



BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA				GEOLOGIST: B. Mabie			
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: D. Rhodes/K. Guy				FLUID LEVEL (ft)			
BORING NO.: M-12				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-45C Track (RAL)				0 HR.		NA	
GROUND ELEV.: 307.0 ft (NAVD88)				NORTHING: 3,909,723 US ft (NAD83)				EASTING: 11,685,560 US ft (NAD83)				24 HR.		27.0	
TOTAL DEPTH: 151.2 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						ROD TYPE: AWJ		HAMMER (ID): 140-lb. Auto (MEC-12)					
DATE STARTED: 9/16/09		COMPLETED: 9/21/09		HOLE DIA.: 3"		CASING DEPTH: 46.2 ft		CORE SIZE: NQ3		BITS USED: 2-7/8" Tri-Cone					
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		
307.0					Ground Surface										
												307.0 0.0			
												306.5 0.5			
												305.0 2.0			
												ASPHALT (Roadway) to 0.5 ft.			
												FILL: ROADWAY BASE COURSE to 2.0 ft.			
												No sampling from 0.0 to 7.6 feet due to soft dig utility clearance by Dominion Personnel.			
299.4	7.6	5	5	7								299.4 7.6			
296.9	10.1	6	5	5								297.9 9.1			
293.5	13.5	4	4	5								RESIDUAL SOIL: Clayey SAND (SC), reddish brown (2.5YR 4/6), medium dense, moist, fine to coarse grained sand, trace mica, relict rock fabric			
												RESIDUAL SOIL: Silty SAND (SM), Yellowish red (5YR 4/6), Loose, moist, fine to coarse grained sand, trace of mica, relict rock fabric			
288.5	18.5	6	6	7								13.5 ft: Brownish yellow (10YR 6/6)			
												18.5 ft: Medium dense			
283.5	23.5	6	6	10											
278.5	28.5	11	8	9								28.5 ft: Reddish yellow (5YR 5/6)			
273.5	33.5	13	17	16								33.5 ft: Brownish yellow (10YR 6/6), dense			
268.5	38.5	23	45	50/0.3								269.0 38.0			
												WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), brownish yellow (10YR 6/6) to yellow (10YR 7/6), very dense, moist, fine to coarse grained sand)			
263.5	43.5	50/0.3													
260.6	46.4	50/0.1										46.5 ft: No Core recovery			
255.7	51.3	30	70/0.4												
251.5	55.5	50/0.0										55.5 ft: Brown with black staining, severely weathered, very close fracturing, very soft to soft, BIOTITE QUARTZ GNEISS (Poor Recovery)			
												243.1 63.9			
												240.8 66.2			
												HARD ROCK: Brown to gray, moderately severe to very slightly weathered, close fracturing, medium hard to hard, BIOTITE QUARTZ GNEISS (6 joints 0-70°, open with orange staining)			
												HARD ROCK: Gray with orange staining, slightly to very slightly weathered, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ GNEISS			

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09

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NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



SHEET 3 OF 3

BECHTEL PROJECT NO.: 25161			MACTEC PROJECT NO.: 6468-09-2473			COUNTY: Louisa, VA			GEOLOGIST: B. Mabie					
SITE DESCRIPTION: North Anna 3 Project Supplement 2						DRILLER: D. Rhodes/K. Guy			FLUID LEVEL (ft)					
BORING NO.: M-12			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-45C Track (RAL)			0 HR. NA					
GROUND ELEV.: 307.0 ft (NAVD88)			NORTHING: 3,909,723 US ft (NAD83)			EASTING: 11,685,560 US ft (NAD83)			24 HR. 27.0					
TOTAL DEPTH: 151.2 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08			ROD TYPE: AWJ			HAMMER (ID):140-lb. Auto (MEC-12)					
DATE STARTED: 9/16/09			COMPLETED: 9/21/09			HOLE DIA.: 3"			CASING DEPTH: 46.2 ft					
						CORE SIZE: NQ3			BITS USED: 2-7/8" Tri-Cone					
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				
157.4					Continued from previous page									
													155.8	151.2
													Boring and coring terminated at 151.2 feet. Boring closed by tremie method with cement-bentonite grout. 24 hour water level measured on 9/21/2009 prior to drilling. Borehole was at a depth of 146.2 feet.	

NORTH ANNA 3 BORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



SHEET 1 OF 2

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SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: D. Rhodes/K. Guy			FLUID LEVEL (ft)		
BORING NO.: M-12				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-45C Track (RAL)			0 HR.	NA	
GROUND ELEV.: 307.0 ft (NAVD88)				NORTHING: 3,909,723 US ft (NAD83)				EASTING: 11,685,560 US ft (NAD83)			24 HR.	27.0	
TOTAL DEPTH: 151.2 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb. Auto (MEC-12)				
DATE STARTED: 9/16/09			COMPLETED: 9/21/09		CASING DEPTH: 46.2 ft		CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 10 bits						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %		RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %		RQD (ft) %	L O G	DESCRIPTION AND REMARKS	
												Begin Coring @ 46.5 ft	
260.5	46.5	4.8	1:11 1:34 1:10 0:35 0:31/0.8	(0.0) 0%	(0.0) 0%		RUN 1	(0.4) 3%	(0.0) 0%				WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (Sampled as Silty SAND (SM), brownish yellow (10YR 6/6) to yellow (10YR 7/6), very dense, moist, fine to coarse grained sand) (continued) 46.5 ft: No Core recovery
255.7	51.3		N=100/0.9				SS-11						
251.5	55.5	0.7	N=50/0.0 0:55/0.7	(0.2) 29%	(0.0) 0%		RUN 2						55.5 ft: Brown with black staining, severely weathered, very close fracturing, very soft to soft, BIOTITE QUARTZ GNEISS (Poor Recovery)
250.8	56.2	5.0	1:26 1:20 1:12 1:09 0:48	(0.2) 4%	(0.0) 0%		RUN 3						
245.8	61.2	5.0	2:14 2:25 2:34 3:03 3:20	(2.3) 46%	(1.4) 28%		RUN 4						(No recovery to 63.9 ft)
240.8	66.2	5.0	2:40 3:02 2:59 4:04 3:48	(5.0) 100%	(4.2) 84%		RUN 5	(2.3) 100%	(1.4) 61%			243.1	63.9 HARD ROCK: Brown to gray, moderately severe to very slightly weathered, close fracturing, medium hard to hard, BIOTITE QUARTZ GNEISS (6 joints 0-70°, open with orange staining)
235.8	71.2	5.0	3:13 2:48 2:37 3:00 3:47	(5.0) 100%	(4.9) 98%		RUN 6	(59.3) 99%	(53.9) 90%			240.8	66.2 HARD ROCK: Gray with orange staining, slightly to very slightly weathered, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (8 joints at 30-60°, tight to open) (5 joints at 40-50°, tight to open)
230.8	76.2	5.0	2:58 3:03 3:06 5:38 2:47	(5.0) 100%	(4.8) 96%		RUN 7						(3 joints at 30-50°, tight to open; 2 joints at 80°, tight; trace hornblende)
225.8	81.2	5.0	2:31 1:58 2:01 2:30 2:58	(5.0) 100%	(5.0) 100%		RUN 8						(6 joints at 30-60°, tight to open with trace staining; trace hornblende)
220.8	86.2	5.0	2:44 2:15 2:03 2:18 3:02	(4.7) 94%	(4.1) 82%		RUN 9						(5 joints at 0-40°, open with orange staining; 2 joints at 80°, open)
215.8	91.2	1.4	2:07 3:50/0.4	(1.4) 100%	(1.3) 93%		RUN 10						(2 joints at 0°, open; 2 joints at 80°, tight)
214.4	92.6	3.6	1:36/0.6 2:49 3:03 3:23	(3.5) 97%	(3.1) 86%		RUN 11						(3 joints at 0°, tight to open with trace orange staining; 1 joint at 70°)
210.8	96.2	3.3	3:05 2:49 3:59 0:48/0.3	(3.3) 100%	(2.9) 88%		RUN 12						(1 joint at 30°, open with trace orange staining; 4 joints at 50-60°, open with trace orange staining)
207.5	99.5	1.7	1:49/0.7 2:30	(1.7) 100%	(1.5) 88%		RUN 13						(3 joints at 20-30°, tight with trace orange staining)
205.8	101.2	5.0	3:06 3:02 3:13 3:03 3:13	(5.0) 100%	(4.5) 90%		RUN 14						(8 joints at 50-60°, tight to open with orange staining)
200.8	106.2	5.0	4:07 3:45 3:26 3:43 3:58	(5.0) 100%	(4.5) 90%		RUN 15						(3 joints at 0°, tight; 4 joints at 40-70°, open)
195.8	111.2	5.0	2:52 2:51 2:09 2:15 2:48	(5.0) 100%	(4.2) 84%		RUN 16						(3 joints at 0°, tight to open; 6 joints at 60-70°, open)
190.8	116.2	4.2	2:40 2:46 2:37 3:05 2:28/0.2	(4.0) 95%	(3.4) 81%		RUN 17						(4 joints at 10-30°, open; 3 joints at 60-70° open)
186.6	120.4						RUN 18						

NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09

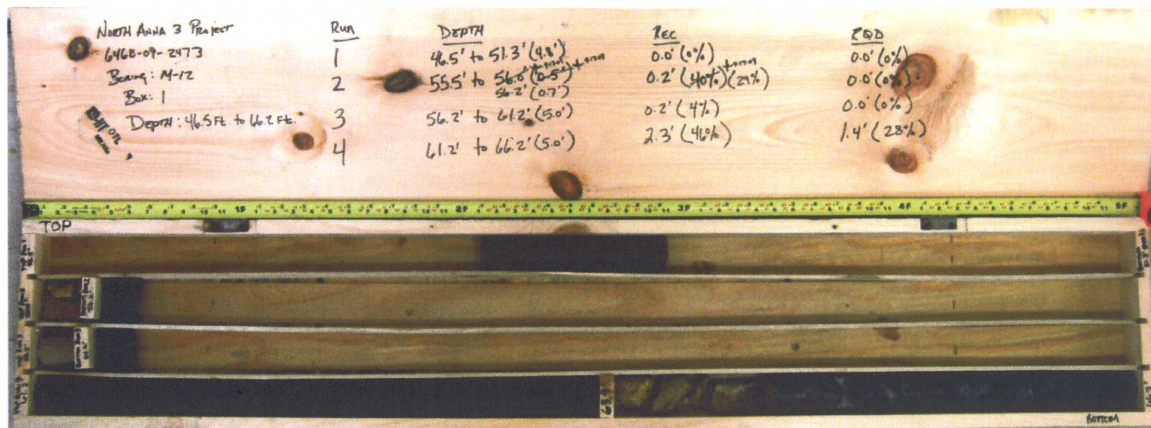


SHEET 2 OF 2

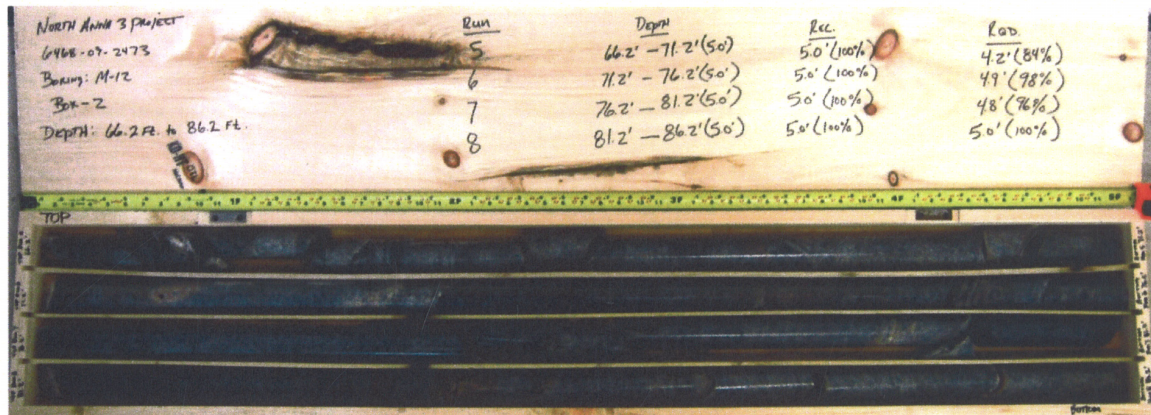
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TOTAL DEPTH: 151.2 ft	SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08		HAMMER (ID): 140-lb. Auto (MEC-12)
DATE STARTED: 9/16/09	COMPLETED: 9/21/09	CASING DEPTH: 46.2 ft	CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 10 bits

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS
Continued from previous page										
185.8	121.2	0.8	1:44/0.8	(0.7)	(0.7)	RUN 19				(1 joint at 60°, tight)
		5.0	2:49	88%	88%					(3 joints at 0°, tight; 4 joints at 70-80°, tight)
180.8	126.2		3:02	(5.0)	(4.8)					HARD ROCK: Gray with orange staining, slightly to very slightly weathered, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ
			2:48	100%	96%					GNEISS (continued)
		5.0	3:21	(5.0)	(5.0)	RUN 20	(24.8)	(22.7)		
			3:38	100%	100%		99%	91%		
			3:26							HARD ROCK: Gray with trace orange staining, slightly weathered to fresh, very close to moderately close fracturing, hard to very hard, BIOTITE QUARTZ
			3:31							GNEISS
175.8	131.2		3:06	(4.3)	(4.0)	RUN 21				(3 joints at 20°, tight; 1 joint at 50°, tight)
		4.3	2:52	100%	93%					(3 joints at 40-50°, tight to open; 1 joint at 90°, tight)
			3:16							
171.5	135.5		3:08							
170.8	136.2	0.7	1:38/0.3	(0.7)	(0.7)	RUN 22				(1 joint at 70°, tight)
		3.2	2:11/0.7	100%	100%	RUN 23				(1 joint at 0°, open; 11 joints at 50-60°, tight to open; 1 joint at 90°, open)
			3:00	(3.2)	(2.0)					
167.6	139.4		2:20	100%	63%	RUN 24				(1 joint at 40°, tight)
		1.8	1:08/0.2	(1.6)	(1.6)					(1 joint at 0°, open; 2 joints at 20-30°, open; 1 joint at 70°, tight)
165.8	141.2		2:03/0.8	89%	89%	RUN 25				
		5.0	2:17	(5.0)	(4.4)					
			2:27	100%	88%					
			2:08							
160.8	146.2		2:42	(5.0)	(5.0)	RUN 26				(3 joints at 0-10°, tight; 1 joint at 40°, tight)
		5.0	3:08	100%	100%					
			2:58							
155.8	151.2		3:34							
			2:57							
			3:06							
			3:19							
			3:07							
Boring and coring terminated at 151.2 feet.										
Boring closed by tremie method with cement-bentonite grout.										
24 hour water level measured on 9/21/2009 prior to drilling. Borehole was at a depth of 146.2 feet.										

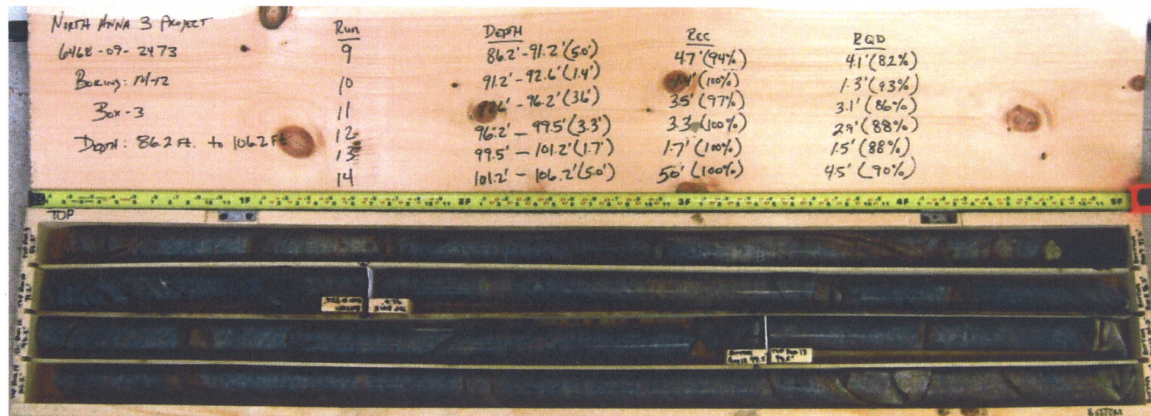
NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/4/09



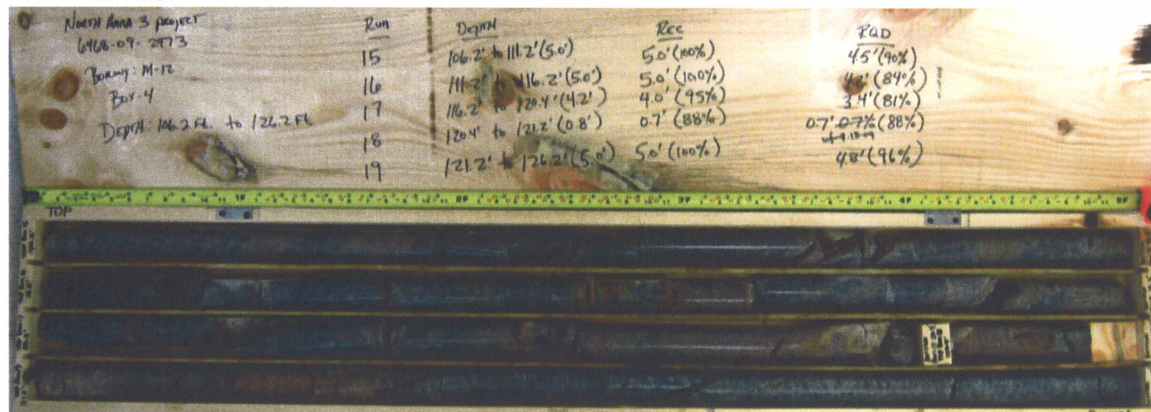
M-12 - Box 1



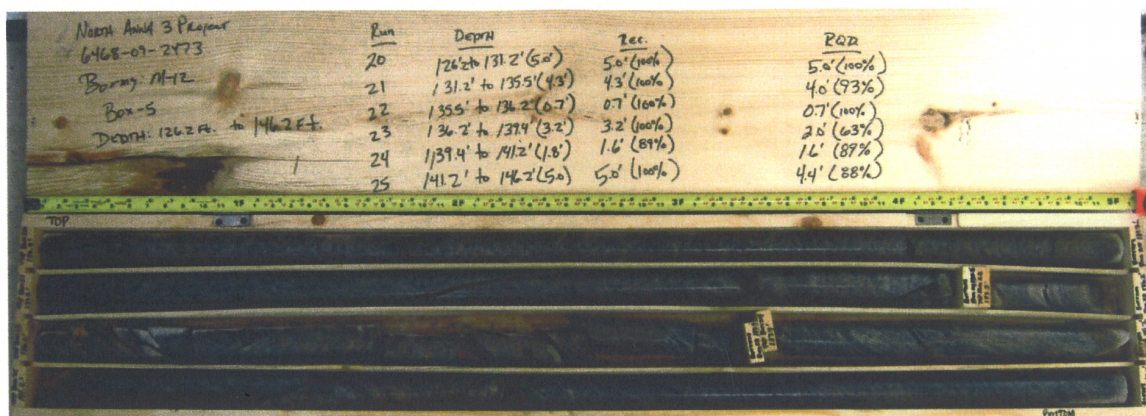
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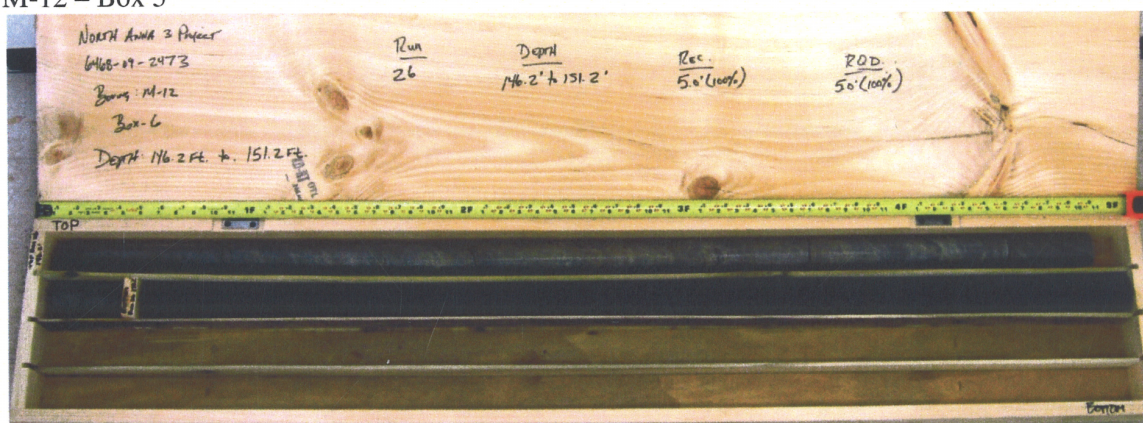
M-12 - Box 3



M-12 - Box 4



M-12 - Box 5



M-12 - Box 6