

NORTH ANNA COL BORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07



MACTEC PROJECT NO.: 6468-06-1472										COUNTY Louisa, VA					GEOLOGIST J. Lachewitz														
SITE DESCRIPTION NORTH ANNA COL															GROUND WATER (ft)														
BORING NO. B-927					DRILL METHOD: HSA/Rot. Wash/Core					SAMPLE METHODS: SPT/CORE					0 HR. ND														
COLLAR ELEV. 292.5 ft (NAVD88)					NORTHING 3,909,966					US ft (NAD83)					EASTING 11,685,879					US ft (NAD83)					24 HR. 22.9				
TOTAL DEPTH 100.4 ft					DRILL MACHINE CME 550 ATV					DRILLER: G. Akins					HAMMER TYPE 140 lbs Auto														
DATE STARTED 8/1/06					COMPLETED 8/7/06					CORE BARREL TYPE: HQ 3 triple tube-wireline																			
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																			
217.7					Continued from previous page																								
														Hard Rock: Light gray, moderately to very slightly weathered, close to wide fracturing, moderately hard to very hard, QUARTZ-BIOTITE GNEISS (<i>continued</i>)															
														192.1	100.4														
Boring and coring terminated at 100.4 ft in Hard Rock: Hard to very hard, QUARTZ-BIOTITE GNEISS																													

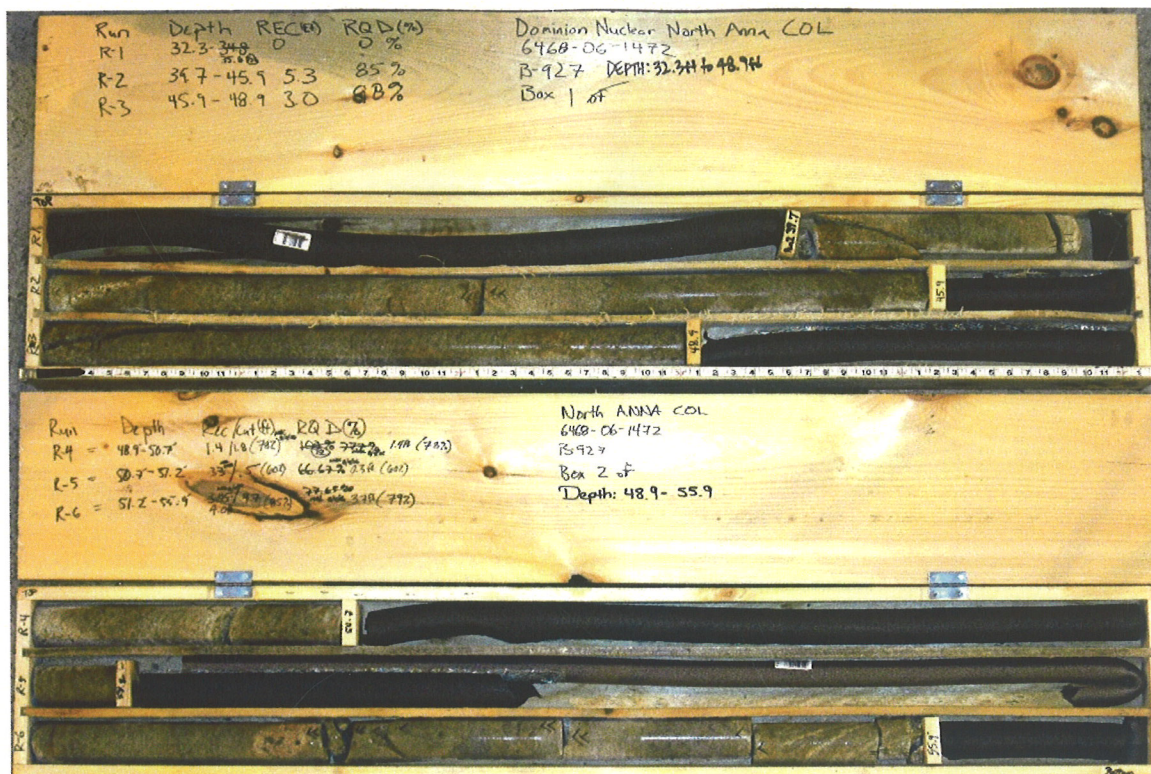
NORTH ANNA COL BORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.CDT 1/19/07



SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472							COUNTY Louisa, VA			GEOLOGIST J. Lachewitz		
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)		
BORING NO. B-927			DRILL METHOD: HSA/Rot. Wash/Core				SAMPLE METHODS: SPT/CORE			0 HR. ND		
COLLAR ELEV. 292.5 ft (NAVD88)			NORTHING 3,909,966		US ft (NAD83)		EASTING 11,685,879		US ft (NAD83)		24 HR. 22.9	
TOTAL DEPTH 100.4 ft			DRILL MACHINE CME 550 ATV				DRILLER: G. Akins			HAMMER TYPE 140 lbs Auto		
DATE STARTED 8/1/06				COMPLETED 8/7/06			CORE BARREL TYPE: HQ 3 triple tube-wireline					
CORE SIZE HQ3				TOTAL RUN 65.7 ft								
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	L O G	DESCRIPTION AND REMARKS		
										Begin Coring @ 32.3 ft		
260.2	32.3	3.6	0:14 0:19 0:40/1.6	(0.0) 0%	(0.0) 0%	1				Weathered Rock: Brownish yellow (10YR 6/8) to light yellowish brown (2.5Y 6/4), moist, very dense, weathered GNEISS (continued)		
256.6	35.9									-No Recovery		
			N=50/0.5			927-11						
										252.7 39.8		
252.8	39.7	6.2	3:58 4:47 6:12 4:51 7:12/2.2	(5.3) 85%	(5.3) 85%	UC-43.0'				Hard Rock: Yellow, white, and light gray, moderately to slightly weathered, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace magnetite and pyrite		
246.6	45.9											
		3.0	10:38 12:41 18:13	(3.0) 100%	(3.0) 100%	3						
243.6	48.9											
241.8	50.7	1.8	21:44 8:58/0.8	(1.4) 78%	(1.4) 78%	4						
241.3	51.2	0.5	12:14/0.5	(0.3) 60%	(0.3) 60%	5				-No Joints		
		4.7	2:46 3:06 8:02 5:03 1:51/0.7	(4.0) 85%	(3.7) 79%	UCS-51.6'						
236.6	55.9									-No Joints		
		3.5	7:57 11:32 11:08 4:49/0.5	(3.5) 100%	(3.5) 100%	7				-No Joints		
233.1	59.4											
231.6	60.9	1.5	13:25 12:15/0.5	(1.3) 87%	(1.3) 87%	8				-No Joints		
		4.9	4:56 7:40 12:22 6:09 11:44/0.9	(4.9) 100%	(3.9) 80%	9						
226.7	65.8											
225.1	67.4	1.6	16:58 12:21/0.6	(1.6) 100%	(1.0) 63%	10						
		3.1	4:44 9:29 10:55/1.1	(3.1) 100%	(3.1) 100%	11						
222.0	70.5									222.0 70.5		
		4.1	5:58 4:15 6:18 11:22/1.1	(3.8) 93%	(2.1) 51%	12				Hard rock: Light gray and white, moderately severe to slightly weathered, close fracturing, soft to hard, QUARTZ-BIOTITE GNEISS		
217.9	74.6									217.9 74.6		
		2.8	16:00 16:10 ND/0.8	(2.8) 100%	(2.6) 93%	UC-74.9'				Hard Rock: Light gray, moderately to very slightly weathered, close to wide fracturing, moderately hard to very hard, QUARTZ-BIOTITE GNEISS		
215.1	77.4									-No Joints		
		3.5	2:25/0.5 5:30 8:13 11:40	(3.5) 100%	(3.5) 100%	14						
211.6	80.9											
		5.0	5:43 4:43 4:36 6:30 8:30	(5.0) 100%	(4.8) 96%	15						
206.6	85.9									-No Joints		
		5.1	4:18 4:24 5:01 7:09 11:10/1.1	(5.1) 100%	(5.1) 100%	16				-No Joints		
201.5	91.0									-No Joints		
		5.0	3:53 3:50 5:19 6:18 8:01	(5.0) 100%	(5.0) 100%	17				-No Joints		
196.5	96.0											
		4.4	4:41 5:48 5:55 8:40/1.4	(4.4) 100%	(4.4) 100%	UC-96.3'				-No Joints		
192.1	100.4									192.1 100.4		
										Coring terminated at 100.4 ft in Hard Rock: Hard to very hard, QUARTZ-BIOTITE GNEISS		

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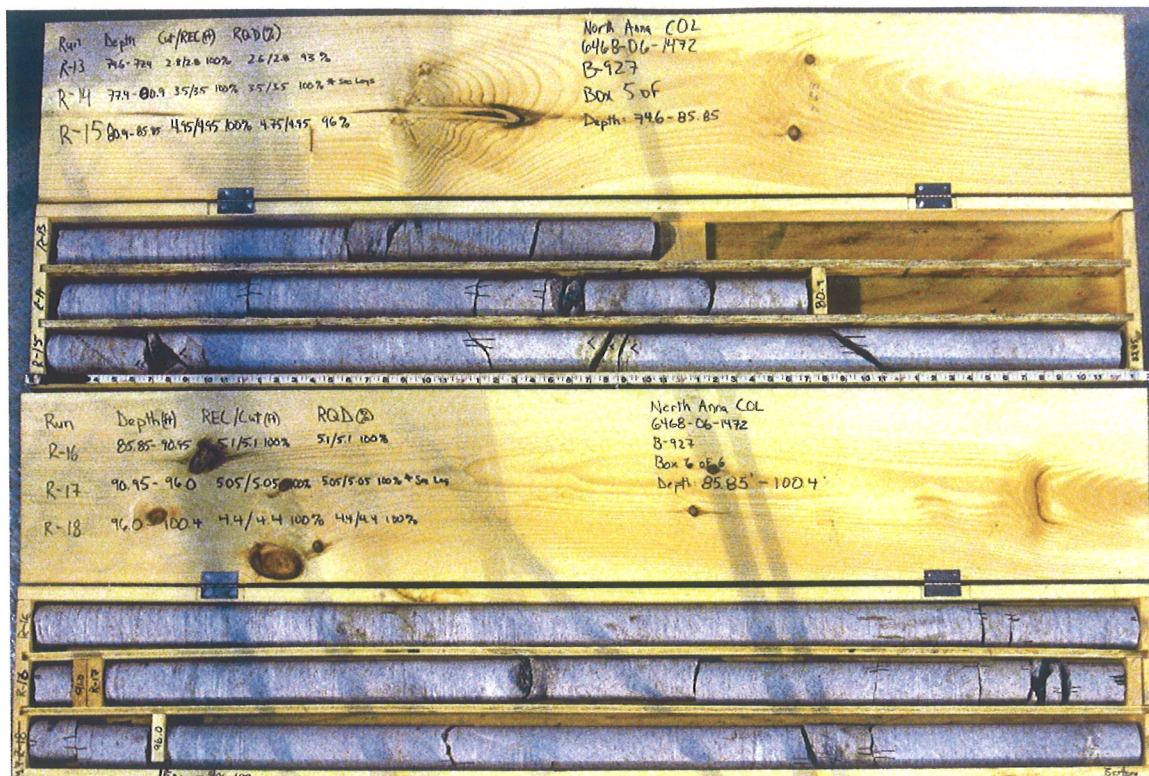
B-927 - Box 1

B-927 - Box 2



B-927 - Box 3

B-927 - Box 4



B-927 - Box 5

B-927 - Box 6



SHEET 1 OF 2

MACTEC PROJECT NO.: 6468-06-1472					COUNTY Louisa, VA					GEOLOGIST J. Wallen/ M. Lear				
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)				
BORING NO. B-928			DRILL METHOD: Mud Rotary/Core			SAMPLE METHODS: SPT/CORE			0 HR. 12.5					
COLLAR ELEV. 272.2 ft (NAVD88)			NORTHING 3,910,223		US ft (NAD83)		EASTING 11,686,159		US ft (NAD83)		24 HR. 8.1			
TOTAL DEPTH 75.2 ft		DRILL MACHINE CME 45 Trailer			DRILLER: D. Rhodes			HAMMER TYPE 140 lbs Auto						
DATE STARTED 9/7/06			COMPLETED 9/14/06			CORE BARREL TYPE: HQ 3 triple tube-wireline								
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				
272.2					Ground Surface								272.2 0.0	
270.7	1.5												Silty, fine to coarse SAND (SM), brownish yellow (10YR 6/6), moist, medium dense, relict rock fabric (Residual Soil)	
268.7	3.5	6	6	6										
266.2	6.0	3	5	5										
263.9	8.3	4	6	7										
261.2	11.0	5	6	8										
258.2	14.0	4	7	7									Silty, fine to coarse SAND (SM), brownish yellow (10YR 6/6), moist, dense to very dense, relict rock fabric (Residual Soil)	
254.0	18.2	5	6	8										
250.1	22.1	6	9	9										
245.1	27.1	10	10	12										
240.1	32.1	11	17	23										
235.1	37.1	27	46	50/0.4									Weathered Rock: Sampled as Silty, fine to coarse SAND (SM), brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6), moist, very dense (BIOTITE-QUARTZ GNEISS)	
230.1	42.1													
225.1	47.1													
223.5	48.7													
220.1	52.1													
													220.1 52.1	
													217.0 55.2	
													215.9 56.3	
								</						

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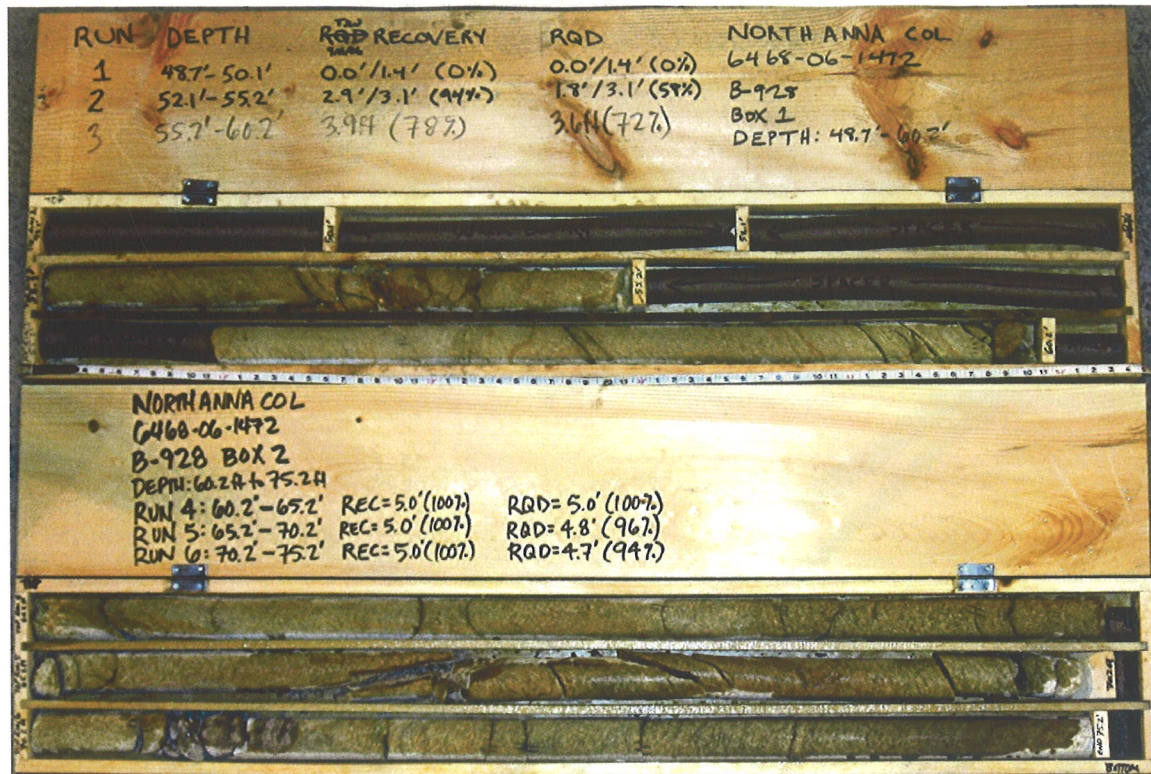
MACTEC PROJECT NO.: 6468-06-1472										COUNTY Louisa, VA					GEOLOGIST J. Wallen/ M. Lear				
SITE DESCRIPTION NORTH ANNA COL															GROUND WATER (ft)				
BORING NO. B-928					DRILL METHOD: Mud Rotary/Core					SAMPLE METHODS: SPT/CORE					0 HR. 12.5				
COLLAR ELEV. 272.2 ft (NAVD88)					NORTHING 3,910,223 US ft (NAD83)					EASTING 11,686,159 US ft (NAD83)					24 HR. 8.1				
TOTAL DEPTH 75.2 ft					DRILL MACHINE CME 45 Trailer					DRILLER: D. Rhodes					HAMMER TYPE 140 lbs Auto				
DATE STARTED 9/7/06					COMPLETED 9/14/06					CORE BARREL TYPE: HQ 3 triple tube-wireline									
ELEV.	DEPTH	BLOW COUNT			BLOWS PER FOOT						SAMP.	MOI	LOG	SOIL AND ROCK DESCRIPTION					
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.								
197.4					Continued from previous page														
														Boring and coring terminated at 75.2 ft in Hard Rock: Hard, BIOTITE-QUARTZ GNEISS					

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SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472										COUNTY Louisa, VA		GEOLOGIST J. Wallen/ M. Lear	
SITE DESCRIPTION NORTH ANNA COL												GROUND WATER (ft)	
BORING NO. B-928		DRILL METHOD: Mud Rotary/Core				SAMPLE METHODS: SPT/CORE				0 HR. 12.5			
COLLAR ELEV. 272.2 ft (NAVD88)		NORTHING 3,910,223		US ft (NAD83)		EASTING 11,686,159		US ft (NAD83)		24 HR. 8.1			
TOTAL DEPTH 75.2 ft		DRILL MACHINE CME 45 Trailer				DRILLER: D. Rhodes				HAMMER TYPE 140 lbs Auto			
DATE STARTED 9/7/06				COMPLETED 9/14/06				CORE BARREL TYPE: HQ 3 triple tube-wireline					
CORE SIZE HQ3				TOTAL RUN 24.5 ft									
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS			
										Begin Coring @ 48.7 ft			
223.5	48.7	1.4	N=50/0.1 1:24	(0.0)	(0.0)	1					Weathered Rock: Sampled as Silty, fine to coarse SAND (SM), brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6), moist, very dense (BIOTITE-QUARTZ GNEISS) (continued)		
222.1	50.1		0.25/0.4	0%	0%						52.1		
220.1	52.1	3.1	N=50/0.0 3:49	(2.9)	(1.8)	UC-52.6'					No Recovery		
217.0	55.2		3:00	94%	58%						Hard Rock: Dark gray, moderately severely weathered, very close to close fracturing, moderately hard, BIOTITE-QUARTZ GNEISS		
		5.0	3:09/1.1	(3.9)	(3.6)	3					(4 joints at 45°)		
			3:56	78%	72%						Weathered Rock: No recovery- BIOTITE-QUARTZ GNEISS (4 joints at 50-60° with clay and brown Fe stain)		
212.0	60.2		2:38								Hard Rock: Tan-gray and white, with orange Fe staining, moderately severe to slightly weathered, close to moderately close fracturing, moderately hard to hard, BIOTITE-QUARTZ GNEISS (4 joints at 45-55° with clay and orange Fe stain)		
		5.0	3:00	(5.0)	(5.0)	4							
			2:57	100%	100%								
207.0	65.2		1:56										
		5.0	2:02	(5.0)	(4.8)	5					(2 joints at 40-50° with trace clay and orange Fe stain; 2 joints at 80-90° with clay and brown Fe stain)		
			2:56	100%	96%								
202.0	70.2		3:01										
		5.0	3:13	(5.0)	(4.7)	UCS-74.7'					(1 joint at 45° with clay; 2 joints at 10-20° with trace clay; fractured quartz vein at 60° from 70.8-71.5 ft)		
			3:20	100%	94%								
			2:54										
197.0	75.2		3:00	(5.0)	(4.7)								
			3:31	100%	94%								
			2:52										
			2:23										
											Coring terminated at 75.2 ft in Hard Rock: Hard, BIOTITE-QUARTZ GNEISS		



B-928 - Box 1

B-928 - Box 2



SHEET 1 OF 1

MACTEC PROJECT NO.: 6468-06-1472				COUNTY Louisa, VA				GEOLOGIST J. Lachewitz/M. Lear									
SITE DESCRIPTION NORTH ANNA COL										GROUND WATER (ft)							
BORING NO. B-928A		DRILL METHOD: Mud Rotary				SAMPLE METHODS: UD/PITCHER BARREL				0 HR. ND							
COLLAR ELEV. 271.8 ft (NAVD88)		NORTHING 3,910,220		US ft (NAD83)		EASTING 11,686,165		US ft (NAD83)		24 HR. ND							
TOTAL DEPTH 37.5 ft		DRILL MACHINE CME 550 ATV				DRILLER: F. Cox				HAMMER TYPE NA							
DATE STARTED 10/23/06		COMPLETED 10/23/06				CORE BARREL TYPE: NA											
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							
271.8					Ground Surface								271.8	0.0			
															No samples due to utility clearance operations- soft dig/vac. truck excavation		
261.8	10.0										928A-UD-1			263.8	8.0	Silty, fine to coarse SAND (SM), tan-white, moist, relict rock fabric (Residual Soil)	
256.8	15.0										928A-UD-2					928A-UD-1: Pushed from 10.0-10.5 ft; push pressure= weight of rig; recovery=0.3 ft-sample not retained for testing due to low recovery	
251.8	20.0										928A-UD-3					928A-UD-2: Pushed from 15.0-16.9 ft; push pressure= ND; recovery=1.8 ft	
246.8	25.0										928A-PB-1					928A-UD-3: Pushed from 20.0-22.0 ft; push pressure= ND; recovery=1.9 ft	
244.5	27.3										928A-PB-2					928A-PB-1: Advanced from 25.0-27.3 ft; recovery=0.7 ft	
																928A-PB-2: Advanced from 27.3-29.8 ft; recovery=0.7 ft	
236.8	35.0										928A-PB-3			241.8	30.0	-Hard drilling at 29.0 ft	
																Weathered Rock: BIOTITE-QUARTZ GNEISS	
																928A-PB-3: Advanced from 35.0-37.5 ft; recovery=0.7 ft	
															234.3	37.5	Boring terminated at 37.5 ft in Weathered Rock: BIOTITE-QUARTZ GNEISS

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