

FLOPET

Denne rapport
tilhører



TEK DOK.SENTER

L.NR. 12483010017

KODE Well 1/9-6 nr 13

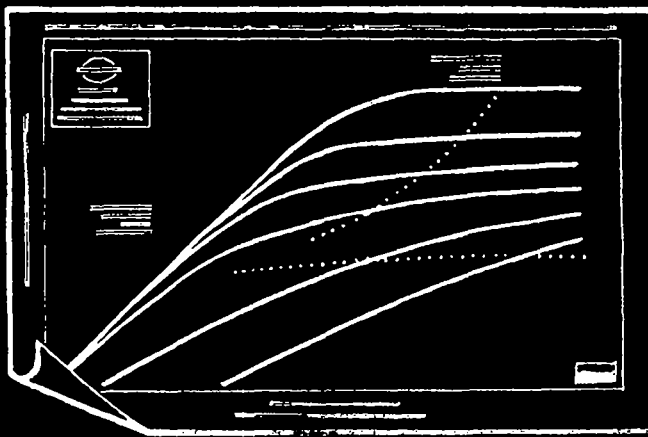
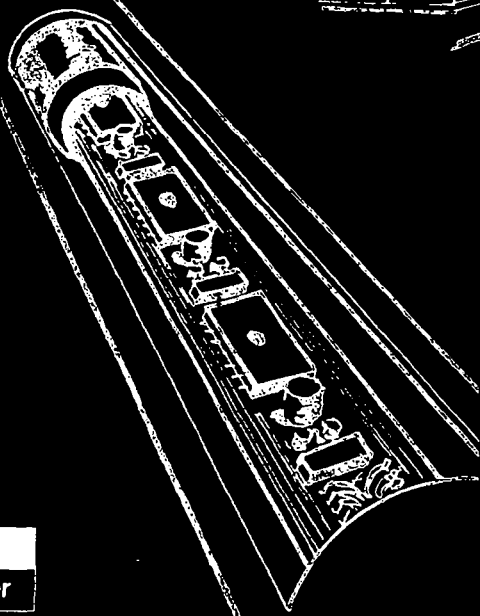
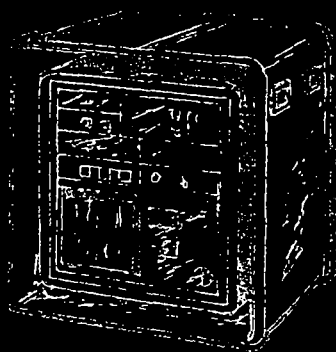
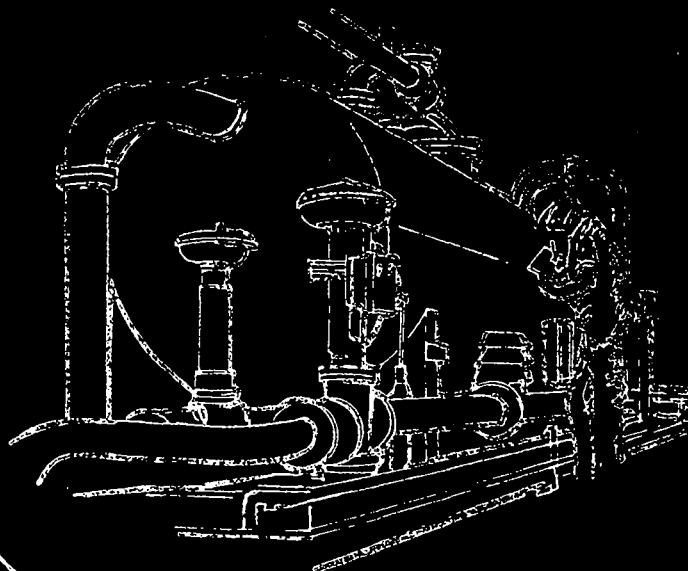
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Well Testing Report

: PHILLIPS PETROLEUM COMPANY NORWAY

: TOMMELITEN Well: 1/9-6

: DST NO. 3 Date: 01.10.82 - 04.10.82



FLOPETROL

DIVISION : E.M.R.
BASE : N.W.B.
REPORT N°: 82/2301/31

Well Testing Report

Client : PHILLIPS PETROLEUM COMPANY NORWAY

Field : TOMMELITEN Well: 1/9-6

Zone : DST NO. 3 Date: 01.10.82 - 04.10.82

FLOPETROL

Client : PPCoN

Section : INDEX

Base : NWB

Field : TOMMELITEN

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Well : 1/9-6

Report N°: 82/2301/31

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N° DOP 101

Flopetrol chief operator
Name : K.MASSIE/A. ESBERGER

Client representative
Name : J. JEWHRST

FLOPETROL

Client : PPCoN

Section :

1

Field : TOMMELITEN

Page : 2

Base : NWB

Well : 1/9-6

Report N° : 82/2301/31

- TEST PROCEDURE -

ZONE PERFORATED 11,560 TO 11,650 FEET, 11,680 TO 11,710 FEET
AND 11,740 TO 11,770 FEET.

TEST STRING RIH, RTTS PACKER SET AT 11,502 FEET, APR-N AT
11,302 FEET.

ZONE ACIDIZED.

WELL SLOWLY OPENED AT CHOKE MANIFOLD TO 40/64" ADJUSTABLE
AND FLOW PASSED THROUGH SEPARATOR FOR 336 MINUTES FOR FLUID
RATE EVALUATION.

CHOKE INCREASED TO 44/64" ADJUSTABLE AND FLOW PASSED THROUGH
SEPARATOR FOR 101 MINUTES FOR FLUID RATE EVALUATION.

CHOKE DECREASED TO 20/64" ADJUSTABLE AND FLOW PASSED THROUGH
SEPARATOR FOR 72 MINUTES FOR FLUID RATE EVALUATION.

CHOKE DECREASED TO 16/64" ADJUSTABLE AND FLOW PASSED THROUGH
SEPARATOR FOR 61 MINUTES FOR FLUID RATE EVALUATION.

WELL SHUT IN AT CHOKE MANIFOLD FOR BUILD UP.

BUILD UP CANCELLED AFTER 154 MINUTES AND APR-N CLOSED DUE TO
LEAKING BOP RAMS.

FORMATION BULLHEADED, REVERSED AND STRING POOH.

SAMPLES TAKEN FROM PRESSURIZED SEPARATOR FOLLOWING SHUT-IN

END DST # 3

FLOPETROL

Client : PPCoNSection : 2Base : NWBField : TOMMELITENPage : 3Well : 1/9-6Report No: 82/2301/31

— MAIN RESULTS —

Tested interval : DST 3Perforations : 11,560 TO 11,650 FEET
11,680 TO 11,710 FEET
11,740 TO 11,770 FEET

Operation	Duration	Bottom hole pressure	Well head pressure	Oil prod. rate	Gas prod. rate	G.O.R.
Units	MINS		PSIG	BOPD	MMSCFD	SCF/BBL
40/64" ADJ.	336	NO BHP	3919	4007	27.32	6818
44/64" ADJ.	101	AVAILABLE	3673	4465	30.69	6873
20/64" ADJ.	72		4618	-	11.48	
16/64" ADJ.	61		4720	1455	8.61	5917

Depth of bottom hole measurements : N/A Reference : RKBTemperature : - at : - depthSeparator gas gravity (air : 1) at choke size : 0.687 AT 40/64" ADJ. CHOKESTO gravity at choke size : 0.8283 AT 40/64" ADJ. CHOKEBSW : 2% H₂O Water cut : 2% H₂O

REMARKS AND OTHER OPERATIONS

TEH ABOVE RESULTS ARE FINAL VALUES FOR EACH FLOW PERIOD.

WATER CHLORIDES 67,000 PPM AT 03:00 HRS 4/10-82
2% CO₂ AVERAGE THROUGH SEPARATOR % H₂S. THROUGHOUT.

- OPERATING AND MEASURING CONDITIONS -

A - TYPE OF GAUGE -

BOTTOM HOLE :

Pressure : SPERRY SUN MRPG 0-10000 PSI

Temperature : _____

WELL HEAD :

Pressure : DWT 0-10000 PSI - FOXBORO 0-10000 PSITemperature : FOXBORO 30-180°F

SEPARATOR :

Pressure : _____

Temperature : _____

B - PRODUCTION RATE CONDITIONS AND SOURCES -

OIL PRODUCTION RATE

- Tank
 Meter
 Dump

- Floco
 Rotron

Reference conditions

- Separator
 Atmospheric
pressure 60°F

Shrinkage measurement

- With tank
 With shrinkage
tester

GAS PRODUCTION RATE

- Orifice meter

Standard conditions

60°F
14.73 PSI

WATER PRODUCTION RATE

- Tank
 Meter

C - WELL DATA -

WELL STATE DURING SURVEY :

Well producing through : _____ tubing / ~~drill pipe~~ / casingMain casing size 7" set at 12,700 Total well depth _____Tubing size 5" set at 12 Packer RTTS set at 11,502

Perforations :

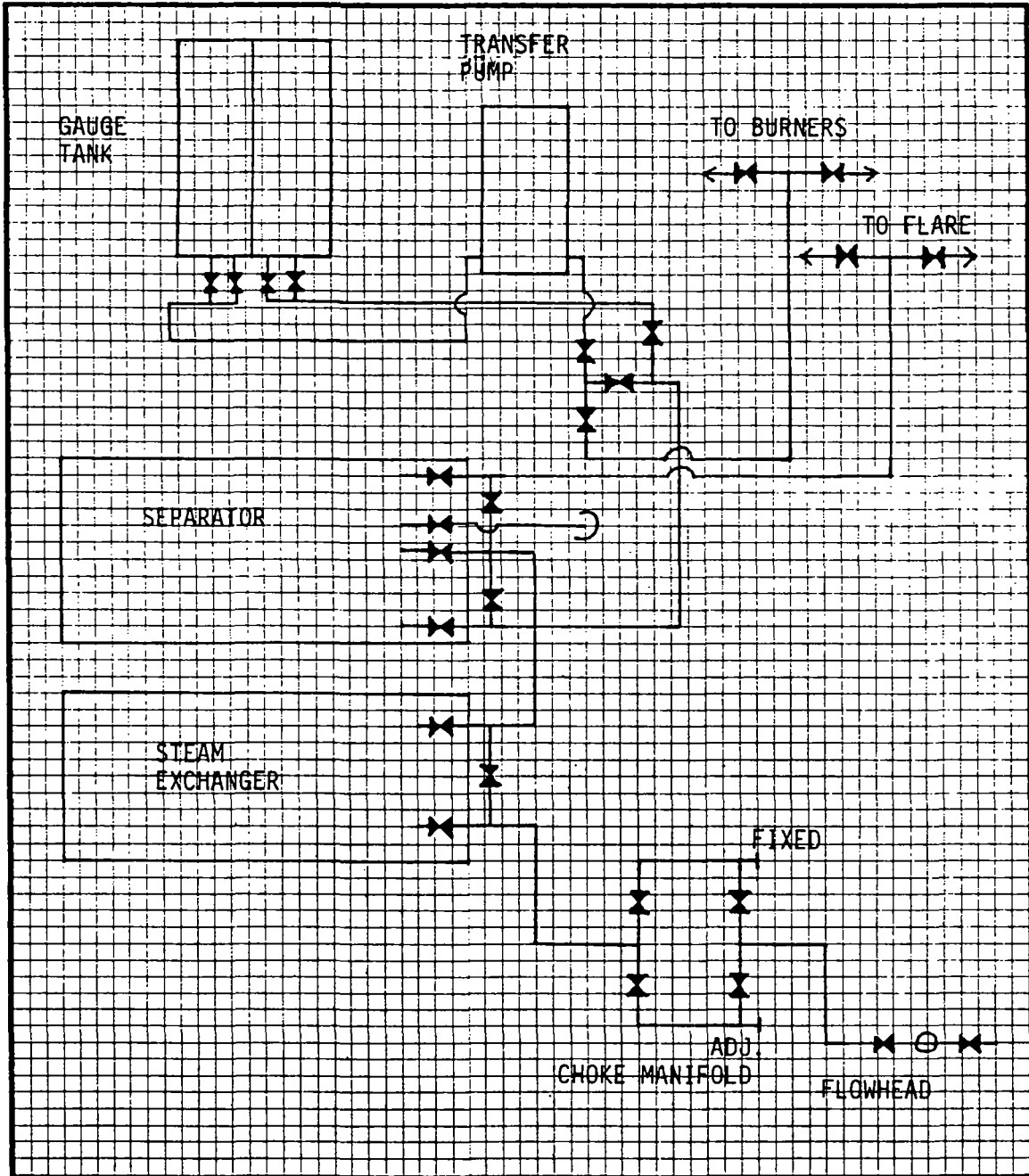
- Zone DST 3 From 11,560 to 11,650 From 11,680 to 11,710 FEET
- Zone DST 3 From 11,740 to 11,770 From _____ to _____

WELL STATE BEFORE TEST :

WILDCAT

- Well closed since _____
 Well flowing since _____ Producing zone _____
Choke size _____

- SURFACE EQUIPMENT LAYOUT -



REMARKS :

NOT TO SCALE
RIG SEDCO 703

NWB

PPCoN

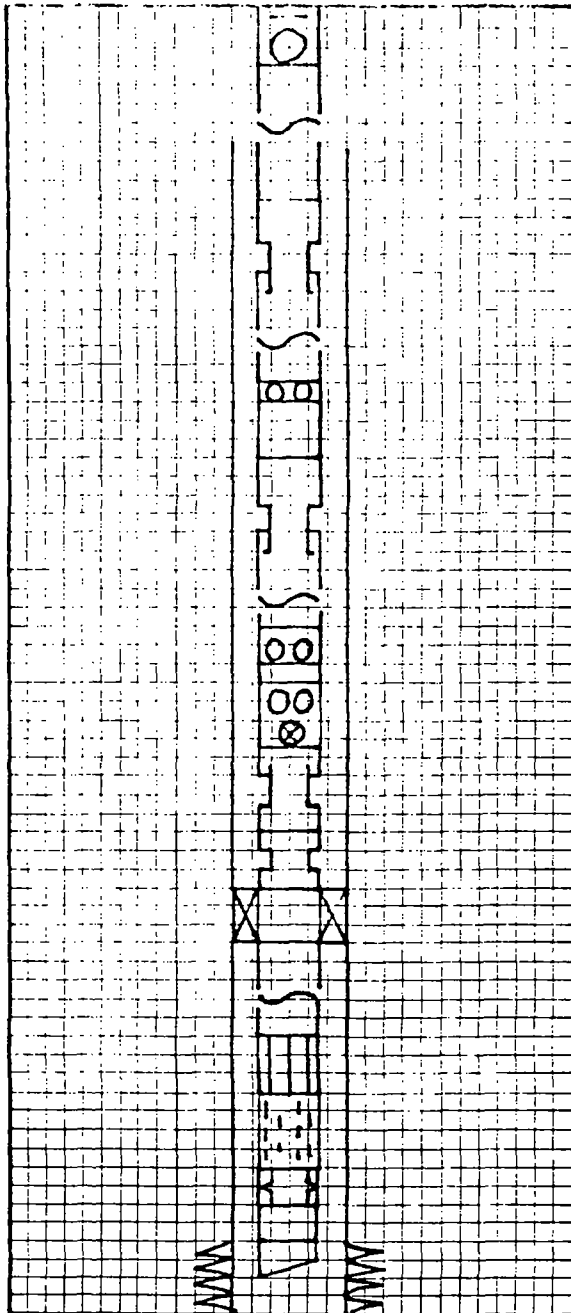
TOMMELITEN

1/9-6

6

82/2301/31

WELL COMPLETION DATA-



EZ-TREE----- SEABED

5" VAM TUBING

3 1/2" VAM TUBING

SLIP JOINTS

4 3/4" DCS.

RTTS CIRCULATING VALVE

4 3/4" DCS

SLIP JOINTS

4 3/4" DCS

APR-M-----11,284 FEET

DP TESTER VALVE

APR-N-----11,302 FEET

JARS

SAFETY JOINT

RTTS PACKER-----11,502 FEET

3 1/2" DP

BUNDLE CARRIER

PERFORATED JOINT

'F' NIPPLE

2 3/8" TUBING

WIRELINE REENTRY GUIDE

PERFORATIONS 11,560 TO 11,650 FEET

11,680 TO 11,710 FEET

11,740 TO 11,770 FEET

REMARKS

NOT TO SCALE-SCHEMATIC ONLY

ALL DEPTHS FROM ROTARY TABLE.

FOR EZ-TREE AND LUBRICATOR VALVE DETAILS SEE ANNEXES.

FLOPETROL

Client : PPCoN

Section : 6

Base : NWB

Field : TOMMELITEN

Page : 7

Well : 1/9-6

Report N°: 82/2301/31

-- SEQUENCE OF EVENTS --

DATE	TIME	OPERATION
		SCHLUMBERGER PERFORATED INTERVAL 11560-11650 FEET RKB.
		11680-11710 FEET RKB, 11740-11770 FEET RKB.
03.10.82	00:10	MADE UP NEW FLOWHEAD ONTO ONE JOINT OF 5" TUBING AND TORQUED UP ALL JOINTS.
	02:30	COMPLETED PRESSURE TESTING ALL SURFACE EQUIPMENT AS STATED IN TEST PROGRAM
	03:15	PRESSURE TESTED FLOWLINE CHIKSANS TO 7000 PSI
	05:10	PRESSURE TESTED ALL VALVES ON FLOWHEAD TO 7000 PSI
	07:00	PICKED UP EZ-TREE AND MADE UP ON TEST STRING.
	07:19	FUNCTION TESTED VALVE AND LATCHING SYSTEMS ON EZ-TREE.
	07:24	RIH WITH EZ-TREE
	08:00	PICKED UP LUBRICATOR VALVE AND MADE UP ONTO TEST STRING.
	08:10	FUNCTION TESTED LUBRICATOR VALVE
	08:12	RIH WITH LUBRICATOR VALVE
	09:15	PICKED UP FLOWHEAD AND MADE UP ONTO TEST STRING. STARTED TO RIG UP SURFACE LINES.
	11:44	FLUSHED THROUGH LINES TO FLARE BOOM.
	11:50	CLOSED CHOKE MANIFOLD AND MASTER VALVE
	12:30	PRESSURE TESTED TO CHOKE MANIFOLD TO 7000 PSI.
	13:00	PRESSURE TESTED FLOWLINE VALVE TO 7000 PSI
	13:15	OPENED MASTER VALVE AND PRESSURE TESTED TEST STRING TO 7000 PSI
	13:37	PRESSURE TESTED EZ-TREE TO 7000 PSI (LEAK OFF TEST)
	13:50	PRESSURE TESTED LUBRICATOR VALVE TO 7000 PSI (LEAK OFF TEST)
	14:30	SET HALLIBURTON RTTS PACKER AT 11502 FT
	15:03	OPENED FLOWLINE VALVE
	15:04	CLOSED MASTER VALVE

N° DOP 107

FLOPETROL

Section : **6**

_ SEQUENCE OF EVENTS _ (Continuation)

Page : 8
Report N°: 82/2301/3

DATE	TIME	OPERATION
03.10.82	15:08	CLOSED CHOKE MANIFOLD
	15:23	PRESSURE TESTED ACID LINE TO CHOKE MANIFOLD TO 7000 PSI
	15:27	CLOSED KILL LINE VALVE
	15:29	OPENED CHOKE MANIFOLD TO BLEED OFF PRESSURE
	15:36	PRESSURE TESTED ACID LINE TO KILL VALVE TO 7000 PSI
	15:40	CLOSED CHOKE MANIFOLD - OPENED MASTER VALVE AND KILL VALVE
	16:40	PRESSURED ANNULUS TO 1500 PSI TO OPEN APR-N VALVE
	16:47	INCREASED ANNULUS PRESSURE TO 1800 PSI
	16:49	BLED OF ANNULUS
	16:50	PRESSURED ANNULUS TO 1800 PSI TO OPEN APR-N VALVE
	16:55	STARTED TO PUMP DOWN STRING WITH ACID UNIT.
	17:03	APR-N VALVE NOT OPEN - BLED OFF PRESSURE AT CHOKE MANIFOLD
	17:07	BLED OFF ANNULUS
	17:10	PRESSURED UP ANNULUS TO 1800 PSI TO OPEN APR-N VALVE
	17:13	BLED ANNULUS
	17:14	PRESSURED ANNULUS TO 1800 PSI TO OPEN APR-N VALVE
	17:17	STARTED TO PUMP DOWN STRING WITH ACID UNIT
	17:22	APR-N NOT OPEN - BLED OFF PRESSURE AT CHOKE MANIFOLD
	17:45	PRESSURED TUBING TO 2050 PSI WITH ACID UNIT
	17:50	PRESSURED ANNULUS TO 1700 PSI TO OPEN APR-N VALVE
	17:54	BLED OFF TUBING PRESSURE AT CHOKE MANIFOLD - APR-N VALVE
		OPENED
	18:03	STARTED PUMPING ACID
	18:16	STOPPED PUMPING ACID
	18:17	CLOSED KILL LINE VALVE TO REPAIR CHIKSAN LEAK IN ACID LINE
	18:24	CLOSED MASTER VALVE
	18:34	CHIKSAN REPLACED
	19:15	ACID LINE REPAIRED AND TESTED TO 7000 PSI
	19:24	OPENED MASTER VALVE
	19:27	OPENED KILL LINE VALVE

N° DOP 108

FLOPETROL

Section : **6**

_ SEQUENCE OF EVENTS _ (Continuation)

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DATE	TIME	OPERATION
03.10.82	19:31	STARTED PUMPING ACID.
	21:44	ACID STIMULATION COMPLETED
	21:48	CLOSED KILL LINE VALVE
	22:00	CLOSED MASTER AND FLOWLINE VALVE
	22:03	bled off pressure at choke manifold - rigged down acid line and made up kill line
	22:34	PRESSURE TESTED KILL LINE TO 7000 PSI
	23:14	OPENED MASTER VALVE
	23:15	OPENED FLOWLINE VALVE
	23:32	OPENED WELL AT CHOKE MANIFOLD ON 8/64" ADJUSTABLE CHOKE
	23:33	INCREASED TO 12/64" ADJUSTABLE CHOKE
	23:34	INCREASED TO 16/64" ADJUSTABLE CHOKE
	23:35	INCREASED TO 20/64" ADJUSTABLE CHOKE
	23:36	INCREASED TO 24/64" ADJUSTABLE CHOKE
	23:37	INCREASED TO 28/64" ADJUSTABLE CHOKE
	23:38	INCREASED TO 32/64" ADJUSTABLE CHOKE
	23:39	INCREASED TO 36/64" ADJUSTABLE CHOKE
	23:40	INCREASED TO 40/64" ADJUSTABLE CHOKE
	23:42	INCREASED TO 44/64" ADJUSTABLE CHOKE
	23:44	INCREASED TO 48/64" ADJUSTABLE CHOKE
	23:48	GAS TO SURFACE
	23:55	UNABLE TO OBTAIN CONTINUOUS BURNING AT FLARE DUE TO EMULSION AND HIGH WATER CONTENT. DECREASED TO 32/64" ADJUSTABLE CHOKE
04.10.82	00:11	DECREASED TO 16/64" ADJUSTABLE CHOKE TO IGNITE FLARE
	00:15	INCREASED TO 32/64" ADJUSTABLE CHOKE - FLARE OUT
	00:17	DECREASED TO 24/64" ADJUSTABLE CHOKE
	00:21	DECREASED TO 16/64" ADJUSTABLE CHOKE - IGNITE FLARE
	00:40	INCREASED TO 18/64" ADJUSTABLE CHOKE
	00:47	INCREASED TO 20/64" ADJUSTABLE CHOKE

N° DOP 108

FLOPETROL

Section : **6**

_ SEQUENCE OF EVENTS _ (Continuation)

Page : 10
Report N°: 82/2301/31

DATE	TIME	OPERATION
04.10.82	01:02	INCREASED TO 22/64" ADJUSTABLE CHOKE
	01:21	INCREASED TO 28/64" ADJUSTABLE CHOKE
	01:28	INCREASED TO 32/64" ADJUSTABLE CHOKE
	01:40	INCREASED TO 36/64" ADJUSTABLE CHOKE
	01:50	INCREASED TO 40/64" ADJUSTABLE CHOKE
	02:02	INCREASED TO 44/64" THEN BACK TO 40/64" ADJUSTABLE CHOKE
	04:50	SWITCHED FLOW THROUGH SEPARATOR
	07:38	INCREASED TO 44/64" ADJUSTABLE CHOKE
	09:19	DECREASED TO 20/64" ADJUSTABLE CHOKE
	10:31	DECREASED TO 16/64" ADJUSTABLE CHOKE
	11:32	CLOSED IN WELL AT CHOKE MANIFOLD
	14:06	WELL SHUT-IN AT APR-N DUE TO LEAK IN PIPE RAMS.
	15:30	CLOSED MASTER VALVE. BLEED OFF PRESSURE IN FLOWLINE
	15:33	CLOSE FLOWLINE VALVE
	15:37	PICKED STRING 10 FEET
	15:44	CLOSED UPPER PIPE RAMS
	15:45	OPENED MASTER VALVE AND FLOWLINE VALVE
	15:50	PRESSURED ANNULUS TO 1800 PSI TO OPEN APR-N
	15:58	OPENED KILL LINE VALVE
	16:00	STARTED BULL HEADING TO KILL WELL
	17:37	FINISHED BULL HEADING
	17:41	SHEARED APR-M. START TO REVERSE CIRCULATE
	18:20	STOPPED REVERSE CIRCULATING. OPENED FLOW LINE VALVE AND CHOKE MANIFOLD TO GAS FLARE
	18:26	SHUT-IN WELL AT CHOKE MANIFOLD
	19:30	CONTINUED TO REVERSE CIRCULATE
	21:30	LANDED STRING
	23:00	CLOSED FLOWLINE VALVE. BREAK OUT FLOWLINE FROM FLOW HEAD
05.10.82	01:45	DISCONNECTED FLOWHEAD FROM TEST STRING
	02:35	LUBRICATOR VALVE THROUGH ROTARY.

N° DOP 108

FLOPETROL

Client : PPCoN
 Field : TOMMELITEN
 Well : 1/9-6

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 Report N': 82/2301/31

Base : STAVANGER

- WELL TESTING DATA SHEET -

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS				WELL HEAD				SEPARATOR				PROD RATES AND FLUID PROPERTIES				GOR	
Time	Cumul	Temp	Pressure	Iq temp	Iq press	Cg press	Temp	Press	Rate	Gravity	BSW	Rate	Gravity	Rate	Gravity	Rate	Gravity	Units	
HRS/MIN	MIN	OF	PSIG																
03:10	17:54																		
17:54	0																		
21:44	230																		
23:15	321																		
23:25	331																		
23:32	338/0			52	2800														
23:33	0/1			52	2820														
23:34	0/1			52	2900														
23:35	0/1			54	2860														
23:36	0/1			54	2650														
23:37	0/1			56	2740														
23:38	0/1			58	2800														
23:39	0/1			61	2720														
23:40	0/1			62	2800														

LIQUID FLOW RATE MEASURING CONDITIONS :

14.73 PSI AND 60°F

TESTED INTERVAL

DEPTH REFERENCE

DEPTH OF B H MEASUREMENTS

: DSI-3

: RKB

: N/A

FLOPETROL

WELL TESTING DATA SHEET(Continuation)

Page Report N°: 82/2301/31

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Section : 7

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS			SEPARATOR			PROD. RATES AND FLUID PROPERTIES				GOR	
Time HRS/MIN	Cumul MIN	BOTTOM HOLE		WELL HEAD		SEPARATOR		OIL OR CONDENSATE		GAS		Co ₂ %	H ₂ S % Units
		Temp.	Pressure	Tg temp of PSIG	Cg.press. PSIG	Temp.	Press.	Rate	Gravity	Rate	Gravity		
							4TH OCTOBER 1982 DST # 3.						
00:15	4/0			95	4630		INCREASED TO 32/64"		ADJUSTABLE CHOKE				
00:17	2/0			-	-		DECREASED TO 24/64"		ADJUSTABLE CHOKE				
00:20	3			93	4900								
00:21	4/0			-	-		DECREASED TO 16/64"		ADJUSTABLE CHOKE				
00:25	4			90	4900							7	0
00:30	9			84	4930					40			
00:35	14			84	4935								
00:40	19/0			83	4952		INCREASED TO 18/64"		ADJUSTABLE CHOKE				
00:45	5			85	4936					30			
00:47	7/0			-	-		INCREASED TO 20/64"		ADJUSTABLE CHOKE				
00:50	3			86	4882								
00:55	8			87	4899							3	0
01:00	13			87	4918					25			
01:02	15/0			-	-		INCREASED TO 22/64"		ADJUSTABLE CHOKE				
01:05	3			88	4850								
01:10	8			90	4858					20			

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS				SEPARATOR				PROD. RATES AND FLUID PROPERTIES				GOR			
04.10.82	02:00	BOTTOM HOLE	WELL HEAD	SEPARATOR	OIL OR CONDENSATE	GAS											
Time	Cumul	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW %	Rate	Gravity	Co ₂ %	H ₂ S %	Units		
HRS/MIN	MIN	PSIG	OF	PSIG					Air=1								
						4TH OCTOBER 1982	DET # 3.										
02:20	18		133	4065													
02:25	23		133	4065													
02:30	28		133	4065						25			4	0			
02:45	43		137	4065													
03:00	58		140	4058						20			3	0			
03:15	73		141	4051						15							
03:30	88		142	4050						15			3.5	0			
03:45	103		145	4045						10							
04:00	118		148	4040						9			3.5	0			
04:15	133		148	4030						9							
04:30	148		150	4024						9			2	0			
04:50	163		-	-													
05:00	178		151	4011						8							
05:15	193		151	3992						8			2				
05:30	208		153	3987						8							
05:45	223		154	3980						8							

FLOPETROL

WELL TESTING DATA SHEET(Continuation)

DATE - TIME	PRESSURE AND TEMPERATURE MEASUREMENTS		WELL HEAD		SEPARATOR		PROD. RATES AND FLUID PROPERTIES				GOR				
	04.10.82	Bottom Hole Pressure	Temp. OF	Iq. Temp. OF	Cg. Press. PSIG	Temp. OF	Press. PSIG	Rate BOPD	Gravity SG	BSW %	Rate MMSCFD	Gravity Air=1	WATER BMPD	Co2 %	H ₂ S Units
						4TH OCTOBER 1982	DST # 3.								
06:00	238		154	3968										3	0
06:15	253		155	3958											
06:30	268		154	3945	104	790		3562	.8280	2	26.93		-	4	0
06:45	283		155	3940											
07:00	298		159	3932	108	790		3991	.8280	2	26.98		-	2	0
07:15	313		161	3922											
07:30	328		161	3919	108	795		4007	.8283	2	27.32		-	2	0
07:38	336/0		-	-											
									INCREASED TO 44/64" ADJUSTABLE CHOKE						
07:39	1		163	3770										1	0
07:41	3		163	3722											
07:42	4		163	3710										2	0
07:43	5		163	3704											
07:45	7		164	3697										2	0
08:00	22		165	3680	146	840		4521	.8287	5	30.09		-		
08:15	37		165	3672	116	840		4424	.8287	5	30.09		-	2	0
08:30	52		167	3673	116	830		4400	.8287	5	29.92		-		

FLOPETROL

DIVISION : EMR
BASE : NWB
REPORT N° : 82/2301/31

Well Testing Report Annexes —

Client : PHILLIPS PETROLEUM COMPANY NORWAY
Field : TOMMELITEN Well : 1/9-6
Zone : DST 3 Date : 01.10.82 TO 04.10.82

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- 1 _ BOTTOM HOLE PRESSURE AND TEMPERATURE MEASUREMENT _
 - 1.1 - B.H. gauge calibration .
 - 1.2 - B.H. pressure calculation .
 - 1.3 - B.H. temperature calculation .

- 2 - LIQUID PRODUCTION RATE MEASUREMENT _
 - 2.1 - Measurements with tank .
 - 2.2 - Measurements with meter .

- 3 - GAS PRODUCTION RATE MEASUREMENT _

- 4 - SAMPLING SHEETS _
 - 4.1 - Bottom hole sampling .
 - 4.2 - Surface sampling .

- 5 - CHARTS AND MISCELLANEOUS _
 - 2 FOXBORO CHARTS
 - 1 BARTON CHART
 - SUBSEA EQUIPMENT

- LIQUID PRODUCTION RATE MEASUREMENT -2.1 - MEASUREMENT WITH TANK -

$$V_o = V \times K \times (1 - BSW)$$

V_o : Net oil volume at 60°F and atmospheric pressure.

V : Gross oil volume measured by tank gauging.

K : Volume correction factor to be applied between the tank temperature during gauging and 60°F.

BSW: Basic sediments and water.

2.2 - MEASUREMENT WITH METER -

a) Shrinkage factor is measured by shrinkage tester.

$$V_o = V_S \times f \times (1 - Shr) \times K \times (1 - BSW)$$

V_o : Net oil volume at 60°F and atmospheric pressure.

V_S : Gross oil volume measured by meter under separator conditions.

f : Meter correction factor = $\frac{\text{Volume measured in tank}}{\text{Volume measured by meter}}$

Shr: Percentage of oil volume reduction between separator and tank conditions, reported to oil volume at separator conditions.

K : Volume correction factor to be applied between the final temperature during shrinkage measurement and 60°F.

BSW: Basic sediments and water.

b) Shrinkage factor is measured with tank.

$$V_o = V_S \times (1 - Shr') \times K \times (1 - BSW)$$

V_o, V_S, K and BSW : Same meaning as in a).

$(1 - Shr')$: Shrinkage factor including meter correction factor.

No: DOP 122

FLOPETROL

Client : PPCoN

Field : TOMMELITEN
Well : 1/9-6

- OIL PRODUCTION RATE - - MEASUREMENT WITH METER -

Section: ANNEX 2.2

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Report N: 82/2301/31

Base : NWB

DATE - TIME	Interval	Meter reading	Vs	B SW	V'*	1 - Shr		OIL GRAVITY			K	Net volume of STO: V _o	Net STO	Cumulative
						Factor	Temp. OF	Gravity	Temp. OF	Grav 60°F				
HRS/MIN	MIN	BBSL	BBSL	%	BBSL	OF	OF	SG	SG	SG	BBSL	BBSL /day	BBSL	BBSL
06:00		600.0												0
06:30	30	690.6	90.6	2	82.84	.896	60	.786	72	.8280	1.000	74.22	3562	74
07:00	30	792.1	101.5	2	92.80	.896	60	.786	72	.8280	1.000	83.15	3991	157
07:30	30	894.0	101.9	2	93.17	.896	60	.787	70	.8283	1.000	83.48	4007	241
07:45		928.6												0
08:00	15	985.0	56.4	0	52.62	.895	60	.786	74	.8287	1.000	47.09	4521	47
08:15	15	1040.2	55.2	0	51.50	.895	60	.786	74	.8287	1.000	46.09	4424	93
08:30	15	1095.1	54.9	0	51.22	.895	60	.786	74	.8287	1.000	45.84	4400	139
08:45	15	1150.3	55.2	0	51.50	.895	60	.785	78	.8292	1.000	46.09	4424	185
09:00	15	1206.0	55.7	0	51.97	.895	60	.785	78	.8292	1.000	46.51	4465	232
10:45		2608.9												0
11:00	15	2625.2	16.3	0	16.57	.893	60	.784	53	.8230	1.000	14.79	1420	15

Shrinkage factor measured by Shrinkage tester Tank
 *V_o = V_S x f x (1 - BSW) = Net oil volume at separator conditions. f =

ROTRON .933
FLOCO 1.017
TESTED INTERVAL : DST No. 3
11,560-11,650 FT 11,680 TO 11,710 FT
PERFORATIONS : 11,740 - 11,770 FT

— GAS PRODUCTION RATE MEASUREMENT by orifice meter —

Reference is made to the rules and coefficients given in AGA gas measurement Committee Report No.3 for orifice metering.

a) EQUATIONS —

$$Q = C \sqrt{hw \times Pf}$$

- Q** : Production rate at reference conditions.
C : Orifice flow coefficient.
hw : Differential pressure in inches of water.
Pf : Flowing pressure in psia.

$$C = F_u \times F_b \times F_g \times Y \times F_{tf} \times F_{pv}$$

- F_u** : Unit conversion factor in desired reference conditions.
F_b : Basic orifice factor (Q in Cu.ft / hour).
F_g : Specific gravity factor.
Y : Expansion factor
F_{tf} : Flowing temperature factor .
F_{pv} : Supercompressibility factor (estimated).

Remarks

F_m : Manometer factor is equal one since only bellows type meters are used.
F_r : Reynolds factor is considered to be one.

UNITS	TABLE OF F _u FACTOR			
	REFERENCE CONDITIONS			
	60°F 14.73 psia	0°C 760mmHg*	15°C 760mmHg *	15°C 750mmHg *
Cu.ft / hour	1	0.9483	1.0004	1.0137
Cu.ft / day	24	22.760	24.009	24.329
m ³ / hour	0.02832	0.02685	0.02833	0.02870
m ³ / day	0.6796	0.6445	0.6799	0.6889

* Mercury at 32°F

b) METER DATA —

Meter type : DANIEL Flange taps - Pf taken down/~~up~~ at 1000
 Flow recorder type: BARTON ID of meter tube : 5.761 INCH

c) SPECIFIC GRAVITY SOURCE —

Sampling point : GAS OUTLET-SEPARATOR Gravitometer type : KIMRAY

d) SUPERCOMPRESSIBILITY FACTOR F_{pv} —

All coefficients are taken from AGA NX 19 manual for natural gas free of air, CO₂ and H₂S . More accurate values could only be determined by laboratory measurement.

FLOPETROL

Client : PPCoNSection: ANNEX **42**Base : NWBField : TOMMELITEN
Well : 82/2301/31Page : 31
Report N°: 82/2301/31

- SURFACE SAMPLING -

Date of sampling : 04.10.82 Service order : _____ Sampling No : 01
Sample nature : GAS Sampling point : SEPARATOR GAS OUTLET

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : DST 3 Perforations : 11560-11650 FT Sampling interval : _____
11680-11710 FT 11740-11770 FT
Depth origin : R.K.B. Tubing Dia. : 5" Casing Dia. : 7"
Surface elevation : _____ Shoe : _____ Shoe : _____

Bottom hole static conditions	Initial pressure : _____ at depth : _____ date : _____
	Latest pressure measured : _____ at depth : _____ date : _____
	Temperature : _____ at depth : _____ date : _____

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 22:30 HRS* Time elapsed since stabilisation : 47 MIN

Bottom hole dynamic conditions	Choke size : <u>16/64"</u> since : <u>10.31</u> Well head pressure : <u>4720 PSI</u> Well head temp : <u>131°F</u>
	Bottom hole pressure : _____ at depth : _____ date : _____
	Bottom hole temp. : _____ at depth : _____ date : _____

Flow measurement of sampled gas - Gravity (air 1) : 0.680 Factor Fpv = $\frac{1}{\sqrt{Z}}$: 1.075
Values used for calculations :

Separator	Pressure : <u>680</u> PSIG	Rates - Gas : <u>8.61</u> MM SCFD	GOR : <u>5282</u> (separator cond)
	Temp : <u>71</u> °F	Oil (separator cond) : <u>1630</u> BOPD	

Stock tank	Atmosphere : <u>76</u> mmHg. <u>60</u> °F	Oil at 60 °F : <u>1455</u> BOPD
	Tank temperature : _____ °F	<input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> C <input checked="" type="checkbox"/> b

BSW : 3.0 % WLR : 3.0 %Transferring fluid : VACUUM Transfer duration : 45 MINFinal conditions of the shipping bottle : _____
Pressure : 500 PSI Temp : AMBIENT

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No : A-13201 sent on : 4.10.82 by : _____ Shipping order No : _____
Addressee : PPCoN, TANANGER BASE

Coupled with	LIQUID	GAS
Bottom hole samples No	_____	_____
Surface samples No	<u>1116/419</u>	<u>A 13214</u>

Measurement conditions,
 Tank . Meter . Dump .
 Corrected with shrinkage tester. Corrected with tank .

D - REMARKS -

* SAMPLE TAKEN AFTER WELL SHUT IN; PRESSURISED SEPARATOR. ALL DATA IS FROM LAST STABILISED FLOW PERIOD THROUGH SEPARATOR. WELL SHUT-IN AT 11:32 HRS ON 04.10.82

Visa Chief Operator

W. SIERSDORFER

No.: DOP 127

FLOPETROL

Client : PPCoNSection: ANNEX **42**Base : NWBField : TOMMELITENPage : 32
Report N°: 82/2301/3Well : 1/9-6

- SURFACE SAMPLING -

Date of sampling : 04.10.82 Service order : _____ Sampling No : 01
Sample nature : GAS Sampling point : SEPARATOR GAS OUTLET

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : DST 3 Perforations : 1156-11650 FT Sampling interval : _____
11680-11710 FT 11740-11770 FT
Depth origin : RKB Tubing Dia : 5" Casing Dia : 7"
Surface elevation : _____ Shoe : _____ Shoe : _____

<u>Bottom hole static conditions</u>	Initial pressure : _____ at depth : _____ date : _____
	Latest pressure measured : _____ at depth : _____ date : _____
	Temperature : _____ at depth : _____ date : _____

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 21:35* Time elapsed since stabilisation : 47 MIN

<u>Bottom hole dynamic conditions</u>	Choke size : <u>16/64"</u> since : <u>10:31</u> Well head pressure <u>4720 PSI</u> Well head temp : <u>131°F</u>
	Bottom hole pressure : _____ at depth : _____ date : _____
	Bottom hole temp : _____ at depth : _____ date : _____

Flow measurement of sampled gas - Gravity (air 1) : 0.680 Factor $F_{pv} = \frac{1}{VZ}$: 1.075
Values used for calculations :

<u>Separator</u>	Pressure : <u>680</u> PSIG	Rates - Gas : <u>8.61</u> MM SCFD	GOR : <u>5202</u>
	Temp : <u>71</u> °F	Oil (separator cond) : <u>1630</u> BOPD	(separator cond) <input checked="" type="checkbox"/> <u>C</u>

<u>Stock tank</u>	Atmosphere : <u>76</u> mmHg. <u>60</u> °F	Oil at 60 °F : <u>1455</u> BOPD
	Tank temperature : _____ °F	<input checked="" type="checkbox"/> <u>A</u> <input checked="" type="checkbox"/> <u>C</u> <input checked="" type="checkbox"/> <u>D</u>

BSW : 3 % WLR : 3 %Transferring fluid : VACUUM Transfer duration : 45 MINFinal conditions of the shipping bottle : _____
Pressure : 500 PSI Temp : AMBIENT

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No : A-13214 sent on : 4.10.82 by : _____ Shipping order No : _____
Addressee : PPCoN TANANGER BASE

<u>Coupled with</u>	<u>LIQUID</u>	<u>GAS</u>
<u>Bottom hole samples No</u>	_____	_____
<u>Surface samples No</u>	<u>1116/149</u>	<u>A-13201</u>

Measurement conditions
 Tank . Meter . Dump .
 Corrected with shrinkage tester . Corrected with tank .

D - REMARKS -

* SAMPLE TAKEN AFTER WELL SHUT IN; FROM PRESSURISED SEPARATOR.
ALL DATA IS FROM THE LAST STABLE FLOW THROUGH THE SEPARATOR.
WELL SHUT IN AT 11:32 HRS ON 04.10.82

Visa Chief Operator

W. SIERSDORFER

No.: DOP 127

FLOPETROL

Client : PPCoNSection: **ANNEX 42**Base : NWBField : TOMMELITENPage : 33Well : 1/9-6Report N°: 82/2301/3

- SURFACE SAMPLING -

Date of sampling : 04.10.82 Service order : _____ Sampling No : 01
Sample nature : OIL Sampling point : SEPARATOR SIGHT GLASS

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : DST 3 Perforations : 11560-11650 FT Sampling interval : _____
11680-11710 FT 11740-11770 FT
Depth origin : RKB Tubing Dia. : 5" Casing Dia. : 7"
Surface elevation : _____ Shoe : _____ Shoe : _____

<u>Bottom hole static conditions</u>	Initial pressure : _____ at depth : _____ date : _____
	Latest pressure measured : _____ at depth : _____ date : _____
	Temperature : _____ at depth : _____ date : _____

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 21:35* Time elapsed since stabilisation : 47 MIN

<u>Bottom hole dynamic conditions</u>	Choke size : <u>16/64"</u> since : <u>10.31</u> Well head pressure : <u>4720 PSI</u> Well head temp : <u>131°F</u>
	Bottom hole pressure : _____ at depth : _____ date : _____
	Bottom hole temp. : _____ at depth : _____ date : _____

Flow measurement of sampled gas - Gravity (air 1) : 0.680 Factor Fpv = $\frac{1}{\sqrt{Z}}$: 1.075
Values used for calculations :

<u>Separator</u>	Pressure : <u>680</u> PSIG	Rates - Gas : <u>8.61</u> MM SCFD	GOR : <u>5282</u>
	Temp : <u>71</u> °F	Oil (separator cond) : <u>1630</u> BOPD	(separator cond)

<u>Stock tank</u>	Atmosphere : <u>76</u> mmHg. <u>60</u> °F	Oil at 60 °F : <u>1455</u> BOPD
	Tank temperature : _____ °F	<input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> C <input type="checkbox"/> b

BSW : 3.0 % WLR : 3.0 %Transferring fluid : MERCURY Transfer duration : 95 MINFinal conditions of the shipping bottle : _____
Pressure : 350 PSI Temp : AMBIENT 50°F

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No : 1116/419 sent on : 04.10.82 by : _____ Shipping order No : _____
Addressee : PPCoN TANANGER BASE, SAMPLE WAREHOUSE, ATTN. A.T. MARKMAN

Coupled with	LIQUID	GAS
Bottom hole samples No.	_____	_____
Surface samples No.	_____	<u>A-13214</u> <u>A-13201</u>

Measurement conditions:

Tank . Meter . Dump .

Corrected with shrinkage tester. Corrected with tank .

D - REMARKS -

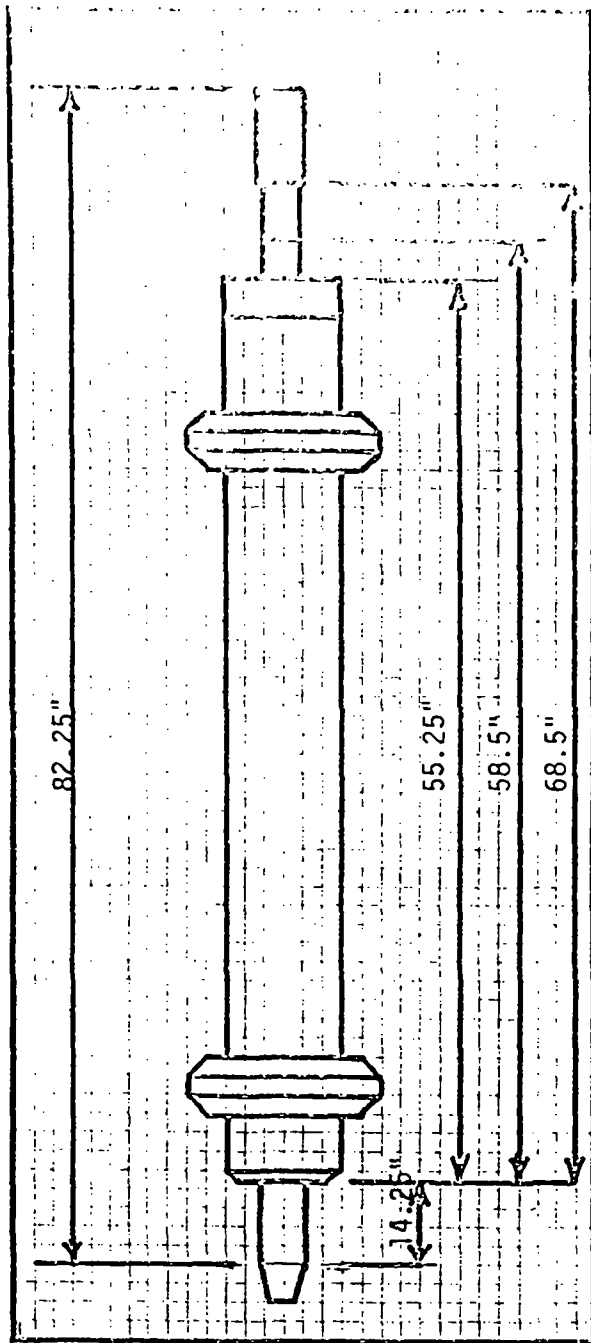
* SAMPLE TAKEN AFTER WELL SHUT IN; FROM PRESSURISED SEPARATOR.
ALL DATA IS FROM THE LAST STABLE FLOW THROUGH THE SEPARATOR.
WELL SHUT IN AT 11:32 HRS ON 04.10.82

Visa Chief Operator

W. SIERSDORFER

No. : DOP 127

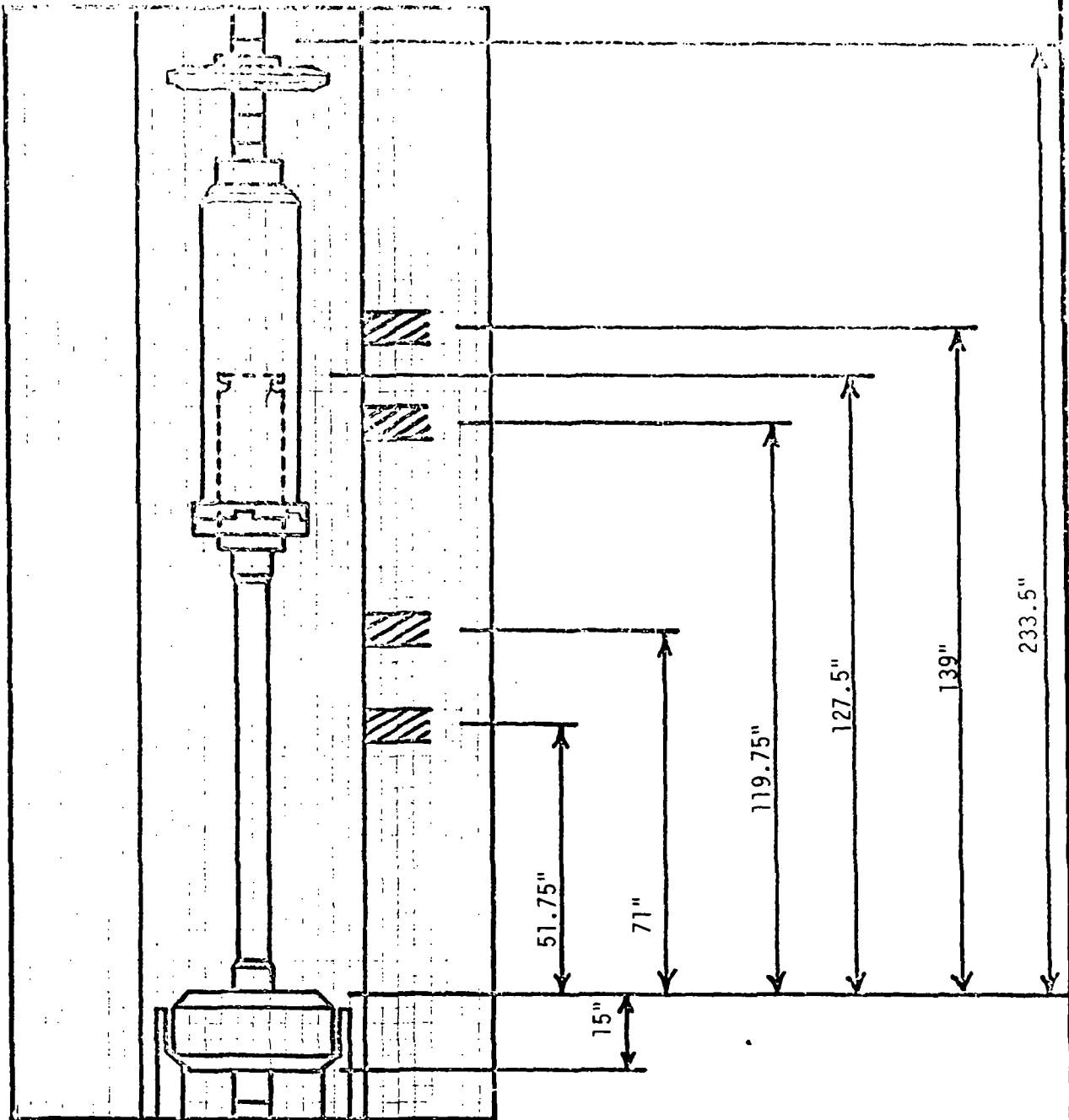
- WELL COMPLETION DATA -



REMARKS :

Lubricator valve

WELL COMPLETION DATA



REMARKS :

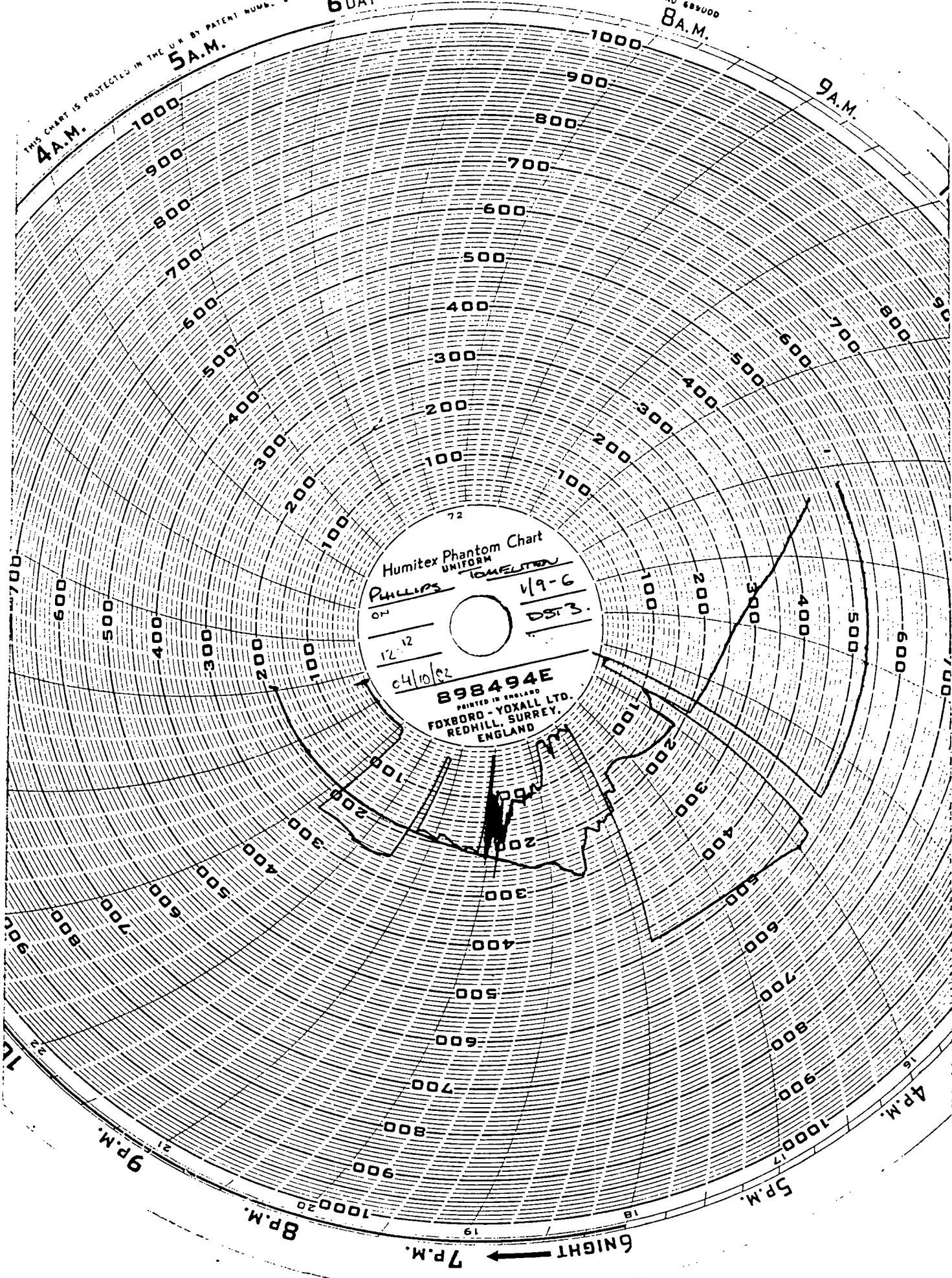
DRAWING SCHEMATIC ONLY
NOT TO SCALE
EZ-TREE ASSEMBLY



FOXBORO SEQUENCE OF EVENTS - 10,000 PSI

<u>ITEM NO.</u>	<u>DATE</u>	<u>TIME</u>	<u>EVENT</u>
1	03.10.82	17:03	BLED OFF PRESSURE AT CHOKE MANIFOLD APR-N NOT OPEN
2		17:22	BLED OFF PRESSURE AT CHOKE MANIFOLD APR-N NOT OPEN
3		17:45	PRESSURE TUBING TO 2050 PSI
4		17:54	BLED OFF TUBING AT CHOKE MANIFOLD TO OPEN APR-N
5		18:16	STOPPED PUMPING ACID.
6		19:31	STARTED PUMPING ACID.
7		21:44	ACID STIMULISATION COMPLETED.
8		22:03	BLED OFF PRESSURE AT CHOKE MANIFOLD
9		23:15	FLOWLINE VALVE OPENED.
10		23:32	OPENED WELL AT CHOKE MANIFOLD
11	04.10.82	01:02	INCREASED TO 32/64" ADJUSTABLE
12		01:21	INCREASED TO 28/64" ADJUSTABLE
13		01:28	INCREASED TO 32/64" ADJUSTABLE
14		01:40	INCREASED TO 36/64" ADJUSTABLE.
15		01:50	INCREASED TO 40/64" ADJUSTABLE.
16		02:02	INCREASED TO 44/64" AND BACK TO 40/64" ADJUSTABLE
17		07:38	INCREASED TO 44/64" ADJUSTABLE.
18		09:19	DECREASED TO 20/64" ADJUSTABLE.
19		10:31	DECREASED TO 16/64" ADJUSTABLE
20		11:32	SHUT-IN WELL AT CHOKE MANIFOLD

THIS CHART IS PROTECTED IN THE U.K. BY PATENT NUMB. 640113 719039 AND REG. TRADEMARKS HUMITEX NO 691588, PHANTOM NO 689000
4 A.M. 5 A.M. 6 DAY 7 A.M. 8 A.M. 9 A.M.



7 P.M. 8 P.M. 9 P.M. 5 P.M. 4 P.M. 6 NIGHT 7 P.M.