GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Howard	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-906	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 6.0
COLLAR ELEV. 311.7 ft (NAVD88)	**NORTHING** 3,909,670 US ft (NAD83)	**EASTING** 11,685,795 US ft (NAD83)	**24 HR.** 28.8
TOTAL DEPTH 150.5 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/19/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	

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
311.7					Ground Surface				311.7 0.0
310.2	1.5								Clayey SAND (SC), strong brown (7.5YR 5/8), dry, medium dense (Residual Soil)
308.2	3.5	4	6	10	16	906-1			308.7 3.0
305.7	6.0	7	11	13	24	906-2			Silty SAND (SM), reddish yellow (7.5YR 7/6, 7.5YR 7/8, 7.5YR 6/8), pinkish white (7.5YR 8/2), pink (7.5YR 7/4), pinkish gray (7.5YR 7/2), and light gray (7.5YR 7/1), dry to moist, medium dense to very dense, saprolitic (Residual Soil)
303.2	8.5	8	9	10	19	906-3			
300.7	11.0	6	8	10	18	906-4			
298.2	13.5	6	8	16	24	906-5			
292.8	18.9	3	6	8	14	906-6			
287.8	23.9	5	7	8	15	906-7			
282.8	28.9	5	6	6	12	906-8			
277.8	33.9	16	20	37	57	906-9			
272.8	38.9	13	37	50/0.3		906-10			276.8 34.9 Weathered Rock: Orange brown, BIOTITE GNEISS
		50/0.1				906-11			272.7 39.0 Hard Rock: Tan gray, gray brown, and gray orange, moderately to slightly weathered, very close to moderately close fracturing, moderately hard to hard, BIOTITE GNEISS
									242.9 68.8 Hard Rock: Tan gray, moderately to slightly weathered, very close to close fracturing, moderately hard, QUARTZ GNEISS
									238.7 73.0
									236.8 74.9

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

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236.9					Continued from previous page				
234.4	77.3								Weathered Rock: Tan gray, severely weathered Quartz GNEISS (partial recovery) *(continued)*
									Hard Rock: Gray, moderately weathered, close fracturing, moderately hard, QUARTZ GNEISS
227.0	84.7								Weathered Rock: Brown gray, severely weathered, QUARTZ GNEISS (partial recovery)
225.7	86.0								Hard Rock: Brown gray, moderately severe to moderately weathered, very close to close fracturing, medium hard, QUARTZ GNEISS
222.9	88.8								Weathered Rock: Brown gray, severely weathered, QUARTZ GNEISS (partial recovery)
									Hard Rock: Gray, gray brown, blue gray, and pink, moderately to very slightly weathered, close to moderately close fracturing, medium hard to hard, BIOTITE GNEISS
181.7	130.0								Weathered Rock: Severely weathered, BIOTITE GNEISS (partial recovery)
178.5	133.2								Hard Rock: Blue gray, slightly weathered to fresh, close to moderately close fracturing, hard to very hard, BIOTITE GNEISS

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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
162.1					Continued from previous page				
									161.2 — 150.5 Boring and coring terminated at 150.5 ft in Hard Rock: Very hard, BIOTITE GNEISS

GEOTECHNICAL CORING LOG

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SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**	
BORING NO. B-906	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 6.0
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TOTAL DEPTH 150.5 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/19/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 111.5 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 @ 39.0 ft
272.7	39.0	1.5	4:30/1.5	(1.0) 67%	(0.0) 0%	1				272.7 Hard Rock: Tan gray, gray brown, and gray orange, moderately to slightly weathered, very close to moderately close fracturing, moderately hard to hard, BIOTITE GNEISS -Weathered zones (2 joints at 70° with weathering) 39.0
271.2	40.5	5.0	1:30 1:30 1:30 2:15 2:00	(3.0) 60%	(2.2) 44%	2				
266.2	45.5	5.0	1:45 2:00 2:15 2:00 2:00	(4.3) 86%	(2.6) 52%	3				(2 joints at 60°, 4 joints at 80-85° with weathering)
261.2	50.5	5.0	2:00 2:00 2:00 2:00 2:00	(4.7) 94%	(3.6) 72%	4				(4 joints at 50-60°, 4 joints at 70-80°)
256.2	55.5	5.0	1:45 2:00 2:15 2:00 2:00	(4.5) 90%	(2.5) 50%	5				(2 joints at 60-70°, 3 joints at 50°)
251.2	60.5	5.0	2:00 2:00 3:15 2:45 3:15	(5.0) 100%	(4.8) 96%	6				(8 joints at 30-40°)
246.2	65.5	3.3	3:15 4:15 3:45 2:15/0.3	(3.3) 100%	(2.0) 61%	7				242.9 68.8
242.9	68.8	6.1	4:15/0.8 5:00 4:45 3:00 2:45 8:45/1.3	(4.6) 75%	(2.0) 33%	8				Hard Rock: Tan gray, moderately to slightly weathered, very close to close fracturing, moderately hard, QUARTZ GNEISS 238.7 73.0
236.8	74.9	5.8	3:45 3:00 3:00 2:00 4:15/1.8	(3.2) 55%	(1.5) 26%	9				236.8 Weathered Rock: Tan gray, severely weathered Quartz GNEISS (partial recovery) 74.9 234.4 Hard Rock: Gray, moderately weathered, close fracturing, moderately hard, QUARTZ GNEISS (6 joints at 40°, 1 joint at 80°) 77.3
231.0	80.7	5.0	2:45 3:00 6:15 4:30 2:45	(2.0) 40%	(0.0) 0%	10				Weathered Rock: Brown gray, severely weathered, QUARTZ GNEISS (partial recovery) 227.0 84.7
226.0	85.7	5.0	2:45 3:15 3:00 4:15 8:00	(2.3) 46%	(1.2) 24%	11				225.7 Hard Rock: Brown gray, moderately severe to moderately weathered, very close to close fracturing, medium hard, QUARTZ GNEISS (4 joints at 30°) 86.0 222.9 Weathered Rock: Brown gray, severely weathered, QUARTZ GNEISS (partial recovery) 88.8
221.0	90.7	4.9	5:00 3:30 3:30 3:15 4:11/0.9	(4.3) 88%	(3.8) 78%	12				Hard Rock: Gray, gray brown, blue gray, and pink, moderately to very slightly weathered, close to moderately close fracturing, medium hard to hard, BIOTITE GNEISS (5 joints at 30-40°)
216.1	95.6	4.4	4:15 2:15 2:15 2:00 1:30/0.4	(4.4) 100%	(3.9) 89%	13				(2 joints at 80°, 1 joint at 20°)
211.7	100.0	5.5	2:30 3:30 3:15 3:00 4:00/1.5	(5.5) 100%	(4.7) 85%	14				(4 joints at 30-40°, 2 joints at 50°)
206.2	105.5	5.0	2:30 2:15 2:15 3:00 2:30	(5.0) 100%	(4.2) 84%	15				(3 joints at 30-40°, 1 joint at 85°; trace epidote)
201.2	110.5	5.0	3:00 3:15 2:45	(4.9) 98%	(4.1) 82%	16				

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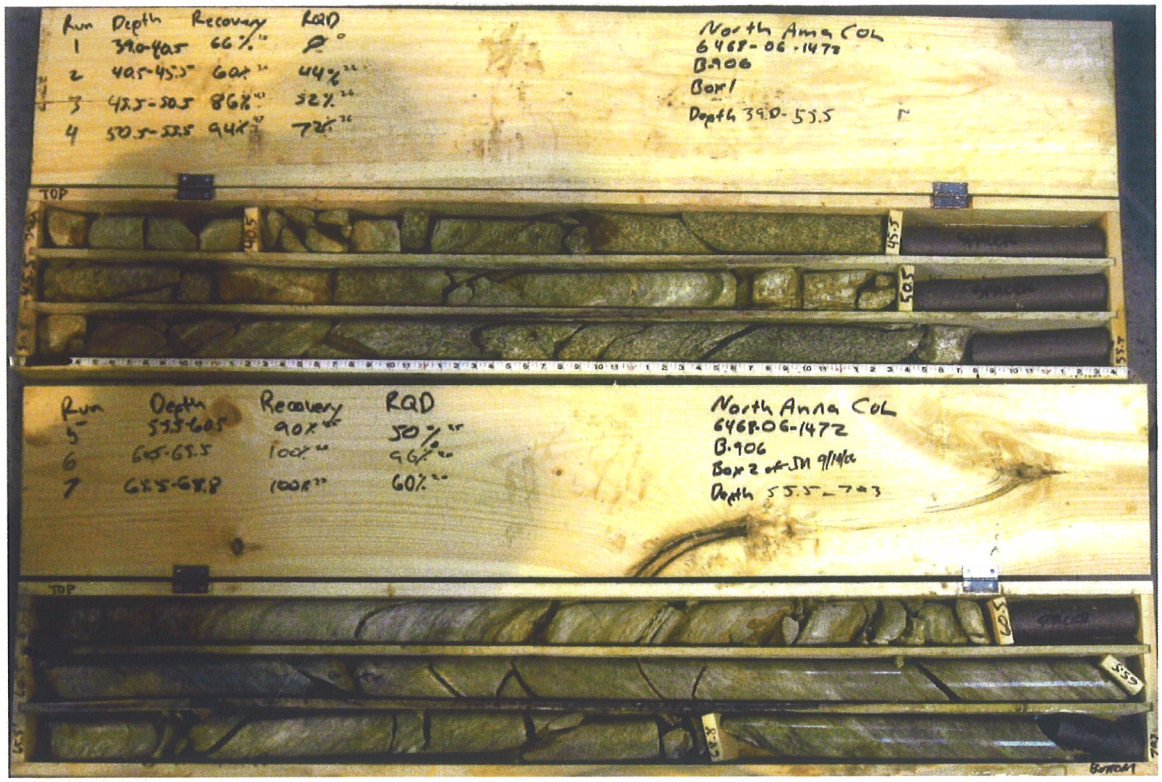
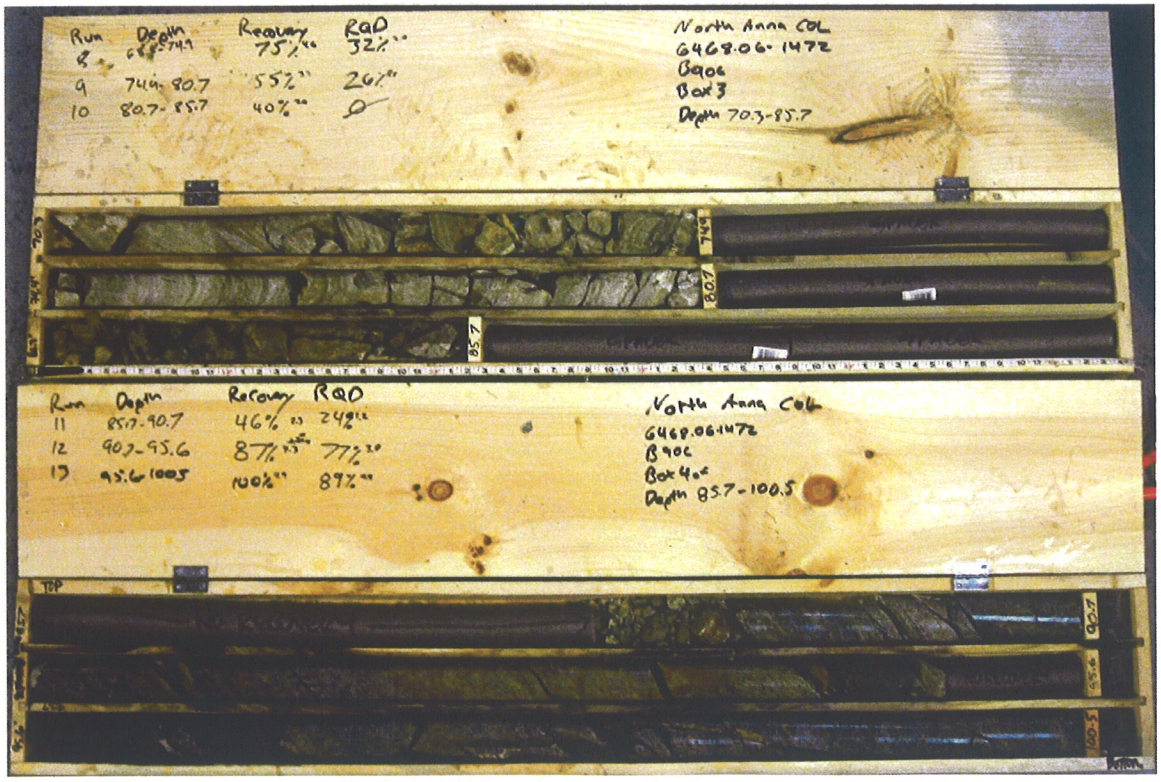
CORE SIZE HQ3	**TOTAL RUN** 111.5 ft		

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
										Continued from previous page
196.2	115.5		3:00 4:00							Hard Rock: Gray, gray brown, blue gray, and pink, moderately to very slightly weathered, close to moderately close fracturing, medium hard to hard, BIOTITE GNEISS *(continued)* (7 joints at 40°; trace epidote, quartz veins)
191.2	120.5	5.0	2:30 3:15 3:15 3:30 5:00	(5.0) 100%	(4.5) 90%	17				
186.2	125.5	5.0	3:00 3:45 4:30 4:00 6:30	(5.0) 100%	(4.1) 82%	18				(7 joints at 30-40°)
181.2	130.5	5.0	3:30 2:30 3:30 3:30 3:30	(4.5) 90%	(3.6) 72%	19				(4 joints at 50°)
										181.7 130.0
176.2	135.5	5.0	3:00 3:45 6:45 5:00 6:30	(4.6) 92%	(2.9) 58%	20				Weathered Rock: Severely weathered, BIOTITE GNEISS (partial recovery) (1 joint at 60°) 178.5 133.2
171.2	140.5	5.0	10:15 9:30 8:45 7:00 10:30	(5.0) 100%	(5.0) 100%	21				Hard Rock: Blue gray, slightly weathered to fresh, close to moderately close fracturing, hard to very hard, BIOTITE GNEISS (4 joints at 60°)
166.3	145.4	4.9	2:45 3:15 4:30 5:30 7:15	(4.9) 100%	(4.5) 92%	22				(5 joints at 60°, 1 joint at 40°; quartz+feldspar veins)
161.2	150.5	5.1	4:45 5:30 5:45 5:15 7:45/1.1	(5.1) 100%	(5.1) 100%	23				(4 joints at 40°, 1 joint at 20°) 161.2 150.5
										Coring terminated at 150.5 ft in Hard Rock: Very hard, BIOTITE GNEISS



B-906 – Box 1
B-906 – Box 2



B-906 – Box 3
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B-906 – Box 5
B-906 – Box 6

B-906 – Box 7
B-906 – Box 8