

GEOTECHNICAL BORING LOG
Prepared By Mr Date 12/369
Checked By DSC Date 12-3-09

SHEET 1 OF 2

BECH1	TEL PRO	JECT I	NO.: 25	161	MACTE	C PR	OJECT NO.:	6468	-09-247	3 C	OUNTY	': L	Louisa, VA GEOLOGIST: C. Baldwin
SITE D	ESCRIP	TION: I	North A	Anna Po	wer Station, l	Jnit 3				D	RILLER	R: D.	. Rhodes FLUID LEVEL (ft)
	IG NO.:						OD: Mud Ro	tarv/F	Rock Co				HINE: CME-45C Track (RAL) 0 HR. NA
	ND ELEV		8.4 ft	(NAVI	D88) NORTH								11,685,864 US ft (NAD83) 24 HR. 16.0
	DEPTH				METHODS:								ROD TYPE: AWJ HAMMER (ID):140-Ib. Auto (MEC-
	STARTE				PLETED: 10/3				CASI		Temper /	1.8 TI	ft CORE SIZE: NQ3 BITS USED: 2-7/8" Tri-Cone
ELEV.			OW CO			8LOVV 40	S PER FOOT 60	80	100	SAMP	1/1	Ō	SOIL AND ROCK DESCRIPTION
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 20				100	NO.	MOI	G	
298.4					•	Grou	nd Surface						298.4
													No sampling from 0.0 to 8.5 feet due to soft dig
	+												utility clearance by Dominion Personnel
-	Ŧ l												.
	‡												<u> </u>
289.9	8.5												289.9
287.8	10.6	5	6	8	14					SS-1	4		RESIDUAL SOIL: Silty SAND (SM), light brown (7.5YR 6/4), medium dense, moist, fine to
	-	8	10	10	20					SS-2			medium grained sand, little mica
284.9	13.5		15	1						SS-3			42.5 (1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.
	‡	8	15	14		29				33-3	-		L 13.5 ft: Light brownish gray (10YR 6/2)
	<u>†</u>												<u>.</u>
279.9	18.5	14	12	100/0.3				-		SS-4	- 1		
	‡	14	12	100/0.5					100/0.3			2	WEATHERED ROCK: Severely weathered,
275.6 -	22.8											\geq	BIOTITE QUARTZ GNEISS (sampled as Silty 275.6 SAND (SM), light brownish gray (10YR 6/2),
	-	50/0.0	1						50/0.0	SS-5			very dense, moist, fine to medium grained sand, little mica)
	Ŧ												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,
	F												BIOTITE QUARTZ GNEISS
-	‡											>>>>	-
	<u>†</u>												
	+											<i>>>>></i>	
-	F I												
	‡											///	}
_	‡												
	<u>†</u>												44.0 ft: complete loss of drill fluid circulation to
	+											111	252.3 formation HARD ROCK: Grayish brown to gray with trace
_	F											}	orange staining, moderately to slightly weathered, very close to moderately close
	‡												fracturing, moderately hard to hard, BIOTITE
	‡					: : :							QUARTZ GNEISS
-	+												
	F 1												7
	‡												
-	‡												
	<u>†</u>							: : :				}	
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BECHT	EL PRO	DJECT N	NO.: 25	5161		MACTEC PR	ROJECT NO.:	6468	-09-2473		COUNT	Y: L	_ouisa, \	/A GE	EOLOGIST:	C. Baldwin	
ITE D	ESCRIF	PTION: I	North /	Anna Pov	ver S	Station, Unit 3	3				DRILLE	R: D	. Rhode	S		FLUID LEVEL (f	t)
ORIN	G NO.:	W-2				DRILL METH	HOD: Mud Ro	tary/F	Rock Co	re	DRILL N	IAC	HINE: CI	ME-45C Tra	ack (RAL)	0 HR. NA	A
ROUI	ND ELE	V.: 298	3.4 ft	(NAVI	088)	NORTHING:	3,909,822	US	ft (NAD	83)	EASTIN	G:	11,685,8	864 U	IS ft (NAD83)	24 HR. 16.	0
OTAL	DEPTH	ł: 143.:	3 ft 5	SAMPLE	MET	THODS: ASTN	1 D 1586-08a;							YPE: AWJ	HAMMER	(ID):140-lb. Auto (MI	EC-1
		ED: 10/				ED: 10/30/09			T		PTH: 20			E SIZE: NO		ED: 2-7/8" Tri-Cone	
ELEV.			OW CO				VS PER FOOT			SAM	Specimentary /	1 L	T		1		
(ft)	(ft)	0.5ft	0.5ft	0.5ft	Ò	20 4		80	100	NO	1/	O		SOIL	AND ROCK D	DESCRIPTION	
(/	()										VIVIOI			JANIE			
223.6						Continued	from previous	page	•	-				HADD DO	OK. O. ish h	20.	
-	Ė							 					}	orange sta	aining, moderat		
_	ļ.												\$			moderately close rd to hard, BIOTITE	
	t											>>>	<u></u>	QUARTZ	GNEISS (conti	nued)	
													}				
-	t											>>>	1				
-	-												}				
-	<u> </u>											111	212.3	HARD BO	CK: Gray and	light gray with trace	
-													Ł	orange sta	aining, slightly to	o verv slightly	
-	F												F	weathered	. very close to	wide fracturing, hard JARTZ GNEISS	
-	L												1	to very rial	iu, DIOTTIE QC	JAINE GIVEIOS	
-	+								: : :				1				
-	<u> </u>												7				
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-	-	1			<u> </u>			· · ·				1///	155.1			ated at 143.3 ft. terminated before 150	14
	‡												-	feet was re		broken core bit in	
_	‡												L	hole. Boring clo	sed by tremie r	method with	
	L							-						cement-be	entonite arout.	sured on 10/30/2009	



25015	TI DDG	IFOT	NO - 054	C4	T.	* A OTE O	DD0 "	COTA	0 . 040	00.0470	COUNTY Lands MA		1 OF 2	
			NO.: 2510					ECTN	U.: 6468		COUNTY: Louisa, VA	GEOLOGIST: C.		
			North An	na Pov							DRILLER: D. Rhodes		FLUID LEVE	
	G NO.:										ORILL MACHINE: CME-4		0 HR.	NA
	ND ELEV		298.4 ft	, —		IORTHIN					ASTING: 11,685,864	US ft (NAD83)	24 HR.	16.0
TOTAL	DEPTH	: 143	.3 ft	SAM	PLE M	ETHODS	: ASTN	/I D 15	86-08a;		3-08; 6032-08		140-lb. Auto (MEC	
DATE S	STARTE	D: 10	0/27/09	COM	PLETE	D: 10/3	0/09	CASIN	IG DEP	ΓH: 20.8 ft C	ORE BARREL TYPE: W	ireline NQ3 Triple T	ube, series 6 & 1	0 bit
ELEV.	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	REC.	RATA	L		DESCRIPTION	N AND REMARKS		
(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ		DESCRIPTION	AND KLIVIAKKS		
											Pagin Ca	ina @ 22 0 ft		
275.6	22.8	3.3	N=50/0.0	(3.3)	(3.3)	RUN 1	(19.5)	(15.4)	2	75.6 HARD R	OCK: Light gray to grayish b	ring @ 22.8 ft rown with orange staini	ng, moderately	
			1:07/0.3 3:54	100%	100%		84%	66%	>>>	severe to	moderately weathered, ver ely hard, BIOTITE QUARTZ	y close to close fracturir		
272.3	26.1	5.0	4:10 6:00	(4.3)	(3.6)	RUN 2				(1 joint at	t 10°, tight; 1 joint at 50°, tig	nt; 1 joint at 70°, tight)		
			2:57 1:24	86%	72%					(3 joints a	at 0-10°, tight; 1 joint at 30°,	open)		
267.3	31.1		1:54 1:33											
207.0	01.1	5.0	1:20	(4.7)	(2.8)	RUN 3					at 0-10°, open; 2 joints at 30	°, tight; 2 joints at 50°, t	ight; 2 joints at	
			1:28 1:26	94%	56%					70-80°, ti	gnt)			
262.3	36.1		1:57 2:40											
		5.0	1:54 1:24	(2.6) 52%	(1.8) 36%	RUN 4				(2 joints a	at 0-10°, tight; 3 joints at 20-	30°, tight to open)		
			1:41	JZ /0	00 /0									
257.3	41.1		2:27	1	(0.0)									
		5.0	2:08 1:52	(4.6) 92%	(3.9) 78%	RUN 5				(1 joint at tight)	t 20°, tight; 1 joint at 20°, op	en; 1 joint at 40°, open;	1 joint at 80-90°,	
			2:00 2:58							• /	omplete loss of drill fluid circ			
252.3	46.1	5.0	2:29 3:03	(5.0)	(4.2)	RUN 6	(38.5)	(32.6)	2	52.3	OCK: Grayish brown to gray		ing moderately to	
		5.0	3:00	100%	84%	KONO	96%	82%		slightly w	eathered, very close to mod			
-	4:02 4:28										OTITE QUARTZ GNEISS at 0-10°, tight; 1 joint at 70°,	tight)		
247.3	51.1	5.0	4:20 3:17	(5.0)	(4.1)	RUN 7					at 0-10°, tight; 1 joint at 30°,			
			2:52 1:53	100%	82%	(o joints at)					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,		
242.3	56.1		2:20 2:46											
242.3	30.1	5.0	4:16	(5.0)	(5.0)	RUN 8				(1 joint at	t 0°, tight; 2 joints at 20°, tigl	nt)		
			3:07 4:09	100%	100%									
237.3	61.1		3:07 3:40											
		5.0	2:35 1:33	(5.0) 100%	(4.2) 84%	RUN 9				(10 joints	at 20-30°, tight; 1 joint at 50)°, tight)		
			1:43 2:06	100 /6	0476									
232.3	66.1		1:37											
		5.0	2:42 2:18	(4.7) 94%	(3.5) 70%	RUN 10					at 0-10°, tight to open; 2 join feet thick at 67.9 ft at 45°)	ts at 20°, tight; 1 joint a	t 50°, tight; 1 quartz	
			2:34 2:12								,			
227.3	71.1	5.0	2:26 3:15	(5.0)	(4.4)	RUN 11				(2 ininte	at 0-10°, tight; 6 joints at 50-	60° tight)		
		0.0	3:37 3:10	100%	88%					(2 JOHRS 6	aco 10 , ugin, o jointo at 00-	oo , agaa,		
000 0	70.		2:43											
222.3	76.1	5.0	2:39 2:35	(5.0)	(4.2)	RUN 12				(1 joint at	t 0°, tight; 4 joints at 20-30°,	tight; 1 joint at 70°, tigh	t)	
			2:14 2:40	100%	84%									
217.3	81.1		3:02 3:22											
217.5	01.1	5.0	3:23 3:06	(3.8)	(3.0)	RUN 13				(3 joints a	at 30°, tight; 3 joints at 50°, t	ight)		
			1:09	76%	60%									
212.3	86.1		1:17 2:10						M 2	12.3				
		5.0	2:11 3:16	(4.9) 98%	(4.9) 98%	RUN 14	(57.1) 100%	(54.4) 95%		HARD R	OCK: Gray and light gray wi eathered, very close to wide			
			3:39 5:36	3070	30 70		100%	35%			deathered, very close to wide CGNEISS	mactumily, mard to very	riiaiu, DIOTTE	
207.3	91.1		7:40	<u> </u>							at 40-50°, tight)			
		5.0	3:24 2:58	(5.0)	(4.3) 86%	RUN 15				(5 joints a	at 0-10°, tight; 1 joint at 20°,	tight; 1 joint at 70°, tigh	t)	
			3:46	1	1		1		11111					
			2:16						1///					



			NO.: 251					ECT N	O.: 64	8-09-2473 COUNTY: Louisa, VA GEOLOGIST: C. Baldwin
SITE D	ESCRIP'	TION:	North An	na Pov	ver Sta	tion, Un	it 3			DRILLER: D. Rhodes FLUID LEVEL (ft
BORIN	G NO.:	W-2			0	RILL ME	THOE	: Mud	Rota	/Rock Core DRILL MACHINE: CME-45C Track (RAL) 0 HR. NA
GROUN	ND ELEV	'.: 2	298.4 ft	(NAVI	N (88C	IORTHIN	G: 3	,909,82	22	IS ft (NAD83) EASTING: 11,685,864
TOTAL	DEPTH	143	.3 ft	SAMI	PLE M	ETHODS	: AST	M D 15	86-08	; 2488-09a; 2113-08; 6032-08 HAMMER (ID): 140-lb. Auto (MEC-12
DATE S	STARTE	D: 10	0/27/09	COM	PLETE	D: 10/30	0/09	CASIN	IG DE	PTH: 20.8 ft CORE BARREL TYPE: Wireline NQ3 Triple Tube, series 6 & 10 bit
ELEV.	DEPTH	RUN	DRILL		JN	CAMD	STI	RATA	L	
(ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	O G	DESCRIPTION AND REMARKS
			(14111/10)	70	70		70	70		
			3:17	100%	88%					Continued from previous page
			3:13 4:45	100%	00%					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
197.3	101.1	5.0	4:34 3:46	(5.0)	(5.0)	RUN 17				QUARTZ GNEISS (continued) (2 joints at 0°, tight; 2 joints at 60-70°, tight)
		5.0	3:30	100%	100%	KON 17			>>>	(2 Johns at 0 , light, 2 Johns at 00-70 , light)
			3:27 2:30							
192.3	106.1	5.0	3:04 3:41	(5.0)	(5.0)	RUN 18	-			(1 joint at 40°, tight)
			3:42 5:08	100%	100%					
187.3	444.4		5:35 6:07							
167.3	111.1	5.0	6:16	(5.0)	(4.7)	RUN 19				(1 joint at 30°, tight; 3 joints at 50-60°, tight)
			5:29 6:13	100%	94%					
182.3	116.1		6:55 7:50							
. 32.0	, 10.1	5.0	3:35 2:59	(5.0) 100%	(5.0) 100%	RUN 20	1			(2 joints at 20-30°, tight)
			3:14	100%	100%				>>>	
177.3	121.1		2:47 2:24	<u> </u>						
		5.0	2:40 2:39	(5.0)	(4.7) 94%	RUN 21				(2 joints at 10°, tight; 4 joints at 20-30°, tight)
			1:59 1:54							
172.3	126.1	F.O.	1:48	(5.0)	(4.7)	RUN 22	-			(2 joints at 20° tight to ones, 4 joint at 20° tight)
		5.0	2:15	(5.0) 100%	94%	NON 22				(2 joints at 20°, tight to open; 1 joint at 80°, tight)
			2:33							
167.3	131.1	5.0	3:00 3:53	(5.0)	(4.7)	RUN 23	-		>>>	(2 joints at 40°, tight; 1 joint at 60°, tight)
			2:48 2:43	100%	94%					
162.3	136.1		2:52 3:09							
102.3	130.1	5.0	3:16	(5.0)		RUN 24	1			(1 joint at 0°, tight; 1 joint at 50°, tight)
			3:06 3:23	100%	100%					
157.3	141.1		3:24 2:57							
155.1	143.3	2.2	6:37 4:00	(2.2)	(2.0) 91%	RUN 25				(2 joints at 30°, open) 155.1
100.1	140.0		3:44/0.2	1.50,0	1			1	1	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.
										dopar of 17111 loca
									1	



	North Ama 3 Project 6468-04-2473 Borins W-Z. Outh 46.1-66.1	8(361-611)	5.1'(100/) Succes	4.1' (92%) 5.1 (10%)	_ •	0
) 15ate 5-1 1	Box Z	¶(611-664)	5.0 (100).)	4.2 (94%)	district edges of select	(1 , 5 1 SE
	Towns and the				Contraction	
					Principal Control of C	

W-2-Box 2

North Anna Stroject 1468-09-1473 Boing W-Z	RVA Rec 10(16.1-71.1) 47(44).) 11(721-721) 5.0 (1007.) 12(76.1-81.1) 5.0 (1007.)	R40 3.5(10%) 4.4(18%) 4.4(18%)
Depth - GC.1-36.1' Box 3	13(411-46-1) 38. (1927)	so in the state of
	The state of the state of	
Control of the Contro	No.	bito

W-2-Box 3

North Ama 3 Project 6464-09-2473 Boring W-2 Depth - 86.1-106.1' Box 4	17 (01.1-16.1)	5.0 (100%) Seeleg	(20) 4.9 (98%) 4.3 (96%) 4.9 (88%) 5.0 (18%)	
e <mark>ante e e</mark> esta in te il eterologica in e e		Sergial Alexander		SECTION S
		新四年		
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W-2- Box 4



W-2 - Box 6



W-2 - Box 7