



SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST S. Nicely					
SITE DESCRIPTION NORTH ANNA COL								GROUND WATER (ft)					
BORING NO. B-929		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT/UD			0 HR. 23.5					
COLLAR ELEV. 329.0 ft (NAVD88)		NORTHING 3,909,214		US ft (NAD83)		EASTING 11,685,655		US ft (NAD83) 24 HR. 23.9					
TOTAL DEPTH 74.0 ft		DRILL MACHINE CME 55 Truck			DRILLER: H. Meyerson			HAMMER TYPE 140 lbs Auto					
DATE STARTED 8/8/06		COMPLETED 8/10/06			CORE BARREL TYPE: NA								
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			
329.0					Ground Surface								329.0 0.0
327.5	1.5												Clayey SAND (SC) strong brown (7.5YR 5/6), moist, medium dense, trace gravel (Residual Soil)
325.5	3.5	7	7	8									
323.0	6.0	5	6	9									Silty, fine to coarse SAND (SM) reddish yellow (7.5YR 6/6&7/6), moist, loose to medium dense, trace clay, relict rock fabric (Residual Soil)
320.3	8.7	4	6	7									
318.8	10.2	3	4	5									
315.5	13.5												
		4	4	5									
310.4	18.6	5	5	6									
306.0	23.0	3	5	4									Silty, fine to coarse SAND (SM) reddish yellow (7.5YR 6/6), moist, medium dense, trace gravel, relict rock fabric (Residual Soil)
301.0	28.0	5	5	5									
296.0	33.0	6	7	8									
291.0	38.0	4	8	6									
286.0	43.0	7	13	14									Silty, fine to coarse SAND (SM) light brown (7.5YR 6/4), moist, very dense, trace gravel, relict rock fabric (Residual Soil)
281.0	48.0	19	26	33									
276.0	53.0	37	42	41									
271.0	58.0	14	19	43									
264.0	65.0												Weathered Rock: Light brown (7.5YR 6/4), moist, very dense, severely weathered, BIOTITE GNEISS
260.7	68.3	50/0.3											
		50/0.2											
255.7	73.3												
		41	50/0.2										255.0 74.0

Boring terminated at 74.0 ft in Weathered
Rock: Very dense, BIOTITE GNEISS

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

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SHEET 1 OF 2

MACTEC PROJECT NO.: 6468-06-1472						COUNTY Louisa, VA						GEOLOGIST S. Nicely					
SITE DESCRIPTION NORTH ANNA COL												GROUND WATER (ft)					
BORING NO. B-930				DRILL METHOD: Mud Rotary				SAMPLE METHODS: SPT				0 HR. 23.4					
COLLAR ELEV. 326.1 ft (NAVD88)				NORTHING 3,909,276				US ft (NAD83)		EASTING 11,685,843		US ft (NAD83)		24 HR. 25.3			
TOTAL DEPTH 123.6 ft				DRILL MACHINE CME 55 Truck				DRILLER: H. Meyerson				HAMMER TYPE 140 lbs Auto					
DATE STARTED 8/17/06				COMPLETED 8/21/06				CORE BARREL TYPE: NA									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION				
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100							
326.1					Ground Surface								326.1	0.0			
324.6	1.5										930-1		323.7	2.4			
322.4	3.7	5	6	7							930-2						
320.1	6.0	3	3	4							930-3						
317.6	8.5	3	4	4							930-4						
315.1	11.0	3	3	4							930-5		315.6	10.5			
312.6	13.5	4	5	5							930-6						
		4	5	5													
307.5	18.6	5	6	5							930-7						
302.4	23.7	5	5	5							930-8						
297.6	28.5	5	8	9							930-9						
292.4	33.7	10	11	13							930-10						
287.5	38.6	10	13	13							930-11						
282.5	43.6	13	17	18							930-12		285.1	41.0			
277.3	48.8	11	13	15							930-13						
272.4	53.7	13	18	19							930-14						
267.4	58.7	16	22	28							930-15		265.1	61.0			
262.4	63.7	20	26	27							930-16						
257.4	68.7	21	32	40							930-17						
252.4	73.7	21	38	41							930-18						

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

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



SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST S. Nicely							
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)					
BORING NO. B-931		DRILL METHOD: Mud Rotary				SAMPLE METHODS: SPT				0 HR. ND					
COLLAR ELEV. 278.5 ft (NAVD88)		NORTHING 3,910,153		US ft (NAD83)		EASTING 11,685,922		US ft (NAD83)		24 HR. ND					
TOTAL DEPTH 74.0 ft		DRILL MACHINE CME 55 Truck				DRILLER: H. Meyerson				HAMMER TYPE 140 lbs Auto					
DATE STARTED 11/6/06		COMPLETED 11/6/06				CORE BARREL TYPE: NA									
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	
278.5					Ground Surface								278.5	0.0	
															No samples due to utility clearance operations -soft dig/vac. truck excavation
269.4	9.1	1	1	1						931-1			269.4	9.1	
267.0	11.5	2	1	2						931-2					Silty, fine to coarse SAND (SM) dark yellowish brown (10YR 4/6), moist, very loose to loose (Residual Soil)
264.7	13.8	1	2	2						931-3					
259.7	18.8	1	2	2						931-4					
254.7	23.8	1	3	3						931-5			257.5	21.0	Sandy, SILT (ML) dark yellowish brown (10YR 4/6), moist, medium stiff, trace gravel
249.5	29.0	2	2	3						931-6			252.5	26.0	Silty, fine to coarse SAND (SM) dark yellowish brown (10YR 4/6), moist, loose (Residual Soil)
244.7	33.8	2	3	4						931-7					
239.8	38.7	3	3	4						931-8			242.5	36.0	Sandy SILT (ML) dark yellowish brown (10YR 4/6), moist, medium stiff (Residual Soil)
234.7	43.8	12	16	21						931-9			238.5	40.0	Silty, fine to coarse SAND (SM) light olive brown (2.5YR 5/4), moist to wet, dense (Residual Soil)
229.7	48.8	15	22	26						931-10					
224.7	53.8	16	21	13						931-11					
219.7	58.8	50/0.4								931-12			221.5	57.0	Weathered Rock: Light olive brown (2.5YR 5/4), moist, very dense, severely weathered, BIOTITE-QUARTZ GNEISS
214.7	63.8	50/0.5								931-13					
209.7	68.8	50/0.2								931-14					
204.7	73.8	50/0.2								931-15			204.5	74.0	

Boring terminated at 74.0 ft in Weathered Rock: Very dense, BIOTITE-QUARTZ GNEISS

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



SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST J. Wallen								
SITE DESCRIPTION NORTH ANNA COL								GROUND WATER (ft)								
BORING NO. B-932		DRILL METHOD: Mud Rotary			SAMPLE METHODS: SPT			0 HR. 0.0								
COLLAR ELEV. 249.9 ft (NAVD88)		NORTHING 3,910,444		US ft (NAD83)		EASTING 11,686,416		US ft (NAD83)		24 HR. 0.0						
TOTAL DEPTH 35.1 ft		DRILL MACHINE CME 550 ATV			DRILLER: G. Akins			HAMMER TYPE 140 lbs Auto								
DATE STARTED 11/8/06		COMPLETED 11/9/06			CORE BARREL TYPE: NA											
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT						SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100						
249.9					Ground Surface								249.9	0.0		
241.4	8.5												241.4	8.5	No samples due to utility clearance operations- soft dig/vac. truck excavation	
238.9	11.0	WOH	1	1							932-1		238.9	11.0	Fine sandy SILT (ML) dark greenish gray (GLE1 4/1), wet to moist, soft, trace gravel (Fill)	
236.4	13.5		1	2							932-2		236.4	13.5		
233.9	16.0	WOH	2	1							932-3		233.9	16.0	CLAY (CH) dark yellowish brown (10YR 4/4), moist, soft, trace sand, organic debris (Fill)	
230.9	19.0		2	1							932-4		230.9	19.0	Fine sandy SILT (ML) dark yellowish brown (10YR 4/4), moist, soft, organic debris (Fill)	
			6	13							932-5				Silty, fine to medium SAND (SM) dark yellowish brown (10YR 3/4), moist, dense to very dense, relict rock fabric (Residual Soil)	
224.9	25.0		16	21							932-6		224.9	25.0		
219.9	30.0										932-7		219.9	30.0	Weathered Rock: Dark yellowish brown (10YR 4/4), moist, very dense, severely weathered, BIOTITE-QUARTZ GNEISS	
214.9	35.0										932-8		214.9	35.0	Boring terminated at 35.1 ft in Weathered Rock: Very dense, severely weathered, BIOTITE-QUARTZ GNEISS	
															Boring encountered abandoned PVC conduit at approximately 15 feet. Drilling stopped and conduit was probed with boroscope by Dominion pers. and determined to be empty.	

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



SHEET 1 OF 2

MACTEC PROJECT NO.: 6468-06-1472					COUNTY Louisa, VA					GEOLOGIST J. Howard				
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)				
BORING NO. B-933			DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. 16.2			
COLLAR ELEV. 296.5 ft (NAVD88)			NORTHING 3,909,827		US ft (NAD83)		EASTING 11,685,791		US ft (NAD83)		24 HR. 21.3			
TOTAL DEPTH 100.2 ft			DRILL MACHINE CME 550 ATV				DRILLER: G. Akins				HAMMER TYPE 140 lbs Auto			
DATE STARTED 9/8/06			COMPLETED 9/12/06				CORE BARREL TYPE: HQ 3 triple tube-wireline							
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT					SAMP.	LOG	SOIL AND ROCK DESCRIPTION		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100			NO.	
296.5					Ground Surface							296.5 0.0		
295.0	1.5										933-1	Clayey SAND (SC) reddish yellow (7.5YR 7/8&6/8), dry to moist, loose (Fill)		
293.0	3.5	3	3	4							933-2			
290.5	6.0	3	4	3							933-3	Silty SAND (SM) Reddish yellow (7.5YR 6/8), brown (7.5YR 5/4), light gray (7.5YR 7/1), and gray (2.5YR 5/1), moist to wet, loose to medium dense, saprolitic (Residual Soil)		
288.0	8.5	3	3	3							933-4			
285.3	11.2	3	3	5							933-5			
283.0	13.5	3	3	5							933-6			
		4	6	9										
277.0	19.5	4	5	4							933-7	Fine to medium SAND (SP) brown (7.5YR 5/2), wet, loose, micaceous, saprolitic (Residual Soil)		
272.0	24.5										933-8	Medium SAND (SP) gray (7.5YR 6/1), wet, very dense (Residual Soil)		
		14	35	25										
267.0	29.5										933-9	Weathered Rock: Orange brown, very dense, severely weathered, BIOTITE-QUARTZ GNEISS		
		50/0.3												
262.0	34.5										933-10			
		45	50/0.4											
257.0	39.5										933-11	Hard Rock: Gray brown, moderately weathered, close fracturing, moderately hard to hard, BIOTITE-QUARTZ GNEISS with weathered rock layers		
		50/0.1										Weathered Rock: Gray brown, very dense, severely weathered, BIOTITE-QUARTZ GNEISS		
250.1	46.4										933-12			
		50/0.1												
												Hard Rock: Blue-gray-pink and gray-orange, moderately to slightly weathered, close to moderately close fracturing, hard, BIOTITE-QUARTZ GNEISS with quartz veins		
					</									

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



SHEET 2 OF 2

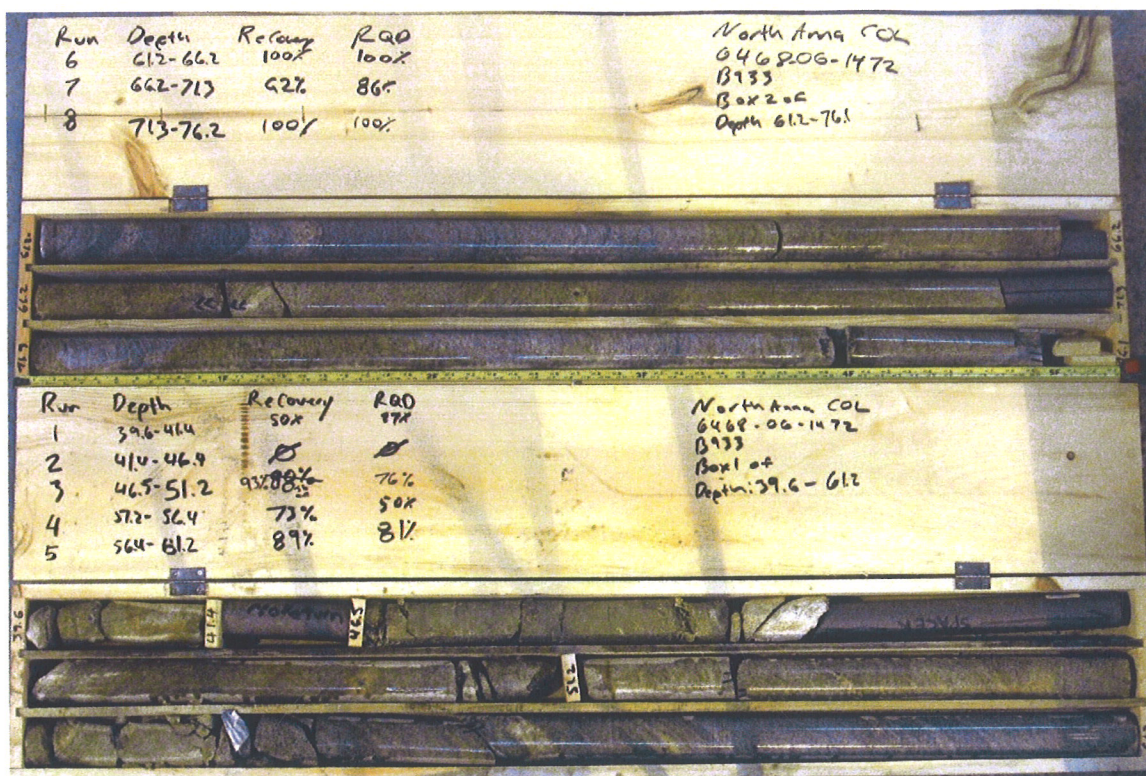
MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST J. Howard								
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft) 0 HR. 16.2 24 HR. 21.3						
BORING NO. B-933		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE										
COLLAR ELEV. 296.5 ft (NAVD88)		NORTHING 3,909,827		US ft (NAD83)		EASTING 11,685,791		US ft (NAD83)								
TOTAL DEPTH 100.2 ft		DRILL MACHINE CME 550 ATV				DRILLER: G. Akins				HAMMER TYPE 140 lbs Auto						
DATE STARTED 9/8/06				COMPLETED 9/12/06				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						
221.7					Continued from previous page											
														Hard Rock: Blue-gray; gray, light brown and brown, slightly weathered to fresh, close to wide fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS (<i>continued</i>)		
														196.3	100.2	Boring and coring terminated at 100.2 ft in Hard Rock: Very hard, BIOTITE-QUARTZ GNEISS

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



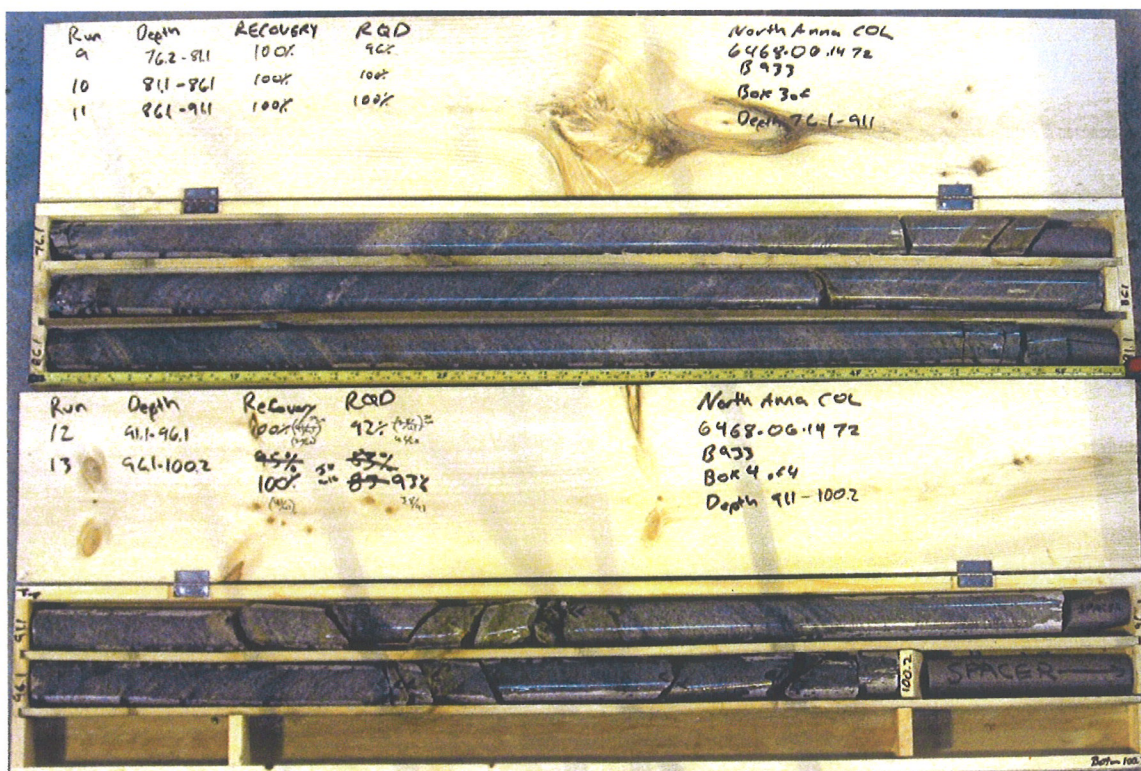
MACTEC PROJECT NO.: 6468-06-1472							COUNTY Louisa, VA			GEOLOGIST J. Howard		
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)		
BORING NO. B-933			DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE			0 HR. 16.2		
COLLAR ELEV. 296.5 ft (NAVD88)			NORTHING 3,909,827		US ft (NAD83)		EASTING 11,685,791		US ft (NAD83)		24 HR. 21.3	
TOTAL DEPTH 100.2 ft			DRILL MACHINE CME 550 ATV				DRILLER: G. Akins			HAMMER TYPE 140 lbs Auto		
DATE STARTED 9/8/06				COMPLETED 9/12/06			CORE BARREL TYPE: HQ 3 triple tube-wireline					
CORE SIZE HQ3				TOTAL RUN 60.5 ft								
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	ROD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS		
										Begin Coring @ 39.6 ft		
256.9	39.6	1.8	3:00	(0.9)	(0.5)	1				256.9	Hard Rock: Gray brown, moderately weathered, close fracturing, moderately	
255.1	41.4	5.0	1:45/0.8	50%	28%	2				255.1	hard to hard, BIOTITE-QUARTZ GNEISS with weathered rock layers	
			1:45	(0.0)	(0.0)						Weathered Rock: Gray brown, very dense, severely weathered,	
			1:00	0%	0%						BIOTITE-QUARTZ GNEISS	
			1:15								-No Recovery	
250.1	46.4		1:15									
250.0	46.5	4.7	N=50/0.1	(4.4)	(3.6)	933-12				248.3	Hard Rock: Blue-gray-pink and gray-orange, moderately to slightly weathered,	
			3:00	94%	77%	UC-50.5'					close to moderately close fracturing, hard, BIOTITE-QUARTZ GNEISS with	
			4:00								quartz veins	
245.3	51.2		2:45									
		5.2	2:45/0.7	(3.8)	(2.6)	4						
			3:00	73%	50%							
			2:15									
			1:45							241.9	Weathered Rock: Severely weathered, BIOTITE-QUARTZ GNEISS	
240.1	56.4		1:30									
		4.8	1:00/1.2	(4.3)	(3.9)	5				239.6	Hard Rock: Blue-gray, gray, light brown and brown, slightly weathered to fresh,	
			1:30	90%	81%						close to wide fracturing, hard to very hard, BIOTITE-QUARTZ GNEISS	
235.3	61.2		5:00									
		5.0	6:30/0.8	(5.0)	(5.0)	6						
			4:45	100%	100%							
			4:30									
			4:15									
230.3	66.2		4:15									
		5.1	4:30	(4.7)	(4.4)	UCS-66.6'					(2 joints at 30°; complete loss of circulation from 67.0-69.0 ft)	
			3:45	92%	86%							
			2:15									
		4.9	5:00/1.1	(4.9)	(4.9)	8					-No Joints	
			4:30	100%	100%							
			4:45									
220.3	76.2		5:00								(2 joints at 30°)	
		4.9	7:00/0.9	(4.9)	(4.7)	9						
			5:30	100%	96%							
			5:30									
215.4	81.1		5:45								(1 joint at 40°)	
		5.0	6:30/0.9	(5.0)	(5.0)	10						
			6:30	100%	100%							
			4:45									
210.4	86.1		6:00								-No Joints	
		5.0	6:45	(5.0)	(5.0)	UC-90.1'						
			5:45	100%	100%							
			4:30									
205.4	91.1		5:00								(2 joints at 20°, 1 joint at 30°, 1 joint at 50°)	
		5.0	5:00	(5.0)	(4.6)	12						
			3:00	100%	92%							
			3:15									
			3:15									
200.4	96.1		4:30								(6 joints at 35°)	
		4.1	5:30	(4.1)	(3.8)	13						
			4:00	100%	93%							
			4:00									
196.3	100.2		9:30							196.3	Coring terminated at 100.2 ft in Hard Rock: Very hard, BIOTITE-QUARTZ	
			8:15								GNEISS	
			2:15/0.1									

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



B-933 - Box 2

B-933 - Box 1



B-933 - Box 3

B-933 - Box 4



SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST J. LAchewitz/M. Lear									
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)							
BORING NO. B-933A		DRILL METHOD: Mud Rotary				SAMPLE METHODS: UD/PITCHER BARREL				0 HR. ND							
COLLAR ELEV. 296.6 ft (NAVD88)		NORTHING 3,909,826		US ft (NAD83)		EASTING 11,685,802		US ft (NAD83)		24 HR. ND							
TOTAL DEPTH 27.5 ft		DRILL MACHINE CME 550 ATV				DRILLER: F. Cox				HAMMER TYPE NA							
DATE STARTED 10/24/06				COMPLETED 10/24/06				CORE BARREL TYPE: NA									
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							
296.6					Ground Surface									296.6	0.0		
																No samples due to utility clearance operations- soft dig/vac. truck excavation	
286.6	10.0										933A-UD-1				288.6	8.0	
281.6	15.0										933A-UD-2						Silty, fine to coarse SAND (SM), brown-gray, moist, relict rock fabric (Residual Soil)
276.6	20.0										933A-UD-3						933A-UD-1: Pushed from 10.0-12.0 ft; push pressure=1500-1600 psi; recovery=1.3 ft
271.6	25.0										933A-PB-1						933A-UD-2: Pushed from 15.0-16.5 ft; push pressure=1200 psi-weight of drill rig; recovery=1.3 ft
																	933A-UD-3: Pushed from 20.0-21.0 ft; push pressure=1500 psi-weight of drill rig; recovery=0.9 ft
																	933A-PB-1: Advanced from 25.0-27.5 ft; recovery=1.6 ft
																	Weathered Rock: BIOTITE-QUARTZ GNEISS
																	Boring terminated at 27.5 ft in Weathered Rock: BIOTITE-QUARTZ GNEISS