

GEOTECHNICAL BORING LOG

Prepared By WPH Date 12/31/09
Checked By DSC Date 12-3-09

SHEET 1 OF 3

[illegible]

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



SHEET 2 OF 3

BECHTEL PROJECT NO.: 25161			MACTEC PROJECT NO.: 6468-09-2473			COUNTY: Louisa, VA			GEOLOGIST: K. Lloyd		
SITE DESCRIPTION: North Anna Power Station, Unit 3						DRILLER: D. Rhodes/P. Pitts			FLUID LEVEL (ft)		
BORING NO.: W-3			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-55 Track (RAL)			0 HR. NA		
GROUND ELEV.: 312.3 ft (NAVD88)			NORTHING: 3,909,715 US ft (NAD83)			EASTING: 11,685,899 US ft (NAD83)			24 HR. 27.2		
TOTAL DEPTH: 150.7 ft		SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08				ROD TYPE: AWJ		HAMMER (ID): 140-lb. Auto (MEC-21)			
DATE STARTED: 10/13/09		COMPLETED: 10/20/09		HOLE DIA.: 4"		CASING DEPTH: 36.8 ft		CORE SIZE: HQ3		BITS USED: 3-7/8" 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					
237.5					Continued from previous page										
													236.6	75.7	HARD ROCK: Grayish brown to gray, with orange staining, moderately to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS
													211.6	100.7	HARD ROCK: Gray to dark gray, very slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS
													199.0	113.3	HARD ROCK: Light gray with orange staining, moderately to slightly weathered, close to moderately close fracturing, hard, QUARTZ GNEISS with biotite (1 joint at 10°, open with orange staining; 3 joints at 30-40°, open with orange staining)
													194.0	118.3	HARD ROCK: Dark gray and gray, with orange staining, moderately weathered to fresh, close to wide fracturing, moderately hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite

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SHEET 3 OF 3

BECHTEL PROJECT NO.: 25161			MACTEC PROJECT NO.: 6468-09-2473			COUNTY: Louisa, VA			GEOLOGIST: K. Lloyd						
SITE DESCRIPTION: North Anna Power Station, Unit 3						DRILLER: D. Rhodes/P. Pitts			FLUID LEVEL (ft)						
BORING NO.: W-3			DRILL METHOD: Mud Rotary/Rock Core			DRILL MACHINE: CME-55 Track (RAL)			0 HR. NA						
GROUND ELEV.: 312.3 ft (NAVD88)			NORTHING: 3,909,715 US ft (NAD83)			EASTING: 11,685,899 US ft (NAD83)			24 HR. 27.2						
TOTAL DEPTH: 150.7 ft			SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08			ROD TYPE: AWJ			HAMMER (ID):140-lb. Auto (MEC-21)						
DATE STARTED: 10/13/09			COMPLETED: 10/20/09			HOLE DIA.: 4"			CASING DEPTH: 36.8 ft						
						CORE SIZE: HQ3			BITS USED: 3-7/8" 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					
162.7					Continued from previous page										
													161.6	150.7	Boring and coring terminated at 150.7 feet. Boring closed by tremie method with cement-bentonite grout. 24 hour water level measured on 10/16/2009 prior to drilling. Borehole was at a depth of 70.7 feet.

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



SHEET 1 OF 2

BECHTEL PROJECT NO.: 25161				MACTEC PROJECT NO.: 6468-09-2473				COUNTY: Louisa, VA		GEOLOGIST: K. Lloyd			
SITE DESCRIPTION: North Anna Power Station, Unit 3								DRILLER: D. Rhodes/P. Pitts			FLUID LEVEL (ft)		
BORING NO.: W-3				DRILL METHOD: Mud Rotary/Rock Core				DRILL MACHINE: CME-55 Track (RAL)			0 HR.	NA	
GROUND ELEV.: 312.3 ft (NAVD88)				NORTHING: 3,909,715 US ft (NAD83)				EASTING: 11,685,899 US ft (NAD83)			24 HR.	27.2	
TOTAL DEPTH: 150.7 ft				SAMPLE METHODS: ASTM D 1586-08a; 2488-09a; 2113-08; 6032-08						HAMMER (ID): 140-lb. Auto (MEC-21)			
DATE STARTED: 10/13/09				COMPLETED: 10/20/09		CASING DEPTH: 36.8 ft		CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 bits					
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS			
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %					
										Begin Coring @ 33.8 ft			
278.5 276.5	33.8 35.8	2.0	1:13 1:08	(0.0) 0%	(0.0) 0%	RUN 1	(0.0) 0%	(0.0) 0%		276.3	WEATHERED ROCK: Severely weathered QUARTZ GNEISS (Sampled as Silty SAND (SM), very pale brown (10YR 7/4) and yellow (10YR 7/6), very dense, moist, fine to coarse grained sand, few mica) (continued)		36.0
276.3	36.0	4.4	N=100/0.2 1:38 1:23 1:03 1:01	(3.5) 80%	(2.8) 64%	SS-8 RUN 2	(13.9) 57%	(6.2) 25%		WEATHERED ROCK and HARD ROCK: Light yellowish tan to light tan, with some orange staining, severely to moderately severely weathered, very close to close fracturing, medium to moderately hard, QUARTZ GNEISS			
271.9	40.4		0:45/0.4	(2.5)	(1.6)	RUN 3				(3 joints at 0-10°, open with orange staining and clay; 2 joints at 60°, open to tight with orange staining and clay)			
		5.0	1:23 1:09 2:13 1:45 2:05	(2.5) 50%	(1.6) 32%					(3 joints at 0-15°, open with orange staining; 1 joint at 70°, open with clay, orange staining, weathered)			
266.9	45.4			(1.6) 59%	(0.5) 19%	RUN 4				(3 joints at 0-15°, open with orange staining, weathered)			
264.2	48.1		1:38 2:02 2:52/0.7	(1.6) 59%	(0.5) 19%					(7 joints at 0-15°, open with orange staining, weathered)			
		2.5	0:25/0.5 1:31 1:46	(2.5) 100%	(1.3) 52%	RUN 5							
261.7	50.6			(2.6) 52%	(0.0) 0%	RUN 6				(very fractured, open with orange staining)			
		5.0	1:25 1:28 2:09 1:22 1:37	(2.6) 52%	(0.0) 0%								
256.7	55.6			(1.2) 24%	(0.0) 0%	RUN 7				(very fractured, open with orange staining)			
		5.0	1:23 0:48 1:03 1:10 1:48	(1.2) 24%	(0.0) 0%								
251.7	60.6			(2.9) 58%	(0.8) 16%	RUN 8	(2.9) 58%	(0.8) 16%		251.7	WEATHERED ROCK and HARD ROCK: Brown, severely to moderately severely weathered, close fracturing, medium hard, BIOTITE GNEISS with quartz vein		60.6
		5.0	1:18 1:24 1:32 1:04 1:01	(2.9) 58%	(0.8) 16%					(very fractured, tight, trace clay, orange staining)			
246.7	65.6			(4.6) 90%	(1.4) 27%	RUN 9	(7.1) 70%	(3.4) 34%		246.7	WEATHERED ROCK and HARD ROCK: Grayish brown and brown, severely to moderately weathered, close fracturing, medium hard, BIOTITE QUARTZ GNEISS		65.6
		5.1	1:23 1:02 1:10 1:38 1:21/1.1	(4.6) 90%	(1.4) 27%					(3 joints at 0-10°, tight; 6 joints at 10-20°, tight, trace clay, orange staining)			
241.6	70.7			(2.5) 50%	(2.0) 40%	RUN 10				(1 joint at 10°, open with clay, orange staining; 2 joints at 60-70°, open with clay, orange staining)			
		5.0	3:23 4:27 4:37 4:35 8:02	(2.5) 50%	(2.0) 40%								
236.6	75.7			(5.0) 100%	(3.9) 78%	RUN 11	(24.5) 98%	(22.6) 90%	236.6	HARD ROCK: Grayish brown to gray, with orange staining, moderately to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE QUARTZ GNEISS		75.7	
		5.0	4:53 4:01 4:08 8:01 7:27	(5.0) 100%	(3.9) 78%				(4 joints at 10-20°, tight with trace clay, orange staining; 5 joints at 50-60°, tight with trace clay, orange staining)				
231.6	80.7			(5.0) 100%	(4.7) 94%	RUN 12			(4 joints at 30-40°, tight with trace clay, orange staining; 1 joint at 70°, tight with trace clay, orange staining; 1 joint at 90°, tight with trace clay, orange staining)				
		5.0	3:57 7:43 4:56 5:49 6:00	(5.0) 100%	(4.7) 94%								
226.6	85.7			(5.0) 100%	(5.0) 100%	RUN 13			(2 joints at 30°, tight with trace clay; 1 joint at 90°, tight, trace clay, orange staining)				
		5.0	4:27 4:47 5:54 5:55 4:51	(5.0) 100%	(5.0) 100%								
221.6	90.7			(4.5) 90%	(4.2) 84%	RUN 14			(2 joints at 30°, open with clay, orange staining; 2 joints at 50-60°, tight with trace clay, orange staining)				
		5.0	5:17 5:12 5:15 6:21 11:31	(4.5) 90%	(4.2) 84%								
216.6	95.7			(5.0) 100%	(4.8) 96%	RUN 15			(2 joints at 10-20°, open with clay, orange staining; 3 joints at 60-70°, tight with trace clay, orange staining)				
		5.0	7:28 8:34 7:18 6:19 6:23	(5.0) 100%	(4.8) 96%								
211.6	100.7			(5.0) 100%	(5.0) 100%	RUN 16	(12.6) 100%	(12.6) 100%	211.6	HARD ROCK: Gray to dark gray, very slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS		100.7	
		5.0	5:03 5:39 7:17 7:15 6:45	(5.0) 100%	(5.0) 100%				(2 joints at 40-50°, tight; 2 joints at 50-60°, tight)				
206.6	105.7			(5.0) 100%	(5.0) 100%	RUN 17			(1 joint at 60°, tight)				
		5.0	5:19 6:12 6:28	(5.0) 100%	(5.0) 100%								

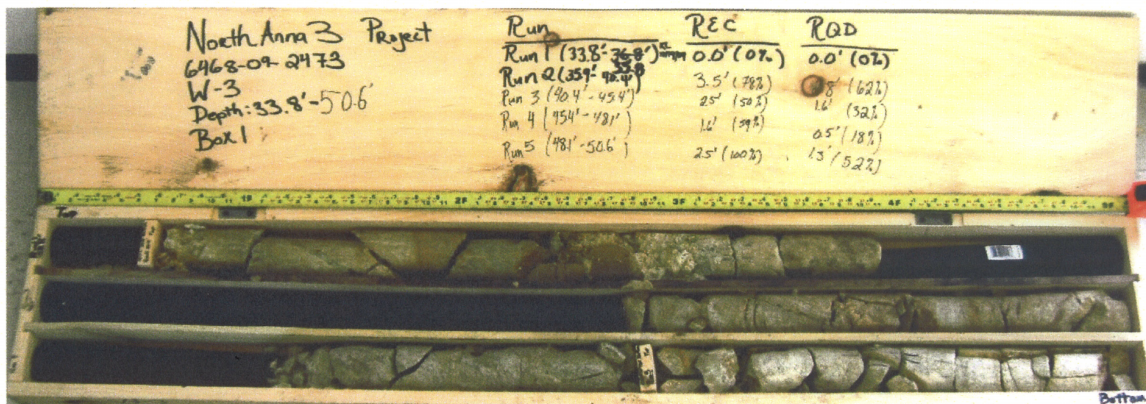
NORTH ANNA 3 CORE NORTH ANNA 3 PROJECT.GPJ NORTH ANNA 3.GDT 12/3/09



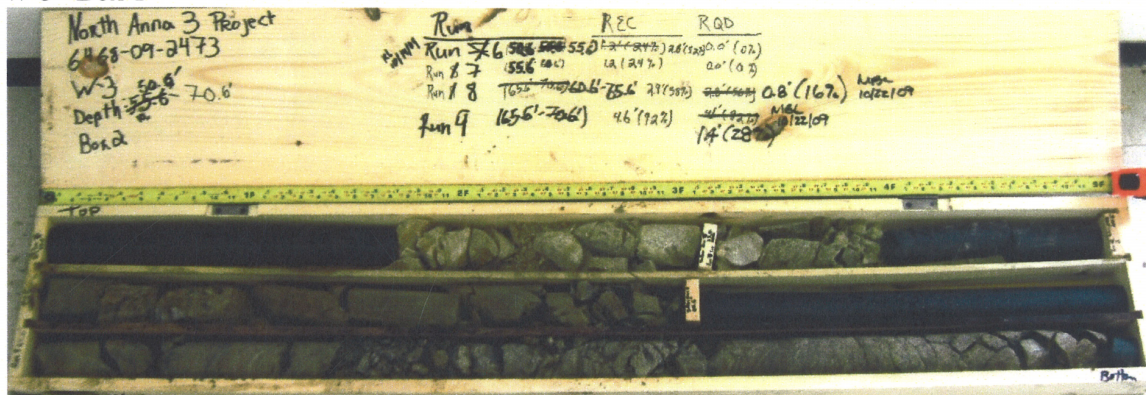
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DATE STARTED: 10/13/09		COMPLETED: 10/20/09	CASING DEPTH: 36.8 ft	CORE BARREL TYPE: Wireline HQ3 Triple Tube, series 6 & 10 bits				

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Continued from previous page
201.6	110.7	5.0	6:17 6:10 7:31 5:58 6:13 5:15 5:16	(5.0) 100%	(4.7) 94%	RUN 18				HARD ROCK: Gray to dark gray, very slightly weathered to fresh, moderately close to wide fracturing, hard to very hard, BIOTITE GNEISS (<i>continued</i>) (1 joint at 60°, open with clay)
196.6	115.7	5.0	6:06 6:09 4:52 4:40 5:59	(5.0) 100%	(5.0) 100%	RUN 19	(5.0) 100%	(4.7) 94%		HARD ROCK: Light gray with orange staining, moderately to slightly weathered, close to moderately close fracturing, hard, QUARTZ GNEISS with biotite (1 joint at 10°, open with orange staining; 3 joints at 30-40°, open with orange staining)
191.6	120.7	5.0	6:12 5:40 8:31 6:58 4:31	(5.0) 100%	(4.6) 92%	RUN 20	(32.0) 99%	(30.5) 94%		HARD ROCK: Dark gray and gray, with orange staining, moderately weathered to fresh, close to wide fracturing, moderately hard to very hard, BIOTITE QUARTZ GNEISS with trace magnetite (2 joints at 60°, tight) (2 joints at 0-10°, open; 4 joints at 50-60°, tight)
186.6	125.7	5.0	7:42 6:03 5:36 6:02 4:55	(5.0) 100%	(4.6) 92%	RUN 21				(1 joint at 10°, tight; 3 joints at 50-60°, tight with trace clay, orange staining)
181.6	130.7	5.0	6:13 6:10 7:10 8:46 8:31	(5.0) 100%	(5.0) 100%	RUN 22				(3 joints at 30-40°, tight)
176.6	135.7	5.0	7:02 6:42 4:22 4:20 3:15	(5.0) 100%	(4.5) 90%	RUN 23				(3 joints at 10-20°, open with orange staining; 2 joints at 50-60°, open; 2 joints at 60-70°, tight with trace clay and orange staining)
171.6	140.7	5.0	5:45 4:38 4:59 5:10 4:21	(5.0) 100%	(4.8) 96%	RUN 24				(2 joints at 20-30°, tight with trace clay and orange staining; 1 joint at 40°, tight with trace orange staining; 1 joint at 80°, tight with trace clay, orange staining)
166.6	145.7	5.0	8:06 8:10 8:13 8:38 7:35	(4.6) 92%	(4.6) 92%	RUN 25				(No joints)
161.6	150.7									Boring and coring terminated at 150.7 feet.
										Boring closed by tremie method with cement-bentonite grout.
										24 hour water level measured on 10/16/2009 prior to drilling. Borehole was at a depth of 70.7 feet.

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



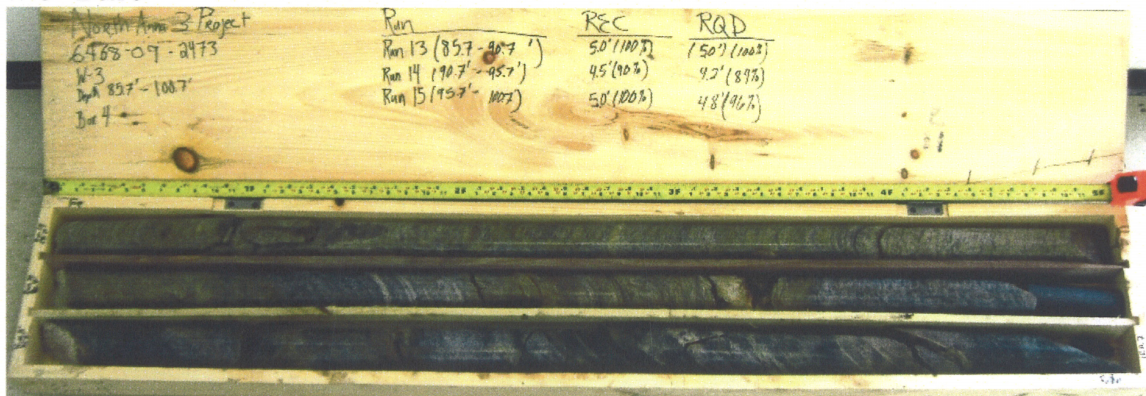
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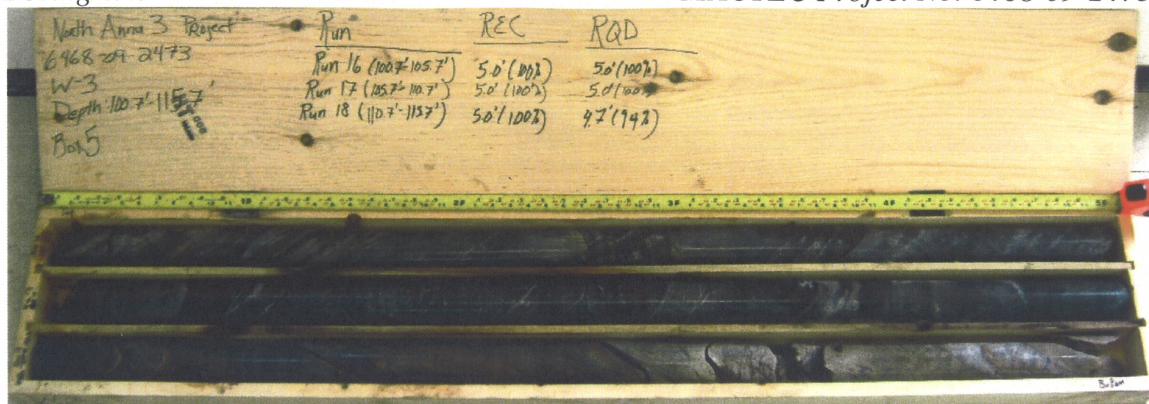
W-3- Box 2



W-3- Box 3



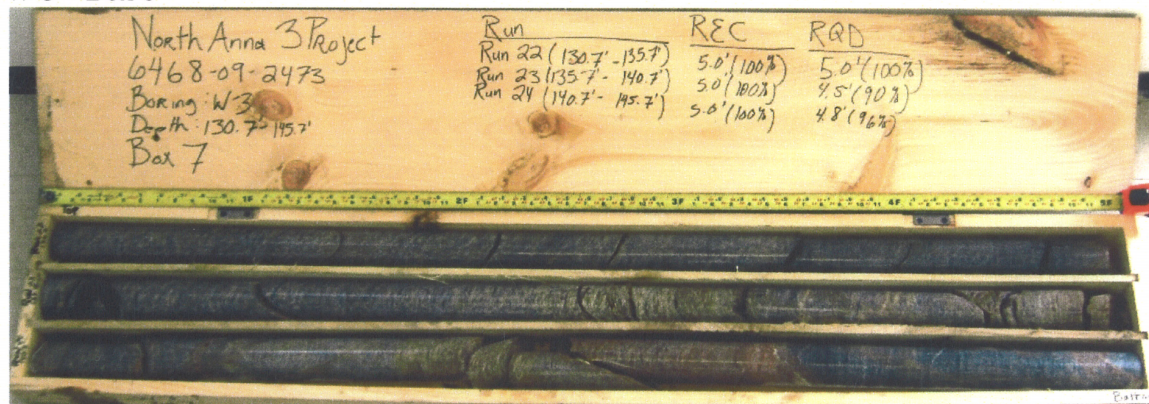
W-3- Box 4



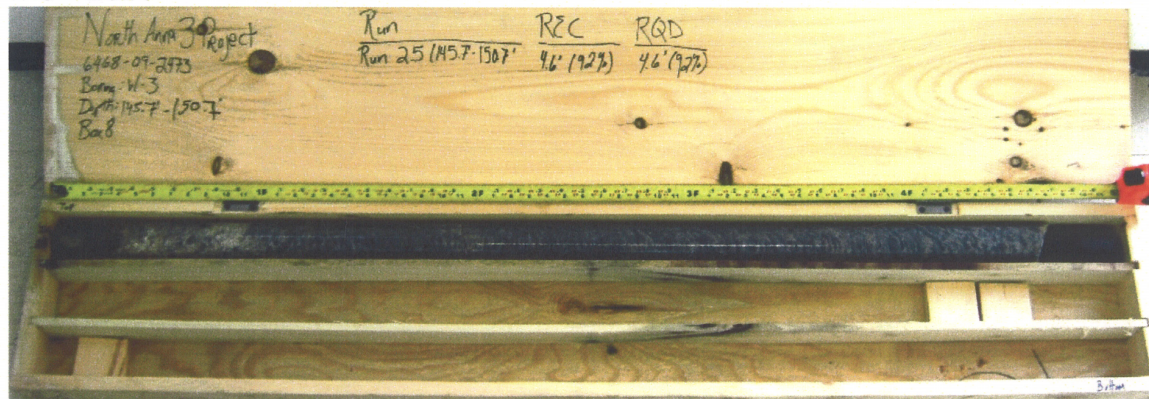
W-3 - Box 5



W-3 - Box 6



W-3 - Box 7



W-3 - Box 8