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NUMBER 6189

PEL 5 AND PEL 6, PATCHAWARRA SOUTHWEST BLOCK

EROMANGA AND COOPER BASINS

NULLA 1

TEST REPORTS

Submitted by

**Delhi Petroleum Pty Ltd
1987**

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MINES AND ENERGY
SOUTH AUSTRALIA



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ENVELOPE 6189

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

TENEMENT HOLDER: Delhi Petroleum Pty Ltd (operator), Vamgas Ltd, Santos Ltd, Hartogen Energy Ltd, Endeavour Resources Ltd and South Australian Oil and Gas Corp. Pty Ltd

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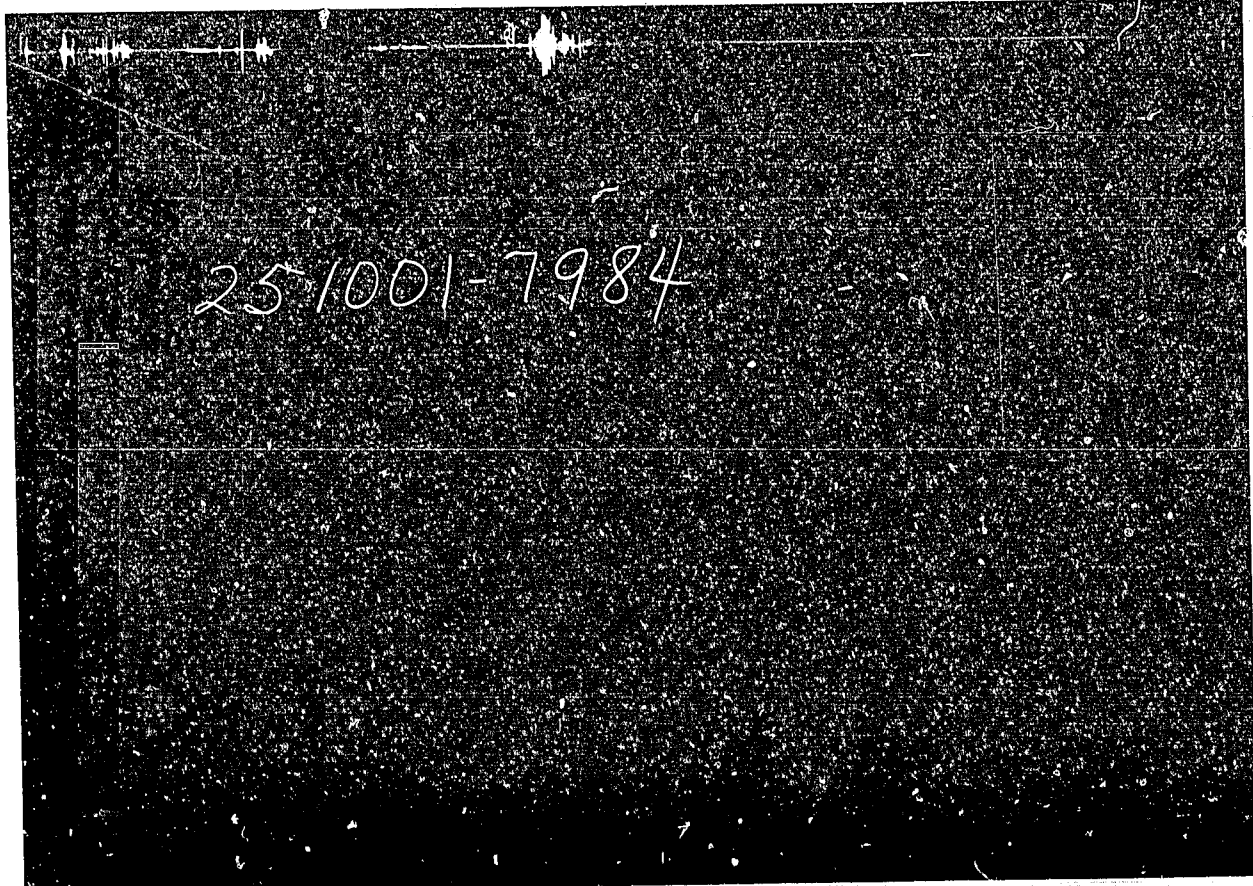
2

NULLA		1	1	8101.8 - 8145.0	DELHI PETROLEUM PTY., LIMITED	
LEASE NAME		WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME	
LEGAL LOCATION SEC. - TWP. - RANG.	SEE REMARKS	FIELD AREA	COOPER BASIN	COUNTRY	SOUTH AUSTRALIA	STATE AUSTRALIA BG



TICKET NO. 25100100
21-NOV-85
MOOMBA

FORMATION TESTING SERVICE REPORT



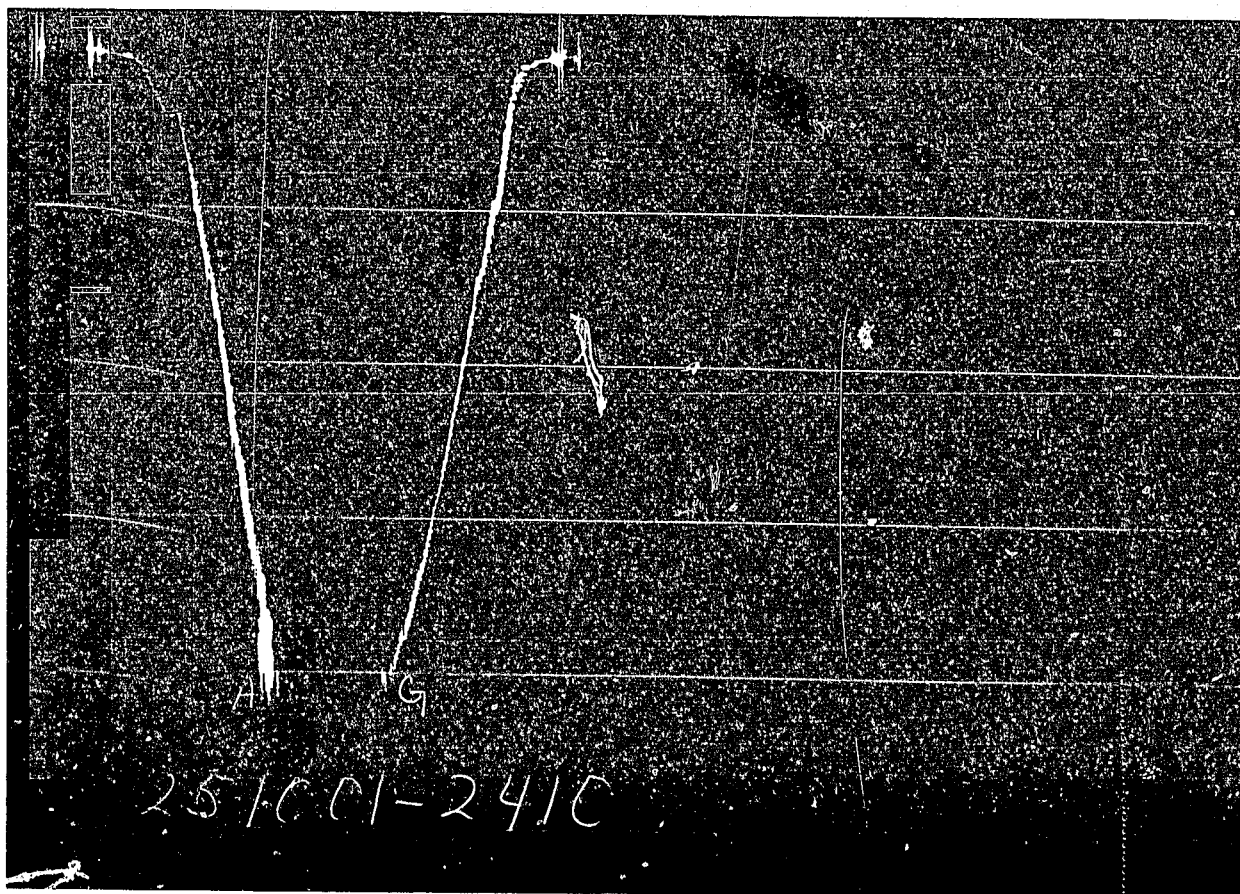
GAUGE NO: 7984 DEPTH: 8058.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
1	INITIAL HYDROSTATIC					
2	INITIAL FIRST FLOW			30.0		F
3	FINAL FIRST FLOW					
4	INITIAL FIRST CLOSED-IN			60.0		C
5	FINAL FIRST CLOSED-IN					
6	INITIAL SECOND FLOW			12.0		F
7	FINAL SECOND FLOW					
8	FINAL HYDROSTATIC					



GAUGE NO: 3289 DEPTH: 8079.1 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
1	INITIAL HYDROSTATIC	3963	3962.8			
2	INITIAL FIRST FLOW			30.0		F
3	INITIAL FIRST FLOW					
4	INITIAL FIRST CLOSED-IN			60.0		C
5	INITIAL FIRST CLOSED-IN					
6	INITIAL SECOND FLOW			12.0		F
7	INITIAL SECOND FLOW					
8	INITIAL HYDROSTATIC	3959	3956.8			

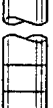


GAUGE NO: 2410 DEPTH: 8142.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
H	INITIAL HYDROSTATIC	4025	4037.3			
A	INITIAL FIRST FLOW					
C	FINAL FIRST FLOW			30.0		F
D	INITIAL FIRST CLOSED-IN					
E	FINAL FIRST CLOSED-IN			60.0		C
F	INITIAL SECOND FLOW					
G	FINAL SECOND FLOW			12.0		F
I	FINAL HYDROSTATIC	4025	4025.8			

EQUIPMENT & HOLE DATA			TICKET NUMBER: 25100100	
FORMATION TESTED: <u>PATCHAWARRA</u>			DATE: <u>9-26-85</u> TEST NO: <u>1</u>	
NET PAY (ft): <u>4.0</u>			TYPE DST: <u>OPEN HOLE</u>	
GROSS TESTED FOOTAGE: <u>49.2</u>			HALLIBURTON CAMP: <u>MOOMBA</u>	
ALL DEPTHS MEASURED FROM: <u>KB</u>			TESTER: <u>P. BATES</u>	
CASING PERFS. (ft): _____			WITNESS: <u>B. BAILEY</u> <u>B. DAVIS</u>	
HOLE OR CASING SIZE (in): <u>8.500</u>			DRILLING CONTRACTOR: <u>S AND T DRILLING COMPANY RIG #14</u>	
ELEVATION (ft): <u>102.0 K.B. (82' G.L.)</u>				
TOTAL DEPTH (ft): <u>8145.0</u>				
PACKER DEPTH(S) (ft): <u>8094. 8102</u>				
FINAL SURFACE CHOKE (in): _____				
BOTTOM HOLE CHOKE (in): <u>0.750</u>				
MUD WEIGHT (lb/gal): <u>9.30</u>				
MUD VISCOSITY (sec): <u>39</u>				
ESTIMATED HOLE TEMP. (°F): _____				
ACTUAL HOLE TEMP. (°F): <u>228 @ 8141.0 ft</u>				
FLUID PROPERTIES FOR RECOVERED MUD & WATER			SAMPLER DATA	
SOURCE	RESISTIVITY	CHLORIDES	Psig AT SURFACE: _____	
_____	_____ @ _____ °F	_____ ppm	cu.ft. OF GAS: _____	
_____	_____ @ _____ °F	_____ ppm	cc OF OIL: _____	
_____	_____ @ _____ °F	_____ ppm	cc OF WATER: _____	
_____	_____ @ _____ °F	_____ ppm	cc OF MUD: _____	
_____	_____ @ _____ °F	_____ ppm	TOTAL LIQUID cc: _____	
HYDROCARBON PROPERTIES			CUSHION DATA	
OIL GRAVITY (°API): _____ @ _____ °F			TYPE _____ AMOUNT _____ WEIGHT _____	
GAS/OIL RATIO (cu.ft. per bbl): _____				
GAS GRAVITY: _____				
RECOVERED: NO REPORTED RECOVERY				
REMARKS: MISRUN....HYDROSPRING FAILED TO OPEN.....SEE PRODUCTION TEST DATA SHEET. LEGAL LOCATION = LAT. 27 DEGREES 46' 51.9" SOUTH LONG. 139 DEGREES 43' 11.4" EAST LINE 85 XGX SP 343				

MEASURED FROM
TESTER VALVE

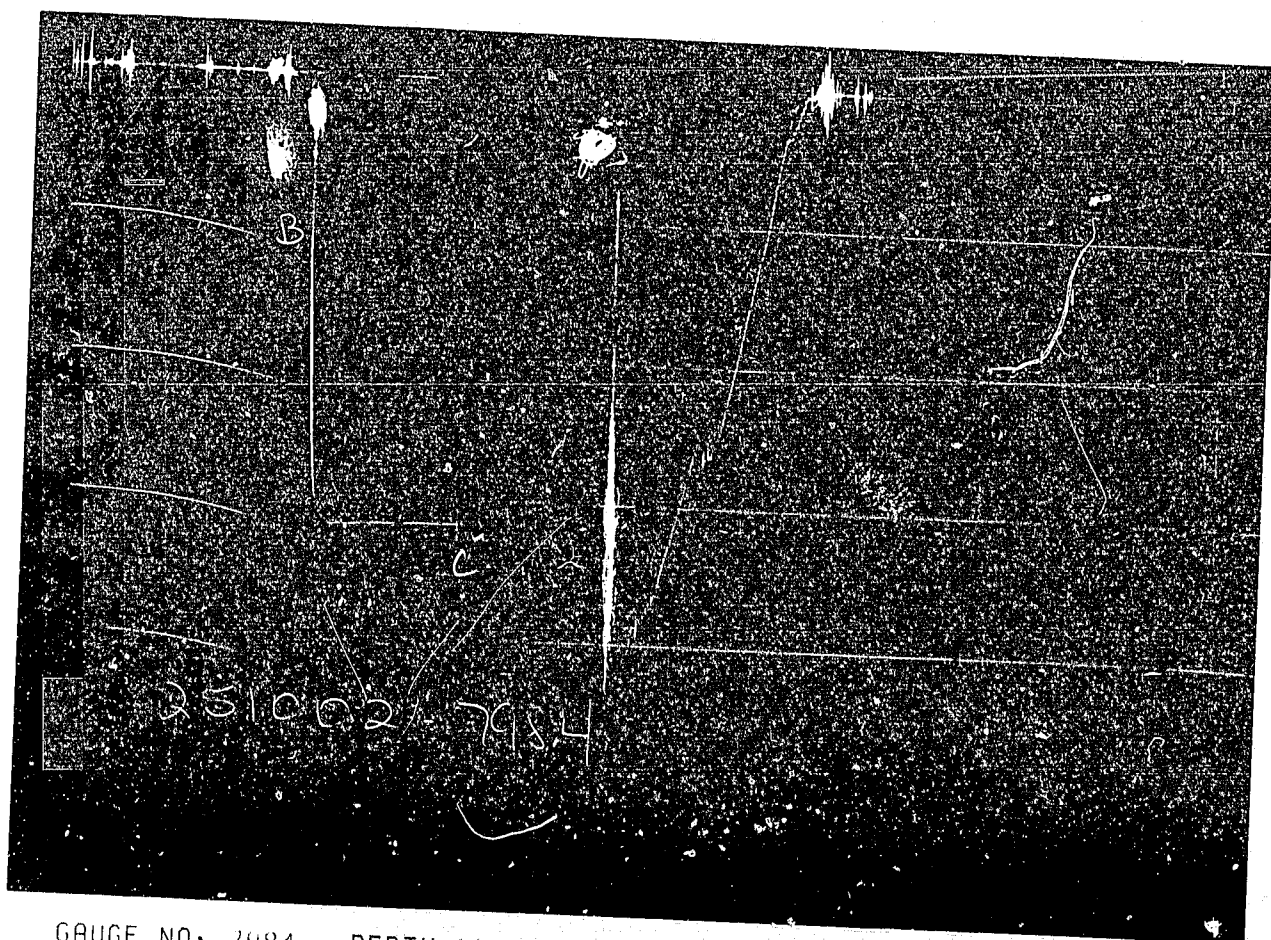
		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	7418.0	
4		FLEX WEIGHT.....	6.000	2.880	178.1	
2		DRILL COLLARS.....	6.250	2.880	396.9	
51		PUMP OUT REVERSING SUB.....	6.000	3.000	1.0	7993.0
1		DRILL COLLARS.....	6.250	2.880	30.5	
40		IMPACT REVERSING SUB.....	6.000	3.000	1.0	8024.6
3		DRILL COLLARS.....	6.250	2.880	30.9	
5		CROSSOVER.....	5.750	1.120	1.0	
20		AP RUNNING CASE.....	5.000	2.250	4.1	8058.0
6		CROSSOVER.....	5.000	2.200	1.0	
12		DUAL CIP VALVE.....	5.000	0.870	4.9	
47		SAMPLE CHAMBER.....	5.000	2.500	4.9	
33		DRAIN VALVE.....	5.000	2.200	0.9	
60		HYDRO SPRING TESTER.....	5.000	0.750	5.3	8077.6
60		AP RUNNING CASE.....	5.000	2.250	4.1	8079.1
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	7.500	1.530	5.8	8094.0
18		DISTRIBUTOR VALVE.....	5.000	1.680	2.0	
70		OPEN HOLE PACKER.....	7.500	1.530	5.8	8101.8
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.500	4.3	
70		FLUSH JOINT ANCHOR.....	5.000	2.370	33.0	
81		BLANKED-OFF RUNNING CASE.....	5.000		4.1	8142.0
TOTAL DEPTH					8145.0	
EQUIPMENT DATA						



TICKET NO. 25100200
21-NOV-85
MOOMBA

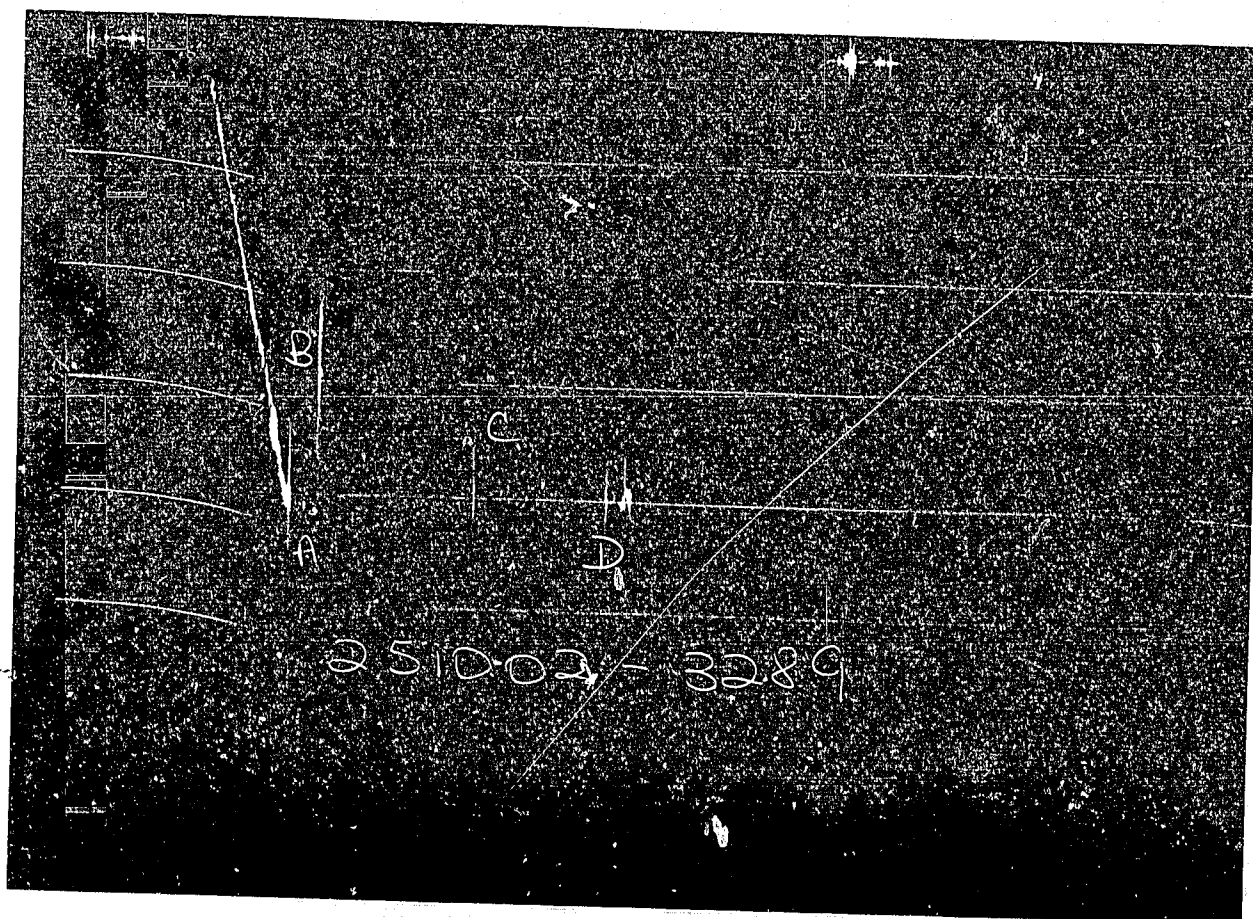
FORMATION TESTING SERVICE REPORT

LEASE NAME		1	2	8278.8 - 8333.0		DELHI/PETROLEUM PTY. LTD.	
WELL NO.		TEST NO.		TESTED INTERVAL		LEASE OWNER/COMPANY NAME	
LEGAL LOCATION		FIELD AREA		COOPER BASIN		STATE AUSTRALIA	
SEC. - TWP. - RNG.		SEE REMARKS		COUNTRY SOUTH AUSTRALIA		STATE AUSTRALIA	
						PW	



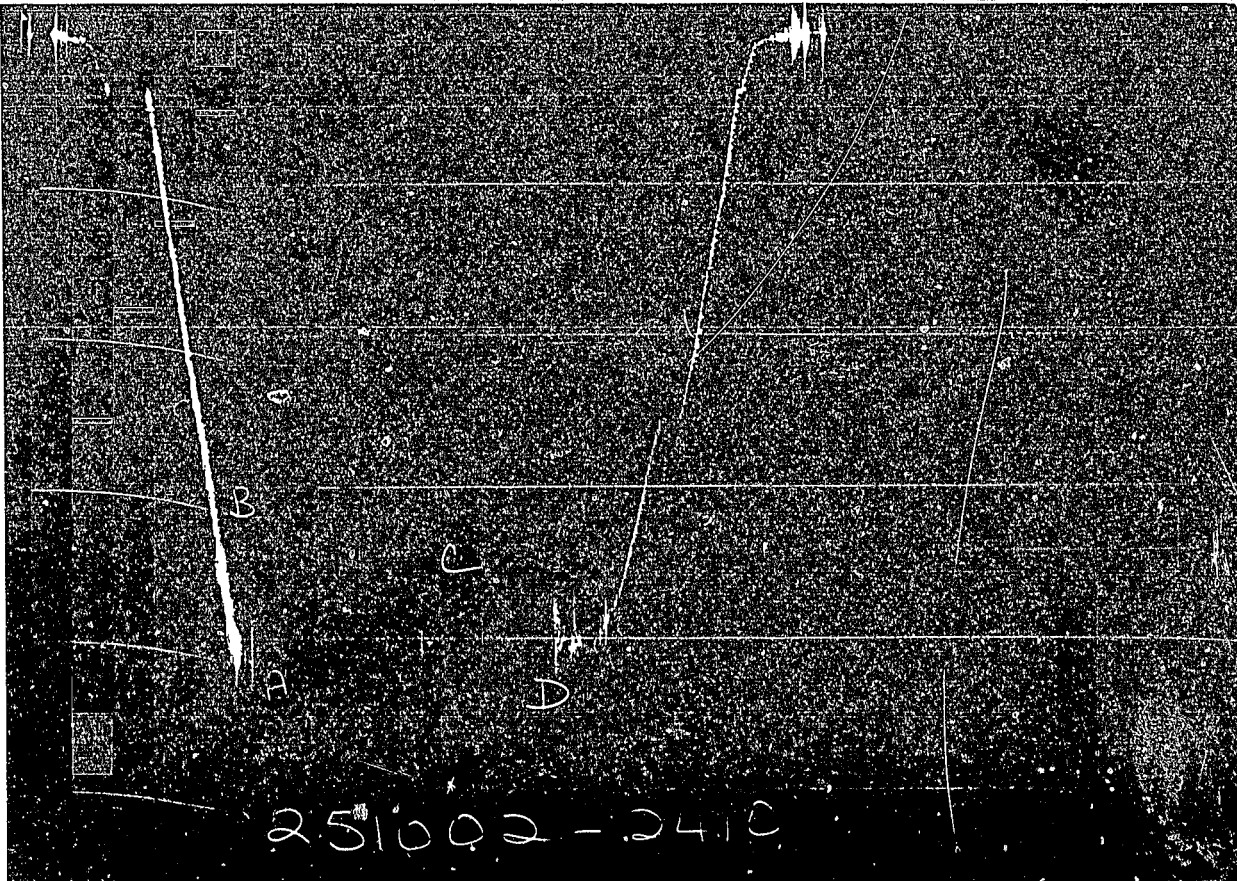
GAUGE NO: 7984 DEPTH: 8235.0 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
	INITIAL HYDROSTATIC					
	INITIAL FIRST FLOW		1218.4			
	FINAL FIRST FLOW		3189.4	195.0	195.0	F
	FINAL HYDROSTATIC					



GAUGE NO: 3289 DEPTH: 8256.1 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
1	INITIAL HYDROSTATIC	4067	4076.1			
2	INITIAL FIRST FLOW	2844	2891.1			
3	FINAL FIRST FLOW	3357	3363.9	195.0	195.0	F
4	FINAL HYDROSTATIC	4050	4044.7			



GAUGE NO: 2410 DEPTH: 8330.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
1	INITIAL HYDROSTATIC	4118	4130.5			
2	INITIAL FIRST FLOW	3083	3085.7	195.0	195.0	F
3	FINAL FIRST FLOW	3460	3468.1			
4	FINAL HYDROSTATIC	4088	4085.5			

EQUIPMENT & HOLE DATA		TICKET NUMBER: <u>25100200</u>	
FORMATION TESTED: <u>PATCHAWARRA</u>		DATE: <u>9-27-85</u> TEST NO: <u>2</u>	
NET PAY (ft): <u>24.0</u>		TYPE DST: <u>OPEN HOLE</u>	
GROSS TESTED FOOTAGE: <u>54.2</u>		HALLIBURTON CAMP: <u>MOOMBA</u>	
ALL DEPTHS MEASURED FROM: <u>KB</u>		TESTER: <u>P. BATES</u>	
CASING PERFS. (ft): _____		WITNESS: <u>B. DAVIS</u>	
HOLE OR CASING SIZE (in): <u>8.500</u>		DRILLING CONTRACTOR: <u>S & T RIG #14</u>	
ELEVATION (ft): <u>82.0</u> G.L. - <u>102'</u> K.B.			
TOTAL DEPTH (ft): <u>8333.0</u>			
PACKER DEPTH(S) (ft): <u>8271, 8279</u>			
FINAL SURFACE CHOKE (in): <u>0.50000</u>			
BOTTOM HOLE CHOKE (in): <u>0.750</u>			
MUD WEIGHT (lb/gal): <u>9.40</u>			
MUD VISCOSITY (sec): <u>39</u>			
ESTIMATED HOLE TEMP. (°F): _____			
ACTUAL HOLE TEMP. (°F): <u>250 @ 8329.0</u> ft			
FLUID PROPERTIES FOR RECOVERED MUD & WATER		SAMPLER DATA	
SOURCE	RESISTIVITY	CHLORIDES	Pstg AT SURFACE: _____
_____	_____ @ _____ °F	_____ ppm	cu.ft. OF GAS: _____
_____	_____ @ _____ °F	_____ ppm	cc OF OIL: _____
_____	_____ @ _____ °F	_____ ppm	cc OF WATER: _____
_____	_____ @ _____ °F	_____ ppm	cc OF MUD: _____
_____	_____ @ _____ °F	_____ ppm	TOTAL LIQUID cc: _____
HYDROCARBON PROPERTIES		CUSHION DATA	
OIL GRAVITY (°API): <u>55.3</u> @ <u>60</u> °F		TYPE	
GAS/OIL RATIO (cu.ft. per bbl): _____		AMOUNT	
GAS GRAVITY: _____		WEIGHT	
RECOVERED:		MEASURED FROM TESTER VALVE	
1860 FEET OF MUD 212 FEET OF CONDENSATE 346 FEET OF VERY GAS AND CONDENSATE CUT MUD 1860 FEET OF MUD (POSSIBLY ERROR IN PUMP STROKES AND/OR EFFICIENCY) TAKEN FROM PUMP STROKES WHILE REVERSE CIRCULATING.			
REMARKS:			
LOCATION: LAT. 27 DEGREES - 46' - 51.9" SOUTH LONG. 139 DEGREES - 43' - 11.4" EAST LINE: 85 XGX SP 343 NOTE: ROTATE D.C.I.P. FOR CLOSED-IN PERIOD - CLOSED HYDROSPRING AND FOLLOWERS ON COMPANY MAN'S DIRECTIONS, MINIMIZING THE CHANCE OF STUCK PIPE IN THE HOLE, PROBABLY DIFFERENTIALLY STUCK ON THE DRILL REMARKS CONTINUED ON NEXT PAGE-----			

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TYPE & SIZE MEASURING DEVICE: 6" CERAMIC SURFACE CHOKE					TICKET NO: 25100200
TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
					-----REMARKS CONTINUED-----
					SURFA PRESSURES RECORDED ON
					THE PRODUCTION TEST DATA PAGE
					(SHOWN BELOW) ARE INACCURATE AS
					IT WAS DISCOVERED THAT THE PRESSURE
					GAUGE WAS PARTIALLY PLUGGED WITH
					RAT HOLE MUD WHEN WE REMOVED IT
					APPROXIMATELY 5 MINUTES AFTER
					PULLING FREE. WHEN ANOTHER GAUGE
					WAS IMMEDIATELY INSTALLED IT
					READ 1150# AND DROPPING WITH
					GAS BLEED OFF (MAXIMUM PROBABLY
					1200#).
					STARTED PICKING UP TOOLS
					STARTED INTO HOLE
					RIGGED UP HEAD AND FLOOR LINES
					TAGGED BOTTOM AND PULLED UP 4'
					SEAT PACKERS AT APPROXIMATELY
					30,000#.
					OPENED TOOL - STRONG BLOW
	.50"	20			CHOKE OPENED
	.50"	100			
	.50"	160			GAS TO SURFACE
	.50"	180			
	.50"	180			
	.50"	180			
	.50"	185			
	.50"	190			
	.50"	190			
	.50"	190			
	.50"	200			
	.50"	215			
	.50"	230			
	.50"	255			

TICKET NO: 25100200

CLOCK NO: 32062 HOUR: 24



GAUGE NO: 7984

DEPTH: 8235.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$	REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW											
B	1	0.0	1218.4								
	2	5.0	2120.7	902.3							
	3	10.0	2826.6	706.0							
	4	15.0	3091.7	265.1							
	5	20.0	3181.3	89.6							
	6	25.0	3208.0	26.6							
	7	30.0	3213.5	5.5							
	8	35.0	3217.5	4.0							
	9	40.0	3210.7	-6.7							
	10	45.0	3210.7	0.0							
	11	50.0	3210.7	0.0							
	12	55.0	3210.7	0.0							
	13	60.0	3210.7	0.0							
	14	65.0	3210.0	-0.7							
	15	70.0	3209.0	-1.0							
	16	75.0	3205.5	-3.5							
	17	80.0	3204.5	-1.0							
	18	85.0	3203.3	-1.2							
	19	90.0	3201.0	-2.2							
	20	95.0	3199.1	-1.9							
	21	100.0	3199.1	0.0							
	22	105.0	3199.1	0.0							
	23	110.0	3199.1	0.0							
	24	115.0	3199.1	0.0							
	25	120.0	3199.1	0.0							
	26	125.0	3199.1	0.0							
	27	130.0	3197.9	-1.2							
	28	135.0	3196.4	-1.6							
	29	140.0	3194.5	-1.9							
	30	145.0	3193.6	-0.9							
	31	150.0	3192.9	-0.7							
	32	155.0	3192.9	0.0							
	33	160.0	3192.9	0.0							
	34	165.0	3192.9	0.0							
	35	170.0	3192.9	0.0							
	36	175.0	3192.0	-0.9							
	37	180.0	3191.5	-0.5							
	38	185.0	3191.0	-0.5							
	39	190.0	3190.1	-0.9							
C	40	195.0	3189.4	-0.7							

REMARKS:

TICKET NO: 25100200
CLOCK NO: 28322 HOUR: 24



GAUGE NO: 3289
DEPTH: 8256.1

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$	REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW											
B	1	0.0	2891.1								
	2	5.0	3000.9	109.7							
	3	10.0	3225.8	224.9							
	4	15.0	3352.0	126.2							
	5	20.0	3389.0	37.0							
	6	25.0	3389.0	0.0							
	7	30.0	3391.8	2.8							
	8	35.0	3392.7	0.9							
	9	40.0	3386.9	-5.8							
	10	45.0	3386.9	0.0							
	11	50.0	3389.2	2.4							
	12	55.0	3387.5	-1.7							
	13	60.0	3384.5	-3.0							
	14	64.9	3383.2	-1.3							
	15	70.0	3381.3	-1.9							
	16	75.0	3379.8	-1.5							
	17	80.0	3379.4	-0.4							
	18	85.0	3377.4	-1.9							
	19	90.0	3375.1	-2.4							
	20	95.0	3374.0	-1.1							
	21	100.0	3374.0	0.0							
	22	105.0	3374.0	0.0							
	23	110.0	3373.3	-0.6							
	24	115.0	3374.2	0.9							
	25	120.0	3374.2	0.0							
	26	125.0	3371.4	-2.8							
	27	130.0	3371.4	0.0							
	28	135.0	3369.7	-1.7							
	29	140.0	3367.1	-2.6							
	30	145.0	3368.6	1.5							
	31	150.0	3367.3	-1.3							
	32	155.0	3367.3	0.0							
	33	160.0	3367.3	0.0							
	34	165.0	3367.3	0.0							
	35	170.0	3366.0	-1.3							
	36	175.0	3365.2	-0.9							
	37	180.0	3364.3	-0.9							
	38	185.0	3363.0	-1.3							
	39	190.0	3363.0	0.0							
C	40	195.0	3363.9	0.9							

REMARKS:

TICKET NO: 25100200
CLOCK NO: 26294 HOUR: 24



GAUGE NO: 2410
DEPTH: 8330.0

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$	REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$
FIRST FLOW											
B	1	0.0	3085.7								
	2	5.0	3170.7	84.9							
	3	10.0	3321.5	150.8							
	4	15.0	3418.4	97.0							
	5	20.0	3462.2	43.7							
	6	25.0	3480.3	18.1							
	7	30.0	3484.8	4.5							
	8	35.0	3485.9	1.1							
	9	40.0	3485.9	0.0							
	10	45.0	3485.9	0.0							
	11	50.0	3485.9	0.0							
	12	55.0	3485.9	0.0							
	13	60.0	3484.8	-1.1							
	14	65.0	3483.5	-1.3							
	15	70.0	3482.9	-0.6							
	16	75.0	3481.7	-1.1							
	17	80.0	3480.8	-1.0							
	18	85.0	3480.1	-0.6							
	19	90.0	3479.0	-1.1							
	20	95.0	3479.0	0.0							
	21	100.0	3478.5	-0.5							
	22	105.0	3478.5	0.0							
	23	110.0	3478.5	0.0							
	24	115.0	3477.4	-1.1							
	25	120.0	3476.8	-0.6							
	26	125.0	3476.0	-0.8							
	27	130.0	3475.3	-0.6							
	28	135.0	3474.5	-0.8							
	29	140.0	3473.4	-1.1							
	30	145.0	3473.4	0.0							
	31	150.0	3472.8	-0.6							
	32	155.0	3472.8	0.0							
	33	160.0	3472.3	-0.5							
	34	165.0	3471.3	-1.0							
	35	170.0	3470.5	-0.8							
	36	175.0	3469.9	-0.6							
	37	180.0	3469.9	0.0							
	38	185.0	3469.1	-0.8							
	39	190.0	3468.3	-0.8							
C	40	195.0	3468.1	-0.2							

REMARKS:

	O.D.	I.D.	LENGTH	DEPTH
 DRILL PIPE.....	4.500	3.826	7595.0	
 FLEX WEIGHT.....	6.000	2.880	178.1	
 DRILL COLLARS.....	6.250	2.880	396.9	
 PUMP OUT REVERSING SUB.....	6.000	3.000	1.0	8170.1
 DRILL COLLARS.....	6.250	2.880	30.5	
 IMPACT REVERSING SUB.....	6.000	3.000	1.0	8201.6
 DRILL COLLARS.....	6.250	2.880	30.9	
 CROSSOVER.....	5.750	1.120	1.0	
 AP RUNNING CASE.....	5.000	2.250	4.1	8235.0
 CROSSOVER.....	5.000	2.200	1.0	
 DUAL DIP VALVE.....	5.000	0.870	4.9	
 SAMPLE CHAMBER.....	5.000	2.500	4.9	
 DRAIN VALVE.....	5.000	2.200	0.9	
 HYDROSPRING TESTER.....	5.000	0.750	5.3	8254.6
 AP RUNNING CASE.....	5.000	2.250	4.1	8256.1
 J-BOX.....	5.000	1.750	5.0	
 V-BOX SAFETY JOINT.....	5.000	1.000	2.8	
 OPEN HOLE PACKER.....	7.500	1.530	5.8	8271.0
 DISTRIBUTOR VALVE.....	5.000	1.680	2.0	
 OPEN HOLE PACKER.....	7.500	1.530	5.8	8278.8
 AP RUNNING CASE.....	5.000	1.500	4.3	
 JOINT ANCHOR.....	5.000	2.970	44.0	
 AP RUNNING CASE.....	5.000		4.1	8330.0
				8333.0

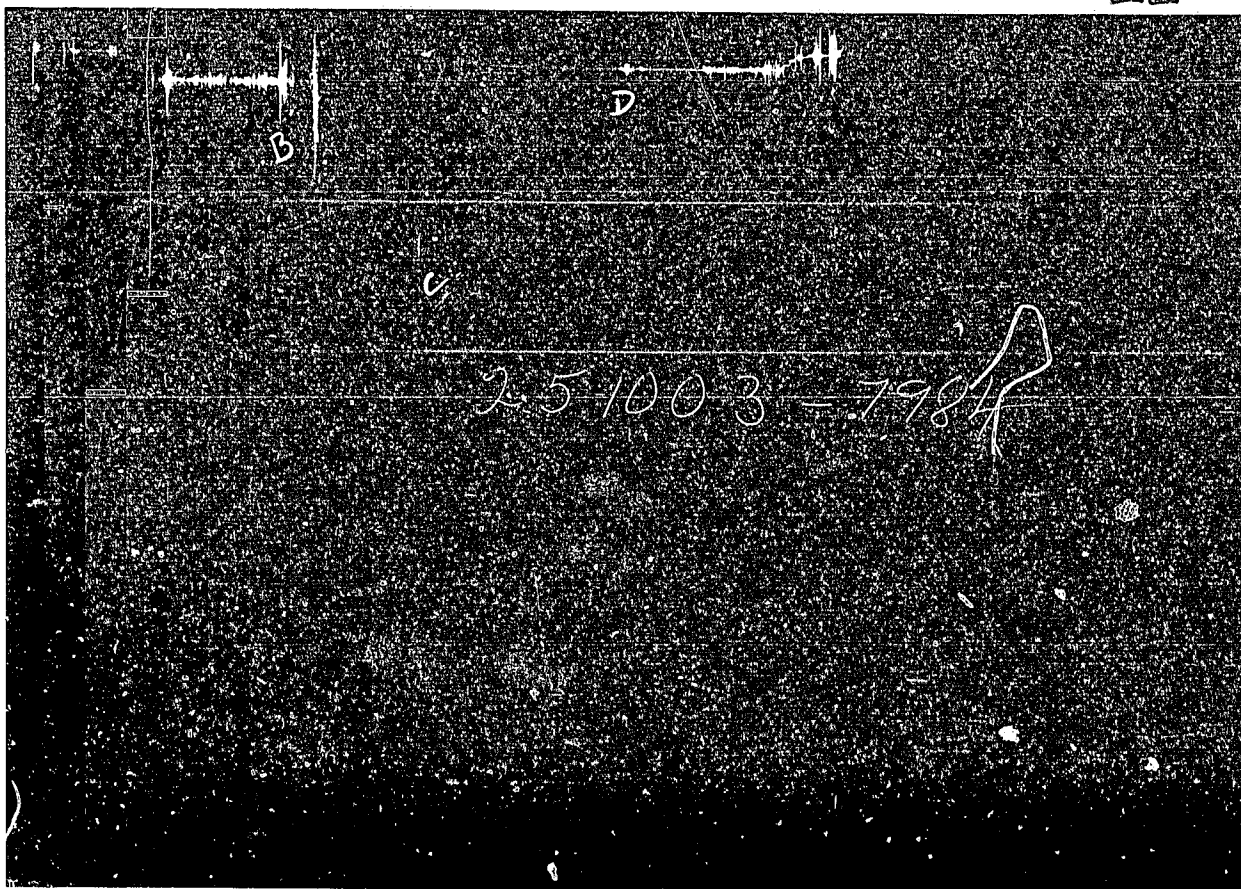
EQUIPMENT DATA

LEASE NAME		1	3	8349.2 - 8415.0		DELHI/SANTOS	
WELL NO.		TEST NO.		TESTED INTERVAL		LEASE OWNER/COMPANY NAME	
LEGAL LOCATION		SEE REMARKS		FIELD AREA		COUNTY SOUTH AUSTRALIA	
SEC. - TWP. - RNG.				COOPER BASIN		STATE AUSTRALIA OR	



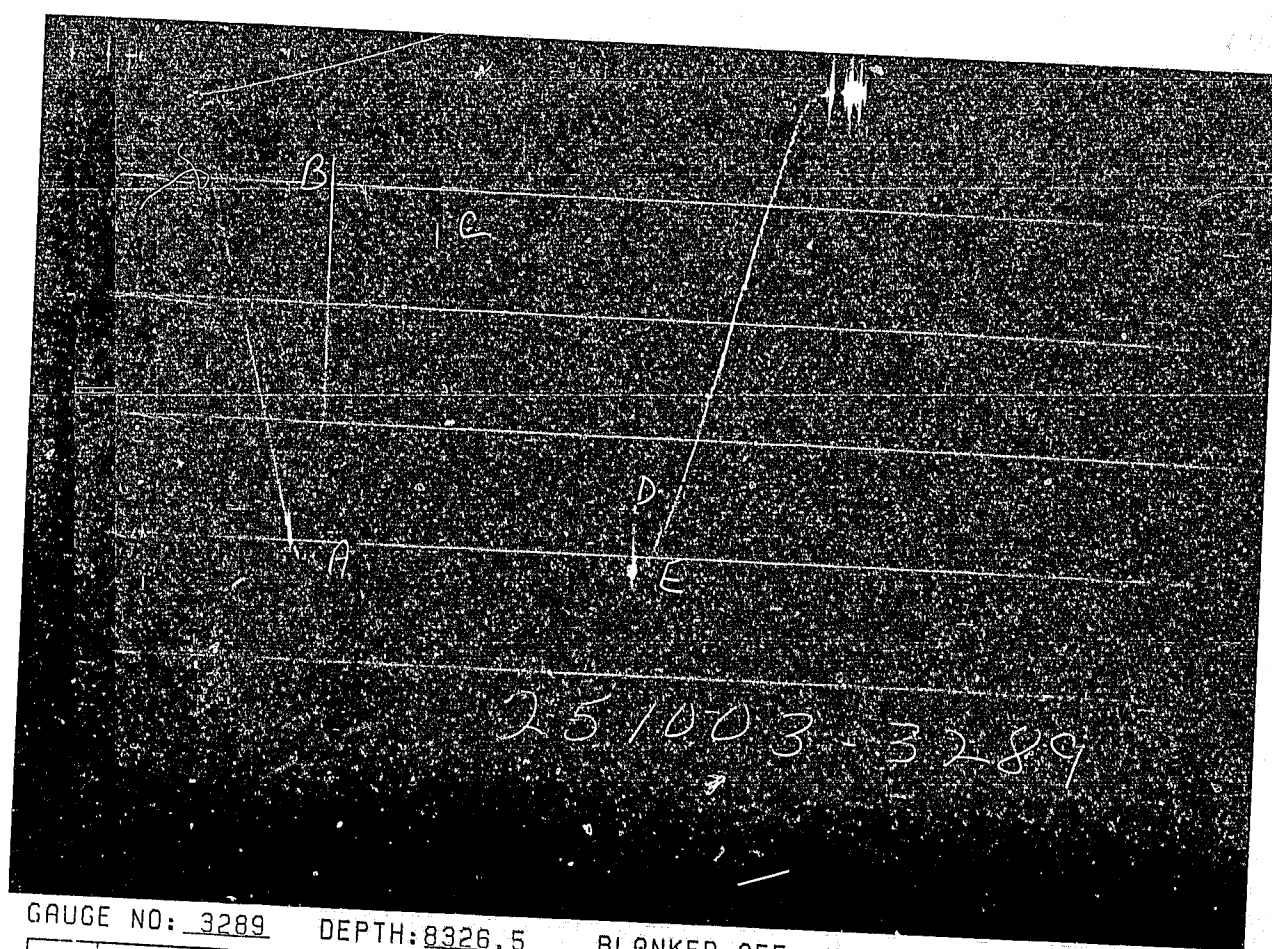
TICKET NO. 25100300
29-JAN-86
MOOMBA

FORMATION TESTING SERVICE REPORT



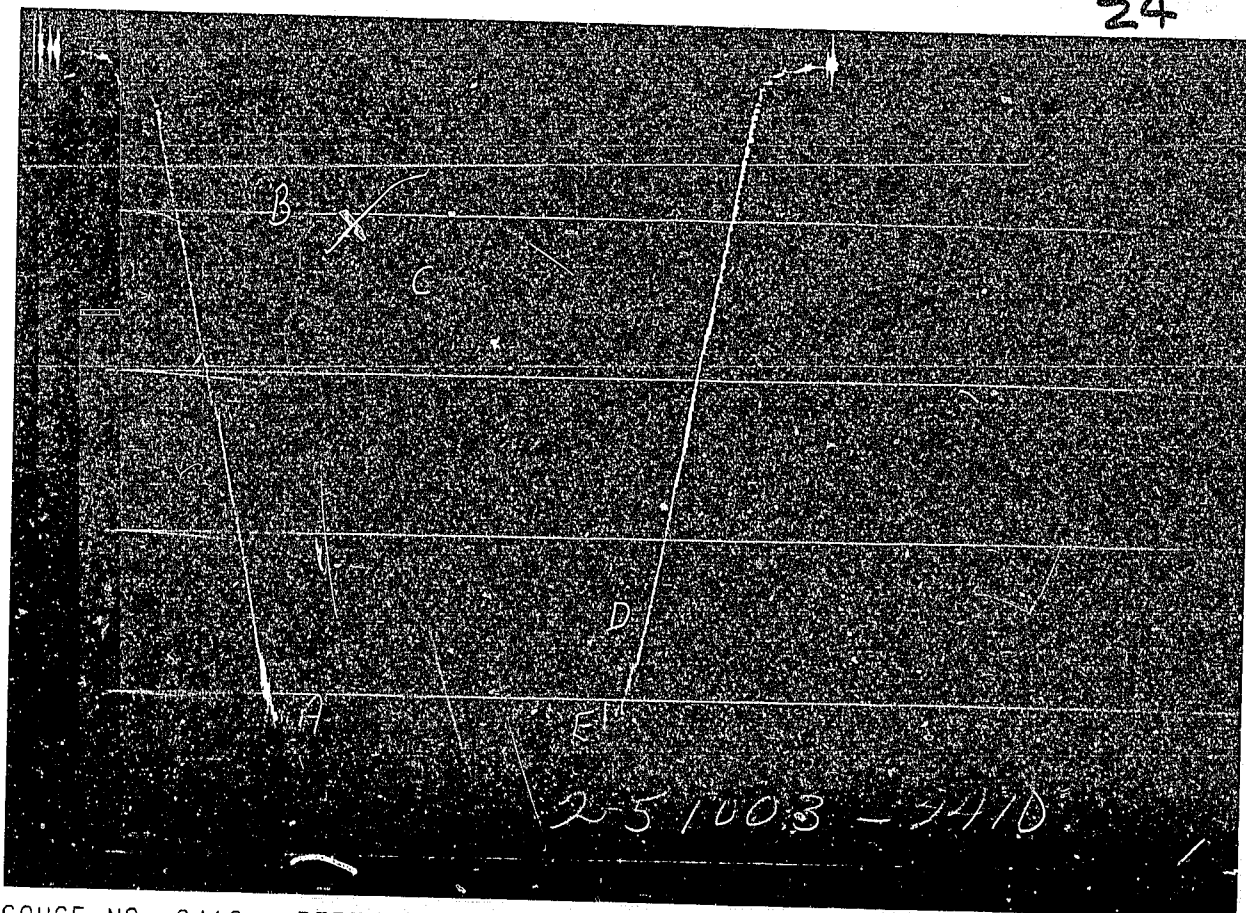
GAUGE NO: 7984 DEPTH: 8305.5 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW		517.3	123.0	121.5	F
C	FINAL FIRST FLOW		1321.6			
D	INITIAL FIRST CLOSED-IN		1321.6	240.0	241.5	C
E	FINAL FIRST CLOSED-IN	104	109.0			
F	FINAL HYDROSTATIC					



GAUGE NO: 3289 DEPTH: 8326.5 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	4114	4107.3			
B	INITIAL FIRST FLOW	731	769.1			
C	FINAL FIRST FLOW	1365	1373.4	123.0	121.5	F
D	INITIAL FIRST CLOSED-IN	1365	1373.4			
E	FINAL FIRST CLOSED-IN	3615	3617.0	240.0	241.5	C
F	FINAL HYDROSTATIC	4110	4079.8			



GAUGE NO: 2410 DEPTH: 8412.0 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	4148	4150.8			
B	INITIAL FIRST FLOW	939	936.9			
C	FINAL FIRST FLOW	1442	1443.9	123.0	121.5	F
D	INITIAL FIRST CLOSED-IN	1442	1443.9			
E	FINAL FIRST CLOSED-IN	3622	3620.6	240.0	241.5	C
F	FINAL HYDROSTATIC	4126	4125.2			

EQUIPMENT & HOLE DATA			TICKET NUMBER: 25100300		
FORMATION TESTED: <u>PATCHAWARRA</u>			DATE: <u>9-29-85</u> TEST NO: <u>3</u>		
NET PAY (ft): <u>27.0</u>			TYPE DST: <u>OPEN HOLE</u>		
GROSS TESTED FOOTAGE: <u>65.8</u>			HALLIBURTON CAMP: <u>MOOMBA</u>		
ALL DEPTHS MEASURED FROM: <u>KELLY BUSHING</u>			TESTER: <u>P. BATES</u>		
CASING PERFS. (ft): _____			WITNESS: <u>B. DAVIS</u>		
HOLE OR CASING SIZE (in): <u>8.500</u>			DRILLING CONTRACTOR: <u>S & T RIG #14</u>		
ELEVATION (ft): <u>102.0 KELLY BUSHING</u>					
TOTAL DEPTH (ft): <u>8415.0</u>					
PACKER DEPTH(S) (ft): <u>8341. 8349</u>					
FINAL SURFACE CHOKE (in): <u>0.50000</u>					
BOTTOM HOLE CHOKE (in): <u>0.750</u>					
MUD WEIGHT (lb/gal): <u>9.50</u>					
MUD VISCOSITY (sec): <u>38</u>					
ESTIMATED HOLE TEMP. (°F): _____					
ACTUAL HOLE TEMP. (°F): <u>236 @ 8411.0</u> ft					
FLUID PROPERTIES FOR RECOVERED MUD & WATER					
SOURCE	RESISTIVITY	CHLORIDES			
_____	_____ @ _____ °F	_____ ppm			
_____	_____ @ _____ °F	_____ ppm			
_____	_____ @ _____ °F	_____ ppm			
_____	_____ @ _____ °F	_____ ppm			
_____	_____ @ _____ °F	_____ ppm			
_____	_____ @ _____ °F	_____ ppm			
HYDROCARBON PROPERTIES			SAMPLER DATA		
OIL GRAVITY (°API): _____ @ _____ °F			Pstg AT SURFACE: _____		
GAS/OIL RATIO (cu.ft. per bbl): _____			cu.ft. OF GAS: _____		
GAS GRAVITY: <u>0.780</u>			cc OF OIL: _____		
			cc OF WATER: _____		
			cc OF MUD: _____		
			TOTAL LIQUID cc: _____		
CUSHION DATA					
TYPE			AMOUNT WEIGHT		
<u>WATER (ET.)</u>			<u>450.0 8.40</u>		
RECOVERED:					
150' OF CONDENSATE					
100' OF CONDENSATE CUT WATER					
MEASURABLE GAS TO SURFACE					
REMARKS:					
LOCATION: LAT. 27 DEGREES 46' 51.9" SOUTH, LONG. 139 DEGREES 43' 11.4"					
EAST. LINE. 85 X GX SP 343					

MEASURED FROM
TESTER VALVE

[illegible]

111

27

TICKET NO: 25100300
CLOCK NO: 32062 HOUR: 24



GAUGE NO: 7984
DEPTH: 8305.5

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$	REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW											
B	1	0.0	517.3								
	2	5.0	626.9	109.5							
	3	10.0	830.3	203.4							
	4	15.0	1051.4	221.1							
	5	20.0	1221.1	169.8							
	6	25.0	1355.8	134.7							
	7	30.0	1420.8	64.9							
	8	35.0	1453.1	32.3							
	9	40.0	1459.3	6.2							
	10	45.0	1443.3	-16.0							
	11	50.0	1438.8	-4.5							
	12	55.0	1450.5	11.7							
	13	60.0	1450.0	-0.5							
	14	65.0	1453.8	3.8							
	15	70.0	1450.2	-3.6							
	16	75.0	1444.0	-6.2							
	17	80.0	1444.0	0.0							
	18	85.0	1427.3	-16.7							
	19	90.0	1404.0	-23.4							
	20	95.0	1386.6	-17.4							
	21	100.0	1363.7	-22.9							
	22	105.0	1355.7	-8.1							
	23	110.0	1341.4	-14.3							
	24	115.0	1320.4	-21.0							
C	25	121.5	1321.6	1.2							
FIRST CLOSED-IN											
C	1	0.0	1321.6								
D	2	241.5	109.0	-1212.6	80.8	0.177					

REMARKS:

GAUGE NO: 3289
DEPTH: 8326.5

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	769.1		
	2	5.0	845.5	76.4	
	3	10.0	991.7	146.2	
	4	15.0	1177.8	186.1	
	5	20.0	1319.7	141.9	
	6	25.0	1432.0	112.3	
	7	30.0	1482.5	50.5	
	8	35.0	1505.2	22.7	
	9	40.0	1501.9	-3.2	
	10	45.0	1485.7	-16.2	
	11	50.0	1490.1	4.3	
	12	55.0	1498.9	8.9	
	13	60.0	1498.9	0.0	
	14	65.0	1498.9	0.0	
	15	70.0	1495.2	-3.7	
	16	75.0	1487.7	-7.6	
	17	80.0	1481.4	-6.3	
	18	85.0	1465.0	-16.4	
	19	90.0	1449.0	-16.0	
	20	95.0	1424.8	-24.2	
	21	100.0	1413.8	-11.0	
	22	105.0	1401.7	-12.1	
	23	110.0	1372.8	-28.9	
	24	115.0	1369.8	-3.0	
C	25	121.5	1373.4	3.7	
FIRST CLOSED-IN					
C	1	0.0	1373.4		
	2	1.0	2906.7	1533.3	1.0 2.095
	3	2.0	2987.4	1614.0	2.0 1.791
	4	3.0	3037.2	1663.8	2.9 1.620
	5	4.0	3082.6	1709.1	3.9 1.497
	6	5.0	3117.4	1744.0	4.8 1.400
	7	6.0	3146.2	1772.8	5.7 1.327
	8	7.0	3175.1	1801.6	6.6 1.263
	9	8.0	3201.7	1828.3	7.5 1.208
	10	9.0	3223.4	1850.0	8.4 1.161
	11	10.0	3238.7	1865.3	9.2 1.119
	12	12.0	3270.8	1897.3	10.9 1.047
	13	14.0	3299.8	1926.4	12.6 0.985
	14	16.0	3325.2	1951.7	14.1 0.934
	15	18.0	3346.9	1973.4	15.7 0.889
	16	20.0	3362.4	1988.9	17.2 0.850
	17	22.0	3379.4	2005.9	18.7 0.814
	18	24.1	3392.7	2019.3	20.1 0.781
	19	26.0	3404.5	2031.1	21.4 0.754
	20	28.0	3415.1	2041.6	22.8 0.727
	21	30.0	3424.9	2051.5	24.0 0.703
	22	35.0	3444.7	2071.3	27.2 0.650
	23	40.0	3462.4	2088.9	30.1 0.606

TICKET NO: 25100300

CLOCK NO: 26294 HOUR: 24

HALLIBURTON
SERVICES

GAUGE NO: 2410

DEPTH: 8412.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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FIRST FLOW

B	1	0.0	936.9		
	2	5.0	972.9	36.0	
	3	10.0	1084.5	111.6	
	4	15.0	1238.4	153.9	
	5	20.0	1386.1	147.7	
	6	25.0	1496.6	110.5	
	7	30.0	1545.7	49.0	
	8	35.0	1570.3	24.6	
	9	40.0	1572.7	2.4	
	10	45.0	1560.5	-12.2	
	11	50.0	1558.5	-1.9	
	12	55.0	1567.0	8.5	
	13	60.0	1566.7	-0.3	
	14	65.0	1568.0	1.3	
	15	70.0	1564.3	-3.7	
	16	75.0	1557.9	-6.4	
	17	80.0	1557.9	0.0	
	18	85.0	1545.0	-12.9	
	19	90.0	1525.6	-19.5	
	20	95.0	1511.3	-14.3	
	21	100.0	1489.4	-21.9	
	22	105.0	1480.0	-9.4	
	23	110.0	1467.7	-12.3	
	24	115.0	1445.2	-22.6	
C	25	121.5	1443.9	-1.3	

FIRST CLOSED-IN

C	1	0.0	1443.9		
	2	1.0	2577.9	1134.0	1.0 2.100
	3	2.0	2771.2	1327.3	2.0 1.789
	4	3.0	2863.1	1419.3	2.9 1.625
	5	4.0	2944.2	1500.4	3.8 1.501
	6	5.0	3001.8	1557.9	4.8 1.404
	7	6.0	3048.4	1604.5	5.7 1.330
	8	7.0	3093.8	1649.9	6.6 1.264
	9	8.0	3126.8	1682.9	7.5 1.209
	10	9.0	3157.9	1714.0	8.4 1.161
	11	10.0	3185.4	1741.5	9.3 1.117
	12	12.0	3225.2	1781.3	10.9 1.047
	13	14.0	3259.1	1815.3	12.5 0.986
	14	16.0	3289.3	1845.4	14.1 0.935
	15	18.0	3313.0	1869.1	15.7 0.890
	16	20.0	3334.9	1891.1	17.1 0.851
	17	22.0	3356.7	1912.9	18.6 0.814
	18	24.0	3371.0	1927.1	20.1 0.782
	19	26.0	3386.9	1943.0	21.4 0.753
	20	28.0	3400.5	1956.6	22.7 0.728
	21	30.0	3412.8	1968.9	24.1 0.703
	22	35.0	3436.5	1992.7	27.2 0.651
	23	40.0	3457.4	2013.5	30.1 0.606

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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FIRST CLOSED-IN - CONTINUED

	24	45.0	3474.5	2030.6	32.8 0.568
	25	50.0	3488.6	2044.8	35.4 0.535
	26	55.0	3499.0	2055.2	37.9 0.506
	27	60.0	3509.0	2065.2	40.2 0.481
	28	70.0	3524.6	2080.7	44.4 0.437
	29	80.0	3538.9	2095.0	48.2 0.401
	30	90.0	3550.0	2106.1	51.7 0.371
	31	100.0	3561.0	2117.1	54.9 0.345
	32	110.0	3569.5	2125.7	57.7 0.323
	33	120.0	3577.0	2133.1	60.4 0.304
	34	135.0	3585.9	2142.0	63.9 0.279
	35	150.0	3593.3	2149.5	67.1 0.258
	36	165.0	3599.2	2155.3	70.0 0.240
	37	180.0	3604.1	2160.3	72.5 0.224
	38	195.0	3609.4	2165.5	74.9 0.210
	39	210.0	3614.4	2170.6	77.0 0.198
	40	225.0	3617.5	2173.6	78.9 0.187
D	41	241.5	3620.6	2176.8	80.8 0.177

REMARKS:

		O.D.	I.D.	LENGTH	DEPTH
1		DRILL PIPE.....	4.500	3.826	7695.5
4		FLEX WEIGHT.....	6.000	2.880	178.1
5		DRILL COLLARS.....	6.250	2.880	365.9
51		PUMP OUT REVERSING SUB.....	6.000	3.000	1.0 8240.0
3		DRILL COLLARS.....	6.250	2.880	31.0
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0 8272.0
3		DRILL COLLARS.....	6.250	2.880	30.9
6		CROSSOVER.....	5.750	1.120	1.0
60		AP RUNNING CASE.....	5.000	2.250	4.1 8305.5
5		CROSSOVER.....	5.000	2.200	1.0
12		DUAL CIP VALVE.....	5.000	0.870	4.9
97		SAMPLE CHAMBER.....	5.000	2.500	4.9 8315.0
33		DRAIN VALVE.....	5.000	2.200	0.9
60		HYDROSPRING TESTER.....	5.000	0.750	5.3 8325.0
80		AP RUNNING CASE.....	5.000	2.250	4.1 8326.5
15		JAR.....	5.000	1.750	5.0
16		VR SAFETY JOINT.....	5.000	1.000	2.8
70		OPEN HOLE PACKER.....	7.500	1.530	5.8 8341.4
18		DISTRIBUTOR VALVE.....	5.000	1.680	2.0
70		OPEN HOLE PACKER.....	7.500	1.530	5.8 8349.2
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.500	4.3
6		CROSSOVER.....	6.000	2.500	1.0
1		DRILL COLLARS.....	6.250	2.880	30.5
6		CROSSOVER.....	5.750	2.500	1.0
60		FLUSH JOINT ANCHOR.....	5.000	2.370	23.0
81		BLANKED-OFF RUNNING CASE.....	5.000		4.1 8412.0
TOTAL DEPTH					8415.0

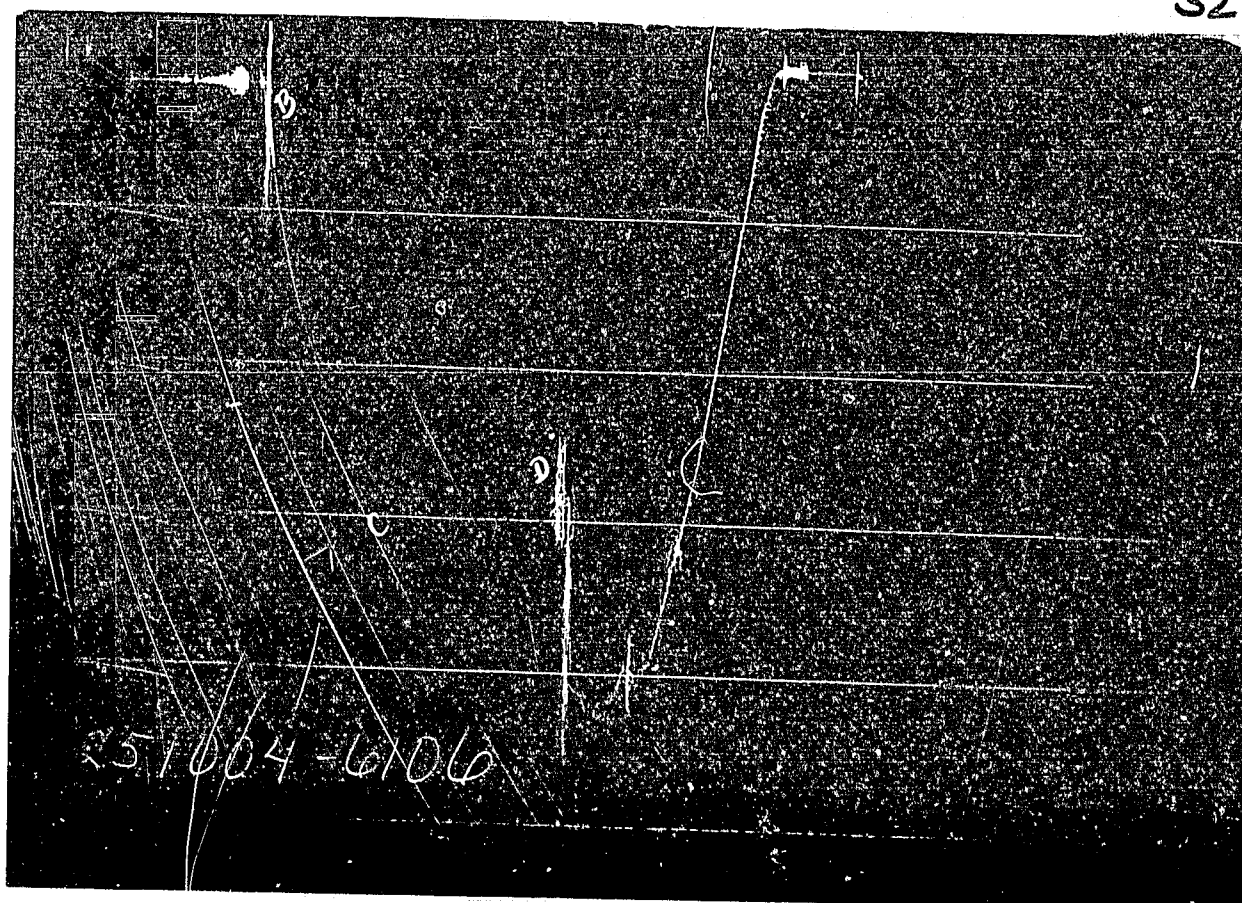
EQUIPMENT DATA

LEASE NAME	NULL	WELL NO.	1	TEST NO.	4	TESTED INTERVAL	8491.6 - 8615.2	LEASE OWNER/COMPANY NAME	DELHI/SANIOS
LEGAL LOCATION	SEE REMARKS	FIELD AREA	COOPER BASIN	COUNTY	SOUTH AUSTRALIA	STATE	AUSTRALIA	BG	
SEC. - TYP. - RNG.									



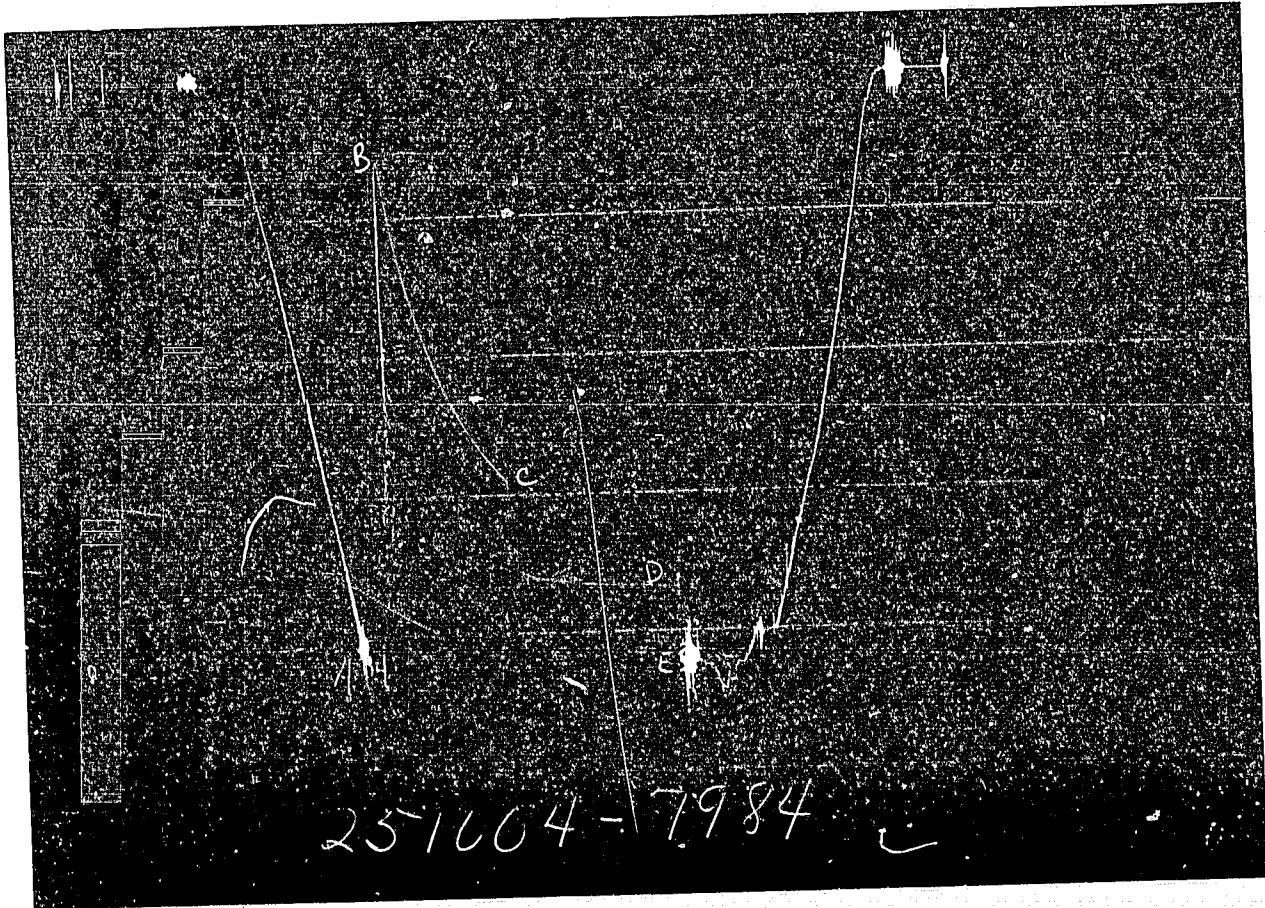
TICKET NO. 25100400
21-NOV-85
MOOMBA

FORMATION TESTING SERVICE REPORT



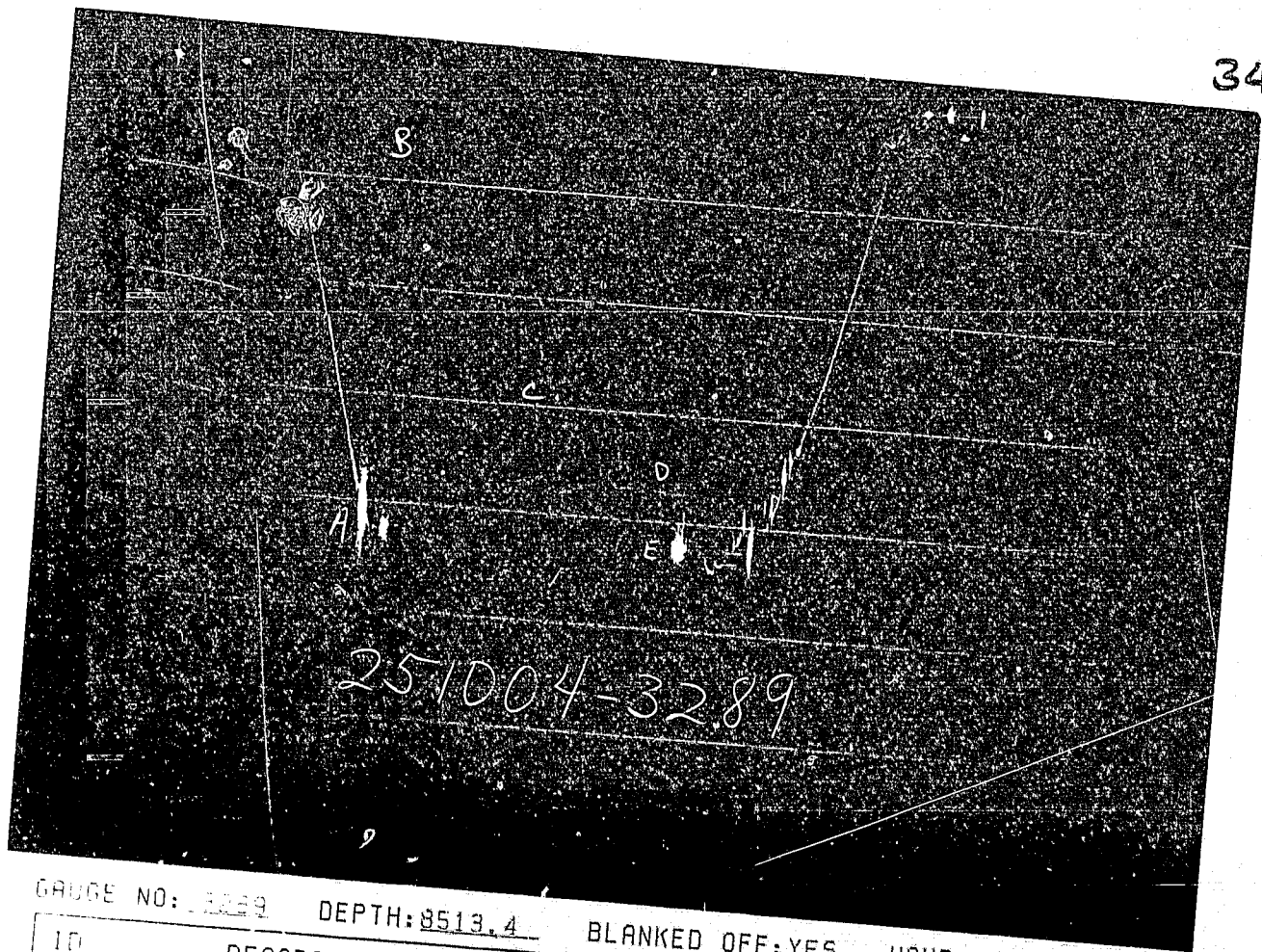
GAUGE NO: 6106 DEPTH: 8446.8 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
1	INITIAL HYDROSTATIC					
2	INITIAL FIRST FLOW		353.3			
3	100% FIRST FLOW	2829	2830.7	152.0	151.6	F
4	100% FIRST CLOSED-IN	2829	2830.7			
5	100% FIRST CLOSED-IN		2836.1	208.0	208.4	C
6	100% HYDROSTATIC					
7	100% HYDROSTATIC RELEASE					



GAUGE NO: 7984 DEPTH: 8467.8 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
	INITIAL HYDROSTATIC	4229	4225.6			
	INITIAL FIRST FLOW	607	611.1	152.0	151.6	F
	INITIAL FIRST FLOW	2905	2908.3			
	INITIAL FIRST CLOSED-IN	2905	2908.3	208.0	208.4	C
	INITIAL FIRST CLOSED-IN	3677	3680.8			
	INITIAL HYDROSTATIC	4222	4222.3			
	INITIAL HYDROSTATIC RELEASE					



GAUGE NO: 3289 DEPTH: 8513.4 BLANKED OFF: YES HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
	HYDROSTATIC	4234	4241.9			
	FAST FLOW	696	693.2			
	FLOW	2913	2915.2	152.0	151.6	F
	CLOSED-IN	2913	2915.2			
	CLOSED-IN	3684	3686.9	208.0	208.4	C
	STATIC	4222	4246.2			
	RELEASE					

EQUIPMENT & HOLE DATA

FORMATION TESTED: PATCHAVARRA
NET PAY (ft): _____
GROSS TESTED FOOTAGE: 123.6
ALL DEPTHS MEASURED FROM: KB
CASING PERFS. (ft): _____
HOLE OR CASING SIZE (in): 8.500
ELEVATION (ft): 102.0 K.B. (82' G.L.)
TOTAL DEPTH (ft): 8676.0
PACKER DEPTH(S) (ft): 8483, 8492, 8615, 8623
FINAL SURFACE CHOKE (in): 0.50000
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.50
MUD VISCOSITY (sec): 37
ESTIMATED HOLE TEMP. (°F): _____
ACTUAL HOLE TEMP. (°F): 246 @ 8672.0 ft

TICKET NUMBER: 25100400
DATE: 10-1-85 TEST NO: 4
TYPE DST: ON BTM. STRADDLE
HALLIBURTON CAMP: MOOMBA
TESTER: P. BATES
WITNESS: B. DAVIS
DRILLING CONTRACTOR: S AND T DRILLING COMPANY RIG #14

FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE	RESISTIVITY	CHLORIDES
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm
_____	_____ °F	_____ ppm

SAMPLER DATA

Psig AT SURFACE: _____
cu.ft. OF GAS: _____
cc OF OIL: _____
cc OF WATER: _____
cc OF MUD: _____
TOTAL LIQUID cc: _____

HYDROCARBON PROPERTIES

OIL GRAVITY (°API): _____ °F
GAS/OIL RATIO (cu.ft. per bbl): _____
GAS GRAVITY: _____

CUSHION DATA

TYPE	AMOUNT	WEIGHT
<u>WATER (FT.)</u>	<u>450.0</u>	<u>8.40</u>

RECOVERED:

5388' OF SLIGHTLY GAS CUT WATER
2190' OF GAS CUT WATER
139' OF MUD CUT WATER

MEASURED FROM
TESTER VALVE

REMARKS:

_____ 46' 51.9" SOUTH
_____ 43' 11.4" EAST
_____ SP 343

TICKET NO: 25100400

CLOCK NO: 13446 HOUR: 24

HALLIBURTON
SERVICES

GAUGE NO: 6106

DEPTH: 8446.8

38

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	353.3			
2	10.0	762.5	409.2		
3	20.0	1102.5	340.0		
4	30.0	1354.4	251.9		
5	40.0	1568.0	213.6		
6	50.0	1748.7	180.7		
7	60.0	1913.4	164.7		
8	70.0	2063.5	150.0		
9	80.0	2192.4	128.9		
10	90.0	2308.1	115.7		
11	100.0	2416.8	108.7		
12	110.0	2511.9	95.1		
13	120.0	2600.5	88.5		
14	130.0	2681.7	81.2		
15	140.0	2752.5	70.9		
C 16	151.6	2830.7	78.2		

FIRST CLOSED-IN					
C 1	0.0	2830.7			
D 2	208.4	2836.1	5.4	87.8	0.237

REMARKS:

TICKET NO: 25100400

CLOCK NO: 32062 HOUR: 24



GAUGE NO: 7984

DEPTH: 8467.8

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	611.1		
	2	10.0	875.9	264.8	
	3	20.0	1191.4	315.6	
	4	30.0	1438.5	247.1	
	5	40.0	1651.4	212.9	
	6	50.0	1834.1	182.8	
	7	60.0	2001.0	166.9	
	8	70.0	2152.6	151.6	
	9	80.0	2282.5	129.9	
	10	90.0	2399.3	116.8	
	11	100.0	2506.7	107.4	
	12	110.0	2600.3	93.6	
	13	120.0	2687.5	87.2	
	14	130.0	2763.0	75.4	
	15	140.0	2833.9	70.9	
C	16	151.6	2908.3	74.4	

FIRST CLOSED-IN					
C	1	0.0	2908.3		
	2	1.0	3412.6	504.3	1.0 2.187
	3	2.0	3453.3	545.0	2.0 1.876
	4	3.0	3472.8	564.5	3.0 1.707
	5	4.0	3487.2	578.9	3.9 1.587
	6	5.0	3499.7	591.3	4.9 1.494
	7	6.0	3508.8	600.5	5.8 1.418
	8	7.0	3516.4	608.1	6.7 1.355
	9	8.0	3523.7	615.4	7.6 1.300
	10	9.0	3530.3	622.0	8.5 1.253
	11	10.0	3536.2	627.9	9.4 1.208
	12	12.0	3545.8	637.5	11.1 1.135
	13	14.0	3554.5	646.2	12.8 1.072
	14	16.0	3561.9	653.6	14.5 1.020
	15	18.0	3569.0	660.7	16.1 0.975
	16	20.0	3573.5	665.2	17.7 0.933
	17	22.0	3578.7	670.4	19.2 0.896
	18	24.0	3583.2	674.9	20.7 0.865
	19	26.0	3587.9	679.6	22.2 0.834
	20	28.0	3591.9	683.6	23.6 0.807
	21	30.0	3595.5	687.2	25.0 0.782
	22	35.0	3604.0	695.7	28.4 0.727
	23	40.0	3610.2	701.9	31.7 0.680
	24	45.0	3615.9	707.6	34.7 0.640
	25	50.0	3621.3	713.0	37.6 0.605
	26	55.0	3625.4	717.1	40.4 0.574
	27	60.0	3628.7	720.4	43.0 0.547
	28	70.0	3634.9	726.6	47.9 0.500
	29	80.0	3639.3	731.0	52.4 0.462
	30	90.0	3647.4	739.1	56.5 0.429
	31	100.0	3652.4	744.1	60.8 0.401
	32	110.0	3656.7	748.4	63.7 0.376

REF	MINUTES	PRESSURE	ΔP	$\frac{1 \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$
FIRST CLOSED-IN - CONTINUED					
33	120.0	3659.9	751.6	67.0	0.355
34	135.0	3665.2	756.9	71.4	0.327
35	150.0	3669.0	760.7	75.4	0.303
36	165.0	3671.3	763.0	79.0	0.283
37	180.0	3673.2	764.9	82.3	0.265
38	195.0	3678.5	770.2	85.3	0.250
D	208.4	3680.8	772.5	87.8	0.237

REMARKS:

TICKET NO: 25100400
CLOCK NO: 28322 HOUR: 24



GAUGE NO: 3289
DEPTH: 8513.4

REF	MINUTES	PRESSURE	AP	$\frac{1 \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$	REF	MINUTES	PRESSURE	AP	$\frac{1 \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$
FIRST FLOW						FIRST CLOSED-IN - CONTINUED					
B	0.0	693.2				32	100.0	3659.8	744.6	60.2	0.401
	10.0	989.9	296.7			33	110.0	3663.4	748.3	63.8	0.376
	20.0	1262.2	272.3			34	120.0	3666.7	751.5	67.0	0.355
	30.0	1502.2	240.0			35	135.0	3671.2	756.0	71.4	0.327
	40.0	1702.4	200.2			36	150.0	3675.3	760.1	75.4	0.303
	50.0	1881.2	178.8			37	165.0	3679.1	764.0	79.0	0.283
	60.0	2044.4	163.2			38	180.0	3681.9	766.8	82.3	0.265
	70.0	2186.1	141.8			39	195.0	3684.1	768.9	85.3	0.250
	80.0	2312.3	126.2			D 40	208.4	3686.9	771.7	87.8	0.237
	90.0	2444.8	132.5								
	100.0	2524.9	80.1								
	110.0	2625.5	100.6								
	120.0	2700.2	74.7								
	130.0	2778.6	78.4								
	140.0	2850.2	71.6								
C	151.6	2915.2	64.9								
FIRST CLOSED-IN											
C	0.0	2915.2									
	1.0	3374.6	459.5	1.0	2.173						
	2.0	3484.3	569.1	2.0	1.887						
	3.0	3498.1	582.9	3.0	1.710						
	4.0	3524.7	609.6	3.9	1.592						
	5.0	3526.5	611.3	4.8	1.498						
	6.0	3526.5	611.3	5.7	1.421						
	6.4	3528.0	612.8	6.1	1.395						
	7.0	3544.1	628.9	6.7	1.355						
	8.0	3546.5	631.3	7.6	1.300						
	9.0	3547.3	632.2	8.5	1.251						
	10.0	3555.3	640.1	9.4	1.209						
	12.0	3559.4	644.2	11.1	1.135						
	14.0	3565.8	650.7	12.8	1.072						
	16.0	3574.4	659.3	14.5	1.019						
	18.0	3579.1	664.0	16.1	0.974						
	20.0	3583.4	668.9	17.6	0.934						
	22.0	3590.3	675.2	19.2	0.896						
	24.0	3592.9	677.8	20.7	0.864						
	26.0	3596.6	681.4	22.2	0.835						
	28.0	3600.2	685.1	23.6	0.807						
	30.0	3605.4	689.2	25.0	0.782						
	32.0	3612.7	697.5	26.4	0.727						
	40.0	3617.0	701.8	31.7	0.680						
	44.0	3622.6	707.4	34.7	0.640						
	50.0	3628.0	712.8	37.6	0.605						
	55.0	3632.7	717.5	40.4	0.575						
	60.0	3638.5	723.1	43.0	0.547						
	65.0	3643.9	728.7	47.9	0.501						
	70.0	3651.4	736.2	52.4	0.462						
	75.0	3654.8	739.7	56.5	0.429						

LEGEND:
REMARKS: TEST WAS THROUGHOUT TEST.

	O.D.	I.D.	LENGTH	DEPTH
1 DRILL PIPE.....	4.500	3.826	7830.2	
4 FLEX WEIGHT.....	6.000	2.880	178.1	
DRILL COLLARS.....	6.250	2.880	364.7	
1 PUMP OUT REVERSING SUB.....	6.000	3.000	1.0	8373.0
DRILL COLLARS.....	6.250	2.880	30.6	
1 IMPACT REVERSING SUB.....	6.000	3.000	1.0	8414.0
DRILL COLLARS.....	6.250	2.880	30.3	
5 CROSSOVER.....	5.750	1.120	1.0	
10 AP RUNNING CASE.....	5.000	2.250	4.1	8446.8
5 CROSSOVER.....	5.000	2.200	1.0	
1 DUAL CIP VALVE.....	5.000	0.870	4.9	
0.2 SAMPLE CHAMBER.....	5.000	2.500	4.9	8456.3
1.1 DRAIN VALVE.....	5.000	2.200	0.9	
0.3 HYDROSPRING TESTER.....	5.000	0.750	5.3	8465.3
AP RUNNING CASE.....	5.000	2.250	4.1	8467.8
15 JAR.....	5.000	1.750	5.0	
1.1 VR SAFETY JOINT.....	5.000	1.000	2.8	
UPPER BODY (PSI EQUALIZING SUB).....	5.000		1.0	8481.7
10 OPEN HOLE PACKER.....	7.500	1.530	5.8	8483.0
1 DISTRIBUTOR VALVE.....	5.000	1.680	2.0	
10 OPEN HOLE PACKER.....	7.500	1.530	5.8	8491.6
1 FLESH JOINT ANCHOR.....	5.000	2.370	18.0	
1 COUPLING (PSI EQUALIZING SUB)...	5.000	2.500	1.0	8511.4
AP RUNNING CASE.....	5.000	2.250	4.1	8513.4
1 CROSSOVER.....	5.000	2.200	1.0	
1 CROSSOVER.....	6.000	2.500	1.0	
1 DRILL COLLARS.....	6.250	2.880	93.2	

EQUIPMENT DATA

	O.D.	I.D.	LENGTH	DEPTH
 CROSSOVER.....	6.000	2.500	1.0	
 CROSSOVER.....	5.000	2.200	0.8	
 OPEN HOLE PACKER.....	7.500	1.530	5.8	8615.2
 DISTRIBUTOR VALVE.....	5.000	1.680	2.0	
 OPEN HOLE PACKER.....	7.500	1.530	5.8	8623.1
 CROSSOVER.....	5.000	2.200	1.0	
 ANCHOR PIPE SAFETY JOINT.....	5.000	1.500	4.3	
 FLUSH JOINT ANCHOR.....	5.000	2.370	8.0	
 CROSSOVER.....	6.000	2.500	1.0	
 DRILL COLLARS.....	6.250	2.880	30.5	
 CROSSOVER.....	6.000	2.500	1.0	
 BLANKED-OFF RUNNING CASE.....	5.000		4.1	8673.0
TOTAL DEPTH				8676.0

EQUIPMENT DATA

DELHI PETROLEUM PTY. LTD.

VELOCITY SURVEY - TIME/DEPTH CALIBRATION

NULLA NO. 1

DISTRIBUTION (9)

DELHI (3) - W. Thiele/Library
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By: G.B. Tickle
Geophysicist
11/2/86

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VELOCITY SURVEY-TIME/DEPTH CALIBRATION

NULLA 1

1.0 SUMMARY

The Nulla 1 velocity survey was hampered by poor hole conditions at 8110 ft which prevented the downhole tool from sampling deeper due to blockages. The horizons prognosed and sampled yielded fair results: the Cadna-Owie was correctly prognosed while the other horizons were prognosed deep.

The datum static was calculated to be 3 msec larger than that used in the seismic survey of 1985.

2.0 INTRODUCTION

A well velocity survey was conducted by Delhi Petroleum Pty. Ltd. at the Nulla 1 wellsite on 5 October, 1985.

Velocity Data Pty Ltd, of Brisbane were the recording contractors, providing the recording equipment and down-hole tool used in the survey.

Thirty-three fair to good quality records were obtained at 22 different levels using ANZOMEX boosters detonated in the mud pit as the energy source. The down-hole tool was a wall-locking vertical motion geophone device.

Check shots at datum (102 ft)* were taken to confirm the static correction used in the processing of line 85-XGX SP 343.

A Time/Depth curve was computed by fitting the integrated sonic time curve to the check-shot data by the least squares method.

*Note: all depths are below KB unless otherwise specified.

NORTHERN
TERRITORY

QUEENSLAND
SOUTH AUSTRALIA

A.T.P. 259P.

000046

PEDIRKA

P.E.L. 586

BIRDSVILLE TRACK RIDGE

NULLA I

PATCHAWARRA S.W.

PATCHAWARRA EAST

WALKILLIE

CUTTAIRRIE

BEANBUSH

DINGOMARA

MOOLION

COONATIE

MERRIM INNAN

PACKSADDE

PACKSADDE - I

MUDRANGIE

WANTANA

MERRIMELIA

MOOMBA

GIDGALPA

MOOMBA

MUDERA

MAMUR

BIG LAKE

DARLINGIE

STRZELECKI

NAPPA - MURT

MCKINLAY

TOOLACHEE

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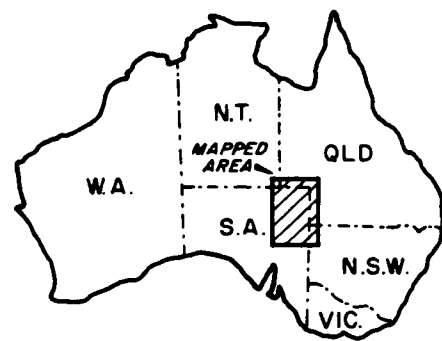
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DELHI PETROLEUM PTY. LTD.

LOCATION MAP NULLA - I

P.E.L. 586 SOUTH AUSTRALIA

SCALE 1 2000000

KILOMETRES 20 0 20 40 60 80 100 120 KILOMETRES



Author : A.R. GILBY

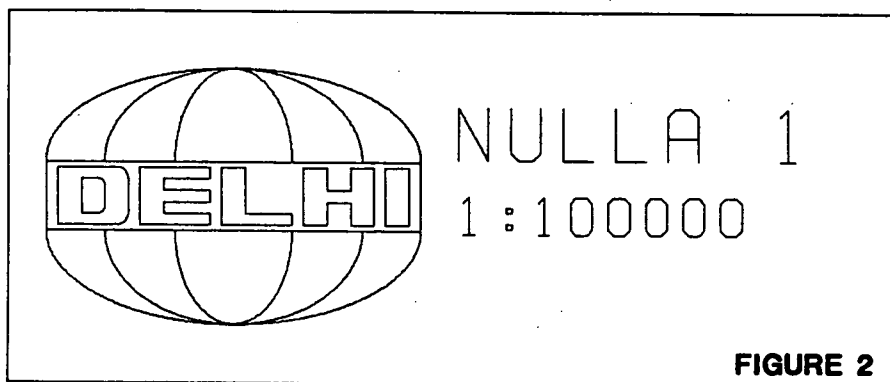
Date : JUNE 1985

Drafted : H. KUSTER

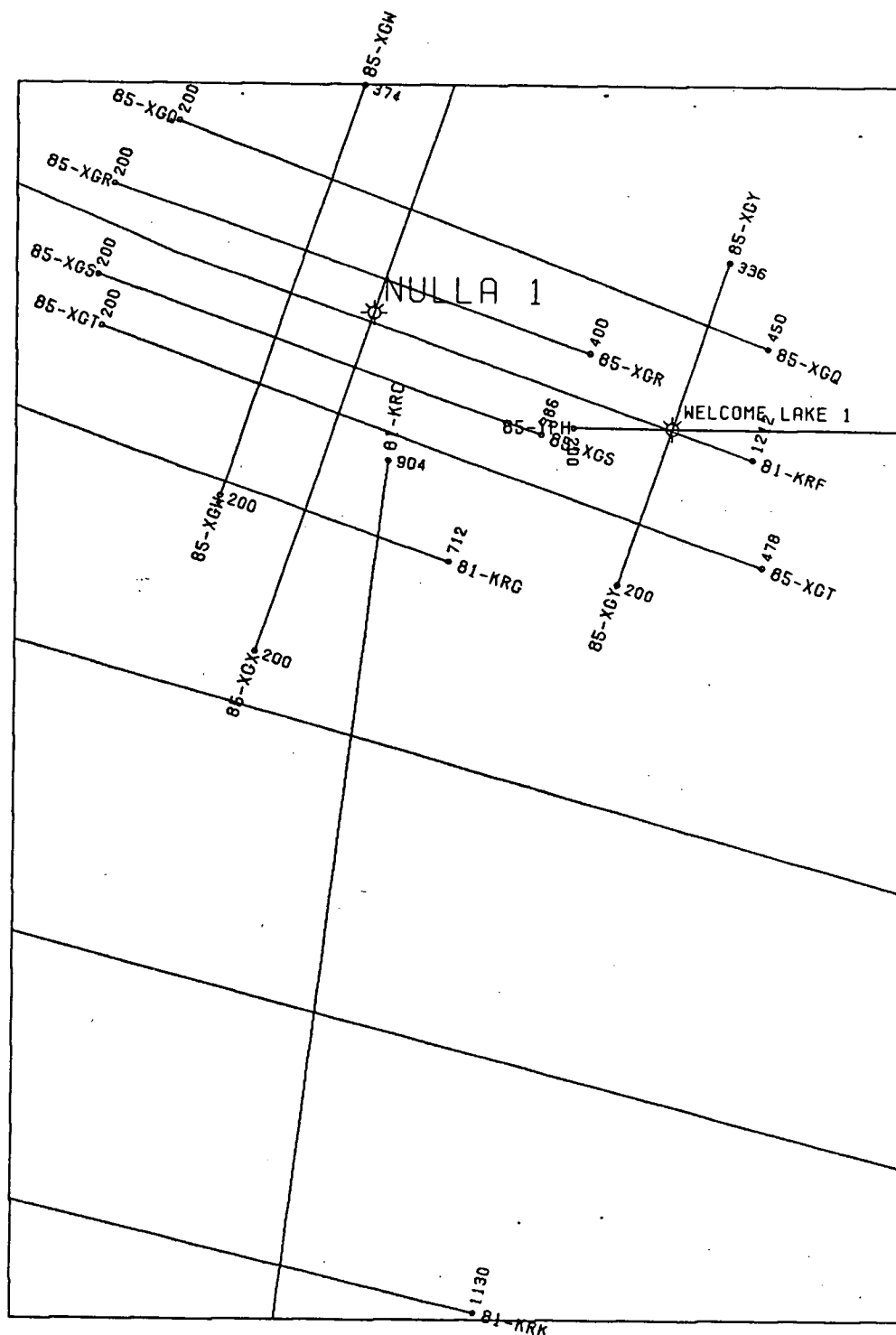
Dwg. No. : 85XG - 5573

File : RD-46

Fig. 1



27 45 00S



27 55 00S

139 40 00E

139 48 00E

3.0 NULLA 1 DEPTH PROGNOSES

Prognoses of formation tops at Nulla 1 were based on an interpretation of 85-XGX line at VP 343, recorded in the Patchawarra Southwest Block.

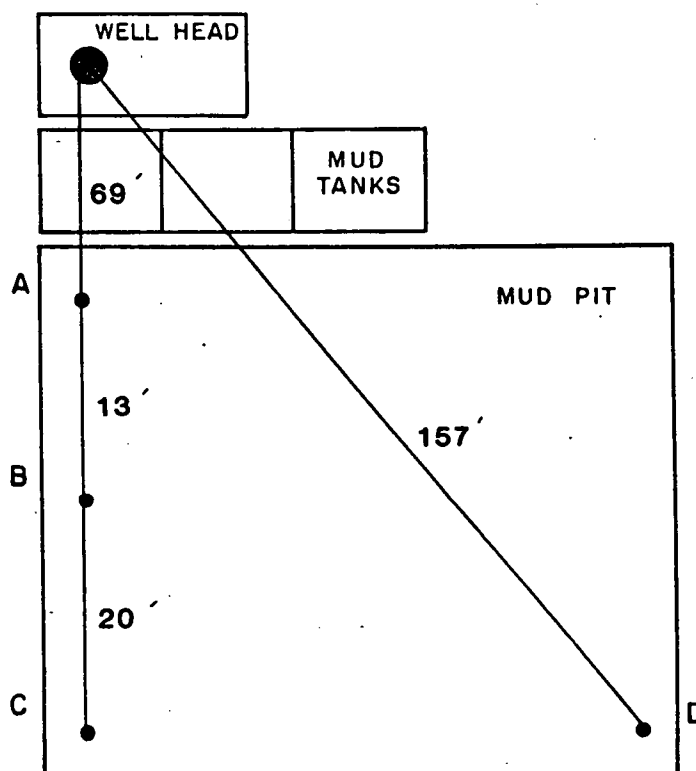
TABLE 1
COMPARISON OF WELLTOP AND PROGNOSSED DEPTHS
DEPTH (feet below MSL)

Horizon	C	UT	P	W
Prognosis	5152	7380	7717	8807
Well Top	5152	7279	7658	8728
Difference	0	101	59	79

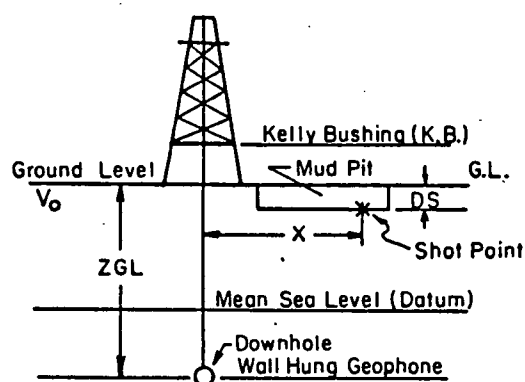
4.0 DATUM STATIC DETERMINATION

Seven shots at datum were taken at three different shot locations (Figure 3) with the down-hole tool locked in casing at mean sea level, 102 ft below KB. Ground level was surveyed at 82 ft above mean sea level. The last datum shot was recorded at the end of the survey.

The mean vertical one-way time after geometrical offset correction was 21 ms (Enclosure 1). A shot depth correction of 3 msec was added due to the shots being 6 ft below the seismic elevation of 82 ft. A LVL velocity of 1917 ft/sec was used in the correction calculation.



• SHOT POINT



$$T = T_0 \cos \left[\tan^{-1} \left(\frac{X}{ZGL - DS} \right) \right] + \frac{DS}{V_0}$$

T_0 = Time from Shot Point to downhole geophone. (record time)

T = Time for vertical ray path from surface level of well-head to downhole geophone level.

BASE: JB (7-85) Dwg. No. 85XP-4491(a) File: RD-33

SHOT POINT	A	B	C	D
Depth Relative to G.L. at K.B.	5'	5'	5'	7'
Horizontal Distance from K.B.	69'	82'	102'	157'

DELHI PETROLEUM PTY. LTD.

GEOMETRY DIAGRAM **NULLA 1** WELL VELOCITY SURVEY

Author:	Drafted	Date
Dwg No.	File No.	FIGURE 3

TABLE 2
DATUM STATIC DETERMINATION

SHOT No	SHOT LOC ft	SHOT DEPTH ft	SHOT OFFSET ft	ARRIVAL TIME ms	SHOT -DATUM STATIC ms	SURFACE -DATUM STATIC ms
2	A	5	69	30	22	24
3	B	5	82	38	26	28
4	B	5	82	34	23	25
5	C	6	102	42	25	28
6	C	6	102	33	20	23
33	C	6	102	34	20	23
average					23	25

TABLE 3
COMPARISON OF SEISMIC AND VELOCITY SURVEY STATIC

	SEISMIC LINE	VELOCITY SURVEY	DIFFERENCE
GROUND ELEVATION (ft)	79	82	-3
DATUM STATIC (ms)	22	25	-3*
INTERVAL VELOCITY GROUND LEVEL TO DATUM (ft/sec)	3590	3280	310

* 2 msec can be attributed to elevation differences.

5.0 WELLSHOOT OPERATIONS

Shots were taken at twenty-two levels down the hole. Eight levels were chosen to coincide with formation tops picked from electric logs by the well site geologist. Several intermediate shots were taken to ensure that subsurface sampling did not exceed 500 feet.

The hole condition was generally good, allowing the tool to couple satisfactorily thus keeping noise levels to a minimum, however, a blockage in the hole prevented the tool from sampling below 8110 ft. Record quality was fair to good.

The explosive type used was ANZOMEX boosters. Various charge sizes were used according to the depth below the surface (Enclosure 1). These provided adequate energy returns.

6.0 TIME/DEPTH CALIBRATION

The Schlumberger digital sonic log (SLS), which lists microsecond/ft values for every half foot interval, is integrated with respect to depth and linearly interpolated to produce a time-depth curve, sampled at millisecond (OWT) intervals.

The checkshot times from the velocity survey are corrected for geometric offset and shot-to-datum static. The differences in time between the checkshots and the sonic derived time-depth curve are calculated. These differences follow linear trends with depth, which indicate drift between the sonic and checkshots. Two or three linear functions are fitted to the above mentioned differences by a least squares method. A drifted time-depth curve is produced by adding the slopes of the linear functions to the raw sonic log and reintegrating with respect to depth. To adjust this uncalibrated time-depth curve to an appropriate TWT from MSL scale, the OWT curve is doubled and then bulk shifted. This bulk shift had been retained from earlier computations and in effect had reduced to zero the time difference between a selected tie point and the undrifted time-depth curve. As this bulk shift was calculated using an undrifted time-depth curve, when it is applied to the drifted version there is likely to be some residual time difference at the tie point.

Table 4 lists the travel time and drift values at the successive stages of the process as well as the final rms errors in time of the checkshots curve. An rms error in equivalent depth is calculated using the interval velocities shown in Enclosure 1. A "worst case" error in depth interpretation for the T/Z curve was computed.

TABLE 4

CHECK SHOT - SONIC TIME DIFFERENCES

DEPTH (ft)		TRAVEL-TIME to DATUM (ms)			CHECK - SONIC		
Below K.B. ft	Below M.S.L. ft	Check-Shot ms	Tied Sonic ms	Drift Corr. Sonic ms	Tied Sonic ms	Drift Corr. Sonic ms	Depth Diff. ft
800	698	108	126	107	-13	1	7
1300	1198	187	203	186	-11	1	4
1800	1698	260	275	259	-10	1	8
2300	2198	331	344	331	-8	0	0
2800	2698	395	406	396	-6	-1	-5
3800	3698	517	523	520	-1	-3	-25
4300	4198	577	581	580	0	-3	-27
4800	4698	635	638	638	2	-3	-29
*5254	5152	682	687	682	0	0	0
5470	5368	704	707	705	2	-1	-11
5802	5700	735	735	738	5	-3	-34
6282	6180	774	774	776	5	-2	-22
6681	6579	805	806	805	4	0	0
6900	6798	819	822	815	1	4	58
7232	7130	846	847	843	4	3	33
7760	7658	889	886	889	8	0	0
7938	7836	907	901	910	11	-3	-26
8110	8008	919	915	919	9	0	-5
RMS Values		Above tie point			8	2	17
		#Below tie point			6	2	26
		Total sonic			7	2	23

* Tie Point.

Includes Tie Point.

7.0 RESULTS

After calibration, the checkshots had a rms depth error of 23 ft and a rms time error of 8 msec. Table 5 indicates the results against prognoses. The prognoses were derived from the interpretation of the 1985-XGX line at VP 343.

The datum static indicates a OWT difference of -3 msec but this was in part due to elevation differences.

While the Cadna-Owie was prognosed low (TWT), an underestimate of the average velocity to the C horizon gave an accurate, although fortuitous, depth prognosis. All other horizons were picked low (TWT), and while velocities to those horizons ranged from 40 ft/sec low to 57 ft/sec high, all horizons were prognosed deeper than was actually the case.

It should be noted that the two way time to the Tirrawarra "W" horizon was calculated from the drift corrected sonic log. This horizon lay below the 8110 ft limit, below which the Velocity Data tool could not be lowered due to an obstruction. Though no checkshot was taken at the W horizon, the drift correction calculated from the 10 shots above it was used to calibrate the sonic as described in Section 6. In this way, a TWT of reasonable confidence can be derived.

TABLE 5
SURVEY RESULTS

DEPTH (feet below M.S.L.)

Horizon	C	UT	P	W
Prognosis	5152	7380	7717	8807
Well top	5152	7279	7658	8728
Difference	0	101	59	79

TWO-WAY TIME* (msecs)

Horizon	C	UT	P	W
Prognosis	1372	1734	1778	1978
Well top	1364	1719	1776	1952
Difference	8	15	2	26

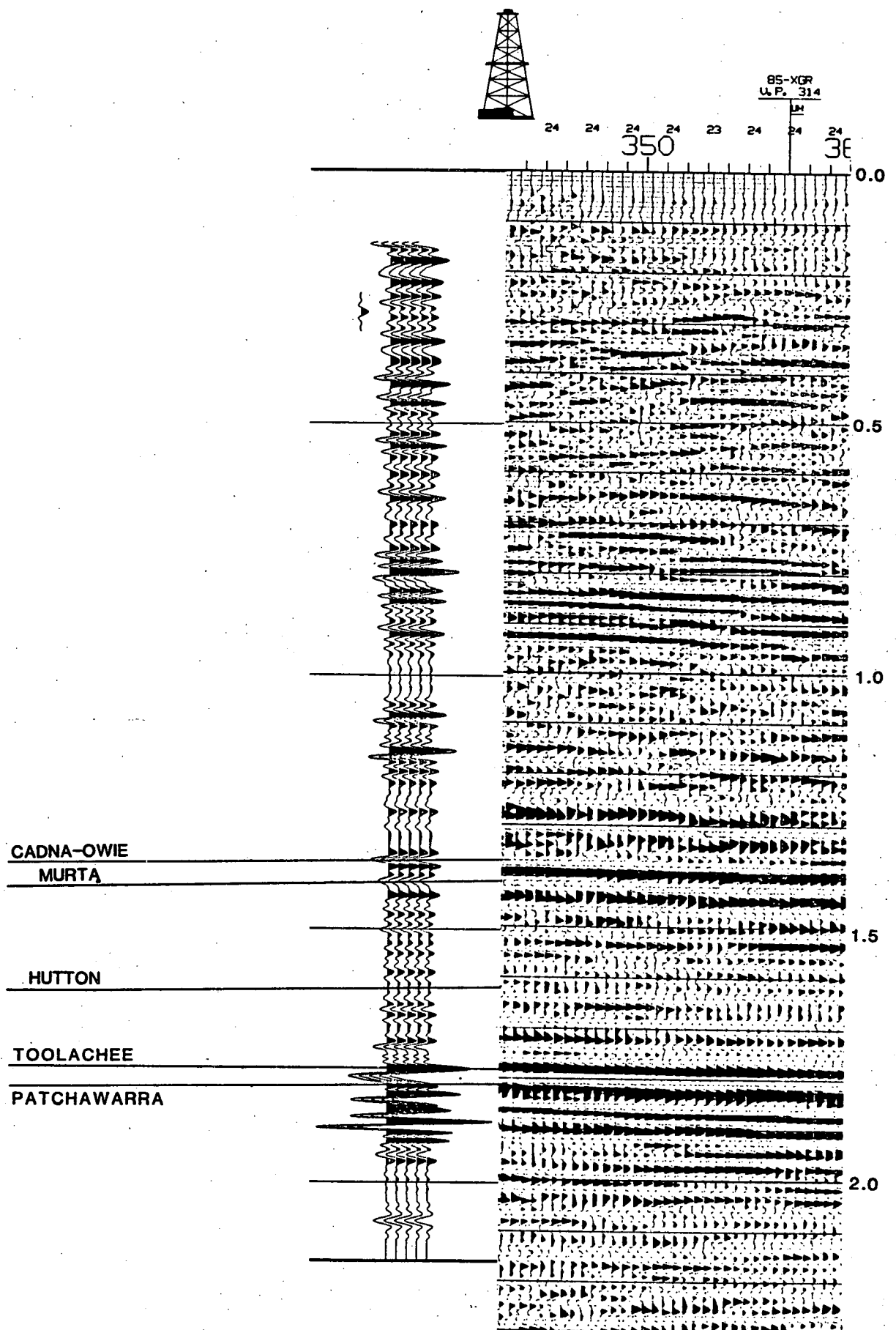
AVERAGE VELOCITY (ft/sec)

Horizon	C	UT	P	W
Prognosis	7510	8510	8681	8900
Well top	7555	8470	8624	8940
Difference	-45	40	57	-40

COMPARISON OF REAL AND SYNTHETIC SEISMOGRAMS

Figure 4

000055



SYNTHETIC LINE 85-XGX VP 343

TABLE 6

SURVEY DATA

Personnel Present

Supervisor	M. McLerie Delhi Petroleum Ltd.
Observer - Well shoot	T. Pooley Velocity Data Pty. Ltd.
Shooter	I. Mackay Velocity Data Pty. Ltd.

Recording Parameters

Energy Source	Explosive - BOOSTERS
Shot Offset and Depth (B.G.L.)	Location A : 69 feet, 5 feet
	Location B : 82 feet, 5 feet
	Location C : 102 feet, 6 feet

Production Shooting:	Location C
Datum Shooting :	Location A, B, C

Equipment

Recorder	E.I.E. RS 44W
Reference Geophone	Hall Sears HS 1
Downhole Geophone	Geospace WLS-100 Wall-locking type
Elements	6 HS 1 4.5 Hz 215 ohm
	high temperature elements
	series parallel connection
	Frequency response: 8-300 Hz within 3db
	Pre-amplifier - 48 db fixed gain
	Frequency response: 5-200 Hz within 3db

Monitor Traces

1	Instrument time break
2-4	Analogue down-hole geophone signal - low, medium and high gain
5	Digital down-hole geophone signal IFP gain
6	Confirmation time break geophone signal

NULLA 1

05-10-85

SHOT RECORD TABLE

6189-1



DATUM SHOTS (DATUM=MSL)

Z(KB)= 102 FT Z(GL)= 82 FT

SHOT NUMBER	LOCAL TIME	SHOT LOCATION	AMP. GAIN	CHARGE SIZE	CHARGE DEPTH FT	OFFSET (FT)	ARRIVAL TIME MS	SHOT TO DATUM STATIC (MS)	SURFACE TO SHOT CORR. (MS)	SURFACE TO DATUM STATIC (MS)	REMARKS
1	04.30	A	--	DET	5	69	---	---			
2	04.35	A	--	1XA	5	69	30	22	2	24	
3	04.40	B	05	1XA	5	82	38	26	2	28	NOISY
4	04.45	B	10	1XA	5	82	34	23	2	25	NOISY
5	04.50	C	--	1XA	6	102	42	25	3	28	NOISY
6	04.55	C	--	1XD	6	102	33	20	3	23	REFRACTION
33	08.00	C	10	1XD	6	102	34	20	3	23	

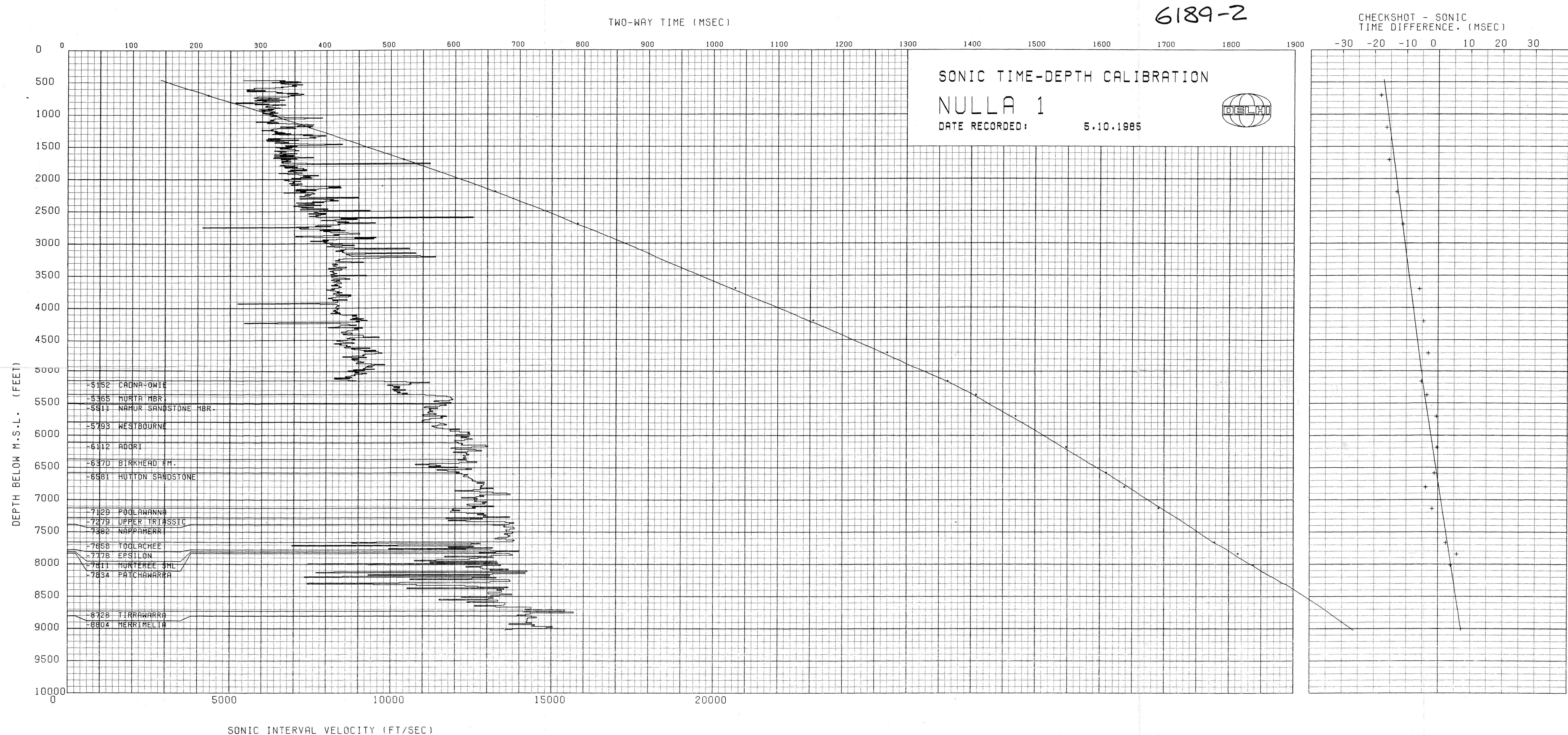
THE SHOT TO DATUM STATIC USED IS 23 MSEC.

THE SURFACE VELOCITY IS 2034 FT/SEC.

SURVEY SHOTS

SHOT NUMBER	LOCAL TIME	CHARGE SIZE	AMP. GAIN	OFFSET (FT)	CHARGE DEPTH	KB DEPTH	RECORD TIME	MSL DEPTH	CORR. TIME	INTERVAL VELOCITY	RMS VELOCITY	REMARKS
7	05.00	1XA	10	102	6	150	38	48	6	8000	8000	
32	07.55	1XD	15	102	6	303	---	201	---	---	---	NOT USED
31	07.50	1XD	30	157	7	800	132	698	106	6500	6594	
30	07.45	1XD	30	157	7	1300	210	1198	185	6329	6482	NOISY
29	07.40	1XQ	35	157	7	1800	282	1698	258	6849	6588	
28	07.35	1XQ	35	157	7	2300	353	2198	329	7042	6689	
27	07.30	1XQ	35	157	7	2800	417	2698	393	7813	6884	
26	07.25	1XQ	35	157	7	3300	---	3198	---	---	---	NOT USED
25	07.20	1XQ	35	157	7	3800	538	3698	515	8197	7217	
24	07.15	1XQ	35	157	7	4300	598	4198	575	8333	7341	
22	07.10	1XQ	40	157	7	4800	---	4698	---	---	---	NO T.B.
23	07.12	1XQ	35	157	7	4800	656	4698	633	8621	7468	RESHOT
8	05.25	1XQ	45	157	7	5254	703	5152	680	9558	7632	CADNA-OWIE (5254)
21	07.05	1XQ	45	157	7	5254	704	5152	681	9558	7632	CADNA-OWIE
20	07.00	1XQ	35	157	7	5470	725	5368	702	10047	7717	MOOGA:MURTA (5467.0)
19	06.55	1XQ	40	157	7	5802	756	5700	733	10710	7867	WESTBOURNE (5895)
18	06.50	1XQ	40	157	7	6282	795	6180	772	12308	8150	ADORI SST (6472)
17	06.45	1XQ	40	157	7	6681	826	6579	803	12871	8381	HUTTON SST (6683)
16	06.40	1XQ	40	157	7	6900	840	6798	817	15643	8558	
14	06.20	1XQ	40	157	7	7232	863	7130	840	12296	8702	POOLLOWANNA (7231)
15	06.30	1XQ	40	157	7	7232	871	7130	848	12296	8702	
9	05.40	1XQ	40	157	7	7760	908	7658	885	12279	8909	
12	06.05	1XQ	40	157	7	7760	912	7658	889	---	---	TOOLACHEE (7760)
13	06.10	1XQ	40	157	7	7760	909	7658	886	---	---	
11	06.00	1XQ	45	157	7	7938	928	7836	905	9622	8924	PATCHAWARRA (7936)
10	05.55	1XQ	45	157	7	8110	940	8008	917	14333	9016	DEEPEST TOOL COULD GET
												6189-1

ENCLOSURE 1
12-FEB-1986





NULLA 1 SYNTHETIC SEISMOGRAM

6189-3

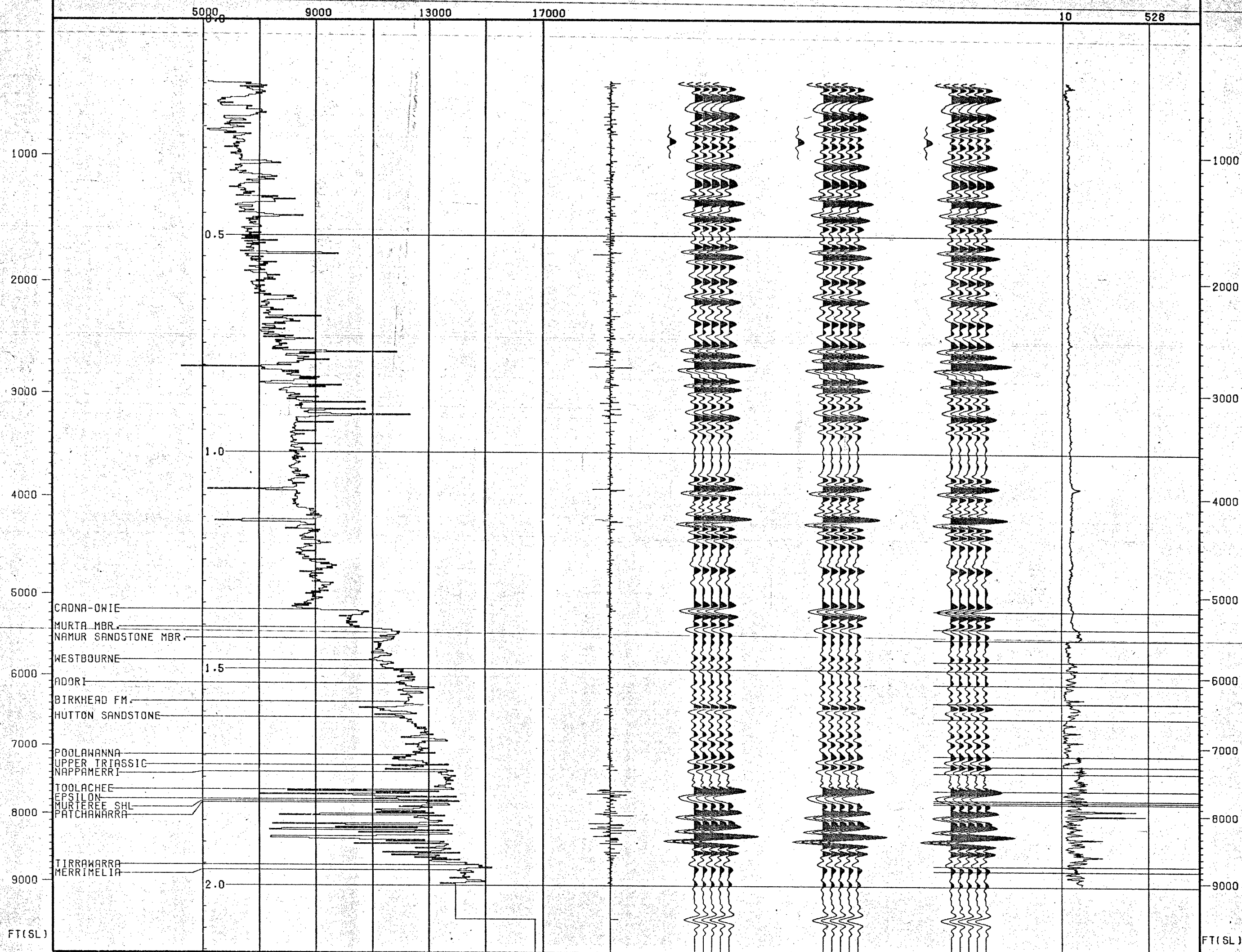
12-FEB-88

NACOWLAH

INTERVAL VELOCITY(FT/SEC)

REFLECTIVITY⁴ PRIMARIES ONLY⁴PRIMARIES ONLY⁵PRIMARIES ONLY⁶

GR



REFLECTIVITY COMPUTED USING :

1. VELOCITY
2. VELOCITY AND DENSITY
3. VELOCITY AND CORRECTED DENSITY
4. SAME AS (1) WITH DRIFT APPLIED
5. SAME AS (2) WITH DRIFT APPLIED
6. SAME AS (3) WITH DRIFT APPLIED

BANDPASS WAVELET

NO. OF FILTER POINTS 39
LOW CUT FREQUENCY 10
HIGH CUT FREQUENCY 55
PHASE SHIFT 0
ZERO PHASE
NORMAL POLARITY

FORMATION TOP KB(FT) = 102	DEPTH(SL)	TIME	VEL(INT)	VEL(AV)	VEL(RMS)
CADNA-OWIE	5152	1363	10143	7560	7560
MURTA MBR.	5365	1405	11580	7637	7650
NAMUR SANDSTONE MBR.	5511	1430	11280	7708	7738
WESTBOURNE	5793	1480	12038	7828	7884
ADORI	6112	1533	12286	7974	8063
BIRKHEAD FM.	6370	1575	12057	8089	8204
HUTTON SANDSTONE	6581	1610	12538	8175	8307
POOLAWANNA	7129	1697	12500	8402	8579
UPPER TRIASSIC	7279	1721	12875	8459	8646
NAPPAMERRI	7382	1737	13463	8500	8694
TOOLACHEE	7658	1778	11429	8614	8833
EPSILON	7778	1799	13200	8647	8868
MURTEREE SHL	7811	1804	11500	8660	8883
PATCHAWARRA	7834	1808	12331	8666	8890
TIRRAWARRA	8728	1953	13818	8938	9190
MERRIMELIA	8804	1964		8965	9222

000057

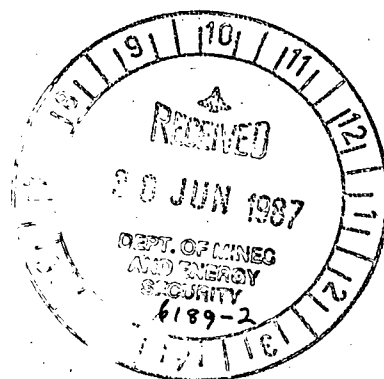
DELHI PETROLEUM

NULLA #1

PATCHAWARRA

ISOCHRONAL

2.2.87/18.2.87





000058

WIRELINE REPORT

CLIENT DELHI PETROLEUM

WELL NULLA #1

PATCHAWARRA

DATE 2/2/87

PROGRAMME ISOCHRONAL

PURPOSE OF WORK ENSURE TUBING IS CLEAR PRIOR TO RUNNING AMERADAS.

REPORT OF WORK PERFORMED

13:00 SPOT W/L UNIT. START RIGGING UP

14:05 RUN IN HOLE

14:35 TAG P.B.T.D. @ 8863' K.B.

14:38 P.O.H.

14:55 IN LUB. SHUT MASTER VALVE. BLEED OFF

LUBRICATOR. RIG UP FOR AMERADA RUN.

Operator's Signature

WORKED PERFORMED BY R. YATES/M. MOORE

OF EXPERTEST

WELL DATA:

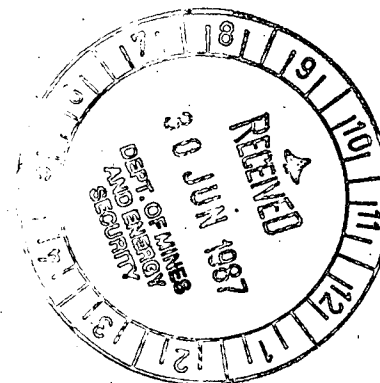
Tubing Size 2-7/8" FWHP SIWHP 2405 psi

Subsurface S.V./Landing Nipple @ S.S.D. @ 8062' K.B.

'X' Nipple @ 'X'/'XN' Nipple @ 8139' K.B. Other @

Min. I.D. @ Packer @ 8100' K.B.

Perforated Interval: 8314'-8340, 8360'-8386



CLIENT DELHI PETROLEUM

STATIC GRADIENT SURVEY

WELL NULLA 1 PATCHAWARRA

OPERATOR R. YATES

DATE 2/2/87

BOMB No. 1 DATA						BOMB No 2 DATA				DWT IN 2417
ELEMENT No. 59451		ELEMENT RANGE 5000				ELEMENT No. 60322		ELEMENT RANGE 5000		DWT OUT 2415
RECORDER No 13028/15 t/s		CLOCK DATA 2395/3 hour				RECORDER No 12952/15 t/s		CLOCK DATA 2297/3 hour		
ENGAGE STYLUS 1558		DISENGAGE 1833				ENGAGE STYLUS 1558		DISENGAGE 1833		
PRESSURE LUBRICATOR 1620						BLEED LUBRICATOR 1827				
DATE	TIME	DEPTH'	DEFLEC- TION	PRESSURE TEMP.	GRADIENT psi/ft	DEPTH'	DEFLEC- TION	PRESSURE TEMP.	GRADIENT psi/ft	REMARKS
2/2/87	16:30	LUB	.918	2389.6	---	LUB	.938	2395.0	---	R.I.H.
	16:33	1000	.986	2566.2	0.1766	1000	1.007	2571.2	0.1762	5 MIN.
	16:40	2000	1.052	2737.7	0.1715	2000	1.072	2737.3	0.1661	5 MIN.
	16:47	3000	1.114	2898.8	0.1611	3000	1.136	2901.0	0.1637	5 MIN.
	16:54	4000	1.173	3052.2	0.1534	4000	1.196	3054.7	0.1536	5 MIN.
	17:01	5000	1.230	3200.4	3200.4	5000	1.253	3200.7	0.1461	5 MIN.
	17:08	6000	1.284	3340.9	0.1405	6000	1.308	3341.8	0.1410	5 MIN.
	17:15	7000	1.1337	3478.8	0.1379	7000	1.362	3480.4	0.1386	5 MIN.
	17:22	8000	1.380	3614.2	0.1120	8000	1.414	3613.9	0.1335	5 MIN
	17:28	8284	1.402	3648.1	0.2017	8284	1.428	3649.8	0.1266	5 MIN.
	17:33	8327	1.404	3653.3	0.1211	8327	1.430	3655.0	0.1195	10 MIN.
	17:43	8373	1.412	3674.1	0.4530	8373	1.438	3675.5	0.4467	10 MIN.
	17:53	8390	1.416	3684.6	0.6129	8390	1.442	3685.8	0.6044	5 MIN.
	18:17	LUB	.922	2400.0	---	LUB	.941	2402.6	---	10 MIN.

GENERAL REMARKS: M.B.H.T.: 260°F 1606: Flex Ameradas In Lubricator.

000059

CLIENT DELHI PETROLEUM																DATE 2/2/87			PAGE No 1 of 6	
WELL NULLA #1 Patchawarra Cleanup																OPERATOR R. Yates				
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS	
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =									
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D					
10:45			ARRIVE ON	LEASE	SPOT	CARAVAN														
13:00			POLE TRUCK	WITH	SEPARATOR	BROKEN DOWN.				RIG UP	WIRELINE FOR	BLIND BOX	RUN							
14:05	0	2405			R.I.H. WITH	1.75" BLIND BOX														
14:35					TAG P.B.T.D. @	8863' K.B.														
14:38					P.O.H.															
14:55					IN LUB. DEPRESSURE.	RIG UP FOR	STATIC GRADIENT.													
16:30	0	2417			R.I.H. FOR	STATIC GRADIENT														
17:58					P.O.H.															
18:27					DEPRESSURE LUB.	STAND BY FOR	SEPARATOR													
3/2/87																				
14:00			POLE TRUCK ON	LOCATION.	SPOT	SEPARATOR, HEATER & 2 TANKS														
16:45			UNLOAD 3½"	EUE TUBING.																
18:45			3½"	EUE TUBING LAID	OUT FOR	FLOW LINES														
4/2/87																				
06:00			START SCREWING	TUBING TOGETHER	FOR	LINES														
11:00			PRESSURE TEST	LINES.	REPAIR	LEAKS														
13:00	0	2443		18/64		FLOW WELL ON	CLEANUP	BYPASS	HEATER &	SEPARATOR										
13:05	0	2298	86																	
13:10	0	2291	86																	

CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra
Cleanup

TELEPHONE (08) 354 0488 TELEX AAB7183

DATE 4/2/87 PAGE No 2 of 6

OPERATOR R. Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						Pt PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	Pt PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
13:15	0	2307	88	18/64															
13:20	0	2296	88																
13:25	0	2273	88																
13:30	0	2271	90																
13:45	0	2270	91																
14:00	0	2265	93							3.8									
14:15	0	2260	93	24/64		OPEN CHOKE													
14:30	0	2058	97																
14:45	12	2065	99																
15:00	16	2066	100						2.5		FLOW THROUGH HEATER & SEPARATOR								
15:15	25	2075	104			372	72	117		6.25						6.25			
15:30	33	2077	104			372	72	118		6.25						6.25			
16:00	61	2091	104			372	72	117		6.25						6.25			
16:30	121	2101	109			363	67	118		5.96						5.96			
17:00	178	2109	111			368	65	114		5.93						5.93			
17:00						BYPASS SEPARATOR TO CLEAR SIGHT GLASS LINE													
17:15						RETURN FLOW THROUGH SEPARATOR													
19:00	536	2123	113			366	56	104		5.56						5.56	129.67	54670	
19:40						BYPASS SEPARATOR TO CHECK SIGHT GLASS LINE													

CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra
Cleanup

TELEPHONE (08) 354 0488 TELEFAX 354 7183

DATE 4/2/87 PAGE No 3 of 6

OPERATOR R. Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
						H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	PI PSI	HW INS. H2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
20:28				24/64		FLOW THROUGH SEPARATOR													
21:00	18	2126	118			373	46	100		5.09	SHRINKAGE .78					5.09			
22:15						BYPASS SEPARATOR. METAL DISPLACER UNABLE TO SENSE CONDENSATE (Over 61 API)													
22:35						GO TO MOOMBA FOR REPLACEMENT TO FLOW DISPLACER													
23:00	550	2151	124			BLEED CASING TO 27 psi											6.13	1169.52	5291
5/2/87																			
01:00	38	2153	126													6.13			
03:00	59	2152	129													6.11			
03:15						FLOW THROUGH SEPARATOR WITH					TEFLON DISPLACER								
05:00	89	2152	131			349	76	90	2.5	6.45						6.45			
07:00	144	2152	131			341	76	86		6.39						6.39	197.981	36816	
07:35						BYPASS SEP. TRY DIFFERENT					DISPLACER								
07:53						FLOW THROUGH SEPARATOR													
09:00	202	2153	135			325	72	91		6.06						6.06			
10:00	223	2153	136			306	70	97		5.78						5.78	433.92	13320	
10:00				30/64		OPEN CHOKE (DETERMINE RATES)													
10:15	285	1905	140																
10:30	310	1905	140			335	100	102		7.18						7.18			
10:45	328	1915	140																

CLIENT DELHI PETROLEUM.....

WELL NULLA #1 Patchawarra.....



DATE 5/2/87..... PAGE No 4 of 6

OPERATOR R. Yates.....

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
						H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	Pf PSI	HW INS. H2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	Pf PSI	HW INS. H2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
11:00	355	1915	140	30/64		338	106	102	2.50	7.42						7.42			
11:30	398	1924	142			390	108	108		7.98						7.98			
12:00	425	1922	142			391	108	111		7.97						7.97			
12:30	451	1940	147			401	108	113		8.05						8.05			
13:00	473	1926	145			401	106	111		7.99						7.99	589.86	13864	
13:00				36/64		OPEN	CHOKE	(DETERMINE RATES)											
13:15	480	1765	147																
13:30	499	1780	145			444	124	117		9.03						9.03			
13:45	514	1775	147																
14:00	524	1780	147			452	124	117		9.11						9.11			
14:30	545	1771	143			448	124	122		9.08						9.08			
15:00	562	1786	143			460	124	118		9.27						9.27			
15:30	575	1784	147			458	124	118		9.25						9.25			
16:00	585	1791	151			500	124	118		9.65						9.65			
16:00				64/64		OPEN	CHOKE	(DETERMINE RATES)											
16:15	600	1722	149																
16:30	601	1722	147			535	126	118											
16:45	605	1723	147																
17:00	610	1724	147			536	126	122		9.98						9.98			

CLIENT DELHI PETROLEUM						 TELEPHONE (08) 354 0488 TELEX AAB7183 138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 CONNARDILLA 5033										DATE 5/2/87 PAGE No 5 of 6			
WELL NULLA #1 Patchawarra Cleanup						OPERATOR R. Yates													
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
17:30	624	1721	149	64/64		536	126	120	2.50	9.99						9.99			
18:00	628	1725	151			536	125	118		10.02						10.02			
18:30	640	1695	151			550	132	115		10.46						10.46			CSG. BLED TO O
19:00	0	1697	144			562	136	113		10.75						10.75	420.36	26650	
19:25						FLOW THROUGH TANDEM					1" CHOKES ON MANIFOLD								
20:00	0	1415	136	64/64	64/64	705	174	108		13.96						13.96			
21:00	0	1450	149			720	178	104		14.32						14.32			
22:00	0	1404	151			700	178	104		14.13						14.13			
22:30	0	2385	140	12/64		330	42	100	1.25	1.03						1.03			
23:00	0	2394	140			330	48	97		1.10						1.10			
23:00				16/64		OPEN CHOKE													
23:30	0	2341	138			330	72	97		2.70						2.70			
24:00	0	2336	140			330	68	97		2.62						2.62			
6/2/87																			
01:00	0	2337	136			332	70	93		2.68						2.68			
		SHUT	WELL	IN															
07:00	0	2393																	
08:00	0	2393																	
09:00	0	2392																	

00065

CLIENT DELHI PETROLEUM				 WIRELINE & WELL TESTING SERVICE				WELL NULLA #1 Patchawarra						
TANK:— CAPACITY 377 BBLs SCALE 1.695 BBLs/INCH								DATE 4/2/87 PAGE No1 of 1 OPERATOR R. YATES						
DATE TIME	ELAPSED TIME HOURS	OIL/CONDENSATE PRODUCTION						WATER PRODUCTION						REMARKS
		METER READG	TANK DIP	TANK PROD.	FLOWRATE	CUM. PROD.	OIL CONDENSATE GRAVITY *AP160F*	METER READG	TANK DIP	TANK PROD.	FLOWRATE	CUM. PROD.	SALINITY PPM	
15:00			1.75	Ø	Ø	Ø			1.25	Ø	Ø	Ø		OPENING GAUGE
19:00			11.75	16.95	101.70	16.95			4.0	4.66	27.97	4.66		
19:40	BY PASS	SEPARATOR												
20:28	FLOW THROUGH	SEPARATOR												
22:15			40.50	48.73	1169.52	65.68	64.0		4.0	Ø	Ø	4.66		
22:15	BY PASS	SEPARATOR												
5/2/87														
03:15	FLOW THROUGH	SEPARATOR												
07:00			56.5	27.12	173.568	92.80			5.5	2.543	24.413	7.203		
10:00			87.5	52.545	420.36	145.345	63.8		6.5	1.695	13.560	8.898		
13:00			130.0	72.038	576.304	217.383			7.5	1.695	13.560	10.593		
16:00			180.0	84.750	678.00	302.133			12.0	7.628	61.024	18.221		SWITCH TANKS
16:00			1.25	Ø	Ø	302.133			1.5	Ø	Ø	18.221		OPENING GAUGE
19:00			31	50.426	403.408	352.559			2.75	2.119	16.952	20.340		172.89 BBL SHIPPED
22:00			61	50.850	406.80	403.409			3.5	1.271	10.168	21.611		
6/2/87														
01:00			71.5	17.798	142.384	421.207			5.0	2.543	20.344	22.882		
	END CLEANUP	FLOW PERIOD.												

000066

WELL... NULLA #1... Patchawacca.....



Date 4/2/87..... Page No. 1 of 1.....

Operator... R. Yates.....

Orifice Fitting Type Daniels Senior
as Flow Recorder Type Foxboro
Date of Last Calibration 30/1/87

Orifice Fitting Size 3.826"
Pressure Range 0-1500 psi
Differential Range 0-200 psi

Gas Specific Gravity Assume .80
Perforated Interval 8314 - 8340
Formation Tested 8360 - 8386

Base Conditions = 14.73psi @ 60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{P_f \times H_w}$	C' = F_u \times F_b \times F_g \times F_{tf} \times F_{pv} \times Y_2							Flow Rate $Q = C' \times \sqrt{P_f \times H_w}$
Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		F_u	F_b	F_g	F_{tf}	F_{pv}	Y_2	C'	
:15	2.25	24	387	72	117	2.50	166.92513	24	1415.0	1.118	.9493	1.04	1.0005	37502.773	6.25
:30	2.50	24	387	72	118	2.50	166.92513	24	1415.0	1.118	.9485	1.04	1.0005	37471.169	6.25
:00	3	24	387	72	117	2.50	166.92513	24	1415.0	1.118	.9493	1.04	1.0005	37502.773	6.25
:30	3.5	24	378	67	118	2.50	159.14144	24	1415.0	1.118	.9485	1.04	1.0005	37471.169	5.96
:00	4	24	383	65	114	2.50	157.78149	24	1415.0	1.118	.9518	1.04	1.0005	37601.538	5.93
:00	6	24	381	56	104	2.50	146.66847	24	1415.0	1.118	.9602	1.04	1.0005	37933.386	5.56
:00	8	24	388	46	100	2.50	133.5964	24	1415.0	1.118	.9636	1.04	1.0005	38067.705	5.08
2/87															
:00	16	24	364	76	90	2.50	166.32498	24	1415.0	1.118	.9723	1.05	1.0005	38780.745	6.45
:00	18	24	355	76	86	2.50	164.25589	24	1415.0	1.118	.9759	1.05	1.0005	38924.33	6.39
:00	20	24	340	72	91	2.50	156.46085	24	1415.0	1.118	.9715	1.05	1.0005	38748.836	6.06
:00	21	24	321	70	97	2.50	149.9996	24	1415.0	1.118	.9662	1.05	1.0005	38537.443	5.78
:30	21.5	30	350	100	102	2.50	187.08286	24	1415.0	1.118	.9619	1.05	1.0005	38365.935	7.18
:00	22	30	353	106	102	2.50	193.43732	24	1415.0	1.118	.9619	1.05	1.0005	38365.935	7.42
:30	22.5	30	405	108	108	2.50	209.1411	24	1415.0	1.118	.9568	1.05	1.0005	38162.518	7.98
:00	23	30	406	108	111	2.50	209.39914	24	1415.0	1.118	.9543	1.05	1.0005	38062.804	7.97
:30	23.5	30	416	108	113	2.50	211.96226	24	1415.0	1.118	.9526	1.05	1.0005	37994.999	8.05
:00	24	30	416	106	111	2.50	209.99047	24	1415.0	1.118	.9543	1.05	1.0005	38062.804	7.99
:30	24.5	36	459	124	117	2.50	238.57074	24	1415.0	1.118	.9493	1.05	1.00055	37865.268	9.03
:00	25	36	467	124	117	2.50	240.64081	24	1415.0	1.118	.9493	1.05	1.00055	37865.268	9.11

000067

WELL ... NULLA #1 Patchawarra
Cleanup



Date 2/2/91 Page No. 2 of 2

Operator R. Yates

Orifice Fitting Type Daniels Senior
Gas Flow Recorder Type Foxboro
Date of Last Calibration 30/1/87

Orifice Fitting Size 3.826"
Pressure Range 0-1500 psi
Differential Range 0-200" H2O

Gas Specific Gravity Assume .80
Perforated Interval 8314 - 8346 8360- 8386
Formation Tested Patchawarra
Base Conditions = 14.73psi @60°F
☒ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	C' = Fu x Fb x Fg x Ftf x Fpv x Y2							Flow Rate $Q = C' \times \sqrt{Pf \times Hw}$
Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
:30	25.5	36	463	124	122	2.50	239.60801	24	1415.0	1.118	.9452	1.055	1.0005	37879.37	9.08
:00	26	36	475	124	118	2.50	242.69322	24	1415.0	1.118	.9485	1.055	1.0005	38182.585	9.27
:30	26.5	36	473	124	118	2.50	242.18174	24	1415.0	1.118	.9485	1.055	1.0005	38182.585	9.25
:00	27	36	515	124	118	2.50	252.70536	24	1415.0	1.118	.9485	1.055	1.0005	38182.585	9.65
:30	27.5	64	550	126	118	2.50	263.24893	24	1415.0	1.118	.9485	1.055	1.0005	38182.585	10.05
:00	28	64	551	126	122	2.50	263.48814	24	1415.0	1.118	.9452	1.055	1.0005	37879.37	9.98
:30	28.5	64	551	126	120	2.50	263.48814	24	1415.0	1.118	.9469	1.055	1.0005	37947.497	9.99
:00	29	64	551	125	118	2.50	262.44046	24	1415.0	1.118	.9485	1.055	1.0005	38182.585	10.02
:30	29.5	64	565	132	115	2.50	273.09339	24	1415.0	1.118	.9510	1.060	1.0010	38311.568	10.46
:00	30	64	577	136	113	2.50	280.12854	24	1415.0	1.118	.9526	1.060	1.0010	38376.024	10.75
:00	31	64+64	720	174	108	2.50	353.94914	24	1415.0	1.118	.9568	1.085	1.0010	39454.309	13.96
:00	32	64+64	735	178	104	2.50	361.70429	24	1415.0	1.118	.9602	1.085	1.0010	39594.511	14.32
:00	33	64+64	715	178	104	2.50	356.74921	24	1415.0	1.118	.9602	1.085	1.0010	39594.511	14.13
:30	33.5	12	345	42	100	1.250	120.37441	24	318.03	1.118	.9636	1.035	1.0013	8521.6263	1.03
:00	34	12	345	48	97	1.250	128.68566	24	318.03	1.118	.9662	1.035	1.0013	8544.6194	1.10
:30	34.5	16	345	72	97	1.75	157.6071	24	637.83	1.118	.9662	1.035	1.0013	17136.792	2.70
:00	35	16	345	68	97	1.75	153.16657	24	637.83	1.118	.9662	1.035	1.0013	17136.792	2.62
2/87															
:00	36	16	347	70	93	1.75	155.85249	24	637.83	1.118	.9697	1.035	1.0013	17198.87	2.68

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CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra



TELEPHONE (08) 354 0488 TELEX AAB7183

DATE 7/2/87 PAGE No 1 of 8

OPERATOR R. Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
06:30						RIG	UP	TANDEM	5000 psi	AMERADAS	&	M.B.H.T.							
07:12						END.		STYLUS											
07:27						FLEX		AMERADAS	IN	LUB.									
07:45	0	2373				PRESSURE		LUB.											
07:50	0	2373																	
07:55	0	2373																	
08:00	0	2373				R.I.H.													
08:22						AMERADAS	HANGING	AT	8284'	K.B.									
08:58	0	2375				PRESSURE	UP	TO	CHOKE										
08:59						S.I.	HAMMER	UNION	LEAKING.	REPAIR	LEAK								
09:28	0	2379				PRESSURE	UP	TO	CHOKE										
09:30	0	2379		16/64		FLOW	RATE		#1										
09:40	0	2384		18/64		OPEN	CHOKE		1.75										
10:00	0	2512	106	18/64		224	136	86	1.75	2.93						2.93			
10:15	0	2492	104	18/64					1.75										
10:30	0	2470	104	18/64		224	130	86	1.75	2.86	S.G.	.922				2.86			
10:45	0	2447	108	18/64					1.75										
11:00	0	2430	108	18/64		225	130	88	1.75	3.86						2.86			
11:15	0	2419	108	18/64					1.75										

CLIENT DELHI PETROLEUM						 138 RICHMOND ROAD MARLESTON SA 5033 TELEPHONE (08) 354 0488 TELEX AA87183										DATE 7/2/87 PAGE No2. of 8			
WELL NULLA #1 Patchawarra																OPERATOR R. Yates			
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						P1 PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	P1 PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
11:30	0	2413	108	18/64		223	128	88	1.75	2.83						2.83			
11:45	0	2407	108	18/64		221	127	88	1.75										
12:00	0	2400	109	18/64		222	136	90	1.75	2.90						2.90			
12:15	0	2400	109	18/64					1.75										
12:30	0	2396	109	18/64		220	122	93	1.75	2.73						2.73			
12:45	0	2388	113	18/64					1.75										
13:00	0	2382	111	18/64		213	120	91	1.75	2.67	CO ₂ = 22%		H ₂ S = 0%			2.67			
13:15	0	2381	111	18/64					1.75		SALINITY = 0%		SHRINKAGE FACTOR = .79						
13:30	0	2376	111	18/64		215	120	91	1.75	2.69						2.69	86.445	31120	
13:30	SHUT	WELL	IN			GAS FLARED .468 mmscf					COND PRODUCED = 14.41 bbl. H ₂ O PRODUCED 0								
13:35	0	2436																	
13:40	0	2435																	
13:45	0	2436																	
13:50	0	2436																	
13:55	0	2436																	
14:00	0	2436																	
14:15	0	2433																	
14:30	0	2434																	
14:45	0	2434																	

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CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra
Isochronal

TELEPHONE (08) 354 0488 TELEX AAB7183

DATE 7/2/87 PAGE No 3 of 8

OPERATOR R. Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						Pt PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	Pt PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
15:00	0	2434																	
15:15	0	2434																	
15:30	0	2434																	
15:45	0	2433																	
16:00	0	2433																	
16:15	0	2433																	
16:30	0	2433																	
17:00	0	2433																	
17:30	0	2433		24/ 64		FLOW	RATE	#2											
17:45	0	2260	108	24/ 64					2.25										
18:00	0	2154	109	24/ 64		279	134	64	2.25										
18:15	0	2158	111	24/ 64					2.25	5.85						5.85			
18:30	0	2162	113	24/ 64		275	132	72	2.25	5.62	S.G. = .924					5.62			
19:00	0	2268	113	24/ 64		219	94	73	2.25	4.25						4.25			
19:30	0	2256	115	24/ 64		233	100	72	2.25	4.52						4.52	269.505	17430	
20:00	0	2255	115	24/ 64		244	98	72	2.25	4.57						4.57			
20:30	0	2256	111	24/ 64		251	98	75	2.25	4.62						4.62			
21:00	0	2257	111	24/ 64		242	98	75	2.25	4.54	CO2 = 21%		H2S = 0%			4.54			
21:30	0	2258	109	24/ 64		274	98	79	2.25	4.81	SHRINKAGE FACTOR = .81						4.81	203.40	23650

000071

CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra
Isochronal

TELEPHONE (08) 354 0488 TELEEX AA87183

DATE 7/2/87 PAGE No 4 of 8

OPERATOR R. Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
						H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	P1 PSI	HW INS. H2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	P1 PSI	HW INS. H2O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
21:30						SHUT	WELL	IN.	GAS FLARED =	.808	mmscf.	COND.	PRODUCED =	37.71	bb1. H2O	PRODUCED = 1.696			
21:35	0	2405																	
21:40	0	2405																	
21:45	0	2405																	
21:50	0	2405																	
21:55	0	2404																	
22:00	0	2404																	
22:15	0	2403																	
22:30	0	2402																	
22:45	0	2400																	
23:00	0	2398																	
23:15	0	2396																	
23:30	0	2395																	
23:45	0	2394																	
24:00	0	2392																	
8/2/87																			
00:15	0	2390																	
00:30	0	2388																	
01:00	0	2386																	

CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra
Isochronal

DATE 8/2/87 PAGE No 5 of 8

OPERATOR R. Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS	
						H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =									
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D					
01:30	0	2383		30/ 64		FLOW	RATE	#3	2.50											
01:45	0	1865	104	30/ 64					2.50											
02:00	0	1905	104	30/ 64		392	96	75	2.50	7.41						7.41				
02:15	0	1941	109	30/ 64					2.50											
02:30	0	1950	113	30/ 64		390	98	75	2.50	7.47	S.G. = .923					7.41				
02:45	0	1963	117	30/ 64					2.50											
03:00	0	1974	118	30/ 64		395	98	79	2.50	7.49						7.49				
03:30	5	1988	122	30/ 64		395	100	79	2.50	7.60						7.60				
04:00	10	1993	117	30/ 64		393	101	81	2.50	7.61						7.61				
04:30	13	2000	122	30/ 64		393	102	82	2.50	7.64						7.64				
05:00	19	2005	126	30/ 64		393	102	82	2.50	7.64	H2S = 0%		CO2 = 21%			7.64				
05:30	19	2007	131	30/ 64		393	102	86	2.50	7.61	SHRINKAGE FACTOR = .80						7.61	610.2	13360	
05:30	SHUT WELL IN.					GAS FLARED = 1.26 mmscf COND. PRODUCED = 96.62 bbl.					H2O PRODUCED = 3.39 bbl.									
05:35	16	2407																		
05:40	12	2406																		
05:45	10	2406																		
05:50	8	2406																		
05:55	7	2406																		
06:00	6	2405																		

CLIENT DELHI PETROLEUM						 WIRELINE & WELL TESTING SERVICE 138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 304 COMANDILLA 5033											DATE 8/2/87 PAGE No 6 of 8			
WELL NULLA #1 Patchawarra						OPERATOR R. Yates														
Isochronal						H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS	
WELLHEAD						H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =									
DATE TIME	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D					
06:15	0	2402																		
06:30	0	2400																		
06:45	0	2398																		
07:00	0	2396																		
07:15	0	2395																		
07:30	0	2393																		
07:45	0	2391																		
08:00	0	2390																		
08:15	0	2389																		
08:30	0	2389																		
09:00	0	2387																		
09:30	0	2387		64/64		FLOW	RATE	#4												
09:45	0	1409	120	64/64																
10:00	0	1452	126	64/64		613	100	106	2.75	11.95	S.G. = .910					11.95				
10:15	0	1453	131	64/64					2.75											
10:30	5	1462	131	64/64		645	100	126	2.75	12.04						12.04				
11:00	8	1458	138	64/64		632	100	120	2.75	11.98						11.98				
11:30	19	1460	140	64/64		626	101	124	2.75	11.95						11.95	706.82	17670		
12:00	26	1471	140	64/64		672	100	126	2.75	12.28						12.28				

CLIENT DELHI PETROLEUM						 TELEPHONE (08) 354 0488 TELEX AA87183 138 RICHMOND ROAD MARLESTON SA 5033 POSTAL ADDRESS: PO BOX 354 COMANDILLA 5033										DATE 8/2/87 PAGE No 7 of 8				
WELL NULLA #1 Patchawarra Isochronal						OPERATOR R. Yates														
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS	
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =									
						Pf PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	Pf PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D					
12:30	34	1470	145	64/64		674	104	133	2.75	12.48						12.48				
13:00	49	1473	151	64/64		664	104	133	2.75	12.38	H ₂ S = 0% CO ₂ = 20%					12.38				
13:30	50	1473	151	64/64		668	104	135	2.75	12.40	SHRINKAGE FACTOR = .760					12.40	605.12	21580		
13:30		SHUT	WELL	IN.		GAS FLARED = 2.03mmscf.					COND. PRODUCED = 104.25bbl.					H ₂ O PRODUCED = 5.085				
13:35	50	2383				CUMM. GAS FLARED = 4.57mmscf.					CUMM COND. PRODUCED = 252.98bbl.					CUMM H ₂ O PRODUCED = 10.17bbl.				
13:40	36	2387																		
13:45	29	2388																		
13:50	20	2387																		
13:55	17	2387																		
14:00	16	2387																		
14:15	11	2388																		
14:30	8	2387																		
14:45	5	2386																		
15:00	2	2384																		
15:15	0	2383																		
15:30	0	2382																		
15:45	0	2380																		
16:00	0	2379																		
16:15	0	2378																		

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CLIENT DELHI PETROLEUM.....

WELL NULLA #1 Patchawarra
Extended Rate

TELEPHONE (08) 354 0488 TELEX AAB7183

DATE 8/2/87..... PAGE No 1 of 8

OPERATOR R.Yates

DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
18:15						RIG UP TANDEM 5000 psi					AMERADAS & M.B.H.T.								
18:27						ENGAGE STYLUS													
18:35	0	2372				PRESSURE LUBRICATOR													
19:05	0	2369				R.I.H.													
19:24						AMERADAS HANGING AT 8264'K.B.													
20:00	0	2363		39/64		FLOW WELL ON EXTENDED RATE													
20:05	0	1820	115	39/64															
20:10	0	1740	120	39/64															
20:15	0	1686	122	39/64															
20:20	0	1657	122	39/64															
20:25	0	1673	124	39/64															
20:30	0	1688	126	39/64		565	138	97	2.50	10.65						10.65			
20:45	0	1701	129	39/64					2.50										
21:00	0	1709	131	39/64		575	140	100	2.50							10.65			
21:15	0	1715	135	39/64					2.50										
21:15	CUT	CHOKE		37/64					2.50										
21:30	5	1774	135	37/64		536	138	100	2.50	10.35						10.35			
21:45	10	1774	136	37/64					2.50										
22:00	16	1776	140	37/64		528	134	100	2.50	10.13	S.G. = .912	H ₂ S = 0%				10.13	447.492	24294	

CLIENT DELHI PETROLEUM																DATE 8/2/87			PAGE No 2 of 8	
WELL NULLA #1 Patchawarra Extended Rate																OPERATOR R. Yates				
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS	
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =									
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D					
22:15	17	1778	140	37/64					2.50											
22:30	22	1778	140	37/64		536	134	106	2.50	10.20						10.20				
22:45	27	1778	142	37/64					2.50											
23:00	31	1779	144	37/64		536	134	108	2.50	10.18						10.18				
24:00	40	1779	145	37/64		542	138	111	2.50	10.27						10.27				
9/2/87																				
01:00	78	1779	147	37/64		544	138	115	2.50	10.25						10.25				
02:00	112	1778	149	37/64		551	138	118	2.50	10.28						10.28	495.786	22094		
06:00	212	1779	156	37/64		480	136	118	2.50	9.51	S.G. = .920	H ₂ S = 0%	CO ₂ = 21%		9.51	447.69	17317			
	10 HOUR GAS FLARED = 4.25mmscf					COND. PRODUCED = 203.82					SHRINKAGE FACTOR = .80					H ₂ O PRODUCED = 12.71				
10:00	259	1770	158	37/64		480	137	122	2.50	9.51						9.51	777.92	12630		
14:00	286	1767	162	37/64		482	138	129	2.50	9.52	S.G. = .918	H ₂ S = 0%	CO ₂ = 20%		9.52	765.294	12779			
18:00	309	1757	160	37/64		480	136	131	2.50	9.41	SHRINKAGE FACTOR = .79				9.41	21410				
22:00	327	1749	162	37/64		531	135	129	2.50	9.93	S.G. = .906	H ₂ S = 0%	CO ₂ = 23%		9.93	14100				
10/2/87											SHRINKAGE FACTOR = .81									
02:00	330	1737	160	37/64		537	133	129	2.50	9.91						9.91	25810			
06:00	336	1727	160	37/64		530	134	129	2.50	9.84	S.G. = .914	H ₂ S = 0%	CO ₂ = 22%		9.84	30000				
24 HOUR GAS FLARED = 9.69mmscf						COND. PRODUCED = 532.234bbl.					H ₂ O = 21.18bbl.					SHRINKAGE FACTOR = .79				
CUMM. GAS FLARED = 13.94mmscf						COND. PRODUCED = 736.055					H ₂ O = 33.90bbl.									

000078

CLIENT DELHI PETROLEUM																DATE 10/2/87 PAGE No 3 of 8			
WELL NULLA #1 Patchawarra						OPERATOR R. Yates													
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
09:35		1725	163	37/64		530		133	1 H.P. x 20	LITRE	GAS SAMPLE TAKEN #A7705								
									1 H.P. x 628	cc	CONDENSATE SAMPLE TAKEN #403								
10:00	345	1725	163	37/64		530	134	133	2.50	9.79	S.G.=.918 H ₂ S=0% CO ₂ =20%		9.79	343.242	29620				
											SHRINKAGE FACTOR = .785								
14:00	349	1716	160	37/64		527	135	135	2.50	9.79	S.G.=.916 H ₂ S=0% CO ₂ =23%		9.79						
											SHRINKAGE FACTOR = .79								
14:05	FLO-PETROL TESTING FOR H ₂ S = 3PPM AND MERCAPTAN SULPHUR = 2PPM																		
	ALS SAMPLES FOR LAB DETERMINATION OF ELEMENTAL & ORGANIC MERCURY																		
	MERCURY BY DRAIGER <.12 mgs/cubic metre.																		
18:00	364	1719	156	37/64		529	132	129	2.50	9.75			9.75						
22:00	349	1701	156	37/64		513	130	129	2.50	9.45	S.G.=.932 H ₂ S=0% CO ₂ =20%		9.45						
											SHRINKAGE FACTOR = .78								
11/2/87																			
02:00	354	1689	140	37/64		511	132	126	2.50	9.54			9.54						
06:00	352	1684	138	37/64		495	130	124	2.50	9.34	S.G.=.928 H ₂ S=0% CO ₂ =24%		9.34						
											SHRINKAGE FACTOR = .79								
24 HOUR	GAS FLARED = 9.61 MMSCF/D					COND PRODUCED = 394.503 BBL/D					H ₂ O = 21.189 BBL/D								
CUMM.	GAS FLARED = 23.55 MMSCF/D					COND PRODUCED = 1130.558 BBL/D					H ₂ O = 55.089 BBL/D								

CLIENT DELHI PETROLEUM						 WIRELINE & WELL TESTING SERVICE 138 RICHMOND ROAD MARLESTON SA 5033 TELEPHONE (08) 354 0488 TELEX AA87183 POSTAL ADDRESS: PO BOX 354 COMANDILLA 5033										DATE 11/2/87 PAGE No 4 of 8			
WELL NULLA #1 Patchawarra Extended Rate						OPERATOR R. Yates													
DATE TIME	WELLHEAD					H.P. SEPARATOR #75					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. = 3.826"					L.P. METER RUN I.D. =								
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
11/2/87																			
09:30	353	1680	133	37/64		494	130	126	2.50	9.32						9.32			
						SHUT	WELL	IN	AT	WING VALVE									
09:35	337	2220																	
09:40	270	2221																	
09:45	223	2223																	
09:50	173	2223																	
09:55	138	2224																	
10:00	108	2227																	
10:15	63	2226																	
10:30	43	2229																	
10:45	34	2227																	
11:00	26	2236																	
11:15	25	2230																	
11:30	20	2229																	
11:45	20	2231																	
12:00	13	2233																	
12:15	11	2227																	
12:30	11	2230																	

080000

CLIENT <u>DELHI PETROLEUM</u>						 138 RICHMOND ROAD MARLETON SA 5033 TELEPHONE (08) 354 0488 TELEX AAB7183 POSTAL ADDRESS: PO BOX 354 COMANDILLA 5033										DATE <u>11/2/87</u> PAGE No 5 of 8						
WELL <u>NULLA #1 Patchawarra</u> <u>Extended Rate/Build Up.</u>						OPERATOR <u>M. Mueller</u>																
DATE TIME	WELLHEAD					H.P. SEPARATOR					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS			
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. =					L.P. METER RUN I.D. =											
						Pf PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	Pf PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D							
13:30	9	2230																				
14:30	2	2226																				
15:30	0	2224																				
19:30	VAC	2225																				
23:30	VAC	2220																				
12/2/87																						
03:30	VAC	2220																				
07:30	VAC	2222																				
11:30	VAC	2226																				
15:00	VAC	2229				P.O.O.H.																
15:30	VAC	2232				IN LUB.																
16:00						DEPRESSURE LUB & PREPARE TO RE-RUN AMERADAS.																

CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra
Build Up

TELEPHONE (08) 354 0488 TELEX AAB7183

138 RICHMOND ROAD MARLETON SA 5033 POSTAL ADDRESS: PO BOX 354 COMANDILLA 5033

DATE 12/2/87 PAGE No6 of 8

OPERATOR M. Mueller

Build Up																			
DATE TIME	WELLHEAD					H.P. SEPARATOR					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBLS/D	G.O.R. SCF/BBL	REMARKS
						H.P. METER RUN I.D. =					L.P. METER RUN I.D. =								
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
17:15	VAC	2237				R.I.H. WITH AMERADAS COUPLED TO 72 HOUR CLOCKS.													
17:37	VAC	2238				HANG BOMBS @ 8284' K.B.													
19:30	VAC	2238																	
23:30	VAC	2236																	
13/2/87																			
03:30	VAC	2237																	
07:30	VAC	2240																	
11:30	VAC	2243																	
15:30	VAC	2246																	
19:30	VAC	2250																	
23:30	VAC	2252																	
14/2/87																			
03:30	VAC	2256																	
07:30	VAC	2259																	
11:30	VAC	2259																	
15:30	VAC	2264																	
19:30	VAC	2265																	
23:30	VAC	2269																	

CLIENT DELHI PETROLEUM																DATE 15/2/87 PAGE No 7 of 8			
WELL NULLA #1 Patchawarra Build Up						OPERATOR M. Mueller													
DATE TIME	WELLHEAD					H.P. SEPARATOR					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. =					L.P. METER RUN I.D. =								
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D				
03:30	VAC	2272																	
07:30	VAC	2274																	
11:30	VAC	2276																	
15:30	VAC	2279				NOTE: 72 HR CLOCKS RAN OUT AT 16:00 HRS. COULD NOT RE-RUN BOMBS.													
19:30	VAC	2281				DUE TO WET WEATHER COULD NOT GET HELPER FROM MOOMBA.													
23:30	VAC	2283																	
16/2/87																			
03:30	VAC	2285																	
07:00	VAC	2287				P.O.O.H.													
07:25						IN LUB.													
07:30	VAC	2287									AWAIT CHOPPER WITH HELPER TO REDRESS AMERADAS AND RE-RUN.								
08:00						DEPRESSURE LUB.													
11:30	VAC	2289																	
15:30	VAC	2293																	
18:00						HELPER ARRIVED.					REDRESS AMERADAS								

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CLIENT DELHI PETROLEUM

WELL NULLA #1 Patchawarra



TELEPHONE (08) 354 0488 TELEX AAB7183

DATE 16/2/87 PAGE No 8 of 8

OPERATOR M. Mueller

DATE TIME	WELLHEAD					H.P. SEPARATOR					L.P. SEPARATOR					TOTAL GAS RATE MMSCF/D	TOTAL LIQUID RATE BBL/D	G.O.R. SCF/BBL	REMARKS	
	CASING PSI	TUBING PSI	TEMP °F	CHOKE SIZE INS	B.S.W. %	H.P. METER RUN I.D. =					L.P. METER RUN I.D. =									
						PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D	PI PSI	HW INS. H ₂ O	TEMP °F	ORIFICE SIZE INS	FLOW RATE MMSCF/D					
19:30	VAC	2292																		
20:10						R.I.H. WITH AMERADAS COUPLED TO 72 HR. CLOCKS														
20:35	VAC	2291				HANG BOMBS @ 8284' K.B.														
23:30	VAC	2293																		
17/2/87																				
03:30	VAC	2295																		
07:30	VAC	2296																		
11:30	VAC	2299																		
15:30	VAC	2302																		
19:30	VAC	2302																		
23:30	VAC	2304																		
18/2/87																				
03:30	VAC	2304																		
07:30	VAC	2306																		
11:30	VAC	2306																		
15:30	VAC	2309				P.O.O.H.														
15:48	VAC	2309				ARRIVE LUB.														
16:18						DEP. LUB.														

NOTE: END OF BUILD UP DUE TO WET WEATHER

STATIC GRADIENT TO BE DONE WHEN

ROADS ARE DRY ENOUGH TO GET TO LEASE

000084

0005

CLIENT DELHI PETROLEUM.....

TANK:— CAPACITY 377 BBLs

SCALE.....1.695 BBLs/INCH.....

Extended Rate



WELL NULLA #1 Patchawarra

DATE 8/2/87.....PAGE No 1 of 2

OPERATOR R. Yates.....

DATE TIME	ELAPSED TIME HOURS	OIL/CONDENSATE PRODUCTION						WATER PRODUCTION						REMARKS
		METER READG	TANK DIP	TANK PROD.	FLOWRATE	CUM. PROD.	OIL CONDENSATE GRAVITY *AP160F*	METER READG	TANK DIP	TANK PROD.	FLOWRATE	CUM. PROD.	SALINITY PPM	
20:00	0		100.5	Ø	Ø	Ø			5.5	Ø	Ø	Ø		OPENING GAUGE
22:00	2.0		121.0	34.748	416.976	34.748	62.0		7.0	2.543	30.516	2.543	Ø	
9/2/87														
02:00	6.0		166.75	77.546	465.276	112.294			10.0	5.085	30.510	7.628	Ø	
02:00	6.0		53.0	Ø	Ø	112.294			4.0	Ø	Ø	7.628		SWITCH TANKS 25-6
06:00	10.0		107.0	91.530	549.180	203.824	61.8		7.0	5.085	30.510	12.713	Ø	SHIP 213.5BBLs #25
10:00	14.0		181.0	125.430	752.580	329.254			9.0	3.390	20.340	16.103	Ø	SWITCH TANKS 6-25
10:00	14.0		34.75	Ø	Ø	329.254			6.0	Ø	Ø	16.103		
14:00	18.0		108.0	124.159	744.954	453.413	60.6		8.0	3.390	20.340	19.493	Ø	SHIP 194BBLs. #6
18:00	22.0		177.25	117.379	704.274	570.792			9.75	2.966	17.796	22.459	Ø	SWITCH TANKS 25-6
18:00	22.0		67.5	Ø	Ø	570.792			4.0	Ø	Ø	22.459		
22:00	26.0		105.25	63.986	383.916	634.778	60.3		6.0	3.390	20.340	25.849	Ø	
22:00	26.0		Ø	Ø	Ø	634.778			1.0	Ø	Ø	25.849		SWITCH TANKS 6-35
10/2/87														
02:00	30.0		27.5	46.613	279.678	681.391			3.75	4.661	27.966	30.510	Ø	SWITCH TANKS 35-6
02:00	30.0		105.25	Ø	Ø	681.391			6.0	Ø	Ø	30.510		
06:00	34.0		137.50	54.664	327.984	736.055	60.8		8.0	3.390	20.340	33.900	Ø	SWITCH TANKS 6-35
06:00	34.0		27.5	Ø	Ø	736.055			3.75	Ø	Ø	33.900		SHIP 223BBLs #25
10:00	38.0		60.0	55.088	330.528	791.143	61.2		5.0	2.119	12.714	36.019	Ø	SWITCH TANKS 35-25
10:00	38.0		49.75	Ø	Ø	791.143			5.25	Ø	Ø	36.019		

CLIENT ... DELHI PETROLEUM

WELL ... NULLA #1 Patchawarra



Date 7/2/87 Page No. 1 of 2

Operator ... R. Yates

Orifice Fitting Type Daniels Senior
 Gas Flow Recorder Type Foxboro
 Date of Last Calibration 30/1/87

Orifice Fitting Size 3.826"
 Pressure Range 0-1500 psi
 Differential Range 0-200"

Gas Specific Gravity Ranarax Reading
 Perforated Interval 8314 - 8340, 8360 - 8386
 Formation Tested Patchawarra

Base Conditions = 14.73psi @ 60°F
☐ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	C' = Fu x Fb x Fg x Ftf x Fpv x Y2							Flow Rate Q = C' x $\sqrt{Pf \times Hw}$
Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
:00	.5	18	239	136	86	1.75	180.28865	24	637.83	1.04144	.9759	1.04	1.0038	16241.878	2.93
:30	1	18	239	130	86	1.75	176.26684	24	637.83	1.04144	.9759	1.04	1.0031	16230.552	2.86
:00	1.5	18	240	130	88	1.75	176.63521	24	637.83	1.04144	.9751	1.04	1.0031	16217.247	2.86
:30	2	18	238	128	88	1.75	174.53939	24	637.83	1.04144	.9751	1.04	1.0031	16217.247	2.83
:00	2.5	18	237	136	90	1.75	179.53272	24	637.83	1.04144	.9723	1.04	1.0038	16181.963	2.90
:30	3	18	235	122	93	1.75	169.32217	24	637.83	1.04144	.9697	1.04	1.0038	16138.691	2.73
:00	3.5	18	228	120	91	1.75	165.40858	24	637.83	1.04144	.9715	1.04	1.0038	16168.650	2.67
:30	4	18	230	120	91	1.75	166.13247	24	637.83	1.04144	.9715	1.04	1.0038	16168.650	2.69
:00	8.5	24	294	134	64	2.25	198.48425	24	1104.70	1.0403	.9962	1.07	1.0028	29482.126	5.85
:30	9.0	24	290	132	72	2.25	195.65275	24	1104.70	1.0403	.9887	1.05	1.0028	28713.247	5.62
:00	9.5	24	234	94	73	2.25	148.31048	24	1104.70	1.0403	.9877	1.05	1.0022	28667.044	4.25
:30	10	24	248	100	72	2.25	157.48015	24	1104.70	1.0403	.9887	1.05	1.0022	28696.066	4.52
:00	10.5	24	259	98	72	2.25	159.31729	24	1104.70	1.0403	.9887	1.05	1.0022	28696.066	4.57
:30	11	24	266	98	75	2.25	161.45587	24	1104.70	1.0403	.9859	1.05	1.0022	28614.801	4.62
:00	11.5	24	257	98	75	2.25	158.70097	24	1104.70	1.0403	.9859	1.05	1.0022	28614.801	4.54
:30	12	24	289	98	79	2.25	168.29141	24	1104.70	1.0403	.9822	1.05	1.0022	28581.401	4.81
2/87															
:00	16.5	30	407	96	75	2.50	197.66638	24	1415.0	1.0409	.9859	1.075	1.0010	37501.797	7.41
:30	17	30	405	98	75	2.50	199.22349	24	1415.0	1.0409	.9859	1.075	1.0010	37501.797	7.47
:00	17.5	30	410	98	79	2.50	200.44949	24	1415.0	1.0409	.9822	1.075	1.0010	37361.056	7.49

00000088

VELL...NULLA.#1..Patchawarra.....
Isochronal



Operator R. Yates

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Drift Fitting Type Daniels Senior .....
Gas Flow Recorder Type Foxboro .....
Date of Last Calibration 30/1/87 .....

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Orifice Fitting Size 3.826"
Pressure Range 0-1500 psi
Differential Range 0-200" H2O

Gas Specific Gravity, Ranarax, Reading Base Conditions = 14.73psi @ 60° F
Perforated Interval, .8314 - .8340, .8360 - .8386 ☐ Flange Taps ☐ Pipe Taps
Formation Tested, Patchawarra

[illegible]

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CLIENT . . . DELHI PETROLEUM . . .

WELL . . . NULLA #1 Patchawarra
Extended Rate

Date . . . 8/2/87 . . . Page No. 1 of 2 . . .

Operator . . . R. Yates . . .

Orifice Fitting Type Daniels Senior
Gas Flow Recorder Type Foxboro
Date of Last Calibration 30/1/87Orifice Fitting Size 8.826"
Pressure Range 0-1500 psi
Differential Range 0-200" H2OGas Specific Gravity Ranarax
Perforated Interval 8314-8340, 8360-8386
Formation Tested PatchawarraBase Conditions = 14.73psi @ 60°F
☐ Flange Taps ☐ Pipe Taps

TIME DATA		Choke Size 64ths Inch	METER RUN DATA				$\sqrt{Pf \times Hw}$	$C' = Fu \times Fb \times Fg \times Ftf \times Fpv \times Y2$							Flow Rate $Q = C' \times \sqrt{Pf \times Hw}$
Time	Elapsed Time Hours		(Pf) Press P.S.I.A.	Diff (Hw) Inches Water	Temp. °F	Plate Size Inches		Fu	Fb	Fg	Ftf	Fpv	Y2	C'	
8:30	.5	39	580	138	97	2.50	282.91341	24	1415.0	1.0426	.9662	1.10	1.001	37668.573	10.65
9:00	1	39	590	140	100	2.50	287.40215	24	1415.0	1.0426	.9636	1.10	1.001	37567.210	10.80
9:30	1.5	37	551	138	100	2.50	275.74988	24	1415.0	1.0426	.9636	1.10	1.001	37567.210	10.35
10:00	2	37	543	134	100	2.50	269.74432	24	1415.0	1.0426	.9636	1.10	1.001	37567.210	10.13
10:30	2.5	37	551	134	106	2.50	271.72412	24	1415.0	1.0471	.9585	1.10	1.001	37529.667	10.20
11:00	3	37	551	134	108	2.50	271.72412	24	1415.0	1.0471	.9568	1.10	1.001	37463.104	10.18
11:00	4	37	557	138	111	2.50	277.24718	24	1415.0	1.0471	.9543	1.09	1.001	37025.534	10.27
2/87															
11:00	5	37	559	138	115	2.50	277.74448	24	1415.0	1.0471	.9510	1.09	1.001	36897.497	10.25
11:00	6	37	559	138	115	2.50	279.47808	24	1415.0	1.0471	.9485	1.09	1.001	36800.501	10.28
11:00	10	37	495	136	118	2.50	259.46097	24	1415.0	1.0426	.9485	1.09	1.001	36642.348	9.51
11:00	14	37	495	137	122	2.50	260.41313	24	1415.0	1.0426	.9452	1.09	1.001	36514.863	9.51
11:00	18	37	497	138	129	2.50	261.88928	24	1415.0	1.0437	.9396	1.09	1.001	36336.821	9.52
11:00	22	37	495	136	131	2.50	259.46097	24	1415.0	1.0437	.9380	1.09	1.001	36274.944	9.41
11:00	26	37	546	135	129	2.50	271.49585	24	1415.0	1.0506	.9396	1.09	1.001	36577.048	9.93
8/2/87															
11:00	30	37	552	133	129	2.50	270.95387	24	1415.0	1.0506	.9396	1.09	1.001	36577.048	9.91
11:00	34	37	545	134	129	2.50	270.24063	24	1415.0	1.0460	.9396	1.09	1.001	36416.896	9.84
11:00	38	37	545	134	133	2.50	270.24063	24	1415.0	1.0437	.9364	1.09	1.001	36213.068	9.79
11:00	42	37	542	135	135	2.50	270.49953	24	1415.0	1.0450	.9349	1.09	1.001	36200.093	9.79

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#ELL.....NULLA #1..Patchawarra...
          Extended Rate

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Date . . . 10/2/87 Page No. . . 2 of 2

Operator R. Yates

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rifice Fitting Type  Daniels Senior .....
as Flow Recorder Type  Foxboro .....
ate of Last Calibration  30/1/87 .....

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Orifice Fitting Size	3.826"
Pressure Range	0-1500 psi
Differential Range	0-200" H ₂ O

Gas Specific Gravity. Ranarex
Perforated Interval. 8314-8340, 8360-8386
Formation Tested Patchawarra

Base Conditions = 14.73psi @ 60°F
☐ Flange Taps ☐ Pipe Taps

[illegible]

000091

CLIENT DELHI PETROLEUM WELL NULLA #1 Formation Patchawarra
 OPERATOR R. Yates DATE 7.2.87
 SURVEY ISOCHRONAL
 TOP BOMB 59451/5000 psi REC. No. 13028 CLOCK DATA 550/48 hour
 MID BOMB REC. No. CLOCK DATA
 BTM BOMB 60322/5000 psi REC. No. 12952 CLOCK DATA 3089/48 hour
 ENG. STYLUS 0712 7.2.87 DISENGAGE STYLUS 1812 8.2.87
 DWT IN 2373 DWTOUT 2373 MBHT 256°F

Date	Time	Cum. Time	Depth	Top		Mid		Bot		Remarks
1987			FT KB	Def.	PSI	Def.	PSI	Def.	PSI	
7/2			LUB	0.9102	2368.8			0.9285	2369.5	
	08:22		8284	1.356	3528.3			1.382	3531.7	R.I.H. ON BOTTOM
	08:25			1.567	3530.9			1.3827	3531.7	
	08:30			1.357	3530.9			1.383	3534.3	
	08:35			1.3573	3530.9			1.383	3534.3	
	08:40			1.3575	3530.9			1.3833	3534.3	
	08:45			1.3576	3533.5			1.3833	3534.3	
	09:50			1.358	3533.5			1.3836	3534.3	
	09:00			1.357	3530.9			1.3825	3531.7	
					FLOW RATE #1					FLOW RATE #1
	09:30	0		1.358	3533.5			1.3833	3534.3	16/64
		0.25		1.3395	3484.1			1.3643	3485.5	18/64
		0.50		1.336	3476.2			1.3593	3472.7	
		0.75		1.3325	3465.8			1.3558	3465.0	
	10:30	1.00		1.3312	3463.2			1.354	3459.8	
		1.25		1.332	3465.8			1.3545	3459.8	
		1.50		1.3325	3465.8			1.355	3462.4	
		1.75		1.331	3463.2			1.3538	3459.8	
	11:30	2.00		1.3312	3463.2			1.354	3459.8	
		2.25		1.3312	3463.2			1.354	3459.8	
		2.50		1.3312	3463.2			1.354	3459.8	
		2.75		1.3312	3463.2			1.354	3459.8	
	12:30	3.00		1.333	3468.4			1.3561	3465.0	
		3.25		1.333	3468.4			1.356	3465.0	
		3.50		1.333	3468.4			1.356	3465.0	
		3.75		1.333	3468.4			1.3559	3465.0	
	13:30	4.00		1.333	3468.4			1.3556	3465.0	FINAL FLOWING PRESSURE END RATE #1.
	13:30	0.00		1.333	3468.4			1.3556	3465.0	SHUT WELL IN AND COMMENCE BUILD UP.
	13:31			1.3452	3499.7			1.3708	3503.5	

000093



CLIENT DELHI PETROLEUM Patchawarra
 WELL NULLA #1 Formation
 OPERATOR Randy Yates DATE 7/2/87
 SURVEY Isochronal
 TOP BOMB 59451/5000 REC. No. CLOCK DATA 550/48 hour
 MID BOMB REC. No. CLOCK DATA
 BTM BOMB 60322/5000 REC. No. CLOCK DATA 3089/48 hour
 ENG. SYLUS 0712 7.2.87 DISENGAGE SYLUS 1812 8.2.87
 DWT IN 2373 DWTOUT 2373 MBHT 256°F

Date 1987	Time	Cum. Time	Depth	Top Def. PSI	Mid Def. PSI	Bot Def. PSI	Remarks
	13:32			1.348 3507.5		1.3732 3508.6	
	13:33			1.349 3510.1		1.3743 3511.2	
	13:34			1.350 3512.7		1.375 3513.7	
	13:35			1.3501 3512.7		1.3755 3513.7	
	13:40			1.3513 3515.3		1.3765 3516.3	
	13:45	0.25		1.352 3517.9		1.3772 3518.9	
	13:50			1.3525 3517.9		1.3778 3521.4	
	13:55			1.3527 3520.5		1.378 3521.4	
	14:00	0.50		1.3527 3520.5		1.378 3521.4	
		0.75		1.3535 3520.5		1.379 3524.0	
		1.00		1.354 3523.1		1.3793 3524.0	
		1.50		1.355 3525.7		1.380 3526.6	
	15:30	2.00		1.3552 3525.7		1.3803 3526.6	
	16:30	3.00		1.3561 3528.3		1.3812 3529.1	
	17:30	4.00		1.357 3530.9		1.3818 3531.7	FINAL SHUT IN PRESSURE. OPEN WELL ON 24/64 CHOKE COMMENCE RATE # 2
				FLOW RATE #2			
	17:30	0.00		1.357 3530.9		1.3818 3531.7	
		0.25		1.284 3340.9		1.301 3323.8	
		0.50		1.2797 3330.5		1.304 3331.5	
		0.75		1.2815 3333.1		1.304 3331.5	
	18:30	1.00		1.2815 3333.1		1.304 3331.5	
		1.50		1.309 3406.0		1.3293 3395.7	
	19:30	2.00		1.306 3398.2		1.3265 3388.0	
		2.50		1.305 3395.6		1.3256 3388.0	
	20:30	3.00		1.3035 3390.4		1.325 3385.4	
		3.50		1.303 3390.4		1.324 3382.8	
	21:30	4.00		1.302 3387.7		1.3232 3380.3	FINAL FLOWING PRESSURE END RATE #2
	21:30	0.00		1.302 3387.7		1.3232 3380.3	SHUT WELL IN & COMMENCE BUILD UP
	21:31			1.332 3465.8		1.350 3449.6	
	21:32			1.339 3484.1		1.3618 3480.4	

000094



CLIENT DELHI PETROLEUM PATCHAWARRA
 OPERATOR R. YATES WELL NULLA #1 FORMATION
 SURVEY ISOCHRONAL DATE 7/8.2.87
 TOP BOMB 59451/5000 REC. No. CLOCK DATA 550/48 Hr.
 MID BOMB REC. No. CLOCK DATA
 BTM BOMB 60322/5000 REC. No. CLOCK DATA 3089/48 Hr.
 ENG. STYLUS 0712 7.2.87 DISENGAGE STYLUS 1812 8.2.87
 DWT IN 2373 DWTOUT 2373 MBHT 256°F

Date	Time	Cum. Time	Depth	Top Def. PSI	Mid Def. PSI	Bot Def. PSI	Remarks
1987							
	21:33			1.341 3489.3		1.3644 3485.5	
	21:34			1.342 3491.9		1.3657 3490.6	
	21:35			1.344 3497.1		1.3667 3493.2	
	21:40			1.3448 3499.7		1.3688 3498.3	
	21:45	0.25		1.3455 3499.7		1.3695 3498.3	
	21:50			1.3462 3502.3		1.370 3500.9	
	21:55			1.3467 3504.9		1.3705 3500.9	
	22:00	0.50		1.347 3504.9		1.371 3503.5	
		0.75		1.348 3507.5		1.3721 3506.0	
	22:30	1.00		1.349 3510.1		1.373 3508.6	
		1.25		1.349 3510.1		1.3735 3508.6	
		1.50		1.3498 3512.7		1.374 3511.2	
		1.75		1.3501 3512.7		1.3745 3511.2	
	23:30	2.00		1.3505 3512.7		1.375 3513.7	
		2.25		1.351 3515.3		1.375 3513.7	
8/2/87	24:00	2.50		1.3513 3515.3		1.3755 3513.7	
		2.75		1.3516 3515.3		1.3755 3513.7	
	00:30	3.00		1.352 3517.9		1.376 3516.3	
		3.25		1.3522 3517.9		1.3762 3516.3	
		3.50		1.3525 3517.9		1.3764 3516.3	
		3.75		1.3525 3517.9		1.3766 3516.3	
	01:30	4.00		1.3505 3512.7		1.374 3511.2	FINAL SHUT IN PRESSURE OPEN WELL ON 30/64CHK COMMENCE RATE #3
				FLOW RATE #3			
	01:30	0.00		1.3505 3512.7		1.374 3511.2	
	01:45	0.25		1.2413 3229.0		1.2605 3218.7	
	02:00	0.50		1.249 3249.9		1.2712 3246.9	
	02:15	0.75		1.248 3247.3		1.2704 3244.3	
	02:30	1.00		1.247 3244.7		1.2695 3244.3	
	02:45	1.25		1.246 3242.0		1.268 3239.2	
	03:00	1.50		1.2445 3236.8		1.2665 3234.1	

CLIENT DELHI PETROLEUM WELL NULLA #1 Patchawarra Formation
 OPERATOR R. YATES DATE 8.2.87
 SURVEY ISOCRONAL
 TOP BOMB 59451/5000 REC. No. CLOCK DATA 550/48 Hr.
 MID BOMB REC. No. CLOCK DATA
 BTM BOMB 60322/5000 REC. No. CLOCK DATA 3089/48 Hr.
 ENG. SYLUS 0712 7.2.87 DISENGAGE SYLUS 1812 8.2.87
 DWT IN 2373 DWTOUT 2373 MBHT 256°F

Date 1987	Time	Cum. Time	Depth	Top Def. PSI	Mid Def. PSI	Bot Def. PSI	Remarks
8/2/87		1.75		1.2435 3234.3		1.2654 3231.5	
	03:30	2.00		1.243 3234.3		1.2645 3231.5	
		2.25		1.2426 3234.3		1.264 3228.9	
		2.50		1.242 3231.6		1.2637 3228.9	
		2.75		1.2413 3229.0		1.263 3226.4	
	04:30	3.00		1.241 3229.0		1.2622 3223.8	
		3.25		1.2404 3226.4		1.2615 3221.2	
		3.50		1.240 3226.4		1.261 3221.2	
		3.75		1.2396 3223.8		1.260 3218.7	
	05:30	4.00		1.2391 3223.8		1.260 3218.7	FINAL FLOWING
	05:30	0.00		1.2391 3223.8		1.260 3218.7	PRESSURE END RATE #3.
	05:31			1.274 3314.9		1.297 3313.6	SHUT WELL IN AND
	05:32			1.3206 3434.6		1.3375 3418.8	COMMENCE BUILD UP.
	05:33			1.3278 3455.4		1.3473 3441.9	
	05:34			1.3298 3460.6		1.350 3449.6	
	05:35			1.331 3463.2		1.352 3454.7	
	05:40			1.3342 3471.0		1.356 3465.0	
	05:45	0.25		1.3358 3476.2		1.3578 3470.1	
	05:50			1.3366 3476.2		1.3587 3472.7	
	05:55			1.3375 3478.8		1.360 3475.2	
	06:00	0.50		1.3381 3481.4		1.3602 3475.2	
	06:15	0.75		1.3396 3486.7		1.362 3480.4	
	06:30	1.00		1.3407 3489.3		1.363 3482.9	
	06:45	1.25		1.3417 3491.9		1.364 3485.5	
	07:00	1.50		1.3421 3491.9		1.365 3488.1	
	07:15	1.75		1.343 3494.5		1.3655 3490.6	
	07:30	2.00		1.3435 3494.5		1.366 3490.6	
		2.25		1.344 3497.1		1.3667 3493.2	
		2.50		1.3442 3497.1		1.367 3493.2	
		2.75		1.345 3499.7		1.3675 3495.8	

CLIENT ... DELHI PETROLEUM Patchawarra
 WELL NULLA #1 Formation
 OPERATOR R. Yates DATE 8.2.87
 SURVEY Isochronal
 TOP BOMB 59451/5000 REC. No. CLOCK DATA 550/48 Hr.
 MID BOMB REC. No. CLOCK DATA
 BTM BOMB 60322/5000 REC. No. CLOCK DATA 3089/48 Hr.
 ENG. STYLUS 0712 7.2.87 DISENGAGE STYLUS 1812 8.2.87
 DWT IN 2373 DWTOUT 2373 MBHT 256°F

Date	Time	Cum. Time	Depth	Top Def.	Top PSI	Mid Def.	Mid PSI	Bot Def.	Bot PSI	Remarks
8/2/87	08:30	3.00		1.3452	3499.7			1.368	3495.8	
		3.25		1.3457	3502.3			1.3685	3498.3	
		3.50		1.3459	3502.3			1.3687	3498.3	
		3.75		1.3461	3502.3			1.369	3498.3	
	09:30	4.00		1.3435	3494.5			1.369	3498.3	FINAL SHUT-IN PRESSURE
					FLOW RATE #4					OPEN WELL ON 64/64 CHK. COMMENCE RATE #4.
	09:30	0.00		1.3435	3494.5			1.369	3498.3	
		0.25		1.1595	3015.8			1.179	3011.1	
		0.50		1.157	3010.6			1.176	3003.5	
		0.75		1.1549	3005.4			1.1745	3000.9	
	10:30	1.00		1.155	3005.4			1.1745	3000.9	
		1.25		1.1575	3010.6			1.176	3003.5	
		1.50		1.1535	3000.2			1.1732	2995.8	
		1.75		1.1521	2997.6			1.171	2990.6	
	11:30	2.00		1.1518	2997.6			1.170	2988.1	
		2.25		1.1512	2995.0			1.1698	2988.1	
		2.50		1.1508	2995.0			1.1692	2988.1	
		2.75		1.1492	2989.8			1.168	2983.0	
	12:30	3.00		1.488	2989.8			1.1672	2980.4	
		3.25		1.1478	2987.2			1.166	2977.8	
		3.50		1.147	2984.6			1.165	2975.3	
		3.75		1.146	2982.0			1.164	2972.7	
	13:30	4.00		1.1453	2979.4			1.1632	2970.2	FINAL FLOWING PRESSURE END RATE #4
	13:30			1.1453	2979.4			1.1632	2970.2	SHUT WELL IN AND COMMENCE BUILD UP
	13:31			1.2036	3130.2			1.217	3108.5	
	13:32			1.263	3286.3			1.2925	3300.7	
	13:33			1.3022	3387.7			1.322	3377.7	
	13:34			1.309	3406.0			1.3276	3393.1	
	13:35			1.313	3416.4			1.3305	3400.8	
	13:40			1.3183	3429.4			1.337	3416.2	

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CLIENT DELHI PETROLEUM WELL NULLA #1 (Patchawarra)
 OPERATOR B. TICKLE DATE 8.2.87
 SURVEY ISOCHRONAL (Extended Rate & Build Up).
 TOP BOMB 59451 x 5000 psi REC. No. 13028 x 15 t/s CLOCK DATA 24706 x 96 Hr.
 MID BOMB REC. No. CLOCK DATA
 BTM BOMB 60322 x 5000 psi REC. No. 12592 x 15 t/s CLOCK DATA 24707 x 96 Hr.
 ENG. STYLUS 18:27 8.2.87 DISENGAGE STYLUS 16:08 12.2.87
 DWT IN 2369 psi DWTOUT 2234 psi MBHT 256°F

Date	Time	Cum. Time	Depth KB	Top Def. PSI	Mid Def. PSI	Bot Def. PSI	Remarks
8.2.87	18:35		LJB	.9095 2368.8		.9282 2369.5	PRESSURE LJB.
	19:05		"	.9095 2368.8		.9282 2369.5	R.I.H.
	19:24		8284'	1.3390 3484.1		1.3650 3488.1	HANG @ 8282' KB
	20:00	0.0	"	1.3407 3489.3		1.3651 3488.1	OPEN WELL 37/64
	20:05		"	1.1916 3101.6		1.2118 3095.7	
	20:10		"	1.1780 3065.2		1.2000 3064.9	
	20:15		"	1.1928 3104.2		1.2150 3103.4	
	20:20		"	1.1965 3114.6		1.2190 3113.6	
	20:25		"	1.1965 3114.6		1.2190 3113.6	
	20:30	.5	"	1.1961 3112.0		1.2184 3111.0	
	20:45		"	1.1945 3109.4		1.2165 3108.5	
	21:00	1.0	"	1.1927 3104.2		1.2150 3103.4	
	21:15		"	1.1919 3101.6		1.2140 3100.8	
	21:30	1.5	"	1.1999 3122.4		1.2222 3121.3	
	21:45		"	1.1993 3119.8		1.2217 3121.3	
	22:00	2.0	"	1.1985 3119.8		1.2210 3118.7	
	22:15		"	1.1976 3117.2		1.2200 3116.2	
	22:30	2.5	"	1.1971 3114.6		1.2194 3113.6	
	22:45		"	1.1962 3112.0		1.2187 3113.6	
	23:00	3.0	"	1.1954 3109.4		1.2178 3111.0	
	24:00	4.0	"	1.1928 3104.2		1.2147 3103.4	
9.2.87	01:00	5.0	"	1.1902 3096.4		1.2120 3095.7	
	02:00	6.0	"	1.1878 3091.2		1.2100 3090.5	
	06:00	10.0	"	1.1798 3070.4		1.2020 3070.0	
	10:00	14	"	1.1723 3049.6		1.1940 3049.6	
	14:00	18	"	1.1653 3031.4		1.1870 3031.6	
	18:00	22	"	1.1590 3015.8		1.1800 3013.7	
	22:00	26	"	1.1522 2997.6		1.1730 2995.8	
10.2.87	02:00	30	"	1.1460 2982.0		1.1660 2977.8	
	06:00	34	"	1.1400 2966.4		1.1610 2965.0	

WELL NULLA #1 (Patchawarra)

DATE 10.2.87

TOP BOMB 59451 x 5000 psi

REC. No. 13028 x 15 t1s

CLOCK DATA 24706 x 96 hr

MID BOMB.

REC. No.

CLOCK DATA

BTM BOMB 60322 x 5000 psi

REC. No. 12592 x 15 t1s

CLOCK DATA 24707 x 96 hr

ENG. STYLUS 18:27 8.2.87

DISENGAGE STYLUS. 16:08 12.2.87

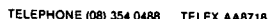
DWT IN 2369 psi

DWTOUT..... 2234 psi

MBHT 256^U F

Date	Time	Cum. Time	Depth KB	Top		Mid		Bot		Remarks
				Def.	PSI	Def.	PSI	Def.	PSI	
10.2.87	10:00	38	8284'	1.1340	2950.8			1.1540	2947.1	
	14:00	42	"	1.1284	2935.2			1.1480	2931.8	
	18:00	46	"	1.1223	2919.6			1.1420	2916.4	
	22:00	50	"	1.1171	2906.6			1.1360	2901.0	
11.2.87	02:00	54	"	1.1130	2896.2			1.1300	2885.7	
	06:00	60.53	"	1.1060	2878.0			1.1240	2870.3	
	09:30	62.5/6.0	"	1.1010	2865.0			1.1190	2857.5	S.I.W.
	09:35		"	1.2054	3135.4			1.2222	3121.3	
	09:40		"	1.2116	3153.6			1.2300	3141.8	
	09:45		"	1.2133	3156.2			1.2320	3146.9	
	09:50		"	1.2151	3161.4			1.2340	3152.0	
	09:55		"	1.2162	3164.0			1.2351	3154.6	
	10:00	.5	"	1.2171	3166.6			1.2362	3157.2	
	10:15		"	1.2190	3171.8			1.2379	3162.3	
	10:30	1.0	"	1.2209	3177.0			1.2400	3167.4	
	10:45		"	1.2221	3179.6			1.2411	3170.0	
	11:00	1.5	"	1.2233	3182.2			1.2422	3172.5	
	11:15		"	1.2245	3187.4			1.2430	3175.1	
	11:30	2.0	"	1.2264	3190.0			1.2450	3180.2	
	11:45		"	1.2267	3192.6			1.2460	3182.8	
	12:00	2.5	"	1.2272	3192.6			1.2461	3182.8	
	12:15		"	1.2284	3195.2			1.2480	3187.9	
	12:30	3.0	"	1.2291	3197.8			1.2480	3187.9	
	13:30	4.0	"	1.2316	3205.6			1.2508	3195.6	
	14:30	5.0	"	1.2336	3210.8			1.2520	3198.2	
	15:30	6.0	"	1.2353	3213.4			1.2540	3203.3	
	19:30	10	"	1.2410	3229.0			1.2600	3218.7	
23:30	14	"	1.2451	3239.4			1.2640	3228.9		
12.2.87	03:03	18	"	1.2495	3252.5			CLOCK STOPPED		
	07:30	22	"	1.2530	3260.3					

Date	Time	Cum. Time	Depth KB	Top		Mid		Bot		Remarks
				Def.	PSI	Def.	PSI	Def.	PSI	
12.2.87	11:30	26	8284'	1.2561	3268.1					
	15:00	27.5	"	1.2589	3275.9			1.2840	3280.2	P.O.O.H.
	15:30	28	LUB	.8560	2228.5			.8710	2224.0	ARRIVE LUB.
			"	.8560	2228.5			.8710	2224.0	DEPRESSURE LUB.
				PREPARE TO RE-RUN AMERADA'S						



138 RICHMOND ROAD MARLESTON SA 5031

POSTAL ADDRESS: PO BOX 354 COWANDILLA 5031

OPERATOR B. Tickle DATE 12.2.87

TOP BOMB 59451 x 5000 psi REC. No. 13028 x 15 t/s CLOCK DATA E-19379 x 72 hr

MID BOMB..... REC. No..... CLOCK DATA.....

BTM BOMB 60322 x 5000 psi REC. No. 12592 x 15 t/s CLOCK DATA E-19380 x 72 hr

ENG. STYLUS 16:34 DISENGAGE STYLUS 19:20

DWT IN 2237 psi DWTOUT 2287 psi MBHT 256°F

[illegible]

[illegible]

Time Run in Hole 08:00 7/2/87 Time off Bottom 17:30 8/2/87

Bomb No. 2 Data

Element No. and Range	59451/5000	60322/5000
Recorder No.	13028	12952
Clock and Lead Screw Data	550/48 hr 15 t/s	3089/48 hr 15 t/s
Engage Stylus	Date: 7/2/87 Time: 07:12	Date: 7/2/87 Time: 07:12
Disengage	Date: 8/2/87 Time: 18:12	Date: 8/2/87 Time: 18:12

Remarks: 0727-0745 Flex Ameradas in Lubricator
M.B.H.T. 256°F

Well-Head Data for Final Build-up

[illegible]



Well: NULLA #1 (Patchawarra) Date: 8/2/87

Lubricator Data:

Operator R. Yates

Pressure with D.W.T. In 2369

Out 2234

Time Pressured 8/2/87 @ 18:35

Time Depressed 1600

Time Run in Hole 8/2/87 @ 19:05

Time off Bottom 1530

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range	59451/5000	60322/5000
Recorder No.	13028	12952
Clock and Lead Screw Data	24706/96 hr. 15 t/s	24707/96 Hr. 15 t/s
Engage Stylus	Date: 8/2/87 Time: 18:27	Date: 8/2/87 Time: 18:27
Disengage	Date: 12/2/87 Time: 16:08	Date: 12/2/87 Time: 16:08

Remarks:

Well-Head Data for Final Build-up

1987 Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
8/2	19:24	Ameradas Hanging at 8284' KB				
	22:00		1776	16	140	
9/2	02:00		1778	112	149	
	06:00		1779	212	156	
	10:00		1770	259	158	
	14:00		1767	286	162	
	18:00		1757	309	160	
	22:00		1749	327	162	
10/2	02:00		1737	330	160	
	06:00		1727	336	160	
	10:00		1725	345	163	
	14:00		1716	349	160	
	18:00		1719	364	156	
	22:00		1701	349	156	
11/2	02:00		1689	354	140	
	06:00		1684	352	138	
	09:30		1680	353	133	S.W.I. @ WING VALVE
						START BUILD UP
	09:35		2220	337		
	09:40		2221	270		
	09:45		2223	223		
	09:50		2223	173		
	09:55		2224	138		
	10:00		2227	108		



Well: NULLA #1 (Patchawarra) Date: 11/2/87

Lubricator Data: Operator M. Mueller

Pressure with D.W.T. In 2369 Out 2234

Time Pressured 18:35 8/2/87 Time Depressed 16:00 12/2/87

Time Run in Hole 19:05 8/2/87 Time off Bottom 15:30 12/2/87

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range	59451 x 5000	60322 x 5000
Recorder No.	13028	12592
Clock and Lead Screw Data	2406 x 96 hr. 15 t/s	24707 x 96 hr. 15 t/s
Engage Stylus	Date: 8/2/87 Time: 18:27	Date: 8/2/87 Time: 18:27
Disengage	Date: 12/2/87 Time: 16:08	Date: 12/2/87 Time: 16:08

Remarks: M.B.H.T. 256°F

Well-Head Data for Final Build-up

1987 Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
11/2	10:15		2226	63		
	10:30	1	2229	43		
	10:45		2227	34		
	11:00		2236	26		
	11:15		2230	25		
	11:30	2	2229	20		
	11:45		2231	20		
	12:00		2233	13		
	12:15		2227	11		
	12:30	3	2230	11		
	13:30	4	2230	9		
	14:30	5	2226	2		
	15:30	6	2224	0		
	19:30	10	2225	VAC		
	23:30	14	2220	VAC		
12/2	03:30	18	2220	VAC		
	07:30	22	2222	VAC		
	11:30	26	2226	VAC		
	15:00		2229	VAC		PULL BOMBS OFF BOTTOM.
	15:30	30	2232	VAC		IN LUB.
	17:15					RE-RUN AMERADAS.

Well: NULLA #1 (Patchawarra) Date: 12/2/87

Lubricator Data: Operator M. Mueller

Pressure with D.W.T. In 2237 Out 2287

Time Pressured 16:41 12/2/87 Time Depressed 08:00 16/2/87

Time Run in Hole 17:15 12/2/87 Time off Bottom 07:00 16/2/87

Bomb No. 1 Data

Bomb No. 2 Data

Element No. and Range	59451 x 5000	60322 x 5000
Recorder No.	13028	12592
Clock and Lead Screw Data	E 19379 x 72 hr. 15 t/s	E 19380 x 72 hr. 15 t/s
Engage Stylus	Date: <u>12/2/87</u> Time: <u>16:34</u>	Date: <u>12/2/87</u> Time: <u>16:34</u>
Disengage	Date: <u>16/2/87</u> Time: <u>19:20</u>	Date: <u>16/2/87</u> Time: <u>19:20</u>

Remarks: M.B.H.T. 256°F

Well-Head Data for Final Build-up

Date	Time	Hours shut-in Time	Wellhead P.S.I.G.	Casing P.S.I.G.	Wellhead Temp.	Remarks
12/2	17:15		2237	VAC		R.I.H. WITH AMERADAS
	17:37		2238	VAC		ON BOTTOM 8284' KB
	19:30	34	2238	VAC		
	23:30	38	2236	VAC		
13/2	03:30	42	2237	VAC		
	07:30	46	2240	VAC		
	11:30	50	2243	VAC		
	15:30	54	2246	VAC		
	19:30	58	2250	VAC		
	23:30	62	2252	VAC		
14/2	03:30	66	2256	VAC		
	07:30	70	2259	VAC		
	11:30	74	2259	VAC		
	15:30	78	2264	VAC		
	19:30	82	2265	VAC		
	23:30	86	2269	VAC		
15/2	03:30	90	2272	VAC		
	07:30	94	2274	VAC		
	11:30	98	2276	VAC		72 HR @ 1600 CLOCKS. RAN UNIT
	15:30	102	2279	VAC		COULD NOT RERUN BOMBS.
	19:30	106	2281	VAC		NO HELPER DUE TO WET
	23:30	110	2283	VAC		WEATHER.
16/2	03:30	114	2285	VAC		

Date: 16/2/87

Operator M. Mueller

Out2287.

Time Depressured...08:00...16/2/87

Time off Bottom..... 07:00 16/2/87

Bomb No. 2 Data

Remarks: M.B.H.T. 256°F

[illegible]

NULLA FIELDWELL #1FULL WELL STREAM ANALYSIS

(Patchawarra).

Recombined reservoir fluid composition calculated from high pressure oil and gas samples as follows:-

<u>COMPONENT</u>	<u>MOLE %</u>
N ₂	0.89
CO ₂	20.64
C ₁	55.83
C ₂	11.72
C ₃	5.04
1C ₄	1.01
NC ₄	1.23
1C ₅	0.49
NC ₅	0.46
C ₆	0.57
C ₇	0.58
C ₈	0.76
C ₉	0.31
C ₁₀	0.19
C ₁₁	0.10
C ₁₂	0.06
C ₁₃	0.04
C ₁₄	0.03
C ₁₅	0.02
C ₁₆	0.01
C ₁₇	0.01
C ₁₈	0.01
	100.00



NULLA NO. 1
PATCHAWARRA 83-1 AND 83-6 RESERVOIRS
PRODUCTION TEST ANALYSIS



PREPARED BY: L. BARRO
DATE: MAY 1987

SUMMARY

Well testing work to confirm hydrocarbon type and obtain deliverability/reservoir parameters was performed on Nulla #1 (Patchawarra 83-1 and 83-6 reservoirs) over the period 2 - 18 February 1987.

Separator oil and gas samples were mathematically recombined to give a full well stream composition which was used to analytically predict the Nulla Patchawarra phase envelope. The results obtained suggest that the reservoir fluid is a gas condensate. However, well stabilization and sampling problems place the reliability of the PVT results in doubt.

The well was flowed to cleanup for 36 hours before conducting a 4 point modified isochronal test (4PMIT) and extended flow test. Test results predict the AOF of Nulla #1 in the range 19.5 - 23.7 MMSCFD.

The extended flow test experienced variation in the condensate/dry gas ratio from 30 to 80 bbl/mmscf as a result of separator pressure fluctuations (550 to 480 psig). The theoretical maximum condensate yield (C_5+) calculated from the FWS composition is 40 bbl/mmscf. Since yields of up to 79 bbl/mmscf were actually obtained in the field, the validity of the separator samples (or LGR) are questionable.

The well was shut-in after a flow period of 61.5 hours and the pressure build-up analysed using Horner techniques. The flow capacity of the 83-1 and 83-6 reservoir is estimated at 639 md-ft. This results in an average permeability of 19.4 md for 33 feet of pay. A mechanical skin of -3.6 was estimated using the 4PMIT determined turbulent flow factor of $3.1 \times 10^{-4} \text{ mscfd}^{-1}$.

The individual properties of the two reservoirs are not known since an open-hole DST precluded analysis of the 83-1 reservoir. However, it may be concluded that there is a significant variation between reservoir permeabilities since the reservoir has taken a very long time to return to its initial pressure (see discussion).

It is recommended that the deliverability/reservoir parameter results presented in this report be used to prepare reservoir simulation models. These models can be used to make gas deliverability predictions from Nulla #1 for gas contract purposes.

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CALCULATION 1 : DRAWDOWN ANALYSIS	
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INTRODUCTION

Nulla #1 was drilled over the period 12 September - 7 October 1985 as an exploration well designed to test the oil potential of the Hutton Sandstone and the Tirrawarra Sandstone as well as the gas/liquids potential of the Patchawarra formation. The Toolachee formation represented a secondary gas target. Four DST's were conducted at Nulla #1, all within the Patchawarra formation. DST #1 (8110-8153 ft KB) was a misrun. DST #2 over the 83-1 sand (8287-8341) flowed gas at a reported 6.5 mmscfd (highly questionable due to pressure gauge problems). DST #3 over the 83-6 sand (8356-8423 ft KB) flowed gas at 3.7 mmscfd. DST #4 (8496-8564 ft KB) flowed gas at RTSTM.

To enhance the reliability of gas deliverability predictions for inclusion into possible non-subject area gas contracts, it is necessary to confirm reserves and obtain PVT/deliverability/reservoir parameter data from a number of PSW Block wells. The Nulla #1 Patchawarra 83-1 and 83-6 reservoirs were tested for determination of reservoir fluid type and deliverability/reservoir parameters.

This report presents the raw data and interpreted results from the 4 point modified isochronal/extended flow test. The expertest raw data report is included as a separate attachment.

RESULTS

TABLE 1

Stabilized Deliverability Equation: $m(P_R) - m(P_{wf}) = aq + bq^2$

$$\text{i.e. : } 756 - m(P_{wf}) = 20.14q + 0.50q^2$$

AOF = 23.7 mmscfd (LIT Analysis)

AOF = 19.5 mmscfd (Pressure Squared Analysis)

TABLE 2

RESERVOIR AND WELL PARAMETERS

PARAMETER	TEST	
	COMBINED PATCHAWARRA EXTENDED FLOW BUILDUP	PATCHAWARRA 83-6 OPEN-HOLE BUILDUP
Flow Capacity (md-ft)	639	28.9
Net Pay* (ft)	33	14
Permeability (md)	19.4	2.1
Total Skin	-0.5	0
Mechanical Skin	-3.6	-
Turbulent Flow Factor	3.1×10^{-4}	-
Time to Pseudo Steady State (hrs)	86	-
Time to End Wellbore Storage (hrs)	<0.08	-
Radius of Investigation (ft)	2124	65
Extrapolated Buildup Pressure* psig	N.A.	3663
Initial Reservoir Pressure ** (psig)	3650	-

* At datum of 8284 ft KB

** Static gradient, 2 February 1987 at 8284 ft KB

NOTE: The Patchawarra 83-1 sand was tested open-hole by DST #2 but was unsuccessful due to the inability of the test tool to close. Additionally, a reliable estimate of flowrate is not available due to a faulty surface pressure gauge. Rough estimate was 6.5 MMSCFD on a declining rate (read after attempted tool closure).

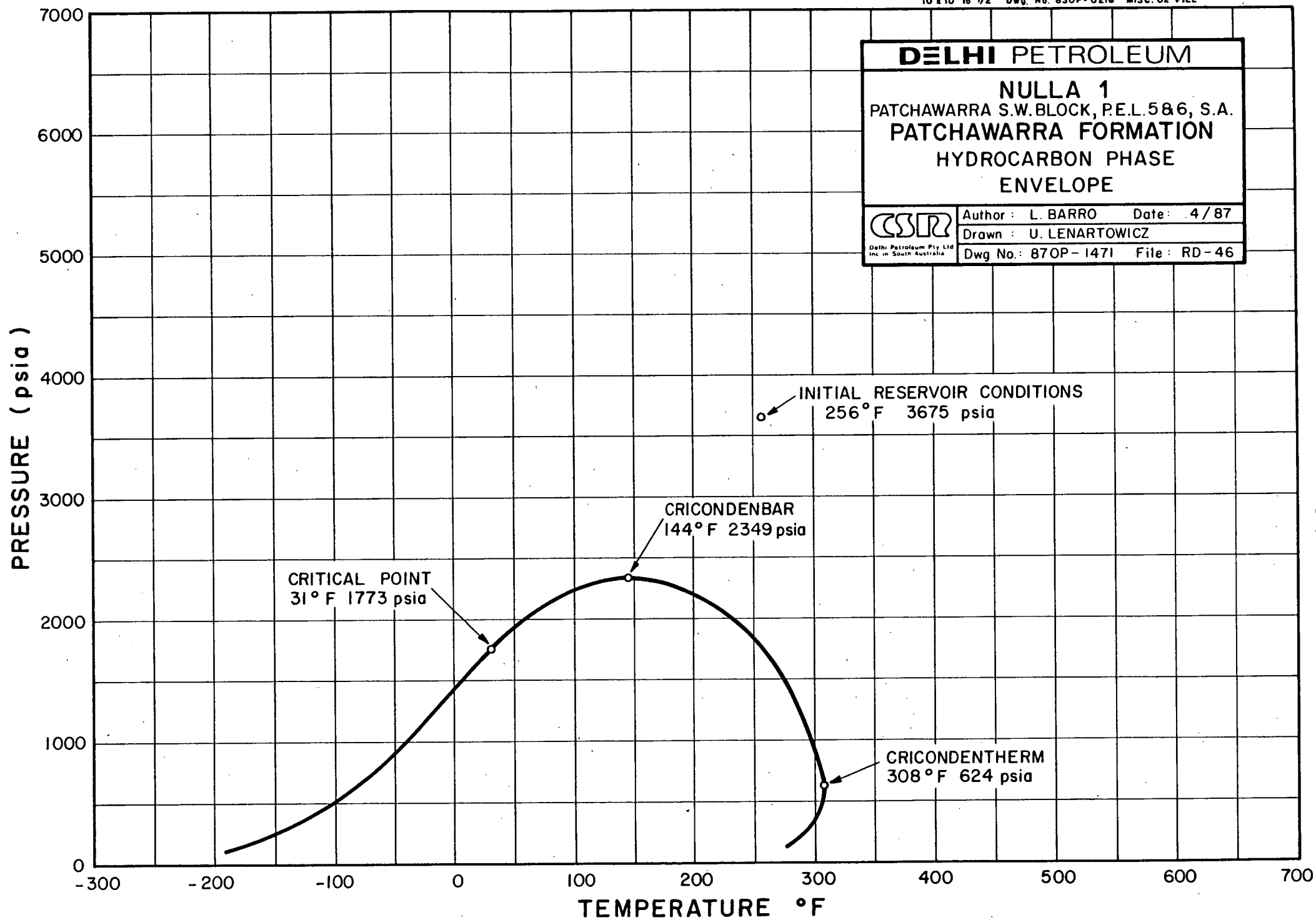


FIGURE 1

000117

DELHI PETROLEUM**NULLA 1**

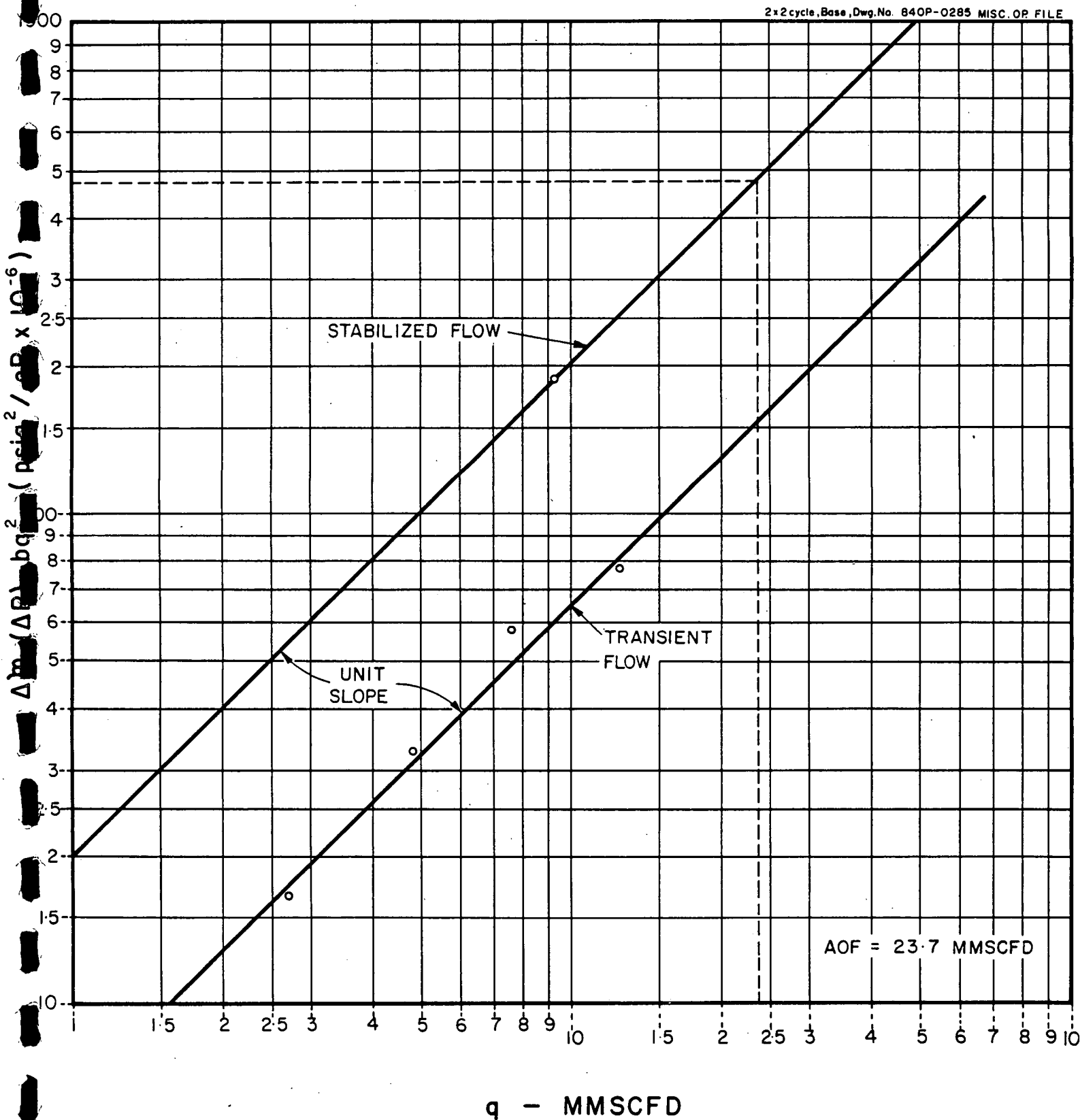
PATCHAWARRA S.W. BLOCK, P.E.L. 5&6, S.A.

PATCHAWARRA FORMATION**4 POINT MODIFIED ISOCHRONAL TEST****LIT ANALYSIS**

Author : L. BARRO Date : 4/87

Drawn : U. LENARTOWICZ

Dwg No: 870P-1478 File: RD-46



000118

FIGURE 2B

PAGE 9

DELHI PETROLEUM

NULLA 1

PATCHAWARRA S.W. BLOCK, P.E.L. 5 & 6, S.A.

PATCHAWARRA FORMATION

4 POINT MODIFIED ISOCHRONAL TEST

PRESSURE SQUARED ANALYSIS

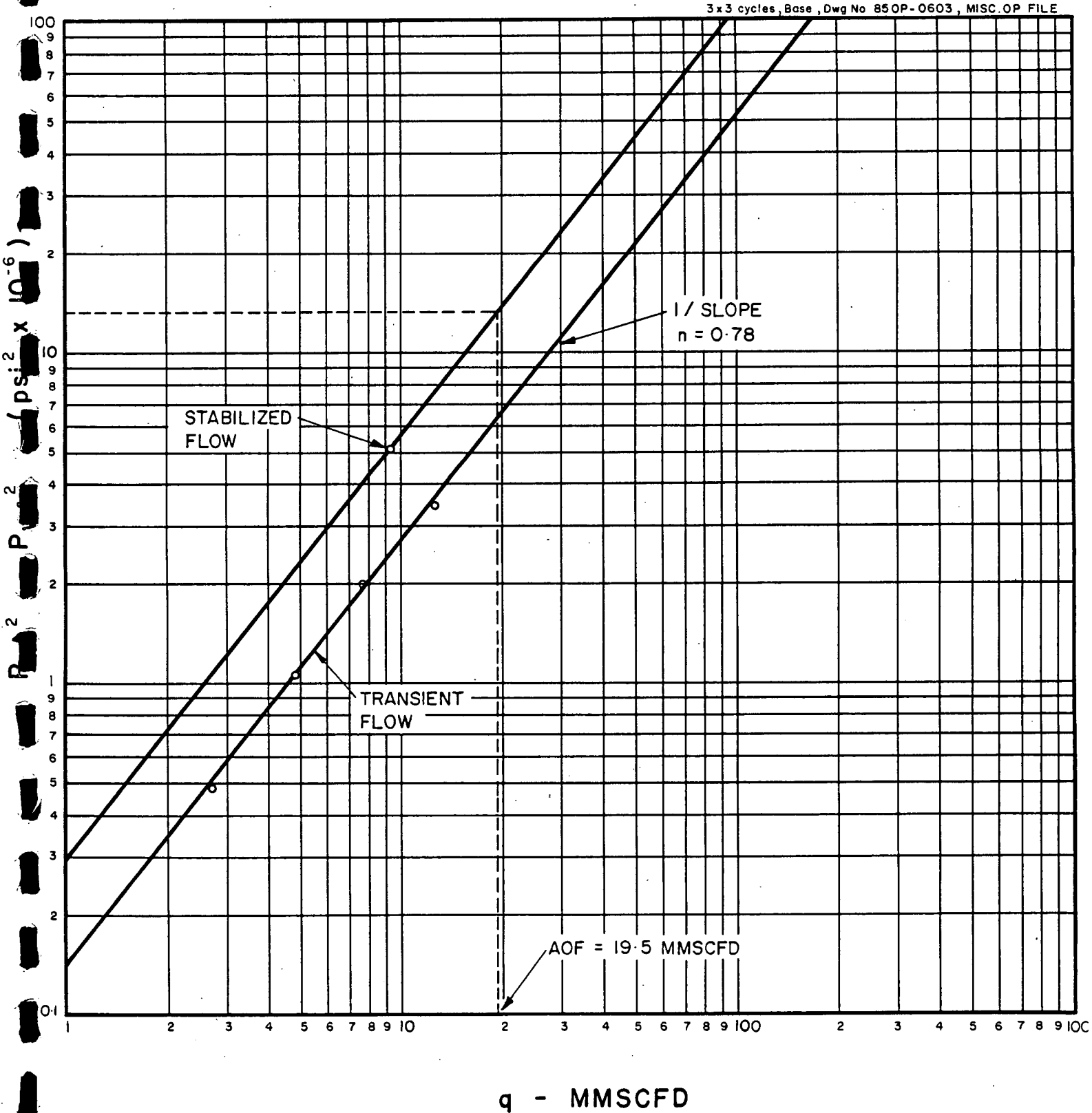
Delhi Petroleum Pty Ltd
Inc in South Australia

Author: L. BARRO

Date: 4 / 87

Drawn: U. LENARTOWICZ

Dwg No: 87OP-1477 File: RD-46



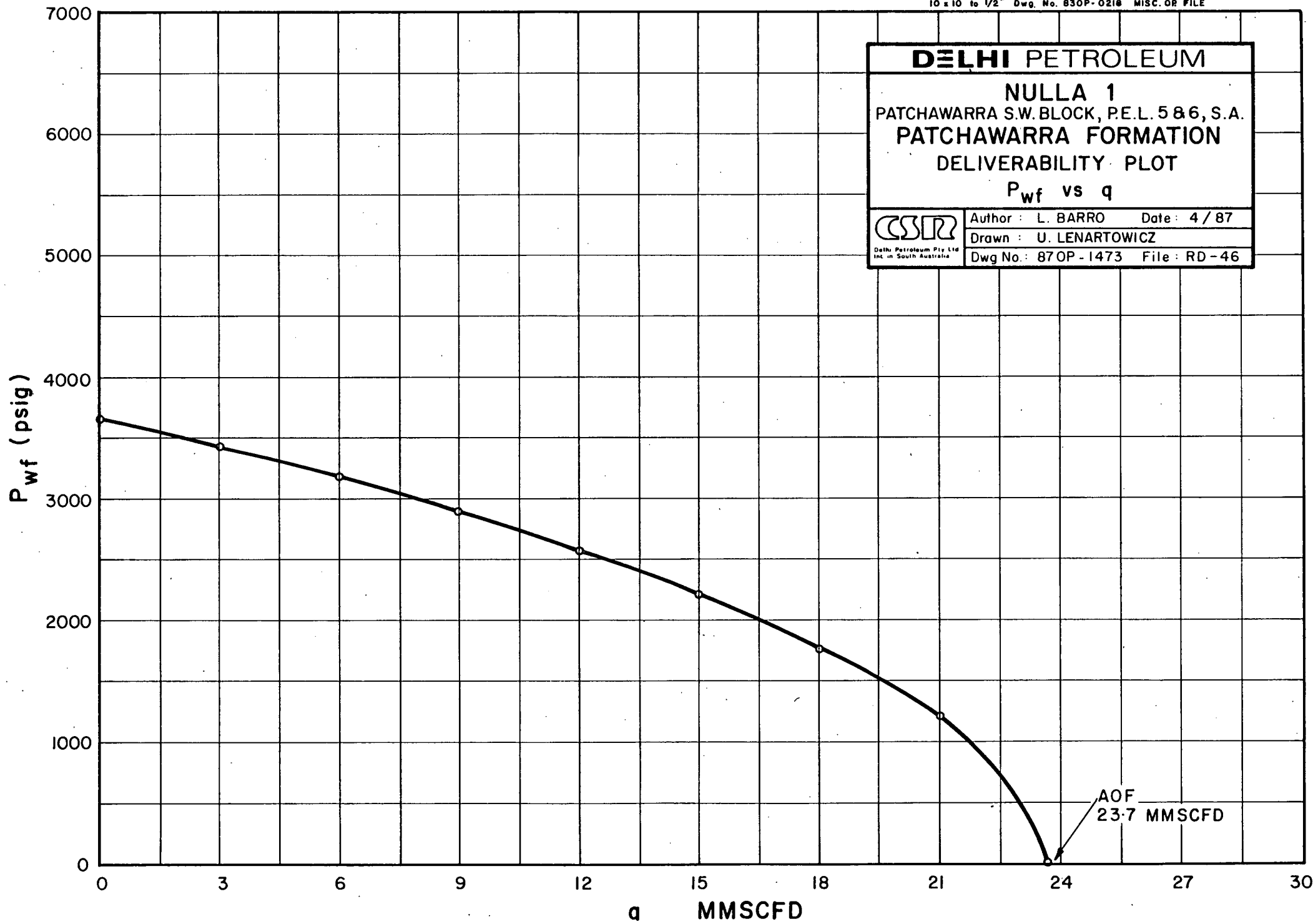
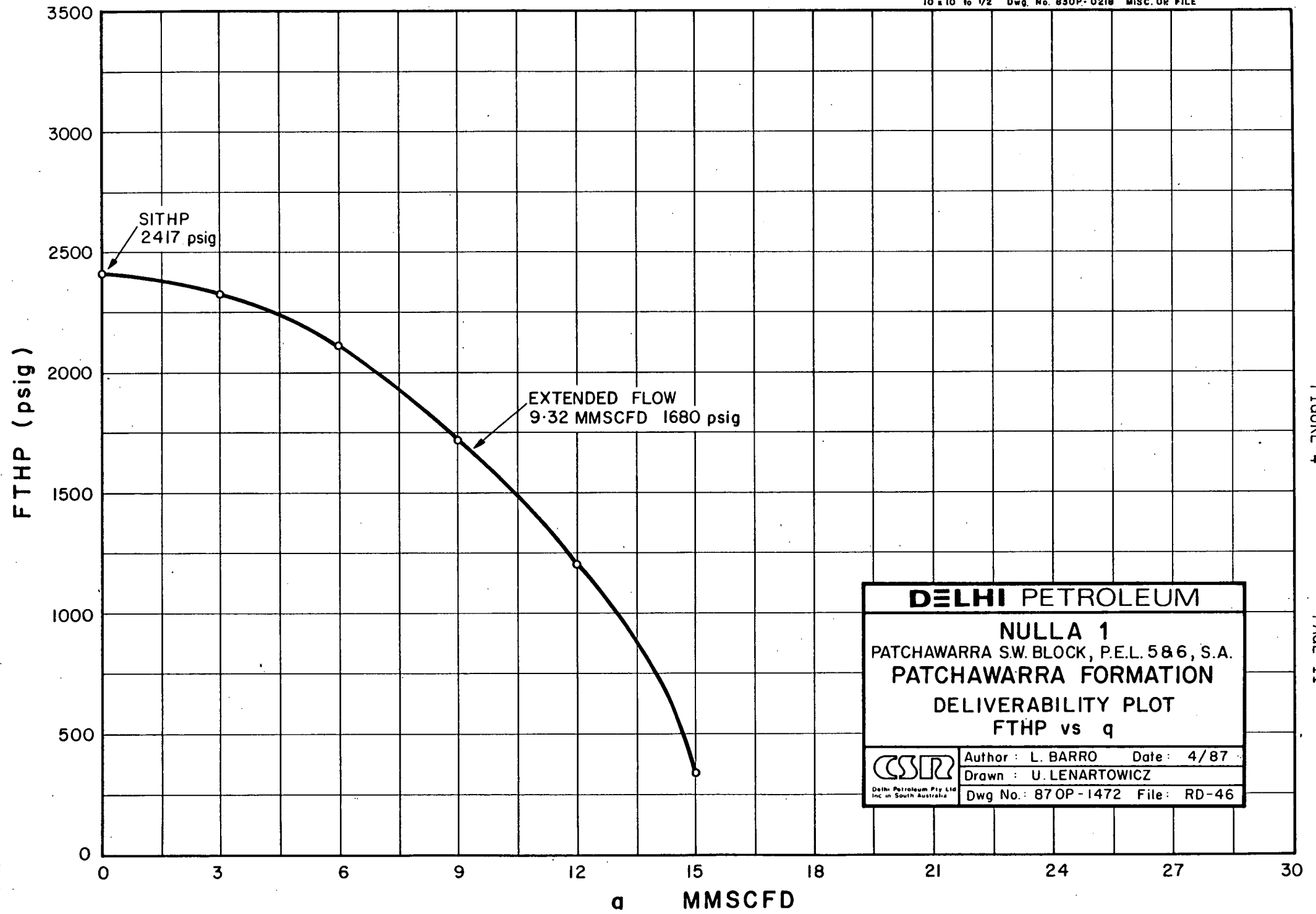


FIGURE 3



DISCUSSION

PVT Properties

A P-T phase envelope was generated from the full well stream (FWS) composition which was calculated by mathematically recombining the separator high pressure oil and gas analyses. Figure 1, results section, summarises the Nulla Patchawarra reservoir PVT properties. Since the reservoir temperature (256°F) is located between the critical point (31°F) and the cricondentherm (307°F), it could be concluded that the Nulla Patchawarra hydrocarbon is a gas condensate (retrograde) reservoir.

However, there is an inconsistency between observed condensate yields (Appendix D, figure 2) and the theoretical maximum condensate yield calculated from the FWS composition (Appendix B, Table 4). The latter value of 40 bbl/mmscf compares to observed condensate yields as high as 79 bbl/mmscf. Clearly the FWS composition is not correct which means that either the separator samples were poorly taken or the recombination oil/gas ratio was incorrect.

It is believed that problems with separator sampling was responsible for the incorrect FWS composition. The separator was run in a 2 phase mode since the water control valve was not functioning. This problem was compounded when the liquid sample was taken from an unsatisfactory position. Instead of sampling from the oil sight glass connection, the sample was taken from the liquid outlet line. The sample was thus contaminated with water. The results of the sampling validity checks performed in the laboratory are shown in Table 1, Appendix B.

Deliverability Predictions

Table 1, results section, summarises the stabilised deliverability equation obtained from the 4 point modified isochronal test (4PMIT). Appendix C contains all data, plots and calculations pertaining to the 4PMIT. The test was analysed using the LIT and pressure squared methods. Figures 2 (A&B) which represent the respective results show the AOF to be in the range 19.5-23.7 mmscfd. Examination of the laminar flow coefficient 'a' and the turbulent flow coefficient 'b', demonstrate that the total reservoir real gas pseudo pressure drop would, at a rate of 9 mmscfd, be 18% due to turbulent effects.

The raw gas deliverability curves, P_{wf} .vs. q and FTHP .vs. q are shown in figures 3 and 4. These plots can be used to predict bottomhole and flowing tubing head pressures for different raw gas rates. For example, at a line pressure of 1200 psig, the estimated gas flowrate is 12 mmscfd.

Reservoir Parameters

Table 2, results section, summarises the reservoir and well parameters. All data, plots and calculations pertaining to the extended flow test are contained in Appendix D. The results of the open-hole DST's are compared to the results determined from the combined Patchawarra (83-1 and 83-6) extended flow buildup. A precise comparison is not possible since open-hole DST #2 (83-1 sand) was a mechanical failure. However a qualitative examination can be made. Bottom-hole pressure data for the two open-hole DST's are shown as figures 7(A&B), Appendix D. The drawdown experienced during the 83-1 test was about 1/3 of the 83-6 drawdown, suggesting that its flowrate was roughly 3 times greater i.e. $3 \times 3.7 = 11$ mmscfd. The separate open-hole rates thus begin to equate to the cased-hole extended flow rates.

The kh determined from the extended flow test is estimated at 639 md-ft. This value is based on a Horner semi-log straight line shown in Figure 6. The line was fitted after checking the P_{wf} .vs. t plot to ensure transient conditions applied (after 1.5 hours). Wellbore storage was less than 0.08 hrs hence early time data can be considered reliable. Data after a Horner time of 8 is considered to represent late time data and is probably being influenced by the two reservoir layering effect (reference 5 and 6). A semi-log straight line of similar slope was fitted to the draw-down plot for the same time interval.

Based on the mapped 33 feet of pay, the estimated average permeability of the two reservoirs is 19.4 md. Mechanical skin of -3.6 was calculated by applying the turbulent flow factor of $3.1 \times 10^{-4} \text{ mscfd}^{-1}$ to the final estimated raw gas flowrate of 9.8 mmscfd. It may be concluded that the Nulla Patchawarra 83-1 and 83-6 reservoirs are undamaged and that turbulent flow effects do not contribute significantly to the overall pressure drop.

The plot of P_{wf} vs. t suggests the well was not produced to pseudo steady state since the plot exhibits curvature for the entire 61.5 hour flow period. However, the radius of investigation (2124 ft) exceeds the 2P OGIP zero contour radius of 1861 ft suggesting that pseudo-steady state conditions should apply.

The well would have to be flowed for a longer duration, until dP_{wf}/dt is constant over a substantial period, before definitive conclusions can be made. If the calculated radius of investigation is correct, the currently mapped 2P OGIP can be considered conservative.

The Horner plot demonstrates that the time required for the reservoir system to return to its initial reservoir pressure of 3650 psig is extraordinarily long. After 964 hours, reservoir pressure was measured at 3578 psig, still 72 psig below initial reservoir pressure. As noted in references 5 and 6, this phenomenon is indicative of a layered reservoir system where there is a significant permeability contrast between layers. This adds weight to the argument that the 83-1 reservoir possesses superior reservoir quality - a kh of about 600 md-ft compared to a kh for the 83-6 reservoir of about 30 md-ft.

CONCLUSIONS

1. Separator oil and gas samples were mathematically recombined to give a full well stream composition which was used to predict the Nulla Patchawarra hydrocarbon P-T phase envelope. Although this plot indicates that the hydrocarbon is a gas condensate (retrograde) fluid, problems associated with separator sampling place all subsequent PVT work in the doubtful category.
2. The stabilized AOF of Nulla #1 Patchawarra reservoir is estimated in the range 19.5 - 23.7 mmscfd.
3. For a gas rate of 9 mmscfd, turbulent flow effects represent 18% of total pressure drop from Nulla #1. The turbulent flow factor is calculated at $3.1 \times 10^{-4} \text{ mscfd}^{-1}$.
4. Bottom-hole flowing pressure behaviour during the extended flow test suggests that the flow regime did not reach pseudo-steady state conditions.
5. The calculated radius of investigation exceeded the proved and probable reservoir boundary radius which indicates that the currently mapped 2P OGIP can be considered conservative.
6. The extended flow/buildup was analysed using a Horner plot and resulted in a kh for the combined Patchawarra 83-1 and 83-6 reservoirs of 639 md-ft. A comparison could not be made to open-hole DST results since a mechanical failure prevented the 83-1 DST from being analysed.
7. The estimated average permeability for the combined reservoirs is 19.4 md. Mechanical skin is estimated at -3.6 which suggests that the Patchawarra reservoirs are not damaged.
8. The time for the reservoir system to return to initial pressure after the extended flow is extraordinarily long. This phenomenon is experienced in layered reservoir systems where there is a significant permeability contrast between layers. Noting this and considering all other test data it may be concluded that the Patchawarra 83-1 sand is a superior quality reservoir.

RECOMMENDATIONS

1. As a result of questionable separator sampling, the Nulla Patchawarra reservoir PVT properties remain undetermined. Future well tests should pay strict attention to the sampling practices recommended by the Operator. Until the issue is resolved, it is recommended that for Nulla, a condensate yield of 40 bbl/mmscf should be used for economic evaluation purposes.
2. The deliverability and reservoir parameter results presented in this report should be used for subsequent preparation of reservoir simulation models. These models can then be used to make gas deliverability predictions from Nulla #1 for gas contract purposes.

NOMENCLATURE

a_t	= Transient laminar flow coefficient ($\text{psi}^2/\text{cp}/\text{mmscfd}$)
a	= Laminar flow coefficient ($\text{psi}^2/\text{cp}/\text{mmscfd}$)
b	= Turbulent flow coefficient ($\text{psi}^2/\text{cp}/\text{mmscfd}^2$)
B_g	= Gas formation volume factor (rb/mscf)
C_s	= Wellbore storage constant (bbl/psi)
C_g	= Gas compressibility (psi^{-1})
C_t	= Total compressibility (psi^{-1})
D	= Turbulent flow factor (mscfd^{-1})
h	= Formation thickness (ft)
k	= Formation permeability (md)
m	= slope of semi-log straight line
$m(P)$	= Real gas pseudo pressure (psi^2/cP)
P	= Reservoir pressure (psi)
P_D	= Dimensionless pressure
P_{wf}	= flowing bottomhole pressure (psi)
P_{ws}	= Shut-in bottomhole pressure (psi)
q	= Production rate (mmscfd or mscfd)
r_w	= Wellbore radius (ft)
r_e	= Reservoir drainage radius (ft)
S_I	= Total skin factor
S	= Mechanical Skin
T	= Reservoir temperature ($^{\circ}\text{R}$)
t	= Flow time (hrs)
t_p	= Horner producing time (hrs)
t_{DA}	= Dimensionless time
Δt	= Shut-in time (hrs)
t_{wbs}	= Time to end of wellbore storage (hrs)
u	= Viscosity (cp)
Z	= Z-factor
$\emptyset$	= Porosity fraction

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APPENDIX AGENERALTABLE 1OPERATIONS SUMMARY

6 January 1987	Move in service-rig and rig up.
7-11 January 1987	Perforate Patchawarra sands, 8314-8340 and 8360-8386 ft KB with 4" casing guns at 4 SPF. Complete well with permanent packer and 2-7/8", 6.5 lb/ft, AB-Modified, J-55 TUBING. Swab well in; clean up flow (estimate), 3.3 MMSCFD, 2250 psig FTHP.
11 January 1987	Release service-rig.
2-3 February 1987	Move in Production test equipment and rig up.
4-6 February 1987	Flow well to clean up.
6-7 February 1987	Well shut-in.
7 February 1987	RIH with ameradas and hang at 8284 ft KB.
7-8 February 1987	Perform 4PMIT.
8 February 1987	POH with ameradas. Change out charts and RIH and hang at 8284 ft KB. Open well at 2000 hrs for extended rate test.
8-11 February 1987	Flow well on extended rate. Final rates, 9.32 MMSCFD, 474 BCPD at FTHP of 1680 psig.
11 February 1987	Shut-in well at 0930 hours.
11-18 February 1987	Monitor bottom-hole pressure buildup.
18 February 1987	POH with ameradas. Temporary rig down (due to severe flooding).
23 March 1987	RIH with ameradas for static pressure gradient.

APPENDIX AGENERALTABLE 2WELL DATA

LOCATION: Latitude : 27° 46' 51.9" S
Longitude : 139° 43' 11.4" E

ELEVATION: Ground Level : 82 ft ASL
Kelly Bushing : 102 ft ASL

CASING SIZE: Surface - 13-3/8", 48 lb/ft, H-40, ST&C to 562'
Intermediate - 9-5/8", 36 lb/ft, J-55 LT&C to 5362'
Production - 7", 23/26 lb/ft, J-55/N-80, LT&C to 8912'

TUBING SIZE: 2-7/8" AB modified J-55, 6.5 lb/ft to 8148 ft KB

MINIMUM I.D.: 2.205"

P.B.T.D.: 8877 ft KB

APPENDIX AGENERALTABLE 3LOG ANALYSIS

<u>PATCHAWARRA</u> <u>SAND</u>	<u>INTERVAL</u> <u>ft KB</u>	<u>AV ϕ (%)</u>	<u>AV Sg (%)</u>	<u>NET PAY (FT)</u>
83-1	8315-8334	12.8	55.0	19
83-6	8369-8384	10.8	40.0	14
		—	—	—
Total System		12.0	48.6	33

APPENDIX AGENERALTABLE 4PRODUCTION DATA

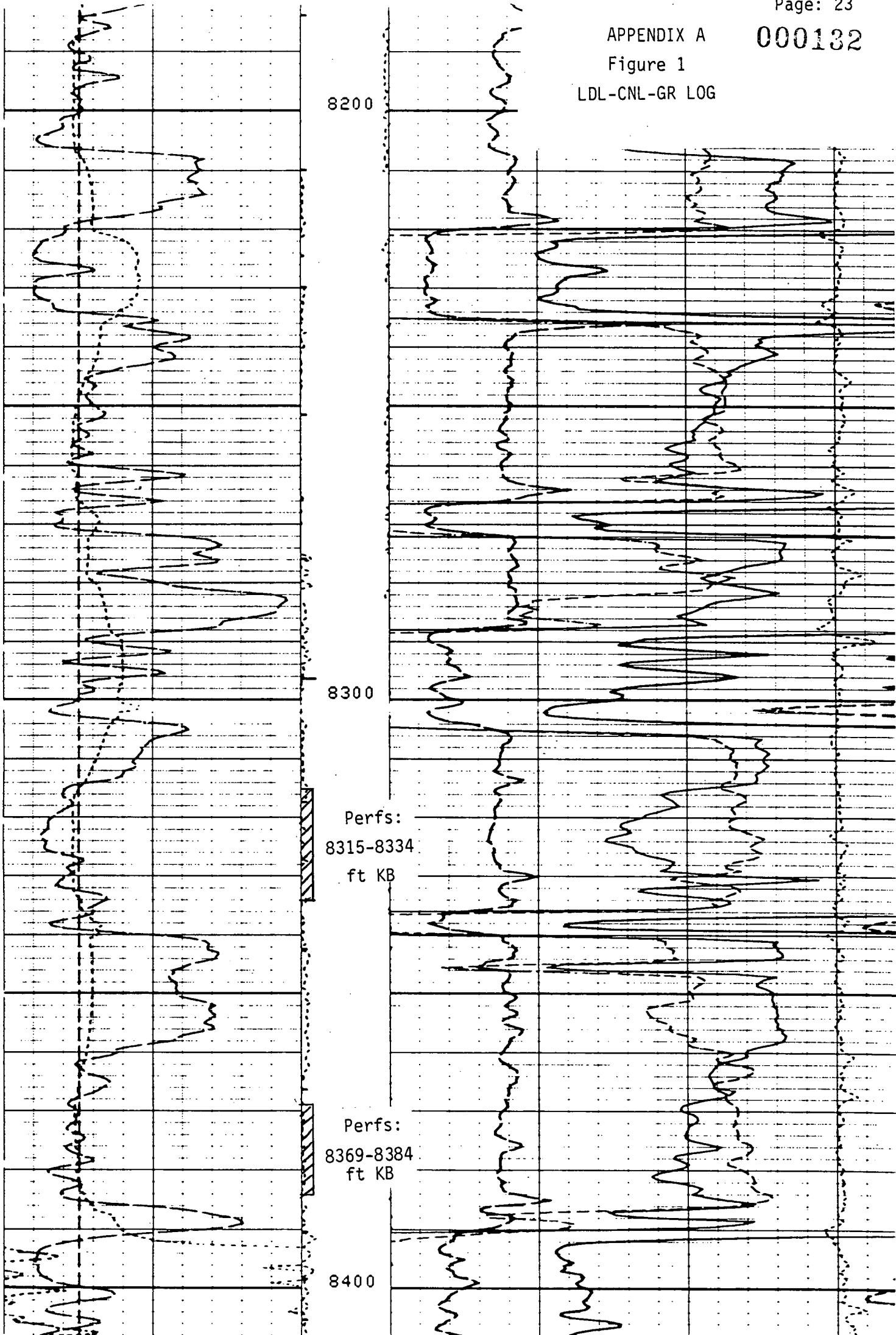
PERIOD	DURATION (hrs)	PERIOD PRODUCTION		
		GAS MMSCF	CONDENSATE BBL	WATER BBL
Cleanup Flow	36	10.79	421.21	22.88
4 PMIT	16	4.57	252.98	10.17
Extended Flow	61.5	24.91	1199.63	57.63
TOTALS:		40.27	1873.82	90.68

APPENDIX A

000132

Figure 1

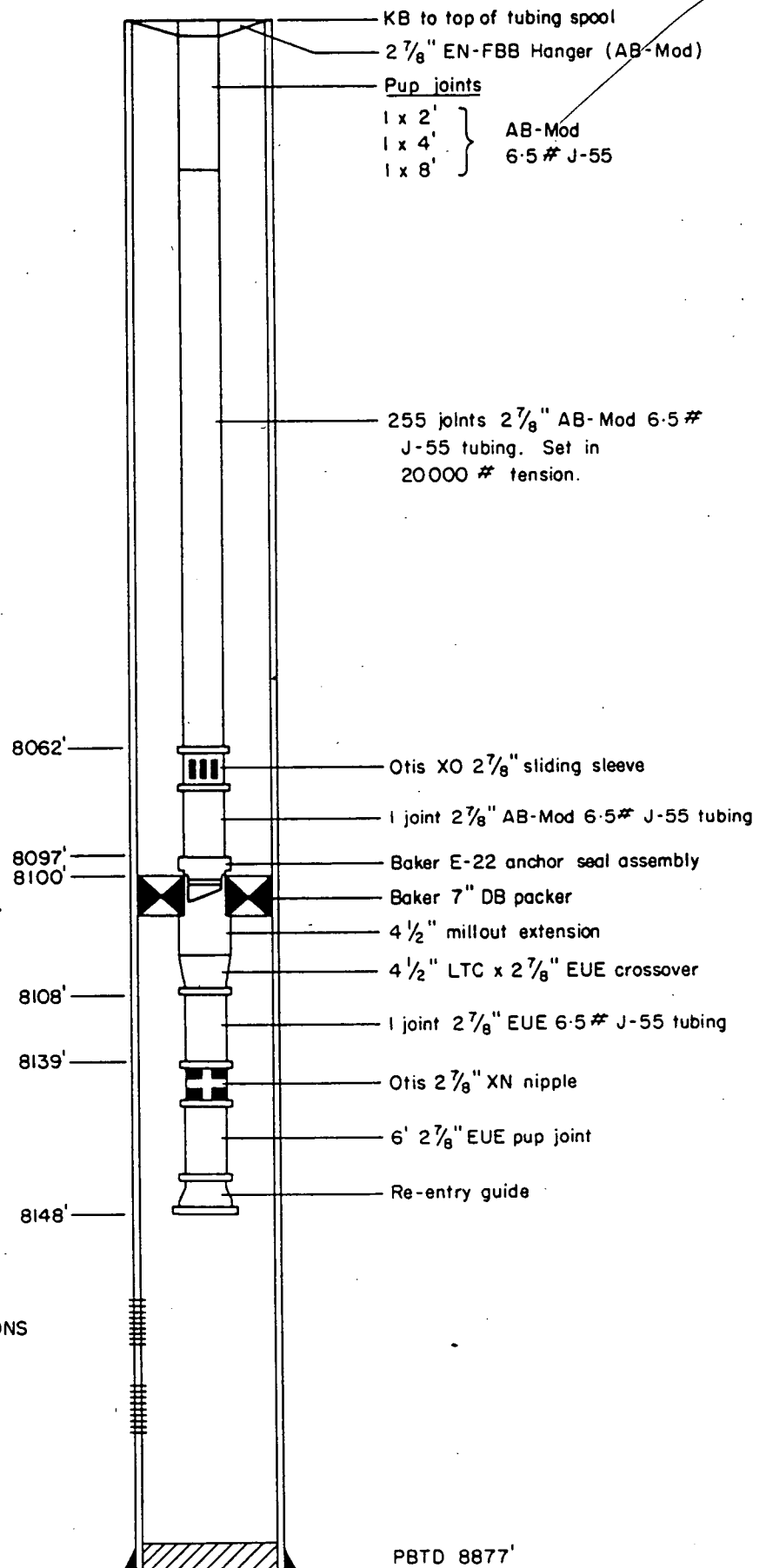
LDL-CNL-GR LOG



WELL : NULLA 1

FIGURE 2

APPENDIX A



PATCHAWARRA PERFORATIONS

8314' - 8340'

8360' - 8386'

PBTD 8877'

NOTE : All depths in ft KB.

NOT TO SCALE

Designed. S. HICKING

Drawn. E.H. COPPINS

Date. FEBRUARY 1987

Dwg No. 870P-1458

File No. RD - 46



DELHI PETROLEUM PTY LTD
STANDARD SINGLE ZONE COMPLETION
DOWNHOLE PRODUCTION EQUIPMENT

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES

TABLE 1

LIQUID SAMPLES VALIDITY CHECKS

BOTTLE NO.	1116/77	9214/290	1116/403
Mercury removed cc	79	88	51
Water removed cc	0	109	72
Opening Pressure psig	187	104	385
Opening Temp. °C	23.5	23.3	23.1
Approx. Vol at 2000 psig	199	60	435
Bubble Point psig	542		551
Separator Pressure psig	495		530

Sample contained in bottle No. 1116/403 was analysed.

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES

TABLE 2

SEPARATOR AND STOCK TANK ANALYSES

COMPONENT	SEPARATOR GAS % MOLE	STOCK TANK LIQUID % MOLE	LIBERATED GAS % MOLE	SEPARATOR LIQUID % MOLE	FWS % MOLE
N ₂	0.94	0.00	0.00	0.00	0.89
CO ₂	21.40	0.00	14.59	5.95	20.64
C ₁	58.25	0.00	22.16	9.04	55.83
C ₂	11.95	0.00	17.85	7.28	11.72
C ₃	4.85	1.87	18.89	8.81	5.04
IC ₄	0.88	1.57	6.35	3.52	1.01
NC ₄	0.98	4.18	8.84	6.08	1.23
IC ₅	0.28	4.82	3.99	4.48	0.49
NC ₅	0.23	6.06	3.49	5.01	0.46
C ₆	0.14	13.35	2.46	8.91	0.57
C ₇	0.07	16.97	0.96	10.45	0.58
C ₈	0.04	24.55	0.40	14.71	0.76
C ₉		10.51	0.02	6.23	0.31
C ₁₀		6.46		3.82	0.19
C ₁₁		3.32		1.97	0.10
C ₁₂		1.91		1.13	0.06
C ₁₃		1.40		0.83	0.04
C ₁₄		0.90		0.53	0.03
C ₁₅		0.61		0.36	0.02
C ₁₆		0.41		0.24	0.01
C ₁₇		0.30		0.18	0.01
C ₁₈		0.25		0.15	0.01
C ₁₉		0.14		0.08	0.00
C ₂₀		0.08		0.05	0.00

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES

TABLE 2 CONTINUED

SEPARATOR AND STOCK TANK ANALYSES

COMPONENT	SEPARATOR GAS % MOLE	STOCK TANK LIQUID % MOLE	LIBERATED GAS % MOLE	SEPARATOR LIQUID % MOLE	FWS % MOLE
C ₂₁		0.10		0.06	0.00
C ₂₂		0.07		0.04	0.00
C ₂₃		0.04		0.02	0.00
C ₂₄		0.05		0.03	0.00
C ₂₅		0.04		0.02	0.00
C ₂₆ ⁺		0.04		0.02	
	100.00	100.00	100.00	100.00	100.00
Mol Wt	26.44	109.33	41.47		29.26
Gravity (AIR=1)	0.912		1.431		
Gravity (Water=1)		0.743			
Mol Wt c ₂₀ ⁺		288		288	

Flash GOR = 608 SCF/BBL at 23°C

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES

TABLE 3

FULL WELL STREAM ANALYSIS

Recombined reservoir fluid composition calculated from high pressure oil and gas samples as follows:-

<u>COMPONENT</u>	<u>MOLE %</u>
N ₂	0.89
CO ₂	20.64
C ₁	55.83
C ₂	11.72
C ₃	5.04
1C ₄	1.01
NC ₄	1.23
1C ₅	0.49
NC ₅	0.46
C ₆	0.57
C ₇	0.58
C ₈	0.76
C ₉	0.31
C ₁₀	0.19
C ₁₁	0.10
C ₁₂	0.06
C ₁₃	0.04
C ₁₄	0.03
C ₁₅	0.02
C ₁₆	0.01
C ₁₇	0.01
C ₁₈	0.01
	100.00

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES

TABLE 4

CONDENSATE YIELDS

COMPONENT	MOLE %	LIQUID GAS RATIO bbl/mm scf
N ₂	0.89	0.0
CO ₂	20.64	0.0
C ₁	55.83	0.0
C ₂	11.72	55.61
C ₃	5.04	31.18
IC ₄	1.01	7.82
NC ₄	1.23	9.17
IC ₅	0.49	4.24
NC ₅	0.46	3.94
C ₆	0.57	5.55
C ₇	0.58	6.33
C ₈ ⁺	1.54	20.52
TOTAL	100.00	144.37

NOTE: (i) Volume of C₃/C₄ in stock tank liquid is calculated at 4.8% of total stock tank liquid hence assume condensate is C₅⁺.

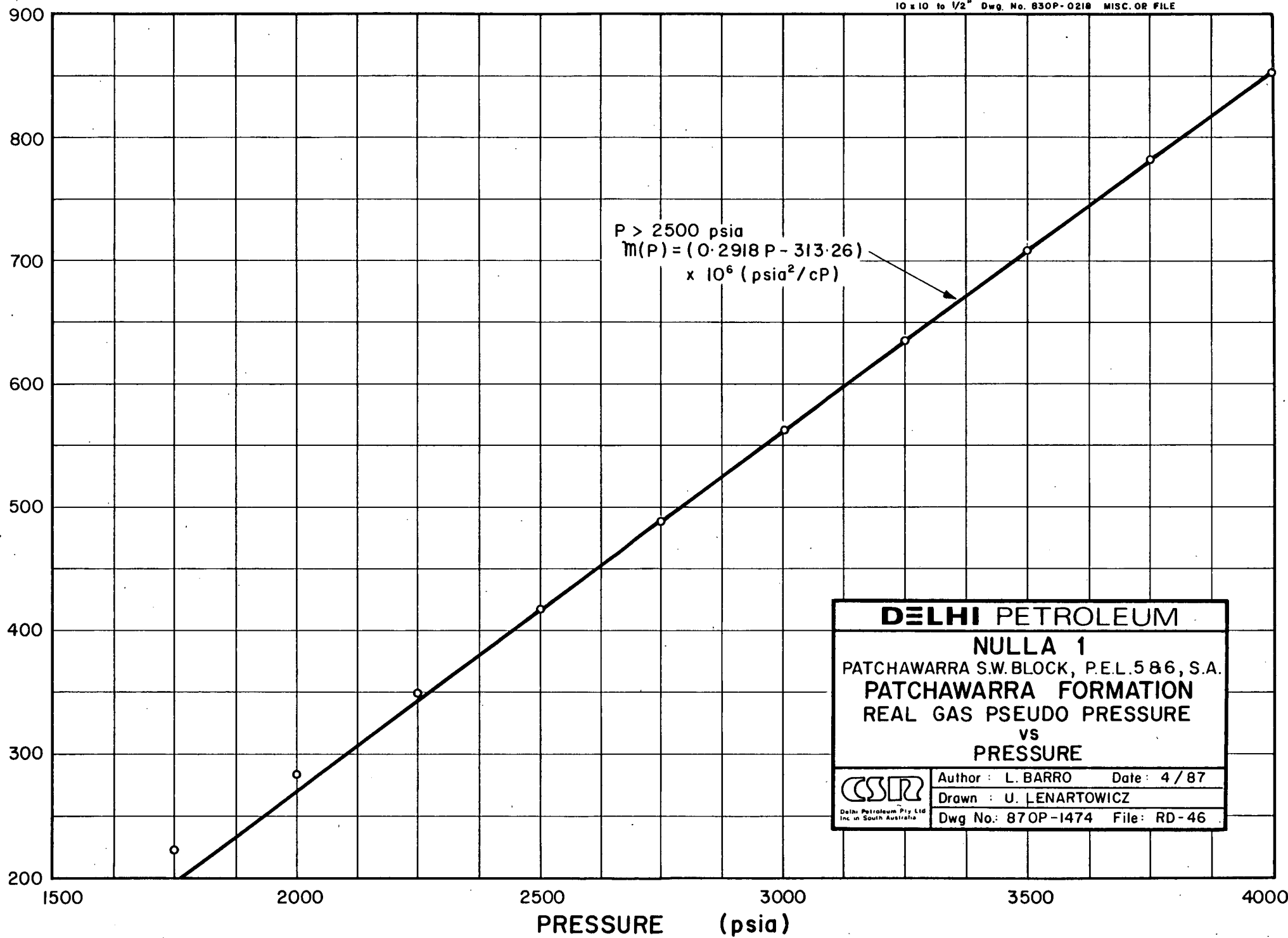
(ii) Condensate yield (C₅⁺) = 40.58 bbl/mm scf

(iii) Source of liquid/gas ratio is Dehi GASANAL program.

APPENDIX B
FULL WELL STREAM COMPOSITION AND REAL GAS PSEUDO PRESSURE
TABLE 5
REAL GAS PSEUDO PRESSURES

P (psia)	u (cP)	Z	$[2P/uZ]$ (psia/cP)	$[\overline{2P/uZ}]$ (psia ² /cP)	ΔP psi	$[2P/\overline{uZ}] \times \Delta P$ (psia ² /cP) x 10 ⁻⁶	$m(P) = \sum \frac{2P}{\overline{uZ}} \times \Delta P$ (psia ² /cP) x 10 ⁻⁶
250	0.0132	0.9739	38894	19447	250	4.862	4.862
500	0.0136	0.9488	77497	58196	250	14.549	19.411
750	0.0141	0.9252	114984	96240	250	24.060	43.471
1000	0.0147	0.9035	150586	132785	250	33.196	76.667
1250	0.0155	0.8843	182393	166490	250	41.622	118.289
1500	0.0164	0.8680	210745	196569	250	49.142	167.431
1750	0.0174	0.8551	235235	222990	250	55.747	223.178
2000	0.0186	0.8460	254201	244718	250	61.179	284.357
2250	0.0199	0.8407	268979	261590	250	65.398	349.755
2500	0.0213	0.8391	279754	274366	250	68.592	418.347
2750	0.0228	0.8410	286835	283294	250	70.824	489.171
3000	0.0243	0.8460	291860	289348	250	72.337	561.508
3250	0.0260	0.8538	292809	292334	250	73.084	634.592
3500	0.0276	0.8638	293613	293211	250	73.303	707.895
3750	0.0293	0.8759	292240	292926	259	73.223	781.127
4000	0.0310	0.8897	290058	291149	250	72.787	853.914

A plot of $m(P)$.vs. P is a straight line for $P > 2500$ psia
i.e. $m(P) = (0.2918 - 313.26) \times 10^6$ (psia²/cP)

REAL GAS PSEUDO PRESSURE
 $\text{psia}^2/\text{cP} \times 10^{-6}$ **DELHI PETROLEUM****NULLA 1**

PATCHAWARRA S.W. BLOCK, P.E.L. 5 & 6, S.A.

PATCHAWARRA FORMATION**REAL GAS PSEUDO PRESSURE**

VS

PRESSUREDelhi Petroleum Pty Ltd
Inc in South Australia

Author : L. BARRO Date : 4 / 87

Drawn : U. LENARTOWICZ

Dwg No: 870P-1474 File: RD-46

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES
CALCULATION NO. 1

RECOMBINATION ANALYSIS

- (i) Material balance around separator is given by:

$$z_i = \frac{L_m}{L_m + G_m} x_i + \frac{G_m}{L_m + G_m} y_i$$

where: z_i = FWS mole fraction (i.e. feed to separator)
 x_i = mole fraction, separator liquid
 y_i = mole fraction, separator gas
 L_m = moles of separator HP liquid
 G_m = moles of separator HP gas

- (ii) x_i and y_i are measured in laboratory.

- (iii) G_m is measured via separator

i.e. $G_m = G$ (G = SCFD)
 $379 \quad (379 \text{ ft}^3 = 1 \text{ lb mole})$

- (iv) L_m is $L \times C \times 5.615$ (L = STBPD)

$$C = \frac{\text{moles HP oil}}{\text{ft}^3 \text{ stock tank oil}}$$

$$1 \text{ bbl} = 5.615 \text{ ft}^3$$

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES
CALCULATION NO. 1

RECOMBINATION ANALYSIS

Measured GOR of HP liquid sample = 608 SCF/bbl at 23°C

i.e. 608 ft³ flash gas + 1 bbl liquid

$$\begin{aligned}\text{Flash Gas} &= \frac{608}{379} \times \frac{520}{533} \quad (1 \text{ lb mole gas} = 379 \text{ ft}^3 \\ &\quad \text{at standard conditions}). \\ &= 1.644 \text{ lb moles}\end{aligned}$$

$$\begin{aligned}\text{Liquid} &= \frac{1 \times 5.615 \times 0.743 \times 62.4}{109.3} \quad (\text{Oil API} = 58.9) \\ &\quad (\text{MWT} = 109.3) \\ &= 2.382 \text{ lb moles}\end{aligned}$$

hence to calculate high pressure liquid composition leaving separator use:

$$\begin{aligned}z_i &= \frac{2.382 x_i}{1.644 + 2.382} + \frac{1.644 y_i}{1.644 + 2.382} \\ &= 0.592 x_i + 0.408 y_i\end{aligned}$$

$$\begin{aligned}\text{Total HP liquid} &= 1.644 + 2.382 \text{ lb moles} \\ &= 4.026 \text{ lb moles}\end{aligned}$$

i.e. 4.026 lb moles HP liquid yields 5.615 ft³ of liquid

$$\begin{aligned}\text{i.e. } L_m &= \frac{330.53 \times 4.026 \times 5.615}{5.615} \\ &= 1330.71 \text{ lb moles}\end{aligned}$$

$$\begin{aligned}G_m &= \frac{9790 \times 10^3}{379} \text{ lb moles} \\ &= 25,831.13 \text{ lb moles}\end{aligned}$$

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES
CALCULATION NO. 1 (Contd.)

RECOMBINATION ANALYSIS

hence to calculate full well stream composition entering separator:

$$z_i = \frac{1330.71}{1330.71 + 25,831.13} x_i + \frac{25,831.13}{1330.71 + 25,831.13} y_i$$

$$= 0.049 x_i + 0.951 y_i$$

$$\begin{aligned} \text{Total moles in full well stream} &= L_m + G_m \\ &= 1330.71 + 25,831.13 \\ &= 27,161.8 \text{ (lb moles/day)} \end{aligned}$$

To calculate volumetric rate at standard conditions use:

$$\begin{aligned} PV &= zNRT \\ \text{i.e. } V &= \frac{(1) (27161.8) (10.73) (520)}{14.7} \\ &= 10.31 \text{ MMSCFD} \end{aligned}$$

i.e. 10.31 SCFD of raw gas produces 9.79 MMSCFD dry gas

$$\text{i.e. (raw gas rate)}_{SC} = \frac{10.31}{9.79} (\text{dry gas})_{SC}$$

$$\text{or } q_{SC} = 1.0531 q_{dry}$$

Hence all dry gas rates measured from the separator will be multiplied by 1.0531 to give the q_{SC} for use in deliverability and drawdown/buildup analysis.

APPENDIX B
RECOMBINATION ANALYSIS AND REAL GAS PSEUDO PRESSURES
CALCULATION NO. 2

RESERVOIR FLUID PVT PROPERTIES

Using the HP-41C Petroleum Fluids Pac, "Gas Properties from Composition" program, the following parameters were determined by inputting the FWS composition:

$$G = 1.002$$

$$T_c^* = 437.11$$

$$P_c^* = 707.66$$

Values of u , C_g , B_g , z are calculated at the average bottom flowing pressure observed during the extended flow period:

$$\begin{aligned} \text{i.e. } P_{av} &= \frac{P_R + P_{wf}}{2} \\ &= \frac{3650 + 2858}{2} \\ &= 3254 \text{ psig} \end{aligned}$$

at this pressure and reservoir temperature, $T = 256^\circ\text{F}$, the following values for the above parameters are calculated using the different HP Petroleum Pac programs:

$$\begin{aligned} \text{i.e. } u &= 0.0260 \text{ (cP)} \\ B_g &= 0.9461 \text{ (RB/MSCF)} \\ Z &= 0.8539 \\ C_q &= 265 \times 10^{-6} \text{ (psi}^{-1}\text{)} \\ C_t &= S_g C_g \\ &= (0.486)(265 \times 10^{-6}) \\ &= 129 \times 10^{-6} \text{ (psi}^{-1}\text{)} \end{aligned}$$

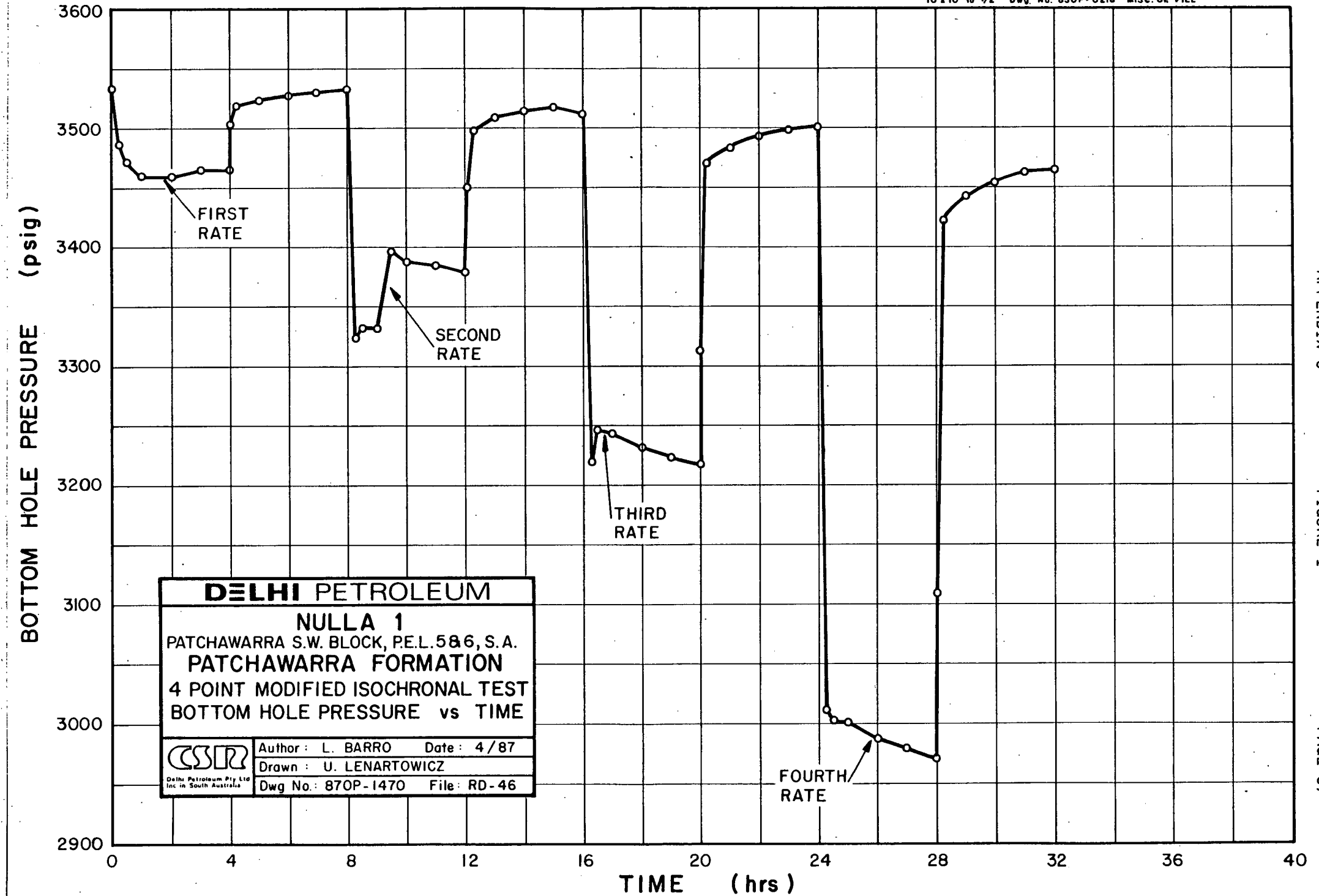
APPENDIX C
4 POINT MODIFIED ISOCHRONAL TEST

TABLE 1

TEST DATA

SEQUENCE	TIME (hrs)	BOTTOM-HOLE PRESSURE (psig)	q (MMSCFD)
Initial Shut-in	32.5	3534	
Flow 1	4	3465	2.69
Shut-in	4	3532	
Flow 2	4	3380	4.81
Shut-in	4	3516	
Flow 3	4	3219	7.61
Shut-in	4	3498	
Flow 4	4	2970	12.40
Extended Flow	61.5	2858	9.32
Initial Reservoir Pressure*		3650	

*Static gradient, 2 February 1987.



APPENDIX C
4 POINT MODIFIED ISOCHRONICAL TEST
CALCULATION # 1
LIT ANALYSIS

	TIME (HRS)	BOTTOM HOLE PRESSURE (psig)	$m(P)$ $psia^2/cP \times 10^{-6}$	$\Delta m(\Delta P)$ $psi^2/cP \times 10^6$	q MMSCFD	$m(\Delta P)/q$ $psi^2/cP/MMSCFD$ $\times 10^{-6}$	q^2 MMSCFD ²	$m(\Delta P) - bq^2$ $psi^2/cP \times 10^{-6}$
Initial Shut-In	32.5	3534	722.3					
Flow 1	4	3465	702.1	20.2	2.69	7.51	7.24	16.58
Shut-In	4	3532	721.7					
Flow 2	4	3380	677.3	44.4	4.81	9.23	23.14	32.83
Shut-In	4	3516	717.0					
Flow 3	4	3219	630.3	86.7	7.61	11.39	57.91	57.75
Shut-In	4	3498	711.7					
Flow 4	4	2970	557.7	154.0	12.40	12.42	153.76	77.12
Total				305.30	27.51	40.55	242.05	
Extended Flow	61.5	2858	525.0	231.1	9.32			187.67
Initial Reservoir Pressure*		3650	756.1					

* Static Gradient Survey, 2 February 1987

APPENDIX C
4 POINT MODIFIED ISOCHRONAL TEST
CALCULATION #1
LIT ANALYSIS (CONT)

Transient Flow:

$$a_t = \frac{\sum \frac{\Delta_m (\Delta P)}{q} \sum q^2 - \sum q \sum m(\Delta P)}{N \sum q^2 - \sum q \sum q}$$

$$= \frac{(40.55) (242.05) - (27.51) (305.30)}{(4) (242.05) - (27.51)^2}$$

$$= \frac{9815.13 - 8398.8}{968.20 - 756.80}$$

$$a_t = 6.70 \text{ (psi}^2\text{/cp/mmscfd)}$$

$$b = \frac{N \sum \Delta_m (\Delta P) - \sum q \sum \frac{\Delta_m (\Delta P)}{q}}{N \sum q^2 - \sum q \sum q}$$

$$= \frac{(4) (305.30) - (27.51) (40.55)}{968.20 - 756.80}$$

$$= \frac{1221.20 - 1115.53}{968.20 - 756.80}$$

$$b = 0.50 \text{ (psi}^2\text{/cp/mmscfd}^2\text{)}$$

Extended Flow:

$$\Delta_m (\Delta P) = 231.1, q = 9.32, b = 0.50$$

APPENDIX C
4 POINT MODIFIED ISOCHRONAL TEST
CALCULATION #1
LIT ANALYSIS (CONT)

$$a = \frac{\Delta m(\Delta P) - bq^2}{q}$$

$$= \frac{231.1 - (0.5)(9.32)^2}{9.32}$$

i.e. $a = 20.14 \text{ (psi}^2/\text{cP/MMSCFD)}$

Stabilised Flow:

$$m(P_R) - m(P_{wf}) = aq + bq^2$$

ie $756 - m(P_{wf}) = 20.14 q + 0.50 q^2$

$$\text{Deliverability } q = \frac{1}{2b} \left[-a + \sqrt{a^2 + 4b [m(P_R) - m(P_{wf})]} \right]$$

for $m(P_{wf}) = 0$, $q = \text{AOF} = \frac{1}{(2)(0.50)} \left[-20.14 + \sqrt{20.14^2 + (4)(0.50)(756)} \right]$

ie $\text{AOF} = 23.65 \text{ (MMSCFD)}$

$$b = \frac{1422 \text{ TD}}{kh}$$

i.e. $D = \frac{(0.50)(639)}{(1422)(716)} \quad (kh = 639 \text{ md-ft, see Appendix D, Calculation \#1})$

$$= 3.14 \times 10^{-4} \text{ (mscfd}^{-1}\text{)}$$

APPENDIX C
4 POINT MODIFIED ISOCHRONAL TEST
CALCULATION #1 (Contd)
LIT ANALYSIS

The following table can be constructed, in order to make a plot of P_{wf} .VS. q and FTHP .vs. q :

q (mmscfd)	$m(P_{wf})$ $\text{psia}^2/\text{cP} \times 10^{-6}$	P_{wf} (psig)	FTHP* (psig)
0	756.0	3650	2417 (SITHP)
3	691.1	3427	2329
6	617.2	3174	2116
9	534.2	2890	1721
12	442.3	2575	1202
15	341.4	2205	338
18	231.5	1766	
21	112.6	1205	
23.7	0	0	

* Predicted by Eclipse reservoir simulator VFP program.

Note that at the stabilised flowrate of 9.32 mmscfd, FTHP was 1680 psig, P_{wf} was 2858 psig; the calculated P_{wf} is 2866 psig (i.e. the total head was over estimated by 8 psi) hence the above FTHP values were correspondingly increased by 8 psi. The resulting curve is shown as Figure 4, results section.

APPENDIX C
4 POINT MODIFIED ISOCHRONAL TEST
CALCULATION #2
PRESSURE SQUARED ANALYSIS

	Time (Hrs)	Bottom-Hole Pressure, P (psig)	p^2 (psig) ² x10 ⁻⁶	Δp^2 psi ² x10 ⁻⁶	q (mmscfd)
Initial Shut-in	32.5	3534	12.489		
Flow 1	4	3465	12.006	0.483	2.69
Shut-in	4	3532	12.475		
Flow 2	4	3380	11.424	1.051	4.81
Shut-in	4	3516	12.362		
Flow 3	4	3219	10.362	2.000	7.61
Shut-in	4	3498	12.236		
Flow 4	4	2970	8.821	3.415	12.40
Extended Flow	61.5	2858	8.168	5.155	9.32
Initial Reservoir Pressure*		3650	13.323		

* Static gradient survey, 2 February 1987

APPENDIX D
EXTENDED FLOW TEST

TABLE 1
DRAWDOWN DATA

t (hr)	P _{wf} (psig)	m(P _{wf}) (psia ² /cP×10 ⁻⁶)
0.0	3488	708.8
0.083	3096	594.4
0.167	3065	585.4
0.25	3103	596.5
0.33	3114	599.7
0.5	3111	598.8
0.75	3109	598.2
1.0	3103	596.5
1.5	3121	601.7
2	3119	601.2
3	3111	598.8
4	3103	596.5
5	3096	594.4
6	3091	593.0
10	3070	586.9
14	3050	581.0
18	3032	575.8
22	3014	570.5
26	2996	565.3
30	2978	560.0
34	2965	556.2
38	2947	551.0
42	2932	546.6
46	2916	541.9
50	2901	537.5
54	2886	533.2
58	2870	528.5
61.5	2858	525.0

APPENDIX D
EXTENDED FLOW TEST
TABLE 2
PRESSURE BUILDUP DATA

Δt (hr)	$\frac{t_p + \Delta t}{\Delta t}$	P_{ws} (psig)	$m(P_{ws})$ $\text{psia}^2/\text{cPx}10^{-6}$	$\Delta m(\Delta P_{ws})$ $\text{psi}^2/\text{cPx}10^{-6}$
0.00	-	2865	527.0	0
0.083	1254	3135	605.8	78.8
0.167	624	3154	611.4	84.4
0.25	417	3156	612.0	85.0
0.33	316	3161	613.4	86.4
0.42	249	3164	614.3	87.3
0.5	209	3167	615.2	88.2
0.75	140	3172	616.6	89.6
1.00	105	3177	618.1	91.1
1.5	70.0	3182	619.5	92.5
2	52.0	3190	621.9	94.9
2.5	42.6	3193	622.7	95.7
3	35.7	3198	624.2	97.2
4	27.0	3206	626.5	99.5
5	21.8	3211	628.0	101.0
6	18.3	3213	628.6	101.6
10	11.4	3229	633.3	106.3
14	8.43	3239	636.2	109.2
18	6.78	3253	640.3	113.3
22	5.73	3260	642.3	115.3
26	5.00	3268	644.6	117.6
27.5	4.78	3276	647.0	120.0 gauges changed
32	4.25	3297	653.1	126.1
38	3.74	3312	657.5	130.5
42	3.48	3320	659.8	132.8
50	3.08	3333	663.6	136.6
62	2.68	3349	668.3	141.3
74	2.41	3364	672.6	145.6
86	2.21	3380	677.3	150.3
102	2.02	3393	681.1	154.1
134	1.78	3427	691.0	164.0
158	1.66	3437	693.9	166.9
174	1.60	3445	696.3	169.3
964	1.11	3578	735.1	208.1

$$t_p = \frac{\text{Cumulative Production}}{\text{Final Rate}} = \frac{40270 \times 24}{9320} = 104 \text{ hours}$$

Note: P_{ws} taken from amerada gauge 59451

TABLE 3

Water Analysis Report

Job No. 3754/87

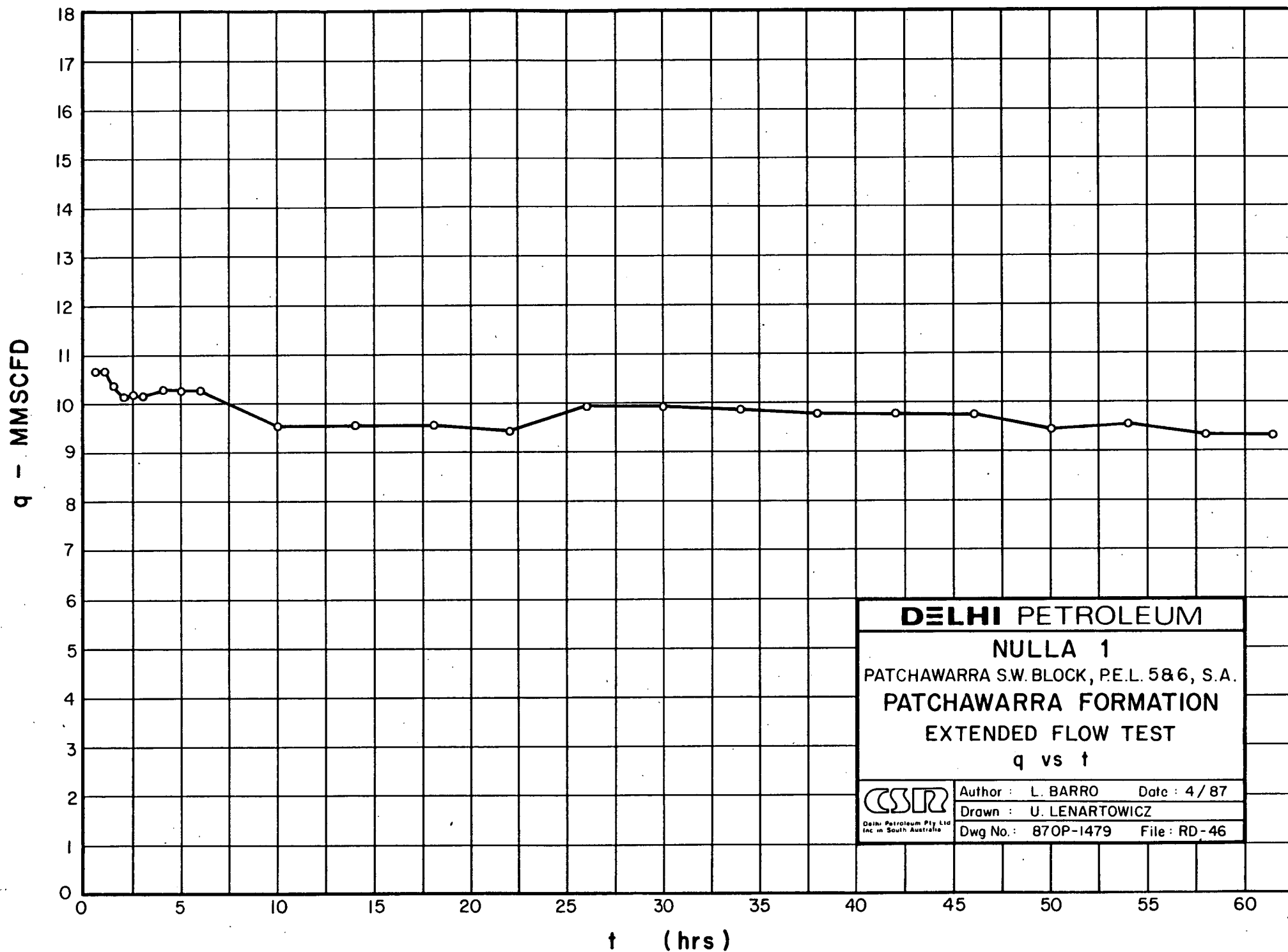
Method W2/1 Page W4

Sample ID. NULLA 1

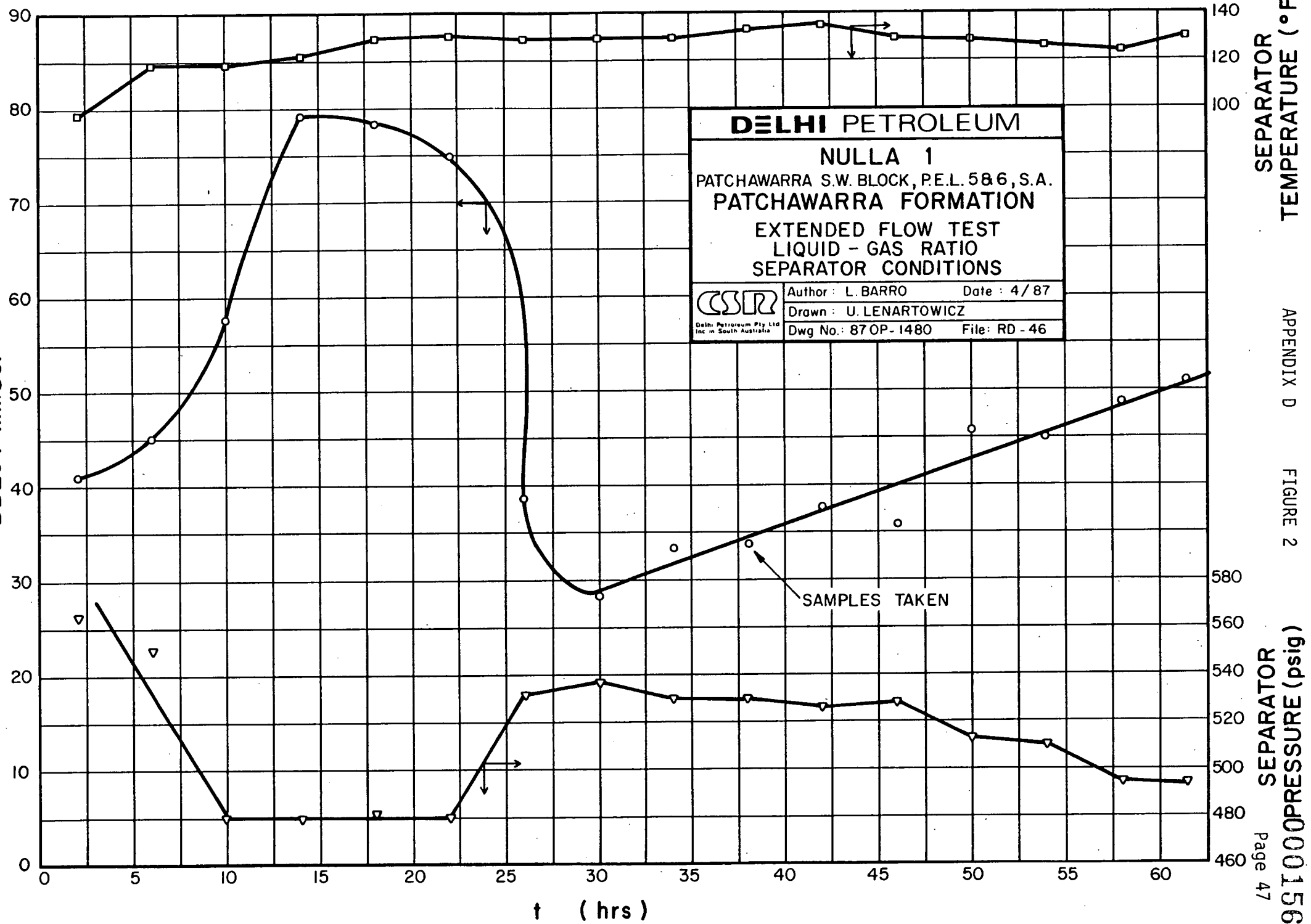
Chemical Composition				Derived Data	
		mg/L	me/L		mg/L
Cations				Total Dissolved Solids	
Calcium	(Ca)	28.0	1.397	A. Based on E.C.	7252
Magnesium	(Mg)	20.0	1.646	B. Calculated (HCO ₃ =CO ₃)	7747
Sodium	(Na)	2510.0	109.178		
Potassium	(K)	560.0	14.322		
Anions				Total Hardness	152
Hydroxide	(OH)			Carbonate Hardness	152
Carbonate	(CO ₃)			Non-Carbonate Hardness	
Bi-Carbonate	(HCO ₃)	498.4	8.170	Total Alkalinity	409
Sulphate	(SO ₄)	920.0	19.155	(Each as CaCO ₃)	
Chloride	(Cl)	3460	97.465	Totals and Balance	
Nitrate	(NO ₃)	<0.1			
Other Analyses				Cations (me/L)	126.5 Diff= 1.75
				Anions (me/L)	124.8 Sum = 251.33
				Diff*100/Sum = 0.70%	
				Sodium / Total Cation Ratio	86.3%
				Remarks	
				SAMPLE PT; STOCKTANK; taken at end of extended flow period on 11/2/87.	
Reaction - pH				6.5	
Conductivity (E.C)				13000	
(micro -S/cm at 25°C)					
Resistivity Ohm.M at 25°C				0.769	
Resistivity Ohm.M at 75°C				0.357	
Resistivity Ohm.M at 95°C				0.299	
				Note: mg/L = Milligrams per litre; me/L = MilliEqvs.per litre	

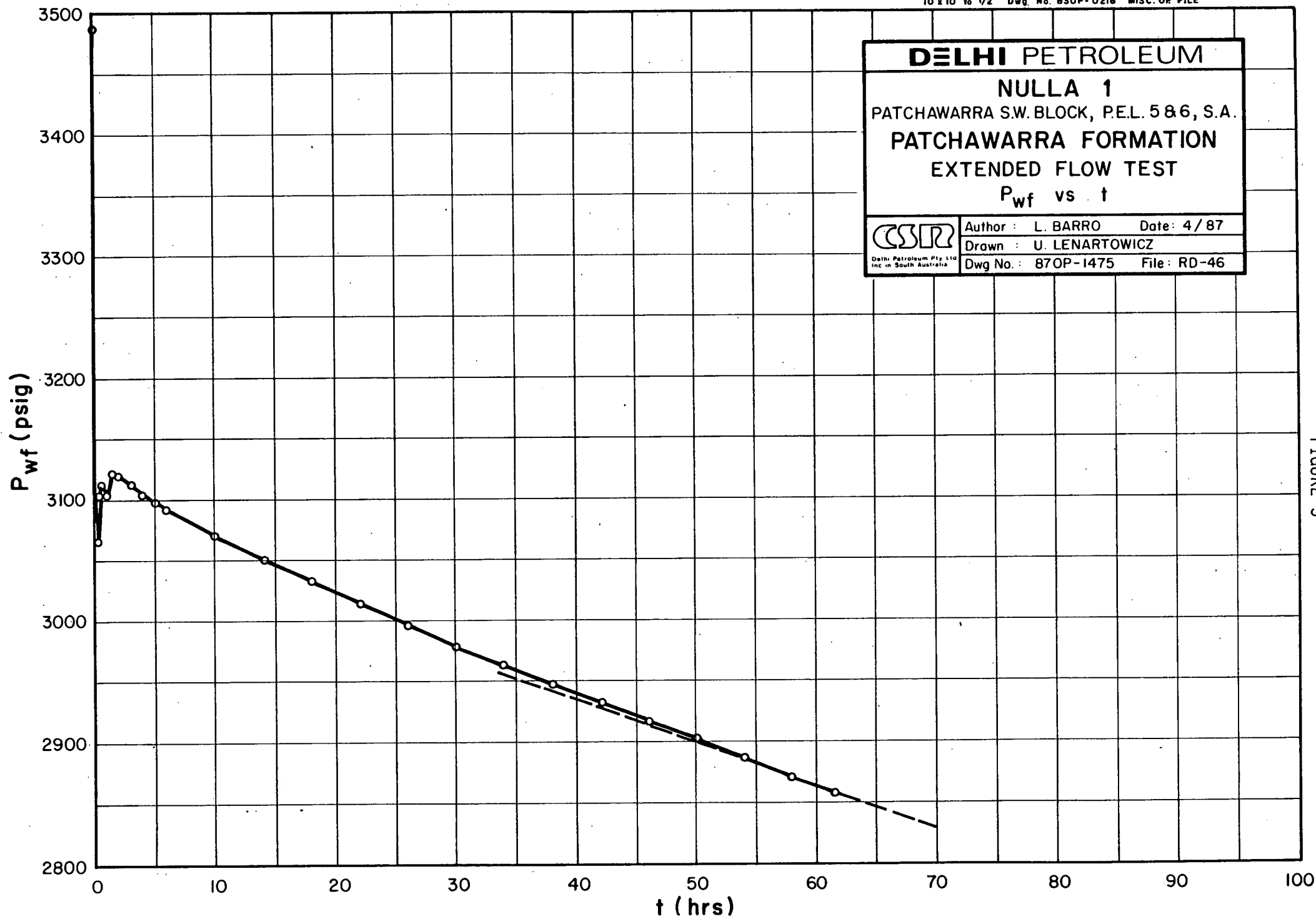
Name: P.ARCHER
Address: DELHI PETROLEUM LTD
G.P.O. BOX 2364
ADELAIDE 5001

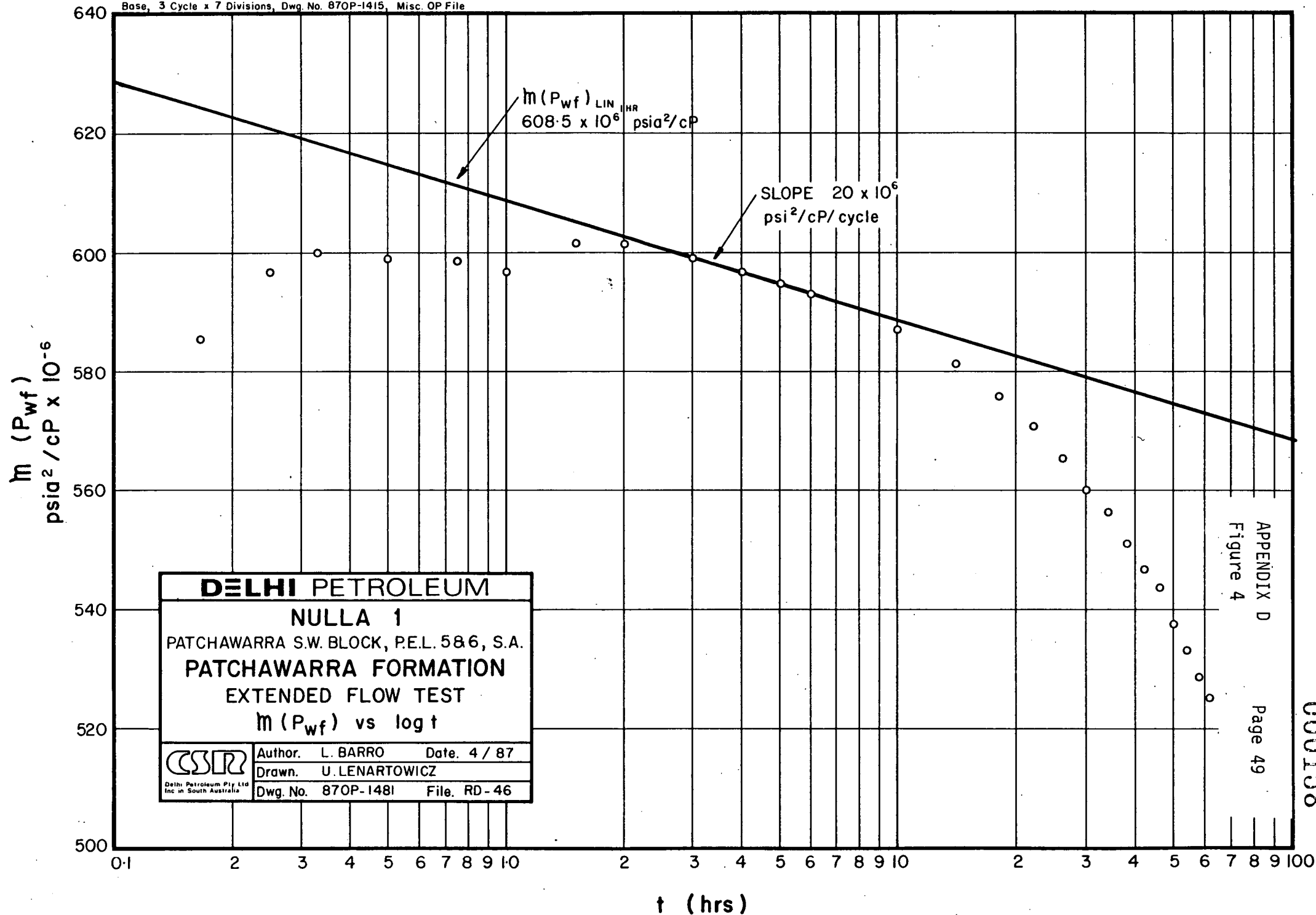
Date Collected 11-2-87
Date Received 7-5-87
Collected by

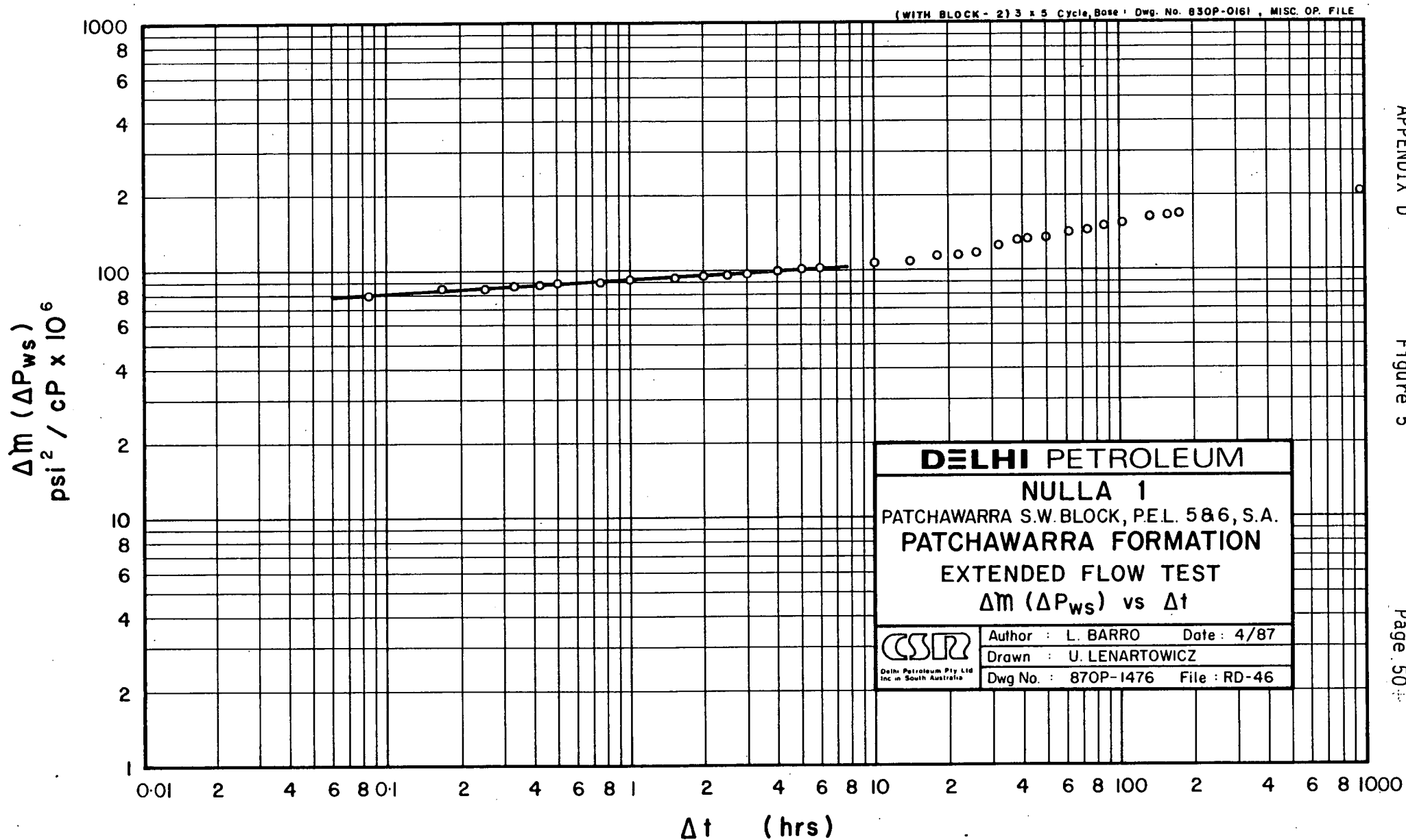


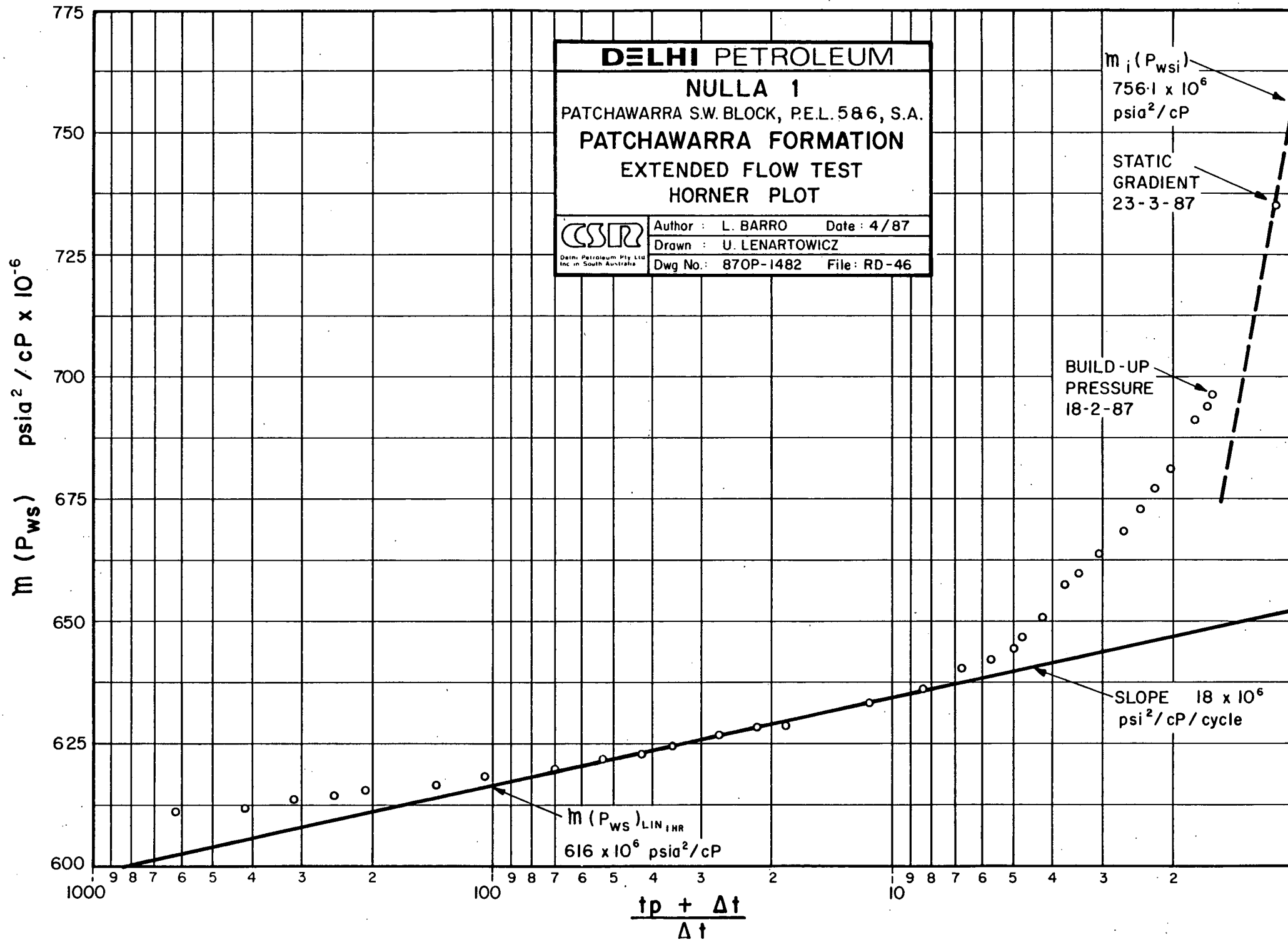
LIQUID - GAS RATIO
BBLs / MMSCF











APPENDIX D
Figure 7a

DST FORM

WELL NAME NULLA

NUMBER 1

DST NO. 2

TICKET NO. 251002

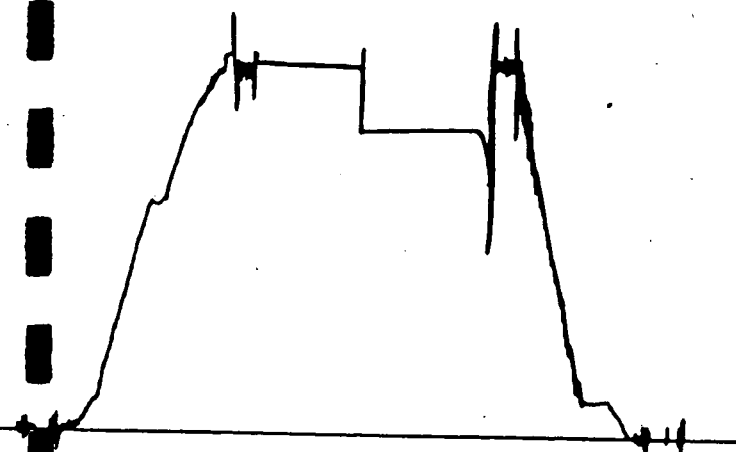
FORMATION TESTED PATCHAWARRA

INT. TESTED 8279'-8333'

RECORDERS' USED TOP / MID / BOTTOM

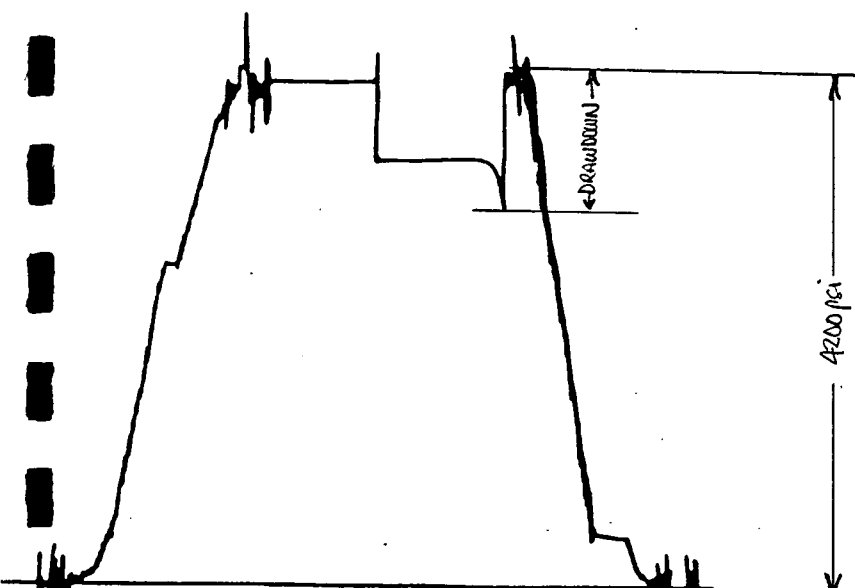
TOP / MID CHART

ELEMENT NUMBER 3289



BOTTOM CHART

ELEMENT NUMBER 2410



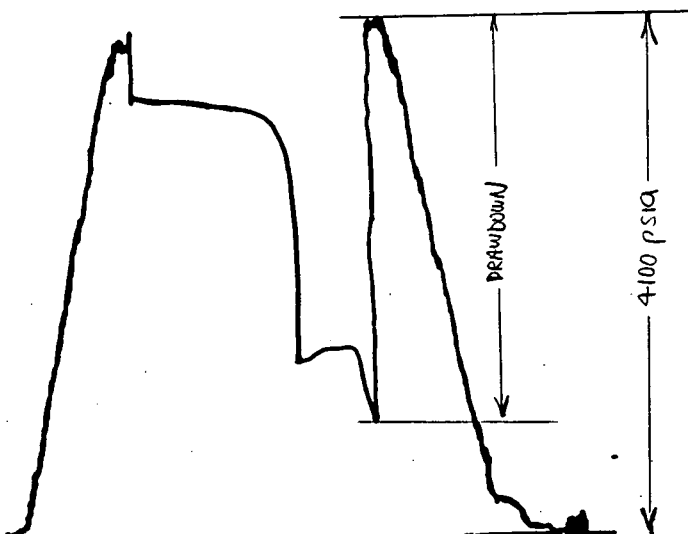
$$\begin{aligned} \text{Drawdown} &= \frac{17}{68} \times 4200 \\ &= 1050 \text{ psi} \end{aligned}$$

DST FORMWELL NAME NULLANUMBER 1DST NO. 3TICKET NO. 251003FORMATION TESTED PATCHAWARRAINT. TESTED 8349' - 8415'RECORDERS' USED TOP / MID / BOTTOMTOP / MID CHART

ELEMENT NUMBER 3289

BOTTOM CHART

ELEMENT NUMBER 2410



$$\begin{aligned}\text{Drawdown} &= \frac{53}{70} \times 4100 \\ &= 3100 \text{ psi}\end{aligned}$$

APPENDIX D
EXTENDED FLOW TEST
CALCULATION #1
PRESSURE DRAWDOWN ANALYSIS

$$\begin{aligned}
 kh &= \frac{1637 \, qT}{m} & (T = 256^\circ\text{F at } 8284' \text{ kb}) \\
 &= \frac{(1637)(9815)(716)}{20 \times 10^6} & (q = 1.0531 \times 9320 \text{ MMSCFD}) \\
 &= 575 \text{ (md-ft)} & (= 9815 \text{ MMSCFD}) \\
 h &= 33 \text{ ft}
 \end{aligned}$$

$$\text{i.e. } k = 17.4 \text{ ft}$$

$$\begin{aligned}
 S' &= 1.151 \left[\frac{m(P_i) - m(P_{wf})}{m} \ln_{1-HR} - \log \frac{k}{\phi u C_t r_w^2} + 3.23 \right] \\
 &= 1.151 \left[\frac{(708.8 - 608.5) \times 10^6}{20 \times 10^6} - \log \frac{17.4}{(0.12)(0.0260)(129 \times 10^{-6})(0.1254)} + 3.23 \right] \\
 &= 1.151 (5.02 - 8.54 + 3.23) \\
 &= -0.30
 \end{aligned}$$

$$S' = S + Dq$$

$$\begin{aligned}
 \text{i.e. } S &= -0.30 - (3.14 \times 10^{-4})(9815) \\
 &= -3.38
 \end{aligned}$$

$$\begin{aligned}
 r_{inv} &= 0.03 \left[\frac{kt}{\phi u C_t} \right]^{1/2} \\
 &= 0.03 \left[\frac{(17.4)(104)}{(0.12)(0.026)(129 \times 10^{-6})} \right]^{1/2} \\
 &= 2012 \text{ ft}
 \end{aligned}$$

APPENDIX D
EXTENDED FLOW TEST
CALCULATION #2
PRESSURE BUILDUP ANALYSIS

$$\begin{aligned}
 kh &= \frac{1637 qT}{m} & (T = 256^\circ\text{F at } 8284' \text{ kb}) \\
 &= \frac{(1637)(9815)(716)}{18 \times 10^6} & (q = 1.0531 \times 9320 \text{ MMSCFD}) \\
 &= 639 \text{ md-ft} & (= 9815 \text{ MMSCFD})
 \end{aligned}$$

$$\begin{aligned}
 \text{Total } h &= 33 \text{ ft} \\
 \text{i.e. } k &= 19.4 \text{ md-ft}
 \end{aligned}$$

$$\begin{aligned}
 S' &= 1.151 \left[\frac{m(P_{ws}) - m(P_{wf})}{m} - \log \frac{k}{\phi_{uc} r_w^2} + 3.23 \right] \\
 &= 1.151 \left[\frac{(616 - 527) \times 10^6}{18 \times 10^6} - \log \frac{19.4}{(0.12)(0.0260)(129 \times 10^{-6})(0.1254)} + 3.23 \right] \\
 &= 1.151 (4.94 - 8.58 + 3.23) \\
 &= -0.48
 \end{aligned}$$

$$S' = S + Dq$$

Where

$$\begin{aligned}
 S' &= -0.48 \\
 D &= 3.14 \times 10^{-4} \text{ MSCFD} \\
 q &= 9815 \text{ MSCFD}
 \end{aligned}$$

$$\begin{aligned}
 \text{i.e. } S &= -0.48 - (3.14 \times 10^{-4})(9815) \\
 &= -3.56
 \end{aligned}$$

APPENDIX D
EXTENDED FLOW TEST
CALCULATION #2 (cont'd)
PRESSURE BUILDUP ANALYSIS

$$\begin{aligned}
 r_{inv} &= 0.03 \left(\frac{kt}{\phi u c_t} \right)^{1/2} \\
 &= 0.03 \left(\frac{(19.4)(104)}{(0.12)(0.026)(129 \times 10^{-6})} \right)^{1/2} \\
 &= 2124 \text{ (ft)}
 \end{aligned}$$

Time to stabilisation:

For a bounded reservoir system;

$$t_{DA} = \frac{2.64 \times 10^{-4} kt}{\phi u c_t \pi r_e^2}$$

The Patchawarra 83-1 and 83-6 reservoir shape can be approximated by:

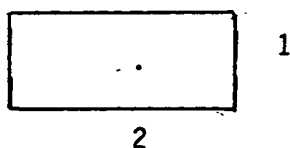


Figure 7 - 12 (b), Page 184, Reference 1

$t_{DA} = 0.1$ when transience ends and pseudo steady state begins.

Drainage area at 2P zero contour for each reservoir is approximately 250 acres

i.e. $r_e = 1861$ ft

$$\begin{aligned}
 t_{ss} &= \frac{(0.1)(0.12)(0.026)(129 \times 10^{-6})(\pi)(1861)^2}{(2.64 \times 10^{-4})(19.4)} \\
 &= 85.5 \text{ hours}
 \end{aligned}$$