

HYDRAULICS CALCULATIONS

PLASTIC VISCOSITY 2.00 cP
 YIELD POINT 3.00 lb/cft²
 POWER LAW k .2502
 POWER LAW n .4854
 DEPTH 1528.0 ft (465.7m)
 VERTICAL DEPTH 1527.9 ft
 DEPTH OF RETURNS 1491.7 ft
 CUTTINGS BULK DENSITY 2.50 spc grv
 MUD DENSITY 8.80 lb/gal
 ACTIVE SURFACE MUD VOLUME 258 bbl
 FLOW RATE 833 gal/min
 BOOSTER FLOW 0 gal/min
 PUMP PRESSURE 2420 psi
 PUMP gal/stk 4.96 gal/stk
 BIT NOZZLES 15, 15, 18

CALCULATED RESULTS:

FROM ft	TO ft	LENGTH ft	ANNULUS/PIPE in	ANN VELO. ft/min	CRIT VELO ft/min	FLOW REGIME	PRESS LOSS psi
0.0	343.0	343.0	18.750/ 5.000	62.5	78.9	LAMINAR	.1
343.0	655.0	312.0	18.730/ 5.000	62.7	79.0	LAMINAR	.1
655.0	1019.5	364.5	18.730/ 5.000	62.7	79.0	LAMINAR	.1
1019.0	1356.0	336.5	18.730/ 8.000	71.2	86.3	LAMINAR	.1
1356.0	1528.0	172.0	12.250/ 8.000	237.2	116.7	TURBULENT	1.1

Annulus Diam	Pipe		i.d.
	j.d.	o.d.	
18.750	6.370	5.000	4.276
18.730	6.370	5.000	4.276
18.730	6.375	5.000	3.000
18.730	8.000	8.000	2.875
12.250	8.000	8.000	2.875

MUD HYDROSTATIC 8.59 lb/gal
 FLOW CONTRIBUTION .02 lb/gal
 CUTTINGS CONTRIBUTION .50 lb/gal
 EQUIVALENT CIRCULATING DENSITY 9.11 lb/gal

SURFACE PRESSURE LOSS 71 psi NOZZLE VELOCITY 450.2 ft/sec
 PIPEBORE PRESSURE LOSS 331 psi HYDRAULIC POWER 773.9 hp
 ANNULAR PRESSURE LOSS 1 psi JET IMPACT FORCE 1708.1 lbs
 BIT PRESSURE LOSS 1592 psi % OF PRESS LOSS AT BIT 80
 TOTAL CALC. PRESS LOSS 1996 psi

VOLUMES:	gal	bbl	Strokes	Minutes @ 168 s.p.m.
1) Pipe Capacity	794	19	160	1.0
2) Pipe Displacement	1605	38	324	1.9
3) Total Annulus	17977	428	3624	21.6 <- LAG
4) Mud in active pits	10853	258	2188	13.0
Circulation (1) + (3)	18771	447	3785	22.5
Hole Volume (1)+(2)+(3)	20377	485	4108	24.5
Total Mud Circulation	29624	705	5973	35.6

