

NB#17: 3357m: Hydraulics for 2+1
 jets. 18 Oct. '85.

HYDRAULICS CALCULATIONS

PLASTIC VISCOSITY 31.00 cP
 YIELD POINT 27.00 lb/cft²
 POWER LAW k 1.2820
 POWER LAW n .6178
 DEPTH 3357.40 m (11,016')
 VERTICAL DEPTH 3357.00 m
 DEPTH OF RETURNS 3352.40 m
 CUTTINGS BULK DENSITY 2.50 spc grv
 MUD DENSITY 9.60 lb/gal
 ACTIVE SURFACE MUD VOLUME 388 bbl
 FLOW RATE 470 gal/min
 BOOSTER FLOW 0 gal/min
 PUMP PRESSURE 2900 psi
 PUMP gal/stk 4.96 gal/stk
 BIT NOZZLES 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	18.750/ 5.000	35.3	289.4	LAMINAR	.3
104.55	1651.4	1546.9	12.347/ 5.000	90.4	386.7	LAMINAR	27.3
1651.4	3043.7	1392.3	12.250/ 5.000	92.1	389.0	LAMINAR	25.4
3043.4	3211.1	167.38	12.250/ 5.000	92.1	389.0	LAMINAR	3.1
3210.8	3357.4	146.35	12.250/ 8.000	133.8	497.2	LAMINAR	7.8

MUD HYDROSTATIC 9.59 lb/gal
 FLOW CONTRIBUTION .11 lb/gal
 CUTTINGS CONTRIBUTION .03 lb/gal
 EQUIVALENT CIRCULATING DENSITY 9.73 lb/gal

SURFACE PRESSURE LOSS 28 psi NOZZLE VELOCITY 501.4 ft/sec
 PIPEBORE PRESSURE LOSS 1021 psi HYDRAULIC POWER 590.6 hp
 ANNULAR PRESSURE LOSS 64 psi JET IMPACT FORCE 1170.4 lbs
 BIT PRESSURE LOSS 2154 psi % OF PRESS LOSS AT BIT 66
 TOTAL CALC. PRESS LOSS 3267 psi

VOLUMES:	gal	bbl	Strokes	Minutes @ 95 s.p.m.
1) Pipe Capacity	7812	186	1575	16.6
2) Pipe Displacement	4516	108	911	9.6
3) Total Annulus	58134	1384	11720	123.7 ← LAG
4) Mud in active pits	16279	388	3282	34.6
Circulation (1) + (3)	65946	1570	13296	140.4
Hole Volume (1)+(2)+(3)	70462	1678	14206	150.0
Total Mud Circulation	82225	1958	16578	175.0
HOLE OUT OF GAUGE:				
CIRCULATION CORRECTION FACTOR =	1.0990			
Corrected Annulus	64664	1540	13037	137.6 ← LAG
Corrected Hole	76993	1833	15523	163.9