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PEL 5 AND PEL 6; PATCHAWARRA EAST BLOCK

EROMANGA BASIN AND COOPER BASIN

KENNY 1 TEST REPORTS

Submitted by

Delhi Petroleum Pty Ltd
1985

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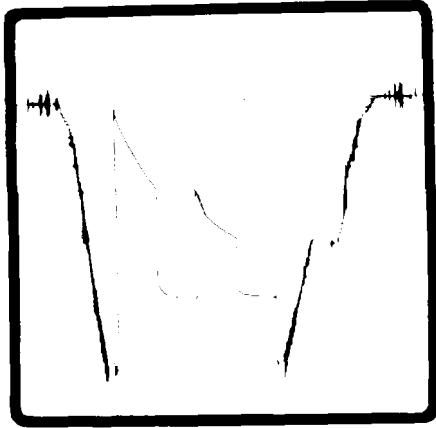
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**PRIMARY INDUSTRIES
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FORMATION TESTING SERVICE REPORT



Duncan, Oklahoma 73536



A Halliburton Company

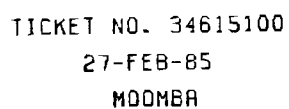
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R95/02582



NOMENCLATURE

B	= Formation Volume Factor (Res Vol / Std Vol)	—
C_t	= System Total Compressibility	$(\text{Vol} / \text{Vol})^{-1} \text{ psi}$
DR	= Damage Ratio	—
h	= Estimated Net Pay Thickness	Ft
k	= Permeability	md
m	{ = (Liquid) Slope Extrapolated Pressure Plot (Gas) Slope Extrapolated m(P) Plot	psi cycle MM psi ² cp cycle
$m(P^*)$	= Real Gas Potential at P^*	MM psi ² cp
$m(P_f)$	= Real Gas Potential at P_f	MM psi ² cp
AOF_1	= Maximum Indicated Absolute Open Flow at Test Conditions	MCFD
AOF_2	= Minimum Indicated Absolute Open Flow at Test Conditions	MCFD
P^*	= Extrapolated Static Pressure	Psig
P_f	= Final Flow Pressure	Psig
Q	= Liquid Production Rate During Test	BPD
Q_1	= Theoretical Liquid Production w/ Damage Removed	BPD
Q_g	= Measured Gas Production Rate	MCFD
r_i	= Approximate Radius of Investigation	Ft
r_w	= 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	



LEGAL LOCATION		SEE REMARKS	
TWP. - R10E, S10N, E10E		COOPER BASIN	
COUNTY		SOUTH AUSTRALIA	
STATE		AUSTRALIA	
LEASE NO.		1	
TEST NO.		1	
LEASE NAME		KENNY	
TESTED INTERVAL		6764.1' - 6832.1'	
LEASE OWNER/COMPANY NAME		DELHI/SANTOS	

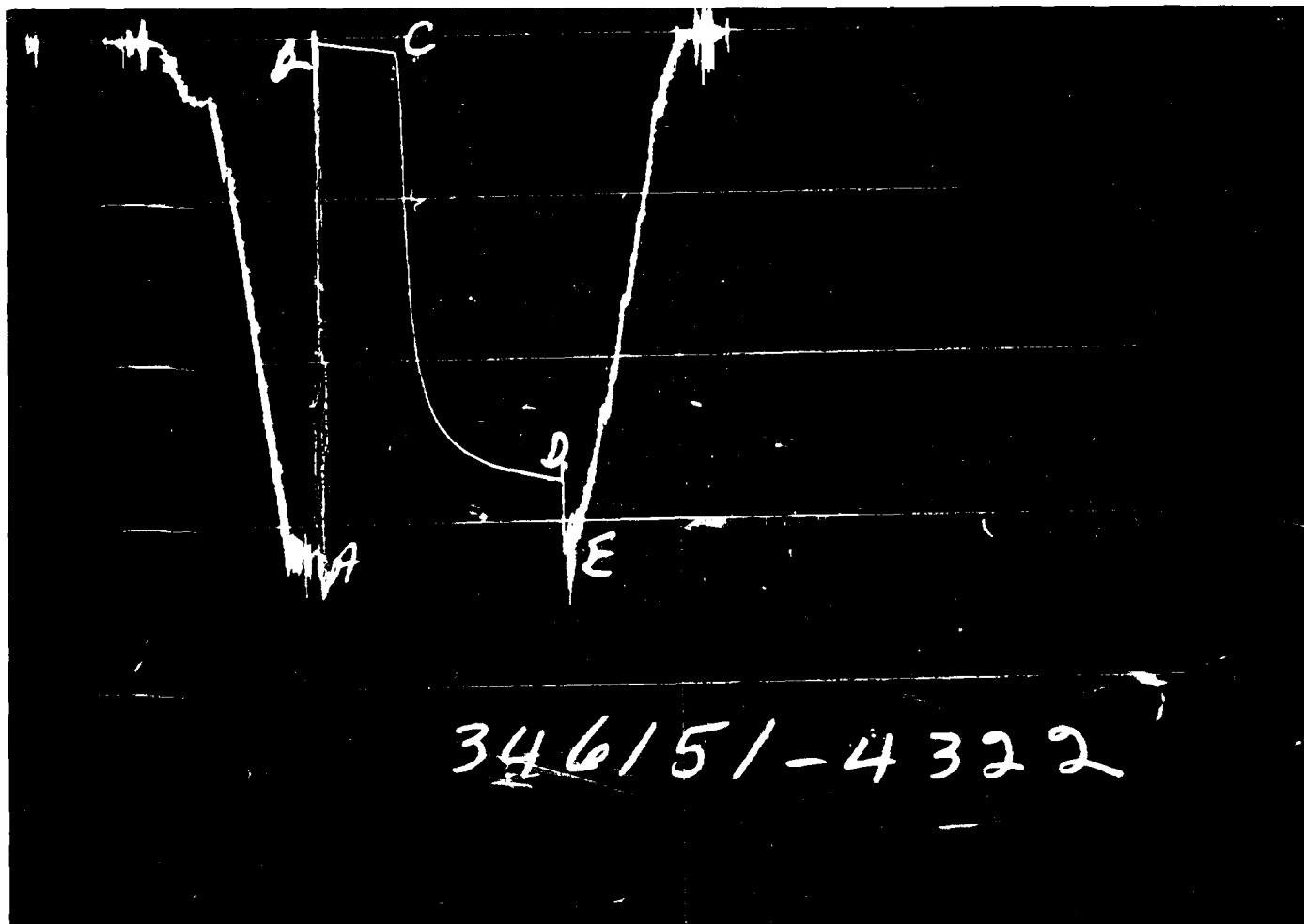
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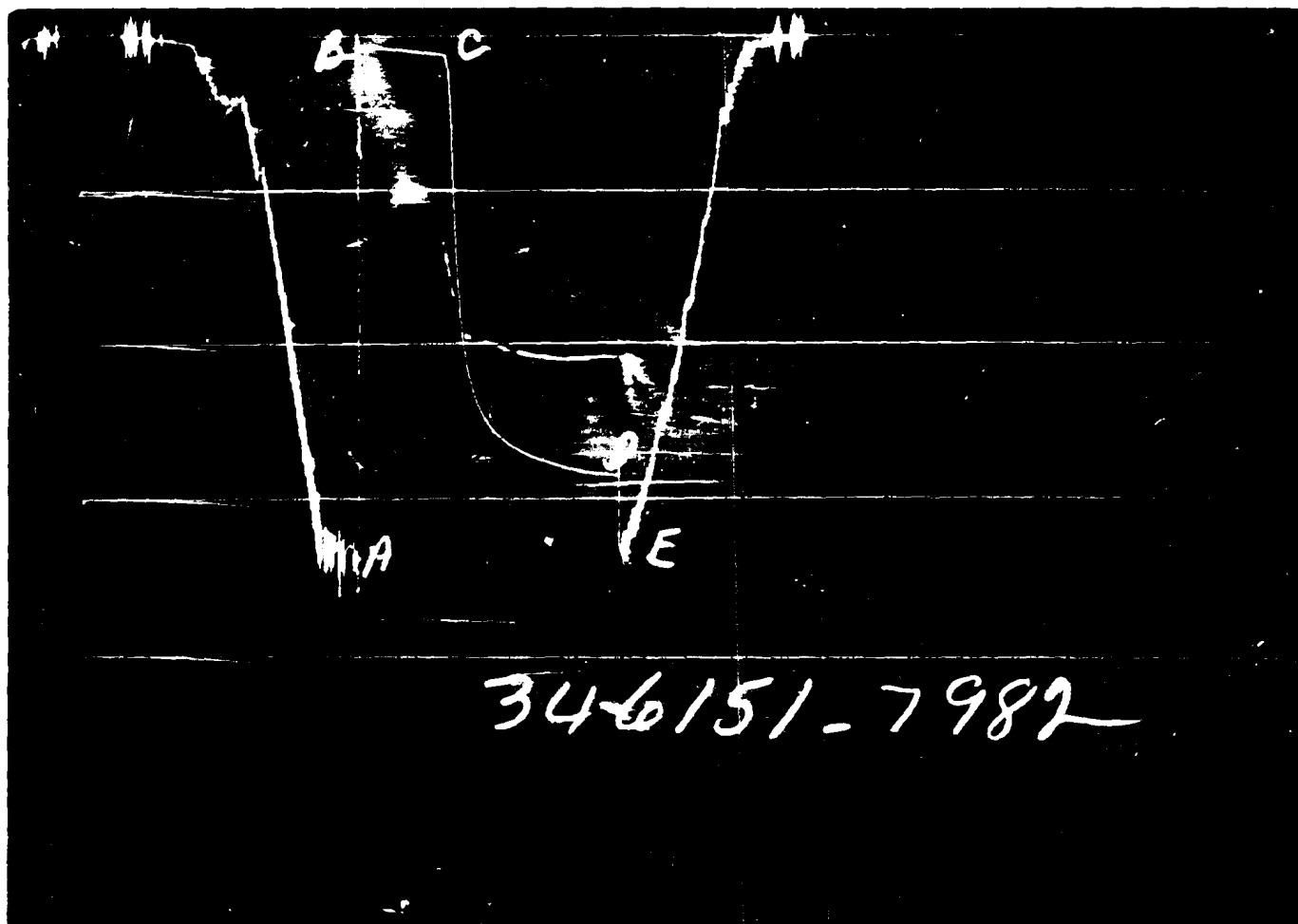
GAUGE NO: 501 DEPTH: 620.0 BLANKED OFF: NO HOUR OF CLOCK: 14

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC					
B	INITIAL FIRST FLOW		8.6			
C	FINAL FIRST FLOW		69.2	93.0	93.3	F
C	INITIAL FIRST CLOSED-IN		69.2			
D	FINAL FIRST CLOSED-IN	70	75.6	185.0	184.7	C
E	FINAL HYDROSTATIC					



GAUGE NO: 5571 DEPTH: 6741.0 BLANKED OFF: NL HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3138	3147.1			
B	INITIAL FIRST FLOW	31	27.6	93.0	93.3	F
C	FINAL FIRST FLOW	91	91.8			
C	INITIAL FIRST CLOSED-IN	91	91.8	185.0	184.7	C
D	FINAL FIRST CLOSED-IN	2725	2737.4			
E	FINAL HYDROSTATIC	3135	3147.6			



GAUGE NO: 1042 DEPTH: 1075.0 BLANKED OFF: 75 HOUR OF CLOCK: 24

ID	DESCRIPTION	PRESSURE		TIME		TYPE
		REPORTED	CALCULATED	REPORTED	CALCULATED	
A	INITIAL HYDROSTATIC	3212	3291.4			
B	INITIAL FIRST FLOW	57	54.1	93.0	93.3	F
C	FINAL FIRST FLOW	114	116.3			
C	INITIAL FIRST CLOSED-IN	114	116.3	185.0	184.7	C
D	FINAL FIRST CLOSED-IN	2734	2852.5			
E	FINAL HYDROSTATIC	3184	3286.8			

EQUIPMENT & HOLE DATA

FORMATION TESTED: BIRKHEAD
NET PAY (ft): _____
GROSS TESTED FOOTAGE: 68.0
ALL DEPTHS MEASURED FROM: R. KELLY BUSHING
CASING PERFS. (ft): _____
HOLE OR CASING SIZE (in): 8.500
ELEVATION (ft): 194
TOTAL DEPTH (ft): 6823.0
PACKER DEPTH(S) (ft): 6756, 6764
FINAL SURFACE CHOKE (in): 0.500
BOTTOM HOLE CHOKE (in): 0.750
MUD WEIGHT (lb/gal): 9.20
MUD VISCOSITY (sec): 40
ESTIMATED HOLE TEMP. (°F): _____
ACTUAL HOLE TEMP. (°F): 224 @ 6819.0 ft

FLUID PROPERTIES FOR RECOVERED MUD & WATER

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

HYDROCARBON PROPERTIES

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

RECOVERED:

4' OF WAXY OIL
176' OF WATERY MUD

REMARKS:

LEGAL LOCATION: LAT. 26 DEGREES 59' 19.8" SOUTH, LONG. 140 DEGREES 48' 08.4" EAST.

TEST WAS CONDUCTED 20 DEC. 84

TICKET NUMBER: 34615100

DATE: 12-20-84 TEST NO: 1

TYPE DST: OPEN HOLE

HALLIBURTON CAMP:
MOOMBA

TESTER: R. BAKER
M. PARSONS

WITNESS: C. RODWELL

DRILLING CONTRACTOR:
S & T RIG #16

SAMPLER DATA

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

CUSHION DATA

TYPE	AMOUNT	WEIGHT
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MEASURED FROM
TESTER VALVE

TICKET NO: 34615100

CLOCK NO: 32067 HOUR: 24



GAUGE NO: 521

DEPTH: 6720.0

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{1 + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
FIRST FLOW					
B	1	0.0	8.6		
	2	15.0	18.8	10.2	
	3	30.0	31.9	13.1	
	4	45.0	41.7	9.7	
	5	60.0	49.2	7.5	
	6	75.0	57.8	8.6	
	7	90.1	68.2	10.4	
C	8	93.3	69.2	1.0	
FIRST CLOSED-IN					
C	1	0.0	69.2		
D	2	184.7	75.6	6.4	62.0 0.178

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{1 + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$

REMARKS:

TICKET NO: 34615100

CLOCK NO: 23547 HOUR: 24

HALLIBURTON

SERVICES

GAUGE NO: 4322

DEPTH: 6741.0

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	27.6		
	2	15.0	37.6	10.0	
	3	30.0	50.4	12.8	
	4	45.0	61.0	10.6	
	5	60.0	69.0	8.1	
	6	75.0	79.1	10.1	
	7	90.0	90.2	11.1	
C	8	93.3	91.8	1.6	

FIRST CLOSED-IN

C	1	0.0	91.8		
	2	10.0	1476.5	1384.8	9.0 1.014
	3	20.0	2043.3	1951.5	16.5 0.754
	4	30.0	2256.8	2165.0	22.7 0.614
	5	40.0	2373.3	2281.5	28.0 0.523
	6	50.0	2452.1	2360.3	32.6 0.457
	7	60.0	2511.9	2420.1	36.5 0.408
	8	70.0	2553.7	2461.9	40.0 0.368
	9	80.0	2586.5	2494.7	43.1 0.336
	10	90.0	2614.3	2522.5	45.8 0.309
	11	100.0	2635.9	2544.2	48.3 0.286
	12	110.0	2654.9	2563.2	50.5 0.267
	13	120.0	2671.1	2579.3	52.5 0.250
	14	130.0	2683.8	2592.0	54.3 0.235
	15	140.0	2696.2	2604.4	56.0 0.222
	16	150.0	2707.4	2615.6	57.5 0.210
	17	160.0	2717.1	2625.3	58.9 0.200
	18	170.0	2725.6	2633.8	60.2 0.190
	19	179.9	2734.7	2642.9	61.4 0.181
D	20	184.7	2737.4	2645.6	62.0 0.178

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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REMARKS:

TICKET NO: 34615100

CLOCK NO: 6596 HOUR: 24


HALLIBURTON
SERVICES

GAUGE NO: 7982

DEPTH: 6820.0

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	54.1		
	2	15.0	62.3	8.2	
	3	30.0	75.2	12.8	
	4	45.0	86.3	11.2	
	5	60.0	95.4	9.0	
	6	75.0	103.9	8.6	
	7	90.0	113.8	9.9	
C	8	93.3	116.3	2.5	

FIRST CLOSED-IN

C	1	0.0	116.3		
	2	10.0	1275.0	1158.7	9.0 1.015
	3	20.0	2075.7	1959.4	16.4 0.754
	4	30.0	2333.6	2217.3	22.7 0.614
	5	40.0	2469.4	2353.1	28.0 0.523
	6	50.0	2555.8	2439.5	32.5 0.457
	7	60.0	2614.3	2498.0	36.5 0.407
	8	70.0	2655.6	2539.3	40.0 0.368
	9	80.0	2692.4	2576.2	43.1 0.338
	10	90.0	2719.1	2602.8	45.8 0.309
	11	100.0	2742.1	2625.8	48.3 0.286
	12	110.0	2763.2	2646.9	50.5 0.267
	13	120.0	2779.9	2663.7	52.5 0.250
	14	130.0	2796.4	2680.1	54.3 0.235
	15	140.0	2809.5	2693.3	56.0 0.222
	16	150.0	2820.6	2704.3	57.5 0.210
	17	160.0	2830.6	2714.3	58.9 0.200
	18	170.0	2840.6	2724.3	60.2 0.190
	19	180.0	2849.2	2732.9	61.5 0.181
D	20	184.7	2852.5	2736.2	62.0 0.178

REF	MINUTES	PRESSURE	ΔP	$\frac{t \times \Delta t}{t + \Delta t}$	$\log \frac{t + \Delta t}{\Delta t}$
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REMARKS:

		O.D.	I.D.	LENGTH	DEPTH	
1		DRILL PIPE.....	4.500	3.826	6103.8	
4		FLEX WEIGHT.....	4.500	2.764	181.8	
3		DRILL COLLARS.....	6.750	2.938	400.8	
50		IMPACT REVERSING SUB.....	6.000	3.000	1.0	6686.0
3		DRILL COLLARS.....	6.250	2.938	31.1	
5		CROSSOVER.....	5.750	2.250	1.0	
80		AP RUNNING CASE.....	5.000	2.250	4.1	6720.0
5		CROSSOVER.....	5.000	2.200	1.0	
12		DUAL CIP VALVE.....	5.000	0.870	4.9	
97		SAMPLE CHAMBER.....	5.000	2.250	4.1	6733.0
33		DRAIN VALVE.....	5.000	2.200	0.9	
60		HYDROSPRING TESTER.....	5.000	0.750	5.3	6739.0
80		AP RUNNING CASE.....	5.000	2.250	4.1	6741.0
15		JAR.....	5.000	1.750	5.0	
16		VR SAFETY JOINT.....	5.000	1.000	2.8	
70		OPEN HOLE PACKER.....	5.000	1.530	5.8	6756.0
18		DISTRIBUTOR VALVE.....	5.000	1.680	2.0	
70		OPEN HOLE PACKER.....	5.000	1.530	5.8	6764.0
19		ANCHOR PIPE SAFETY JOINT.....	5.000	1.500	4.3	
5		CROSSOVER.....	5.750	2.250	1.0	
3		DRILL COLLARS.....	6.250	2.938	30.2	
5		CROSSOVER.....	5.750	2.250	1.0	
20		FLUSH JOINT ANCHOR.....	5.000	2.370	17.0	
81		BLANKED-OFF RUNNING CASE.....	5.000		4.1	6820.0
TOTAL DEPTH					6823.0	

EQUIPMENT DATA

EQUATIONS FOR DST LIQUID WELL ANALYSIS

Transmissibility	$\frac{kh}{\mu} = \frac{162.6 QB}{m}$	$\frac{\text{md-ft}}{\text{cp}}$
Indicated Flow Capacity	$kh = \frac{kh}{\mu} \mu$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Damage Ratio	$DR = .183 \frac{P^* - P_i}{m}$	—
Theoretical Potential w/ Damage Removed	$Q_1 = Q DR$	BPD
Approx. Radius of Investigation	$r_i = 4.63 \sqrt{kt}$	ft

EQUATIONS FOR DST GAS WELL ANALYSIS

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