GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** S. Lehman	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-912	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 10.1
COLLAR ELEV. 275.1 ft (NAVD88)	**NORTHING** 3,910,022 US ft (NAD83)	**EASTING** 11,686,051 US ft (NAD83)	**24 HR.** 10.6
TOTAL DEPTH 151.8 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** D. White	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 10/23/06	**COMPLETED** 10/25/06	**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
275.1					Ground Surface				275.1 — 0.0
									No samples due to utility clearance operations -soft dig/vac. truck excavation to 8.7 ft
266.0	9.1								266.4 — 8.7
		5	7	5	12	912-1			Silty SAND (SM), light olive brown (2.5Y 5/4) to yellowish brown (10YR 5/6), moist, medium dense to very dense, micaceous, rock fragments (Residual Soil)
263.5	11.6								
		5	6	8	14	912-2			
261.0	14.1								
		14	29	48	77	912-3			
256.0	19.1								255.5 — 19.6
		46	50/0.3			912-4			Weathered Rock: Olive brown, severely weathered, soft, QUARTZ GNEISS
251.0	24.1								
		50/0.4				912-5			
246.0	29.1								245.7 — 29.4
		50/0.3				912-6			244.8 — 30.3
									Hard Rock: White with orange Fe staining, slightly weathered, close fracturing, moderately hard, QUARTZ GNEISS with biotite
									243.3 — 31.8
									Hard Rock: Dark gray with orange Fe staining, moderately severely weathered, close fracturing, medium hard, BIOTITE GNEISS
									Hard Rock: Light to dark gray, slightly weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ-BIOTITE GNEISS
									218.3 — 56.8
									Hard Rock: Light gray, fresh, moderately close to very wide fracturing, hard, QUARTZ GNEISS with biotite and trace magnetite

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

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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
200.3					Continued from previous page				
									Hard Rock: Light gray, fresh, moderately close to very wide fracturing, hard, QUARTZ GNEISS with biotite and trace magnetite *(continued)*
173.3	101.8								Hard Rock: Light gray, fresh, very wide fracturing, hard, QUARTZ-BIOTITE GNEISS
158.3	116.8								Hard Rock: Light gray, slightly weathered to fresh, moderately close to wide fracturing, moderately hard to hard, QUARTZ GNEISS with biotite

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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
125.5					Continued from previous page				
									123.3 — Boring and coring terminated at 151.8 ft in Hard Rock: Hard, QUARTZ GNEISS — 151.8

GEOTECHNICAL CORING LOG

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TOTAL DEPTH 151.8 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** D. White	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 10/23/06	**COMPLETED** 10/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 122.4 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 @ 29.4 ft
245.7	29.4	2.4	2:04 3:32 2:32/0.4	(2.0) 83%	(0.0) 0%	1				245.7 — 29.4 244.8 — 30.3 243.3 — 31.8 Hard Rock: White with orange Fe staining, slightly weathered, close fracturing, moderately hard, QUARTZ GNEISS with biotite (3 joints at 70° Fe stain) Hard Rock: Dark gray with orange Fe staining, moderately severely weathered, close fracturing, medium hard, BIOTITE GNEISS
243.3	31.8	5.0	1:37 2:42 2:26 4:02 2:47	(4.2) 84%	(1.7) 34%	2				Hard Rock: Light to dark gray, slightly weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ-BIOTITE GNEISS (5 joints at 45° slightly to severely weathered, Fe stain) (1 joint at 60°, 1 joint at 45°, 1 joint at 20°-all moderately weathered, Fe stain)
238.3	36.8	5.0	2:25 2:29 2:34 3:42 3:36	(5.0) 100%	(4.4) 88%	UCS-37.1'				
233.3	41.8	5.0	3:20 3:38 3:14 3:20 3:12	(5.0) 100%	(4.7) 94%	4				(3 joints at 30° with Fe stain; 1 joint at 55° moderately weathered)
228.3	46.8	5.0	2:25 2:06 3:28 5:16 5:30	(5.0) 100%	(4.7) 94%	UC-48.9'				(1 joint at 45° moderately weathered with clay, 2 joints at 20° slightly weathered)
223.3	51.8	5.0	7:50 1:43 2:07 1:53 2:06	(5.0) 100%	(4.9) 98%	6				-No Joints
218.3	56.8	5.0	2:23 2:13 2:31 3:38 8:26	(5.0) 100%	(4.9) 98%	7				218.3 — 56.8 Hard Rock: Light gray, fresh, moderately close to very wide fracturing, hard, QUARTZ GNEISS with biotite and trace magnetite (1 joint at 60° moderately weathered, Fe stain)
213.3	61.8	5.0	10:29 6:42 4:37 5:52 8:47	(4.9) 98%	(4.9) 98%	UC-62.2'				-No Joints
208.3	66.8	5.0	4:26 4:43 7:42 16:20 12:14	(5.0) 100%	(5.0) 100%	9				-No Joints
203.3	71.8	5.0	2:16 2:51 3:07 3:44 3:45	(5.0) 100%	(5.0) 100%	10				-No Joints
198.3	76.8	5.0	4:43 4:59 4:46 5:53 5:48	(5.0) 100%	(4.9) 98%	11				(1 joint at 90° with clay; 3 joints at 20° with Fe stain)
193.3	81.8	5.0	4:46 5:02 4:45 5:20 4:52	(5.0) 100%	(4.2) 84%	UC-82.4'				(3 joints at 60° with trace clay, Fe stain)
188.3	86.8	5.0	3:26 3:41 2:59 3:07 2:29	(5.0) 100%	(4.4) 88%	13				(3 joints at 60° slightly weathered, Fe stain; 1 joint at 30° slightly weathered)
183.3	91.8	5.0	2:09 2:26 2:24 2:10 2:18	(5.0) 100%	(5.0) 100%	14				(1 joint at 30° with Fe stain)
178.3	96.8	5.0	2:27 2:34 2:55 3:00 2:43	(5.0) 100%	(5.0) 100%	15				-No Joints; Quartz+feldspar vein at 99.7-99.9 ft
173.3	101.8	5.0	3:02 3:04	(5.0) 100%	(5.0) 100%	16				173.3 — 101.8 Hard Rock: Light gray, fresh, very wide fracturing, hard, QUARTZ-BIOTITE GNEISS

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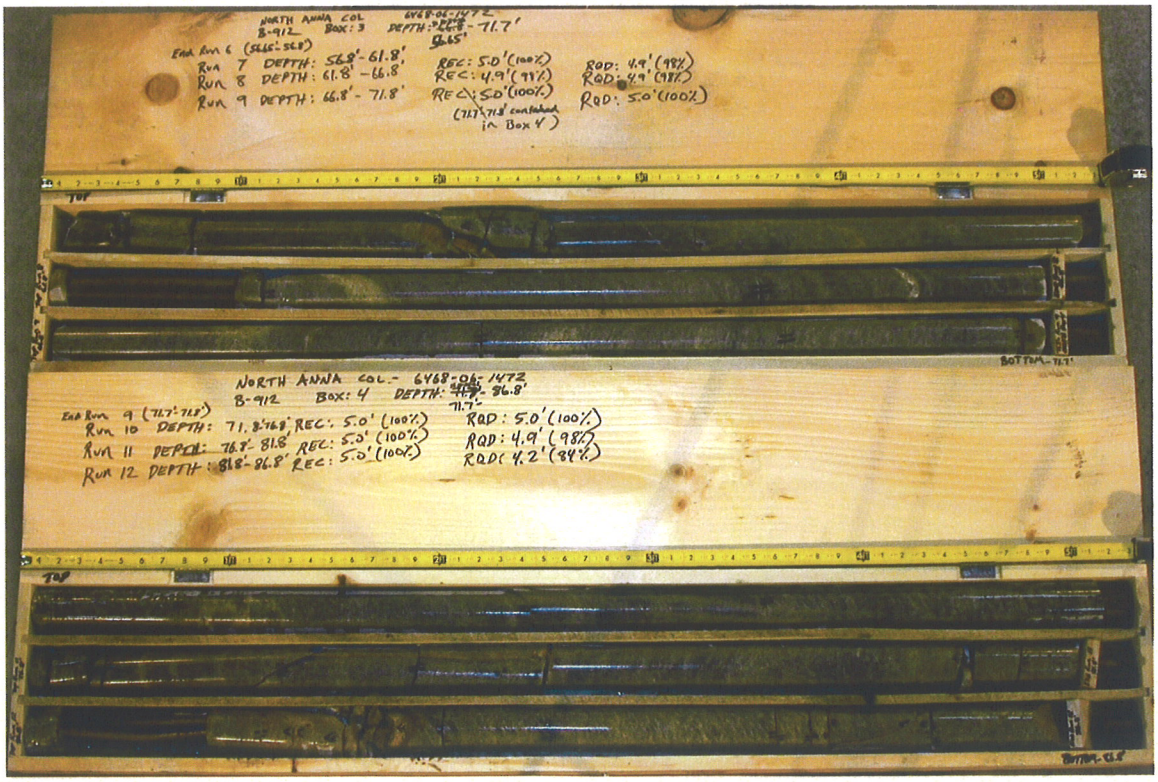
TOTAL DEPTH 151.8 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** D. White	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 10/23/06	**COMPLETED** 10/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 122.4 ft		

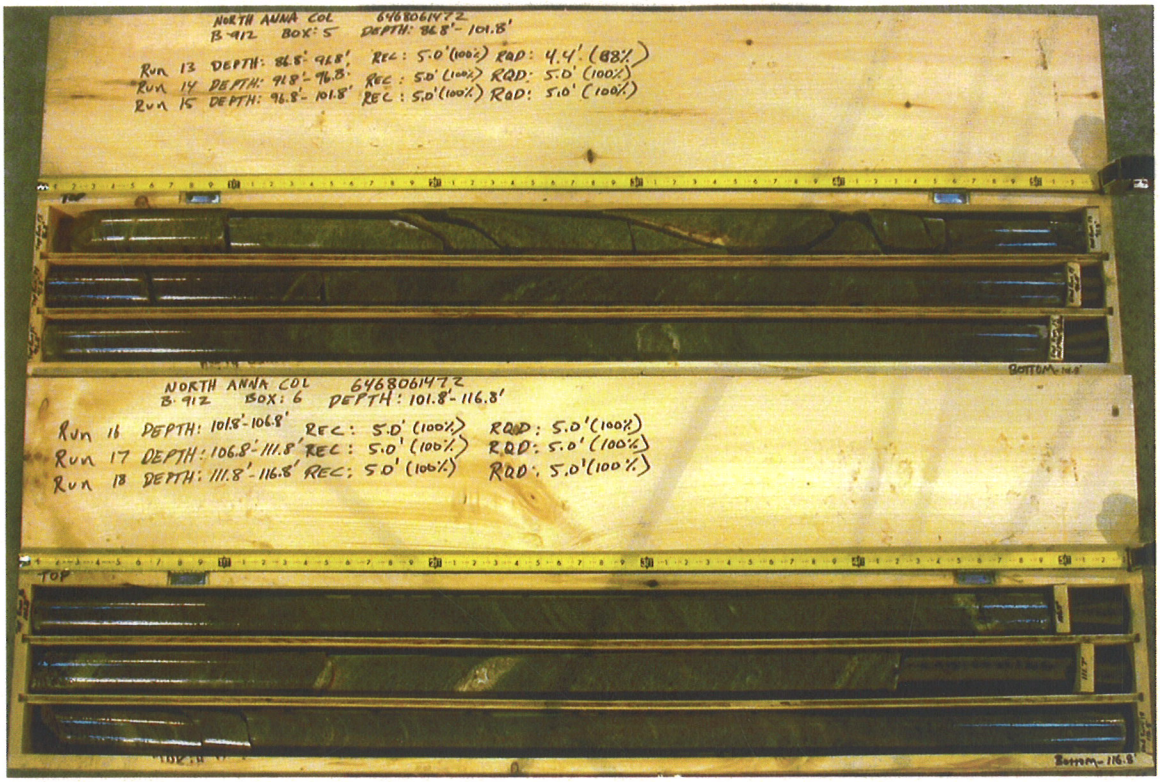
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
			3:33							-No Joints
168.3	106.8		3:56 4:30							Hard Rock: Light gray, fresh, very wide fracturing, hard, QUARTZ-BIOTITE GNEISS *(continued)*
		5.0	4:17	(5.0)	(5.0)	UCS-111.4'				-No Joints; Quartz+feldspar vein at 45° from 108.8-109.1 ft
			4:31	100%	100%					
			4:37							
			5:40							
163.3	111.8		4:44							
		5.0	4:36	(5.0)	(5.0)	18				-No Joints
			4:25	100%	100%					
			4:44							
			4:48							
158.3	116.8		4:20							158.3 116.8
		5.0	4:16	(5.0)	(5.0)	19				Hard Rock: Light gray, slightly weathered to fresh, moderately close to wide fracturing, moderately hard to hard, QUARTZ GNEISS with biotite
			4:13	100%	100%					(4 joints at 20-30° slightly weathered, trace clay, and Fe stain)
			3:39							
			2:21							
153.3	121.8		2:06							
		5.0	2:16	(5.0)	(4.8)	20				(1 joint at 60° with trace clay and Fe stain; 2 joints at 30° moderately weathered)
			4:57	100%	96%					
			2:27							
			2:13							
148.3	126.8		2:18							
		5.0	2:47	(5.0)	(5.0)	21				(4 joints at 50-60° with trace clay; 1 joint at 20° with Fe stain)
			2:12	100%	100%					
			2:57							
			2:47							
143.3	131.8		3:37							
		5.0	3:24	(5.0)	(4.9)	22				(2 joints at 45° and 2 joints at 30° slightly weathered, Fe stain)
			3:24	100%	98%					
			3:47							
			3:08							
138.3	136.8		4:09							
		5.0	4:07	(5.0)	(5.0)	23				(2 joints at 30° slightly weathered, Fe stain; 1 joint at 80-90° with clay and Fe stain; Quartz+feldspar veins at 136.7-137.1 ft and 137.9-138.8 ft)
			4:04	100%	100%					
			4:40							
			4:36							
133.3	141.8		3:52							
		5.0	2:57	(5.0)	(4.8)	UC-143.9'				(3 joints at 50° slightly weathered, Fe stain)
			3:02	100%	96%					
			3:03							
			2:41							
128.3	146.8		2:51							
		5.0	2:29	(5.0)	(5.0)	25				-No Joints
			3:03	100%	100%					
			4:04							
			4:48							
123.3	151.8		5:26							123.3 151.8
										Coring terminated at 151.8 ft in Hard Rock: Hard, QUARTZ GNEISS

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

B-912 – Box 1
B-912 – Box 2

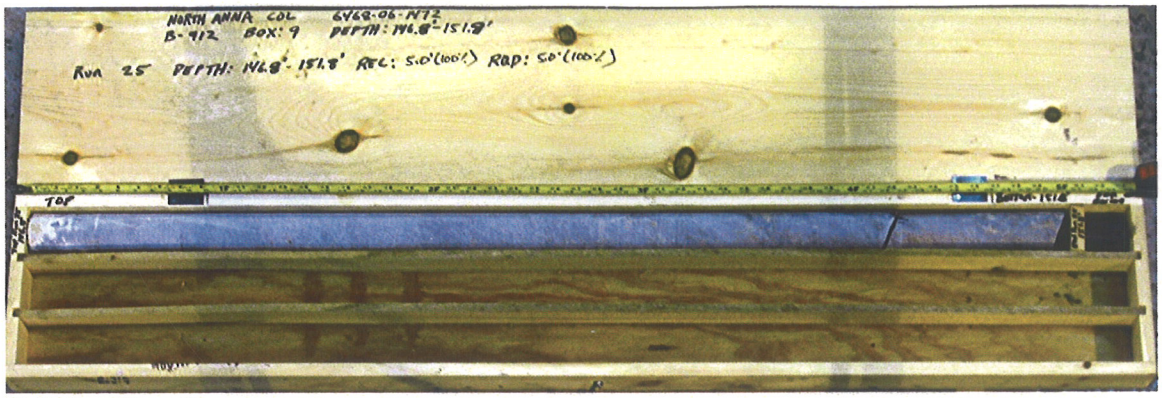


B-912 – Box 3
B-912 – Box 4



B-912 – Box 5
B-912 – Box 6

B-912 – Box 8
B-912 – Box 7


NORTH ANNA COL 6468-06-1472
B-912 BOX: 9 DEPTH: 146.8'-151.8'
RUN 25 DEPTH: 146.8'-151.8' REC: 5.0'(100%) RQD: 5.0'(100%)
TOP

B-912 – Box 9