GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-917	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 274.9 ft (NAVD88)	NORTHING 3,910,161 US ft (NAD83)	EASTING 11,686,029 US ft (NAD83)
TOTAL DEPTH 150.8 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson
DATE STARTED 9/25/06	COMPLETED 9/29/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

0 HR.	8.3	
24 HR.	8.7	
HAMMER TYPE 140 lbs Auto		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 20 40 60 80 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
274.9					Ground Surface				274.9 — 0.0
273.5	1.4								Sandy SILT (ML), yellowish brown (10YR 4/6), moist, very soft, to Silty, medium to coarse SAND (SM), dark gray (10YR 4/1) and yellowish brown (10YR 4/6), moist, medium dense (FILL)
271.1	3.8	3	1	1	2	917-1			270.5 — 4.4
268.6	6.3	25	8	7	15	917-2			Silty, fine to coarse SAND (SM), brownish yellow (10YR 6/8) to yellowish brown (10YR 5/8 and 5/4), moist to wet, medium dense to loose, trace clay (Residual Soil)
266.2	8.7	2	3	2	5	917-3			
263.3	11.6	2	2	3	5	917-4			
261.4	13.5	2	3	4	7	917-5			
256.6	18.3	2	4	4	8	917-6			
251.3	23.6	4	4	3	7	917-7			
246.3	28.6	3	4	4	8	917-8			248.9 — 26.0
241.4	33.5	6	8	9	17	917-9			Silty, fine to coarse SAND (SM), Brownish yellow (10YR 6/6), olive yellow (2.5Y 6/6), and light olive brown (2.5Y 5/4), moist, medium dense to very dense (Residual Soil)
236.4	38.5	8	9	9	18	917-10			
231.4	43.5	9	13	14	27	917-11			
226.4	48.5	10	12	12	24	917-12			
221.4	53.5	9	16	23	39	917-13			
216.4	58.5	18	28	31	59	917-14			217.9 — 57.0
211.4	63.5	43	50/0.3			917-15			Weathered Rock: Light olive brown (2.5Y 5/4), brown (10YR 4/3), olive yellow (2.5Y 6/6), light yellowish brown (2.5Y 6/4), and brownish yellow (10YR 6/8), moist, very dense, weathered, BIOTITE QUARTZ GNEISS
206.4	68.5	39	50/0.2			917-16			
201.4	73.5	50/0.4				917-17			
		50/0.2				917-18			

NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07

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TOTAL DEPTH 150.8 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson
DATE STARTED 9/25/06	COMPLETED 9/29/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	8.3
24 HR.	8.7

HAMMER TYPE 140 lbs Auto

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
200.0					Continued from previous page				
196.4	78.5	50/0.2				917-19			Weathered Rock: Light olive brown (2.5Y 5/4), brown (10YR 4/3), olive yellow (2.5Y 6/6), light yellowish brown (2.5Y 6/4), and brownish yellow (10YR 6/8), moist, very dense, weathered, BIOTITE QUARTZ GNEISS *(continued)*
191.4	83.5	50/0.3				917-20			
187.4	87.5	50/0.3				917-21			187.1 — 87.8
									Hard Rock: Brownish gray, moderately weathered, very close to close fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS
									178.8 — 96.1
									Hard Rock: Light gray, fresh, very close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS

GEOTECHNICAL BORING LOG

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DATE STARTED 9/25/06	COMPLETED 9/29/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	8.3
24 HR.	8.7

HAMMER TYPE 140 lbs Auto

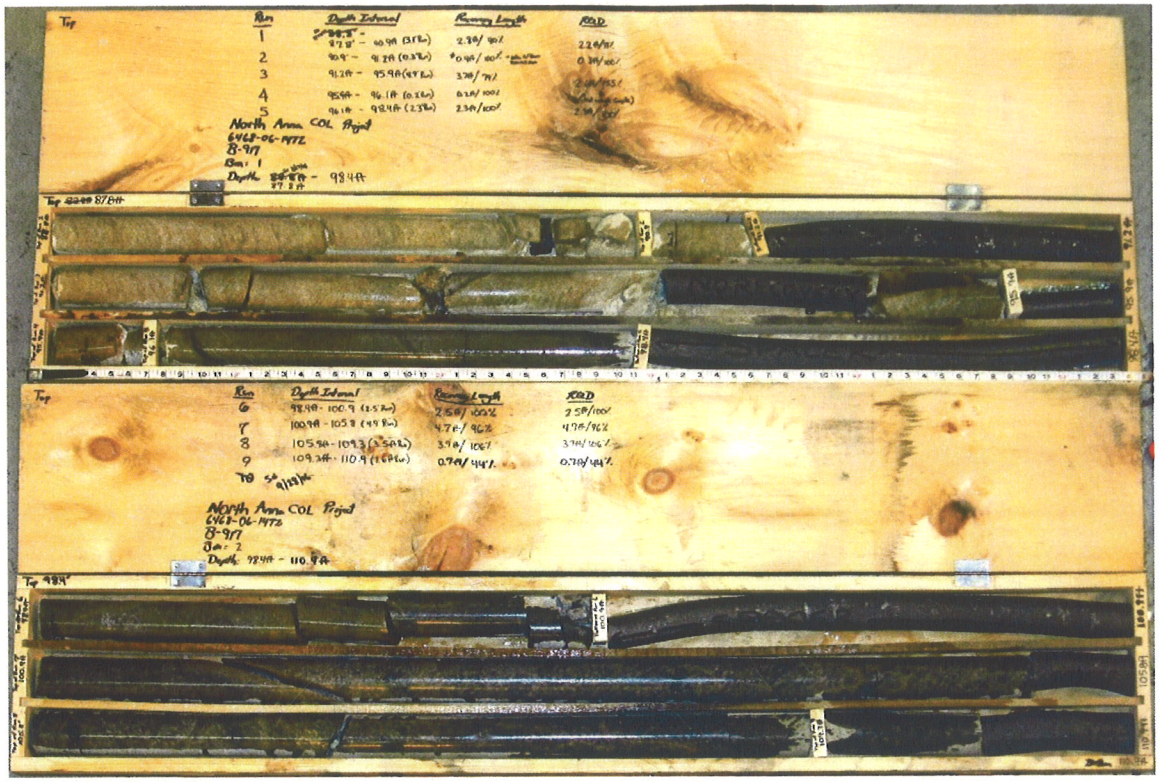
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
125.2					Continued from previous page				
									124.1 — 150.8 Boring and coring terminated at 150.8 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS

GEOTECHNICAL CORING LOG

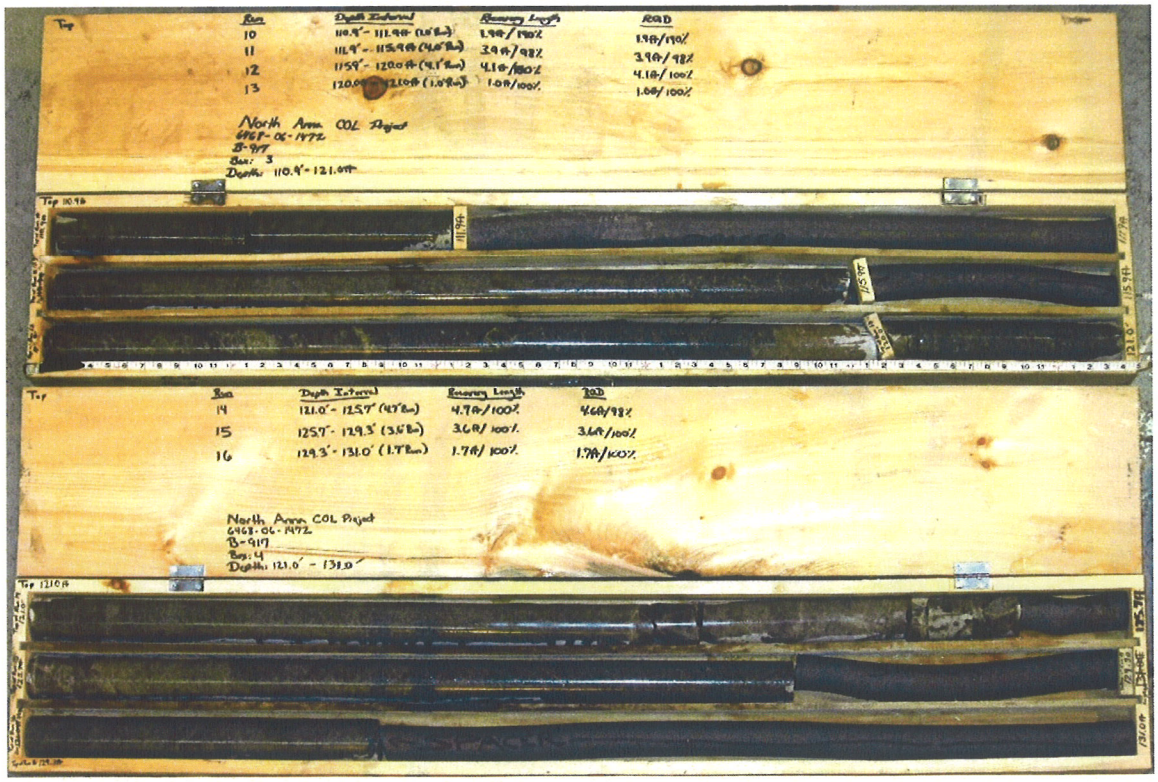
MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S. Nicely	
SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-917	DRILL METHOD: Mud Rotary/Core	SAMPLE METHODS: SPT/CORE	0 HR. 8.3
COLLAR ELEV. 274.9 ft (NAVD88)	NORTHING 3,910,161 US ft (NAD83)	EASTING 11,686,029 US ft (NAD83)	24 HR. 8.7
TOTAL DEPTH 150.8 ft	DRILL MACHINE CME 55 Truck	DRILLER: H. Meyerson	HAMMER TYPE 140 lbs Auto
DATE STARTED 9/25/06	COMPLETED 9/29/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	
CORE SIZE HQ3	TOTAL RUN 63.0 ft		

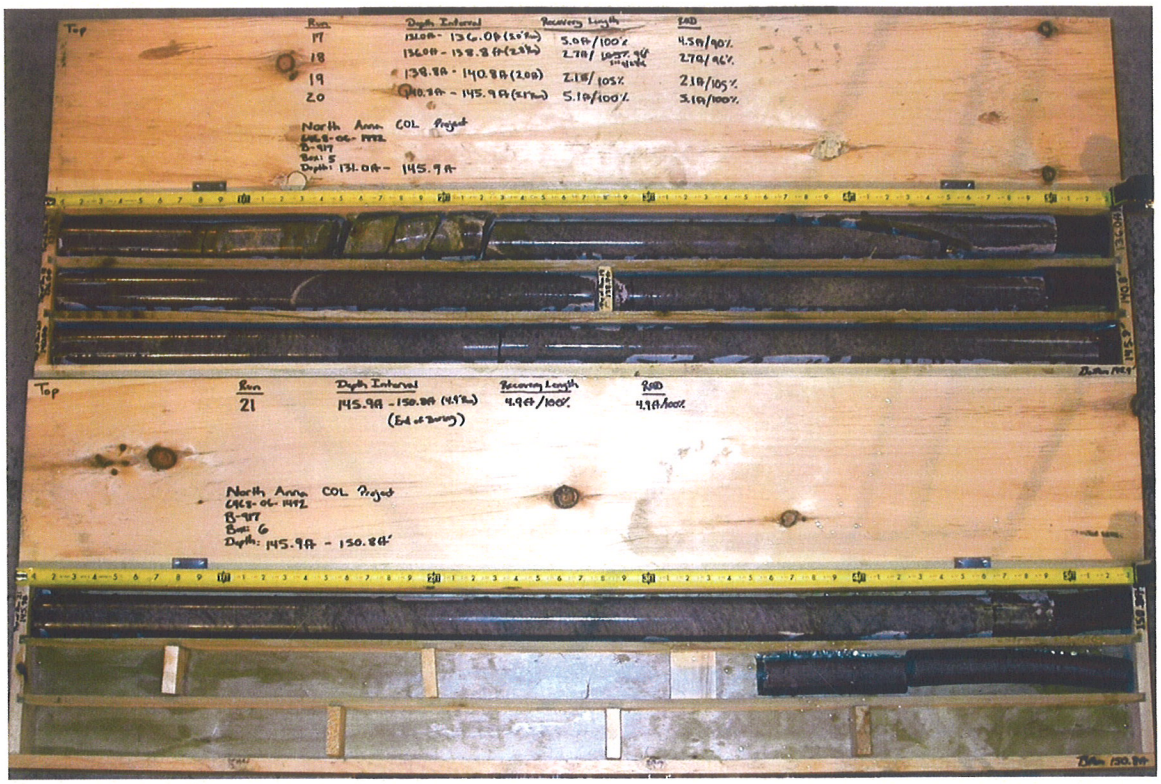
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 87.8 ft
187.1	87.8	3.1	2:53 2:46 2:56	(2.8) 90%	(2.2) 71%	1				187.1 / 87.8 Hard Rock: Brownish gray, moderately weathered, very close to close fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS (1 joint at 20° with Fe and Mn stain; 1 joint at 45° with Fe stain) (1 joint at 90°) -Highly fractured zones from 91.3-91.9 ft, 93.0-93.2 ft, and 94.3-95.3 ft
184.0	90.9									
183.7	91.2	0.3	2:50/0.1 0:12/0.3	(0.4) 133%	(0.3) 100%	2				
		4.7	2:15 1:43 0:57 2:46/1.7	(3.7) 79%	(2.6) 55%	3				
179.0	95.9									178.8 / 96.1
178.8	96.1	0.2	0:29/0.2	(0.2) 100%	(NA)	4				Hard Rock: Light gray, fresh, very close to very wide fracturing, very hard, BIOTITE-QUARTZ GNEISS -No Joints -No Joints (1 joint at 65°)
176.5	98.4	2.3	4:55 11:05	(2.3) 100%	(2.3) 100%	5				
		2.5	15:23/0.3 0:37/0.5	(2.5) 100%	(2.5) 100%	6				
174.0	100.9									
		4.9	8:03 10:48	(4.7) 96%	(4.7) 96%	7				
169.1	105.8		5:15 5:43 5:22 6:49							
		3.5	8:53/0.9	(3.7) 106%	(3.7) 106%	8				-No Joints
165.6	109.3		7:03 7:46 13:35							
164.0	110.9	1.6	16:31/0.5	(0.7) 44%	(0.7) 44%	9				-No Joints
163.0	111.9	1.0	13:13/0.6 17:48	(1.9) 190%	(1.9) 190%	10				-No Joints
		4.0	3:49 3:21 4:34	(3.9) 98%	(3.9) 98%	11				-No Joints
159.0	115.9		4:57 5:24							
		4.1	5:14 6:04 7:44	(4.1) 100%	(4.1) 100%	12				(1 joint at 25° with Fe stain)
154.9	120.0		11:23/1.1							
153.9	121.0	1.0	4:26	(1.0) 100%	(1.0) 100%	13				-No Joints (2 joints at 10-15°; Quartz vein from 123.9-125.7 ft
		4.7	4:47 4:25 4:43 8:23	(4.7) 100%	(4.6) 98%	14				
149.2	125.7		14:51/0.7							
		3.6	7:37 8:44 11:05	(3.6) 100%	(3.6) 100%	15				-No Joints; Quartz vein cont. from 125.7-126.0 ft
145.6	129.3		11:39/0.6							
143.9	131.0	1.7	1:53/0.4 4:37	(1.7) 100%	(1.7) 100%	16				-No Joints
		5.0	1:05/0.3 5:54 5:19 4:31 4:47	(5.0) 100%	(4.5) 90%	17				(2 joints at 70-75° with Fe staining; 5 joints at 20-30° with Fe stain, slightly weathered)
138.9	136.0									
		2.8	6:06 6:17 8:41	(2.7) 96%	(2.7) 96%	18				-No Joints
136.1	138.8		12:56/0.8							
		2.0	0:25/0.2 8:56	(2.1) 105%	(2.1) 105%	19				-No Joints
134.1	140.8									
		5.1	11:37/0.8 4:19 4:22 4:36 5:23	(5.1) 100%	(5.1) 100%	20				-No Joints
129.0	145.9									
		4.9	8:46 1:29/0.1 5:07 4:48 7:06	(4.9) 100%	(4.9) 100%	21				-No Joints
124.1	150.8		6:21 9:07/0.9							124.1 / 150.8
										Coring terminated at 150.8 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS



B-917 – Box 1
B-917 – Box 2



B-917 – Box 3
B-917 – Box 4



B-917 – Box 5
B-917 – Box 6