

Drilling Test 6500 ft

	OD	Id		
Drill Pipe	4.5	3.825 inches	Pump HP	1000
Collars	6	2 inches	Max rate	617
Mud Weight		10 #/gal	HHP max	360
Viscosity		35 cp		
Pump Rate		180 gal/min	HHP rate	263
Max pressure		2500 psi	HHP sys	251
hole size	8	inches		
Mud	O 600	120 O 300	87	
vis plastic		33 cp	54	
n		0.46 K	2433.514	

Surface pressure 8.6 psi
HHP sur 0.9

Drill String Prssure drop

		Length ft	
Drill pipe	0.018 psi/ft	5810	104 psi
Collars	0.402 psi/ft	690	278 psi
		6500	
		Total DS	382 psi
HHP DS	40.1		
		Pressure @ bit	2118

Bit Pressure drop

	1	2	3	At
nozzle /32	7	8	8	0.136 inches
vj	424 ft/sec			450.03 ft/sec
Pb	1619 psi		Pb max	1808.27 psi
HHP	170 HHP		area	0.128 in2

Annulus Pressure

			dp/dl	pressure
	vel col	2.626 ft/sec	0.112	77 psi
	vel dp	1.681 ft/sec	0.040	233 psi
			total	310

HHP 32.55

Pd 692

total 2311 2500.00

stand pipe 2302 2491.42

Slip Velocity 25.12 ft/min 0.42 ft/sec

part vel col 2.21
part vel dp 1.26

alpha calculations

	dp vel	dp dP	dp P	col vel	col dP	col P	ds P		
q1	200	5.580	0.028	165.000	20	1	426.000	591.000	
q2	300	8.380	0.058	335.000	31	1	867.000	1202.000	
ann	200	1.87	0.082	479	2.92	0.159	110	589	1180
	300	2.8	0.148	860	4.38	0.171	118	978	2180
							ann P		total
Alpha		1.51							

opt horsepower

P_{opt} 996 psi

Q_{opt} 179 gpm

A_{topt} 0.140 in² 7.8

P_B 1504 psi

jet impact

P_{fopt} 1425

P_{bopt} 1075

Q_{opt} 227

A_{topt} 0.182 jet size 8.9

			12500 ft		
	OD		Id		
Drill Pipe	4.5	3.825 inches		Pump HP	1000
Collars	6	2 inches		Max rate	617
Mud Weight		10.5 #/gal		HHP max	360
Viscosity		cp			
Pump Rate		150 gal/min		HHP rate	219
Max pressure		2500 psi		HHP sys	212
hole size	8	inches			
Mud	O 600	120 O 300		75	
vis plastic		45 cp		54	
n		0.68 K		640.6642	

Surface pressure	6.7 psi
HHP sur	0.6

Drill String Prssure drop

		Length ft	
Drill pipe	0.014 psi/ft	11810	165.3 psi
Collars	0.321 psi/ft	690	221.5 psi
		12500	
		Total DS	386.8 psi
HHP DS	34.1		
		Pressure @ bit	2110.00 psi

Bit Pressure drop

	1	2	3	At
nozzle /32	7	7	7	0.113 inches
vj	425.73 ft/sec			438.29 ft/sec
Pb	1711.00 psi		Pb max	1798.00 psi
HHP	149.74 HHP		area	0.110 in2

Annulus Pressure

		dp/dl	pressure
vel col	2.186 ft/sec	0.076	52.44
vel dp	1.401 ft/sec	0.022	259.82
		total	312.26

HHP 27.33

Pd 699.09

total 2410.09 2497.09

stand pipe 2403.38 2493.29

Slip Velocity 21.61 ft/min 0.36 ft/sec

part vel col 1.83
part vel dp 1.04

alpha calculations

	dp P	col P	dpa P	col a P	total
q1	200	376	478	506	74 1434
q2	300	765	971	911	86 2733

Alpha 1.59

opt horsepower

P_{opt} 965 psi
 Q_{opt} 156 gpm
 A_{topt} 0.124 in² jet size 7.3
 P_B 1535 psi

jet impact

P_{fopt} 1393
 P_{bopt} 1107
 Q_{opt} 196
 A_{topt} 0.164 jet size 8.4

