



MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST S. Lehman								
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)						
BORING NO. B-943		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. 6.2						
COLLAR ELEV. 300.4 ft (NAVD88)		NORTHING 3,909,355		US ft (NAD83)		EASTING 11,683,892		US ft (NAD83)		24 HR. 4.2						
TOTAL DEPTH 101.9 ft		DRILL MACHINE CME 55LC Track				DRILLER: D. White				HAMMER TYPE 140 lbs Auto						
DATE STARTED 10/16/06			COMPLETED 10/17/06			CORE BARREL TYPE: HQ 3 triple tube-wireline										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100			
300.4					Ground Surface							300.4	0.0			
300.4	0.0	4	5	7							943-1			Sandy SILT (ML) light brownish gray (2.5Y 6/3), brown (7.5YR 4/4), and dark yellowish brown (2.5Y 4/4), moist, stiff and medium stiff to very stiff, trace clay, micaceous, relict rock fabric (Residual Soil)		
296.9	3.5	2	4	5							943-2					
294.4	6.0	2	3	2							943-3					
291.9	8.5	2	3	4							943-4					
289.4	11.0	5	7	14							943-5					
286.9	13.5	4	8	9							943-6					
281.3	19.1	12	50/0.3								943-7			280.8	19.6	Weathered Rock: Light brownish gray (2.5Y 6/2), moist, very dense, severely weathered, QUARTZ GNEISS
276.3	24.1	50/0.0									943-8			276.3	24.1	Hard Rock: Light gray with orange Fe staining, moderately to slightly weathered, moderately hard, QUARTZ GNEISS with biotite
														274.1	26.3	Weathered Rock: No recovery-QUARTZ GNEISS with biotite
														271.2	29.2	Hard Rock: Light gray, slightly weathered, moderately hard, QUARTZ GNEISS with biotite
														268.5	31.9	Weathered Rock: No recovery-QUARTZ GNEISS with biotite
																Hard Rock: Light gray, moderately severe to slightly weathered, close to moderately close fracturing, soft to moderately hard, QUARTZ GNEISS with biotite
														253.7	46.7	Weathered Rock: No recovery-QUARTZ GNEISS with biotite
														250.1	50.3	Hard Rock: Light gray, moderately severe to very slightly weathered, close to moderately close fracturing, medium hard to hard, QUARTZ GNEISS with biotite
														243.5	56.9	Hard Rock: Light gray, slightly weathered to fresh, close to moderately close fracturing, hard, QUARTZ GNEISS with biotite and trace pyrite

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SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)					
BORING NO. B-943		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. 6.2					
COLLAR ELEV. 300.4 ft (NAVD88)		NORTHING 3,909,355		US ft (NAD83)		EASTING 11,683,892		US ft (NAD83)		24 HR. 4.2					
TOTAL DEPTH 101.9 ft		DRILL MACHINE CME 55LC Track				DRILLER: D. White				HAMMER TYPE 140 lbs Auto					
DATE STARTED 10/16/06			COMPLETED 10/17/06			CORE BARREL TYPE: HQ 3 triple tube-wireline									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80					100	
225.6					Continued from previous page										
													223.1	77.3	Weathered Rock: No recovery-BIOTITE GNEISS
													220.1	80.3	Hard Rock: Dark gray, moderately weathered to fresh, close to moderately close fracturing, medium hard to hard, QUARTZ-BIOTITE GNEISS
													198.5	101.9	Boring and coring terminated at 101.9 ft in Hard Rock: Hard, QUARTZ-BIOTITE GNEISS

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SITE DESCRIPTION NORTH ANNA COL									GROUND WATER (ft)	
BORING NO. B-943			DRILL METHOD: Mud Rotary/Core			SAMPLE METHODS: SPT/CORE			0 HR. 6.2	
COLLAR ELEV. 300.4 ft (NAVD88)			NORTHING 3,909,355		US ft (NAD83)		EASTING 11,683,892		US ft (NAD83)	
TOTAL DEPTH 101.9 ft			DRILL MACHINE CME 55LC Track			DRILLER: D. White			HAMMER TYPE 140 lbs Auto	
DATE STARTED 10/16/06			COMPLETED 10/17/06			CORE BARREL TYPE: HQ 3 triple tube-wireline				
CORE SIZE HQ3			TOTAL RUN 77.8 ft							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)		REC. (%)	RQD (%)		
										Begin Coring @ 24.1 ft
276.3	24.1	2.7	N=50/0.0 1:26	(0.9)	(0.0)	1				276.3 Hard Rock: Light gray with orange Fe staining, moderately to slightly weathered, moderately hard, QUARTZ GNEISS with biotite
273.6	26.8		1:48	33%	0%					274.1 Weathered Rock: No recovery-QUARTZ GNEISS with biotite
		5.1	1:36/0.7	(2.4)	(0.0)	2				271.2 Hard Rock: Light gray, slightly weathered, moderately hard, QUARTZ GNEISS with biotite
			2:30	47%	0%					29.2 Weathered Rock: No recovery-QUARTZ GNEISS with biotite
			2:01							
			3:20							
268.5	31.9		2:57							31.9
		5.0	2:12/1.1	(5.0)	(5.0)	3				Hard Rock: Light gray, moderately severe to slightly weathered, close to moderately close fracturing, soft to moderately hard, QUARTZ GNEISS with biotite
			2:10	100%	100%					(2 joints at 70° and 4 joints 45° moderately to slightly weathered with Fe stain)
263.5	36.9		2:35							(2 joints at 60° and 3 joints 45° moderately to slightly weathered with Fe stain)
		5.0	2:18			4				
			2:23							
			2:40							
258.5	41.9		2:49	(5.0)	(5.0)	5				(2 joints at 60° and 3 joints 20° very severely to moderately weathered with Fe stain)
		5.0	2:33	100%	100%					
			2:32							
			2:51							
			2:48							
253.5	46.9		2:01	(4.8)	(3.3)	6				46.7
		5.0	1:56	96%	66%					Weathered Rock: No recovery-QUARTZ GNEISS with biotite
			2:06							
			2:15							
			1:58							
248.5	51.9		3:38	(1.6)	(0.0)	7				50.3
		5.0	2:28	32%	0%					Hard Rock: Light gray, moderately severe to very slightly weathered, close to moderately close fracturing, medium hard to hard, QUARTZ GNEISS with biotite
			2:24							(3 joints at 60° and 5 joints 45° slightly weathered with Fe stain)
			2:20							
			1:52							
243.5	56.9		1:43	(4.6)	(1.4)	8				56.9
		5.0	2:10	92%	28%					Hard Rock: Light gray, slightly weathered to fresh, close to moderately close fracturing, hard, QUARTZ GNEISS with biotite and trace pyrite
			2:01							(4 joints at 60° and 2 joints 45° slightly weathered with Fe stain)
			2:16							
			2:24							
238.5	61.9		2:20	(4.9)	(3.7)	9				
		5.0	2:40	98%	74%					(1 joint at 90° moderately to slightly weathered with Fe stain; 1 joint at 60° with clay and Fe stain; 3 joints at 45° weathered with Fe stain)
			3:57							
			4:10							
			3:19							
233.5	66.9		3:05	(5.0)	(4.8)	10				
		5.0	3:30	100%	96%					(2 joints at 70°, 1 joint at 90°, 3 joints at 30°-all slightly weathered with Fe stain)
			3:15							
			4:00							
			4:14							
228.5	71.9		4:40	(5.0)	(4.3)	11				
		5.0	3:48	100%	86%					(2 joints at 70° and 3 joints 45° slightly weathered with Fe stain)
			3:47							
			3:42							
			3:52							
223.5	76.9		3:05	(5.0)	(5.0)	12				
		5.0	3:28	100%	100%					Weathered Rock: No recovery-BIOTITE GNEISS
			4:36							
			4:28							
			3:34							
218.5	81.9		5:49	(2.0)	(1.6)	13				77.3
		5.0	2:53	40%	32%					Hard Rock: Dark gray, moderately weathered to fresh, close to moderately close fracturing, medium hard to hard, QUARTZ-BIOTITE GNEISS
			4:02							(1 joint at 45°, 3 joints at 20° moderately to slightly weathered with light Fe stain)
			3:27							
			5:14							
213.5	86.9		3:21	(5.0)	(4.7)	14				
		5.0	3:24	100%	94%					(1 joint at 45° and 1 joint at 70° weathered and trace clay)
			2:57							
			2:34							
			2:41							
208.5	91.9		3:37	(4.7)	(4.3)	15				
		5.0	3:03	94%	86%					(1 joint at 60° with clay, moderately severe weathering; 2 joints at 45° moderately weathered)
			2:31							
			2:17							
			2:59							
203.5	96.9		4:24	(4.9)	(4.4)	16				
		5.0	4:21	98%	88%					(1 joint at 20° slightly weathered)
			4:11							
			4:49							
			3:59							
			3:01	(4.9)	(4.7)					
			2:29	98%	94%					

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SITE DESCRIPTION NORTH ANNA COL									GROUND WATER (ft)		
BORING NO. B-943			DRILL METHOD: Mud Rotary/Core			SAMPLE METHODS: SPT/CORE			0 HR. 6.2		
COLLAR ELEV. 300.4 ft (NAVD88)			NORTHING 3,909,355		US ft (NAD83)		EASTING 11,683,892		US ft (NAD83)		24 HR. 4.2
TOTAL DEPTH 101.9 ft		DRILL MACHINE CME 55LC Track			DRILLER: D. White			HAMMER TYPE 140 lbs Auto			
DATE STARTED 10/16/06			COMPLETED 10/17/06			CORE BARREL TYPE: HQ 3 triple tube-wireline					
CORE SIZE HQ3			TOTAL RUN 77.8 ft								
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
			2:49							Continued from previous page	
198.5	101.9		2:46 2:26							Hard Rock: Dark gray, moderately weathered to fresh, close to moderately close fracturing, medium hard to hard, QUARTZ-BIOTITE GNEISS (continued) Coring terminated at 101.9 ft in Hard Rock: Hard, QUARTZ-BIOTITE GNEISS	

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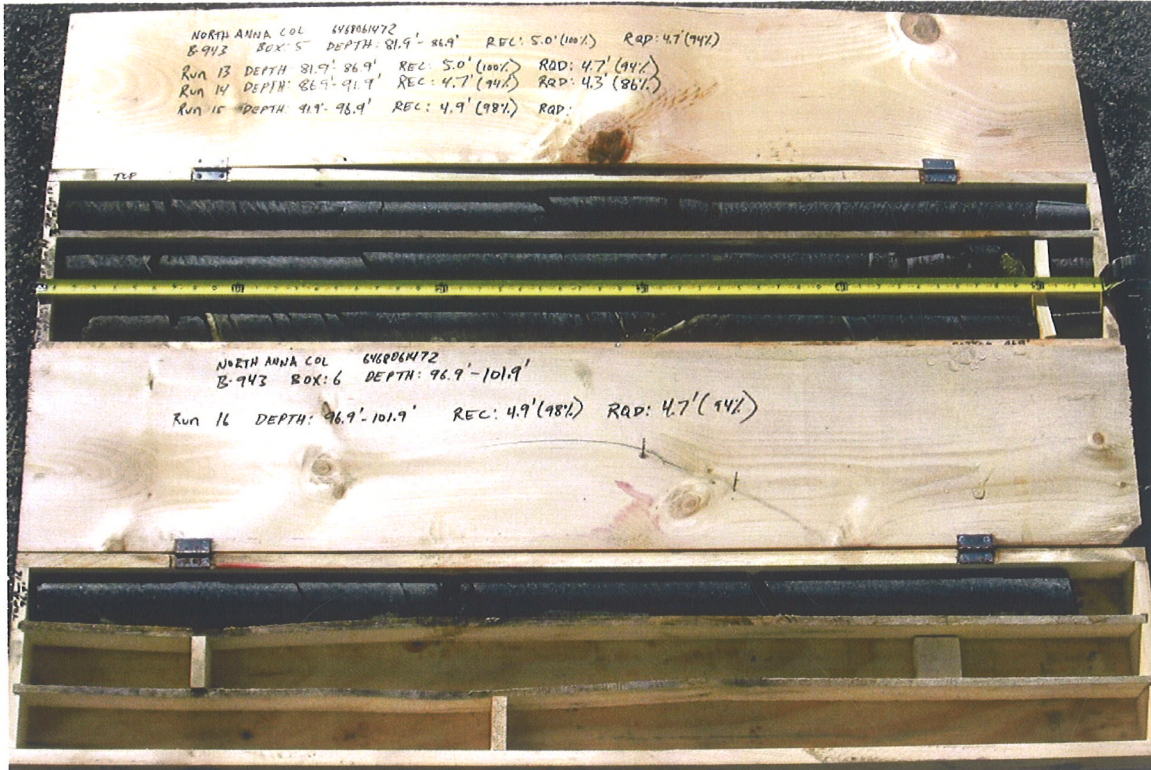
B-943 – Box 1

B-943 – Box 2



B-943 – Box 4

B-943 – Box 3

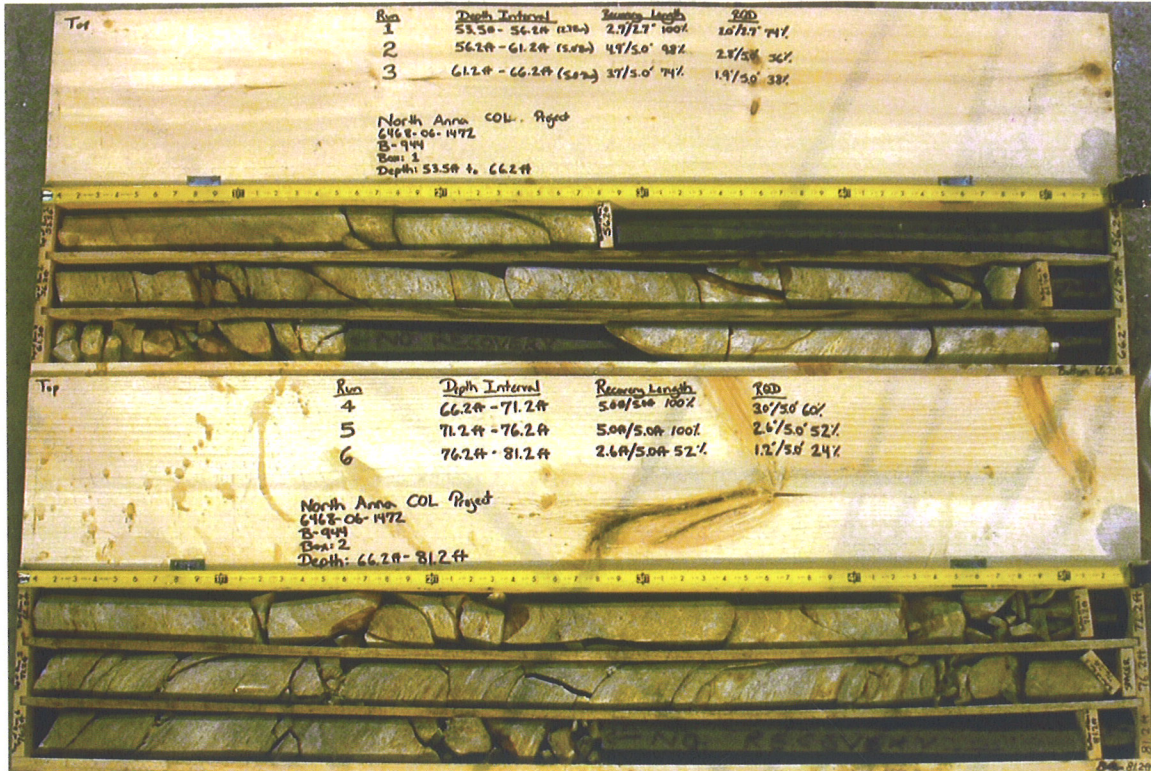


B-943 - Box 5
B-943 - Box 6



MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST S. Nicely							
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)					
BORING NO. B-944		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. 7.1					
COLLAR ELEV. 334.7 ft (NAVD88)		NORTHING 3,908,772		US ft (NAD83)		EASTING 11,684,128		US ft (NAD83)		24 HR. 23.4					
TOTAL DEPTH 86.4 ft		DRILL MACHINE CME 550 ATV				DRILLER: F. Cox (Knoxville 550)				HAMMER TYPE 140 lbs Auto					
DATE STARTED 10/18/06			COMPLETED 10/20/06			CORE BARREL TYPE: HQ 3 triple tube-wireline									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80					100	
259.9					Continued from previous page										
														Hard Rock: Reddish brown and light gray, moderately severe to moderately weathered, very close to moderately close fracturing, soft to very hard, BIOTITE-QUARTZ GNEISS <i>(continued)</i>	
248.5	86.2										944-15		248.3	86.4	Boring and coring terminated at 86.4 ft in Weathered Rock: Soft, severely weathered, BIOTITE-QUARTZ GNEISS

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B-944 - Box 1
B-944 - Box 2



B-944 - Box 3



MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST S. Nicely									
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)							
BORING NO. B-945		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. ND							
COLLAR ELEV. 281.5 ft (NAVD88)		NORTHING 3,910,136		US ft (NAD83)		EASTING 11,683,780		US ft (NAD83)		24 HR. ND							
TOTAL DEPTH 100.6 ft		DRILL MACHINE CME 550 ATV				DRILLER: G. Akins				HAMMER TYPE 140 lbs Auto							
DATE STARTED 10/25/06		COMPLETED 10/26/06				CORE BARREL TYPE: HQ 3 triple tube-wireline											
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80					100			
281.5					Ground Surface								281.5	0.0			
280.0	1.5										945-1				Silty, fine to coarse SAND (SM) pale brown (10YR 6/3), light yellowish brown (10YR 6/4), yellowish brown (10YR 5/8), light olive brown (2.5YR 5/4), and light yellowish brown (2.5YR 6/4), dry to wet, medium dense, micaceous (Residual Soil)		
278.3	3.2	4	7	7							945-2						
275.3	6.2	6	6	7							945-3						
273.2	8.3	6	8	8							945-4						
270.2	11.3	5	7	7							945-5						
267.1	14.4	5	5	8							945-6						
262.1	19.4	5	7	7							945-7						
257.1	24.4	5	6	8							945-8						
252.1	29.4	5	6	8							945-9						
247.1	34.4	5	7	8							945-10						
242.1	39.4	5	7	9							945-11						
237.1	44.4	7	10	13							945-12						
232.1	49.4	8	11	13							945-13						
227.1	54.4	10	15	15							945-14						
222.1	59.4	31	50/0.4								945-15						
		50/0.1															
															228.0	53.5	Weathered Rock: Light yellowish brown (2.5YR 6/4), moist, very dense, severely weathered, BIOTITE-QUARTZ GNEISS
															221.0	60.5	Hard Rock: Light gray, moderately to slightly weathered, very close to close fracturing, medium hard to very hard, BIOTITE-QUARTZ GNEISS
															210.6	70.9	Hard Rock: Light gray, slightly weathered to fresh, very close to wide fracturing, very hard, BIOTITE-QUARTZ GNEISS

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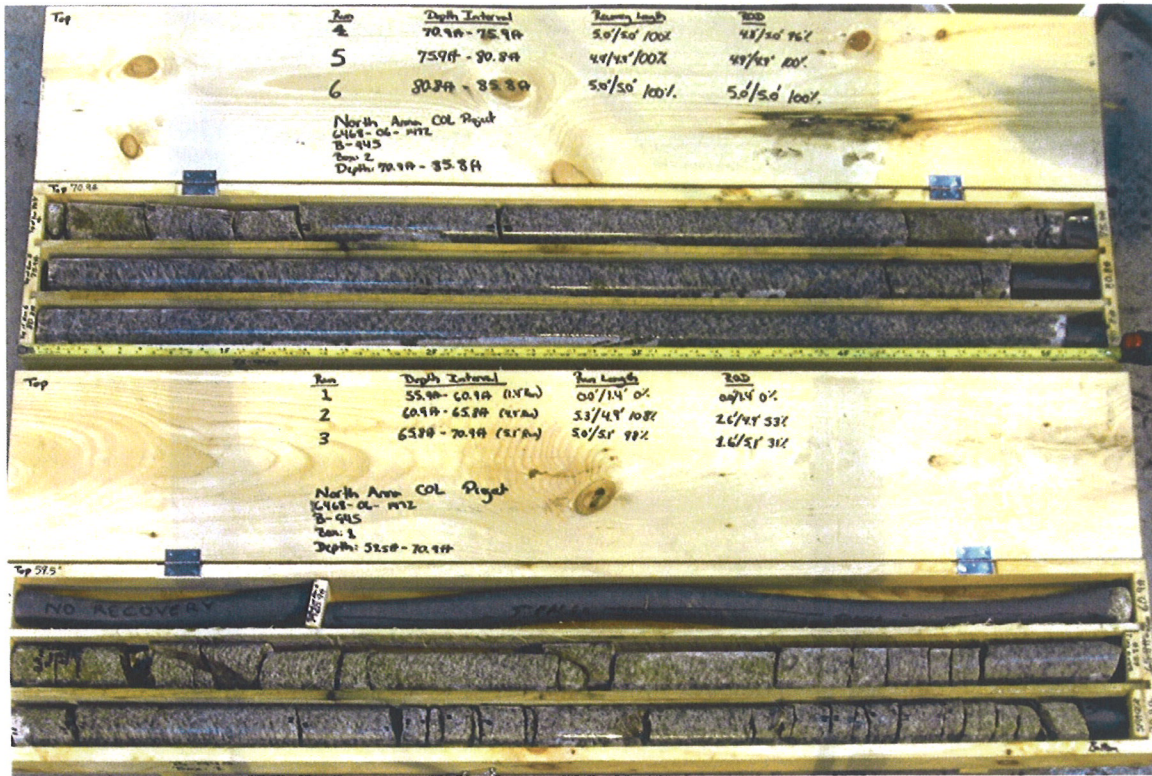
MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST S. Nicely						
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)				
BORING NO. B-945		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. ND				
COLLAR ELEV. 281.5 ft (NAVD88)		NORTHING 3,910,136		US ft (NAD83)		EASTING 11,683,780		US ft (NAD83)		24 HR. ND				
TOTAL DEPTH 100.6 ft		DRILL MACHINE CME 550 ATV				DRILLER: G. Akins				HAMMER TYPE 140 lbs Auto				
DATE STARTED 10/25/06			COMPLETED 10/26/06			CORE BARREL TYPE: HQ 3 triple tube-wireline								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80					100
206.7					Continued from previous page									
													Hard Rock: Light gray, slightly weathered to fresh, very close to wide fracturing, very hard, BIOTITE-QUARTZ GNEISS (continued)	
														Boring and coring terminated at 100.6 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS

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BORING NO. B-945		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. ND	
COLLAR ELEV. 281.5 ft (NAVD88)		NORTHING 3,910,136		US ft (NAD83)		EASTING 11,683,780		US ft (NAD83)		24 HR. ND	
TOTAL DEPTH 100.6 ft		DRILL MACHINE CME 550 ATV				DRILLER: G. Akins				HAMMER TYPE 140 lbs Auto	
DATE STARTED 10/25/06				COMPLETED 10/26/06				CORE BARREL TYPE: HQ 3 triple tube-wireline			
CORE SIZE HQ3				TOTAL RUN 41.1 ft							
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS	
										Begin Coring @ 59.5 ft	
222.0	59.5	1.4	0:44/1.4	(0,0)	(0,0)	1				221.0 Weathered Rock: Light yellowish brown (2.5YR 6/4), moist, very dense, severely weathered, BIOTITE-QUARTZ GNEISS (continued) 60.5	
220.6	60.9	4.9	0:57 0:58 1:04 1:03 1:53/0.9	(5,3) 108%	(2,6) 53%	2				-No Recovery Hard Rock: Light gray, moderately to slightly weathered, very close to close fracturing, medium hard to very hard, BIOTITE-QUARTZ GNEISS (5 joints at 10-20° with Fe staining; 2 joints at 60-70° with little clay and Fe staining) (3 joints at 60-70° with Fe stain; 2 joints at 20° with little Fe stain)	
215.7	65.8	5.1	1:44 1:57 2:27 2:04 1:53/1.1	(5,0) 98%	(1,6) 31%	3					
210.6	70.9	5.0	1:54 2:15 2:25 2:05 2:03	(5,0) 100%	(4,8) 96%	4				210.6 Hard Rock: Light gray, slightly weathered to fresh, very close to wide fracturing, very hard, BIOTITE-QUARTZ GNEISS (2 joints at 70° with Fe and Mn stain) 70.9	
205.6	75.9	4.9	4:52 4:53 5:22 6:23 5:47/0.9	(4,9) 100%	(4,9) 100%	5				-No Joints	
200.7	80.8	5.0	5:36 5:17 3:49 4:33 6:03	(5,0) 100%	(5,0) 100%	6				-No Joints	
195.7	85.8	4.5	6:05 6:02 5:58 8:28 6:28/0.5	(4,5) 100%	(4,5) 100%	7				(1 joint at 15°, 1 joint at 25°)	
191.2	90.3	5.5	2:50 3:55 3:04 4:14 4:54 2:57/0.5	(5,5) 100%	(5,5) 100%	8				-No Joints	
185.7	95.8	4.8	3:57 4:04 3:19 3:39 5:33/0.8	(3,8) 79%	(3,8) 79%	9				-Unable to retrieve bottom 1 ft of run	
180.9	100.6									180.9 Coring terminated at 100.6 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS 100.6	

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



B-945 - Box 2
B-945 - Box 1



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