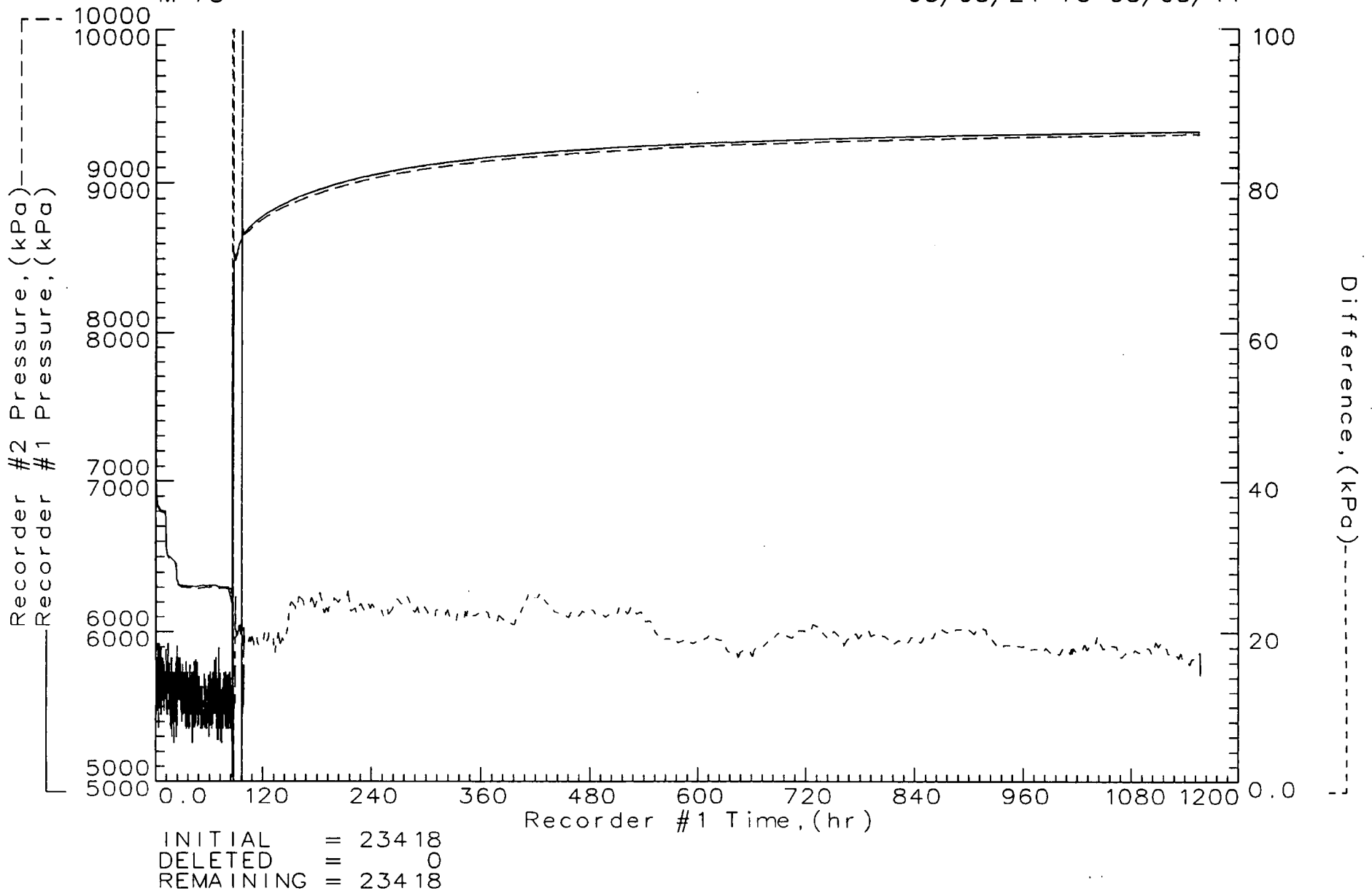
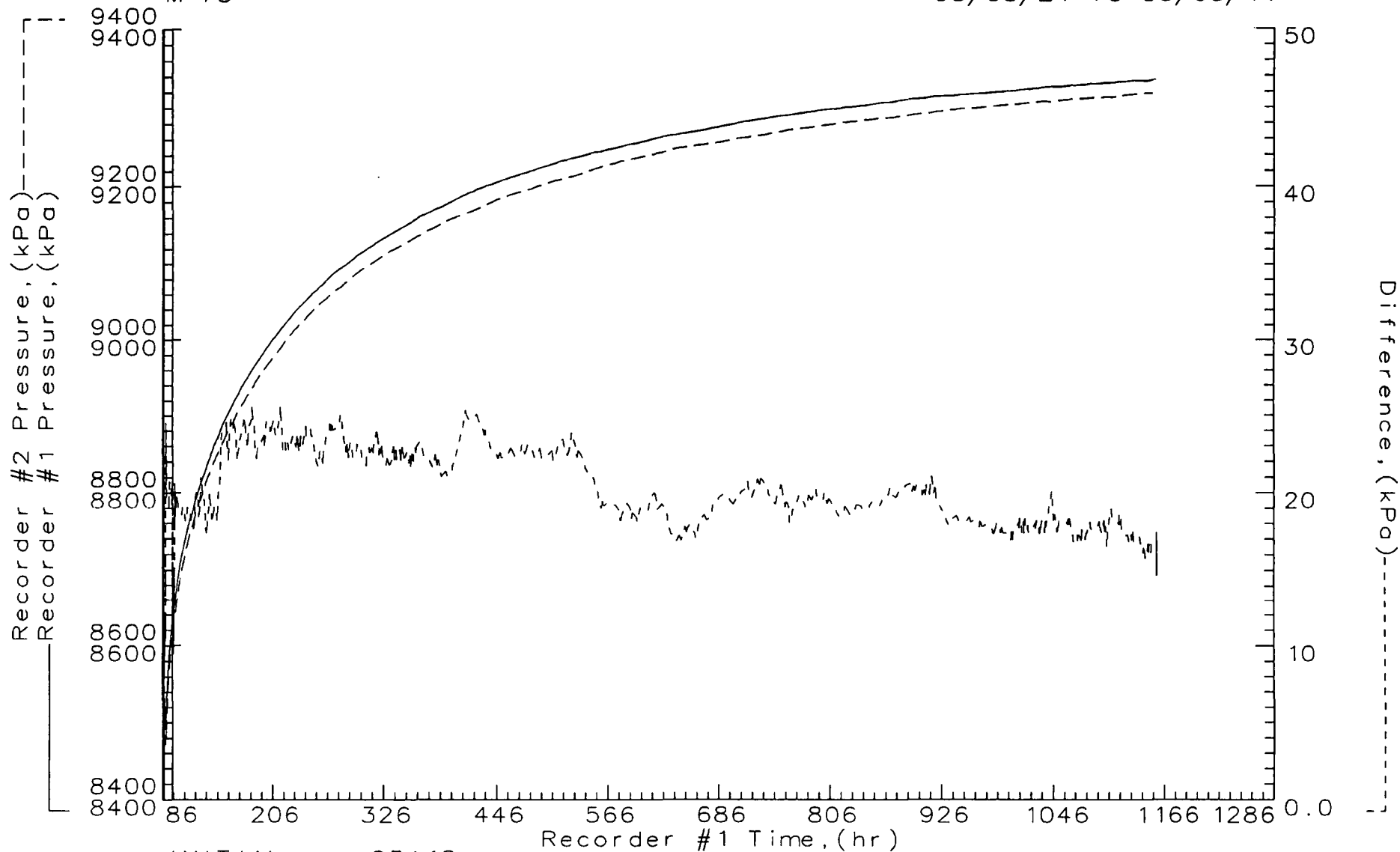


Figure 3

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT : 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



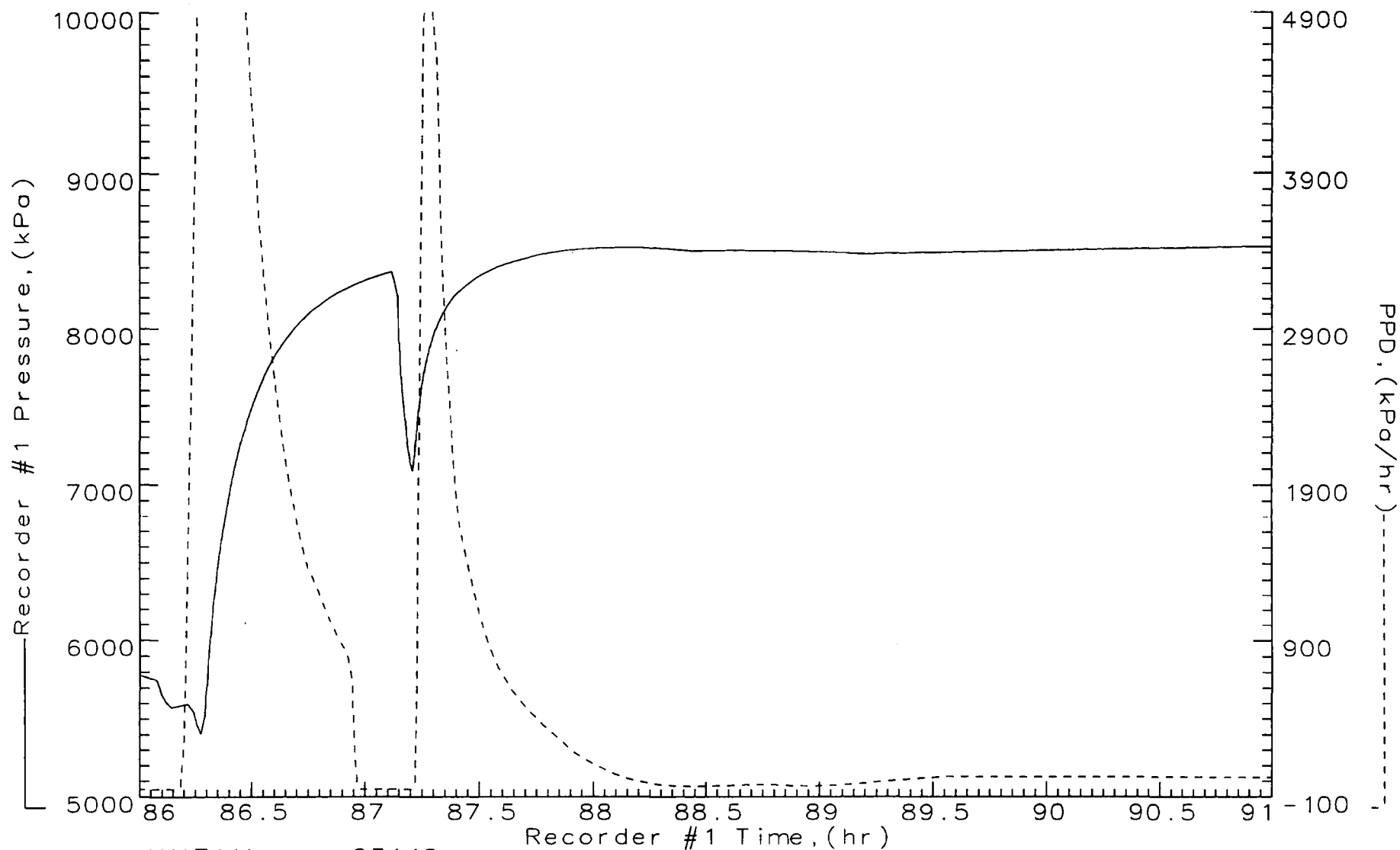
INITIAL = 23418
DELETED = 0
REMAINING = 23418

Figure 4

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT : 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



INITIAL = 23418
DELETED = 0
REMAINING = 23418

Figure 5

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

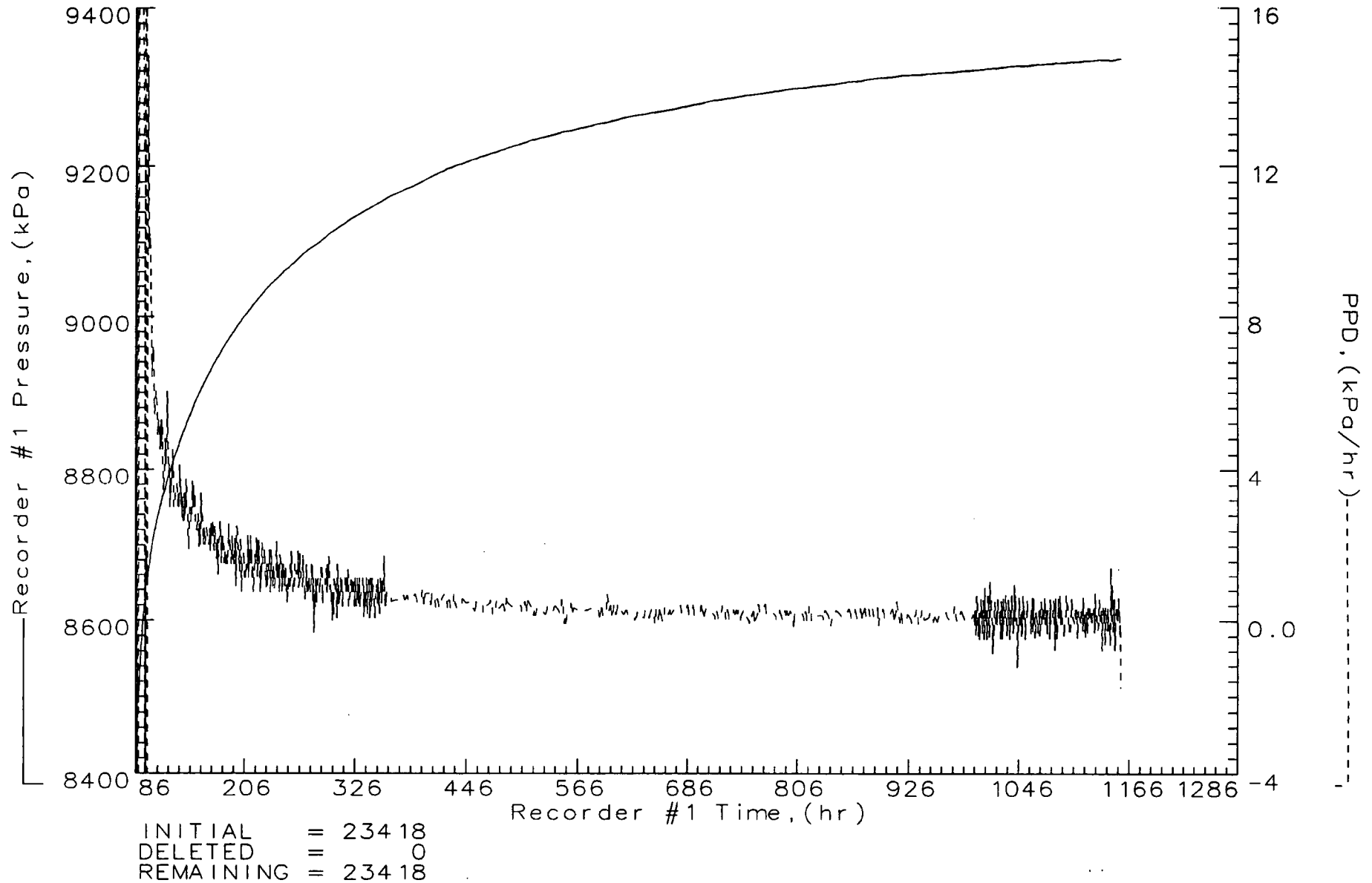
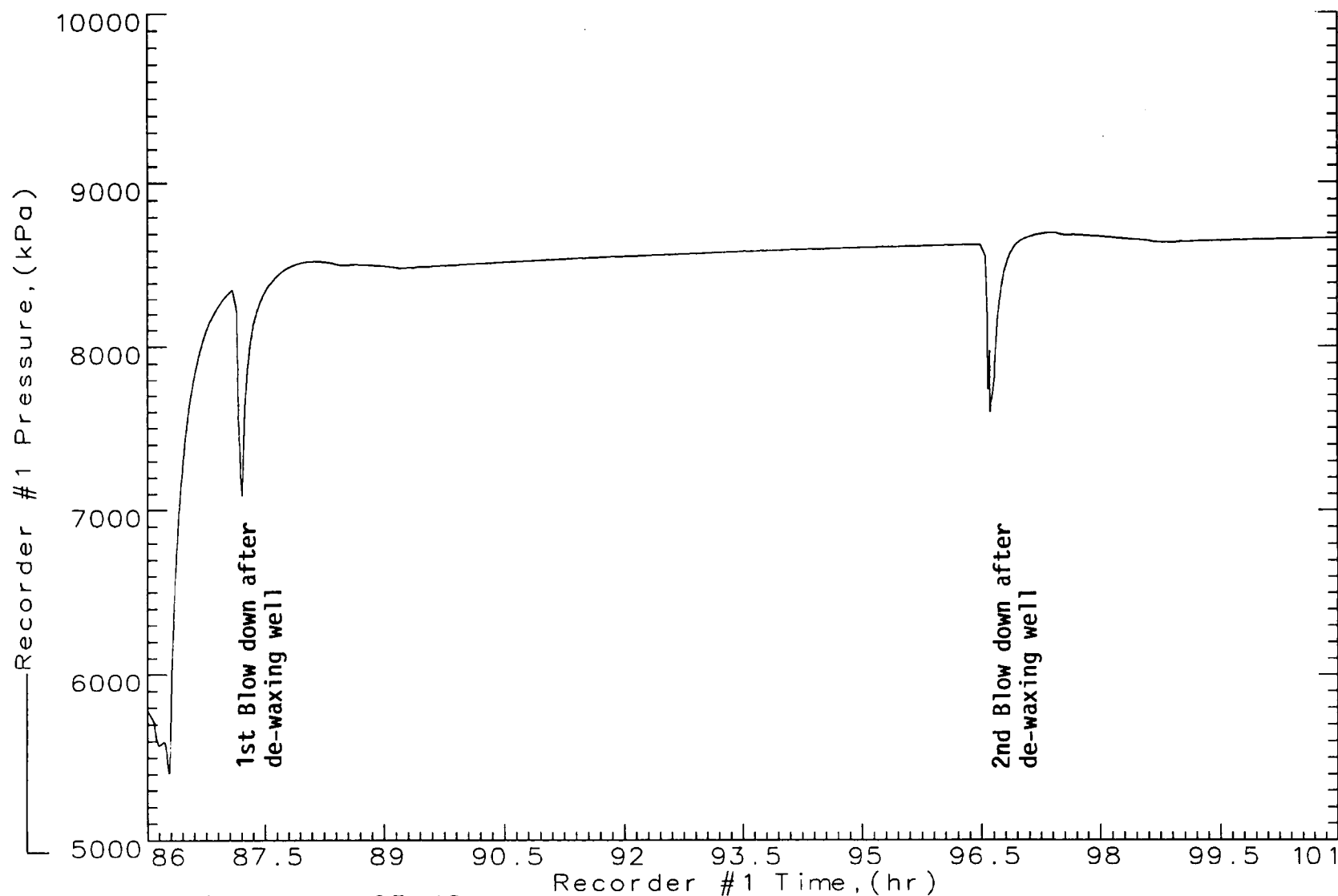


Figure 6

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT : 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



INITIAL = 234 18
DELETED = 0
REMAINING = 234 18

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

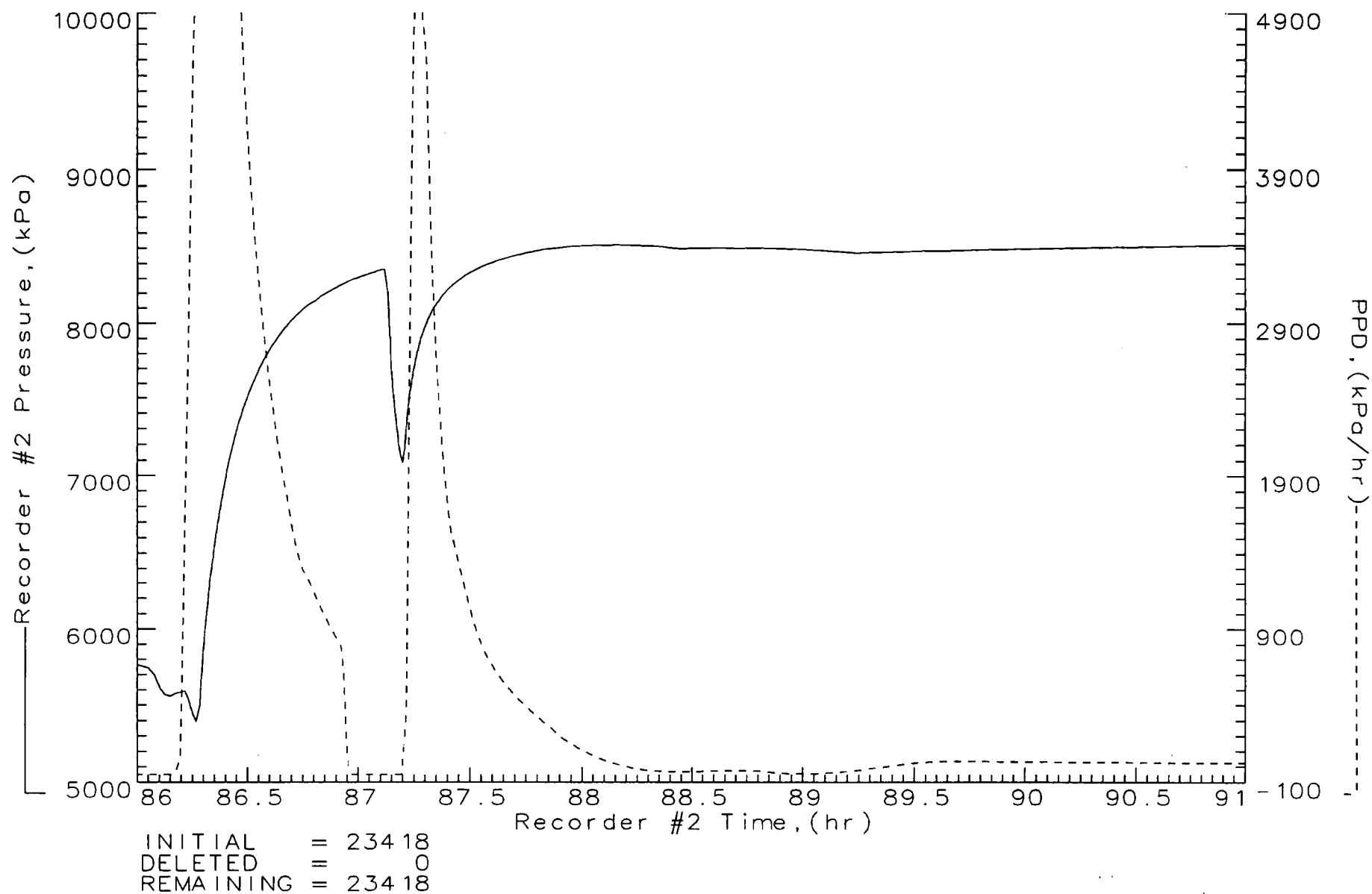
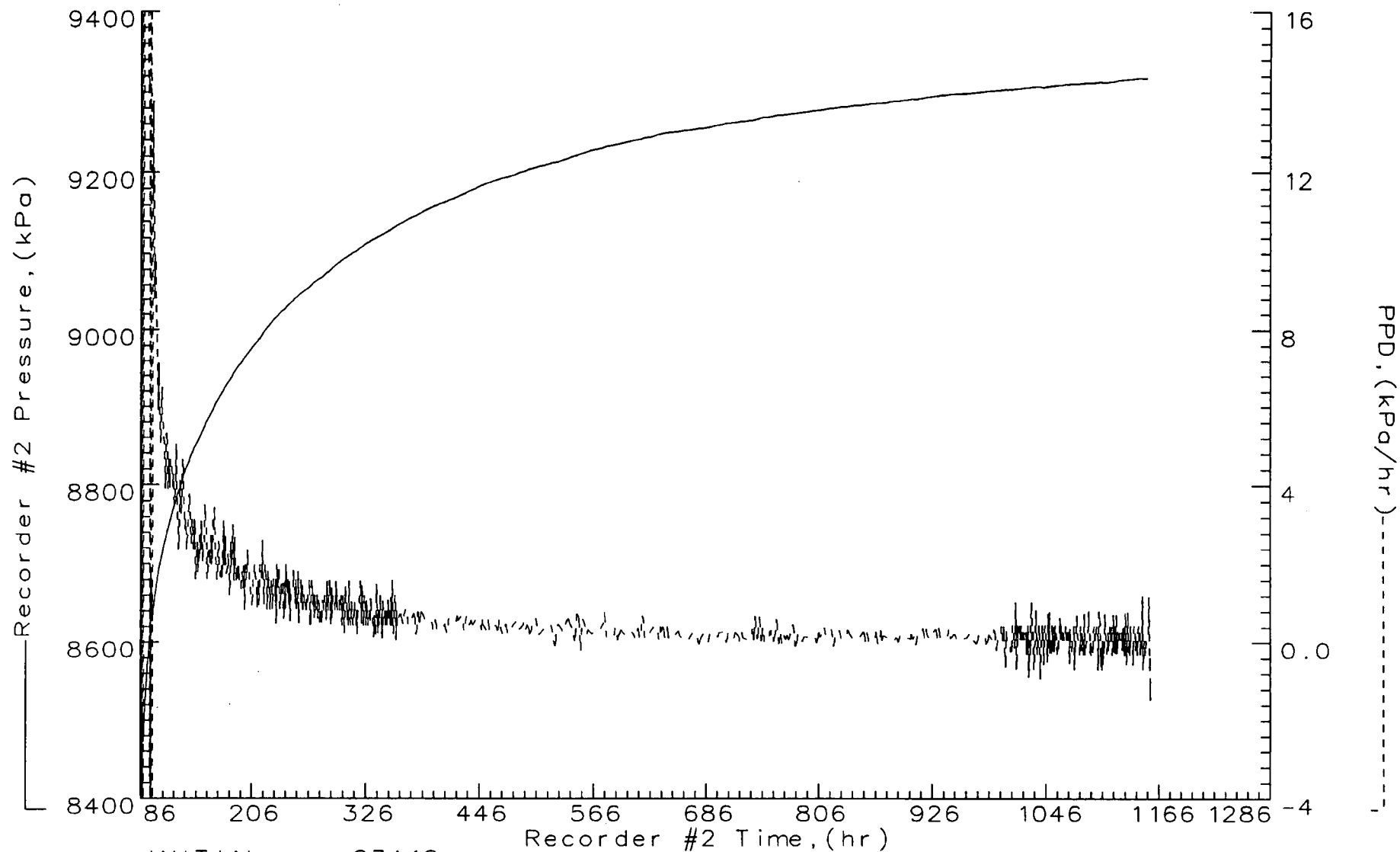


Figure 8

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT : 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



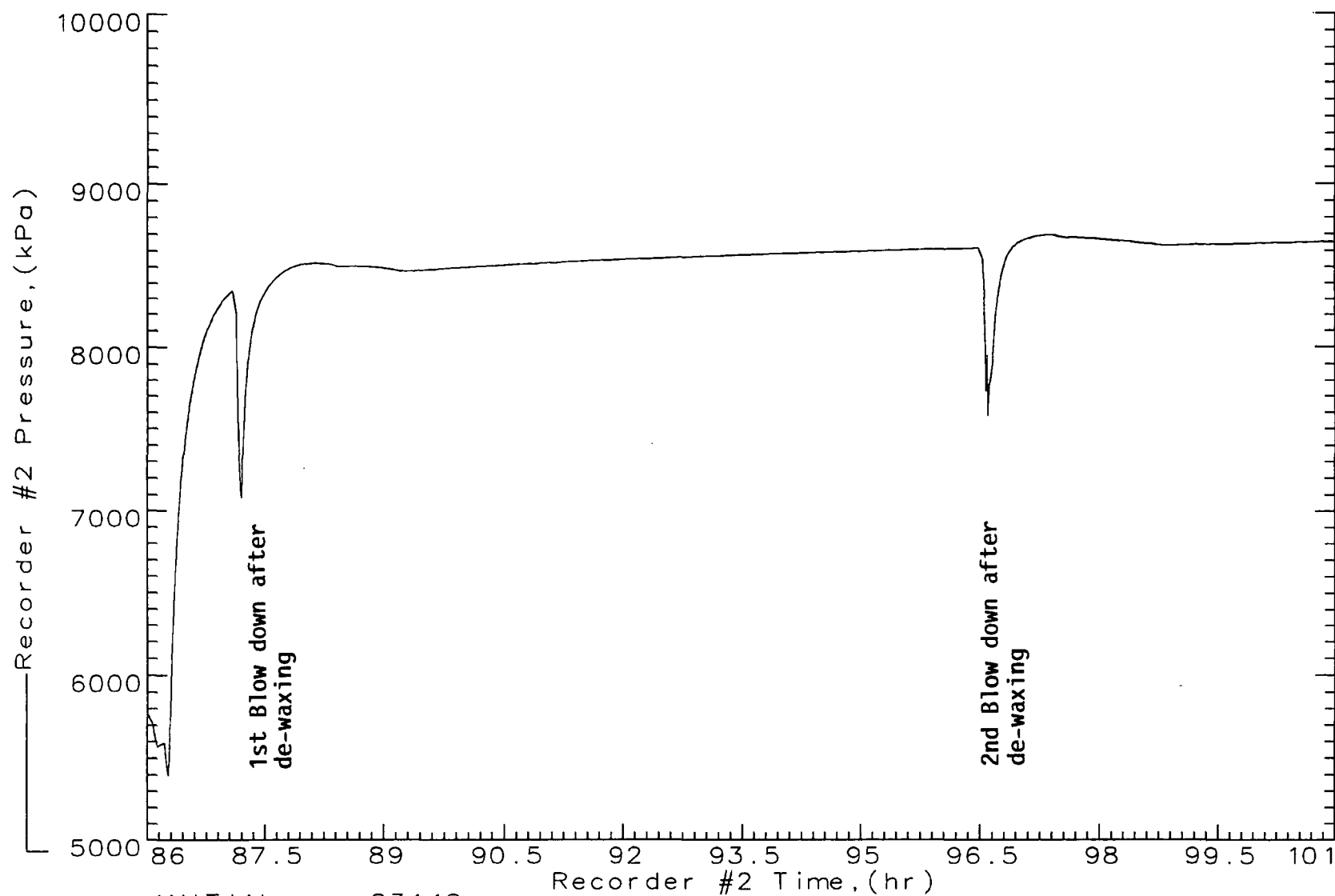
INITIAL = 23418
DELETED = 0
REMAINING = 23418

Figure 9

VALIDATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



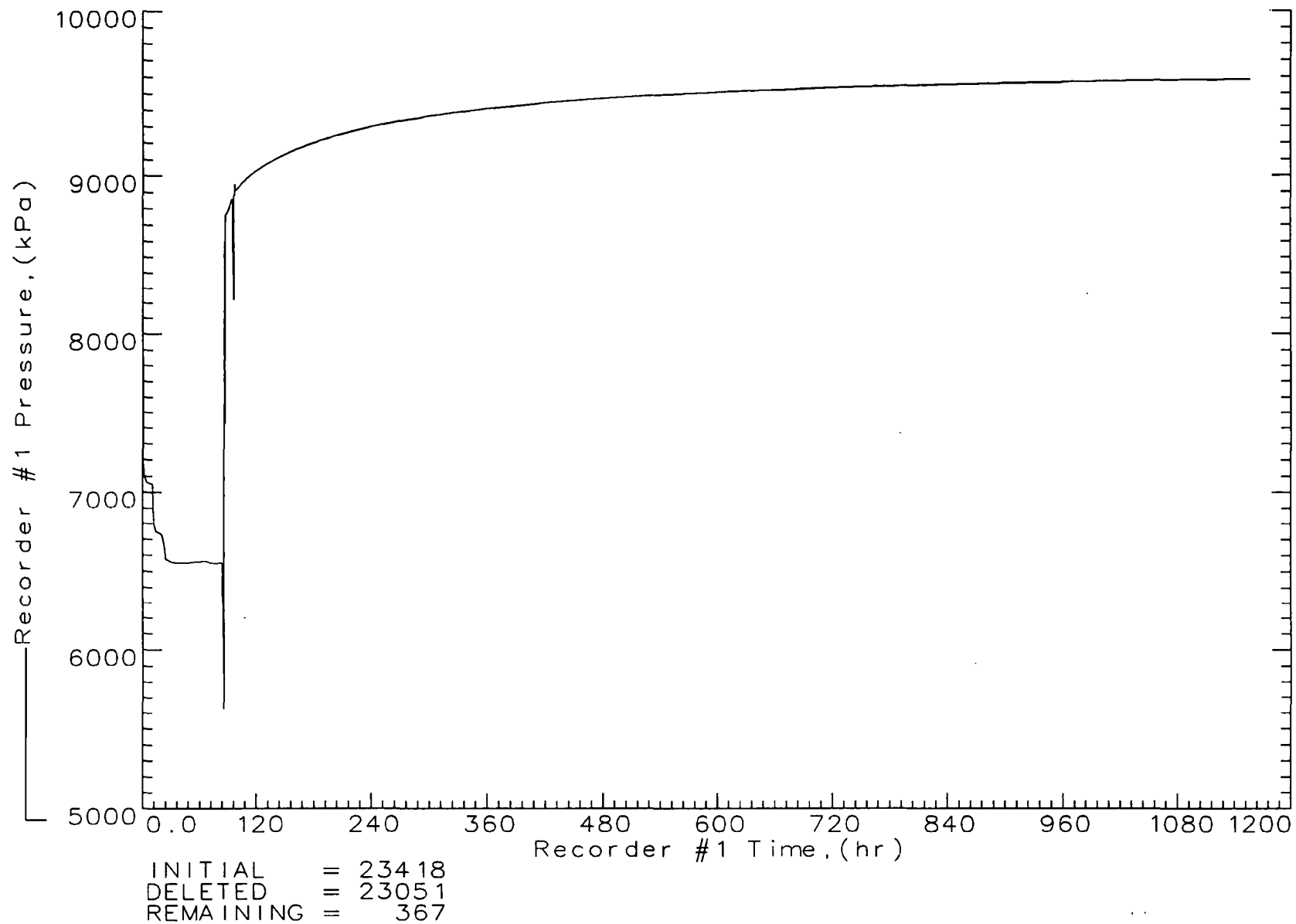
INITIAL = 234 18
DELETED = 0
REMAINING = 234 18

Figure 10

VALID DATA

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

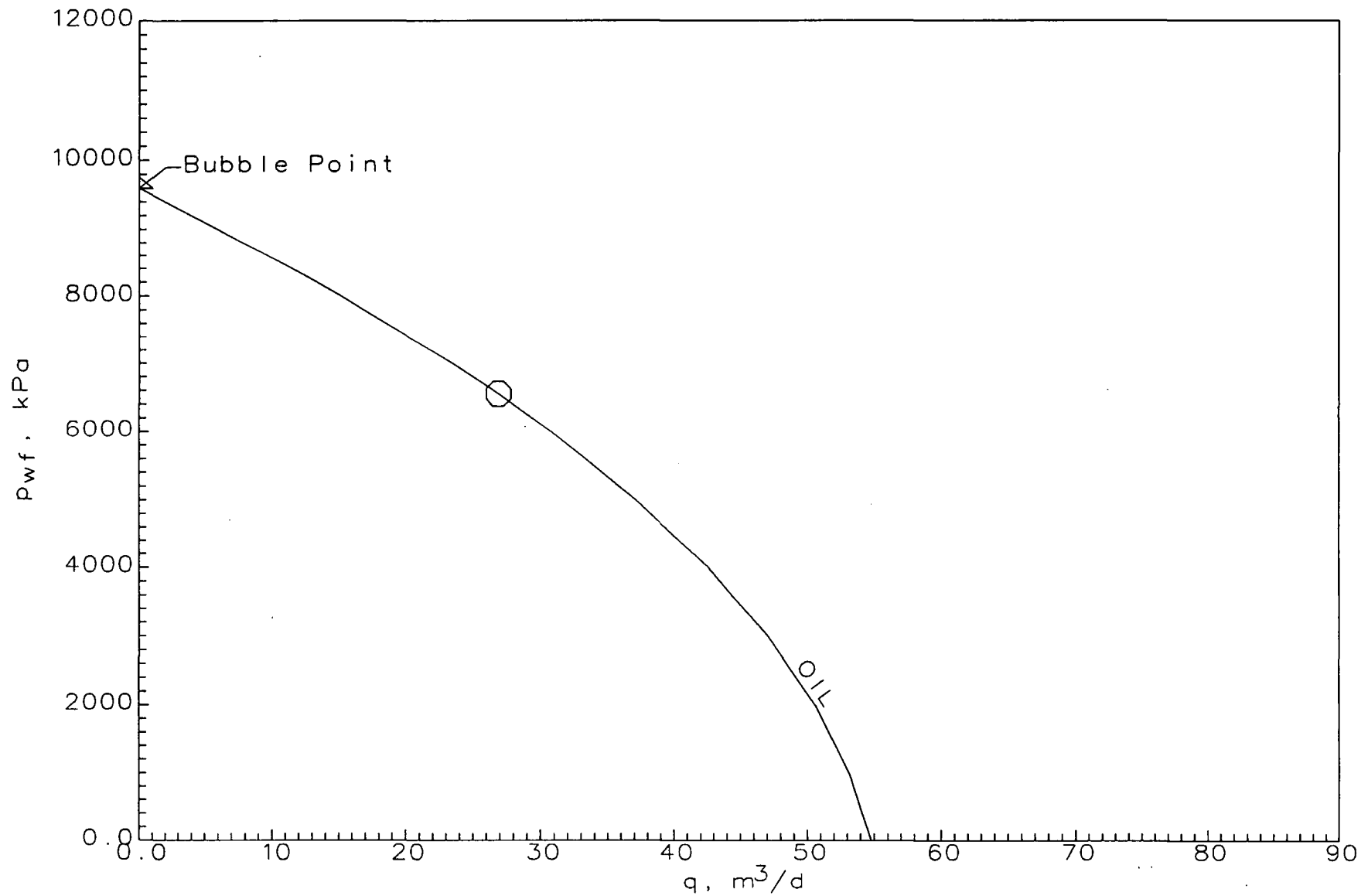


I . P . R .

PARAMOUNT ET AL CAMERON
M-73
SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

LEGEND

- - Oil
- △ - Water
- ◇ - Stab
- - Ignored



Oil Well Test

Inflow Performance Relationship

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Reservoir Pressure	=	9602.0	kPa
Bubble Point Pressure	=	9602.0	kPa

Stabilized Conditions

Flowing Pressure	=	6551.0	kPa
Stabilized Oil Rate	=	26.90	m ³ /d
Stabilized Water Rate	=	-	m ³ /d

I. P. R. Results

Maximum Oil Rate	=	54.77	m ³ /d
Maximum Water Rate	=	-	m ³ /d
Maximum Total Rate	=	-	m ³ /d

Oil Well Test

Inflow Performance Relationship

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Flowing Pressure	Oil Rate	Water Rate	Total Rate	Test Oil Rate	Test Water Rate	
kPa	3 m /d	3 m /d	3 m /d	3 m /d	3 m /d	
0.0	54.77	-	-	-	-	
1000.0	53.15	-	-	-	-	
2000.0	50.58	-	-	-	-	
3000.0	47.07	-	-	-	-	
4000.0	42.60	-	-	-	-	
5000.0	37.18	-	-	-	-	
6000.0	30.81	-	-	-	-	
6551.0	26.90	-	-	26.90	-	Selected Stabilized
6551.0	26.90	-	-	26.90	-	
7000.0	23.50	-	-	-	-	
8000.0	15.23	-	-	-	-	
9000.0	6.01	-	-	-	-	
9602.0	0.00	-	0.00	-	-	

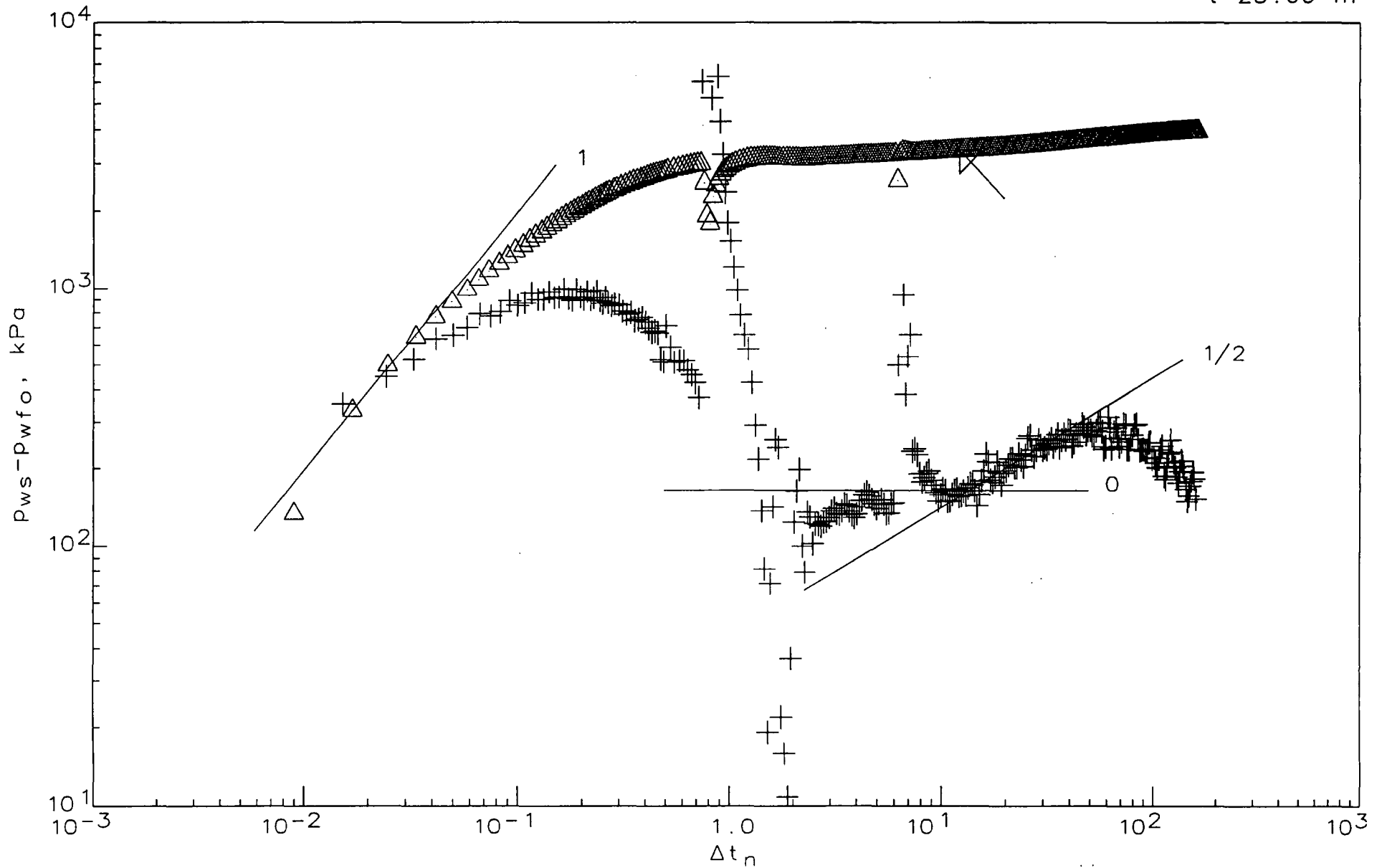
DIAGNOSTIC PREPLOT TYPECURVE

PRESSURE BUILDUP PLOT

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 14 15.5-1420.5 mKB
93/03/24 TO 93/05/11

$t=23.60$ hr



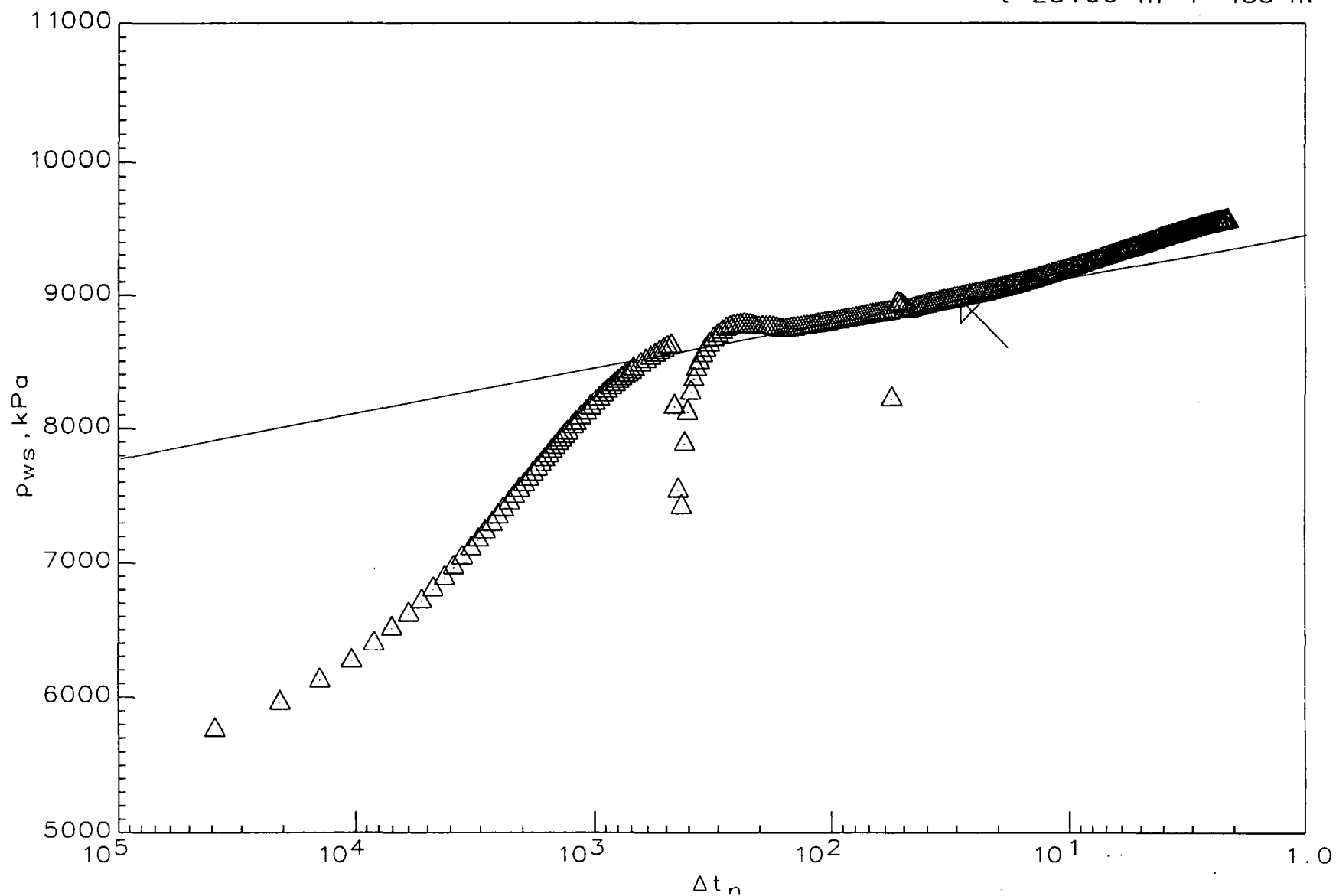
SUPERPOSITION PRESSURE BUILDUP PLOT

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

$[k_1/u]_t = 417.82$ $k_1 = 80.23$ mD $s = 3.8$ $p^* = 9474.6$

$t = 23.60$ hr $r = 183$ m



Oil Well Test - BUILDUP

Radial Flow Analysis

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Production And Times

Cumulative Production (oil)	=	-	m ³	<DEF>
Corrected Flow Time	tc =	1377.749	hr	<DEF>
Final Oil Rate	qo =	34.00	m ³ /d	

Fluid Properties

P V T Reference Pressure	pRef =	9581.7	kPa	<DEF>
Oil Compressibility	co =	3.586x10 ⁻⁰⁵	kPa ⁻¹	<DEF>
Oil Formation Vol Factor	Bo =	1.14		<DEF>
Oil Viscosity	muo =	1.656	mPa.s	<DEF>
Solution Gas Oil Ratio	Rso =	43.6	m ³ /m ³	<DEF>

Reservoir Parameters

Net Pay	h =	5.00	m	
Perforated Interval (MD)	=	-	m	
Total Porosity	phit =	8.00	%	
Water Saturation	Sw =	40.00	%	
Oil Saturation	So =	55.00	%	
Gas Saturation	Sg =	5.00	%	
Wellbore Radius	rw =	0.07	m	
Formation Temperature	T =	55.50	deg C	
Formation Compressibility	cf =	7.736x10 ⁻⁰⁷	kPa ⁻¹	<DEF>
Total Compressibility	ct =	2.653x10 ⁻⁰⁵	kPa ⁻¹	<DEF>

Oil Well Test - BUILDUP

Radial Flow Analysis

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Zone 1

Pressures

Initial Pressure	$p_i =$	-	kPa
Extrapolated Pressure	$p^* =$	9474.6	kPa
Average Reservoir Pressure	$p_R =$	-	kPa
Final Flowing Pressure	$p_{wfo} =$	5626.8	kPa

Straight Line Results

Total Sandface Rate	$QTBT =$	333.51	$\frac{m^3}{d}$
Semilog Slope	$msl =$	338.5	kPa/cycle
Transmissivity (Total)	$kh/\mu =$	2089.11	mDm/mPa.s
Mobility (Total)	$k/\mu =$	417.822	mD/mPa.s
Flow Capacity (Oil)	$kh =$	401.15	mDm
Permeability (Oil)	$k =$	80.23	mD
Skin Effect (Total)	$s =$	3.814	
Partial Penetration Skin	$spp =$	-	
Inclination Skin	$sinc =$	0.000	
Damage Skin	$sd =$	3.81	
Pressure Drop (Total Skin)	$delps =$	1121.7	kPa
Flow Efficiency	$FE =$	0.66	
Damage Ratio	$DR =$	1.52	

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time 1/2	Quad Time 1/4	Pressure kPa	Delta Pressure kPa
hr	hr	hr	hr	hr	kPa	kPa
0.000	0.000	0.000	0.000	0.000	5626.8	0.0
0.009	38848.419	0.009	33.563	5.003	5761.0	134.2
0.017	20603.203	0.017	33.528	4.950	5959.3	332.5
0.025	14034.754	0.025	33.501	4.914	6124.4	497.6
0.034	10339.855	0.034	33.476	4.883	6270.6	643.7
0.042	8384.777	0.042	33.456	4.860	6397.9	771.1
0.050	7055.243	0.049	33.439	4.840	6513.0	886.2
0.059	5990.408	0.058	33.420	4.821	6618.4	991.6
0.067	5283.987	0.066	33.405	4.805	6716.7	1089.8
0.075	4728.218	0.074	33.391	4.791	6806.5	1179.7
0.084	4229.460	0.083	33.376	4.777	6889.7	1262.9
0.092	3867.998	0.090	33.364	4.765	6969.2	1342.4
0.100	3564.333	0.098	33.352	4.754	7043.1	1416.3
0.109	3275.950	0.107	33.339	4.742	7111.6	1484.8
0.117	3056.823	0.114	33.328	4.732	7178.4	1551.6
0.125	2865.717	0.122	33.317	4.723	7240.4	1613.6
0.134	2677.966	0.130	33.306	4.713	7298.5	1671.6
0.142	2531.030	0.138	33.296	4.704	7353.2	1726.4
0.150	2399.745	0.145	33.286	4.696	7405.3	1778.4
0.159	2267.816	0.154	33.276	4.687	7454.3	1827.5
0.167	2162.462	0.161	33.267	4.680	7502.0	1875.2
0.175	2066.722	0.169	33.258	4.673	7547.3	1920.4
0.184	1968.945	0.177	33.248	4.665	7587.7	1960.9
0.192	1889.710	0.185	33.240	4.658	7627.9	2001.0
0.200	1816.799	0.192	33.232	4.652	7667.8	2041.0
0.209	1741.427	0.200	33.223	4.645	7703.7	2076.8
0.217	1679.664	0.208	33.215	4.639	7739.1	2112.3
0.225	1622.280	0.215	33.207	4.633	7772.9	2146.0
0.234	1562.398	0.223	33.199	4.627	7804.4	2177.6
0.242	1512.896	0.231	33.192	4.621	7837.4	2210.5
0.250	1466.550	0.238	33.184	4.616	7866.6	2239.8
0.259	1417.821	0.246	33.176	4.610	7895.4	2268.6
0.267	1377.252	0.253	33.169	4.605	7921.6	2294.7
0.275	1339.034	0.261	33.163	4.600	7948.2	2321.4
0.284	1298.601	0.269	33.155	4.595	7973.3	2346.4
0.300	1232.682	0.283	33.142	4.585	8018.8	2392.0
0.309	1198.587	0.291	33.135	4.580	8042.9	2416.1
0.325	1142.612	0.305	33.122	4.572	8084.2	2457.4
0.342	1088.845	0.320	33.109	4.563	8121.1	2494.2

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time 1/2	Quad Time 1/4	Pressure	Delta Pressure
hr	hr	hr	hr	hr	kPa	kPa
0.359	1040.139	0.335	33.096	4.554	8158.7	2531.8
0.375	998.306	0.350	33.085	4.546	8190.8	2564.0
0.392	957.574	0.364	33.073	4.538	8220.4	2593.6
0.409	920.202	0.379	33.061	4.531	8252.3	2625.5
0.425	887.738	0.393	33.050	4.523	8278.6	2651.8
0.442	855.798	0.408	33.039	4.516	8305.9	2679.1
0.459	826.203	0.422	33.028	4.509	8328.9	2702.0
0.475	800.266	0.436	33.018	4.503	8351.2	2724.4
0.492	774.538	0.451	33.007	4.496	8372.8	2746.0
0.509	750.511	0.465	32.997	4.490	8394.2	2767.4
0.525	729.303	0.478	32.987	4.484	8404.3	2777.5
0.542	708.126	0.493	32.977	4.478	8424.2	2797.3
0.559	688.221	0.507	32.967	4.472	8445.8	2818.9
0.600	644.801	0.541	32.944	4.458	8480.6	2853.7
0.634	612.998	0.569	32.926	4.447	8505.1	2878.3
0.667	585.187	0.596	32.909	4.437	8531.2	2904.3
0.700	559.959	0.623	32.892	4.427	8552.4	2925.5
0.734	536.301	0.651	32.875	4.417	8573.0	2946.2
0.767	515.310	0.677	32.859	4.408	8590.5	2963.7
0.800	496.021	0.703	32.843	4.399	8606.5	2979.6
0.834	477.714	0.730	32.827	4.391	8618.9	2992.1
0.867	461.291	0.756	32.812	4.383	8163.8	2537.0
0.900	446.048	0.782	32.797	4.375	7546.0	1919.2
0.934	431.446	0.809	32.783	4.367	7423.9	1797.0
0.967	418.233	0.834	32.768	4.359	7890.1	2263.3
1.000	405.872	0.860	32.755	4.352	8120.9	2494.1
1.034	393.942	0.886	32.741	4.345	8266.4	2639.5
1.067	383.072	0.911	32.727	4.338	8368.3	2741.4
1.100	372.837	0.936	32.714	4.331	8444.5	2817.6
1.134	362.899	0.962	32.701	4.324	8495.2	2868.3
1.175	351.659	0.992	32.685	4.316	8550.3	2923.5
1.217	340.908	1.024	32.669	4.308	8591.8	2964.9
1.267	329.012	1.061	32.651	4.299	8632.1	3005.2
1.334	314.429	1.110	32.627	4.287	8672.4	3045.5
1.400	301.385	1.158	32.604	4.276	8701.0	3074.2
1.467	289.306	1.206	32.581	4.265	8727.3	3100.5
1.534	278.247	1.254	32.559	4.255	8747.3	3120.5
1.600	268.227	1.301	32.537	4.245	8759.6	3132.8
1.667	258.837	1.348	32.516	4.235	8768.5	3141.7

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time 1/2	Quad Time 1/4	Pressure	Delta Pressure
hr	hr	hr	hr	hr	kPa	kPa
1.734	250.146	1.395	32.495	4.225	8774.8	3147.9
1.800	242.193	1.441	32.475	4.216	8777.7	3150.9
1.867	234.672	1.487	32.456	4.207	8780.0	3153.2
1.934	227.651	1.533	32.436	4.199	8778.9	3152.0
2.000	221.176	1.578	32.417	4.190	8775.8	3148.9
2.067	215.007	1.623	32.398	4.182	8770.7	3143.9
2.134	209.209	1.668	32.380	4.174	8761.4	3134.5
2.200	203.827	1.712	32.362	4.166	8757.9	3131.0
2.300	196.235	1.778	32.336	4.155	8759.6	3132.8
2.400	189.246	1.844	32.310	4.144	8759.0	3132.2
2.500	182.790	1.909	32.285	4.133	8758.8	3132.0
2.600	176.806	1.974	32.260	4.123	8756.5	3129.7
2.700	171.244	2.038	32.236	4.113	8750.7	3123.8
2.800	166.058	2.101	32.212	4.103	8746.2	3119.4
2.900	161.212	2.164	32.189	4.094	8738.6	3111.8
3.000	156.672	2.227	32.166	4.085	8740.4	3113.5
3.100	152.408	2.289	32.143	4.076	8743.1	3116.3
3.200	148.397	2.351	32.121	4.067	8747.8	3121.0
3.300	144.615	2.413	32.100	4.059	8750.0	3123.1
3.434	139.873	2.495	32.071	4.048	8753.9	3127.0
3.567	135.498	2.575	32.044	4.037	8758.0	3131.1
3.700	131.420	2.655	32.017	4.027	8761.5	3134.6
3.834	127.580	2.735	31.990	4.016	8765.2	3138.4
3.967	124.010	2.814	31.964	4.007	8768.7	3141.9
4.100	120.657	2.892	31.938	3.997	8772.2	3145.4
4.234	117.479	2.970	31.913	3.988	8775.8	3148.9
4.367	114.505	3.047	31.888	3.979	8779.5	3152.6
4.534	111.003	3.143	31.858	3.968	8783.8	3156.9
4.700	107.752	3.238	31.828	3.957	8787.7	3160.8
4.867	104.691	3.333	31.799	3.947	8791.6	3164.7
5.034	101.819	3.427	31.771	3.937	8795.5	3168.7
5.200	99.136	3.520	31.743	3.927	8799.6	3172.8
5.367	96.592	3.612	31.715	3.917	8803.1	3176.3
5.534	94.191	3.705	31.688	3.908	8806.6	3179.8
5.734	91.488	3.814	31.656	3.897	8810.4	3183.5
5.934	88.954	3.923	31.624	3.886	8814.1	3187.2
6.134	86.573	4.031	31.594	3.876	8817.8	3190.9
6.334	84.332	4.138	31.564	3.865	8821.7	3194.9
6.534	82.219	4.244	31.534	3.856	8825.6	3198.8

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time	Quad Time	Pressure	Delta Pressure
hr	hr	hr	1/2 hr	1/4 hr	kPa	kPa
6.767	79.903	4.367	31.500	3.844	8830.3	3203.4
7.000	77.729	4.489	31.467	3.833	8834.8	3207.9
7.234	75.678	4.611	31.434	3.823	8838.9	3212.0
7.467	73.753	4.731	31.402	3.812	8842.8	3216.0
7.700	71.936	4.851	31.370	3.802	8846.3	3219.5
7.967	69.974	4.987	31.335	3.791	8850.2	3223.4
8.234	68.130	5.122	31.300	3.780	8854.3	3227.5
8.500	66.400	5.255	31.266	3.769	8858.2	3231.4
8.767	64.760	5.388	31.232	3.759	8861.8	3234.9
9.067	63.024	5.537	31.195	3.747	8865.3	3238.5
9.367	61.391	5.684	31.158	3.736	8869.0	3242.2
9.667	59.851	5.830	31.122	3.725	8872.9	3246.1
10.000	58.241	5.991	31.083	3.713	8876.8	3250.0
10.317	56.798	6.143	31.047	3.703	8876.8	3250.0
10.667	55.296	6.310	31.007	3.691	8888.4	3261.6
11.000	53.948	6.468	30.970	3.680	8946.1	3319.3
11.367	52.547	6.640	30.930	3.668	8937.6	3310.8
11.734	51.227	6.812	30.891	3.657	8926.1	3299.3
12.100	49.983	6.981	30.852	3.646	8910.4	3283.6
12.500	48.700	7.165	30.811	3.634	8892.7	3265.9
12.900	47.491	7.347	30.770	3.622	8898.6	3271.7
13.334	46.253	7.544	30.727	3.610	8905.0	3278.2
13.767	45.090	7.739	30.685	3.598	8910.3	3283.5
14.200	43.992	7.932	30.643	3.586	8914.6	3287.8
14.667	42.874	8.139	30.599	3.574	8919.3	3292.5
15.134	41.820	8.344	30.556	3.562	8924.0	3297.2
15.634	40.754	8.562	30.510	3.550	8929.1	3302.3
16.134	39.750	8.778	30.465	3.538	8934.0	3307.2
16.667	38.739	9.007	30.418	3.525	8938.3	3311.5
17.200	37.786	9.235	30.372	3.513	8942.8	3316.0
17.767	36.829	9.474	30.324	3.500	8946.5	3319.7
18.334	35.927	9.712	30.277	3.488	8950.4	3323.6
18.934	35.026	9.962	30.228	3.475	8954.5	3327.7
19.534	34.175	10.210	30.180	3.462	8958.9	3332.0
20.167	33.327	10.470	30.130	3.450	8962.8	3335.9
20.800	32.527	10.728	30.081	3.437	8966.3	3339.5
21.467	31.730	10.997	30.030	3.424	8970.2	3343.4
22.167	30.941	11.277	29.978	3.411	8974.3	3347.5
22.867	30.196	11.556	29.927	3.398	8978.4	3351.6

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time	Quad Time	Pressure	Delta Pressure
hr	hr	hr	1/2 hr	1/4 hr	kPa	kPa
23.600	29.459	11.845	29.874	3.385	8982.5	3355.7
24.367	28.731	12.145	29.819	3.372	8986.2	3359.4
25.134	28.043	12.443	29.766	3.359	8990.3	3363.5
25.934	27.366	12.751	29.712	3.345	8994.2	3367.4
26.767	26.699	13.069	29.656	3.332	8998.1	3371.3
27.634	26.045	13.398	29.599	3.318	9002.6	3375.8
28.500	25.427	13.723	29.543	3.305	9006.7	3379.9
29.400	24.820	14.059	29.486	3.291	9011.0	3384.2
30.334	24.224	14.404	29.428	3.278	9014.7	3387.9
31.300	23.643	14.759	29.369	3.264	9018.0	3391.2
32.300	23.074	15.123	29.309	3.250	9022.5	3395.7
33.334	22.518	15.496	29.248	3.236	9026.8	3400.0
34.400	21.977	15.877	29.186	3.222	9032.1	3405.2
35.500	21.450	16.268	29.124	3.208	9037.9	3411.1
36.634	20.936	16.667	29.061	3.193	9042.4	3415.6
37.800	20.437	17.073	28.997	3.179	9046.7	3419.9
39.000	19.952	17.489	28.933	3.165	9051.0	3424.2
40.234	19.481	17.912	28.868	3.150	9055.7	3428.8
41.500	19.023	18.342	28.802	3.136	9061.1	3434.3
42.800	18.579	18.781	28.736	3.121	9064.8	3438.0
44.134	18.148	19.227	28.670	3.107	9069.3	3442.5
45.534	17.720	19.691	28.601	3.092	9074.0	3447.2
46.967	17.307	20.162	28.532	3.077	9078.7	3451.9
48.434	16.906	20.640	28.463	3.063	9083.8	3456.9
49.967	16.510	21.135	28.392	3.048	9089.0	3462.2
51.534	16.127	21.636	28.321	3.033	9094.1	3467.3
53.167	15.750	22.154	28.248	3.018	9098.6	3471.8
54.834	15.386	22.678	28.176	3.003	9103.6	3476.8
56.567	15.028	23.218	28.101	2.987	9109.3	3482.5
58.334	14.683	23.764	28.027	2.972	9113.8	3487.0
60.167	14.345	24.325	27.951	2.957	9118.9	3492.0
62.067	14.013	24.901	27.874	2.941	9124.3	3497.5
64.034	13.688	25.491	27.796	2.925	9131.1	3504.3
66.034	13.376	26.086	27.718	2.910	9136.8	3510.0
68.100	13.071	26.695	27.639	2.894	9142.1	3515.2
70.234	12.773	27.319	27.559	2.878	9147.1	3520.3
72.434	12.482	27.955	27.478	2.863	9153.0	3526.2
74.700	12.199	28.604	27.396	2.847	9159.0	3532.2
77.034	11.923	29.266	27.314	2.831	9164.3	3537.5

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time	Quad Time	Pressure	Delta Pressure
hr	hr	hr	1/2 hr	1/4 hr	kPa	kPa
79.467	11.650	29.950	27.229	2.814	9170.0	3543.1
81.967	11.386	30.646	27.144	2.798	9175.4	3548.6
84.534	11.129	31.353	27.058	2.782	9180.9	3554.0
87.200	10.877	32.081	26.971	2.766	9186.9	3560.1
89.934	10.632	32.819	26.883	2.749	9192.8	3565.9
92.767	10.392	33.577	26.794	2.733	9198.0	3571.2
95.667	10.160	34.345	26.704	2.716	9204.4	3577.6
98.667	9.932	35.131	26.614	2.699	9210.3	3583.5
101.767	9.710	35.935	26.522	2.682	9215.4	3588.5
104.967	9.493	36.756	26.429	2.666	9222.0	3595.2
108.267	9.282	37.594	26.335	2.649	9227.6	3600.8
111.667	9.075	38.449	26.240	2.632	9233.7	3606.9
115.167	8.874	39.319	26.144	2.615	9240.3	3613.5
118.767	8.679	40.205	26.047	2.597	9246.2	3619.3
122.500	8.487	41.113	25.949	2.580	9251.2	3624.4
126.334	8.301	42.036	25.851	2.563	9257.5	3630.6
130.300	8.118	42.980	25.751	2.546	9263.3	3636.5
134.367	7.942	43.938	25.650	2.528	9269.3	3642.5
138.567	7.769	44.916	25.548	2.511	9275.4	3648.5
142.900	7.600	45.913	25.446	2.493	9282.4	3655.6
147.367	7.435	46.930	25.342	2.476	9288.1	3661.2
151.967	7.275	47.965	25.237	2.458	9294.3	3667.5
156.734	7.117	49.025	25.131	2.440	9300.3	3673.5
161.634	6.964	50.102	25.024	2.422	9306.6	3679.7
166.700	6.815	51.203	24.916	2.404	9312.0	3685.2
171.900	6.669	52.319	24.807	2.387	9318.1	3691.2
177.267	6.527	53.457	24.697	2.369	9324.1	3697.3
182.800	6.389	54.616	24.586	2.351	9330.9	3704.1
188.500	6.254	55.795	24.475	2.332	9337.0	3710.2
194.400	6.122	57.000	24.361	2.314	9342.8	3716.0
200.467	5.993	58.225	24.247	2.296	9347.1	3720.3
206.734	5.867	59.473	24.132	2.278	9353.2	3726.3
213.200	5.744	60.745	24.016	2.259	9360.6	3733.7
219.867	5.624	62.039	23.899	2.241	9365.2	3738.4
226.734	5.508	63.354	23.780	2.222	9370.7	3743.9
233.834	5.393	64.696	23.661	2.204	9376.9	3750.1
241.134	5.282	66.057	23.541	2.185	9382.8	3756.0
248.667	5.174	67.443	23.419	2.167	9387.9	3761.0
256.434	5.068	68.852	23.297	2.148	9392.9	3766.1

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time	Quad Time	Pressure	Delta Pressure
hr	hr	hr	1/2 hr	1/4 hr	kPa	kPa
264.434	4.965	70.283	23.174	2.129	9398.4	3771.6
272.700	4.864	71.741	23.050	2.111	9405.2	3778.4
281.250	4.765	73.228	22.924	2.092	9410.5	3783.6
290.084	4.669	74.741	22.797	2.073	9415.0	3788.1
299.167	4.575	76.275	22.670	2.054	9420.2	3793.4
308.500	4.483	77.827	22.541	2.035	9425.5	3798.7
318.167	4.394	79.411	22.412	2.016	9431.1	3804.3
328.167	4.307	81.025	22.281	1.997	9437.4	3810.5
338.417	4.222	82.653	22.150	1.978	9443.0	3816.2
349.000	4.139	84.308	22.018	1.959	9447.7	3820.9
359.917	4.058	85.988	21.885	1.940	9452.4	3825.6
371.167	3.979	87.692	21.751	1.921	9457.1	3830.2
382.750	3.902	89.418	21.616	1.902	9461.7	3834.9
394.750	3.827	91.176	21.480	1.883	9466.2	3839.4
407.084	3.754	92.954	21.344	1.864	9470.9	3844.1
419.834	3.682	94.760	21.206	1.844	9476.0	3849.1
433.000	3.612	96.593	21.068	1.825	9480.6	3853.8
446.500	3.545	98.440	20.929	1.806	9484.4	3857.5
460.500	3.478	100.321	20.789	1.787	9489.0	3862.2
474.917	3.413	102.224	20.648	1.768	9492.4	3865.5
489.750	3.350	104.147	20.507	1.749	9496.6	3869.8
505.084	3.289	106.097	20.364	1.730	9500.5	3873.7
520.834	3.229	108.064	20.222	1.710	9505.4	3878.6
537.084	3.171	110.054	20.078	1.691	9509.5	3882.7
553.834	3.114	112.067	19.934	1.672	9512.3	3885.4
571.167	3.058	114.109	19.789	1.653	9516.2	3889.3
589.000	3.004	116.168	19.644	1.634	9519.7	3892.8
607.417	2.951	118.253	19.498	1.615	9524.3	3897.5
626.417	2.899	120.359	19.351	1.596	9528.8	3902.0
646.000	2.849	122.486	19.203	1.577	9532.5	3905.7
666.167	2.800	124.630	19.055	1.558	9536.2	3909.4
687.000	2.752	126.798	18.907	1.539	9539.5	3912.7
708.500	2.705	128.988	18.758	1.521	9542.7	3915.9
730.667	2.660	131.196	18.608	1.502	9545.6	3918.8
753.500	2.615	133.419	18.458	1.483	9549.3	3922.5
777.000	2.572	135.657	18.308	1.464	9552.8	3926.0
801.250	2.530	137.913	18.157	1.446	9556.1	3929.3
826.250	2.489	140.186	18.006	1.427	9559.3	3932.4
852.084	2.449	142.479	17.855	1.409	9561.6	3934.8

Oil Well Test - BUILDUP

Time / Pressure Listing

(Superposition)

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Delta Time	Super Time	Equiv. Time	Root Time 1/2	Quad Time 1/4	Pressure kPa	Delta Pressure kPa
hr	hr	hr	hr	hr	kPa	kPa
878.667	2.410	144.782	17.703	1.390	9564.1	3937.3
906.084	2.372	147.101	17.551	1.372	9566.7	3939.8
934.334	2.335	149.431	17.399	1.354	9569.6	3942.8
963.467	2.299	151.775	17.247	1.335	9572.3	3945.5
993.534	2.264	154.133	17.094	1.317	9575.6	3948.8
1024.534	2.230	156.502	16.941	1.299	9578.0	3951.1
1056.500	2.196	158.882	16.788	1.281	9580.3	3953.5
1070.867	2.182	159.932	16.721	1.273	9581.7	3954.8

COMPOSITE MODEL

Analysis is based on the idealized model of a two-zone composite reservoir, with wellbore storage and skin. This model has been extensively studied in the petroleum literature. The principal reference is: Olarewaju and Lee (1987) SPE 16763.

The major assumptions in the model are:

Both the inner and outer zones can be assumed to be homogeneous or dual porosity (pseudo-steady state inter-porosity flow). The wellbore has a finite volume and an infinitesimal skin. The outer zone is finite acting. The inner and outer zone can have different transmissivities and different storativities. There is no transition region between the inner and outer zones. Both zones have the same net pay.

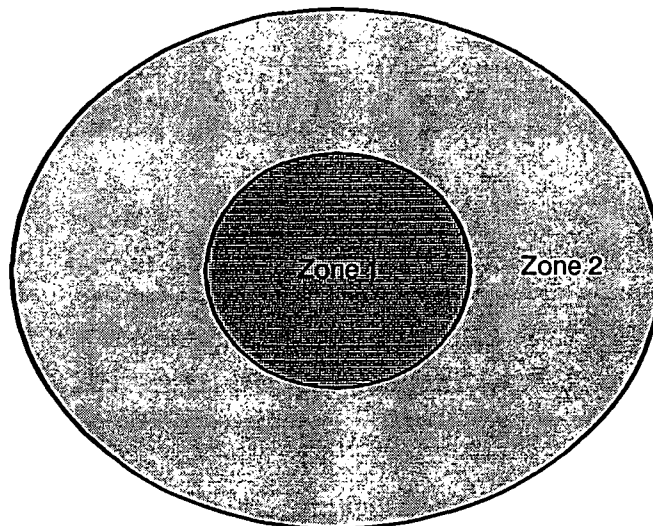
Model Variables

C_D	-	Dimensionless Storage Constant
s	-	Skin Damage
r_w	-	Wellbore Radius
h	-	Net Pay
c_t	-	Total Compressibility
ϕ_{hit}	-	Total Porosity

For each zone specify:

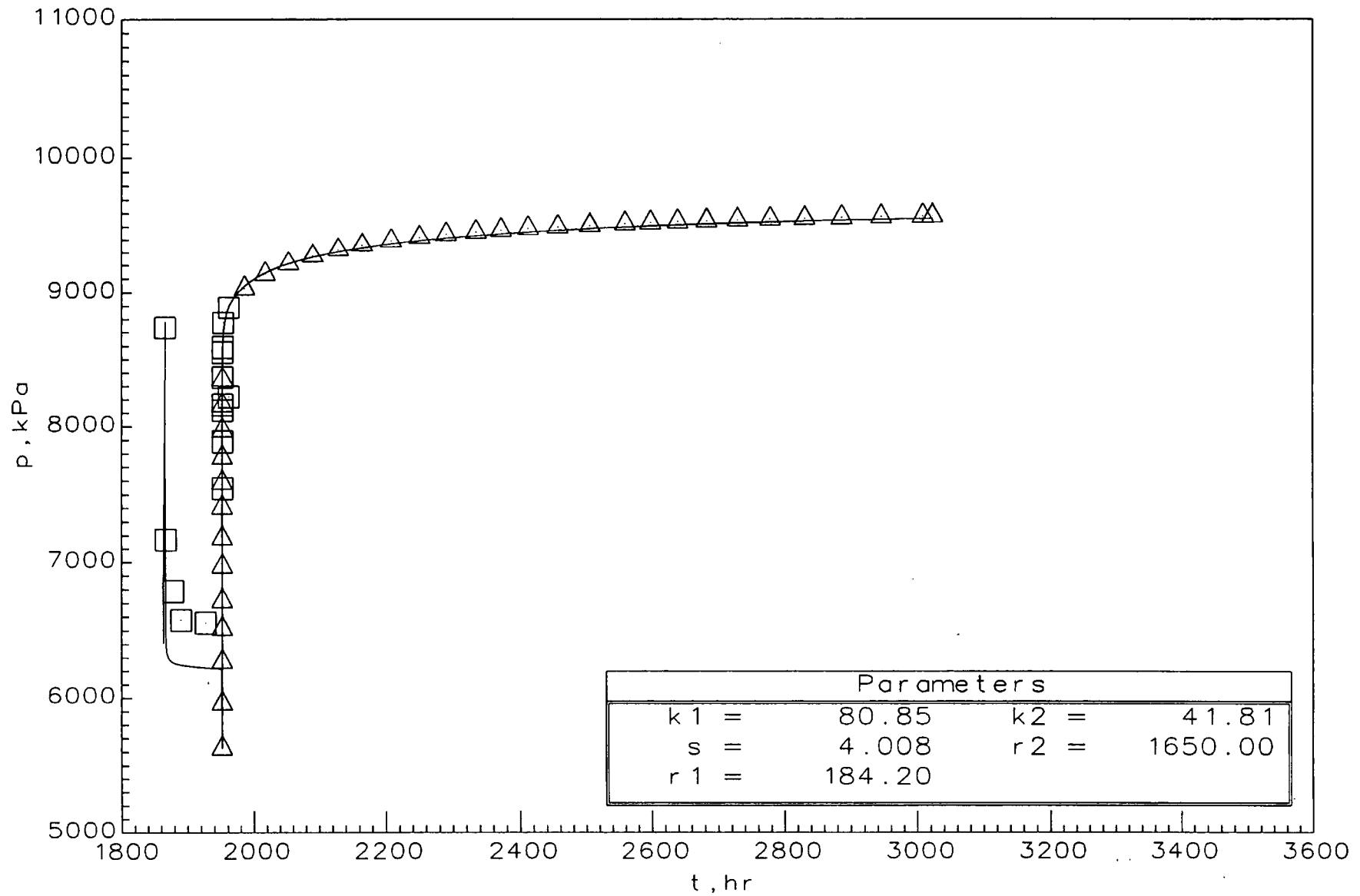
k	-	Permeability
Λ	-	Inter-porosity Flow Co-efficient
Ω	-	Storativity Ratio
r	-	Radial Extent of Zone

Schematic



COMPOSITE MODEL

PARAMOUNT ET AL CAMERON
M-73
SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



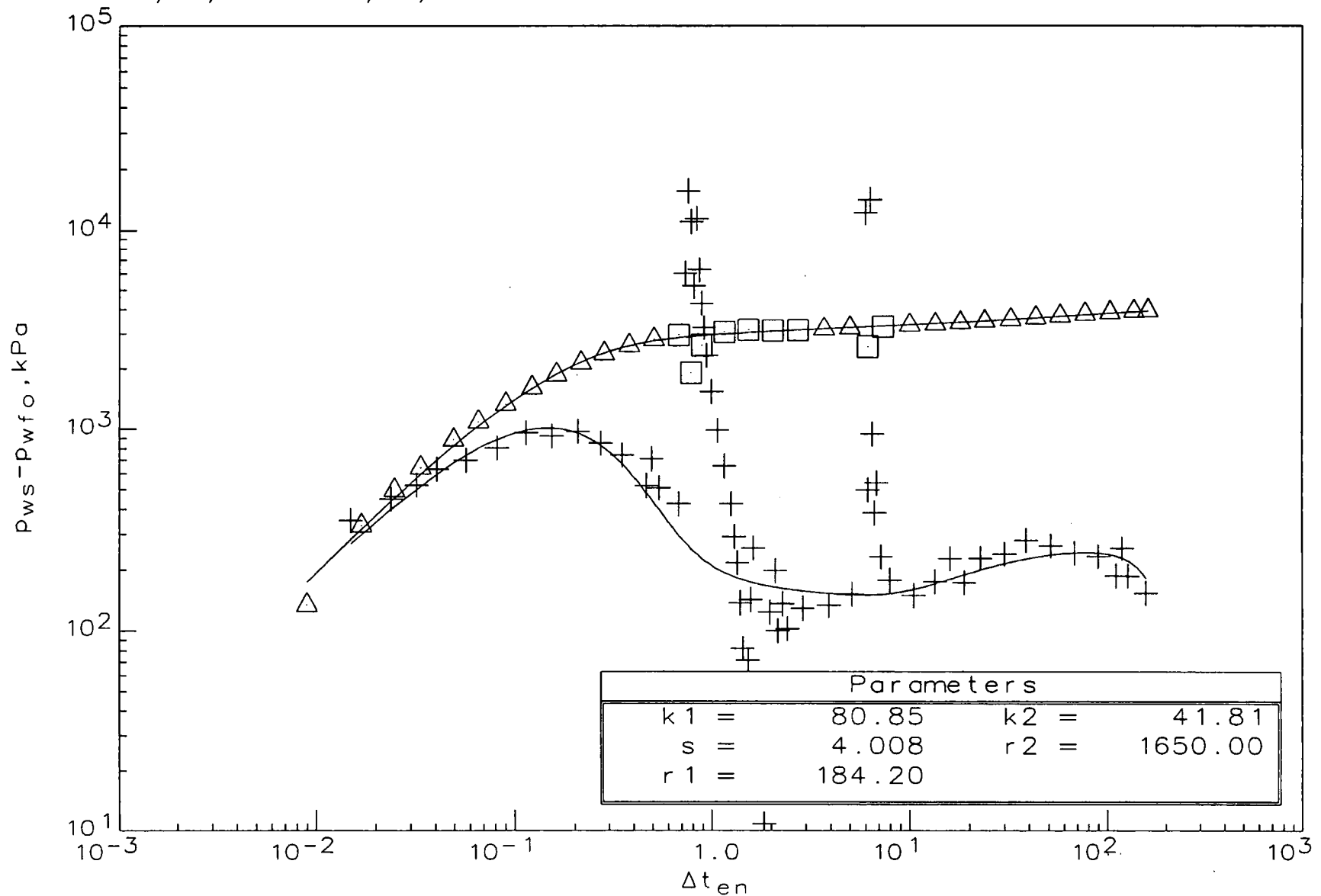
COMPOSITE MODEL

PARAMOUNT ET AL CAMERON

M-73

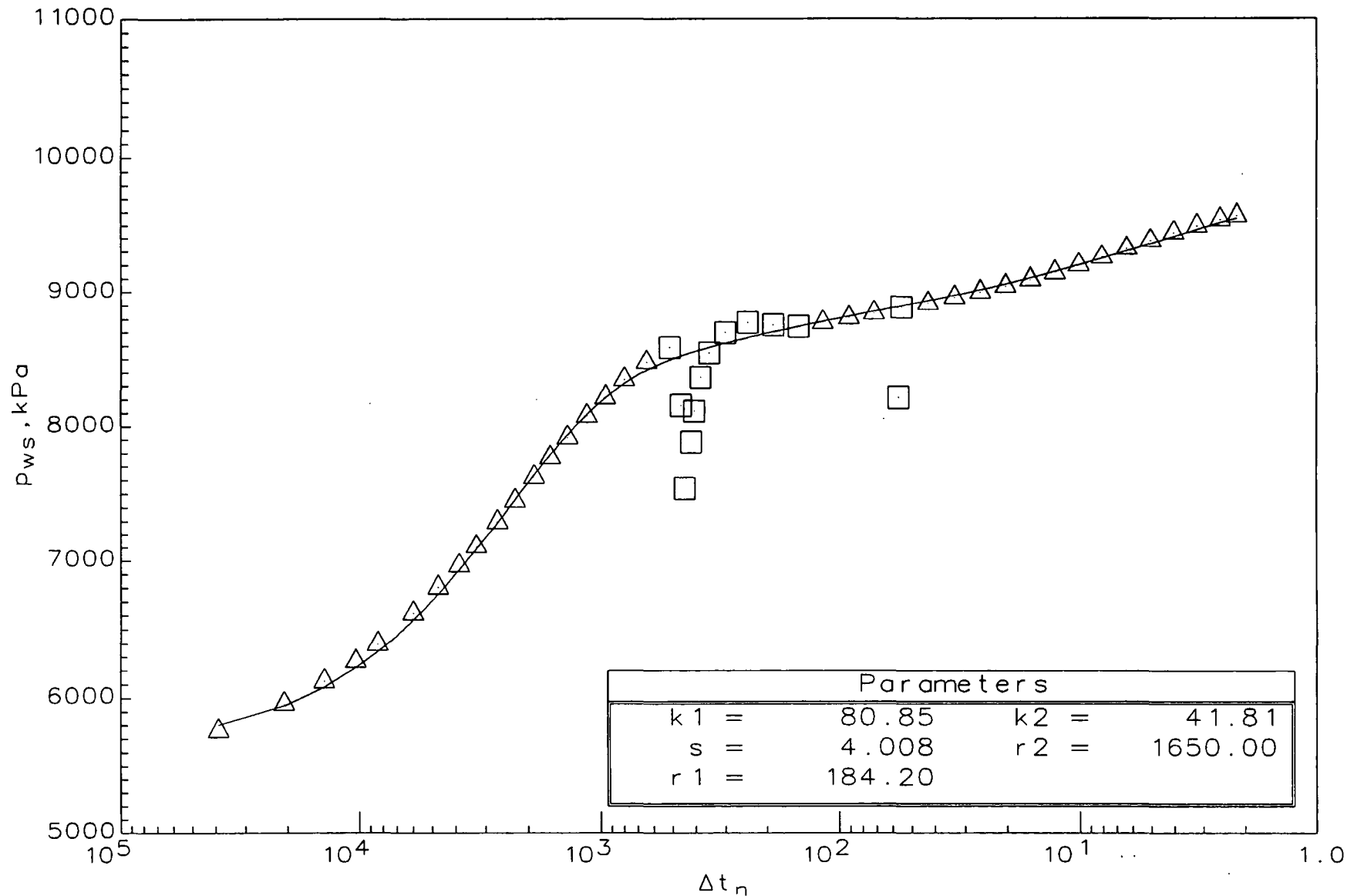
SULPHUR POINT: 1415.5-1420.5 mKB

93/03/24 TO 93/05/11



COMPOSITE MODEL

PARAMOUNT ET AL CAMERON
M-73
SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

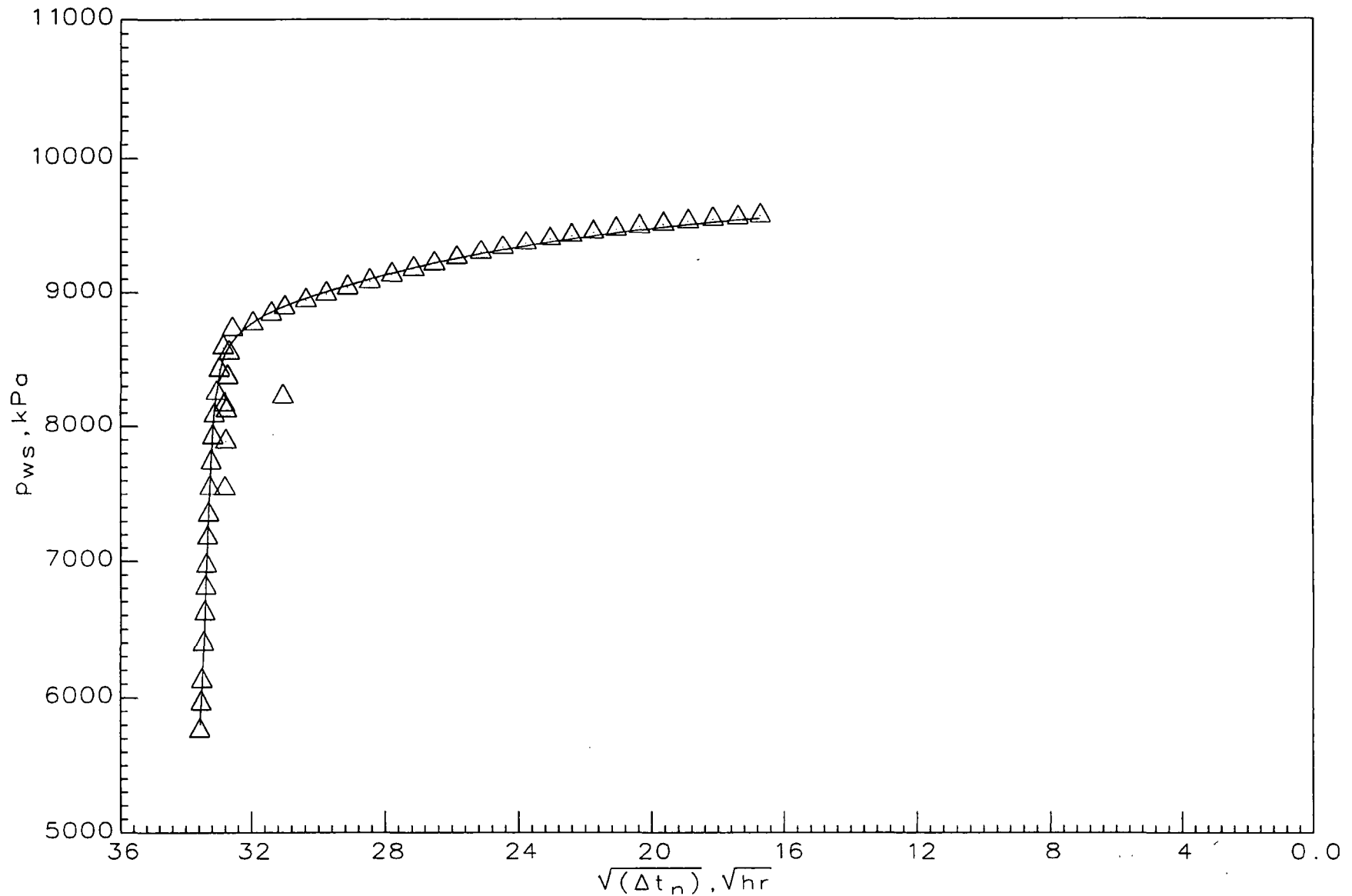


SUPER TANDEM ROOT T

PRESSURE BUILDUP PLOT

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11

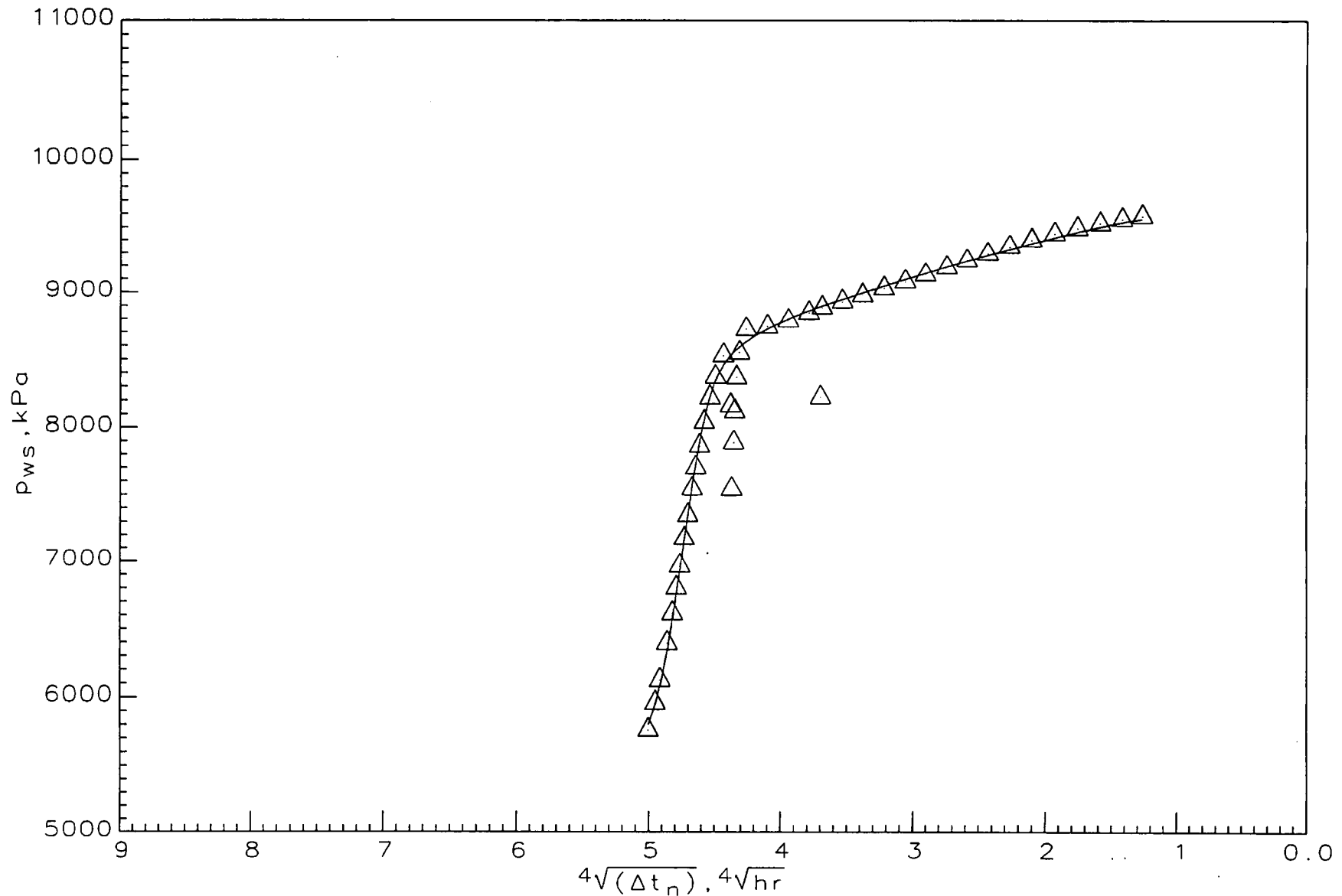


SUPER TANDEM QUAD ROOT T

PRESSURE BUILDUP PLOT

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



Oil Well Test - SYNTHESIZER

Model Parameters

Composite Model

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Synthetic Initial Pressure = 9826.1 kPa

Zone 1

Transmissivity (Total)	kh/mu =	2105.27	mDm/mPa.s
Mobility (Total)	k/mu =	421.053	mD/mPa.s
Flow Capacity (Oil)	kh =	404.25	mDm
Permeability (Oil)	k =	80.85	mD
Skin	s =	4.008	
Wellbore Storage Constant (dim.)	CD =	2093.37	
Apparent Wellbore Storage (dim.)	=	-	
Storage Pressure Param (dim.)	=	-	
Radius	re =	184.20	m
Inter Porosity Coeff	Lambda =	-	
Storativity Ratio	Omega =	-	

Zone 2

Transmissivity (Total)	kh/mu =	1088.70	mDm/mPa.s
Mobility (Total)	k/mu =	217.740	mD/mPa.s
Flow Capacity (Oil)	kh =	209.05	mDm
Permeability (Oil)	k =	41.81	mD
Radius	re =	1650.00	m
Inter Porosity Coeff	Lambda =	-	
Storativity Ratio	Omega =	-	

Oil Well Test - SYNTHESIZER

Composite Model

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Production And Pressure

Final Oil Rate	qo =	34.00	m ³ /d
Final Flowing Pressure	Pwfo =	5626.8	kPa
Initial Pressure	pi =	-	kPa

Fluid Properties

P V T Reference Pressure	pRef =	9581.7	kPa	<DEF>
Oil Compressibility	co =	3.586x10 ⁻⁰⁵	kPa ⁻¹	<DEF>
Oil Formation Vol Factor	Bo =	1.14		<DEF>
Oil Viscosity	muo =	1.656	mPa.s	<DEF>
Solution Gas Oil Ratio	Rso =	43.6	m ³ /m ³	<DEF>

Reservoir Parameters

Net Pay	h =	5.00	m	
Total Porosity	phit =	8.00	%	
Water Saturation	Sw =	40.00	%	
Oil Saturation	So =	55.00	%	
Gas Saturation	Sg =	5.00	%	
Wellbore Radius	rw =	0.07	m	
Formation Temperature	T =	55.50	deg C	
Formation Compressibility	cf =	7.736x10 ⁻⁰⁷	kPa ⁻¹	<DEF>
Total Compressibility	ct =	2.653x10 ⁻⁰⁵	kPa ⁻¹	<DEF>

Oil Well Test - SYNTHESIZER

Composite Model

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Synthesis Results

Average Error	=	21.4	kPa
Synthetic Initial Pressure	=	9826.1	kPa
Pressure At 1 Year Shut-in	=	9601.7	kPa
Pressure Drop Due To Skin	delps =	1162.6	kPa
Flow Efficiency	FE =	0.72	
Damage Ratio	DR =	1.38	

Extended Rates

3 - Month Constant Rate	=	30.93	$\frac{\text{m}^3}{\text{d}}$
6 - Month Constant Rate	=	28.80	$\frac{\text{m}^3}{\text{d}}$

Stabilized Rate

Time To Stabilize	ts =	2547.537	hr
Stabilized Rate @ Current Skin	qs =	30.56	$\frac{\text{m}^3}{\text{d}}$
Stabilized Rate @ Skin Of 0	qs =	40.76	$\frac{\text{m}^3}{\text{d}}$
Stabilized Rate @ Skin Of -4	qs =	61.14	$\frac{\text{m}^3}{\text{d}}$

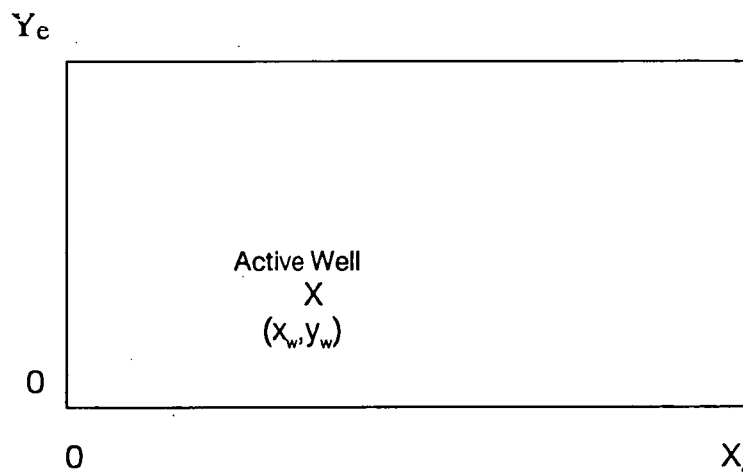
STORAGE-SKIN-BOUNDARIES MODEL

The storage and skin model simulates pressure response in an active well within a rectangular shaped reservoir with homogeneous or dual porosity characteristics. This well may be at any location within the reservoir and any no-flow boundaries will be modelled using as many image wells as the reservoir well/shape configuration demands (sometimes, more than 1000 images are used). The skin effect is handled through the concept of effective wellbore radius. This gives an increased robustness to the solution at large negative skins and early times. The dual porosity model is that of pseudo-steady state inter-porosity flow.

Model Variables

C_D	-	Dimensionless Storage Constant (with Changing Wellbore Storage)
s	-	Skin Damage
k	-	Permeability
h	-	Net Pay
r_w	-	Wellbore Radius
ct	-	Total Compressibility
ϕ_{it}	-	Total Porosity
Λ	-	Inter-porosity Flow Co-efficient
Ω	-	Storativity Ratio
x_e	-	length of reservoir
y_e	-	width of reservoir
x_w	-	x - location of active well
y_w	-	y - location of active well

Schematic



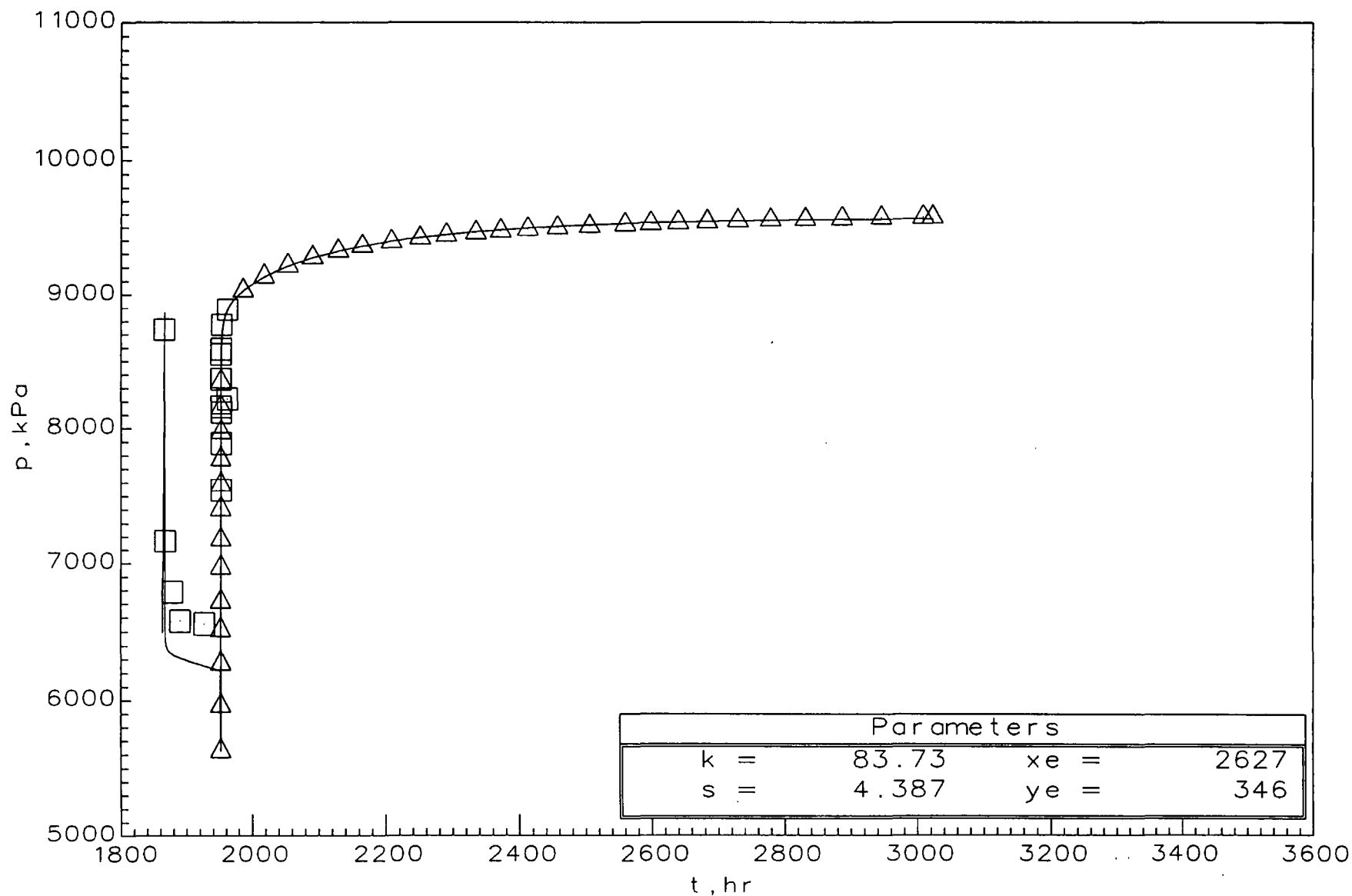
STORAGE - SKIN - BOUNDARIES

PARAMOUNT ET AL CAMERON

M-73

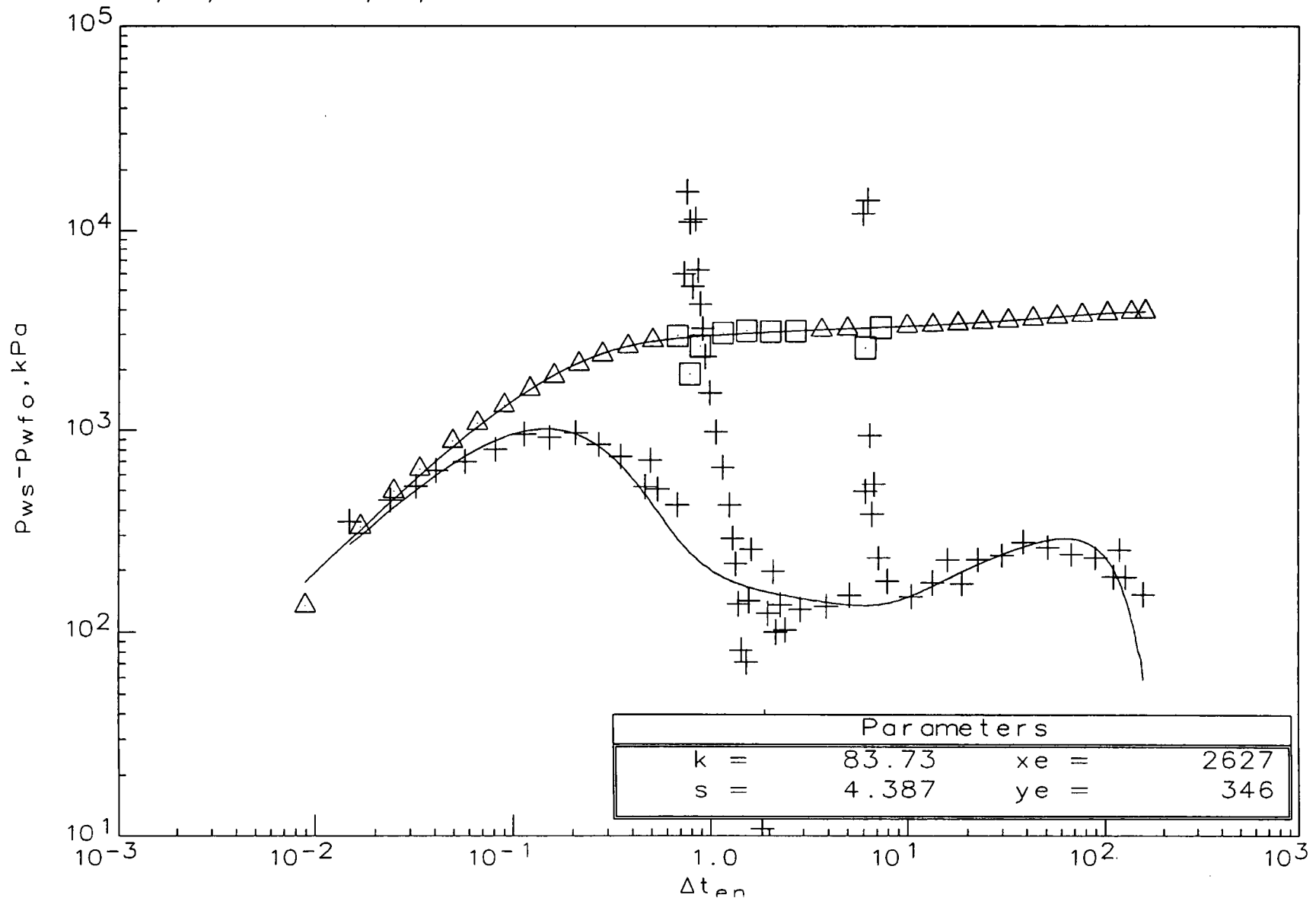
SULPHUR POINT : 1415.5-1420.5 mKB

93/03/24 TO 93/05/11



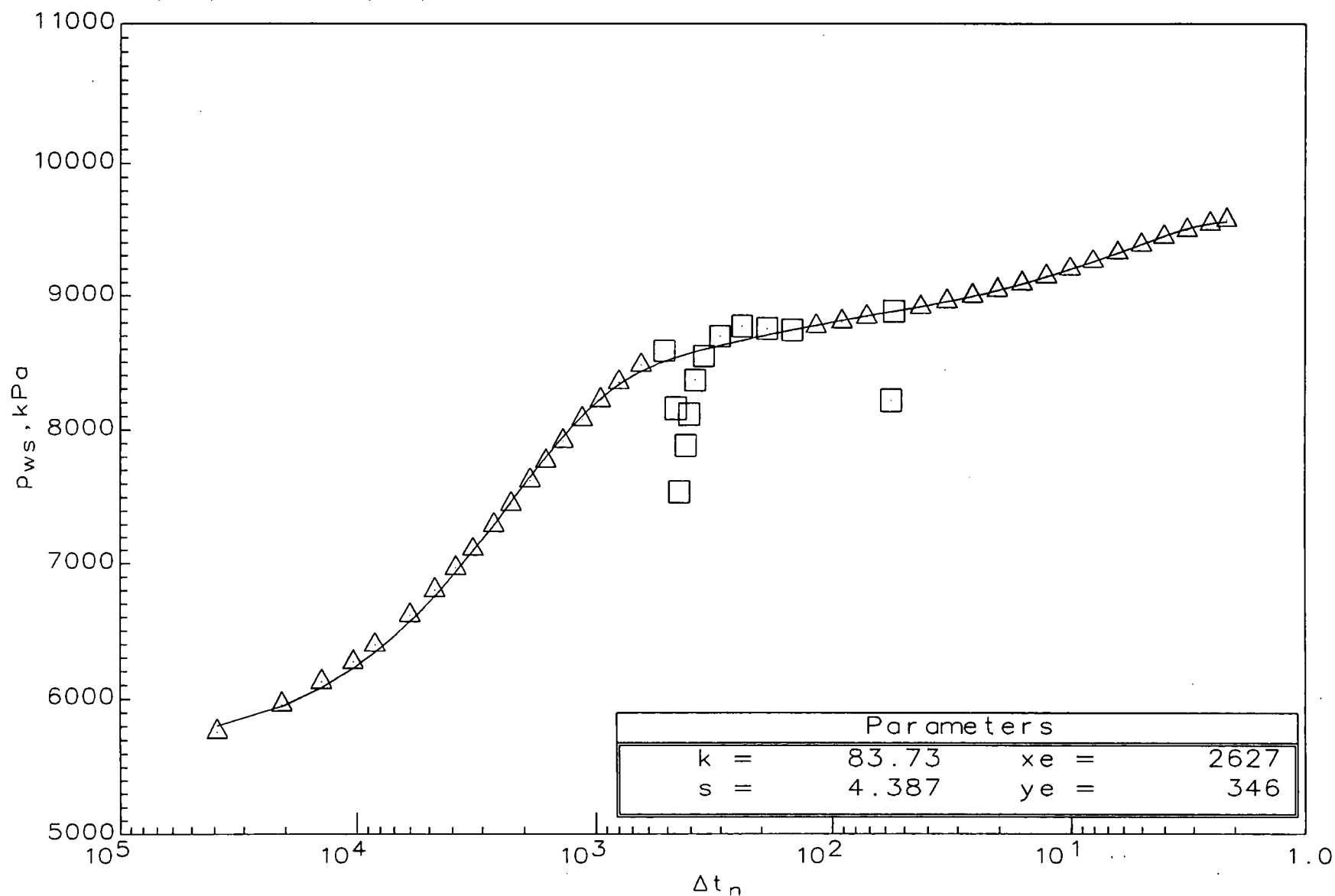
STORAGE - SKIN - BOUNDARIES

PARAMOUNT ET AL CAMERON
M-73
SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



STORAGE - SKIN - BOUNDARIES

PARAMOUNT ET AL CAMERON
M-73
SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



Oil Well Test - SYNTHESIZER

Model Parameters

Storage - Skin - Boundaries Model

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Synthetic Initial Pressure = 11677.2 kPa

Formation Parameters

Transmissivity (Total) kh/mu = 2180.17 mDm/mPa.s

Mobility (Total) k/mu = 436.034 mD/mPa.s

Flow Capacity (Oil) kh = 418.63 mDm

Permeability (Oil) k = 83.73 mD

Skin s = 4.387

Wellbore Storage Constant (dim.) CD = 2093.64

Inter Porosity Coeff Lambda = -

Storativity Ratio Omega = -

N. B. Origin At Lower Left Corner

Reservoir Length (xe) = 2627 m

Reservoir Width (ye) = 346 m

Active Well At xw = - m <DEF>

Active Well At yw = - m <DEF>

Oil Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Production And Pressure

Final Oil Rate	qo =	34.00	³ m /d
Final Flowing Pressure	Pwfo =	5626.8	kPa
Initial Pressure	pi =	-	kPa

Fluid Properties

P V T Reference Pressure	pRef =	9581.7	kPa	<DEF>
Oil Compressibility	co =	3.586x10 ⁻⁰⁵	⁻¹ kPa	<DEF>
Oil Formation Vol Factor	Bo =	1.14		<DEF>
Oil Viscosity	muo =	1.656	mPa.s	<DEF>
Solution Gas Oil Ratio	Rso =	43.6	³ m / ³ m	<DEF>

Reservoir Parameters

Net Pay	h =	5.00	m	
Total Porosity	phit =	8.00	%	
Water Saturation	Sw =	40.00	%	
Oil Saturation	So =	55.00	%	
Gas Saturation	Sg =	5.00	%	
Wellbore Radius	rw =	0.07	m	
Formation Temperature	T =	55.50	deg C	
Formation Compressibility	cf =	7.736x10 ⁻⁰⁷	⁻¹ kPa	<DEF>
Total Compressibility	ct =	2.653x10 ⁻⁰⁵	⁻¹ kPa	<DEF>

Oil Well Test - SYNTHESIZER

Storage - Skin - Boundaries Model

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Synthesis Results

Average Error	=	15.0	kPa
Synthetic Initial Pressure	=	11677.2	kPa
Pressure At 1 Year Shut-in	=	9566.5	kPa
Pressure Drop Due To Skin	delps =	1229.2	kPa
Flow Efficiency	FE =	0.80	
Damage Ratio	DR =	1.25	

Extended Rates

3 - Month Constant Rate	=	27.84	m^3/d
6 - Month Constant Rate	=	19.49	m^3/d

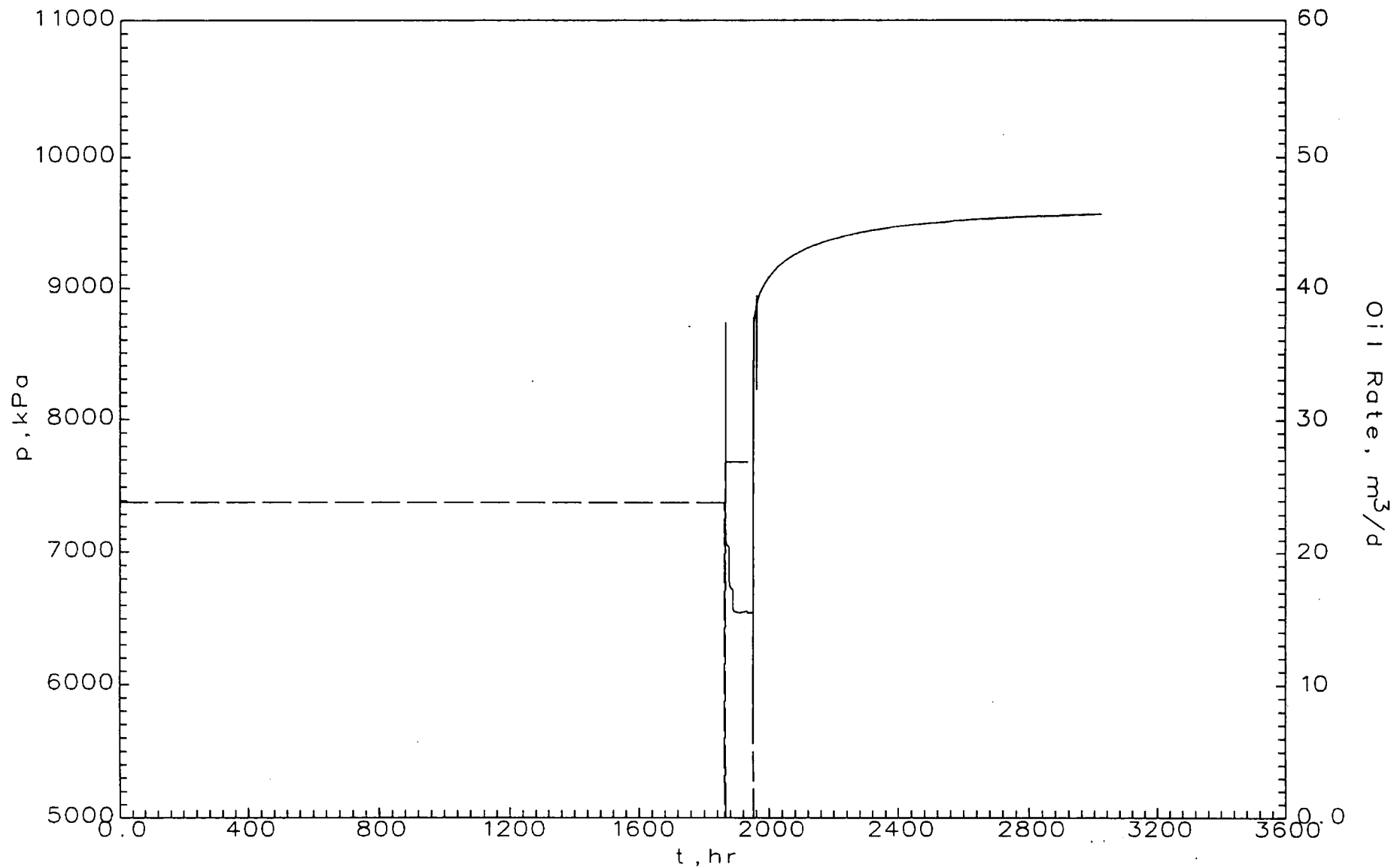
Stabilized Rate

Time To Stabilize	ts =	909.817	hr
Stabilized Rate @ Current Skin	qs =	37.20	m^3/d
Stabilized Rate @ Skin Of 0	qs =	47.90	m^3/d
Stabilized Rate @ Skin Of -4	qs =	64.95	m^3/d

STRIP. CHART

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT: 1415.5-1420.5 mKB
93/03/24 TO 93/05/11



Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
hr	hr	kPa	3 m /d	3 m /d	3 3 10 m /d
1863.000	1863.000	-	23.90	0.00	22.600
3.000	1866.000	8737.3	0.00	0.00	0.000
1.025	1867.025	7167.1	26.90	0.00	24.000
2.025	1868.025	7098.0	-	-	-
3.025	1869.025	7075.3	-	-	-
4.025	1870.025	7064.2	-	-	-
5.025	1871.025	7061.5	-	-	-
6.025	1872.025	7056.9	-	-	-
7.025	1873.025	7054.0	-	-	-
8.025	1874.025	7051.8	-	-	-
9.025	1875.025	7049.7	-	-	-
10.025	1876.025	7051.3	-	-	-
11.025	1877.025	7047.8	-	-	-
12.025	1878.025	6788.6	-	-	-
13.025	1879.025	6760.1	-	-	-
14.025	1880.025	6749.9	-	-	-
15.025	1881.025	6745.1	-	-	-
16.025	1882.025	6741.6	-	-	-
17.025	1883.025	6739.6	-	-	-
18.025	1884.025	6736.9	-	-	-
19.025	1885.025	6731.9	-	-	-
20.025	1886.025	6728.9	-	-	-
21.025	1887.025	6728.9	-	-	-
22.025	1888.025	6728.7	-	-	-
23.025	1889.025	6644.4	-	-	-
24.025	1890.025	6576.9	-	-	-
25.025	1891.025	6568.8	-	-	-
26.025	1892.025	6565.8	-	-	-
27.025	1893.025	6559.8	-	-	-
28.025	1894.025	6559.4	-	-	-
29.025	1895.025	6558.4	-	-	-
30.025	1896.025	6557.4	-	-	-
31.025	1897.025	6557.4	-	-	-
32.025	1898.025	6555.5	-	-	-
33.025	1899.025	6555.5	-	-	-
34.025	1900.025	6554.3	-	-	-
35.025	1901.025	6554.5	-	-	-
36.025	1902.025	6552.8	-	-	-
37.025	1903.025	6552.4	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
hr	hr	kPa	3 m /d	3 m /d	3 3 10 m /d
38.025	1904.025	6551.6	-	-	-
39.025	1905.025	6552.0	-	-	-
40.025	1906.025	6551.2	-	-	-
41.025	1907.025	6551.2	-	-	-
42.025	1908.025	6552.4	-	-	-
43.025	1909.025	6550.0	-	-	-
44.025	1910.025	6548.9	-	-	-
45.025	1911.025	6549.2	-	-	-
46.025	1912.025	6546.5	-	-	-
47.025	1913.025	6550.8	-	-	-
48.025	1914.025	6551.0	-	-	-
49.025	1915.025	6552.4	-	-	-
50.025	1916.025	6554.5	-	-	-
51.025	1917.025	6555.6	-	-	-
52.025	1918.025	6556.4	-	-	-
53.025	1919.025	6555.9	-	-	-
54.025	1920.025	6556.4	-	-	-
55.025	1921.025	6556.0	-	-	-
56.025	1922.025	6555.5	-	-	-
57.025	1923.025	6554.1	-	-	-
58.025	1924.025	6557.6	-	-	-
59.025	1925.025	6556.0	-	-	-
60.025	1926.025	6557.6	-	-	-
61.025	1927.025	6557.2	-	-	-
62.025	1928.025	6558.4	-	-	-
63.025	1929.025	6560.3	-	-	-
64.025	1930.025	6562.1	-	-	-
65.025	1931.025	6562.1	-	-	-
66.025	1932.025	6562.6	-	-	-
67.025	1933.025	6563.4	-	-	-
68.025	1934.025	6548.2	-	-	-
69.025	1935.025	6547.3	-	-	-
70.025	1936.025	6550.0	-	-	-
71.025	1937.025	6547.9	-	-	-
72.025	1938.025	6549.2	-	-	-
73.025	1939.025	6551.2	-	-	-
74.025	1940.025	6553.3	-	-	-
75.025	1941.025	6552.3	-	-	-
76.025	1942.025	6549.2	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
			3	3	3 3
hr	hr	kPa	m /d	m /d	10 m /d
77.025	1943.025	6549.6	-	-	-
78.025	1944.025	6546.5	-	-	-
79.025	1945.025	6549.8	-	-	-
80.025	1946.025	6548.8	-	-	-
81.025	1947.025	6553.3	-	-	-
82.025	1948.025	6551.4	-	-	-
83.025	1949.025	6551.5	-	-	-
84.025	1950.025	6552.3	-	-	-
85.025	1951.025	6551.1	-	-	-
85.925	1951.925	5626.8	34.00	0.00	30.000
85.934	1951.934	5761.0	0.00	0.00	0.000
85.942	1951.942	5959.3	-	-	-
85.950	1951.950	6124.4	-	-	-
85.959	1951.959	6270.6	-	-	-
85.967	1951.967	6397.9	-	-	-
85.975	1951.975	6513.0	-	-	-
85.984	1951.984	6618.4	-	-	-
85.992	1951.992	6716.7	-	-	-
86.000	1952.000	6806.5	-	-	-
86.009	1952.009	6889.7	-	-	-
86.017	1952.017	6969.2	-	-	-
86.025	1952.025	7043.1	-	-	-
86.034	1952.034	7111.6	-	-	-
86.042	1952.042	7178.4	-	-	-
86.050	1952.050	7240.4	-	-	-
86.059	1952.059	7298.5	-	-	-
86.067	1952.067	7353.2	-	-	-
86.075	1952.075	7405.3	-	-	-
86.084	1952.084	7454.3	-	-	-
86.092	1952.092	7502.0	-	-	-
86.100	1952.100	7547.3	-	-	-
86.109	1952.109	7587.7	-	-	-
86.117	1952.117	7627.9	-	-	-
86.125	1952.125	7667.8	-	-	-
86.134	1952.134	7703.7	-	-	-
86.142	1952.142	7739.1	-	-	-
86.150	1952.150	7772.9	-	-	-
86.159	1952.159	7804.4	-	-	-
86.167	1952.167	7837.4	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
			3	3	3 3
hr	hr	kPa	m /d	m /d	10 m /d
86.175	1952.175	7866.6	-	-	-
86.184	1952.184	7895.4	-	-	-
86.192	1952.192	7921.6	-	-	-
86.200	1952.200	7948.2	-	-	-
86.209	1952.209	7973.3	-	-	-
86.225	1952.225	8018.8	-	-	-
86.234	1952.234	8042.9	-	-	-
86.250	1952.250	8084.2	-	-	-
86.267	1952.267	8121.1	-	-	-
86.284	1952.284	8158.7	-	-	-
86.300	1952.300	8190.8	-	-	-
86.317	1952.317	8220.4	-	-	-
86.334	1952.334	8252.3	-	-	-
86.350	1952.350	8278.6	-	-	-
86.367	1952.367	8305.9	-	-	-
86.384	1952.384	8328.9	-	-	-
86.400	1952.400	8351.2	-	-	-
86.417	1952.417	8372.8	-	-	-
86.434	1952.434	8394.2	-	-	-
86.450	1952.450	8404.3	-	-	-
86.467	1952.467	8424.2	-	-	-
86.484	1952.484	8445.8	-	-	-
86.525	1952.525	8480.6	-	-	-
86.559	1952.559	8505.1	-	-	-
86.592	1952.592	8531.2	-	-	-
86.625	1952.625	8552.4	-	-	-
86.659	1952.659	8573.0	-	-	-
86.692	1952.692	8590.5	-	-	-
86.725	1952.725	8606.5	-	-	-
86.759	1952.759	8618.9	-	-	-
86.792	1952.792	8163.8	-	-	-
86.825	1952.825	7546.0	-	-	-
86.859	1952.859	7423.9	-	-	-
86.892	1952.892	7890.1	-	-	-
86.925	1952.925	8120.9	-	-	-
86.959	1952.959	8266.4	-	-	-
86.992	1952.992	8368.3	-	-	-
87.025	1953.025	8444.5	-	-	-
87.059	1953.059	8495.2	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
hr	hr	kPa	3 m /d	3 m /d	3 3 10 m /d
87.100	1953.100	8550.3	-	-	-
87.142	1953.142	8591.8	-	-	-
87.192	1953.192	8632.1	-	-	-
87.259	1953.259	8672.4	-	-	-
87.325	1953.325	8701.0	-	-	-
87.392	1953.392	8727.3	-	-	-
87.459	1953.459	8747.3	-	-	-
87.525	1953.525	8759.6	-	-	-
87.592	1953.592	8768.5	-	-	-
87.659	1953.659	8774.8	-	-	-
87.725	1953.725	8777.7	-	-	-
87.792	1953.792	8780.0	-	-	-
87.859	1953.859	8778.9	-	-	-
87.925	1953.925	8775.8	-	-	-
87.992	1953.992	8770.7	-	-	-
88.059	1954.059	8761.4	-	-	-
88.125	1954.125	8757.9	-	-	-
88.225	1954.225	8759.6	-	-	-
88.325	1954.325	8759.0	-	-	-
88.425	1954.425	8758.8	-	-	-
88.525	1954.525	8756.5	-	-	-
88.625	1954.625	8750.7	-	-	-
88.725	1954.725	8746.2	-	-	-
88.825	1954.825	8738.6	-	-	-
88.925	1954.925	8740.4	-	-	-
89.025	1955.025	8743.1	-	-	-
89.125	1955.125	8747.8	-	-	-
89.225	1955.225	8750.0	-	-	-
89.359	1955.359	8753.9	-	-	-
89.492	1955.492	8758.0	-	-	-
89.625	1955.625	8761.5	-	-	-
89.759	1955.759	8765.2	-	-	-
89.892	1955.892	8768.7	-	-	-
90.025	1956.025	8772.2	-	-	-
90.159	1956.159	8775.8	-	-	-
90.292	1956.292	8779.5	-	-	-
90.459	1956.459	8783.8	-	-	-
90.625	1956.625	8787.7	-	-	-
90.792	1956.792	8791.6	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
hr	hr	kPa	3 m /d	3 m /d	3 3 10 m /d
90.959	1956.959	8795.5	-	-	-
91.125	1957.125	8799.6	-	-	-
91.292	1957.292	8803.1	-	-	-
91.459	1957.459	8806.6	-	-	-
91.659	1957.659	8810.4	-	-	-
91.859	1957.859	8814.1	-	-	-
92.059	1958.059	8817.8	-	-	-
92.259	1958.259	8821.7	-	-	-
92.459	1958.459	8825.6	-	-	-
92.692	1958.692	8830.3	-	-	-
92.925	1958.925	8834.8	-	-	-
93.159	1959.159	8838.9	-	-	-
93.392	1959.392	8842.8	-	-	-
93.625	1959.625	8846.3	-	-	-
93.892	1959.892	8850.2	-	-	-
94.159	1960.159	8854.3	-	-	-
94.425	1960.425	8858.2	-	-	-
94.692	1960.692	8861.8	-	-	-
94.992	1960.992	8865.3	-	-	-
95.292	1961.292	8869.0	-	-	-
95.592	1961.592	8872.9	-	-	-
95.925	1961.925	8876.8	-	-	-
96.242	1962.242	8222.5	-	-	-
96.592	1962.592	8888.4	-	-	-
96.925	1962.925	8946.1	-	-	-
97.292	1963.292	8937.6	-	-	-
97.659	1963.659	8926.1	-	-	-
98.025	1964.025	8910.4	-	-	-
98.425	1964.425	8892.7	-	-	-
98.825	1964.825	8898.6	-	-	-
99.259	1965.259	8905.0	-	-	-
99.692	1965.692	8910.3	-	-	-
100.125	1966.125	8914.6	-	-	-
100.592	1966.592	8919.3	-	-	-
101.059	1967.059	8924.0	-	-	-
101.559	1967.559	8929.1	-	-	-
102.059	1968.059	8934.0	-	-	-
102.592	1968.592	8938.3	-	-	-
103.125	1969.125	8942.8	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
			3	3	3 3
hr	hr	kPa	m /d	m /d	10 m /d
103.692	1969.692	8946.5	-	-	-
104.259	1970.259	8950.4	-	-	-
104.859	1970.859	8954.5	-	-	-
105.459	1971.459	8958.9	-	-	-
106.092	1972.092	8962.8	-	-	-
106.725	1972.725	8966.3	-	-	-
107.392	1973.392	8970.2	-	-	-
108.092	1974.092	8974.3	-	-	-
108.792	1974.792	8978.4	-	-	-
109.525	1975.525	8982.5	-	-	-
110.292	1976.292	8986.2	-	-	-
111.059	1977.059	8990.3	-	-	-
111.859	1977.859	8994.2	-	-	-
112.692	1978.692	8998.1	-	-	-
113.559	1979.559	9002.6	-	-	-
114.425	1980.425	9006.7	-	-	-
115.325	1981.325	9011.0	-	-	-
116.259	1982.259	9014.7	-	-	-
117.225	1983.225	9018.0	-	-	-
118.225	1984.225	9022.5	-	-	-
119.259	1985.259	9026.8	-	-	-
120.325	1986.325	9032.1	-	-	-
121.425	1987.425	9037.9	-	-	-
122.559	1988.559	9042.4	-	-	-
123.725	1989.725	9046.7	-	-	-
124.925	1990.925	9051.0	-	-	-
126.159	1992.159	9055.7	-	-	-
127.425	1993.425	9061.1	-	-	-
128.725	1994.725	9064.8	-	-	-
130.059	1996.059	9069.3	-	-	-
131.459	1997.459	9074.0	-	-	-
132.892	1998.892	9078.7	-	-	-
134.359	2000.359	9083.8	-	-	-
135.892	2001.892	9089.0	-	-	-
137.459	2003.459	9094.1	-	-	-
139.092	2005.092	9098.6	-	-	-
140.759	2006.759	9103.6	-	-	-
142.492	2008.492	9109.3	-	-	-
144.259	2010.259	9113.8	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
hr	hr	kPa	3 m /d	3 m /d	3 3 10 m /d
146.092	2012.092	9118.9	-	-	-
147.992	2013.992	9124.3	-	-	-
149.959	2015.959	9131.1	-	-	-
151.959	2017.959	9136.8	-	-	-
154.025	2020.025	9142.1	-	-	-
156.159	2022.159	9147.1	-	-	-
158.359	2024.359	9153.0	-	-	-
160.625	2026.625	9159.0	-	-	-
162.959	2028.959	9164.3	-	-	-
165.392	2031.392	9170.0	-	-	-
167.892	2033.892	9175.4	-	-	-
170.459	2036.459	9180.9	-	-	-
173.125	2039.125	9186.9	-	-	-
175.859	2041.859	9192.8	-	-	-
178.692	2044.692	9198.0	-	-	-
181.592	2047.592	9204.4	-	-	-
184.592	2050.592	9210.3	-	-	-
187.692	2053.692	9215.4	-	-	-
190.892	2056.892	9222.0	-	-	-
194.192	2060.192	9227.6	-	-	-
197.592	2063.592	9233.7	-	-	-
201.092	2067.092	9240.3	-	-	-
204.692	2070.692	9246.2	-	-	-
208.425	2074.425	9251.2	-	-	-
212.259	2078.259	9257.5	-	-	-
216.225	2082.225	9263.3	-	-	-
220.292	2086.292	9269.3	-	-	-
224.492	2090.492	9275.4	-	-	-
228.825	2094.825	9282.4	-	-	-
233.292	2099.292	9288.1	-	-	-
237.892	2103.892	9294.3	-	-	-
242.659	2108.659	9300.3	-	-	-
247.559	2113.559	9306.6	-	-	-
252.625	2118.625	9312.0	-	-	-
257.825	2123.825	9318.1	-	-	-
263.192	2129.192	9324.1	-	-	-
268.725	2134.725	9330.9	-	-	-
274.425	2140.425	9337.0	-	-	-
280.325	2146.325	9342.8	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
			3	3	3 3
hr	hr	kPa	m /d	m /d	10 m /d
286.392	2152.392	9347.1	-	-	-
292.659	2158.659	9353.2	-	-	-
299.125	2165.125	9360.6	-	-	-
305.792	2171.792	9365.2	-	-	-
312.659	2178.659	9370.7	-	-	-
319.759	2185.759	9376.9	-	-	-
327.059	2193.059	9382.8	-	-	-
334.592	2200.592	9387.9	-	-	-
342.359	2208.359	9392.9	-	-	-
350.359	2216.359	9398.4	-	-	-
358.625	2224.625	9405.2	-	-	-
367.175	2233.175	9410.5	-	-	-
376.009	2242.009	9415.0	-	-	-
385.092	2251.092	9420.2	-	-	-
394.425	2260.425	9425.5	-	-	-
404.092	2270.092	9431.1	-	-	-
414.092	2280.092	9437.4	-	-	-
424.342	2290.342	9443.0	-	-	-
434.925	2300.925	9447.7	-	-	-
445.842	2311.842	9452.4	-	-	-
457.092	2323.092	9457.1	-	-	-
468.675	2334.675	9461.7	-	-	-
480.675	2346.675	9466.2	-	-	-
493.009	2359.009	9470.9	-	-	-
505.759	2371.759	9476.0	-	-	-
518.925	2384.925	9480.6	-	-	-
532.425	2398.425	9484.4	-	-	-
546.425	2412.425	9489.0	-	-	-
560.842	2426.842	9492.4	-	-	-
575.675	2441.675	9496.6	-	-	-
591.009	2457.009	9500.5	-	-	-
606.759	2472.759	9505.4	-	-	-
623.009	2489.009	9509.5	-	-	-
639.759	2505.759	9512.3	-	-	-
657.092	2523.092	9516.2	-	-	-
674.925	2540.925	9519.7	-	-	-
693.342	2559.342	9524.3	-	-	-
712.342	2578.342	9528.8	-	-	-
731.925	2597.925	9532.5	-	-	-

Oil Well Test - BUILDUP

Production History

PARAMOUNT ET AL CAMERON
M-73

SULPHUR POINT:1415.5-1420.5 mKB
93/03/24 TO 93/05/11

Time	Cumulative	Pressure	Oil	Water	Gas
	Time		Rate	Rate	Rate
hr	hr	kPa	3 m /d	3 m /d	3 3 10 m /d
752.092	2618.092	9536.2	-	-	-
772.925	2638.925	9539.5	-	-	-
794.425	2660.425	9542.7	-	-	-
816.592	2682.592	9545.6	-	-	-
839.425	2705.425	9549.3	-	-	-
862.925	2728.925	9552.8	-	-	-
887.175	2753.175	9556.1	-	-	-
912.175	2778.175	9559.3	-	-	-
938.009	2804.009	9561.6	-	-	-
964.592	2830.592	9564.1	-	-	-
992.009	2858.009	9566.7	-	-	-
1020.259	2886.259	9569.6	-	-	-
1049.392	2915.392	9572.3	-	-	-
1079.459	2945.459	9575.6	-	-	-
1110.459	2976.459	9578.0	-	-	-
1142.425	3008.425	9580.3	-	-	-
1156.792	3022.792	9581.7	-	-	-

Cameron Hills M-73 Production Test Data

Date	Fluid Produced (m3)	Oil Produced (M3)	Prod Hours (hrs)	Cumm OTD (m3)	Oil Rate (m3/d)	BS&W (%)	H2O Produced (M3)	Cumm H2O (M3)	Gas Rate (E3m3/d)	GOR (m3/m3)	Tubing P Pressure (kPa)
02-Jan-93	21.3	21.3	17	21.3	30.0		0.0	0.0			5000
03-Jan-93	23.5	23.5	18	44.8	31.3	0.05	0.0	0.0	17.2	549	
04-Jan-93	24.0	24.0	24	68.8	24.0		0.0	0.0			5000
05-Jan-93	27.6	27.6	24	96.4	27.6	0.05	0.0	0.0	18	653	4900
06-Jan-93	32.4	32.4	24	128.8	32.4	0.05	0.0	0.0	17.9	553	4850
07-Jan-93	27.2	27.2	24	155.9	27.2	0.05	0.0	0.1	17.5	644	4850
08-Jan-93	26.9	26.9	22	182.8	29.3	0.05	0.0	0.1	18.4	627	4850
09-Jan-93	22.8	22.8	24	205.6	22.8	0.05	0.0	0.1	18.8	825	4850
10-Jan-93	30.0	30.0	24	235.6	30.0	0.05	0.0	0.1	19	634	4900
11-Jan-93	25.5	25.5	24	261.1	25.5	0.05	0.0	0.1	19.5	765	4800
12-Jan-93	17.4	17.4	21	278.5	19.9	0.05	0.0	0.1	21.7	1082	4800
13-Jan-93	27	27.0	22	305.5	29.4	0.05	0.0	0.1	22.1	751	4800
14-Jan-93	28.7	28.7	24	334.2	28.7	0.05	0.0	0.1	23.6	823	4800
15-Jan-93	27.9	27.9	24	362.0	27.9	0.05	0.0	0.2	25.5	914	4400
16-Jan-93	30.8	30.8	24	392.8	30.8	0.05	0.0	0.2	27.5	893	4200
17-Jan-93	21.9	21.9	24	414.7	21.9	0.05	0.0	0.2	22.5	1028	4400
18-Jan-93	15.6	15.6	16	430.3	23.4	0.05	0.0	0.2	27	1154	
19-Jan-93	25.4	25.4	24	455.7	25.4	0.1	0.0	0.2	23.4	922	4800
20-Jan-93	23	23.0	24	478.7	23.0	0.1	0.0	0.2	24.1	1049	
21-Jan-93	19	19.0	24	497.6	19.0	0.1	0.0	0.3	23.6	1243	5000
22-Jan-93	23.3	23.3	24	520.9	23.3	0.1	0.0	0.3	23.6	1014	4800
23-Jan-93	24	24.0	24	544.9	24.0	0.2	0.0	0.3	23.6	985	4800
24-Jan-93	21	21.0	24	565.8	21.0	0.1	0.0	0.4	24	1144	4800
25-Jan-93	20.6	20.4	24	586.3	20.4	0.8	0.2	0.5	24.8	1214	4800
26-Jan-93	14	14.0	16	600.3	21.0	0.05	0.0	0.5	23.8	1134	4800
27-Jan-93	13.9	13.8	24	614.1	13.8	0.5	0.1	0.6	23	1663	4800
28-Jan-93	26	25.9	24	640.0	25.9	0.5	0.1	0.7	23	889	5000
29-Jan-93	19	19.0	24	658.9	19.0	0.2	0.0	0.8	22	1160	4800
30-Jan-93	24	23.9	24	682.8	23.9	0.5	0.1	0.9	23	963	4800
31-Jan-93	26	25.9	24	708.8	25.9	0.2	0.1	0.9	21	809	4800
01-Feb-93	25	25.0	24	733.7	25.0	0.2	0.1	1.0	22	882	4800
02-Feb-93	24	24.0	24	757.7	24.0	0.2	0.0	1.0	21	877	4800
03-Feb-93	22	21.8	24	779.5	21.8	0.8	0.2	1.2	21	962	4900
05-Feb-93	22	21.8	24	801.3	21.8	0.8	0.2	1.4	23	1054	4900
06-Feb-93	18	17.9	24	819.3	17.9	0.3	0.1	1.4	21	1170	5000
07-Feb-93	19	18.9	24	838.2	18.9	0.4	0.1	1.5	21	1110	5000
08-Feb-93	32	31.9	24	870.1	31.9	0.4	0.1	1.6	20	628	4900
09-Feb-93	25	25.0	24	895.0	25.0	0.2	0.1	1.7	22.5	902	4800
10-Feb-93	23	23.0	24	918.0	23.0	0.2	0.0	1.7	22.5	980	4900
11-Feb-93	13	13.0	24	930.9	13.0	0.2	0.0	1.8	22	1696	4800
12-Feb-93	19	18.9	24	949.9	18.9	0.3	0.1	1.8	21	1109	4800
13-Feb-93	19	18.9	24	968.8	18.9	0.3	0.1	1.9	19.5	1029	4800
14-Feb-93	20	20.0	24	988.8	20.0	0.2	0.0	1.9	21	1052	5200
15-Feb-93	29	28.9	24	1017.7	28.9	0.2	0.1	2.0	23.1	798	4600
16-Feb-93	12	12.0	18	1029.7	16.0	0.2	0.0	2.0	22.1	1384	4800
17-Feb-93	26	25.9	24	1055.6	25.9	0.2	0.1	2.1	22.5	867	4800
18-Feb-93	31	30.9	24	1086.6	30.9	0.2	0.1	2.1	22.5	727	4700
19-Feb-93	21	21.0	24	1107.6	21.0	0.1	0.0	2.1	21.5	1025	5000
20-Feb-93	14	14.0	17	1121.6	19.7	0.1	0.0	2.1	23.1	1170	4600
21-Feb-93	21	21.0	24	1142.5	21.0	0.1	0.0	2.2	23	1096	4600
22-Feb-93	19	19.0	24	1161.5	19.0	0.1	0.0	2.2	21.5	1133	4800
23-Feb-93	25	25.0	24	1186.5	25.0	0.2	0.1	2.2	23.5	942	4600
24-Feb-93	26	25.9	24	1212.4	25.9	0.2	0.1	2.3	24.1	929	4500
25-Feb-93	24	24.0	24	1236.4	24.0	0.2	0.0	2.3	24	1002	4600
26-Feb-93	20	20.0	24	1256.3	20.0	0.2	0.0	2.4	22	1102	4600
27-Feb-93	24	24.0	24	1280.3	24.0	0.2	0.0	2.4	24	1002	4600
28-Feb-93	24	24.0	24	1304.3	24.0	0	0.0	2.4	23.6	983	4600
01-Mar-93	17	17.0	18	1321.2	22.6	0.2	0.0	2.5	23.6	1043	4600
02-Mar-93	20	20.0	24	1341.2	20.0	0.2	0.0	2.5	24	1202	4600
03-Mar-93	29	28.9	24	1370.1	28.9	0.2	0.1	2.6	24.6	850	4600
04-Mar-93	20	20.0	24	1390.1	20.0	0.2	0.0	2.6	24	1202	4600
05-Mar-93	18	18.0	24	1408.1	18.0	0.2	0.0	2.6	22	1225	4600
06-Mar-93	24	24.0	24	1432.0	24.0	0.2	0.0	2.7	23.6	985	4600
07-Mar-93	25	25.0	24	1457.0	25.0	0.2	0.1	2.7	24	962	4600
08-Mar-93	25	25.0	24	1481.9	25.0	0.2	0.1	2.8	25.4	1018	4600
09-Mar-93	22	22.0	24	1503.9	22.0	0.2	0.0	2.8	25	1139	4500
10-Mar-93	24	24.0	24	1527.8	24.0	0.2	0.0	2.9	23.8	994	4600
11-Mar-93	24	24.0	24	1551.8	24.0	0.2	0.0	2.9	22	919	4600
12-Mar-93	19	19.0	24	1570.7	19.0	0.2	0.0	3.0	23.5	1239	4600
13-Mar-93	27	26.9	24	1597.7	26.9	0.2	0.1	3.0	22	816	4600
14-Mar-93	19	19.0	24	1616.6	19.0	0.2	0.0	3.1	22	1160	4600
15-Mar-93	25	25.0	24	1641.6	25.0	0.2	0.1	3.1	23	922	4500
16-Mar-93	28	27.9	24	1669.5	27.9	0.2	0.1	3.2	23	823	4800
17-Mar-93	24	24.0	24	1693.5	24.0	0.2	0.0	3.2	24	1002	4500
18-Mar-93	28	27.9	24	1721.4	27.9	0.2	0.1	3.3	23	823	4500
19-Mar-93	24	24.0	24	1745.4	24.0	0.2	0.0	3.3	23	960	4500
20-Mar-93	25	25.0	24	1770.3	25.0	0.2	0.1	3.4	24	962	4500
21-Mar-93	25	25.0	24	1795.3	25.0	0.2	0.1	3.4	24	962	4400
22-Mar-93	27	26.9	24	1822.2	26.9	0.2	0.1	3.5	24	891	4600
23-Mar-93	25	25.0	24	1847.2	25.0	0.2	0.1	3.5	24	962	4400
24-Mar-93	23	23.0	21	1870.1	26.2	0.2	0.0	3.6	22	839	4400
25-Mar-93	26	26.0	24	1896.1	26.0	0.1	0.0	3.6	24	924	4200
26-Mar-93	28	28.0	24	1924.1	28.0	0.1	0.0	3.6	24	858	4200
27-Mar-93	16	16.0	14	1940.1	27.4	0.1	0.0	3.6	24	876	4200

Average

1948

23.9 0.2 0.0

22.6 979

NORTHLAND
WIRELINER SERVICES LTD.

Subsurface Pressure Reports

PARAMOUNT RESOURCES LTD.

M-73

93/03/24 - 93/05/11

Starburst
Electronic Pressure Recorder

(403) 255 - 9700

NORTHLAND WIRELINE SERVICES LTD.
400C, 9705 HORTON RD. S.W.
SUBSURFACE PRESSURE MEASUREMENTS

COMPANY:	PARAMOUNT RESOURCES LTD.
ADDRESS:	4000, 350 - 7 AVE. S.W.CAL.
WELL NAME:	PARAMOUNT ET AL CAMERON
LOCATION:	M-73
FIELD / POOL:	CAMERON HILLS / SULPHUR POINT

TYPE OF TEST:	FLOW & BUILD UP
WELL STATUS:	OIL 1.5 % H2S
PRODUCING INTERVAL (M CF):	1411.8 - 1416.8
MID POINT PERFS (M CF):	1414.3
ELEVATIONS CF:	771.45 KB: 775.15
PRODUCING THROUGH TUBING (MM):	73 CASING: 139.7

PROBE SERIAL #:	20013 [TOP]
PROBE RANGE:	0 - 41369 KPAG
LAST CALIBRATION DATE:	93/03/19
TIME INTERVAL - NORMAL/FAST:	PGM / PGM

TUBING PRESSURE	INITIAL	6240	FINAL	6520 (KPAG)
CASING PRESSURE	INITIAL	600	FINAL	0 (KPAG)
RUN DEPTH (M CF):				1396.0
TIME ON BOTTOM:				93/03/24 09:02
TIME OFF BOTTOM:				93/05/11 14:25

MAXIMUM TEMPERATURE:	55.7 C
DATE OF TEST:	93/03/24 08:37

COMMENTS:

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON (M-73)

Probe: 20013 [TOP]

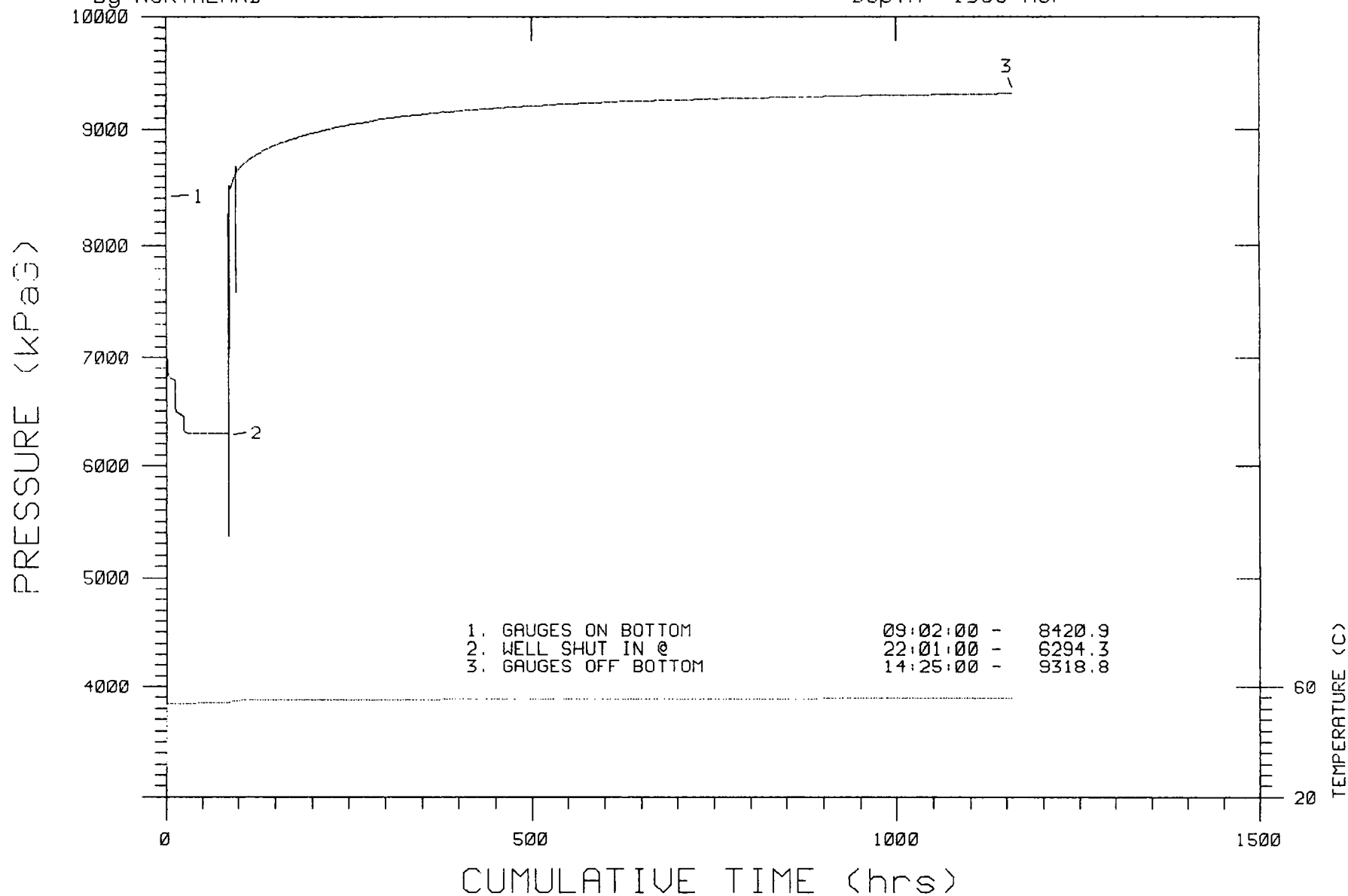
Pressure vs Time

By NORTHLAND

CARERRON HILLS / SULPHUR POINT

FLOW & BUILD UP

Depth: 1396 MCF



On Bottom 93/03/24 09:02:00

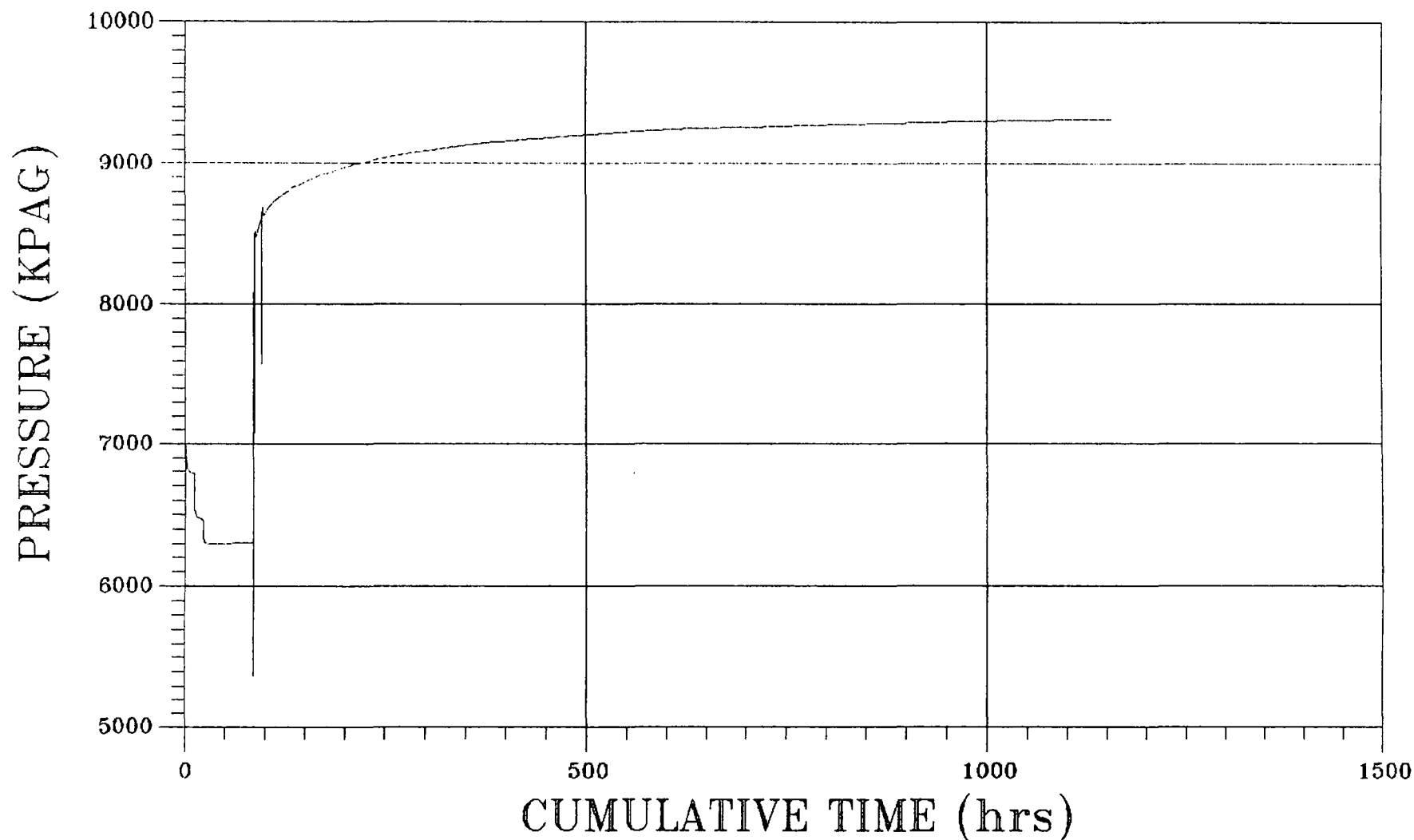
Off Bottom 93/05/11 14:25:00

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON (M-73)

Probe: 20013 [TOP]
Pressure vs Time
By NORTHLAND

CARERRON HILLS / SULPHUR POINT
FLOW & BUILD UP
Depth: 1396 MCF



On Bottom 93/03/24 09:02:00

Off Bottom 93/05/11 14:25:00

PROGRAMMED SAMPLE INTERVALS

From	To	Primary	Fast
-----	-----	-----	-----
93/03/24 08:37	93/04/08 08:37	2M	30S
93/04/08 08:37	93/05/04 23:37	5M	5M
93/05/04 23:37	--END OF RUN--	2M	30S

Page 1

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
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Printing every 120th item.

Recorders on bottom - 93/03/24 09:02:00

--- Primary Time: 2M Fast Time: 30S ---

1	93/03/24 09:02:00	0.000		31.05	8420.89*
121	93/03/24 11:41:00	2.650		53.94	6825.49
241	93/03/24 15:41:00	6.650		53.97	6795.57
361	93/03/24 19:41:00	10.650		53.98	6788.31
481	93/03/24 23:23:00	14.350		53.98	6490.29
601	93/03/25 03:23:00	18.350		53.98	6478.53
721	93/03/25 07:23:00	22.350		53.97	6469.50
841	93/03/25 11:17:00	26.250		53.96	6305.34
961	93/03/25 15:17:00	30.250		53.95	6298.67
1081	93/03/25 19:17:00	34.250		53.94	6296.53
1201	93/03/25 23:17:00	38.250		53.93	6289.15
1321	93/03/26 03:17:00	42.250		53.92	6294.04
1441	93/03/26 07:17:00	46.250		53.92	6290.98
1561	93/03/26 11:17:00	50.250		53.91	6294.07
1681	93/03/26 15:17:00	54.250		53.91	6298.77
1801	93/03/26 19:17:00	58.250		53.91	6297.32
1921	93/03/26 23:17:00	62.250		53.91	6300.59
2041	93/03/27 03:17:00	66.250		53.91	6303.30
2161	93/03/27 07:17:00	70.250		53.90	6289.04
2281	93/03/27 11:17:00	74.250		53.90	6300.98
2401	93/03/27 15:17:00	78.250		53.90	6286.87
2521	93/03/27 19:17:00	82.250		53.89	6293.03

WELL SHUT IN @ -- 93/03/27 22:00:00

2603	93/03/27 22:01:00	84.983	0.017	53.89	6294.30
2641	93/03/27 22:54:30	85.875	0.908	53.87	5837.75*
2761	93/03/28 00:14:00	87.200	2.233	54.33	7080.45*

Date: 93/03/24 09:02 to 93/03/28 00:14 Acc time: 0.000 to 87.200 Page 1

* - denotes fast readings

Recorder: 20013

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
2881	93/03/28 03:17:00	90.250	5.283	54.62	8502.49
3001	93/03/28 07:17:00	94.250	9.283	54.86	8582.90
3121	93/03/28 10:23:00	97.350	12.383	54.81	8691.54
3241	93/03/28 14:23:00	101.350	16.383	54.98	8656.77
3361	93/03/28 18:23:00	105.350	20.383	55.05	8689.44
3481	93/03/28 22:23:00	109.350	24.383	55.10	8713.67
3601	93/03/29 02:23:00	113.350	28.383	55.15	8733.55
3721	93/03/29 06:23:00	117.350	32.383	55.18	8752.07
3841	93/03/29 10:23:00	121.350	36.383	55.20	8769.33
3961	93/03/29 14:23:00	125.350	40.383	55.23	8785.88
4081	93/03/29 18:23:00	129.350	44.383	55.26	8798.80
4201	93/03/29 22:23:00	133.350	48.383	55.27	8814.27
4321	93/03/30 02:23:00	137.350	52.383	55.29	8825.96
4441	93/03/30 06:23:00	141.350	56.383	55.31	8838.91
4561	93/03/30 10:23:00	145.350	60.383	55.32	8850.26
4681	93/03/30 14:23:00	149.350	64.383	55.33	8858.36
4801	93/03/30 18:23:00	153.350	68.383	55.34	8868.78
4921	93/03/30 22:23:00	157.350	72.383	55.35	8879.77
5041	93/03/31 02:23:00	161.350	76.383	55.37	8888.21
5161	93/03/31 06:23:00	165.350	80.383	55.37	8897.78
5281	93/03/31 10:23:00	169.350	84.383	55.39	8907.66
5401	93/03/31 14:23:00	173.350	88.383	55.40	8915.58
5521	93/03/31 18:23:00	177.350	92.383	55.40	8924.06
5641	93/03/31 22:23:00	181.350	96.383	55.40	8931.98
5761	93/04/01 02:23:00	185.350	100.383	55.41	8939.55
5881	93/04/01 06:23:00	189.350	104.383	55.41	8948.74
6001	93/04/01 10:23:00	193.350	108.383	55.42	8955.41
6121	93/04/01 14:23:00	197.350	112.383	55.43	8962.06
6241	93/04/01 18:23:00	201.350	116.383	55.43	8968.38
6361	93/04/01 22:23:00	205.350	120.383	55.44	8975.58
6481	93/04/02 02:23:00	209.350	124.383	55.44	8981.16
6601	93/04/02 06:23:00	213.350	128.383	55.44	8987.30
6721	93/04/02 10:23:00	217.350	132.383	55.44	8993.98
6841	93/04/02 14:23:00	221.350	136.383	55.44	9001.02
6961	93/04/02 18:23:00	225.350	140.383	55.45	9006.97
7081	93/04/02 22:23:00	229.350	144.383	55.45	9011.65
7201	93/04/03 02:23:00	233.350	148.383	55.45	9017.42
7321	93/04/03 06:23:00	237.350	152.383	55.46	9022.47
7441	93/04/03 10:23:00	241.350	156.383	55.46	9026.98
7561	93/04/03 14:23:00	245.350	160.383	55.46	9032.94
7681	93/04/03 18:23:00	249.350	164.383	55.46	9037.45
7801	93/04/03 22:23:00	253.350	168.383	55.47	9043.20
7921	93/04/04 02:23:00	257.350	172.383	55.47	9047.52
8041	93/04/04 06:23:00	261.350	176.383	55.47	9051.67
8161	93/04/04 10:23:00	265.350	180.383	55.47	9055.81
8281	93/04/04 14:23:00	269.350	184.383	55.47	9059.97

Date: 93/03/28 00:14 to 93/04/04 14:23 Acc time: 87.208 to 269.350 Page

* - denotes fast readings

Recorder: 20013

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
8401	93/04/04 18:23:00	273.350	188.383	55.48	9064.65
8521	93/04/04 22:23:00	277.350	192.383	55.48	9068.24
8641	93/04/05 02:23:00	281.350	196.383	55.49	9071.30
8761	93/04/05 06:23:00	285.350	200.383	55.49	9075.45
8881	93/04/05 10:23:00	289.350	204.383	55.49	9080.15
9001	93/04/05 14:23:00	293.350	208.383	55.49	9084.12
9121	93/04/05 18:23:00	297.350	212.383	55.49	9088.26
9241	93/04/05 22:23:00	301.350	216.383	55.50	9092.04
9361	93/04/06 02:23:00	305.350	220.383	55.50	9095.27
9481	93/04/06 06:23:00	309.350	224.383	55.50	9098.70
9601	93/04/06 10:23:00	313.350	228.383	55.51	9101.40
9721	93/04/06 14:23:00	317.350	232.383	55.51	9104.10
9841	93/04/06 18:23:00	321.350	236.383	55.51	9108.08
9961	93/04/06 22:23:00	325.350	240.383	55.51	9111.85
10081	93/04/07 02:23:00	329.350	244.383	55.52	9114.73
10201	93/04/07 06:23:00	333.350	248.383	55.52	9117.80
10321	93/04/07 10:23:00	337.350	252.383	55.52	9119.79
10441	93/04/07 14:23:00	341.350	256.383	55.52	9123.02
10561	93/04/07 18:23:00	345.350	260.383	55.52	9125.55
10681	93/04/07 22:23:00	349.350	264.383	55.52	9127.91
10801	93/04/08 02:23:00	353.350	268.383	55.52	9131.15
10921	93/04/08 06:23:00	357.350	272.383	55.52	9134.40

--- Primary Time: 5M Fast Time: 5M ---

11041	93/04/08 13:02:00	364.000	279.033	55.53	9138.53
11161	93/04/08 23:02:00	374.000	289.033	55.53	9144.66
11281	93/04/09 09:02:00	384.000	299.033	55.54	9150.42
11401	93/04/09 19:02:00	394.000	309.033	55.54	9156.90
11521	93/04/10 05:02:00	404.000	319.033	55.55	9161.38
11641	93/04/10 15:02:00	414.000	329.033	55.55	9164.99
11761	93/04/11 01:02:00	424.000	339.033	55.56	9170.76
11881	93/04/11 11:02:00	434.000	349.033	55.56	9176.17
12001	93/04/11 21:02:00	444.000	359.033	55.56	9181.59
12121	93/04/12 07:02:00	454.000	369.033	55.56	9186.45
12241	93/04/12 17:02:00	464.000	379.033	55.57	9190.58
12361	93/04/13 03:02:00	474.000	389.033	55.58	9194.17
12481	93/04/13 13:02:00	484.000	399.033	55.58	9197.24
12601	93/04/13 23:02:00	494.000	409.033	55.58	9201.74
12721	93/04/14 09:02:00	504.000	419.033	55.59	9205.70
12841	93/04/14 19:02:00	514.000	429.033	55.59	9208.58
12961	93/04/15 05:02:00	524.000	439.033	55.59	9212.37
13081	93/04/15 15:02:00	534.000	449.033	55.59	9215.26
13201	93/04/16 01:02:00	544.000	459.033	55.59	9219.77
13321	93/04/16 11:02:00	554.000	469.033	55.60	9223.19
13441	93/04/16 21:02:00	564.000	479.033	55.60	9227.33

Date: 93/04/04 14:25 to 93/04/16 21:02 Acc time: 269.383 to 564.000 Page 3

* - denotes fast readings

Recorder: 20013

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
13561	93/04/17 07:02:00	574.000	489.033	55.61	9229.84
13681	93/04/17 17:02:00	584.000	499.033	55.61	9233.08
13801	93/04/18 03:02:00	594.000	509.033	55.61	9235.61
13921	93/04/18 13:02:00	604.000	519.033	55.62	9238.11
14041	93/04/18 23:02:00	614.000	529.033	55.61	9240.65
14161	93/04/19 09:02:00	624.000	539.033	55.61	9243.72
14281	93/04/19 19:02:00	634.000	549.033	55.62	9246.95
14401	93/04/20 05:02:00	644.000	559.033	55.62	9249.11
14521	93/04/20 15:02:00	654.000	569.033	55.63	9250.54
14641	93/04/21 01:02:00	664.000	579.033	55.63	9252.51
14761	93/04/21 11:02:00	674.000	589.033	55.63	9254.13
14881	93/04/21 21:02:00	684.000	599.033	55.63	9255.22
15001	93/04/22 07:02:00	694.000	609.033	55.64	9257.55
15121	93/04/22 17:02:00	704.000	619.033	55.64	9259.90
15241	93/04/23 03:02:00	714.000	629.033	55.64	9261.70
15361	93/04/23 13:02:00	724.000	639.033	55.64	9263.33
15481	93/04/23 23:02:00	734.000	649.033	55.64	9264.77
15601	93/04/24 09:02:00	744.000	659.033	55.64	9268.20
15721	93/04/24 19:02:00	754.000	669.033	55.64	9269.11
15841	93/04/25 05:02:00	764.000	679.033	55.64	9271.98
15961	93/04/25 15:02:00	774.000	689.033	55.64	9272.70
16081	93/04/26 01:02:00	784.000	699.033	55.64	9274.51
16201	93/04/26 11:02:00	794.000	709.033	55.64	9275.77
16321	93/04/26 21:02:00	804.000	719.033	55.64	9277.58
16441	93/04/27 07:02:00	814.000	729.033	55.64	9279.38
16561	93/04/27 17:02:00	824.000	739.033	55.64	9280.65
16681	93/04/28 03:02:00	834.000	749.033	55.64	9281.91
16801	93/04/28 13:02:00	844.000	759.033	55.64	9283.72
16921	93/04/28 23:02:00	854.000	769.033	55.65	9284.79
17041	93/04/29 09:02:00	864.000	779.033	55.65	9285.87
17161	93/04/29 19:02:00	874.000	789.033	55.65	9286.77
17281	93/04/30 05:02:00	884.000	799.033	55.65	9288.56
17401	93/04/30 15:02:00	894.000	809.033	55.65	9289.66
17521	93/05/01 01:02:00	904.000	819.033	55.65	9291.10
17641	93/05/01 11:02:00	914.000	829.033	55.65	9292.55
17761	93/05/01 21:02:00	924.000	839.033	55.65	9294.16
17881	93/05/02 07:02:00	934.000	849.033	55.66	9296.49
18001	93/05/02 17:02:00	944.000	859.033	55.66	9297.04
18121	93/05/03 03:02:00	954.000	869.033	55.66	9297.94
18241	93/05/03 13:02:00	964.000	879.033	55.66	9298.65
18361	93/05/03 23:02:00	974.000	889.033	55.66	9299.73
18481	93/05/04 09:02:00	984.000	899.033	55.66	9301.17
18601	93/05/04 19:02:00	994.000	909.033	55.66	9302.44

--- Primary Time: 2M Fast Time: 30S ---

18721 93/05/05 01:47:00 1000.750 915.783 55.66 9303.34
 Date: 93/04/16 21:07 to 93/05/05 01:47 Acc time: 564.083 to 1000.750 Page 4

* - denotes fast readings

Recorder: 20013

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
18841	93/05/05 05:47:00	1004.750	919.783	55.66	9303.16
18961	93/05/05 09:47:00	1008.750	923.783	55.66	9303.34
19081	93/05/05 13:47:00	1012.750	927.783	55.66	9304.24
19201	93/05/05 17:47:00	1016.750	931.783	55.66	9304.42
19321	93/05/05 21:47:00	1020.750	935.783	55.66	9305.15
19441	93/05/06 01:47:00	1024.750	939.783	55.66	9305.87
19561	93/05/06 05:47:00	1028.750	943.783	55.66	9305.52
19681	93/05/06 09:47:00	1032.750	947.783	55.66	9306.77
19801	93/05/06 13:47:00	1036.750	951.783	55.66	9306.95
19921	93/05/06 17:47:00	1040.750	955.783	55.66	9306.41
20041	93/05/06 21:47:00	1044.750	959.783	55.66	9306.59
20161	93/05/07 01:47:00	1048.750	963.783	55.66	9307.49
20281	93/05/07 05:47:00	1052.750	967.783	55.66	9307.85
20401	93/05/07 09:47:00	1056.750	971.783	55.66	9308.40
20521	93/05/07 13:47:00	1060.750	975.783	55.66	9308.40
20641	93/05/07 17:47:00	1064.750	979.783	55.66	9309.48
20761	93/05/07 21:47:00	1068.750	983.783	55.66	9310.20
20881	93/05/08 01:47:00	1072.750	987.783	55.66	9310.38
21001	93/05/08 05:47:00	1076.750	991.783	55.66	9310.40
21121	93/05/08 09:47:00	1080.750	995.783	55.66	9311.30
21241	93/05/08 13:47:00	1084.750	999.783	55.66	9310.92
21361	93/05/08 17:47:00	1088.750	1003.783	55.66	9311.10
21481	93/05/08 21:47:00	1092.750	1007.783	55.66	9312.01
21601	93/05/09 01:47:00	1096.750	1011.783	55.66	9311.65
21721	93/05/09 05:47:00	1100.750	1015.783	55.66	9312.91
21841	93/05/09 09:47:00	1104.750	1019.783	55.66	9313.28
21961	93/05/09 13:47:00	1108.750	1023.783	55.66	9312.73
22081	93/05/09 17:47:00	1112.750	1027.783	55.66	9312.73
22201	93/05/09 21:47:00	1116.750	1031.783	55.66	9313.45
22321	93/05/10 01:47:00	1120.750	1035.783	55.66	9314.35
22441	93/05/10 05:47:00	1124.750	1039.783	55.66	9314.90
22561	93/05/10 09:47:00	1128.750	1043.783	55.66	9315.26
22681	93/05/10 13:47:00	1132.750	1047.783	55.67	9315.96
22801	93/05/10 17:47:00	1136.750	1051.783	55.66	9316.34
22921	93/05/10 21:47:00	1140.750	1055.783	55.66	9317.06
23041	93/05/11 01:47:00	1144.750	1059.783	55.67	9317.41
23161	93/05/11 05:47:00	1148.750	1063.783	55.67	9318.13
23281	93/05/11 09:47:00	1152.750	1067.783	55.67	9317.41
23401	93/05/11 13:47:00	1156.750	1071.783	55.67	9317.95

Recorders off bottom - 93/05/11 14:25:00

Date: 93/05/05 01:49 to 93/05/11 14:25 Acc time: 1000.783 to 1157.383 Page 5

* - denotes fast readings

Recorder: 20013

NORTHLAND
WIRELINE SERVICES LTD.

Subsurface Pressure Reports

PARAMOUNT RESOURCES LTD.

M-73

93/03/24 - 93/05/11

Starburst
Electronic Pressure Recorder

(403) 255 - 9700

NORTHLAND WIRELINE SERVICES LTD.
400C, 9705 HORTON RD. S.W.
SUBSURFACE PRESSURE MEASUREMENTS

COMPANY:	PARAMOUNT RESOURCES LTD.
ADDRESS:	4000, 350 - 7 AVE. S.W.CAL.
WELL NAME:	PARAMOUNT ET AL CAMERON
LOCATION:	M-73
FIELD / POOL:	CAMERON HILLS / SULPHUR POINT

TYPE OF TEST:	FLOW & BUILD UP
WELL STATUS:	OIL 1.5 % H2S
PRODUCING INTERVAL (M CF):	1411.8 - 1416.8
MID POINT PERFS (M CF):	1414.3
ELEVATIONS CF:	771.45 KB: 775.15
PRODUCING THROUGH TUBING (MM):	73 CASING: 139.7

PROBE SERIAL #:	20004 [BOTTOM]
PROBE RANGE:	0 - 41354 KPAG
LAST CALIBRATION DATE:	93/03/19
TIME INTERVAL - NORMAL/FAST:	PGM / PGM

TUBING PRESSURE	INITIAL	6240	FINAL	6520 (KPAG)
CASING PRESSURE	INITIAL	600	FINAL	0 (KPAG)
RUN DEPTH (M CF):				1398.0
TIME ON BOTTOM:				93/03/24 09:02
TIME OFF BOTTOM:				93/05/11 14:25

MAXIMUM TEMPERATURE:	55.7 C
DATE OF TEST:	93/03/24 08:39

COMMENTS:

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON (M-73)

Probe: 20004 (BOTTOM)

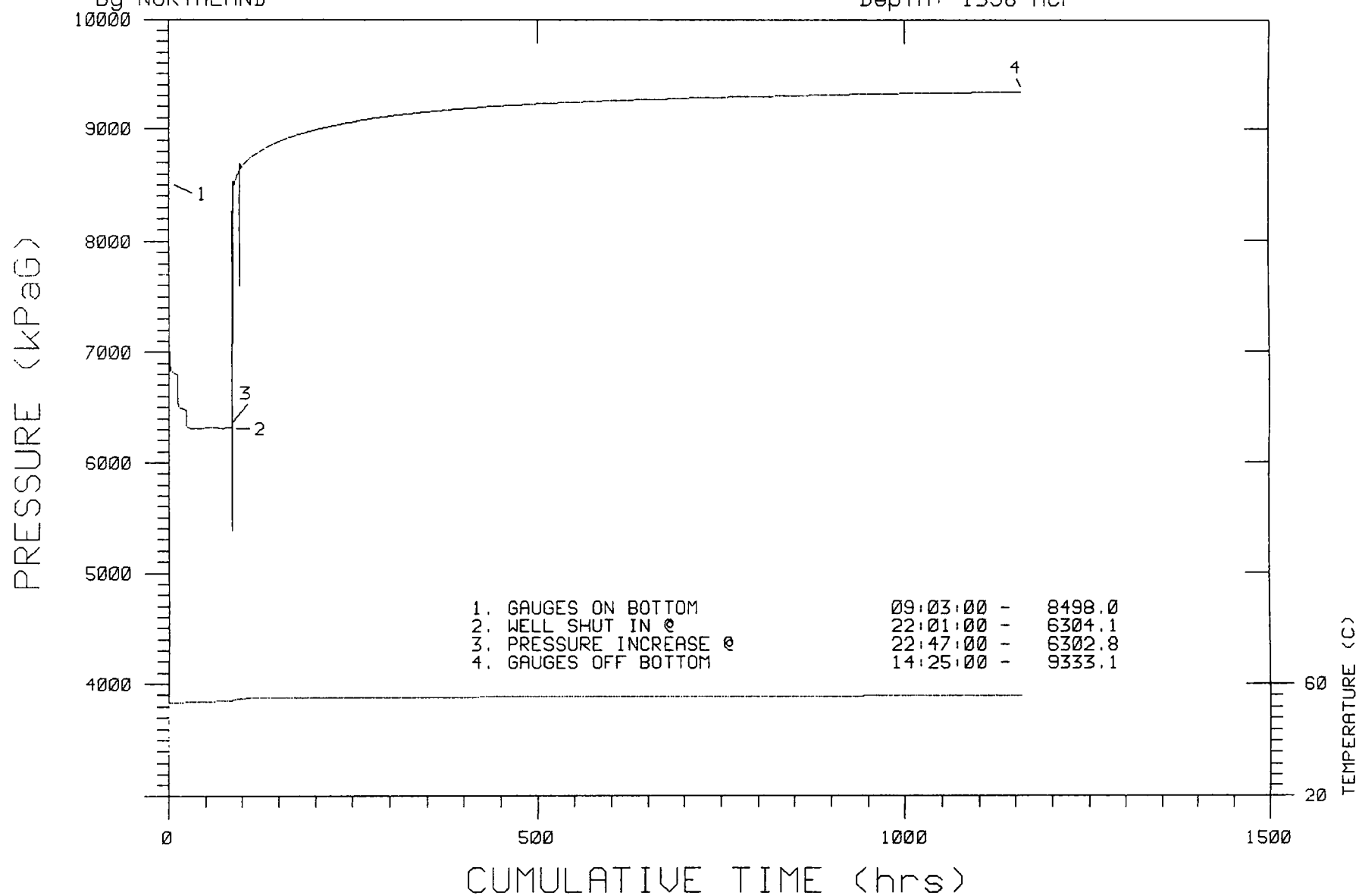
Pressure vs Time

By NORTHLAND

CARRERON HILLS / SULPHUR POINT

FLOW & BUILD UP

Depth: 1398 MCF



**NORTHLAND
WIRELINE SERVICES LTD.**

Subsurface Pressure Reports

PARAMOUNT RESOURCES LTD.

M-73

93/05/11

Starburst

Electronic Pressure Recorder

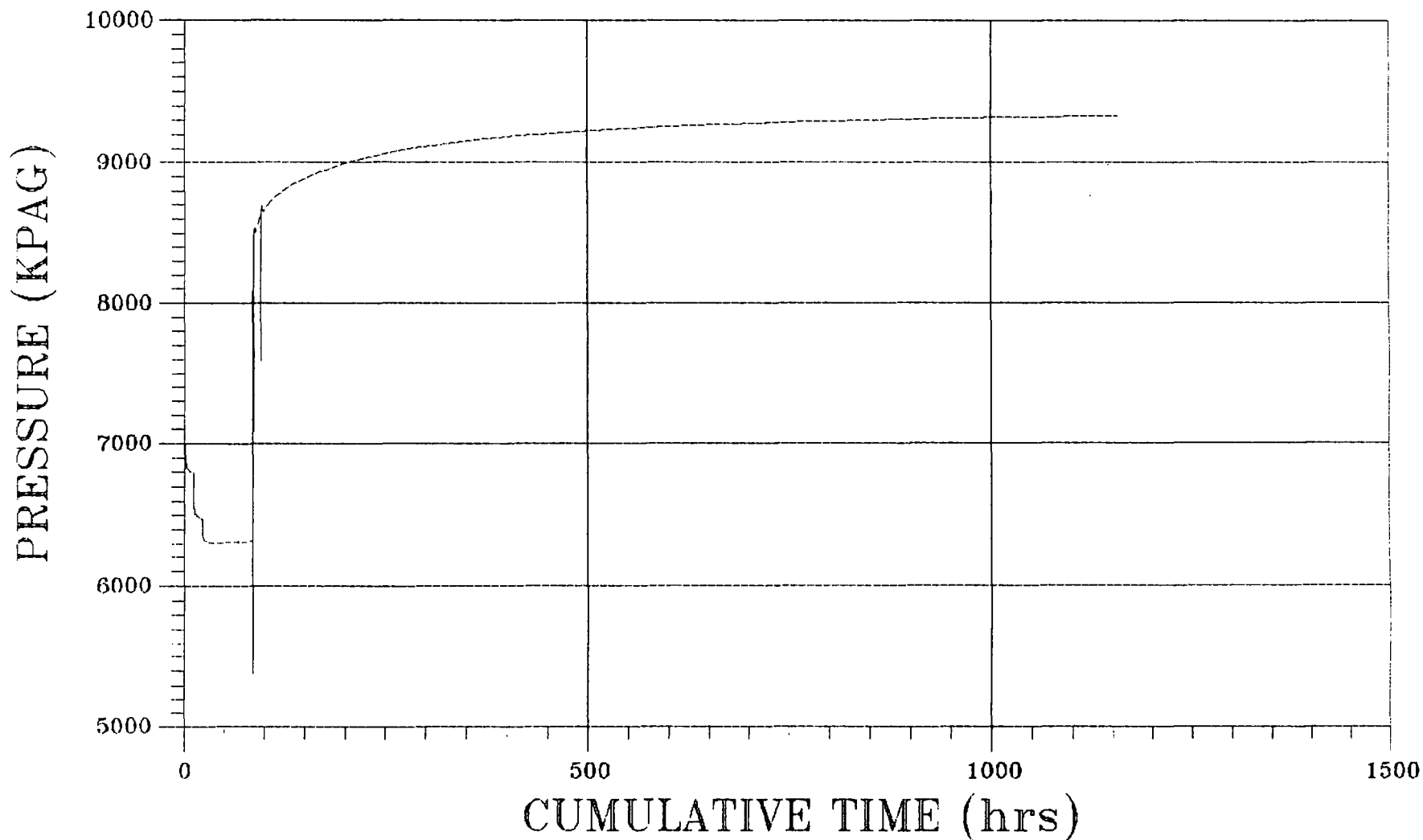
(403) 255 - 9700

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON (M-73)

Probe: 20004 [BOTTOM]
Pressure vs Time
By NORTHLAND

CARERRON HILLS / SULPHUR POINT
FLOW & BUILD UP
Depth: 1398 MCF



On Bottom 93/03/24 09:02:00

Off Bottom 93/05/11 14:25:00

PROGRAMMED SAMPLE INTERVALS

From	To	Primary	Fast
-----	-----	-----	-----
93/03/24 08:39	93/04/08 08:39	2M	30S
93/04/08 08:39	93/05/04 23:39	5M	5M
93/05/04 23:39	--END OF RUN--	2M	30S

Page 1

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
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Printing every 120th item.

Recorders on bottom - 93/03/24 09:02:00

--- Primary Time: 2M Fast Time: 30S ---

1	93/03/24 09:03:00	0.017		34.75	8497.98
121	93/03/24 11:51:00	2.817		53.78	6838.97
241	93/03/24 15:51:00	6.817		53.83	6803.85
361	93/03/24 19:51:00	10.817		53.85	6800.77
481	93/03/24 23:27:00	14.417		53.84	6502.76
601	93/03/25 03:27:00	18.417		53.83	6489.53
721	93/03/25 07:27:00	22.417		53.82	6481.74
841	93/03/25 11:21:00	26.317		53.81	6319.22
961	93/03/25 15:21:00	30.317		53.79	6310.45
1081	93/03/25 19:21:00	34.317		53.78	6307.33
1201	93/03/25 23:21:00	38.317		53.77	6301.87
1321	93/03/26 03:21:00	42.317		53.77	6305.36
1441	93/03/26 07:21:00	46.317		53.76	6303.02
1561	93/03/26 11:21:00	50.317		53.76	6307.29
1681	93/03/26 15:21:00	54.317		53.76	6309.24
1801	93/03/26 19:21:00	58.317		53.75	6308.06
1921	93/03/26 23:21:00	62.317		53.75	6311.36
2041	93/03/27 03:21:00	66.317		53.74	6315.63
2161	93/03/27 07:21:00	70.317		53.74	6296.58
2281	93/03/27 11:21:00	74.317		53.74	6303.19
2401	93/03/27 15:21:00	78.317		53.74	6302.41
2521	93/03/27 19:21:00	82.317		53.74	6303.96

WELL SHUT IN @ -- 93/03/27 22:00:00

2601	93/03/27 22:01:00	84.983	0.017	53.74	6304.15
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PRESSURE INCREASE @ -- 93/03/27 22:47:00

2624	93/03/27 22:47:00	85.750	0.000	53.72	6302.78
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Date: 93/03/24 09:03 to 93/03/27 22:47 Acc time: 0.017 to 85.750 Page 1

* - denotes fast readings

Recorder: 20004

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
2641	93/03/27 22:55:30	85.892	0.142	53.69	5830.38*
2761	93/03/28 00:16:30	87.242	1.492	54.05	7561.10*
2881	93/03/28 03:27:00	90.417	4.667	54.52	8526.21
3001	93/03/28 07:27:00	94.417	8.667	54.74	8605.76
3121	93/03/28 10:27:00	97.417	11.667	54.69	8701.89
3241	93/03/28 14:27:00	101.417	15.667	54.89	8677.03
3361	93/03/28 18:27:00	105.417	19.667	54.99	8709.11
3481	93/03/28 22:27:00	109.417	23.667	55.05	8732.94
3601	93/03/29 02:27:00	113.417	27.667	55.09	8752.86
3721	93/03/29 06:27:00	117.417	31.667	55.13	8770.44
3841	93/03/29 10:27:00	121.417	35.667	55.15	8789.35
3961	93/03/29 14:27:00	125.417	39.667	55.18	8804.38
4081	93/03/29 18:27:00	129.417	43.667	55.20	8818.82
4201	93/03/29 22:27:00	133.417	47.667	55.21	8832.27
4321	93/03/30 02:27:00	137.417	51.667	55.23	8845.73
4441	93/03/30 06:27:00	141.417	55.667	55.24	8857.62
4561	93/03/30 10:27:00	145.417	59.667	55.27	8868.76
4681	93/03/30 14:27:00	149.417	63.667	55.27	8881.03
4801	93/03/30 18:27:00	153.417	67.667	55.29	8892.74
4921	93/03/30 22:27:00	157.417	71.667	55.30	8902.50
5041	93/03/31 02:27:00	161.417	75.667	55.31	8912.82
5161	93/03/31 06:27:00	165.417	79.667	55.31	8922.17
5281	93/03/31 10:27:00	169.417	83.667	55.31	8930.55
5401	93/03/31 14:27:00	173.417	87.667	55.32	8939.71
5521	93/03/31 18:27:00	177.417	91.667	55.32	8947.70
5641	93/03/31 22:27:00	181.417	95.667	55.33	8956.47
5761	93/04/01 02:27:00	185.417	99.667	55.34	8964.27
5881	93/04/01 06:27:00	189.417	103.667	55.35	8971.29
6001	93/04/01 10:27:00	193.417	107.667	55.35	8978.69
6121	93/04/01 14:27:00	197.417	111.667	55.35	8985.32
6241	93/04/01 18:27:00	201.417	115.667	55.35	8993.11
6361	93/04/01 22:27:00	205.417	119.667	55.36	8999.74
6481	93/04/02 02:27:00	209.417	123.667	55.36	9005.00
6601	93/04/02 06:27:00	213.417	127.667	55.36	9012.40
6721	93/04/02 10:27:00	217.417	131.667	55.37	9017.08
6841	93/04/02 14:27:00	221.417	135.667	55.37	9023.90
6961	93/04/02 18:27:00	225.417	139.667	55.37	9029.35
7081	93/04/02 22:27:00	229.417	143.667	55.38	9035.79
7201	93/04/03 02:27:00	233.417	147.667	55.39	9040.67
7321	93/04/03 06:27:00	237.417	151.667	55.39	9046.12
7441	93/04/03 10:27:00	241.417	155.667	55.39	9051.19
7561	93/04/03 14:27:00	245.417	159.667	55.39	9056.25
7681	93/04/03 18:27:00	249.417	163.667	55.40	9061.52
7801	93/04/03 22:27:00	253.417	167.667	55.41	9065.23
7921	93/04/04 02:27:00	257.417	171.667	55.41	9069.90
8041	93/04/04 06:27:00	261.417	175.667	55.41	9074.19

Date: 93/03/27 22:47 to 93/04/04 06:27 Acc time: 85.758 to 261.417 Page 2

* - denotes fast readings

Recorder: 20004

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
8161	93/04/04 10:27:00	265.417	179.667	55.41	9079.64
8281	93/04/04 14:27:00	269.417	183.667	55.42	9084.52
8401	93/04/04 18:27:00	273.417	187.667	55.42	9088.42
8521	93/04/04 22:27:00	277.417	191.667	55.43	9092.51
8641	93/04/05 02:27:00	281.417	195.667	55.43	9096.61
8761	93/04/05 06:27:00	285.417	199.667	55.44	9098.76
8881	93/04/05 10:27:00	289.417	203.667	55.44	9102.85
9001	93/04/05 14:27:00	293.417	207.667	55.44	9106.55
9121	93/04/05 18:27:00	297.417	211.667	55.44	9110.83
9241	93/04/05 22:27:00	301.417	215.667	55.44	9115.12
9361	93/04/06 02:27:00	305.417	219.667	55.45	9117.66
9481	93/04/06 06:27:00	309.417	223.667	55.45	9120.97
9601	93/04/06 10:27:00	313.417	227.667	55.45	9123.89
9721	93/04/06 14:27:00	317.417	231.667	55.45	9127.59
9841	93/04/06 18:27:00	321.417	235.667	55.45	9130.71
9961	93/04/06 22:27:00	325.417	239.667	55.45	9134.21
10081	93/04/07 02:27:00	329.417	243.667	55.46	9136.95
10201	93/04/07 06:27:00	333.417	247.667	55.46	9139.49
10321	93/04/07 10:27:00	337.417	251.667	55.46	9142.41
10441	93/04/07 14:27:00	341.417	255.667	55.47	9145.53
10561	93/04/07 18:27:00	345.417	259.667	55.47	9148.27
10681	93/04/07 22:27:00	349.417	263.667	55.48	9150.42
10801	93/04/08 02:27:00	353.417	267.667	55.47	9153.14
10921	93/04/08 06:27:00	357.417	271.667	55.47	9156.64

--- Primary Time: 5M Fast Time: 5M ---

11041	93/04/08 13:09:00	364.117	278.367	55.49	9161.72
11161	93/04/08 23:09:00	374.117	288.367	55.50	9166.79
11281	93/04/09 09:09:00	384.117	298.367	55.50	9172.44
11401	93/04/09 19:09:00	394.117	308.367	55.50	9177.90
11521	93/04/10 05:09:00	404.117	318.367	55.50	9183.94
11641	93/04/10 15:09:00	414.117	328.367	55.51	9190.37
11761	93/04/11 01:09:00	424.117	338.367	55.51	9195.44
11881	93/04/11 11:09:00	434.117	348.367	55.52	9200.12
12001	93/04/11 21:09:00	444.117	358.367	55.52	9204.41
12121	93/04/12 07:09:00	454.117	368.367	55.52	9208.88
12241	93/04/12 17:09:00	464.117	378.367	55.53	9213.57
12361	93/04/13 03:09:00	474.117	388.367	55.53	9217.28
12481	93/04/13 13:09:00	484.117	398.367	55.53	9220.20
12601	93/04/13 23:09:00	494.117	408.367	55.53	9224.29
12721	93/04/14 09:09:00	504.117	418.367	55.53	9228.18
12841	93/04/14 19:09:00	514.117	428.367	55.53	9232.08
12961	93/04/15 05:09:00	524.117	438.367	55.54	9235.00
13081	93/04/15 15:09:00	534.117	448.367	55.55	9237.74
13201	93/04/16 01:09:00	544.117	458.367	55.56	9241.26

Date: 93/04/04 06:29 to 93/04/16 01:09 Acc time: 261.450 to 544.117 Page 3

* - denotes fast readings

Recorder: 20004

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
13321	93/04/16 11:09:00	554.117	468.367	55.56	9243.59
13441	93/04/16 21:09:00	564.117	478.367	55.56	9246.33
13561	93/04/17 07:09:00	574.117	488.367	55.57	9249.06
13681	93/04/17 17:09:00	584.117	498.367	55.57	9251.98
13801	93/04/18 03:09:00	594.117	508.367	55.57	9254.51
13921	93/04/18 13:09:00	604.117	518.367	55.57	9257.24
14041	93/04/18 23:09:00	614.117	528.367	55.58	9260.37
14161	93/04/19 09:09:00	624.117	538.367	55.59	9262.91
14281	93/04/19 19:09:00	634.117	548.367	55.59	9264.48
14401	93/04/20 05:09:00	644.117	558.367	55.59	9266.43
14521	93/04/20 15:09:00	654.117	568.367	55.60	9268.57
14641	93/04/21 01:09:00	664.117	578.367	55.60	9270.33
14761	93/04/21 11:09:00	674.117	588.367	55.60	9272.28
14881	93/04/21 21:09:00	684.117	598.367	55.60	9274.81
15001	93/04/22 07:09:00	694.117	608.367	55.60	9277.34
15121	93/04/22 17:09:00	704.117	618.367	55.60	9279.48
15241	93/04/23 03:09:00	714.117	628.367	55.60	9282.01
15361	93/04/23 13:09:00	724.117	638.367	55.60	9283.38
15481	93/04/23 23:09:00	734.117	648.367	55.61	9285.72
15601	93/04/24 09:09:00	744.117	658.367	55.61	9287.68
15721	93/04/24 19:09:00	754.117	668.367	55.62	9289.44
15841	93/04/25 05:09:00	764.117	678.367	55.62	9290.02
15961	93/04/25 15:09:00	774.117	688.367	55.62	9292.55
16081	93/04/26 01:09:00	784.117	698.367	55.62	9294.31
16201	93/04/26 11:09:00	794.117	708.367	55.62	9295.68
16321	93/04/26 21:09:00	804.117	718.367	55.63	9296.85
16441	93/04/27 07:09:00	814.117	728.367	55.64	9298.22
16561	93/04/27 17:09:00	824.117	738.367	55.64	9299.78
16681	93/04/28 03:09:00	834.117	748.367	55.64	9300.96
16801	93/04/28 13:09:00	844.117	758.367	55.64	9302.32
16921	93/04/28 23:09:00	854.117	768.367	55.64	9304.06
17041	93/04/29 09:09:00	864.117	778.367	55.64	9306.02
17161	93/04/29 19:09:00	874.117	788.367	55.64	9306.79
17281	93/04/30 05:09:00	884.117	798.367	55.64	9308.93
17401	93/04/30 15:09:00	894.117	808.367	55.64	9309.91
17521	93/05/01 01:09:00	904.117	818.367	55.64	9311.47
17641	93/05/01 11:09:00	914.117	828.367	55.65	9313.04
17761	93/05/01 21:09:00	924.117	838.367	55.65	9313.24
17881	93/05/02 07:09:00	934.117	848.367	55.65	9314.02
18001	93/05/02 17:09:00	944.117	858.367	55.65	9315.38
18121	93/05/03 03:09:00	954.117	868.367	55.65	9316.16
18241	93/05/03 13:09:00	964.117	878.367	55.65	9317.13
18361	93/05/03 23:09:00	974.117	888.367	55.65	9317.72
18481	93/05/04 09:09:00	984.117	898.367	55.65	9318.88
18601	93/05/04 19:09:00	994.117	908.367	55.65	9320.05

--- Primary Time: 2M Fast Time: 30S ---

18721 93/05/05 01:51:00 1000.817 915.067 55.65 9320.44
 Date: 93/04/16 01:14 to 93/05/05 01:51 Acc time: 544.200 to 1000.817 Page

* - denotes fast readings

Recorder: 20004

PARAMOUNT RESOURCES LTD.

PARAMOUNT ET AL CAMERON

(M-73)

Item #	Date	Total Acc Time	Event Acc Time	Temp C	Pres KPAG
18841	93/05/05 05:51:00	1004.817	919.067	55.66	9320.64
18961	93/05/05 09:51:00	1008.817	923.067	55.66	9321.23
19081	93/05/05 13:51:00	1012.817	927.067	55.66	9321.62
19201	93/05/05 17:51:00	1016.817	931.067	55.66	9322.98
19321	93/05/05 21:51:00	1020.817	935.067	55.66	9322.79
19441	93/05/06 01:51:00	1024.817	939.067	55.66	9323.37
19561	93/05/06 05:51:00	1028.817	943.067	55.66	9323.56
19681	93/05/06 09:51:00	1032.817	947.067	55.65	9324.53
19801	93/05/06 13:51:00	1036.817	951.067	55.66	9324.34
19921	93/05/06 17:51:00	1040.817	955.067	55.66	9325.12
20041	93/05/06 21:51:00	1044.817	959.067	55.65	9326.28
20161	93/05/07 01:51:00	1048.817	963.067	55.65	9325.50
20281	93/05/07 05:51:00	1052.817	967.067	55.66	9325.90
20401	93/05/07 09:51:00	1056.817	971.067	55.66	9326.29
20521	93/05/07 13:51:00	1060.817	975.067	55.66	9326.68
20641	93/05/07 17:51:00	1064.817	979.067	55.66	9327.07
20761	93/05/07 21:51:00	1068.817	983.067	55.66	9327.07
20881	93/05/08 01:51:00	1072.817	987.067	55.66	9327.46
21001	93/05/08 05:51:00	1076.817	991.067	55.66	9327.85
21121	93/05/08 09:51:00	1080.817	995.067	55.66	9328.24
21241	93/05/08 13:51:00	1084.817	999.067	55.66	9328.82
21361	93/05/08 17:51:00	1088.817	1003.067	55.66	9328.63
21481	93/05/08 21:51:00	1092.817	1007.067	55.66	9329.41
21601	93/05/09 01:51:00	1096.817	1011.067	55.66	9329.41
21721	93/05/09 05:51:00	1100.817	1015.067	55.66	9330.57
21841	93/05/09 09:51:00	1104.817	1019.067	55.66	9330.77
21961	93/05/09 13:51:00	1108.817	1023.067	55.66	9331.16
22081	93/05/09 17:51:00	1112.817	1027.067	55.66	9331.35
22201	93/05/09 21:51:00	1116.817	1031.067	55.66	9331.94
22321	93/05/10 01:51:00	1120.817	1035.067	55.66	9331.74
22441	93/05/10 05:51:00	1124.817	1039.067	55.66	9332.14
22561	93/05/10 09:51:00	1128.817	1043.067	55.66	9332.14
22681	93/05/10 13:51:00	1132.817	1047.067	55.66	9332.92
22801	93/05/10 17:51:00	1136.817	1051.067	55.66	9333.31
22921	93/05/10 21:51:00	1140.817	1055.067	55.67	9333.31
23041	93/05/11 01:51:00	1144.817	1059.067	55.66	9333.31
23161	93/05/11 05:51:00	1148.817	1063.067	55.66	9334.09
23281	93/05/11 09:51:00	1152.817	1067.067	55.66	9334.09
23401	93/05/11 13:51:00	1156.817	1071.067	55.67	9334.68

Recorders off bottom - 93/05/11 14:25:00

Date: 93/05/05 01:53 to 93/05/11 14:25 Acc time: 1000.850 to 1157.383 Page :

* - denotes fast readings

Recorder: 20004

NORTHLAND
WIRELINE SERVICES LTD.

Subsurface Pressure Reports

PARAMOUNT RESOURCES LTD.

M-73

93/05/11

Starburst
Electronic Pressure Recorder

(403) 255 - 9700

NORTHLAND WIRELINE SERVICES LTD.
400C, 9705 HORTON RD. S.W.
SUBSURFACE PRESSURE MEASUREMENTS

COMPANY: PARAMOUNT RESOURCES LTD.
ADDRESS: 4000, 350 - 7 AVE. S.W.CAL.
WELL NAME: PARAMOUNT ET AL CAMERON
LOCATION: M-73
FIELD / POOL: CAMERON HILLS / SULPHER POINT

TYPE OF TEST: STATIC GRADIENT
WELL STATUS: OIL 1.5 % H2S
PRODUCING INTERVAL (M CF): 1411.8-1416.8
MID POINT PERFS (M CF): 1414.3
ELEVATIONS CF: 771.45 KB: 775.15
PRODUCING THROUGH TUBING (MM): 73 CASING: 139.7

PROBE SERIAL #: 20013 [TOP]
PROBE RANGE: 0 - 41369 KPAG
LAST CALIBRATION DATE: 93/03/19
TIME INTERVAL - NORMAL/FAST: 10S / 0S

TUBING PRESSURE INITIAL 6490 FINAL 6490 (KPAG)
CASING PRESSURE INITIAL 0 FINAL 0 (KPAG)
RUN DEPTH (M CF): 1495.5
TIME ON BOTTOM: 93/05/11 18:25
TIME OFF BOTTOM: 93/05/11 18:30

TEMPERATURE @ RUN DEPTH: 56.2 C
GRADIENT @ RUN DEPTH: 8.52 KPA/M
PRESSURE @ RUN DEPTH: 10154.5 KPAG
PRESSURE @ MPP: 9462.8 KPAG
SHUT IN DATE: 93/03/27 22:00:00
DATE OF TEST: 93/05/11 17:07

COMMENTS:
58.67 MM F NIPPLE @ 1388.32 MCF
57.15 MM R PROFILE IN ON/OFF @ 1398.07 MCF

NORTHLAND
Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Well Name: PARAMOUNT ET AL CAMERON
Unique Well ID: M-73
Date of test: 93/05/11 17:07:00
Date of gradient test:

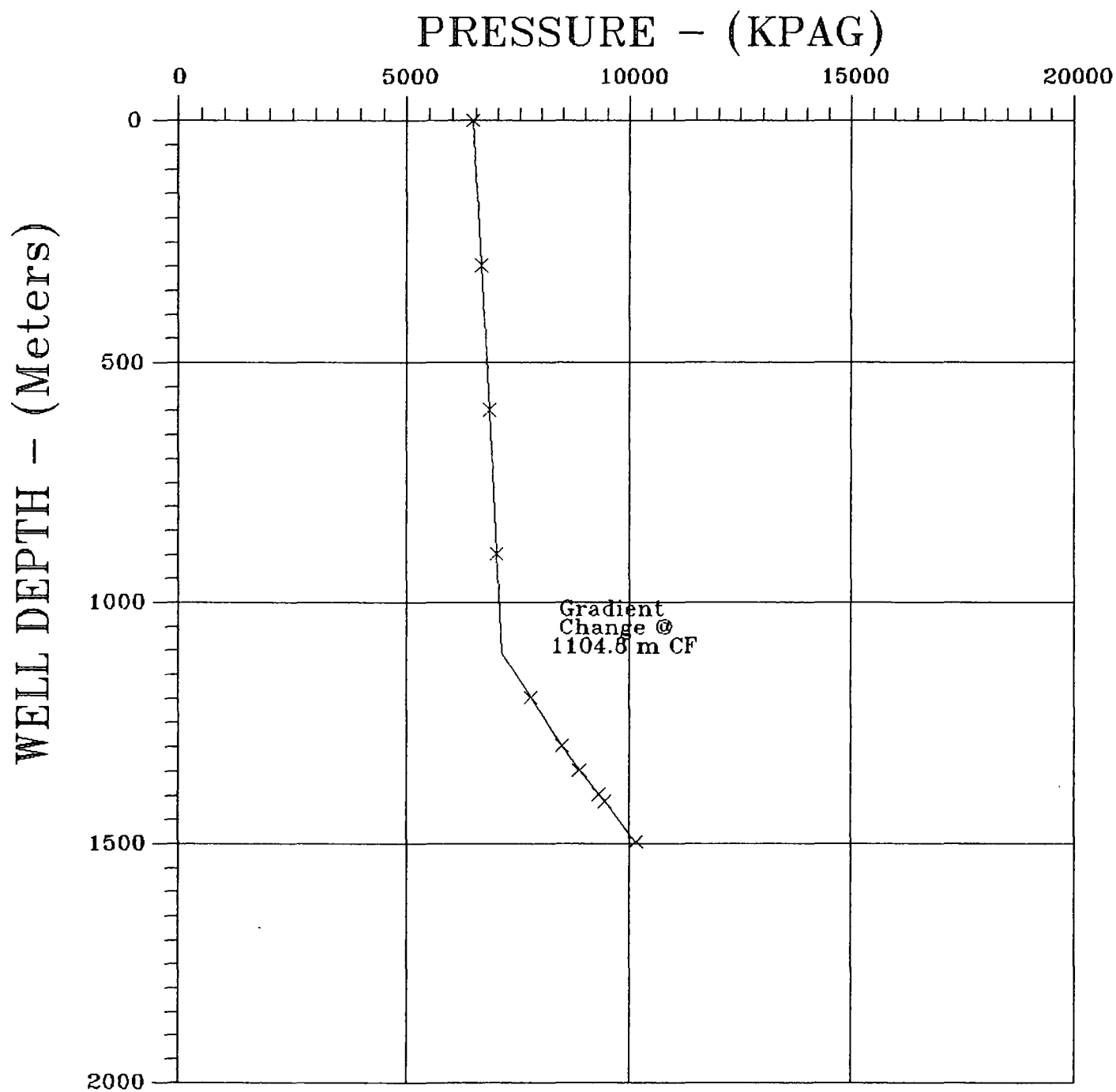
Readings and Calculations For Static Gradient

Depth Stops	Time Stop	Pressure (KPAG)	Gradient (KPAG/M)
Surface	17:17 - 17:22	6445.4	0.00
298.0	17:25 - 17:30	6620.7	0.59
598.0	17:33 - 17:38	6802.8	0.61
898.0	17:41 - 17:46	6975.1	0.57
1198.0	17:49 - 17:54	7764.4	2.63
1298.0	17:55 - 18:00	8483.7	7.19
1348.0	18:01 - 18:06	8870.5	7.74
1398.0	18:07 - 18:12	9305.3	8.70
1412.3	18:13 - 18:23	9445.8	9.83
1495.5	18:25 - 18:30	10154.5	8.52

Temperature On Bottom: 56.2

Recorder # 20013 [top]

PARAMOUNT RESOURCES LTD.
PARAMOUNT ET AL CAMERON (M-73)
STATIC GRADIENT Plot (93/05/11 17:07:00)



RECORDER # 20013

NORTHLAND

NORTHLAND WIRELINE SERVICES LTD.
400C, 9705 HORTON RD. S.W.
SUBSURFACE PRESSURE MEASUREMENTS

COMPANY:	PARAMOUNT RESOURCES LTD.
ADDRESS:	4000, 350 - 7 AVE. S.W.CAL.
WELL NAME:	PARAMOUNT ET AL CAMERON
LOCATION:	M-73
FIELD / POOL:	CAMERON HILLS / SULPHUR POINT

TYPE OF TEST:	STATIC GRADIENT
WELL STATUS:	OIL 1.5 % H2S
PRODUCING INTERVAL (M CF):	1411.8-1416.8
MID POINT PERFS (M CF):	1414.3
ELEVATIONS CF:	771.45 KB: 775.15
PRODUCING THROUGH TUBING (MM):	73 CASING: 139.7

PROBE SERIAL #:	20004 [BOTTOM]
PROBE RANGE:	0 - 41354 KPAG
LAST CALIBRATION DATE:	93/03/19
TIME INTERVAL - NORMAL/FAST:	10S / 0S

TUBING PRESSURE	INITIAL	6490	FINAL	6490 (KPAG)
CASING PRESSURE	INITIAL	0	FINAL	0 (KPAG)
RUN DEPTH (M CF):				1497.5
TIME ON BOTTOM:				93/05/11 18:25
TIME OFF BOTTOM:				93/05/11 18:30

TEMPERATURE @ RUN DEPTH:	56.2	C
GRADIENT @ RUN DEPTH:	8.52	KPA/M
PRESSURE @ RUN DEPTH:	10171.3	KPAG
PRESSURE @ MPP:	9462.6	KPAG
SHUT IN DATE:	93/03/27	22:00:00
DATE OF TEST:	93/05/11	17:10

COMMENTS:

58.67 MM F NIPPLE @ 1388.32 MCF
57.15 MM R PROFILE IN ON/OFF @ 1398.07 MCF

NORTHLAND
Subsurface Pressure Measurements

Company: PARAMOUNT RESOURCES LTD.
Well Name: PARAMOUNT ET AL CAMERON
Unique Well ID: M-73
Date of test: 93/05/11 17:10:00
Date of gradient test:

Readings and Calculations For Static Gradient

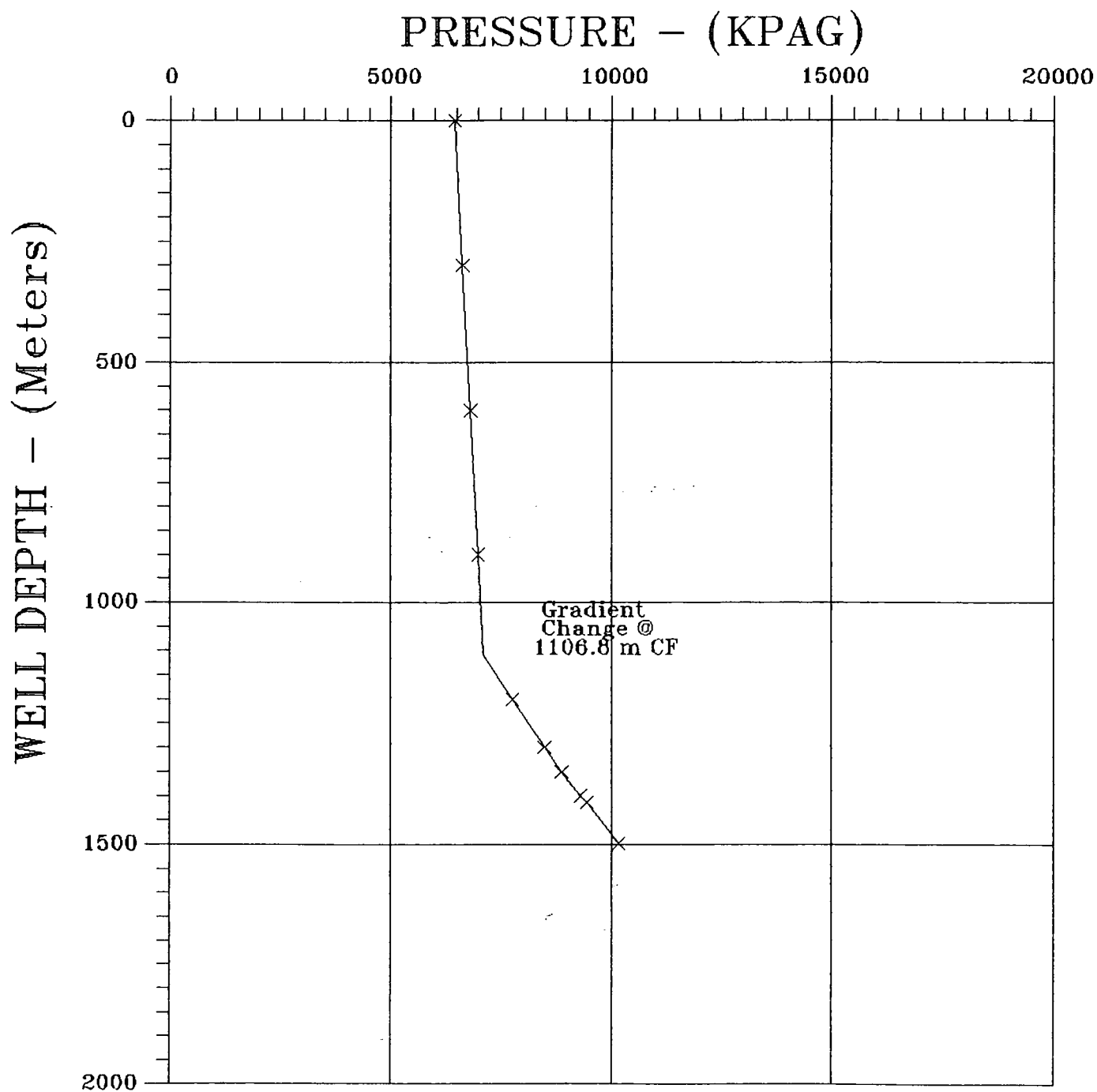
Depth Stops	Time Stop	Pressure (KPAG)	Gradient (KPAG/M)

Surface	17:17 - 17:22	6457.0	0.00
300.0	17:25 - 17:30	6632.9	0.59
600.0	17:33 - 17:38	6818.9	0.62
900.0	17:41 - 17:46	6988.9	0.57
1200.0	17:49 - 17:54	7778.6	2.63
1300.0	17:55 - 18:00	8500.0	7.21
1350.0	18:01 - 18:06	8887.4	7.75
1400.0	18:07 - 18:12	9322.3	8.70
1414.3	18:13 - 18:23	9462.6	9.82
1497.5	18:25 - 18:30	10171.3	8.52

Temperature On Bottom: 56.2

Recorder # 20004 [bottom]

PARAMOUNT RESOURCES LTD.
PARAMOUNT ET AL CAMERON (M-73)
STATIC GRADIENT Plot (93/05/11 17:10:00)



RECORDER # 20004

NORTHLAND

BASIC TIME FUNCTIONS

Flow Time

$$t$$

Shut-In Time

$$\Delta t$$

Horner Time

$$\frac{t + \Delta t}{\Delta t}$$

Superposition Time

$$t_n = \sum_{j=1}^n \frac{q_j - q_{j-1}}{q_n} \log(t - t_{j-1})$$

$$\Delta t_n = \sum_{j=1}^n \frac{q_j}{q_n} \log \frac{t_n + \Delta t - t_{j-1}}{t_n + \Delta t - t_j}$$

Equivalent Time

$$\Delta t_e = \frac{t \cdot \Delta t}{t + \Delta t}$$

Root Time

$$\sqrt{t}$$

$$\sqrt{\Delta t}$$

Tandem Root Time

$$\sqrt{t + \Delta t} - \sqrt{\Delta t}$$

BASIC TIME FUNCTIONS (cont'd)

Quad Root Time

$$\sqrt[4]{t}$$

$$\sqrt[4]{\Delta t}$$

Tandem Quad Root Time

$$\sqrt[4]{t+\Delta t} - \sqrt[4]{\Delta t}$$

- Note:
1. Complex time functions like "super-linear-equivalent time" and many others are simply derived from the above.
 2. Subscripts not shown above, but used for linear and bi-linear functions are 'l' and 'b', respectively.

TYPE CURVES - DIMENSIONLESS VARIABLES

$$\Delta p_D = \frac{(kh/\mu)_i \Delta p}{1842 q_i B_i}$$

$$t_D = \frac{3.6E-6 (k/\mu)_i t}{\phi c r_w^2}$$

$$\frac{t_D}{C_D} = 2.262E-5 \left(\frac{kh}{\mu}\right)_i \frac{t}{C}$$

$$C_D e^{2s} = \frac{0.1592 C e^{2s}}{\phi c h r_w^2}$$

$$t_{DA} = \frac{3.6E-6 (k/\mu)_i t}{\phi c A}$$

$$t_{Dxf} = \frac{3.6E-6 (k/\mu)_i t}{\phi c x_f^2}$$

$$(k_f w)_D = \frac{k_f w}{k x_f}$$

Note: t represents the time function used for the typecurve data plot.

SEMILOG ANALYSIS

Transmissivity $\left(\frac{kh}{\mu}\right)_i = \frac{2121 q_i B_i}{m}$

Permeability $k = \frac{2121 q_o B_o \mu_o}{mh}$

Skin Factor $s' = 1.151 \left[\frac{p_{ws} - p_{wfo}}{m} - \log \frac{t \Delta t}{t + \Delta t} - \log \left(\frac{(k/\mu)_i}{\phi_i c_i r_w^2} \right) + 5.09 \right]$

Pressure Drop due to Skin $\Delta p_s = 0.869 ms'$

Flow Efficiency $FE = \frac{\bar{p}_R - p_{wfo} - 0.869 ms'}{\bar{p}_R - p_{wfo}}$

Damage Ratio $DR = \frac{1}{FE}$

Radius of Investigation $r_{inv} = \sqrt{\frac{(k/\mu)_i t}{69444 \phi_i c_i}}$

Time to Stabilization $t_s = \frac{\phi c A}{3.6E-6 (k/\mu)_i} (t_{DA})_{pss}$

SEMILOG ANALYSIS (cont'd)

Stabilized Rate

$$q_s = \frac{P_i - P_{wfo}}{\frac{2121 B_o}{(k/\mu)_o h} \left(\log\left(\frac{4A}{1.781 r_w^2 C_A}\right) + \frac{4\pi(t_{DA})_{ps}}{2.303} + \frac{2s'}{2.303} \right)}$$

Productivity Index

$$PI = \frac{q}{\bar{P}_R - P_{wfo}}$$

MBH Average Pressure

$$\bar{P}_R = p^* - \frac{m}{2.303} (MBH \text{ function})$$

DIETZ Average Pressure

$$(\Delta t)_{\bar{P}_R} = \frac{\phi c_t A}{3.6E-6 C_A (k/\mu)_i}$$

LINEAR ANALYSIS

Fracture half-length

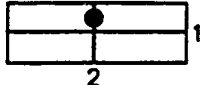
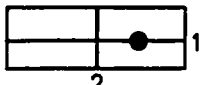
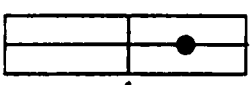
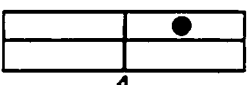
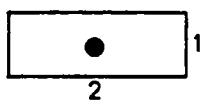
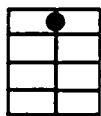
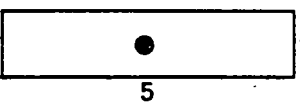
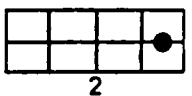
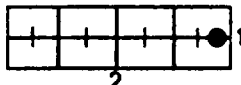
$$x_f = \frac{6.195 q_i B_i}{mh(\phi ck/\mu)_i^{1/2}}$$

Channel width

$$W = \frac{12.390 q_i B_i}{mh(\phi ck/\mu)_i^{1/2}}$$

Skin Factor

$$s = \ln \frac{2 r_w}{x_f}$$

	<u>lnC_A</u>	<u>C_A</u>	<u>STABILIZED CONDITIONS FOR t_{DA} ></u>		<u>lnC_A</u>	<u>C_A</u>	<u>STABILIZED CONDITIONS FOR t_{DA} ></u>
IN BOUNDED RESERVOIRS							
	3.45	31.6	0.1		2.38	10.8	0.3
	3.43	30.9	0.1		1.58	4.86	1.0
	3.45	31.6	0.1		0.73	2.07	0.8
	3.32	27.6	0.2		1.00	2.72	0.8
	3.30	27.1	0.2		-1.46	0.232	2.5
	3.09	21.9	0.4		-2.16	0.115	3.0
	3.12	22.6	0.2		1.22	3.39	0.6
	1.68	5.38	0.7		1.14	3.13	0.3
	0.86	2.36	0.7		-0.50	0.607	1.0
	2.56	12.9	0.6		-2.20	0.111	1.2
	1.52	4.57	0.5		-2.32	0.098	0.9

IN WATER DRIVE RESERVOIRS



2.95 19.1 0.1

IN RESERVOIRS OF UNKNOWN PRODUCTION CHARACTER



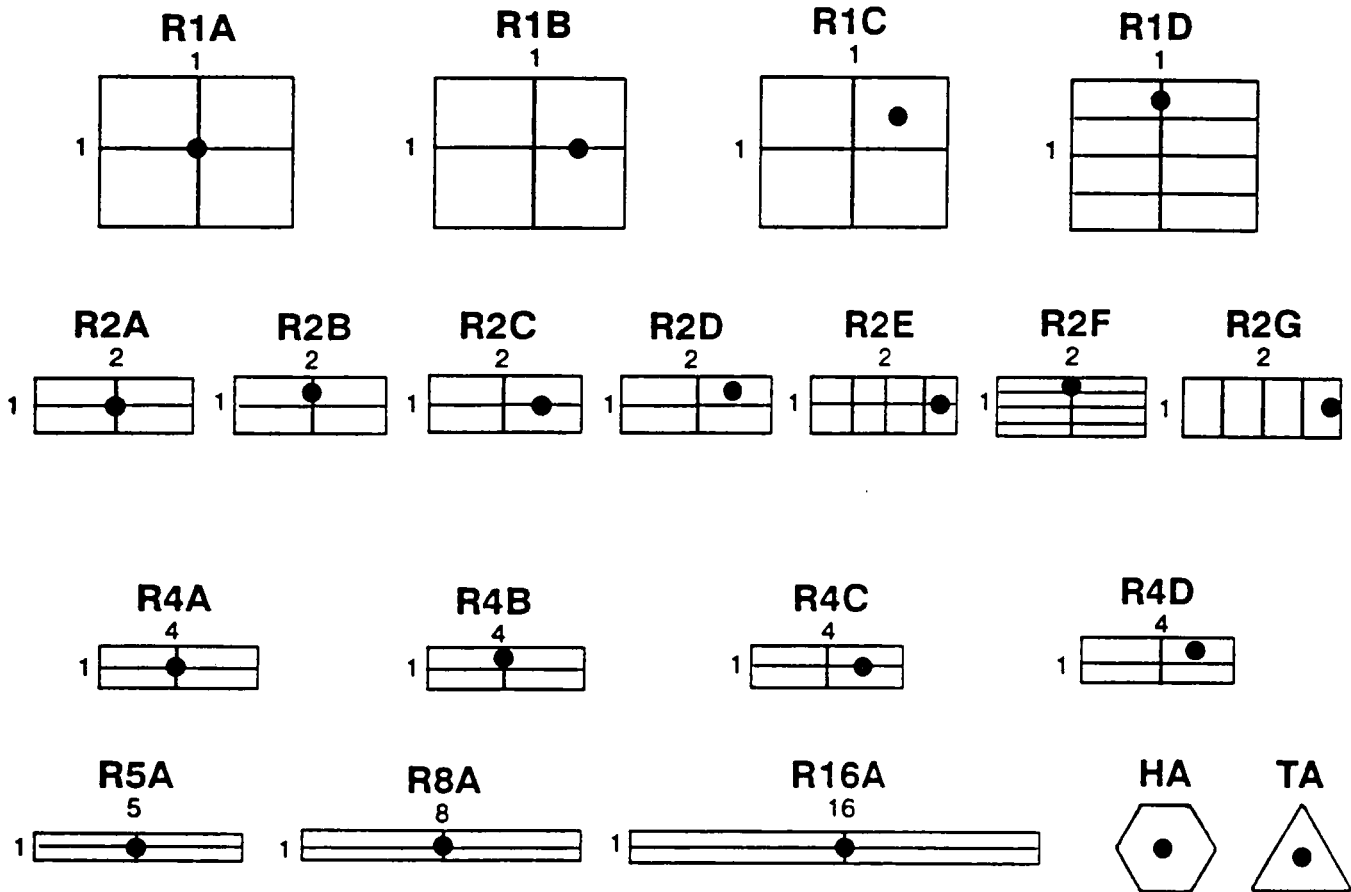
3.22 25 0.1

PSEUDO-STEADY STATE SHAPE FACTORS FOR VARIOUS RESERVOIRS

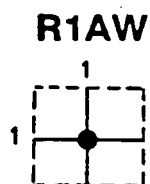
FROM DIETZ (1965)

MBH AVERAGE PRESSURE CALCULATIONS SHAPE CODES

NO FLOW OUTER BOUNDARY



CONSTANT PRESSURE OUTER BOUNDARY



NOMENCLATURE

<u>Symbol</u>	<u>Description</u>	<u>Metric (SI)</u>	<u>Field</u>
a	LIT flow equation coefficient	-	-
A	drainage area	m ²	ft ²
AOF	absolute open flow potential (gas)	10 ³ m ³ /d	MMcfd
b	LIT flow equation coefficient	-	-
B	formation volume factor	-	-
c	compressibility	kpa ⁻¹	psi ⁻¹
c _{ws}	compressibility of wellbore fluids	kpa ⁻¹	psi ⁻¹
C	wellbore storage/unloading constant	m ³ /kPa	bbl/psi
C	simplified flow equation coefficient	-	-
C _A	shape factor	-	-
C _{aD}	apparent wellbore storage constant	-	-
C _D	dimensionless wellbore storage constant	-	-
C _{pD}	storage pressure parameter	-	-
DR	damage ratio	-	-
F	wellbore capacity (McKinley)	m ³ /kPa	ft ³ /psi
FE	flow efficiency	-	-
G	relative density (gas)	-	-
GOR	gas-oil ratio	m ³ /m ³	ft ³ /bbl
h	net pay	m	ft
k	permeability	mD	md
k _(x,y,z)	permeability in the x,y,z direction	mD	md
k _f	fracture permeability	mD	md
k _f w	fracture conductivity	mD.m	md.ft
kh	flow capacity	mD.m	md.ft
k/μ	mobility	-	-
kh/μ	transmissivity	-	-

<u>Symbol</u>	<u>Description</u>	<u>Metric (SI)</u>	<u>Field</u>
L	length of horizontal well	m	ft
L _e	effective length of horizontal well	m	ft
m	slope of transient plots	-	-
n	simplified flow equation coefficient	-	-
p	pressure	kPa	psia
p _{bp}	bubble point pressure	kPa	psia
p _c	gas pseudo-critical pressure	kPa	psia
p _i	initial pressure	kPa	psia
p _R	average reservoir pressure	kPa	psia
p _{tf}	flowing wellhead pressure	kPa	psia
p _{ts}	shut-in wellhead pressure	kPa	psia
p _{wf}	flowing sandface pressure	kPa	psia
P _{wfo}	final flowing pressure	kPa	psia
p _{ws}	shut-in sandface pressure	kPa	psia
p*	extrapolated pressure	kPa	psia
Δp _D	dimensionless pressure	-	-
Δp	pressure drop	kPa	psi
PI	productivity index	m ³ /d/kPa	bbl/d/psi
q	flow rate - gas	10 ³ m ³ /d	MMcf/d
	- liquid	m ³ /d	bbl/d
q _j	j th flow rate	m ³ /d	bbl/d
q _n	n th flow rate	m ³ /d	bbl/d
q _s	stabilized rate - gas	10 ³ m ³ /d	MMcf/d
	- liquid	m ³ /d	bbl/d
r _e	external radius	m	ft
r _{inv}	radius of investigation	m	ft
r _w	wellbore radius	m	ft
R _s	solution gas ratio	m ³ /m ³	ft ³ /bbl

<u>Symbol</u>	<u>Description</u>	<u>Metric (SI)</u>	<u>Field</u>
s	skin factor	-	-
s'	apparent skin factor	-	-
S	saturation (oil, gas, water)	-	-
t	time	hr	hr
t_D	dimensionless time	hr	hr
t_s	pseudo-time	hr	hr
t_{DA}	dimensionless time (based on drainage area)	hr	hr
t_{Dxf}	dimensionless time (based on fracture 1/2 length)	hr	hr
t_n	n th flow period, or superposition time	-	-
Δt	shut-in time	hr	hr
Δt_s	shut-in pseudo-time	hr	hr
Δt_e	equivalent time	hr	hr
(t_{DA})_{pss}	dimensionless time at pseudo-steady state	-	-
t_s	time to stabilization	hr	hr
T	temperature	K	°R
T_c	gas pseudo-critical temperature	K	°R
V_{ws}	wellbore volume - gas - liquid	m ³ m ³	ft ³ bbl
W	channel width	m	ft
w	fracture width	m	ft
x_e	length of reservoir	m	ft
x_f	fracture half-length	m	ft
x_o	x -location of observation well	m	ft
x_w	x- location of centre of active well	m	ft
y_e	width of reservoir	m	ft
y_o	y- location of observation well	m	ft
y_w	y- location of centre of active well	m	ft
Z	gas compressibility factor	-	-
z_w	z-location of centre of active well	m	ft

<u>Symbol</u>	<u>Description</u>	<u>Metric (SI)</u>	<u>Field</u>
α	wellbore storage/unloading constant	m^3/kPa	bbl/psi
μ	viscosity - gas - liquid	$\mu\text{Pa}\cdot\text{s}$ $\text{mPa}\cdot\text{s}$	cp cp
λ	inter-porosity flow coefficient	-	-
T	transmissivity (McKinley)	$\text{mD}\cdot\text{m}/\text{mPa}\cdot\text{s}$	md.ft/cp
ϕ	porosity	-	-
ψ	pseudo-pressure	$\text{kPa}^2/\mu\text{Pa}\cdot\text{s}$	psia^2/cp
w	storativity ratio	-	-

Subscripts

D	dimensionless
DA	dimensionless based on area
Dxf	dimensionless based on fracture half -length
f	formation or flowing
g	gas
i	initial
o	oil
R	reservoir
s	shut-in, skin, stabilized or storage
t	total, transient, or wellhead (tubing head)
w	water or wellbore (sandface)
ref	evaluated at reference pressure

Superscripts

-	average
---	---------

UNITS CONVERSION AND PREFIXES

<u>METRIC (SI) UNIT</u>	<u>FIELD UNIT</u>	<u>DIVIDED BY</u>
$10^3\text{m}^3/\text{d}$	MMcfd	2.817 399 E + 01
kPa	psia	6.894 757 E + 00
mD	md	9.869 233 E - 01
mD.m	md.ft	3.008 142 E - 01
m	ft	3.048 E - 01
m^3	bbl (35 Imp gal) (42 US gal)	1.589 873 E - 01
Pa.s	cp	1.0 E + 03
°C	°F	(°F-32)/9 E + 00
K	°R	5/9 E + 00
m^2	section (640 acres)	2.589 988 E + 06
ha	section (640 acres)	2.589 988 E + 02
m^3	gallon (Imp)	4.546 09 E - 03
m^3	gallon (US)	3.785 412 E - 03
$\text{m}^3/10^3\text{m}^3$	bbl/MMcf	5.643 052 E - 03

Standard conditions: Metric (SI) 15°C, 101.325 kPa
Field 60°F, 14.65 psia

SPECIFIC REFERENCES

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