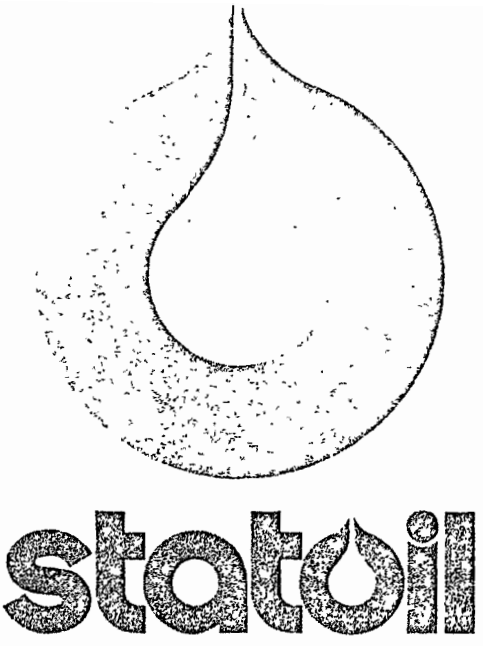


WELL TEST REPORT

PL 050

WELL NO. 34/10-5

OCTOBER 1980

Den norske stats oljeselskap a.s

WELL DATA

Operator	:	Statoil
Well	:	34/10-5
Location	:	61° 11' 25.32"N 02° 10' 23.4"E
Classification	:	Exploration well
Rig	:	Ross Rig
Spudded	:	18. October 1979
Completed	:	3. January 1980
RKB-elevation	:	25 m
Water depth	:	136 m
Total depth	:	2780 m
Objective	:	Sandstone of middle Jurrasic age
Status	:	Plugged and temporarily abandoned

TEST REPORT 34/10-5

CONTENTS:

APPENDICES

1. INTRODUCTION

Well 34/10-5 is the fourth well drilled on the Delta-structure in block 34/10. The well penetrated the Brent and the Statfjord formation and reached a total depth of 2780 m RKB. The Brent formation contain hydrocarbons while the Statfjord formation contain water.

2. OBJECTIVES

The objectives of testing well 34/10-5 were:

1. To test the Brent formation for productivity, pressure and temperature.

2. To obtain representative samples of the reservoir fluid.

3. To run the repeat formation tester to obtain a pressure profile in the Brent formation.

3. CONCLUSIONS

1. RFT and DST data in the Brent formation indicate that well 34/10-5 represent the same pressure system as found in previous drilled wells.

2. The drill stem test indicate a permeability thickness from 89251 md ft to 103739 md ft and a permeability from 579 md to 673 md in the tested part of the Tarbert zone.

3. The gradient in the oil zone is estimated to 0.074 bar/m. In the waterzone, the gradient is estimated to .105 bar/m.

4. The maksimum temperature recorded during the drill stem test was 74.5^{o}C or 166.1^{o}F at -1901 mMSL.

5. No water was produced.

6. The hydrocarbon system is similar to those found is wells 34/10-1, 3 and 4.

4. DISCUSSION

4.1 DST analysis.

One drill stem test was run in well 34/10-5. The well was perforated in the Brent formation from 1925 m RKB to 1927 m RKB (Tarbert). This zone consist of clean/argillaceous sandstone.

Two pressure build up test were analysed. PBU no. 2 indicate a permeability thickness of 89251 md ft and a permeability of 579 and PBU no. 4 indicate a permeability thickness of 103739 md ft and a permeability of 673 md. PBU no.2 is probably the most reliable due to a constant production rate during the drawdown prior to the PBU. PBU no.4 could be affected by the choke changes during the drawdown. The permeability calculated from PBU no. 2 and 4 compare well with the measured core permeabilities.

The total skin factor is significant lower than the calculated skin due to partial penetration. The partial penetration skin factor is calculated to +63. The skin values calculated from the Horner analysis is in a range from +5.9 to +6.8. The cement bond log however, indicate a bad cement bond in the tested interval. Channeling behind the casing will increase the effective perforated interval and decrease the effect of partial penetration. Therefore a separation of the total skin into formation skin and partical penetration skin is difficult.

The reservoir pressure calculated from the PBU's is 4540 psia at -1882 m MSL. This pressure compare excellent with the RFT data.

A thickness of 47 m, an average porosity of 29% and a water saturation of 21.5% were used in the DST analysis. These values are estimated from the CPI log in appendix A5. The PVT data were taken from the Core lab. report RFLA 80016 based on a sample taken during the DST.

The analysis, test sequence and rate data etc. can be found in appendix A1.

4.2 RFT analysis.

The repeat formation tester was run in the Brent formation, data from 1898 m RKB to 2100.5 m RKB are available.

The RFT data and the pressures obtained from the DST analysis compare excellent.

The gradient in the oil zone is estimated to 0.074 bar/m, in the water zone it is estimated to 0.105 bar/m.

The RFT pressures from this well, compare well with other wells located on this structure in the Brent formation. The RFT data and analysis can be found in appendix A2.

4.3 Reservoir temperature

The maximum temperature recorded during the drill stem test was 74.5^{o}C or 166.1^{o}F. This is close to temperatures measured in wells 34/10-1, 3 and 4.

A plot of the maximum recorded temperature versus depth for well 34/10-5 and previous drilled well can be found in appendix A3.

4.4 Reservoir fluid.

Two bottom-hole samples were taken and analysed by Statoil, SINTEF and Core Lab. The analysis indicate the same hydrocarbon system as in wells 34/10-1, 3 and 4. In addition two RFT samples were taken. The analysis done by Statoil indicate the same as above.

A summary of the sampling can be found in appendix A4.

APPENDIX A1 PAGE

BOTTOM HOLE PRESSURE REPORT

Well 34/10-5 Test no. DST No.1

Test Date 29/12-79 Date of analysis 26/9-80

Gauge no. Lynes DMR 314 S/N 1044

SUMMARY OF THE RESULTS

	PBU No. 2	PBU No. 4
	Semilog Analysis	Semilog Analysis
Kh md·ft	89251	103739
K md	579	673
S	+5.9	+6.8
$\bar{P}$ (psia)at- 1882m ss	4541	4540

Max. recorded Temp. 74.5°C (166.1°F)

Remarks

Anna Aabø
Signature

Well 34/10-5, DST#1 Test date 29.12.79

Reservoir Parameters

Perforations 1925 - 1927 m RKB Zone(s) TARBERT

Wellbore radius .11m feet

RKB Elev 25m feet

Midpoint Production -1901m ss Bomb at 1907m RKB -1882m ss

Pressure Functions Evaluated at -_____ ss Datum Depth -_____ ss

Delta P required to correct to datum _____ psig Gradient _____ psi/ft

Estimated Average Pressure _____ psig

Formation Volume Factor 1.222 vol/vol Viscosity 1.25 cp

Thickness 47m feet Porosity 29 % Drainage Area — acres

Oil Saturation 78.5 % Oil Compressibility 7.5 x 10^{-6} psi $^{-1}$

Water Saturation 21.5 % Water Compressibility 3.0 x 10^{-6} psi $^{-1}$

Gas Saturation — % Gas Compressibility _____ 10^{-6} psi $^{-1}$

Formation Compressibility 3.0 x 10^{-6} psi $^{-1}$

System Compressibility $C_t = S_o C_o + S_w C_w + S_g C_g + C_f$

$C_t = .785 \times 7.5 \times 10^{-6} + .215 \times 3.0 \times 10^{-6} + — \times — \; 10^{-6} + 3.0 \times 10^{-6}$

$C_t = 9.53 \times 10^{-6}$ psi $^{-1}$

Rates Reported on Test. See page A1-16

Choke ___/___ inches Oil Rate _____ STBPD Gas Rate _____ MMSCFD

FTP _____ psig Water Rate _____ BWD GOR _____ SCF/STB

^{0}API _____ Gas Spec. Grav. _____

Cumulative Production Oil 467.2 STB Gas _____

PBU #2 Water 0

PBU #4 Oil: 849.6 STB Gas: 232 MSCF

Water: 0

Well 34/10-5, DST#1 PBU #2 Test Date 29/12-79

Horner Analysis

Effective Production Time tp = Cumulative Production / Rate Reported on Test.

tp = 467.2 / (2192)(24×60) = 307 min

Straight line starts at 1.39 hrs Slope = 6.1 psi/cycle

$P_{wf's}$ = 4469 psia

P_{1hr} = 4535.9 psia

P^* = 4541.1 psia

Calculated Values

$Kh = \frac{162.6\ Q\ B\mu}{M} = \frac{162.6(2192)(1.222)(1.25)}{6.1} = 89251$ md.ft

$K = Kh/h = \frac{89251}{((47)(3.28))} = 579$ md.

$$S = 1.1513\left[\left[\frac{P1hr - Pwfs}{M}\right] + Log\left[\frac{tp+1}{tp}\right] - Log\left[\frac{K}{\phi \mu C_t r_w^2}\right] + 3.2275\right]$$

$$S = 1.1513\left[\left[\frac{4536-4469}{6.1}\right] + Log\left[\frac{307+60}{307}\right] - Log\left[\frac{579}{(.29)(1.25)(9.63\times10^{-6})(.35)^2}\right] + 3.2275\right]$$

S = + 5.9

$t_{DA} = \frac{0.000264\ Kt}{\phi \mu C_t A} = \frac{0.000264}{\quad} =$ _____

P_{DMBH} = ≃0

$\bar{P} = P^* - P_{DMBH}\left[\frac{M}{2.303}\right]$ = 4541 psia @ − 1882 m ss

= _____ @ − _____ ss Datum

$\Delta P_s = 0.87\, m\, S = (0.87)(6.1)(5.9) = 31.3$ psi

$PI_a = \frac{Q_o}{P^* - P_{wf}} = \frac{2192}{4541 - 4469} = 30.4\ STBPD/psi = 70.1\ m^3PD/bar$

$PI_{s=0} = \frac{Q}{P^* - P_{wf} - \Delta P_s} = \frac{2192}{4541 - 4469 - 31} = 53.5\ STBPD/psi = 123.4\ m^3PD/bar$

Well 34/10-5, DST#1 PBU #4 Test Date 29/12-79

Horner Analysis

Effective Production Time tp = Cumulative Production / Rate Reported on Test.

t_p = 849.6 / 4556 × 24 × 60 = 268 min.

Straight line starts at 1.47 hrs Slope = 10.908 psi/cycle

$P_{wf's}$ = 4403 psia

P_{1hr} = 4532.3 psia

P^* = 4540.3 psia

Calculated Values

$$Kh = \frac{162.6\ Q\ B\mu}{M} = \frac{162.6(4656)(1.222)(1.25)}{10.908} = 103739 \text{ md.ft}$$

$$K = Kh/h = \frac{103739}{(47 \times 3.28)} = 673 \text{ md.}$$

$$S = 1.1513 \left[\left[\frac{P1hr - Pwfs}{M}\right] + Log\left[\frac{tp+1}{tp}\right] - Log\left[\frac{K}{\phi \mu C_t r_w^2}\right] + 3.2275\right]$$

$$S = 1.1513 \left[\left[\frac{4532-4403}{10.908}\right] + Log\left[\frac{268+60}{268}\right] - Log\left[\frac{673}{(.24)(1.25)(9.53\times 10^{-6})(.35)^2}\right] + 3.2275\right]$$

S = + 6.8

$$t_{DA} = \frac{0.000264\ Kt}{\phi \mu C_t A} = \frac{0.000264}{\quad} = \quad$$

$P_{DMBH} = \approx 0$

$$\bar{P} = P^* - P_{DMBH}\left[\frac{M}{2.303}\right] = 4540 \text{ psia @ } - 1882 \text{ m ss}$$

= _____ psia @ − _____ ss Datum

$\Delta P_s = 0.87 m s = 0.87 \times 10.908 \times 6.8 = 64.5$ psi

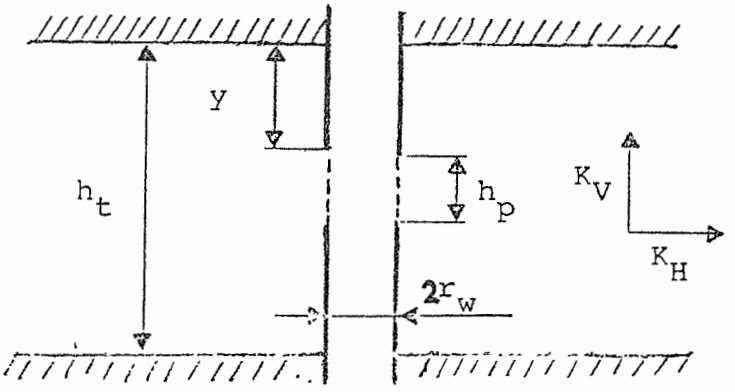
$$PI_a = \frac{Q_o}{p^* - P_{wf}} = \frac{4556}{4540 - 4403} = 33.3 \text{ STBPD/psi} = 76.8 \text{ m}^3\text{PD/bar}$$

$$PI_{s=0} = \frac{Q_o}{p^* - P_{wf} - \Delta P_s} = \frac{4556}{4540 - 4403 - 64.5} = 62.8 \text{ STBPD/psi} = 144.8 \text{ m}^3\text{PD/bar}$$

Well 34/10-5
DST#1

Test date 29/12-79

PARTIAL PENETRATION SKIN FACTOR



h_t = 47m, 154.2ft

h_p = 2m, 6.6ft

y = 29m, 95.1ft

r_w = 0.11m, 0.35ft

K_H/K_V = 1.3

$$z_m = y + h_p/2$$

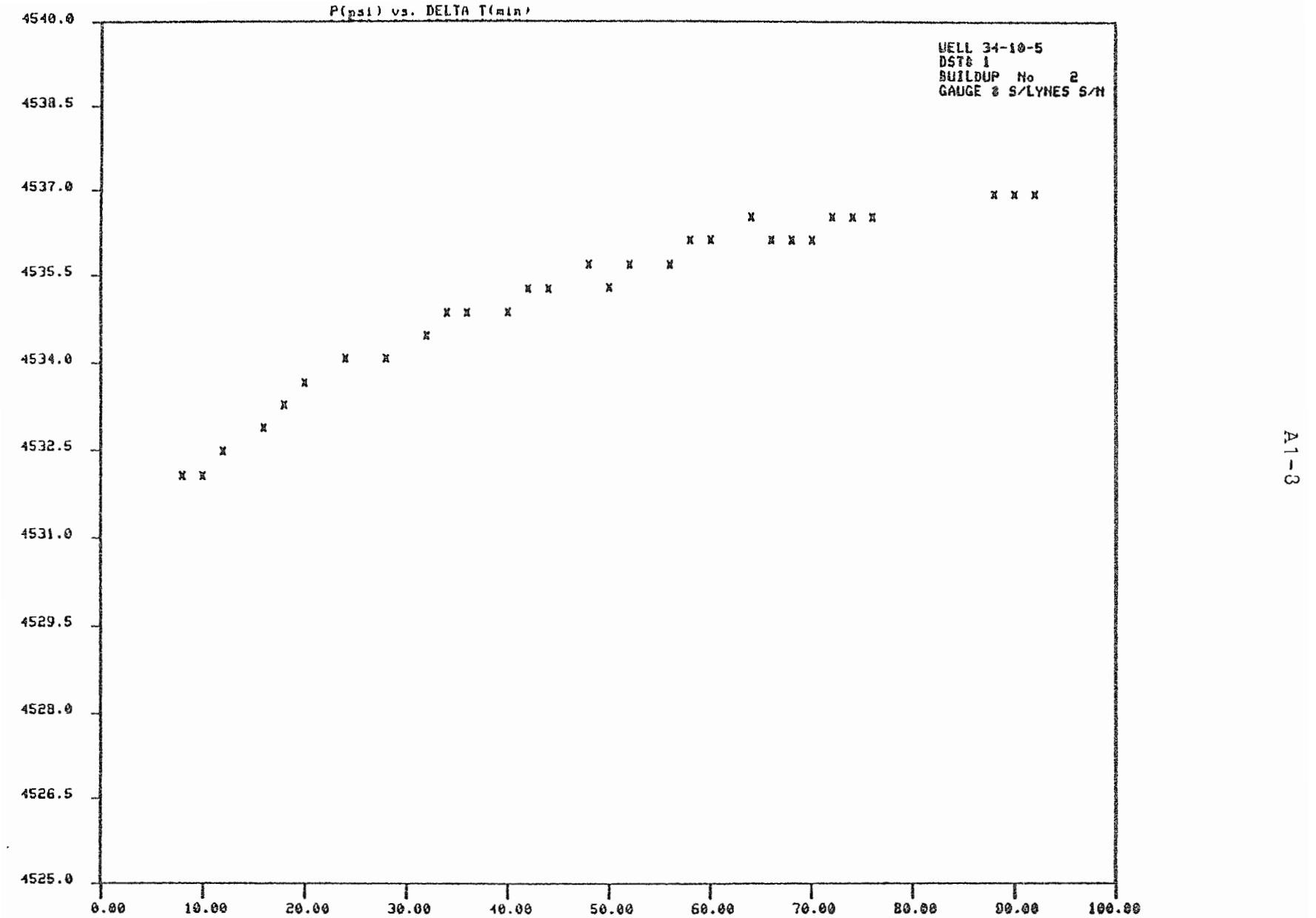
$$r_{wc} = r_w e^{0.2126(z_m/h_t + 2.753)}$$

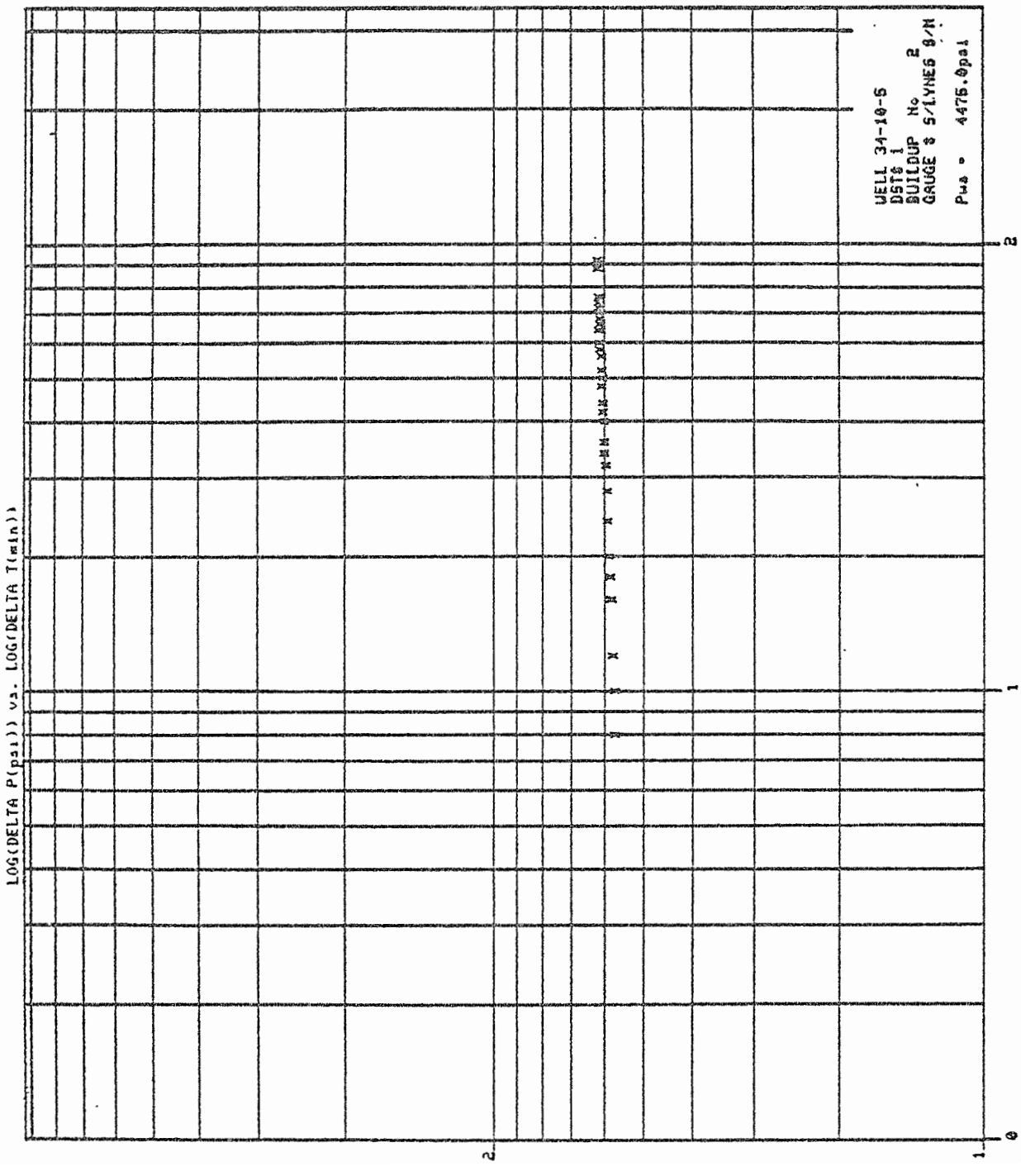
$$S_p = 1.35((h_t/h_p - 1)^{0.825}(\ln(h_t(K_H/K_V)^{0.5} + 7) - (0.49 + 0.1\ln(h_t(K_H/K_V)^{0.5}))\ln r_{wc} - 1.95))$$

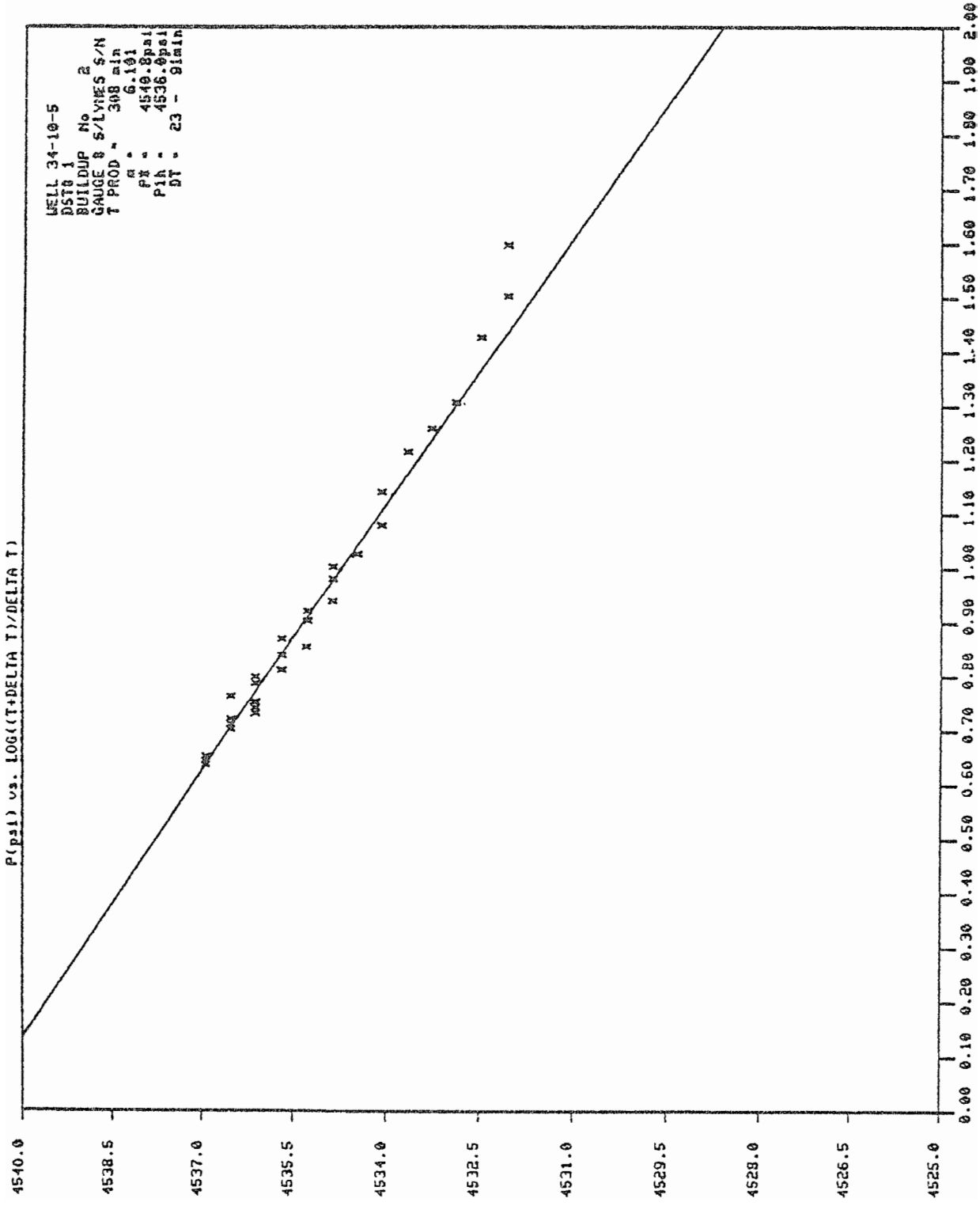
S_p = +62.9

BRØNN 34-10-5 DST# 1
BUILDUP NUMMER 2
GAUGE S/LYNES S/N

NR.	TID	TRYKK
1	6.19	4532.070
2	6.19	4532.070
3	6.21	4532.070
4	6.23	4532.490
5	6.27	4532.890
6	6.29	4533.280
7	6.31	4533.660
8	6.35	4534.080
9	6.39	4534.080
10	6.43	4534.470
11	6.45	4534.860
12	6.47	4534.860
13	6.51	4534.870
14	6.53	4535.270
15	6.55	4535.270
16	6.59	4535.690
17	7.01	4535.290
18	7.03	4535.690
19	7.07	4535.690
20	7.09	4536.110
21	7.11	4536.110
22	7.15	4536.510
23	7.17	4536.110
24	7.19	4536.110
25	7.21	4536.110
26	7.23	4536.510
27	7.25	4536.510
28	7.27	4536.510
29	7.39	4536.930
30	7.41	4536.930
31	7.43	4536.930

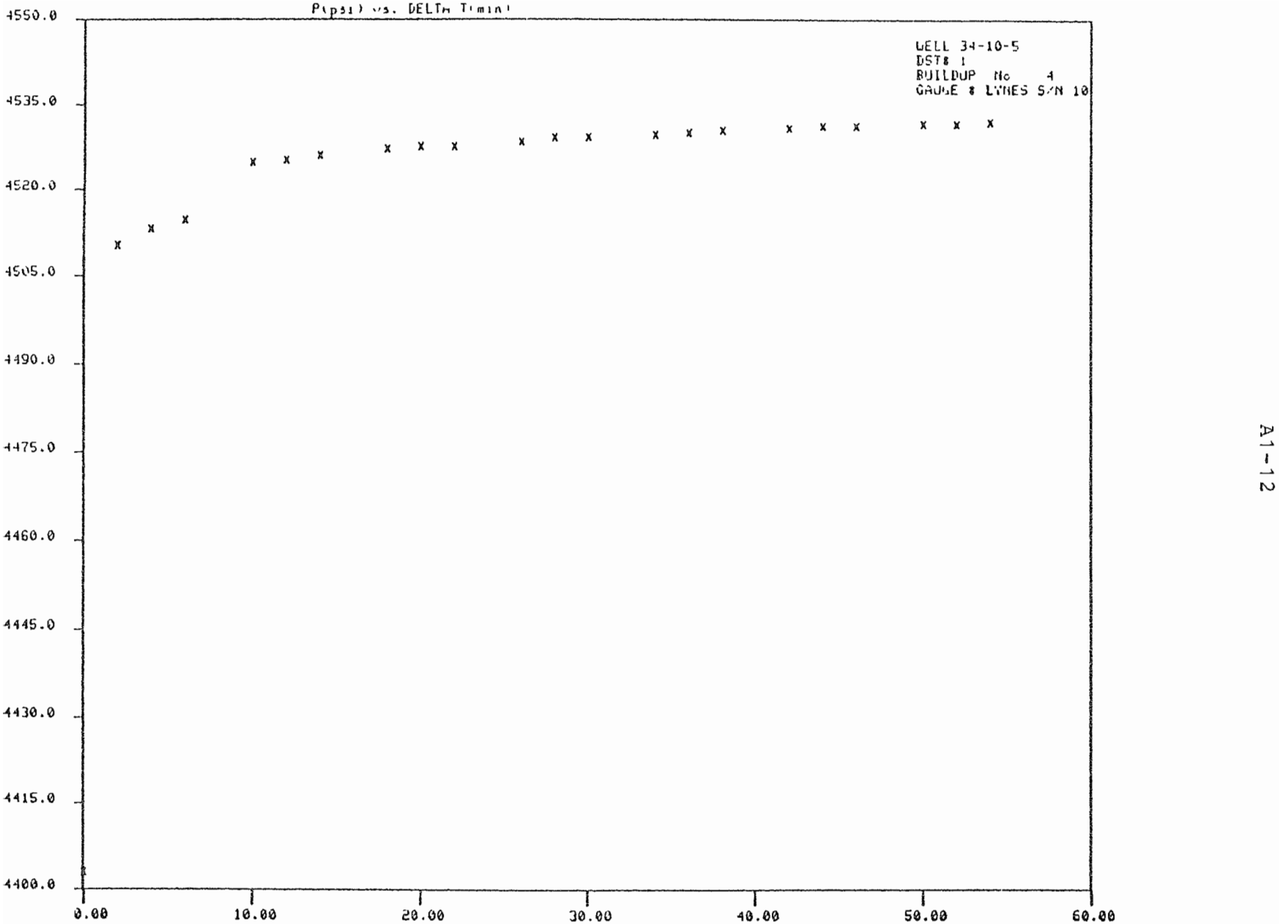

P(psi) vs. DELTA T(min)
WELL 34-10-5
DST# 1
BUILDUP No 2
GAUGE # S/LYNES S/N
4540.0
4538.5
4537.0
4535.5
4534.0
4532.5
4531.0
4529.5
4528.0
4526.5
4525.0
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00

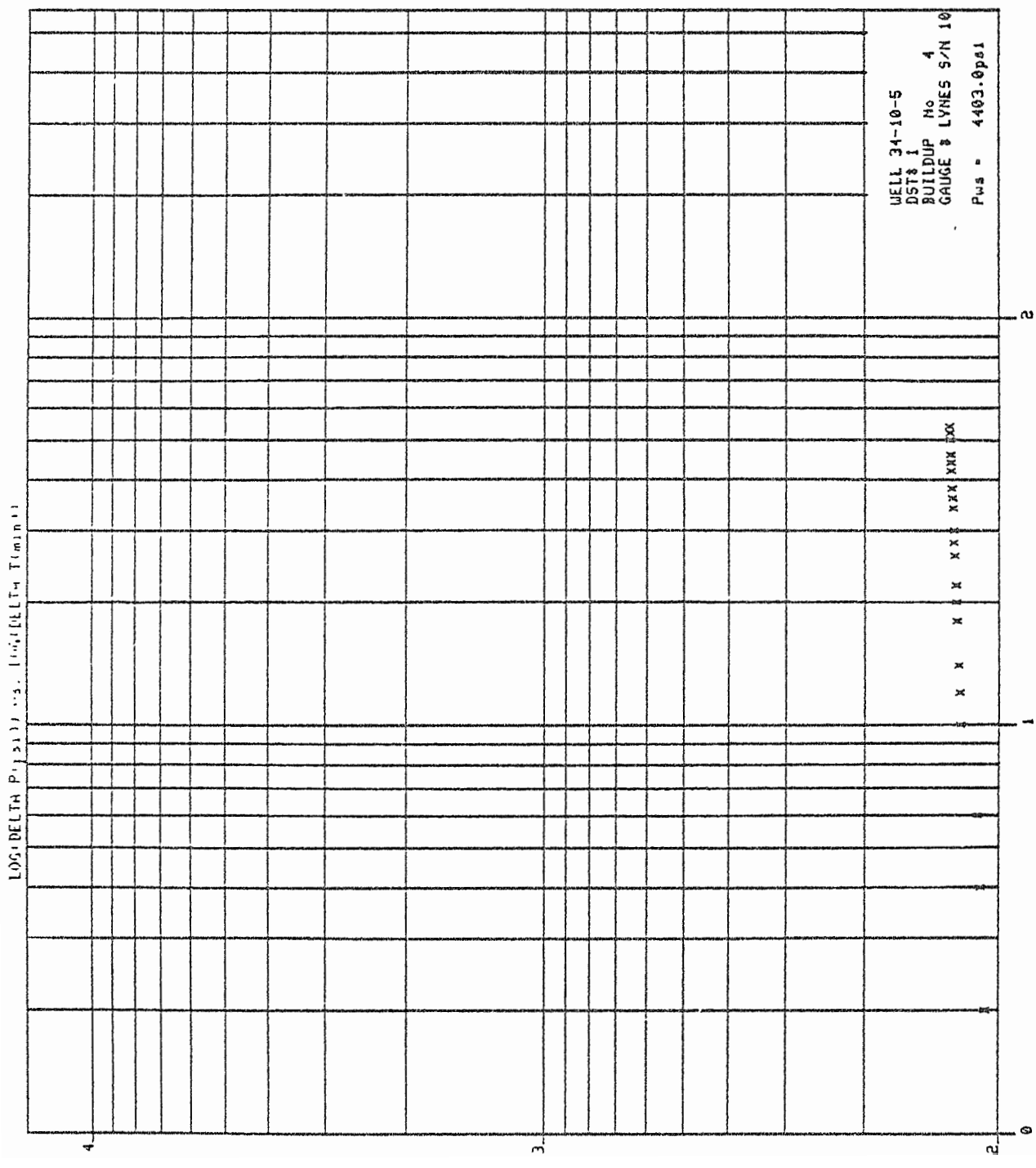

WELL 34-10-5
DST# 1
BUILDUP No. 2
GAUGE # S/LYNES 8/M
Pws = 4476.0psi
LOG(DELTA P(psi)) vs. LOG(DELTA T(min))
2
1
0
2
1

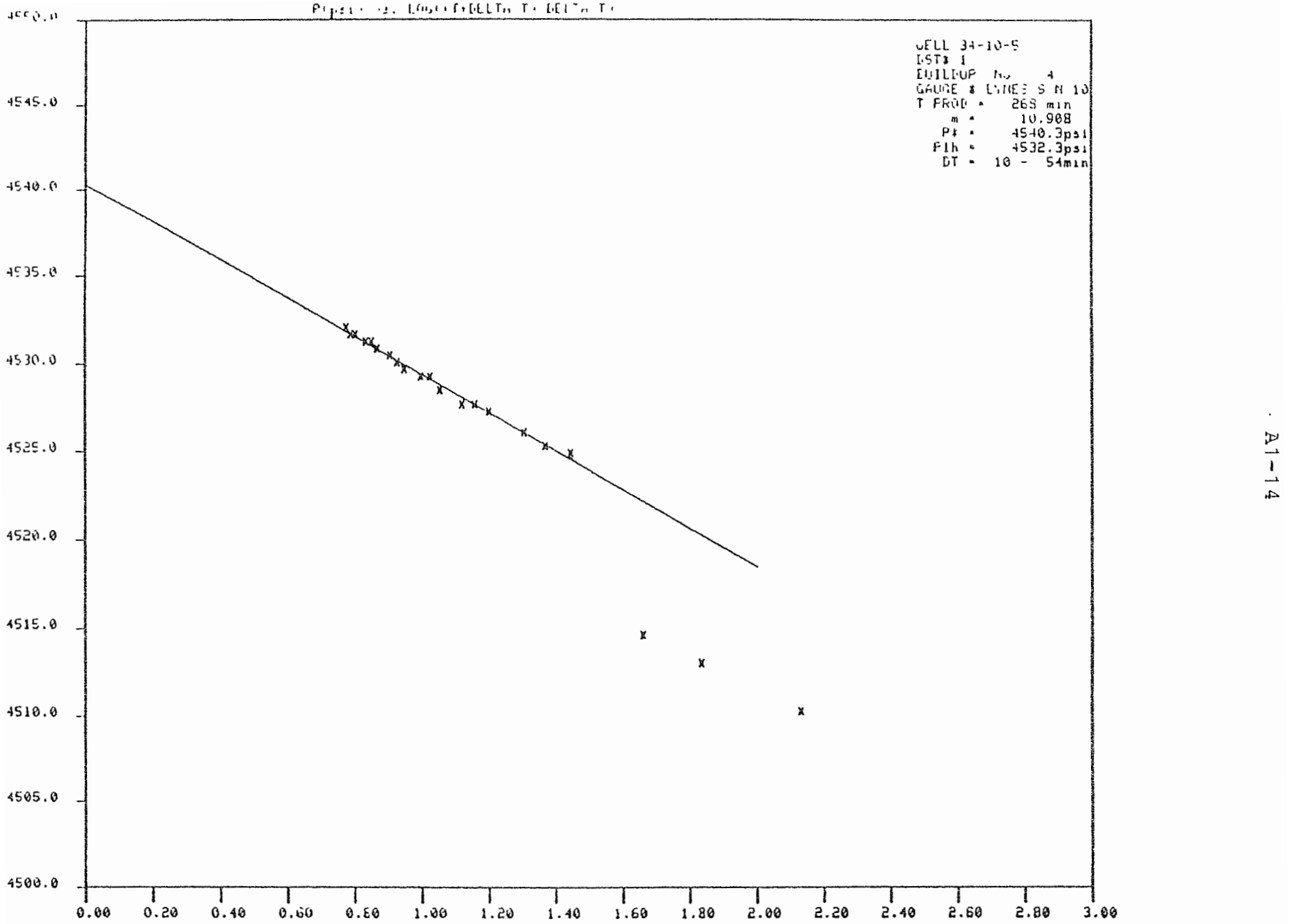

WELL 34-10-5
DST# 1
BUILDUP No 2
GAUGE # S/LYMES S/N
T PROD = 308 min
m = 6.101
P* = 4540.8psi
P1h = 4536.0psi
DT = 23 - 91min
P(psi) vs. LOG((T+DELTA T)/DELTA T)
4540.0
4538.5
4537.0
4535.5
4534.0
4532.5
4531.0
4529.5
4528.0
4526.5
4525.0
0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00

BRØNN 34-10-5 DST# 1
BUILDUP NUMMER 4
GAUGE LYNES S/N 10

NR.	TID	TRYKK
1	18.01	4403.000
2	18.03	4510.300
3	18.05	4513.070
4	18.07	4514.660
5	18.11	4524.920
6	18.13	4525.320
7	18.15	4526.110
8	18.19	4527.290
9	18.21	4527.680
10	18.23	4527.680
11	18.27	4528.490
12	18.29	4529.260
13	18.31	4529.260
14	18.35	4529.680
15	18.37	4530.090
16	18.39	4530.480
17	18.43	4530.870
18	18.45	4531.260
19	18.47	4531.260
20	18.51	4531.680
21	18.53	4531.680
22	18.55	4532.070


P(psi) vs. DELTA T(min)
WELL 34-10-5
DST# 1
BUILDUP No 4
GAUGE # LYNES S/N 10
4550.0
4535.0
4520.0
4505.0
4490.0
4475.0
4460.0
4445.0
4430.0
4415.0
4400.0
0.00
10.00
20.00
30.00
40.00
50.00
60.00

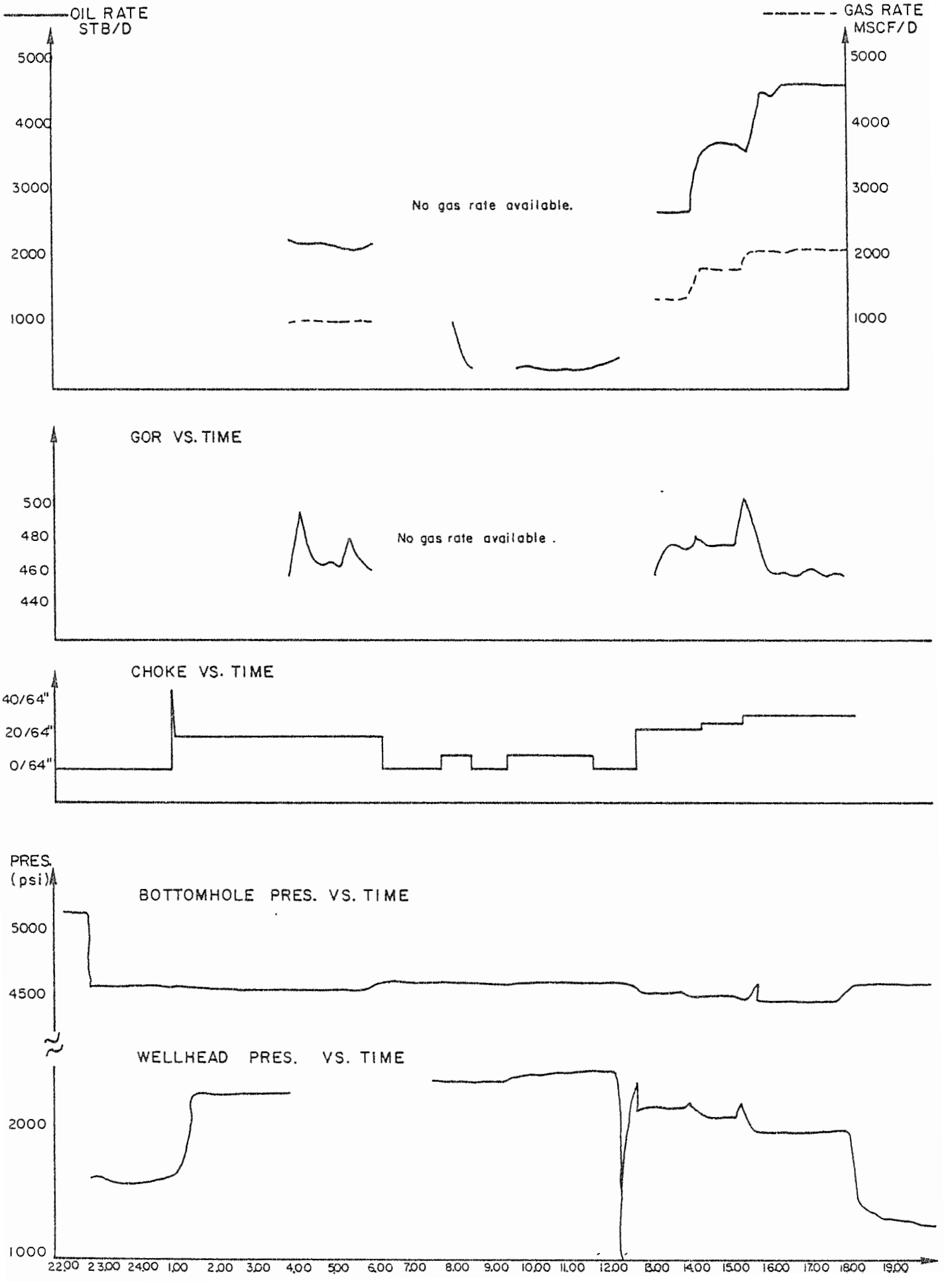

WELL 34-10-5
DST# 1
BUILDUP No 4
GAUGE # LYNES S/N 10
Pws - 4403.0psi
LOG(DELTA Pressure) vs. LOG(DELTA Time)
4
3
2
1
0
2


WELL 34-10-5
DST# 1
BUILDUP No 4
GAUGE # LYNES S N 10
T PROD = 265 min
m = 10.908
P* = 4540.3psi
P1h = 4532.3psi
DT = 10 - 54min
4550.0
4545.0
4540.0
4535.0
4530.0
4525.0
4520.0
4515.0
4510.0
4505.0
4500.0
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
2.00
2.20
2.40
2.60
2.80
3.00

A1-15

34/10-5, DST NO. 1

PRESSURE, CHOKE AND FLOWDIAGRAM



FLOW RATES

Well no. 34/10-5 DST no. 1

Date: 29.12.79

TIME	CHOKE (1/64")	Qo (STBOPD)	Qg (MMSCFPD)	GOR ($\frac{SCF}{STB}$)
01.00 - 01.01	48			
01.03 - 06.10	20	2191.65	1.0366	473
07.57 - 08.33	8	408.0		
09.28 - 11.55	8	333.2		
12.47 - 14.04	24	2859.7	1.3524	473
14.04 - 15.17	28	3707.8	1.8184	490
15.17 - 15.22	24	3664.6	2.063	563
15.22 - 18.01	32	4556.3	2.0972	460

A1-17
LAYOUT FOR TESTSTRING
34/10-5, DST No. 1

I.D. inchs	O.D. inchs	TESTSTRING	Length m	Depth m RKB
2.75	3.50	TDS TUBING (ABOVE RT)	6.23	-6.33
2.75	3.50	TDS TUBING 2 SGLS (BELOW RT)	11.77	11.77
2.75	3.50	X-OVER 3½ TDS BOX x 4½ ACME AN		
2.88	13.38	OTIS LUBRICATOR VALVE	2.24	14.01
		X-O 4½ ACME BOX x 3½ TDS PIN		
2.75	3.50	TDS TUBING, 5 STD + 1 PUP 10'	139.45	153.46
1.98	13.38	OTIS SUBSEA TEST TREE, ABOVE H	5.54	159.00
1.98	13.38	OTIS SUBSEA TEST TREE, BELOW HANG	0.35	159.35
		X-O 4½ ACME-PIN x 3½ TDS PIN		
2.75	3.50	TDS TUBING SG STDS	1513.51	1672.89
2.625	5.50	X-O 3½ TDS BOX x 3½ IF PIN	0.40	1673.29
2.25	5.00	SLIP JOINT (OPEN)	5.54	1678.83
2.25	5.00	SLIP JOINT (CLOSED)	4.01	1682.84
2.25	4.75	4 3/4 DC, 5 STDS	142.80	1825.64
2.25	4.75	X-O 3½ IF BOX x 2 7/8 SUE PIN	0.24	1825.88
2.44	4.87	RTTS CIRCULATING VALVE	0.91	1826.79
2.75	4.75	X-O 2 7/8 EUE BOX x 3½ IF PIN	0.25	1827.04
2.25	4.75	4 3/4 DC, 1 STD	28.56	1855.60
2.25	5.00	SLIP JOINT (CLOSED)	4.01	1859.61
2.25	5.00	SLIP JOINT (CLOSED)	4.01	1863.63
2.25	4.75	4 3/4 DC, 1 STD	28.56	1892.18
2.25	5.00	APR-A REVERSE VALVE	0.91	1893.09
2.25	5.00	APR-N TESTER VALVE	3.89	1896.98
2.37	4.62	BIG JOHN JARS	1.52	1898.50
2.44	4.87	RTTS CIRC. VALVE	0.99	1899.49
2.44	5.00	RTTS SAFTY JOINT	0.84	1900.33
2.18	5.75	RTTS PACKER	0.82	1900.85
2.44	2.87	PUP JOINT	0.80	1901.65
2.44	2.87	2 1/8 PERFORATED TUBING	3.44	1905.09
		X-O 2 7/8 EUE PIN x 2 7/8 EUE BOX		
1.79	3.00	OTIS X-N NIPPEL	0.78	1905.87
		X-O 2 7/8 EUE BOX x 2 7/8 EUE PIN		
	←	2 JT 2 7/8 EUE TUBING	19.04	1924.91
		WELL PLUG		

WELL NO.: 34/10-5 DST NO.: 1 DATE: 29.12.79

WIRELINE NIPPLE (1905.9 m RKB)

GAUGE TYPE AND NUMBER: Lynes, 1044
DEPTH, PRESSURE ELEMENT: 1920 m RANGE: 0-5000 psi.
MODE: 2 min. DELAY: 7 hrs.
ACTUATED: time 0.148 date: 28.12.79
WILL RUN OUT: time 1030 date: 29.12.79

GAUGE TYPE AND NUMBER: Lynes, 1206
DEPTH, PRESSURE ELEMENT: 1934 m RANGE: 0-5000 psi.
MODE: 2 min. DELAY: 7 hrs.
ACTUATED: time: 0204 date: 28.12.79
WILL RUN OUT: time: 1046 date: 29.12.79

GAUGE TYPE AND NUMBER: Lynes, 1208
DEPTH, PRESSURE ELEMENT: 1948 m RANGE: 0-5000 psi.
MODE: 4 min. DELAY: 7 hrs.
ACTUATED: time: 0152 date: 28.12.79
WILL RUN OUT: time: 0752 date: 31.12.79

D.S.T. HANGER (1915.6 m RKB)

GAUGE TYPE AND NUMBER: Amarada, RPG 3, 8167
DEPTH, PRESSURE ELEMENT: 1917.5 m RANGE: 8000 psi.
MODE: 72 hrs. clock DELAY: 0
ACTUATED: time: 0210 date: 28.12.79
WILL RUN OUT: time: 0210 date: 31.12.79

GAUGE TYPE AND NUMBER: Amarada, RPG3, 31329
DEPTH, PRESSURE ELEMENT: 1919.5 m RANGE: 6000 psi.
MODE: 72 hrs. clock DELAY: 0
ACTUATED: time: 0210 date: 28.12.79
WILL RUN OUT: time: 0210 date: 31.12.79

GAUGE TYPE AND NUMBER:
DEPTH, PRESSURE ELEMENT: RANGE:
MODE: DELAY:
ACTUATED: time: date:
WILL RUN OUT: time: date:

DIARY OF EVENTS		WELL No. 34/10-5 ZONE TESTED: Brent	DST No. 1 PERFS. 1925 - 1927
DATE	TIME	OPERATIONS	
		Two isolation squeezes were made. CBL/VDL indicate good bond down to 1929 m.	
		PERFORATION	
27.12.79	2315	Rig up Schlumberger HJ 4" 4 spf perforating gun.	
	2400	RIH with perforating gun.	
28.12.79	0045	Tie in CCL to same on original CBL/VDL. Gun fired successfully.	
	0130	Out of hole w/perforating gun: All shots fired.	
		TESTSTRING/EQUIPMENT PREPARATION	
	0200	Start RIH w/test string. Installed two Amarada ressure gauges in DST hanger, and three Lynes gauges in Otis XN nipple.	
	1130	Found leak on control line on SSTT. Repaired the SSTT. Encountered problems with the unlatching system on SSTT. Dogs were set upside down. (See Otis failure report.)	
	1530	Landed SSTT in wear bushing. Started to pressure test the string. Repaired leak on Dowell unit and repaired leak on OTIS choke manifold.	
	2150	Set RTTS packer.	
	2250	Opened APR-n valve. WHP 1655 psi. Could not hold annuls pressure first. Found leak on rig manifold. Closed APR-n.	

DAIRY OF EVENTS		WELL No. 34/10-5 ZONE TESTED: Brent	DST No. 1 PERFS. 1925 - 1927
DATE	TIME	OPERATIONS	
		1. FLOW PERIOD	
29.12.79	0057	Opened APR-n valve. WHP 1660 psi.	
	0101	Opened well on 48/64" fixed choke.	
	0103	Changed to 20/64" fixed choke. Flow directed to burner. WHP 1470 psi.	
	0123	Mud to surface.	
	0124	Ignite burner.	
	0128	WHP = 1820 psi.	
	0200	WHP = 2270 psi.	
	0238	Directed flow through separator, WHP = 2271 psi.	
	0410	Flow to surge tank.	
	0415	Meter check.	
	0445	Cought two PVT samples at separator.	
	0500	Meter check.	
	0607	Bleed off annuls pressure. WHP 2150 psi. WHP increased to 2390 psi. APR-n valve was not closed. Closed Halliburton choke manifold.	

DIARY OF EVENTS

WELL No. 34/10-5 DST No. 1
ZONE TESTED: Brent PERFS: 1925 - 1927

DATE	TIME	OPERATIONS
		BOTTOM HOLE SAMPLING
	0625	Bleed off at Halliburton choke manifold to WHP = 2250 psi. Closed Halliburton choke manifold. Immidiate build up to WHP = 2365 psi.
	0630	Close lubricator valve. Bleed off at surface. Pressure tested lubricator valve.
	0730	Pressure up above lubricator valve. WHP = 2300 psi.
	0744	Opened well on 8/64" choke and flow to surge tank. Choke manifold plugged. Shut in at choke manifold and changed over to other side of choke manifold.
	0757	Opened well on 8/64" choke and flow to surge tank to measure rate.
	0834	Shut in at choke manifold.
	0840	Close lubricator valve and bleed off above.
	0855	Samplers set to close at 1125.
	0925	Opened lubricator valve and RIH w/samplers.
	0929	Opened well on 8/64" choke.
	1020	Samplers at 6000 ft (1828.8 m)
	1150	Start POOH w/samplers.
	1155	Well shut in at Halliburton choke manifold.

DIARY OF EVENTS

WELL No. 34/10-5 DST No. 1

ZONE TESTED: Brent PERFS: 1925 - 1927

DATE	TIME	OPERATIONS
	1215	Close lubricator valve. Bleed of above. Out of hole w/samplers.
		2. FLOW PERIOD
	1225	Opened lubricator valve.
	1247	Opened well on 24/64" fixed choke. Flow to separator. WHP = 2195 psi. Bubble hose partly plugged by solids sand + cament and possibly some illminite. Cleaned out by itself.
	1305	Started BS & W sampling for solid detection. First samples contained from 0.5% to traces to solids.
	1400	WHP = 2209 psi.
	1405	Change to 24/64" + 14/64" chokes in parallell. WHP = 2130 psi.
	1415	Directed flow to tank for meter check.
	1517	Change to 24/64" choke.
	1522	Change to 32/64" choke. WHP = 1993 psi.
	1800	WHP = 2009 psi. Well constantly producing traces of sand.
		BUILD UP PERIOD
	1801	Bleed off annulus pressure. APR-n valve closed. WHP decreasing slowly.
	1804	Close in at Halliburton choke manifold WHP = 1210 psi.
	1810	WHP = 1449 psi. Possible small leak in APR-n valve.

DIARY OF EVENTS

WELL No. 34/10-5 DST No. 1

ZONE TESTED Brent Perfs. 1925 - 1927

DATE	TIME	OPERATIONS
	1900	WHP = 1375 psi, slowly decreasing.
	2000	WHP = 1360 psi, remaining fairly constant.
	2120	Open APR-n valve, start bullheading.

APPENDIX A2 PAGE

RFT DATA, 34/10-5

DEPTH (mMSL)	PRESSURE (psig)
-1873	4510
-1879.5	4518
-1887.5	4527
-1897.5	4537
-1903.	4541
-1912	4552
-1926	4568
-1934	4577
-1950	4596
-1959	4608
-1974	4631
-1993.5	4660
-2015	4688
-2041	4728
-2075.5	4777

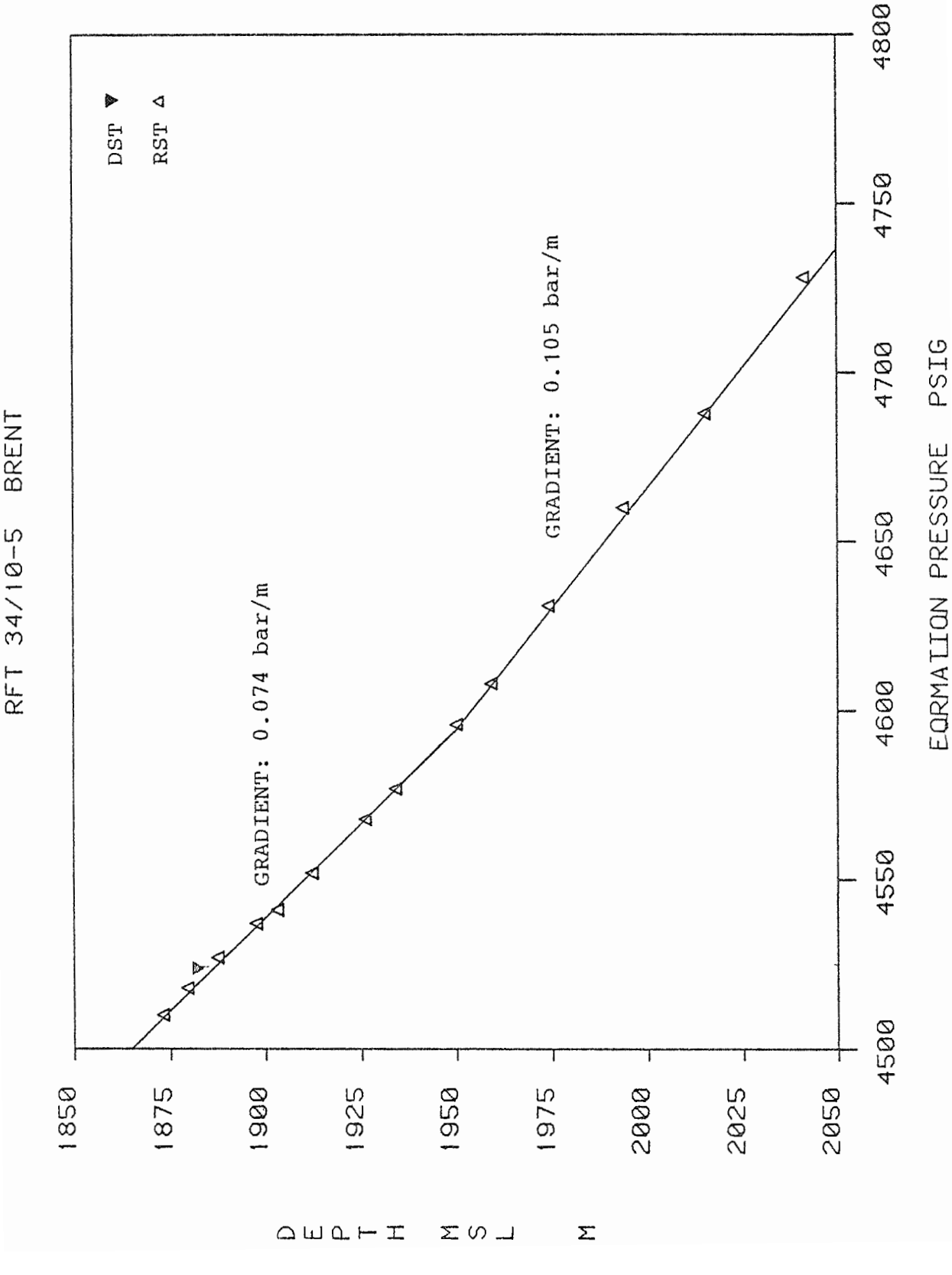
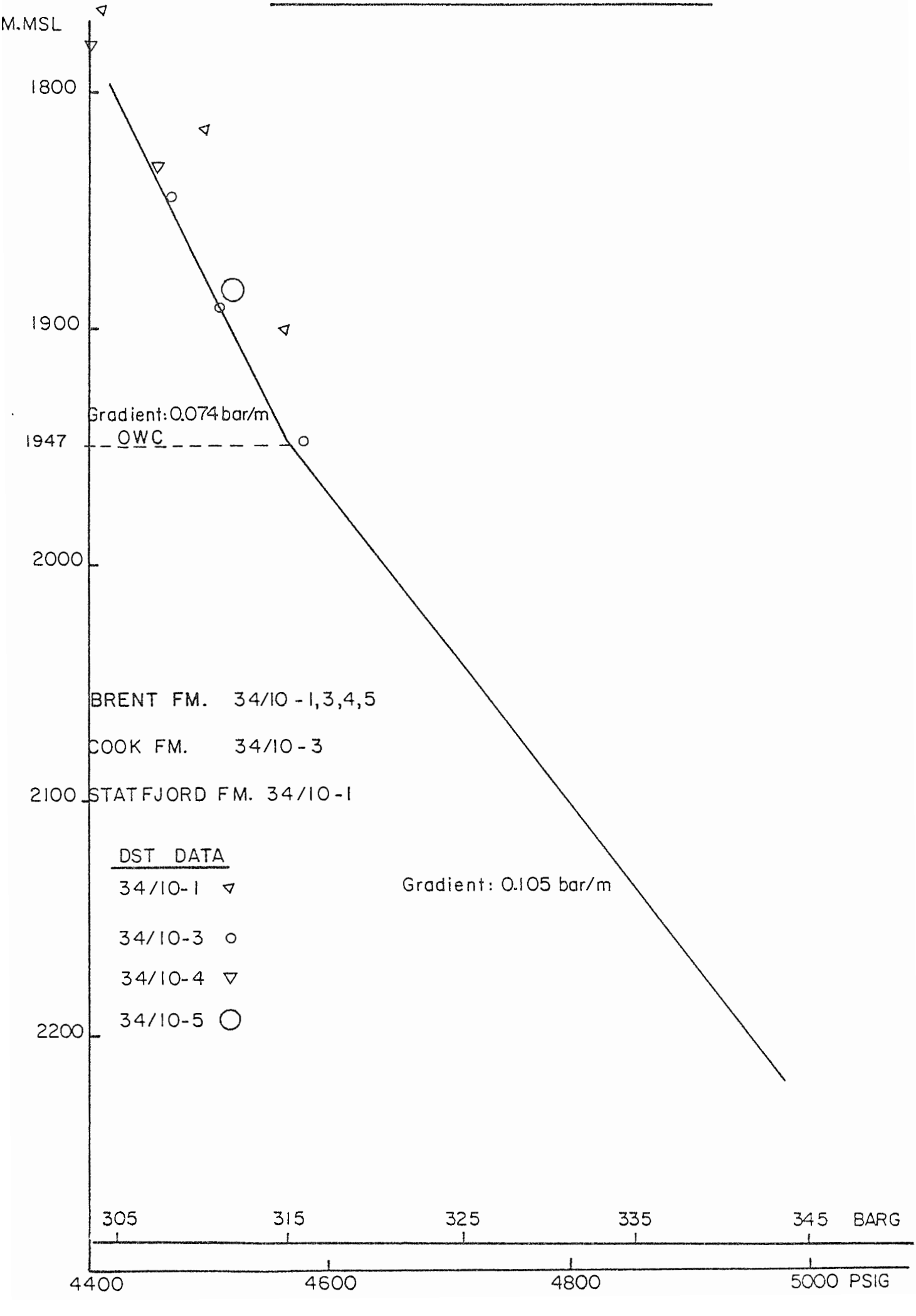

RFT 34/10-5 BRENT
DST ▼
RST △
GRADIENT: 0.074 bar/m
GRADIENT: 0.105 bar/m
DEPTH MSL M
1850
1875
1900
1925
1950
1975
2000
2025
2050
4500
4550
4600
4650
4700
4750
4800
FORMATION PRESSURE PSIG

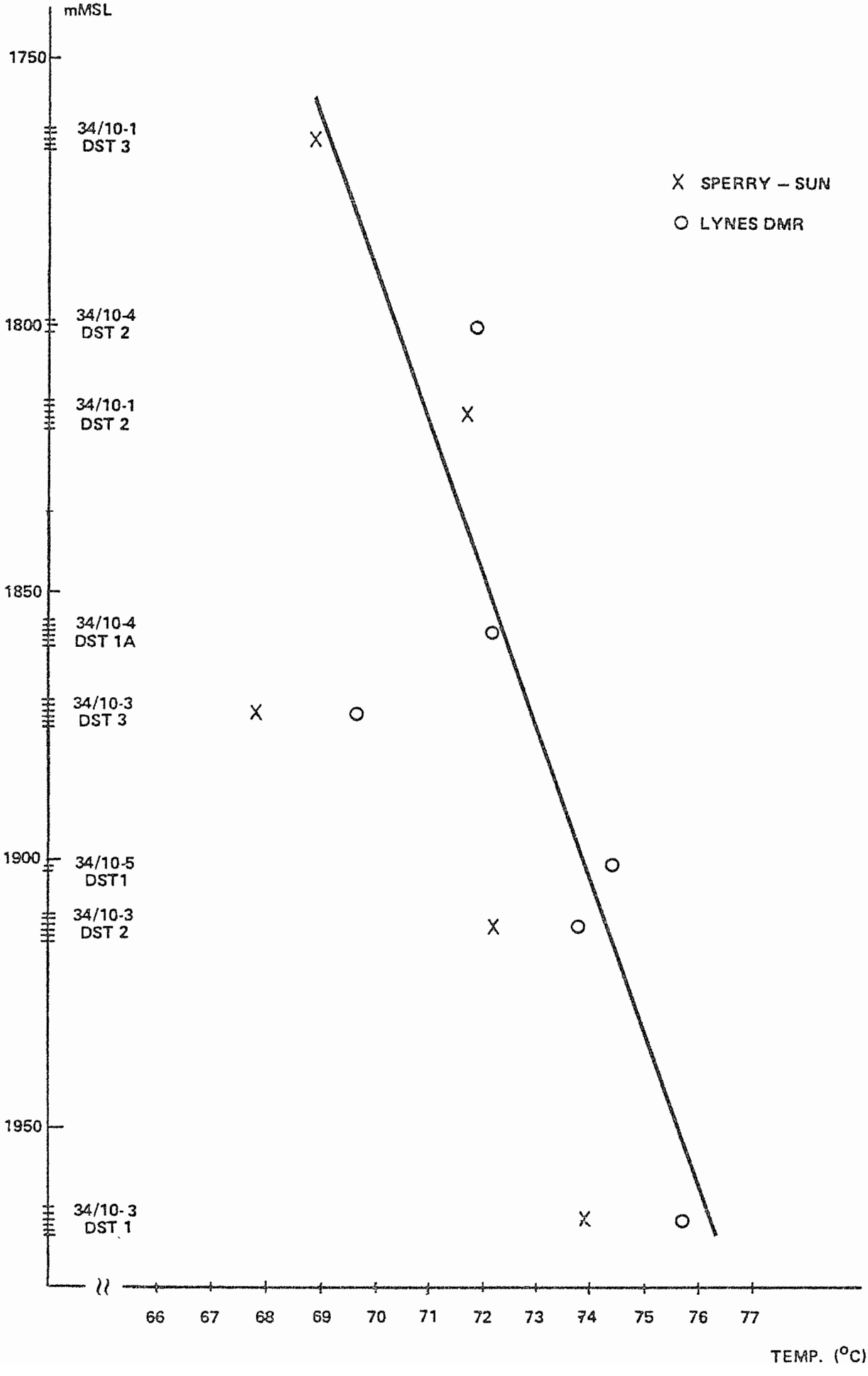
FIG. 3.1.1

RFT OG DST DATA 34/10 DELTA



APPENDIX A3 PAGE

34/10 - BRENT


mMSL
1750
1800
1850
1900
1950
34/10-1 DST 3
34/10-4 DST 2
34/10-1 DST 2
34/10-4 DST 1A
34/10-3 DST 3
34/10-5 DST1
34/10-3 DST 2
34/10-3 DST 1
X SPERRY – SUN
O LYNES DMR
66
67
68
69
70
71
72
73
74
75
76
77
TEMP. (°C)

APPENDIX A4 PAGE

SURFACE SAMPLING ON SEPARATOR

DST No 1. (1925 - 1927m RKB)

DATE/TIME	SAMPLE No	TYPE OF SAMPLE	TRANSFER TIME	BOTTLE No.
29-12-79				
05.00	1	OIL	30 min	20475/75
05.00	1	GAS	30 min	A 7706
05.30	2	OIL	30 min	16251/39
05.30	2	GAS	30 min	A 7092

BOTTOM HOLE SAMPLING

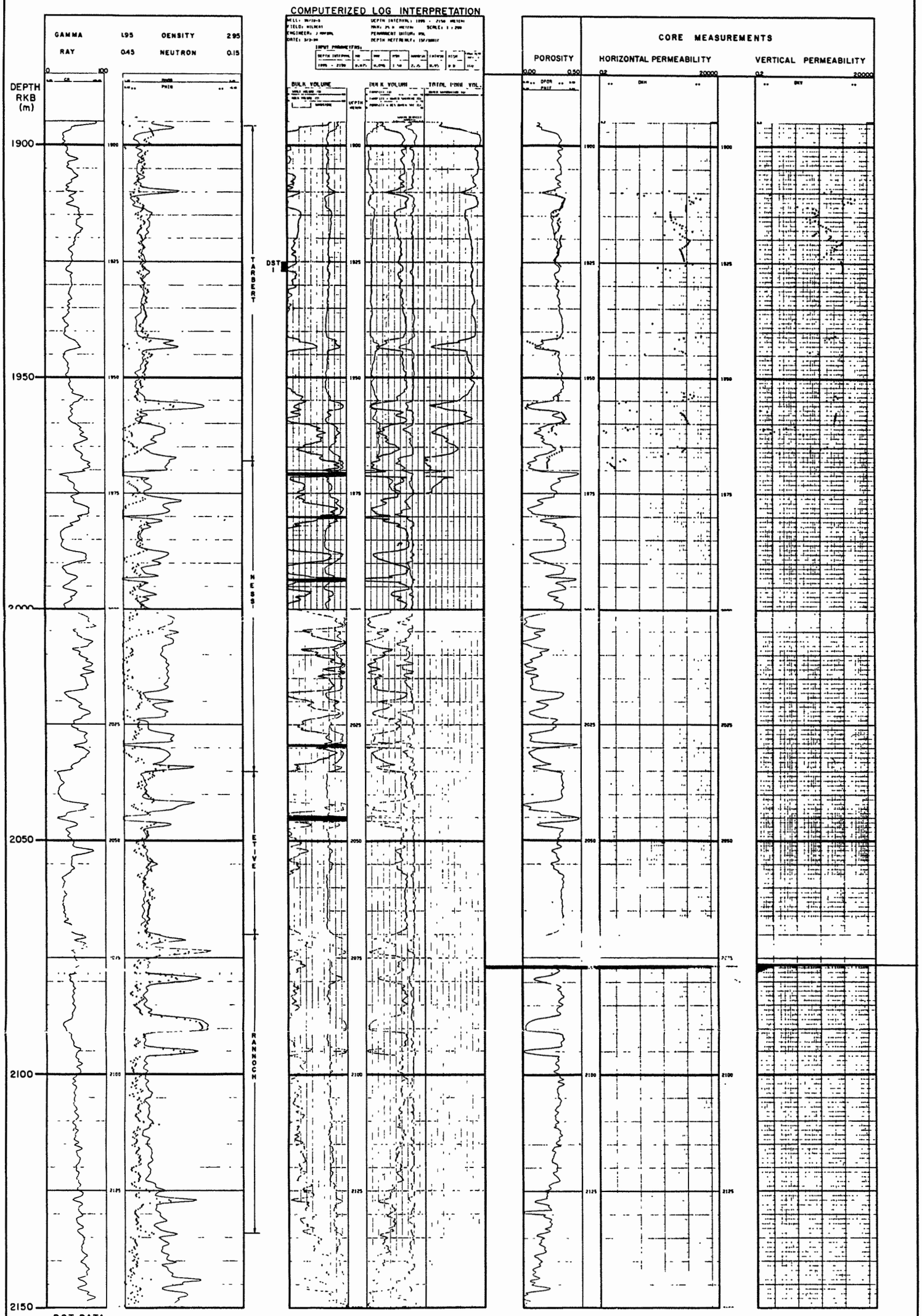
DST No 1 (1925 - 1927m RKB)

DATE/TIME	SAMPLE No	BOTTLE No	DEPTH (m)
29-12-79			
11.30	1	20475/67	1850
11.30	2	16251/35	1830

APPENDIX A5 PAGE

SUMMARY LOG WELL 34/10-5

BRENT FORMATION



DST DATA

DST 1
Interval : 1925 - 1927
Choke size : 32/64"
Production : 4580 STBO/D
2108 SCF/D
Traces of sand

Location
61° 11' 25.32" N
02° 10' 23. 4" E

KB-elevation = 25 m
Water depth = 136 m
Total depth = 2780m

Status:
Spudded: 18/10 1979
Rig released: 3/1 - 1980
Plugged and abandonned

MARCH 1980
PRO/ EVALTEK
JRa/AM

Data used in the DST analysis

The cutoff criteria used to calculate porosity, water saturation and net pay are:

Porosity, Ø	< 12%
Water saturation, Sw	> 65%
Shale volume, VSH	> 40%

From these outoff criteria the following are calculated:

h = 47 m (1896 - 1943 m RKB)
Ø = 29%
Sw = 21.5%

These values are used in the DST analysis.