



GEOTECHNICAL BORING LOG

Prepared By MB Date 12/3/09

Checked By DSC Date 12-3-09

SHEET 1 OF 2

BECHTEL PROJECT NO.: 25161			MACTEC PROJECT NO.: 6468-09-2473			COUNTY: Louisa, VA			GEOLOGIST: C. Baldwin					
SITE DESCRIPTION: North Anna Power Station, Unit 3						DRILLER: D. Rhodes			FLUID LEVEL (ft)					
BORING NO.: W-2			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-45C Track (RAL)			0 HR. NA					
GROUND ELEV.: 298.4 ft (NAVD88)			NORTHING: 3,909,822 US ft (NAD83)			EASTING: 11,685,864 US ft (NAD83)			24 HR. 16.0					
TOTAL DEPTH: 143.3 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: 10/27/09		COMPLETED: 10/30/09		HOLE DIA.: 3"		CASING DEPTH: 20.8 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	
298.4					Ground Surface							298.4	0.0	
289.9	8.5											289.9	8.5	No sampling from 0.0 to 8.5 feet due to soft dig utility clearance by Dominion Personnel
287.8	10.6	5	6	8						SS-1		287.8		RESIDUAL SOIL: Silty SAND (SM), light brown (7.5YR 6/4), medium dense, moist, fine to medium grained sand, little mica
284.9	13.5	8	10	10						SS-2		284.9		
279.9	18.5	8	15	14						SS-3		279.9		
275.6	22.8	14	12	100/0.3						SS-4		275.6	19.5	WEATHERED ROCK: Severely weathered, BIOTITE QUARTZ GNEISS (sampled as Silty SAND (SM), light brownish gray (10YR 6/2), very dense, moist, fine to medium grained sand, little mica)
		50/0.0								SS-5		275.6	22.8	22.8 ft: Bit refusal and SPT refusal with no penetration.
														HARD ROCK: Light gray to grayish brown with orange staining, moderately severe to moderately weathered, very close to close fracturing, medium to moderately hard, BIOTITE QUARTZ GNEISS
														44.0 ft: complete loss of drill fluid circulation to formation
														HARD ROCK: Grayish brown to gray with trace orange staining, moderately to slightly weathered, very close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS

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



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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	
223.6					Continued from previous page									
												HARD ROCK: Grayish brown to gray with trace orange staining, moderately to slightly weathered, very close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (continued)		
												212.3	HARD ROCK: Gray and light gray with trace orange staining, slightly to very slightly weathered, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS	86.1
												155.1		143.3
													Boring and coring terminated at 143.3 ft. Note: Boring and coring terminated before 150 feet was reached due to broken core bit in hole. Boring closed by tremie method with cement-bentonite grout.	

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

24 hour water level measured on 10/30/2009 prior to drilling. Borehole was at a depth of 141.1 feet.



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GROUND ELEV.: 298.4 ft (NAVD88)		NORTHING: 3,909,822 US ft (NAD83)		EASTING: 11,685,864 US ft (NAD83)		24 HR. 16.0	
TOTAL DEPTH: 143.3 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08				HAMMER (ID): 140-lb. Auto (MEC-12)	
DATE STARTED: 10/27/09		COMPLETED: 10/30/09		CASING DEPTH: 20.8 ft		CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 10 bits	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)		REC. (%)	RQD (%)		
										Begin Coring @ 22.8 ft
275.6	22.8	3.3	N=50/0.0 1:07/0.3	(3.3) 100%	(3.3) 100%	RUN 1	(19.5) 84%	(15.4) 66%	275.6	HARD ROCK: Light gray to grayish brown with orange staining, moderately severe to moderately weathered, very close to close fracturing, medium to moderately hard, BIOTITE QUARTZ GNEISS
272.3	26.1	5.0	3:54 4:10 6:00	(4.3) 86%	(3.6) 72%	RUN 2				(1 joint at 10°, tight; 1 joint at 50°, tight; 1 joint at 70°, tight) (3 joints at 0-10°, tight; 1 joint at 30°, open)
267.3	31.1	5.0	2:57 1:24 1:54 1:33 1:20	(4.7) 94%	(2.8) 56%	RUN 3				(3 joints at 0-10°, open; 2 joints at 30°, tight; 2 joints at 50°, tight; 2 joints at 70-80°, tight)
262.3	36.1	5.0	1:50 1:28 1:26 1:57 2:40	(2.6) 52%	(1.8) 36%	RUN 4				(2 joints at 0-10°, tight; 3 joints at 20-30°, tight to open)
257.3	41.1	5.0	1:54 1:24 1:41 11:02 2:27	(4.6) 92%	(3.9) 78%	RUN 5				(1 joint at 20°, tight; 1 joint at 20°, open; 1 joint at 40°, open; 1 joint at 80-90°, tight)
252.3	46.1	5.0	2:08 1:52 2:00 2:58 2:29	(5.0) 100%	(4.2) 84%	RUN 6	(38.5) 96%	(32.6) 82%	252.3	44.0 ft: complete loss of drill fluid circulation to formation
247.3	51.1	5.0	3:03 3:00 4:02 4:28 4:20	(5.0) 100%	(4.1) 82%	RUN 7				HARD ROCK: Grayish brown to gray with trace orange staining, moderately to slightly weathered, very close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS (7 joints at 0-10°, tight; 1 joint at 70°, tight)
242.3	56.1	5.0	3:17 2:52 1:53 2:20 2:46	(5.0) 100%	(4.1) 82%	RUN 8				(6 joints at 0-10°, tight; 1 joint at 30°, tight)
237.3	61.1	5.0	4:16 3:07 4:09 3:07 3:40	(5.0) 100%	(5.0) 100%	RUN 9				(1 joint at 0°, tight; 2 joints at 20°, tight)
232.3	66.1	5.0	2:35 1:33 1:43 2:06 1:37	(5.0) 100%	(4.2) 84%	RUN 10				(10 joints at 20-30°, tight; 1 joint at 50°, tight)
227.3	71.1	5.0	2:42 2:18 2:34 2:12 2:26	(4.7) 94%	(3.5) 70%	RUN 11				(4 joints at 0-10°, tight to open; 2 joints at 20°, tight; 1 joint at 50°, tight; 1 quartz vein 0.1 feet thick at 67.9 ft at 45°)
222.3	76.1	5.0	3:15 3:37 3:10 2:43 2:39	(5.0) 100%	(4.4) 88%	RUN 12				(2 joints at 0-10°, tight; 6 joints at 50-60°, tight)
217.3	81.1	5.0	2:35 2:14 2:40 3:02 3:22	(5.0) 100%	(4.2) 84%	RUN 13				(1 joint at 0°, tight; 4 joints at 20-30°, tight; 1 joint at 70°, tight)
212.3	86.1	5.0	3:23 3:06 1:09 1:17 2:10	(3.8) 76%	(3.0) 60%	RUN 14				(3 joints at 30°, tight; 3 joints at 50°, tight)
207.3	91.1	5.0	2:11 3:16 3:39 5:36 7:40	(4.9) 98%	(4.9) 98%	RUN 15	(57.1) 100%	(54.4) 95%	212.3	HARD ROCK: Gray and light gray with trace orange staining, slightly to very slightly weathered, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (3 joints at 40-50°, tight)
202.3	96.1	5.0	3:24 2:58 3:46 2:16 2:42	(5.0) 100%	(4.3) 86%	RUN 16				(5 joints at 0-10°, tight; 1 joint at 20°, tight; 1 joint at 70°, tight)
		5.0	3:25	(5.0)	(4.4)	RUN 16				(5 joints at 0-10°, tight; 3 joints at 50-60°, tight)

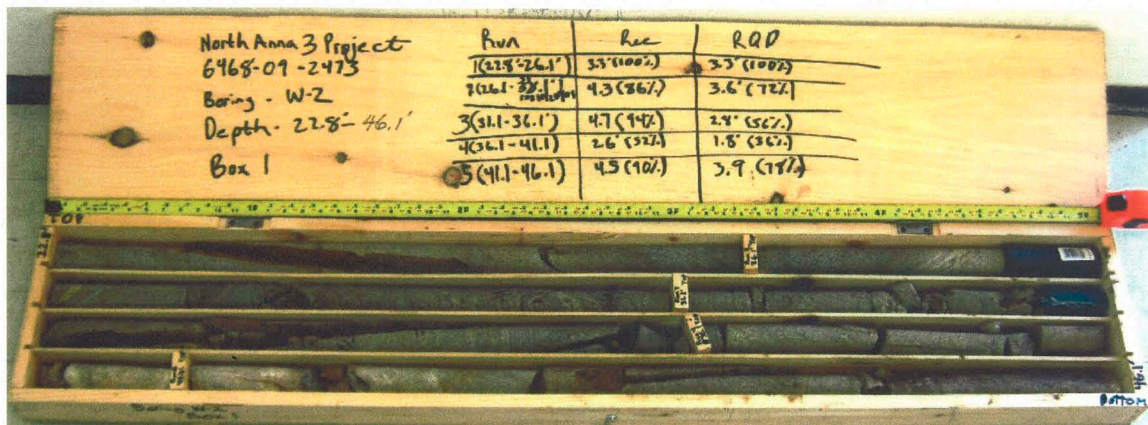
NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/3/09



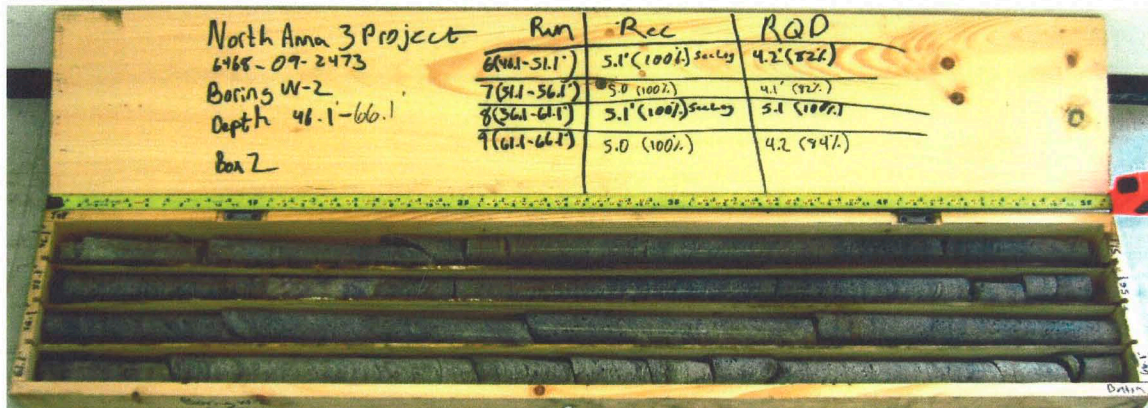
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				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
										Continued from previous page	
197.3	101.1		3:17 3:13 4:45 4:34	100%	88%					HARD ROCK: Gray and light gray with trace orange staining, slightly to very slightly weathered, very close to wide fracturing, hard to very hard, BIOTITE QUARTZ GNEISS (<i>continued</i>)	
		5.0	3:46 3:30 3:27 2:30 3:04	(5.0) 100%	(5.0) 100%	RUN 17				(2 joints at 0°, tight; 2 joints at 60-70°, tight)	
192.3	106.1	5.0	3:41 3:42 5:08 5:35 6:07	(5.0) 100%	(5.0) 100%	RUN 18				(1 joint at 40°, tight)	
187.3	111.1	5.0	6:16 5:29 6:13 6:55 7:50	(5.0) 100%	(4.7) 94%	RUN 19				(1 joint at 30°, tight; 3 joints at 50-60°, tight)	
182.3	116.1	5.0	3:35 2:59 3:14 2:47 2:24	(5.0) 100%	(5.0) 100%	RUN 20				(2 joints at 20-30°, tight)	
177.3	121.1	5.0	2:40 2:39 1:59 1:54 1:48	(5.0) 100%	(4.7) 94%	RUN 21				(2 joints at 10°, tight; 4 joints at 20-30°, tight)	
172.3	126.1	5.0	2:14 2:15 2:33 2:41 3:00	(5.0) 100%	(4.7) 94%	RUN 22				(2 joints at 20°, tight to open; 1 joint at 80°, tight)	
167.3	131.1	5.0	3:53 2:48 2:43 2:52 3:09	(5.0) 100%	(4.7) 94%	RUN 23				(2 joints at 40°, tight; 1 joint at 60°, tight)	
162.3	136.1	5.0	3:16 3:06 3:23 3:24 2:57	(5.0) 100%	(5.0) 100%	RUN 24				(1 joint at 0°, tight; 1 joint at 50°, tight)	
157.3	141.1	2.2	6:37 4:00	(2.2) 100%	(2.0) 91%	RUN 25				(2 joints at 30°, open)	
155.1	143.3		3:44/0.2						155.1	143.3	Boring and coring terminated at 143.3 ft. Note: Boring and coring terminated before 150 feet was reached due to broken core bit in hole. Boring closed by tremie method with cement-bentonite grout. 24 hour water level measured on 10/30/2009 prior to drilling. Borehole was at a depth of 141.1 feet.

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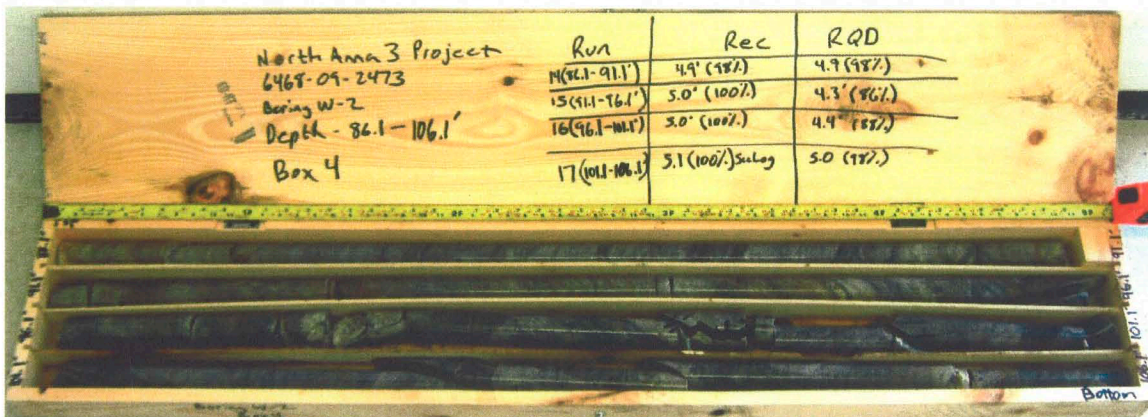
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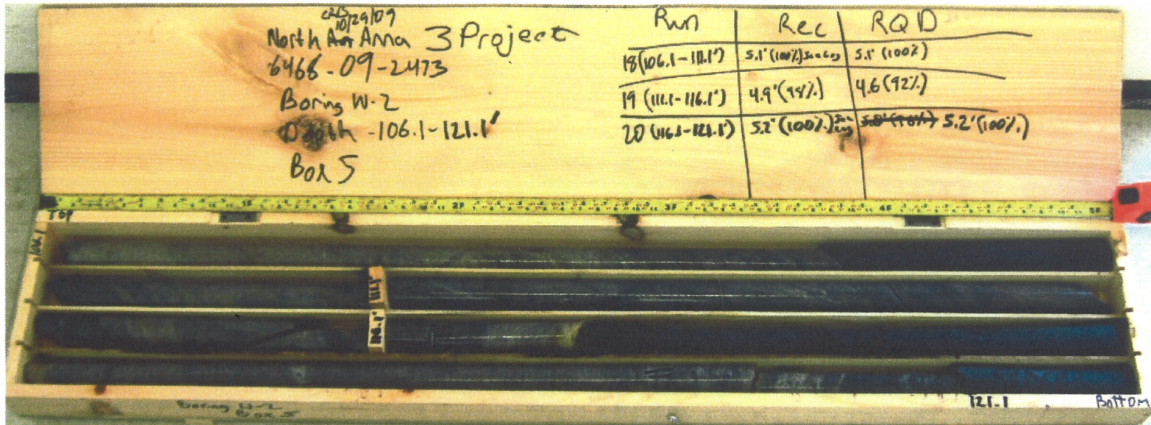
W-2- Box 2



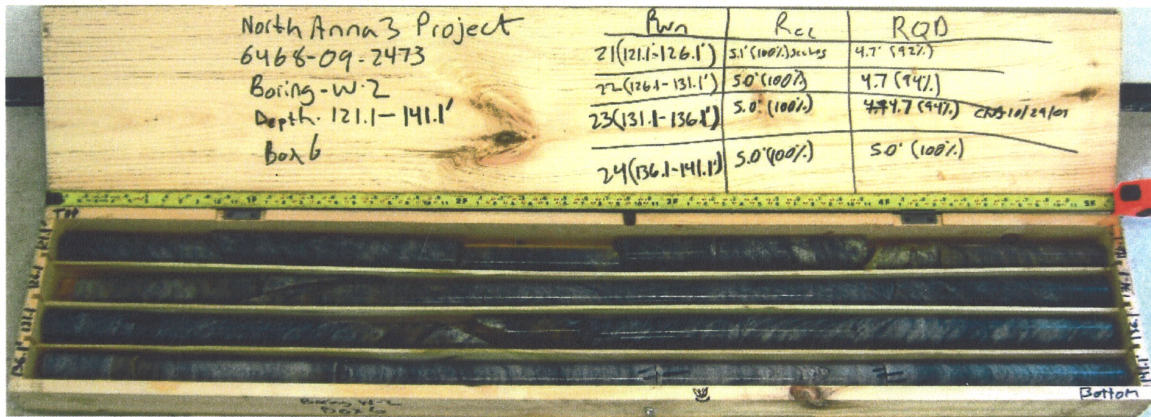
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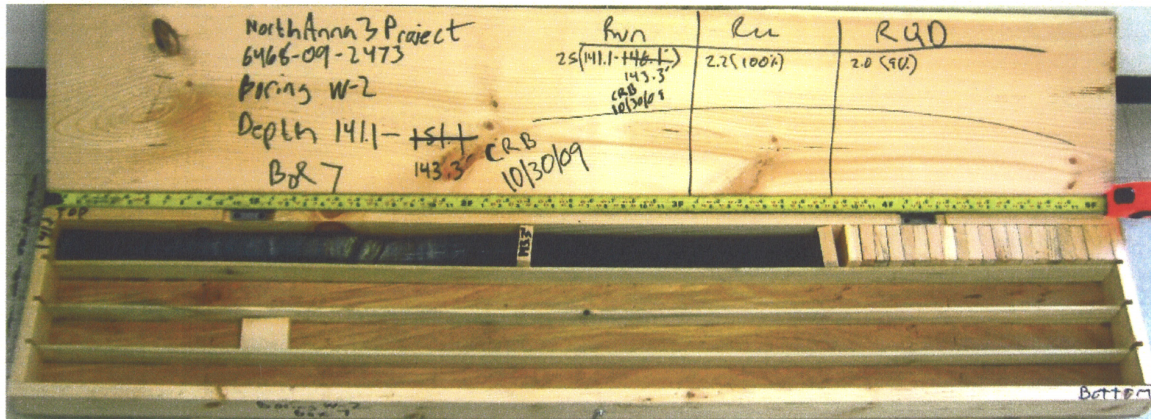
W-2- Box 4



W-2 - Box 5



W-2 - Box 6



W-2 - Box 7