

# GEOTECHNICAL BORING LOG

Prepared By JSS Date 12/09/09

Checked By MAN Date 12/16/09

SHEET 1 OF 3

[illegible]

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: B. Mabie			
SITE DESCRIPTION: North Anna 3 Project Supplement 2						DRILLER: D. Rhodes/K. Guy			FLUID LEVEL (ft)			
BORING NO.: M-28			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-45C Track (RAL)			0 HR. NA			
GROUND ELEV.: 308.2 ft (NAVD88)			NORTHING: 3,909,636 US ft (NAD83)			EASTING: 11,685,672 US ft (NAD83)			24 HR. 24.5			
TOTAL DEPTH: 150.0 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: 9/10/09			COMPLETED: 9/13/09			HOLE DIA.: 3"			CASING DEPTH: 21.6 ft			
						CORE SIZE: NQ3			BITS USED: 2-7/8" Tri-Cone			
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	MOI	
233.4					Continued from previous page							
												233.2 HARD ROCK: Light to dark gray, moderately to slightly weathered, close fracturing, moderately hard, QUARTZ BIOTITE GNEISS 75.0
												223.2 HARD ROCK: Light gray to gray, with orange staining, moderately to slightly weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS 85.0
												203.2 HARD ROCK: Light gray to gray, with orange staining, moderately to slightly weathered, close to very close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS with zones of WEATHERED ROCK: BIOTITE QUARTZ GNEISS 105.0
												188.2 HARD ROCK: Gray with orange staining, moderately to very slightly weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS 120.0

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



SHEET 3 OF 3

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						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			
158.6					Continued from previous page								
												Boring and coring terminated at 150.0 feet.  Boring closed by tremie method with cement-bentonite grout.  24 hour water level measured on 9/13/2009 prior to drilling. Borehole was at a depth of 115.0 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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GROUND ELEV.: 308.2 ft (NAVD88)				NORTHING: 3,909,636 US ft (NAD83)				EASTING: 11,685,672 US ft (NAD83)		24 HR. 24.5		
TOTAL DEPTH: 150.0 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb. Auto (MEC-12)			
DATE STARTED: 9/10/09			COMPLETED: 9/13/09		CASING DEPTH: 21.6 ft		CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 bit					
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 @ 24.2 ft		
284.0	24.2	0.8	N=50/0.0	(0.8)	(0.8)	RUN 1	(10.6)	(6.9)		284.0	24.2	
283.2	25.0	5.0	1:49/0.8	100%	100%	RUN 2	56%	37%		HARD ROCK and WEATHERED ROCK: Light gray to light brown, with orange staining, severely to moderately weathered, with slightly weathered zones, very close to moderately close fracturing, medium hard to moderately hard, BIOTITE QUARTZ GNEISS (Several fractures at 80-90°, 1 joint at 70°, open) (3 joints at 30-50°, tight; 1 joint at 80°, tight)		
			2:35	(1.9)	(1.6)							
			2:30	(1.9)	(1.6)							
			1:31	(1.9)	(1.6)							
			0:25	(1.9)	(1.6)							
278.2	30.0	5.0	1:08	(2.6)	(1.9)	RUN 3						
			1:46	(2.6)	(1.9)							
			2:32	(2.6)	(1.9)							
			2:08	(2.6)	(1.9)							
			2:02	(2.6)	(1.9)							
			2:39	(3.4)	(1.8)	RUN 4						
			2:48	(3.4)	(1.8)							
			2:06	(3.4)	(1.8)							
			1:58	(3.4)	(1.8)							
			2:15	(3.4)	(1.8)							
			2:00	(1.9)	(0.8)	RUN 5						
			2:30	(1.9)	(0.8)							
			2:39	(1.9)	(0.8)							
			6:34	(1.9)	(0.8)							
265.2	43.0	2.0	2:43	(2.0)	(1.9)	RUN 6	(31.6)	(27.6)		265.2	43.0	
			2:56	(2.0)	(1.9)		99%	86%				
263.2	45.0	5.0	3:02	(4.9)	(4.0)	RUN 7						
			2:57	(4.9)	(4.0)							
			3:04	(4.9)	(4.0)							
			3:07	(4.9)	(4.0)							
			3:36	(4.8)	(4.7)	RUN 8						
			4:38	(4.8)	(4.7)							
			5:16	(4.8)	(4.7)							
			4:49	(4.8)	(4.7)							
			5:18	(4.8)	(4.7)							
			5:23	(5.0)	(5.0)	RUN 9						
			3:46	(5.0)	(5.0)							
			3:43	(5.0)	(5.0)							
			3:49	(5.0)	(5.0)							
			4:42	(5.0)	(5.0)							
			5:32	(5.0)	(3.0)	RUN 10						
			5:17	(5.0)	(3.0)							
			5:48	(5.0)	(3.0)							
			7:25	(5.0)	(3.0)							
			4:48	(5.0)	(3.0)							
			6:32	(5.0)	(4.2)	RUN 11						
			4:13	(5.0)	(4.2)							
			3:45	(5.0)	(4.2)							
			3:48	(5.0)	(4.2)							
			3:50	(5.0)	(4.2)							
			4:39	(3.9)	(3.2)	RUN 12						
			4:06	(3.9)	(3.2)							
			3:09	(3.9)	(3.2)							
			3:34	(3.9)	(3.2)							
			3:38	(1.0)	(0.8)	RUN 13						
			3:26	(1.0)	(0.8)							
			2:50	(1.0)	(0.8)	RUN 14	(9.0)	(8.4)				
			2:40	(1.0)	(0.8)		90%	84%				
			2:37	(4.0)	(3.6)							
			2:07	(4.0)	(3.6)							
			2:24	(5.0)	(4.8)	RUN 15						
			2:31	(5.0)	(4.8)							
			1:48	(5.0)	(4.8)							
			2:04	(5.0)	(4.8)							
			2:21	(5.0)	(4.8)							
			2:16	(4.6)	(4.0)	RUN 16	(18.2)	(15.2)		223.2	85.0	
			2:33	(4.6)	(4.0)		91%	76%				
			2:54	(4.6)	(4.0)							
			3:26	(4.6)	(4.0)							
			2:08	(4.6)	(4.0)							
			2:33	(2.9)	(2.1)	RUN 17						
			2:46	(2.9)	(2.1)							
			2:23	(2.9)	(2.1)							
			3:18	(2.0)	(2.0)	RUN 18						
			3:06	(2.0)	(2.0)							
			3:20	(2.0)	(2.0)							
			3:17	(5.0)	(4.3)	RUN 19						
			2:57	(5.0)	(4.3)							
			2:50	(5.0)	(4.3)							
			3:12	(5.0)	(4.3)							

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



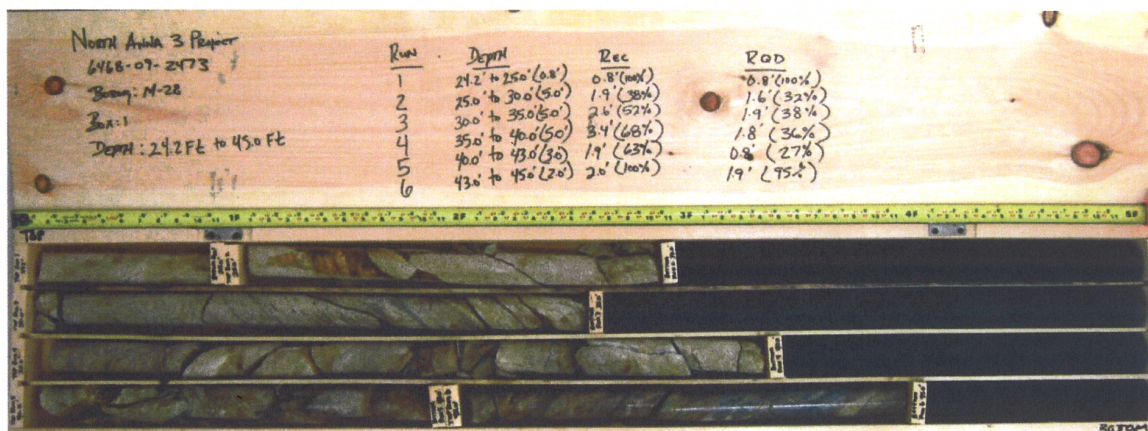


SHEET 2 OF 2

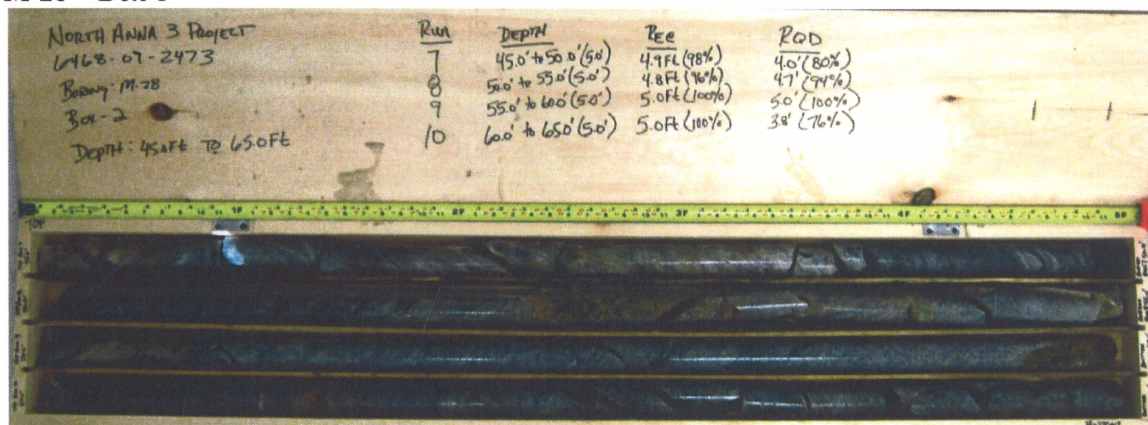
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										Continued from previous page	
208.2	100.0	5.0	2:37 2:27 2:33 2:11 1:49 2:03	(3.7) 74%	(2.8) 56%	RUN 20					HARD ROCK: Light gray to gray, with orange staining, moderately to slightly weathered, close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS ( <i>continued</i> ) (6 joints at 50-60°, open)
203.2	105.0	4.6	3:23 2:40 2:35 1:48 3:28/0.6	(2.2) 48%	(1.0) 22%	RUN 21	(7.6) 51%	(3.6) 24%		203.2	105.0
198.6	109.6										
198.2	110.0	0.4	1:12/0.4	(0.1) 25%	(0.0) 0%	RUN 22					
		5.0	2:15 1:52 2:33 3:41 4:16	(1.3) 26%	(0.4) 8%	RUN 23					
193.2	115.0	4.0	3:46 3:01 2:37 3:30	(3.5) 88%	(2.2) 55%	RUN 24					
189.2	119.0										
188.2	120.0	1.0	3:03	(0.5) 50%	(0.0) 0%	RUN 25				188.2	
		5.0	2:20 2:55 3:21 3:17 3:12	(4.3) 86%	(3.3) 66%	RUN 26	(29.1) 97%	(26.8) 89%			
183.2	125.0	5.0	2:57 2:41 2:47 2:45 3:23	(4.8) 96%	(4.5) 90%	RUN 27					
178.2	130.0	5.0	2:51 3:07 3:17 4:12 3:03	(5.0) 100%	(4.8) 96%	RUN 28					
173.2	135.0	5.0	3:25 3:14 3:23 3:18 3:23	(5.0) 100%	(4.7) 94%	RUN 29					
168.2	140.0	5.0	3:06 2:56 2:53 2:48 2:45	(5.0) 100%	(4.6) 92%	RUN 30					
163.2	145.0	5.0	3:03 2:26 3:00 2:49 3:02	(5.0) 100%	(4.9) 98%	RUN 31					
158.2	150.0									158.2	150.0
Boring and coring terminated at 150.0 feet.											
Boring closed by tremie method with cement-bentonite grout.											
24 hour water level measured on 9/13/2009 prior to drilling. Borehole was at a depth of 115.0 feet.											

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

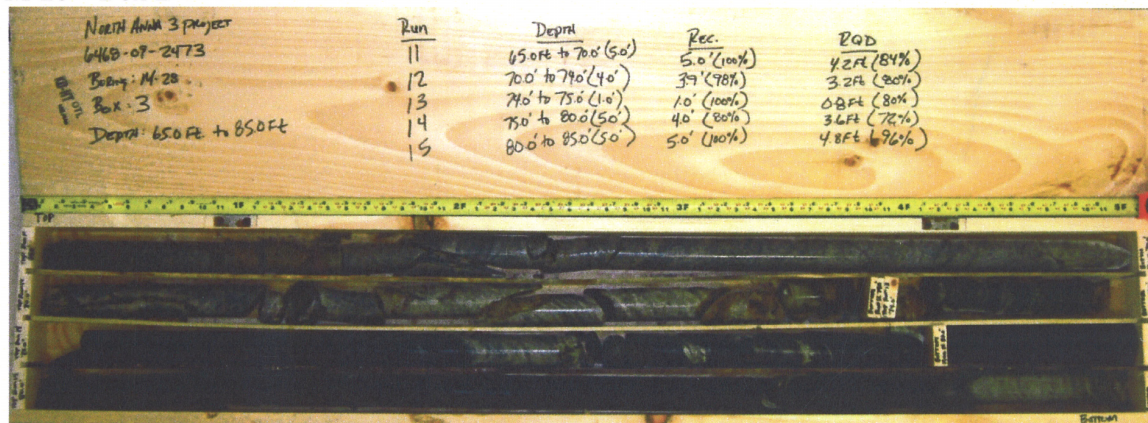




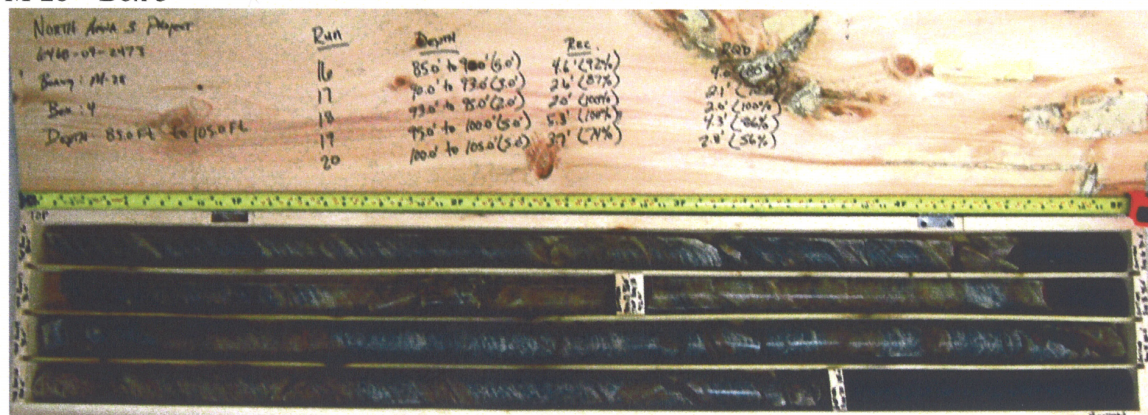
M-28 - Box 1



M-28 - Box 2

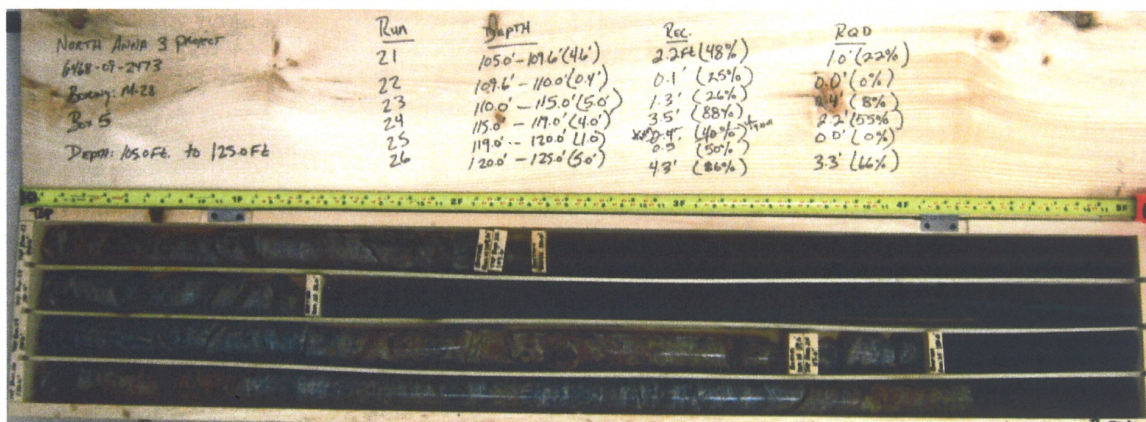


M-28 - Box 3

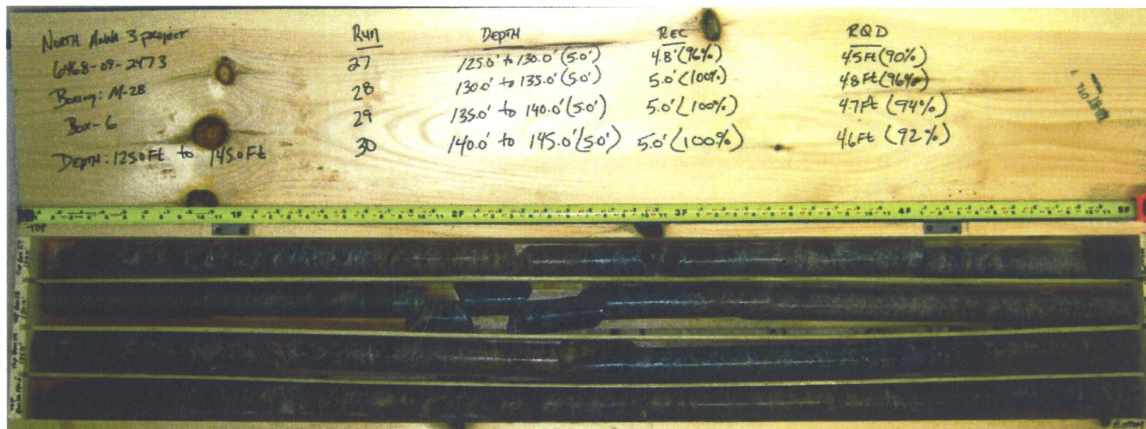


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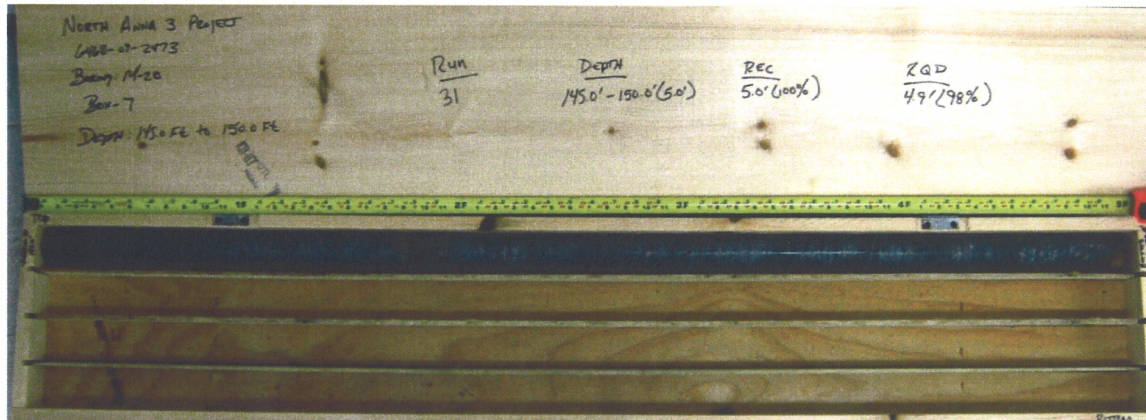




M-28 - Box 5



M-28 - Box 6



M-28 - Box 7