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NUMBER 7220/2

PPL 13

EROMANGA AND COOPER BASINS

MARSILEA 1

TEST REPORTS

Submitted by

**Santos Ltd
1994**

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MINES AND ENERGY
SOUTH AUSTRALIA



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ENVELOPE 7220/2

TENEMENT: PPL 13; Eromanga and Cooper Basins

TENEMENT HOLDER: Santos Ltd (operator), Delhi Petroleum Pty Ltd, Vamgas Ltd and Sagasco Resources Ltd

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		MESA NO.	
REPORTS:	Coppock, S. and King, G., 1990. Results of modified isochronal gas production test, reservoir pressure buildup and static pressure gradient surveys of the Patchawarra Formation gas reservoir perforated interval 7614-7968 feet KB, conducted over the period 5-16/6/90 (Oilserv Australia Ltd).	7220/2 R 1 Pgs 3-49	
	Halliday, G.L., 1990. Marsilea Field, Patchawarra Formation, reservoir management plan (Santos Ltd, Petroleum Development Department, report no. RE:050/90, September 1990).	7220/2 R 2 Pgs 50-58	
PLAN	Scale		
Fig. 1	Mettika Trough 'V'-Horizon depth structure map. 1:25 000	Pg. 55	A3
REPORTS:	Grindlay, A. and Smith, A., 1991. Results of 96 hour reservoir pressure buildup, bottomhole pressure and static pressure gradient surveys, plus a liquids evaluation test, of the Patchawarra Formation gas producing zone, conducted over the period 9-23/5/91 (Expertest Pty Ltd).	7220/2 R 3 Pgs 59-84	
	Downie, M.L., 1991. Interpretation of the 1990 modified isochronal gas production test and associated pressure surveys (Santos Ltd, Petroleum Development Department, report no. RE:046/91, July 1991).	7220/2 R 4 Pgs 85-90	
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REPORTS:	Potter, B. and Taylor, S., 1993. Results of 96 hour reservoir pressure buildup, bottomhole pressure and static pressure gradient surveys, plus a liquids evaluation test, of the Patchawarra Formation gas producing zone, conducted over the period 17-23/6/93 (Expertest Pty Ltd).	7220/2 R 5 Pgs 124-139	
	Taylor, S., Hull, B. and Douer, N., 1994. Results of a liquids evaluation test of the Patchawarra Formation gas producing zone, conducted over the period 18-23/6/94 (Expertest Pty Ltd).	7220/2 R 6 Pgs 140-148	

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NATA CERTIFICATE

Telephone: (08) 372 2700

8 June 1989

Mr C. Martin
Santos Limited
39 Grenfell Street
ADELAIDE SA 5000

REPORT AC 2651/89

YOUR REFERENCE:

Supply Authority 25320

REPORT COMPRISING:

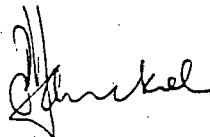
Cover sheet
Pages W1 - W3
Sample Identification Pages W1 - W3
Stiff Diagrams not available

DATE RECEIVED:

29 May 1989

Approved Signatory:

Martin R. Hanckel



Manager, Chemistry Services:

Dr Brian G. Steveson

for Dr William G. Spencer
General Manager
Applied Sciences Group

The report relates specifically to the sample tested and also the entire batch in so far as the sample is truly representative of the sample source.

hy



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YOUR REFERENCE:

Supply Authority 25320

REPORT COMPRISING:

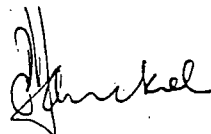
Cover sheet
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hy



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Date Collected NOT SHOWN
Date Received 21-5-89
Collected by



MDEL JOB NUMBER
2651/89

PAGE
W1

DATE 02-May-89

WELL: MARSILEA 1
D.S.T.:

1

SANTOS

FORMATION: PATCHAWARRA

INTERVAL: 7790'-7889'

RESULT: (1) = 10.9MMCFD

RECOVERY: TR CONDENSATE + 5BBLs MUDDY WATER

SAMPLE: MUDDY WATER

COLLECTED FROM: REVERSE CIRC @ MANIFOLD

SAMPLE PRESSURE: NOT SHOWN

SAMPLE Res/API: RES 0.38 @ 77°F

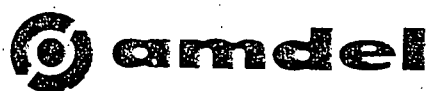
TIME TAKEN: 10.00

REMARKS: NOT SHOWN

SAMPLE 1 of 1

GEOLOGIST: M.BADCOCK

AMDEL Resistivity @ 25 °C = 0.444 Ohm.m



DEL JOB NUMBER
2651/89

PAGE
W2

DATE 08-May-89

WELL: MARSILEA 1
D.S.T.:

2

SANTOS

FORMATION: PATCHAWARRA

INTERVAL: 7920-7936' (L)

RESULT: MISSRUN

RECOVERY: 10' MUD SLIME, 550' WATER CUSHION, 1/2 LITRE FRESH WATER IN

SAMPLE: DRILLING MAKE UP WATER/H2O CUSHION

COLLECTED FROM: TURKEYS NEST

SAMPLE PRESSURE: NOT SHOWN

SAMPLE Res/API: RES 0.54 @ 73°F

TIME TAKEN: 06.00 HRS

REMARKS: NOT SHOWN

GEOLOGIST: M. BADCOCK

SAMPLE 1 of 3

AMDEL Resistivity @ 25 °C = 0.578 Ohm.m



AMDEL JOB NUMBER
2651/89

PAGE
W3

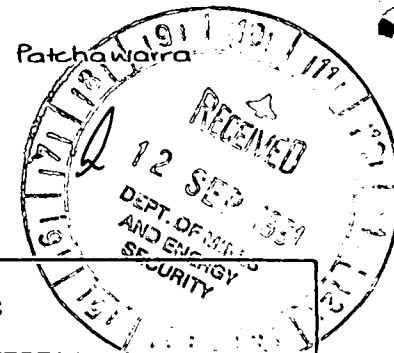
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*****
#                                     DATE NOT SHOWN #
#                                     #
# WELL: MARSILEA 1 #
# D.S.T.: 1 #
#                                     ----- #
#                                     SANTOS #
#                                     ----- #
# FORMATION: NOT SHOWN #
# INTERVAL: 7790'-7889' (D) #
# RESULT: NOT SHOWN #
# RECOVERY: NOT SHOWN #
#                                     #
# SAMPLE: MUD FILTRATE #
# COLLECTED FROM: NOT SHOWN #
# SAMPLE PRESSURE: NOT SHOWN #
# SAMPLE Res/API: RMF = 0.14 @ 76°F #
# TIME TAKEN: NOT SHOWN #
#                                     #
# REMARKS: NOT SHOWN #
#                                     #
#                                     #
# SAMPLE of #
# GEOLOGIST: NOT SHOWN #
#                                     #
#
```

AMDEL Resistivity @ 25 °C = 0.168 Ohm.m

SANTOS LTD.
WELL TEST SUMMARY

Page 1.

WELL: Marsilea #1 Lat.: 28° 21' 20" S
 TESTED BY: Oilserv Australia Ltd. LOCATION: Long: 140° 56' 18" E
 CASING SIZE: 7 ins PERFORATIONS: 7614 - 7968 ft DATE: 5-15/6/1990 FORMATION: Patchawarra
 TUBING SIZE: 2-7/8 ins WEIGHT: 234.26 lb/ft PRODUCING THROUGH: Tubing
 GRADE: J55 LT4C.
 GRADE: J55 NK3SB



DESCRIPTION OF TEST

INITIAL SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing kPa	Casing kPa	Temp. °C	
5/6/90	1800		18203	0		Diverted flow to separator - on cleanup
8/6/90	1400		17996	5050	59	HP Samples taken.
	2104					Choke determination commenced.
	2400	0	15444	4400	68	Shut Well In
10/6/90	1900	43	18561	0	17.5	Opened well on rate #1

Flow Period

Run No.: 1 Duration of Run: 4 Hours. Orifice Size: 2.000 ins
 Flow Well On: 13/64" Choke. Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing kPa	Casing kPa	Temp. °C	Pf kPa	Hw kPa	Temp. °C		
10/6/90	1900	0	18561	0	17.5					
	2000	1	17872	0	40	1172	21.41	5	3.600	1.200
	2100	2	17906	0	43	1172	22.91	9	2.880	0.480
	2200	3	18030	0	45	1172	22.41	12	1.440	2.400
	2300	4	18009	0	45	1172	20.92	14	2.160	0.960

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing kPa	Casing kPa	Temp. °C	
10/6/90	2300	0	18009	0	45	
	2330	0.5	18617	0	27	
	2400	1	18658	0	17	
11/6/90	0030	1.5	18630	0	15	
	0100	2	18616	0	13	
	0130	2.5	18616	0	13	
	0200	3	18603	0	13	
	0230	3.5	18603	0	12	
	0300	4	18596	0	12	Opened well on rate # 2

Orifice Size: 2.250 ins
Meter Run: 3.826 ins

[illegible]

500

3RD SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
11/6/90	0700	0	17582	0	51	Shut well in
	0730	0.5	18691	0	28	
	0800	1	18699	0		
	0830	1.5	18699	0		
	0900	2	18692	0		
	0930	2.5	18672	0		
	1000	3	18658	0		
	1030	3.5	18651	0		
	1100	4	18651	0	22	Opened well on rate # 3

Flow Period

Run No.: 3 Duration of Run: 4 Hours.
Flow Well On: 2 1/64" Choke.

Orifice Size: 2.500 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			kPa	kPa	°C	kPa	kPa	°C		
11/6/90	1100	0	18651	0	22					
	1200	1	16838	0	50	1379	26.89	7	3.840	2.400
	1300	2	16982	0	53	1379	27.39	10	3.120	3.600
	1400	3	17044	0	55	1379	27.39	12.5	2.640	4.320
	1500	4	17079	0	56.5	1379	27.39	14	2.880	4.320

SANTOS LTD.
WELL TEST SUMMARY

Page 4. ✓

4TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
11/6/90	1500	0	17079	0	56.5	Shut well in
	1530	0.5	18754	0		
	1600	1	18761	0		
	1630	1.5	18748	0		
	1700	2	18720	0		
	1730	2.5	18706	0		
	1800	3	18685	0		
	1830	3.5	18679	0		
	1900	4	18679	0	17	Opened well on rate #4

Flow Period

Run No.: 4 Duration of Run: 4 Hours.
Flow Well On: 29/64" Choke.

Orifice Size: 2.750 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing kPa	Casing kPa	Temp. °C	Pf kPa	Hw kPa	Temp. °C		
11/6/90	1900	0	18679	0	17					
	2000	1	14824	0	55	2000	26.89	16	4.800	8.880
	2100	2	15100	0	59	2069	27.14	20	6.240	6.720
	2200	3	15293	800	62	2069	27.39	23	6.720	4.080
	2300	4	15307	1100	64	2069	27.39	25	3.600	7.200

WP 2548G

00006

WELL TEST SUMMARY
FINAL STABILIZATION FLOW PERIOD

Flow Period

Run No.: 5 Duration of Run: 36 Hours.
Flow Well On: 26/64" Choke. (20 hrs only used for rates)

Orifice Size: 2.750 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover		Data	Condensate Production m ³ /d	Water Production m ³ /d
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			kPa	kPa	°C	kPa	kPa	°C		
11/6/90	2300	0	15307	1100	64					
	2400	1	16065	1800	65	1862	24.4	24		
12/6/90	0100	2	16100	3600	67	1862	24.4	26		
	0200	3	16100	4200	68	1862	24.4	27		
	0300	4	16114	4800	69	1862	24.4	28		
	0400	5	16134	5200	69	1862	24.4	29		
	0500	6	16148	5700	70	1862	24.4	31		
	0600	7	16169	6000	71	1862	24.4	31		
	0700	8	16189	6175	72	1862	24.4	33		
	0725		P.O.O.H. due to E/line			signal loss				
	0728		Cut choke to 16/64"							
	0740		Increased choke to 21/64"							
2 1/64"	0800		17196	5800	71	1517	18.43	30		
	0820		Cut choke to 16/64"							
	0828		Cut choke to 15/64"							
	0830		Opened choke to 26/64".			Closed swab valve.				
	0900		16203	5800	71	1862	25.40	31		
	0945		16217	6400	72	1862	25.40	33		
			Shut well in to			repair leaking Swab valve.				
	0953		Opened well on			26/64" choke				
	1000		Shut well in to			repair leaking Swab valve.				
	1040		Opened well on			26/64" choke				
	1100		16782	3200	69	1517	21.91	31.5		
	1200		17210	4400	70	1655	16.43	31.5		
	1245		Shut well in - remove obstructions			from choke.				
	1248		Run E-line gauges.							
	1330		18837	1000	37					
	1455		on bottom @ 8000' KB							
	1500	0	18768	0	22	Opened well on 26/64" choke.				
	1600	1	15203	1400	66	2000	26.39	29	3.360	6.720
	1700	2	15410	4000	69	2000	26.89	32	1.920	7.920
	1800	3	15507	5400	71	2000	26.89	34	2.880	7.920
	1900	4	15583	6200	72	2069	26.89	36	2.400	5.520

WP 2548G

00007

WELL TEST SUMMARY

Run No.: 5 Duration of Run: 36 Hours. Orifice Size: 2.750 ins
Flow Well On: 26/64" Choke. (20 hrs only used for rates) Meter Run: 3.826 ins

[illegible]

0000

FINAL BUILD-UP, SUBSURFACE PRESSURES

LUB.

[illegible]

SANTOS LTD.
WELL TEST SUMMARY
CALCULATION SHEET

Page 8.

GAS RATES THROUGH SEPARATOR

Run No.	Hw		Pf		Size Orifice Plate		Ft	
	(kPa)	("w.g.)	(kPa)	(psig)	(mm)	(inches)	(°C)	(°F)
1	20.92	84	1172	170	50.800	2.000	14	57.2
2	26.9	108	1248	181	57.150	2.250	10	50.0
3	27.39	110	1379	200	63.500	2.500	14	57.2
4	27.39	110	2069	300	69.850	2.750	25	77.0
5	27.14	109	2117	307	69.850	2.750	44.5	112.1

Separator Gas Properties

Specific Gravity = 0.841 ✓
 TC = 413.3 °R ✓
 PC = 751.3 psia ✓
 CO2 CONTENT = 21.19 mole % ✓
 Meter Run = 3.826"

GAS RATES THROUGH SEPARATOR

Run No.	Q	
	E3 m ³ /d	mmscf/d
1	79.351	2.816
2	121.366	4.308
3	163.414	5.800
4	248.849	8.833
5	241.457	8.570

WP 2548G

00011

GAS WELL DELIVERABILITY TEST CALCULATIONS
(Base Conditions = 14.65 psia and 60°F)

WELL NAME: Marsilea # 1 DATE: 5-15/6/1990 ELEMENT NO: E-Line SRO Gauge DEPTH TESTED: 8000' KB
DWT IN: _____ OUT: _____
LUB IN: _____ OUT: _____

SIMPLIFIED ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	Bottom Hole Temp (°C)	Meas.	Δp^2 ($\times 10^6$ psia ²)	Flow Rate E 3m ³ /d	H/Carbon Prod. m ³ /d	Water Prod. m ³ /d	REMARKS
Initial Shut In	43	3411.4	141.4	✓	—	—	—	—	$q = C(\bar{p}_R^2 - p_{wf}^2)^n$ ✓ slope n = _____ $\bar{p}_R =$ _____ psia $C = \frac{q}{(\bar{p}_R^2 - p_{wf}^2)^n}$ ✓ = _____ AOF (MMscfd) ✓ = _____
Flow 1	4	3363.3	141.2	✓	0.326		2.520	1.260	
Shut In	4	3413.6	141.1	✓	—	—	—	—	
Flow 2	4	3320.4	140.9	✓	0.628		2.820	2.460	
Shut In	4	3415.0	140.8	✓	—	—	—	—	
Flow 3	4	3276.6	140.6	✓	0.926		3.120	3.660	
Shut In	4	3415.8	140.5	✓	—	—	—	—	
Flow 4	4	3185.4	140.3	✓	1.521		5.340	6.720	
Extended Flow	* 36	3187.8	139.3	✓	1.328		2.364	5.928	
Final Shut In	48.13	3389.7	138.2	✓	—	—	—	—	

WP 2548G

* During these 36 hours, the well was shut in several times due to a leaking swab valve.
Ext flow rates calculated over final 20 hour period only.

00012

GAS WELL DELIVERABILITY TEST CALCULATIONS
 (Base Conditions = 14.65 psia and 60°F)

LIT (ψ) ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	ψ ($\times 10^6$ psia ² /cp)	$\Delta\psi$ ($\times 10^6$ psia ² /cp)	Flow Rate (q) (MMscfd)	$\Delta\psi/q$	q^2	$\Delta\psi - bq^2$
Initial Shut In	43	3411.4						
Flow 1	4	3363.3						
Shut In	4	3413.6						
Flow 2	4	3320.4						
Shut In	4	3415.0						
Flow 3	4	3276.6						
Shut In	4	3415.8						
Flow 4	4	3185.4						
Total=								
Extended Flow	* 36	3187.8						
Final Shut In	48.13	3389.7						

WP 2548G

* During these 36 hours the well was shut in several times due to a leaking swab valve.
 Ext flow rates calculated over final 20 hour period only.

00013

GAS WELL DELIVERABILITY TEST CALCULATIONS

L.I.T. (Ψ) ANALYSIS

DISCARDED POINT _____

RESULTS

$$N = \text{_____} \quad \bar{\Psi}_R = \text{_____} \text{ MMpsia}^2/\text{cp}$$

$$\text{TRANSIENT FLOW: } \bar{\Psi}_R - \Psi_{wf} = a_t q + bq^2$$

$$a, a_t = \frac{\sum \frac{\Delta \Psi}{q} \sum q^2 - \sum q \sum \Delta \Psi}{N \sum q^2 - \sum q \sum q} = \text{_____}$$

$$\text{i.e. } \text{_____} - \Psi_{wf} = \text{_____} q + \text{_____} q^2$$

$$b = \frac{N \sum \Delta \Psi - \sum q \sum \frac{\Delta \Psi}{q}}{N \sum q^2 - \sum q \sum q} = \text{_____}$$

$$\text{STABLIZED FLOW: } \bar{\Psi}_R - \Psi_{wf} = aq + bq^2$$

$$\text{i.e. } \text{_____} - \Psi_{wf} = \text{_____} q + \text{_____} q^2$$

(EXTENDED FLOW)

$$\Delta \Psi = \text{_____} q = \text{_____} \quad b = \text{_____}$$

DELIVERABILITY:

$$a = \frac{\Delta \Psi - bq^2}{q} = \text{_____}$$

$$q = \frac{1}{2b} [-a + \sqrt{a^2 + 4b (\bar{\Psi}_R - \Psi_{wf})}]$$

$$\text{FOR } \Psi_{wf} = 0, q = \text{AOF} = \text{_____} \text{ MMscfd}$$

$$\text{A.O.F.} = \text{_____} \text{ MMSCFD} \quad n = \text{_____}$$

$$\text{Total Volume of Gas Produced During Test} = \text{_____} \text{ MMSCF}$$

$$\text{Condensate} = \text{_____} \text{ Bbls}$$

$$\text{Water} = \text{_____} \text{ Bbls}$$

REMARKS

Interpreted by:

Date:

MARSILEA #1

Date: 10/6/90

Lubricator Data:

Pressure with D.W.T.

Time Pressured

1518

10/6/90

Time Depressed

0830

12/6/90

Time Run in Hole

10/6/90

Time off Bottom

0725

12/6/90

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range

58508 x 4000 psig

Recorder No.

55387

Click and Lead Screw Data

F23707 - 120 hr S.P.

Engage Stylus

Date: 10/6/90 Time: 14:59

Date:

Time:

Disengage

Date: 12/6/90 Time: 09:10

Date:

Time:

Remarks:

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
10/6/90	1518		18582	0		Pressure Up Lubricator
	1548					Run In Hole
	1645					Hang @ 8000' KR
	1900		18561	0	17.5	Open Well on 3/64
	2000		17872	0	40	Choke Rate #1
	2100		17906	0	43	
	2200		18030	0	45	
	2300		18009	0	45	S.W.I.
	2400		18658	0	17	
12/6/90	0100		18616	0	13	
	0200		18603	0	13	
	0300		18596	0	12	Open Well on 1/64"
	0400		17444	0	45	Choke Rate #2
	0500		17513	0	48	
	0600		17575	0	50	
	0700		17582	0	51	S.W.I.
	0800		18699	0		
	0900		18692	0		
	1000		18658	0		
	1100		18651	0		
	1200		16838	0	22	Open Well on 3/64'
	1300		16982	0	50	Choke Rate #3
	1400		17044	0	53	
	1500		17079	0	55	
					56.5	S.W.I.

SANTOS LTD.
ISO-CHRONAL AND BUILD-UP SURVEY CONTINUATION
Date 11.6.90

0016

Date: 11.6.90

PAGE 2 of

Well: MARSILEA #1

Well-Head Data for Final Build-up						
Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
11-6-90	1600		18761	0		
	1700		18720	0		
	1800		18685	0		
	1900		18679	0		Open well on 29/64 choke
	2000		14824	0	55	
	2100		15100	0	59	
	2200		15293	300	62	
	2300		15307	1100	64	Reduce choke to 26/64
12-6-90	2400		16065	1800	65	
	0100		16100	3600	67	
	0200		16100	4200	68	
	0300		16114	4800	69	
	0400		16134	5200	69	
	0500		16148	5700	70	
	0600		16169	6000	71	
	0700		16189	6175	72	
	0725					P.O.O.H
	0830					Depressure Lub
	0910					Disengage Stylus.
		</				

ISO - CHRONAL AND BUILD-UP SURVEY

MARSILEA #1

Date: 12/6/90

00017

for data:

re with D.W.T.

ressed.

Run Hole

18837 Kpa

1216 12/6/90

1248 12/6/90

Time Depressed.

Time off Bottom.

Bomb No. 1 Data

Bomb No. 2 Data

ner No. and Range 58508 x 4000 PSI

cord No. 55387

ck and Lead Screw Data F23707 x 120hr. S.P.

gag Stylus Date: 12/6/90 Time: 1156

Date:

Time:

sepage Date: 12/6/90 Time: 0950

Date:

Time:

arks:

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
12/6/90	1156					Engage Stylus
	1245		18837	1000	37	Pressure Up Lubricator
	1248					Run In Hole
	1455					Hang @ 8000' KB
	1500		18768	0	22	Open Well on 2 1/4" choke
	1600		15203	1400	66	
	1700		15410	4000	69	
	1800		15507	5000	71	
	1900		15583	6200	72	
	2000		15617	7100	73	
	2100		15652	600	74	
	2200		15686	1200	75	
	2300		15707	1600	76	
	2400		15721	1900	76.5	
12/7/90	0100		15727	2100	77	
	0200		15734	2350	78	
	0300		15762	2600	78	
	0400		15790	2700	78.5	
	0500		15796	2850	79	
	0600		15810	3000	79	
	0700		15824	3200	79	
	0800		15838	3400	79	
	0900		15845	3500	80	
	1000		15845	3600	80	

Well: MARSILEA #1

Date: 13-6-90

PAGE 2 of 2

[illegible]

MARSILEA #1

Date: 5/6/90

Lubricator Data:

Pressure with D.W.T.

18582

Time Pressured

1430

5/6/90

Time Depressed

1307

10-6-90

Run in Hole

1540

5/6/90

Time off Bottom

1130

10-6-90

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range

58508 x 4000 psig

Recorder No.

55387

Clock and Lead Screw Data

F23407 x 120hr S.P.

Engage Stylus

Date: 5-6-90 Time: 1250

Date:

Time:

Disengage

Date: 10-6-90 Time: 1342

Date:

Time:

Remarks:

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
5/6/90	1540		18589	0		Run In Hole
	1715					Hang @ 8000' KB
	1720					Pressure Test Lines
	1731					Open to Flare
	1735					Shut Well In
	1746					Pressure Test Lines
	1750					Open Well on 1 3/4"
	1800		18203	0		Choke
	1900		18134	200	36	
	2000		18044	200	38	
	2100		17996	250	39	
	2200		18010	300	40	
	2300		18017	300	41	
	2400		18051	300	41	
5/6/90	0100		18072	300	42	
	0200		18086	350	42	
	0300		18079	350	43	
	0400		18086	350	43.5	
	0500		18086	350	44	
	0600		18092	350	44	
	0700		18092	350	44.5	
	0800		18099	350	45	
	0900		18106	400	45	

SANTOS LTD.

00020

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

Well: MARSILEA #1

Date: 6/6/90
Page 2 of 4

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead Y	KPA Casing	°C Wellhead Temp.	Remarks
6/6/90	1000		18106	400	45.5	
	1100		18127	400	46	
	1200		18134	400	46	
	1300		18134	400	46	
	1400		18141	500	47	
	1405				-	Change Choke to 15/64"
	1500		17955	650	49	
	1600		17961	850	50	
	1700		17975	1100	50	
	1800		17982	1350	51	
	1900		17989	1550	51.5	
	2000		17996	1750	52	
	2100		17996	2000	52	
	2116		-	-	-	Change Choke to 16/64"
	2200		17879	2400	53	
	2300		17886	2700	53.5	
	2400		17886	3000	54	
7/6/90	0100		17886	3300	54	
	0200		17899	3600	55	
	0300		17906	3700	55	
	0400		17906	4000	56	
	0500		17906	4200	56	
	0600		17899	4400	57	
	0700		17899	4500	57	
	0800		17899	4600	57	Change Choke to 15/64"
	0900		18009	4450	56.5	
	1000		18016	4400	57	
	1100		18003	4350	57	
	1200		18016	4400	56.5	
	1300		17996	4300	57	
	1400		18009	4300	57	
	1500		17996	4400	57	
	1600		18009	4350	57	
	1700		18009	4400	57	
	1800		18009	4450	57	
	1900		18003	4450	58	

SANTOS LTD.

00021

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

Well: MARSILEA #1

Date: 7/6/90

Page 3 of 4

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
7/6/90	2000		17996	4450	58	
	2100		18009	4500	58	
	2200		18009	4500	58	
	2300		17996	4550	58	
	2400		17996	4600	58	
8/6/90	0100		17996	4600	58	
	0200		17989	4600	58	
	0300		17996	4700	58	
	0400		17989	4700	58	
	0500		17989	4750	58	
	0600		17975	4800	58	
	0700		17975	4850	58	
	0800		17982	4850	58	
	0900		18003	4900	58	
	1000		17989	4950	58	
	1100		18003	5000	58.5	
	1200		18003	5000	58.5	
	1300		18003	5050	59	
	1400		17996	5050	59	
	1500		18009	5050	59	
	1600		18009	5100	59.5	
	1700		17989	5150	60	
	1800		17996	5200	60	
	1900		17982	5200	60	
	2000		17989	5250	60	
	2100		17961	5300	59.5	
	2300		16203	2000	65	
9/6/90	2400		15444	4400	68	Shut Well In.
	0100		18872	0		
	0200		18851	0		
	0300		18823	0		
	0400		18784	0		
	0500		18768	0		
	0600		18748	0		
	1000		18720	0		
	1400		18685	0		
	1800		18650	0		

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

Weil: MARSILEA #1

Date: 9-6-90

PAGE 4 of 4

Well-Head Data for Final Build-up

[illegible]

BOMB No. 1 DATA

ELEMENT No. 58508 ELEMENT RANGE: 0-4000 Psi
RECORDER No. 55387 CLOCK DATA: F23707 * 120hr
ENGAGE SYLUS: 1156 12/6/90 DISENGAGE: 15/6/90

BOMB No. 2 DATA

ELEMENT No..... ELEMENT RANGE:.....
 RECORDER No..... CLOCK DATA:.....
 ENGAGE STYLUS:..... DISENGAGE:.....

LUBRICATOR DATA

PRESSURE WITH D.W.T.:

TIME PRESSURED:

TIME DEPRESSURED:

General Comments:

0000

Client: SANTOS LTD Well: MARSILEA # 1 Date: 4TH JUNE, 1990

SEQUENCE OF EVENTS: PAGE NO: 1

DATE:	TIME:	REMARKS:
5/6/90	0700	Start rigging up Electric line & PT equipment.
	0900	Make up Tool String with EPG-520 S/N 56027 & RPG-3 Amerada 180 hr clock. Service generator.
	1413	Stab lubricator on wellhead.
	1430	Open swab valve & pressure up lubricator to SIWHP 18589kPa.
	1540	R.I.H. WHP 18589 kPa.
	1655	Correlate depth with OCL. T.S. 15' deep.
	1715	At survey depth of 8000'. Hang off.
	1720	Pressure test lines to SIWHP 18589 kPa - OK.
	1731	Open well to flare, bypass separator.
	1735	Shut in well to change out choke.
	1746	Pressure test lines.
	1750	Open well to flare on $1\frac{3}{4}$ " variable choke. Bypass separator.
	1800	Divert flow through separator.
6/6/90	1400	Increase choke to $1\frac{5}{8}$ ".
	2118	Increase choke to $1\frac{5}{8}$ ".
7/6/90	0800	Decrease choke to $1\frac{5}{8}$ ".
8/6/90	1200	Commence HP surface sampling.
	2100	Commence choke setting determination.
	2400	Shut in well for build up.
9/6/90		Monitor build up.
10/6/90		Monitor build up.
	1130	P.O.O.H. to rehead gauge as per programme.
	1230	In lubricator.
	1307	Close swab valve & depressure lubricator. Unstab & rig down electric line to rehead cable head, redress Tool String & Amerada.
	1510	Stab lubricator on swab valve.

cont/2

SEQUENCE OF EVENTS:

PAGE NO: 2

DATE:	TIME:	REMARKS:
	1518	Open swab valve & pressure up lubricator. Hang at 10' KB.
	1548	R.I.H. WHP 18582 kPa.
	1645	On depth, hang off at 8000'KB.
	1900	Open well at wing valve for rate # 1 of Modified Isochronal on $1\frac{3}{4}$ " to separator & flare.
	2300	Shut in well at wing valve for rate # 1 build up.
11/6/90	0300	Open well for rate # 2 on $1\frac{3}{4}$ ".
	0700	shut in well at wing valve for rate # 2 build up.
	1100	Open well for rate # 3 $2\frac{1}{4}$ ".
	1500	Shut in well at wing valve for rate # 3 build up.
	1900	Open well for rate # 4 on $1\frac{3}{4}$ ".
12/6/90	2300	Decrease choke to $2\frac{3}{4}$ " for Extended Flow.
	0510	Gauge signal attenuating, tool failed. Wait on daylight & instructions from town to P.O.O.H.
	0725	Start P.O.O.H.
	0728	Reduce choke to $1\frac{3}{4}$ " & start P.O.O.H.
	1740	Increase choke to $2\frac{1}{4}$ " once in tubing.
	0820	Reduce choke to $1\frac{3}{4}$ ".
	0828	Reduce choke to $1\frac{3}{4}$ " as pull into lubricator.
	0830	Close swab valve & bleed lubricator, increase choke to 26.
	0845	Truble shoot gauge & Tool String. Gauge OK.
	0945	Leak noticed in wellhead to swab valve cross over. Shut in to tighten.
	0953	Open well on $2\frac{3}{4}$ ".
	1000	Cross over still leaking. shut in well at M.V. remove and out cross over.
	1040	Open well on $2\frac{3}{4}$ ". Rehead cable head. Short in insulation due to high temperature. Redress Tool string & Amerada gauge.

cont/3

SEQUENCE OF EVENTS:

PAGE NO: 3

DATE:	TIME:	REMARKS:
	1210	Stab lubricator on wellhead.
	1216	Open swab valve & pressure up lubricator.
	1245	Shut in well at wing valve to check choke & whilst running flow tee. Metal & rubber (Weco Seal) bits found in .
	1248	R.I.H. & OCL to depth.
	1455	Hang off at survey depth of 8000'KB.
	1500	Open well up to 2 3/4" for continuation of extended flow. Monitor Extended Flow BHP.
13/6/90		Monitor Extended Flow BHP.
	1100	Shut in well for build up. FFBHP 21980 kPa, FFBHT 139.3 deg. FFIHP 15845 kPa, FFIHT 81 deg C. Monitor build up.
	2100	Gauge temperature declining steadily. Gauge malfunctioning.
14/6/90	0600	Power down gauge & await instructions from town.
	1600	Power up gauge - working OK. Continue monitoring build up.
15/6/90		monitor build up.
	1108	P.O.O.H. FSIBHP 23372 kPa, FSIBHT 139.2 deg F. FSITHP 184.
	1110	Stop # 1 7950' KB.
	1125	P.O.O.H. Gradient : 0.212 psi/ft.
	1129	Stop # 2 7791'KB.
	1200	P.O.O.H. Gradient: 0.484 psi/ft.
	1203	Stop # 3 7580' KB.
	1240	P.O.O.H. Gradient: 0.313 psi/ft.
	1242	Stop # 4 7500' KB.
	1311	P.O.O.H. Gradient: 0.012 psi/ft.
	1318	Stop # 5 7000'KB.
	1340	P.O.O.H. Gradient: 0.078 psi/ft.
	1345	Stop # 6 6500' KB.

cont/4

SEQUENCE OF EVENTS:

PAGE NO: 4

DATE:

TIME:

REMARKS:

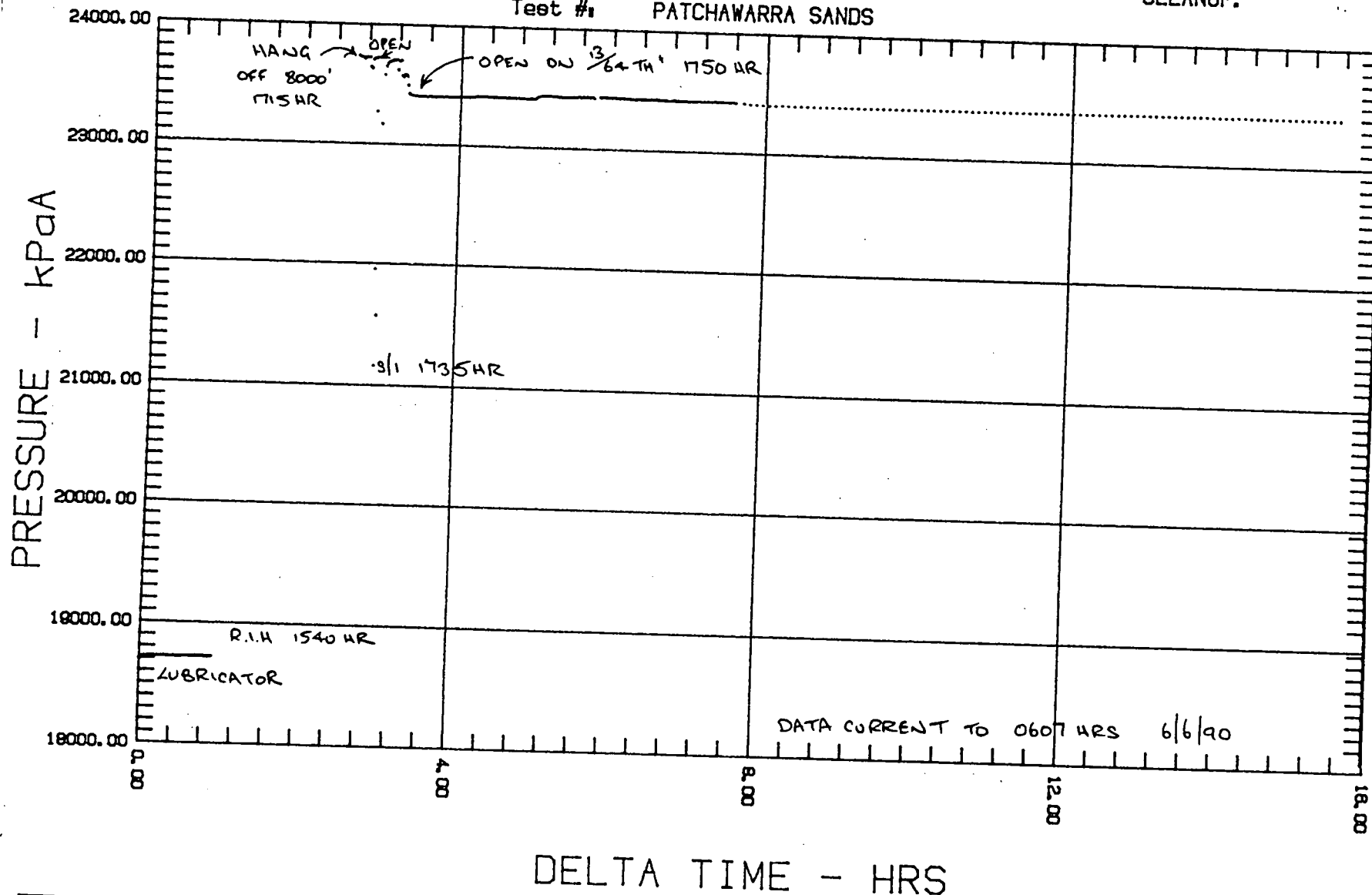
1409		P.O.O.H. Gradient: 0.077 psi/ft.
1414		Stop # 7 6000' KB.
1433		P.O.O.H. Gradient: 0.077 psi/ft.
1438		Stop # 8 5500' KB.
1502		P.O.O.H. Gradient: 0.079 psi/ft.
1507		Stop # 9 5000' KB.
1525		P.O.O.H. Gradient: 0.080 psi/ft.
1535		Stop # 10 4000' KB.
1557		P.O.O.H. Gradient: 0.082 psi/ft.
1606		Stop # 11 3000' KB.
1629		P.O.O.H. Gradient: 0.083 psi/ft.
1639		Stop # 12 2000' Kb.
1657		P.O.O.H. Gradient: 0.090 psi/ft.
1707		Stop # 13 1000'KB.
1727		P.O.O.H. Gradient: 0.096 psi/ft.
1742		Stop # 14 0'KB. In lubricator.
1806		Close swab valve & depressure lubricator.
1805		Close M.V. & secure well, stand down for night.
16/6/90	0700	Unstab lubricator & rig off wellhead. E.O.T. Start rigging down Electric line. Move to next location : Amyema # 1.

Plot starting date: 8/ 5/90
time: 14:37:23

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST
CLEANUP.



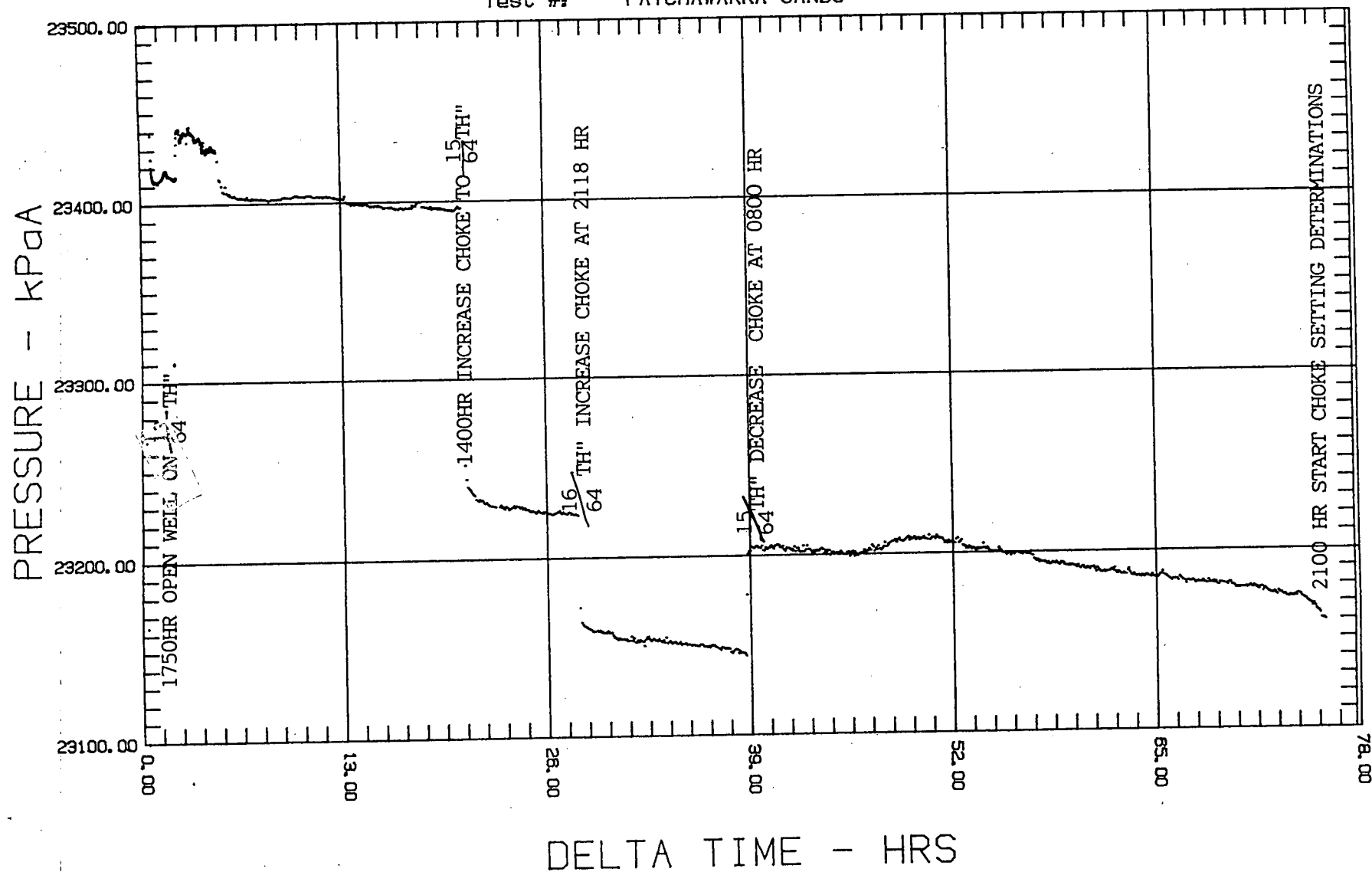
00028

Plot starting date: 6/ 5/90
time: 17:17: 3

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP.



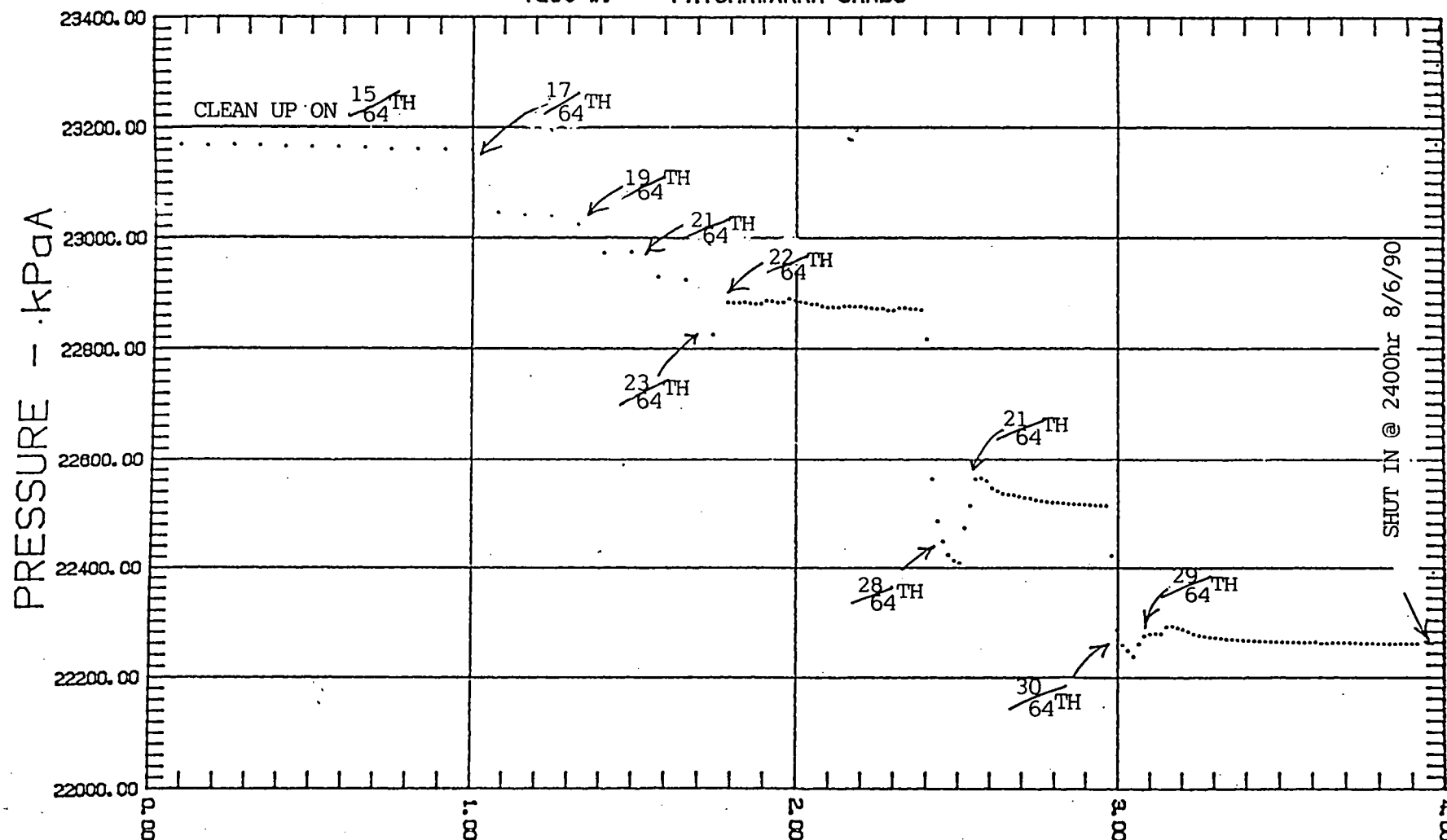
00029

Plot starting date: 6/ 8/90
time: 20: 2:41

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST
CLEANUP



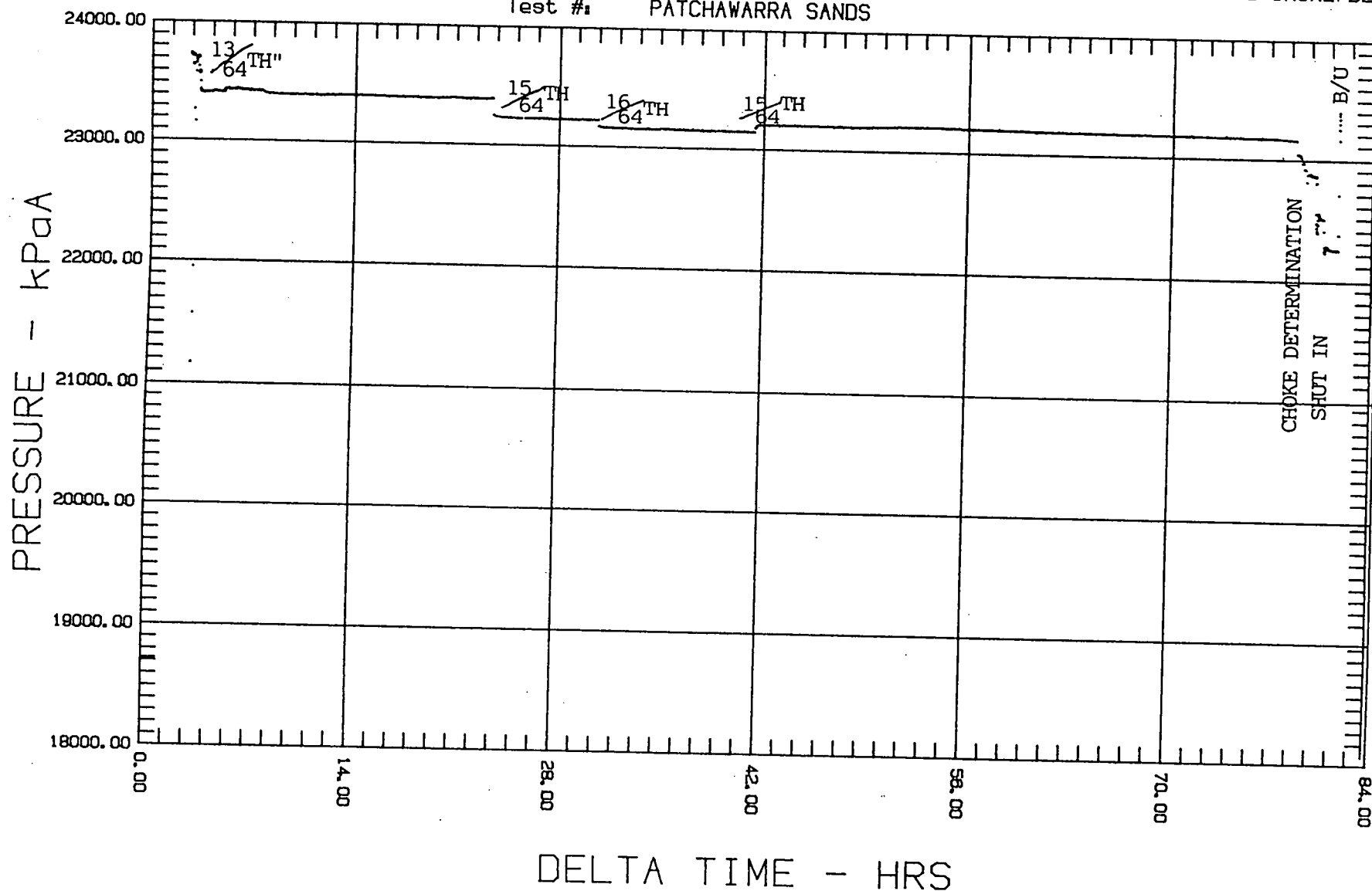
00030

Plot starting date: 8/ 5/90
time: 14:37:23

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP & CHOKE DETERMINATION.



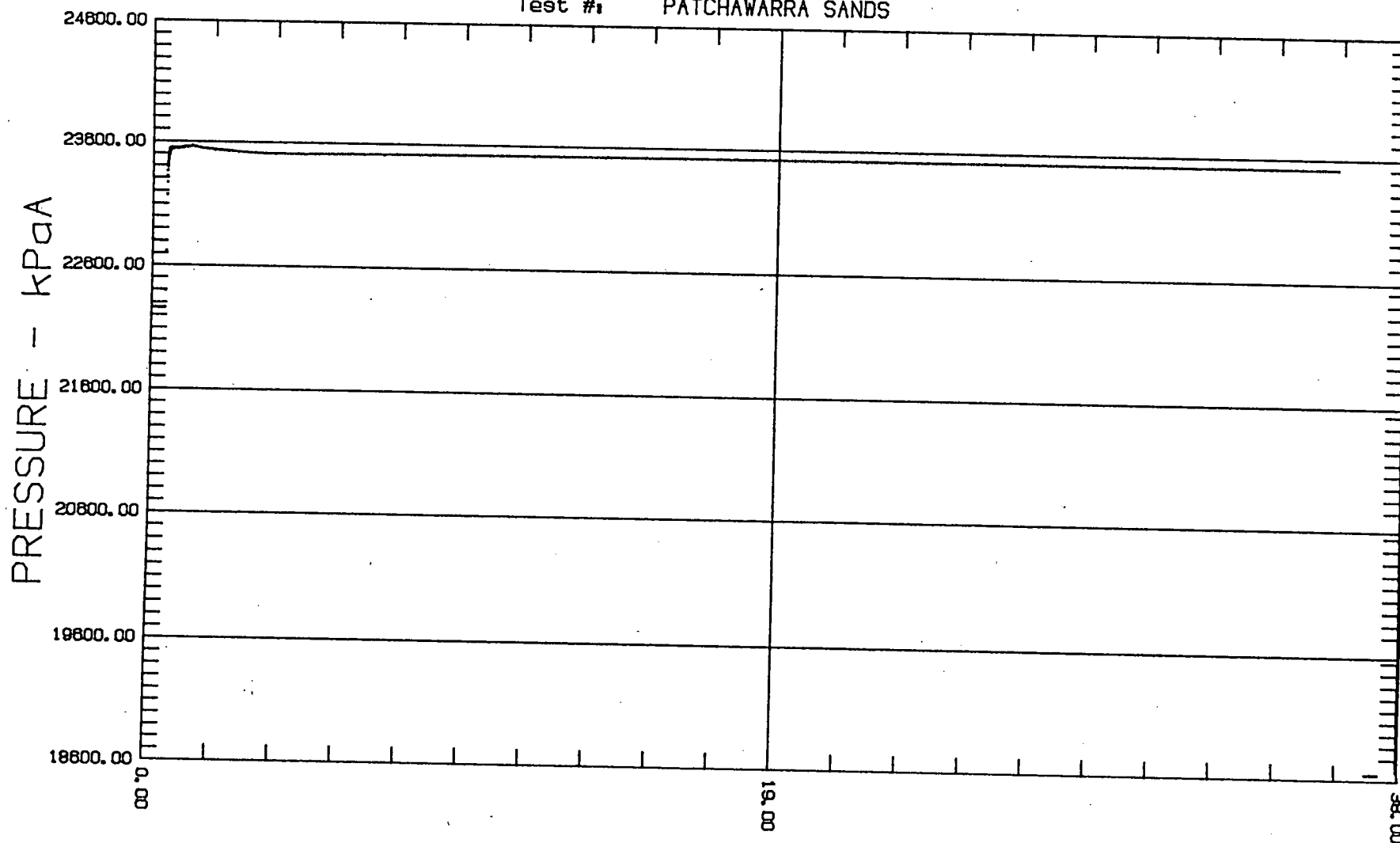
00031

Plot starting date: 6/ 8/90
time: 23:36: 0

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP BUILDUP.



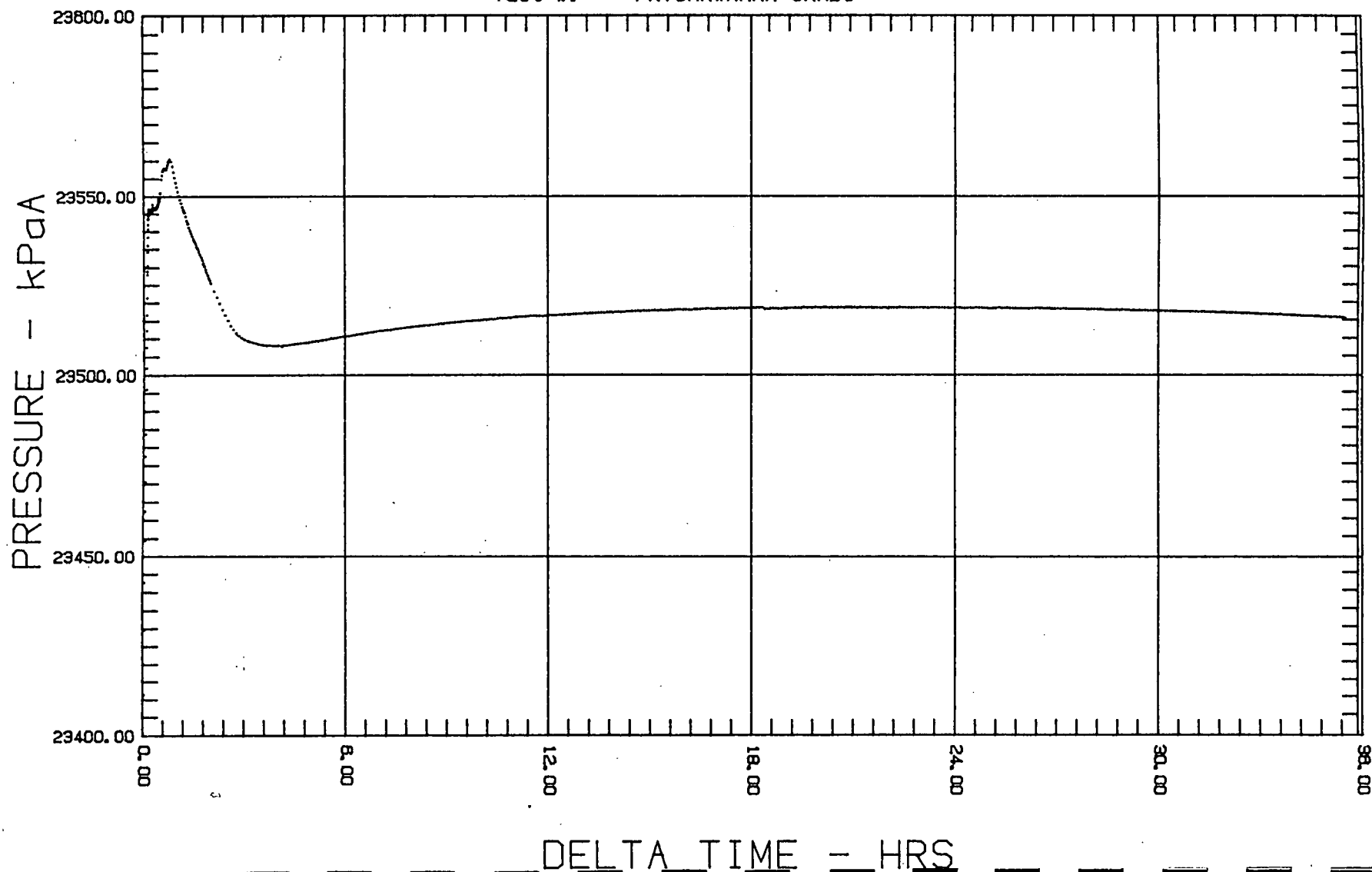
00032

Plot starting date: 6/ 9/90
time: 0: 0:25

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP BUILDUP.



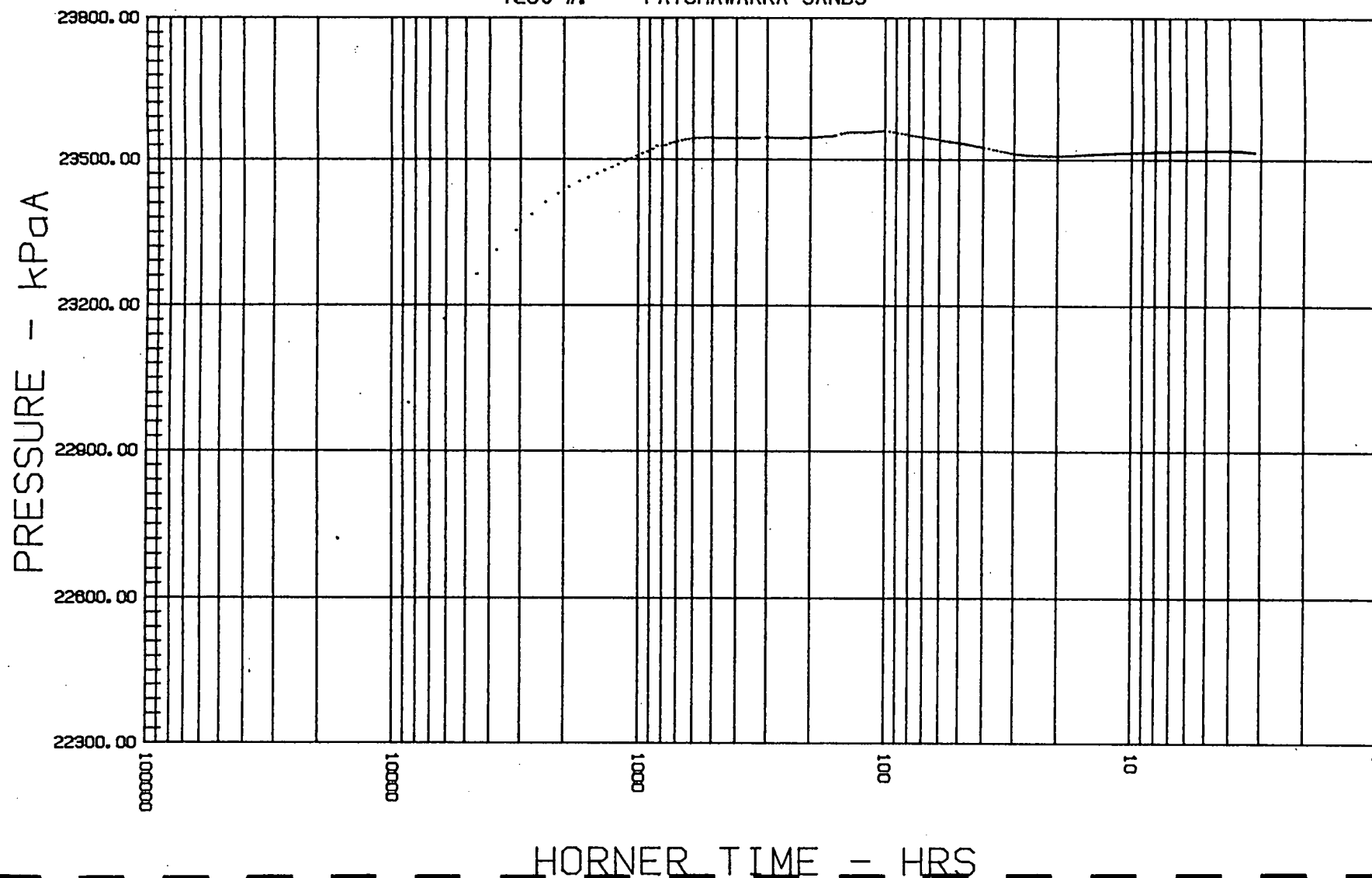
00033

Plot starting date: 6/ 9/90
time: 0: 0: 25

Gauge S/N
Flow time: 78.250 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP BUILDUP.



00034

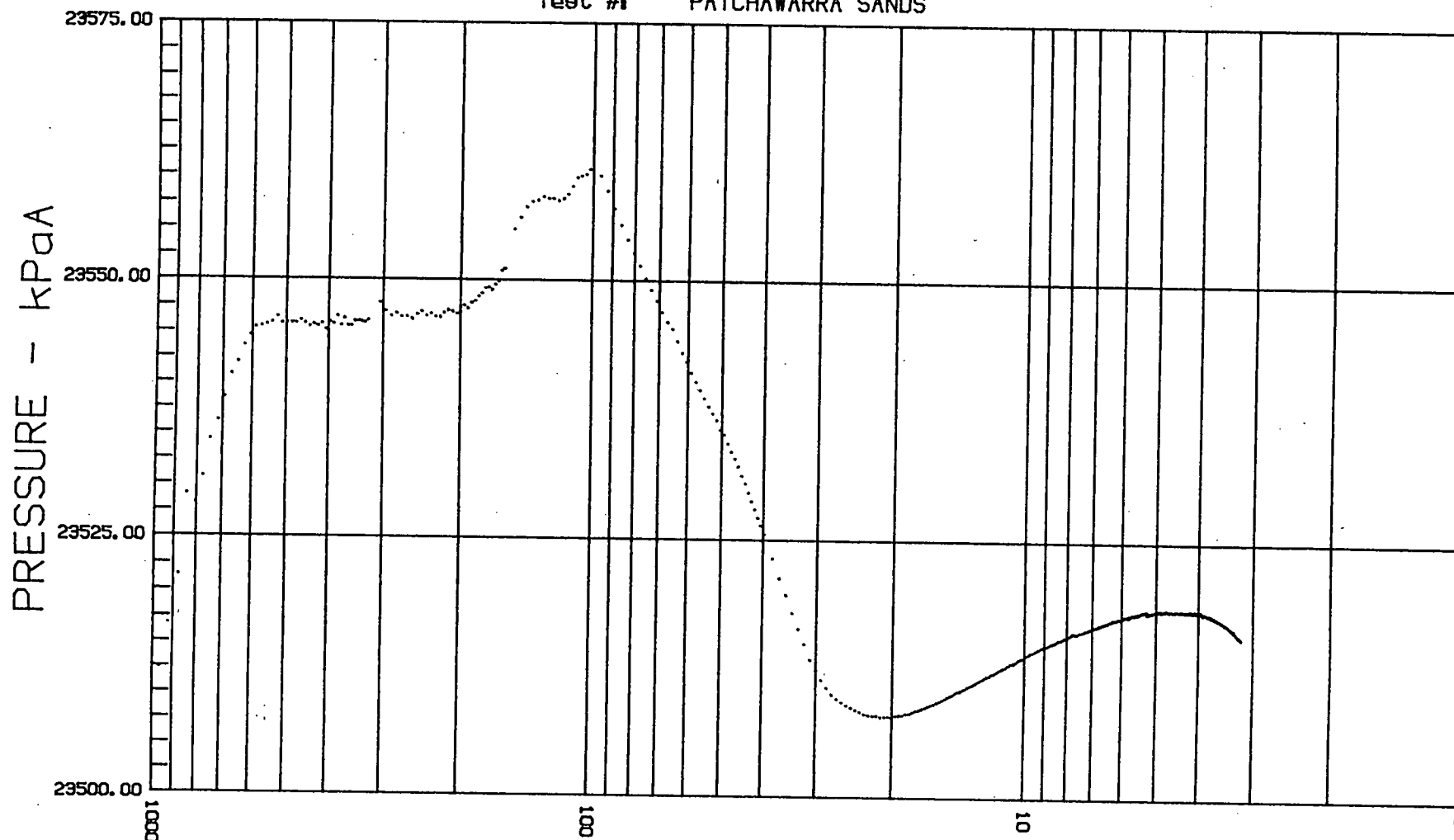
Plot starting date: 6/ 9/90
time: 0: 0: 25

Gauge S/N

Flow time: 78.250 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP BUILDUP.



00035

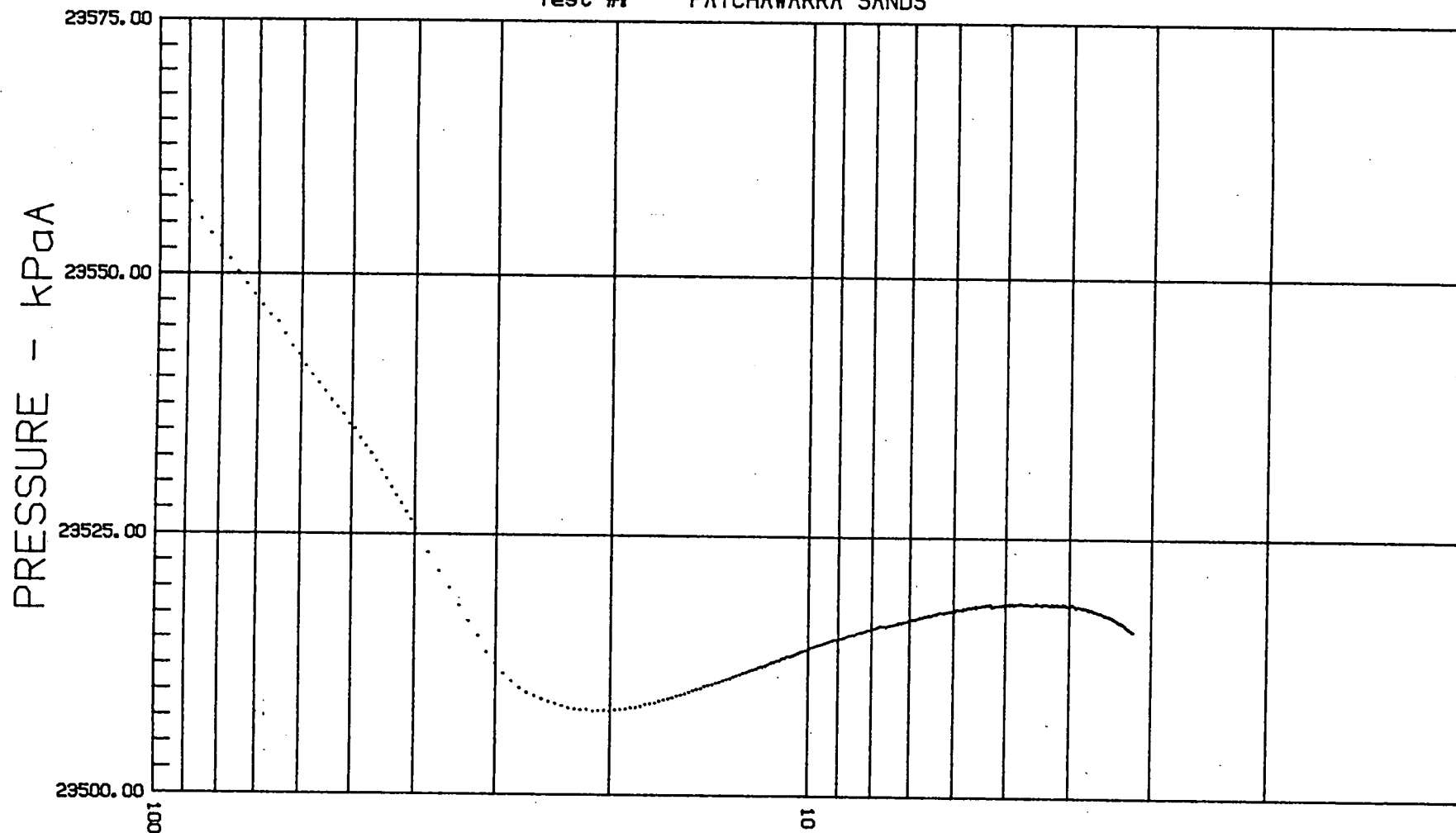
HORNER TIME - HRS

Plot starting date: 6/ 9/90
time: 0: 0:25

Gauge S/N
Flow time: 78.250 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP BUILDUP.



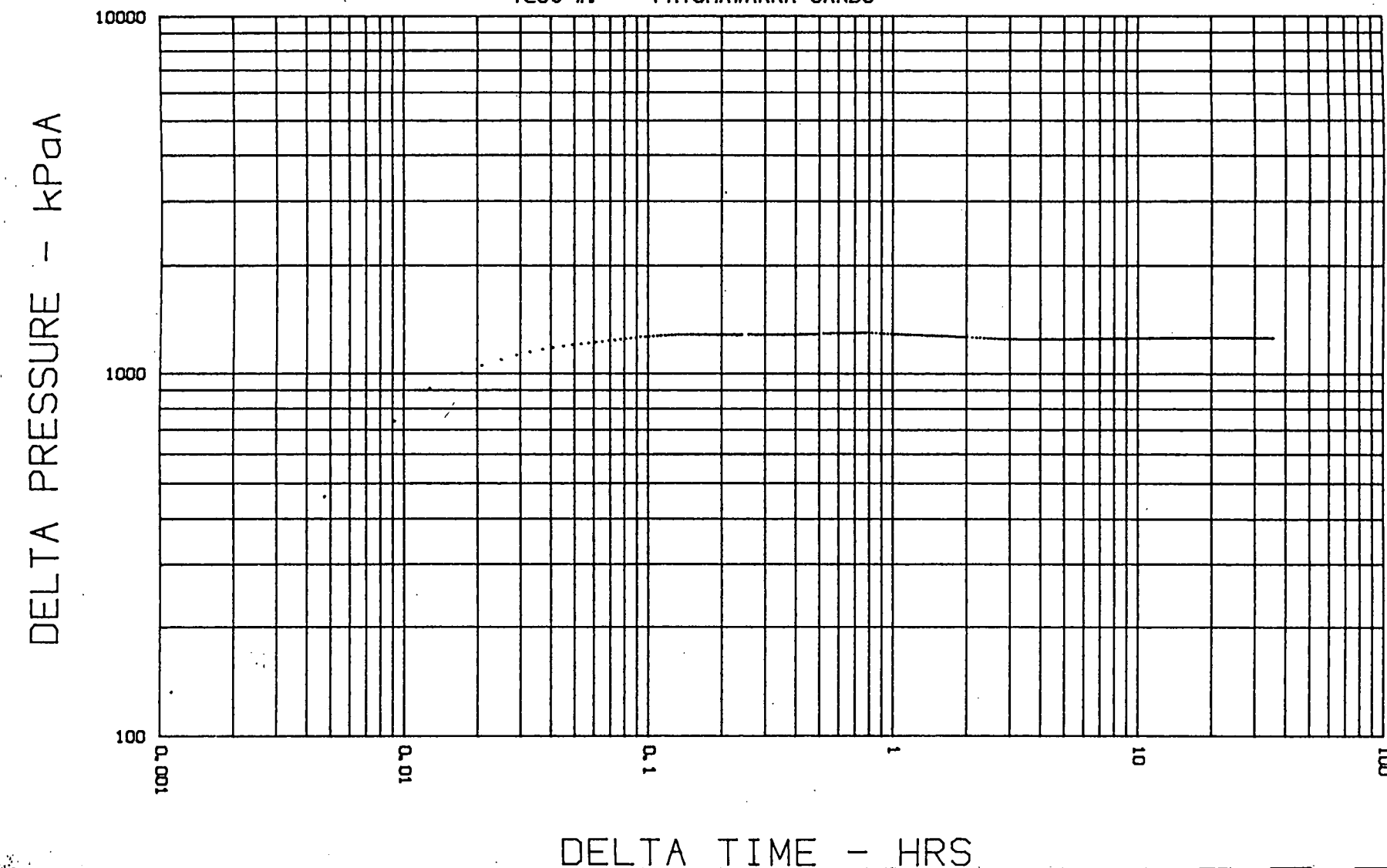
00036

HORNER TIME - HRS

Plot starting date: 6/ 9/90
time: 0: 0:25

Company: OILSERV AUSTRALIA LTD
Client: SANTOS LTD
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
CLEANUP BUILDUP.



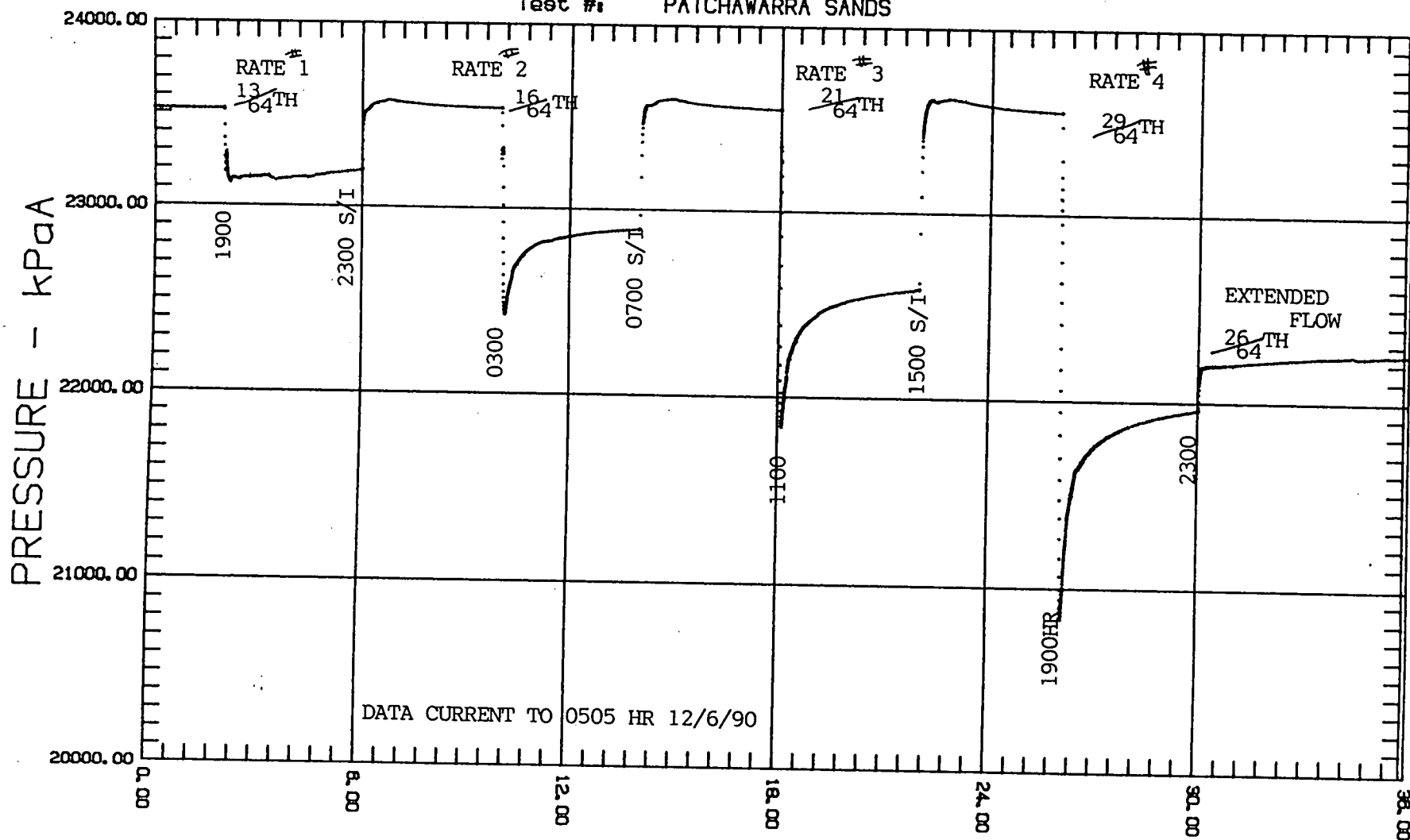
00037

Plot starting date: 6/10/90
time: 17: 0: 6

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
FLOW RATES & EXTENDED FLOW.



00038

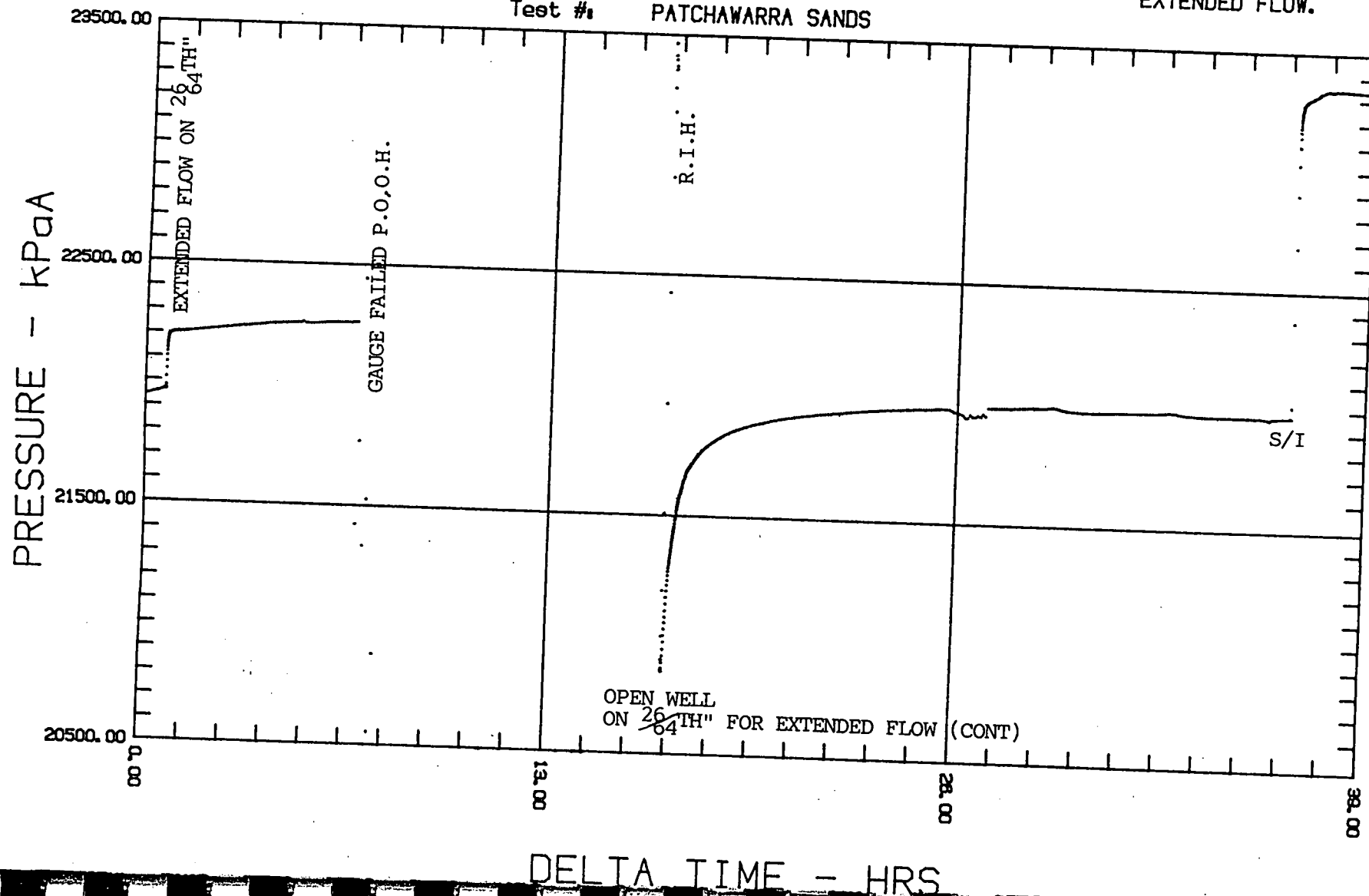
DELTA TIME - HRS

Plot starting date: 8/11/90
time: 22:21:43

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
EXTENDED FLOW.



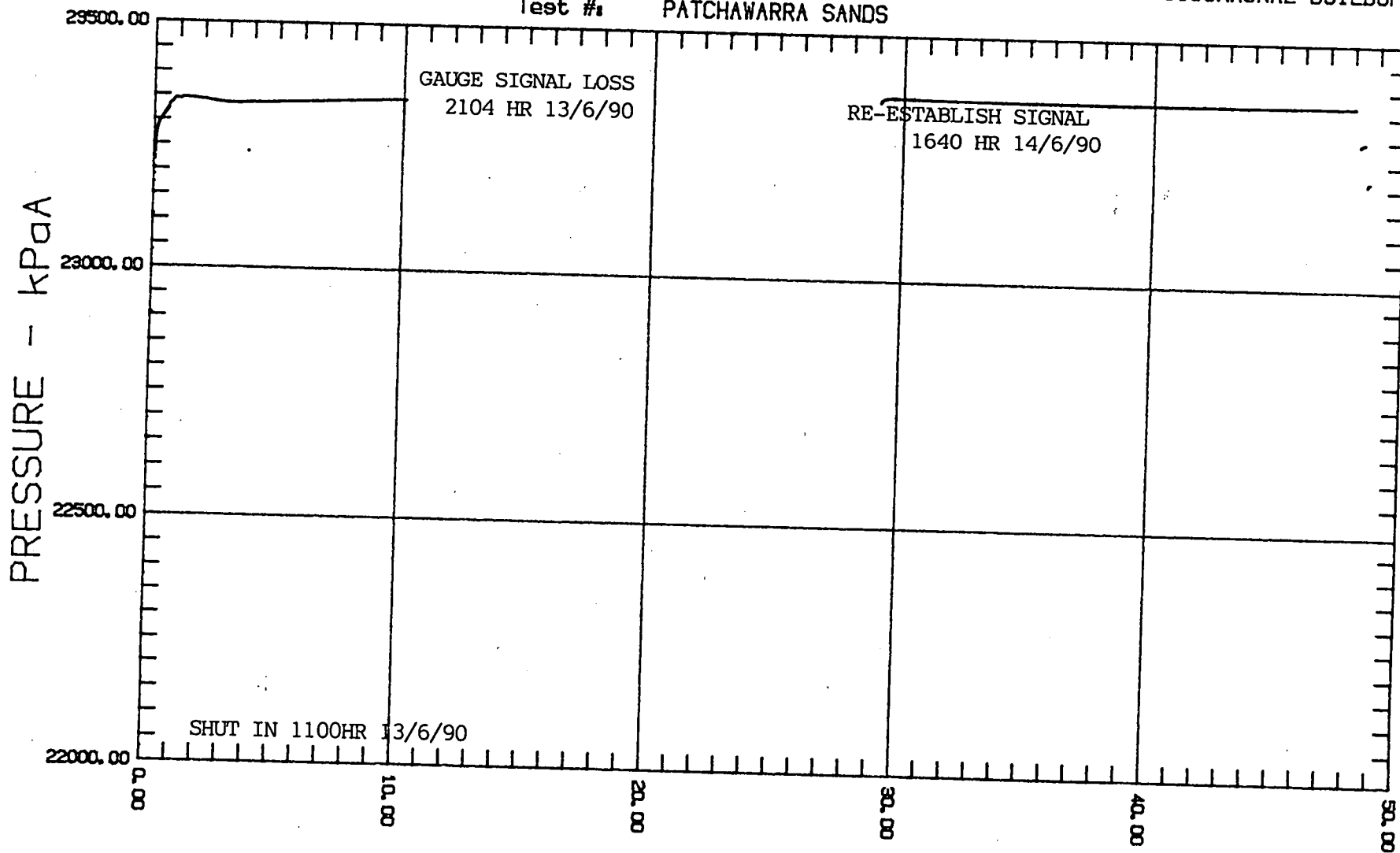
000039

Plot starting date: 6/13/90
time: 11: 0:13

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
ISOCHRONAL BUILDUP.



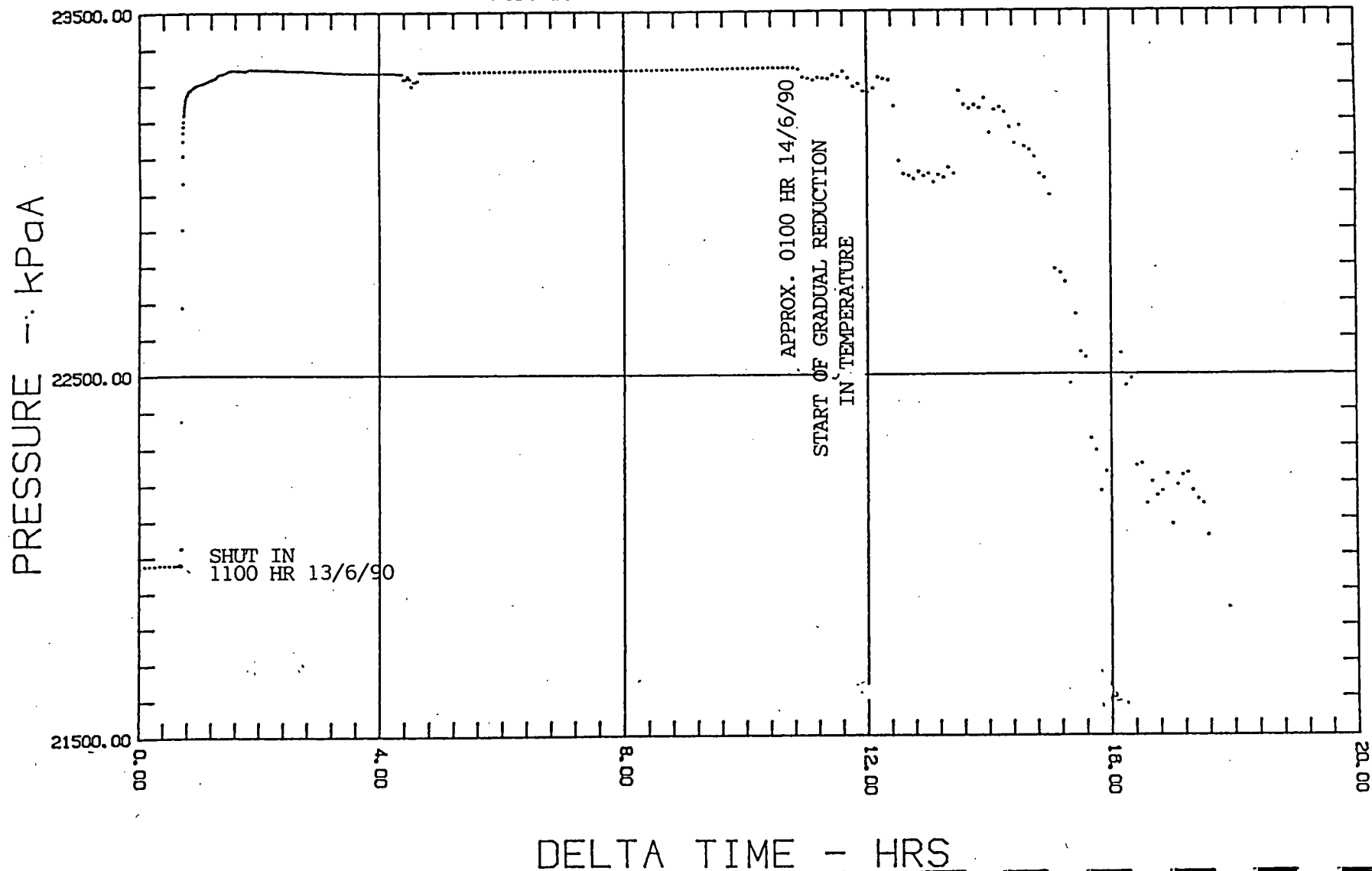
00040

Plot starting date: 6/13/90
time: 10:18:32

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
BUILDUP.



00041

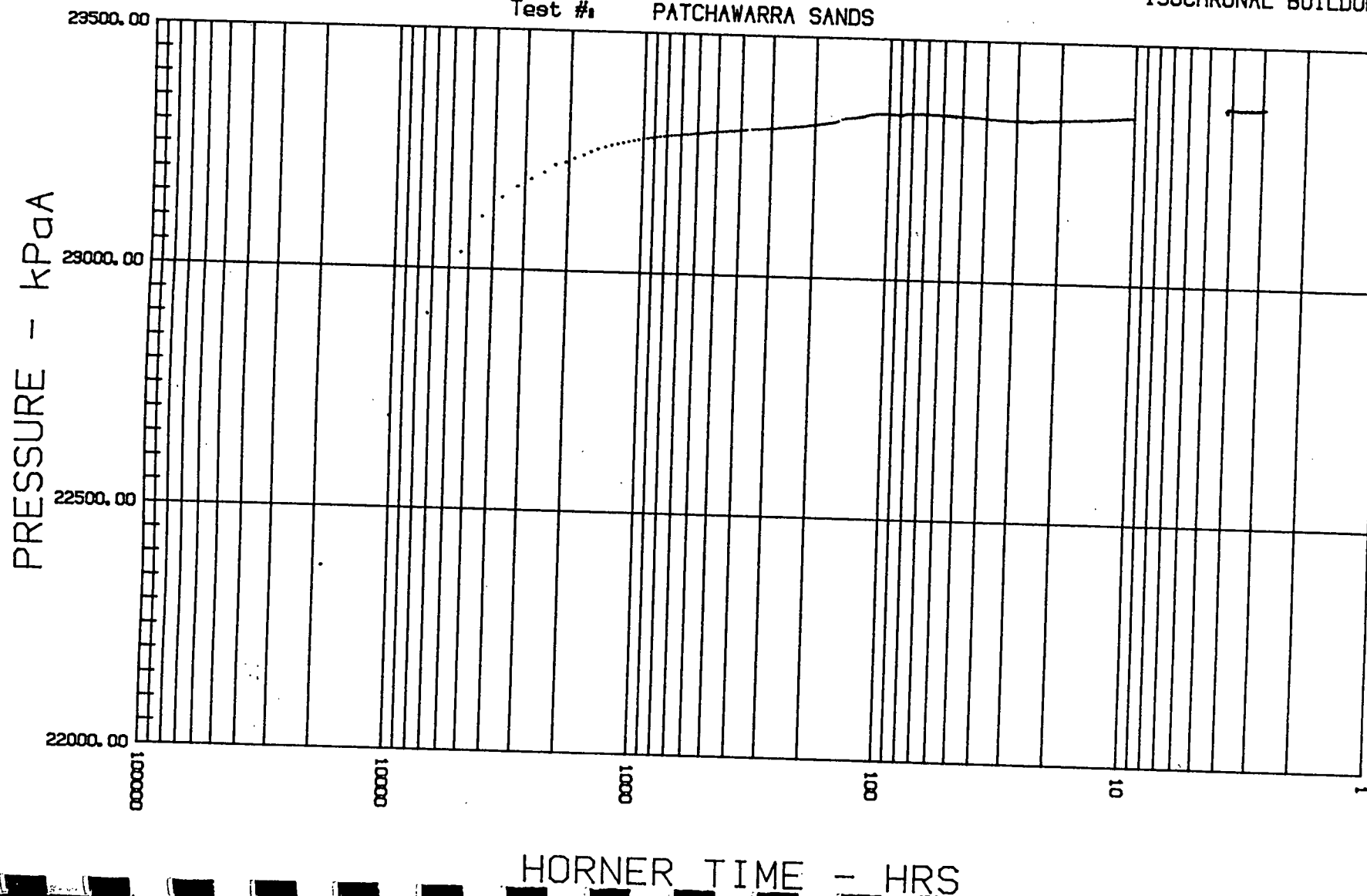
Plot starting date: 8/13/90
time: 11: 0: 13

Gauge S/N

Flow time: 93.190 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
ISOCHRONAL BUILDUP.



00042

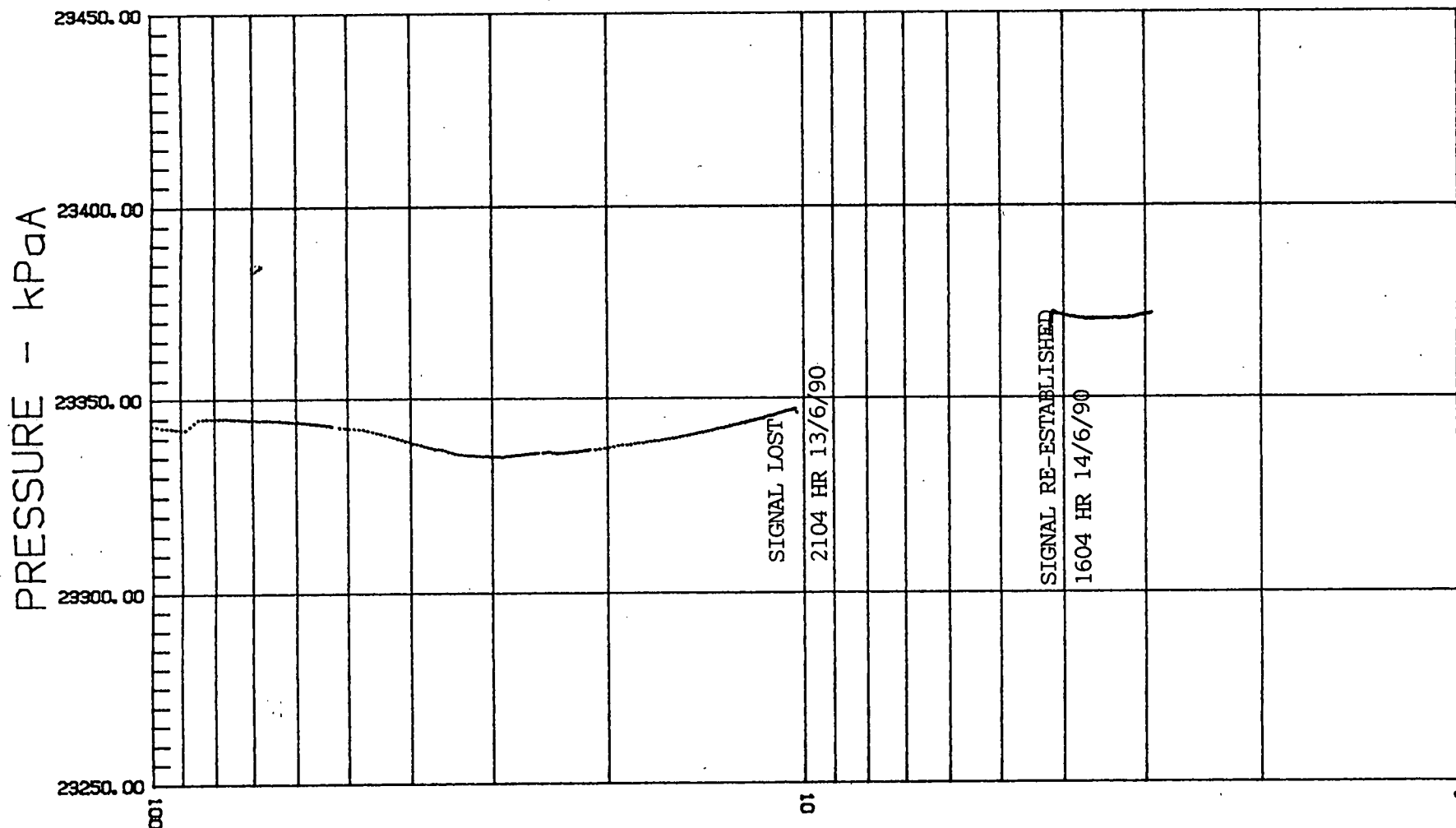
Plot starting date: 8/13/90
time: 11: 0: 13

Gauge S/N

Flow time: 93.190 HRS

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
ISOCHRONAL BUILDUP.



HORNER TIME - HRS

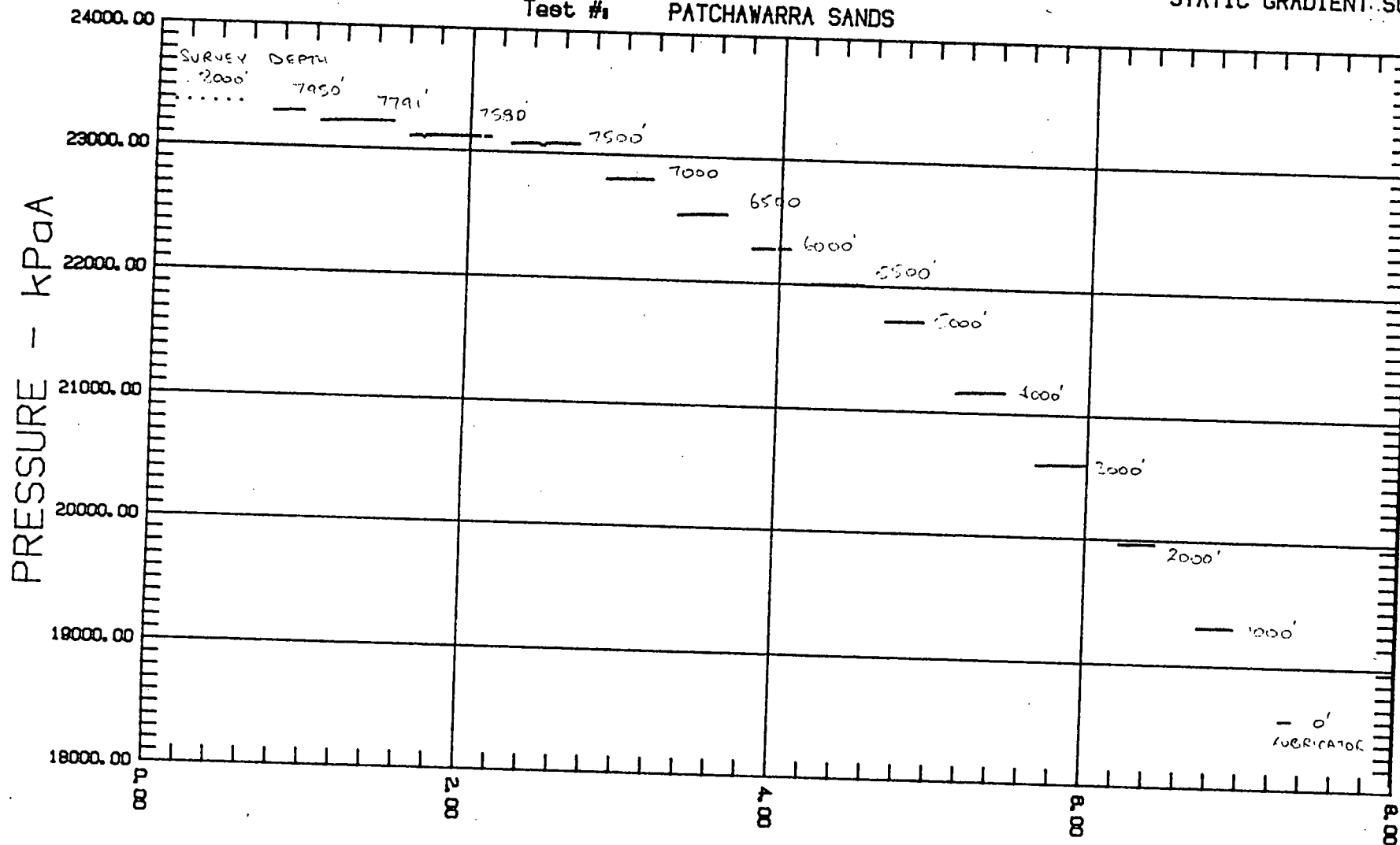
83700

Plot starting date: 6/15/90
time: 10:28:51

Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
STATIC GRADIENT SURVEY.

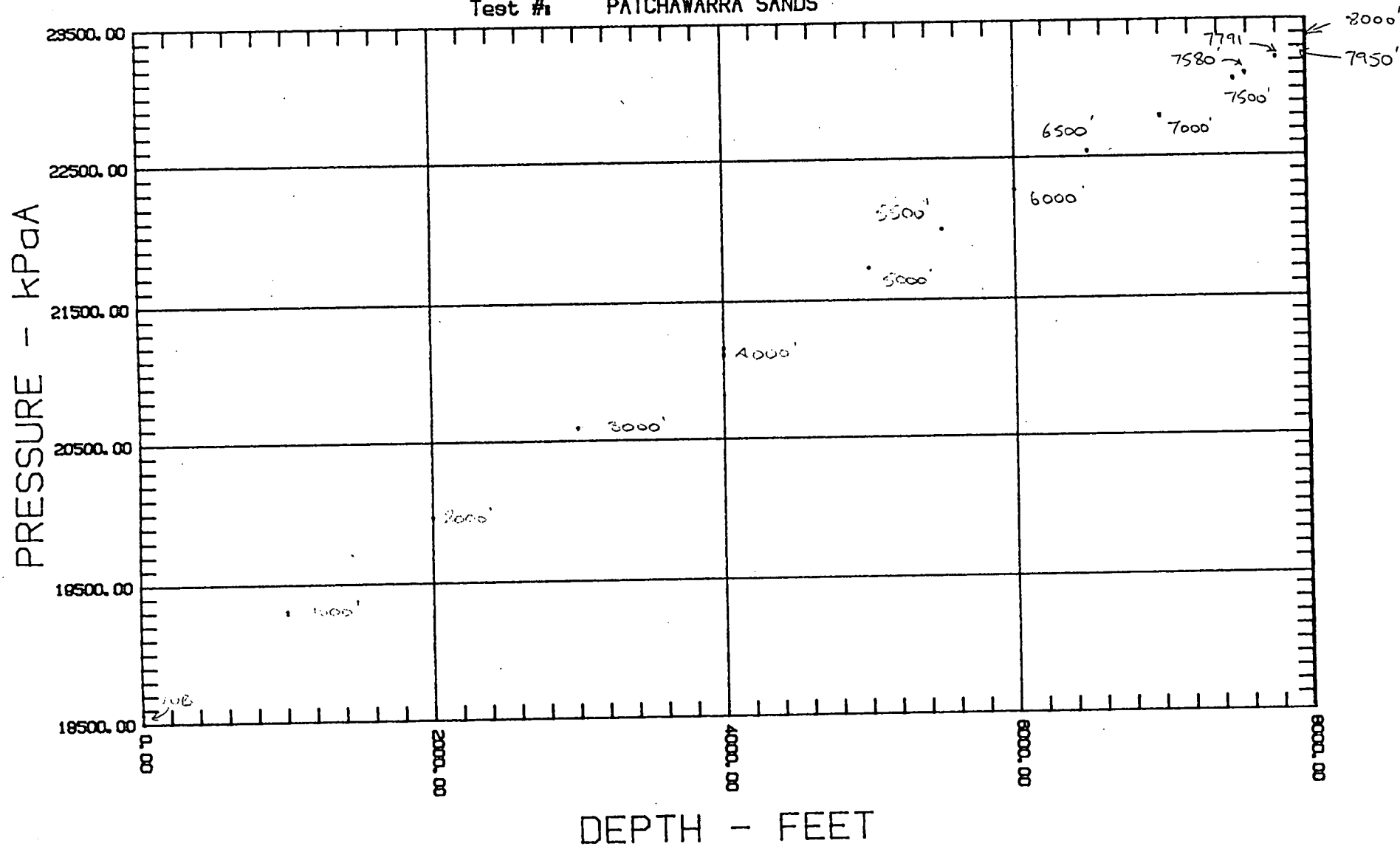


00044

Plot starting date: 6/15/90
time: 10:28:51
Gauge S/N

Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
STATIC GRADIENT SURVEY.



00045

00046

OILSERV AUSTRALIA LTD
DOWNHOLE GAUGE REPORT

CLIENT: SANTOS LTD WELL NAME/NUMBER: MARSILEA NO 1

GAUGE TYPE: GRC EPG-520 SERIAL NUMBER: 56027

DATE OF CALIBRATION: 21/2/90 RANGE: 10,000 PSI

C/U &
TYPE OF TEST: MOD. ISOCHRONAL TYPE OF WELL: ~~Oil~~ GAS/COND/WATER

WAS GAUGE CHECKED AGAINST DWT: YES/~~NO~~

IF YES, PRESSURE DIFFERENTIAL: +131KPa

DEPTH RUN TO: 8000 FT. MAX PRESSURE RECORDED: 23737.5 ~~PSI~~/KPA

HOURS IN HOLE: 229.5 HRS. MAX TEMP. RECORDED: 146.94 ~~SE~~/°C

HOURS WELL FLOWING: 121.25 HRS. NEW ROPE SOCKET: YES/~~NO~~

HOURS WELL SHUT IN: 108.25 HRS. OCL RUN: YES/~~NO~~

PROBLEMS ENCOUNTERED

Temperature signal attenuating after ten hours into post Isochronal build up.
A gradual decline over nine hours occurred until the signal was lost at 0600hrs
14/6/90. Tool was kept in hole & depowered (build up continued with Amerada
RPG-3) On a trial repowering ten hours later - gauge signal appeared ok
with pressure & temperature figures being 10mm ensurate with a normal
build up & consistant with earlier figures. On P.O.O.H. cable insulation in
cable head seen to be starting to crack & break down.

COMMENTS: (FAILURE REPORT)

Rope socket (cable head connection) failed six hours into extended flow
period on 12/6/90. The high temperature of the well 296°F near operating
limit of cable causes the insulation exposed inside the cable head to crack
when under torsional stress (caused when cable head contact is made up. Water
entering the rope socket then can effect a short in the signal. On P.O.O.H.
to rehead the gauge was found to be ok as was the rest of the tool string.

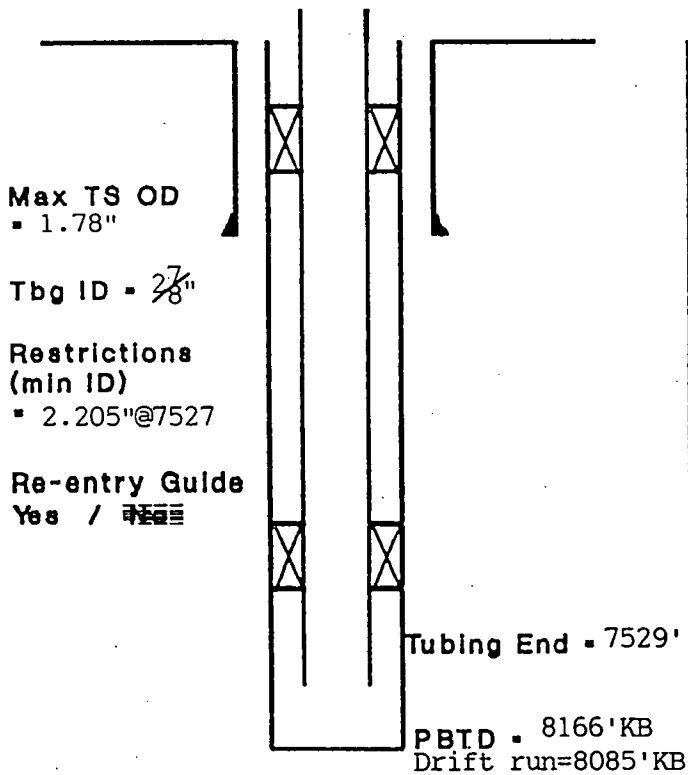
DISTRIBUTION: 1. TO CLIENT 2. OAL BASE 3. RETAIN ON JOB.

CASED HOLE 'Z' CHART

SAFE WINCH DRIVING WITH SMALL DIAMETER CABLES

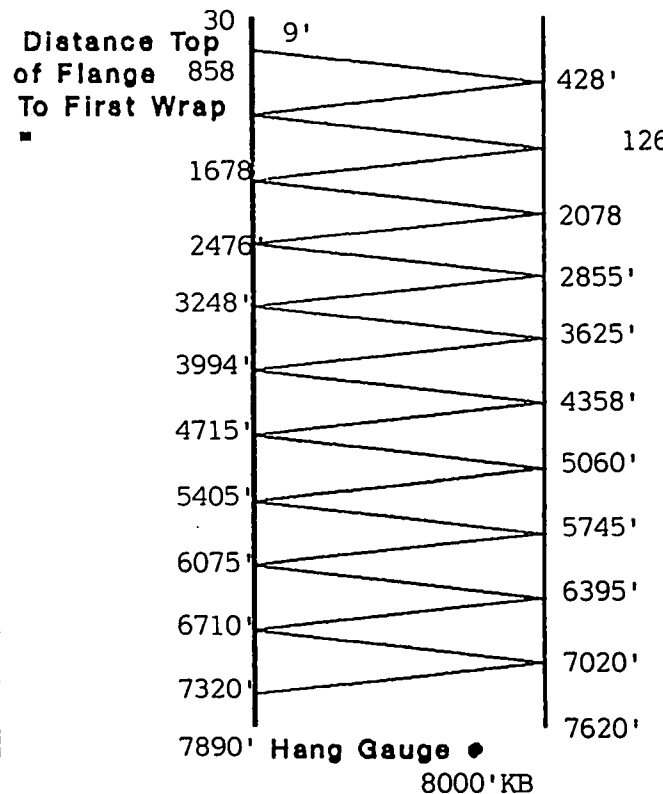
MARSILEA NO 1

WELL SKETCH



DRUM

Mark Your Start Position of Cable



GAUGE HANG DEPTHS

COMMENTS

1. 8000	
2. 7950	
3. 7791	
4. 7580	
5. 7500	
6. 7000	
7. 6500	
8. 6000	
9. 5500	
10. 5000	
11. 4000	
12. 3000	

13. 2000
14. 1000
15. LUBRICATOR

COMING OUT OF HOLE

STOP

AT 200 FT

(CHECK TOOL TRAP IS SET)



AUSTRALIA LIMITED
(INCORPORATED IN W.A.)

WIRELINE REPORT

00048

MARSILEA NO 1

WELL:

DATE: 3/6/90

PROGRAM: MODIFIED ISOCHRONAL

PURPOSE OF WORK: DUMMY RUN WITH 1.75 GAUGE RING

REPORT OF WORK PERFORMED:

1530 RIG UP

1550 PRESSURE UP LUBRICATOR

1555 RUN IN HOLE

1645 TAG 8100'KB NO OBSTRUCTIONS

1645 P.O.O.H.

1715 RIG DOWN @ SURFACE

OPERATOR'S SIGNATURE

WORK PERFORMED BY: G.KING

OF OILSERV AUSTRALIA LTD

WELL DATA:

Tubing Size: 2 7/8 FWHP: SIWHP: 18600 KPA

Sub Surface S.V./Landing Nipple @ S.S.D. @:

"X" Nipple @ "N"/"XN" Nipple @ other

Min I.D. @ Packer @

Perforated Interval:

ASC II FILE RECORD

CLEAN UP FLOW:MRSL1CUF

4 RATE MODIFIED ISOCHRONAL:MRSL1ISO

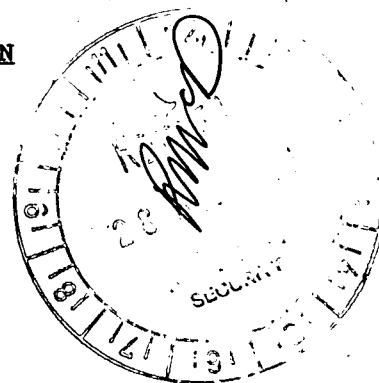
EXTENDED FLOW:MRSL1XFL

BUILFUP AFTER EXTENDED FLOW:MRSL1BU

STATIC GRADIENT SURVEY:MRSL1SGS

SANTOS LIMITED
PETROLEUM DEVELOPMENT DEPARTMENT
MARSILEA FIELD PATCHAWARRA FORMATION
RESERVOIR MANAGEMENT PLAN

Report No.: RE:050/90
Author: G.L. Halliday
Date: September, 1990



CONTENTS

1. INTRODUCTION
2. CURRENT DEVELOPMENT
3. DISCUSSION AND FUTURE PLAN

TABLES

1. RESERVOIR DATA

FIGURES

1. 'V' DEPTH STRUCTURE CONTOUR MAP
2. MARSILEA 1 GR-MSFL-DLL EXCERPT
3. RFT RESULTS

1. INTRODUCTION

The Marsilea field is situated 4 km from the Brumby field and 3 km from both the Mettika field and the Anyema field (see Figure 1). The field consists of 8 Patchawarra Formation sands (see Figure 2) in a domal anticline with 4 way dip closure. Although the sands intersected in Marsilea 1 are the same as those intersected in the neighbouring Mettika and Anyema fields, sand development in Marsilea is not as good. Two of the sands are shaley and one is very thin.

An extensive RFT survey (Figure 3) was run over the Marsilea, Anyema and Mettika fields in 1989. On the basis of this survey and geological interpretation it has been concluded that there are 4 distinct fluid systems, each system having an identifiable limit. In the uppermost system, which contains a very minor share of the total OGIP, the field limit has been set at the LKG. In the other 3 systems field limits have been derived from the RFT data and lie between the LKG and the LCC. Possible OGIP can therefore be mapped in each sand but, since the reservoir limits are reasonably well defined by the pressure data, there is little confidence that this gas exists.

Reservoir quality in the sands tested is good, DST 1 having flowed gas at 10.9 MMCFD from the 74-5 and 74-6 sands ($kh = 851$ md-ft). Other sands were not tested.

2. CURRENT DEVELOPMENT

Marsilea 1 was put on production in June 1990. Gas is delivered to Moomba via the Toolachee satellite station, the compressors being bypassed at present.

3. DISCUSSION AND FUTURE PLAN

Marsilea 1 will adequately drain the reservoir because it is crestally located, it has good productivity and the lateral extent of the reservoir is not large. Recoverable reserves (Table 1) have been estimated using the SRM reservoir model and an assumed suction pressure of 50 psia. As a reliable fluid sample had not been analysed at the time of writing, gas composition (see Table 1) has been assumed to be the same as that of the nearby Brumby field.

Marsilea 1 came on line in June 1990, and has been subjected to a deliverability test which has not yet been analysed. Samples have been taken and the potential for retrograde condensation will be evaluated if laboratory studies which are yet to be done indicate that the gas from nearby Mettika 3 is retrograde. If retrograde behaviour is found to occur, there will be no economical means of improving liquids recovery because reserves are small.

Since this field has small reserves and liquid loading may be significant, bottomhole pressure buildup surveys will be conducted until the gas-in-place estimate is confidently predicted after which time pressure build up surveys will no longer be carried out on a routine basis.

The resistivity of water taken from the meter run will be measured as required by the regulations and LET's will be run if necessary.

RG18

RESERVOIR DATA

FIELD: MARSILEA
FORMATION: PATCHAWARRA
BLOCK/STATE: T00/ SA

REF DATE: 31/12/89

COMPOSITIONAL DATA

OGIP (2P): TO LKG/GWC 5.7 BCF
SUB LKG 20.1 BCF
Total 25.8 BCF
Init Rec Raw Gas: 20.5 BCF
Cum Prod Raw Gas: 0.0 BCF
REMAINING RAW GAS: 20.5 BCF
Basis for estimation: Volumetrics
RECOVERY FACTOR
RAW GAS: 0.7930
SALES GAS: 0.7930
ETHANE: 0.7930
LPG: 0.7930
C5+: 0.7930
YIELD FACTORS
SALES GAS SHRINKAGE 0.7287
C2 42.84 (BBL/MMSCF)
LPG 20.74 (BBL/MMSCF)
C5+ 15.64 (BBL/MMSCF)
FORMATION VOLUME FACTOR (1/Bg) 173.20 SCF/RCF
NUMBER OF PRODUCIBLE COMPLETIONS 1
Current Daily Production Rate: 14.3 MMCFD (July 1990)
(Based on PRS)

	FWS (mole %)	LIQUIDS	SALES	COMPONENT BBL/MMCF	RAW BBL/MMCF
N2+	0.59		0.59		NIL
CO2	17.76		1.82		NIL
C1	68.09		68.09		NIL
C2	9.03	6.77	2.26	632.6	42.84
C3	2.30	2.18	0.11	651.3	14.23
iC4	0.33	0.33		774.0	2.55
nC4	0.53	0.53		745.8	3.95
iC5	0.15	0.15		866.0	1.30
nC5	0.19	0.19		857.4	1.63
C6	0.22	0.22		973.2	2.14
C7	0.24	0.24		1092.0	2.62
C8+	0.57	0.57		1394.9	7.95
	100.00	11.19	72.87		79.22

Original Reservoir Pres 3390 (psia)

Reservoir Temperature 748 (R)

MW C8+ = 135.43

SG C8+ = 0.7280

SG FWS = 0.8485

Composition assumed to be same as at Brumby because samples not analysed yet

PRINTED ON 6SEP90

TABLE 1

00054

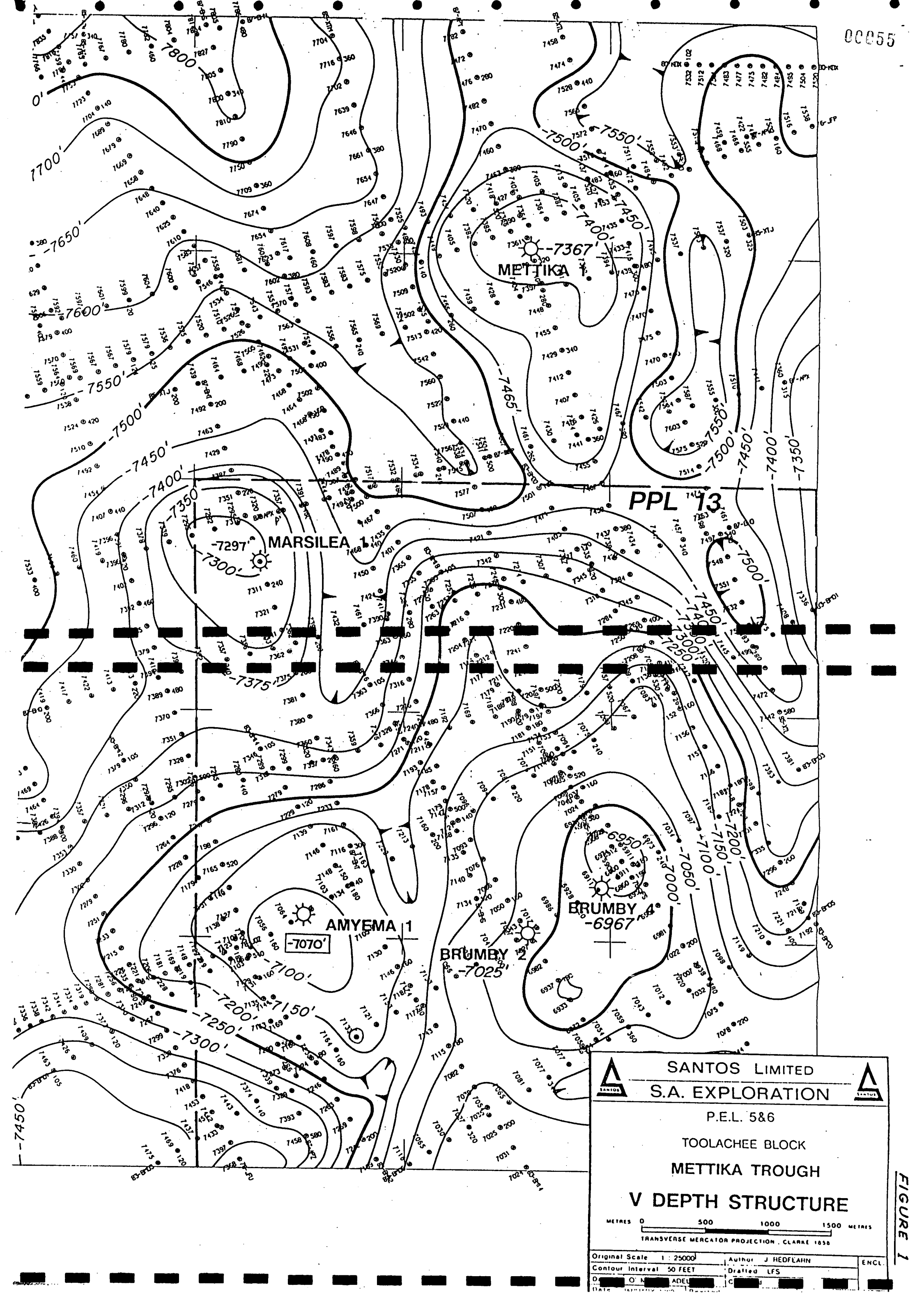
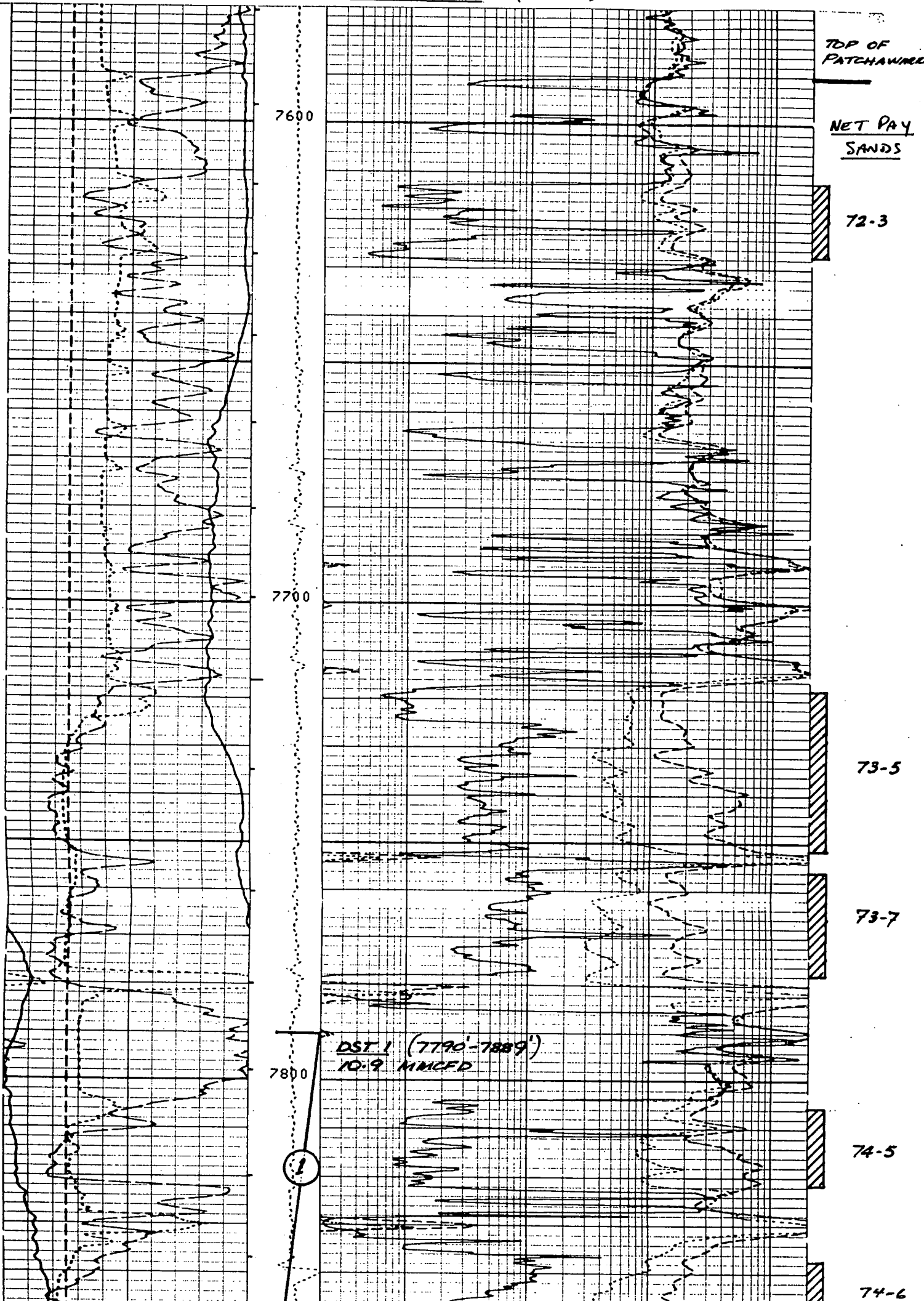
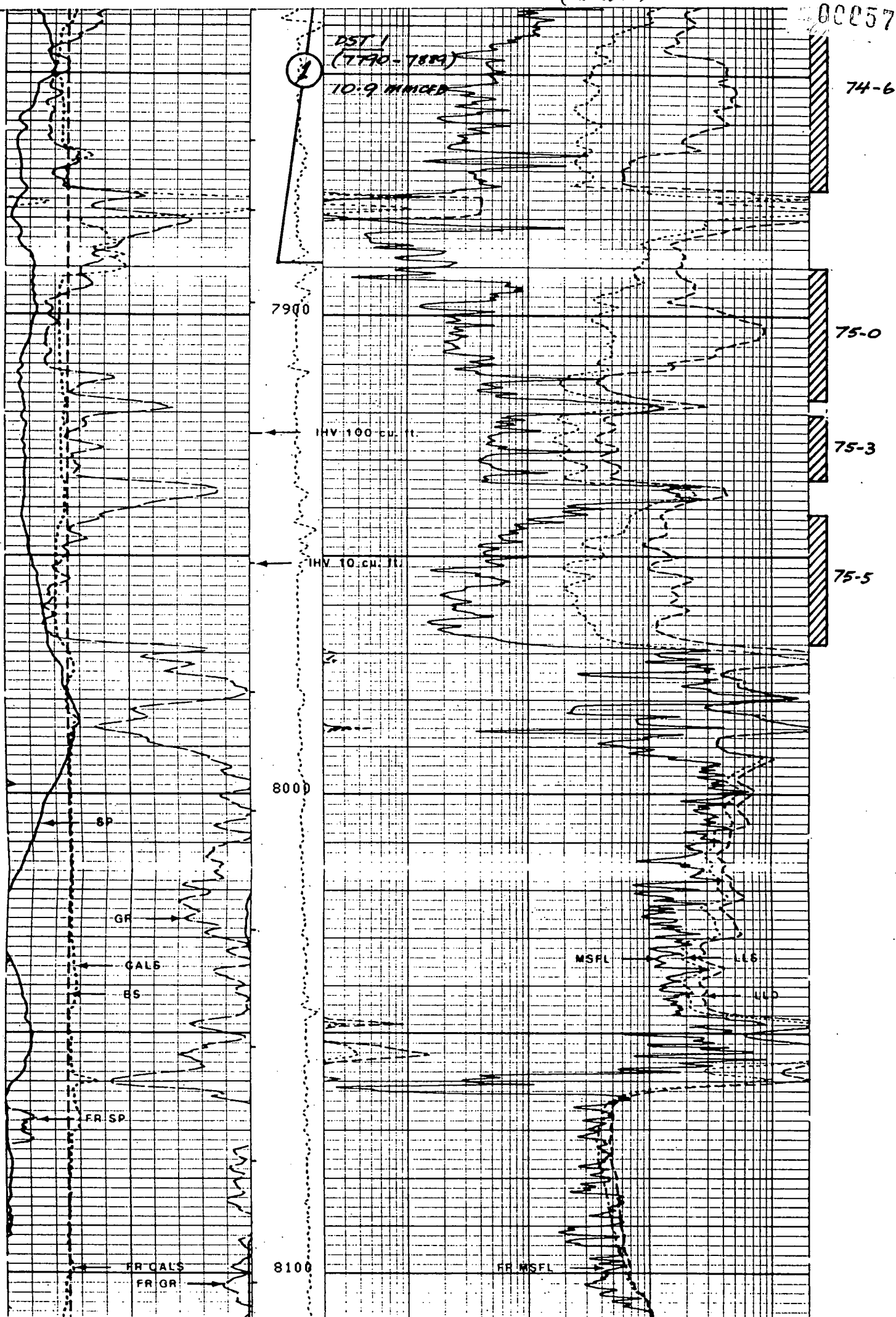


FIGURE 1





METTIKA, MARSILEA AND AMYEMA PATCHAWARRA FORMATION

(Showing reservoir limits and lowest closing contours
in Amyema and Marsilea fields)

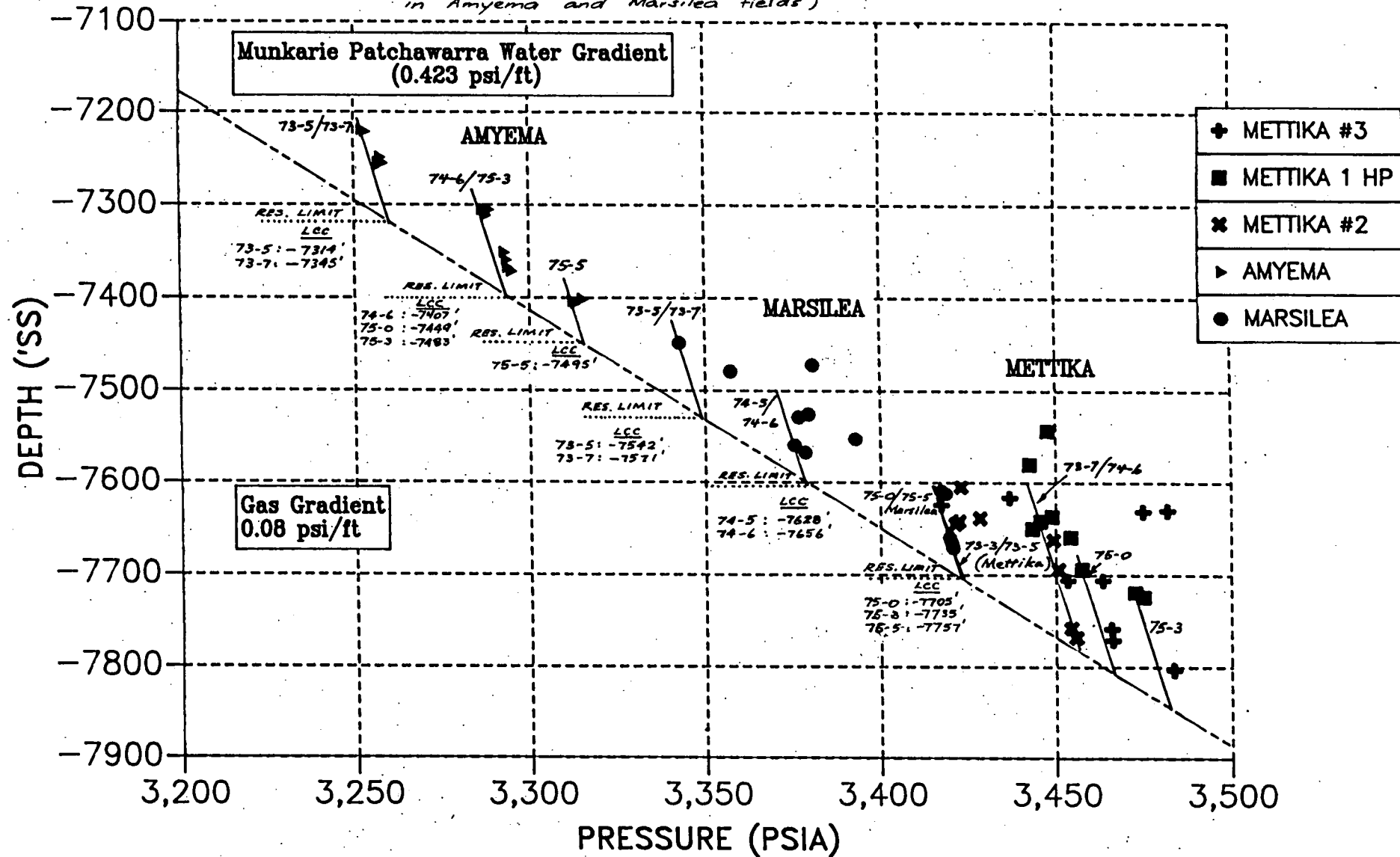


FIGURE 3

00058

WELL: Marsilea # 1

Pf = kPa

ORIFICE SIZE: mm "

T = °C

LINE SIZE: mm "

Diff = kPa

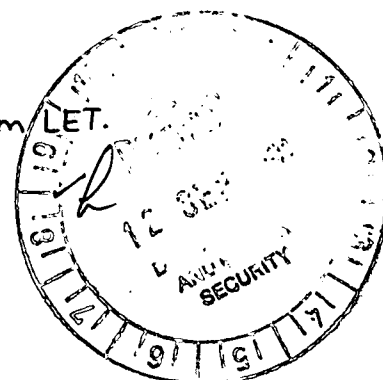
Cumulative Production to end of April '91 = 83.8 m³ x 10⁶

Number of hours online in April '91 = 29 days

Production in April '91 = 4.0514 m³ x 10⁶.. Average flow rate in April '91 = (4.0514 / 29) x 24 = 0.140 m³ x 10⁶/dNumber of days online in May '91 before Shut In 1500hrs 19 / 5 / 91
= 18.625 days... Production up to 1500 hrs 19 / 5 / 91 = 18.625 x 0.140 = 2.608 m³ x 10⁶

Total cumulative production = 83.8 + 2.608
 = 86.4 m³ x 10⁶
 = 3066.9 mmscf ✓

Flow rate just prior to Shut In = 0.121 m³ x 10⁶
 = 4.288 mmscf/d } from LET.



SUB-SURFACE PRESSURE SURVEY

CO.		RUN 10 FIELD MARSILEA	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 7574'
CASING	-	CASING PRESS	ON BOTTOM 1024 19/5
LINER	-	TUBING PRESS	OFF BOTTOM 1100 23/5
DATE	910523	ELEMENT RANGE 0 - 4100	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1500 19/5
MAX TEMP	146 C	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 850208	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BUILD-UP

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	15:00	1965.3	1965.3	.0	16:48	2191.0	2191.0	1.8
	15:02	1998.7	1998.7	.0	17:49	2192.6	2192.6	2.8
	15:04	2045.6	2045.6	.1	19:26	2192.7	2192.7	4.4
	15:06	2106.0	2106.0	.1	21:42	2192.7	2192.7	6.7
	15:06	2150.6	2150.6	.1	1:03	2192.8	2192.8	10.1
	15:07	2195.1	2195.1	.1	5:47	2197.0	2197.0	14.8
	15:08	2223.7	2223.7	.1	11:29	2199.1	2199.1	20.5
	15:09	2236.2	2236.2	.2	17:13	2199.8	2199.8	26.2
	15:18	2234.4	2234.4	.3	23:35	2203.1	2203.1	32.6
	15:30	2233.3	2233.3	.5	7:26	2206.0	2206.0	40.4
	15:35	2235.2	2235.2	.6	16:55	2206.2	2206.2	49.9
	15:38	2236.8	2236.8	.6	3:12	2206.4	2206.4	60.2
	15:43	2225.3	2225.3	.7	16:05	2206.7	2206.7	73.1
	15:48	2211.8	2211.8	.8	4:05	2208.1	2208.1	85.1
	15:56	2201.8	2201.8	.9	11:00	2210.4	2210.4	92.0
	16:05	2197.9	2197.9	1.1	0:00	.0	.0	.0

LUB IN DWT = 1352 PSI / OUT = 1796 PSI
 LUB IN AMERADA = 1345 PSI / OUT = 1807 PSI

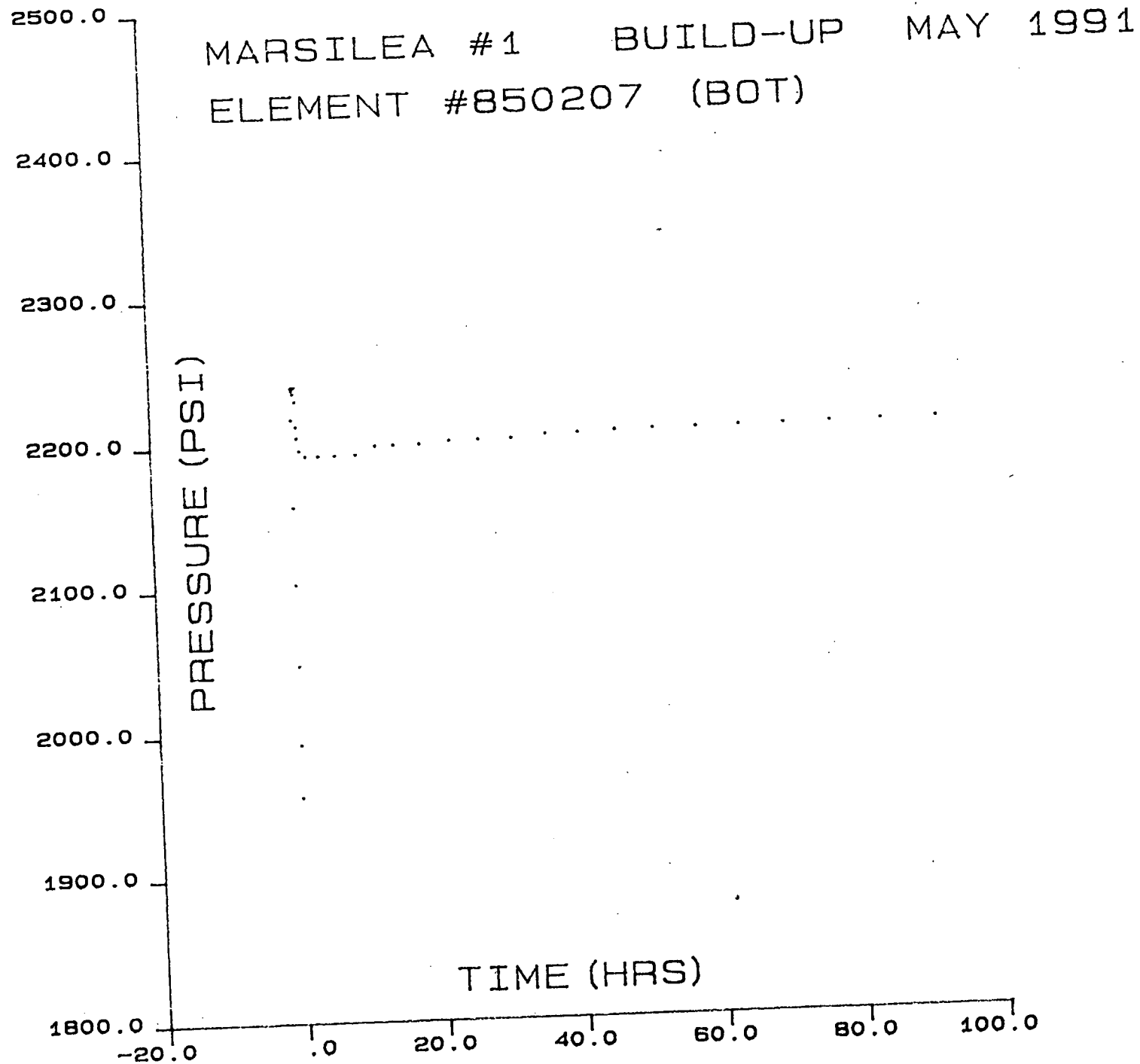
SUB-SURFACE PRESSURE SURVEY

CO.		RUN 20 FIELD MARSILEA	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 7580'
CASING	-	CASING PRESS	ON BOTTOM 1024 19/5
LINER	-	TUBING PRESS	OFF BOTTOM 1100 23/5
DATE	910523	ELEMENT RANGE 0 - 4092	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1500 19/5
MAX TEMP	146 C	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 850207	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	BUILD-UP

SURVEY DATA

CO.				RUN 20 FIELD MARSILEA				WELL 01			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
15:00	1956.4	1956.4	.0	0:11	2192.6	2192.6	9.2				
15:02	1993.0	1993.0	.0	3:03	2198.3	2198.3	12.1				
15:03	2047.2	2047.2	.0	5:38	2198.6	2198.6	14.6				
15:04	2103.2	2103.2	.1	9:20	2198.8	2198.8	18.3				
15:05	2157.0	2157.0	.1	13:34	2200.6	2200.6	22.6				
15:08	2217.6	2217.6	.1	17:44	2200.8	2200.8	26.7				
15:13	2239.7	2239.7	.2	22:30	2201.0	2201.0	31.5				
15:18	2237.9	2237.9	.3	3:21	2203.5	2203.5	36.4				
15:26	2235.6	2235.6	.4	8:00	2203.7	2203.7	41.0				
15:34	2239.7	2239.7	.6	13:17	2204.8	2204.8	46.3				
15:39	2239.8	2239.8	.6	18:40	2205.0	2205.0	51.7				
15:42	2229.9	2229.9	.7	0:48	2205.3	2205.3	57.8				
15:48	2212.7	2212.7	.8	6:55	2205.5	2205.5	63.9				
15:52	2205.2	2205.2	.9	13:18	2205.8	2205.8	70.3				
16:11	2196.2	2196.2	1.2	19:55	2206.1	2206.1	76.9				
17:00	2192.3	2192.3	2.0	3:10	2206.4	2206.4	84.2				
18:53	2192.4	2192.4	3.9	11:00	2207.0	2207.0	92.0				
21:15	2192.5	2192.5	6.2	0:00	.0	.0	.0				

LUB IN DWT = 1352 PSI / OUT = 1796 PSI
 LUB IN AMERADA = 1356 PSI / OUT = 1804 PSI



00062

00063

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0488 TELEX AAG7183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON
SOUTH AUSTRALIA 5033

Tested Thursday, 23rd May 1991.

CLIENT	LOCATION	FORMATION
Santos Ltd.	MARSILEA #1	PATCHAWARRA

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	850208	4100	16/ 1/91
Bottom	850207	4075	16/ 1/91

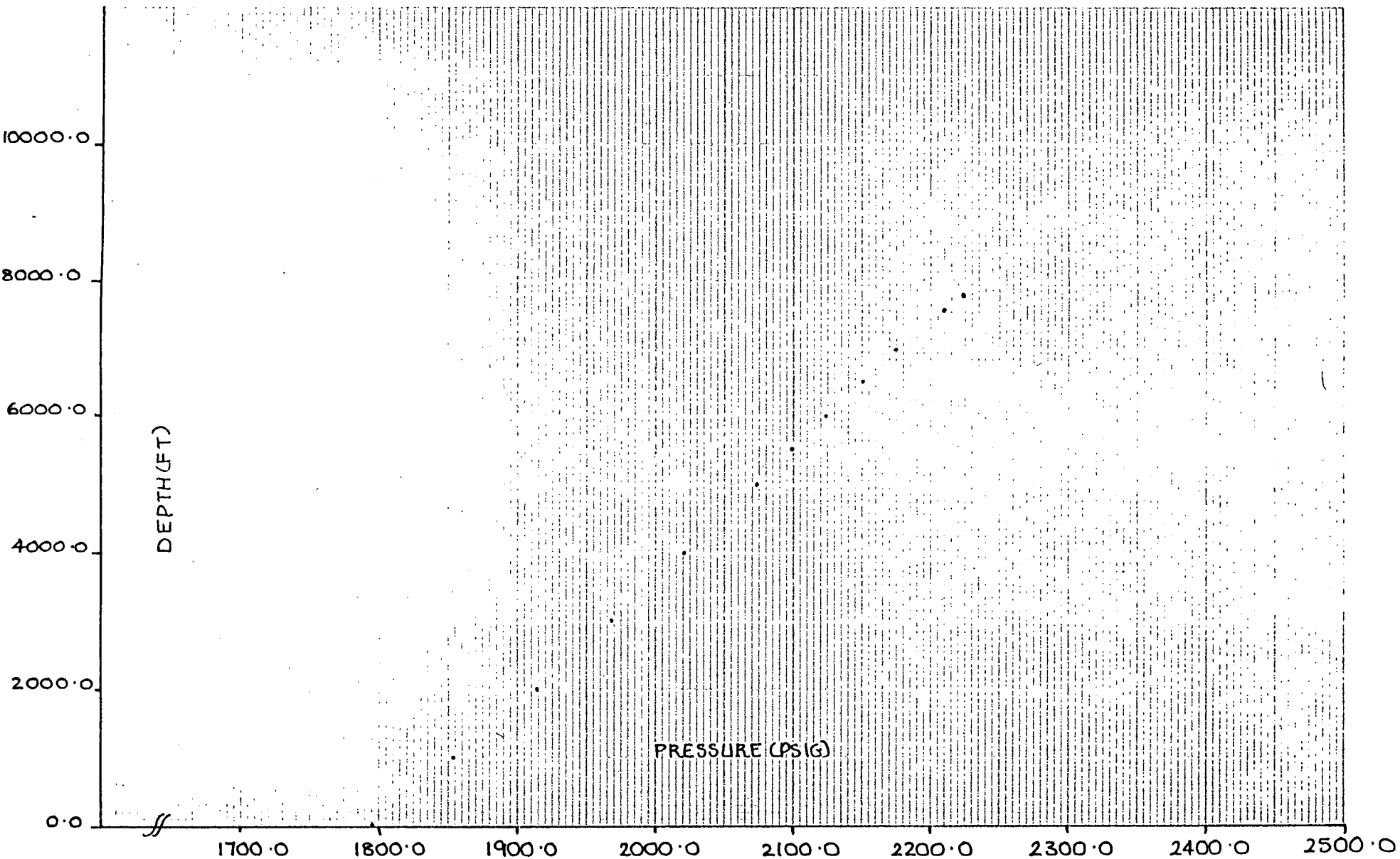
WELL DATA	
PARAMETER	VALUE
DWT In	1796 PSIG
DWT Out	1796 PSIG
Max BHT	296 F

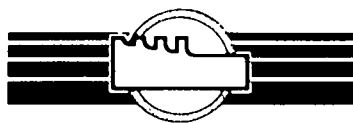
DEPTH FT KB	TOP ELEMENT			BOTTOM ELEMENT		
	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.8770	1795.4	-----	0.8840	1802.2	-----
1000	0.9060	1854.9	0.060	0.9140	1863.5	0.061
2000	0.9350	1914.5	0.060	0.9430	1922.7	0.059
3000	0.9610	1967.9	0.053	0.9690	1975.8	0.053
4000	0.9870	2021.3	0.053	0.9990	2037.1	0.061
5000	1.0120	2072.7	0.051	1.0200	2080.1	0.043
5500	1.0250	2099.4	0.053	1.0320	2104.6	0.049
6000	1.0370	2124.0	0.049	1.0450	2131.2	0.053
6500	1.0500	2150.8	0.053	1.0580	2157.8	0.053
7000	1.0620	2175.4	0.049	1.0700	2182.3	0.049
7580	1.0790	2210.3	0.060	1.0860	2215.0	0.056
7791	1.0850	2222.6	0.058	1.0930	2229.4	0.068
LUB.	0.8770	1795.4	-----	0.8840	1802.2	-----

GENERAL REMARKS

MARSILEA # 1 — STATIC PRESSURE GRADIENT — 23/5/91

ELEMENT # 850208/4100 (TOP)





CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 2 OF 2

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 23.5.91

TEST TYPE : STATIC GRADIENT

OPR : A. GRINOLAY

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

TIME
(HOURS)TUBING
PRESSURE
(PSI/KPa)ANNULUS
PRESSURE
(PSI/KPa)

ELEMENT SERIAL NO.

850208

850207

DATE : 23-5-91

ELEMENT RANGE

4100 PSI

4075 PSI.

PRESSURE LUBRICATOR

13:51

12383

12383

RECORDING SECTION SERIAL NO.

K3434

K3433

RUN IN HOLE

14:06

12383

12383

DATE OF CALIBRATION:

16.1.91

16.1.91

ON DEPTH AT : 7791 FT/M

15:25

12376

12376

CLOCK SERIAL NO.

25512

25509

DATE : 23-5-91

CLOCK RANGE

3HR

3HR

PULL OUT OF HOLE

1535

12376

12376

LEAD SCREW TYPE

15TLS

15TLS

AT SURFACE

1553

12383

12383

DEPRESSURE LUBRICATOR

1610

12383

12383

ENGAGE STYLUS DATE 23-5-91 TIME

13:40

13:40

MAXIMUM BHT AT 7791 FT/M = 147 °F/C

DISENGAGE STYLUS DATE ——— TIME

16:17

16:17

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

DATE

TIME

REMARKS

23-5-91

13:46

BOMBS IN LUB.

13:51

PRESSURE UP.

14:01

DEPRESSURE LUB.

14:06

PRESSURE UP & R.I.H.

23.5.91

15:35

P.O.O.H

15:53

AT SURFACE DEPRESSURE LUBRICATOR

16:00

PRESSURE UP LUBRICATOR

16:10

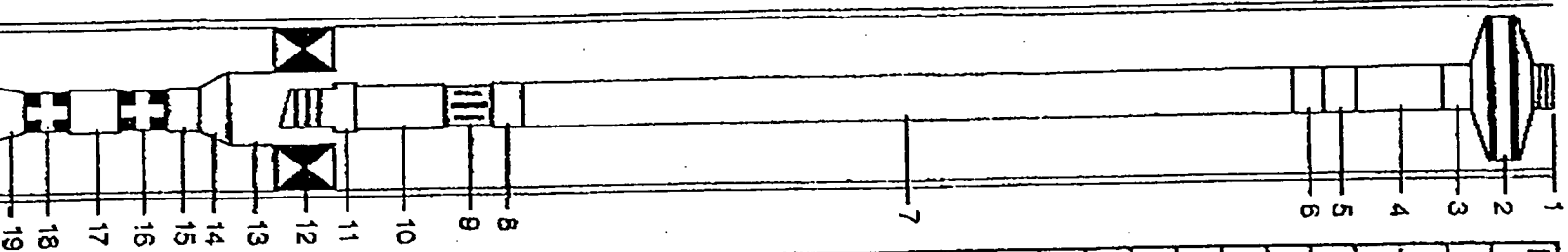
DEPRESSURE LUBRICATOR. Rig OUT ELEMENTS. INSPECT CHARTS.

PETROLEUM ENGINEERING DEPARTMENT

00056



DOWNHOLE INSTALLATION MARSILEA 1



ITEM NO.	DESCRIPTION	LENGTH (ft)	DEPTH K.B. (ft)	MIN. I.D. (in)
1	K.B. to top of tubinghead spool	16.20	0.00	
2	C.I.W. F.B.B.-EN tubing hanger 2 7/8" CS Hydril x 2 7/8" AB-J3SS	0.70		
3	Nipple 2 7/8" AB-J3SS J55 pin x pin	0.32		
4	1 joint 2 7/8" 6.5# J55 AB-J3SS tubing	31.18		
5	1 x 6' & 1 x 4' 2 7/8" 6.5# J55 AB-J3SS pup jls	9.48		
6	X-over 2 7/8" J55 AB-J3SS box x NK3SB pin	1.70		
7	236 joints 2 7/8" 6.5# J55 NK3SB tubing	7391.74		
8	X-over 2 7/8" J55 NK3SB box x AB-J3SS pin J55	1.70		
9	Onls 2 7/8" 121 XDH23110 sliding sleeve	3.58		2.313
10	1 joint 2 7/8" 6.5# J55 AB-J3SS tubing	31.20		
11	Baker E-22 size 80-32 anchor seal assembly	(3.29)	7487.80	
	Permanent Downhole Equipment			
12	Baker DB packer size 84-32 4 1/2" AB-J3SS	4.11	7487.80	
13	Millicut extension 4 1/2" AB-J3SS pin x pin	5.38		
14	Swage 4 1/2" box x 2 7/8" pin J55 AB-J3SS	1.75		
15	8' x 2 7/8" 6.5# J55 AB-J3SS pup joint	7.65		
16	Onls 2 7/8" 711 X23103 nipple AB-J3SS b x p	0.95	7508.69	2.313
17	1 x 12' & 1 x 8' 2 7/8" 6.5# J55 AB-J3SS pup jls	19.38		
18	Onls 2 7/8" 711 XN23117 nipple AB-J3SS b x p	1.02	7527.02	2.205
19	Re-entry guide 2 7/8" AB-J3SS x 3 1/2" J55	1.00		
	End of tailpipe		7529.04	
	Perforated thru tubing 75-3 sand on 6/4/1990			
	Rest of sands perforated on 10/5/1990			
PERFORATED INTERVALS:				
FORMATION	INTERVAL	SIZE	TYPE	S.P.F.
PATCHAWARRA	72-3 7614' - 7621'	2 7/8"	E/Iel	4
	73-5 7719' - 7749			
	73-7 7784' - 7779'			
	74-5 7806' - 7823'			
	74-6 7838' - 7875'			
	75-0 7890' - 7911'			
	75-3 7911' - 7927'			
	75-5 7942' - 7968'			
REMARKS:				
ANNULUS FLUID : 2% KCl 9-Oppg filtered inhibited brine				
INDICATED STRING WEIGHT : 43,000 #				
CALCULATED STRING WEIGHT : 41,973 #				
SLACK-OFF WEIGHT : 5,000 #				
TENSION :				
NOT TO SCALE				
PROPOSED	WELLSITE SUPERVISOR	M. Dunne	DATE OF INSTALLATION	14/3/1990
RE-COMPLETION	DRAFTED	E. Coppins	DATE	2/5/1990

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 1. OF 8

WELL NAME: MARSILEA #1.

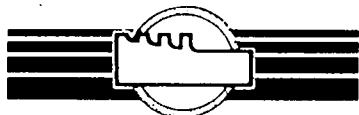
FORMATION : PATCHAWARRA

DATE: 10-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A.SMITH.

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCFD m ³ /10 ³	OIL BBLG m ³	WATER BBLG m ³	L.G.R m ³ /10 m ³	
10 TH MAY 1991.															
10:00	0	9412	9412	65	100%	COMMENCE L.E.T.									
12:00	2	9425	9425	67		9101	81	133.24	0	15.996	11.103	0	1.333	120	
14:00	4	9467	9467	65		9170	81	132.52	0	19.999	22.146	0	2.999	151	
16:00	6	9494	9494	65		9170	81	131.16	0	19.195	33.076	0	4.599	146	
18:00	8	9494	9494	66		9101	81	129.18	0	18.395	43.841	0	6.132	142	
20:00	10	9508	9508	69		9136	81	128.10	0	19.195	54.516	0	7.732	150	
22:00	12	9522	9522	72		9136	81	126.70	0	18.395	65.074	0	9.265	145	
24:00	14	9501	9501	72		9101	82	128.80	0	17.596	75.807	0	10.731	137	
11 TH MAY 1991.															
02:00	16	9460	9460	72		9067	82	129.85	0	19.195	86.628	0	12.331	148	
04:00	18	9515	9515	72		9101	82	128.80	0	19.195	87.361	0	13.931	149	
06:00	20	9570	9570	72		9170	82	128.02	0	17.596	98.029	0	15.397	137	
08:00	22	9667	9667	66		9274	79	124.31	0	18.395	108.388	0	16.930	148	
10:00	24	9667	9667	68		9343	79	123.39	0	18.395	118.670	0	18.463	149	
12:00	26	9653	9653	70		9412	80	125.08	0	18.395	129.093	0	19.996	147	
14:00	28	9653	9653	69		9412	80	125.08	0	18.395	139.516	0	21.529	147	
16:00	30	9701	9701	70		9446	80	122.35	0	19.195	149.712	0	23.129	157	
18:00	32	9749	9749	69		9446	80	119.25	0	18.395	159.650	0	24.662	154	
20:00	34	9798	9798	70		9481	81	117.58	0	16.796	169.448	0	26.062	142	
22:00	36	9722	9722	70		9412	81	118.61	0	16.796	179.332	0	27.462	142	
24:00	38	9598	9598	70	100%	9239	81	124.72	0	17.596	189.725	0	28.928	141	



CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 2. OF 8

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA.

DATE: 12-5-91.

TEST TYPE : L.E.T & B.H.P.

OPR : A. SMITH

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION			L.G.R	
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCFD m ³ /10 ³	OIL BBLG m ³	WATER BBLG m ³	L.G.R	m ³ /10 ⁶ m ³
12 TH MAY 1991.															
02:00	40	9529	9529	74	100%	9170	83	126.43	0	19.995	200.261	0	30.594	158	
04:00	42	9550	9550	76		9239	83	124.16		18.395	210.608		32.127	148	
06:00	44	9584	9584	76		9274	83	124.45		18.395	220.979		33.660	148	
08:00	46	9584	9584	70		9274	80	123.93		18.395	231.306		35.193	148	
10:00	48	9598	9598	70		9239	80	126.55		17.596	241.852		36.659	139	
12:00	50	9584	9584	73		9377	82	125.50		17.596	252.310		38.125	140	
14:00	52	9570	9570	75		9308	83	129.02		17.596	263.062		39.591	136	
16:00	56	9653	9653	74		9308	82	123.46		18.395	283.639		42.657	149	
22:00	60	9653	9653	69		9308	82	122.17		19.995	304.001		45.989	164	
13 TH MAY 1991.															
02:00	64	9687	9687	69		9343	82	119.43		18.395	323.906		49.055	154	
06:00	68	9687	9687	69		9343	80	118.43		17.596	343.644		51.988	148	
10:00	72	9612	9612	71		9308	80	124.22		16.796	364.347		54.787	135	
14:00	76	9550	9550	70		9308	81	126.75		19.195	385.472		57.186	151	
18:00	80	9550	9550	71		9239	82	125.79		18.395	406.437		60.252	146	
22:00	84	9563	9563	71		9205	82	125.49		18.795	427.352		63.385	150	
14 TH MAY 1991.															
02:00	88	9653	9653	70		9377	81	119.89		18.395	447.334		66.451	153	
06:00	92	9584	9584	68		9205	81	124.43		17.995	468.072		69.450	145	
10:00	96	9515	9515	72		9170	80	127.38		18.795	489.302		72.583	147	
14:00	100	9529	9529	76	100%	9274	82	128.91	0	18.795	510.787	0	75.716	146	

89000



CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB

PAGE: 3 OF 8

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 14TH MAY 1991.

TEST TYPE : L.E.T & B.H.P

OPR : A.SMITH.

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLS m ³	WATER BBLS m ³	L.G.R. m ³ /10 ⁶ m ³	
14 TH MAY 1991.															
18:00	104	9529	9529	79	100%	9170	82	126.62	0	19.996	531.89	0	79.049	158	
22:00	108	9543	9543	76		9170	82	125.20		18.395	552.757		82.115	147	
15 TH MAY 1991.															
02:00	112	9529	9529	69		9170	82	125.20		18.795	573.624		85.248	150	
06:00	116	9543	9543	69		9101	81	126.40		19.195	599.691		88.447	152	
10:00	120	9343	9343	72		8929	81	135.56		20.395	617.284		91.846	150	
14:00	124	9377	9377	74		9101	82	131.51		18.795	639.202		94.979	143	
18:00	128	9363	9363	79		8998	83	131.72		19.595	661.155		98.245	149	
22:00	132	9377	9377	77		8998	82	130.58		15.996	682.918		100.911	123	
16 TH MAY 1991.															
02:00	136	9412	9412	71		9032	82	129.55		14.795	704.510		104.049	145	
04:00	138	10446	10446	65	100%	9963	76	99.15	0	22.394	712.773	0	105.910	226	
04:15	COMPRESSOR DOWN, LINE PRESSURE UP, BURST RUPTURE DISC, BYPASS SEPARATOR. NOTE: 0400HR READING OFF CHARTS.														
06:00	140	11101	11101	68	100%										
10:00	144	11749	11749	61											
12:00	146	8977	8977	70											
14:00	148	9046	9046	72											
16:00	150	9136	9136	74											
18:00	152	9211	9211	76	100%	TRIM FLOW THROUGH SEPARATOR & CONTINUE TEST.									
19:00	153	9226	9226	75	100%	8825	80	115.79	0	20.795	717.597	0	106.776	180	
20:00	154	9239	9239	75	100%	8860	80	117.55	0	22.394	722.495	0	107.709	190	

69000



TEST RESULTS

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 4 OF 8

WELL NAME: MARGILEA #1.

FORMATION : PATCHAWARRA

DATE: 16-5-91

TEST TYPE : W.E.T & B.H.P

OPR : A. SMITH

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCFD m ³ /10 ³	OIL BBLS m ³	WATER BBLS m ³	L.C.R	m ³ /10 ⁶ m ³
16 TH MAY 1991.															
21:00	155	9453	9453	74	60%										
22:00	156	9281	9281	74	100%	8895	79	107.35	0	18.395	731.441	0	109.242	171	
22:35		9239	9239	74	100%	P.L.T TOOL FAILURE, S.W.I TO P.O.O.H.									
17 TH MAY 1991.															
01:15		12383	12383	74		P.L.T TOOL @ SURFACE & OPEN WELL 100%.									
02:00	160	9274	9274	65	100%	CONTINUE TEST. NOTE: 0900 HRS → 10:30 HRS 25% CHOKE FOR SCHLUMBERGER P.L.T.									
06:00	169	9308	9308	65		8963	76	107.03	0	22.394	749.279	0	112.979	209.	
09:00	167	9343	9343	67		9032	77	108.88		21.328	762.889		115.640	196	
11:00	169	9239	9239	65		8998	75	98.86		11.197	771.127		116.573	113	
12:00	170	9356	9356	68		9136	77	104.56		25.594	775.489		117.639	245	
13:00	171	9377	9377	67		9170	77	108.24		23.994	779.994		118.639	222	
14:00	172	9446	9446	67		9239	76	109.10		19.195	784.540		119.439	176	
15:00	173	9467	9467	67		9274	77	107.30		17.596	789.011		120.172	164	
16:00	174	9481	9481	68		9239	77	108.76		20.795	793.543		121.038	191	
17:00	175	9522	9522	68		9274	77	107.30		19.195	798.04		121.938	179	
17:30	175.5	9556	9556	70	100%	9308	78	105.63		19.195	800.215		122.238	182	
17:30						S.W.I FOR SCHLUMBERGER P.L.T PROGRAMME.									
17:35		11928	11928												
17:40		12390	12390												
17:45		12528	12528												
18:00	.5	12618	12618												

00073

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 5 OF 8

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 17-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A. SMITH.

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION			L.C.R.	
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLS m ³	WATER BBLS m ³	m ³ /10 ⁶ m ³	
17 TH MAY 1991.															
18:30	1.	12501	12501												
19:00		12432	12432												
19:30	2.	12411	12411												
20:30	3.	12397	12397												
22:30	5.	12432	12432												
18 TH MAY 1991.															
00:30	7.	12425	12425												
04:00	186	12397	12397			OPEN WELL 100% & CONTINUE L.E.T & B.H.P. (P.L.T COMPLETED).									
06:00	188	9184	9184	64	100%	8826	71	107.51	0	16.796	809.174	0	123.636	156	
08:00	190	9212	9212	65		8861	72	110.92		22.394	818.417		125.504	202	
10:00	192	9308	9308	66		8964	74	112.65		22.394	827.804		127.370	199	
12:00	194	9308	9308	69		9067	78	115.39		20.795	837.420		129.103	180	
14:00	196	9273	9273	70		9067	78	115.39		21.595	847.036		130.903	187	
16:00	198	9273	9273	70		9032	78	118.19		21.595	856.985		132.703	183	
18:00	200	9308	9308	74		8929	80	118.12		23.194	866.728		134.636	196	
20:00	202	9356	9356	73		8998	79	117.54		19.995	876.523		136.302	170	
22:00	204	9377	9377	71		8998	79	117.54		20.795	886.318		138.035	177	
24:00	206	9370	9370	73		8964	79	118.76		20.795	896.215		139.768	175	
19 TH MAY 1991.															
0200	208	9359	9359	74		8964	80	119.87		20.795	906.204		141.501	173	
04:00	210	9377	9377	74	100%	8929	80	119.58	0	21.595	916.169	0	143.300	181	

00072

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB

PAGE: 6 OF 8

WELL NAME: MARSILEA #1

FORMATION : PATCHAWARRA

DATE: 19-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A. SMITH

TIME		WELLHEAD DATA				SEPARATOR		FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLs m ³	WATER BBLs m ³	L.G.R	m ³ /10 ⁶ m ³
19 TH MAY 1991.															
06:00	212	9322	9322	73	100%	8895	80	120.74	0	19.195	926.231	0	144.900	159	
08:00	214	9342	9342	75	↓	8929	79	124.26	↑	19.195	936.586	↑	146.499	159	
10:00	216	9343	9343	72	↓	8998	80	123.05		20.795	946.840		148.232	169	
10:05		9343	9343	72	R.I.H WITH GAUGES										
10:24		9322	9322	73	@ HANG DEPTH 7580' KB										
11:00	217	9343	9343	75	100%	8964	82	122.03		19.195	951.925		149.032	157	
11:30		9343	9343	77	↑										
12:00	218	9343	9343	79		8998	82	123.74		20.795	957.081		149.898	168	
12:30		9343	9343	79											
13:00	219	9356	9356	79		9067	82	122.90		20.795	962.202		150.769	169	
13:30		9356	9356	79											
14:00	220	9356	9356	79		9067	82	122.90		20.795	967.323		151.630	169	
14:30		9356	9356	79	↓				↓			↓			
15:00	221	9343	9343	78	100%	9067	82	122.90	0	20.795	972.444	0	152.496	169	
15:00	0	S.W.I FOR 96 HR BUILD UP, (AS PER PROGRAMME)													
15:05		11983	11983												
15:10		12342	12342												
15:15	.25	12507	12507												
15:30	.5	12611	12611												
15:45	.75	12570	12570												
16:00	1	12480	12480												

00072

CUSTOMER : SANTOS

PERFORATIONS: 764' → 7968' KB.

PAGE: 7. OF 8

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 19-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A.SMITH

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLS m ³	WATER BBLS m ³		
19 TH MAY 1991.															
16:15		12466	12466												
16:30		12439	12439												
16:45		12432	12432												
17:00	2	12425	12425												
17:15		12418	12418												
17:30		12411	12411												
17:45		12411	12411												
18:00	3	12411	12411												
18:15		12404	12404												
18:30		12404	12404												
18:45		12397	12397												
19:00	4	12397	12397												
23:00		12376	12376												
20 TH MAY 1991.															
03:00	12	12363	12363												
07:00		12342	12342												
11:00		12383	12383												
15:00	24	12376	12376												
19:00		12363	12363												
23:00		12349	12349												
21 ST MAY 1991.															

00073

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968'KG

PAGE: 8 OF 8

WELL NAME: MARSIKEA#1.

FORMATION : PATCHAWARRA

DATE: 21-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A SMITH

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ 10 ³	OIL BBLS m ³	WATER BBLS m ³		
21 ST MAY 1991.															
03:00	36	12349	12349												
07:00		12363	12363												
11:00		12425	12425												
15:00	48	12418	12418												
19:00		12411	12411												
23:00		12397	12397												
22 ND MAY 1991.															
03:00	60	12383	12383												
07:00		12383	12383												
11:00		12362	12362												
1500	72	12363	12363												
1900	76	12363	12363												
2300	80	12356	12356												
23 RD MAY 1991															
0300	84	12349	12349												
0700	88	12342	12342												
1100	92	12369	12369												
P.O.A.H. END BUILD-UP SURVEY. SEE GAUGE RUN DATA SHEET.															

00074



CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 1. OF 6.

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 10 - 5 - 91

TEST TYPE : L.E.T & B.H.P

OPR : A. SMITH.

ORIFICE METER TYPE: DANIELS SNR.

STATIC PRESSURE RANGE : 0 → 1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .800

METER RUN SIZE : 2.900"

DIFFERENTIAL PRESS. RANGE: 0 → 100 IN WC

FG $\sqrt{(1/SG)}$ = 1.1180

SEPARATOR NO : # 238

STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU × FG) = 26.8328

DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE %	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	$C_1 = F_B \times F_{TF} \times F_{PV} \times Y_2$				C ₁	C (C = C ₁ × C ₂)	GAS FLOW RATE $Q = \sqrt{(P_F \times H_W) \times C}$	
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)
10 TH MAY 1991.															
10:00	0	COMMENCE L E.T.													
12:00	2	100%	1335	50	178	1.75"	258.360	674.44	.9028	1.1202	1.0002	682.187	18304.998	4.729	133.24
14:00	4		1345	49	178		256.720		.9028	1.1212	1.0002	682.844	18322.629	4.704	132.52
16:00	6		1345	48	178		254.086		.9028	1.1212	1.0002	682.841	18322.555	4.655	131.16
18:00	8		1335	47	178		250.489		.9028	1.1202	1.0002	682.178	18304.776	4.585	129.18
20:00	10		1340	46	178		248.274		.9028	1.1207	1.0002	682.505	18313.551	4.547	128.10
22:00	12		1340	45	178		245.560		.9028	1.1207	1.0002	682.503	18313.478	4.497	126.70
24:00	14	100%	1335	47	180		250.489		.9014	1.1186	1.0002	680.147	18250.283	4.572	128.80
11 TH MAY 1991.															
02:00	16	100%	1330	48	180		252.666		.9014	1.1180	1.0002	679.826	18241.672	4.609	129.85
04:00	18		1335	47	180		250.489		.9014	1.1186	1.0002	680.147	18250.283	4.572	128.80
06:00	20		1345	46	180		248.737		.9014	1.1196	1.0002	680.793	18267.608	4.544	128.02
08:00	22		1360	42	174		238.998		.9056	1.1262	1.0002	688.020	18461.515	4.412	124.31
10:00	24		1370	41	174		237.002		.9056	1.1273	1.0002	688.704	18479.883	4.380	123.39
12:00	26		1380	42	176		240.749		.9042	1.1268	1.0002	687.256	18441.015	4.440	125.08
14:00	28		1380	42	176		240.749		.9042	1.1268	1.0002	687.256	18441.015	4.440	125.08
16:00	30		1385	40	176		235.372		.9042	1.1273	1.0002	687.589	18449.960	4.343	122.35
18:00	32		1385	38	176		229.412		.9042	1.1273	1.0001	687.584	18449.816	4.233	119.25
20:00	34	100%	1390	37	178	1.75"	226.781	674.44	.9028	1.1262	1.0001	685.797	18401.881	4.173	117.58

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB

PAGE: 2. OF 6

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 11-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A.SMITH

ORIFICE METER TYPE: DANIELS SNR.

STATIC PRESSURE RANGE : 0 → 1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .800

METER RUN SIZE : 2.900"

DIFFERENTIAL PRESS. RANGE: 0 → 100 IN WC

FG $\sqrt{(1/SG)}$ = 1.1180

SEPARATOR NO : #238

STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU × FG) = 26.8928

DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE %	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	√(P _F × H _W)	C ₁ = F _B × F _{TF} × F _{PV} × Y ₂				C ₁	C (C = C ₁ × C ₂)	GAS FLOW RATE Q = √(P _F × H _W) × C	
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)
11 TH MAY 1991.															
22:00	36	100%	1380	38	178	1.75"	228.998	674.44	.9028	1.1251	1.0001	685.139	18384.086	4.210	118.61
24:00	38	↑	1355	43	178	↑	241.381	↑	.9028	1.1223	1.0002	683.488	18339.933	4.427	124.72
12 TH MAY 1991.															
02:00	40		1345	45	181		246.018		.9007	1.1189	1.0002	679.779	18240.402	4.487	126.43
04:00	42		1355	43	181		241.381		.9007	1.1199	1.0002	680.418	18257.539	4.407	124.16
06:00	44		1360	43	181		241.826		.9007	1.1204	1.0002	680.740	18266.193	4.417	124.45
08:00	46		1360	42	176		238.998		.9042	1.1245	1.0002	685.904	18404.750	4.399	123.93
10:00	48		1355	44	176		244.172		.9042	1.1240	1.0002	685.572	18395.952	4.492	126.55
12:00	50		1375	43	180		243.156		.9014	1.1228	1.0002	682.738	18319.794	4.454	125.50
14:00	52		1365	46	181		250.579		.9007	1.1210	1.0002	681.071	18275.072	4.579	129.02
16:00	56		1365	42	180		239.437		.9014	1.1218	1.0002	682.083	18302.220	4.382	123.46
22:00	60		1365	41	179		236.569		.9021	1.1226	1.0002	683.110	18329.765	4.336	122.17
13 TH MAY 1991.															
02:00	64		1370	39	179		231.149		.9021	1.1231	1.0002	683.433	18338.446	4.239	119.43
06:00	68		1370	38	176		228.166		.9042	1.1256	1.0001	686.568	18422.576	4.203	118.43
10:00	72		1365	42	176		239.437		.9042	1.1251	1.0002	686.241	18413.803	4.409	124.22
14:00	76		1365	44	178		245.071		.9028	1.1234	1.0002	684.154	18357.784	4.499	126.75
18:00	80	↓	1355	44	180	↓	244.172	↓	.9014	1.1207	1.0002	681.437	18284.896	4.465	125.79
22:00	84	100%	1350	44	180	1.75"	243.721	674.44	.9014	1.1202	1.0002	681.112	18276.174	4.454	125.49

92000

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB

PAGE: 3. OF 6

WELL NAME: MARSILEA #1.

FORMATION : PATCHANARRA

DATE: 14-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A.SMITH.

ORIFICE METER TYPE: DANIELS SNR.

STATIC PRESSURE RANGE : 0 → 1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .800

METER RUN SIZE : 2.900"

DIFFERENTIAL PRESS. RANGE: 0 → 100 IN WC

FG $\sqrt{(1/SG)}$ = 1.1180

SEPARATOR NO : #238

STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU × FG) = 26.8328

DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE %	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	√(P _F × H _W)	C ₁ = F _B × F _{TF} × F _{PV} × Y ₂				C ₁	C (C = C ₁ × C ₂)	GAS FLOW RATE Q = √(P _F × H _W) × C			
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)		
14 TH MAY 1991.																	
02:00	88	100%	1375	39	178	1.75"	231.570	674.44	.9028	1.1245	1.0002	684.804	18375.237	4.255	119.89		
06:00	92		1350	43	178		240.936		.9028	1.1218	1.0002	683.158	18331.056	4.417	124.43		
10:00	96		1345	45	176		246.018		.9042	1.1229	1.0002	684.902	18377.866	4.521	127.38		
14:00	100		1360	46	180		250.120		.9014	1.1213	1.0002	681.768	18293.770	4.576	128.91		
18:00	104		1345	45	180		246.018		.9014	1.1196	1.0002	680.790	18267.535	4.499	126.618		
22:00	108		1345	44	180		243.269		.9014	1.1196	1.0002	680.788	18267.462	4.449	125.20		
15 TH MAY 1991.																	
02:00	112		1345	44	180		243.269		.9014	1.1196	1.0002	680.788	18267.462	4.449	125.20		
06:00	116		1335	45	178		245.102		.9028	1.1202	1.0002	682.173	18304.629	4.487	126.40		
10:00	120		1310	53	178		263.496		.9028	1.1175	1.0002	680.551	18261.124	4.812	135.56		
14:00	124		1335	49	180		255.763		.9019	1.1186	1.0002	680.153	18250.430	4.668	131.51		
18:00	128		1320	50	181		256.905		.9007	1.1162	1.0002	678.189	18197.721	4.675	131.72		
22:00	132		1320	49	180		254.322		.9014	1.1169	1.0002	679.183	18224.403	4.635	130.58		
16 TH MAY 1991.																	
02:00	136		1325	48	180		252.190		.9014	1.1175	1.0002	679.503	18232.996	4.599	129.55		
04:00	138	100%	1460	24	169	1.75"	187.189	674.44	.9092	1.1424	1.0001	700.640	18800.154	3.519	99.15		
04:15							BYPASS SEPARATOR & REFER TO SEQUENCE OF EVENTS.										
18:00	152						TRIM FLOW THROUGH SEPARATOR & CONTINUE TEST.										
19:00	153	100%	1295	39	176	1.75"	224.733	674.44	.9092	1.1174	1.0002	681.541	18287.680	4.110	115.79		

00077

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 4. OF 6

WELL NAME: MARSILEA #1.

FORMATION : PATCHANAREA

DATE: 16-5-91

TEST TYPE : L.E.T & B.H.P.

OPR : A. SMITH.

ORIFICE METER TYPE: DANIELS SNR.

STATIC PRESSURE RANGE : 0 → 1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .800

METER RUN SIZE : 2.900"

DIFFERENTIAL PRESS. RANGE: 0 → 100 IN WC

FG $\sqrt{(1/SG)}$ = 1.1180

SEPARATOR NO : #238

STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU × FG) = 26.8328

DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	C ₁ = F _B × F _{TF} × F _{PV} × Y ₂				C ₁	C (C = C ₁ × C ₂)	GAS FLOW RATE Q = $\sqrt{(P_F \times H_W) \times C}$	
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)
16 TH MAY 1991.															
20:00	154	100%	1300	40	176	1.750"	228.035	674.44	.9042	1.1179	1.0002	681.877	18296.686	4.172	117.55
22:00	156	100%	1305	33	174	1.750"	207.521		.9056	1.1201	1.0001	684.240	18360.086	3.810	107.35
22:35	S.W.I & REFER TO SEQUENCE OF EVENTS.														
17 TH MAY 1991.															
02:00	160	CONTINUE TEST													
06:00	164	100%	1315	32	169	1.750"	205.134		.9092	1.1254	1.0001	690.192	18519.809	3.800	107.03
09:00	167		1325	33	171		209.105		.9078	1.1248	1.0001	688.763	18481.451	3.869	108.88
11:00	169		1320	27	167		198.786		.9107	1.1277	1.0001	692.701	18581.144	3.509	98.86
12:00	170		1340	30	171		200.499		.9078	1.1265	1.0001	689.806	18509.462	3.711	104.56
13:00	171		1345	32	171		207.461		.9078	1.1271	1.0001	690.163	18519.042	3.892	108.29
14:00	172		1355	32	169		208.231		.9092	1.1300	1.0001	693.051	18596.509	3.872	109.10
15:00	173		1360	31	171		205.329		.9078	1.1288	1.0001	691.217	18547.322	3.808	107.30
16:00	174		1355	32	171		208.231		.9078	1.1283	1.0001	690.868	18537.934	3.860	108.76
17:00	175		1360	31	171		205.329		.9078	1.1288	1.0001	691.217	18547.322	3.808	107.30
17:30	175.5	100%	1365	30	172	1.750"	202.361	674.44	.9071	1.1285	1.0001	690.481	18527.565	3.749	105.63
17:30	S.W.I FOR SCHLUMBERGER P.L.T														
18 TH MAY 1991.															
04:00	D.L.T COMPLETED OPEN WELL 100% CONTINUE L.E.T & BHP.														
06:00	188	100%	1295	32	160	1.750"	203.568	674.44	.9158	1.1309	1.0001	698.619	18745.923	3.816	107.51

00078

CUSTOMER : SANTOS

PERFORATIONS: 761A' → 7968' KB

PAGE: 5 OF 6

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 18-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A. SMITH

ORIFICE METER TYPE: DANIELS SNR.

STATIC PRESSURE RANGE : 0 → 1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .800

METER RUN SIZE : 2.900"

DIFFERENTIAL PRESS. RANGE: 0 → 100 IN WC

FG $\sqrt{(1/SG)}$ = 1.1180

SEPARATOR NO : #238

STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU × FG) = 26.8328

DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE %	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	C ₁ = F _B × F _{TF} × F _{PV} × Y ₂				C ₁	C (C = C ₁ × C ₂)	GAS FLOW RATE Q = $\sqrt{(P_F \times H_W) \times C}$	
								F _B	F _{TF}	F _{PV}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)
18 TH MAY 1991.															
08:00	190	100%	1300	34	161	1.750"	210.238	674.44	.9151	1.1306	1.0001	697.881	18726.118	3.937	110.92
10:00	192		1315	35	165		214.53A		.9121	1.1289	1.0001	694.553	18636.628	3.998	112.65
12:00	194		1330	37	172		221.833		.9071	1.1245	1.0001	688.060	18462.589	4.096	115.39
14:00	196		1330	37	172		221.833		.9071	1.1245	1.0001	688.060	18462.589	4.096	115.39
16:00	198		1325	39	172		227.321		.9071	1.1240	1.0002	687.718	18463.423	4.195	118.19
18:00	200		1310	40	176		228.910		.9042	1.1190	1.0002	682.543	18314.577	4.192	118.12
20:00	202		1320	39	174		226.892		.9056	1.1217	1.0002	685.276	18387.901	4.172	117.54
22:00	204		1320	39	174		226.892		.9056	1.1217	1.0002	685.276	18387.901	4.172	117.54
24:00	206		1315	40	174		229.347		.9056	1.1212	1.0002	684.939	18378.846	4.215	118.76
19 TH MAY 1991.															
02:00	208		1315	41	176		232.196		.9042	1.1196	1.0002	682.880	18323.612	4.255	119.871
04:00	210		1310	41	176		231.754		.9042	1.1190	1.0002	682.546	18314.652	4.244	119.58
06:00	212		1305	42	176		234.115		.9042	1.1185	1.0002	682.216	18305.778	4.286	120.74
08:00	214		1310	44	174		240.083		.9056	1.1206	1.0002	689.610	18370.027	4.410	124.26
10:00	216		1320	43	176		238.244		.9042	1.1201	1.0002	683.220	18332.731	4.368	123.05
11:00	217		1315	43	180		237.792		.9014	1.1164	1.0002	678.844	18215.298	4.331	122.03
12:00	218		1320	44	180		240.998		.9014	1.1170	1.0002	679.169	18229.031	4.392	123.74
13:00	219		1330	43	180		239.144		.9014	1.1180	1.0002	679.813	18241.303	4.362	122.90
14:00	220		1330	43	180		239.144		.9014	1.1180	1.0002	679.813	18241.303	4.362	122.90

CUSTOMER :	SANTOS	PERFORATIONS:	7614' → 7968' KB	PAGE: 6	OF 6
WELL NAME:	MARSILEA #1.	FORMATION :	PATCHAWARRA	DATE:	19-5-91
TEST TYPE :	L.E.T & B.H.P			OPR :	A.SMITH

ORIFICE METER TYPE:	DANIELS SNR	STATIC PRESSURE RANGE :	0 → 1500 PSIG	GAS SPECIFIC GRAVITY (SG) =	.800
METER RUN SIZE :	2.900"	DIFFERENTIAL PRESS. RANGE:	0 → 100 IN WC	FG $\sqrt{(1/SG)}$	= 1.1180
SEPARATOR NO :	# 235	STANDARD CONDITIONS :	14.73 PSI @ 60°F	C ₂ (FU × FG)	= 26.8328

[illegible]

CUSTOMER : SANTOS

PERFORATIONS: 7614' - 7968' KB

PAGE: 1. OF 3

WELL NAME: MARSIEA #1.

FORMATION : PATCHAWARRA

DATE: 9-5-91

TEST TYPE : L.E.T & B.H.P.

OPR : A.SMTH.

DATE/TIME	DESCRIPTION OF EVENTS
9 TH MAY 1991.	
11:55	ARRIVE ON LOCATION, S.W.I & RIG UP SWAB VALVE.
12:05	WELL BACK ON LINE 100%, RIG UP WIRELINE EQUIPMENT, SPOT & COMMENCE RIGGING UP OF TESTING EQUIPMENT.
16:05	WIRELINE EQUIPMENT PRESSURE TESTED O.K. & R.I.H WITH A 1.75" BLIND BOX TO P.B.T.D.
16:25	@ P.B.T.D, 8096' KB. (PERFORATIONS & TUBING CLEAR) & P.O.O.H.
16:55	@ SURFACE.
17:00	SECURE LOCATION.
10 TH MAY 1991.	
09:00	RIG IN COMPLETED & PRESSURE TEST EQUIPMENT.
09:30	PRESSURE TEST, (GOOD), TRIM FLOW THROUGH SEPARATOR, GAS BACK IN LINE TO PRODUCT-ION & ENGAGE A 1.750" ORIFICE PLATE.
10:00	COMMENCE L.E.T.
12 TH MAY 1991.	
12:00	COLLECT 2x 500ml L.P WATER SAMPLES FROM SEPARATOR.
13 TH MAY 1991.	
10:00	DRAIN WATER FROM TEST TANK.
11:00	DRAINING COMPLETED, NEW TARE DIP & 3HR RATE @ 14:00.
15 TH MAY 1991.	
08:00	SCHLUMBERGER ARRIVE ON LOCATION & RIG UP FOR P.L.T.
18:00	DRAIN WATER FROM TEST TANK
19:00	DRAINING COMPLETED, NEW TARE DIP
16 TH MAY 1991.	
04:15	COMPRESSOR'S DOWN, LINE PRESSURE UP, BURST RUPTURE DISC IN SEPARATOR & BYPASS SEPARATOR.

00081

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' KB.

PAGE: 2 OF 3

WELL NAME: MARSILEA #1.

FORMATION : PATCHAWARRA

DATE: 16-5-91

TEST TYPE : L.E.T & B.H.P

OPR : A. SMITH

DATE/TIME

DESCRIPTION OF EVENTS

16TH MAY 1991.08:00 HEAD FOR MOOMBA TO REDRESS A PRESSURE TEST P.S.V & TO REPLACE N/A RUPTURE DISC FOR A 2ND P.S.V.

17:30 ARRIVE BACK ON LOCATION & RIG IN THE 2. P.S.V.'S.

18:00 TRIM FLOW THROUGH SEPARATOR & ENGAGE A 1.750" PLATE, CONTINUE TEST.

20:00 CHOKE WELL BACK TO 50% TO ENABLE SCHLUMBERGER TO RUN IN HOLE WITH P.L.T TOOL.

20:30 CHOKE WELL BACK TO 25% TO INCREASE TOOLSTRING WEIGHT.

20:40 INCREASE CHOKE TO 60%

21:45 P.L.T TOOL OUT OF END OF TUBING, INCREASE CHOKE TO 100% & REFER TO SCHLUMBERGER P.L.T REPORT FOR MORE INFORMATION.

22:35 P.L.T TOOL FAILURE, S.W.I TO P.O.O.H

17TH MAY 1991.

01:15 P.L.T TOOL @ SURFACE & OPEN WELL TO 100%. (FLOWING THROUGH SEPARATOR).

02:00 CONTINUE L.E.T & B.H.P.

09:00 CHOKE WELL BACK TO 25% TO ENABLE SCHLUMBERGER TO R.I.H WITH P.L.T TOOL.

10:30 P.L.T TOOL OUT OF END OF TUBING, INCREASE CHOKE TO 100% & REFER TO SCHLUMBERGER P.L.T REPORT

17:30 S.W.I FOR SCHLUMBERGER P.L.T PROGRAMME. & DRAIN WATER OFF TANK

18TH MAY 1991.

04:00 P.L.T COMPLETED, OPEN WELL 100%, TRIM FLOW THROUGH SEPARATOR, ENGAGING A 1.750" ORIFICE PLATE & CONTINUE L.E.T & B.H.P.

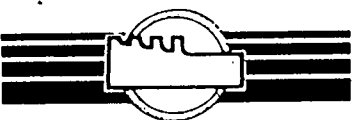
19TH MAY 1991.

06:30 PREPARE ELEMENTS FOR B.H.P.

07:05 PRESSURE LUBRICATOR.

09:05 DEPRESSURE LUBRICATOR. (AS PER PROGRAMME.

00082



PERFORATIONS: 7614' → 7968' KB.
FORMATION : PATCHAWARRA

PAGE: 3. OF 3.
DATE: 10-5-91.
OPR: A. SMITH

[illegible]

0083

EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS

PERFORATIONS: 7614' → 7968' CB

PAGE: 1. OF 2

WELL NAME: MARSILEA*1.

FORMATION : PATCHAWARRA

DATE: 19-5-90

TEST TYPE : L.E.T & B.H.P

OPR : A. SMITH

GAUGE DATA	UPPER PRESSURE GAUGE	LOWER PRESSURE GAUGE	TEMPERATURE GAUGE	RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
ELEMENT SERIAL NO.	850208	850207	/	DATE : 19-5-91		1352	
ELEMENT RANGE	4100 PSI	4075 PSI		PRESSURE LUBRICATOR :	07:05	9322	9322
RECORDING SECTION SERIAL NO.	K343A	K3433		RUN IN HOLE :	10:05	9343	9343
DATE OF CALIBRATION: @ 290°F	16-1-91	16-1-91		ON DEPTH AT : 7580 FT/M	10:24	9322	9322
CLOCK SERIAL NO.	24730	15296		DATE : 23-5-91			
CLOCK RANGE	120 HR	120 HR		PULL OUT OF HOLE :	11:00	12369	12369
LEAD SCREW TYPE	15 T/L	15 T/L		AT SURFACE :	11:20	12369	12369
				DEPRESSURE LUBRICATOR :	13:20	12383	12383
ENGAGE SYLUS DATE 19-5-91 TIME 06:55	06:55	06:55		MAXIMUM BHT AT 7580 FT/M = 146 %IC		1796	
DISENGAGE SYLUS DATE 23-5-91 TIME 13:27	13:27	13:27		N.B. ALL DEPTHS ARE MEASURED FROM K.B.			

DATE	TIME	REMARKS	B/UP: 92 _{hrs} 5520 min
19-5-91	07:05	PRESSURE LUB.	
	09:05	BLEED LUB.	
	10:05	PRESSURE LUB & R.I.H.	IN/OUT RUN
	10:24	@ 7580' CB. (HANG DEPTH).	Top : 1345/1807 10
	15:00	S.N.I FOR 96 HR BUILD UP	Bot : 1356/1804 20
23-5-91	11:00	P.O.O.H END BUILD-UP.	
	11:20	@ SURF. DEPRESSURE LUB.	
	12:20	PRESSURE UP. LUB.	
	13:20	DEPRESSURE LUB.	
	13:27	DISENGAGE SYLUS.	

SANTOS LTD.
PETROLEUM DEVELOPMENT DEPARTMENT
A.C.N. 007 550 923

MARSILEA #1 PATCHAWARRA FORMATION
MODIFIED ISOCHRONAL
5TH-15TH JUNE, 1990

Report: RE:046/91
Author: M.L. Downie
Date: July, 1991



	<u>Page No.</u>
1. INTRODUCTION	1
2. RESULTS	2
3. CONCLUSIONS/RECOMMENDATIONS	3
4. DISCUSSION	4

APPENDICES

I	Modified Isochronal Analysis
II	Pressure Build-up Analyses
III	Welltest Data
IV	Compositional Data
V	Static Gradient

1. INTRODUCTION

00087

Marsilea #1 was drilled during April/May, 1989 as an exploration well, located northwest of the Brumby field.

Three open hole DST's were conducted. DST #1 (7790'-7889' KB) flowed gas at 10.9 MMscf/d with a surface pressure of 2084 psia on ½" choke.

DST #2 (7922'-7938' KB) was a mis-run. DST #3 (7922'-7938' KB) flowed at a rate too small to measure.

In March, 1990, the well was completed as a single Patchawarra gas producer with 2 7/8" tubing and was perforated with 2 1/8" enerjets over eight Patchawarra sands.

The following table provides the formation parameters for the completion in the well.

FORMATION	SAND	NET PAY (ft)	POROSITY (%)	WATER SATURATION (%)	PERFORATED INTERVAL (ft KB)
PATCHAWARRA	72-3	1	10.7	25.4	7614-7621
	73-5	23	11.7	16.6	7719-7749
	73-7	16	10.0	24.3	7764-7779
	74-5	10	12.9	11.5	7806-7823
	74-6	31	11.3	18.8	7838-7875
	75-0	17	12.7	14.2	7890-7927
	75-3	10	10.3	41.8	
	75-5	25	11.7	22.2	
		133	11.5	20.4	7942-7968

A modified isochronal test of Marsilea #1 commenced on June 5th, 1990 to determine well deliverability characteristics and reservoir properties.

Separator fluid samples were collected during the extended flow period and these have been recombined into full well stream composition for fluid properties.

This report presents the results and conclusions arising from the testing of Marsilea #1.

2. RESULTS

00088

The following results were obtained from modified isochronal techniques.

Simplified Analysis:

AOF 42.6 MMscf/d
C 2.4 E- 04 MMscf/d/psia²
n 0.74

LIT Analysis

AOF 31.6 MMscf/d
a 4.0 E+ 03 psia²/cp/Mscf/d
b 0.46 psia²/cp/Mscf²/d²
D 1.523 E- 03 day/Mscf

The following results were obtained from pressure build-up analysis using numerical modelling techniques.

Flow capacity	5667 md-ft
Permeability	42.6 md
Apparent skin	20.9
True skin	7.8
Extrapolated pressure	3389 psia @ 8000' KB
Static pressure	3379 psia @ 7950' KB

The flow rates are as follows:

Gas	8.5	MMscf/d @ FTHP 2440 psia
Condensate	1.7	bbls/MMscf
Water	4.3	bbls/MMscf

3. CONCLUSIONS/RECOMMENDATIONS

1. The well has shown good productivity with the flow capacity of 5667 md-ft.
2. Mechanical problems were experienced during the extended flow and extended shut-in periods. The extended flow period was interrupted several times due to a leaking swab valve therefore flow rates were calculated over the final 20 hour period only. The extended shut-in period was interrupted by gauge failure towards the end of the period and a continuous build-up was not achieved. As pressure at the point of failure and after re-start had stabilized the interpretation has not been duly affected. It is recommended the next pressure build-up survey on Marsilea 1 be run for 96 hours to provide more conclusive results.
3. The recombined full well stream composition is valid and should be adopted.

Method

Testing began with the well being flowed to clean-up for 78 hours and after establishing isochronal rates was shut-in for 43 hours before commencing the isochronal test sequence. The isochronal test sequence consisted of four flow and shut-in periods of four hourly durations followed by an extended flow of 36 hours and extended shut-in for 48 hours. A static gradient survey was performed to complete the test programme.

Analysis

The pressure build-up analysis was performed using the ECL "WELTEST" software package which provides the use of numerical simulation techniques and diagnostic plots.

Results

The superposition plot (Appendix II) of the build-up exhibits a rise in pressure in the middle time region which is attributed to multi-layering effects. This "hump" in the middle time region of the build-up made the slope estimate for the transient period slightly questionable although a reasonable fit was made. Flow capacity of 5667 md-ft is good but productivity could be improved as the true skin value of 7.8 indicates the wells' productivity potential is not being reached. A small stimulation should be considered to fully maximise the wells productivity. The deliverability plots indicate clean-up problems during the test as the stabilized point has plotted below the transient line.

The "humping" effect coupled with mechanical gauge problems during the build-up have hindered the interpretation of this test but reasonable results have been obtained. A longer (96 hours), mechanically sound pressure build-up survey is required to provide better quality data and a more precise interpretation.

Composition

The well was sampled during the extended flow period and a compositional study was performed by Petrolab (Appendix IV).

APPENDIX 1

Modified Isochronal Analysis

RATE DATA

00092

Time	Rate
Hours	Mscf/day
0.0	3727.0
78.0	0.0
121.0	2816.0
125.0	0.0
129.0	4308.0
133.0	0.0
137.0	5800.0
141.0	0.0
145.0	8833.0
149.0	8570.0
185.0	0.0

SIMPLIFIED

AOF plot

dP**2 10**

7

slope = 1.35
n = 0.74
C = 2.4 E-04 MMscf/day/psia2
AOF = 42.57 MMscf/day

MARSILEA #1

6

5

3

4

5

RATE

10**

06690

dm(P) - FQ**2 10**

9

slope = 1.03
 a = 4.049 E+03 psia²/cp/Mscf/day
 b = 0.46 psia²/cp/Mscf²/day²
 D = 1.523 E-03 day/Mscf
 AOF = 31.59 MMscf/day

MARSILEA #1

8

7

3

4

5

RATE 10**

00094

00095

APPENDIX II

Pressure Build-up Analysis

FIELD : Marsilea

WELL : Marsilea 1

TEST NO. : Modified Isochronal
Extended Build-up

DATE : 5 - 15 June 1990

00097

RUN TYPE : Analysis

PHASE : GAS

NO. OF WELLS : 1

PVT DATA : Reservoir temperature = 748.0 deg F
 Standard temperature = 60.0 deg F
 Standard pressure = 14.7 psia

Table	Pressure	Z-factor	Viscosity
	psia		cpoise
	14.7	0.999	0.01400
	200.0	0.988	0.01450
	400.0	0.976	0.01470
	600.0	0.965	0.01500
	800.0	0.955	0.01540
	1000.0	0.946	0.01580
	1200.0	0.938	0.01600
	1400.0	0.931	0.01640
	1600.0	0.926	0.01670
	1800.0	0.922	0.01710
	2000.0	0.919	0.01750
	2200.0	0.917	0.01790
	2400.0	0.917	0.01840
	2600.0	0.918	0.01890
	2800.0	0.92	0.19500
	3000.0	0.924	0.02000
	3200.0	0.928	0.02060
	3400.0	0.933	0.02110
	3600.0	0.94	0.02170

Calculations to use REAL time

Visc * comp calculated at first pressure in data

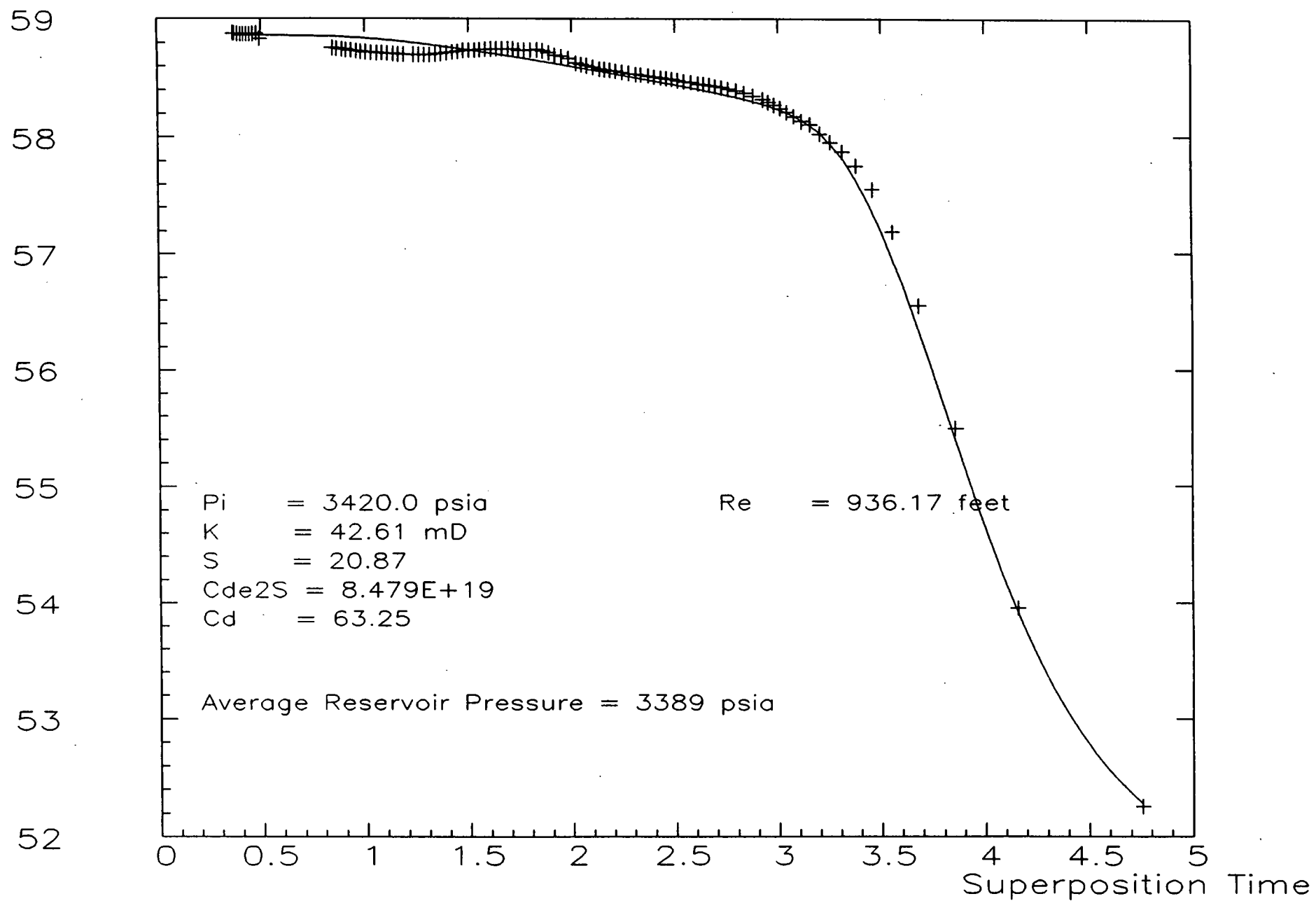
WELL DATA : Well radius = 0.354 feet
 Formation thickness = 133.0 feet
 Porosity = 0.115
 Rock compressibility = 3.000E-07 1/psi
 Water saturation = 0.204
 Water compressibility = 3.000E-07 1/psi

PRESSURE DATA

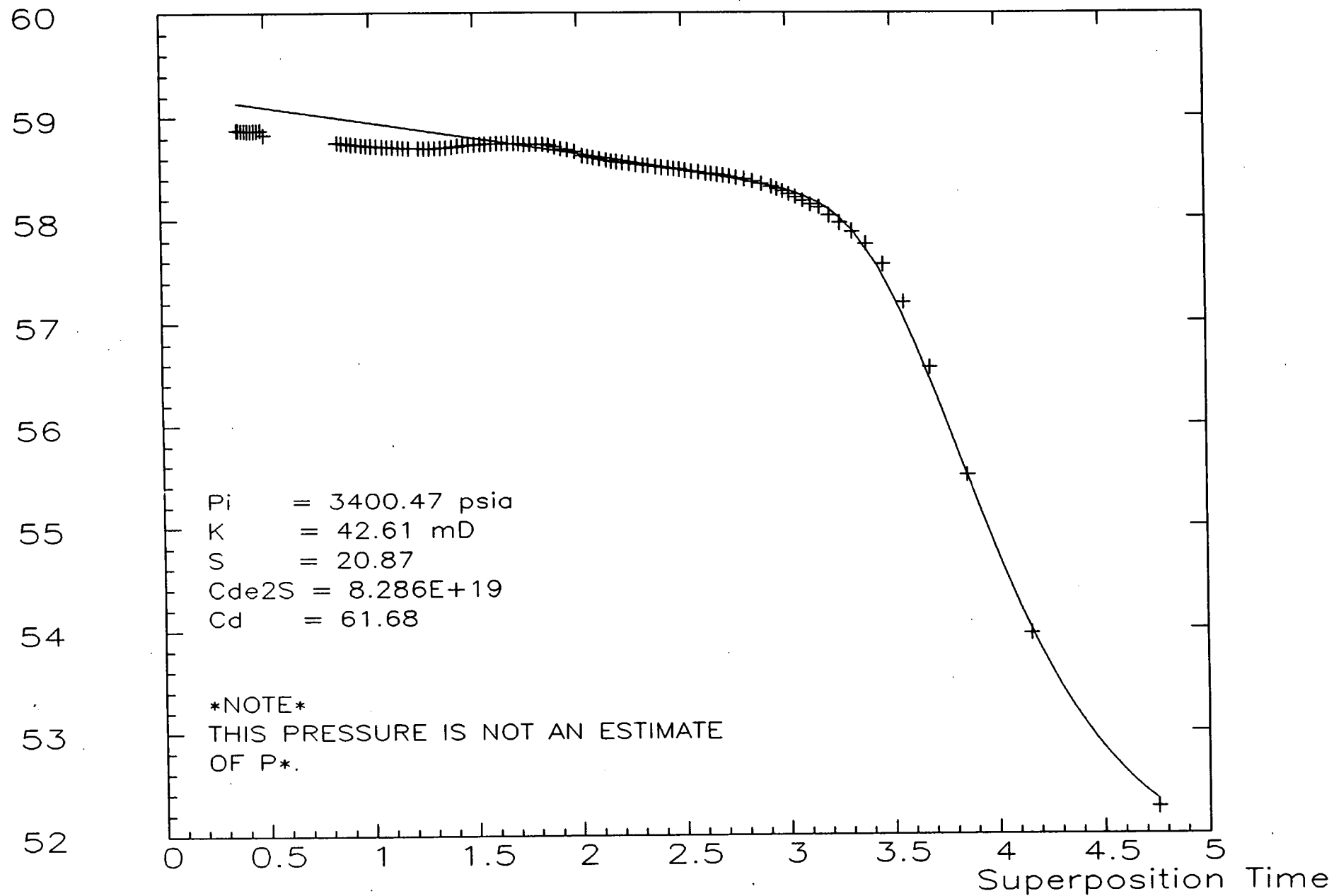
00098

Time	Pressure	Time	Pressure	Time	Pressure
Hours	psia	Hours	psia	Hours	psia
0.0	3420.0	185.14	3377.336	186.758	3385.677
78.0	3362.0	185.152	3377.736	186.876	3385.57
121.0	3411.4	185.164	3377.932	187.009	3385.514
125.0	3363.3	185.176	3378.228	187.14	3385.348
129.0	3413.6	185.188	3378.52	187.273	3385.178
133.0	3320.4	185.2	3378.664	187.437	3384.96
137.0	3415.0	185.212	3378.836	187.603	3384.778
141.0	3276.6	185.228	3379.086	187.768	3384.636
145.0	3415.8	185.244	3379.339	187.966	3384.524
149.0	3185.4	185.265	3379.579	188.163	3384.497
185.0	3187.8	185.281	3379.697	188.361	3384.482
185.001	3194.713	185.305	3379.937	188.593	3384.535
185.004	3245.487	185.329	3380.207	189.054	3384.6
185.008	3290.817	185.353	3380.471	189.318	3384.66
185.012	3322.058	185.377	3380.669	189.583	3384.738
185.016	3340.732	185.401	3380.855	189.925	3384.814
185.02	3351.508	185.425	3381.071	190.258	3384.906
185.024	3357.326	185.457	3381.474	190.59	3384.986
185.028	3360.753	185.489	3381.825	191.004	3385.093
185.032	3363.135	185.521	3382.109	191.419	3385.196
185.036	3365.176	185.553	3382.462	191.834	3385.325
185.04	3367.525	185.602	3383.62	192.25	3385.442
185.044	3368.285	185.653	3384.089	192.748	3385.591
185.048	3369.463	185.704	3384.366	193.246	3385.728
185.052	3370.53	185.755	3384.955	193.743	3385.864
185.056	3371.439	185.806	3385.434	194.325	3386.042
185.06	3372.281	185.857	3385.694	194.905	3386.192
185.064	3372.922	185.925	3385.669	214.076	3388.449
185.068	3373.572	185.993	3385.596	215.876	3389.741
185.076	3374.389	186.061	3385.537	217.785	3389.637
185.084	3375.104	186.129	3385.911	219.777	3389.583
185.092	3375.689	186.197	3385.921	221.852	3389.575
185.1	3376.138	186.282	3385.915	224.093	3389.58
185.108	3376.492	186.367	3385.883	226.5	3389.612
185.116	3376.795	186.452	3385.866	228.99	3389.647
185.124	3377.032	186.554	3385.801	231.646	3389.766
185.132	3377.226	186.656	3385.746	233.002	3389.789

P psi2/cp *10**7



P psi2/cp *10**7



APPENDIX III

Welltest Data

SANTOS LTD.
WELL TEST SUMMARY

Page 1.

WELL: Marsilea #1 Lat.: 28° 21' 20.68" S
 TESTED BY: Oilserve Australia Ltd. LOCATION: Long: 140° 56' 18.86" E
 CASING SIZE: 7 ins PERFORATIONS: 7614 - 7968 ft
 TUBING SIZE: 2-7/8 ins WEIGHT: 234 26 lb/ft
 WEIGHT: 6.5 lb/ft DATE: 5-15/6/1990 FORMATION: Patchawarra
 PRODUCING THROUGH: Tubing
 GRADE: J55 LT4C.
 GRADE: J55 NK3SB

DESCRIPTION OF TEST

INITIAL SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
5/6/90	1800		18203	0		Diverted flow to separator - on cleanup
8/6/90	1400		17996	5050	59	HP Samples taken.
	2104					Choke determination commenced.
	2400	0	15444	4400	68	Shut Well In
10/6/90	1900	43	18561	0	17.5	Opened well on rate #1

Flow Period

Run No.: 1 Duration of Run: 4 Hours. Orifice Size: 2.000 ins
 Flow Well On: 13/64" Choke. Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			kPa	kPa	°C	kPa	kPa	°C		
10/6/90	1900	0	18561	0	17.5					
	2000	1	17872	0	40	1172	21.41	5	3.600	1.200
	2100	2	17906	0	43	1172	22.91	9	2.880	0.480
	2200	3	18030	0	45	1172	22.41	12	1.440	2.400
	2300	4	18009	0	45	1172	20.92	14	2.160	0.960

Page 2.

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing kPa	Casing kPa	Temp. °C	
10/6/90	2300	0	18009	0	45	
	2330	0.5	18617	0	27	
	2400	1	18658	0	17	
11/6/90	0030	1.5	18630	0	15	
	0100	2	18616	0	13	
	0130	2.5	18616	0	13	
	0200	3	18603	0	13	
	0230	3.5	18603	0	12	
	0300	4	18596	0	12	Opened well on rate # 2

Run No.: 2 Duration of Run: 4 Hours.
Flow Well On: 16/64" Choke.

Orifice Size: 2.250 ins
Meter Run: 3.826 ins

[illegible]

0103

3RD SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
11/6/90	0700	0	17582	0	51	Shut well in
	0730	0.5	18691	0	28	
	0800	1	18699	0		
	0830	1.5	18699	0		
	0900	2	18692	0		
	0930	2.5	18672	0		
	1000	3	18658	0		
	1030	3.5	18651	0		
	1100	4	18651	0	22	opened well on rate # 3

Flow Period

Run No.: 3 Duration of Run: 4 Hours.
Flow Well On: 2 1/64" Choke.

Orifice Size: 2.500 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			kPa	kPa	°C	kPa	kPa	°C		
11/6/90	1100	0	18651	0	22					
	1200	1	16838	0	50	1379	26.89	7	3.840	2.400
	1300	2	16982	0	53	1379	27.39	10	3.120	3.600
	1400	3	17044	0	55	1379	27.39	12.5	2.640	4.320
	1500	4	17079	0	56.5	1379	27.39	14	2.880	4.320

SANTOS LTD.
WELL TEST SUMMARY

Page 4. ✓

4TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			KPa	KPa	°C	
11/6/90	1500	0	17079	0	56.5	Shut well in
	1530	0.5	18754	0		
	1600	1	18761	0		
	1630	1.5	18748	0		
	1700	2	18720	0		
	1730	2.5	18706	0		
	1800	3	18685	0		
	1830	3.5	18679	0		
	1900	4	18679	0	17	Opened well on rate # 4

Flow Period

Run No.: 4 Duration of Run: 4 Hours.
Flow Well On: 29/64" Choke.

Orifice Size: 2.750 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			KPa	KPa	°C	KPa	KPa	°C		
11/6/90	1900	0	18679	0	17					
	2000	1	14824	0	55	2000	26.89	16	4.800	8.880
	2100	2	15100	0	59	2069	27.14	20	6.240	6.720
	2200	3	15293	800	62	2069	27.39	23	6.720	4.080
	2300	4	15307	1100	64	2069	27.39	25	3.600	7.200

WP 2548G

0.105

WELL TEST SUMMARY
FINAL STABILIZATION FLOW PERIOD

Flow Period

Run No.: 5 Duration of Run: 36 Hours.
Flow Well On: 26/64" Choke. (20 hrs only used for rates)

Orifice Size: 2.750 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production m ³ /d	Water Production m ³ /d
			Tubing kPa	Casing kPa	Temp. °C	PF kPa	HW kPa	Temp. °C		
11/6/90	2300	0	15307	1100	64					
	2400	1	16065	1800	65	1862	24.4	24		
12/6/90	0100	2	16100	3600	67	1862	24.4	26		
	0200	3	16100	4200	68	1862	24.4	27		
	0300	4	16114	4800	69	1862	24.4	28		
	0400	5	16134	5200	69	1862	24.4	29		
	0500	6	16148	5700	70	1862	24.4	31		
	0600	7	16169	6000	71	1862	24.4	31		
	0700	8	16189	6175	72	1862	24.4	33		
	0725		P.O.O.H. due to E/line			signal loss				
	0728		Cut choke to 16/64"							
	0740		Increased choke to 21/64"							
2 1/64"	0800		17196	5800	71	1517	18.43	30		
	0820		Cut choke to 14/64"							
	0828		Cut choke to 13/64"							
	0830		Opened choke to 26/64".			Closed swab valve.				
	0900		16203	5800	71	1862	25.40	31		
	0945		16217	6400	72	1862	25.40	33		
			Shut well in to repair leaking Swab valve.							
	0953		Opened well on 26/64" choke							
	1000		Shut well in to repair leaking Swab valve.							
	1040		Opened well on 26/64" choke							
	1100		16782	3200	69	1517	21.91	31.5		
	1200		17210	4400	70	1655	16.43	31.5		
	1245		Shut well in - remove obstructions			from choke.				
	1248		Run E-line gauges.							
	1330		18837	1000	37					
	1455		on bottom @ 8000' KB							
	1500	0	18768	0	22	Opened well on 26/64" choke.				
	1600	1	15203	1400	66	2000	26.39	29	3.360	6.720
	1700	2	15410	4000	69	2000	26.89	32	1.920	7.920
	1800	3	15507	5400	71	2000	26.89	34	2.880	7.920
	1900	4	15583	6200	72	2069	26.89	36	2.400	5.520

WELL TEST SUMMARY

Run No.: 5 Duration of Run: 36 Hours. Orifice Size: 2.750 ins
Flow Well On: 26/64" Choke. (20 hrs only used for rates) Meter Run: 3.826 ins

[illegible]

00-000000

06108

SANTOS · LTD.:
WELL TEST SUMMARY

BOMB DEPTH

' KB

DWT
LUB.

[illegible]

WP 2548G

5010

SANTOS LTD.
WELL TEST SUMMARY
CALCULATION SHEET

Page 8.

GAS RATES THROUGH SEPARATOR

Run No.	Ihw		Pf		Size Orifice Plate		Ft	
	(kPa)	("w.g.)	(kPa)	(psig)	(mm)	(inches)	(°C)	(°F)
1	20.92	84	1172	170	50.800	2.000	14	57.2
2	26.9	108	1248	181	57.150	2.250	10	50.0
3	27.39	110	1379	200	63.500	2.500	14	57.2
4	27.39	110	2069	300	69.850	2.750	25	77.0
5	27.14	109	2117	307	69.850	2.750	44.5	112.1

Separator Gas Properties

Specific Gravity = 0.841 ✓
 TC = 413.3 °R ✓
 PC = 751.3 psia ✓
 CO2 CONTENT = 21.19 mole % ✓

 Meter Run = 3.826"

GAS RATES THROUGH SEPARATOR

ONE-TRIP PRODUCTION DATA			
Run No.	Q		
	E3 m ³ /d	mmscf/d	
1	79.351	2.816	✓
2	121.366	4.308	✓
3	163.414	5.800	✓
4	248.849	8.833	✓
5	241.457	8.570	✓

WP 2548G

00110

GAS WELL DELIVERABILITY TEST CALCULATIONS
(Base Conditions = 14.65 psia and 60°F)

WELL NAME: Marsilea # 1 DATE: 5-15/6/1990 ELEMENT NO: E-Line SRO Gauge DEPTH TESTED: 8000' KB
DWT IN: _____ OUT: _____
LUB IN: _____ OUT: _____

SIMPLIFIED ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	Bottom Hole Temp (°C)	Meas.	Δp^2 ($\times 10^6$ psia ²)	Flow Rate E 3m ³ /d	H/Carbon Prod. m ³ /d	Water Prod. m ³ /d	REMARKS
Initial Shut In	43	3411.4	141.4	✓	—	—	—	—	$q = C(\bar{p}_R^2 - p_{wf}^2)^n$ ✓ slope n = _____ $\bar{p}_R =$ _____ psia ✓ $C = \frac{q}{(\bar{p}_R^2 - p_{wf}^2)^n}$ ✓ = _____ AOF (MMscfd) ✓ = _____
Flow 1	4	3363.3	141.2	✓	0.326		2.520	1.260	
Shut In	4	3413.6	141.1	✓	—	—	—	—	
Flow 2	4	3320.4	140.9	✓	0.628		2.820	2.460	
Shut In	4	3415.0	140.8	✓	—	—	—	—	
Flow 3	4	3276.6	140.6	✓	0.926		3.120	3.660	
Shut In	4	3415.8	140.5	✓	—	—	—	—	
Flow 4	4	3185.4	140.3	✓	1.521		5.340	6.720	
Extended Flow	* 36	3187.8	139.3	✓	1.328		2.364	5.928	
Final Shut In	48.13	3389.7	138.2	✓	—	—	—	—	

WP 2548G

* During these 36 hours the well was shut in several times due to a leaking swab valve.
Flow rate calculated over final 20 hour period only.

00111

GAS WELL DELIVERABILITY TEST CALCULATIONS
 (Base Conditions = 14.65 psia and 60°F)

LIT (ψ) ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	ψ ($\times 10^6$ psia ² /cp)	$\Delta\psi$ ($\times 10^6$ psia ² /cp)	Flow Rate (q) (MMscfd)	$\Delta\psi/q$	q^2	$\Delta\psi - bq^2$
Initial Shut In	43	3411.4						
Flow 1	4	3363.3						
Shut In	4	3413.6						
Flow 2	4	3320.4						
Shut In	4	3415.0						
Flow 3	4	3276.6						
Shut In	4	3415.8						
Flow 4	4	3185.4						
Total=								
Extended Flow	* 36	3187.8						
Final Shut In	48.13	3389.7						

WP 2548G ✓

* During these 36 hours the well was shut in several times due to a leaking swab valve.
 Ext flow rates calculated over final 20 hour period only.

00112

APPENDIX IV

Compositional Data

PETROLAB

Company : Santos Limited
Well : Marsilea # 1
File : S-90028

Surface Samples Set # 1

Sampling Conditions

Date : June 5 1990
Pressure : 200 psig
Temperature : 81 deg F

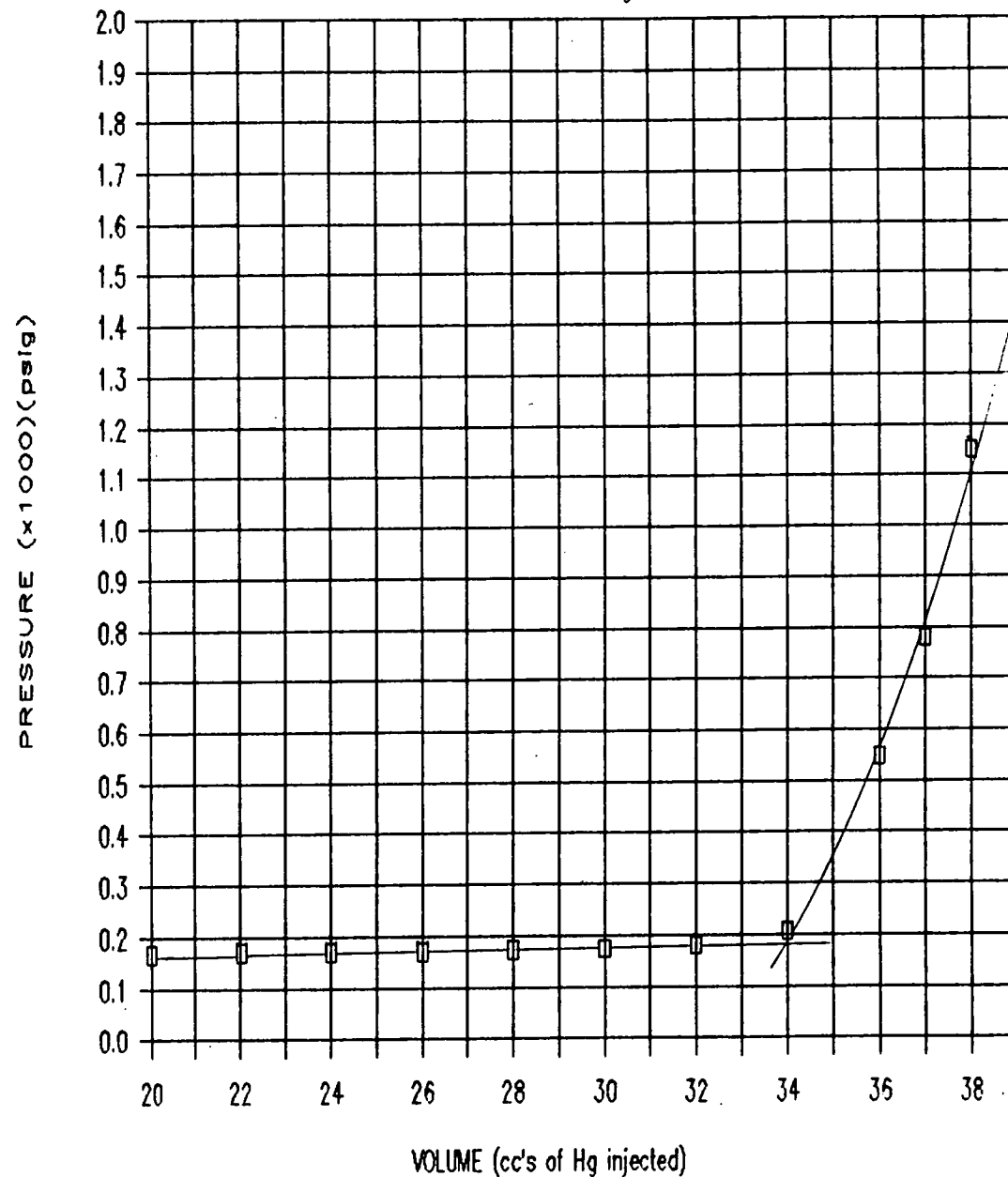
Cylinder # : ED 5580 (gas)
Opening Pressure : 215 psig @ 129 deg F

Cylinder # : L-37 (liquid)
Opening Pressure : 170 psig @ 59 deg F

Volume (cc's)	Pressure (psig)
20.00	167
22.00	170
24.00	170
26.00	170
28.00	173
30.00	175
32.00	180
34.00	208
36.00	548
37.00	780
38.00	1150
39.00	1500

Saturation Pressure : 185 psig @ 59 deg F

Page : 1 of 8



00114

PETROLAB

Company : Santos Limited
Well : Marsilea # 1
File : S-90028

Surface Samples Set # 2

Sampling Conditions

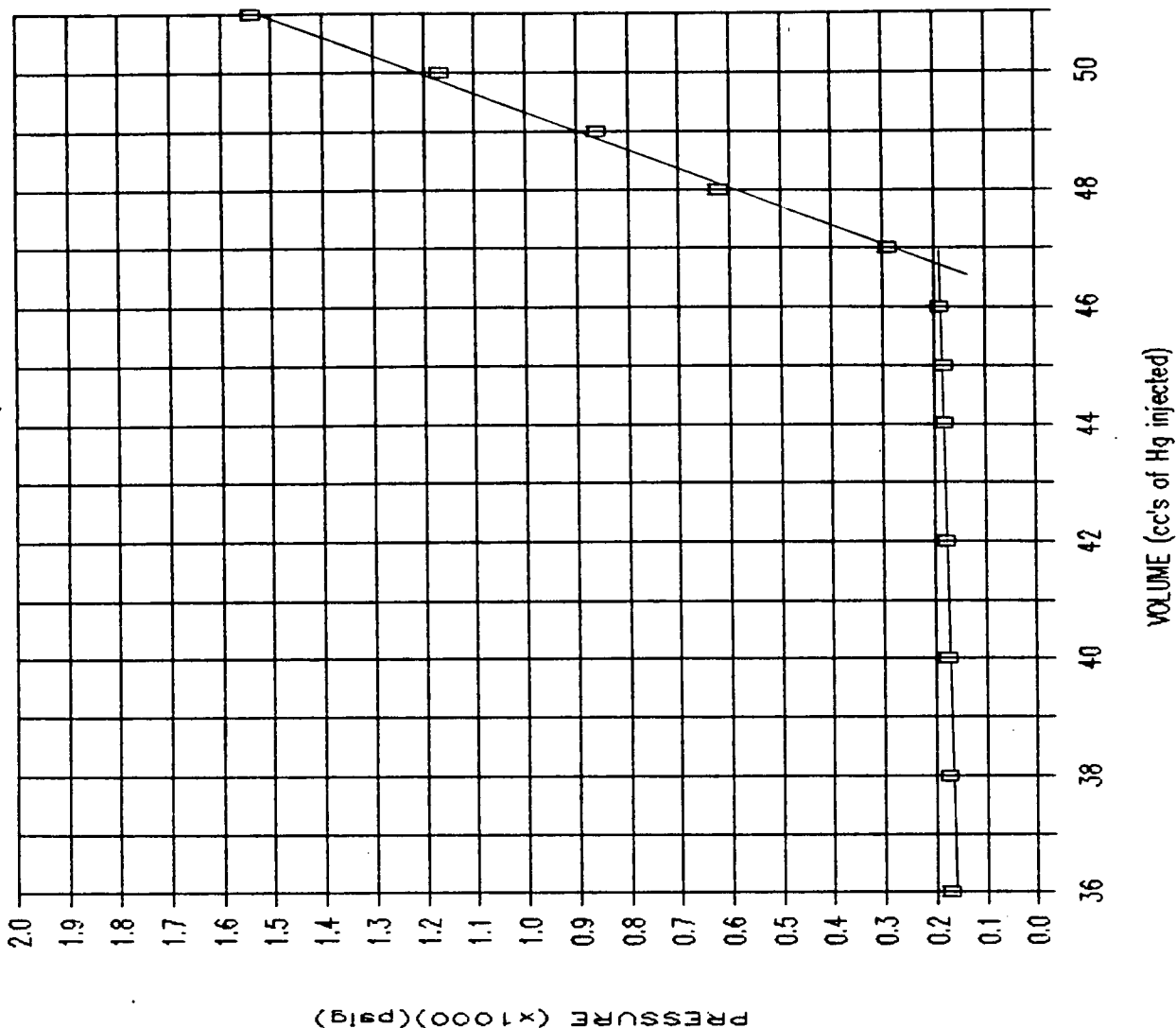
Date : June 5 1990
Pressure : 200 psig
Temperature : 81 deg F

Cylinder # : EO 5575 (gas)
Opening Pressure : 205 psig @ 118 deg F

Cylinder # : L-34 (liquid)
Opening Pressure : 160 psig @ 59 deg F

Volume (cc's)	Pressure (psig)
36.00	172
38.00	174
40.00	176
42.00	178
44.00	180
45.00	182
46.00	190
47.00	290
48.00	620
49.00	860
50.00	1170
51.00	1540

Saturation Pressure : 190 psig @ 59 deg F



PETROLAB

Company : Santos Limited
Well : Marsilea # 1
File : S-90028

Surface Samples Set # 3

Sampling Conditions

Date : June 5 1990
Pressure : 200 psig
Temperature : 81 deg F

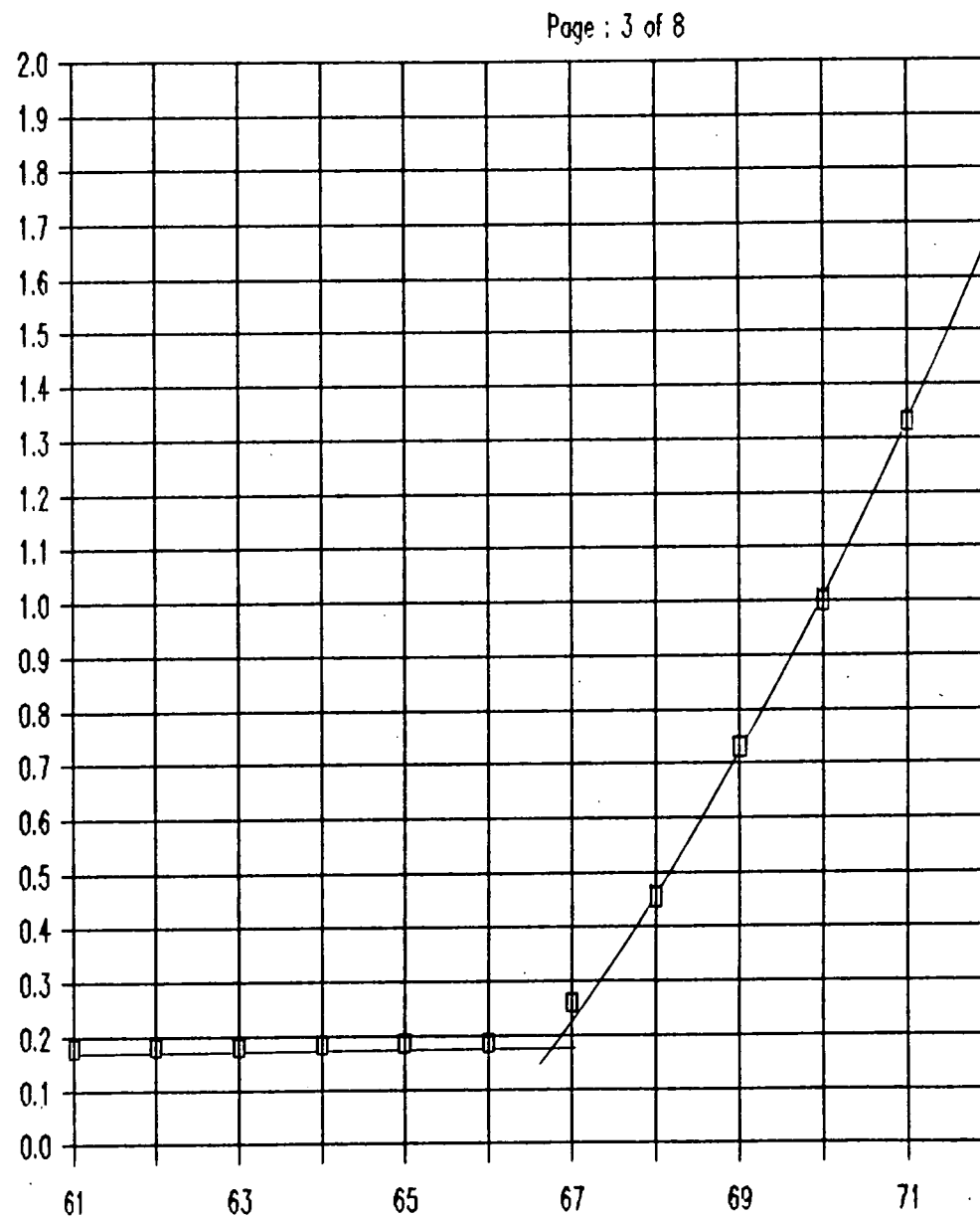
Cylinder # : ED 5545 (gas)
Opening Pressure : 200 psig @ 117 deg F

Cylinder # : L-33 (liquid)
Opening Pressure : 172 psig @ 59 deg F

Volume (cc's)	Pressure (psig)
------------------	--------------------

61.00	179
62.00	180
63.00	181
64.00	183
65.00	185
66.00	187
67.00	260
68.00	455
69.00	730
70.00	1000
71.00	1330
72.00	1690

PRESSURE (x1000)(psig)



Saturation Pressure : 188 psig @ 59 deg F

VOLUME (cc's of Hg injected)

00116

P E T R O L A B

Company: Santos Limited
Well : Marsilea # 1

Page: 4 of 8
File: S 90028

COMPOSITIONAL ANALYSIS OF
SEPARATOR GAS

Cyl # ED-5580

Component	Mol %	GPM	
Hydrogen Sulphide	0.00		Pressure Base : 14.696 Zsc: 0.997
Carbon Dioxide	20.89		
Nitrogen	1.71		Mol Weight : 24.39 Gas Gravity: 0.845
Methane	67.06		Pc : 747.6 Tc : 411.4
Ethane	7.44	1.991	
Propane	1.48	0.408	Mol Weight C7+: 102.6 Density C7+: 0.6925
Iso-Butane	0.32	0.105	
N-Butane	0.33	0.104	Mol Weight C8+: 113.9 Density C8+: 0.7063
Iso-Pentane	0.11	0.040	
N-Pentane	0.11	0.040	Heating Value (BTU/ft3) Gross: 911 Nett: 824
Hexanes	0.17	0.066	
Heptanes	0.24	0.101	Wobbe Index: 991
Octanes	0.08	0.036	Zpt: 0.964
Nonanes	0.05	0.025	
Decanes	0.01	0.005	Liquid Content (Bbl/MMSCF of Raw Gas):
Undecanes	0.00	0.000	Ethane : 35.3 L P G : 14.1 Pentanes Plus: 7.8
Dodecanes Plus	0.00	0.000	
TOTAL	100.00	2.921	

Remarks: Laboratory Opening Pressure - 215 psig @ 129 deg F
Sampled at 200 psig and 81 deg F

P E T R O L A B

Company: Santos Limited
Well : Marsilea # 1

Page: 5 of 8
File: S 9002B

COMPOSITIONAL ANALYSIS OF
SEPARATOR GAS

Cyl # ED-5575

Component	Mol %	GPM	
Hydrogen Sulphide	0.00		Pressure Base : 14.696 Zsc: 0.997
Carbon Dioxide	21.86		
Nitrogen	0.62		Mol Weight : 24.46 Gas Gravity: 0.847
Methane	67.40		Pc : 753.5 Tc : 413.9
Ethane	7.33	1.962	
Propane	1.50	0.414	Mol Weight C7+: 103.2 Density C7+: 0.6932
Iso-Butane	0.23	0.075	
N-Butane	0.30	0.095	Mol Weight C8+: 113.1 Density C8+: 0.7053
Iso-Pentane	0.12	0.044	
N-Pentane	0.13	0.047	Heating Value (BTU/ft3) Gross: 908 Nett: 822
Hexanes	0.13	0.050	
Heptanes	0.22	0.093	Wobbe Index: 987
Octanes	0.10	0.045	Zpt: 0.963
Nonanes	0.05	0.025	
Decanes	0.01	0.005	Liquid Content (Bbl/MMSCF of Raw Gas):
Undecanes	0.00	0.000	Ethane : 34.8 L P G : 13.3
Dodecanes Plus	0.00	0.000	Pentanes Plus: 7.7
TOTAL	100.00	2.855	

Remarks: Laboratory Opening Pressure - 205 psig @ 118 deg F
Sampled at 200 psig and 81 deg F

P E T R O L A B

Company: Santos Limited
Well : Marsilea # 1

Page: 6 of 8
File: S 90028

COMPOSITIONAL ANALYSIS OF
SEPARATOR GAS

Cyl # ED-5545

Component	Mol %	GPM	
Hydrogen Sulphide	0.00		Pressure Base : 14.696 Zsc: 0.997
Carbon Dioxide	21.19		
Nitrogen	0.43		Mol Weight : 24.28 Gas Gravity: 0.841
Methane	67.98		Pc : 751.3 Tc : 413.3
Ethane	7.60	2.034	
Propane	1.49	0.411	Mol Weight C7+: 103.0 Density C7+: 0.6930
Iso-Butane	0.25	0.082	
N-Butane	0.33	0.104	Mol Weight C8+: 112.9 Density C8+: 0.7052
Iso-Pentane	0.12	0.044	
N-Pentane	0.12	0.043	Heating Value (BTU/ft3) Gross: 919 Nett: 831
Hexanes	0.15	0.058	
Heptanes	0.20	0.084	Wobbe Index: 1002
Octanes	0.09	0.041	Zpt: 0.964
Nonanes	0.04	0.020	
Decanes	0.01	0.005	Liquid Content (Bbl/MMSCF of Raw Gas):
Undecanes	0.00	0.000	Ethane : 36.1 L P G : 13.6
Dodecanes Plus	0.00	0.000	Pentanes Plus: 7.3
TOTAL	100.00	2.926	

Remarks: Laboratory Opening Pressure - 200 psig @ 117 deg F
Sampled at 200 psig and 81 deg F

P E T R O L A B

Company: Santos Limited
Well : Marsilea # 1

Page: 8 of 8
File: S 90028

COMPOSITIONAL ANALYSIS OF
RECOMBINED RESERVOIR FLUID

Cyl. # L-33 Cyl. # ED 5545

Component		Separator Liquid Mol %	Separator Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide	H2S	0.00	0.00	0.00
Carbon Dioxide	CO2	3.07	21.19	21.15
Nitrogen	N2	0.01	0.43	0.43
Methane	C1	3.34	67.98	67.84
Ethane	C2	2.54	7.60	7.59
Propane	C3	2.05	1.49	1.49
Iso-Butane	iC4	0.87	0.25	0.25
N-Butane	nC4	1.62	0.33	0.33
Iso-Pentane	iC5	1.28	0.12	0.12
N-Pentane	nC5	1.53	0.12	0.12
Hexanes	C6	3.41	0.15	0.16
Heptanes	C7	15.35	0.20	0.23
Octanes	C8	18.58	0.09	0.13
Nonanes	C9	20.37	0.04	0.08
Decanes	C10	8.57	0.01	0.03
Undecanes	C11	4.17	0.00	0.01
Dodecanes Plus	C12+	13.24	0.00	0.04
TOTAL		100.00	100.00	100.00
Ratios				
Molar Ratio	:	0.0021	0.9979	1.0000
Mass Ratio	:	0.0089	0.9911	1.0000
Gas Liquid Ratio	:	1.0000	bbl@PT* 490079 SCF**	--
Stream Properties				
Molecular Weight	:	101.7	24.28	24.46
Density obs. (gm/cc)	:	0.8037 @ PT*	--	--
Gravity (AIR = 1.000)	:	44.4 API @60F	0.841	--
GHV (BTU/scf)	:	--	919.0	--
Heptanes Plus Properties				
Mol %	:	80.28	0.34	0.52
Molecular Weight	:	113.9	103.0	106.6
Density (gm/cc @ 60 F)	:	0.8175	0.6930	0.7331
Gravity (API @ 60 F)	:	41.4	72.5	61.3
Octanes Plus Properties				
Mol %	:	64.93	0.14	0.29
Molecular Weight	:	118.4	112.9	115.7
Density (gm/cc @ 60 F)	:	0.8292	0.7052	0.7635
Gravity (API @ 60 F)	:	39.0	69.0	53.7
Decanes Plus Properties				
Mol %	:	25.98	0.01	0.08
Molecular Weight	:	140.8	134.0	139.8
Density (gm/cc @ 60 F)	:	0.8561	0.7278	0.8346
Gravity (API @ 60 F)	:	33.6	62.7	37.9
Undecanes Plus Properties				
Mol %	:	17.41	0.00	0.05
Molecular Weight	:	150.3	--	150.3
Density (gm/cc @ 60 F)	:	0.8708	--	0.8708
Gravity (API @ 60 F)	:	30.8	--	30.8
Dodecanes Plus Properties				
Mol %	:	13.24	0.00	0.04
Molecular Weight	:	157.1	--	157.1
Density (gm/cc @ 60 F)	:	0.8826	--	0.8826
Gravity (API @ 60 F)	:	28.7	--	28.7

* (P)ressure 200 psi, (T)emperature 81 deg F

** 490079 SCF / SEP BBL @ PT = 503459 SCF / ST BBL
503459 = 507397 * (1.0904*1.0185) / (1.0847*1.0319)

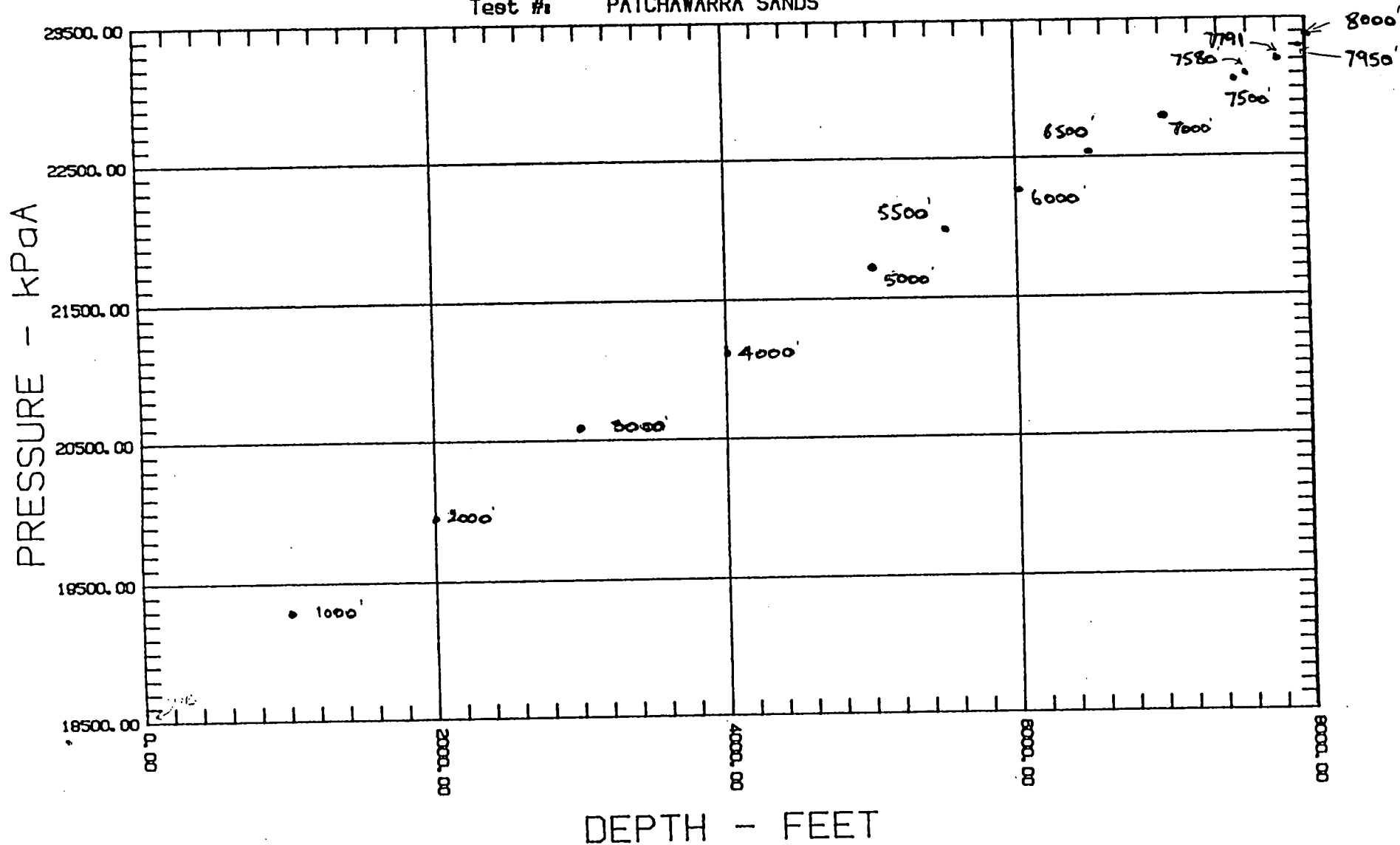
APPENDIX V

Static Gradient

Plot starting date: 6/15/90
time: 10:28:51
Gauge S/N

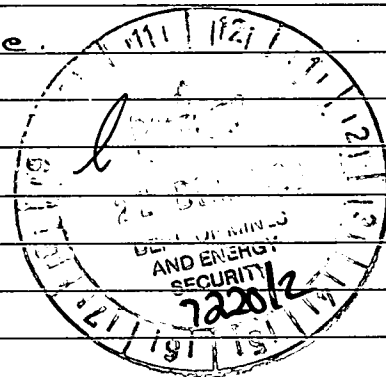
Company: OILSERV AUSTRALIA LTD
Client: SANTOS
Well name: MARSILEA
Well #: 1
Test #: PATCHAWARRA SANDS

Location: COOPER BASIN
Operator: S. COPPOCK
Comments: MODIFIED ISOCHRONAL TEST.
STATIC GRADIENT SURVEY.



06123

CUSTOMER :	Santos Ltd	PERFORATIONS:	7614' - 7823' KB	PAGE: 1	OF 2
WELL NAME:	Marsilea #1	FORMATION :	Patchawarra	DATE: 17 th June 1993	
TEST TYPE :	L.E.T & B.H.P.S.			OPR : B. Potter	

[illegible]

01124

CUSTOMER : Santos L.T.O.

WELL NAME: Marsilea #1

TEST TYPE : L.E.T. / B.H.P

PERFORATIONS: 7614'-7823' KB

FORMATION : Patchawarra

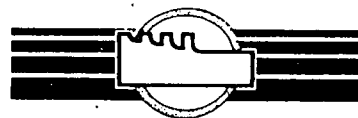
PAGE: 2 OF 2

DATE: 23.6.93

OPR : S. TAYLOR.

[illegible]

EXPERTEST PTY. LTD.



FIELD READINGS

CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB

PAGE: 1 OF 3

WELL NAME: Marsilea #1

FORMATION : Patchawarra

DATE: 17th June 1993

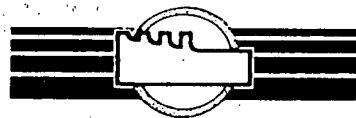
TEST TYPE : L.E.T & B.H.P.S.

OPR : B. Potter

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/GM)	OIL (IN/GM)	OIL API GRAVITY @ 60°F	WATER (IN/GM)
17 th June 1993														
0900		Arrive location, shut in well and fit swab valve.												
0915		Well back on line, rig up w/L unit.												
0940		R.I.H with 1.75" B.B.												
1005		Tag depth @ 7841' KB tubing all clear P.O.C.H												
1025		At surface with toolstring secure unit												
18 th June 1993														
0900		Shut in well, fit test flanges.												
0910		Open well 100% choke, Bypass separator gas in line												
0930		4826	0	61	100	Divert flow through separator								
1000	0	4833		59	100	Commence L.E.T. Engage 1.00" o.p.								
1200	2	4833		60		-	1.00"	695	40	122	5.75	0.0		5.75
1400	4	4833		59				695	41	118	12.75	0.0		12.75
1600	6	4833		59				695	40	118	18.0	0.0		18.0
1800	8	4833		59				695	40	107	23.25	0.0		23.25
19 th June 1993														
0600	20	4826		60				691	39	104	59.0	0.0		59.0
0800	22	4750		59				682	41	104	64.5	0.0		64.5
0900		Pressure Lubricator, with gauges for B.H.P.S.												
1000	24	4613	↓	59	↓		↓	659	47	109	72.0	0.0		72.0
		Depressure Lubricator												

EXPERTEST PTY. LTD.

FIELD READINGS



CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB

PAGE: 2 OF 3

WELL NAME: Marsilea #1

FORMATION : Patchawarra

DATE: 19th June 1993

TEST TYPE : L.E.T & B.H.P.S

OPR : B. Potter

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/GM)	OIL (IN/GM)	OIL API GRAVITY @ 60°F	WATER (IN/GM)
19 th June 1993														
1100		Pressure Lubricator. R.I.H to perform B.H.P.S.												
1130		@ Hang depth 7700' KB. Continue to flow well.												
1200	26	4613	0	59	100	-	1.00"	660	45	113	76.75	0.0		76.75
1400	28	4606	↓	59	↓		↓	659	46	113	82.5	0.0		82.5
1600	30	4592	↓	58	↓		↓	656	46	108	88.5	0.0		88.5
		L.E.T completed. Collect samples as per program.												
		Shut in well, commence 96 hr Build up period.												
		See Test Results for Build up data.												
23693														
12:10	92	1436	0	-	P.O.O.H with B.H.P. gauges									
12:28		1435	"		At surface depressure lubricator.									
13:29		1435	"		Pressure up lubricator for one hour.									
14:29		1435	"		Depressure lubricator.									
					Prepare gauges for static gradient survey.									
14:50		1436	0		Pressure lubricator									
15:00		1436	"		Depressure lubricator.									
15:05		1436	"		Pressure lubricator R.I.H with S.G.S.									
16:21		1434	"		Arrive at hang Depth 7700' KB As per programme.									
16:31		1434	"		P.O.O.H.									
16:49		1437	"		Arrive in lubricator depressure.									
16:54		1434	"		Pressure up lubricator.									

00127

CUSTOMER : Sanhos L.T.D

PERFORATIONS: 7614' - 7823' LB

PAGE: 3 OF 3

WELL NAME: Marsilea #1

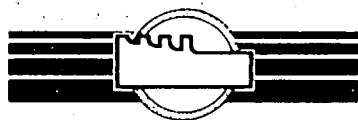
FORMATION : Patchawarra

DATE: 23.6.93

TEST TYPE : C.E.T./B.H.P./S.G.S.

OPR : S.TAYLOR

[illegible]



CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB

PAGE: 1 OF 3

WELL NAME: Marsilea #1

FORMATION : Patchawarra

DATE: 18th June 1993

TEST TYPE : L.E.T & B.H.P.S.

OPR : B. Potter

TIME		WELLHEAD DATA				Separator		FLOW RATES			CUMULATIVE PRODUCTION			L.G.R m ³ /10 ⁶ m ³	
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ 10 ³	OIL BBLs m ³	WATER BBLs m ³		
18 th June 1993															
1000	0	4833	0	59	100	Commence L.E.T.									
1200	2	4833		60		4792	50	26.18	-	18.42	2.18	-	1.535	704	
1400	4	4833		59		4792	48	26.66	-	22.43	4.40	-	3.404	773	
1600	6	4833		59		4792	48	26.33	-	16.82	6.59	-	4.806	639	
1800	8	4833		59		4792	42	26.78	-	16.82	8.82	-	6.208	628	
19 th June 1993															
0600	20	4826		60		4764	40	26.48	-	19.09	22.06	-	15.753	721	
0800	22	4750		59		4702	40	26.94	-	17.63	24.30	-	17.222	654	
0900		Pressure Lubricator for B.H.P.S.													
1000	24	4613	1	59		4544	43	28.05	-	24.03	26.64	-	19.224		
		Depressure Lubricator.													
1100		Pressure Lubricator. R.I.H. to perform B.H.P.S.													
1130		@ Hang depth 7700' KB. Continue to flow well													
1200	26	4613		59		4551	45	27.30	-	15.22	28.91	-	20.492	557	
1400	28	4606		59		4544	45	27.58	-	18.42	31.21	-	22.027	668	
1600	30	4592		58		4523	42	27.71	-	19.22	33.52	-	23.629	694	
	(4742)	L.E.T completed, shut in well, commence 96 hr Build up Period.													
1615		8267												Collect Samples as per program	
1630		8950													
1645		9357													

00129

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB

PAGE: 2 OF 3

WELL NAME: Marsilea # 1

FORMATION : Patchawarra

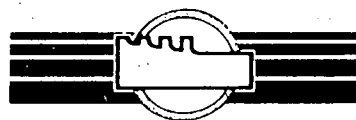
DATE: 19th June 1993

TEST TYPE : L.E.T & B.H.P.S.

OPR : B. Potter

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ 10 ³	OIL BBLS m ³	WATER BBLS m ³		
19 th June 1993															
1700	1	9687	0	Continue 96 hr Build up period											
1715		10074													
1730		10143													
1745		10211													
1800	2	10246													
1815		10143													
1830		9977													
1845		9936													
1900	3	994													
1930		9874													
2000	4	9860													
20 th June 1993															
0200	10	9874													
0600	14	9881													
1000	18	9881													
1400	22	9887													
1800	26	9887													
2200	30	9881													
21 st June 1993															
0200	34	9881													
0600	38	9881	↓												

00130



CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB

PAGE: 3 OF 3

WELL NAME: Marsilea # 1

FORMATION : PatChawarra

DATE: 21st June 1993

TEST TYPE : L.E.T & B.H.P.S

OPR : B. Potter

TIME		WELLHEAD DATA				FLOW RATES					CUMULATIVE PRODUCTION			
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ 10 ³	OIL BBLS m ³	WATER BBLS m ³	
21 st June 1993														
1000	42	9881	0	Continue 96 hr Build up period.										
1400	46	9881												
16:00	48	9874												
				Night Readings taken from chart.										
22.6.93														
02:00	58	9908	0											
06:00	62	9915	"											
17:00	73	9901	"											
23.6.93														
				Night Readings taken from chart.										
02:00	82	9887	0											
06:00	86	9887	"											
12:10	92	9901		P.O.O.H with B.H.P. Survey.										
12:28		9894		At surface										
14:29		9894		Depressure lubricator & retrieve charts.										
15:05		9901		R.I.H. with S.G.S. as programme instructed.										
16:21		9887		Arrive at hang depth 7700' KB.										
16:31		9887		P.O.O.H.										
16:49		9908		At surface.										
17:12		9887		Depressure lubricator retrieve charts.										
				Survey complete rig down equipment.										

00131

TEST TYPE : L.E.T & B.H.P.S.

FORMATION : Patchawarra

DATE: 18th June 1993

OPR : B. Potter

GAS SPECIFIC GRAVITY (SG) = 0.846

$$FG \sqrt{(I/SG)} = 1.0872$$
$$C_2 \quad (FU \times FG) = 26.093$$

00132

EXPERTEST PTY. LTD.

LIQUID PRODUCTION

CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB.

PAGE: 1 OF 1

WELL NAME: Marsilea #1

FORMATION : Patchawarra

DATE: 18th June 1993

TEST TYPE : L.E.T & B.H.P.S.

OPR : B. Potter

TANK
NUMBER

#1 = # 68

TANK

#1 = 56.6 bbls/m³

TANK

#1 = 1" = 0.267 m³ bbls/in - m³/cm

OIL API GRAVITY = - @ 60°F

NUMBER

#2 =

CAPACITY

#2 = bbls/m³

SCALE

#2 = bbls/in - m³/cm

DATE

FLOW

TANK

TOTAL

OIL/CONDENSATE PRODUCTION

WATER PRODUCTION

TIME

TIME
(HOURS)USED
(NUMBER)TANK DIP
(IN/GM)TANK
DIP
(IN/GM)TANK
PRODUCTION
(BBLs/m³)FLOW
RATE
(BPD/m³D)CUMULATIVE
PRODUCTION
(BBLs/m³)TANK
DIP
(IN/GM)TANK
PRODUCTION
(BBLs/m³)FLOW
RATE
(BPD/m³D)CUMULATIVE
PRODUCTION
(BBLs/m³)18th June 1993

1000	0	# 68	0.0	0.0	Initial oil dip			0.0	Initial water Dip.		
1200	2		5.75	0.0	-	-	-	5.75	1.535	18.42	1.535
1400	4		12.75	0.0	-	-	-	12.75	1.869	22.43	3.404
1600	6		18.0	0.0	-	-	-	18.0	1.402	16.82	4.806
1800	8		23.25	0.0	-	-	-	23.25	1.402	16.82	6.208
19 th June 1993											
0600	20		59.0	0.0	-	-	-	59.0	9.545	19.09	15.753
0800	22		64.5	0.0	-	-	-	64.5	1.469	17.63	17.222
1000	24		72.0	0.0	-	-	-	72.0	2.002	24.03	19.224
1200	26		76.75	0.0	-	-	-	76.75	1.268	15.22	20.492
1400	28		82.5	0.0	-	-	-	82.5	1.535	18.42	22.027
1600	30		88.5	0.0	-	-	-	88.5	1.602	19.22	23.629

L.E.T completed.

30 HRS TOTAL

Qc: NIL m³/dQw: 18.904 m³/d

00133

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : Santos Ltd

PERFORATIONS: 7614' - 7823' KB

PAGE: 1 OF 2

WELL NAME: Marsilea # 1

FORMATION : Patchawarra

DATE: 19th June 1993

TEST TYPE : B.H.P.S.

OPR : B. Potter

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

TIME
(HOURS)TUBING
PRESSURE
(PSI/KPa)ANNULUS
PRESSURE
(PSI/KPa)

ELEMENT SERIAL NO.

56429

56432

29217

DATE : 19.6.93

ELEMENT RANGE

(PSI)

3000

3000

135°-378°F

PRESSURE LUBRICATOR

09:00

4654

0

RECORDING SECTION SERIAL NO.

14628

70544

12952

RUN IN HOLE

11:00

4613

DATE OF CALIBRATION:

@ 290°F

6.1.93

6.1.93

12.8.92

ON DEPTH AT

7700 FT/M

11:30

4620

CLOCK SERIAL NO.

1

1103

1389

DATE

23.6.93

CLOCK RANGE

(hr)

120

120

120

PULL OUT OF HOLE

12:10

9901

LEAD SCREW TYPE

15 TLS

15 TLS

15 TLS

AT SURFACE

12:28

9894

DEPRESSURE LUBRICATOR

14:29

9894

ENGAGE STYLUS

DATE

19.6.93

TIME

08:56

08:56

08:56

MAXIMUM BHT AT

FT/M =

°F/C

Temp element Run.

DISENGAGE STYLUS

DATE

23.6.93

TIME

14:35

14:35

14:35

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

DATE

TIME

REMARKS

The 120 hour clocks in the lower pressure and temperature gauges failed during the PBU.

SUB-SURFACE PRESSURE SURVEY

CO.		RUN 01 FIELD MARSILEA	WELL 1
EFF DEPTH		WELL STAT	TOOL HUNG 7700'KB
CASING	-	CASING PRESS	ON BOTTOM 1130 19/6
LINER	-	TUBING PRESS	OFF BOTTOM 1210 23/6
DATE	930619	ELEMENT RANGE 0 - 3093	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1600 19/6
MAX TEMP	300	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 56429	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	LET/BHP

SURVEY DATA

CO.	RUN 01 FIELD MARSILEA				WELL 1			
	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
START A	16:00	1279.0	1279.0	.0	2:08	1776.1	1776.1	10.1
BUILD-UP	16:02	1333.4	1333.4	.0	5:30	1777.9	1777.9	13.5
	16:04	1409.9	1409.9	.1	8:56	1778.7	1778.7	16.9
	16:05	1485.0	1485.0	.1	12:48	1777.9	1777.9	20.8
	16:11	1607.1	1607.1	.2	18:21	1779.0	1779.0	26.3
	16:15	1695.5	1695.5	.3	0:18	1779.0	1779.0	32.3
	16:24	1758.4	1758.4	.4	5:59	1779.1	1779.1	38.0
	16:38	1792.7	1792.7	.6	12:13	1780.2	1780.2	44.2
	17:09	1793.7	1793.7	1.2	18:13	1780.8	1780.8	50.2
	17:19	1793.7	1793.7	1.3	1:03	1781.8	1781.8	57.0
	17:29	1811.6	1811.6	1.5	8:05	1782.5	1782.5	64.1
	17:42	1824.2	1824.2	1.7	17:09	1783.9	1783.9	73.1
	17:57	1836.7	1836.7	1.9	0:15	1785.6	1785.6	80.2
	18:10	1842.5	1842.5	2.2	6:53	1787.1	1787.1	86.9
	18:16	1837.4	1837.4	2.3	12:10	1787.8	1787.8	92.2
	18:24	1813.0	1813.0	2.4	11:48	1281.9	1281.9	-4.2
	18:42	1792.1	1792.1	2.7	12:24	1284.0	1284.0	-3.6
	19:51	1776.0	1776.0	3.8	13:17	1281.4	1281.4	-2.7
	20:59	1772.7	1772.7	5.0	14:24	1278.8	1278.8	-1.6
	22:12	1773.9	1773.9	6.2	15:45	1278.3	1278.3	-.3
	23:36	1775.4	1775.4	7.6	0:00	.0	.0	.0

LUBRICATOR DWT; IN: 675 psi / OUT: 1435 psi
 LUBRICATOR AMERADA; IN: 663 psi / OUT: 1430 psi
 ELEMENT #56432 ALSO RUN, BUT CLOCK FAILED.

END
BUILD UP

MARSILEA #1

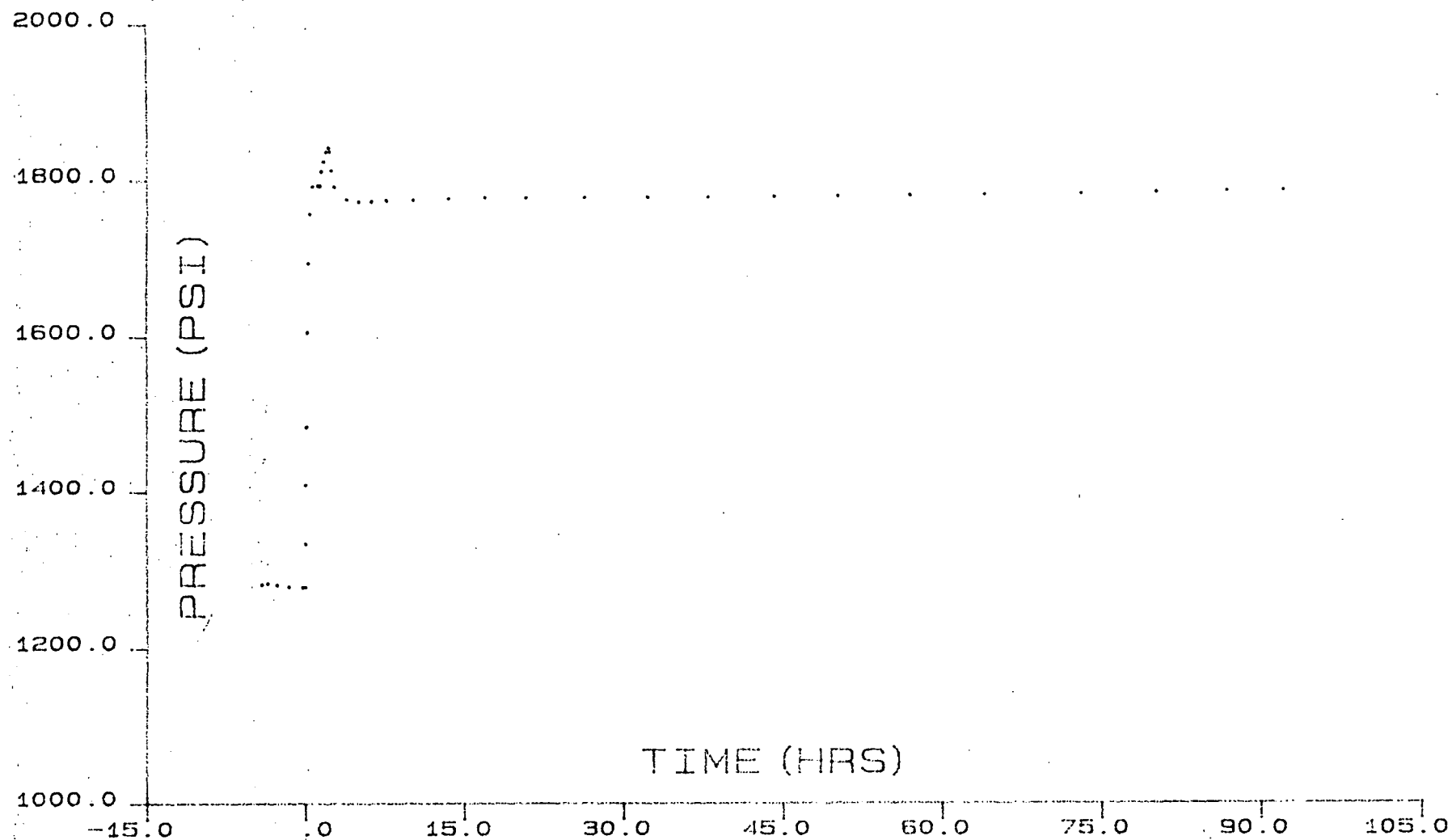
LET/BHP

JUNE '93

ELEMENT #56429

AT

7700'KB



00136

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : Santos L.T.D.

PERFORATIONS: 7614' - 7823' LB

PAGE: 2 OF 2

WELL NAME: Marsilea

FORMATION : Patchawarra

DATE: 23.6.93

TEST TYPE : L.E.T. / P.B.U. / S.G.S.

OPR : S. TAYLOR

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

TIME
(HOURS)TUBING
PRESSURE
(' 'KPa)ANNULUS
PRESSURE
(' 'KPa)

ELEMENT SERIAL NO.

56429

56432

29217

DATE : 23.6.93

1

ELEMENT RANGE

Psi

3000

3000

135°-378°F

PRESSURE LUBRICATOR

16:54

9901

Ø

RECORDING SECTION SERIAL NO.

14628

70544

12952

RUN IN HOLE

15:05

9901

"

DATE OF CALIBRATION:

@ 290°F

6.1.93

6.1.93

12.8.92

ON DEPTH AT : 7700' LB FT/

16:21

9887

"

CLOCK SERIAL NO.

S/N°1

S/N°2

2180

DATE : 23.6.93

CLOCK RANGE

3 HR

3 HR

3 HR

PULL OUT OF HOLE

16:31

9887

Ø

LEAD SCREW TYPE

15 TUS

15 TUS

15 TUS

AT SURFACE

16:49

9908

"

DEPRESSURE LUBRICATOR

17:04

9887

"

ENGAGE STYLUS

DATE 23.6.93

TIME

14:45

14:45

14:45

MAXIMUM BHT AT — FT/M = — °F/C

DISENGAGE STYLUS

DATE 23.6.93

TIME

17:12

17:12

17:12

N.B. ALL DEPTHS ARE MEASURED FROM K.B.

DATE

TIME

REMARKS

00137

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0400 TELEX AAB7183

FAX (08) 43 7400

138 RICHMOND ROAD MARLESTON

SOUTH AUSTRALIA 5033

Tested Wednesday, 23rd June 1993.

STATIC PRESSURE GRADIENT REPORT

CLIENT	LOCATION	FORMATION
SANTOS LTD.	MARSILEA #1	PATCHAWARRA

P R E S S U R E E L E M E N T D A T A

POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	56429	3000	6/ 1/93
Bottom	56432	3000	6/ 1/93

W E L L D A T A

PARAMETER	VALUE
DWT In	1436 PSIG
DWT Out	1434 PSIG
Max BHT	N/A

T O P E L E M E N T**B O T T O M E L E M E N T**

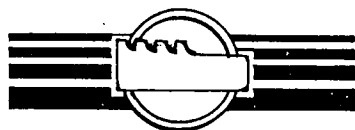
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.9290	1431.4	-	0.9310	1431.7	-
1000	0.9640	1485.5	0.054	0.9670	1487.5	0.056
2000	0.9970	1536.5	0.051	0.9990	1537.1	0.050
3000	1.0280	1584.4	0.048	1.0310	1586.7	0.050
4000	1.0570	1629.3	0.045	1.0600	1631.6	0.045
5000	1.0860	1674.2	0.045	1.0880	1675.0	0.043
5500	1.1010	1697.4	0.046	1.1020	1696.7	0.043
6000	1.1150	1719.0	0.043	1.1170	1719.9	0.047
6500	1.1300	1742.3	0.046	1.1320	1743.2	0.047
7000	1.1430	1762.4	0.040	1.1450	1763.3	0.040
7500	1.1590	1787.2	0.050	1.1600	1786.6	0.047
7700	1.1640	1794.9	0.039	1.1650	1794.3	0.039
LUB.	0.9340	1439.1	-	0.9330	1434.8	-

G E N E R A L R E M A R K S

TEMP ELEMENT RUN
29217/135-378 F

EXPERTEST PTY. LTD.

STATIC PRESSURE GRADIENT SURVEY



Location: MARSILEA #1

Tested: 23rd June 1993.

Formation: PATCHAWARRA

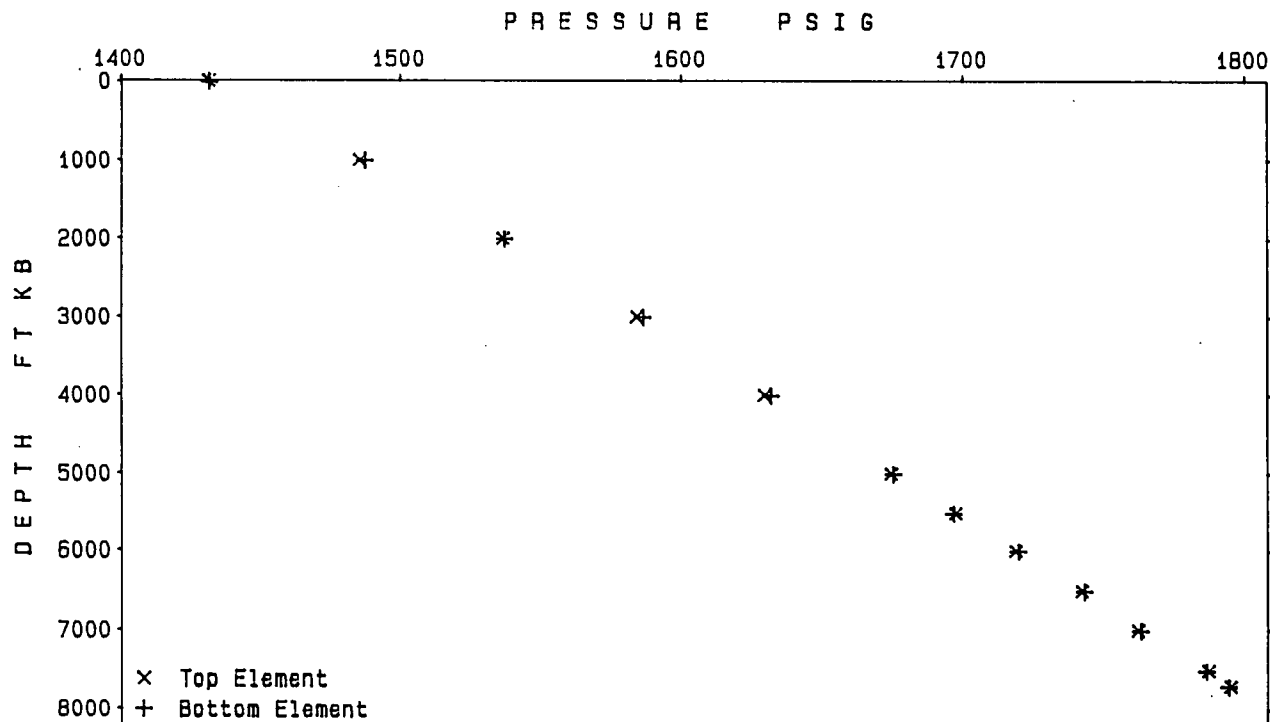
Client: SANTOS LTD.

PRESSURE ELEMENT DATA

Position	Serial No	Range	Calibrated
Top	56429	3000	6/ 1/93
Bottom	56432	3000	6/ 1/93

WELL DATA

DWT In	1436 PSIG
DWT Out	1434 PSIG
Max BHT	N/A



TOP ELEMENT

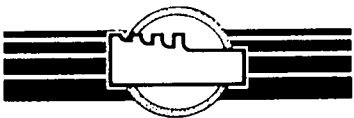
BOTTOM ELEMENT

Depth FT KB	Deflection Inches	Pressure PSIG	Gradient PSI/FT	Deflection Inches	Pressure PSIG	Gradient PSI/FT
LUB.	0.9290	1431.4	-	0.9310	1431.7	-
1000	0.9640	1485.5	0.054	0.9670	1487.5	0.056
2000	0.9970	1536.5	0.051	0.9990	1537.1	0.050
3000	1.0280	1584.4	0.048	1.0310	1586.7	0.050
4000	1.0570	1629.3	0.045	1.0600	1631.6	0.045
5000	1.0860	1674.2	0.045	1.0880	1675.0	0.043
5500	1.1010	1697.4	0.046	1.1020	1696.7	0.043
6000	1.1150	1719.0	0.043	1.1170	1719.9	0.047
6500	1.1300	1742.3	0.046	1.1320	1743.2	0.047
7000	1.1430	1762.4	0.040	1.1450	1763.3	0.040
7500	1.1590	1787.2	0.049	1.1600	1786.6	0.047
7700	1.1640	1794.9	0.039	1.1650	1794.3	0.039
LUB.	0.9340	1439.1	-	0.9330	1434.8	-

GENERAL REMARKS

TEMP ELEMENT RUN
29217/135-378 F

EXPERTEST PTY. LTD.



SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823' KB

PAGE: 1 OF 1

WELL NAME: MARSILEA #1

FORMATION : PATCHAWARRA

DATE: 18.6.94

TEST TYPE : L.E.T.

OPR : S. TAYLOR

DATE/TIME	DESCRIPTION OF EVENTS
SATURDAY 18.6.94	
16:00	ARRIVE ON LOCATION, HOLD SAFETY MEETING & SPOT TEST EQUIPMENT. RIG IN SEPARATOR & LIQUIDS TANKS PRESSURE TEST EQUIPMENT
17:15	SECURE LOCATION
MONDAY 20.6.94	
11:15	RIG IN WELL HEAD CHART RECORDER
11:30	OPEN WELL ON 85% CHOKE BYPASS SEPARATOR TO FLARE PIT.
11:33	LIQUIDS TO SURFACE
12:00	CONTINUE TO UNLOAD LIQUIDS INTO FLARE PIT.
21/6/94	
10:00	TRIM FLOWTHROUGH SEPARATOR. CHANGE OUT NEEDLE & SEAT IN H ₂ O DUMP BODY.
11:30	COMMENCE TEST. 500" ORIFACE PLATE IN SERVICE.
18:00	CHANGE TANKS.
22/6/94	
08:00	CHANGE TANKS. OBTAIN 2X 500 cc L.P H ₂ O SAMPLES.
09:00	SEPARATOR ON BYPASS. END TEST. COMMENCE RIGGING OUT.
09:50	HAND WELL BACK TO PRODUCTION (OPERATOR SOWN SUCKERS).
10:00	CREW DEPART LOCATION TO DULLINGARI FOR MURTA PRESSURE SURVEY.
23/6/94	
10:00	A.O.L COMPLETE RIG OUT OF TEST EQUIPMENT.

TO FLARE
 CHOKE = 35%
 FTHP = 364 kPa
 Q_g = 2.508 m³/d.
 Q_L = NIL
 Q_W = 78.088 m³/d.

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823' KB

PAGE: 1 OF 3

WELL NAME: MARSHEN #1

FORMATION : PATCHANARRA

DATE: 18 6 94

TEST TYPE : LIQUID EVALUATION TEST

OPR : S. TRIMOR

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF. PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)
SATURDAY 18 TH JUNE														
1600		ARRIVE ON LOCATION, HOLD SAFETY MEETING & SPOT TEST EQUIPMENT.												
		RIG IN SEPARATOR AND LIQUIDS TANKS												
		PRESSURE TEST EQUIPMENT												
17:15		SECURE LOCATION												
MONDAY 20 TH JUNE														
11:30		OPEN WELL ON 85% CHOKER BYPASSING SEPARATOR TO FLARE PIT.												
		350	0											
11:33		LIQUIDS TO SURFACE												
		45	0		85									
1200		31	0		"									
1230		30	0		"									
1300		25	0		"									
1330		28	0		"									
1400		28	0		"									
1430		25	0		"									
1500		25	0		"									
1530		25	0		"									
1600		25	0		"									

EXPERTEST PTY. LTD.

FIELD READINGS

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823' KB

PAGE: 2 OF 3

WELL NAME: MARSOLEA #1

FORMATION : PATCHAWARRA

DATE: 20.6.94

TEST TYPE: LIQUID EVALUATION TEST

OPR: B. HULL

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF. PRESS. (IN WC)	GAS TEMP (°F/°C)	TOTAL LIQUID (IN/GM)	OIL (IN/GM)	OIL API GRAVITY @ 60°F	WATER (IN/GM)
MONDAY 20TH JUNE														
1630		25	0		85									
17:00		25	"											
17:30		25	"											
18:00		25	"											
21/6/94														
06:00		28	0		85									
08:00		30	"		"									
10:00		30	"	59	"	TRIM FLOW THROUGH SEPARATOR.								
11:30	0	51	"	60	"	COMMENCE TEST .500" ORIFICE PLATE.					15.5	.5		15
12:00	.5	49	"	59	"		.500	43	83	50	23	.5		22.5
14:00	2.5	53	"	60	"		"	45	83	53	47	.5		46.5
16:00	4.5	50	"	60	"		"	43	84	51	70.5	.5		70
18:00	6.5	53	"	60	"		"	46	80	51	95.25	.5		94.75
18:00						CHANGE TANKS					5.25	Ø		5.25
22/6/94														
06:00	18.5	54	Ø	59	85		.500	44	76	41	150	Ø		150
08:00	20.5	55	Ø	65	"		"	48	70	53	173.75	Ø		173.75
09:00	21.5	57	Ø	64	"		"	49	104	51	15.75	Ø		15.25
09:00						SEPARATOR ON BYPASS. END TEST								

FIELD READINGS

WELL NAME: MARSILBA #1

TEST TYPE : L.E.T

FORMATION : PATCHWARRA

DATE: 20/6/24

OPR : N. DOVER

[illegible]

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823'

PAGE: 1 OF 2.

WELL NAME: MARSILEA #1

FORMATION : PATCHAWARRA

DATE: 18/6/94

TEST TYPE : L.E.T

OPR : S. TAYLOR.

TIME		WELLHEAD DATA					FLOW RATES			CUMULATIVE PRODUCTION			L.G.R	
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ 10 ³	OIL BBLs m ³	WATER BBLs m ³	L.G.R m ³ /10m ³
18/6/94														
16:00						P.O.L. SPOT TEST EQUIPMENT & PRESSURE TEST								
17:15						SECURE LOCATION.								
20/6/94														
11:30		2413	Ø		85	OPEN WELL ON 85% CHOKE BYPASS SEPARATOR. FLOW TO FLARE.								
11:33		310	Ø		"	LIQUIDS TO SURFACE.								
12:00	.5	214	Ø		"									
12:30		207	Ø		"									
13:00	1.5	172	Ø		"									
13:30		193	Ø		"									
14:00	2.5	193	Ø		"									
14:30		172	Ø		"									
15:00	3.5	172	Ø		"									
15:30		172	Ø		"									
16:00	4.5	172	Ø		"									
16:30		172	Ø		"									
17:00	5.5	172	Ø		"									
17:30		172	Ø		"									
18:00	6.5	172	Ø		"									
21/6/94														
06:00	18.5	193	Ø		85									

27100

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823'

PAGE: 2 OF 2.

WELL NAME: MARSILEA # 1

FORMATION : PATCHAWARRA

DATE: 21/6/94

TEST TYPE : L.E.T

OPR : N. DOVER.

TIME		WELLHEAD DATA				SEPARATOR.		FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m ³ /10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /10 ³	OIL BBLs m ³	WATER BBLs m ³	L.G.R m ³ /10 ⁶ m ³	
21/6/94															
08:00	20.5	207	Ø		85										
10:00	22.5	207	Ø	59	"	TRIM FLOW THROUGH SEPARATOR.									
11:30	0	352	Ø	60	"	COMMENCE TEST - 500" ORIFACE PLATE IN SERVICE.									
12:00	.5	338	Ø	59	"	296	50	2.476	Ø	96.12	.0516	Ø	2.0	38821	
14:00	2.5	365	Ø	60	"	310	53	2.507	Ø	76.896	.261	Ø	8.408	30673	
16:00	4.5	345	Ø	60	"	296	51	2.487	Ø	75.3	.468	Ø	14.683	30277	
18:00	6.5	365	Ø	60	"	317	51	2.487	Ø	79.3	.675	Ø	21.291	31886	
22/6/94															
06:00	18.5	372	Ø	59	85	303	41	2.423	Ø	77.296	1.887	Ø	59.939	31901	
08:00	20.5	379	Ø	65	"	331	53	2.356	Ø	76.095	2.083	Ø	66.28	32298	
09:00	21.5	393	Ø	64	"	338	51	2.913	Ø	88.104	2.204	Ø	69.951	30245	
09:00						SEPARATOR ON BYPASS, END TEST. COMMENCE RIGGING OUT.									
09:50						HAND WELL BACK TO PRODUCTION (OPERATOR JOHN SUCKERS).									
10:00		(364)				CREW DEPART TO DULLINGARI FOR MURTA PRESSURE SURVEY.									
23/6/94															
10:30						A.O.L COMPLETE RIG OUT OF TEST EQUIPMENT									
12:00						DEPART LOCATION.									

GAS FLOW CALCULATIONS

CUSTOMER : SANTOS LTD

WELL NAME: MARSILEA #1

TEST TYPE : L.E.T

PERFORATIONS: 7614' - 7823' KB

FORMATION : PATCHAWARA

PAGE: 1 OF 1

DATE: 21/6/94

OPR : N. DOVER

ORIFICE METER TYPE: DANIELS SNR

STATIC PRESSURE RANGE : 0 - 1500

PSIG

GAS SPECIFIC GRAVITY (SG) = .846

METER RUN SIZE : 3.068

DIFFERENTIAL PRESS. RANGE: 0 - 200

IN WC

$$FG \sqrt{(I/SG)} = 1.0872$$

SEPARATOR NO : 459

STANDARD CONDITIONS : 14.73 PSI @ 60°F

$$C_2 \quad (FU \times FG) = 26.0931$$
[illegible]

EXPERTEST PTY. LTD.

LIQUID PRODUCTION

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823' KB

PAGE: 1 OF 1

WELL NAME: MARSILEA #1

FORMATION : PATCHAWARRA

DATE: 21/6/94

TEST TYPE : L.E.T

OPR : N. DOVER.

TANK

#1 = 50

TANK

#1 = 56.6

~~bbls~~/m³

TANK

#1 = 1" = .267 m³ bbls/in - m³/cm

OIL API GRAVITY = @ 60°F

NUMBER

#2 = 63

CAPACITY

#2 = 56.6

~~bbls~~/m³

SCALE

#2 = 1" = .267 m³ bbls/in - m³/cm

DATE

FLOW

TANK

TOTAL

OIL/CONDENSATE PRODUCTION

WATER PRODUCTION

TIME

TIME
(HOURS)USED
(NUMBER)TANK DIP
(IN/CM)TANK
DIP
(IN/CM)TANK
PRODUCTION
(~~BBL~~/m³)FLOW
RATE
(~~BPD~~/m³D)CUMULATIVE
PRODUCTION
(~~BBL~~S/m³)TANK
DIP
(IN/CM)TANK
PRODUCTION
(~~BBL~~S/m³)FLOW
RATE
(~~BPD~~/m³D)CUMULATIVE
PRODUCTION
(~~BBL~~S/m³)

21/6/94

11:30

0

#1

15.5

↓ .5

OPENING DIP

↓ 15

12:00

.5

"

23

↓ .5

∅

∅

∅

↓ 22.5

2.00

96.12

2.0

14:00

2.5

"

47

0 .5

"

"

"

75 46.5

6.408

76.896

8.408

16:00

4.5

"

70.5

↑ .5

"

"

"

70

6.275

75.3

14.683

18:00

6.6

"

95.25

↓ .5

"

"

"

94.75

6.608

79.3

21.291

18:00

1.25

#2

5.25

0

CHANGE TANKS OPENING DIP

5.25

22/6/94

06:00

18.5

"

150

∅

∅

∅

∅

168.5 150

38.678

77.296

59.939

08:00

20.5

"

173.75

"

"

"

"

173.75

6.341

76.095

66.28

08:00

20.5

#1

2

↑ .5

CHANGE TANKS OPENING DIP

↑ 1.5

09:00

21.5

"

15.75

↑ .5

15.25

3.671

88.104

69.951

09:00

END TEST.

21.5 HRS

QC: NIL

QW: 78.088 m³/d.

CUSTOMER : SANTOS LTD

PERFORATIONS: 7614' - 7823' KB.

PAGE: 1 OF 1

WELL NAME: MARSILKA #1

FORMATION : PATCHAWARRA

DATE: 22/6/94

TEST TYPE : L.E.T

OPR : N. DOVER.

SAMPLE # 1

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH	OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)	SAMPLE POINT	SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)
08:00	1	500	H ₂ O	5	—	—	—	SEPARATOR WATER DUMP LINE	331	53	102	17.

WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS	BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	L.G.R. m ³ /10 ⁶ m ³	PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)
379	65	85		331	53	1.0067	.846		2.356	Ø	76.095	32298.		

REMARKS:

SAMPLE #

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH	OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)	SAMPLE POINT	SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)
08:00	2	500	H ₂ O	5	—	—	—	SEPARATOR WATER DUMP LINE	331	53	102	17.

WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS	BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE %	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D	L.G.R. m ³ /10 ⁶ m ³	PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)
379	65	85		331	53	1.0067	.846		2.356	Ø	76.095	32298.		

REMARKS:

SAMPLE #

TIME SAMPLE COLLECTED	CYLINDER SERIAL NO.	CYLINDER VOLUME (CC)	SAMPLE TYPE	SAMPLING DURATION (MINS)	CYLINDER INITIALLY FILLED WITH	OUTAGE (CC)	VOLUME OF FILL REMAINING WITH SAMPLE (CC)	SAMPLE POINT	SAMPLE PRESS (PSI/KPa)	SAMPLE TEMP (°F/°C)	AMBIENT PRESS (PSI/KPa)	AMBIENT TEMP (°F/°C)

WELLHEAD DATA				SEPARATOR DATA			GRAVITIES		FLOW RATES			RATIOS	BOTTOM HOLE	
TUBING PRESS (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	BS&W (%)	SEPARATOR PRESS (PSI/KPa)	SEPARATOR TEMP (°F/°C)	FPV	GAS SPECIFIC GRAVITY	OIL API GRAV @60°F	GAS MMSCFD m ³ 10 ³ /D	OIL BPD m ³ /D	WATER BPD m ³ /D		PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)

REMARKS: