

HYDRAULICS CALCULATIONS

PLASTIC VISCOSITY	24.00 cP
YIELD POINT	22.00 lb/cft <sup>2</sup>
POWER LAW k	1.0951
POWER LAW n	.6057
DEPTH	3533.53 m (12,086')
VERTICAL DEPTH	3533.19 m
DEPTH OF RETURNS	3573.76 m
CUTTINGS BULK DENSITY	2.50 spc grv
MUD DENSITY	9.80 lb/gal
ACTIVE SURFACE MUD VOLUME	545 bbl
FLOW RATE	595 gal/min
BOOSTER FLOW	0 gal/min
PUMP PRESSURE	3300 psi
PUMP gal/stk	4.96 gal/stk
BIT NOZZLES	14, 14, 14

CALCULATED RESULTS:

FROM m	TO m	LENGTH m	ANNULUS/PIPE in	ANN VELO. ft/min	CRIT VELO ft/min	FLOW REGIME	PRESS LOSS psi
0.00	104.55	104.55	13.750/ 5.000	44.7	247.9	LAMINAR	.3
104.55	1551.4	1546.9	12.347/ 5.000	114.4	323.6	LAMINAR	25.9
1551.4	3369.9	1713.5	12.250/ 5.000	116.6	330.5	LAMINAR	29.7
3369.6	3537.2	167.38	12.250/ 5.000	116.6	330.5	LAMINAR	2.9
3537.2	3683.6	146.35	12.250/ 8.000	169.5	419.6	LAMINAR	7.4

Annulus Diam	Pipe		
	j.d.	o.d.	i.d.
13.750	6.375	5.000	4.276
12.347	6.375	5.000	4.276
12.250	6.375	5.000	4.275
12.250	6.375	5.000	3.000
12.250	8.000	3.000	2.375

MUD HYDROSTATIC	9.77 lb/gal
FLOW CONTRIBUTION	.11 lb/gal
CUTTINGS CONTRIBUTION	.06 lb/gal
EQUIVALENT CIRCULATING DENSITY	9.94 lb/gal

SURFACE PRESSURE LOSS	44 psi	NOZZLE VELOCITY	423.3 ft/sec
PIPEBORE PRESSURE LOSS	1502 psi	HYDRAULIC POWER	544.2 hp
ANNULAR PRESSURE LOSS	66 psi	JET IMPACT FORCE	1277.5 lbs
BIT PRESSURE LOSS	1563 psi	% OF PRESS LOSS AT BIT	49
TOTAL CALC. PRESS LOSS	3130 psi		

VOLUMES:	gal	bbl	Strokes	Minutes @ 120 s.p.m.
1) Pipe Capacity	8611	205	1736	14.5
2) Pipe Displacement	4343	115	976	8.1
3) Total Annulus	63560	1513	12315	106.8 ← LAG
4) Mud in active pits	22373	545	4612	38.4
Circulation (1) + (3)	72171	1713	14551	121.3
Hole Volume (1)+(2)+(3)	77014	1834	15527	129.4
Total Mud Circulation	95044	2263	19162	159.7
HOLE OUT OF GAUGE:				
CIRCULATION CORRECTION FACTOR = 1.0631				
Corrected Annulus	68116	1622	13733	114.5 ← LAG
Corrected Hole	81569	1942	16445	137.1

