

APPENDIX 2

DRILL STEM TEST RESULTS

DRILL STEM TEST REPORT

<u>OPERATOR:</u> MOONIE OIL NL		<u>DATE:</u> 23 JULY 1985
<u>WELL NAME:</u> EAST MEREENIE	<u>NO.</u> 18 P	<u>Basin:</u> AMADEUS
<u>FIELD:</u> MEREENIE	<u>STRUCTURE:</u>	
<u>TEST NO:</u> 1	<u>FORMATION:</u> PACOOTTA	<u>SAND NO:</u> P3 120-130
<u>ELEVATIONS</u>	<u>GL:</u> 2313 FT	<u>KB:</u> 2325 FT
		<u>PACKER AT:</u> 4605.34 FT
<u>INTERVAL:</u> 4605.34 TO 4660 FT		<u>TEST TYPE:</u> OPEN HOLE

TEST STATISTICS

<u>COMPANY:</u> HALLIBURTON		<u>OPERATOR:</u> NORM COWLEY	
<u>TOOL:</u> CONVENTIONAL	<u>CHOKE SIZE</u>	<u>TOP:</u> .5 INS	<u>BOTTOM:</u> .75 INS
<u>ANCHOR LENGTH:</u> 45 FT	<u>QD:</u> 5 INS		
<u>PERFORATED:</u> 4611 TO 4660 FT	<u>LENGTH:</u> 49 FT		
<u>PRESSURE RECORDER:</u> TYPE	<u>POSITION</u>	<u>DEPTH</u>	<u>CLOCK</u>
1. BORDON TUBE	TOP	4583 FT	24 HR
2. BORDON TUBE	BOTTOM	4685 FT	48 HR

CAPACITIES

<u>HOLE SIZE:</u>	7.625 INS	<u>INTERVAL:</u>	4487 TO 4660 FT
<u>RAT HOLE:</u>	7.625 INS	<u>INTERVAL:</u>	4605.34 TO 4660 FT
<u>DRILL PIPE:</u>	BLS/FT	<u>COLLARS:</u>	BLS/FT

TIME RECORD

<u>ACTUAL</u>		<u>ELAPSED TIMES</u>	
START CLOCK:	0023 HRS	START TO SEPERATOR:	0906 HRS
START IN HOLE:	0233 HRS	STOP SEPERATOR:	1006 HRS
TOOL OPENED:	0752 HRS	IF:	15 MINS
TOOL SHUT:	0807 HRS	ISI:	30 MINS
TOOL OPENED:	0837 HRS	FF:	92 MINS
TOOL SHUT:	1009 HRS	FSI:	214 MINS
PACK PULLED:	1343 HRS	TOTAL FLOW:	10 MINS
OUT OF HOLE:	2111 HRS	SEPERATOR FLOW:	60 MINS

PRESSURE RECORD

CHART: BOTTOM	CLOCK: 48 HR
IHP:	2103.4 PSI
IFP:	954 PSI
ISIP:	1715.5 PSI
FFP:	1201.4 PSI
FSIP:	1715.5 PSI
FHP:	2097.8 PSI
WHFP:	210 PSI

RECOVERY

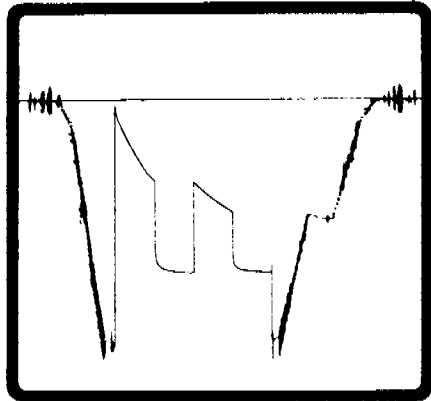
GTS:	5 MIN	AT 775000 CU FT/D
OTS:	9 MIN	AT 1325 BLS/D (US)
WTS:	MIN	AT BLS/D (US)
GOR:	584	CU FT/BL
ORIFICE SIZE:	1	INS
FLOW PROVER PRESSURE:	29	PSI
SG OF GAS:	.964	GM/CC
SG OF OIL:	47.8	API AT 60°F
WATER SALINITY:		PPM
MAXIMUM TEMP:	140°F	

NATURE OF BLOW: IMMEDIATE STRONG BLOW: 7.54 AM - 3 PSI: 7.56-15 PSI 7.58-8 PSI  
8.02-SLUGGING MUD AND OIL 8.04-130 PSI.

FF: 8.37-8.43AM GAS FLARE. OIL TO FLARE PIT 8.43 AM. 8.50AM 8-10 SEC SLUGS.

REMARKS: VALID TEST: RECOVERY 8710 LTS (54.7 BLS) FLOW RATE 1325 BLS/D. 46  
API. OIL GRAVITY: 0.794 AT 22 DEGREES C. GREEN/BROWN (REFLECTED LIGHT) RED IN  
TRANSMITTED LIGHT.

# FORMATION TESTING SERVICE REPORT



Duncan, Oklahoma 73536



A Halliburton Company

# NOMENCLATURE

B	= Formation Volume Factor (Res Vol / Std Vol) .....	—
$C_t$	= System Total Compressibility .....	(Vol / Vol) / psi
DR	= Damage Ratio .....	—
h	= Estimated Net Pay Thickness .....	ft
k	= Permeability .....	md
m	{ = (Liquid) Slope Extrapolated Pressure Plot .....	psi cycle
		(Gas) Slope Extrapolated m(P) Plot .....
		MM psi <sup>2</sup> cp cycle
m(P*)	= Real Gas Potential at P* .....	MM psi <sup>2</sup> cp
m(P <sub>f</sub> )	= Real Gas Potential at P <sub>f</sub> .....	MM psi <sup>2</sup> cp
AOF <sub>1</sub>	= Maximum Indicated Absolute Open Flow at Test Conditions .....	MCFD
AOF <sub>2</sub>	= Minimum Indicated Absolute Open Flow at Test Conditions ..	MCFD
P*	= Extrapolated Static Pressure .....	Psig
P <sub>f</sub>	= Final Flow Pressure .....	Psig
Q	= Liquid Production Rate During Test .....	BPD
Q <sub>1</sub>	= Theoretical Liquid Production w Damage Removed .....	BPD
Q <sub>g</sub>	= Measured Gas Production Rate .....	MCFD
r <sub>i</sub>	= Approximate Radius of Investigation .....	ft
r <sub>w</sub>	= Radius of Well Bore .....	ft
S	= Skin Factor .....	
t	= Total Flow Time Previous to Closed-in .....	Minutes
Δt	= Closed-in Time at Data Point .....	Minutes
T	= Temperature Rankine .....	R
φ	= Porosity .....	—
μ	= Viscosity of Gas or Liquid .....	cp
Log	= Common Log .....	



TICKET NO. 34658100  
07-AUG-85  
ALICE SPRINGS

## FORMATION TESTING SERVICE REPORT

LEASE NAME	WELL NO.	TEST NO.	TESTED INTERVAL	LEASE OWNER/COMPANY NAME
NEREENIE EAST	18	1	4605.3 - 4660.0	MOONIE OIL, N.L.
LEGAL LOCATION SEC. - TWP. - RMC.	FIELD AREA	COUNTY	N. TERRITORY	STATE
	ARMARDEES BASIN			AUSTRALIA BC

346581-8511

GAUGE NO: 8511 DEPTH: 4583.2 BLANKED OFF: NO HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2066	2061.6			
B	INITIAL FIRST FLOW	655	650.3			
C	FINAL FIRST FLOW	921	918.6	15.0	15.2	F
C	INITIAL FIRST CLOSED-IN	921	918.6			
D	FINAL FIRST CLOSED-IN	1690	1686.6	30.0	30.3	C
E	INITIAL SECOND FLOW	700	686.6			
F	FINAL SECOND FLOW	1178	1173.1	92.0	91.2	F
F	INITIAL SECOND CLOSED-IN	1178	1173.1			
G	FINAL SECOND CLOSED-IN	1690	1686.6	214.0	214.3	C
H	FINAL HYDROSTATIC	2071	2060.9			

8.6  
A  
H  
G  
I  
246581-8531

GAUGE NO: 8531 DEPTH: 4657.0 BLANKED OFF: YES HOUR OF CLOCK: 48

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	2103	2099.6			
B	INITIAL FIRST FLOW	712	700.1	15.0	15.2	F
C	FINAL FIRST FLOW	954	947.9			
C	INITIAL FIRST CLOSED-IN	954	947.9	30.0	30.3	C
D	FINAL FIRST CLOSED-IN	1716	1711.5			
E	INITIAL SECOND FLOW	740	732.7	92.0	91.2	F
F	FINAL SECOND FLOW	1201	1198.2			
F	INITIAL SECOND CLOSED-IN	1201	1198.2	214.0	214.3	C
G	FINAL SECOND CLOSED-IN	1716	1712.1			
H	FINAL HYDROSTATIC	2098	2095.1			

## EQUIPMENT & HOLE DATA

FORMATION TESTED: PACOOTA P-3

NET PAY (ft):

GROSS TESTED FOOTAGE: 54.7

ALL DEPTHS MEASURED FROM: KB

CASING PERFS. (ft):

HOLE OR CASING SIZE (in): 7.625

ELEVATION (ft):

TOTAL DEPTH (ft): 4660.0

PACKER DEPTH(S) (ft): 4598. 4605

FINAL SURFACE CHOKE (in): 0.50000

BOTTOM HOLE CHOKE (in): 0.750

MUD WEIGHT (lb/gal): 8.60

MUD VISCOSITY (sec): 50

ESTIMATED HOLE TEMP. (°F):

ACTUAL HOLE TEMP. (°F): 140 @ 4656.0 ft

TICKET NUMBER: 34658100

DATE: 7-23-85 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:

ALICE SPRINGS

TESTER: N. COWLEY

WITNESS: R. YOUNG

DRILLING CONTRACTOR:

OCEAN DRILLING & EXPLORATION #19

## FLUID PROPERTIES FOR RECOVERED MUD & WATER

SOURCE

RESISTIVITY

CHLORIDES

°F ppm

°F ppm

°F ppm

°F ppm

°F ppm

°F ppm

## SAMPLER DATA

Pstg AT SURFACE:

cu.ft. OF GAS:

cc OF OIL:

cc OF WATER:

cc OF MUD:

TOTAL LIQUID cc:

## HYDROCARBON PROPERTIES

OIL GRAVITY (°API): 47.8 @ 60°F

GAS/OIL RATIO (cu.ft. per bbl):

GAS GRAVITY:

## CUSHION DATA

TYPE AMOUNT WEIGHT

## RECOVERED:

6 BARRELS OF GAS CUT OIL  
GAS AND OIL TO SURFACE

MEASURED FROM  
TESTER VALVE

## REMARKS:

TEST WAS CONDUCTED ON 23RD OF JULY, 1985.

DIMENSIONS OF THE TUBULAR GOODS ABOVE THE DRILL COLLARS WERE NOT REPORTED.



TYPE &amp; SIZE MEASURING DEVICE:

6" CERAMIC SURFACE CHOKE

TICKET NO: 34658100

TIME	CHOKE SIZE	SURFACE PRESSURE PSI	GAS RATE MCF	LIQUID RATE BPD	REMARKS
7-23-85					
0100					PICKED UP TOOL
0233					TOOL MADE UP, RAN IN HOLE.
0741					HEAD UP TO FLOOR MANIFOLD
0751					SEATED PACKERS WITH 30,000#
0752	.50				OPENED TOOL WITH A MODERATE TO
					STRONG BLOW
0754	"	3			
0755	"	10			
0756	"	15			GAS TO SURFACE
0757	"	10			
0801	"	30			OIL TO SURFACE
0804	"	130			
0806	"	150			
0807		160			CLOSED TOOL
0837	"	60			OPENED TOOL
0843	"	50			OIL TO SURFACE
0845	"	80			
0846	"	100			
0847	"	120			
0848	"	140			
0850	"	160			
0853	"	180			
0900	"	190			
0905	"	195			
0910	"	200			
0915	"	205			
0920	"	210			
0930	"	210			
0940	"	210			
0950	"	210			
1000	"	210			
1009	"	210			CLOSED TOOL
1343					PULLED FREE AND OPENED BY-PASS
1345					DROPPED BAR TO REVERSE CIRCULATE
1346					PIN BROKE, STARTED REVERSING.
1635					BROKE DOWN HEAD, FINISHED

TYPE & SIZE MEASURING DEVICE:	6" CERAMIC SURFACE CHOKE	TICKET NO: 34658100
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[illegible]

TICKET NO: 34658100

CLOCK NO: 30361 HOUR: 24



GAUGE NO: 8511

DEPTH: 4583.2

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	650.3			
2	1.0	652.2	2.0		
3	2.0	662.6	10.4		
4	3.0	650.7	-12.0		
5	4.0	652.9	2.2		
6	5.0	664.3	11.4		
7	6.0	677.5	13.2		
8	7.0	690.5	13.0		
9	8.0	712.1	21.6		
10	9.0	745.0	32.9		
11	10.0	780.8	35.8		
12	11.0	812.0	31.2		
13	12.0	843.6	31.6		
14	13.0	875.9	32.4		
15	14.0	901.8	25.9		
C 16	15.2	918.6	16.7		
FIRST CLOSED-IN					
C 1	0.0	918.6			
2	1.0	1643.2	724.6	0.9	1.223
3	2.0	1659.2	740.6	1.8	0.935
4	3.0	1666.3	747.7	2.5	0.780
5	4.0	1670.1	751.5	3.2	0.682
6	5.0	1672.7	754.2	3.8	0.605
7	6.0	1674.7	756.1	4.3	0.549
8	7.0	1676.0	757.4	4.8	0.500
9	8.0	1677.4	758.9	5.2	0.462
10	9.0	1678.7	760.2	5.7	0.429
11	10.0	1679.5	761.0	6.0	0.400
12	12.0	1681.1	762.5	6.7	0.355
13	14.0	1682.0	763.5	7.3	0.319
14	16.0	1683.1	764.5	7.8	0.290
15	18.0	1683.5	764.9	8.2	0.266
16	20.0	1684.5	766.0	8.6	0.246
17	22.0	1684.5	766.0	9.0	0.228
18	24.0	1685.6	767.0	9.3	0.213
19	26.0	1685.6	767.0	9.6	0.200
20	28.0	1686.1	767.5	9.8	0.188
D 21	30.3	1686.6	768.1	10.1	0.176
SECOND FLOW					
E 1	0.0	686.6			
2	6.0	787.6	101.1		
3	12.0	955.3	167.6		
4	18.0	1063.6	108.3		
5	24.0	1111.1	47.5		
6	30.0	1139.9	28.9		
7	36.0	1161.1	21.1		

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
8	42.0	1172.7	11.6		
9	48.0	1177.8	5.1		
10	54.0	1179.6	1.8		
11	60.0	1179.6	0.0		
12	66.0	1179.6	0.0		
13	72.0	1178.5	-1.2		
14	78.0	1176.5	-2.0		
15	84.0	1175.6	-0.9		
16	90.0	1174.5	-1.0		
F 17	91.2	1173.1	-1.4		
SECOND CLOSED-IN					
F 1	0.0	1173.1			
2	1.0	1656.2	483.1	1.0	2.034
3	2.0	1660.9	487.8	2.0	1.724
4	3.0	1663.8	490.7	2.9	1.565
5	4.0	1665.4	492.2	3.9	1.441
6	5.0	1666.8	493.7	4.8	1.349
7	6.0	1668.0	494.9	5.6	1.276
8	7.0	1669.4	496.3	6.6	1.209
9	8.0	1670.1	497.0	7.4	1.155
10	9.0	1670.7	497.6	8.3	1.110
11	10.0	1671.5	498.4	9.1	1.068
12	12.0	1672.2	499.1	10.8	0.994
13	14.0	1673.4	500.3	12.4	0.933
14	16.0	1674.3	501.2	13.9	0.883
15	18.0	1674.8	501.7	15.4	0.840
16	20.0	1675.6	502.5	16.8	0.801
17	22.0	1676.1	503.0	18.3	0.765
18	24.0	1676.6	503.5	19.6	0.735
19	26.0	1676.6	503.5	20.9	0.707
20	28.0	1677.4	504.3	22.2	0.681
21	30.0	1677.7	504.6	23.4	0.658
22	35.0	1678.6	505.5	26.3	0.606
23	40.0	1678.9	505.8	29.1	0.563
24	45.0	1679.5	506.4	31.6	0.527
25	50.0	1680.1	506.9	34.0	0.495
26	55.0	1681.2	508.1	36.3	0.467
27	60.0	1681.2	508.1	38.4	0.443
28	70.0	1682.0	508.9	42.2	0.401
29	80.0	1683.1	510.0	45.6	0.367
30	90.0	1683.1	510.0	48.8	0.339
31	100.0	1683.1	510.0	51.5	0.315
32	110.0	1684.1	511.0	54.1	0.294
33	120.0	1684.9	511.8	56.4	0.276
34	135.0	1684.9	511.8	59.5	0.252
35	150.0	1684.9	511.8	62.2	0.233
36	165.0	1684.9	511.8	64.7	0.216
37	180.0	1685.7	512.6	66.9	0.202
38	195.0	1685.7	512.6	68.8	0.189
39	210.0	1685.6	512.5	70.6	0.178
G 40	214.3	1686.6	513.5	71.1	0.175

REMARKS:

TICKET NO: 34658100

CLOCK NO: 25702 HOUR: 48



GAUGE NO: 8531

DEPTH: 4657.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$
FIRST FLOW					
B 1	0.0	700.1			
2	1.0	712.4	12.3		
3	2.0	703.5	-8.9		
4	3.0	700.4	-3.1		
5	4.0	702.1	1.7		
6	5.0	712.7	10.6		
7	6.0	724.7	12.0		
8	7.0	739.4	14.8		
9	8.0	755.2	15.7		
10	9.0	787.7	32.6		
11	10.0	824.8	37.0		
12	11.0	849.4	24.7		
13	12.0	874.8	25.3		
14	13.0	899.7	24.9		
15	14.0	927.6	27.9		
C 16	15.2	947.9	20.3		

## FIRST CLOSED-IN

C 1	0.0	947.9			
2	1.0	1655.6	707.7	0.9	1.229
3	2.0	1681.4	733.5	1.8	0.929
4	3.0	1688.0	740.1	2.5	0.778
5	4.0	1693.1	745.2	3.2	0.682
6	5.0	1695.9	748.0	3.8	0.606
7	6.0	1698.0	750.1	4.3	0.550
8	7.0	1700.3	752.4	4.8	0.500
9	8.0	1702.1	754.2	5.2	0.463
10	9.0	1702.8	754.9	5.7	0.430
11	10.0	1703.8	755.9	6.0	0.403
12	12.0	1705.1	757.2	6.7	0.356
13	14.0	1706.9	759.0	7.3	0.319
14	16.0	1707.6	759.7	7.8	0.290
15	18.0	1708.6	760.7	8.2	0.266
16	20.0	1709.3	761.4	8.6	0.245
17	22.0	1710.0	762.1	9.0	0.228
18	24.0	1710.7	762.8	9.3	0.213
19	26.0	1711.0	763.1	9.6	0.200
20	28.0	1711.0	763.1	9.8	0.188
D 21	30.3	1711.5	763.6	10.1	0.176

## SECOND FLOW

E 1	0.0	732.7			
2	6.0	831.6	98.9		
3	12.0	991.1	159.5		
4	18.0	1096.1	105.0		
5	24.0	1139.9	43.7		
6	30.0	1166.1	26.3		
7	36.0	1185.0	18.9		


















REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{1 + \Delta t}$	$\log \frac{1 + \Delta t}{\Delta t}$
SECOND FLOW - CONTINUED					
8	42.0	1196.8	11.8		
9	48.0	1202.8	6.0		
10	54.0	1205.1	2.4		
11	60.0	1205.1	0.0		
12	66.0	1205.1	0.0		
13	72.0	1204.9	-0.3		
14	78.0	1203.2	-1.7		
15	84.0	1201.5	-1.7		
16	90.0	1200.0	-1.5		
F 17	91.2	1198.2	-1.8		

## SECOND CLOSED-IN

F 1	0.0	1198.2			
2	1.0	1664.9	466.7	1.0	2.025
3	2.0	1675.8	477.6	2.0	1.728
4	3.0	1681.1	482.9	2.9	1.565
5	4.0	1684.8	486.6	3.8	1.442
6	5.0	1687.5	489.3	4.8	1.347
7	6.0	1688.9	490.7	5.7	1.271
8	7.0	1690.7	492.5	6.5	1.211
9	8.0	1692.0	493.8	7.5	1.153
10	9.0	1693.1	494.9	8.3	1.108
11	10.0	1694.5	496.3	9.1	1.065
12	12.0	1696.3	498.1	10.8	0.995
13	14.0	1697.5	499.3	12.4	0.934
14	16.0	1698.6	500.4	13.9	0.883
15	18.0	1699.4	501.2	15.4	0.840
16	20.0	1700.1	501.9	16.8	0.800
17	22.0	1700.8	502.7	18.3	0.765
18	24.0	1701.7	503.5	19.5	0.736
19	26.0	1701.7	503.5	20.9	0.706
20	28.0	1702.1	503.9	22.2	0.681
21	30.0	1703.1	504.9	23.4	0.658
22	35.0	1703.7	505.5	26.3	0.606
23	40.0	1704.5	506.3	29.1	0.564
24	45.0	1705.1	506.9	31.6	0.526
25	50.0	1705.8	507.6	34.0	0.495
26	55.0	1706.5	508.3	36.3	0.467
27	60.0	1706.9	508.7	38.4	0.443
28	70.0	1707.9	509.7	42.2	0.401
29	80.0	1707.9	509.7	45.6	0.367
30	90.0	1708.9	510.7	48.7	0.339
31	100.0	1708.9	510.7	51.5	0.315
32	110.0	1709.4	511.2	54.1	0.294
33	120.0	1709.4	511.2	56.4	0.276
34	135.0	1710.6	512.4	59.5	0.252
35	150.0	1710.6	512.4	62.2	0.233
36	165.0	1711.0	512.8	64.7	0.216
37	180.0	1711.0	512.8	66.9	0.202
38	195.0	1711.5	513.4	68.8	0.189
39	210.0	1711.5	513.4	70.6	0.178
G 40	214.3	1712.1	513.9	71.1	0.175

REMARKS:

TICKET NO. 34658100

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	4075.7		
		DRILL PIPE.....	4.500	182.7		
		DRILL COLLARS.....	6.500	2.750	280.0	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	4538.3
		DRILL COLLARS.....	6.500	2.750	30.6	
5		CROSSOVER.....	5.750	1.0		
2		DUAL CIP VALVE.....	5.000	0.870	4.9	
60		HYDROSPRING TESTER.....	5.000	0.750	5.3	4581.0
0		AP RUNNING CASE.....	5.000	2.250	4.1	4583.2
15		JAR.....	5.000	1.750	5.0	
5		VR SAFETY JOINT.....	5.000	1.000	2.8	
0		OPEN HOLE PACKER.....	6.750	1.530	5.8	4597.5
18		DISTRIBUTOR VALVE.....	5.000	1.680	2.0	
0		OPEN HOLE PACKER.....	6.750	1.530	5.8	4605.3
18		ANCHOR PIPE SAFETY JOINT.....	5.000	1.500	4.3	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	45.0	
1		BLANKED-OFF RUNNING CASE.....	5.000	4.1	4657.0	
		TOTAL DEPTH			4660.0	

EQUIPMENT DATA

## EQUATIONS FOR DST LIQUID WELL ANALYSIS

Transmissibility	$\frac{kh}{\mu}$	$\frac{162.6 \text{ QB}}{m}$	$\frac{\text{md-ft}}{\text{cp}}$
Indicated Flow Capacity	$kh$	$\frac{kh}{\mu} \mu$	md-ft
Average Effective Permeability	$k$	$\frac{kh}{h}$	md
Skin Factor	$S$	$1.151 \left[ \frac{P^* - P_f}{m} \text{LOG} \left( \frac{k(t/60)}{\phi \mu C_f r_w^2} \right) + 3.23 \right] -$	—
Damage Ratio	$DR$	$\frac{P^* - P_f}{P^* - P_f - 0.87 mS}$	—
Theoretical Potential w/ Damage Removed	$Q_1$	$Q DR$	BPD
Approx. Radius of Investigation	$r_i$	$0.032 \sqrt{\frac{k(t/60)}{\phi \mu C_i}}$	ft

## EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh$	$\frac{1637 Q_{gi} T}{m}$	md-ft
Average Effective Permeability	$k$	$\frac{kh}{h}$	md
Skin Factor	$S$	$1.151 \left[ \frac{m(P^*) - m(P_f)}{m} \text{LOG} \left( \frac{k(t/60)}{\phi \mu C_f r_w^2} \right) + 3.23 \right] -$	—
Damage Ratio	$DR$	$\frac{m(P^*) - m(P_f)}{m(P^*) - m(P_f) - 0.87 mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1$	$\frac{Q_{gi} m(P^*)}{m(P^*) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2$	$Q_{gi} \sqrt{\frac{m(P^*)}{m(P^*) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i$	$0.032 \sqrt{\frac{k(t/60)}{\phi \mu C_i}}$	ft