

**FINAL DATA REPORT
Revision 0
GEOTECHNICAL EXPLORATION AND TESTING
SUPPLEMENT 2
DOMINION POWER
NORTH ANNA NUCLEAR POWER STATION
NORTH ANNA 3 PROJECT
MINERAL, LOUISA COUNTY, VIRGINIA**

December 16, 2009

VOLUME 1

**APPENDIX B
Geotechnical Field Data**

Prepared By:

**MACTEC ENGINEERING AND CONSULTING, INC.
RALEIGH, NORTH CAROLINA**

MACTEC PROJECT No. 6468-09-2473

Prepared For:

**Bechtel Power Corporation
Subcontractor No. 25161-500-HC4-CY00-00001**

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**APPENDIX B.1
Geotechnical Boring Logs**

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**MACTEC ENGINEERING AND CONSULTING, INC.
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KEY TO CLASSIFICATION AND SYMBOLS

SOILS

Soils classified under the Unified Soil Classification System (USCS) and in accordance with ASTM D 2488-08

CORRELATION OF SPT RESISTANCE WITH RELATIVE DENSITY-CONSISTENCY				MOISTURE CONTENT	MODIFIERS	
GRANULAR MATERIAL		SILTS AND CLAYS		DRY-Absence of moisture	Approximate %	Modifiers
RELATIVE DENSITY	SPT N Value (blows/ft)	CONSISTENCY	SPT N Value (blows/ft)	MOIST-Damp/no visible H2O	<5%	TRACE
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	WET-Visible free water	5 to 10%	FEW
LOOSE	5 - 10	SOFT	3 - 4		15 to 25%	LITTLE
MEDIUM DENSE	11 - 30	MEDIUM - STIFF	5 - 8	<u>HCl Reaction</u>	30 to 45%	SOME
DENSE	31 - 50	STIFF	9 - 15	NONE - No visible reaction	50 to 100%	MOSTLY
VERY DENSE	> 50	VERY STIFF	16 - 30	WEAK - Some reaction/slow	Modifiers provide an estimate of the percentages of gravel, sand, and fines (silt or clay size particles) or other material such as organics, mica, mineral components, etc.	
		HARD	> 30	STRONG - Violent reaction		
COLOR of Soil/Rock: see Munsell Soil Color Charts				SPT Sample Numbering: SS-1, SS-2, SS-3, etc.		
Particle Size Range for Sand: Fine, Medium, Coarse						
Particle Size Range for Gravel: Fine or Coarse				Example Soil Description: Silty SAND (SM), light gray (10Y7/1), medium dense, wet, fine to coarse sand, little mica, relict rock fabric		
Measurements: Horizontal measurements are rounded to nearest foot. Vertical measurements, such as SPT sample recovery or penetration, sample depths, core run depth, core run length, core recovery, core RQD, etc. are rounded to nearest tenth of a foot (0.1 ft).						
				Coordinate System and Datum Reference Information: Horizontal - Virginia State Plane Coordinate System, South Zone, NAD 83 (CORS96)(EPOCH 2002); Elevation - NAVD88 (Geoid03)		
 Borehole fluid level at time of drilling completion				 Borehole fluid level 24 hours after drilling completion		

ROCK

In general, the North Anna Site is composed of moderately to strongly metamorphosed rock of granitic composition commonly described as quartz gneiss and biotite gneiss (or a combination of these); locally zones of schist and/or pegmatitic zones may be encountered.

Example Rock Core Run Description: Light gray with trace orange staining, slightly weathered, moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS with trace magnetite (2 Joints at 45°, tight with trace orange staining; 2 joints at 60°, open with clay)

WEATHERING DESCRIPTION		FRACTURE SPACING		ROCK HARDNESS DESCRIPTION	
SEVERE	Rock except quartz discolored or stained; severe loss in strength; some fragments of strong rock remain	VERY CLOSE	< 0.15 ft (2")	VERY SOFT	Can be carved with knife; pieces >1" can be broken by finger pressure; crumbles easily
MODERATELY SEVERE	Rock except quartz discolored or stained; crystals dull, show clay alteration; thud sound when struck by hammer	CLOSE	0.15 ft (2") to 1 foot	SOFT	Can be gouged/grooved with knife; small thin pieces broken by finger pressure
MODERATE	Significant portions show discoloration and weathering effects; crystals dull; dull sound under hammer blows	MODERATELY CLOSE	1 to 3 feet	MEDIUM HARD	Can be gouged/grooved by knife with firm pressure; easily broken by hammer
SLIGHT	Rock generally fresh; joints stained; discoloration extends into rock, may contain clay; some crystals dull	WIDE	>3 feet	MODERATELY HARD	Can be scratched by knife or steel pick; moderate hammer blows to break sample
VERY SLIGHT	Rock generally fresh; joints stained, may show thin clay coatings; crystals bright; rock rings under hammer blows	JOINT DESCRIPTION	Tight-Core pieces fit tightly together; no gaps	HARD	Rock core rings when struck with a hammer; Can be scratched by knife or steel pick only with difficulty
FRESH	Rock fresh, crystals bright, few joints may show slight staining, rock rings under hammer blows		Open-Core pieces fit loosely together; has gaps	VERY HARD	Rock core rings when struck with a hammer; Cannot be scratched by knife or steel pick

Core Terms-Abbreviations	EXPLANATION
DRILL RATE	Time in minutes it takes to core one foot, for each foot or partial foot of a core run. (1:32; 0:54/0.7 ft)
CORE RUN; RUN LENGTH	Cored Interval; Total distance of core run measured to nearest 0.1 ft. Core runs are not to exceed 5 feet.
CORE RECOVERY (REC.)	Total length of recovered core, measured to nearest 0.1 ft, divided by the core run length, and expressed as a percentage.
CORE RQD (RQD)	Rock Quality Designation. Sum of intact core pieces greater than 4 inches in length, measured to the nearest 0.1 ft, divided by the core run length, and expressed as a percentage.

Legend-NORTH ANNA 3, Rev 0

SOIL AND ROCK SYMBOLS AND DESCRIPTIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
ROCK				WR	WEATHERED ROCK	
				HR-WR	HARD ROCK - WEATHERED ROCK	
				HR	HARD ROCK	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES	
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES	
		FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
					CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	OL			ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS		
			CH	INORGANIC CLAYS OF HIGH PLASTICITY		
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
HIGHLY ORGANIC SOILS				PT	MUCK, PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



GEOTECHNICAL BORING LOG

Prepared By JJJ Date 12/16/09Checked By MAN Date 12/16/09

SHEET 1 OF 3

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA				GEOLOGIST: A. Mwembeshi				
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: R. Landeros/D. Reneau				FLUID LEVEL (ft)				
BORING NO.: M-1				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-550X (ATL)				0 HR.		NA		
GROUND ELEV.: 314.1 ft (NAVD88)				NORTHING: 3,909,611 US ft (NAD83)				EASTING: 11,685,484 US ft (NAD83)				24 HR.		48.0		
TOTAL DEPTH: 151.1 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08					ROD TYPE: AWJ		HAMMER (ID):140-lb. Auto (MEC-05)						
DATE STARTED: 9/16/09			COMPLETED: 9/18/09		HOLE DIA.: 3"		CASING DEPTH: 43.2 ft		CORE SIZE: NQ3		BITS USED: 2-7/8" Tri-Cone					
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						
314.1					Ground Surface									314.1	0.0	
														313.6	0.5	
														312.1	2.0	
														No sampling from 0.0 to 9.5 feet due to soft dig utility clearance by Dominion Personnel		
304.6	9.5													304.6	9.5	
302.3	11.8	2	3	3						SS-1				RESIDUAL SOIL: Silty SAND (SM), yellowish red (5YR 5/6), loose, moist, fine grained sand, trace of mica, relict rock fabric		
299.7	14.4	3	4	3						SS-2				11.8 ft: Brownish yellow (10YR 6/6), fine to medium grained sand		
295.9	18.2	3	4	4						SS-3				14.4 ft: Light brownish gray (10YR 6/2), few mica		
290.9	23.2	3	4	4						SS-4				18.2 ft: Pale brown (10YR 6/8), fine to coarse grained sand, trace mica		
285.9	28.2	4	4	6						SS-5				23.2 ft: Very pale brown (10YR 7/3), little mica		
280.9	33.2	12	16	20						SS-6				28.2 ft: Grayish brown (10YR 5/2), dense, fine grained sand, trace mica		
275.9	38.2	35	46	50/0.4						SS-7				33.2 ft: Light brownish gray (10YR 6/2), very dense		
270.9	43.2	16	25	36						SS-8				38.2 ft: Few mica		
		50/0.1								SS-9				273.1	41.0	
														270.0	44.1	
														WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (No Recovery)		
														HARD ROCK: Light gray brown, brownish gray, and gray brown, moderately severely to slightly weathered, very close to close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS		
														255.6	58.5	
														HARD ROCK: Gray to light gray, with pink and brown, slightly weathered to fresh, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS		

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



SHEET 2 OF 3

BECHTEL PROJECT NO.: 25161			MACTEC PROJECT NO.: 6468-09-2473			COUNTY: Louisa, VA			GEOLOGIST: A. Mwembeshi				
SITE DESCRIPTION: North Anna 3 Project Supplement 2						DRILLER: R. Landeros/D. Reneau			FLUID LEVEL (ft) 0 HR. NA 24 HR. 48.0				
BORING NO.: M-1			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-550X (ATL)							
GROUND ELEV.: 314.1 ft (NAVD88)			NORTHING: 3,909,611 US ft (NAD83)			EASTING: 11,685,484 US ft (NAD83)							
TOTAL DEPTH: 151.1 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						ROD TYPE: AWJ		HAMMER (ID):140-lb. Auto (MEC-05)		
DATE STARTED: 9/16/09			COMPLETED: 9/18/09		HOLE DIA.: 3"		CASING DEPTH: 43.2 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			
239.3					Continued from previous page								
													<p>HARD ROCK: Gray to light gray, with pink and brown, slightly weathered to fresh, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (<i>continued</i>)</p> <p>129.0 ft: Loss of drill fluid circulation to 132.5 ft</p> <p>133.5 ft: Loss of drill fluid circulation to 136.8 ft</p> <p>137.5 ft: Complete loss of drill fluid circulation for remainder of boring</p>

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: A. Mwembeshi					
SITE DESCRIPTION: North Anna 3 Project Supplement 2						DRILLER: R. Landeros/D. Reneau			FLUID LEVEL (ft)					
BORING NO.: M-1			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-550X (ATL)			0 HR. NA					
GROUND ELEV.: 314.1 ft (NAVD88)			NORTHING: 3,909,611 US ft (NAD83)			EASTING: 11,685,484 US ft (NAD83)			24 HR. 48.0					
TOTAL DEPTH: 151.1 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08			ROD TYPE: AWJ			HAMMER (ID): 140-lb. Auto (MEC-05)					
DATE STARTED: 9/16/09			COMPLETED: 9/18/09			HOLE DIA.: 3"			CASING DEPTH: 43.2 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				
164.5					Continued from previous page									
													163.0	151.1
														<p>Boring and coring terminated at 151.1 feet.</p> <p>Boring closed by tremie method with cement-bentonite grout.</p> <p>24 hour water level measured on 9/18/2009 prior to drilling. Borehole was at a depth of 136.8 feet.</p>

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



SHEET 1 OF 2

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA		GEOLOGIST: A. Mwembeshi				
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: R. Landeros/D. Reneau			FLUID LEVEL (ft)			
BORING NO.: M-1				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-550X (ATL)			0 HR. NA			
GROUND ELEV.: 314.1 ft (NAVD88)				NORTHING: 3,909,611 US ft (NAD83)				EASTING: 11,685,484 US ft (NAD83)		24 HR. 48.0				
TOTAL DEPTH: 151.1 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb. Auto (MEC-05)					
DATE STARTED: 9/16/09			COMPLETED: 9/18/09		CASING DEPTH: 43.2 ft		CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 8 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 @ 43.2 ft		
270.9	43.2	5.0	N=50/0.1 0:43 2:17 2:01 1:57 2:15	(4.1) 82%	(4.1) 82%		RUN 1	(0.0) 0%	(0.0) 0%			270.0	WEATHERED ROCK: Severely weathered BIOTITE QUARTZ GNEISS (No Recovery) <i>(continued)</i> 44.1	
265.9	48.2							(10.0) 69%	(7.8) 54%			HARD ROCK: Light gray brown, brownish gray, and gray brown, moderately severely to slightly weathered, very close to close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS (1 joint at 75°, open with brown staining) (Quartz Vein) (Quartz vein)		
265.6	48.5	0.3 5.0	0:49/0.3 0:39 0:49 1:30 2:04 2:02	(0.2) 67%	(0.0) 0%		RUN 2 RUN 3							
260.6	53.5	5.0		(1.9) 38%	(0.4) 8%								(1 joint at 30°, open with black staining; 2 joints at 45°, open with orange staining)	
		5.0	1:19 2:27 1:09 2:03 3:01	(3.8) 76%	(3.3) 66%		RUN 4							
255.6	58.5												255.6	58.5
254.6	59.5	1.0	6:25	(1.0) 100%	(1.0) 100%		RUN 5 RUN 6	(91.7) 99%	(85.6) 92%				HARD ROCK: Gray to light gray, with pink and brown, slightly weathered to fresh, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (2 joints at 30°, open with black staining; 1 joint at 45°, open; 1 joint at 75°, open) (2 joints at 0-10°, open with orange staining; 3 joints at 30°, open with orange staining)	
		4.0	1:25 1:38 1:33 2:38	(4.0) 100%	(3.6) 90%								(3 joints at 45°, open with orange staining; 3 joints at 75°, open with orange staining)	
250.6	63.5	5.0	2:27 1:38 2:00 2:47 3:08	(4.5) 90%	(4.1) 82%		RUN 7						(1 joint at 45°, open with orange staining)	
245.6	68.5	5.0		(5.0) 100%	(4.4) 88%		RUN 8						(3 joints at 45°, open with orange staining; 3 joints at 75°, open with orange staining)	
		5.0	2:15 2:16 2:24 2:13 2:20	(5.0) 100%	(5.0) 100%		RUN 9						(1 joint at 45°, open with orange staining)	
235.6	78.5	5.0	3:16 2:50 2:39 2:45 2:50	(5.0) 100%	(5.0) 100%		RUN 10						(No joints)	
		5.0	4:02 3:30 5:44 6:20	(5.0) 100%	(5.0) 100%									
230.6	83.5	5.0	1:35 2:46 3:39 4:36 5:22	(4.8) 96%	(4.5) 90%		RUN 11						(1 joint at 30°, open with trace mica; 1 joint at 45°, open with trace brown staining)	
225.6	88.5	5.0	8:17 6:13 2:20 1:35 3:16	(5.0) 100%	(4.5) 90%		RUN 12						(1 joint at 0-10°, ope with orange staining; 5 joints at 45°, open with trace mica and orange staining)	
		5.0	8:01 5:55 5:35 5:04 5:10	(5.0) 100%	(5.0) 100%		RUN 13						(1 joint at 45°, open with trace brown staining)	
215.6	98.5	5.0		(5.0) 100%	(5.0) 100%		RUN 14						(1 joint at 45°, open with orange staining)	
		5.0	7:16 8:24 3:05 2:58 3:24	(5.0) 100%	(5.0) 100%									
210.6	103.5	5.0	3:21 2:11 2:21 4:20 3:55	(4.0) 80%	(4.5) 90%		RUN 15						(2 joints at 15°, open with trace orange staining; 2 joints at 45°, open with orange staining)	
205.6	108.5	5.0		(4.8) 96%	(3.8) 76%		RUN 16						(1 joint at 15°, open with brown and black staining; 4 joints at 45°, open with orange-brown staining)	
200.6	113.5	5.0	5:14 4:49 3:47 2:41 1:59	(5.0) 100%	(4.3) 86%		RUN 17					(1 joint at 0-10°, open with trace orange staining; 9 joints at 45°, open with trace orange and black staining)		

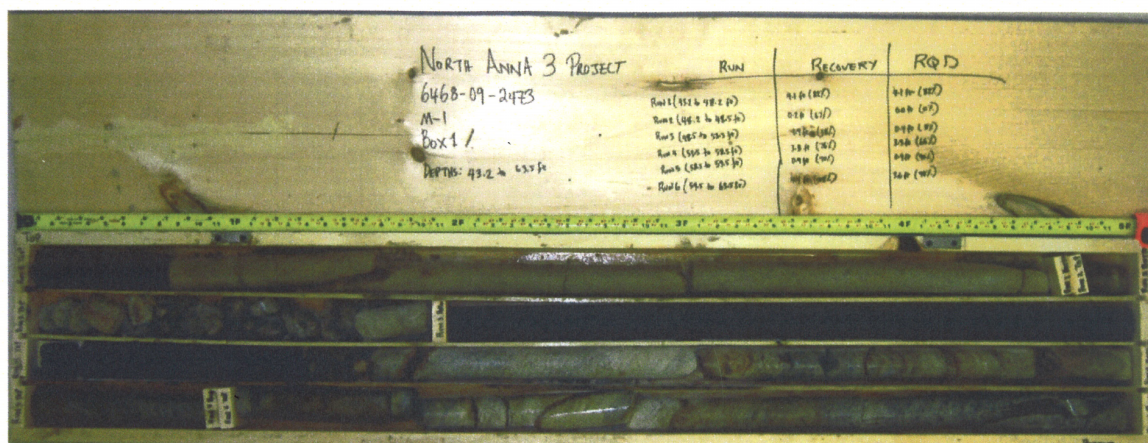
NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/16/09



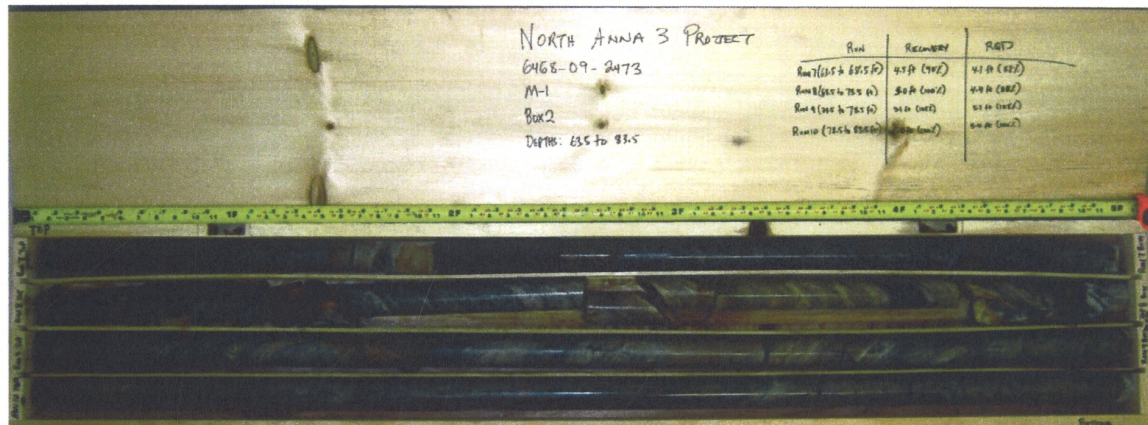
SHEET 2 OF 2

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA		GEOLOGIST: A. Mwembeshi			
SITE DESCRIPTION: North Anna 3 Project Supplement 2								DRILLER: R. Landeros/D. Reneau			FLUID LEVEL (ft)		
BORING NO.: M-1				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-550X (ATL)			0 HR. NA		
GROUND ELEV.: 314.1 ft (NAVD88)				NORTHING: 3,909,611 US ft (NAD83)				EASTING: 11,685,484 US ft (NAD83)			24 HR. 48.0		
TOTAL DEPTH: 151.1 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb. Auto (MEC-05)				
DATE STARTED: 9/16/09			COMPLETED: 9/18/09		CASING DEPTH: 43.2 ft			CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 8 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			
										Continued from previous page			
195.6	118.5	5.0	3:36 3:00 3:03 2:57 3:04 1:28	(5.0) 100%	(4.7) 94%	RUN 18				HARD ROCK: Gray to light gray, with pink and brown, slightly weathered to fresh, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (continued) (1 joint at 30°, open with orange staining; 2 joints at 45°, open with orange staining; 1 joint at 75°, open with orange-brown staining; 0.1 ft thick quart vein at 119.5 ft and 0.8 ft thick quartz vein at 122.5 ft) (1 joint at 75°, open with orange staining)			
190.6	123.5	5.0	3:30 5:10 5:50 4:20 3:36	(5.0) 100%	(5.0) 100%	RUN 19				(2 joints at 0-10°, open with orange staining; 2 joints at 45°, open with orange staining; 1 joint at 90°, open with orange and black staining) 129.0 ft: Loss of drill fluid circulation to 132.5 ft			
185.6	128.5	5.0	3:15 3:44 3:19 5:19 4:22	(5.0) 100%	(4.5) 90%	RUN 20				133.5 ft: Loss of drill fluid circulation to 136.8 ft (1 joint at 45°, open with trace orange staining; quartz vein from 136.2-136.8 ft)			
177.3	136.8	3.3	5:51 6:36 4:32	(3.3) 100%	(3.3) 100%	RUN 21				(No joints) 137.5 ft: Complete loss of drill fluid circulation for remainder of boring			
176.6	137.5	0.7	0:56/0.3	(0.7)	(0.7)	RUN 22				(No joints)			
175.6	138.5	1.0	6:29/0.7	100%	100%	RUN 23				(3 joints at 40-50°, open with orange staining; 1 joint at 75°, tight; 0.1 ft thick quartz vein at 140.0 feet)			
		5.0	2:36 3:48 3:23 3:58 3:17	(1.0) 100%	(1.0) 100%	RUN 24				(7 joints at 50-60°, open with orange staining; 4 joints at 60-90°, tight)			
170.6	143.5	5.0	4:12 4:37 4:25 5:26 5:36	(5.0) 100%	(4.2) 84%	RUN 25				(1 joint at 45°, open with orange staining; 2 joints at 75-90°, tight to open with brown staining)			
165.6	148.5	2.6	8:30 7:32 7:01/0.6	(2.6) 100%	(2.6) 100%	RUN 26				163.0			
163.0	151.1									151.1			
Boring and coring terminated at 151.1 feet.													
Boring closed by tremie method with cement-bentonite grout.													
24 hour water level measured on 9/18/2009 prior to drilling. Borehole was at a depth of 136.8 feet.													

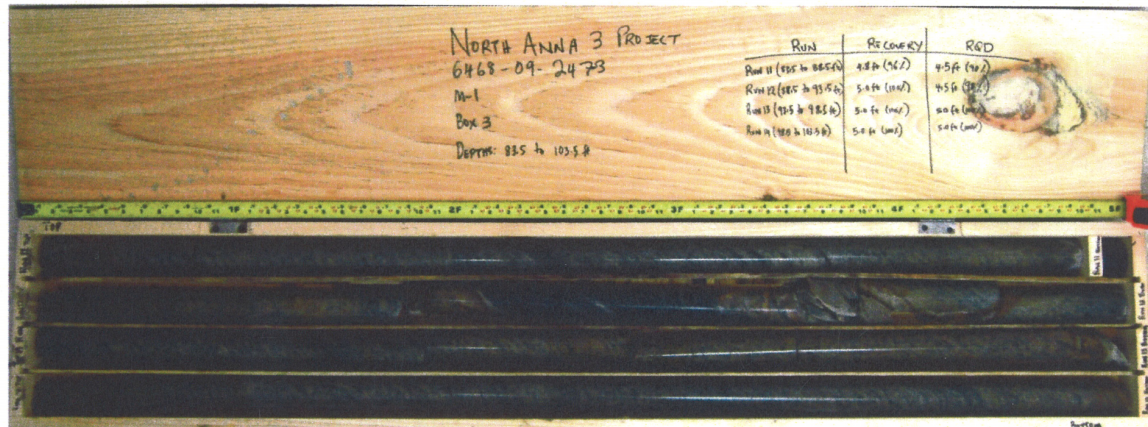
NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/16/09



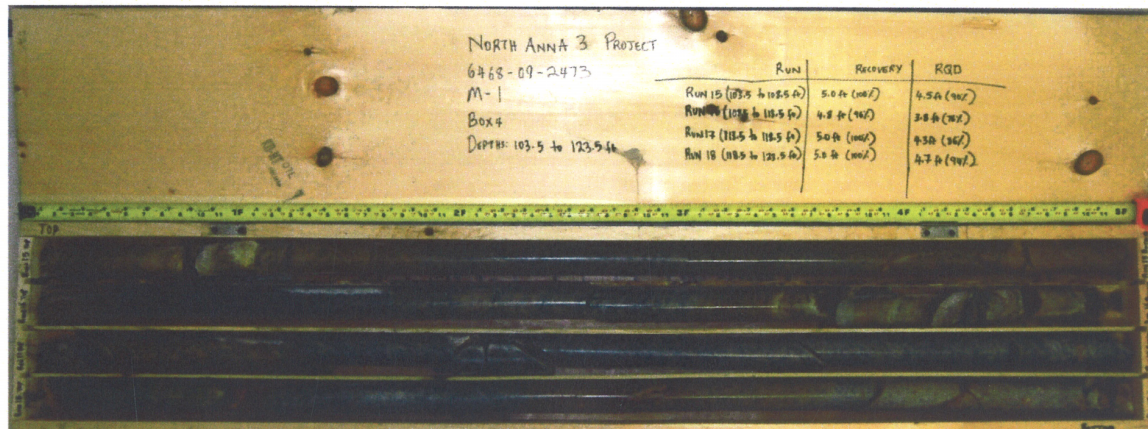
M-1 - Box 1



M-1 - Box 2



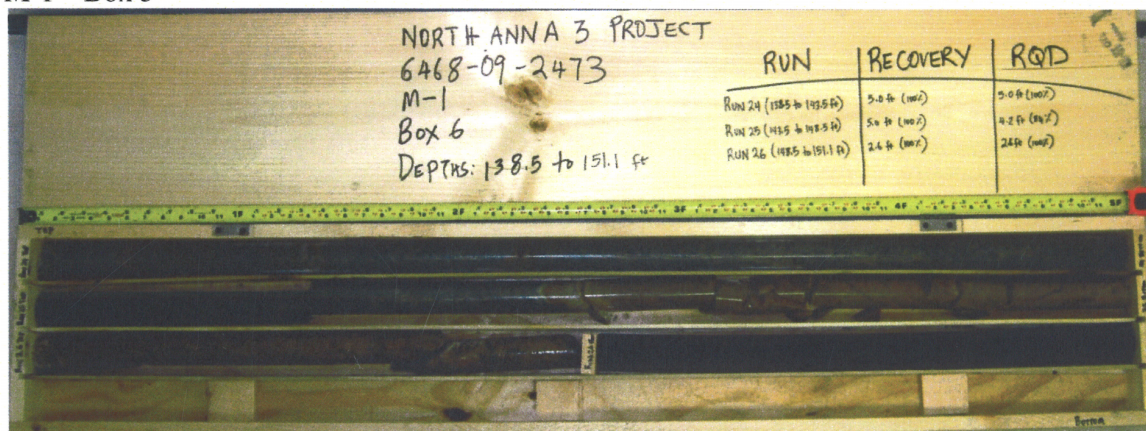
M-1 - Box 3



M-1 - Box 4



M-1 – Box 5



M-1 – Box 6