

SOUTH AUSTRALIA
DEPARTMENT OF MINES AND ENERGY



OPEN FILE ENVELOPE NO. 7149/2

PEL 5 AND PEL 6, MURTA BLOCK

EROMANGA AND COOPER BASINS

KUJANI 1

TEST REPORTS

Submitted by

Santos Ltd

1992

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ENVELOPE 7149/2

TENEMENT: PEL 5 and PEL 6, Murta Block; Eromanga and Cooper Basins

TENEMENT HOLDER: Santos Ltd (operator), Delhi Petroleum Pty Ltd, Vamgas Ltd, SAGASCO Resources Ltd and Hartogen Energy Ltd

CONTENTS

REPORTS:	Halliday, G.L., 1990. Kujani Field, Patchawarra Formation, reservoir management plan (Santos Ltd Reservoir Engineering Dept, report no. RE: 059/90, dated Sept. 1990).	SADME NO. 7149/2 R 1 Pgs 3-8
	Oilserv Australia Ltd, 1991. Results of Kujani 1 Patchawarra Formation perforated interval 6628-6668' KB modified isochronal test and buildup survey plus flowing and static pressure gradient surveys, conducted during the period 16-26 April 1991.	7149/2 R 2 Pgs 9-52
	Dianos, M., 1992. Interpretation of above modified isochronal test of 16-26 April 1991, plus interpretation of single rate production test of 13 October 1991. (Santos Ltd Reservoir Engineering Dept. report no. RE: 004/92, dated March 1992).	7149/2 R 3 Pgs 53-60
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REPORTS:	Kunac, S. and Kappler, M., 1991. Results of post-frac single rate gas production test and buildup plus static gradient surveys conducted over the period 10-18 October 1991 (Oilserv Australia Ltd).	7149/2 R 4 Pgs 145-169
	Black, P., 1992. Results of BHP, buildup and static pressure gradient surveys conducted over the period 12-17 April 1992 (Expertest Pty Ltd).	7149/2 R 5 Pgs 170-182

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ENVELOPE 7149/2 (Update)

REPORT: Bowyer, P., 1993. Results of liquids 7149/2 R
evaluation test (LET), plus bottomhole Pgs
pressure gradient and static pressure
gradient surveys of the Patchawarra
Formation producing zone, conducted
over the period 19-27 July 1993
(Expertest Pty Ltd)

END OF CONTENTS.

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

Report No: RE:059/90
Date: September, 1990
Author: G.L. HALLIDAY



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1. INTRODUCTION

The Kujani field which was discovered with the drilling of Kujani 1 in April 1988 is located in the Murta Block approximately 16 Km south of the Daralingie gas satellite and 8 Km SSW of Thurakinna. The field is located on an unfaulted domal anticline as shown in Figure 1 and consists of a single Patchawarra sand (the 66-2) as can be seen in Figure 2. This sand flowed gas on DST at a rate of 3.85 MMCFD from which a permeability of 4.8 md was calculated. Porosity is 13.4%. As can be seen from Figure 2, no gas water contact was intersected by Kujani 1. Since surrounding reservoirs are typically more than 50% full, and Kujani lies on a migration pathway from the north east through Bob's Well, Waukatanna, Thurakinna and Wancoocha, it was considered conservative to apply a 50% fill factor to this reservoir. OGIP, recoverable reserves and other reservoir data appear in Table 1.

2. CURRENT DEVELOPMENT

Kujani 1 is the only well in the field and there are no facilities in place for production.

3. DISCUSSION AND FUTURE PLANS

The current plan is to bring Kujani onto production in February 1991. This will require the completion and connection of Kujani 1 only since additional wells cannot be justified. Kujani 1 is situated near the crest of the reservoir. Since no reliable samples have been obtained to date, fluid composition is not known and the potential for retrograde behaviour has not been evaluated. However, the gas is rich having yielded 25 barrels of condensate per MMcf during a DST and it is assumed to be similar to Daralingie gas. Upon completion Kujani 1 will be subjected to a deliverability test during which samples will be taken for compositional and PVT analysis. Owing to the small reserves, bottom hole pressure buildup surveys will be conducted only until the estimate of recoverable reserves is confirmed. The resistivity of water taken from the meter run will be measured and LET's will be conducted, if necessary, in accordance with the regulations.

RG18

RESERVOIR DATA

FIELD: KUJANI
 FORMATION: PATCHAWARRA
 BLOCK/STATE: MUR/ SA

REF DATE: 31/12/89

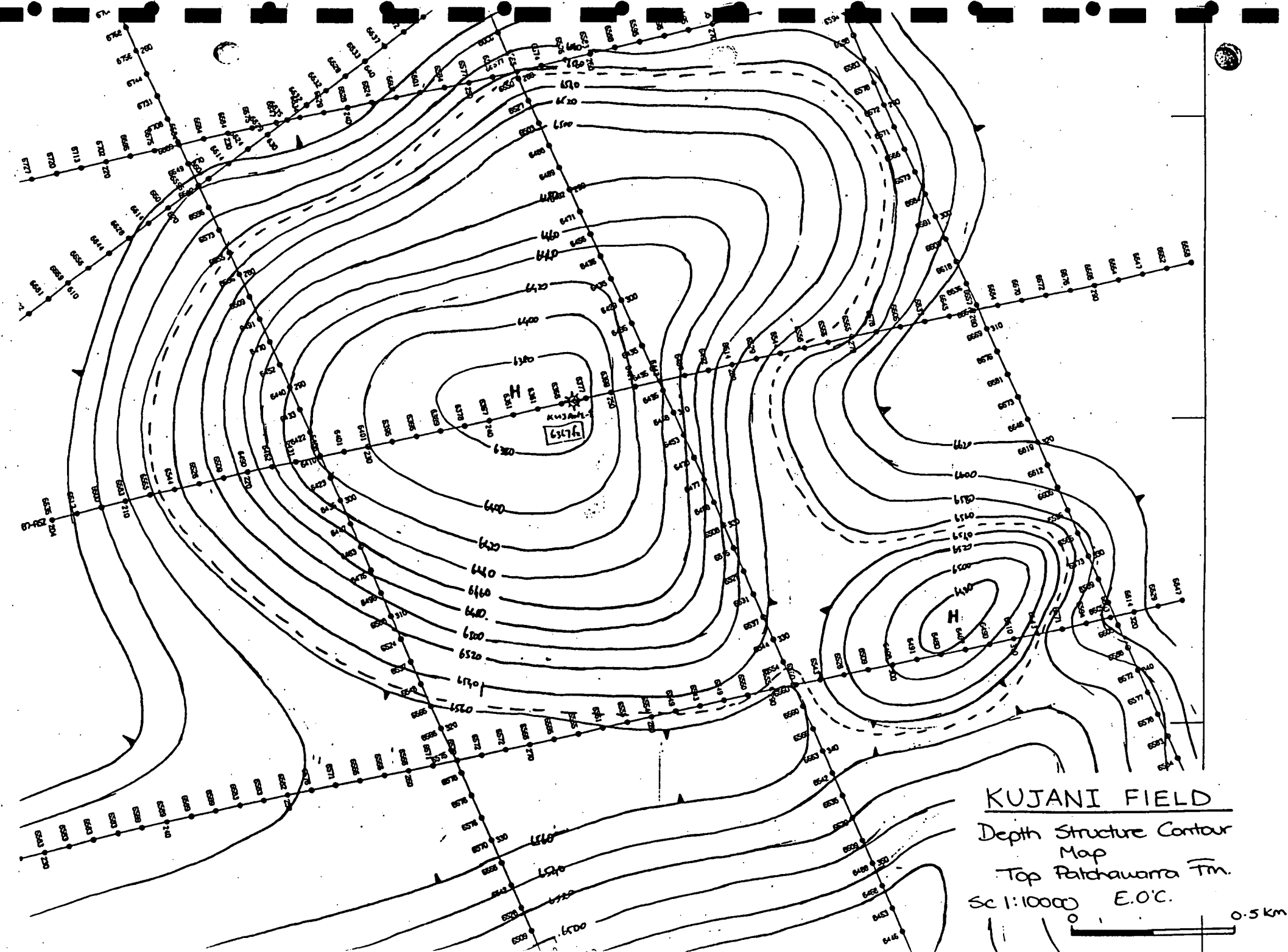
COMPOSITIONAL DATA

					FWS (mole %)	LIQUIDS	SALES	COMPONENT BBL/MMCF	RAW BBL/MMCF
OGIP (2P):	TO LKG/GWC	1.0	BCF						
	SUB LKG	4.4	BCF						
	Total	5.4	BCF						
Init Rec Raw Gas:		4.2	BCF	N2+	1.09		1.09		NIL
Cum Prod Raw Gas:		0.0	BCF	CO2	7.12		1.97		NIL
REMAINING RAW GAS:		4.2	BCF	C1	72.93		72.93		NIL
Basis for estimation:	Volumetrics			C2	9.96	7.47	2.49	632.6	47.26
RECOVERY FACTOR				C3	4.10	3.89	0.20	651.3	25.37
RAW GAS:	0.7730			IC4	0.64	0.64		774.0	4.95
SALES GAS:	0.7730			nC4	1.29	1.29		745.8	9.62
ETHANE:	0.7730			IC5	0.43	0.43		866.0	3.72
LPG:	0.7700			nC5	0.43	0.43		857.4	3.69
C5+:	0.6300			C6	0.42	0.42		973.2	4.09
YIELD FACTORS				C7	0.42	0.42		1092.0	4.59
SALES GAS SHRINKAGE	0.7868			CB+	1.17	1.17		1190.6	13.93
C2	47.26	(BBL/MMSCF)			100.00	16.16	78.68		117.21
LPG	39.94	(BBL/MMSCF)						Original Reservoir Pres	3049 (psia)
C5+	30.02	(BBL/MMSCF)						Reservoir Temperature	748 (R)
FORMATION VOLUME FACTOR (1/Bg)	157.80	SCF/RCF						MW C8+ =	131.00
NUMBER OF PRODUCIBLE COMPLETIONS	0							SG C8+ =	0.8250
Current Daily Production Rate: (Based on PRS)	0.0	MMCFD	at 31/05/90					SG FWS =	0.8284
								Composition assumed to be same as at Daralingie because samples not available as yet	

PRINTED ON 6SEP90

TABLE 1

00006



KUJANI FIELD
 Depth Structure Contour
 Map
 Top Patchawarra Tm.
 Sc 1:10000 E.O.C.

00007

FIGURE 1

Kujani #1
KB 129'
MSFL Log.
Patchawarra
Fm.

00008

66-2 sand

NP 33'

Ø 13.4%

Sw 35.9%

6600

①

6700

DST #1: 6609'-6666' (Lgr.)

GTS @ 3.85 MMCFD w/
98 BCPD, 70 BWPD (muddy)

Rec: Gas

DST 2: 6745'-6968' (Lgr.)

GTS @ RTSTM

Rec: 334' M, 60' WM & 40' MW

②

6800

68-0

NS 13'

Ø 13.6%

Sw 44.8%

MSFL

321

7.4

Lat.: 28° 29' 58.7" S
WELL: KUJANI # 1 LOCATION: Long: 139° 58' 50.2" E
TESTED BY: Oilserv PERFORATIONS: 6628 - 6668ft
CASING SIZE: 7 ins WEIGHT: 23 & 26 lb/ft
TUBING SIZE: 2-7/8 ins WEIGHT: 6.5 lb/ft

DATE: 16 - 26 / 4 / 91 FORMATION: Patchawarra
PRODUCING THROUGH: Tubing
GRADE: J55 LT#C
GRADE: J55 ABIJ3SS

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	
16/4/91	2200	0	2861	0	44	Shut well in
18/4/91	1300	39	15727	0	36.5	Opened well on rate #1
	1425		13728	0	31	S.W.I. to remove choke blockage
	1730		15679	0	26.5	Opened well on rate #1

Flow Period

Run No.: 1 Duration of Run: 6 Hours.
Flow Well On: 17/64" Choke.

Orifice Size: 1.500 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 sig	kPa w.g.	°F		
18/4/91	1730	0	15679	0	26.5					
	1800	0.5	10018	0	30	270	129	68		
	1830	1	9591	0	31.5	270	126	70	27.000	NIL
	1900	1.5	9563	0	32	270	122	70		
	1930	2	9563	0	32.5	270	120	72	NIL	NIL
	2000	2.5	9625	0	33	270	118	73		
	2030	3	9605	0	34	270	120	75.2	10.800	NIL
	2100	3.5	9598	0	34	270	119	76		
	2130	4	9605	0	34.5	270	118	77	7.680	NIL
	2200	4.5	9591	0	34.5	270	118	77		
	2230	5	9584	0	35	270	118	77	13.680	NIL
	2300	5.5	9584	0	35.5	270	118	79		
	2330	6	9584	0	35.5	270	118	79	6.480	NIL

SANTOS LTD.
WELL TEST SUMMARY

Page 2.

2nd SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing kPa	Casing kPa	Temp. °C	
18/4/91	2330	0	9584	0	35.5	Shut well in
19/4/91	0030	1	15796	0		
	0130	2	15810	0		
	0230	3	15817	0		
	0330	4	15817	0		
	0430	5	15810	0		
	0530	6	15803	0		Opened well on rate #2

Flow Period

Run No.: 2 Duration of Run: 6 Hours.
Flow Well On: 21/64 Choke.

Orifice Size: 2.000 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 psig	Hw kPa w.g.	Temp. °F		
19/4/91	0530	0	15803	0	10			26		
	0600	0.5	7991	0	32.5	275	48	79		
	0630	1	7909	0	33.5	280	50	86	90.960	NIL
	0700	1.5	7874	0	35	275	48	79		
	0730	2	7874	0	36	275	48	79	12.000	NIL
	0800	2.5	7888	0	36.5	275	48	79		
	0830	3	7881	0	37	275	48	79	12.000	NIL
	0900	3.5	7909	0	37.5	275	48	79		
	0930	4	7909	0	39	270	50	81	10.800	NIL
	1000	4.5	7915	0	39.5	270	50	81		
	1030	5	7922	0	40.5	270	50	82	11.280	NIL
	1100	5.5	7922	0	41	270	51	84		
	1130	6	7929	0	41.5	270	52	84	11.520	NIL

00010

3RD SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
19/4/91	1130	0	7929	0	41.5	Shut well in
	1230	1	15776	0		
	1330	2	15803	0		
	1430	3	15817	0		
	1530	4	15817	0		
	1630	5	15817	0		
	1730	6	15803	0		Opened well on rate # 3

Flow Period

Run No.: 3 Duration of Run: 6 Hours.
Flow Well On: 27/64" Choke.

Orifice Size: 2.250 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 sig	kPa w.g.	°C °F		
19/4/91	1730	0	15803	0	26.5					
	1800	0.5	5950	0	35	250	44	86		
	1830	1	5874	0	36.5	255	43	84	28.320	1.440
	1900	1.5	5868	0	37	255	43	84		
	1930	2	5868	0	38	255	42	84	26.400	1.200
	2000	2.5	5861	0	37.5	255	42	86		
	2030	3	5861	0	39.5	260	40	86	25.560	1.200
	2100	3.5	5861	0	40	260	40	88		
	2130	4	5868	0	40	260	40	88	25.560	0.240
	2200	4.5	5888	0	40.5	260	40	89		
	2230	5	5888	0	41.5	260	40	90	23.760	1.440
	2300	5.5	5888	0	41.5	260	40	91		
	2330	6	5888	0	42	260	40	91	21.120	1.200

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00011

4TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
19/4/91	2330	0	5888	0	42	Shut well in
20/4/91	0030	1	15714	0		
	0130	2	15748	0		
	0230	3	15776	0		
	0330	4	15783	0		
	0430	5	15790	0		
	0530	6	15783	0		Opened well on rate # 4

Flow Period

Run No.: 4 Duration of Run: 6 Hours.
Flow Well On: 45/64" 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 psig	kPa w.g.	°C °F		
20/4/91	0530	0	15783	0						
	0600	0.5	2820	0	35.5	130	40	90		
	0630	1	2820	0	36.5	130	38	86	28.560	2.640
	0700	1.5	2820	0	38.5	130	38	86		
	0730	2	2820	0	39.5	130	38	86	25.560	1.440
	0800	2.5	2820	0	40	130	38	88		
	0830	3	2820	0	40	130	38	90	25.320	1.200
	0900	3.5	2820	0	41	130	39	91		
	0930	4	2826	0	42	130	40	93	22.560	1.320
	1000	4.5	2827	0	43	130	40	93		
	1030	5	2834	0	43	130	40	95	21.480	0.600
	1100	5.5	2834	0	44.5	130	41	96		
	1130	6	2827	0	45	130	41	97	19.320	1.200

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00012

WELL TEST SUMMARY
FINAL STABILIZATION FLOW PERIOD

Flow Period

Run No.: 5 Duration of Run: 24 Hours.
Flow Well On: 32/64" Choke.

Orifice Size: 2.250 ins
Meter Run: 3.826 ins

[illegible]

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00013

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WELL TEST SUMMARY
FINAL BUILD-UP PERIOD

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Date	Time	Shut in Period (Hours)	Tubing Pressure kPa	Casing Pressure kPa	Wellhead Temp. °C	REMARKS
21/4/91	1130	0	4737	0	54	Shut well in
	1145	0.25	13549	0		
	1200	0.5	15424	0		
	1215	0.75	15700	0		
	1230	1	15762	0		
	1245	1.25	15790	0		
	1300	1.5	15796	0		
	1315	1.75	15803	0		
	1330	2	15810			
	1345	2.25	15817			
	1400	2.5	15824			
	1415	2.75	15824			
	1430	3	15831			
	1445	3.25	15838			
	1500	3.5	15838			
	1515	3.75	15838			
	1530	4	15838			
	1600	4.5	15838			
	1800	6.5	15831			
	2200	10.5	15810			
22/4/91	0200	14.5	15796			
	0600	18.5	15796			
	1000	22.5	15783			
	1400	26.5	15776			
	1800	30.5	15769			
	2200	34.5	15762			
23/4/91	0200	38.5	15755			
	0600	42.5	15748			
	1000	46.5	15755			
	1400	50.5	15762			
	1800	54.5	15748			
	2200	58.5	15741			
24/4/91	0200	62.5	15734			
	0600	66.5	15734			
	1000	70.5	15748			
	1400	74.5	15748			
	1800	78.5	15748			
	2200	82.5	15734			
25/4/91	0200	86.5	15734			
	0600	90.5	15727			
	1000	94.5	15748			
	1130	96	15748			P.O.O.H.

00014

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00015

WELL TEST SUMMARY

CONDITIONING FLOW FOR PVT SAMPLING

Flow Period

Run No.: 6 Duration of Run: Hours.
Flow Well On: 17/64" Choke.

Orifice Size: 1.500 ins
Meter Run: 3.826 ins

[illegible]

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WELL TEST SUMMARY
CALCULATION SHEET

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GAS RATES THROUGH SEPARATOR

Run No.	Hw		Pf		Size Orifice Plate		Ft	
	(kPa)	("w.g.)	(kPa)	(psig)	(mm)	(inches)	(°C)	(°F)
1	29.37	118	1862	270	38.100	1.500	26.1	79
2	12.94	52	1862	270	50.800	2.000	28.9	84
3	9.96	40	1793	260	57.150	2.250	32.8	91
4	10.21	41	896	130	69.850	2.750	36.1	97
5 EXT	12.94	52	1724	250	57.150	2.250	41.1	106

Conditioning	17.42	70	2206	320	38.100	1.500	40	104
Flow-sampling (PVT)	✓	✓	✓	✓	✓	✓	✓	✓

Separator Gas Properties

Specific Gravity = 0.838 ✓
 TC = 423.59 °R ✓
 PC = 671.46 psia ✓
 CO2 CONTENT = 4.08 mole % ✓

Meter Run = 3.826"

GAS RATES THROUGH SEPARATOR

Run No.	Q	
	E3 m ³ /d	mmscf/d
1	63.441	2.252
2	77.079	2.736
3	85.624	3.039
4	99.989	3.549
5 EXT	94.142	3.341

Conditioning Flow-sampling (PVT)	51.954	1.844
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00017

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

WELL NAME: Kujani # 1DATE: 16 - 26 / 4 / 1991ELEMENT NO: 53563 (TOP)DEPTH TESTED: 6738' KBDWT IN: 2281 PSIOUT: 2282 PSILUB IN: 2263 PSIOUT: 2262 PSI

SIMPLIFIED ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	Bottom Hole Temp. (°F)	Meas.	Δp^2 (x10 ⁶ psia ²)	Flow Rate E3m ³ /d	H/Carbon Prod. m ³ /d	Water Prod. m ³ /d	REMARKS
Initial Shut In	39	2991.95	256.6	✓	—	—	—	—	$q = C(\bar{p}_R^2 - p_{wf}^2)^n$ slope n = _____ $\bar{p}_R =$ _____ psia $C = \frac{q}{(\bar{p}_R^2 - p_{wf}^2)^n}$ = _____ AOF (MMscfd) = _____
Flow 1	6	1847.85	255.7	✓	5.537		10.940	NIL	
Shut In	6	2987.25	255.6	✓	—	—	—	—	
Flow 2	6	1549.15	255.0	✓	6.524		24.760	NIL	
Shut In	6	2982.75	255.2	✓	—	—	—	—	
Flow 3	6	1213.05	254.7	✓	7.425		25.120	1.120	
Shut In	6	2980.95	255.1	✓	—	—	—	—	
Flow 4	6	828.05	254.8	✓	8.200		23.800	1.400	
Extended Flow	24	1044.95	254.8	✓	7.844		23.770	0.930	
Final Shut In	96	2989.25	255.8	✓	—	—	—	—	

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Conditioning Flow - PVT	29.28	Not	Recorded			16.654	0.549	
----------------------------	-------	-----	----------	--	--	--------	-------	--

Sampling. ✓

✓

✓

✓

✓

00018

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	39	2991.95						
Flow 1	6	1847.85						
Shut In	6	2987.25						
Flow 2	6	1549.15						
Shut In	6	2982.75						
Flow 3	6	1213.05						
Shut In	6	2980.95						
Flow 4	6	828.05						
Total=								
Extended Flow	24	1044.95						
Final Shut In	96	2989.25						

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GAS WELL DELIVERABILITY TEST CALCULATIONSL.I.T. (Ψ) ANALYSIS

DISCARDED POINT _____

N = _____ $\bar{\Psi}_R$ = _____ MMpsia²/cp

$$a, a_t = \frac{\sum \frac{\Delta \Psi}{q} \sum q^2 - \sum q \sum \Delta \Psi}{N \sum q^2 - \sum q \sum q} = \underline{\hspace{2cm}}$$

$$b = \frac{N \sum \Delta \Psi - \sum q \frac{\sum \Delta \Psi}{q}}{N \sum q^2 - \sum q \sum q} = \underline{\hspace{2cm}}$$

(EXTENDED FLOW)

$$\Delta \Psi = \underline{\hspace{2cm}} \quad q = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$$a = \frac{\Delta \Psi - bq^2}{q} = \underline{\hspace{2cm}}$$

A.O.F. = _____ MMSCFD $n = \underline{\hspace{2cm}}$

Total Volume of Gas Produced During Test = _____ MMSCF

Condensate = _____ Bbls

Water = _____ Bbls

RESULTSTRANSIENT FLOW: $\bar{\Psi}_R - \Psi_{wf} = a_t q + bq^2$ i.e. _____ - Ψ_{wf} = _____ q + _____ q²STABILIZED FLOW: $\bar{\Psi}_R - \Psi_{wf} = aq + bq^2$ i.e. _____ - Ψ_{wf} = _____ q + _____ q²

DELIVERABILITY:

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

FOR $\Psi_{wf} = 0$, $q = \text{AOF} = \underline{\hspace{2cm}}$ MMscfd

REMARKS

SUB-SURFACE PRESSURE SURVEY

CO.		RUN 01 FIELD KUJANI	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 6738'
CASING	-	CASING PRESS	ON BOTTOM 1048 18/4
LINER	-	TUBING PRESS	OFF BOTTOM 1130 25/4
DATE	910425	ELEMENT RANGE 0 - 5263	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1130 21/4
MAX TEMP	-	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 53563	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	MODIFIED ISOCHRONAL

SURVEY DATA

CO.	RUN 01 FIELD KUJANI				WELL 01			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	
11:30	1030.3	1030.3	.0	14:03	2934.3	2934.3	2.6	
11:31	1060.2	1060.2	.0	14:46	2936.7	2936.7	3.3	
11:33	1115.6	1115.6	.1	16:04	2943.5	2943.5	4.6	
11:34	1195.3	1195.3	.1	17:30	2947.7	2947.7	6.0	
11:35	1255.9	1255.9	.1	20:11	2953.1	2953.1	8.7	
11:37	1329.5	1329.5	.1	22:02	2955.8	2955.8	10.5	
11:38	1393.2	1393.2	.1	1:42	2960.3	2960.3	14.2	
11:40	1489.7	1489.7	.2	4:19	2961.8	2961.8	16.8	
11:45	1608.9	1608.9	.2	6:28	2961.3	2961.3	19.0	
11:47	1696.5	1696.5	.3	9:18	2963.3	2963.3	21.8	
11:51	1776.4	1776.4	.4	13:15	2964.0	2964.0	25.8	
11:53	1864.7	1864.7	.4	17:22	2966.2	2966.2	29.9	
11:56	2023.3	2023.3	.4	22:33	2968.5	2968.5	35.1	
12:00	2151.3	2151.3	.5	3:07	2967.4	2967.4	39.6	
12:03	2239.6	2239.6	.6	9:35	2968.4	2968.4	46.1	
12:09	2327.3	2327.3	.7	16:22	2966.9	2966.9	52.9	
12:11	2441.6	2441.6	.7	0:01	2969.4	2969.4	60.5	
12:13	2524.1	2524.1	.7	10:35	2970.4	2970.4	71.1	
12:17	2629.5	2629.5	.8	18:57	2971.9	2971.9	79.5	
12:20	2713.5	2713.5	.8	7:30	2972.3	2972.3	92.0	
12:24	2762.7	2762.7	.9	11:30	2974.6	2974.6	96.0	
12:28	2808.6	2808.6	1.0	- 11:14	2977.3	2977.3	-70.7	
12:32	2845.4	2845.4	1.0	- 11:12	2846.7	2846.7	-70.7	
12:37	2873.5	2873.5	1.1	- 11:11	2739.2	2739.2	-70.7	
12:41	2896.8	2896.8	1.2	- 11:11	2569.2	2569.2	-70.7	
12:51	2909.6	2909.6	1.4	- 11:11	2361.4	2361.4	-70.7	
13:01	2919.8	2919.8	1.5	- 11:09	2127.9	2127.9	-70.7	
13:15	2926.3	2926.3	1.8	- 11:03	1937.8	1937.8	-70.5	
13:31	2928.4	2928.4	2.0	- 10:49	1863.9	1863.9	-70.3	
13:51	2931.9	2931.9	2.4	- 10:39	1845.9	1845.9	-70.2	

SURVEY DATA

00022

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
-	10:28	1836.6	1836.6	-70.0	-	9:15	2968.1 *	2968.1 -44.8
-	10:07	1831.2	1831.2	-69.6	-	9:16	2778.9	2778.9 -44.8
-	9:11	1830.9	1830.9	-68.7	-	9:17	2533.5	2533.5 -44.8
-	8:52	1841.0	1841.0	-68.4	-	9:23	2140.2	2140.2 -44.9
-	7:27	1833.8	1833.8	-66.9	-	9:26	1796.0	1796.0 -44.9
-	6:11	1833.5	1833.5	-65.7	-	9:28	1434.1	1434.1 -45.0
-	5:02	1833.2 *	1833.2	-64.5	-	9:20	1231.9	1231.9 -44.8
-	5:00	1919.9	1919.9	-64.5	-	9:08	1213.7	1213.7 -44.6
-	4:55	2027.9	2027.9	-64.4	-	8:46	1203.6	1203.6 -44.3
-	4:49	2197.9	2197.9	-64.3	-	7:23	1199.3	1199.3 -42.9
-	4:47	2371.4	2371.4	-64.3	-	5:47	1199.0	1199.0 -41.3
-	4:40	2559.0	2559.0	-64.2	-	4:23	1198.7	1198.7 -39.9
-	4:33	2688.5	2688.5	-64.1	-	3:18	1198.4 *	1198.4 -38.8
-	4:26	2832.0	2832.0	-63.9	-	3:15	1348.0	1348.0 -38.7
-	4:20	2887.9	2887.9	-63.8	-	3:11	1537.2	1537.2 -38.7
-	4:12	2928.6	2928.6	-63.7	-	3:07	1775.1	1775.1 -38.6
-	4:00	2944.5	2944.5	-63.5	-	2:57	2051.6	2051.6 -38.5
-	3:44	2954.1	2954.1	-63.2	-	2:51	2258.0	2258.0 -38.4
-	2:50	2965.8	2965.8	-62.3	-	2:39	2544.2	2544.2 -38.2
-	1:41	2967.1	2967.1	-61.2	-	2:31	2732.9	2732.9 -38.0
-	22:56	2972.7	2972.7	-58.4	-	2:16	2878.7	2878.7 -37.8
-	22:13	2972.6 *	2972.6	-57.7	-	2:04	2924.1	2924.1 -37.6
-	22:13	2762.3	2762.3	-57.7	-	1:50	2939.2	2939.2 -37.3
-	22:14	2495.7	2495.7	-57.7	-	1:26	2946.5	2946.5 -36.9
-	22:18	2151.4	2151.4	-57.8	-	0:11	2957.2	2957.2 -35.7
-	22:18	1853.6	1853.6	-57.8	-	22:22	2963.6	2963.6 -33.9
-	22:11	1619.1	1619.1	-57.7	-	20:44	2966.4	2966.4 -32.2
-	22:02	1569.9	1569.9	-57.5	-	20:18	2966.3 *	2966.3 -31.8
-	21:53	1556.0	1556.0	-57.4	-	20:18	2824.4	2824.4 -31.8
-	21:35	1541.6	1541.6	-57.1	-	20:19	2608.3	2608.3 -31.8
-	21:01	1530.8	1530.8	-56.5	-	20:21	2415.8	2415.8 -31.8
-	19:51	1530.6	1530.6	-55.4	-	20:23	2171.4	2171.4 -31.9
-	18:37	1533.0	1533.0	-54.1	-	20:27	1815.2	1815.2 -32.0
-	17:17	1532.7	1532.7	-52.8	-	20:33	1410.0	1410.0 -32.0
-	16:09	1534.5 *	1534.5	-51.7	-	20:37	976.1	976.1 -32.1
-	16:07	1657.6	1657.6	-51.6	-	20:37	855.8	855.8 -32.1
-	16:02	1823.3	1823.3	-51.5	-	20:28	823.9	823.9 -32.0
-	15:57	1986.3	1986.3	-51.4	-	20:12	818.1	818.1 -31.7
-	15:51	2146.7	2146.7	-51.4	-	19:26	817.9	817.9 -30.9
-	15:45	2300.2	2300.2	-51.3	-	17:30	817.5	817.5 -29.0
-	15:38	2503.0	2503.0	-51.1	-	15:50	817.1	817.1 -27.3
-	15:33	2654.0	2654.0	-51.1	-	14:31	813.4 *	813.4 -26.0
-	15:25	2800.2	2800.2	-50.9	-	14:27	876.1	876.1 -25.9
-	15:18	2884.5	2884.5	-50.8	-	14:23	970.0	970.0 -25.9
-	15:07	2922.2	2922.2	-50.6	-	14:19	1007.7	1007.7 -25.8
-	14:53	2941.3	2941.3	-50.4	-	14:10	1025.3	1025.3 -25.7
-	13:38	2958.4	2958.4	-49.1	-	13:59	1031.8	1031.8 -25.5
-	12:25	2965.4	2965.4	-47.9	-	13:08	1031.6	1031.6 -24.6
-	11:10	2968.6	2968.6	-46.7	-	11:25	1031.2	1031.2 -22.9
-	9:59	2968.3	2968.3	-45.5	-	9:50	1030.8	1030.8 -21.3

SURVEY DATA

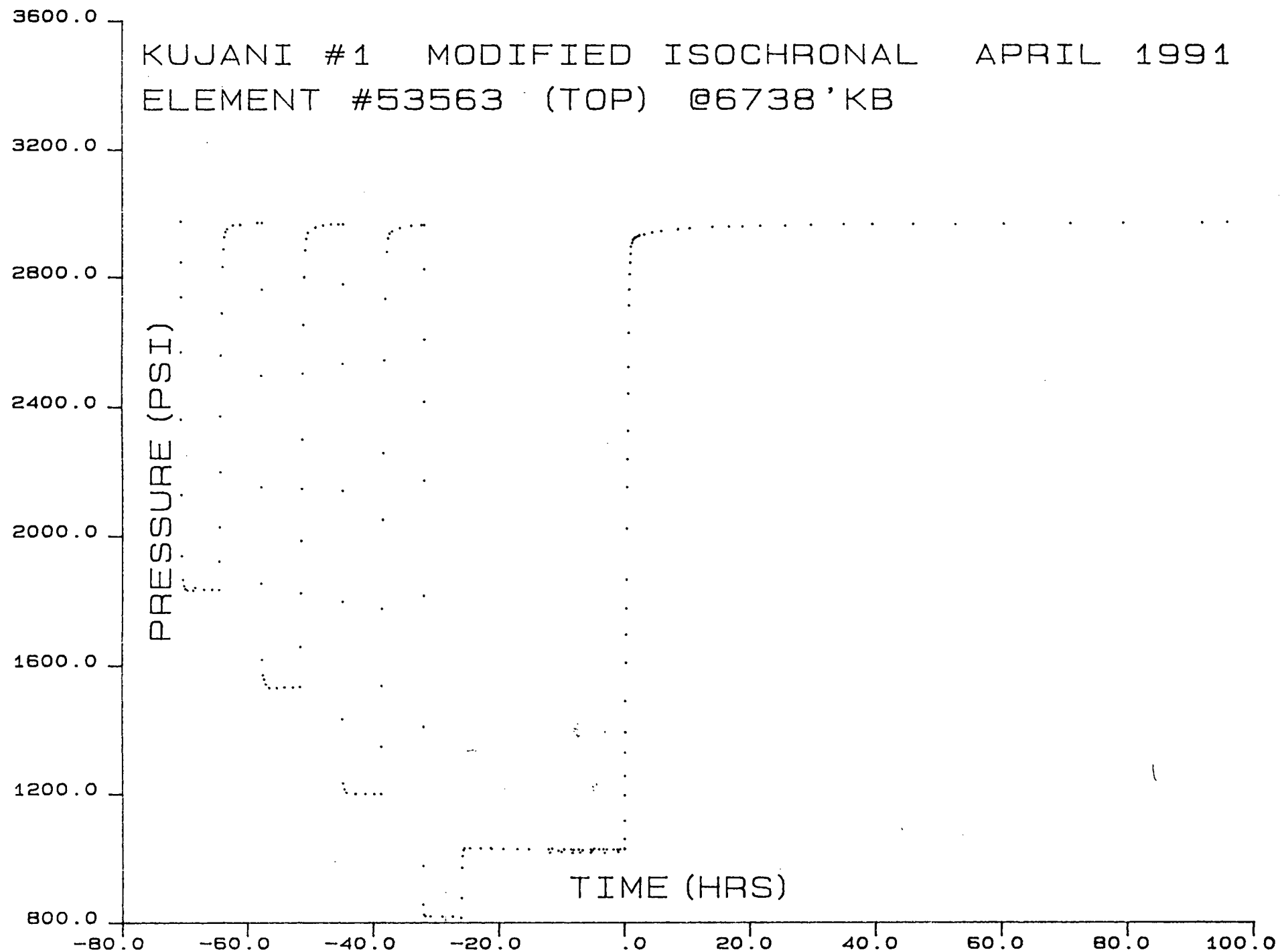
00023

CO.	RUN 01 FIELD KUJANI				WELL 01			
	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
-	9:38	1029.2	1029.2	-21.1	4:49	1025.0	1025.0	-6.7
-	7:50	1028.8	1028.8	-19.3	6:07	1028.6	1028.6	-5.4
-	5:35	1028.3	1028.3	-17.1	6:07	1017.9	1017.9	-5.4
-	3:47	1027.9	1027.9	-15.3	6:23	1025.1	1025.1	-5.1
-	0:38	1027.2	1027.2	-12.1	6:38	1030.1	1030.1	-4.9
-	0:24	1017.5	1017.5	-11.9	7:29	1027.5	1027.5	-4.0
-	0:02	1030.0	1030.0	-11.5	8:08	1027.4	1027.4	-3.4
	0:59	1023.2	1023.2	-10.5	8:20	1016.0	1016.0	-3.2
	1:28	1019.7	1019.7	-10.0	8:41	1027.0	1027.0	-2.8
	1:51	1027.7	1027.7	-9.6	9:44	1026.8	1026.8	-1.8
	3:00	1027.5	1027.5	-8.5	10:22	1026.6	1026.6	-1.1
	3:13	1016.2	1016.2	-8.3	10:29	1019.0	1019.0	-1.0
	3:23	1026.6	1026.6	-8.1	10:49	1028.3	1028.3	-.7
	4:12	1026.4	1026.4	-7.3	11:30	1028.2	1028.2	.0
	4:25	1017.5	1017.5	-7.1	0:00	.0	.0	.0

LUB IN DWT = 2281 PSI / OUT = 2282 PSI

LUB IN AMERADA = 2263 PSI / OUT = 2262 PSI

KUJANI #1 MODIFIED ISOCHRONAL APRIL 1991
ELEMENT #53563 (TOP) @6738'KB



SUB-SURFACE PRESSURE SURVEY

00025

CO.		RUN 02 FIELD KUJANI	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 6744'
CASING	-	CASING PRESS	ON BOTTOM 1048 18/4
LINER	-	TUBING PRESS	OFF BOTTOM 1130 25/4
DATE	910425	ELEMENT RANGE 0 - 5109	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1130 21/4
MAX TEMP	-	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 55994	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	MODIFIED ISOCHRONAL

SURVEY DATA

CO.	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
	11:30	1031.5	1031.5	.0	15:31	2948.0	2948.0	4.0
	11:33	1079.0	1079.0	.0	16:32	2950.6	2950.6	5.0
	11:35	1158.5	1158.5	.1	18:03	2954.1	2954.1	6.5
	11:36	1228.1	1228.1	.1	20:07	2959.2	2959.2	8.6
	11:37	1317.4	1317.4	.1	22:36	2959.4	2959.4	11.1
	11:39	1405.2	1405.2	.1	2:05	2965.1	2965.1	14.6
	11:42	1484.0	1484.0	.2	5:36	2967.3	2967.3	18.1
	11:44	1607.9	1607.9	.2	8:54	2967.6	2967.6	21.4
	11:46	1716.5	1716.5	.3	12:24	2970.5	2970.5	24.9
	11:49	1828.1	1828.1	.3	16:11	2974.4	2974.4	28.7
	11:49	1890.8	1890.8	.3	20:15	2974.8	2974.8	32.8
	11:51	1995.1	1995.1	.3	0:49	2975.2	2975.2	37.3
	11:52	2121.3	2121.3	.4	5:54	2973.6	2973.6	42.4
	11:55	2243.8	2243.8	.4	11:07	2974.1	2974.1	47.6
	11:58	2352.0	2352.0	.5	17:03	2974.6	2974.6	53.5
	12:01	2440.6	2440.6	.5	1:12	2975.4	2975.4	61.7
	12:08	2565.3	2565.3	.6	8:42	2976.1	2976.1	69.2
	12:10	2660.6	2660.6	.7	16:21	2976.8	2976.8	76.9
	12:16	2756.3	2756.3	.8	0:20	2977.5	2977.5	84.8
	12:18	2817.4	2817.4	.8	8:50	2978.3	2978.3	93.3
	12:29	2843.1	2843.1	1.0	11:30	2978.5	2978.5	96.0
	12:29	2875.7	2875.7	1.0	- 4:53	2982.3	2982.3	-64.4
	12:34	2886.5	2886.5	1.1	- 4:53	2890.8	2890.8	-64.4
	12:41	2909.2	2909.2	1.2	- 4:54	2707.5	2707.5	-64.4
	12:51	2919.2	2919.2	1.3	- 4:54	2566.5	2566.5	-64.4
	13:03	2927.7	2927.7	1.5	- 4:56	2408.8	2408.8	-64.4
	13:17	2932.9	2932.9	1.8	- 4:50	2402.4	2402.4	-64.3
	13:36	2935.2	2935.2	2.1	- 4:50	2337.4	2337.4	-64.3
	14:11	2942.2	2942.2	2.7	- 4:50	2253.8	2253.8	-64.3
	14:42	2945.3	2945.3	3.2	- 4:49	2104.1	2104.1	-64.3

SURVEY DATA

00026

CO.	RUN 02 FIELD KUJANI				WELL 01			
	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
-	4:45	1977.2	1977.2	-64.2	-	11:49	1538.8	-47.3
-	4:41	1914.8	1914.8	-64.2	-	11:46	1595.4	-47.3
-	4:35	1873.4	1873.4	-64.1	-	11:43	1663.3	-47.2
-	4:24	1841.7	1841.7	-63.9	-	11:41	1736.7	-47.2
-	4:06	1836.1	1836.1	-63.6	-	11:38	1842.7	-47.1
-	3:34	1830.7	1830.7	-63.1	-	11:36	1977.0	-47.1
-	3:14	1830.8	1830.8	-62.7	-	11:34	2093.9	-47.1
-	3:01	1840.3	1840.3	-62.5	-	11:32	2234.1	-47.0
-	1:56	1840.3	1840.3	-61.4	-	11:30	2402.7	-47.0
-	0:43	1832.3	1832.3	-60.2	-	11:28	2531.8	-47.0
-	23:53	1832.3	1832.3	-59.4	-	11:24	2592.7	-46.9
-	23:21	1832.4	1832.4	-58.9	-	11:22	2714.0	-46.9
-	23:16	1900.7	1900.7	-58.8	-	11:17	2801.5	-46.8
-	23:14	1972.9	1972.9	-58.7	-	11:11	2834.9	-46.7
-	23:14	2092.6	2092.6	-58.7	-	11:01	2848.0	-46.5
-	23:10	2222.8	2222.8	-58.7	-	10:53	2880.4	-46.4
-	23:08	2336.1	2336.1	-58.6	-	10:47	2923.6	-46.3
-	23:05	2449.8	2449.8	-58.6	-	10:40	2945.7	-46.2
-	23:04	2569.9	2569.9	-58.6	-	10:29	2953.4	-46.0
-	23:02	2720.9	2720.9	-58.5	-	10:17	2961.1	-45.8
-	23:00	2821.8	2821.8	-58.5	-	9:39	2967.4	-45.1
-	22:56	2896.0	2896.0	-58.4	-	8:45	2967.5	-44.2
-	22:51	2915.0	2915.0	-58.3	-	7:59	2971.1	-43.5
-	22:40	2941.3	2941.3	-58.2	-	7:10	2973.8	-42.7
-	22:26	2959.5	2959.5	-57.9	-	6:10	2977.7	-41.7
-	21:46	2967.0	2967.0	-57.3	-	5:29	2977.8	-41.0
-	21:00	2970.5	2970.5	-56.5	-	5:12	2974.5	-40.7
-	20:05	2977.0	2977.0	-55.6	-	5:12	2861.6	-40.7
-	18:58	2977.1	2977.1	-54.5	-	5:12	2734.6	-40.7
-	17:46	2981.6	2981.6	-53.3	-	5:16	2563.6	-40.8
-	16:58	2977.3	2977.3	-52.5	-	5:19	2415.8	-40.8
-	16:56	2882.7	2882.7	-52.4	-	5:22	2210.9	-40.9
-	16:56	2734.3	2734.3	-52.4	-	5:24	1987.3	-40.9
-	16:58	2577.1	2577.1	-52.5	-	5:30	1753.2	-41.0
-	17:03	2415.3	2415.3	-52.6	-	5:34	1554.3	-41.1
-	17:05	2213.1	2213.1	-52.6	-	5:39	1294.9	-41.2
-	17:09	2039.2	2039.2	-52.7	-	5:36	1249.1	-41.1
-	17:12	1879.3	1879.3	-52.7	-	5:26	1233.8	-40.9
-	17:15	1720.6	1720.6	-52.7	-	5:13	1222.1	-40.7
-	17:17	1623.1	1623.1	-52.8	-	4:46	1207.8	-40.3
-	17:09	1602.8	1602.8	-52.7	-	3:55	1207.8	-39.4
-	16:55	1573.2	1573.2	-52.4	-	2:15	1203.7	-37.8
-	16:42	1553.0	1553.0	-52.2	-	1:03	1203.8	-36.5
-	16:27	1543.5	1543.5	-51.9	-	23:48	1206.4	-35.3
-	16:06	1537.2	1537.2	-51.6	-	23:42	1341.3	-35.2
-	15:29	1537.2	1537.2	-51.0	-	23:40	1541.7	-35.2
-	14:54	1535.0	1535.0	-50.4	-	23:39	1793.3	-35.2
-	14:28	1538.6	1538.6	-50.0	-	23:32	2092.2	-35.0
-	13:50	1538.6	1538.6	-49.3	-	23:28	2281.5	-35.0
-	12:40	1538.8	1538.8	-48.2	-	23:25	2494.7	-34.9

SURVEY DATA

00027

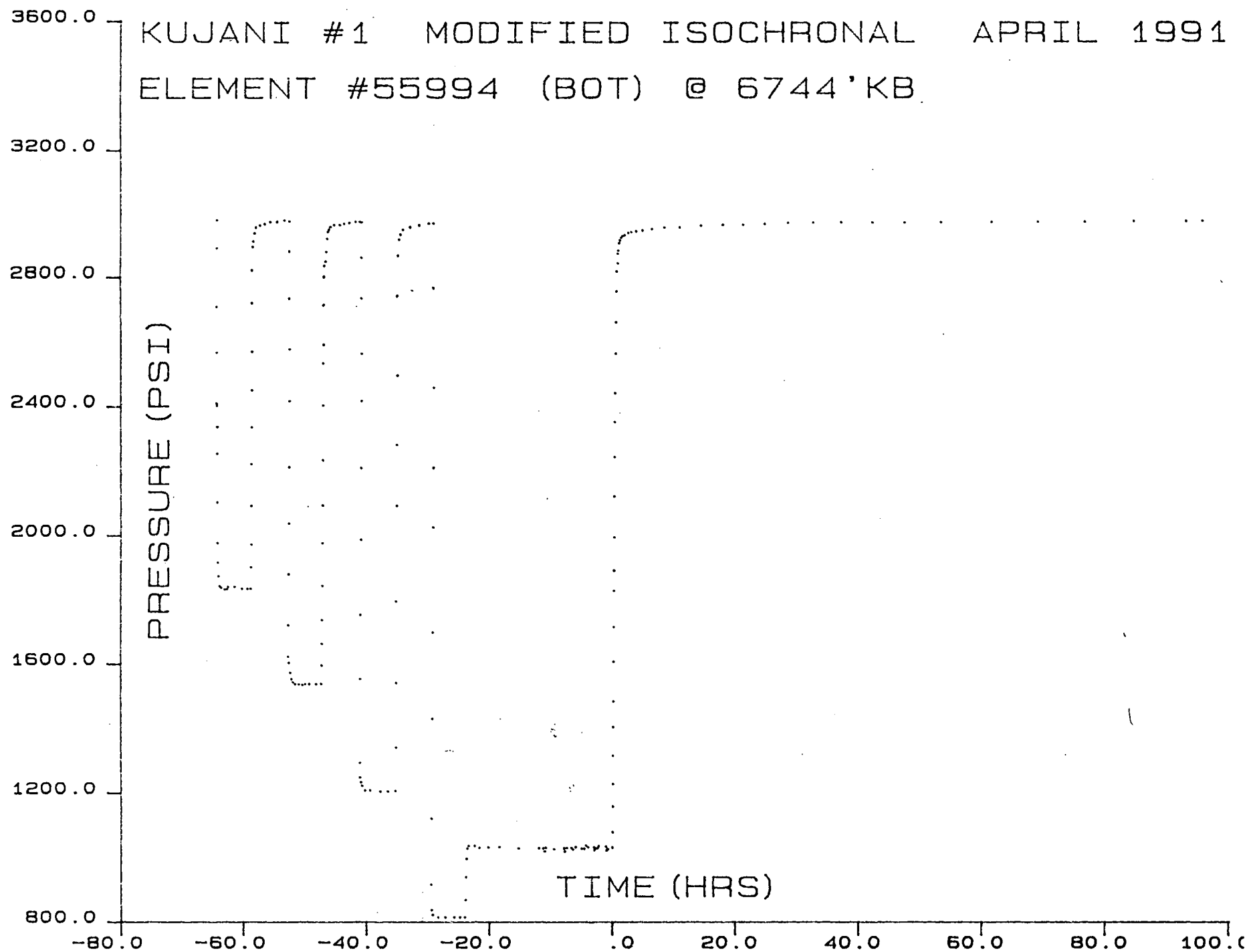
CO.				RUN 02 FIELD KUJANI				WELL 01						
	TIME	P-T	DP-DT	DTIME		TIME	P-T	DP-DT	DTIME		TIME	P-T	DP-DT	DTIME
-	23:21	2743.8	2743.8	-34.9	-	10:54	1038.2	1038.2	-22.4					
-	23:16	2868.4	2868.4	-34.8	-	10:09	1030.3	1030.3	-21.6					
-	23:04	2920.8	2920.8	-34.6	-	8:41	1033.5	1033.5	-20.2					
-	22:52	2936.8	2936.3	-34.4	-	6:53	1033.7	1033.7	-18.4					
-	22:26	2952.0	2952.0	-33.9	-	3:46	1028.9	1028.9	-15.3					
-	21:16	2960.6	2960.6	-32.8	-	0:27	1029.2	1029.2	-12.0					
-	19:47	2966.3	2966.3	-31.3		0:15	1029.2	1029.2	-11.2					
-	18:15	2971.6	2971.6	-29.7		0:30	1019.3	1019.3	-11.0					
-	17:28	2971.9	2971.9	-29.0		0:40	1031.6	1031.6	-10.8					
-	17:28	2766.4	2766.4	-29.0		2:01	1025.8	1025.8	-9.5					
-	17:32	2457.3	2457.3	-29.0		3:38	1030.3	1030.3	-7.9					
-	17:36	2211.4	2211.4	-29.1		3:47	1018.8	1018.8	-7.7					
-	17:39	2026.2	2026.2	-29.1		4:06	1030.8	1030.8	-7.4					
-	17:44	1698.7	1698.7	-29.2		4:50	1031.4	1031.4	-6.7					
-	17:50	1430.4	1430.4	-29.3		5:08	1025.3	1025.3	-6.4					
-	17:58	1121.3	1121.3	-29.5		5:31	1033.5	1033.5	-6.0					
-	18:01	915.3	915.3	-29.5		6:30	1028.0	1028.0	-5.0					
-	17:54	835.6	835.6	-29.4		6:57	1028.1	1028.1	-4.6					
-	17:41	820.6	820.6	-29.2		7:13	1038.8	1038.8	-4.3					
-	16:47	812.6	812.6	-28.3		7:33	1031.9	1031.9	-3.9					
-	15:39	812.7	812.7	-27.1		8:29	1032.8	1032.8	-3.0					
-	14:11	812.8	812.8	-25.7		8:35	1022.8	1022.8	-2.9					
-	13:16	812.9	812.9	-24.8		8:47	1030.0	1030.0	-2.7					
-	12:27	813.0	813.0	-24.0		9:07	1030.0	1030.0	-2.4					
-	12:21	867.2	867.2	-23.9		9:17	1037.2	1037.2	-2.2					
-	12:18	938.5	938.5	-23.8		10:26	1034.0	1034.0	-1.1					
-	12:15	996.7	996.7	-23.7		10:33	1022.3	1022.3	-1.0					
-	12:07	1028.6	1028.6	-23.6		10:46	1026.6	1026.6	-.7					
-	11:53	1038.1	1038.1	-23.4		11:30	1033.6	1033.6	.0					

LUB IN DWT = 2281 PSI / OUT = 2282 PSI

LUB IN AMERADA = 2256 PSI / OUT = 2251 PSI

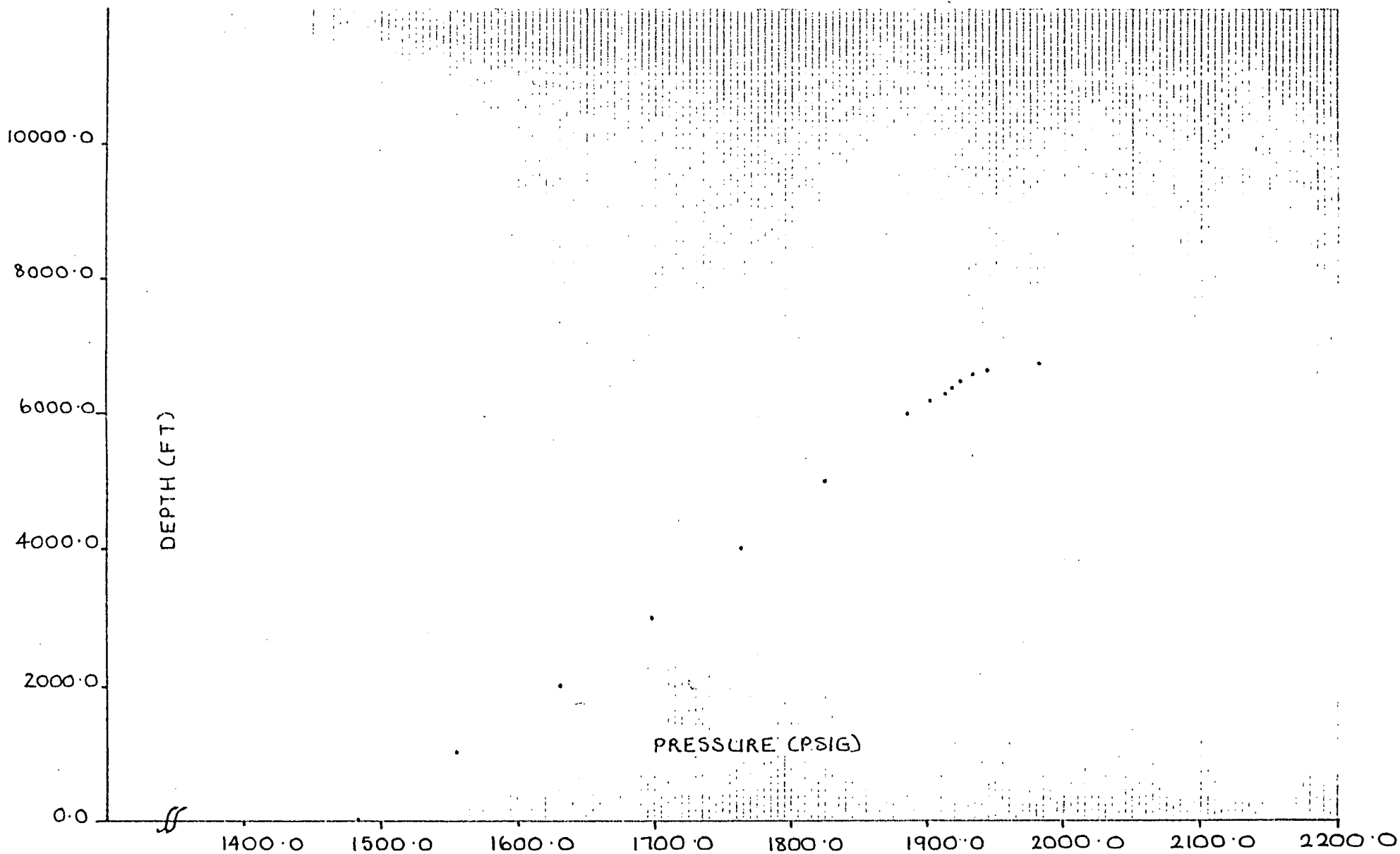
PLEASE NOTE; CHART EXHIBITS STAIRSTEPPING PROBLEMS.

KUJANI #1 MODIFIED ISOCHRONAL APRIL 1991
ELEMENT #55994 (BOT) @ 6744'KB



KUJANI # 1 - FLOWING PRESSURE GRADIENT - 26/4/91

ELEMENT # 53563 / 5000 (TOP)



KUSANI #1

DATE: 26/4/91.

BOTTOM

ELEMENT No. 59546 ELEMENT RANGE: 200°F - 400°F
RECORDER No. 73359 CLOCK DATA: 134411 X 12 HRS
ENGAGE SYLUS: 10:50 DISENGAGE: 13:47

BOMB No. 2 DATA

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

LUBRICATOR DATA

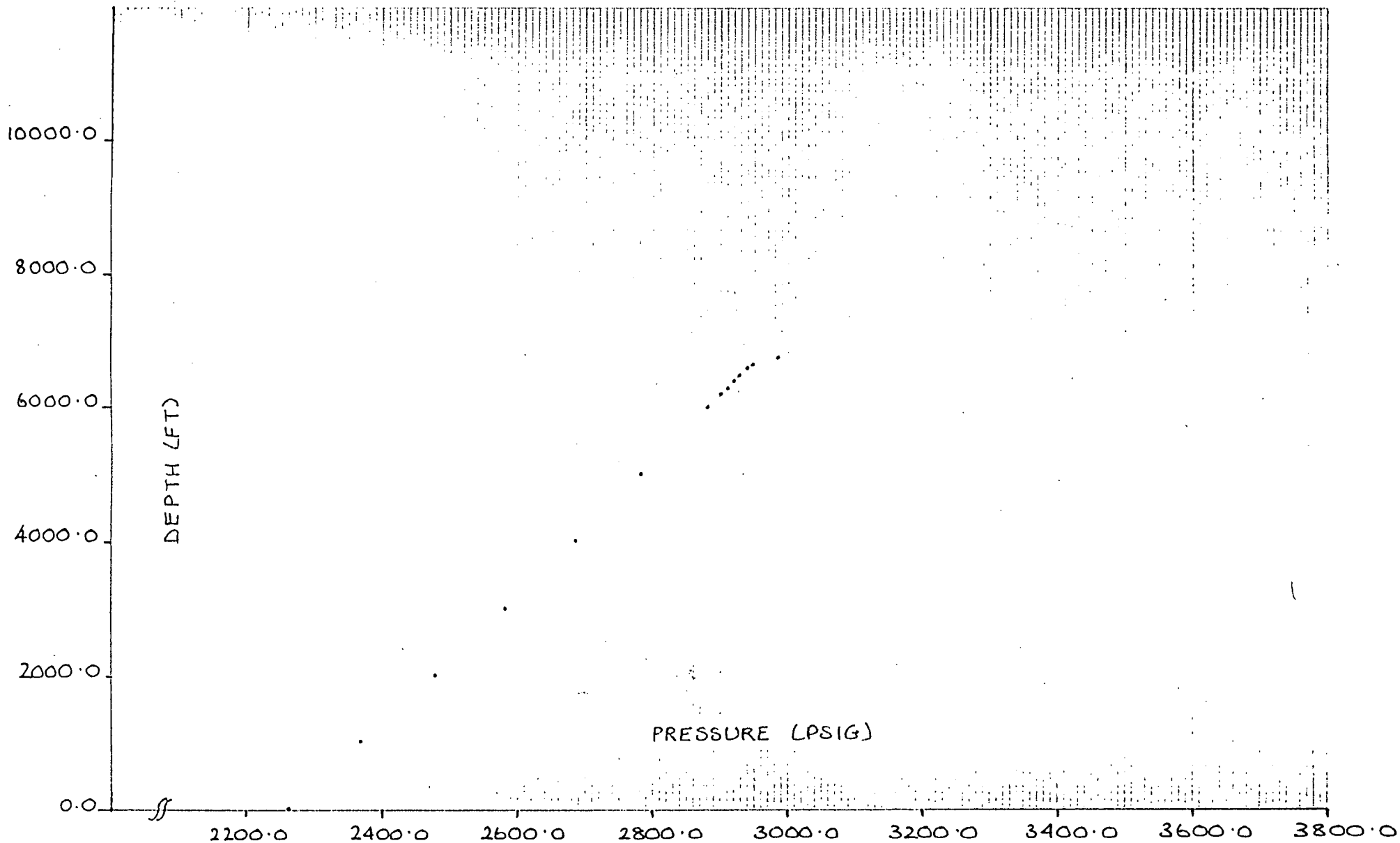
PRESSURE WITH D.W.T.: 1504 PSI.
TIME PRESSURED: 11:06
TIME DEPRESSURED: 13:33.

General Comments:	TWO PRESSURE ELEMENTS USED	TOP ELEM # 53563 RANGE 0-5000 PSI.	MIDDLE ELEM # 55994 RANGE 0-5000 PSI.	GOIO
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00031

KUJANI # 1 — STATIC PRESSURE GRADIENT — 25/4/91

ELEMENT # 53563 / 5000 (TOP)



KUJANI #1

STATIC GRADIENT SURVEY

DATE: 25/4/91.

BOMB No. 3 DATA

ELEMENT No. 59546 ELEMENT RANGE: 200°-400°F
RECORDER No. 73359 CLOCK DATA: #3 4411 x 12 hrs
ENGAGE SYLUS: 15:25 DISENGAGE: 18:04

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:

[illegible]

General Comments: TWO PRESSURE ELEMENTS USED

TOP ELEM[#] 53563 RANGE 0-5000 PSI.
MIDDLE ELEM[#] 55994 RANGE 0-5000 PSI.

00034
GOIO

Well: Kujani #1 Date: 18.4.91 - 25/4/91

Lubricator Data: ① 2263 / 2262
② 2256 / 2251 Page 1 of 4

Pressure with D.W.T. 15727 kpa in, 15734 KPA OUT
2281 psi.g 2282 psi.g

Time Pressured 0813 18.4.91 Time Depressed 1400 Hrs 25/4/91

Time Run in Hole 1013 18.4.91 Time off Bottom 1130 Hrs 25/4/91

TOP Bomb No. 1 Data MID Bomb No. 2 Data

Element No. and Range	<u>53563 0-5000 psi</u>	<u>55994 0-5000 psi</u>
Recorder No.	<u>55387</u>	<u>55663</u>
Clock and Lead Screw Data	<u>H-25512 x 180hr</u>	<u>H-25513 x 180hr</u>
Engage Stylus	Date: <u>18.4.91</u> Time: <u>0759</u>	Date: <u>18.4.91</u> Time: <u>0759</u>
Disengage	Date: <u>25/4/91</u> Time: <u>1450 Hrs</u>	Date: <u>25/4/91</u> Time: <u>1450 Hrs</u>

Remarks: BOTTOM RT7
Element No #59546 Range 200°-400°F Engage Stylus 18.4.91 0759
Recorder 73359 Clock F-16591 x 120hr. Disengage Stylus 1450 HRS

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
<u>18.4.91</u>	<u>0759</u>					<u>Engage Stylus</u>
	<u>0813</u>		<u>15727</u>	<u>0</u>		<u>Pressure Up Lubricator</u>
	<u>1013</u>		<u>15727</u>	<u>0</u>		<u>Run In Hole</u>
	<u>1048</u>		<u>-</u>	<u>-</u>		<u>Hang @ 6750' K.B</u>
	<u>1300</u>		<u>15727</u>	<u>0</u>	<u>36.5</u>	<u>Open Well to 7/8" Choke</u>
	<u>1400</u>		<u>13824</u>	<u>0</u>	<u>30.5</u>	<u>Rate #1</u>
	<u>1425</u>		<u>13728</u>	<u>0</u>	<u>31</u>	<u>Shut Well In to</u>
	<u>1500</u>		<u>15693</u>	<u>0</u>		<u>remove obstruction</u>
	<u>1538</u>		<u>15706</u>	<u>0</u>		<u>Pressure Test Lines</u>
	<u>1540</u>		<u>15638</u>	<u>0</u>		<u>Pressure Test Lines</u>
	<u>1600</u>		<u>15583</u>	<u>0</u>		
	<u>1700</u>		<u>15679</u>	<u>0</u>		
	<u>1730</u>		<u>15679</u>	<u>0</u>	<u>26.5</u>	<u>Open Well to 7/8" Choke</u>
	<u>1830</u>		<u>9591</u>	<u>0</u>	<u>31.5</u>	<u>Rate #1</u>
	<u>1930</u>		<u>9863</u>	<u>0</u>	<u>32.5</u>	
	<u>2030</u>		<u>9605</u>	<u>0</u>	<u>34</u>	
	<u>2130</u>		<u>9605</u>	<u>0</u>	<u>34.5</u>	
	<u>2230</u>		<u>9584</u>	<u>0</u>	<u>35</u>	
	<u>2330</u>		<u>9584</u>	<u>0</u>	<u>35.5</u>	<u>Shut Well In for</u>
<u>19.4.91</u>	<u>0030</u>		<u>15796</u>	<u>0</u>		<u>BuildUp</u>
	<u>0130</u>		<u>15810</u>	<u>0</u>		
	<u>0230</u>		<u>15817</u>	<u>0</u>		
	<u>0330</u>		<u>15817</u>	<u>0</u>		

SANTOS LTD.

00036

ISO - CHRONAL AND BUILD-UP SURVEY CONTINUATION

Well: Kujani #1Date: 19.4.91

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Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPa Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
19.4.91	0430		15810	0		
	0530		15803	0	10	Open Well to 2 1/64" Choke
	0630		7909	0	33.5	Rate #2
	0730		7874	0	36	
	0830		7881	0	37	
	0930		7909	0	39-	
	1030		7922	0	40.5	
	1130		7929	0	41.5	Shut Well In for Buildup
	1230		15776	0		
	1330		15803	0		
	1430		15817	0		
	1530		15817	0		
	1630		15817	0		
	1730		15803	0	26.5	Open Well to 2 7/64" Choke
	1830		5874	0	36.5	Rate #3
	1930		5868	0	38	
	2030		5861	0	40	
	2130		5868	0	40	
	2230		5888	0	41.5	
	2330		5888	0	42	Shut Well In for Buildup
20.4.91	0030		15714	0		
	0130		15748	0		
	0230		15776	0		
	0330		15783	0		
	0430		15790	0		
	0530		15783	0	10	Open Well to 4 5/64" Choke
	0630		2820	0	36.5	Rate #4
	0730		2820		39.5	
	0830		2820		40	
	0930		2826		42	
	1030		2834		43	
	1130		2827		45	Reduce Choke to 3 3/64"
	1230		4737		47	for Extended Flow.
	1330		4737		47.5	
	1430		4737		48	
	1530		4723		48.5	

SANTOS LTD.

ISO • CHRONAL AND BUILD-UP SURVEY CONTINUATION

Well: Kujani #1

Date: 20.4.91

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Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	KPA Wellhead	KPA Casing	°C Wellhead Temp.	Remarks
20.4.91	1630		4730	0	48.5	
	1730		4723	0	48	
	1830		4737	0	48	
	1930		4744	0	48	
	2030		4744	0	48	
	2130		4744	0	48.5	
	2230		4744	0	49	
	2330		4737	0	49.5	
21.4.91	0030		4744	0	49	
	0130		4737	0	48.5	
	0230		4737	0	49	
	0330		4723	0	49.5	
	0430		4723	0	49.5	
	0530		4737	0	50	
	0630		4716	0	49	
	0730		4729	0	50	
	0830		4736	0	51	
	0930		4730	0	51	
	1030		4687	0	53	
	1130		4737	0	54	
	1230		15762	0		Shot Well In for Final BuildUp
	1330		15810	0		
	1430		15831	0		
	1530		15838	0		
	1600		15838	0		
	1800		15831	0		
	2200		15810	0		
22.4.91	0200		15796	0		
	0600		15796	0		
	1000		15783	0		
	1400		15776	0		
	1800		15769	0		
	2200		15762	0		
23.4.91	0200		15755	0		
	0600		15748	0		
	1000		15755	0		

Well:.....Kujani #1

Date: 23.4.91

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[illegible]

SECTION # 1

FIELD READINGS

By: OILSERV AUSTRALIA LTD
6 BREDBO STREET
LONSDALE. SA. 5160.

TELEPHONE: (08) 326 1588
FACSIMILE: (08) 326 1593

PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OilServ	PERFORATIONS: 6628' - 6668' KB	PAGE: 1 OF 13
WELL NAME: Kujani #1	FORMATION: Patchawarra	DATE: 14.4.91
TEST TYPE: Modified Isochronal		OPR: HIRST/WILSON

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				L.G.R
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE m ³ /10 ³ AM	OIL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	
14.	4.91														
1230						Arrive on location									
						Spot Seperator and Tanks									
1319						Truck Departs Location									
						Spot all Testing Equipment and Accommodation									
1530						Rig up Slick Line Unit									
1645						Pressure Up Lubricator									
1650						Run In Hole 1.75" Gauge Ring - Commence Dummy Run									
1803						String free of Obstructions to 6830' KB, Pull Out of Hole									
1829						Arrive in Lubricator									
1832						Depressure Lubricator and Secure Well overnight									
15.	4.91														
0630						Fill Heater with Water at Daralingie Satellite									
						Rig Up all Gas Testing Equipment									
1416		15617	0	33.5		Pressure Test Lines									
1450	0	15603	0	31	16/64	Open Well to 16/64" Choke bypass Seperator									
1600	1.10	11418	0	28	16/64	Change Choke to 20/64"									
1640	1.50					Well Slugging Liquid									
1700	2.10	8557	0	30	20/64										
1800	3.10	8557	0	30	20/64	Turn Flow Through Seperator and Trim.									
1900	4.10	8584	0	31	20/64		1.75	270	69	64	69.4	18.72	0	18.72	0.27
2000	5.10	8632	0	32	20/64		1.75	270	70	72	69.2	25.44	0.24	25.68	0.37
2200	7.10	8674	0	33.5	20/64		1.75	270	70	73	69.1	21.96	0.48	22.44	0.32



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OilServ	PERFORATIONS: 6628' - 6668 KB'	PAGE: 2 OF 13
WELL NAME: Kujani #1	FORMATION: Patchawarra	DATE: 15-4-91
TEST TYPE: Modified Isochronal		OPR: HIRST/WILSON

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				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	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE m ³ /10 ³ /DAY	OIL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	
15	4.91														
2400	9.10	8708	0	34	20/64		1.75	270	70	75	68.9	19.80	1.20	21.00	0.30
16	4.91														
0200	11.10	8784	0	35	20/64		1.75	270	68	77	67.8	22.80	1.20	24.00	0.35
0400	13.10	8784	0	36	20/64		1.75	275	66	77	67.4	20.28	1.20	21.48	0.32
0600	15.10	8798	0	36.5	20/64		1.75	275	67	77	67.9	21.24	0.96	22.20	0.33
0800	17.10	8826	0	38	20/64		1.75	275	68	79	68.3	23.28	1.20	24.48	0.36
1000	19.10	8888	0	40	20/64		1.75	275	71	81	69.6	22.86	0.66	23.52	0.34
1200	21.10	8908	0	42	20/64		1.75	275	73	84	70.3	18.90	1.26	20.16	0.29
1400	23.10	8936	0	43	20/64		1.75	275	73	88	70.0	20.22	1.02	21.24	0.30
1600	25.10	8970	0	43	20/64		1.75	275	73	88	70.0	20.46	0.66	21.12	0.30
1700	26.10	8964	0	42	20/64		1.75	275	73	88	70.0	14.40	1.68	16.08	0.23
1700					17/64		Change Choke to 17/64"				Commence Choke Determinations				
1800	27.10	10337	0	41	17/64		1.50	275	104	84	60.9	19.44	0.24	19.68	0.32
1800					21/64		Change Choke to 21/64"								
1900	28.10	8474	0	42	21/64		1.75	280	78	88	73.0	19.80	1.44	21.24	0.29
1900					25/64		Change Choke to 25/64"								
1920		6978	0	43	27/64		Change Choke to 27/64"								
2000	29.10	6212	0	43	27/64		2.00	285	64	98	87.9	21.24	3.12	24.36	0.28
2000					31/64		Change Choke to 31/64"								
2011		5378	0	43	32/64		Change Choke to 32/64"								
2100	30.10	4471	0	43.5	32/64		2.25	295	44	105	95.6	24.36	1.32	25.68	0.27
2100					42/64		Change Choke to 42/64"								



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OilServ	PERFORATIONS: 6628'-6668'KB	PAGE: 3 OF 13
WELL NAME: Kujani #1	FORMATION: Patchawarra	DATE: 16-4-91
TEST TYPE: Modified Isochronal		OPR: HIRST/WILSON

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				
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)	GAS FLOW RATE m³/10³DAY	OIL FLOW RATE m³/DAY	WATER FLOW RATE m³/DAY	TOTAL LIQUID FLOW RATE m³/DAY	L.G.R.
16	4.91														
2117		3179	0	44	43/64		Change Choke to		43/64"						
2125		3034	0	44	45/64		Change Choke to		45/64"						
2200	31.10	2861	0	44	45/64		2.75	120	44	104	100.5	16.68	2.28	18.96	0.19
2200	0	-	-	-	S.I.		Shot Well In								
2230	0.30	15472	0		S.I.										
2300	1.0	15755	0												
2330	1.30	15753	0												
2400	2.00	15790	0												
17	4.91														
0100	3.00	15803	0												
0200	4.00	15824	0												
0600	8.00	15803	0												
1000	12.0	15789	0												
1400	16.0	15776	0												
1800	20.0	15762	0												
2200	24.0	15741	0												
18	4.91														
0200	28.0	15734	0												
0600	32.0	15727	0												
0813	34.13	15727	0				Pressure Up Lubricator								
1013	36.13	15727	0				Run In Hole with Ameradas.								
1048	36.48	-	-				Hang @ 6750'KB								



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: <i>OilServ</i>	PERFORATIONS: <i>6628'-6668'KB</i>	PAGE: <i>4</i> OF <i>13</i>
WELL NAME: <i>Kujani #1</i>	FORMATION: <i>Patchawarra</i>	DATE: <i>18.4.91</i>
TEST TYPE: <i>Modified Isochronal</i>		OPR: <i>HIKST</i>

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESTS				L.G.R
DATE	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°F/°C)	CHOKESIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE m³10³/DAY	OIL FLOW RATE m³/DAY	WATER FLOW RATE m³/DAY	TOTAL LIQUID FLOW RATE m³/DAY	
TIME															
18	4-91														
1300		15727	0	36.5	1 7/64		Open	Well to 1 7/64"	Choke	Rate #1					
1330		13866	0	30.5	1 7/64		1.25	250	40	77	24.96				
1400		13824	0	30.5	1 7/64		1.25	255	49	100	27.17	5.52	0	5.52	0.20
							Rock Choke to Clear Obstruction								
1425		13728	0	31	S.I.		Shut	Well In to Remove	Blockage	11.23	0		11.23		
1500		15693	0				Change over whole Choke.								
1538		15706					Pressure Test Lines								
1540		15638	0				Pressure Test Lines								
1600		15583	0		S.I.										
1700		15679	0		S.I.										
1730	0	15679	0	26.5	1 7/64		Open	Well to 1 7/64"	Choke	Rate #1					
1800	0.30	10018	0	30	1 7/64		1.50	270	129	68	68.57				
1830	1.0	9591	0	31.5	1 7/64		1.50	270	126	70	66.53	27	0	27	0.39
1900	1.30	9563	0	32	1 7/64		1.50	270	122	70	66.53				
1930	2.00	9563	0	32.5	1 7/64		1.50	270	120	72	65.83	0	0	0	
2000	2.30	9625	0	33	1 7/64		1.50	270	118	73	65.14				
2030	3.00	9605	0	34	1 7/64		1.50	270	120	75.2	65.55	10.8	0	10.8	0.16
2100	3.30	9593	0	34	1 7/64		1.50	270	119	76	65.20				
2130	4.00	9605	0	34.5	1 7/64		1.50	270	118	77	64.85	7.68	0	7.68	0.12
2200	4.30	9591	0	34.5	1 7/64		1.50	270	118	77	64.85				
2230	5.00	9584	0	35	1 7/64		1.50	270	118	77	64.85	13.68	0	13.68	0.21
2300	5.30	9584	0	35.5	1 7/64		1.50	270	118	77	64.71				



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: <i>OilServ</i>	PERFORATIONS: <i>6628' - 6668' KB</i>	PAGE: <i>5</i> OF <i>13</i>
WELL NAME: <i>Kujani #1</i>	FORMATION: <i>Patchawarra</i>	DATE: <i>18-4-91</i>
TEST TYPE: <i>Modified Isochronal</i>		OPR: <i>HIRST</i>

TIME		WELLHEAD DATA					SEPARATOR DATA				TEST TOTALS				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	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE m ³ /10 ³ /DAY	OIL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	
<i>18-4-91</i>															
<i>2330</i>		<i>9534</i>	<i>0</i>	<i>35.5</i>	<i>1 7/64</i>		<i>1.50</i>	<i>270</i>	<i>118</i>	<i>79</i>	<i>64.71</i>	<i>6.48</i>	<i>0</i>	<i>6.48</i>	<i>0.10</i>
<i>2330</i>	<i>0</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>S.I</i>		<i>Shut</i>	<i>Well In for BuildUp</i>							
<i>2400</i>	<i>0.30</i>	<i>15631</i>	<i>0</i>												
<i>19-4-91</i>															
<i>0030</i>	<i>1.00</i>	<i>15796</i>	<i>0</i>												
<i>0100</i>	<i>1.30</i>	<i>15810</i>	<i>0</i>												
<i>0130</i>	<i>2.00</i>	<i>15810</i>	<i>0</i>												
<i>0200</i>	<i>2.30</i>	<i>15817</i>	<i>0</i>												
<i>0230</i>	<i>3.00</i>	<i>15817</i>	<i>0</i>												
<i>0300</i>	<i>3.30</i>	<i>15817</i>	<i>0</i>												
<i>0330</i>	<i>4.00</i>	<i>15817</i>	<i>0</i>												
<i>0400</i>	<i>4.30</i>	<i>15810</i>	<i>0</i>												
<i>0430</i>	<i>5.00</i>	<i>15810</i>	<i>0</i>												
<i>0500</i>	<i>5.30</i>	<i>15810</i>	<i>0</i>												
<i>0530</i>	<i>6.00</i>	<i>15803</i>	<i>0</i>	<i>10</i>	<i>2 1/64</i>		<i>Open</i>	<i>Well to 2 1/64" Choke</i>			<i>Rate #2</i>				
<i>0600</i>	<i>0.30</i>	<i>7991</i>	<i>0</i>	<i>32.5</i>	<i>2 1/64</i>		<i>2.00</i>	<i>275</i>	<i>48</i>	<i>79</i>	<i>76.35</i>				
<i>0630</i>	<i>1.00</i>	<i>7909</i>	<i>0</i>	<i>33.5</i>	<i>2 1/64</i>		<i>2.00</i>	<i>280</i>	<i>50</i>	<i>86</i>	<i>77.99</i>	<i>90.96</i>	<i>0</i>	<i>90.96</i>	<i>1.16</i>
<i>0700</i>	<i>1.30</i>	<i>7874</i>	<i>0</i>	<i>35</i>	<i>2 1/64</i>		<i>2.00</i>	<i>275</i>	<i>48</i>	<i>79</i>	<i>76.35</i>				
<i>0730</i>	<i>2.00</i>	<i>7874</i>	<i>0</i>	<i>36</i>	<i>2 1/64</i>		<i>2.00</i>	<i>275</i>	<i>48</i>	<i>79</i>	<i>76.35</i>	<i>12.00</i>	<i>0</i>	<i>12.00</i>	<i>0.16</i>
<i>0800</i>	<i>2.30</i>	<i>7858</i>	<i>0</i>	<i>36.5</i>	<i>2 1/64</i>		<i>2.00</i>	<i>275</i>	<i>48</i>	<i>79</i>	<i>76.35</i>				
<i>0830</i>	<i>3.00</i>	<i>7851</i>	<i>0</i>	<i>37</i>	<i>2 1/64</i>		<i>2.00</i>	<i>275</i>	<i>48</i>	<i>79</i>	<i>76.35</i>	<i>12.00</i>	<i>0</i>	<i>12.00</i>	<i>0.16</i>
<i>0900</i>	<i>3.30</i>	<i>7709</i>	<i>0</i>	<i>37.5</i>	<i>2 1/64</i>		<i>2.00</i>	<i>275</i>	<i>48</i>	<i>79</i>	<i>76.35</i>				



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OilServ	PERFORATIONS: 6628'-6668' KB	PAGE: 6 OF 13
WELL NAME: Kujani #1	FORMATION: Patchawarra	DATE: 19.4.91
TEST TYPE: Modified Isochronal		OPR: HIRST

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				
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)	GAS FLOW RATE m ³ /10 ³ /DAY	OIL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	L.G.R.
19.4.91															
0930	4.00	7909	0	39	2 1/64		2.00	270	50	81	77.034	10.8	0	10.8	0.14
1000	4.30	7915	0	39.5	2 1/64		2.00	270	50	81	77.034				
1030	5.00	7922	0	40.5	2 1/64		2.00	270	50	82	76.871	11.3	0	11.3	0.15
1100	5.30	7922	0	41	2 1/64		2.00	270	51	84	77.474				
1130	6.00	7929	0	41.5	2 1/64		2.00	270	52	84	78.231	11.52	0	11.52	0.15
1130	0				S.I.		Shut	Well	In	for	BuildUp				
1200		15520	0												
1230	1.00	15776	0												
1300		15796	0												
1330	2.00	15803	0												
1400		15810	0												
1430	3.00	15817	0												
1500		15817	0												
1530	4.00	15817	0												
1600		15817	0												
1630	5.00	15817	0												
1700		15810	0												
1730	6.00	15803	0	26.5	2 7/64		Open	Well	to	2 7/64" Choke	Rate #3				
1800	0.30	5950	0	35	2 7/64		2.25	250	44	86	89.78				
1830	1.00	5874	0	36.5	2 7/64		2.25	255	43	84	89.83	28.32	1.44	29.76	0.33
1900	1.30	5868	0	37	2 7/64		2.25	255	43	84	89.83				
1930	2.00	5868	0	38	2 7/64		2.25	255	42	84	88.78	26.40	1.20	27.60	0.31



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: <i>OilServ</i>	PERFORATIONS: <i>6628' - 6668' KB</i>	PAGE: <i>7</i> OF <i>13</i>
WELL NAME: <i>Kujani #1</i>	FORMATION: <i>Patchawarra</i>	DATE: <i>19-4-91</i>
TEST TYPE: <i>Modified Isochronal</i>		OPR: <i>HIRST</i>

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				L.G.R.
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)	GAS FLOW RATE m ³ /DAY	QAL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	
<i>19-4-91</i>															
<i>2000</i>	<i>2.30</i>	<i>5861</i>	<i>0</i>	<i>37.5</i>	<i>27/64</i>		<i>2.25</i>	<i>255</i>	<i>42</i>	<i>86</i>	<i>88.60</i>				
<i>2030</i>	<i>3.00</i>	<i>5861</i>	<i>0</i>	<i>39.5</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>86</i>	<i>87.31</i>	<i>25.56</i>	<i>1.20</i>	<i>26.76</i>	<i>0.31</i>
<i>2100</i>	<i>3.30</i>	<i>5861</i>	<i>0</i>	<i>40</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>88</i>	<i>87.13</i>				
<i>2130</i>	<i>4.00</i>	<i>5868</i>	<i>0</i>	<i>40</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>88</i>	<i>87.13</i>	<i>25.56</i>	<i>0.24</i>	<i>25.80</i>	<i>0.30</i>
<i>2200</i>	<i>4.30</i>	<i>5888</i>	<i>0</i>	<i>40.5</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>89</i>	<i>87.05</i>				
<i>2230</i>	<i>5.00</i>	<i>5888</i>	<i>0</i>	<i>41.5</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>90</i>	<i>86.95</i>	<i>23.76</i>	<i>1.44</i>	<i>25.20</i>	<i>0.29</i>
<i>2300</i>	<i>5.30</i>	<i>5888</i>	<i>0</i>	<i>41.5</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>91</i>	<i>86.78</i>				
<i>2330</i>	<i>6.00</i>	<i>5888</i>	<i>0</i>	<i>42</i>	<i>27/64</i>		<i>2.25</i>	<i>260</i>	<i>40</i>	<i>91</i>	<i>86.78</i>	<i>21.12</i>	<i>1.20</i>	<i>22.32</i>	<i>0.26</i>
<i>2330</i>	<i>-</i>	<i>-</i>	<i>-</i>		<i>S.I.</i>		<i>Shut Well In for BuildUp</i>								
<i>2400</i>	<i>0.30</i>	<i>15445</i>	<i>0</i>												
<i>20-4-91</i>															
<i>0030</i>	<i>1.00</i>	<i>15714</i>	<i>0</i>												
<i>0100</i>		<i>15741</i>	<i>0</i>												
<i>0130</i>	<i>2.00</i>	<i>15748</i>	<i>0</i>												
<i>0200</i>		<i>15769</i>	<i>0</i>												
<i>0230</i>	<i>3.00</i>	<i>15776</i>	<i>0</i>												
<i>0300</i>		<i>15783</i>	<i>0</i>												
<i>0330</i>	<i>4.00</i>	<i>15783</i>	<i>0</i>												
<i>0400</i>		<i>15790</i>	<i>0</i>												
<i>0430</i>	<i>5.00</i>	<i>15790</i>	<i>0</i>												
<i>0500</i>		<i>15790</i>	<i>0</i>												
<i>0530</i>	<i>6.00</i>	<i>15783</i>	<i>0</i>												



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: <i>Oi/Serv</i>	PERFORATIONS: <i>6628'-6668'KB</i>	PAGE: <i>8</i> OF <i>13</i>
WELL NAME: <i>Kujani #1</i>	FORMATION: <i>Patchawarra</i>	DATE: <i>20-4-91</i>
TEST TYPE: <i>Modified Isochronal</i>		OPR: <i>HIRST</i>

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				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	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE m ³ /10 ³ /DAY	OIL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	
<i>20-4-91</i>															
<i>0600</i>	<i>0.30</i>	<i>2820</i>	<i>0</i>	<i>35.5</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>40</i>	<i>90</i>	<i>100.88</i>				
<i>0630</i>	<i>1.00</i>	<i>2820</i>	<i>0</i>	<i>36.5</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>38</i>	<i>86</i>	<i>98.68</i>	<i>28.56</i>	<i>2.64</i>	<i>31.20</i>	<i>0.32</i>
<i>0700</i>	<i>1.80</i>	<i>2820</i>	<i>0</i>	<i>38.5</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>38</i>	<i>86</i>	<i>98.68</i>				
<i>0730</i>	<i>2.00</i>	<i>2820</i>	<i>0</i>	<i>39.5</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>38</i>	<i>86</i>	<i>98.68</i>	<i>25.56</i>	<i>1.44</i>	<i>27.0</i>	<i>0.27</i>
<i>0800</i>	<i>2.30</i>	<i>2820</i>	<i>0</i>	<i>40</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>38</i>	<i>88</i>	<i>98.50</i>				
<i>0830</i>	<i>3.00</i>	<i>2820</i>	<i>0</i>	<i>40</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>38</i>	<i>90</i>	<i>98.32</i>	<i>25.32</i>	<i>1.20</i>	<i>26.52</i>	<i>0.27</i>
<i>0900</i>	<i>3.30</i>	<i>2820</i>	<i>0</i>	<i>41</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>39</i>	<i>91</i>	<i>99.42</i>				
<i>0930</i>	<i>4.00</i>	<i>2826</i>	<i>0</i>	<i>42</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>40</i>	<i>93</i>	<i>100.51</i>	<i>22.56</i>	<i>1.32</i>	<i>23.88</i>	<i>0.24</i>
<i>1000</i>	<i>4.30</i>	<i>2827</i>	<i>0</i>	<i>43</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>40</i>	<i>93</i>	<i>100.51</i>				
<i>1030</i>	<i>5.00</i>	<i>2834</i>	<i>0</i>	<i>43</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>40</i>	<i>95</i>	<i>100.33</i>	<i>21.48</i>	<i>0.60</i>	<i>22.08</i>	<i>0.22</i>
<i>1100</i>	<i>5.30</i>	<i>2834</i>	<i>0</i>	<i>44.5</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>41</i>	<i>96</i>	<i>101.49</i>				
<i>1130</i>	<i>6.00</i>	<i>2827</i>	<i>0</i>	<i>48</i>	<i>45/64</i>		<i>2.75</i>	<i>130</i>	<i>41</i>	<i>97</i>	<i>101.39</i>	<i>19.32</i>	<i>1.20</i>	<i>20.52</i>	<i>0.20</i>
<i>1130</i>	<i>0</i>						<i>Reduce Choke to 37/64"</i>				<i>for Extended Flow Rate</i>				
<i>1230</i>	<i>1.00</i>	<i>4737</i>	<i>0</i>	<i>47</i>	<i>37/64</i>		<i>2.25</i>	<i>250</i>	<i>52</i>	<i>97</i>	<i>96.44</i>	<i>25.32</i>	<i>0.48</i>	<i>25.80</i>	<i>0.27</i>
<i>1330</i>	<i>2.00</i>	<i>4737</i>	<i>0</i>	<i>47.5</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>51</i>	<i>99</i>	<i>96.27</i>	<i>25.20</i>	<i>0.60</i>	<i>25.80</i>	<i>0.27</i>
<i>1430</i>	<i>3.00</i>	<i>4737</i>	<i>0</i>	<i>48</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>51</i>	<i>100</i>	<i>96.08</i>	<i>24.00</i>	<i>0.60</i>	<i>24.60</i>	<i>0.26</i>
<i>1530</i>	<i>4.00</i>	<i>4723</i>	<i>0</i>	<i>48.5</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>51</i>	<i>100</i>	<i>96.08</i>	<i>22.80</i>	<i>1.80</i>	<i>24.60</i>	<i>0.26</i>
<i>1630</i>	<i>5.00</i>	<i>4730</i>	<i>0</i>	<i>48.5</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>50</i>	<i>101</i>	<i>95.04</i>	<i>23.40</i>	<i>1.80</i>	<i>25.20</i>	<i>0.26</i>
<i>1730</i>	<i>6.00</i>	<i>4723</i>	<i>0</i>	<i>48</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>50</i>	<i>101</i>	<i>95.04</i>	<i>21.48</i>	<i>0.60</i>	<i>22.08</i>	<i>0.23</i>
<i>1830</i>	<i>7.00</i>	<i>4737</i>	<i>0</i>	<i>48</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>50</i>	<i>100</i>	<i>95.13</i>	<i>21.84</i>	<i>1.20</i>	<i>23.04</i>	<i>0.24</i>
<i>1930</i>	<i>8.00</i>	<i>4744</i>	<i>0</i>	<i>48</i>	<i>37/64</i>		<i>2.25</i>	<i>260</i>	<i>49</i>	<i>100</i>	<i>95.10</i>	<i>26.04</i>	<i>0.84</i>	<i>26.88</i>	<i>0.28</i>
<i>2030</i>	<i>9.00</i>	<i>4744</i>	<i>0</i>	<i>48</i>	<i>37/64</i>		<i>2.25</i>	<i>255</i>	<i>50</i>	<i>99</i>	<i>95.32</i>	<i>23.76</i>	<i>0.72</i>	<i>24.48</i>	<i>0.26</i>



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: <i>Oil Serv</i>	PERFORATIONS: <i>6628' - 6668' KB</i>	PAGE: <i>9</i> OF <i>13</i>
WELL NAME: <i>Kujani #1</i>	FORMATION: <i>Patchawarra</i>	DATE: <i>20.4.91</i>
TEST TYPE: <i>Modified Isochronal</i>		OPR: <i>HIRST</i>

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				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	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE m ³ /10 ³ /DAY	OIL FLOW RATE m ³ /DAY	WATER FLOW RATE m ³ /DAY	TOTAL LIQUID FLOW RATE m ³ /DAY	
2130	10.00	4744	0	48.5	32/64		2.25	255	50	100	95.22	23.28	0.96	24.24	0.25
2230	11.00	4744	0	49	32/64		2.25	260	49	100	95.20	26.16	1.20	27.36	0.29
2330	12.00	4737	0	49.5	32/64		2.25	260	47	100	93.14	19.20	0.96	20.16	0.22
21.4.91															
0030	13.00	4744	0	49	32/64		2.25	260	46	100	92.14	29.76	0.96	30.72	0.33
0130	14.00	4737	0	48.5	32/64		2.25	260	48	100	94.22	24.12	0.84	24.96	0.26
0230	15.00	4737	0	49	32/64		2.25	260	46	100	92.23	23.28	0.48	23.76	0.26
0330	16.00	4723	0	49	32/64		2.25	260	46	100	92.23	25.80	0.84	26.64	0.29
0430	17.00	4723	0	49.5	32/64		2.25	265	46	100	93.04	22.80	0.96	23.76	0.26
0530	18.00	4737	0	50	32/64		2.25	265	45	101	91.93	21.84	1.20	23.04	0.25
* 0630	19.00	4716	0	49	32/64		2.25	260	46	100	92.14	26.40	0.96	27.36	0.29
* 07:30	20.00	4729	0	50	32/64		2.25	260	46	102	91.96	24.24	0.96	25.20	0.27
08:30	21.00	4736	0	51	32/64		2.25	255	48	102	93.03	23.28	0.72	24.00	0.26
09:30	22.00	4730	0	51	32/64		2.25	255	50	104	94.76	23.28	0.72	24.00	0.25
10:30	23.00	4687	0	53	32/64		2.25	250	52	105	95.59	20.88	0.72	21.60	0.23
11:30	24.00	4737	0	54	32/64		2.25	250	52	106	95.50	22.32	1.20	23.52	0.25
11:30	0	-	-	-	S.I.		Shot	Well	In	for	BuildUp				
1145	00.15	13549	0												
1200	00.30	15424	0												
1215	00.45	15700	0												
1230	01.00	15762	0												
1245	01.15	15790	0												



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OILSERV AUST.	PERFORATIONS: 6628' - 6668' KB	PAGE: 10 OF 13
WELL NAME: KUJANI #1.	FORMATION: PATCHAWARRA	DATE: 21.4.91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: HIRST

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				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	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	GAS FLOW RATE M ³ /DAY	OIL FLOW RATE M ³ /DAY	WATER FLOW RATE M ³ /DAY	TOTAL LIQUID FLOW RATE M ³ /DAY	
21/4/91															
1300	01.30	15796	0		S.I.										
1315	01.45	15803	0		"										
1330	02.00	15810	0		"										
1345	02.15	15817	0		"										
1400	02.30	15824	0		"										
1415	02.45	15824	0		"										
1430	03.00	15831	0		"										
1445	03.15	15838	0		"										
1500	03.30	15838	0		"										
1515	03.45	15838	0		"										
1530	04.00	15838	0		"										
1600	04.30	15838	0		"										
1800	06.30	15831	0		"										
2200	10.30	15810	0		"										
22/4/91															
0200	14.30	15796	0		"										
0600	18.30	15796	0		"										
1000	22.30	15783	0		"										
1400	26.30	15776	0		"										
1800	30.30	15769	0		"										
2200	34.30	15762	0		"										



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OILSERV Aust	PERFORATIONS: 6628' - 6668' KB	PAGE: 11 OF 13
WELL NAME: KUJANI #1	FORMATION: PATCHAWARRA	DATE: 23.4.91.
TEST TYPE: MODIFIED ISOCHRONAL		OPR: HIRST

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/CM)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/CM)
23.4.91.					S.I.									
0200	38.30	15755	0		"									
0600	42.30	15748	0		"									
1000	46.30	15755	0		"									
1400	50.30	15762	0		"									
1800	54.30	15748	0		"									
2200	58.30	15741	0		"									
24/4/91.														
0200	62.30	15734	0		"									
0600	66.30	15734	0		"									
1000	70.30	15748	0		"									
1400	74.30	15748	0		"									
1800	78.30	15748	0		"									
2200	82.30	15734	0		"									
25/4/91.														
0200	86.30	15734	0		"									
0600	90.30	15727	0		"									
1000	94.30	15748	0		"									
1130	96	15748	0		"	P.O.O.H WITH AMERADA'S, END OF BUILDUP								
1200		15769	0		"	IN LUB								
1400		15734	0			DEPRESSURE LUB								
1415						RIG OUT AMERADA'S								
1420						PREPARE AMERADA'S FOR STATIC GRADIENT								



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR: OILSERV AUST	PERFORATIONS: 6628' - 6668' K.B	PAGE: 12 OF 13
WELL NAME: KUTANI #1	FORMATION: PATCHAWARRA	DATE: 25/4/91
TEST TYPE: MODIFIED ISOCHRONAL		OPR: S. KUNAC

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				L.G.R
DATE TIME	FLOW OR SHUT-IN TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)	WELLHEAD TEMP (°C)	CHOKE SIZE	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP °C	GAS FLOW RATE M ³ /D	OIL FLOW RATE M ³ /D	WATER FLOW RATE M ³ /D	TOTAL LIQUID FLOW RATE M ³ /D	
25/4/91															
1540						FINISH PREPARING AMERADA'S									
1545						PRESSURE LUB									
1555		15734	0			R.I.H WITH AMERADA'S TO PERFORM STATIC GRADIENT									
1715						P.O.G.H WITH AMERADA'S									
1737						IN LUB									
1747		15734	0			DEPRESSURE LUB, RIG OUT AMERADA'S									
1813		15734	0			PRESSURE TEST LINES TO INLET OF SEPARATOR									
						AND FIRE UP HEATER FOR CONDITIONING FLOW									
1943	0	15734	0		17/64"	OPEN WELL TO 17/64" CHOKER TO START CONDITIONING FLOW									
2100	1.17	10163	0			TRIM FLOW INTO SEPARATOR									
2115						ENGAGE 1.50" O/P									
2200	2.17	10280	0	31.5	17/64"		1.50"	290	75	31	52.854	15.120	0.600	15.720	0.297
2400	4.17	10315	0	34	17/64"		1.50"	300	72	31	52.699	16.920	0.420	17.340	0.329
26/4/91															
0200	6.17	10329	0	35.5	17/64"		1.50"	300	72	35	52.257	18.960	0.720	19.680	0.377
0400	8.17	10349	0	36	17/64"		1.50"	305	71	36	52.228	22.320	0.360	22.680	0.434
0600	10.17	10363	0	36.5	17/64"		1.50"	310	70	36	52.296	11.160	0.240	11.400	0.218
0800	12.17	10370	0	38	17/64"		1.50"	305	70	32.5	52.241	17.280	0.840	18.120	0.347
1000	14.17	10391	0	40	17/64"		1.50"	300	71	33	52.109	18.000	0.480	18.480	0.355
1020						PREPARE AMERADA'S FOR FLOWING GRADIENT									
1106						PRESSURE UP LUB									
1116		10370	0	41	17/64"	R.I.H WITH AMERADA'S FOR FLOWING GRADIENT									



PETROLEUM ENGINEERING : FIELD READINGS

CONTRACTOR:	OILSERV AUST	PERFORATIONS:	6628'-6668' K.B	PAGE:	13 OF 13
WELL NAME:	KUTANI #1	FORMATION:	PATCHAWARRA	DATE:	26/4/91
TEST TYPE:	MODIFIED ISCHRONAL			OPR:	S.KUNAC

TIME		WELLHEAD DATA					SEPARATOR DATA				WELL TEST RESULTS				
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 °C	GAS FLOW RATE M ³ /D	OIL FLOW RATE M ³ /D	WATER FLOW RATE M ³ /D	TOTAL LIQUID FLOW RATE M ³ /D	L.G.R
26/4/91															
1200	16.17	10377	0	42	17/64"		1.50"	305	75	38	53.4616	16.800	0.480	17.280	0.323
1237						P.O.O.H WITH AMERADA'S									
1320						IN LUB									
1333		10432	0	42	17/64"	DEPRESSURE LUB, RIG OUT AMERADA'S									
1400	18.17	10432	0	42	17/64"		1.50"	315	71	39	53.7784	15.840	0.480	16.320	0.303
1600	20.17	10432	0	42	17/64"		1.50"	310	75	39	53.8018	15.120	0.480	15.600	0.290
1700	21.17	10405	0	41.5	17/64"		1.50"	310	75	39	53.8018	17.280	0.480	17.760	0.330
1700	21.17					COLLECT 1 ST SET OF SAMPLE GAS #73				CONDENSATE #PDE 156					
1800	22.17	10405	0	42	17/64"		1.50"	310	75	39	53.8018	16.560	0.480	17.040	0.317
1800	22.17					COLLECT 2 ND SET OF SAMPLE GAS #66				CONDENSATE #PDE 139					
1900	23.17	10377	0	41	17/64"		1.50"	315	74	39.5	53.8296	16.320	1.200	17.520	0.325
1900	23.17					COLLECT 3 RD SET OF SAMPLE GAS #67				CONDENSATE #PDE 167					
1900	23.17					COLLECT 2 x 500 cc H ₂ O SAMPLES									
		S.G. = 826		CO ₂ = 6%		H ₂ S = 0 PPM.		SALINITY = 1.6gms/100gms		A.P.I. = 62.2					
2100	25.17	10377	0	41.5	17/64"		1.50"	315	70	39	52.4044	15.480	0.600	16.080	0.307
2300	27.17	10377	0	41.5	17/64"		1.50"	320	68	40	51.9644	15.960	0.480	16.440	0.316
27/4/91															
0100	29.17	10398	0	42	17/64"		1.50"	320	70	40	52.7251	16.680	0.720	17.400	0.330
0100						SHOT WELL IN									
0100						END OF TEST.									

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A.C.N. 007 550 923

PETROLEUM DEVELOPMENT DEPARTMENT

KUJANI #1 MODIFIED ISOCHRONAL
16 - 26 April, 1991
SINGLE RATE TEST, OCTOBER 13, 1991

Report: RE:004/92
Author: M. Dianos
Date : March, 1992



1. INTRODUCTION
2. RESULTS
3. CONCLUSIONS/RECOMMENDATIONS
4. DISCUSSION

APPENDICES

- I MODIFIED ISOCHRONAL TEST, APRIL 1991
 - a) Rate Data, Simplified and LIT Analysis
 - b) Pressure Build-Up Analysis and Reservoir Parameters
 - c) Welltest Data
 - d) Static and Flowing Gradients
- II SINGLE RATE TEST AND BUILD-UP, OCTOBER 1991
 - a) Rate Data, Log Delta P vs. Log Delta t Plot
 - b) Pressure Build-up Analysis, Reservoir Parameters, Tp correction
 - c) Welltest Data
 - d) Static Pressure Gradient
- III COMPOSITIONAL DATA - PETROLAB RESERVOIR FLUID STUDY Ref: S - 91013

FIGURES

1. Modified Isochronal, Horner Plot
2. Modified Isochronal, Simplified Analysis
3. Modified Isochronal, LIT Analysis
4. Single Rate Test, Log Delta P vs. Log Delta t Plot
5. Single Rate Test, Horner Plot
6. Single Rate Test, Pressure Extrapolation
7. Single Rate Test, Log Delta P vs/ Log Delta t Plot

1. INTRODUCTION

Kujani #1 was drilled in April/May 1988, at the crestal position of both the Hutton Sandstone and the Patchawarra Formation. It was regarded as a dual oil/gas exploration well with the Hutton and Birkhead Formations as oil targets and the Epsilon and Patchawarra Formations as gas targets.

Two DST's were run in the Patchawarra Formation. Only DST #1 was successful, producing GTS in 5 minutes @ 735 psi from the 66-2 Patchawarra sand at a flowrate of 3.85 MMscf/d.

Kujani #1 was cased to 6948'KB and suspended as a Patchawarra gas/condensate well in May 1988 and completed with TCP's in March 1991 at 6628'-6668' KB using 4 x 3 3/8" shots per foot. The well was connected in June 1991 as a single Patchawarra gas/condensate producer.

The perforated intervals and associated sands are listed below :

Formation	Sand	Net Pay (ft)	Porosity (%)	Water Saturation (%)	Perforated Interval (ft KB)

Patchawarra	66-2	33	13.4	35.9	6628 - 6668

A Modified Isochronal was commenced on April 16, 1991 to determine well deliverability and reservoir parameters.

Separator fluid samples were collected during the extended flow, these were analysed by 'Petrolab' and recombined full well stream composition used to calculate fluid properties.

An apparent skin of 35 was interpreted from the modified isochronal test, compared with an apparent skin of 9.9 calculated from DST #1. A mini-fracture stimulation of Kujani #1 was then carried out in September, 1991 in order to reduce the wellbore skin damage sustained, most likely during well completion. The fracture stimulation was conducted using 12,600 lbs of 16/20 Carbolite Proppant.

A Single Rate test and Build-Up Survey were conducted on October 13, 1991 to determine the results of the fracture stimulation.

2. RESULTS

The results of the pre-fracture and post-fracture pressure surveys are compared versus the results of DST #1 as set out below :

Post-fracture SRT	Pre-fracture Mod-Iso	DST #1
October 13, 1991	April 16, 1991	May 1988

HORNER PLOT:

Permeability,md	9.1	8.5	4.9
Flow Capacity,md-ft	300.3	281.2	279.3
Apparent Skin	2	34.9	9.9
Extrapolated Pressure	2914 psia	2991 psia	3049 psia
	@ 6678' KB	@ 6738' KB	@ 6613' KB
Static Pressure	2882 psia	2992 psia	
	@ 6690' KB	@ 6600' KB	
Gas Flow Rate	7.65 MMscf/d	3.35 MMscf/d	3.85MMscf/d
@ FTHP	@ 1349 psia	@ 1754 psia	@ 735 psia
Condensate Flow	29.4	44.6	25.5 bbls/MMscf
Water Flow	1.2	1.9	18.2 bbls/MMscf

SIMPLIFIED ANALYSIS:

AOF, MMscf/d	3.87
C, E-08 MMscf/d/psia ²	5.4
n	1.13

LIT ANALYSIS:

AOF, MMscf/d	3.88
a, E+05 psia ² /cp/Mscf/d	1.48
b, psia ² /cp/Mscf ² /d ²	1.37
D, E-04 d/Mscf	3.741
True Skin	33.6

3. CONCLUSIONS/RECOMMENDATIONS

1. The damage removal mini-fracture was successful, with a reduction in apparent skin from 35 to 2.
2. The pre-fracture modified isochronal test and the post- fracture single rate tests showed a consistent flow capacity of approximately 290 md-ft.
3. The recombined full well stream composition is valid and has been adopted.

4. DISCUSSION

Method

a. Pre-fracture modified isochronal test

Testing began with the well being on 17/64" choke for the first flow period. The isochronal test sequence consisted of four flow and shut-in periods of six hours duration each, followed by an extended flow of 24 hours. Finally, the well was shut in for 96 hours. A static gradient survey was then run and the well brought on line for conditioning flow, a flowing gradient survey and PVT sampling.

b. Post-fracture single rate test

The well was opened on 100 % choke and flowed for 23 hours for a flow test. The well was then shut in for a build-up time of 96 hours. A static gradient survey was performed to complete the test programme.

Analysis

The pressure survey analyses were performed using the in-house ECL 'Weltest' Software Package, which provides the use of numerical simulation techniques and diagnostic plots.

For the particular case of the post-fracture single rate test, a log-log plot of ΔP vs. Δt (Figure 4) was obtained.

It was not possible to obtain fracture parameters, since the log-log plot shows very little data falling on the 1/4 slope line, indicating a very short bi-linear flow period and no visible linear flow regime.

This seems reasonable, since the fracture involved was only small, intended simply for damage removal.

Results

a. Pre-fracture modified isochronal test

The results indicate reasonable productivity with a flow capacity of 281 md-ft. The apparent skin of 34.9 is surprisingly high compared with that of 9.9 obtained from DST #1. This damage was most likely sustained during drilling and well completion operations.

The results of the Simplified Analysis compare well with those of the LIT analysis, the deliverability being 3.9 MMscf/d for both techniques. (figures 2 & 3)

b. Post-fracture single rate test

The observed decrease in apparent skin from 34.9 to 2 is very favourable. An increase in gas flowrate from 3.35 to 7.65 MMscf/d was observed.

Composition

The sample taken during the pre-fracture modified isochronal test was used to calculate fluid properties in both analyses. 'Petrolab' PVT studies indicated the dew point to be 2875 psig @ 230°F, indicating retrograde behaviour. The results are included in Appendix III.

A P P E N D I X I a.

RATE DATA, SIMPLIFIED LIT ANALYSIS

FIELD : KUJANI

WELL : #1

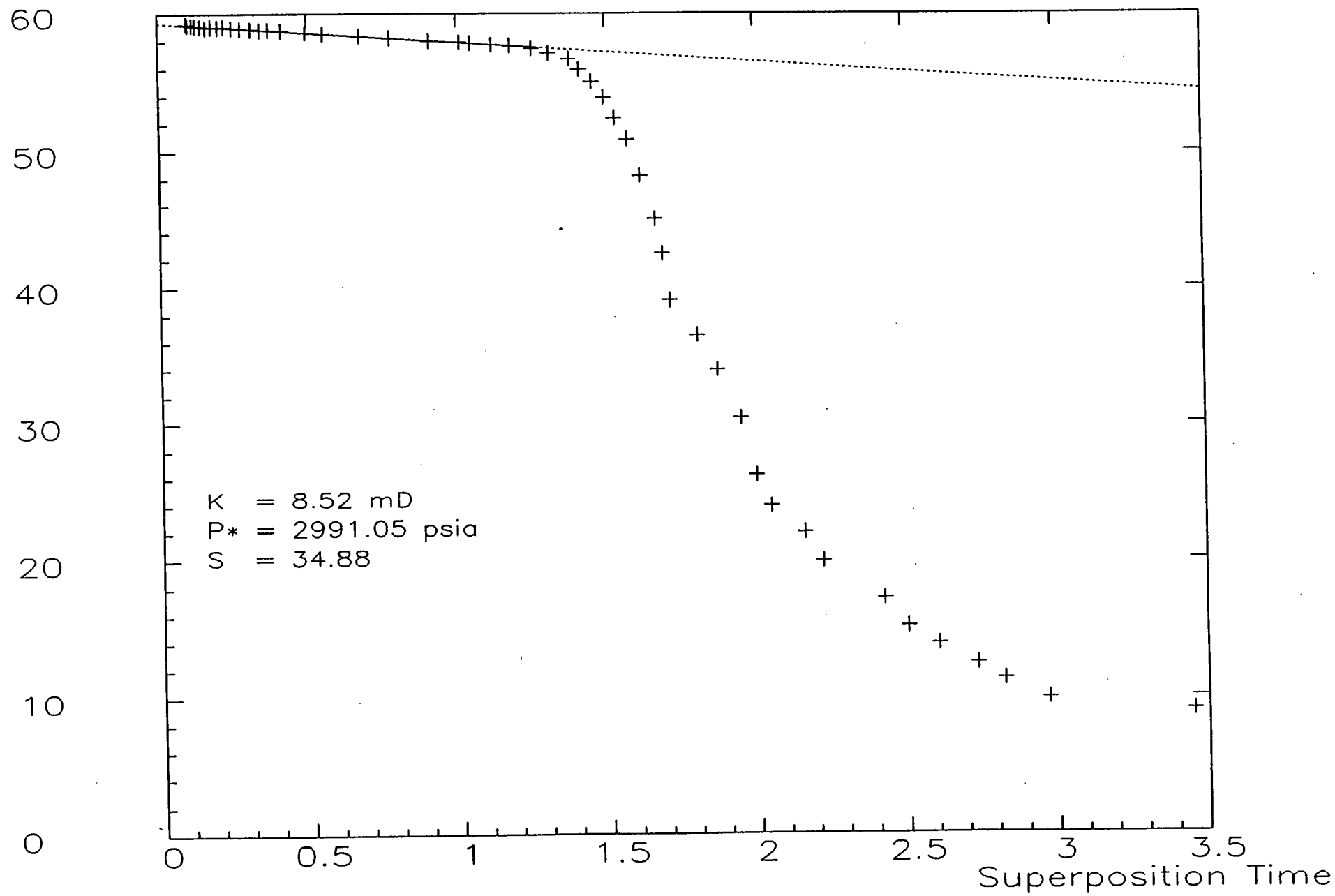
TEST NO. : 1 modified isochronal

DATE : 16-26 apr 1991

RATE DATA

Time	Rate
Hours	Mscf/day
0.0	3341.0
55.0	0.0
98.5	2252.0
104.5	0.0
110.5	2736.0
116.5	0.0
122.5	3039.0
128.5	0.0
134.5	3549.0
140.5	3341.0
164.5	0.0

P psi²/cp * 10⁷



SIMPLIFIED

AOF plot

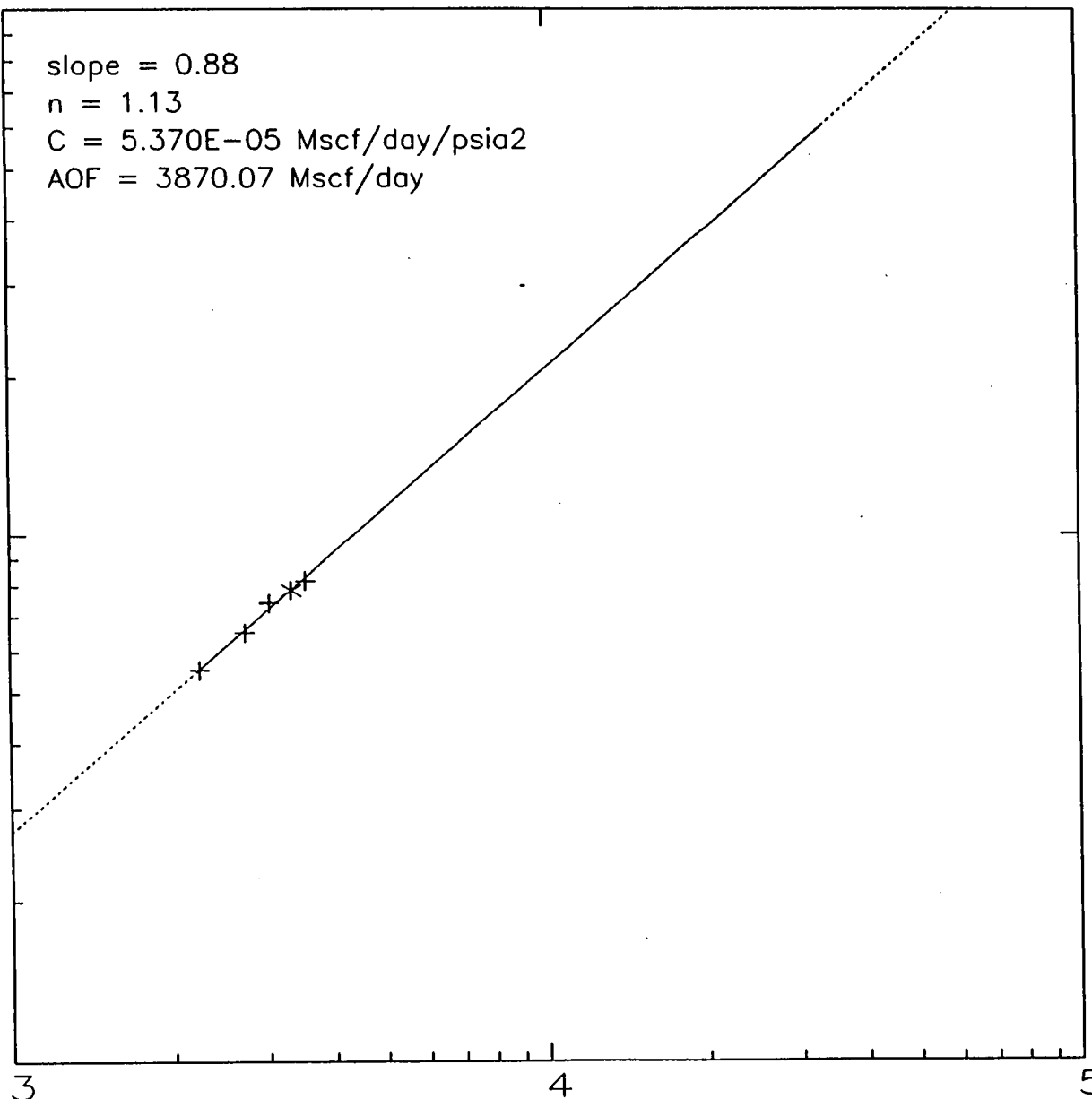
dP**2 10**

8

slope = 0.88
n = 1.13
C = 5.370E-05 Mscf/day/psia2
AOF = 3870.07 Mscf/day

7

6



00005

RATE 10**

LIT - PSEUDO PRESSURE AOF plot

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

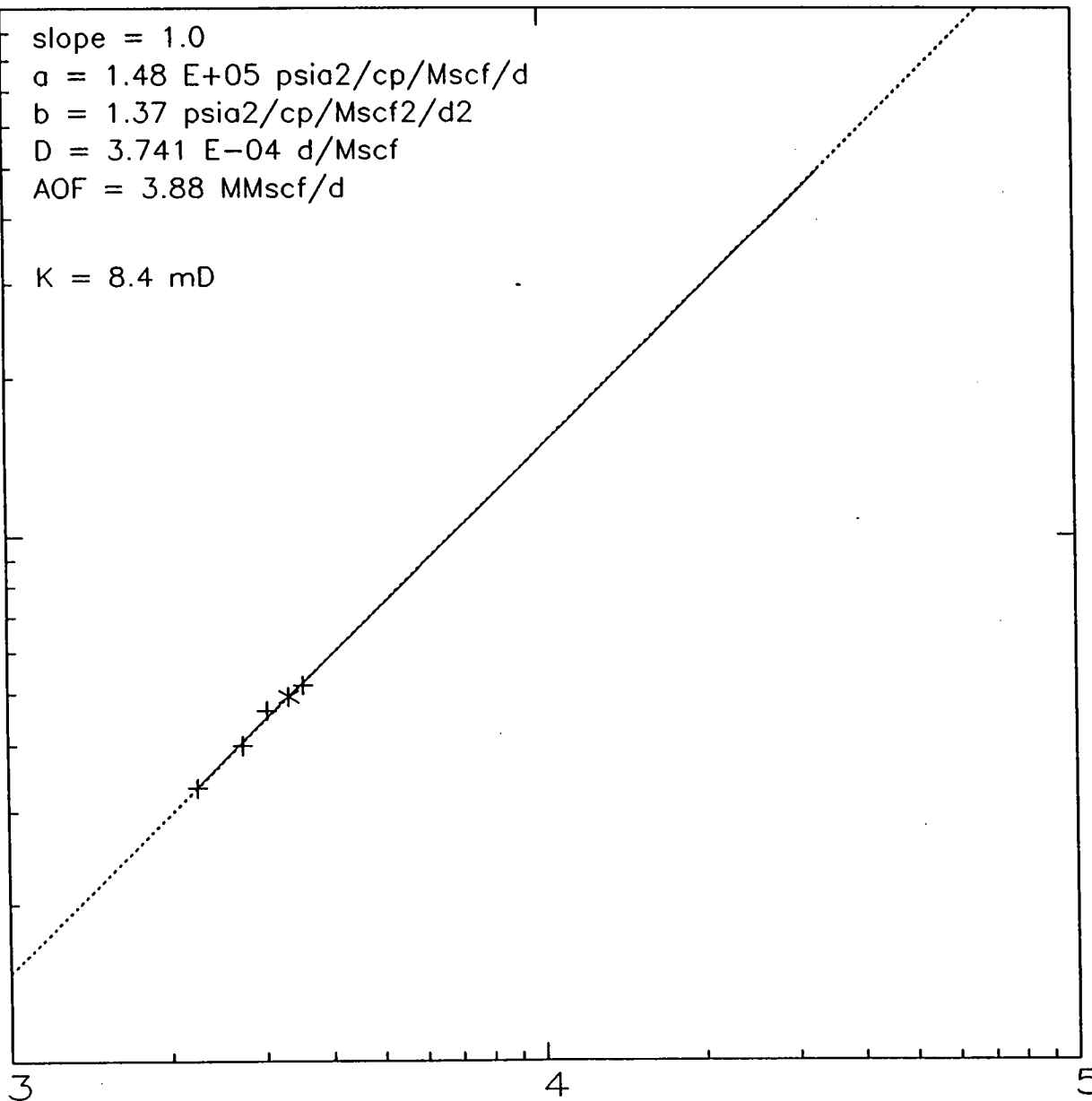
10

slope = 1.0
 $a = 1.48 \text{ E}+05 \text{ psia}^2/\text{cp}/\text{Mscf}/\text{d}$
 $b = 1.37 \text{ psia}^2/\text{cp}/\text{Mscf}^2/\text{d}^2$
 $D = 3.741 \text{ E}-04 \text{ d}/\text{Mscf}$
 $\text{AOF} = 3.88 \text{ MMscf}/\text{d}$

$K = 8.4 \text{ mD}$

9

8



RATE

10**

99000

A P P E N D I X I b.

PRESSURE BUILD-UP ANALYSIS AND RESERVOIR PARAMETERS

RUN TYPE : Analysis

00068

PHASE : GAS

NO. OF WELLS : 1

PVT DATA : Reservoir temperature = 256.0 deg F
Standard temperature = 60.0 deg F
Standard pressure = 14.7 psia
Gas gravity = 0.943

Gas Composition :

<u>Component</u>	<u>Mole Fraction xi</u>	<u>Molar Mass g/mol</u>	<u>Critical Temperature</u>	<u>Critical Pressure</u>
N2	0.0221000	28.013000	-232.3840	492.97000
CO2	0.0507000	44.010000	87.926000	1070.9500
H2S	0.0000000	34.076000	212.72000	1305.9400
He	0.0000000	4.0030000	-450.1300	33.210000
CH4	0.6656000	16.042000	-116.6080	667.76000
C2H6	0.1033000	30.070000	90.104000	707.76000
C3H8	0.0633000	44.097000	206.02400	616.26000
iC4H10	0.0124000	58.124000	275.00000	529.07000
nC4H10	0.0228000	58.124000	305.67200	550.66000
iC5H12	0.0078000	72.151000	369.12200	490.37000
nC5H12	0.0084000	72.151000	385.71800	488.58000
C6H14	0.0110000	86.178000	453.72200	436.87000
C7H16+	0.0326000	114.23200	564.24200	360.57000

Calculations to use PSEUDO time

WELL DATA : Well radius = 0.354 feet
Formation thickness = 33.0 feet
Porosity = 0.134
Rock compressibility = 4.500E-06 1/psi
Water saturation = 0.359
Water compressibility = 3.500E-06 1/psi

PRESSURE DATA

00069

Time	Pressure	Time	Pressure
Hours	psia	Hours	psia
0.0	2991.0	165.461	2823.29
55.0	1045.0	165.534	2860.04
98.5	2991.95	165.614	2888.11
104.5	1847.85	165.686	2911.45
110.5	2987.25	165.856	2924.27
116.5	1549.15	166.013	2934.46
122.5	2982.75	166.258	2940.96
128.5	1213.05	166.509	2943.0
134.5	2980.95	166.856	2946.6
140.5	828.05	167.056	2948.91
164.5	1044.94	167.764	2951.38
164.517	1074.84	169.059	2958.17
164.552	1130.23	170.506	2962.31
164.571	1209.92	173.181	2967.74
164.586	1270.52	175.026	2970.48
164.613	1344.16	178.699	2974.9
164.64	1407.88	181.318	2976.42
164.664	1504.33	183.47	2975.94
164.749	1623.58	186.302	2977.93
164.781	1711.14	190.258	2978.62
164.852	1791.05	194.368	2980.86
164.888	1879.3	199.552	2983.11
164.927	2037.99	204.11	2982.1
164.992	2165.91	210.591	2983.01
165.055	2254.26	217.372	2981.51
165.158	2341.93	225.009	2984.0
165.187	2456.23	235.585	2985.06
165.215	2538.78	243.95	2986.6
165.279	2644.11	256.504	2986.96
165.338	2728.13	260.5	2989.21
165.404	2777.31		

A P P E N D I X I C .

WELL TEST DATA

DATE: 16 - 26 / 4 / 91 FORMATION: Patchawarra
PRODUCING THROUGH: Tubing
GRADE: J55 LT#C
GRADE: J55 AB1J3SS

INITIAL SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing kPa	Casing kPa	Temp. °C	
16/4/91	2200	0	2861	0	44	
						Shut well in
18/4/91	1300	39	15727	0	36.5	Opened well on rate #1
	1425		13728	0	31	S.W.I. to remove choke blockage
	1730		15679	0	26.5	Opened well on rate #1

Run No.: 1 Duration of Run: 6 Hours.
Flow Well On: 17/64" Choke.

Orifice Size: 1.500 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 kPa	Casing kPa	Temp. °C	Pf kPa	Hw kPa	Temp. °F		
18/4/91	1730	0	15679	0	26.5	270	129	68		
	1800	0.5	10018	0	30	270	129	68		
	1830	1	9591	0	31.5	270	126	70	27.000	NIL
	1900	1.5	9563	0	32	270	122	70		
	1930	2	9563	0	32.5	270	120	72	NIL	NIL
	2000	2.5	9625	0	33	270	118	73		
	2030	3	9605	0	34	270	120	75.2	10.800	NIL
	2100	3.5	9598	0	34	270	119	76		
	2130	4	9605	0	34.5	270	118	77	7.680	NIL
	2200	4.5	9591	0	34.5	270	118	77		
	2230	5	9584	0	35	270	118	77	13.680	NIL
	2300	5.5	9584	0	35.5	270	118	79		
	2330	6	9584	0	35.5	270	118	79	6.480	NIL

00071

SANTOS LTD.
WELL TEST SUMMARY

Page 2.

2nd SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
18/4/91	2330	0	9584	0	35.5	Shut well in
19/4/91	0030	1	15796	0		
	0130	2	15810	0		
	0230	3	15817	0		
	0330	4	15817	0		
	0430	5	15810	0		
	0530	6	15803	0		Opened well on rate #2

Flow Period

Run No.: 2 Duration of Run: 6 Hours.
Flow Well On: 21/64"choke.

Orifice Size: 2.000 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 psig	kPa w.g.	°C °F		
19/4/91	0530	0	15803	0	10					
	0600	0.5	7991	0	32.5	275	48	79		
	0630	1	7909	0	33.5	280	50	86	90.960	NIL
	0700	1.5	7874	0	35	275	48	79		
	0730	2	7874	0	36	275	48	79	12.000	NIL
	0800	2.5	7888	0	36.5	275	48	79		
	0830	3	7881	0	37	275	48	79	12.000	NIL
	0900	3.5	7909	0	37.5	275	48	79		
	0930	4	7909	0	39	270	50	81	10.800	NIL
	1000	4.5	7915	0	39.5	270	50	81		
	1030	5	7922	0	40.5	270	50	82	11.280	NIL
	1100	5.5	7922	0	41	270	51	84		
	1130	6	7929	0	41.5	270	52	84	11.520	NIL

00072

WELL TEST SUMMARY

3RD SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
19/4/91	1130	0	7929	0	41.5	Shut well in
	1230	1	15776	0		
	1330	2	15803	0		
	1430	3	15817	0		
	1530	4	15817	0		
	1630	5	15817	0		
	1730	6	15803	0		Opened well on rate # 3

Flow Period

Run No.: 3 Duration of Run: 6 Hours.
Flow Well On: 27/64" Choke.

Orifice Size: 2.250 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	Iiw	Temp.		
			kPa	kPa	°C	kPa psig	kPa w.g.	°F		
19/4/91	1730	0	15803	0	26.5					
	1800	0.5	5950	0	35	250	44	86		
	1830	1	5874	0	36.5	255	43	84	28.320	1.440
	1900	1.5	5868	0	37	255	43	84		
	1930	2	5868	0	38	255	42	84	26.400	1.200
	2000	2.5	5861	0	37.5	255	42	86		
	2030	3	5861	0	39.5	260	40	86	25.560	1.200
	2100	3.5	5861	0	40	260	40	88		
	2130	4	5868	0	40	260	40	88	25.560	0.240
	2200	4.5	5888	0	40.5	260	40	89		
	2230	5	5888	0	41.5	260	40	90	23.760	1.440
	2300	5.5	5888	0	41.5	260	40	91		
	2330	6	5888	0	42	260	40	91	21.120	1.200

WP 2548G

00073

4TH SHUT IN PERIOD

Time of Observations			Observed Pressures			REMARKS
Date	Time	Shut In Time (Hours)	Tubing	Casing	Temp.	
			kPa	kPa	°C	
19/4/91	2330	0	5888	0	42	Shut well in
20/4/91	0030	1	15714	0		
	0130	2	15748	0		
	0230	3	15776	0		
	0330	4	15783	0		
	0430	5	15790	0		Opened well on rate # 4
	0530	6	15783	0		

Flow Period

Run No.: 4 Duration of Run: 6 Hours.
Flow Well On: 45/64" Choke.

Orifice Size: 2.750 ins
Meter Run: 3.826 ins

Date	Time	Flow Time (Hours)	Wellhead Readings			Meter or Prover Data			Condensate Production	Water Production
			Tubing	Casing	Temp.	Pf	Hw	Temp.		
			kPa	kPa	°C	kPa psig	kPa w.g	°C °F	m ³ /d	m ³ /d
20/4/91	0530	0	15783	0						
	0600	0.5	2820	0	35.5	130	40	90		
	0630	1	2820	0	36.5	130	38	86	28.560	2.640
	0700	1.5	2820	0	38.5	130	38	86		
	0730	2	2820	0	39.5	130	38	86	25.560	1.440
	0800	2.5	2820	0	40	130	38	88		
	0830	3	2820	0	40	130	38	90	25.320	1.200
	0900	3.5	2820	0	41	130	39	91		
	0930	4	2826	0	42	130	40	93	22.560	1.320
	1000	4.5	2827	0	43	130	40	93		
	1030	5	2834	0	43	130	40	95	21.480	0.600
	1100	5.5	2834	0	44.5	130	41	96		
	1130	6	2827	0	45	130	41	97	19.320	1.200

✓

Orifice Size: 2.250 ins
Meter Run: 3.826 ins

000075

WELL TEST SUMMARY
FINAL BUILD-UP PERIOD

Date	Time	Shut in Period (Hours)	Tubing Pressure kPa	Casing Pressure kPa	Wellhead Temp. °C	REMARKS
21/4/91	1130	0	4737	0	54	Shut well in
	1145	0.25	13549	0		
	1200	0.5	15424	0		
	1215	0.75	15700	0		
	1230	1	15762	0		
	1245	1.25	15790	0		
	1300	1.5	15796	0		
	1315	1.75	15803	0		
	1330	2	15810			
	1345	2.25	15817			
	1400	2.5	15824			
	1415	2.75	15824			
	1430	3	15831			
	1445	3.25	15838			
	1500	3.5	15838			
	1515	3.75	15838			
	1530	4	15838			
	1600	4.5	15838			
	1800	6.5	15831			
	2200	10.5	15810			
22/4/91	0200	14.5	15796			
	0600	18.5	15796			
	1000	22.5	15783			
	1400	26.5	15776			
	1800	30.5	15769			
	2200	34.5	15762			
23/4/91	0200	38.5	15755			
	0600	42.5	15748			
	1000	46.5	15755			
	1400	50.5	15762			
	1800	54.5	15748			
	2200	58.5	15741			
24/4/91	0200	62.5	15734			
	0600	66.5	15734			
	1000	70.5	15742			
	1400	74.5	15748			
	1800	78.5	15748			
	2200	82.5	15734			
25/4/91	0200	86.5	15734			
	0600	90.5	15727			
	1000	94.5	15748			
	1130	96	15748			P.O.O.H.

00076

WP 2548G

00077

CONDITIONING FLOW FOR PVT SAMPLING

Run No.: 6 Duration of Run: Hours.
Flow Well On: 17/64" Choke.

Orifice Size: 1.500 ins
Meter Run: 3.826 ins

[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	29.37	118	1862	270	38.100	1.500	26.1	79
2	12.94	52	1862	270	50.800	2.000	28.9	84
3	9.96	40	1793	260	57.150	2.250	32.8	91
4	10.21	41	896	130	69.850	2.750	36.1	97
5 EXT	12.94	52	1724	250	57.150	2.250	41.1	106

Conditioning	17.42	70	2206	320	38.100	1.500	40	104
Flow-sampling (PVT)	✓	✓	✓	✓	✓	✓	✓	✓

Separator Gas Properties

Specific Gravity = 0.838 ✓
 TC = 423.59 °R ✓
 PC = 671.46 psia ✓
 CO2 CONTENT = 4.08 mole % ✓

Meter Run = 3.826"

GAS RATES THROUGH SEPARATOR

Run No.	Q	
	E3 m ³ /d	mmscf/d
1	63.441	2.252
2	77.079	2.736
3	85.624	3.039
4	99.989	3.549
5 EXT	94.142	3.341

Conditioning	51.954	1.844
Flow-sampling (PVT)	✓	✓

00080

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

WELL NAME: Kujani # 1DATE: 16 - 26 / 4 / 1991ELEMENT NO: 53563 (TOP)DEPTH TESTED: 6738' KBDWT IN: 2281 PSIOUT: 2282 PSILUB IN: 2263 PSIOUT: 2262 PSI

SIMPLIFIED ANALYSIS

	Duration (hours)	Sandface Pressure (psia)	Bottom Hole Temp. (°F)	Meas.	Δp_6^2 (x10 ⁶ psia ²)	Flow Rate E 3m ³ /d	H/Carbon Prod. m ³ /d	Water Prod. m ³ /d	REMARKS
Initial Shut In	39	2991.95	256.6	✓	—	—	—	—	$q = C(\bar{p}_R^2 - p_{wf}^2)^n$ slope n = _____ $\bar{p}_R =$ _____ psia $C = \frac{1q}{(\bar{p}_R^2 - p_{wf}^2)^n}$ = _____ AOF (MMscfd) = _____
Flow 1	6	1847.85	255.7	✓	5.537		10.940	NIL	
Shut In	6	2987.25	255.6	✓	—	—	—	—	
Flow 2	6	1549.15	255.0	✓	6.524		24.760	NIL	
Shut In	6	2982.75	255.2	✓	—	—	—	—	
Flow 3	6	1213.05	254.7	✓	7.425		25.120	1.120	
Shut In	6	2980.95	255.1	✓	—	—	—	—	
Flow 4	6	828.05	254.8	✓	8.200		23.800	1.400	
Extended Flow	24	1044.95	254.8	✓	7.844		23.770	0.930	
Final Shut In	96	2989.25	255.8	✓	—	—	—	—	

WP 2548G

Conditioning Flow - PVT	29.28	Not	Re	cord	ed		16.654	0.549	
----------------------------	-------	-----	----	------	----	--	--------	-------	--

Sampling.

✓

✓

✓

✓

✓

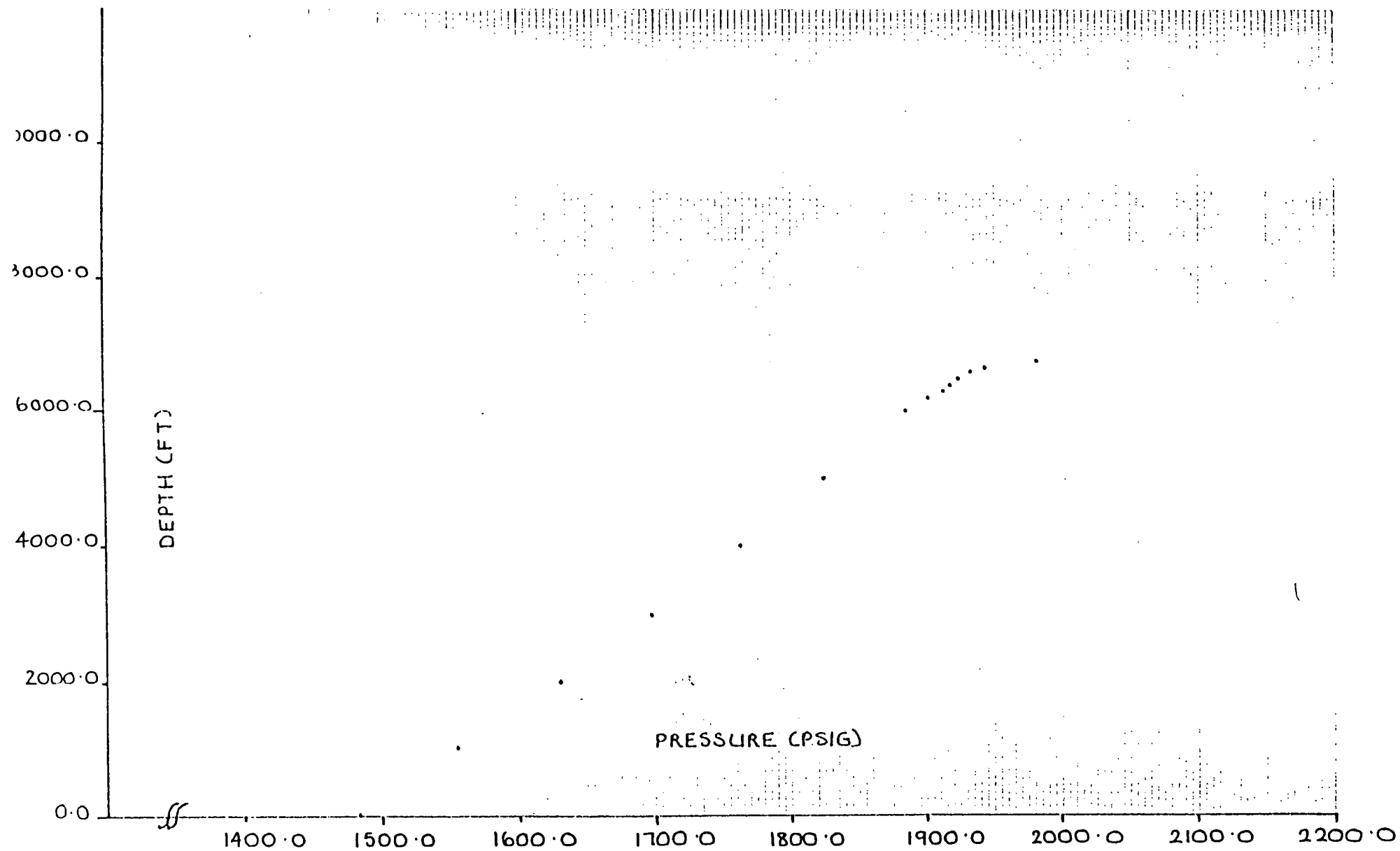
00081

A P P E N D I X I d.

STATIC AND FLOWING GRADIENTS

KUJANI # 1 — FLOWING PRESSURE GRADIENT — 26 / 4 / 91

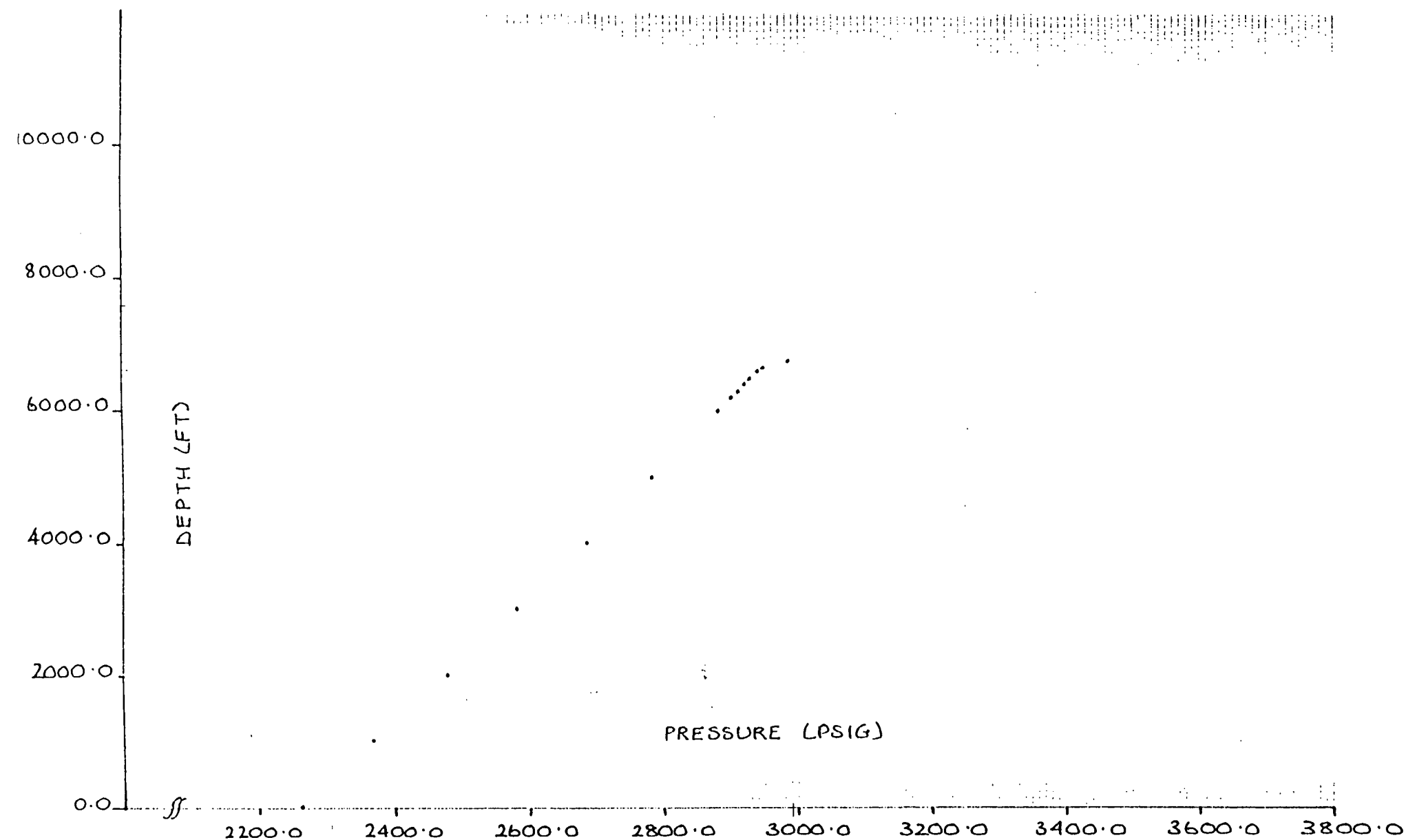
ELEMENT # 53563 / 5000 (TOP)



00083

KUJANI # 1 — STATIC PRESSURE GRADIENT — 25/4/91

ELEMENT # 53563 / 5000 (TOP)



00084

A P P E N D I X I I a.RATE DATA, LOG ΔP vs LOG Δt PLOT

FIELD : KUJANI

WELL : #1-POST-FRAC.

TEST NO. : 1 - S.R.T.

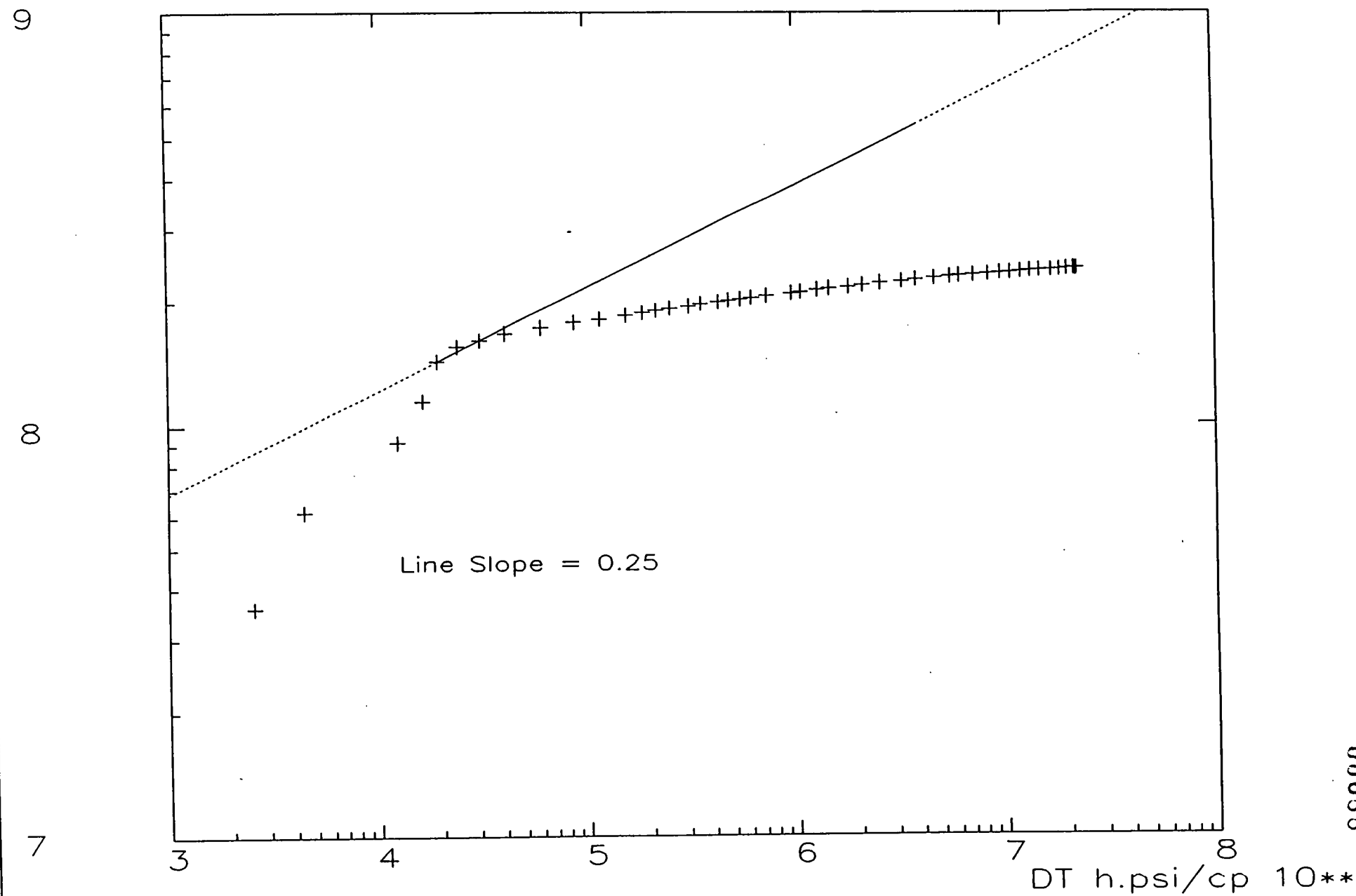
DATE : 13 OCT 1991

RATE DATA

00087

Time	Rate
Hours	Mscf/day
0.0	7645.41
875.0	0.0

DP psi2/cp 10**



00088

A P P E N D I X I I b.

PRESSURE BUILD-UP ANALYSIS AND RESERVOIR PARAMETERS

RUN TYPE : Analysis

PHASE : GAS

NO. OF WELLS : 1

PVT DATA : Reservoir temperature = 242.2 deg F
 Standard temperature = 60.0 deg F
 Standard pressure = 14.7 psia
 Gas gravity = 0.943

Gas Composition :

Component	Mole Fraction xi	Molar Mass g/mol	Critical Temperature	Critical Pressure
N2	0.0221000	28.013000	-232.3840	492.97000
CO2	0.0507000	44.010000	87.926000	1070.9500
H2S	0.0000000	34.076000	212.72000	1305.9400
He	0.0000000	4.0030000	-450.1300	33.210000
CH4	0.6656000	16.042000	-116.6080	667.76000
C2H6	0.1033000	30.070000	90.104000	707.76000
C3H8	0.0633000	44.097000	206.02400	616.26000
iC4H10	0.0124000	58.124000	275.00000	529.07000
nC4H10	0.0228000	58.124000	305.67200	550.66000
iC5H12	0.0078000	72.151000	369.12200	490.37000
nC5H12	0.0084000	72.151000	385.71800	488.58000
C6H14	0.0110000	86.178000	453.72200	436.87000
C7H16+	0.0326000	114.23200	564.24200	360.57000

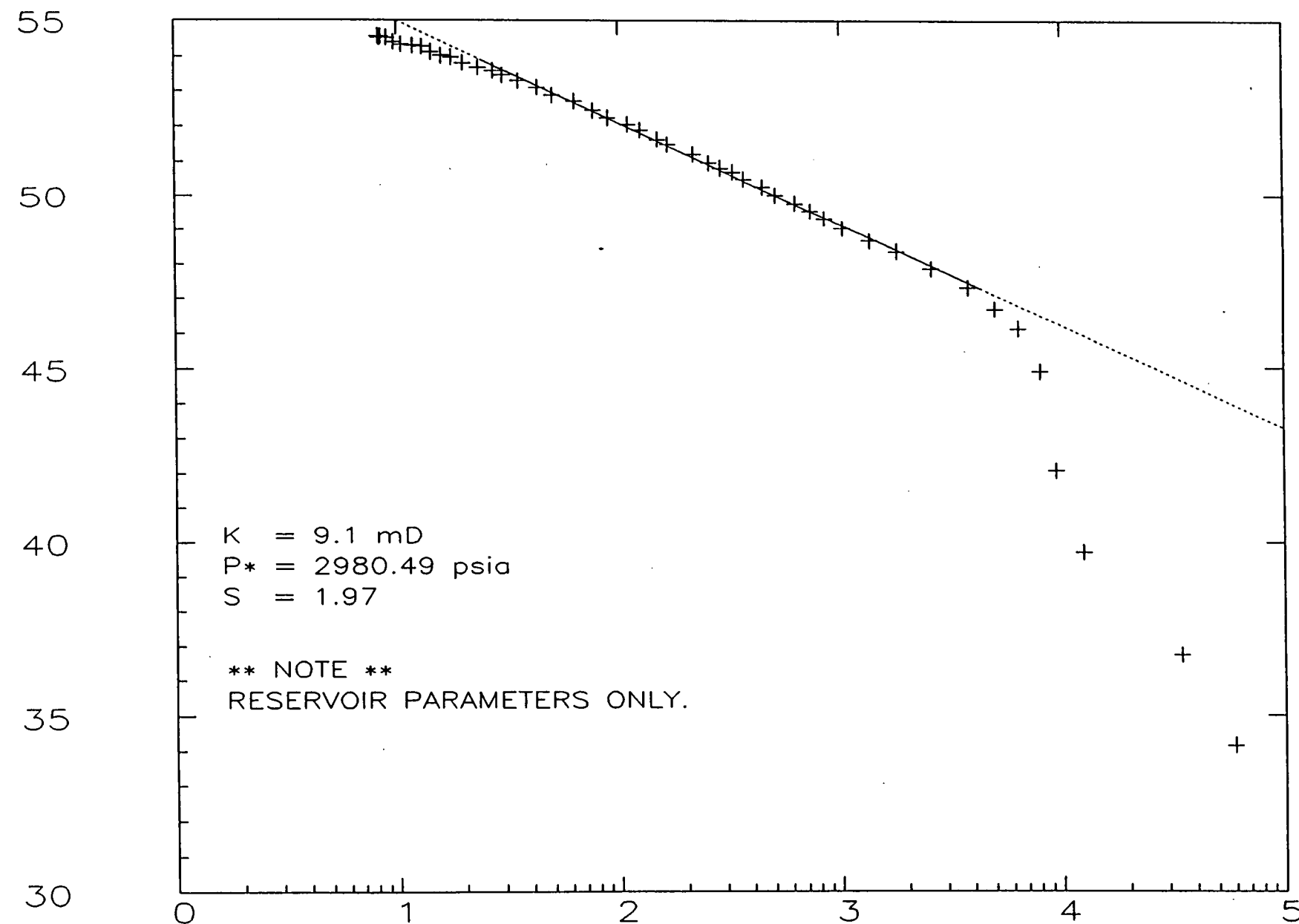
Calculations to use PSEUDO time

WELL DATA : Well radius = 0.354 feet
 Formation thickness = 33.0 feet
 Porosity = 0.134
 Rock compressibility = 4.500E-06 1/psi
 Water saturation = 0.359
 Water compressibility = 3.500E-06 1/psi

PRESSURE DATA

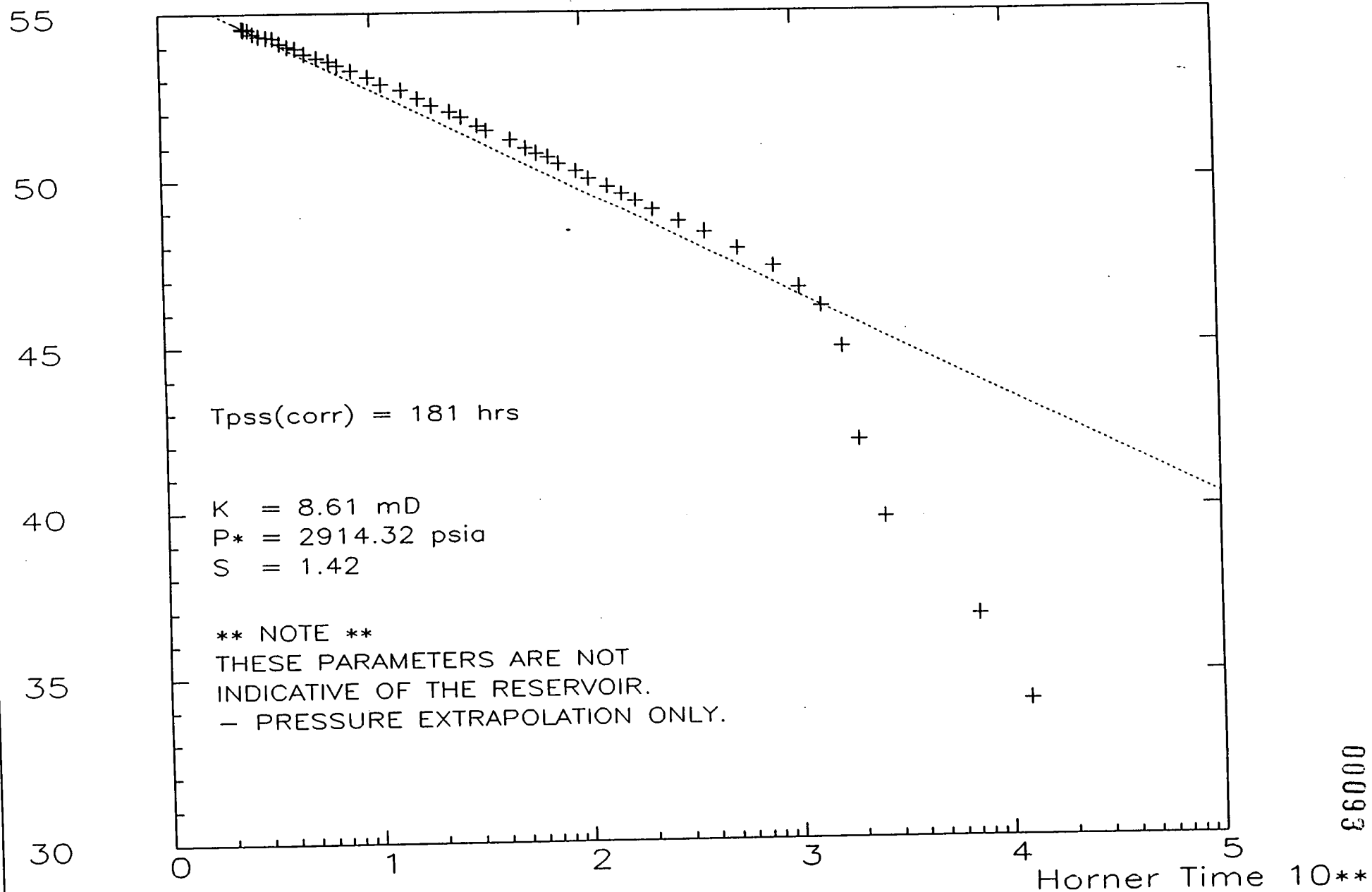
Time	Pressure	Time	Pressure
Hours	psia	Hours	psia
0.0	2086.65	879.81	2784.2
875.0	2086.89	880.747	2792.69
875.014	2212.94	881.542	2797.66
875.025	2301.6	883.05	2803.52
875.066	2401.04	884.363	2810.01
875.086	2478.57	886.382	2818.16
875.101	2570.77	889.382	2823.72
875.124	2610.41	891.766	2830.65
875.156	2628.42	895.515	2836.56
875.203	2648.48	899.268	2841.7
875.294	2665.68	901.801	2845.72
875.416	2681.58	906.344	2848.62
875.547	2691.29	911.906	2852.51
875.724	2703.04	916.882	2857.49
875.867	2712.23	921.682	2858.97
876.002	2719.36	927.36	2862.28
876.167	2726.48	932.947	2866.93
876.429	2734.06	939.154	2867.89
876.631	2741.41	947.852	2868.77
876.975	2748.43	954.719	2870.91
877.211	2754.74	961.284	2874.76
877.513	2758.43	967.796	2875.81
877.827	2763.15	969.467	2874.89
878.331	2771.11	971.0	2876.11
879.343	2779.56		

P psi2/cp *10**7



00092

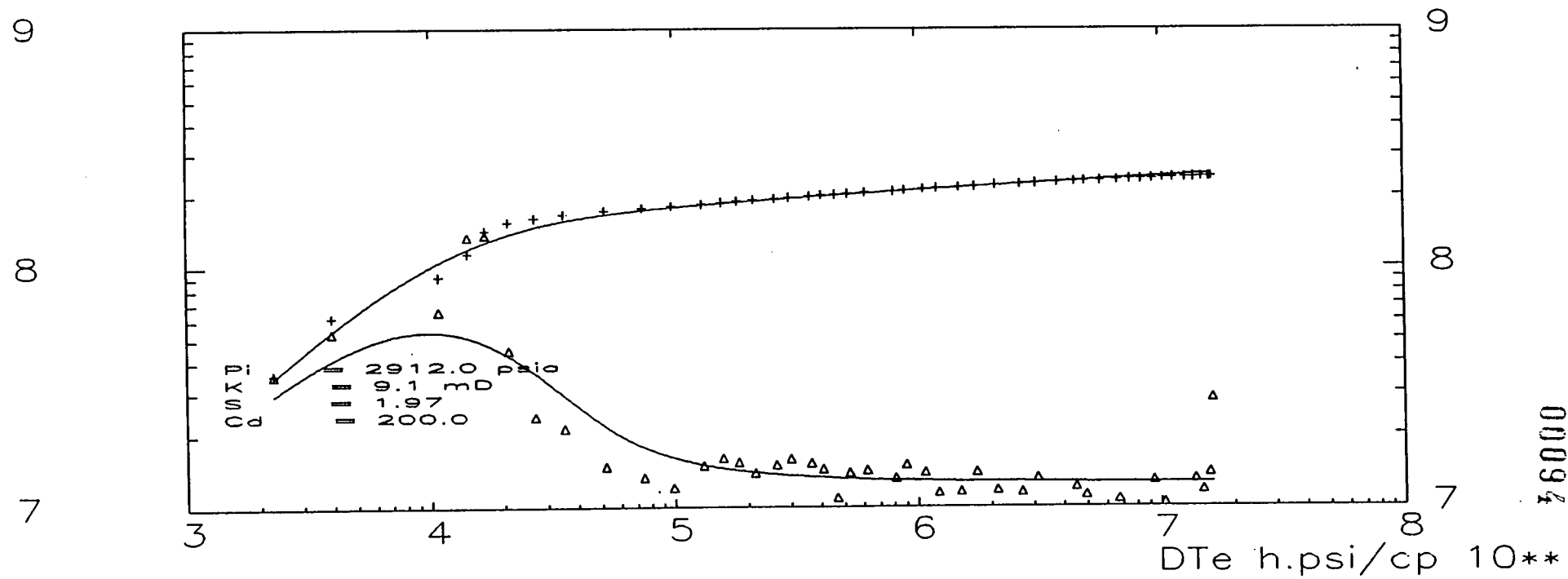
P psi2/cp *10**7



00093

DP psi2/cp 10**

Derivative P psi2/cp 10**



Pressure Survey Data Sheet

Project: KUJANI
 Subject: KUJANI #1 POST-FRAC OCT91
 Date: 05-Mar-92 06:37
 By: MD File: KUJANI
 Sheet 1 of 1

Data		P approx 2914.3 (psia) for z, viscosity, and Cg estimates			
OGIP	5.4 (BCF)	porosity	0.134 (fraction)	Cg	4.92E-04 (1/psi)
Gp	0.3 (BCF)	Sw	0.359 (fraction)	Cw	3.70E-06 (1/psi)
RRG	5.1 (BCF)	Sg	0.641 (fraction)	Cf	4.50E-06 (1/psi)
z	0.839	h	33.0 (feet)	Ct	3.21E-04 (1/psi)
T	702 (R)	viscosity	0.0215 (cp)	k	9.1 (mD)
P datum	2017 (psia)	Ca	31.6 Shape Fac		

Calculations

Datum Correction

Area 14,878,314 sq ft
 342 acres
 t to pss 181.0 hours
 OhSg 2.83

	KB	SS
KB	129	(feet)
Datum Depth	-6151	6280 (feet)
Gauge Depth	6674	-6545 (feet)
delta h	-12825	(feet)
Static Gradient	0.07	(psi/ft)
MPP	6648	-6519 (feet)
Gas Gradient	0.07	(psi/ft)
Correction	-897.8	(psi)
P Avg	2914	(psia)
P Datum	2017	(psia)
=====		
z	0.839	
P/z	2404	(psia)
Gp	0.2788	(BCF)
=====		

Net Pay Averages

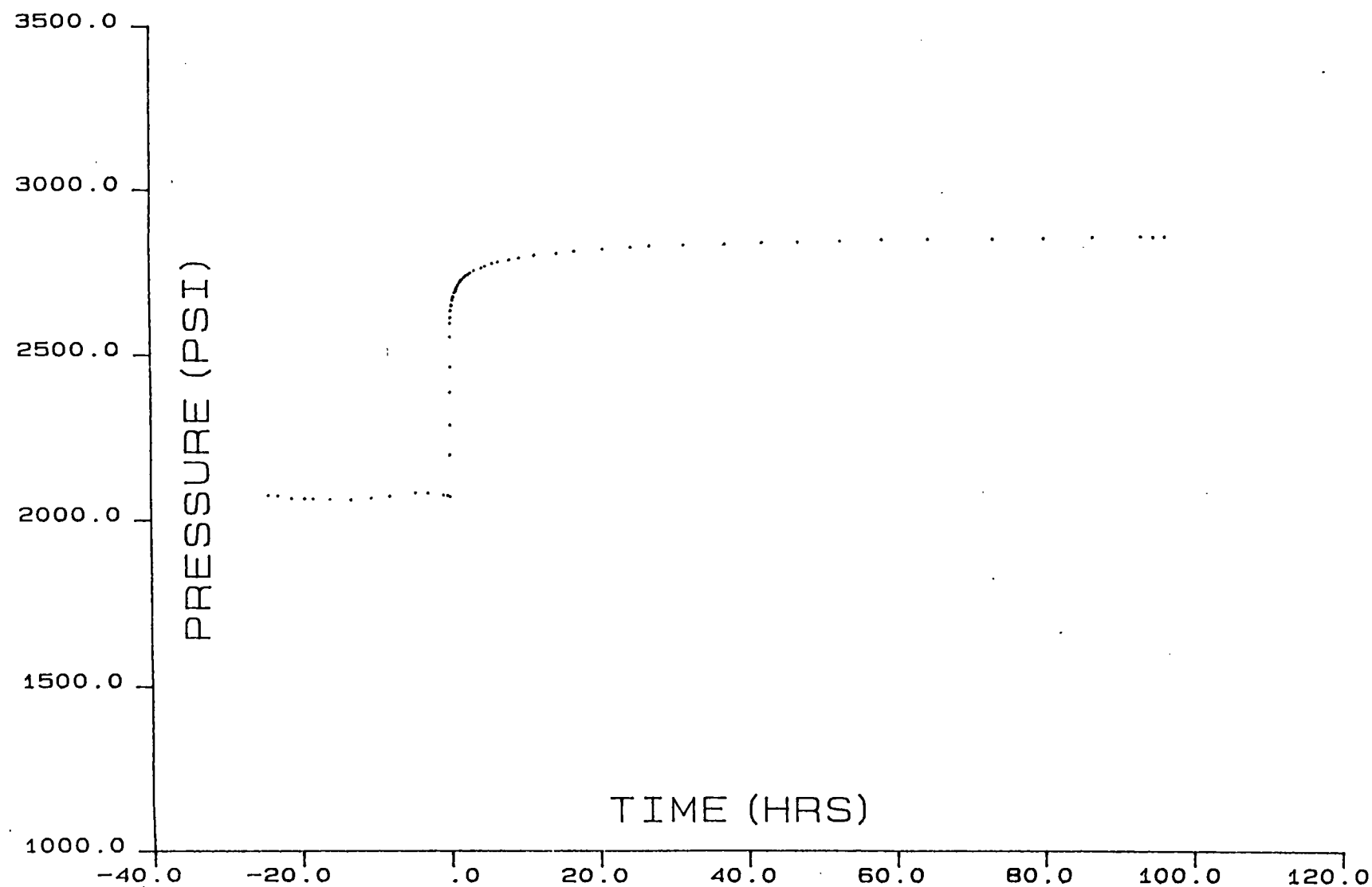
Formation	h	porosity	Sw
Patchawarra66-2	33	0.134	0.359
	0	0	0.000
	0	0	0.000
	0	0	0.000
	0	0	0.000
	0	0	0.000
Total	33	0.134	0.359

Comments

A P P E N D I X I I C .

WELLTEST DATA

KUJANI #1 POST FRAC SINGLE RATE TEST AND
BUILDUP 12 - 18 OCTOBER 1991
ELEMENT #55994 @ 6678 FT KB



00097

SECTION 1

TEST RESULTS

By: OILSERV AUSTRALIA LTD
6 BREDBO STREET
LONSDALE. SA. 5160.

TELEPHONE: (08) 326 1588
FACSIMILE: (08) 326 1593



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' K.B	PAGE: 1 OF 6
WELL NAME: KUTANI #1	FORMATION: PATCHAWARRA	DATE: 10/10/91
TEST TYPE: SINGLE RATE & BUILDUP		OPR: KUNAC, KADLER

TIME		WELLHEAD DATA				SEPARATOR DATA		FLOW RATES			CUMULATIVE PRODUCTION				UPH: KUNAC, KAPPLER	
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 m³/10³D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³/10³	OIL BBLs m³	WATER BBLs m³	L.G.R. BBLs/MMSCF m³/10⁶m³		
						SINGLE RATE FLOW AND BUILDUP TEST										
10/10/91						LEAVE BRUMBY #1 TO TRAVEL TO KUTANI #1										
1030						ARRIVE ON LOCATION KUTANI #1 WITH TEST EQUIPMENT & CARAVAN										
1545						START SPOTTING TEST EQUIPMENT										
						FINISH SPOTTING TEST EQUIPMENT										
1615						RIG UP CARAVAN & START TO LAY OUT SOME SEPARATOR EQUIPMENT										
1705						RIG UP W/LINE UNIT FOR BLIND BOX RUN, AND TEST EQUIPMENT FOLLOWING DAY										
1715																
1800																
11/10/91						RIG UP W/LINE UNIT FOR BLIND BOX RUN										
0705						SHUT WELL IN TO RIG UP SWAB VALVE										
0910						WELL BACK ON LINE										
0940						FINISH RIGGING UP W/LINE UNIT										
1050						PRESSURE UP LUB										
1100					20%	CHOKE WELL BACK, BEFORE RUNNING IN HOLE										
1103						FOR BLIND BOX RUN										
1108						R.I.H WITH WEIGHT BAR, SPANCLARS & 1.750" GAUGE CUTTER TO 6830' K.B, NO OBSTRUCTIONS										
1115						START RIGGING UP TEST EQUIPMENT										
1156						P.O.O.H										

66000

66099



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' I.C.B	PAGE: 2 OF 6
WELL NAME: KUJANI #1	FORMATION: PATCHAWARRA	DATE: 11/10/91
TEST TYPE: SINGLE RATE & BUILDUP		OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR 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	L.G.R. BBLS/MMSCF m ³ /10 ⁶ m ³	
11/10/91															
1252						IN LUB									
1253		12714	0		20%	DEPRESSURE LUB, LEAVE W/LINE UNIT RIGGED UP TO RUN AMERADA'S FOR FLOW & BUILDUP SURVEY									
1455						SHUT WELL IN TO RIG UP TO TEST FLANGES ON METER RUN									
1600		14962	0			SHUT IN TUBING PRESSURE									
1606						OPEN WELL BACK ON LINE, BY-PASSING SEPARATOR									
1630						PRESSURE UP SEPARATOR, LEAKING AT TWO POINTS, DEPRESSURE AND REPAIR									
1710		8584				PRESSURE UP SEPARATOR O.K									
1800	00.00	9467	0	74	100%	Trim Flow Thru Separator									
1810					100%	ENGAGE 2.250" O/P									
2000	02.00	9274	10	75	100%	8515	70	218.3837	38.040	0.360	18.1986	3.170	0.030	0.176	
2200	04.00	9260	200	75	100%	8515	71	215.6011	30.840	2.040	36.1654	5.740	0.200	0.153	
2400	06.00	9274	300	75	100%	8515	70	216.3127	35.400	1.800	54.1915	8.690	0.350	0.172	
12/10/91															
0200	08.00	9281	300	75	100%	8446	69.5	215.5638	34.680	0.840	72.1552	11.580	0.420	0.165	
0400	10.00	9253	300	75	100%	8412	70	214.6548	38.400	1.800	90.0431	14.780	0.570	0.187	
0600	12.00	9260	350	75	100%	8446	70.5	214.8549	34.200	1.200	107.9477	17.630	0.670	0.165	
						S.G = .838, CO ₂ = 3%, H ₂ S = 0. P.P.M, A.P.I = 59.8									
0800	14.00	9274	350	75	100%	8550	65	218.5233	33.000	1.440	126.1580	20.380	0.790	0.158	
1000	16.00	9260	400	76	100%	8584	68	218.8988	35.880	1.440	144.3996	23.370	0.910	0.170	

00100



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' KB	PAGE: 3 OF 6
WELL NAME: KUSANI #1	FORMATION: PATCHAWARRA	DATE: 12/10/91
TEST TYPE: SINGLE RATE & BUILD UP		OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR DATA		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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLS m³	WATER BBLS m³	BBLS/MMSCF m³/10³m³	
12/10/91															
1010								PREPARE AMERADAS FOR FLOW & BUILD UP SURVEY							
1135								IN LUB ATMOSPHERE							
1200	18:00	9253	400	76	100%	8619	70	217.9680	36.600	1.440	162.5636	26.420	1.030	0.175	
1205								PRESSURE UP LUB							
1307		9260	400	76	20%	CHOKE WELL BACK TO R.I.H WITH AMERADA'S									
1309						R.I.H WITH AMERADA'S									
1400	20:00	10894	400	70	20%	8481	66	181.9764	32.520	1.680	177.7283	29.130	1.170	0.188	
1407						ON HANG DEPTH 6690' K.B									
1410					100%	OPEN WELL BACK UP TO 100%									
1600	22:00	9274	400	76	100%	8688	71	216.2252	36.780	1.920	195.7471	32.195	1.330	0.179	
1800	24:00	9246	400	76	100%	8584	71.5	216.3404	32.040	1.080	213.7755	34.865	1.420	0.153	
2000	26:00	9239	400	76	100%	8550	72	215.4453	35.160	1.320	231.7293	37.795	1.530	0.169	
2200	28:00	9184	400	76	100%	8515	72.5	214.5573	34.560	1.800	249.6091	40.675	1.680	0.169	
2400	30:00	9184	400	76	100%	8550	72.5	215.0983	32.520	1.320	267.5340	43.385	1.790	0.157	
13/10/91															
0200	32:00	9191	400	75.5	100%	8515	69.5	216.6734	37.800	1.680	285.5901	46.535	1.930	0.182	
0400	34:00	9232	400	75.5	100%	8550	67.5	216.6003	33.720	1.200	303.6401	49.345	2.030	0.161	
0600	36:00	9253	400	75	100%	8550	70.5	212.2988	36.600	1.680	321.3317	52.395	2.170	0.180	
0800	38:00	9363	400	76	100%	8584	71	208.1910	35.040	1.560	338.6810	55.315	2.300	0.176	
0800						COLLECT 1 ST SET OF SAMPLES GAS* 151, CONDENSATE* 156									
0900	39:00	9412	400	75.5	100%	8860	70	213.1149	32.400	1.440	347.5608	56.665	2.360	0.159	
0900						COLLECT 2 ND SET OF SAMPLES GAS* 117, CONDENSATE* 186									

00101



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' KB	PAGE: 4 OF 6
WELL NAME: KUJANI #1	FORMATION: PATCHAWARRA	DATE: 13/10/91
TEST TYPE: SINGLE RATE & BUILD UP		OPR: KUNAC, KAPLER

TIME		WELLHEAD DATA				SEPARATOR 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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLS m³	WATER BBLS m³	L.G.R. BBLS/MMSCF m³/10⁶m³	
13/10/91															
0900						COLLECT 2x500" H₂O SAMPLES									
1100	41:00	9412	400	76	100%	8860	72.5	211.3196	24.240	0.720	365.1708	58.685	2.420	0.118	
1300	43:00	9336	400	76	100%	8791	72	214.9789	32.640	1.800	383.0857	61.405	2.570	0.160	
1500	45:00	9301	400	76	100%	8756	71.5	216.9432	32.640	1.080	401.1643	64.125	2.660	0.155	
1500	00:00					SHUT IN WELL FOR BUILD UP									
1515		14652	450												
1530		14783	450												
1545		14866	450												
1600	01:00	14907	450												
1615		14948	450												
1630		14983	450												
1645		15017	450												
1700	02:00	15038	450												
1715		15059	450												
1730		15072	450												
1745		15093	450												
1800	03:00	15107	450												
1815		15114	450												
1830		15128	450												
1845		15141	450												
1900	04:00	15148	450												
2200	07:00	15231	425												

00102

TEST TYPE:

SINGLE RATE & BUILD UP

PATCHAWARRA

DATE:

14/10/91

OPR:

KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR 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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLs m³	WATER BBLs m³	L.G.R. BBLs/MMSCF m³/10⁶m³
14/10/91														
0200	11.00	15266	425											
0600	15.00	15293	300											
1000	19.00	15328	200											
1400	23.00	15355	100											
1800	27.00	15369	50											
2200	31.00	15383	0											
15/10/91														
0200	35.00	15383	0											
0600	39.00	15390	0											
1000	43.00	15390	0											
1400	47.00	15397	0											
1800	51.00	15403	0											
2200	55.00	15403	0											
16/10/91														
0200	59.00	15410	0											
0600	63.00	15410	0											
1000	67.00	15417	0											
1400	71.00	15417	0											
1800	75.00	15424	0											
2200	79.00	15417	0											
17/10/91														
0200	83.00	15417	0											

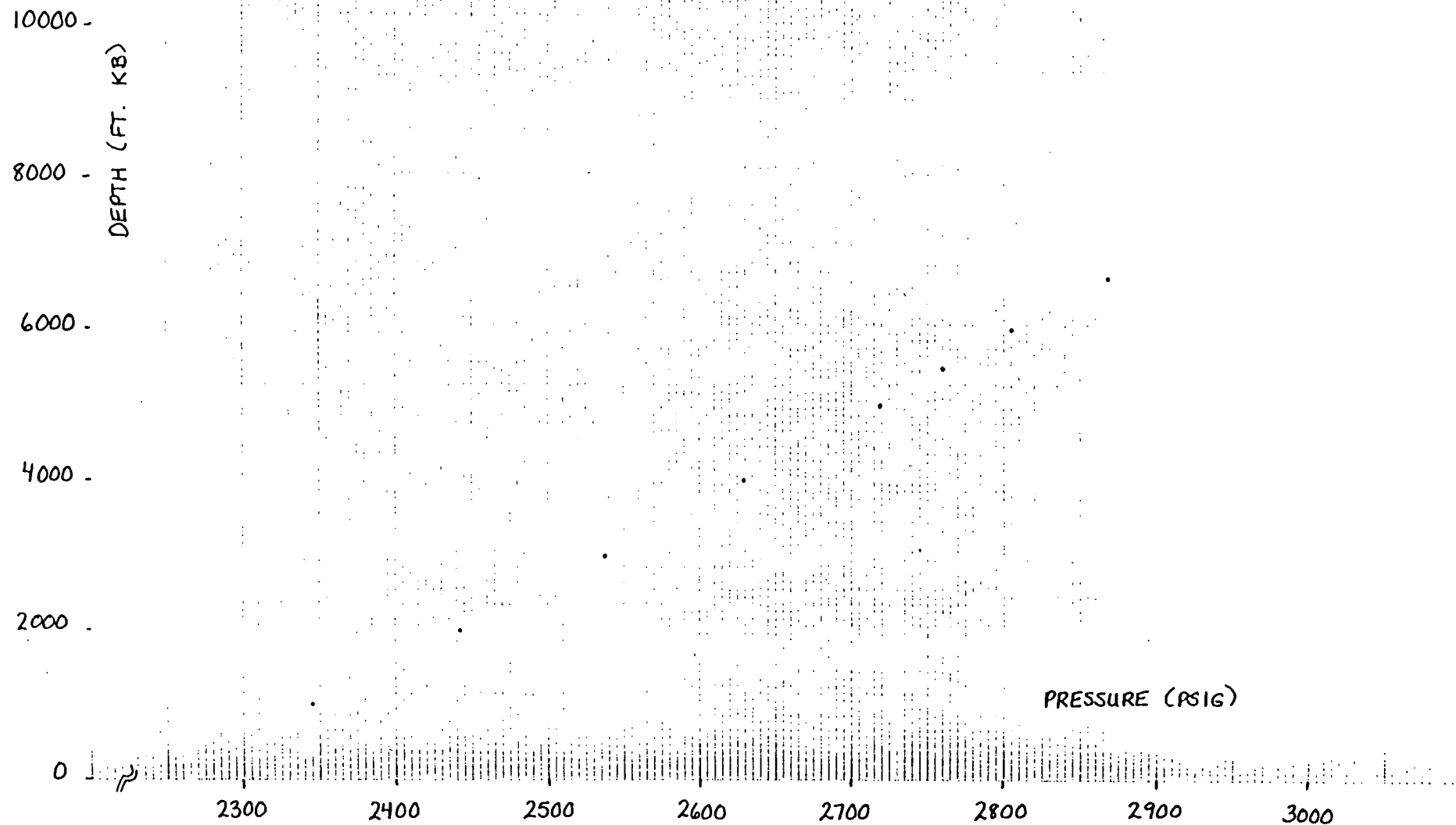
00103

00103

A P P E N D I X I I d.

STATIC PRESSURE GRADIENT

KUJANI # 1 - STATIC PRESSURE GRADIENT - 18/10/91
ELEMENT # 55994 (TOP)



00106

A P P E N D I X I I I

COMPOSITIONAL DATA
PETROLAB RESERVOIR FLUID STUDY

Ref: S-91013

47 Woodforde Road, Magill,
South Australia, 5072
P.O. Box 410,
Magill, South Australia, 5072



Fax: 364 1500
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Reservoir Fluid and Core Services, Laboratory Consulting and Analysis

Adelaide, June 28 1991
P. O. Box 410
Magill
S. A. 5072

Santos Limited
101 Grenfell Street
Adelaide
S.A. 5001

Subject: Reservoir Fluid Study
Well : Kujani # 1
File : S - 91013

Attention: Mr. Matthew Butler

Dear Sirs,

Three sets of primary gas and liquid samples of subject well were submitted to our laboratory in Adelaide for use in a reservoir fluid study. The results of this study are presented in the following report.

During standard quality checks we determined the single phase opening pressures of the gas samples, at approximately 10° C higher than the separator temperature, to see if any leakage had taken place during transportation. We then determined the compositions with the help of a gas chromatograph.

The validity of the separator liquid samples was checked by measuring their bubble point pressures at room temperature and correlate these pressures with gas opening pressures and field separator pressure.

The composition of one of the separator liquid samples was determined by flashing the sample under atmospheric conditions into two phases. Through measurements of densities, molecular weights, quantities produced and compositions of the evolved stock tank gas and liquid from the flash experiment, we were able to mathematically recombine these products into the desired fluid composition.

The separator liquid composition was extended to C-12+ by means of capillary column gas chromatography of flashed stock tank liquid.

A mathematical recombination of the separator products into their produced field ratios, after a correction of the produced separator gas rate, resulted in the actual produced reservoir fluid composition.

This standard correction results in a more accurate gas rate by dividing out the assumed field values of the gas gravity and supercompressibility factors (F_g and F_{pv}) and multiplying in the values of these factors found in the laboratory.

The corrected producing gas / liquid ratio was 18266 of cubic feet of separator gas at 14.696 psia and 60° F., for every barrel of produced stock tank liquid at 60° F. In the laboratory this ratio was determined to be equivalent to 14970 standard cubic feet of separator gas per barrel of separator liquid at 310 psig and 102° F. The compositions of the separator products were used with this ratio to calculate the wellstream composition.

We then continued with the actual physical recombination using this same ratio.

The recombined reservoir fluid was charged to a visual P V T cell and thermally expanded to the reservoir temperature of 230° F.

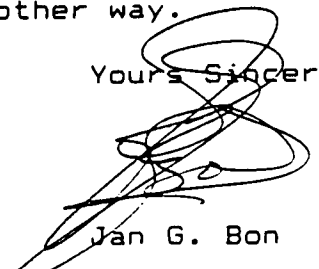
During a constant composition expansion at this temperature, a dew point pressure of 2875 psig was observed. Other data obtained during this Pressure - Volume relations experiment, include relative volume versus pressure, gas compressibility, specific volume and gas expansion above the dew point and the distribution of retrograde liquid versus pressure below it.

The reservoir fluid was then produced by means of a constant volume differential depletion. At each depletion pressure the amount, and composition of the produced wellstream was determined and the retrograde liquid observed. Together with other measured gas properties this data allowed us to calculate the compositions of the retrograde liquid remaining in the cell.

The produced compositions and volumes from the depletion study were used in conjunction with published equilibrium constants to calculate cumulative stock tank liquid and separator gas recoveries resulting from conventional separation. A summary of this surface recovery data is given on page 21.

We thank Santos Limited for the opportunity to be of service. Please do not hesitate in contacting us should you require any further information or if we can assist you in any other way.

Yours Sincerely,



Jan G. Bon

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

File: S 91013

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P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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File: S 91013

SUMMARY OF RESULTS

SATURATED VAPOUR:

Reservoir Temperature (deg F)	:	230
Dew Point Pressure (psig)	:	2875
Gas Formation Volume Factor (Bg)	:	0.00548
Gas Expansion Factor (E)	:	182.5
Gas Deviation Factor (Z)	:	0.812
Specific Volume (CFT/LB)	:	0.07565
Density (gm/cc)	:	0.2117
Viscosity (centipoise)	:	0.07565
Molecular Weight	:	27.50
Gas Gravity (Air = 1.000)	:	0.955
Gross Heating Value (BTU/ft3)	:	1471

Total Plant Products in Dew Point Fluid (GPMM)

Ethane	:	2756
Propane	:	1740
Butanes	:	1122
Pentanes Plus	:	2649

FLASH DATA:

1st Separator Pressure (psig)	:	1160
1st Separator Temperature (°F)	:	86
2nd Separator Pressure (psig)	:	--
2nd Separator Temperature (°F)	:	--
Stock Tank Pressure (psig)	:	0
Stock Tank Temperature (°F)	:	60
1st Separator GOR (scf/bbl)	:	12987
2nd Separator GOR (scf/bbl)	:	--
Stock Tank GOR (scf/bbl)	:	1348
Total GOR (scf/bbl)	:	14335
1st Sep. Gas/Prod. WS (mscf/mm scf)	:	850
2nd Sep. Gas/Prod. WS (mscf/mm scf)	:	--
ST T Liq/Produced W/S (stb/mm scf)	:	65.41

Total Plant Products in Primary Separator Gas (GPMM)

Ethane	:	2301
Propane	:	1154
Butanes	:	510
Pentanes Plus	:	241

Total Plant Products in Secondary Separator Gas (GPMM)

Ethane	:	-
Propane	:	-
Butanes	:	-
Pentanes Plus	:	-

P E T R O L A B

Company: Santos Limited
 Well : Kujani # 1
 Field : Wildcat
 Sampled: April 26 1991

Page : 2 of 34
 File : S 91013
 State : S. A.
 Country: Australia

FIELD CHARACTERISTICS

Formation Name	:	Patchawarra
Date first well completed	:	--
Original reservoir pressure (psia)	:	--
@ datum (ft TVDss)	:	--
Original Gas-Liquid Ratio SCF/STB)	:	--
Separator pressure (psig)	:	--
Separator temperature (deg F)	:	--
Liquid gravity (deg API @ 60 F)	:	--

WELL CHARACTERISTICS

Depth datum (ft)	:	--
Elevation above MSL (ft)	:	--
Total depth (ft MD)	:	--
Producing interval (ft)	:	--
Perforated intervals (ft KB)	:	6628 - 6668
Tubing size (inch)	:	--
Tubing shoe (ft MDKB)	:	--
Reservoir temperature (deg F)	:	230
Last reservoir pressure (psia)	:	3000
@ datum (ft KB)	:	--
date	:	--
Status of well	:	--

SURFACE SAMPLING CONDITIONS

Gas cylinders No.	:	G-073 , G-066 , G-067
Liquid cylinders No.	:	PDE #156, PDE #139, PDE #167
Date sampled	:	April 26, 1991
Choke size (inch)	:	17/64
Tubing head pressure (psig)	:	1510
Tubing head temperature (deg F)	:	107.6
Flowing bottom hole pressure (psig)	:	--
Separator pressure (psig)	:	310
Separator temperature (deg F)	:	102.2
Liquid rate (STB/DAY)	:	178
Water cut (%)	:	--
Field Shrinkage Factor (STB/SEPBBL)	:	--
Liquid gravity (deg API @ 60 F)	:	--
Gas rate (MMSCF/DAY)	:	2.11
Ambient temperature (deg F)	:	--
Pressure base (psia)	:	14.696
Temperature base (deg F)	:	60
Compressibility factor (Fpv)	:	1.0407
Field gas gravity (air=1.000)	:	0.826
Gas gravity factor (Fg)	:	1.1003
Produced field GOR (SCF/STB)	:	18243
Lab Compressibility factor (Fpv)	:	1.0325
Lab Gas gravity factor (Fg)	:	1.1104
Corrected GOR (SCF/STB)	:	18266
Sampled by	:	Oilserve Australia

$$* \quad 18266 = 18243 * (1.0325 * 1.1104) / (1.0407 * 1.1003)$$

PETROLAB

Company : Santos Limited
Well : Kujani # 1
File : S-91013

Surface Samples Set # 1

Sampling Conditions

Date : April 26 1991
Pressure : 310 psig
Temperature : 102 deg F

Cylinder # : G-073 (gas)
Opening Pressure : 348 psig @ 122 deg F

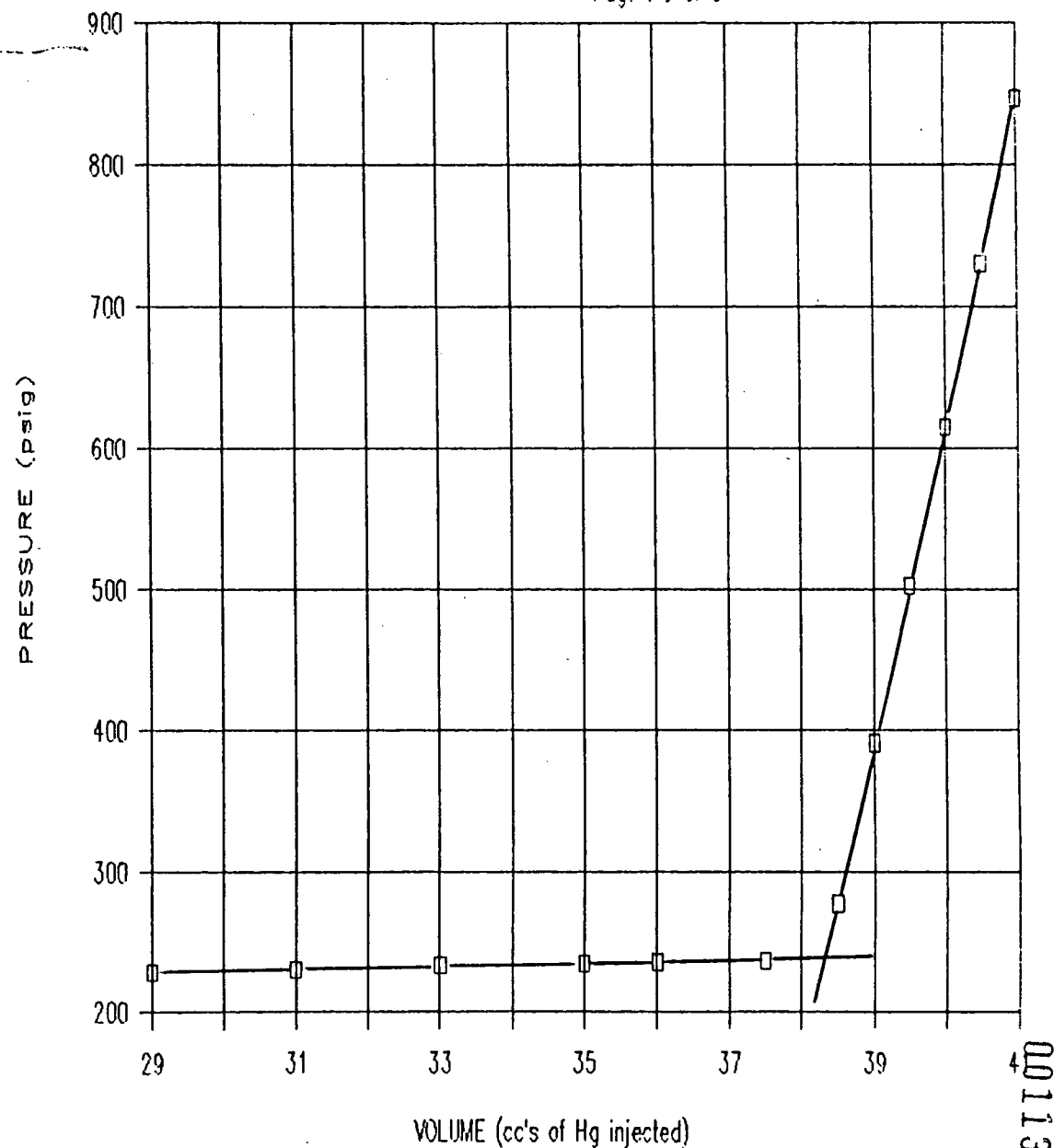
Cylinder # : PDE#156 (liquid)
Opening Pressure : 217 psig @ 72 deg F

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

29.00	228
31.00	230
33.00	233
35.00	234
36.00	235
37.50	236
38.50	277
39.00	391
39.50	503
40.00	615
40.50	730
41.00	846

Saturation Pressure : 239 psig @ 72 deg F

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PETROLAB

Company : Santos Limited
Well : Kujani # 1
File : S-91013

Surface Samples Set # 2

Sampling Conditions

Date : April 26 1991
Pressure : 310 psig
Temperature : 102 deg F

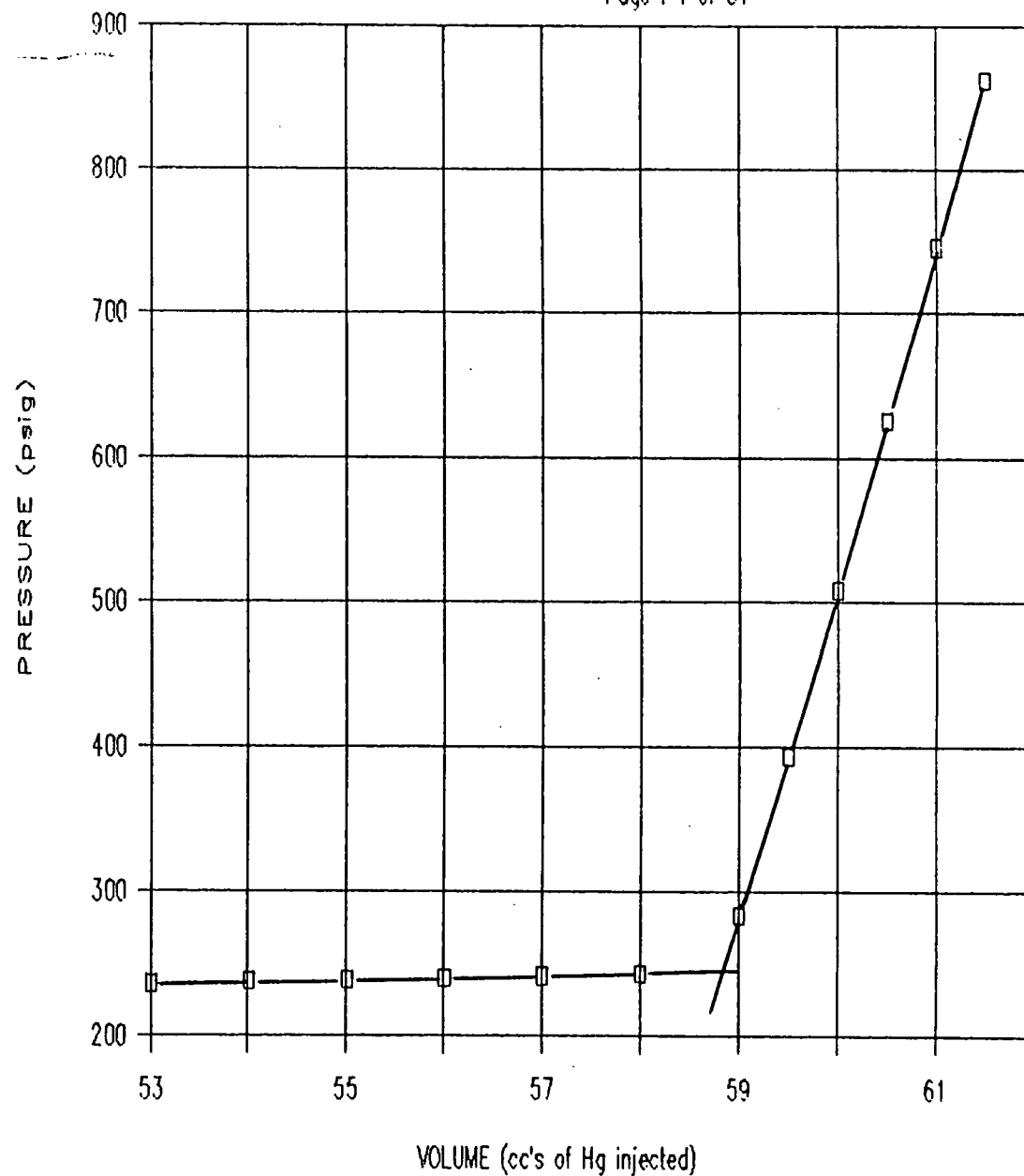
Cylinder # : G-066 (gas)
Opening Pressure : 370 psig @ 136 deg F

Cylinder # : PDE # 139 (liquid)
Opening Pressure : 243 psig @ 70 deg F

Volume (cc's)	Pressure (psig)
53.00	235
54.00	237
55.00	238
56.00	239
57.00	241
58.00	242
59.00	283
59.50	394
60.00	508
60.50	625
61.00	745
61.50	862

Saturation Pressure : 243 psig @ 70 deg F

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PETROLAB

Company : Santos Limited
Well : Kujani # 1
File : S-91013

Surface Samples Set # 3

Sampling Conditions

Date : April 26 1991
Pressure : 315 psig
Temperature : 103 deg F

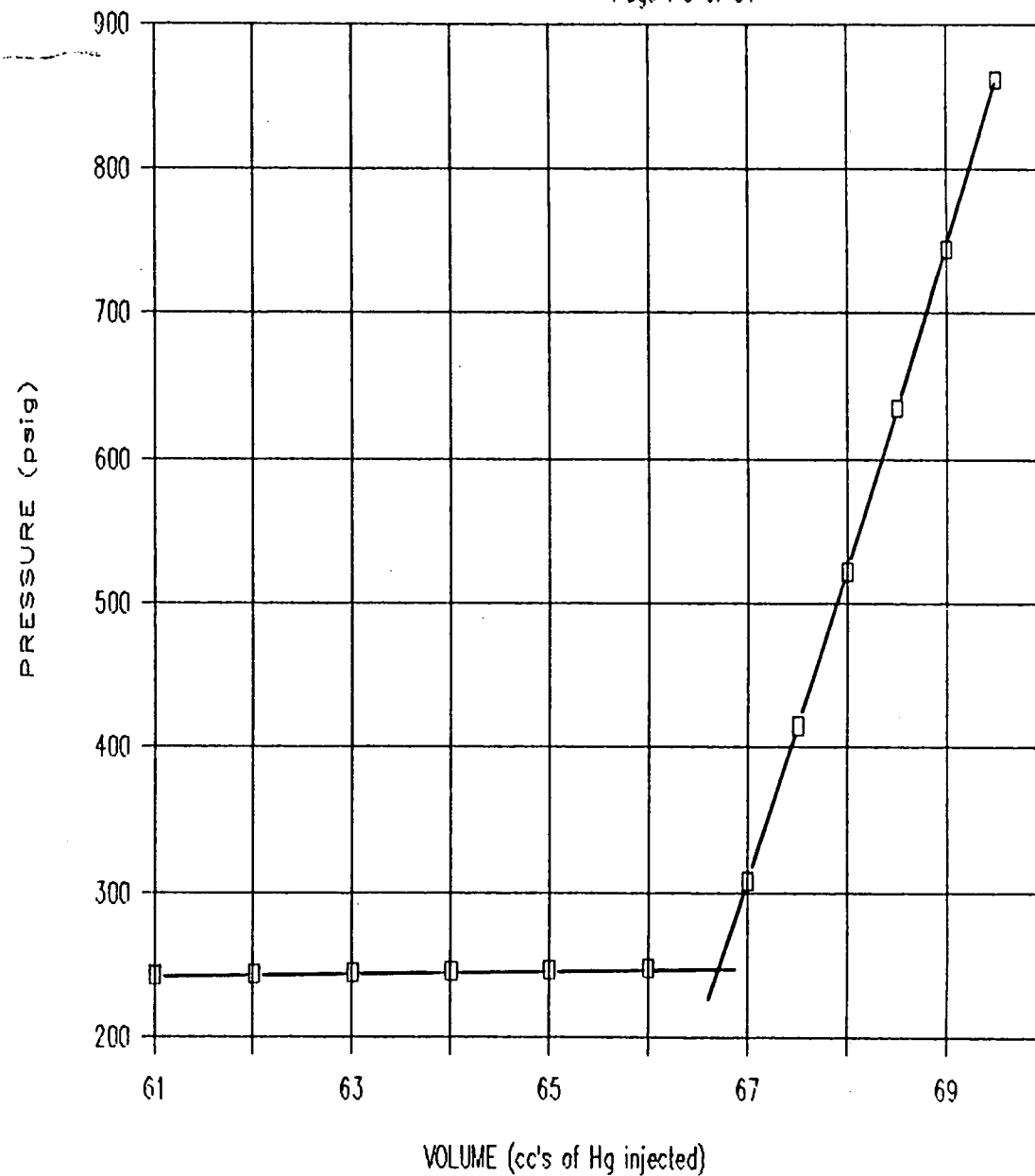
Cylinder # : G-067 (gas)
Opening Pressure : 370 psig @ 136 deg F

Cylinder # : PDE # 167 (liquid)
Opening Pressure : 233 psig @ 70 deg F

Volume (cc's)	Pressure (psig)
61.00	243
62.00	244
63.00	245
64.00	246
65.00	247
66.00	248
67.00	308
67.50	415
68.00	522
68.50	635
69.00	744
69.50	862

Saturation Pressure : 249 psig @ 70 deg F

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P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

Page: 6 of 34
File: S 91013

COMPOSITIONAL ANALYSIS OF
SEPARATOR GAS

Cyl # G-073

Component	Mol %	GPM	
Hydrogen Sulphide	0.00		Pressure Base : 14.696
Carbon Dioxide	5.32		Zsc: 0.996
Nitrogen	2.16		Mol Weight : 23.35
Methane	70.99		Gas Gravity: 0.809
Ethane	10.73	2.872	Pc : 678.3
Propane	6.17	1.701	Tc : 414.9
Iso-Butane	1.09	0.357	Mol Weight C7+: 106.4
N-Butane	1.88	0.593	Density C7+: 0.6973
Iso-Pentane	0.51	0.187	Mol Weight C8+: 124.3
N-Pentane	0.50	0.181	Density C8+: 0.7178
Hexanes	0.35	0.136	Heating Value (BTU/ft3)
Heptanes	0.19	0.080	Gross: 1241
Octanes	0.05	0.023	Nett: 1127
Nonanes	0.02	0.010	Wobbe Index: 1380
Decanes	0.02	0.011	Zpt: 0.940
Undecanes	0.01	0.006	Liquid Content
Dodecanes Plus	0.01	0.006	(Bbl/MMSCF of Raw Gas):
TOTAL	100.00	6.163	Ethane : 50.9
			L P G : 60.6
			Pentanes Plus: 15.5

Remarks: Laboratory Opening Pressure : 348 psig @ 122 deg F
Sampled at 310 psig and 102 deg F

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

Page: 7 of 34
File: S 91013

COMPOSITIONAL ANALYSIS OF
SEPARATOR GAS

Cyl # G-066

Component	Mol %	GPM	
Hydrogen Sulphide	0.00		Pressure Base : 14.696
Carbon Dioxide	5.35		Zsc: 0.996
Nitrogen	2.35		Mol Weight : 23.39
Methane	70.73		Gas Gravity: 0.811
Ethane	10.73	2.872	Pc : 678.0
Propane	6.20	1.710	Tc : 414.9
Iso-Butane	1.10	0.360	Mol Weight C7+: 107.2
N-Butane	1.89	0.596	Density C7+: 0.6983
Iso-Pentane	0.51	0.187	Mol Weight C8+: 124.0
N-Pentane	0.50	0.181	Density C8+: 0.7175
Hexanes	0.34	0.132	Heating Value (BTU/ft3)
Heptanes	0.18	0.076	Gross: 1240
Octanes	0.05	0.023	Nett: 1126
Nonanes	0.03	0.015	Wobbe Index: 1377
Decanes	0.02	0.011	Zpt: 0.940
Undecanes	0.01	0.006	Liquid Content
Dodecanes Plus	0.01	0.006	(Bbl/MMSCF of Raw Gas):
TOTAL	100.00	6.175	Ethane : 50.9
			L P G : 61.0
			Pentanes Plus: 15.5

Remarks: Laboratory Opening Pressure : 370 psig @ 136 deg F
Sampled at 310 psig and 102 deg F

P E T R O L A B

Company: Santos Limited
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COMPOSITIONAL ANALYSIS OF
SEPARATOR GAS

Cyl # G-067

Component	Mol %	GPM	
Hydrogen Sulphide	0.00		Pressure Base : 14.696
Carbon Dioxide	5.37		Zsc: 0.996
Nitrogen	2.14		Mol Weight : 23.37
Methane	70.86		Gas Gravity: 0.810
Ethane	10.76	2.880	Pc : 678.5
Propane	6.22	1.715	Tc : 415.3
Iso-Butane	1.13	0.370	Mol Weight C7+: 102.9
N-Butane	1.87	0.590	Density C7+: 0.6929
Iso-Pentane	0.51	0.187	Mol Weight C8+: 117.6
N-Pentane	0.50	0.181	Density C8+: 0.7105
Hexanes	0.36	0.140	Heating Value (BTU/ft3)
Heptanes	0.19	0.080	Gross: 1242
Octanes	0.05	0.023	Nett: 1128
Nonanes	0.02	0.010	Wobbe Index: 1380
Decanes	0.01	0.005	Zpt: 0.940
Undecanes	0.01	0.006	Liquid Content
Dodecanes Plus	0.00	0.000	(Bbl/MMSCF of Raw Gas):
TOTAL	100.00	6.187	Ethane : 51.1
			L P G : 61.2
			Pentanes Plus: 15.3

Remarks: Laboratory Opening Pressure : 370 psig @ 136 deg F
Sampled at 315 psig and 103 deg F

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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COMPOSITIONAL ANALYSIS OF RECOMBINED SEPARATOR LIQUID

Cylinder # PDE-139

Component	Stock Tank Liquid Mol %	Stock Tank Gas Mol %	Separator Liquid Mol %
Hydrogen Sulphide H2S	0.00	0.00	0.00
Carbon Dioxide CO2	0.05	3.60	0.94
Nitrogen N2	0.00	0.62	0.16
Methane C1	0.14	23.37	5.93
Ethane C2	0.59	16.58	4.58
Propane C3	3.09	23.70	8.23
Iso-Butane iC4	2.16	6.50	3.24
N-Butane nC4	6.24	13.00	7.92
Iso-Pentane iC5	5.03	3.92	4.75
N-Pentane nC5	6.46	3.91	5.83
Hexanes C6	15.27	2.80	12.16
Heptanes C7	24.00	1.48	18.39
Octanes C8	12.12	0.34	9.18
Nonanes C9	8.45	0.13	6.38
Decanes C10	5.12	0.04	3.85
Undecanes C11	3.01	0.01	2.27
Dodecanes Plus C12+	8.25	0.00	6.19
TOTAL	100.00	100.00	100.00
<u>Ratios</u>			
Molar Ratio :	0.7509	0.2491	1.0000
Mass Ratio :	0.8794	0.1206	1.0000
Liquid Ratio (bbl/bbl) :	1.0000 @ SC	--	1.2202 @ PT*
Gas Liquid Ratio :	1.0000 bbl @ SC	312 SCF	--
<u>Stream Properties</u>			
Molecular Weight :	102.3	42.29	87.3
Density obs. (gm/cc) :	0.7232 @ 60 F	--	0.6754 @ PT*
Gravity (AIR = 1.000) :	64.0 API @ 60 F	1.484	--
GHV (BTU/scf) :	--	2358.0	--
<u>Heptanes Plus Properties</u>			
Mol % :	60.96	2.00	46.26
Molecular Weight :	122.5	100.5	122.3
Density (gm/cc @ 60 F) :	0.7641	0.6898	0.7634
Gravity (API @ 60 F) :	53.5	73.4	53.7
<u>Octanes Plus Properties</u>			
Mol % :	36.96	0.52	27.87
Molecular Weight :	139.8	113.3	139.7
Density (gm/cc @ 60 F) :	0.7846	0.7057	0.7842
Gravity (API @ 60 F) :	48.7	68.8	48.8
<u>Decanes Plus Properties</u>			
Mol % :	16.39	0.05	12.31
Molecular Weight :	173.7	136.6	173.5
Density (gm/cc @ 60 F) :	0.8120	0.7303	0.8120
Gravity (API @ 60 F) :	42.6	62.1	42.6
<u>Undecanes Plus Properties</u>			
Mol % :	11.27	0.01	8.46
Molecular Weight :	191.7	147.0	191.7
Density (gm/cc @ 60 F) :	0.8235	0.7400	0.8235
Gravity (API @ 60 F) :	40.2	59.5	40.2
<u>Dodecanes Plus Properties</u>			
Mol % :	8.25	0.00	6.19
Molecular Weight :	208.1	--	208.1
Density (gm/cc @ 60 F) :	0.8329	--	0.8329
Gravity (API @ 60 F) :	38.2	--	38.2

* (P)ressure 310 psig, (T)emperature 102 deg F

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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COMPOSITIONAL ANALYSIS OF
RECOMBINED RESERVOIR FLUID

Cyl. # PDE-139 Cyl. # G-066

Component	Separator Liquid Mol %	Separator Gas Mol %	Reservoir Fluid Mol %
Hydrogen Sulphide H ₂ S	0.00	0.00	0.00
Carbon Dioxide CO ₂	0.94	5.35	5.07
Nitrogen N ₂	0.16	2.35	2.21
Methane C ₁	5.93	70.73	66.56
Ethane C ₂	4.58	10.73	10.33
Propane C ₃	8.23	6.20	6.33
Iso-Butane iC ₄	3.24	1.10	1.24
N-Butane nC ₄	7.92	1.89	2.28
Iso-Pentane iC ₅	4.75	0.51	0.78
N-Pentane nC ₅	5.83	0.50	0.84
Hexanes C ₆	12.16	0.34	1.10
Heptanes C ₇	18.39	0.18	1.35
Octanes C ₈	9.18	0.05	0.64
Nonanes C ₉	6.38	0.03	0.44
Decanes C ₁₀	3.85	0.02	0.27
Undecanes C ₁₁	2.27	0.01	0.16
Dodecanes Plus C ₁₂ +	6.19	0.01	0.40
TOTAL	100.00	100.00	100.00
Ratios			
Molar Ratio :	0.0643	0.9357	1.0000
Mass Ratio :	0.1936	0.8064	1.0000
Gas Liquid Ratio :	1.0000	bbl @ PT* 14970 SCF**	--
Stream Properties			
Molecular Weight :	87.3	25.00	27.50
Density obs. (gm/cc) :	0.6754 @ PT*	--	--
Gravity (AIR = 1.000) :	77.8 API @ 60 F	0.867	0.955
GHV (BTU/scf) :	--	1305.0	1471.0
Heptanes Plus Properties			
Mol % :	46.26	0.30	3.26
Molecular Weight :	122.3	106.7	121.0
Density (gm/cc @ 60 F) :	0.7634	0.6977	0.7580
Gravity (API @ 60 F) :	53.7	71.1	55.0
Octanes Plus Properties			
Mol % :	27.87	0.12	1.91
Molecular Weight :	139.7	122.8	138.7
Density (gm/cc @ 60 F) :	0.7842	0.7163	0.7803
Gravity (API @ 60 F) :	48.8	65.9	49.7
Decanes Plus Properties			
Mol % :	12.31	0.04	0.83
Molecular Weight :	173.5	144.0	172.3
Density (gm/cc @ 60 F) :	0.8120	0.7373	0.8090
Gravity (API @ 60 F) :	42.6	60.2	43.2
Undecanes Plus Properties			
Mol % :	8.46	0.02	0.56
Molecular Weight :	191.7	154.0	190.6
Density (gm/cc @ 60 F) :	0.8235	0.7462	0.8213
Gravity (API @ 60 F) :	40.2	57.9	40.6
Dodecanes Plus Properties			
Mol % :	6.19	0.01	0.40
Molecular Weight :	208.1	161.0	207.2
Density (gm/cc @ 60 F) :	0.8329	0.7521	0.8314
Gravity (API @ 60 F) :	38.2	56.5	38.5

* (P)ressure 310 psi, (T)emperature 102 deg F

** 14970 SCF / SEP BBL @ PT = 18266 SCF / ST BBL
18266 = 18243 * (1.0325*1.1104) / (1.0407*1.1003)

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CONSTANT MASS STUDY
@ 230 deg F

Pressure (psig)	Relative Volume (V/Vsat) (1)	Formation Volume Factor (Bg) (2)	Gas Expansion Factor (E) (3)	Deviation Factor (Z)	Specific Volume (CFT/LB)
5000	0.6877	0.00377	265.38	0.969	0.05202
4552	0.7232	0.00396	252.35	0.928	0.05471
4029	0.7771	0.00426	234.84	0.883	0.05879
3731	0.8171	0.00448	223.35	0.860	0.06181
3514	0.8512	0.00466	214.40	0.844	0.06439
3209	0.9118	0.00500	200.14	0.826	0.06898
3103	0.9360	0.00513	194.97	0.820	0.07081
2985 *	0.9657	0.00529	188.98	0.814	0.07306
2875 **	1.0000	0.00548	182.50	0.812	0.07565

* Reservoir Pressure

** Dew Point Pressure

(1) Cubic feet of gas at indicated pressure and temperature
per cubic foot at saturation pressure

(2) Cubic feet of gas at indicated pressure and temperature
per cubic foot at 14.696 psia and 60 deg F

(3) Cubic feet of gas at 14.696 psia and 60 deg F
per cubic foot at indicated pressure and temperature

P E T R O L A B

Company: Santos Limited
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CONSTANT MASS STUDY
@ 230 deg F

Pressure (psig)	Relative Volume (V/Vsat) (1)	Retrograde Liquid Deposit (Bbl/MMSCF) (Volume%)	
		(2)	(3)
2875 *	1.0000	0.00	0.00
2828	1.0131	6.23	0.64
2692	1.0585	19.39	1.99
2514	1.1303	29.12	2.98
2402	1.1837	33.87	3.47
2206	1.2921	40.12	4.11
2013	1.4257	43.84	4.49
1802	1.6079	47.20	4.84
1589	1.8427	49.46	5.07
1333	2.2378	50.86	5.21
1182	2.5457	51.02	5.23

* Dew Point Pressure

- (1) Cubic feet of gas at indicated pressure and temperature per cubic foot at saturation pressure
- (2) Barrels of liquid at indicated pressure and temperature per MMSCF of original reservoir fluid
- (3) Percent of reservoir hydrocarbon pore space at dew point

P E T R O L A B

Company: Santos Limited
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CONSTANT VOLUME DEPLETION STUDY
@ 230 deg F

Pressure (psig)	Cumulative Produced Fluid (1)	Deviation Factor (Z)		Gas Viscosity (Centipoise)	Retrograde Liquid	
		Liberated Gas	Two Phase		(BBL/ MMSCF) (2)	(Vol. %) (3)
2875 *	0.000	0.812	0.812	0.0248	0.00	0.00
2506	12.525	0.821	0.810	0.0212	28.57	2.93
2201	23.011	0.833	0.809	0.0193	36.65	3.76
1885	33.615	0.849	0.804	0.0177	43.00	4.41
1598	44.475	0.865	0.816	0.0166	45.49	4.66
1296	55.343	0.890	0.825	0.0155	45.88	4.70
997	65.348	0.912	0.820	0.0146	45.30	4.64
696	75.382	0.938	0.811	0.0139	43.67	4.48
397	85.266	0.966	0.785	0.0132	41.34	4.24

* Dew Point Pressure

(1) Wellstream produced : Cumulative volume percent of initial fluid

(2) Barrels of liquid at indicated pressure and temperature per
MMSCF of original reservoir fluid

(3) Percent of reservoir hydrocarbon pore space at dew point

P E T R O L A B

Company: Santos Limited
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PRODUCED WELLSTREAM COMPOSITIONS

Pressure (psig):	2875	2506	2201
Component	Mol %	Mol %	Mol %
Hydrogen Sulphide	0.00	0.00	0.00
Carbon Dioxide	5.07	5.14	5.19
Nitrogen	2.21	2.26	2.28
Methane	66.56	68.65	69.10
Ethane	10.33	10.39	10.43
Propane	6.33	6.25	6.21
Iso-Butane	1.24	1.20	1.18
N-Butane	2.28	2.18	2.14
Iso-Pentane	0.78	0.73	0.70
N-Pentane	0.84	0.77	0.74
Hexanes	1.10	0.95	0.88
Heptanes	1.35	0.70	0.58
Octanes	0.64	0.30	0.23
Nonanes	0.44	0.18	0.13
Decanes	0.27	0.10	0.07
Undecanes	0.16	0.06	0.04
Dodecanes Plus	0.40	0.14	0.10
TOTAL	100.00	100.00	100.00
<u>Stream Properties</u>			
Molecular Weight :	27.50	25.34	24.89
Gravity (AIR = 1.000) :	0.955	0.879	0.863
Gross HV (BTU/SCF) :	1471	1352	1326
Nett HV (BTU/SCF) :	1341	1230	1206
Wobbe Index :	1505	1442	1427
Critical Pressure (psia):	664.4	671.0	672.5
Critical Temperature (R):	444.3	429.6	426.4
<u>G P M Content</u>			
Ethane Plus :	8.267	7.195	6.959
Propane Plus :	5.511	4.423	4.176
Butanes Plus :	3.771	2.705	2.469
Pentanes Plus :	2.649	1.627	1.411
<u>Heptanes Plus Properties</u>			
Mol % :	3.26	1.48	1.15
Molecular Weight :	120.8	115.4	113.1
Density (gm/cc @ 60 F) :	0.763	0.758	0.755
Gravity (API @ 60 F) :	53.7	55.1	55.6
<u>Octanes Plus Properties</u>			
Mol % :	1.91	0.78	0.57
Molecular Weight :	138.4	132.7	130.5
Density (gm/cc @ 60 F) :	0.779	0.774	0.772
Gravity (API @ 60 F) :	49.9	51.1	51.5
<u>Decanes Plus Properties</u>			
Mol % :	0.83	0.30	0.21
Molecular Weight :	171.8	165.5	162.2
Density (gm/cc @ 60 F) :	0.805	0.800	0.798
Gravity (API @ 60 F) :	44.2	45.2	45.7
<u>Undecanes Plus Properties</u>			
Mol % :	0.56	0.20	0.14
Molecular Weight :	190.0	181.3	176.3
Density (gm/cc @ 60 F) :	0.816	0.811	0.808
Gravity (API @ 60 F) :	41.6	42.8	43.5
<u>Dodecanes Plus Properties</u>			
Molecular Weight :	207.2	196.0	188.0
Density (gm/cc @ 60 F) :	0.827	0.820	0.815
Gravity (API @ 60 F) :	39.5	40.9	41.9

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Company: Santos Limited
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PRODUCED WELLSTREAM COMPOSITIONS

Pressure (psig):	1885	1598	1296
Component	Mol %	Mol %	Mol %
Hydrogen Sulphide	0.00	0.00	0.00
Carbon Dioxide	5.24	5.24	5.25
Nitrogen	2.32	2.32	2.32
Methane	69.40	69.31	69.13
Ethane	10.50	10.52	10.57
Propane	6.19	6.23	6.28
Iso-Butane	1.16	1.17	1.18
N-Butane	2.09	2.11	2.14
Iso-Pentane	0.67	0.68	0.69
N-Pentane	0.71	0.71	0.72
Hexanes	0.81	0.81	0.81
Heptanes	0.46	0.48	0.50
Octanes	0.19	0.18	0.19
Nonanes	0.10	0.09	0.08
Decanes	0.05	0.05	0.05
Undecanes	0.03	0.03	0.02
Dodecanes Plus	0.08	0.07	0.07
TOTAL	100.00	100.00	100.00
<u>Stream Properties</u>			
Molecular Weight :	24.56	24.57	24.62
Gravity (AIR = 1.000) :	0.852	0.852	0.854
Gross HV (BTU/SCF) :	1306	1307	1309
Nett HV (BTU/SCF) :	1188	1189	1191
Wobbe Index :	1415	1416	1417
Critical Pressure (psia):	673.7	673.7	673.7
Critical Temperature (R):	423.9	424.2	424.8
<u>G P M Content</u>			
Ethane Plus :	6.787	6.807	6.853
Propane Plus :	3.986	4.000	4.033
Butanes Plus :	2.284	2.287	2.307
Pentanes Plus :	1.247	1.241	1.249
<u>Heptanes Plus Properties</u>			
Mol % :	0.91	0.90	0.91
Molecular Weight :	112.4	110.8	109.7
Density (gm/cc @ 60 F) :	0.755	0.753	0.752
Gravity (API @ 60 F) :	55.8	56.2	56.5
<u>Octanes Plus Properties</u>			
Mol % :	0.45	0.42	0.41
Molecular Weight :	129.1	127.8	126.4
Density (gm/cc @ 60 F) :	0.771	0.770	0.769
Gravity (API @ 60 F) :	51.9	52.1	52.4
<u>Decanes Plus Properties</u>			
Mol % :	0.16	0.15	0.14
Molecular Weight :	160.4	156.8	155.9
Density (gm/cc @ 60 F) :	0.797	0.794	0.793
Gravity (API @ 60 F) :	46.0	46.6	46.7
<u>Undecanes Plus Properties</u>			
Mol % :	0.11	0.10	0.09
Molecular Weight :	172.3	168.2	168.0
Density (gm/cc @ 60 F) :	0.805	0.802	0.802
Gravity (API @ 60 F) :	44.1	44.7	44.8
<u>Dodecanes Plus Properties</u>			
Molecular Weight :	181.8	177.3	174.0
Density (gm/cc @ 60 F) :	0.811	0.808	0.806
Gravity (API @ 60 F) :	42.7	43.4	43.9

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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PRODUCED WELLSTREAM COMPOSITIONS

Pressure (psig):	997	696	397
Component	Mol %	Mol %	Mol %
Hydrogen Sulphide	0.00	0.00	0.00
Carbon Dioxide	5.27	5.26	5.16
Nitrogen	2.33	2.30	2.21
Methane	68.81	68.10	66.67
Ethane	10.65	10.73	10.70
Propane	6.37	6.53	6.77
Iso-Butane	1.20	1.26	1.36
N-Butane	2.18	2.29	2.52
Iso-Pentane	0.70	0.75	0.87
N-Pentane	0.73	0.79	0.93
Hexanes	0.82	0.90	1.15
Heptanes	0.53	0.62	0.90
Octanes	0.20	0.23	0.33
Nonanes	0.08	0.09	0.18
Decanes	0.05	0.05	0.09
Undecanes	0.02	0.03	0.04
Dodecanes Plus	0.06	0.07	0.12
TOTAL	100.00	100.00	100.00
<u>Stream Properties</u>			
Molecular Weight :	24.73	25.10	26.14
Gravity (AIR = 1.000) :	0.858	0.871	0.907
Gross HV (BTU/SCF) :	1314	1335	1395
Nett HV (BTU/SCF) :	1196	1215	1271
Wobbe Index :	1419	1431	1465
Critical Pressure (psia):	673.5	672.5	669.0
Critical Temperature (R):	425.8	429.2	437.7
<u>G P M Content</u>			
Ethane Plus :	6.941	7.198	7.826
Propane Plus :	4.100	4.335	4.971
Butanes Plus :	2.349	2.540	3.110
Pentanes Plus :	1.271	1.409	1.873
<u>Heptanes Plus Properties</u>			
Mol % :	0.94	1.09	1.66
Molecular Weight :	108.5	108.5	110.1
Density (gm/cc @ 60 F) :	0.750	0.751	0.752
Gravity (API @ 60 F) :	56.9	56.9	56.4
<u>Octanes Plus Properties</u>			
Mol % :	0.41	0.47	0.76
Molecular Weight :	124.6	125.0	126.8
Density (gm/cc @ 60 F) :	0.767	0.767	0.769
Gravity (API @ 60 F) :	52.9	52.8	52.4
<u>Decanes Plus Properties</u>			
Mol % :	0.13	0.15	0.25
Molecular Weight :	153.9	154.9	157.0
Density (gm/cc @ 60 F) :	0.792	0.792	0.794
Gravity (API @ 60 F) :	47.1	46.9	46.5
<u>Undecanes Plus Properties</u>			
Mol % :	0.08	0.10	0.16
Molecular Weight :	166.3	165.3	170.0
Density (gm/cc @ 60 F) :	0.801	0.800	0.803
Gravity (API @ 60 F) :	45.0	45.2	44.5
<u>Dodecanes Plus Properties</u>			
Molecular Weight :	172.7	173.2	177.7
Density (gm/cc @ 60 F) :	0.805	0.806	0.809
Gravity (API @ 60 F) :	44.1	44.0	43.3

P E T R O L A B

Company: Santos Limited
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CALCULATED RETROGRADE LIQUID COMPOSITIONS

Pressure (psig): 2506 2201 1885

Component Mol % Mol % Mol %

Hydrogen Sulphide	0.00	0.00	0.00
Carbon Dioxide	3.17	3.00	2.79
Nitrogen	1.03	0.88	0.71
Methane	12.30	20.09	26.06
Ethane	8.85	8.54	8.15
Propane	8.51	8.43	8.28
Iso-Butane	2.33	2.34	2.34
N-Butane	4.79	4.82	4.85
Iso-Pentane	2.19	2.23	2.25
N-Pentane	2.59	2.62	2.66
Hexanes	4.94	5.01	5.07
Heptanes Plus	49.30	42.04	36.84
TOTAL	100.00	100.00	100.00

Stream Properties

Molecular Weight :	83.6	75.5	69.5
Density @ P & T :	0.551	0.516	0.499

Hexanes Plus Properties

Mol % :	54.24	47.05	41.91
Molecular Weight :	121.3	120.4	119.2
Density (gm/cc @ 60 F):	0.768	0.766	0.762
Gravity (API @ 60 F) :	52.6	53.0	54.0

Heptanes Plus Properties

Molecular Weight :	125.1	124.8	124.0
Density (gm/cc @ 60 F):	0.774	0.774	0.770
Gravity (API @ 60 F) :	51.1	51.3	52.1

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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CALCULATED RETROGRADE
LIQUID COMPOSITIONS

Pressure (psig):	1598	1296	997
Component	Mol %	Mol %	Mol %
Hydrogen Sulphide	0.00	0.00	0.00
Carbon Dioxide	2.54	2.24	1.89
Nitrogen	0.55	0.40	0.27
Methane	21.69	20.16	19.83
Ethane	7.64	6.95	6.07
Propane	8.10	7.70	7.08
Iso-Butane	2.36	2.32	2.23
N-Butane	4.95	4.92	4.76
Iso-Pentane	2.36	2.41	2.40
N-Pentane	2.82	2.91	2.91
Hexanes	5.54	5.84	6.09
Heptanes Plus	41.45	44.15	46.47
TOTAL	100.00	100.00	100.00

Stream Properties

Molecular Weight :	74.9	77.9	80.2
Density @ P & T :	0.496	0.495	0.498

Hexanes Plus Properties

Mol % :	46.99	49.99	52.56
Molecular Weight :	119.6	119.9	120.2
Density (gm/cc @ 60 F):	0.764	0.765	0.766
Gravity (API @ 60 F) :	53.6	53.4	53.0

Heptanes Plus Properties

Molecular Weight :	124.4	124.7	125.0
Density (gm/cc @ 60 F):	0.772	0.773	0.774
Gravity (API @ 60 F) :	51.7	51.4	51.1

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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CALCULATED RETROGRADE LIQUID COMPOSITIONS

Pressure (psig): 696 397 *

Component Mol % Mol %

Hydrogen Sulphide	0.00	0.00
Carbon Dioxide	1.45	1.00
Nitrogen	0.15	0.22
Methane	17.47	8.19
Ethane	4.86	3.34
Propane	6.03	3.97
Iso-Butane	1.99	1.25
N-Butane	4.35	2.78
Iso-Pentane	2.31	1.95
N-Pentane	2.85	2.54
Hexanes	6.31	3.66
Heptanes Plus	52.23	71.10
TOTAL	100.00	100.00

Stream Properties

Molecular Weight	:	85.9	115.7
Density @ P & T	:	0.506	0.675

Hexanes Plus Properties

Mol %	:	58.54	74.76
Molecular Weight	:	120.9	141.1
Density (gm/cc @ 60 F):	:	0.768	0.784
Gravity (API @ 60 F)	:	52.5	48.9

Heptanes Plus Properties

Molecular Weight	:	125.4	144.0
Density (gm/cc @ 60 F):	:	0.776	0.787
Gravity (API @ 60 F)	:	50.7	48.1

* Abandonment Pressure Liquid Phase analysed

PETROLAB

Company: Santos Limited
Well : Kujani # 1

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EQUILIBRIUM RATIOS (K - VALUES) *

Component	PRESSURE (psig)							
	2506	2201	1885	1598	1296	997	696	397
Carbon Dioxide	1.625	1.731	1.877	2.060	2.340	2.783	3.616	5.658
Nitrogen	2.185	2.611	3.271	4.200	5.811	8.735	15.030	32.889
Methane	5.582	3.440	2.664	3.195	3.429	3.469	3.899	6.016
Ethane	1.174	1.221	1.288	1.377	1.521	1.754	2.208	3.344
Propane	0.734	0.737	0.748	0.770	0.816	0.900	1.083	1.564
Iso-Butane	0.514	0.504	0.496	0.496	0.509	0.540	0.632	0.881
N-Butane	0.456	0.443	0.431	0.427	0.434	0.458	0.526	0.725
Iso-Pentane	0.331	0.314	0.298	0.288	0.284	0.291	0.324	0.433
N-Pentane	0.299	0.282	0.266	0.253	0.248	0.252	0.278	0.367
Hexanes	0.193	0.176	0.159	0.147	0.139	0.135	0.143	0.180
Heptanes Plus	0.030	0.027	0.025	0.022	0.021	0.020	0.021	0.026

* Mol percent Component (i) in Produced Gas Phase divided by
Mol percent Component (i) in Calculated Liquid Phase.

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Client: Santos Limited
Well : Kujani # 1

PETROLAB

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CALCULATED CUMULATIVE RECOVERY DURING DEPLETION

Cumulative Recovery per MMSCF of Original Fluid*	Initial in Place	Dew Point 2875	Reservoir Pressure							
			2506	2201	1885	1598	1296	997	696	397
Well Stream - MSCF	1000	0	125.25	230.11	336.15	444.75	553.43	653.48	753.82	852.66
Stock Tank Liquid - Deg API @ 60		78.2	82.6	83.9	84.7	85.1	85.4	85.7	85.6	84.6
Cumulative Produced (Bbl)	0.00	0.00	4.45	7.52	10.10	12.72	15.37	17.87	20.79	24.93
Remaining in Vapor (Bbl)	65.41	65.41	29.79	21.01	14.62	12.06	9.62	7.44	5.91	4.80
In Retrograde Liquid (Bbl)	0.00	0.00	31.17	36.89	40.69	40.63	40.43	40.10	38.72	35.68
Primary Separator Gas - MSCF	849.55	0.00	113.22	209.41	307.86	408.65	509.34	601.74	693.16	779.89
Second Stage Gas - MSCF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stock Tank Gas - MSCF	88.21	0.00	7.53	13.05	17.95	23.03	28.23	33.25	39.11	46.92
Total "Plant Products" - Gallons										
In Well Stream										
Ethane	2756	0	347	639	936	1241	1547	1832	2119	2401
Propane	1740	0	215	394	575	761	948	1123	1304	1488
Butanes	1122	0	135	246	356	470	585	692	806	928
Pentanes Plus	2649	0	204	352	484	619	754	882	1023	1208
In Primary Separator Gas										
Ethane	2301	0	292	537	788	1044	1302	1542	1783	2020
Propane	1154	0	155	287	422	561	701	832	963	1090
Butanes	510	0	74	137	203	271	339	403	467	527
Pentanes Plus	241	0	34	65	96	129	162	191	220	248
In Secondary Separator Gas										
Ethane	0	0	0	0	0	0	0	0	0	0
Propane	0	0	0	0	0	0	0	0	0	0
Butanes	0	0	0	0	0	0	0	0	0	0
Pentanes Plus	0	0	0	0	0	0	0	0	0	0
Gas Oil Ratio*										
1st Sep. Gas/Stock Tank Liquid (SCF/BBL)		12987	25413	31408	38162	38422	37998	36882	31366	20944
1st+2nd Sep. Gas/Stock Tank Liquid (SCF/BBL)		12987	25413	31408	38162	38422	37998	36882	31366	20944
1st Sep. Gas/Produced WellStream (MSCF/MMSCF)		850	904	917	929	928	927	924	911	877
1st+2nd Sep. Gas/Produced WS (MSCF/MMSCF)		850	904	917	929	928	927	924	911	877
Stock Tank Liquid/Produced WS (STB/MMSCF)		65.41	35.57	29.21	24.33	24.15	24.38	25.04	29.05	41.90

*Primary Separator @ 1160 psig and 86 deg F; Stock Tank @ 14.696 psia and 60 deg F; No second stage

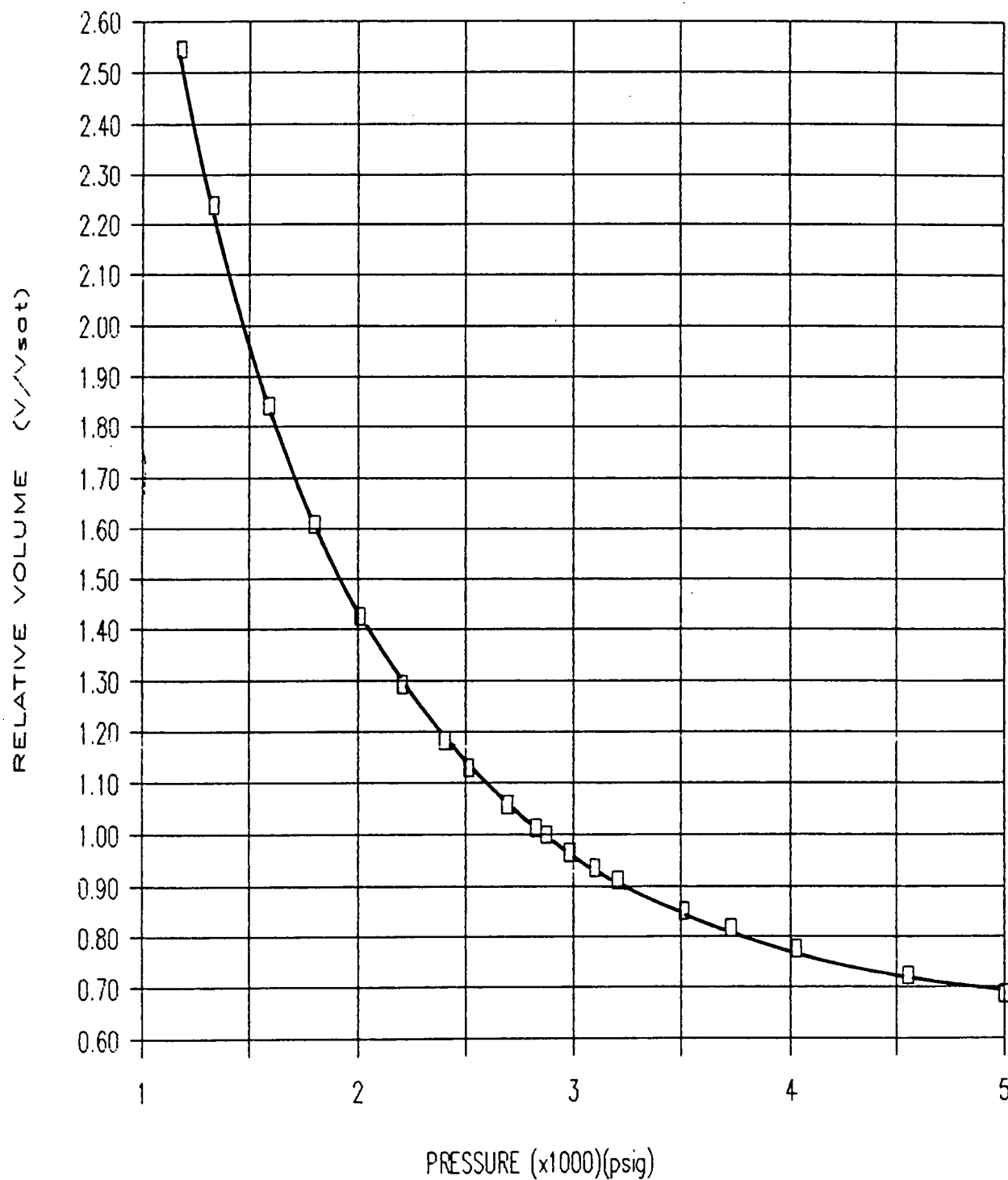
00131

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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RELATIVE VOLUME

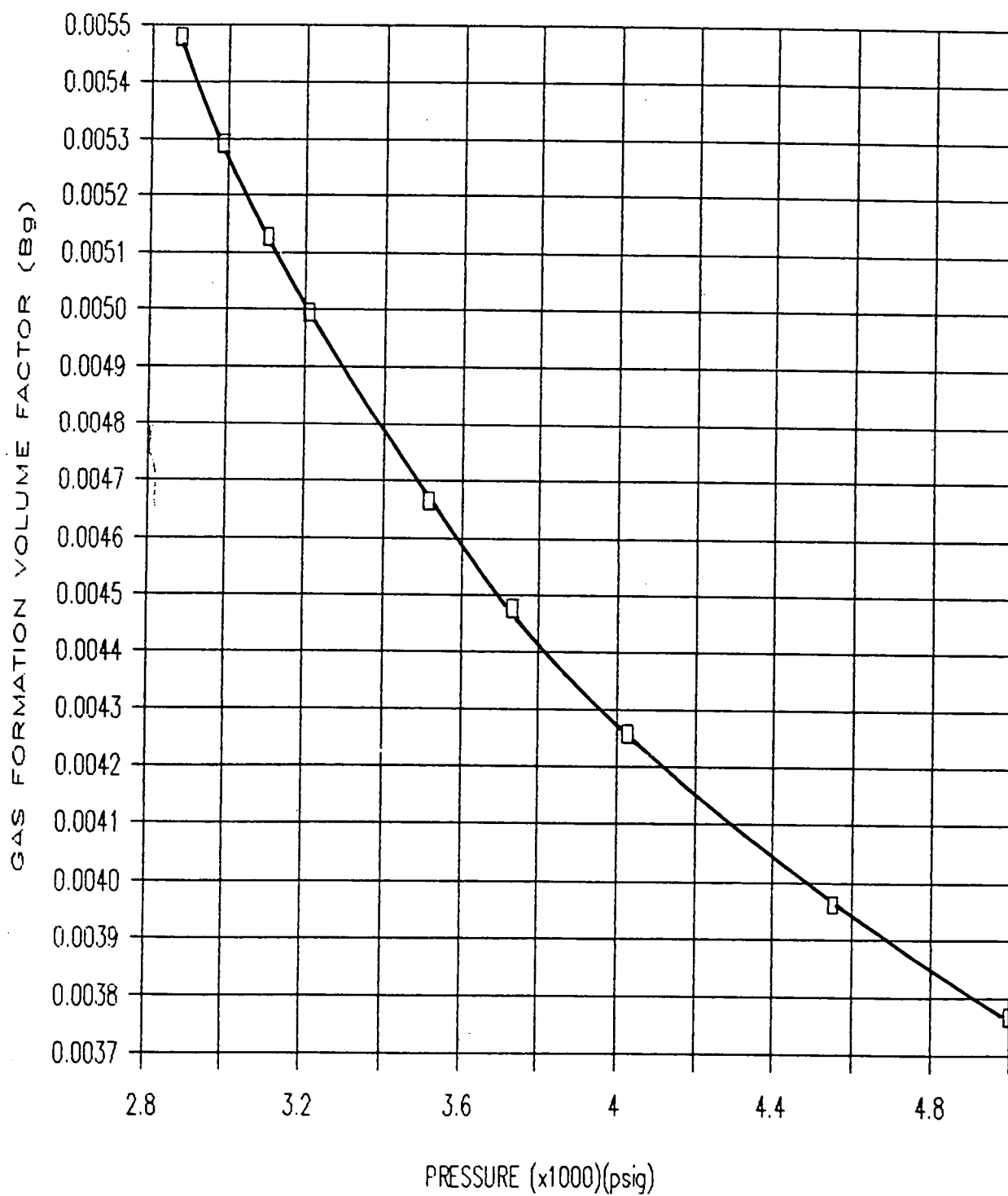


P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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GAS FORMATION VOLUME FACTOR

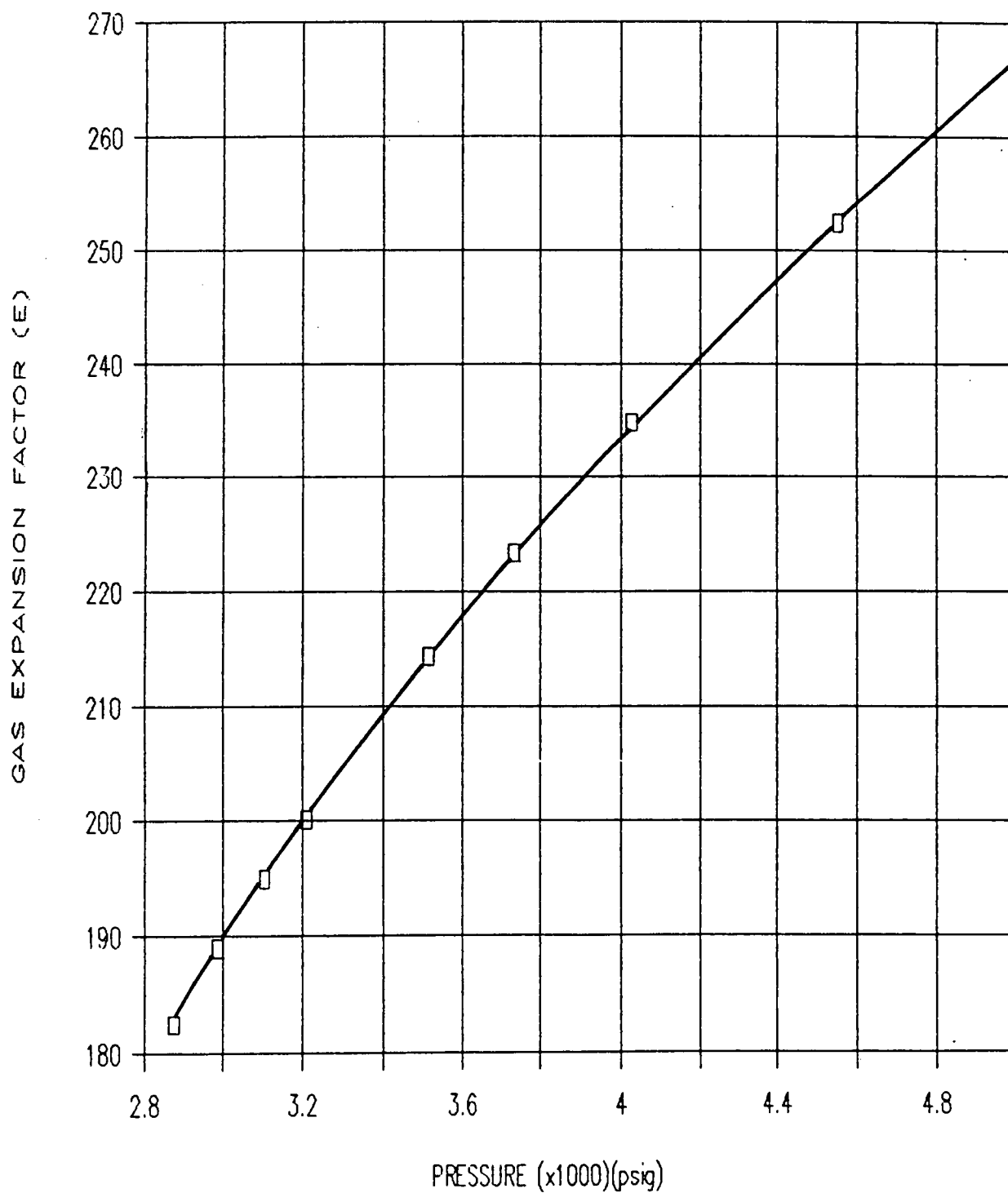


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GAS EXPANSION FACTOR

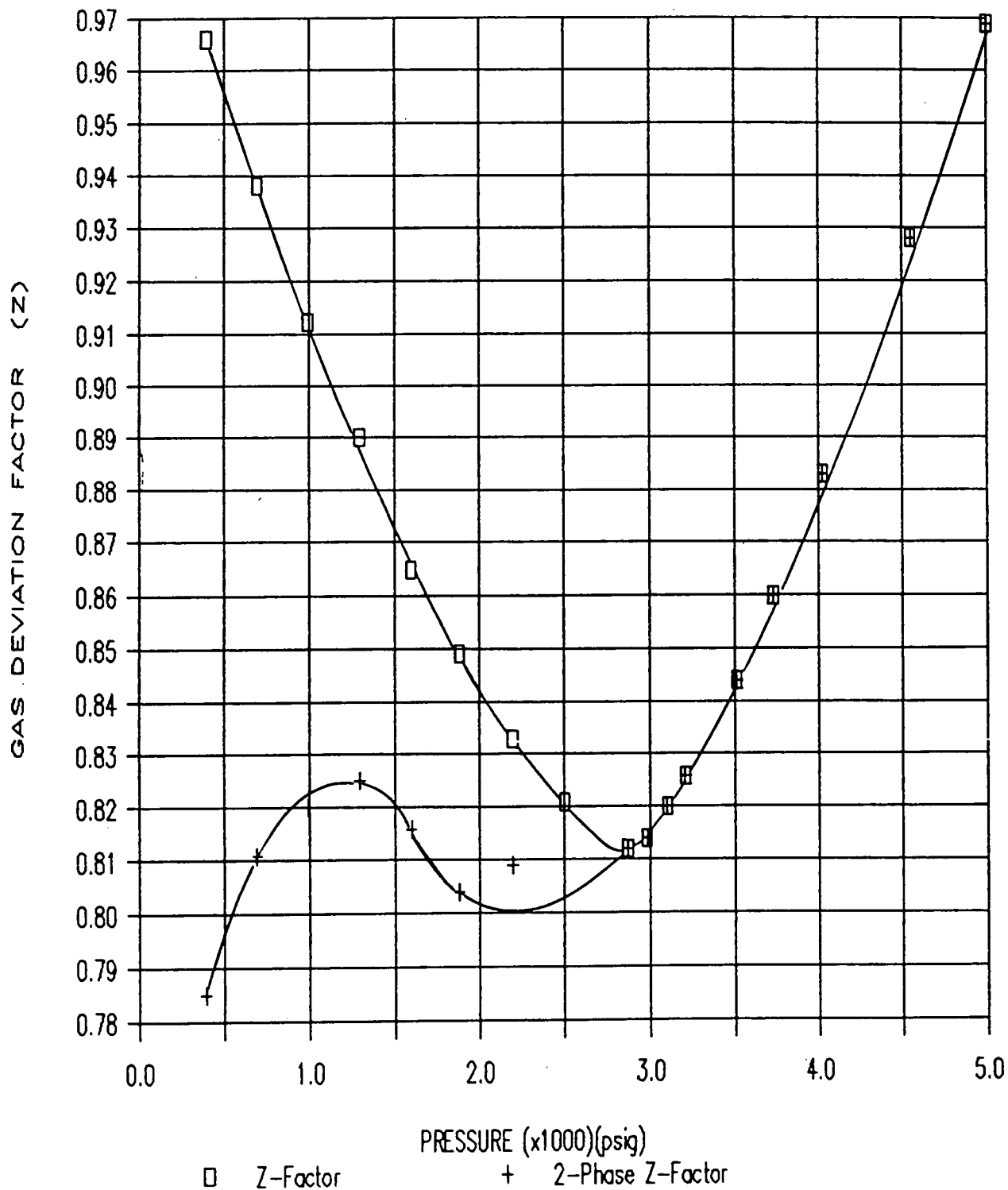


P E T R O L A B

Company: Santos Limited
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GAS DEVIATION FACTOR

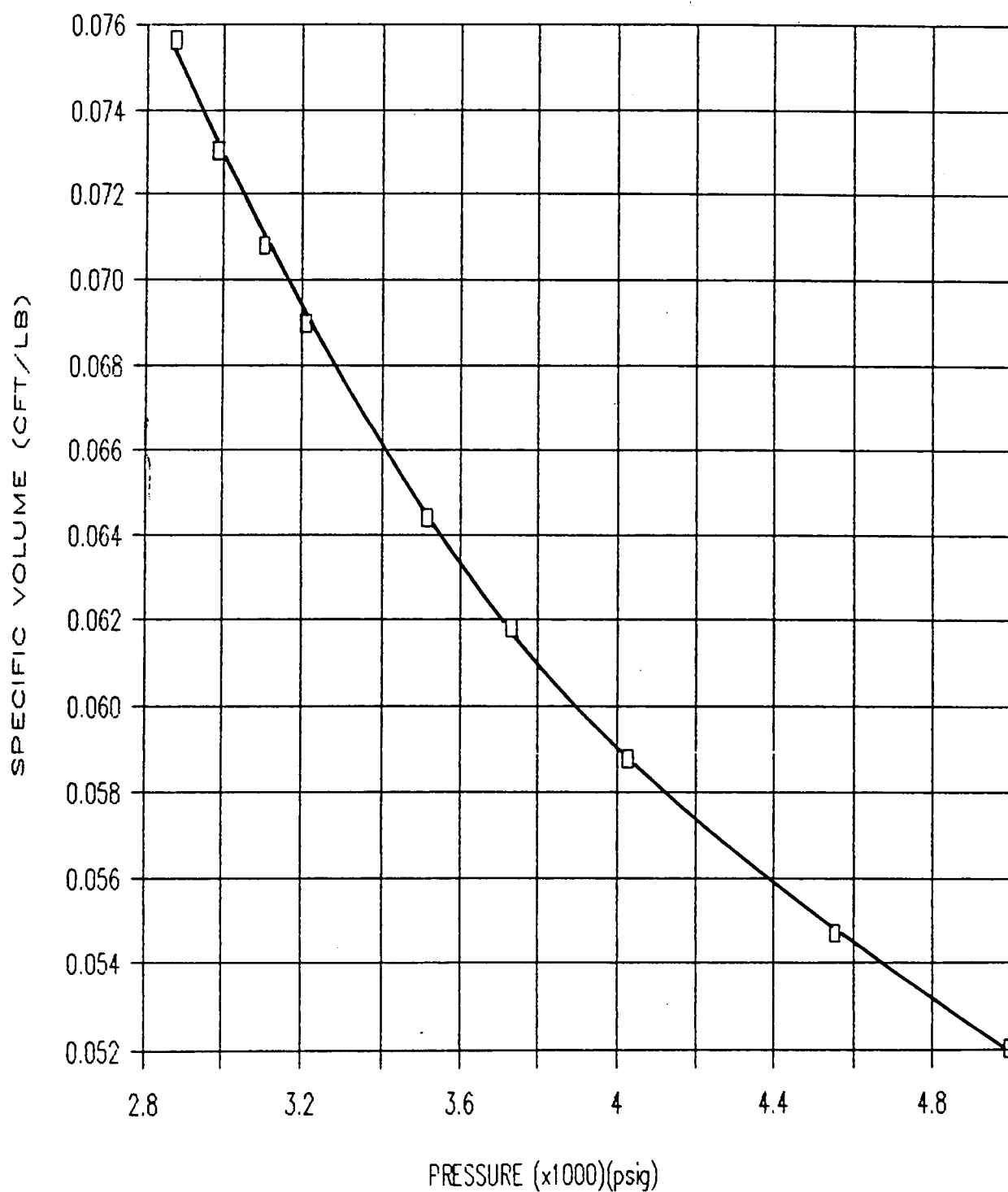


P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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RESERVOIR FLUID SPECIFIC VOLUME

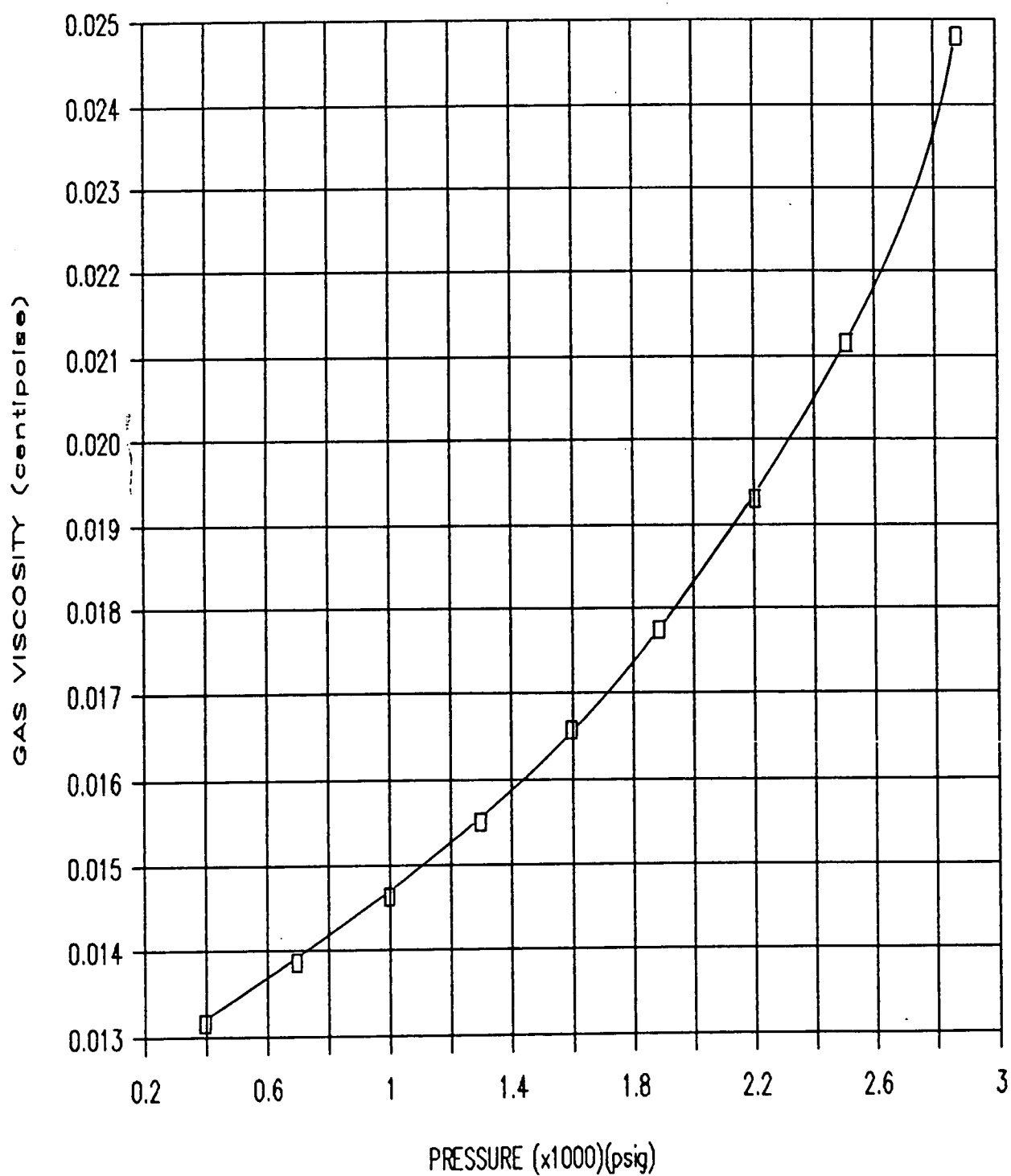


P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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VISCOSITY OF RESERVOIR FLUID

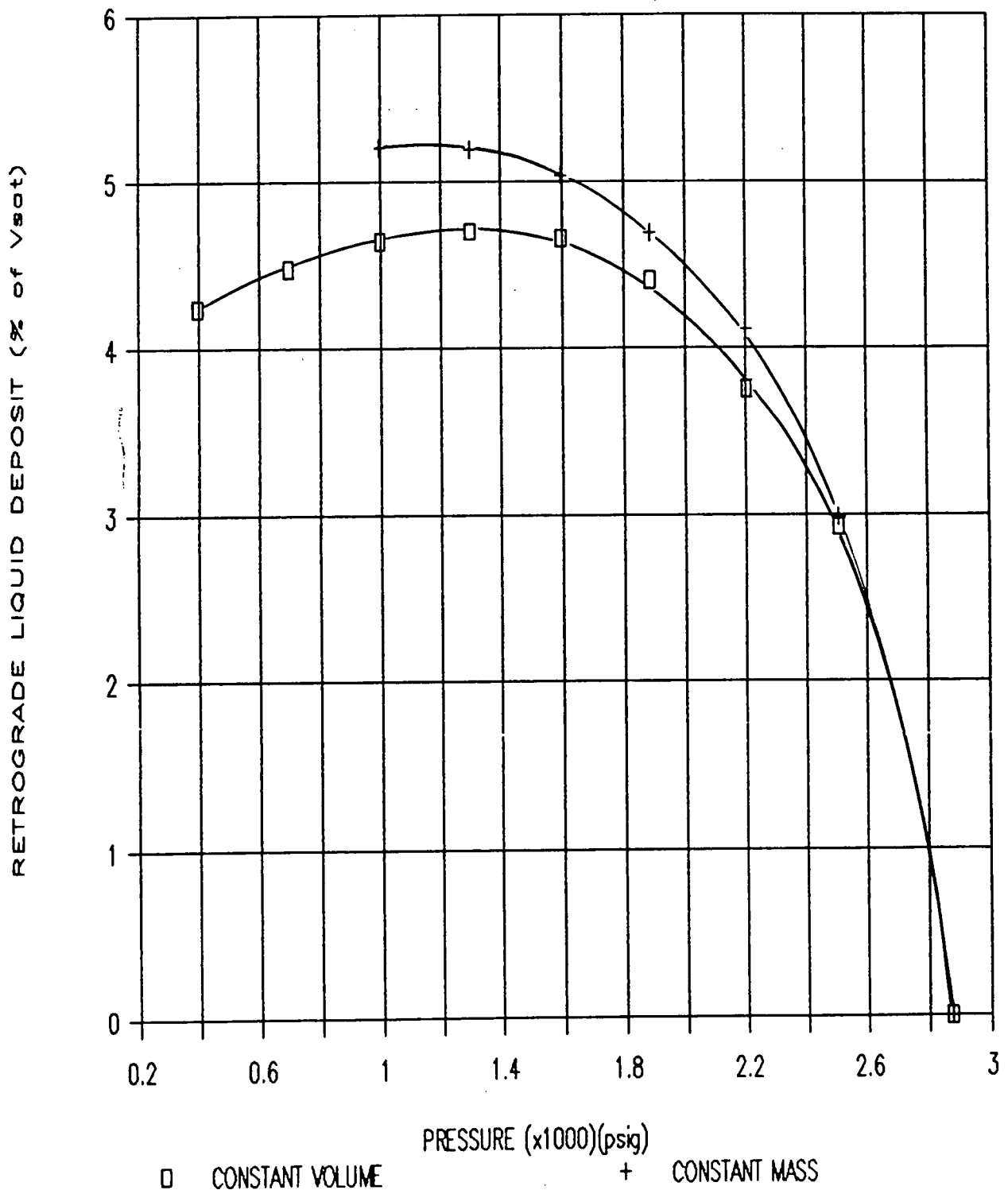


P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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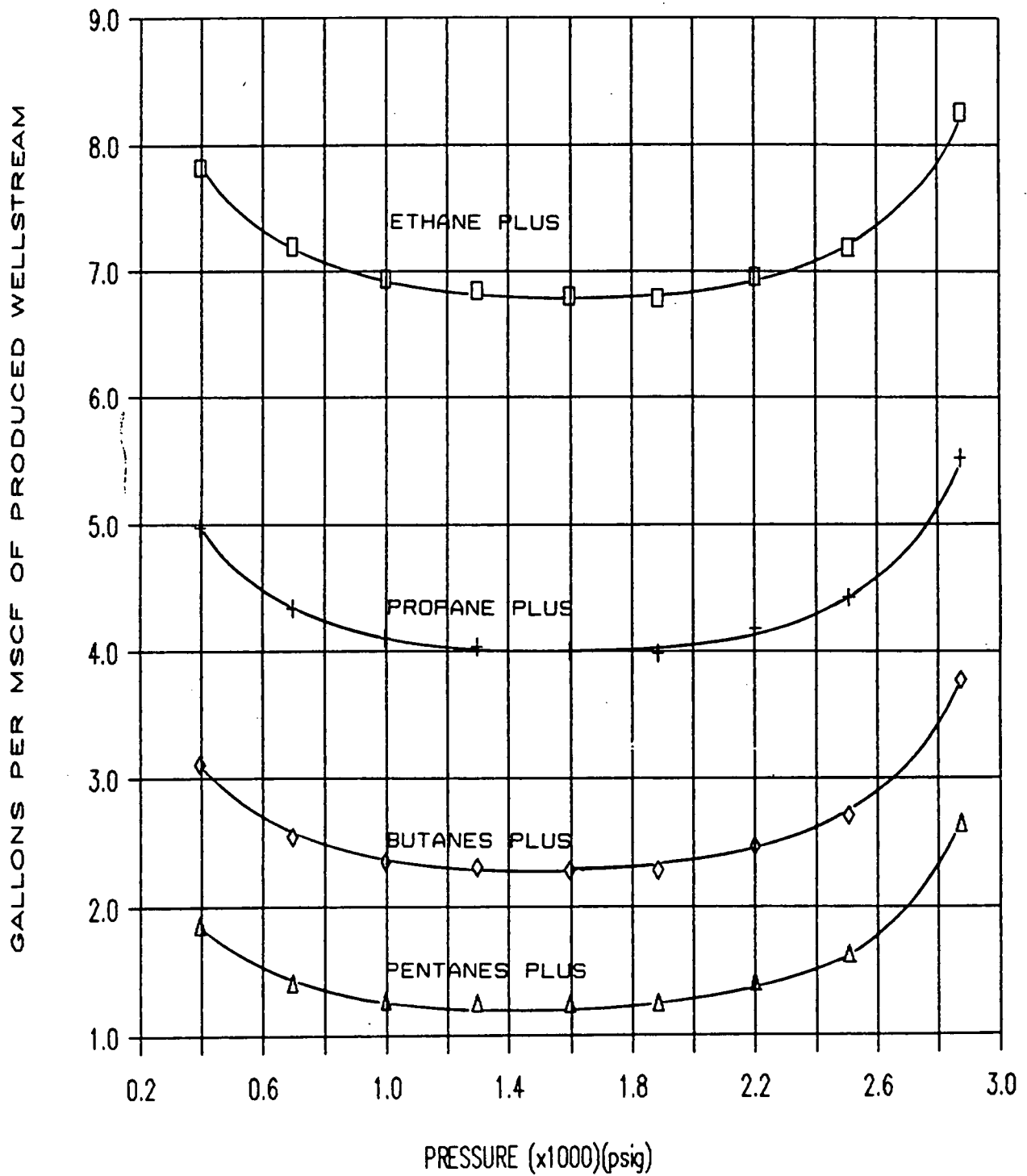
RETROGRADE CONDENSATION



P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

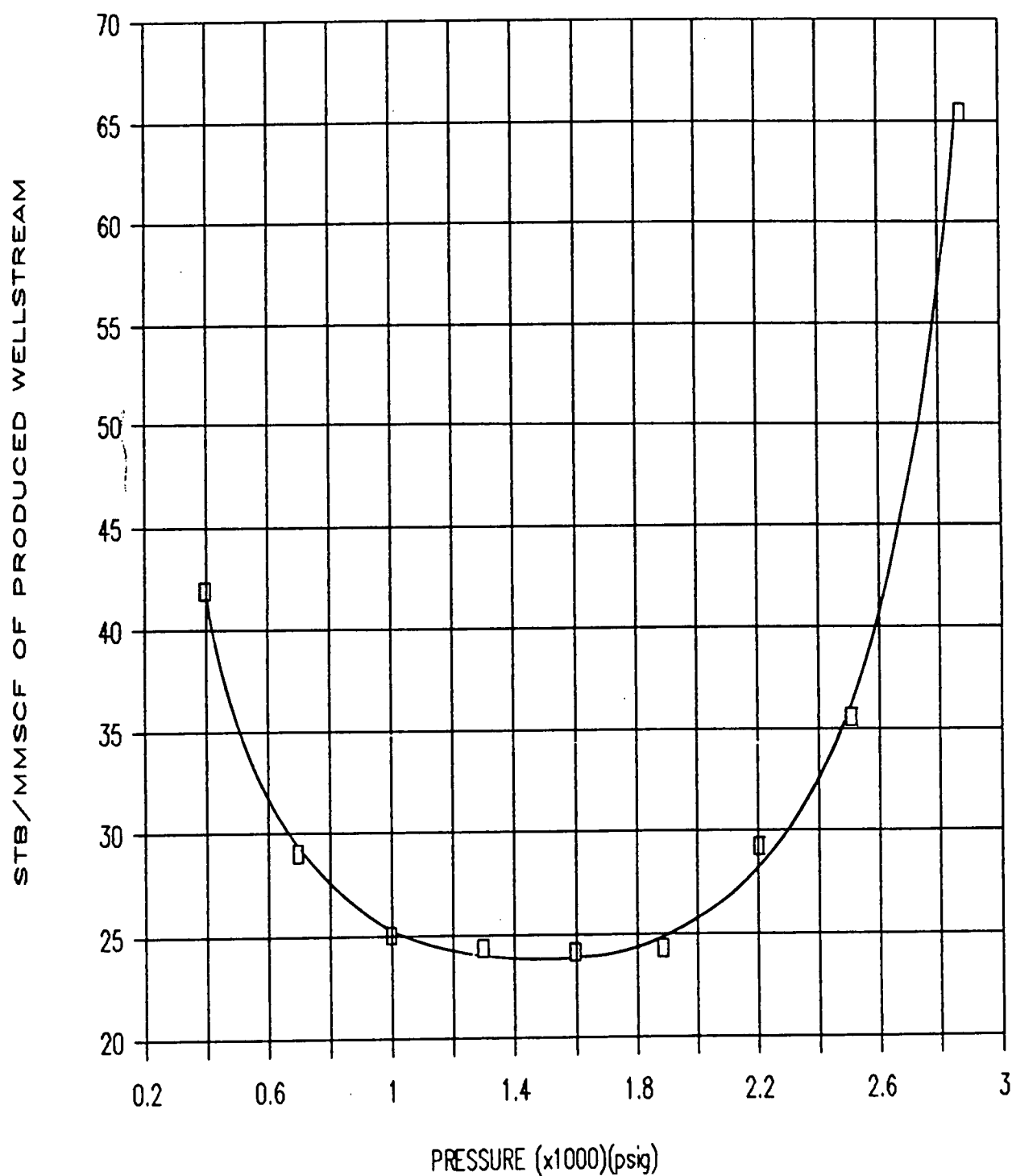
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G P M CONTENT
IN PRODUCED WELLSTREAM

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

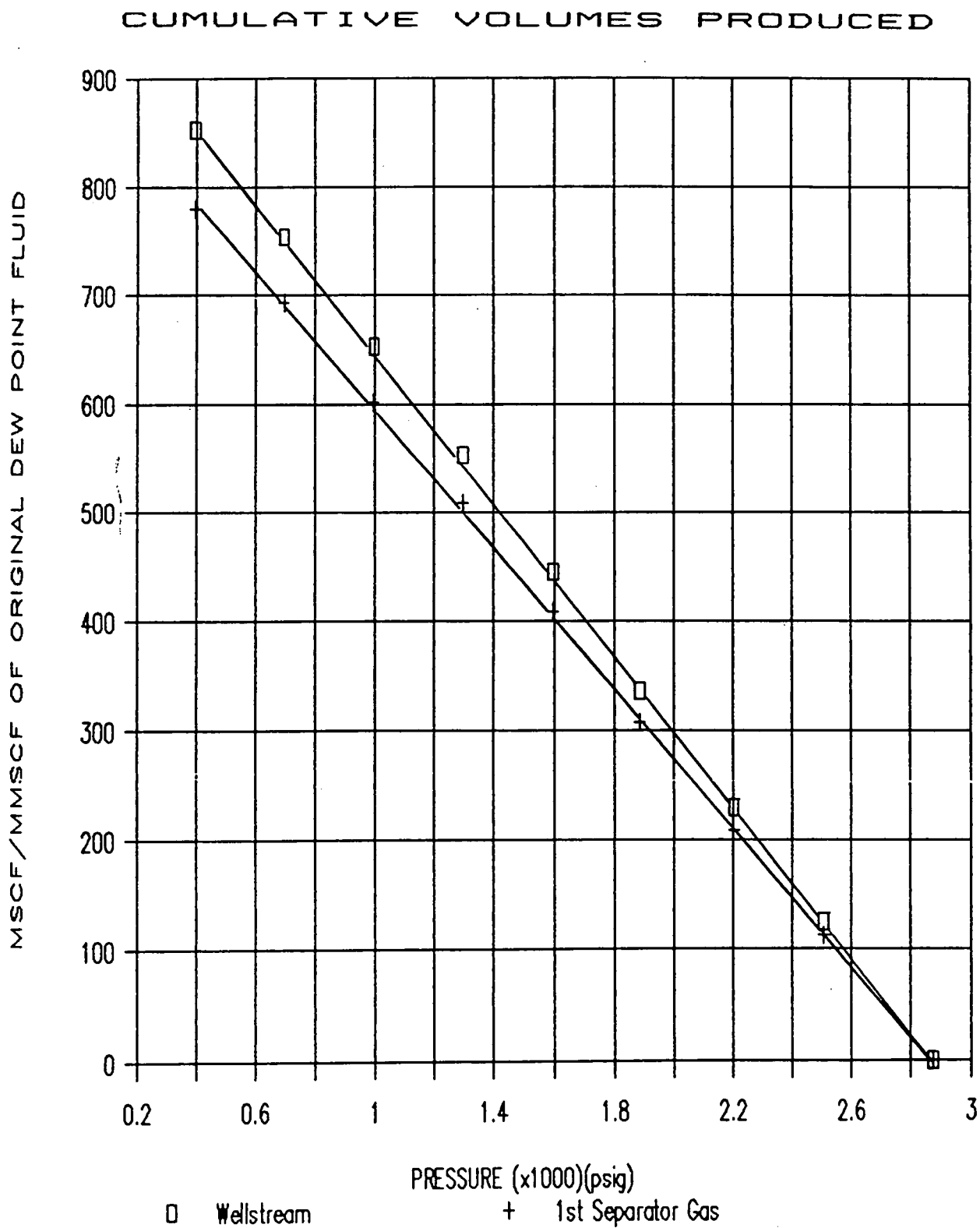
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File: S 91013

STOCK TANK LIQUID
IN PRODUCED WELLSTREAM

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

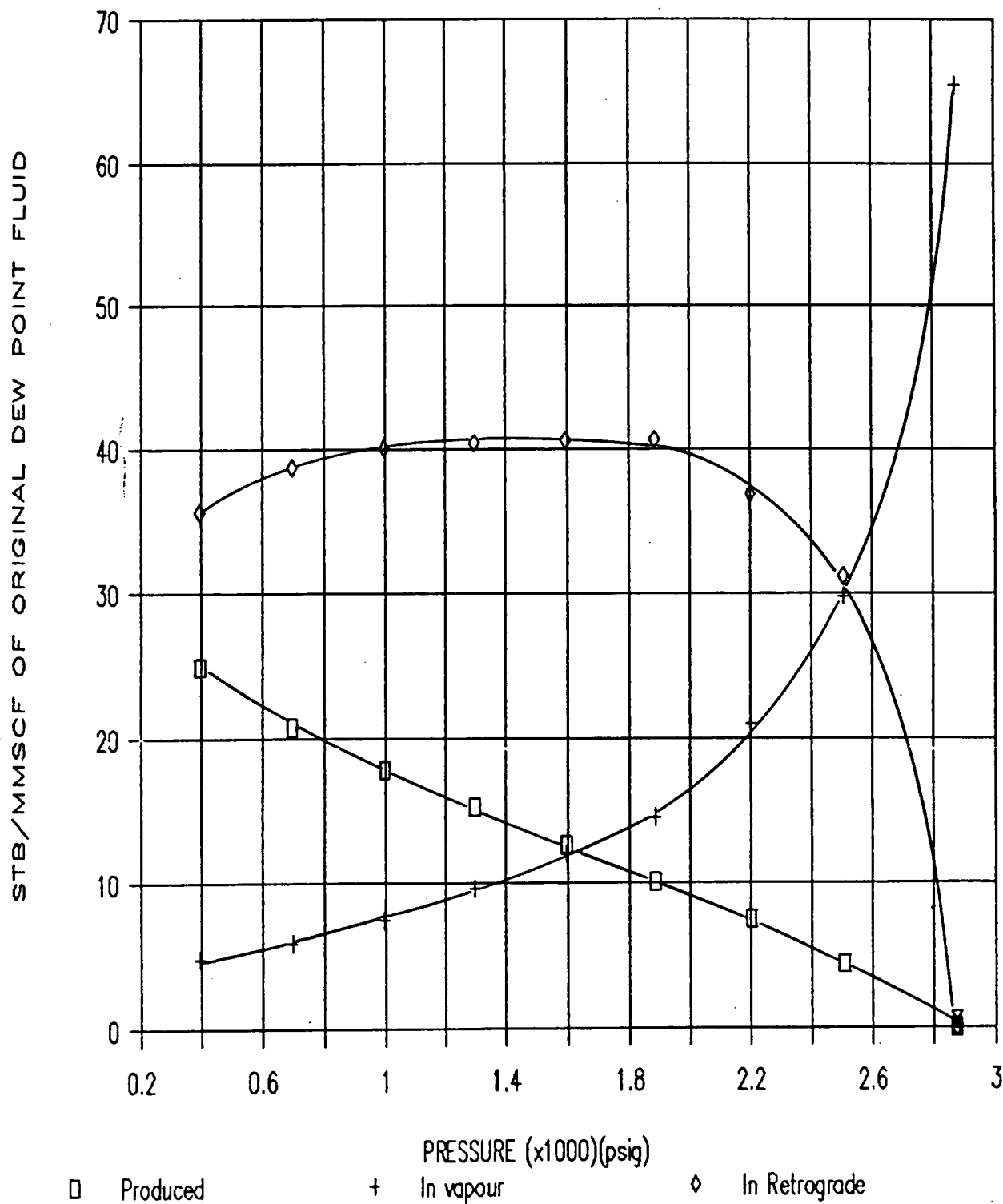
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P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

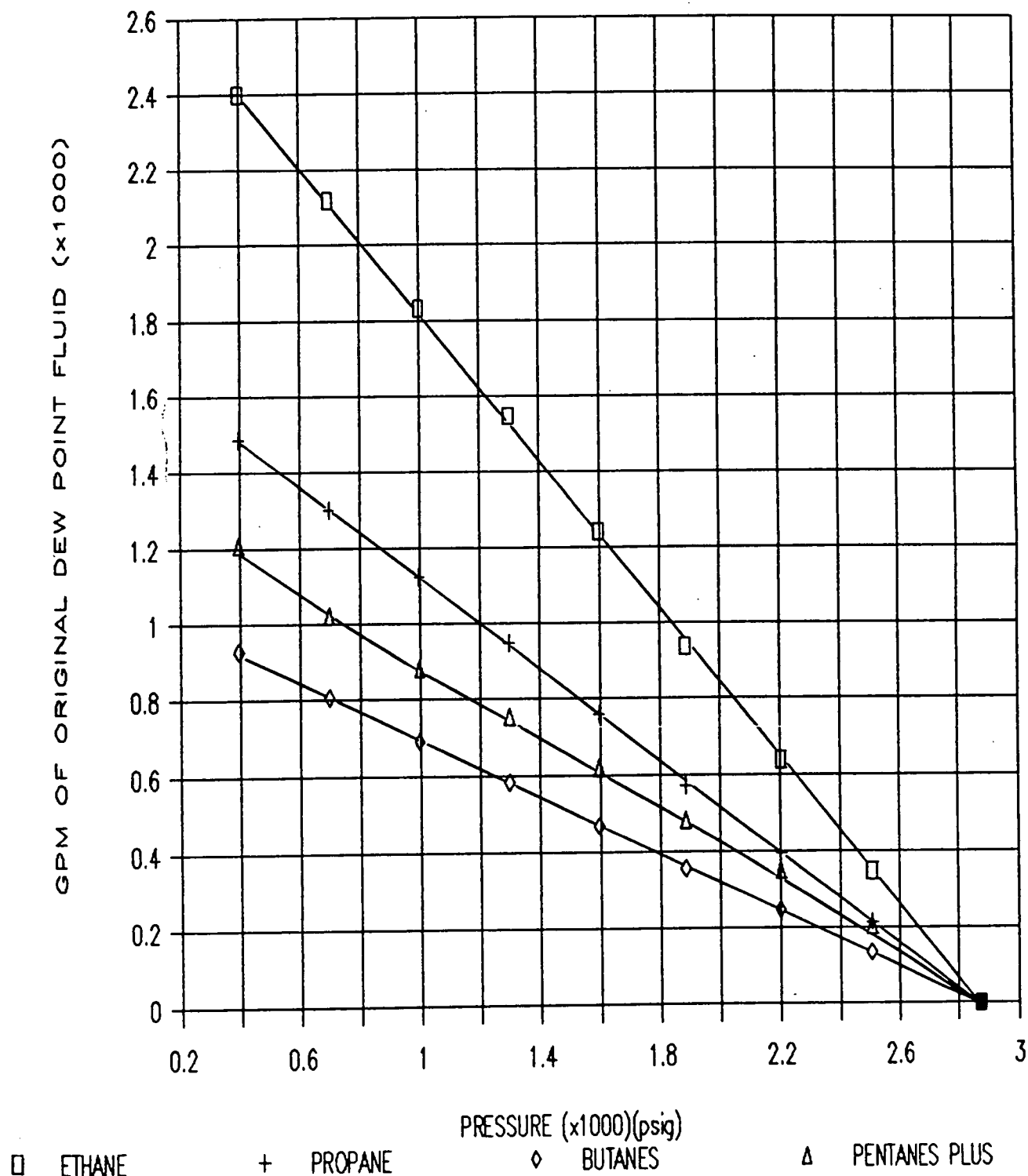
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File: S 91013

CUMULATIVE STOCK TANK LIQUID
PRODUCTION AND CONDENSATION

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

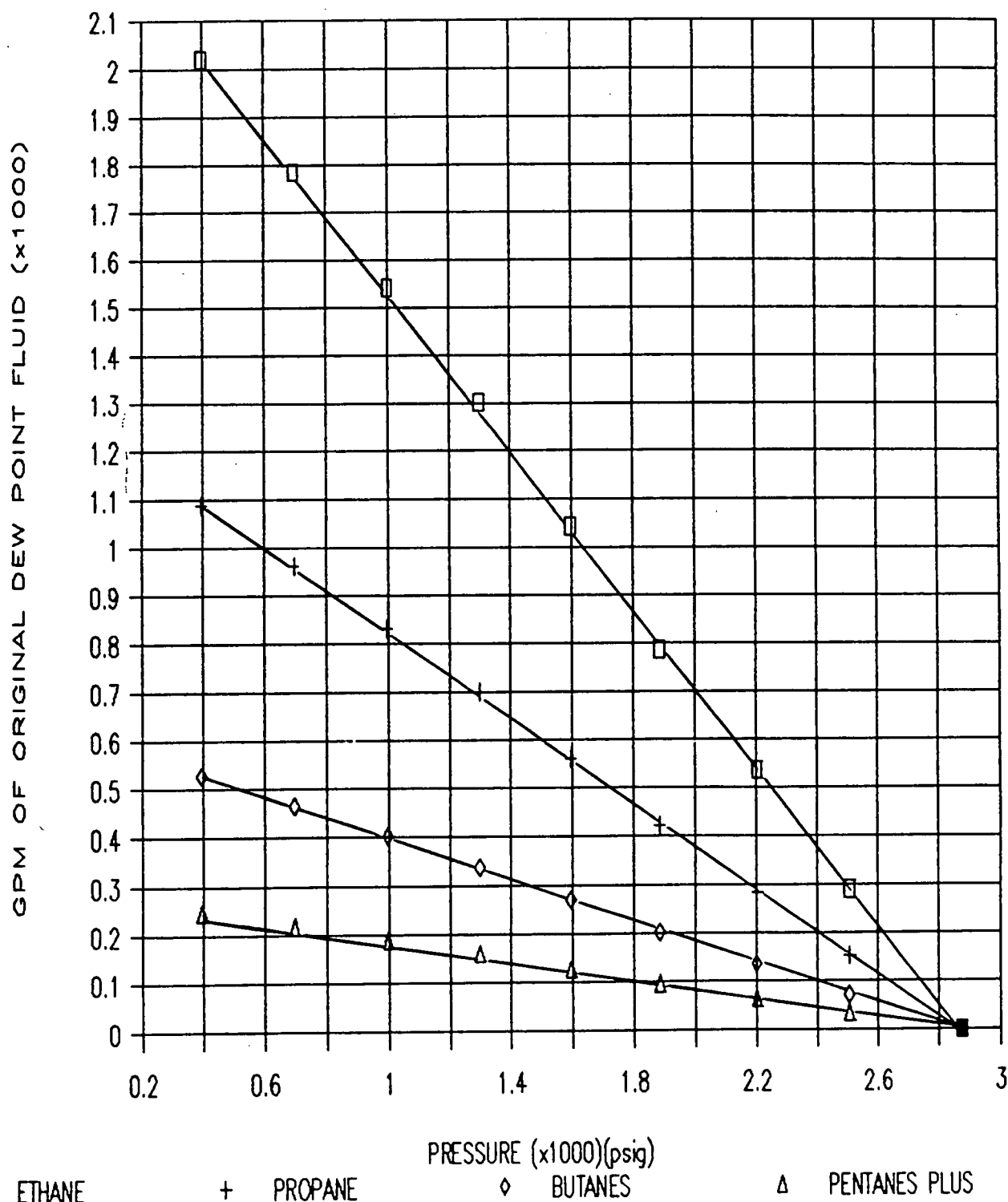
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PLANT PRODUCTS
IN PRODUCED WELLSTREAM

P E T R O L A B

Company: Santos Limited
Well : Kujani # 1

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PLANT PRODUCTS
IN PRIMARY SEPARATOR GAS

Kupini #1

Summary of Post - Frac Single Rate Test
and Buildup Survey

11 - 18 October 1991.

Flow Test

11-10-91 Opened well on 100% choke at 2000 hours.
 12-10-91 Ran in the hole with ameradas to 6690 ft KB @ 1407 hrs.
 Opened well back up on 100% choke @ 1410 hrs. and
 continued flow test until 1500 hrs on 13/10/91.

F.T.H.P. (final) = 9301 kPa

Separator Pressure = 8584 kPa

Separator Temperature = 70 °C

Gas Flow Rate = 215.4 $10^3 \text{ m}^3/\text{d}$ Oil Flow Rate = 35.791 m^3/d Water Flow Rate = 1.485 m^3/d

13-10-91 Shut well in at 1500 hours.

Element # 55994 @ 6678 ft. KB = 2072.2 psig

= 14288 kPa

Element # 53563 @ 6684 ft. KB = 2050.0 psig

= 14135 kPa

Buildup Survey

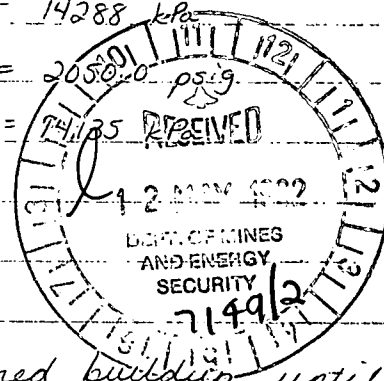
13-10-91 Shut well in @ 1500 hours and monitored buildup until
 1500 hours on 17/10/91 for a buildup time of 96 hours.

Element # 55994 @ 6678 ft. KB (final) = 2861.5 psig
 = (19730 kPa)

Element # 53563 @ 6684 ft. KB (final) = 2837.5 psig
 = (19565 kPa)

Element # 59548 @ 6690 ft. KB Max. BHT = 242.2 °F
 = (117 °C)

LEGAL BOSS



Kuyani #1

Post Frac Single Rate Test and Buildup

11 - 18 October 1991

Production SummaryCumulative production to end September 1991 = $6.2 \cdot 10^6 \text{ m}^3$ Average gas rate for September 1991 = $131.1 \cdot 10^3 \text{ m}^3/\text{d}$

Production time to test shut in = 12.6 days in October

October production = $12.6 \times 131.1 = 1655 \cdot 10^3 \text{ m}^3$ New cumulative production = $6200 \cdot 10^3 \text{ m}^3 + 1655 \cdot 10^3 \text{ m}^3 = 7855 \cdot 10^3 \text{ m}^3$

$$t = \frac{7855 \cdot 10^3 \text{ m}^3}{131.1 \cdot 10^3 \text{ m}^3/\text{d}} \times 24 \text{ hrs./day} = 1438 \text{ hrs.}$$

If test gas rate = $215.4 \cdot 10^3 \text{ m}^3/\text{d}$

$$t = \frac{7855 \cdot 10^3 \text{ m}^3}{215.4 \cdot 10^3 \text{ m}^3/\text{d}} \times 24 \text{ hrs./day} = 875 \text{ hrs.}$$

Static Gradient Survey

18-10-91 Static gradient survey was conducted. MPP = 6648 ft. KB.

Element # 55994 @ 6690 ft. KB = 2867 psig (19768 kPa)

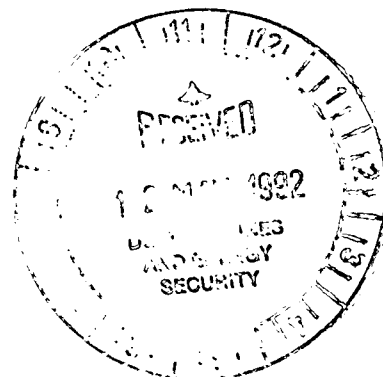
Element # 53563 @ 6690 ft. KB = 2831 psig (19520 kPa)

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 01 FIELD KUJANI	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 6678 FT KB
CASING	-	CASING PRESS	ON BOTTOM 1407 911012
LINER	-	TUBING PRESS	OFF BOTTOM 1500 911017
DATE 911012		ELEMENT RANGE 0 - 5162	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1500 911013
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 55994	MPP
TUBING	-		
UNITS ENGLISH		PURPOSE POST FRAC SRT & BUILDUP	

SURVEY DATA

CO. SANTOS			RUN 01 FIELD KUJANI			WELL 01		
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	
8:00	2072.2	2072.2	.0	22:23	2809.1	2809.1	14.4	
8:01	2198.3	2198.3	.0	0:46	2816.0	2816.0	16.8	
8:01	2286.9	2286.9	.0	4:31	2821.9	2821.9	20.5	
8:04	2386.4	2386.4	.1	8:16	2827.1	2827.1	24.3	
8:05	2463.9	2463.9	.1	10:48	2831.1	2831.1	26.8	
8:06	2556.1	2556.1	.1	15:21	2834.0	2834.0	31.3	
8:07	2595.8	2595.8	.1	20:54	2837.9	2837.9	36.9	
8:09	2613.8	2613.8	.2	1:53	2842.8	2842.8	41.9	
8:12	2633.8	2633.8	.2	6:41	2844.3	2844.3	46.7	
8:18	2651.0	2651.0	.3	12:22	2847.6	2847.6	52.4	
8:25	2666.9	2666.9	.4	17:57	2852.3	2852.3	57.9	
8:33	2676.6	2676.6	.5	0:09	2853.2	2853.2	64.2	
8:43	2688.4	2688.4	.7	8:51	2854.1	2854.1	72.9	
8:52	2697.6	2697.6	.9	15:43	2856.3	2856.3	79.7	
9:00	2704.7	2704.7	1.0	22:17	2860.1	2860.1	86.3	
9:10	2711.8	2711.8	1.2	4:48	2861.2	2861.2	92.8	
9:26	2719.4	2719.4	1.4	6:28	2860.2	2860.2	94.5	
9:38	2726.8	2726.8	1.6	8:00	2861.5	2861.5	96.0	
9:58	2733.8	2733.8	2.0	- 16:24	2074.3	2074.3	-24.4	
10:13	2740.1	2740.1	2.2	- 15:02	2073.6	2073.6	-23.0	
10:31	2743.8	2743.8	2.5	- 13:12	2066.1	2066.1	-21.2	
10:50	2748.5	2748.5	2.8	- 11:26	2065.2	2065.2	-19.4	
11:20	2756.5	2756.5	3.3	- 10:16	2064.5	2064.5	-18.3	
12:21	2764.9	2764.9	4.3	- 8:05	2063.3	2063.3	-16.1	
12:49	2769.6	2769.6	4.8	- 5:13	2061.7	2061.7	-13.2	
13:45	2778.0	2778.0	5.7	- 2:29	2068.7	2068.7	-10.5	
14:33	2783.0	2783.0	6.5	- 0:03	2073.6	2073.6	-8.1	
16:03	2788.9	2788.9	8.0		3:25	2083.5	-4.6	
17:22	2795.4	2795.4	9.4		5:02	2082.6	-3.0	
19:23	2803.5	2803.5	11.4		7:08	2075.3	-.9	

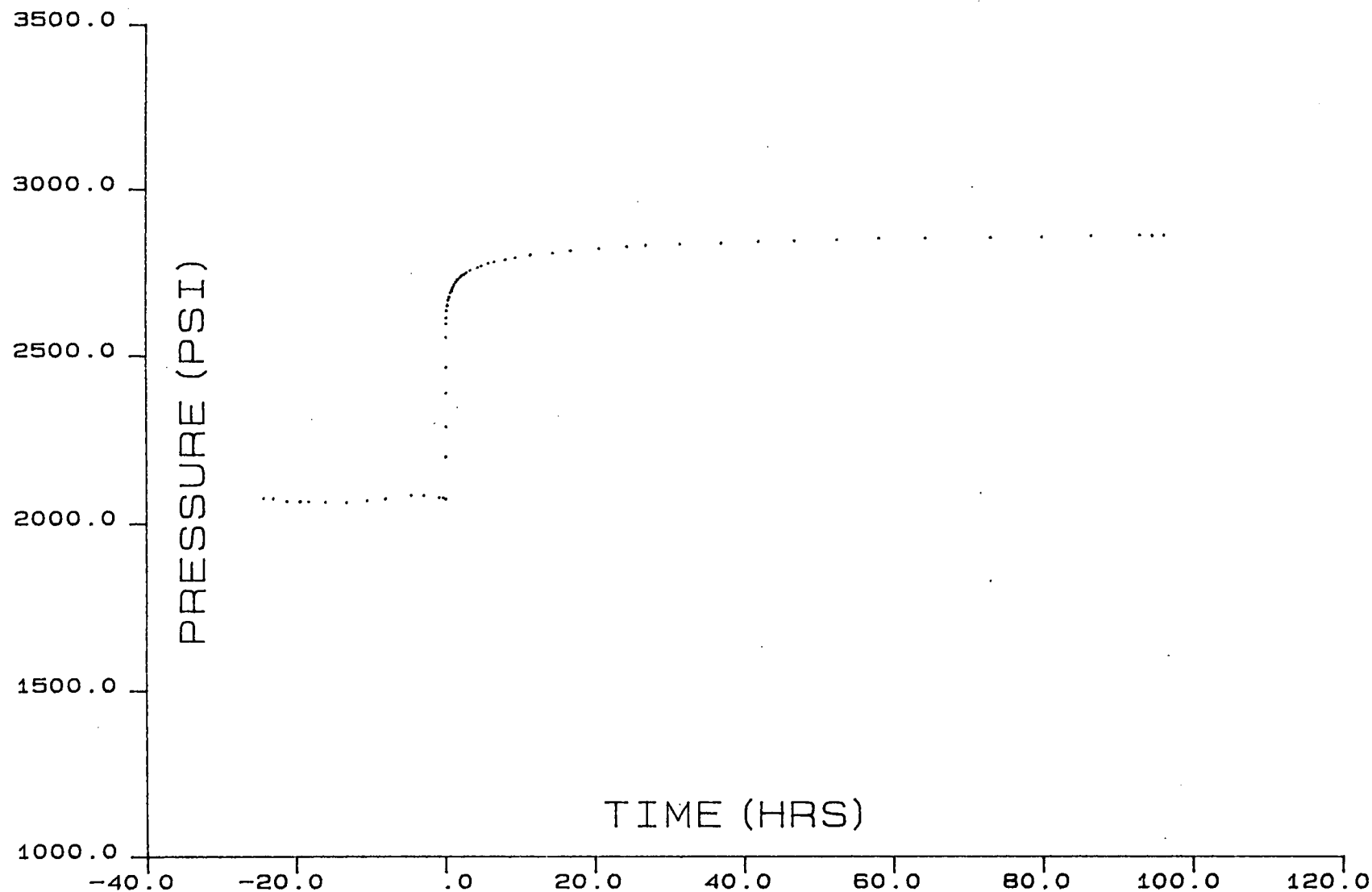


SURVEY DATA

CO. SANTOS				RUN 01 FIELD KUJANI				WELL 01			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME				
7:39	2075.0	2075.0	-.4	0:00	.0	.0	.0				

LUB IN DWT = 1343 PSI / OUT = 2236 PSI
LUB IN AMERADA = 1344 PSI / OUT = 2253 PSI

KUJANI #1 POST FRAC SINGLE RATE TEST AND
BUILDUP 12 - 18 OCTOBER 1991
ELEMENT #55994 @ 6678 FT KB



00149

SUB-SURFACE PRESSURE SURVEY

CO. SANTOS		RUN 02 FIELD KUJANI	WELL 01
EFF DEPTH		WELL STAT	TOOL HUNG 6684 FT KB
CASING	-	CASING PRESS	ON BOTTOM 1407 911012
LINER	-	TUBING PRESS	OFF BOTTOM 1500 911017
DATE 911012		ELEMENT RANGE 0 - 5275	ZERO POINT
ELEVATION		ZONE	SHUT-IN 1500 911013
MAX TEMP		PICK-UP	ON-PROD
PERF	-	CAL SER NO. 53563	MPP
TUBING	-		
UNITS ENGLISH		PURPOSE	POST FRAC SRT & BUILDUP

SURVEY DATA

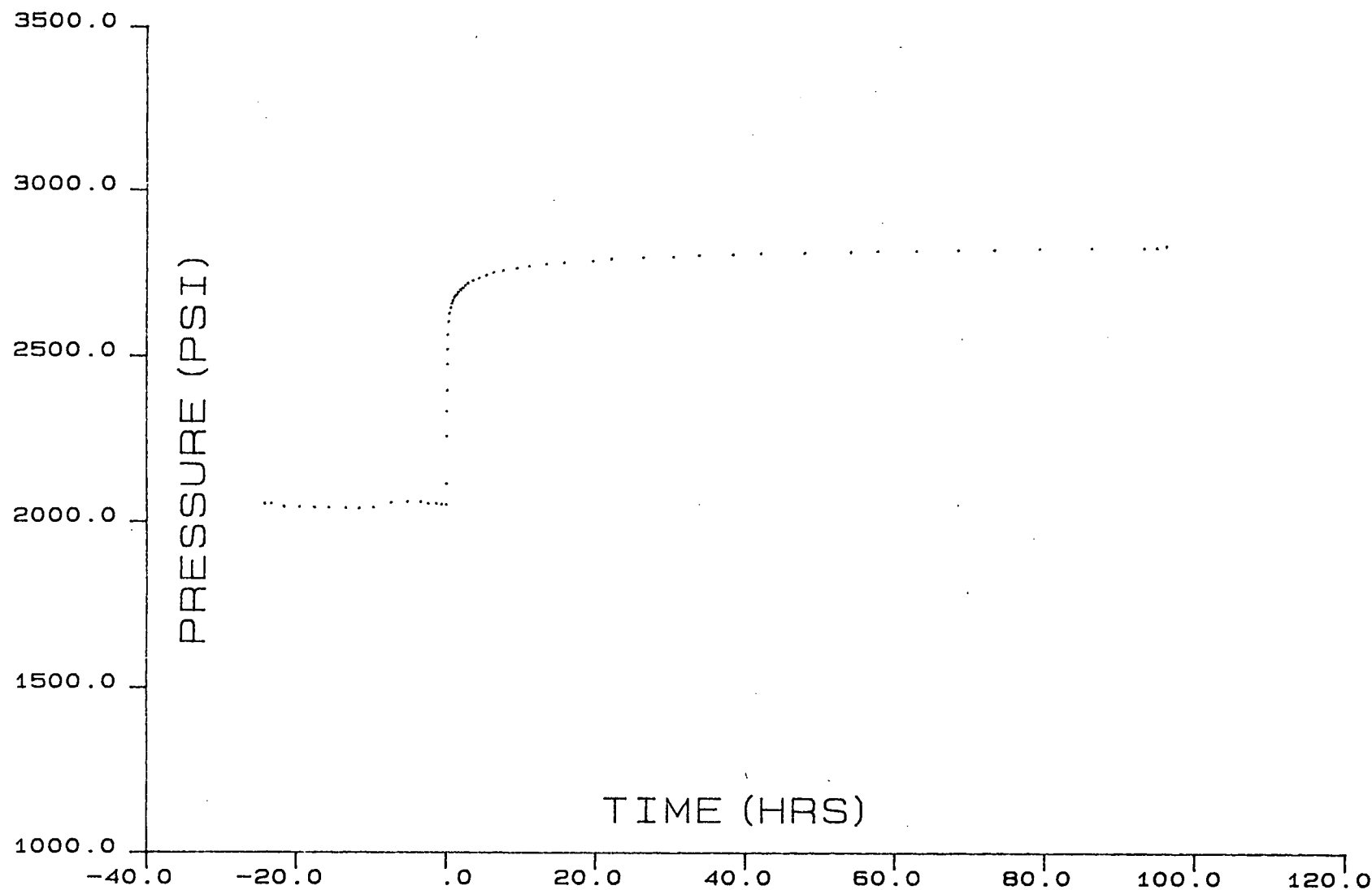
CO. SANTOS			RUN 02 FIELD KUJANI			WELL 01		
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	
8:00	2050.0	2050.0	.0	5:58	2794.4	2794.4	22.0	
8:00	2113.5	2113.5	.0	10:14	2798.9	2798.9	26.2	
8:01	2256.5	2256.5	.0	14:15	2800.1	2800.1	30.2	
8:04	2332.1	2332.1	.1	17:40	2805.8	2805.8	33.7	
8:06	2395.6	2395.6	.1	22:12	2807.9	2807.9	38.2	
8:07	2475.0	2475.0	.1	1:54	2811.9	2811.9	41.9	
8:07	2521.3	2521.3	.1	7:42	2814.2	2814.2	47.7	
8:10	2564.3	2564.3	.2	13:56	2816.9	2816.9	53.9	
8:15	2603.1	2603.1	.2	17:33	2819.8	2819.8	57.5	
8:22	2629.0	2629.0	.4	22:41	2820.6	2820.6	62.7	
8:32	2645.5	2645.5	.5	4:17	2823.2	2823.2	68.3	
8:42	2657.9	2657.9	.7	9:05	2824.9	2824.9	73.1	
8:50	2666.5	2666.5	.8	15:05	2828.2	2828.2	79.1	
9:01	2675.7	2675.7	1.0	22:03	2829.8	2829.8	86.0	
9:13	2683.3	2683.3	1.2	5:02	2830.8	2830.8	93.0	
9:30	2692.4	2692.4	1.5	6:44	2831.9	2831.9	94.7	
9:49	2699.6	2699.6	1.8	8:00	2837.5	2837.5	96.0	
10:10	2705.3	2705.3	2.2	- 16:19	2053.6	2053.6	-24.3	
10:28	2712.3	2712.3	2.5	- 15:23	2053.2	2053.2	-23.4	
10:51	2719.0	2719.0	2.8	- 13:41	2044.0	2044.0	-21.7	
11:30	2727.4	2727.4	3.5	- 11:35	2043.1	2043.1	-19.6	
12:19	2735.3	2735.3	4.3	- 9:36	2042.3	2042.3	-17.6	
13:18	2744.1	2744.1	5.3	- 7:40	2041.5	2041.5	-15.7	
14:16	2752.4	2752.4	6.3	- 5:24	2040.5	2040.5	-13.4	
15:34	2758.2	2758.2	7.6	- 3:39	2039.8	2039.8	-11.6	
17:24	2765.6	2765.6	9.4	- 1:46	2043.2	2043.2	-9.8	
19:01	2771.5	2771.5	11.0	0:38	2057.6	2057.6	-7.4	
21:19	2778.8	2778.8	13.3	2:49	2059.6	2059.6	-5.2	
23:42	2783.6	2783.6	15.7	4:35	2058.9	2058.9	-3.4	
3:32	2787.8	2787.8	19.5	5:32	2053.7	2053.7	-2.5	

SURVEY DATA

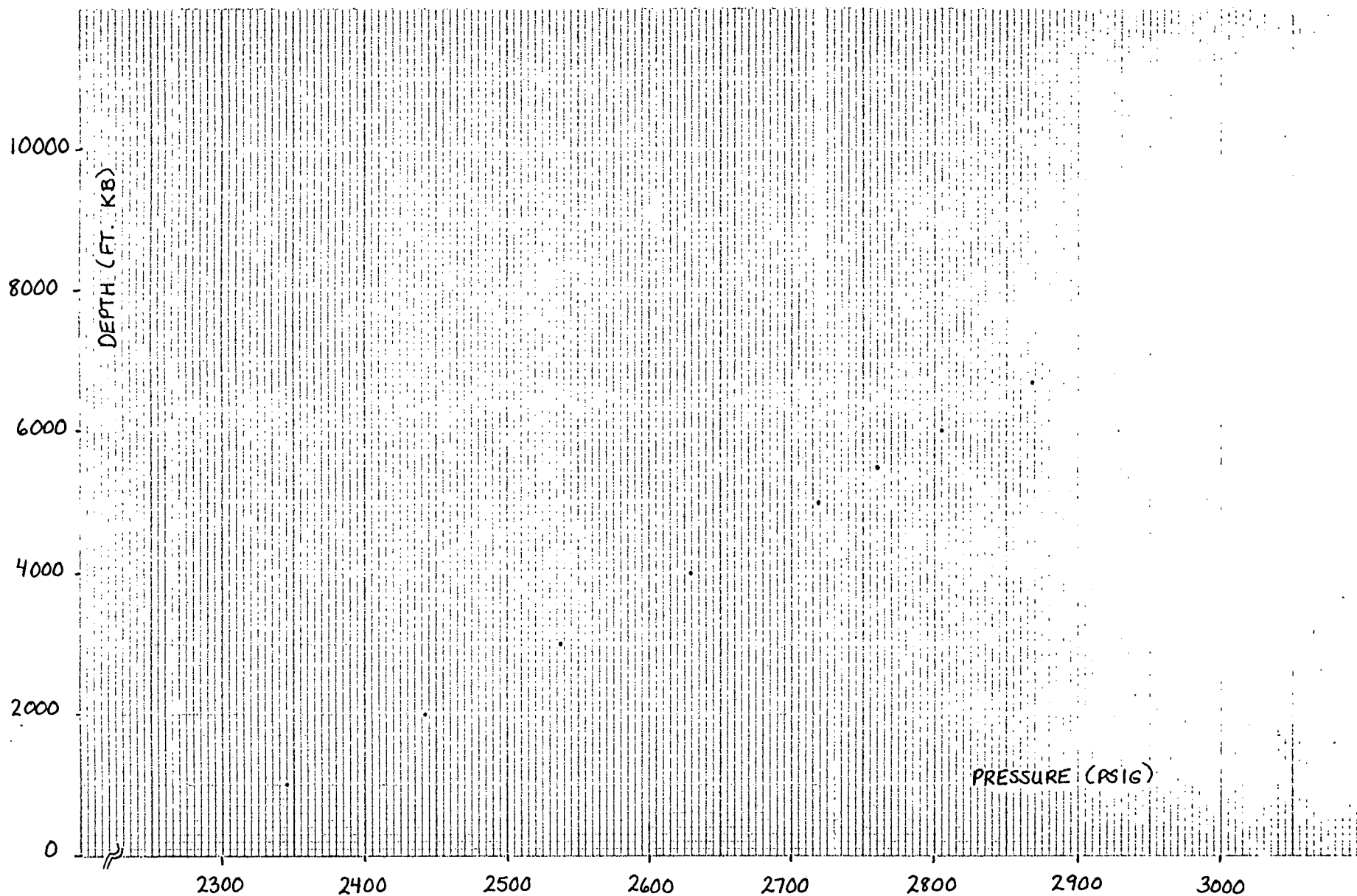
CO. SANTOS			RUN 02 FIELD KUJANI			WELL 01		
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	
6:38	2053.2	2053.2	-1.4	7:20	2050.0	2050.0	-.7	

LUB IN DWT = 1343 PSI / OUT = 2236 PSI
LUB IN AMERADA = 1327 PSI / OUT = 2235 PSI

KUJANI #1 POST FRAC SINGLE RATE TEST AND
BUILDUP 12 - 18 OCTOBER 1991
ELEMENT # 53563 @ 6684 FT KB



KUJANI # 1 - STATIC PRESSURE GRADIENT - 18/10/91
ELEMENT # 55994 (TOP)



00153

S E C T I O N 1

TEST RESULTS

By: OILSERV AUSTRALIA LTD
6 BREDBO STREET
LONSDALE. SA. 5160.

TELEPHONE: (08) 326 1588
FACSIMILE: (08) 326 1593



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' K.B	PAGE: 1 OF 6
WELL NAME: KUTANI #1	FORMATION: PATCHAWARRA	DATE: 10/10/91
TEST TYPE: SINGLE RATE & Buildup		OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR 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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLs m³	WATER BBLs m³	L.G.R. BBLs/MMSCF m³/10³m³	
						SINGLE RATE FLOW AND BUILDUP TEST									
10/10/91						LEAVE BRUMBY #1 TO TRAVEL TO KUTANI #1									
1030						ARRIVE ON LOCATION, KUTANI #1 WITH TEST EQUIPMENT									
1545						a CARAVAN									
1615						START SPOTTING TEST EQUIPMENT									
1705						FINISH SPOTTING TEST EQUIPMENT									
1715						RIG UP CARAVAN a START TO LAY OUT SOME SEPARATOR									
						EQUIPMENT									
1800						RIG UP W/LINE UNIT FOR BLIND BOX RUN, AND TEST									
						EQUIPMENT following day									
11/10/91						RIG UP W/LINE UNIT FOR BLIND BOX RUN									
0705						SHUT WELL IN TO RIG UP SWAB VALVE									
0910						WELL BACK ON LINE									
0940						FINISH RIGGING UP W/LINE UNIT									
1050						PRESSURE UP LUB									
1100						CHOKE WELL BACK, BEFORE RUNNING IN HOLE									
1103					20%	FOR BLIND BOX RUN									
1108						R.I.H WITH WEIGHT BAR, SPANCLIPS a 1.750" GAUGE CUTTER									
						TO 6830' K.B, NO OBSTRUCTIONS									
1115						START RIGGING UP TEST EQUIPMENT									
1156						P.O. O.H									

00155



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' I.C.B	PAGE: 2 OF 6
WELL NAME: KUJANI #1	FORMATION: PATCHAWARRA	DATE: 11/10/91
TEST TYPE: SINGLE RATE & BUILDUP		OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR 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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLs m³	WATER BBLs m³	L.G.R. BBLs/MMSCF m³/10⁶m³		
11/10/91																
1252						IN LUB										
1253		12714	0		20%	DEPRESSURE LUB, LEAVE W/LINE UNIT RIGGED UP TO RUN AMERADA'S FOR FLOW & BUILDUP SURVEY										
1455						SHUT WELL IN TO RIG UP TO TEST FLANGES ON METER RUN										
1600		14962	0			SHUT IN TUBING PRESSURE										
1606						OPEN WELL BACK ON LINE, BY-PASSING SEPARATOR										
1630						PRESSURE UP SEPARATOR, LEAKING AT TWO POINTS, DEPRESSURE AND REPAIR										
1710		8584				PRESSURE UP SEPARATOR O.K										
1800	00.00	9467	0	74	100%	TRIM FLOW THRU SEPARATOR										
1810					100%	ENGAGE 2.250" O/P										
2000	02.00	9274	10	75	100%	8515	70	218.3837	38.040	0.360	18.1986	3.170	0.030	0.176		
2200	04.00	9260	200	75	100%	8515	71	215.6011	30.840	2.040	36.1654	5.740	0.200	0.153		
2400	06.00	9274	300	75	100%	8515	70	216.3127	35.400	1.800	54.1915	8.690	0.350	0.172		
12/10/91																
0200	08.00	9281	300	75	100%	8446	69.5	215.5638	34.680	0.840	72.1552	11.580	0.420	0.165		
0400	10.00	9253	300	75	100%	8412	70	214.6548	38.400	1.800	90.0431	14.780	0.570	0.187		
0600	12.00	9260	350	75	100%	8446	70.5	214.8549	34.200	1.200	107.9477	17.630	0.670	0.165		
			S.G = .838, CO2 = 3%, H2S = 0. P.P.M, A.P.I = 59.8													
0800	14.00	9274	350	75	100%	8550	65	218.5233	33.000	1.440	126.1580	20.380	0.790	0.158		
1000	16.00	9260	400	76	100%	8584	68	218.8988	35.880	1.440	144.3996	23.370	0.910	0.170		



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' KB	PAGE: 3 OF 6
WELL NAME: KUSANI #1	FORMATION: PATCHAWARRA	DATE: 12/10/91
TEST TYPE: SINGLE RATE & BUILD UP		OPR: KUNAC, KAPPLER

TEST TYPE: SINGLE RATE & BUILD UP																
TIME		WELLHEAD DATA				SEPARATOR 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 m³/10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³/10³	OIL BBLS m³	WATER BBLS m³	L.G.R. BBLS/MMSCF m³/10⁶m³		
12/10/91																
1010						PREPARE AMERADAS FOR FLOW & BUILD UP SURVEY										
1135						IN LUB ATMOSPHERE										
1200	18.00	9253	400	76	100%	8619	70	217.9680	36.600	1.440	162.5636	26.420	1.030	0.175		
1205						PRESSURE UP LUB										
1307		9260	400	76	20%	CHOKE WELL BACK TO R.I.H WITH AMERADA'S										
1309						R.I.H WITH AMERADA'S										
1400	20.00	10894	400	70	20%	8481	66	181.9764	32.520	1.680	177.7283	29.130	1.170	0.188		
1407						ON HANG DEPTH 6690' K.B										
1410					100%	OPEN WELL BACK UP TO 100%										
1600	22.00	9274	400	76	100%	8688	71	216.2252	36.780	1.920	195.7471	32.195	1.330	0.179		
1800	24.00	9246	400	76	100%	8584	71.5	216.3404	32.040	1.080	213.7755	34.865	1.420	0.153		
2000	26.00	9239	400	76	100%	8550	72	215.4453	35.160	1.320	231.7293	37.795	1.530	0.169		
2200	28.00	9184	400	76	100%	8515	72.5	214.5573	34.560	1.800	249.6091	40.675	1.680	0.169		
2400	30.00	9184	400	76	100%	8550	72.5	215.0983	32.520	1.320	267.5340	43.385	1.790	0.157		
13/10/91																
0200	32.00	9191	400	75.5	100%	8515	69.5	216.6734	37.800	1.680	285.5901	46.535	1.930	0.182		
0400	34.00	9232	400	75.5	100%	8550	67.5	216.6003	33.720	1.200	303.6401	49.345	2.030	0.161		
0600	36.00	9253	400	75	100%	8550	70.5	212.2988	36.600	1.680	321.3317	52.395	2.170	0.180		
0800	38.00	9363	400	76	100%	8584	71	208.1910	35.040	1.560	338.6810	55.315	2.300	0.176		
0800						COLLECT 1 ST SET OF SAMPLES GAS* 151, CONDENSATE* 156										
0900	39.00	9412	400	75.5	100%	8860	70	213.1149	32.400	1.440	347.5608	56.665	2.360	0.159		
0900						COLLECT 2 ND SET OF SAMPLES GAS* 117, CONDENSATE* 186										

00157



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628'- 6688' KB	PAGE: 4 OF 6
WELL NAME: KUJANI #1	FORMATION: PATCHAWARRA	DATE: 13/10/91
TEST TYPE: SINGLE RATE & BUILD UP		OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR 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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLs m³	WATER BBLs m³	L.G.R. BBLs/MMSCF m³/10⁶m³	
13/10/91															
0900						COLLECT 2x500" H₂O SAMPLES									
1100	41.00	9412	400	76	100%	8860	72.5	211.3196	24.240	0.720	365.1708	58.685	2.420	0.118	
1300	43.00	9336	400	76	100%	8791	72	214.9789	32.640	1.800	383.0857	61.405	2.570	0.160	
1500	45.00	9301	400	76	100%	8756	71.5	216.9432	32.640	1.080	401.1643	64.125	2.660	0.155	
1500	00.00					SHUT IN WELL FOR BUILD UP									
1515		14652	450												
1530		14783	450												
1545		14866	450												
1600	01.00	14907	450												
1615		14948	450												
1630		14983	450												
1645		15017	450												
1700	02.00	15038	450												
1715		15059	450												
1730		15072	450												
1745		15093	450												
1800	03.00	15107	450												
1815		15114	450												
1830		15128	450												
1845		15141	450												
1900	04.00	15148	450												
2200	07.00	15231	425												

00158



PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' KB	PAGE: 5 OF 6
WELL NAME: KUSANI #1	FORMATION: PATCHAWARRA	DATE: 14/10/91
TEST TYPE: SINGLE RATE & BUILD UP		OPR: KUNAC, KAPPLER

TIME		WELLHEAD DATA				SEPARATOR 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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLs m³	WATER BBLs m³	L.G.R.	
14/10/91																
0200	11.00	15266	425													
0600	15.00	15293	300													
1000	19.00	15328	200													
1400	23.00	15355	100													
1800	27.00	15369	50													
2200	31.00	15383	0													
15/10/91																
0200	35.00	15383	0													
0600	39.00	15390	0													
1000	43.00	15390	0													
1400	47.00	15397	0													
1800	51.00	15403	0													
2200	55.00	15403	0													
16/10/91																
0200	59.00	15410	0													
0600	63.00	15410	0													
1000	67.00	15417	0													
1400	71.00	15417	0													
1800	75.00	15424	0													
2200	79.00	15417	0													
17/10/91																
0200	83.00	15417	0													

00159

PETROLEUM ENGINEERING : TEST RESULTS

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' KB	PAGE: 6 OF 6
WELL NAME: KUSANI #1	FORMATION: PATCHAWARRA	DATE: 17/10/91
TEST TYPE: SINGLE RATE & BUILD UP		OPR: KUNAC, KAPPLER

[illegible]

S E C T I O N 2

LIQUID PRODUCTION

By: OILSERV AUSTRALIA LTD
6 BREDBO STREET
LONSDALE. SA. 5160.

TELEPHONE: (08) 326 1588
FACSIMILE: (08) 326 1593



PETROLEUM ENGINEERING : LIQUID PRODUCTION

CONTRACTOR: OILSERV	PERFORATIONS: 6628' - 6688' K.B	PAGE: 1 OF 2
WELL NAME: KUTANI #1	FORMATION: PATCHAWARRA	DATE: 11/10/91
TEST TYPE: SINGLE RATE & BUILDUP		OPR: KUNAC, KAPPA
TANK #1 =	#1 = CALIBRATED GTRES bbls/in-m³/cm	OIL API GRAVITY = @ 60°F
TANK #2 =	#2 = CALIBRATED GTRES bbls/in-m³/cm	59.8

DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP LITRES	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP LITRES	TANK PRODUCTION (BBLs/m³)	FLOW RATE (BPD) (m³/D)	CUMULATIVE PRODUCTION (BBLs/m³)	TOTAL TANK DIP LITRES	TANK PRODUCTION (BBLs/m³)	FLOW RATE (BPD) (m³/D)	CUMULATIVE PRODUCTION (BBLs/m³)
				SINGLE RATE FLOW AND BUILDUP TEST							
11/10/91											
1455				SHUT WELL IN, TO RIG UP TO TEST FLANGES ON METER RUN							
1606				OPEN WELL BACK ON LINE, BY PASSING SEPARATOR							
1800	00.00			TRIM FLOW THRU SEPARATOR							
2000	02.00	*1	3200	3200	3.170	38.040	3.170	30	0.030	0.360	0.030
2200	04.00	*1	5940	5940	2.570	30.840	5.740	200	0.170	2.040	0.200
2400	06.00	*2	3300	3300	2.950	35.400	8.690	150	0.150	1.800	0.350
12/10/91											
0200	08.00	*2	6260	6260	2.890	34.680	11.580	220	0.070	0.840	0.420
0400	10.00	*1	3400	3400	3.200	38.400	14.780	150	0.150	1.800	0.570
0600	12.00	*1	6350	6350	2.850	34.200	17.630	250	0.100	1.200	0.670
0800	14.00	*2	3110	3110	2.750	33.000	20.380	140	0.120	1.440	0.790
1000	16.00	*2	6220	6220	2.990	35.880	23.370	260	0.120	1.440	0.910
1200	18.00	*1	3200	3200	3.050	36.600	26.420	120	0.120	1.440	1.030
1307				CHOKE WELL BACK TO R.I.H WITH AMERADA'S							
1400	20.00	*1	6050	6050	2.710	32.520	29.130	260	0.140	1.680	1.170
1410				OPEN WELL BACK UP TO 100%							
1600	22.00	*2	3350	3350	3.065	36.780	32.195	160	0.160	1.920	1.330
1800	24.00	*2	6110	6110	2.670	32.040	34.865	250	0.090	1.080	1.420
2000	26.00	*1	3120	3120	2.930	35.160	37.795	110	0.110	1.320	1.530
2200	28.00	*1	6150	6150	2.880	34.560	40.675	260	0.150	1.800	1.680

00162

PETROLEUM ENGINEERING : LIQUID PRODUCTION

CONTRACTOR: OILSERV		PERFORATIONS: 6628'-6688' KB		PAGE: 2 OF 2	
WELL NAME: KUSANI #1		FORMATION: PATCHAWARRA		DATE: 12/10/91	
TEST TYPE: SINGLE RATE & BUILD UP				OPR: KUNAC, KAPPLER	
TANK	#1 = bbls/m ³	TANK	#1 = CALIBRATED LITRES bbls/in-m ³ /cm	OIL API GRAVITY = @ 60°F	
CAPACITY	#2 = bbls/m ³	SCALE	#2 = CALIBRATED LITRES bbls/in-m ³ /cm		
				59.8	

[illegible]

00163

S E C T I O N 3

GAS FLOW CALCULATIONS

By: OILSERV AUSTRALIA LTD
6 BREDBO STREET
LONSDALE. SA. 5160.

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FACSIMILE: (08) 326 1593



PETROLEUM ENGINEERING : GAS FLOW CALCULATIONS

CONTRACTOR: OILSERV	PERFORATIONS: 6628'-6688' K.B	PAGE: 1 OF 2
WELL NAME: KUTANI * 1	FORMATION: PATCHAWARRA	DATE: 11/10/91
TEST TYPE: SINGLE RATE & BUILDUP		OPR: KUNAC, KAPPLER

ORIFICE METER TYPE: DANIELS							STATIC PRESSURE RANGE: 0-1500 PSIG				GAS SPECIFIC GRAVITY (SG) = .838				
METER RUN SIZE: 3.826"							DIFFERENTIAL PRESS. RANGE: 0-200 IN WC				FG = $\sqrt{(1/SG)}$ = 1.0924				
SEPARATOR NO.:							STANDARD CONDITIONS: 14.73 PSI @ 60°F				C ₂ = (FU X FG) =				
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE	STATIC PRESS P _f (PSIA)	DIFF PRESS H _w (IN WC)	GAS FLOW TEMP. °C	ORIF. PLATE SIZE (IN)	$\sqrt{(P_f \times H_w)}$	C ₁ = F _B x F _{TF} x F _{PV} x Y ₂				CUMULATIVE GAS PRODUCTION M3 10 ³	C (C = C ₁ x 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)
SINGLE RATE FLOW AND BUILDUP TEST															
11/10/91															
1455															
1606															
1800	00.00	100%													
1810		100%				2.250"									
2000	02.00	100%	1250	53	70	2.250"	257.3630	1104.6734	0.9173	1.1334	1.0002	18.1986	1254.9154	7.7512	218.3837
2200	04.00	100%	1250	52	71	2.250"	254.9234	1104.6734	0.9160	1.1313	1.0002	36.1654	1250.7818	7.6525	215.6011
2400	06.00	100%	1250	52	70	2.250"	254.9234	1104.6734	0.9173	1.1334	1.0002	54.1915	1254.9099	7.6777	216.3127
12/10/91															
0200	08.00	100%	1240	52	69.9	2.250"	253.9015	1104.6734	0.9180	1.1332	1.0002	72.1552	1255.5988	7.6512	215.5638
0400	10.00	100%	1235	52	70	2.250"	253.3890	1104.6734	0.9173	1.1316	1.0002	90.0431	1252.8331	7.6189	214.6548
0600	12.00	100%	1240	52	70.5	2.250"	253.9015	1104.6734	0.9166	1.1311	1.0002	107.9477	1251.4694	7.6260	214.8549
0800	14.00	100%	1255	51	65	2.250"	252.9649	1104.6734	0.9240	1.1455	1.0002	126.1580	1277.5497	7.7562	218.5233
1000	16.00	100%	1260	52	68	2.250"	255.9413	1104.6734	0.9200	1.1391	1.0002	144.3996	1264.8623	7.7695	218.8988
1200	18.00	100%	1265	52	70	2.250"	256.4487	1104.6734	0.9173	1.1353	1.0002	162.5636	1256.9919	7.7365	217.9680
1307		20%													
1400	20.00	20%	1245	36	66	2.250"	211.6844	1104.6734	0.9227	1.1417	1.0002	177.7283	1271.3542	6.4590	181.9764
1410		100%													
1600	22.00	100%	1275	51	71	2.250"	254.9730	1104.6734	0.9160	1.1344	1.0002	195.7471	1254.1583	7.6746	216.2252
1800	24.00	100%	1260	52	71.5	2.250"	255.9413	1104.6734	0.9153	1.1315	1.0002	213.7755	1250.0792	7.6787	216.3404

SECTION 4

SUBSURFACE PRESSURE GAUGE CALIBRATION REPORT

By: OILSERV AUSTRALIA LTD
6 BREDBO STREET
LONSDALE. SA. 5160.

TELEPHONE: (08) 326 1588
FACSIMILE: (08) 326 1593

OILSERV

AUSTRALIA LIMITED
(INCORPORATED IN WA)COMPANY SANTOSWELL NO. KUJAN 1 # 1FIELD PATCHAWARRAINTERVAL TESTED 6628'6688' KBCOUNTRY AUSTRALIATECHNICIAN S.A.C.DATE: 30/8/91CALIBRATION NO. 1DATE OF LAST CALIBRATION: 9-8-91Subsurface
Pressure Gauge
Calibration
ReportPAGE 1 OF 1

CALIBRATION STEPS

LEAST SQUARES CALCULATIONS

P (PRESSURE) DWT	D (1)	Y (4)	AY (5)	Y ²	Y P	Pc = KY + A	NON LINEARITY CORRECTION C - P - Pc	C ²
500		0.1916				501.7161	1.716	2.94
1000		0.3852				1000.5274	0.527	0.28
1500		0.5791				1500.1117	0.112	0.01
2000		0.7721				1997.3772	-2.623	6.88
2500		0.9670				2499.538	-0.462	0.21
3000		1.1609				2999.1223	-0.878	0.77
3500		1.3551				3499.4795	-0.520	0.27
4000		1.5496				4000.6097	0.610	0.37
4500		1.7440				4501.4823	1.482	2.20
5000		1.9375				5000.036	0.036	0.00
Σ	27500	10.6421		14.432	3720.8	Σ + = 4.483 Σ - = 4.483		13.94

$$A = \frac{\sum P}{n} = \frac{27500}{10} = 2750$$

$$B = \frac{\sum Y}{n} = \frac{10.6421}{10} = 1.06421$$

$$C = \frac{\sum (Y)^2}{\sum Y} = \frac{13.94}{10.6421} = 1.3561572$$

$$D = \frac{\sum (YP)}{\sum Y} = \frac{3720.8}{10.6421} = 3502.2035$$

$$K = \frac{D - A}{C - B} = \frac{3502.2035 - 2750}{1.3561572 - 1.06421} = 2576.5049$$

$$a = A - BK = 2750 - 2576.5049 \times 1.06421 = 8.0577306$$

$$a = D - CK = 3502.2035 - 2576.5049 \times 1.3561572 = 1.394$$

CALIBRATION RESULTS

$$K = 2576.5049$$

$$a + p = 8.5527306$$

$$P_R - D_0 = Y_R = \frac{P_R - D_0}{K} = \frac{8.5527306}{2576.5049} = 0.003319$$

REMARKS

OWNER OF GAUGE OILSERV TYPE OF ELEMENT: RPG-3

PRESSURE ELEMENT NO. 55994 RANGE: 0-5000 PSI RECORDING SECTION NO. 12068

DEADWEIGHT TESTER TYPE AND RANGE: CHANDLER 55-1 SERIAL NO. 18731

BASE LINE DRAWN AT ATMOSPHERIC PRESSURE READING $D_0 = 14.7$ TEMPERATURE =

REFERENCE LINE READING $D_R =$ REFERENCE PRESSURE $P_R =$ TEMPERATURE =

MAXIMUM TEMPERATURE EXPECTED = 240°F CALIBRATION TEMPERATURE = 240°F

DRAWING ALL CALIBRATION STEPS ☐ WITH A CLOCK ☒ WITH A CRANK

EQUIVALENT PRESSURE p OF LEVEL DIFFERENCE BETWEEN DWT AND THE BELLWS

LEVEL DIFFERENCE $H = 1.5$

SPECIFIC GRAVITY OF OIL $D = 0.33$ } $p = 0.495$ { ☒ PLUS IN CASE OF DWT ABOVE THE BELLWS
☐ MINUS IN CASE OF DWT BENEATH THE BELLWS

- (1) D = READING ON THE CHART-SCANNER FOR THE PRESSURE p (5) ΔY = FOR CHECKING
- (2) D_0 = READING FOR BASE LINE (6) n = NUMBER OF CALIBRATION STEPS
- (3) D_r = READING FOR REFERENCE LINE (7) Σ = SUM
- (4) γ = DEFLECTION { ☐ $D = D_0$ IF NO REFERENCE LINE (8) σ = STANDARD DEVIATION
☐ $D = D_R$ IF REFERENCE LINE DRAWN

00168

Kujani 1
 Bottomhole Pressure Survey
 12-17 April 1992

Pressure Buildup

- 12-04-92 Well flowing on 100% choke. Ameradas were run to hang depth 6615 ft KB @ 1800 hours. Pressures were monitored while the well was flowing.
- 13-04-92 Shut well in @ 0800 hours and monitored pressures until 0800 on 17/04/92 for a buildup time of 96 hours.

Element # 850207 @ 6609 ft KB.

B.H.F.P. @ shut-in = 1862.0 psig (12838 kPag)

S.I.B.H.P. final = 2481.4 psig (17109 kPag)

Max. B.H.T. = 243.6°F

Static Gradient

17-04-92 A static gradient was run to 6720 ft KB.

Element # 850207 S.I.B.H.P. = 2508.8 psig (17298 kPag)

Production Summary ☐

Cumulative gas produced to end of March 1992 = 45.3 10^6 m^3

Production rate for March 1992 = 213.5 $10^3 \text{ m}^3/\text{d}$

assume: Production to test shut-in = 12.33 days $\times$ 213.5 $10^3 \text{ m}^3/\text{d}$ = 2633.2 10^3 m^3

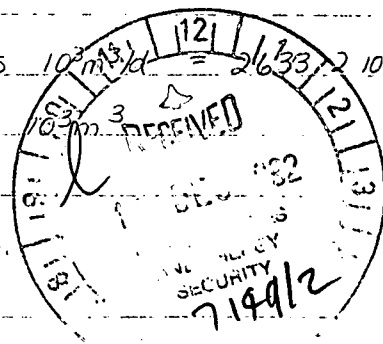
New cumulative = 45300 + 2633.2 = 47933.2 10^3 m^3

$t = \frac{47933.2 \times 10^3 \text{ m}^3}{213.5 \times 10^3 \text{ m}^3/\text{d}} \times 24$

$213.5 \times 10^3 \text{ m}^3/\text{d}$

$t = 5388 \text{ hrs.}$

EDAL BOSS



open file

SUB-SURFACE PRESSURE SURVEY

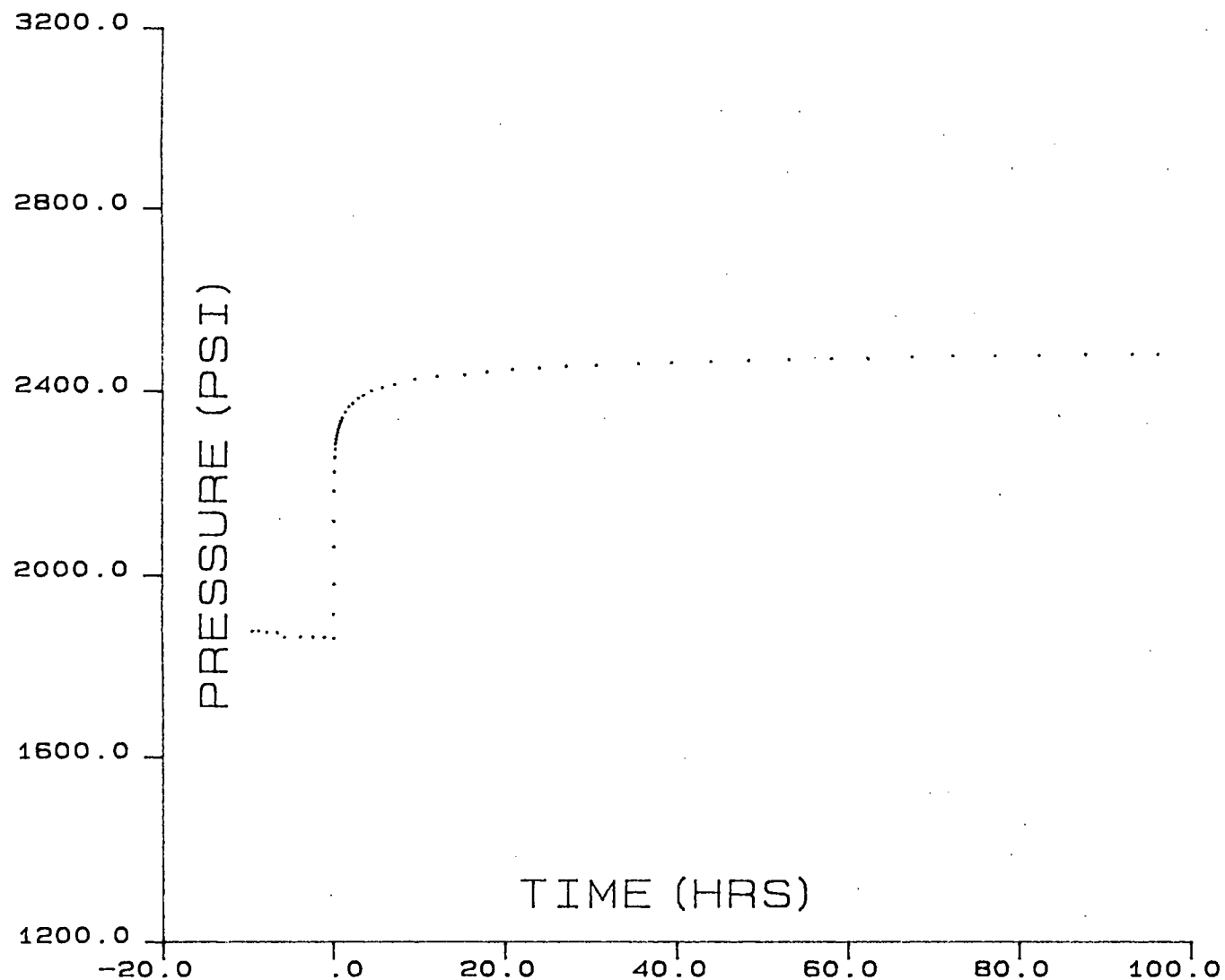
CO. SANTOS		RUN 03 FIELD KUJANI		WELL 01	
EFF DEPTH		WELL STAT		TOOL HUNG	6609 FT KB
CASING	-	CASING PRESS		ON BOTTOM	1555 920412
LINER	-	TUBING PRESS		OFF BOTTOM	0800 920417
DATE	920412	ELEMENT RANGE	0 - 4088	ZERO POINT	
ELEVATION		ZONE		SHUT-IN	0800 920413
MAX TEMP		PICK-UP		ON-PROD	
PERF	-	CAL SER NO.	850207	MPP	
TUBING	-				
UNITS	ENGLISH	PURPOSE	BOTTOMHOLE PRESSURE SURVEY		

SURVEY DATA

CO. SANTOS				RUN 03 FIELD KUJANI				WELL 01			
TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME	TIME	P-T	DP-DT	DTIME
8:00	1862.0	1862.0	.0	23:15	2436.1	2436.1	15.3				
8:00	1913.1	1913.1	.0	1:50	2441.6	2441.6	17.8				
8:03	1980.3	1980.3	.0	4:49	2447.5	2447.5	20.8				
8:05	2062.4	2062.4	.1	7:58	2450.8	2450.8	24.0				
8:05	2119.9	2119.9	.1	11:05	2454.4	2454.4	27.1				
8:05	2184.3	2184.3	.1	14:34	2456.5	2456.5	30.6				
8:07	2227.1	2227.1	.1	19:30	2460.3	2460.3	35.5				
8:09	2258.2	2258.2	.2	23:22	2462.6	2462.6	39.4				
8:12	2275.0	2275.0	.2	3:57	2465.2	2465.2	43.9				
8:15	2286.6	2286.6	.2	8:18	2467.7	2467.7	48.3				
8:19	2295.4	2295.4	.3	13:02	2469.4	2469.4	53.0				
8:23	2303.7	2303.7	.4	17:58	2471.8	2471.8	58.0				
8:28	2310.8	2310.8	.5	22:15	2472.0	2472.0	62.2				
8:32	2317.9	2317.9	.5	3:24	2475.7	2475.7	67.4				
8:38	2322.6	2322.6	.6	8:10	2477.8	2477.8	72.2				
8:42	2328.3	2328.3	.7	13:05	2477.7	2477.7	77.1				
8:50	2335.3	2335.3	.8	18:13	2478.7	2478.7	82.2				
9:01	2342.6	2342.6	1.0	23:36	2480.9	2480.9	87.6				
9:22	2355.5	2355.5	1.4	5:01	2481.3	2481.3	93.0				
9:46	2366.9	2366.9	1.8	8:00	2481.4	2481.4	96.0				
10:13	2374.6	2374.6	2.2	-	1:34	1876.8	-9.6				
10:53	2384.8	2384.8	2.9	-	0:47	1878.4	-8.8				
11:26	2391.6	2391.6	3.4		0:15	1874.7	-7.7				
12:25	2401.2	2401.2	4.4		1:25	1873.9	-6.6				
13:39	2408.2	2408.2	5.7		2:19	1863.7	-5.7				
15:05	2415.1	2415.1	7.1		4:05	1864.7	-3.9				
17:26	2426.1	2426.1	9.4		5:36	1864.1	-2.4				
20:02	2432.8	2432.8	12.0		6:57	1863.3	-1.1				

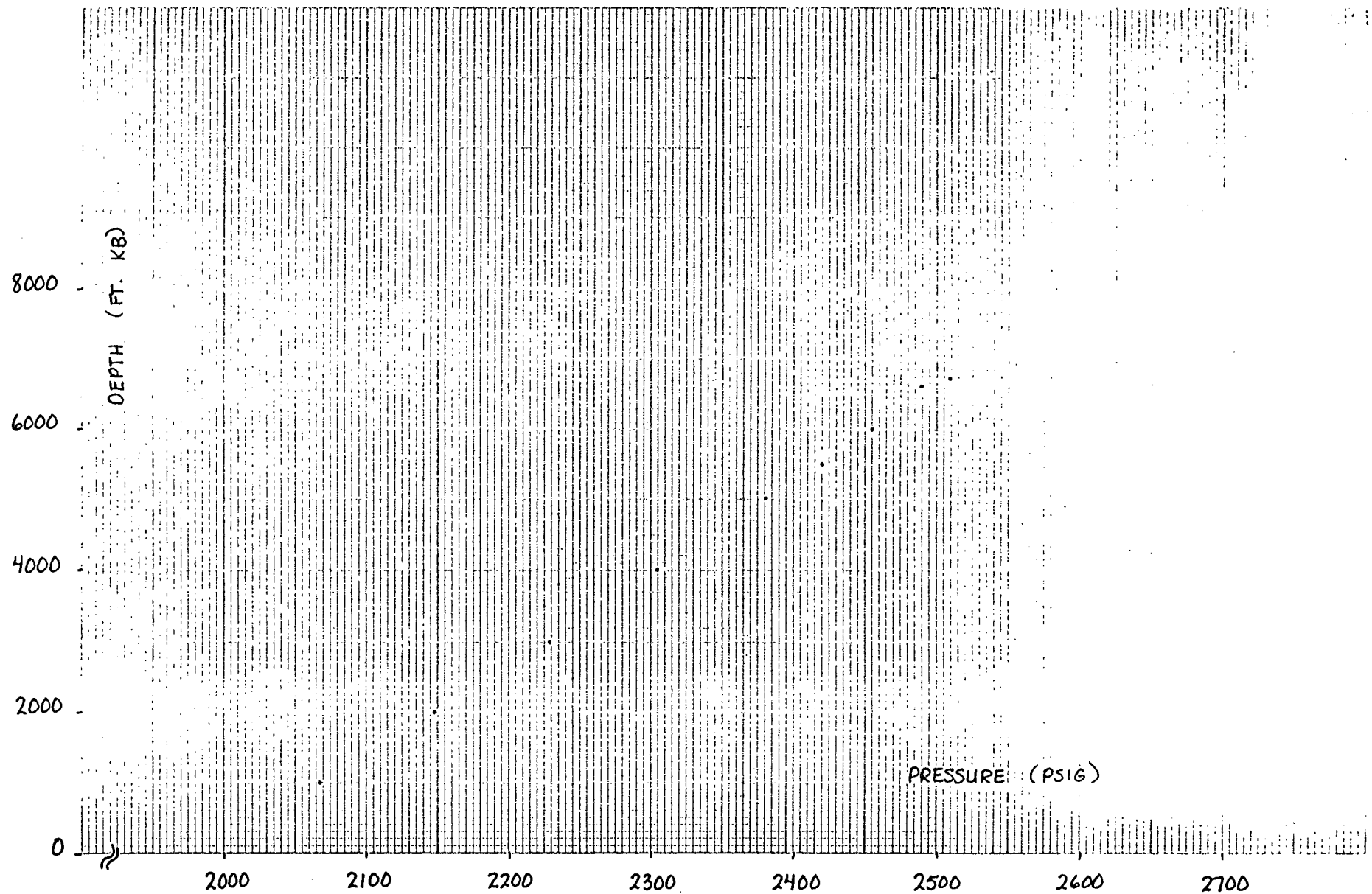
LUB IN DWT = 1287 PSI / OUT = 1984 PSI
 LUB IN AMERADA = 1294 PSI / OUT = 1991 PSI

KUJANI 1 BOTTOMHOLE PRESSURE BUILDUP
12 - 17 APRIL 1992
ELEMENT #850207 @ 6609 FT. KB



00172

KUJANI #1 - STATIC PRESSURE GRADIENT - 17/04/92.
ELEMENT # 850207 (BOTTOM)



00173

EXPERTEST

WIRELINE & WELL TESTING SERVICE

PO BOX 354 COWANDILLA 5033

PH. (08) 354 0488 TELEX AAB7183

FAX (08) 43 7408

138 RICHMOND ROAD MARLESTON

SOUTH AUSTRALIA 5033

Tested Friday, 17th April 1992.

CLIENT	LOCATION	FORMATION
Santos Ltd.	KUJANI #1	PATCHAWARRA

STATIC PRESSURE GRADIENT REPORT

PRESSURE ELEMENT DATA			
POSITION	SERIAL NO.	RANGE	CALIBRATED
Top	850208	4100	6/ 3/92
Bottom	850207	4075	6/ 3/92

WELL DATA	
PARAMETER	VALUE
DWT In	1988 PSIG
DWT Out	1983 PSIG
Max BHT	TEMP/ELE

TOP ELEMENT				BOTTOM ELEMENT		
DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.9700	1991.2	----	0.9770	1985.1	----
1000	1.0100	2073.4	0.082	1.0170	2066.7	0.082
2000	1.0490	2153.6	0.080	1.0565	2147.3	0.081
3000	1.0870	2231.7	0.078	1.0960	2228.0	0.081
4000	1.1250	2309.8	0.078	1.1335	2304.5	0.077
5000	1.1620	2385.9	0.076	1.1710	2381.1	0.077
5500	1.1800	2422.9	0.074	1.1900	2419.9	0.078
6000	1.1965	2456.9	0.068	1.2065	2453.6	0.067
6615	1.2145	2493.9	0.060	1.2235	2488.4	0.057
6720	1.2235	2512.4	0.176	1.2335	2508.8	0.195
LUB.	0.9705	1992.2	----	0.9795	1990.2	----

GENERAL REMARKS

SEQUENCE OF EVENTS

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6792' - 6812' KB.

PAGE: 1 OF 2

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

DATE: 12.4.92

TEST TYPE : P.B.U.

OPR : P. BLACK

DATE/TIME	DESCRIPTION OF EVENTS
12.4.92	
0845	ARRIVE ON LOCATION
0850	RIG UP WIRELINE EQUIPMENT.
1012	RUN IN HOLE WITH 1.75" BLIND BOX
1035	AT BLIND BOX DEPTH OF 6800' KB, TUBING CLEAR.
1036	PULL OUT OF HOLE WITH BLIND BOX
1120	AT SURFACE WITH BLIND BOX
1300	PREPARE ELEMENTS FOR BUILD UP SURVEY.
1335	PRESSURE LUBRICATOR
1435	DEPRESSURE LUBRICATOR
1535	PRESSURE LUBRICATOR RUN IN HOLE.
1555	AT SURVEY DEPTH OF 6615' KB. AND FLOW WELL OVER NIGHT.
13.4.92	
0800	SHUT WELL IN FOR 96 HRS. BUILD UP AND MONITOR PRESSURES
17.4.92	
0800	BUILD-UP COMPLETE + P.O.O.H.
0818	AT SURFACE + DEPRESSURE WTB'
0918	PRESSURE WTB'
1018	DEPRESSURE WTB' + RIG OUT GAUGES - CHARTS O.K. + PREPARE ELEMENTS FOR STATIC GRADIENT SURVEY.
1056	PRESSURE WTB' WITH SURVEY GAUGES.
1106	DEPRESSURE WTB'
1111	PRESSURE WTB' + R.I.H. WITH GAUGES + PERFORM GRADIENT AS PER PROGRAM.

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6792-6812' KB

PAGE: 1 OF 4

WELL NAME: KUJANI #1

FORMATION : PATCHAWARIPA

DATE: 12.4.92

TEST TYPE : P.B.U.

OPR : P. BLACK

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (KPa)	ANNULUS PRESSURE (KPa)	WELLHEAD TEMP (°C)	CHOKE SIZE %	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLS m³	WATER BBLS m³		
12.4.92															
1335		8873	Ø	72	100	PRESSURE LUBRICATOR									
1435		8922		74	"	DEPRESSURE LUBRICATOR									
1535		8949		74	"	PRESSURE LUBRICATOR AND RUN IN HOLE TO SURVEY									
1800		8873		72	"	DEPTH OF 6615' KB.									
2200		8832		72	"										
13.4.92															
0200		8722		72	"										
0600		8715		72	"										
0630		8722		72	"										
0700		8722		73	"										
0730		8722		74	"										
0800	0	8722		75	"	SHUT WELL IN FOR 96 HRS. BUILD UP AND MONITOR									
0815		12838		N/A	SI	PRESSURES.									
0830		12900													
0845		12955													
0900	1	13010													
0915		13121													
0930		13141													
0945		13148													
1000	2	13183													
1015		13203													

00177

EXPERTEST PTY. LTD.

TEST RESULTS

CUSTOMER : SANTOS LTD

PERFORATIONS: 6792'-6812' K13

PAGE: 2 OF 4

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

DATE: 13.4.92

TEST TYPE : P.B.U.

OPR : P. BLACK

TIME		WELLHEAD DATA						FLOW RATES			CUMULATIVE PRODUCTION				
DATE TIME	FLOW OR SHUT IN TIME (HOURS)	TUBING PRESSURE (KPa)	ANNULUS PRESSURE (KPa)	WELLHEAD TEMP (°F/°C)	CHOKE SIZE	PRESSURE (PSI/KPa)	TEMP (°F/°C)	GAS MMSCFD m 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		
13.4.92															
1030		13224	N/A	N/A.											
1045		13238													
1100	3	13259													
1115		13272													
1130		13334													
1145		13348													
1200	4	13355													
1400	6	13403													
1800	10	13438													
2200	14	13472													
14.4.92															
0200	18	13548													
0600	22	13555													
1000	26	13562													
1400	30	13576													
1800	34	13583													
2200	38	13610													
15.4.92															
0200	42	13624													
0600	46	13624													

} READINGS FROM CHART, CROW IN MOOMBA.

00178

CUSTOMER : Santos Ltd.

PERFORATIONS: 6628- 6812' KB

PAGE: 3 OF 4

WELL NAME: Kujani #1

FORMATION : Patchawarra

DATE: 15.4.92

TEST TYPE : B.H.P.S.

OPR : M. WRIGHT

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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	GAS MMSCF m³10³	OIL BBLs m³	WATER BBLs m³				
WEDNESDAY 15.4.92																	
1000	50	13625	N/A	N/A													
1400		13631				TAKEN FROM CHART											
1800	58	13638				TAKEN FROM CHART											
2200		13638															
THURSDAY 16.4.92																	
0200		13645															
0600	70	13666															
1000		13645															
1400	78	13645															
1800		13652				TAKEN FROM CHART											
2200	86	13666				TAKEN FROM CHART											
FRIDAY 17.4.92																	
0200		13659															
0600	94	13680															
0800	96	13680				96hrs BUILD-UP COMPLETE & P.O.O.H.											
0818		13673				AT SURFACE & DEPRESSURE WUB'											
0918		13659				PRESSURE WUB'											
1018		13680				DEPRESSURE WUB' & RIG OUT GAUGES - CHARTS											
						& PREPARE GAUGES FOR STATIC GRADIENT SURVEY.											

CUSTOMER :	SANTOS LTD.	PERFORATIONS:	6792-6812'WB	PAGE:	4	OF	4
WELL NAME:	KUSANI #1	FORMATION :	PATCHANWARA	DATE:	17.4.92		
TEST TYPE :	B.H.P.S.			OPR :	M.10/1964P		

[illegible]

EXPERTEST PTY. LTD.

BHP/BHT GAUGE RUN DATA

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6792-6812' K.B.

PAGE: 1 OF 1

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

DATE: 12-4-92

TEST TYPE : P.B.U.

OPR : P. BLACK

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

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

ELEMENT SERIAL NO.

850209

850207

22819

DATE

12-4-92

1287 psi

ELEMENT RANGE

4100 PSI

4075 PSI

180°-414°F

PRESSURE LUBRICATOR

1335

8873

Ø

RECORDING SECTION SERIAL NO.

3434

3433

70545

RUN IN HOLE

1535

8949

Ø

DATE OF CALIBRATION:

ON DEPTH AT

6615 FT

1555

8956

Ø

CLOCK SERIAL NO.

2

4

6

DATE

17-4-92

CLOCK RANGE

120 HRS

120 HRS

120 HRS

PULL OUT OF HOLE

0800

13680

Ø

LEAD SCREW TYPE

15 TLS

15 TLS

15 TLS

AT SURFACE

0818

13673

Ø

DEPRESSURE LUBRICATOR

1018

13680

Ø

ENGAGE STYLUS DATE 12-4-92 TIME

1328

1328

1328

MAXIMUM BHT AT 6615 FT/M = 243.6 °F/ft

1984 psi

DISENGAGE STYLUS DATE 17-4-92 TIME

1035

1035

1035

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

DATE

TIME

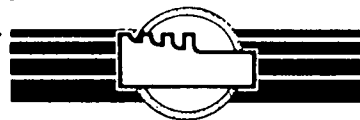
REMARKS

17-4-92

- N.B. CLOCK No #2 FAILED DURING BUILD-UP PERIOD. APPROX. HALF WAY THROUGH SURVEY
TEMP. EL. RAN.

00181

EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : Santos Ltd

PERFORATIONS: 6792-6812' KB

PAGE: 1 OF 1

WELL NAME: KUSANI #1

FORMATION : PACHAWARRA

DATE: 17.4.92

TEST TYPE : B.H.P.S - S.G.S.

OPR : M. WRIGHT

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

22.819

DATE : 17.4.92

ELEMENT RANGE

4100PSI

4075PSI

KD-4KIF

PRESSURE LUBRICATOR :

1056

13659

Ø

RECORDING SECTION SERIAL NO.

K3434

K3433

70545

RUN IN HOLE :

1111

13721

Ø

DATE OF CALIBRATION:

ON DEPTH AT : 6720 KB FT²

1223

13659

Ø

CLOCK SERIAL NO.

2387

A14044

A16081

DATE : 17.4.92

CLOCK RANGE

3hrs

3hrs

3hrs

PULL OUT OF HOLE :

1233

13666

Ø

LEAD SCREW TYPE

15TH

15TH

15TH

AT SURFACE :

1250

13673

Ø

DEPRESSURE LUBRICATOR :

1315

13673

Ø

ENGAGE STYLUS DATE 17.4.92 TIME

1048

1048

1048

MAXIMUM BHT AT 6720 FT² = °F/C

DISENGAGE STYLUS DATE 17.4.92 TIME

1325

1325

1325

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

DATE

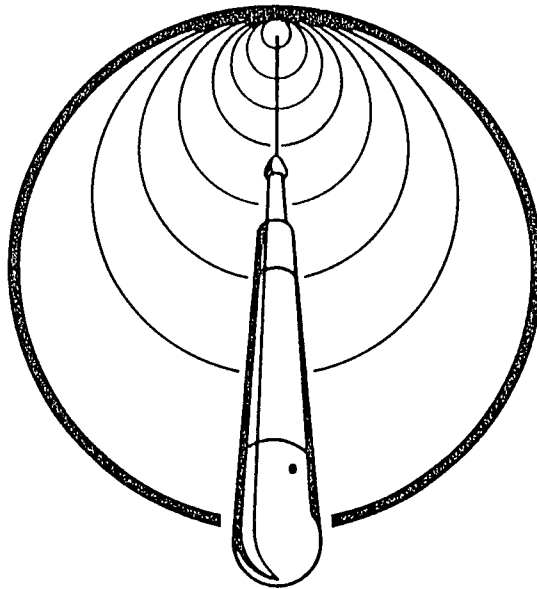
TIME

REMARKS

Temp. EL. RAN.

22 FEB 1995

COPY

EXPERTEST PTY LTDELECTRIC WIRELINE
SERVICE

Customer: SANTOS LTD
Well: KUJANI #1
Formation: PATCHAWARRA
Test Type: B.H.P.S.
Date: 08/01/95

7149/002 O/P

L



SEQUENCE OF EVENTS

200114

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6628'-6812'KB

PAGE: 1 OF 2

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

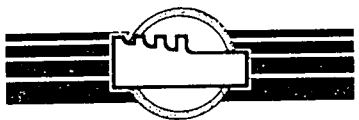
DATE: 08/01/95

TEST TYPE : B.H.P.S

OPR : B. POTTER

DATE/TIME	DESCRIPTION OF EVENTS
	This report has been generated by CARS Version 1.00 User No. 016.
	For further information, please call Dave Hawkes on (08) 354-0488.
08/01/95	
09:15	ARRIVE ON LOCATION. CONDUCT SAFETY MEETING.
09:26	SHUT IN WELL. FIT SWAB VALVE.
09:36	WELL BACK ON LINE 100% CHOKE. CONTINUE RIG IN WIRELINE UNIT.
14:00	RUN IN HOLE WITH 1.75" BLIND BOX.
14:25	AT 6800'KB, NO OBSTRUCTIONS. PULL OUT OF HOLE.
14:45	AT 3700'KB, MOTOR ON UNIT SHUT DOWN.
15:00	ADVISE MOOMBA AND ORGANIZE MECHANIC.
16:30	MECHANIC ARRIVE LOCATION.
18:15	UNABLE TO REPAIR ON LOCATION. SECURE UNIT AND RETURN TO MOOMBA.
09/01/95	
10:20	ARRIVE ON LOCATION.
10:30	REPAIR WIRELINE UNIT AND PULL OUT OF HOLE.
11:45	ARRIVE AT SURFACE WITH TOOLSTRING AND DEPRESSURE LUBRICATOR.
13:58	PREPARE 1XAMERADA AND 1XEMR GAUGE FOR BHPS/SGS.
14:17	GAUGES IN LUBRICATOR AND PRESSURE LUBRICATOR.
14:47	RUN IN HOLE WITH GAUGES.
15:14	ARRIVE AT HANG DEPTH OF 6720'KB.
	SECURE LEASE.
15:30	GAUGES HANG OVERNIGHT WITH WELL FLOWING AT 100% CHOKE.

EXPERTEST PTY. LTD.



SEQUENCE OF EVENTS

200114..

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6628'-6812'KB

PAGE: 2 OF 2

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

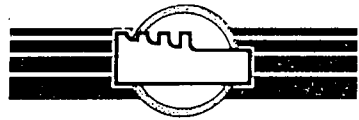
DATE: 10/01

TEST TYPE : B.H.P.S

OPR : B. POTTER

DATE/TIME	DESCRIPTION OF EVENTS
10/01/95	
08:40	SHUT IN WELL FOR BHPS/SGS.
11/01/95	
06:40	CREW UNBALE TO OBTAIN BUILD UP READINGS, WET WEATHER CONDITIONS CAUSED INABILITY TO GET TO LOCATION.
12/01/95	
06:40	CREW UNABLE TO OBTAIN BUILD UP READINGS, WET WEATHER CONDITIONS CAUSED INABILITY TO GET TO LOCATION.
13/01/95	
06:40	CREW UNABLE TO OBTAIN READINGS DUE TO WET WEATHER CONDITONS.
14/01/95	
09:00	ARRIVE ON LOCATION.
09:07	PULL OUT OF HOLE. PERFORMING S.G.S.
10:18	ARRIVE AT SURFACE WITH GAUGES.
10:48	DEPRESSURE LUBRICATOR. RECOVER CHART. OK.
11:00	RIG DOWN EQUIPMENT.
11:30	SEUCRE LEASE. HAND WELL BACK TO PRODUCTION.

EXPERTEST PTY. LTD.



FIELD READINGS

200114

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6628'-6812'KB

PAGE: 1 OF 3

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

DATE: 08/01

TEST TYPE : 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/K)	ANNULUS PRESSURE (PSI/K)	WELLHEAD TEMP (°C)	CHOKE SIZE (%)	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/M)	OIL (IN/M)	OIL API GRAVITY @ 60°F	WATER (IN/M)	
				This report has been generated by CARS Version 1.00 User No. 016.											
				For further information, please call Dave Hawkes on (08) 354-0488.											
08/01/95															
09:15		ARRIVE ON LOCATION. CONDUCT SAFETY MEETING.													
09:26		SHUT IN WELL. FIT SWAB VALVE.													
09:36		WELL BACK ON LINE 100% CHOKE. CONTINUE RIG IN WIRELINE UNIT.													
14:00		RUN IN HOLE WITH 1.75" BLIND BOX.													
14:25		AT 6800'KB, NO OBSTRUCTIONS. PULL OUT OF HOLE.													
14:45		AT 3700'KB, MOTOR ON UNIT SHUT DOWN.													
15:00		ADVISE MOOMBA AND ORGANIZE MECHANIC.													
16:30		MECHANIC ARRIVE LOCATION.													
18:15		UNABLE TO REPAIR ON LOCATION. SECURE UNIT AND RETURN TO MOOMBA.													
09/01/95															
10:20		ARRIVE ON LOCATION.													
10:30		REPAIR WIRELINE UNIT AND PULL OUT OF HOLE.													
11:45		ARRIVE AT SURFACE WITH TOOLSTRING AND DEPRESSURE LUBRICATOR.													
13:58		PREPARE 1XAMERADA AND 1XEMR GAUGE FOR BHPS/SGS.													
14:17		GAUGES IN LUBRICATOR AND PRESSURE LUBRICATOR.													
14:17	0.00	720		68	100										
14:47		RUN IN HOLE WITH GAUGES.													
14:47	0.00	720		70											
15:14		ARRIVE AT HANG DEPTH OF 6720'KB.													



FIELD READINGS

200114

CUSTOMER : SANTOS LTD.

PERFORATIONS: 6628'-6812'KB

PAGE: 2 OF 3

WELL NAME: KUJANI #1

FORMATION : PATCHAWARRA

DATE: 09/01/95

TEST TYPE : 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/K)	ANNULUS PRESSURE (PSI/K)	WELLHEAD TEMP (°C)	CHOKE SIZE (%)	BS&W (%)	ORIFICE PLATE SIZE (IN)	STATIC PRESS. (PSIG)	DIFF PRESS. (IN WC)	GAS TEMP (°F)	TOTAL LIQUID (IN/M)	OIL (IN/CM)	OIL API GRAVITY @ 60°F	WATER (IN/M)		
09/01/95																
15:14		SECURE	LEASE.													
15:14	0.00	710		70												
15:30		GAUGES	HANG OVERNIGHT WITH			WELL FLOWING AT 100% CHOKE.										
15:30	0.00	170		74	100											
10/01/95																
08:00	0.00	680		70	100											
08:30	0.00	680		70												
08:40		SHUT IN WELL FOR BHPS/SGS.														
08:40	0.00	683		70	100											
08:45	0.00	1120														
08:50	0.00	1185														
08:55	0.00	1198														
09:00	0.00	1207														
10:00	0.00	1240														
11/01/95																
06:40		CREW UNBALE TO OBTAIN BUILD UP READINGS,						WET WEATHER CONDITIONS CAUSED INABILITY TO GET								
06:40		TO LOCATION.														
12/01/95																
06:40		CREW UNABLE TO OBTAIN BUILD UP READINGS,						WET WEATHER CONDITIONS CAUSED								
06:40		INABILITY TO GET TO LOCATION.														

200114

PERFORATIONS: 6628'-6812'KB

PAGE: 3 OF 3

FORMATION : PATCHAWARRA

DATE: 13/01/2014

OPR : B. POTTER

[illegible]

GAUGE RUN SHEET

200114..

CUSTOMER: SANTOS LTD
WELL NAME: KUJANI #1
TEST TYPE: BAPS 1565

PERFORATIONS: 6628'-6812'
FORMATIONS: PATCHAWARRA

PAGE: 1 of
DATE: 9-1-95
OPR: B.HULL

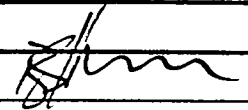
GAUGE DATA	TOP GAUGE	BOTTOM GAUGE	RUN DATA	TIME (HOURS)	TUBING PRESSURE (PSI/KPa)	ANNULUS PRESSURE (PSI/KPa)
ELEMENT SERIAL No.	487	29386	DATE : 9-1-95			
ELEMENT RANGE PSI	5000	2925	PRESSURE LUBRICATOR :	14:17	720	0
ELEMENT TYPE	EMP-S	AMERADA	RUN IN HOLE :	14:47	720	0
DATE OF CALIBRATION:	29-7-94	7-2-94	ON DEPTH AT 6720 FT#	15:14	710	0
CLOCK SERIAL No.		F-15295	MAX. RECORDED BHP PSI			1619.89
CLOCK RANGE hrs		120	MAX. RECORDED BHT OF			236.28
ENGAGE BATTERY/STYLUS DATE: 9-1-95 TIME	13:58	14:07	DATE : 14-1-95			
			PULL OUT OF HOLE :	09:07	1309	0
DISENGAGE BATTERY/STYLUS DATE: 14-1-95 TIME	11:17	10:52	DEPRESSURE LUBRICATOR :	10:48	1312	0
NB: ALL DEPTHS ARE MEASURED FROM KB.						

TEST DURATION 118 HOURS

GAUGE RUN TIME HOURS 211

GAUGE CHECKS	DATE	COND.	GAUGE
PRE-JOB CHECK/PERFORMED BY	8-1-95	B.HULL	
PRESS PSI #/G		0.0	1.41
TEMP °F		73.4	75.8
POST-JOB CHECK/PERFORMED BY	14-1-95	B.HULL	
PRESS PSI #/G		0	1.27
TEMP °F		81	84.25
CALIBRATION CHECK/PERFORMED BY	19-10-94	L. HARVEY	
PRESS PSI #/G		2489	2488
TEMP °F		269	270

BATTERY DATA	DATE
BATTERY SERIAL No.: 4925	
PRE-JOB PBU/BHP CYCLES: 2	
PRE-JOB SGS/FGS CYCLES: 0	
PRE-JOB LOADED VOLTS: 10.74	8-1-95
POST-JOB LOADED VOLTS: 10.79	14-1-95

OPERATOR'S SIGNATURE: 

This sheet is submitted as 'Original' and is Not typed

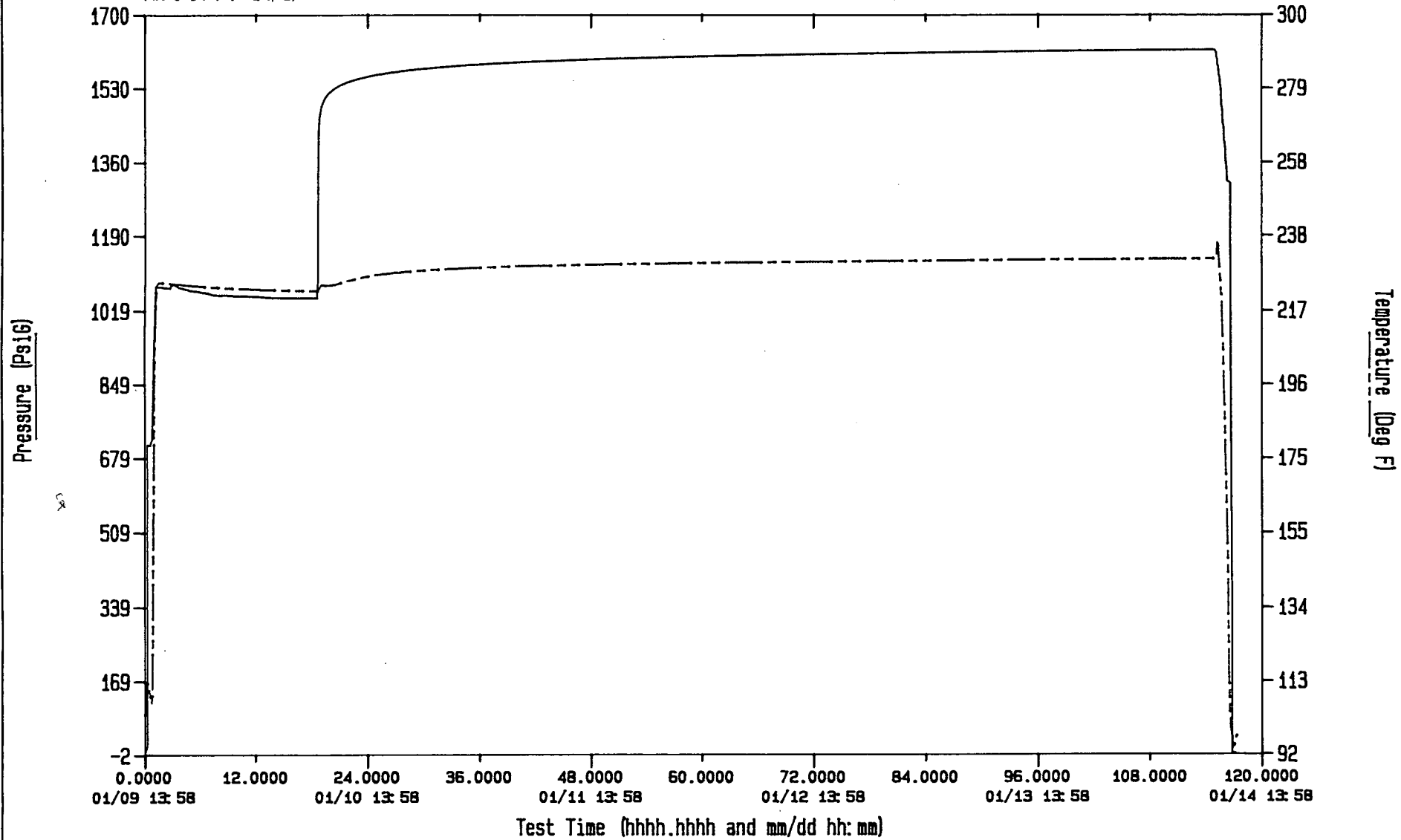
COMMENTS:

200114.4

01/14/95
15:24:27

Company : SANTOS
Well : KUJANI #1 MOOMBA/PATCHAKAPPA
Test Date: 14/1/95

EMP S/N : 060-487
File Ref: KUJANI#1
Plot Ref: TOP



14/01/95

Santos

Page A1

Expertest Ltd File Reference KUJANI#1

Company SANTOS
 Street
 City
 Country
 Service Company EXPERTEST
 Representative B.S.HULL

Well Name KUJANI #1
 Location MOOMBA/PATCHAWARRA
 Field
 Pool
 Status (Oil, Gas, Other) ...

Test Type BHP/SGS
 Date of Test 14/1/95
 Producing Interval (CF)
 Perf. Type
 Producing Through
 Elevation
 Pool Datum (subsea)

Recorder Depth (KB) 6720.00 ft
 Recorder Position TOP
 MPP Interval (KB)
 Datum Depth of Well from(KB)

Static Test
 Press. (Gauge) Tubing Prior
 Casing Prior
 Shut In Date Start
 Stop
 Duration .
 Bottom Hole Temperature
 Pressure
 Press. Gradient.

McAllister Gauge ID
 Serial # 487
 Model # 168
 Xducer Type Strain
 Pressure Range 5000.0 PSIA
 Calibration ID 649-14210
 Last Calibration Date 29/07/94

Test Information
 Set Up Time 08/01/95 14:56
 Delay to First Reading 00:00:00
 Custom Program ID Not used Normal mode
 Data Recording Interval 00:00:32
 Format 1 : 1 Pressure:Temperature
 Abs. to Ga. press. adjust .. 14.7 Psi
 Battery Connected 09/01/95 13:58:00
 Disconnected 14/01/95 11:17:00
 Usage (Readings) ... 117.3167 (4 21:19:00)

Other Information

14/01/95

Santos

Page 1

200114...

Company: SANTOS

Ref : KUJANI#1

Well : ANI #1 MOOMBA/PATCHAWARRA

Field:

Depth ft KB	Reading Time MM/DD hh:mm:ss	Test Time hours	Pressure PsiG	Temperature Deg F	Gradient Psi/ft
6720.00	01/14 09:04:44	115.1122	1619.893	231.55	
6500.00	01/14 09:12:44	115.2456	1597.212	234.31	0.103
6000.00	01/14 09:20:12	115.3700	1577.811	234.67	0.039
5500.00	01/14 09:28:12	115.5033	1555.699	228.21	0.044
5000.00	01/14 09:35:40	115.6278	1533.344	222.92	0.045
4000.00	01/14 09:44:12	115.7700	1488.404	214.83	0.045
3000.00	01/14 09:54:20	115.9389	1443.124	198.23	0.045
2000.00	01/14 10:03:24	116.0900	1398.429	179.97	0.045
1000.00	01/14 10:12:28	116.2411	1353.495	162.49	0.045
0.00	01/14 10:27:56	116.4989	1308.214	112.76	0.045

200114...

95/04/14
18:12:13

Company SANTOS

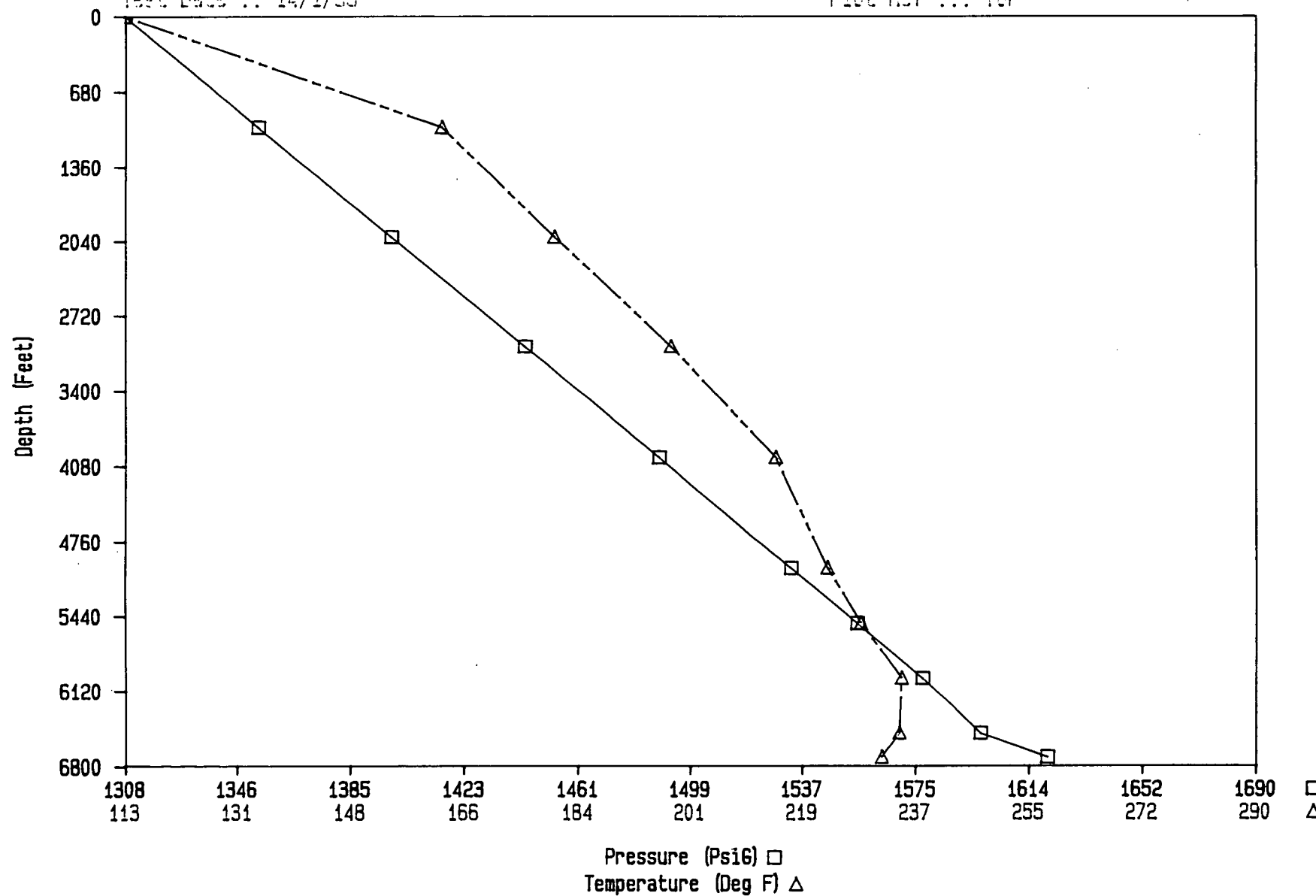
Well KUJANI #1 MOOMEA/PATCHAKAPPA

Test Date .. 14/1/95

EMP S/N 080-487

File Ref ... KUJANI#1

Plot Ref ... TOP



STATIC GRADIENT DATA PLOT / WITH TEMPERATURE GRADIENT

CUSTOMER : Santos.

PERFORATIONS: 6628' - 6812' KB

PAGE: 1 OF 2

WELL NAME: Kujani #1

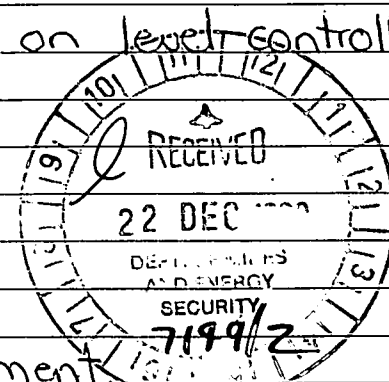
FORMATION : Patchawarra.

DATE: 19/7/93

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

OPR: P. Bowyer

DATE/TIME	DESCRIPTION OF EVENTS
19/7/93.	
1600	Arrive on location, spot wire line unit & check out lease & flange type.
1630	Depart lease for Moomba.
20/7/93.	
0830	Arrive back on location & spot frac tank, separator #37, clean & genset.
0915	Commence rig in of test equipment.
1007	Field operator S.W.I. to fit swab valve & test flanges
1036	Pressure test all lines & put well B.O.L to 100% choke
1300	Rig up complete R.I.H with 1.5" Toolstring & 1.75" B/Box.
1330	Tag on obstruction @ 6832' KB & P.O.O.H., Pressure test separator & divert flow through vessel.
1350	At surface, depressure lub & secure wire line unit.
1355	1.250" orifice plate in service
1400	Commence test, levels up in separator
1410	By pass separator & depressure to repair leaking union on level controller.
1415	Divert flow through separator & continue with test.
22/7/93.	
1300	Prepare ameras for B.H.P.s
1340	Pressure lub for B.H.P (2x pressure elements & 1 MBHT)
1440	Depressure lub.
1540	Pressure lub & R.I.H
1558	At 6720' KB, hang depth. prepare H.P sample equipment
1630	1st set of samples taken from separator: gas # SPE 204, condensate # SPE 063 & 1 H ₂ O
1700	1st set of samples completed





SEQUENCE OF EVENTS

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' KB.

PAGE: 2 OF 2

WELL NAME: Kujani #1

FORMATION : Patchawarra

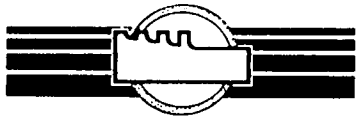
DATE: 22/7/93

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

OPR : P. Bowyer

DATE/TIME	DESCRIPTION OF EVENTS
22/7/93	
1730	2 ND set of samples taken from separator : gas [#] SPE 305, condensate [#] PDE 181 & 1 H ₂ O sample.
1800	2 ND set of samples completed, continue to flow overnight
23/7/93.	
0800	S.W.I. for 96 HR build up.
27/7/93	
08:10	P.O.O.H WITH GAUGES
08:30	AT SURFACE AND DEPRESSURE THE LUB.
09:30	PRESSURE LUB.
10:35	DEPRESSURE LUB (BOTH CHARTS GOOD.)
10:40	PREPARE GAUGES FROM FOR S.G.S.
11:03	PRESSURE LUB
11:18	DEPRESSURE LUB.
11:23	PRESSURE LUB AND R.I.H WITH GAUGES.
1223	AT BOTTOM STOP OF 6'120' K.B. AS PER PROGRAMME.
1241	P.O.O.H WITH GAUGES
1259	AT SURFACE AND DEPRESSURE LUB
1304	PRESSURE LUB
1319	DEPRESSURE LUB (BOTH CHARTS GOOD)
1430	R. D. M.O. AND HAND WELL BACK TO PRODUCTION.

CHOKE: 100 %
 FTMP: 8693 kPa
 Q_g: 97.140 E3m³/d
 Q_c: 10.838 m³/d
 Q_w: 1.527 m³/d



FIELD READINGS

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' KB.

PAGE: 1 OF 3

WELL NAME: Kujani # 1

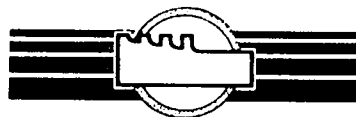
FORMATION : Patchawarra

DATE: 19/7/93.

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

OPR : P. Bowyer

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)
19/7/93														
1600					100									
1630														
20/7/93														
0830														
0915														
1007														
1036														
1300														
1330														
1350														
1355														
1400	0	8756	34	60			1.250	1245	108	131	9.25	3		6.25
1400														
1410														
1415														
1600	2	8750	34	59				1245	113	131	12.25	6.25		6.25
1800	4	8646	34	58				1230	120	133	16	9.75		6.25
21/7/93														
0600	16	8701	34	57	100		1.250	1225	116	133	40.5	31.25		9.25



FIELD READINGS

CUSTOMER : Santos

PERFORATIONS: 6628'-6812'KB.

PAGE: 2 OF 3

WELL NAME: Kuigani #1

FORMATION : Patchawarra

DATE: 21/7/93

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

OPR : P. Bowyer

TIME		WELLHEAD DATA					SEPARATOR DATA				LIQUID PRODUCTION			
DATE	FLOW OR SHOT-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)
21/7/93														
0800	18	8729	34	58	100		1.250	1230	114	133	44.25	34		10.25
1000	20	8784	34	59				1245	124	134	46.75	35.75		11
1200	22	8770	34	63				1250	120	138	50.75	39.5		11.25
1400	24	8812	34	63				1255	116	138	54.5	43		11.5
1600	26	8860	34	60				1260	110	138	58	45.5		12.5
1800	28	8798	34	59				1245	114	138	62	49		13
22/7/93														
0600	40	8619	34	55				1205	128	134	85.25	69.75		15.5
0800	42	8536	27	57				1210	126	136	89.25	73.25		16
1000	44	8556	27	58				1215	128	138	93.5	77		16.5
1200	46	8646	27	60				1225	128	140	97.25	80.25		17
1300								Prepare amerasdas for B.H.P.s						
1340		8619	27	60				Pressure Lub for B.H.P (2x pressure elements & 1 MBHT)						
1400	48	8708	27	60				1235	126	143	101.25	83.75		17.5
1440		8729	27	60				Depressure Lub.						
1540		8639	27	60				Pressure Lub & R.I.H						
1558		8660	27	60				At 6720'KB, hang depth, prepare to take samples.						
1600	50	8660	27	60				1240	124	142	105.25	87.25		18
1630								1st set of samples taken from separator.						
								gas* SPE204, condensate* SPE 063 & 1 H ₂ O sample.						
1700	51	8619	27	60	100		1.250	1230	126	143	107.5	89.25		18.25

FIELD READINGS

CUSTOMER : Santos.

PERFORATIONS: 6628' - 6812' KB

PAGE: 3 OF 3

WELL NAME: Kyiani #1

FORMATION : Patchawara

DATE: 22/7/93

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

OPR : P. Brunner

[illegible]



CUSTOMER : Santos.

PERFORATIONS: 6628' - 6812' KB.

PAGE: 1 OF 5

WELL NAME: Kujani #1

FORMATION : Patchawarra

DATE: 19/7/93.

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

OPR : P. Bowyer

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		
19/7/93																
1600					100	A.O.L. & spot wire line unit & check flange size.										
1630						Depart lease for Moomba.										
20/7/93																
0830						Arrive back on location & spot test equipment & clean										
0915						Commence rig in of test equipment										
1007						S.W.I to fit test flanges & fit swab valve.										
1036						Pressure test all lines & put well B.O.L to 100% choke										
1300						Rig in complete, R.I.H with 1.75" B/Box & 1.5" toolstring.										
1330						Tag an obstruction @ 6832' KB & P.O.O.H, pressure separator										
						& divert flow through vessel.										
1350						At surface, depressure lub & secure wire line unit.										
1355						1.250" orifice plate in service										
1400	0	8756	34	60		8584	55	93.957	Commence test, levels up in separator.							
1410						depressure (By pass) separator, leaking union on level										
						controller to repair.										
1415						Divert flow through separator & continue with test.										
1600	2	8750	34	59		8584	55	96.109	10.404	0	8.009	867	0	108		
1800	4	8646	34	58		8481	56	97.924	11.208	0	16.169	1.801	0	114		
21/7/93																
0600	16	8701	34	57		8446	56	96.033	11.480	1.602	64.185	7.541	801	136		
0800	18	8729	34	58	100	8481	56	95.442	8.808	3.204	72.138	8.275	1.068	126		



TEST RESULTS

CUSTOMER : Santos.

PERFORATIONS: 6628' - 6812' KB.

PAGE: 2 OF 5

WELL NAME: Kujani #1.

FORMATION : Patchawarra

DATE: 21/7/93.

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

OPR : P. Bowyer

TIME		WELLHEAD DATA				Separator		FLOW RATES			CUMULATIVE PRODUCTION				
DATE	FLOW OR SHUT-IN TIME	TUBING PRESSURE	ANNULUS PRESSURE	WELLHEAD TEMP	CHOKE SIZE	PRESSURE	TEMP	GAS	OIL	WATER	GAS	OIL	WATER	L.G.R	
TIME	(HOURS)	(PSI/KPa)	(PSI/KPa)	(°F/°C)	%	(PSI/KPa)	(°F/°C)	MMSCFD m ³ 10 ³ /D	BPD m ³ /D	BPD m ³ /D	MMSCF m ³ 10 ³	BBLS m ³	BBLS m ³	m ³ /10 ⁶ m ³	
21/7/93.															
1000	20	8784	34	59	100	8584	57	100.106	5.604	2.400	80.480	8.742	1.268	80	
1200	22	8770	34	63		8619	59	97.982	12.012	.792	88.645	9.743	1.334	130	
1400	24	8812	34	63		8653	59	96.570	11.208	.792	96.692	10.677	1.400	124	
1600	26	8860	34	60		8688	59	94.267	8.004	3.204	104.547	11.344	1.667	119	
1800	28	8798	34	59		8584	59	95.263	11.208	1.596	112.485	12.278	1.800	134	
22/7/93															
0600	40	8619	34	55		8308	57	99.674	11.080	2.467	162.322	17.818	2.467	136	
0800	42	8556	27	57		8343	58	98.778	11.208	1.596	170.553	18.752	2.600	130	
1000	44	8556	27	58		8377	59	99.448	12.012	1.596	178.840	19.753	2.733	137	
1200	46	8646	27	60		8446	60	99.588	10.404	1.596	187.139	20.62	2.866	120	
1300						Prepare ameradas for B.H.P.s.									
1340		8619	27	60		Pressure Lub for B.H.P (2x pressure elements & 1 MBHT)									
1400	48	8708	27	60		8515	62	98.766	11.208	1.596	195.369	21.554	2.999	130	
1440		8729	27	60		Depressure Lub.									
1540		8639	27	60		Pressure Lub & R.I.H.									
1558		8660	27	60		At 6720' KB, hang depth, prepare to take samples.									
1600	50	8660	27	60		8550	61	98.395	11.208	1.596	203.568	22.488	3.132	130	
1630						1st set of samples taken from separator.									
						gas * SPE 204, condensate * SPE 063 & 1 H ₂ O sample.									
1700	51	8619	27	60		8481	62	98.522	12.816	1.584	207.673	23.022	3.198	146	
1700					100	1st set of samples completed.									

CUSTOMER : Santos.

PERFORATIONS: 6628' - 6812' KB.

PAGE: 3 OF 5

WELL NAME: Kujani #1

FORMATION : Patchawarra.

DATE: 22/7/93.

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

OPR : P. Bowyer

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 /D	OIL BPD m ³ /D	WATER BPD m ³ /D	GAS MMSCF m ³ /D	OIL BBLS m ³	WATER BBLS m ³	L.G.R m ³ /10 ⁶ m ³	
22/7/93															
1730					100	2nd set of samples taken from separator									
								gas # SPE 305, condensate # PDE 181 & 1 H ₂ O sample							
1800	52	8708	27	59		8481	62	98.522	9.600	1.584	211.778	23.422	3.264	113	
1800						2nd set of samples completed, continue to flow overnight									
23/7/93															
0600	64	8688	27	58		8481	63	96.602	10.946	1.334	260.079	28.895	3.931	127	
0800	66	8688	27	57	100	8481	63	96.602	10.404	1.596	268.129	29.762	4.064	124	
0800	0				S/I	S.W.I to end test & commence 96HR build up.									
0815		10777	0												
0830		10825													
0845		10873													
0900	1	10880													
0915		10942													
0930		10963													
0945		10977													
1000	2	10997													
1015		11004													
1030		11011													
1045		11018													
1100	3	11025													
1115		11032	0		S/I										

TEST RESULTS

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' KB

PAGE: 4 OF 5

WELL NAME: Kujani #1

FORMATION : Patchawarra

DATE: 23/7/93

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

OPR: P. Browyer

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		
23/7/93															
1130		11046	0		S/I	build up cont									
1145		11073													
1200	4	11087													
1400	6	11108													
1800	10	11135				Taken from recorder									
24/7/93															
0600	22	11177													
1000	26	11177													
1400	30	11177													
1800	34	11190													
25/7/93															
0600	46	11218													
1000	50	11218													
1400	54	11218													
1800	58	11218													
26/7/93															
0600	70	11220													
1000	74	11220													
1400	78	11230													
1800	82	11230													
					S/I										

TEST RESULTS

CUSTOMER : SANTO LTD

PERFORATIONS: 6628' - 6812' K. B.

PAGE: 5 OF 5

WELL NAME: Kuyani #1

FORMATION : PATCHAWARRA

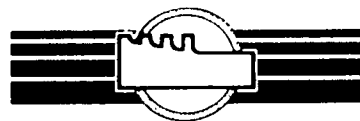
DATE: 27-7-93

TEST TYPE : L. ET. / B.H.P.

OPR: D HITCHENS

[illegible]

EXPERTEST PTY. LTD.



GAS FLOW CALCULATIONS

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' KB

PAGE: 1 OF 2

WELL NAME: Kujani #1

FORMATION : Patchawarra

DATE: 20/7/93

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

OPR : P. Bowyer

ORIFICE METER TYPE: Daniels Sna

STATIC PRESSURE RANGE : 0 - 1500 PSIG

GAS SPECIFIC GRAVITY (SG) = .828

METER RUN SIZE : 3.826"

DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC

FG $\sqrt{(1/SG)}$ = 1.0989

SEPARATOR NO : 37

STANDARD CONDITIONS : 14.73 PSI @ 60°F

C₂ (FU x FG) = 26.3752

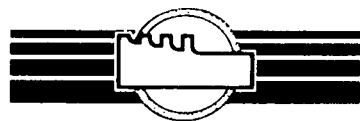
DATE TIME	FLOW TIME (HOURS)	CHOKE SIZE %	STATIC PRESS P _F (PSIA)	DIFF PRESS H _W (IN WC)	GAS FLOW TEMP (°F)	ORIF. PLATE SIZE (IN)	$\sqrt{(P_F \times H_W)}$	C ₁ = F _B × F _{TF} × F _{pv} × Y ₂				C ₁	C (C = C ₁ × C ₂)	GAS FLOW RATE Q = $\sqrt{(P_F \times H_W) \times C}$	
								F _B	F _{TF}	F _{pv}	Y ₂			(MMSCFD)	(m ³ 10 ³ /D)
20/7/93															
1400	0	100	1260	108	131	1.25	368.8507	316.26	.9380	1.1493	1.0006	341.1464	8997.8113	3.319	93.957
1600	2		1260	113	131		377.2923		.9380	1.1493	1.0006	341.1553	8998.0458	3.395	96.109
1800	4		1245	120	133		386.4810		.9364	1.1451	1.0006	339.3334	8949.9916	3.459	97.924
21/7/93															
0600	16		1240	116	133		379.2211		.9364	1.1445	1.0006	339.1514	8945.1913	3.392	96.033
0800	18		1245	114	133		376.6951		.9364	1.1451	1.0006	339.3226	8949.7086	3.371	95.442
1000	20		1260	124	134		395.2297		.9356	1.1456	1.0006	339.2150	8946.8697	3.536	100.106
1200	22		1265	120	138		389.5736		.9325	1.1414	1.0006	336.8390	8884.2022	3.461	97.982
1400	24		1270	116	138		383.7821		.9325	1.1420	1.0006	336.9951	8888.3191	3.411	96.570
1600	26		1275	110	138		374.4600		.9325	1.1425	1.0006	337.1473	8892.3344	3.330	94.267
1800	28		1260	114	138		378.9581		.9325	1.1409	1.0006	336.6650	8879.6130	3.365	95.263
22/7/93															
0600	40		1220	128	134		395.1271		.9356	1.1409	1.0007	337.8385	8910.5633	3.521	99.674
0800	42		1225	126	136		392.8307		.9341	1.1392	1.0007	336.7591	8882.0963	3.489	98.778
1000	44		1230	128	138		396.7435		.9325	1.1375	1.0007	335.7005	8894.1736	3.513	99.448
1200	46		1240	128	140		398.3534		.9309	1.1364	1.0007	334.8130	8830.7672	3.518	99.588
1400	48		1250	126	143		396.8198		.9286	1.1342	1.0007	333.3315	8791.6919	3.489	98.766
1600	50	↓	1255	124	142	↓	394.4446	↓	.9294	1.1358	1.0006	334.0801	8811.4366	3.476	98.395
1700	51	100	1245	126	143	1.25	396.0252	316.26	.9286	1.1337	1.0007	333.1758	8787.5859	3.480	98.522

CUSTOMER :	Santos.	PERFORATIONS:	6628' - 6812' KB	PAGE:	2 OF 2
WELL NAME:	Kujani # 1	FORMATION :	Patchawarra.	DATE:	22/7/93.
TEST TYPE :	L.E.T / B.H.P			OPR :	P. Bowyer

ORIFICE METER TYPE: Daniels Snr.	STATIC PRESSURE RANGE : 0 - 1500 PSIG	GAS SPECIFIC GRAVITY (SG) = 0.828
METER RUN SIZE : 3.826"	DIFFERENTIAL PRESS. RANGE: 0 - 200 IN WC	FG $\sqrt{(1/SG)}$ = 1.0989
SEPARATOR NO : 37	STANDARD CONDITIONS : 14.73 PSI @ 60°F	C ₂ (FU x FG) = 26.3752

[illegible]

EXPERTEST PTY. LTD.



LIQUID PRODUCTION

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' KB

PAGE: 1 OF 2

WELL NAME: Kujani #1

FORMATION : Patchawarra.

DATE: 20/7/93.

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

OPR : P. Bowyer

TANK NUMBER	#1 = 56 #2 =	TANK CAPACITY	#1 = 56.6 m ³ bbls/m ³ #2 = bbls/m ³	TANK SCALE	#1 = 1" = .267 m ³ bbls/in - m ³ /cm #2 = bbls/in - m ³ /cm	OIL API GRAVITY = @ 60°F
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DATE TIME	FLOW TIME (HOURS)	TANK USED (NUMBER)	TOTAL TANK DIP (IN/CM)	OIL/CONDENSATE PRODUCTION				WATER PRODUCTION			
				TANK DIP (IN/CM)	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD/m ³ D)	CUMULATIVE PRODUCTION (BBLs/m ³)	TANK DIP (IN/CM)	TANK PRODUCTION (BBLs/m ³)	FLOW RATE (BPD/m ³ D)	CUMULATIVE PRODUCTION (BBLs/m ³)
20/7/93											
1400	0	56	9.25	3				6.25	Opening dip.		
1600	2		12.5	6.25	.867	10.404	.867	6.25			
1800	4		16	9.75	.934	11.208	1.801	6.25			
21/7/93											
0600	16		40.5	31.25	5.740	11.480	7.541	9.25	.801	1.602	.801
0800	18		44.25	34	.734	8.808	8.275	10.25	.267	3.204	1.068
1000	20		46.75	35.75	.467	5.604	8.742	11	.200	2.400	1.268
1200	22		50.75	39.5	1.001	12.012	9.743	11.25	.066	.792	1.334
1400	24		54.5	43	.934	11.208	10.677	11.5	.066	.792	1.400
1600	26		58	45.5	.667	8.004	11.344	12.5	.267	3.204	1.667
1800	28		62	49	.934	11.208	12.278	13	.133	1.596	1.800
22/7/93											
0600	40		85.25	69.75	5.540	11.080	17.818	15.5	.667	1.334	2.467
0800	42		89.25	73.25	.934	11.208	18.752	16	.133	1.596	2.600
1000	44		93.5	77	1.001	12.012	19.753	16.5	.133	1.596	2.733
1200	46		97.25	80.25	.867	10.404	20.62	17	.133	1.596	2.866
1400	48		101.25	83.75	.934	11.208	21.554	17.5	.133	1.596	2.999
1600	50		105.25	87.25	.934	11.208	22.488	18	.133	1.596	3.132
1700	51		107.5	89.25	.534	12.816	23.022	18.25	.066	1.584	3.198
1800	52	56	109.25	90.75	.400	9.600	23.422	18.5	.066	1.584	3.264

CUSTOMER :	Santos.	PERFORATIONS:	6628' - 6812' KB.	PAGE:	2 OF 2
WELL NAME:	Kujani #1.	FORMATION :	Patchawarra.	DATE:	23/7/93
TEST TYPE :	L.E.T / B.H.P			OPR :	P. Bruxner

CUSTOMER : Santos.			PERFORATIONS: 6628' - 6812' KB.			PAGE: 2 OF 2		
WELL NAME: Kujani #1.			FORMATION : Patchawarra.			DATE: 23/7/93		
TEST TYPE : L.E.T / B.H.P						OPR : P. Bowyer		
TANK	#1 = 56.6m ³	bbls/m ³	TANK	#1 = 1" = 0.267m ³	bbls/in - m ³ /cm	OIL API GRAVITY = @ 60°F		
CAPACITY	#2 =	bbls/m ³	SCALE	#2 =	bbls/in - m ³ /cm			

ET 105

EXPERTEST PTY. LTD.



SAMPLING DATA

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' KB

PAGE: 1 OF 2

WELL NAME: Kujani #1

FORMATION : Patchawarra

DATE: 22/7/93

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

OPR : P. Bowyer

SAMPLE # SPE 204

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)	
1700	SPE204	500	GAS	30	Evacuated	/	/		Separator Meter Run		8481	62		22	
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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³/10⁶m³	PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	
8619	60	100%		8481	62	1.1337	0.828	—	98.522	12.816	1.584	146			

REMARKS:

SAMPLE # SPE 063

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)
1700	SPE063	500	Condensate	30	Acidified Brine		475	25		Separator Sight glass		8481	62		22
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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³/10⁶m³		PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)
8619	60	100%		8481	62	1.1337	0.828	—	98.522	12.816	1.584	146			

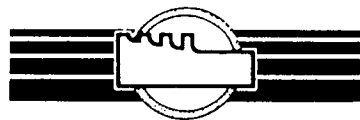
REMARKS:

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)
1700	*1	1/2LTR	H2O	2	/		/	/		Separator H2O line.					22
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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³/10m³	PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)	
8619	60	100%		8481	62	1.1337	0.828	-	98.522	12.816	1.584		146		

REMARKS:

EXPERTEST PTY. LTD.



SAMPLING DATA

CUSTOMER : Santos.

PERFORATIONS: 6628' - 6812' KB

PAGE: 2 OF 2

WELL NAME: Kujani*1

FORMATION : Patchawarra

DATE: 22/7/93

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

OPR : P. Bowyer

SAMPLE # SPE 305

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)	
1800	SPE 305	500	GAS	30	Evacuated	/	/		Separator meter Run		8481	62		22	
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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³/10⁶ m³		PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)
8708	59	100%		8481	62	1.1337	828		98.522	9.600	1.584	113			

REMARKS:

SAMPLE # PDE 181

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)
1800	PDE 181	500	Condensate	30	Acidified Brine		475	25		Separator Sight glass		8481	62		22
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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³/10⁶m³	PRESSURE	TEMPERATURE	
													(PSI/KPa)	(°F/°C)	
8708	59	100%		8481	62	1.1337	828		98.522	9.600	1.584	113			

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)
1800	# 2	1/2 LTR	H2O	2	/	/	/		Separator H2o line			62		22
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 m³10³/D	OIL BPD m³/D	WATER BPD m³/D	L.G.R m³ / 10⁶ m³	PRESSURE (PSI/KPa)	TEMPERATURE (°F/°C)
8708	59	100%		8481	62	1.1337	828		98.522	9.600	1.584	113		

REMARKS:

[illegible]

SUB-SURFACE PRESSURE SURVEY

CO.		RUN 02 FIELD KUJANI	WELL 1
EFF DEPTH		WELL STAT	TOOL HUNG 6714'KB
CASING	-	CASING PRESS	ON BOTTOM 1558 22/7
LINER	-	TUBING PRESS	OFF BOTTOM 0810 27/7
DATE	930723	ELEMENT RANGE 0 - 5050	ZERO POINT
ELEVATION		ZONE	SHUT-IN 0800 23/7
MAX TEMP	242	PICK-UP	ON-PROD
PERF	-	CAL SER NO. 21821	MPP
TUBING	-		
UNITS	ENGLISH	PURPOSE	LET/BHP

SURVEY DATA

CO.	RUN 02 FIELD KUJANI				WELL 1				
	TIME	P-T	DP-DT	DTIME		TIME	P-T	DP-DT	DTIME
WELL SHUT IN.	8:00	1675.0	1675.0	.0		7:39	2022.6	2022.6	23.6
	8:01	1696.2	1696.2	.0		13:32	2025.8	2025.8	29.5
	8:02	1732.2	1732.2	.0		21:00	2028.3	2028.3	37.0
	8:04	1791.2	1791.2	.1		1:55	2030.0	2030.0	41.9
	8:05	1842.6	1842.6	.1		8:52	2030.7	2030.7	48.9
	8:06	1877.1	1877.1	.1		14:56	2032.3	2032.3	54.9
	8:08	1917.7	1917.7	.1		20:42	2031.8	2031.8	60.7
	8:17	1941.5	1941.5	.3		2:41	2033.5	2033.5	66.7
	8:39	1959.3	1959.3	.6		9:38	2034.4	2034.4	73.6
	9:28	1978.5	1978.5	1.5		16:18	2036.8	2036.8	80.3
	10:52	1988.7	1988.7	2.9		21:31	2040.6	2040.6	85.5
	12:23	1997.1	1997.1	4.4		5:41	2044.7	2044.7	93.7
	13:49	2000.1	2000.1	5.8	END	8:40	2046.3	2046.3	96.2
	15:57	2006.2	2006.2	7.9	BUILD UP	7:32	1670.9	1670.9	-15.5
	18:23	2013.1	2013.1	10.4	-	4:51	1671.9	1671.9	-12.9
	20:22	2013.1	2013.1	12.4	-	0:05	1673.9	1673.9	-8.1
	23:15	2016.3	2016.3	15.2		5:41	1673.4	1673.4	-2.3
	2:44	2020.2	2020.2	18.7		7:17	1673.1	1673.1	-.7

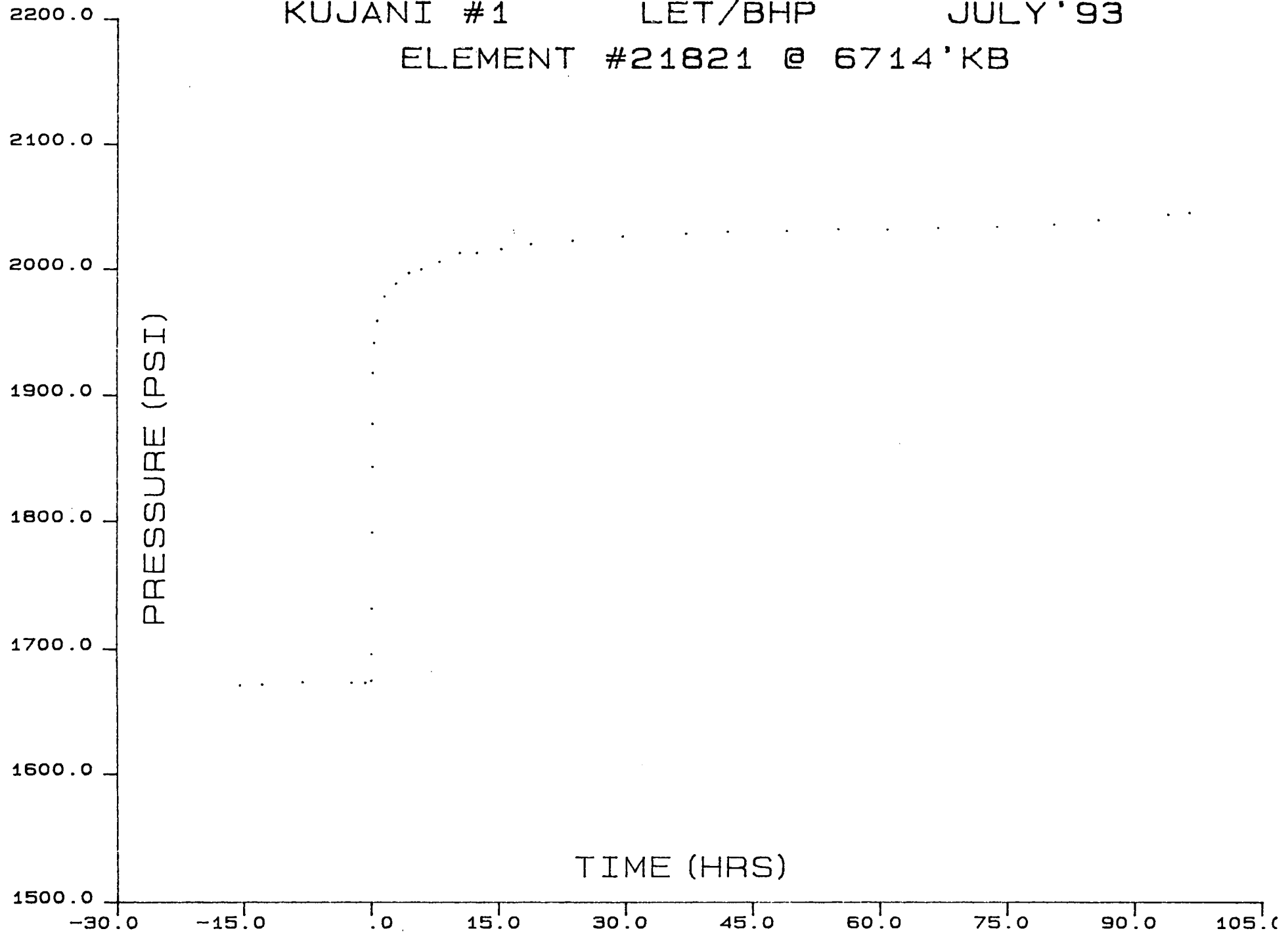
LUBRICATOR DWT; IN: 1250 psi / OUT: 1632 psi
 LUBRICATOR AMERADA; IN: 1275 psi / OUT: 1642 psi
 ELEMENT #21379 WAS ALSO RUN.

KUJANI #1

LET/BHP

JULY '93

ELEMENT #21821 @ 6714'KB



EXPERTEST PTY. LTD.



BHP/BHT GAUGE RUN DATA

CUSTOMER : Santos

PERFORATIONS: 6628' - 6812' K.B.

PAGE: 1 OF 1

WELL NAME: Kujani #1

FORMATION : Patchawarra

DATE: 27. 7. 93

TEST TYPE : Static Gradient

OPR : D. HITCHENS

GAUGE DATA

UPPER
PRESSURE
GAUGELOWER
PRESSURE
GAUGETEMPERATURE
GAUGE

RUN DATA

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

ELEMENT SERIAL NO.

21821

21379

MBHT

DATE : 27. 7. 93

ELEMENT RANGE

PSI

4750

4825

PRESSURE LUBRICATOR :

11:03

11,260

Ø

RECORDING SECTION SERIAL NO.

14619

59288

RUN IN HOLE :

11:23

11,260

"

DATE OF CALIBRATION:

@ 290°F

12/7/93

12/7/93

ON DEPTH AT MPP : 6720' FT/M

12:26

11,270

"

CLOCK SERIAL NO.

2509

2297

DATE : 27. 7. 93

CLOCK RANGE

HR

3

3

PULL OUT OF HOLE :

12:41

11,260

Ø

LEAD SCREW TYPE

TCS

15

15

AT SURFACE :

12:59

11,260

"

DEPRESSURE LUBRICATOR :

13:19

11,260

"

ENGAGE STYLUS

DATE 27. 7. 93

TIME

10:56

10:56

MAXIMUM BHT AT 6720' FT/M = 242 °F/G

DISENGAGE STYLUS

DATE 27. 7. 93

TIME

13:26

13:26

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

DATE

TIME

REMARKS

Tested Tuesday, 27th July 1993.

STATIC PRESSURE GRADIENT REPORT**CLIENT****LOCATION****FORMATION**

SANTOS LTD.

KUJANI #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	21821	4750	12/ 7/93
Bottom	21379	4825	12/ 7/93

W E L L D A T A

PARAMETER	VALUE
DWT In	1633 PSIG
DWT Out	1633 PSIG
Max BHT	242 F

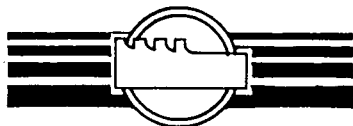
T O P E L E M E N T**B O T T O M E L E M E N T**

DEPTH FT KB	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT	DEFLECTION INCHES	PRESSURE PSIG	GRADIENT PSI/FT
LUB.	0.6530	1649.6	-	0.6660	1640.9	-
1000	0.6780	1712.4	0.063	0.6910	1702.7	0.062
2000	0.7020	1772.8	0.060	0.7160	1764.5	0.062
3000	0.7250	1830.6	0.058	0.7415	1827.5	0.063
4000	0.7490	1891.0	0.060	0.7660	1888.1	0.061
5000	0.7720	1948.9	0.058	0.7900	1947.4	0.059
5500	0.7840	1979.1	0.060	0.8020	1977.1	0.059
6000	0.7950	2006.8	0.055	0.8130	2004.3	0.054
6500	0.8040	2029.4	0.045	0.8230	2029.0	0.050
6720	0.8100	2044.5	0.069	0.8310	2048.8	0.090
LUB.	0.6520	1647.1	-	0.6640	1636.0	-

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

EXPERTEST PTY. LTD.

STATIC PRESSURE GRADIENT SURVEY



Location: KUJANI #1

Tested: 27th July 1993.

Formation: PATCHAWARRA

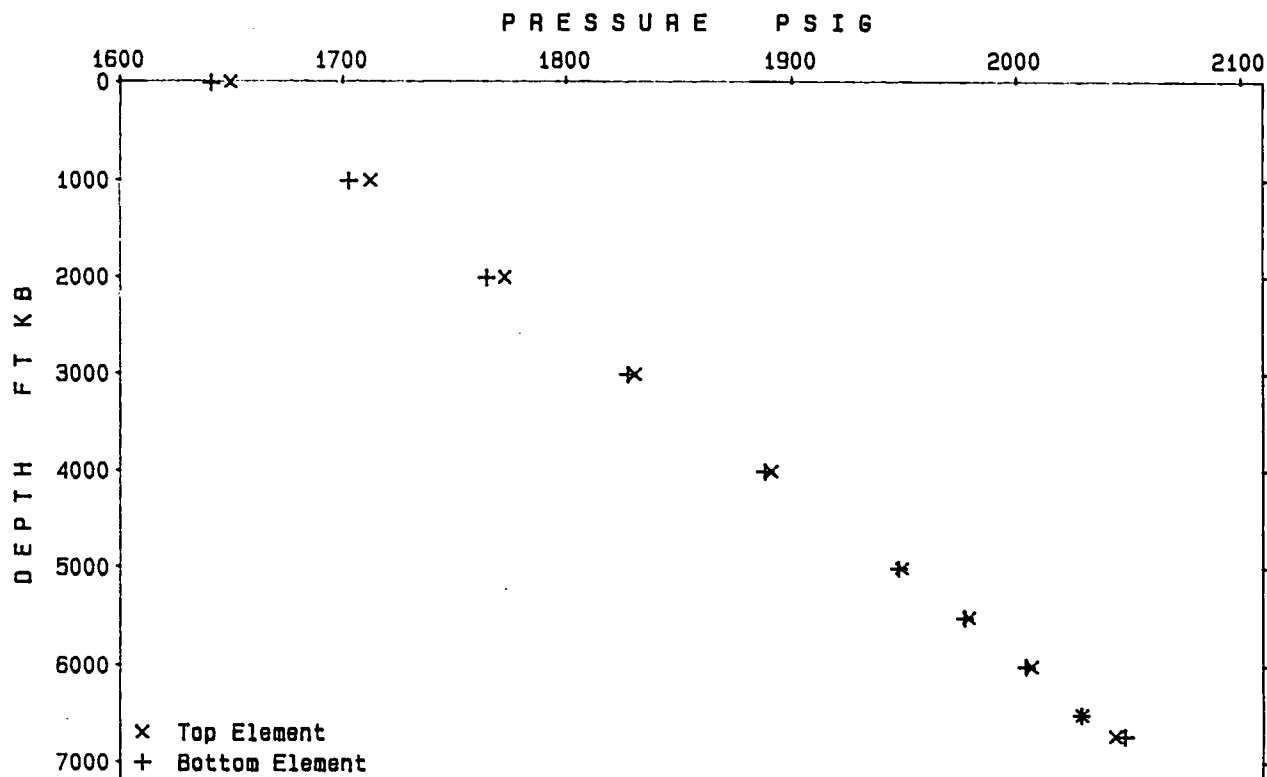
Client: SANTOS LTD.

PRESSURE ELEMENT DATA

Position	Serial No	Range	Calibrated
Top	21821	4750	12/ 7/93
Bottom	21379	4825	12/ 7/93

WELL DATA

DWT In	1633 PSIG
DWT Out	1633 PSIG
Max BHT	242 F



TOP ELEMENT

BOTTOM ELEMENT

Depth FT KB	Deflection Inches	Pressure PSIG	Gradient PSI/FT	Deflection Inches	Pressure PSIG	Gradient PSI/FT
LUB.	0.6530	1649.6	-	0.6660	1640.9	-
1000	0.6780	1712.4	0.063	0.6910	1702.7	0.062
2000	0.7020	1772.8	0.060	0.7160	1764.5	0.062
3000	0.7250	1830.6	0.058	0.7415	1827.5	0.063
4000	0.7490	1891.0	0.060	0.7660	1888.1	0.061
5000	0.7720	1948.9	0.058	0.7900	1947.4	0.059
5500	0.7840	1979.1	0.060	0.8020	1977.1	0.059
6000	0.7950	2006.8	0.055	0.8130	2004.3	0.054
6500	0.8040	2029.4	0.045	0.8230	2029.0	0.049
6720	0.8100	2044.5	0.069	0.8310	2048.8	0.090
LUB.	0.6520	1647.1	-	0.6640	1636.0	-

GENERAL REMARKS