GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Howard	
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**	
BORING NO. B-905	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 23.0
COLLAR ELEV. 306.8 ft (NAVD88)	**NORTHING** 3,909,733 US ft (NAD83)	**EASTING** 11,685,822 US ft (NAD83)	**24 HR.** 21.9
TOTAL DEPTH 150.4 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/19/06	**COMPLETED** 9/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
306.8					Ground Surface				306.8 0.0
305.3	1.5								Silty SAND (SM), reddish yellow (7.5YR 6/8), pinkish gray (7.5YR 7/2), reddish yellow (7.5YR 6/6), and light gray (5YR 7/1), dry, medium dense to very dense, micaceous and saprolitic (Residual Soil)
303.8	3.0	6	6	6	12	905-1			
		7	10	13	23	905-2			
298.3	8.5								
		6	8	9	17	905-3			
291.9	14.9								
		13	16	14	30	905-4			
286.9	19.9								
		27	27	30	57	905-5			
281.9	24.9								282.9 23.9
280.7	26.1	50/0.3				905-6			Weathered Rock: Gray to tan, BIOTITE GNEISS 280.7 26.1
		50/0.0				905-7			Hard Rock: Tan gray, moderately to very slightly weathered, close to moderately close fracturing, medium hard to hard, QUARTZ GNEISS
									266.3 40.5
									Hard Rock: Blue-gray to tan-gray, moderately weathered to fresh, close to moderately close fracturing, hard to very hard, BIOTITE GNEISS

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

GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Howard	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-905	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 23.0
COLLAR ELEV. 306.8 ft (NAVD88)	**NORTHING** 3,909,733 US ft (NAD83)	**EASTING** 11,685,822 US ft (NAD83)	**24 HR.** 21.9
TOTAL DEPTH 150.4 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/19/06	**COMPLETED** 9/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
231.9					Continued from previous page				
									229.0 — 77.8 Weathered Rock: Tan-gray, severely weathered, BIOTITE GNEISS 226.6 — 80.2 Hard Rock: Gray-tan, light gray, and blue-gray, moderate severely weathered to fresh, very close to moderately close fracturing, medium hard to hard, BIOTITE GNEISS
									185.0 — 121.8 Weathered Rock: BIOTITE GNEISS-little to no recovery 181.4 — 125.4 Hard Rock: Gray-tan and blue-gray, moderately weathered to fresh, very close to wide fracturing, hard to very hard, BIOTITE GNEISS, locally with quartz and feldspar veins
									159.2 — 147.6

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

GEOTECHNICAL BORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Howard
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**
BORING NO. B-905	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE — **0 HR.** 23.0
COLLAR ELEV. 306.8 ft (NAVD88)	**NORTHING** 3,909,733 US ft (NAD83)	**EASTING** 11,685,822 US ft (NAD83) — **24 HR.** 21.9
TOTAL DEPTH 150.4 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins — **HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/19/06	**COMPLETED** 9/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
157.1					Continued from previous page				
	156.4								Hard Rock: Blue-gray and brown, moderately to slightly weathered, moderately close fracturing, moderately hard, BIOTITE GNEISS *(continued)*
	150.4								Boring and coring terminated at 150.4 ft in Hard Rock: Hard, BIOTITE GNEISS

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

GEOTECHNICAL CORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Howard	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-905	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 23.0
COLLAR ELEV. 306.8 ft **(NAVD88)**	**NORTHING** 3,909,733 **US ft (NAD83)**	**EASTING** 11,685,822 **US ft (NAD83)**	**24 HR.** 21.9
TOTAL DEPTH 150.4 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/19/06	**COMPLETED** 9/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 124.3 ft		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 26.1 ft
280.7	26.1	4.4	*N=50/0.0* 2:00 1:30 0:30 1:00	(2.2) 50%	(2.2) 50%	1				280.7 Hard Rock: Tan gray, moderately to very slightly weathered, close to moderately close fracturing, medium hard to hard, QUARTZ GNEISS 26.1
276.3	30.5									
271.4	35.4	4.9	1:30/0.4 2:00 1:45 1:15 1:30 3:00/0.9	(3.9) 80%	(3.0) 61%	2				
266.3	40.5	5.1	3:00 3:00 2:30 3:15 3:30/1.1	(5.1) 100%	(5.1) 100%	3				(2 joints at 80°) 266.3 40.5
261.3	45.5	5.0	3:45 4:15 5:00 7:15 4:30	(4.7) 94%	(4.7) 94%	4				Hard Rock: Blue-gray to tan-gray, moderately weathered to fresh, close to moderately close fracturing, hard to very hard, BIOTITE GNEISS (1 joint at 40°, 1 joint at 75°, 2 joints at 20°; loss of circulation from 44.4 to 44.6 ft)
256.4	50.4	4.9	5:00 7:00 7:15 10:30 9:30/0.9	(4.9) 100%	(4.9) 100%	5				(1 joint at 10°, 1 joint at 80°, 2 joints at 50°)
251.6	55.2	4.8	3:00 8:30 7:15 6:45 7:30/0.8	(4.2) 88%	(3.4) 71%	6				
246.5	60.3	5.1	9:15 3:45 3:00 2:30 4:00/1.1	(5.1) 100%	(4.2) 82%	7				(4 joints at 30-40°)
241.6	65.2	4.9	6:45 3:00 3:45 6:30 8:00/0.9	(4.9) 100%	(4.9) 100%	8				(2 joints at 20°, 2 joints at 40°)
236.5	70.3	5.1	6:00 3:00 1:45 2:00 2:15/1.1	(4.8) 94%	(4.0) 78%	9				(3 joints at 30°, 1 joint at 10°)
233.6	73.2	2.9	4:00 2:15 2:30/0.9	(2.9) 100%	(1.3) 45%	10				(5 joints at 10°, 1 joint at 50°, 1 joint at 85°; trace epidote)
226.6	80.2	7.0	3:30 4:00 3:30 3:45 2:30 3:30 5:00	(5.3) 76%	(4.7) 67%	11				(4 joints at 10°, 1 joint at 85°) 229.0 77.8 Weathered Rock: Tan-gray, severely weathered, BIOTITE GNEISS 226.6 80.2
221.3	85.5	5.3	4:30 4:45 5:00 6:00 5:15	(5.3) 100%	(3.8) 72%	12				Hard Rock: Gray-tan, light gray, and blue-gray, moderate severely weathered to fresh, very close to moderately close fracturing, medium hard to hard, BIOTITE GNEISS (7 joints at 20°, 3 joints at 80°)
216.3	90.5	5.0	2:45 2:00 3:45 3:30 4:30	(3.3) 66%	(0.5) 10%	13				
211.3	95.5	5.0	2:30 2:00 2:15 2:00 2:00	(3.5) 70%	(1.3) 26%	14				(2 joints at 40°, 1 joint at 85°)
206.3	100.5	5.0	1:45 1:30 1:30 1:15 1:00	(4.5) 90%	(3.8) 76%	15				(3 joints at 60°, 1 joint at 85°)

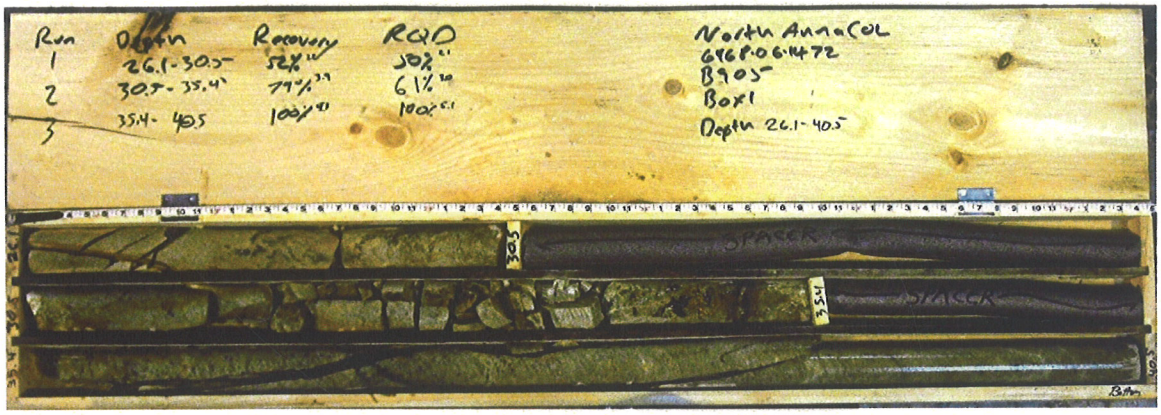
NORTH ANNA COL_.E NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07

MACTEC

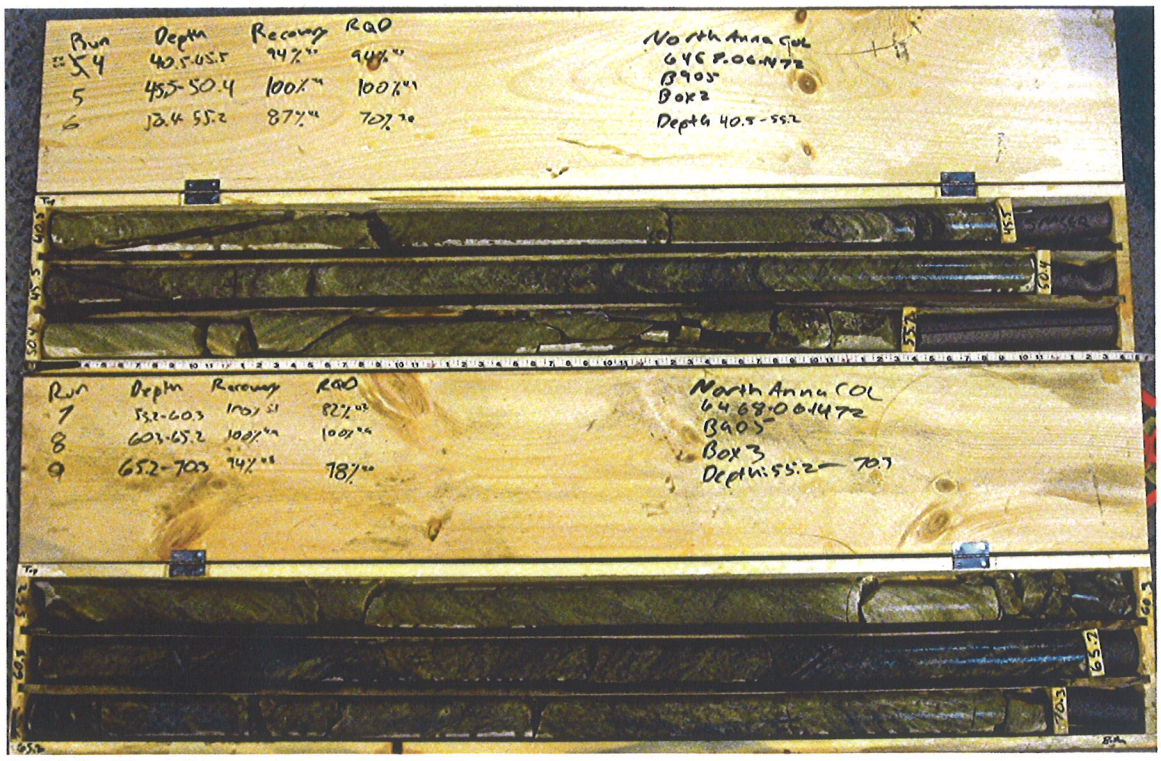
MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** J. Howard	
SITE DESCRIPTION NORTH ANNA COL			**GROUND WATER (ft)**
BORING NO. B-905	**DRILL METHOD:** Mud Rotary/Core	**SAMPLE METHODS:** SPT/CORE	**0 HR.** 23.0
COLLAR ELEV. 306.8 ft (NAVD88)	**NORTHING** 3,909,733 US ft (NAD83)	**EASTING** 11,685,822 US ft (NAD83)	**24 HR.** 21.9
TOTAL DEPTH 150.4 ft	**DRILL MACHINE** CME 550 ATV	**DRILLER:** G. Akins	**HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/19/06	**COMPLETED** 9/25/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline	
CORE SIZE HQ3	**TOTAL RUN** 124.3 ft		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
201.3	105.5	5.0	1:30 ND ND ND ND	(5.0) 100%	(4.8) 96%	16				(2 joints at 10°, 2 joints at 60-70°) Hard Rock: Gray-tan, light gray, and blue-gray, moderate severely weathered to fresh, very close to moderately close fracturing, medium hard to hard, BIOTITE GNEISS *(continued)*
196.3	110.5	5.0	2:00 1:45 1:30 1:15 1:45	(5.0) 100%	(4.5) 90%	17				(1 joint at 20°, 2 joints at 40-50°; quartz+feldspar veins)
191.3	115.5	5.0	2:45/2.0 2:00 1:30 1:45	(4.7) 94%	(4.2) 84%	18				(4 joints at 10-20°, 2 joints at 50°)
186.3	120.5	5.0	1:30 1:15 1:30 1:45 1:45	(4.3) 86%	(2.7) 54%	19				(3 joints at 30-40°, 4 joints at 50-60°)
181.4	125.4	4.9	3:00 3:15 2:00 2:15 2:30/0.9	(1.6) 33%	(0.4) 8%	20				185.0 — 121.8 Weathered Rock: BIOTITE GNEISS-little to no recovery 181.4 — 125.4
179.4	127.4	2.0	2:00/2.0	(2.0) 100%	(1.2) 60%	21				Hard Rock: Gray-tan and blue-gray, moderately weathered to fresh, very close to wide fracturing, hard to very hard, BIOTITE GNEISS, locally with quartz and feldspar veins (3 joints at 30°)
176.2	130.6	3.2	1:15 1:00 2:00 0:30/0.2	(2.6) 81%	(1.2) 38%	22				
171.3	135.5	4.9	2:15 2:00 4:00 3:00 4:30/0.9	(4.9) 100%	(4.9) 100%	23				(2 joints at 40°, 1 joint at 30°, 1 joint at 0°; quartz+feldspar veins)
168.1	138.7	3.2	6:30 6:00 12:30 4:00/0.2	(3.2) 100%	(3.2) 100%	24				-No Joints
161.5	145.3	6.6	6:30 6:30 3:00 3:30 4:00 6:00/1.6	(6.6) 100%	(6.6) 100%	25				-No Joints
156.4	150.4	5.1	6:45 6:15 2:30 2:30 2:00/1.1	(5.1) 100%	(5.0) 98%	26				(3 joints at 40°) 159.2 — 147.6 Hard Rock: Blue-gray and brown, moderately to slightly weathered, moderately close fracturing, moderately hard, BIOTITE GNEISS 156.4 — 150.4 Coring terminated at 150.4 ft in Hard Rock: Hard, BIOTITE GNEISS

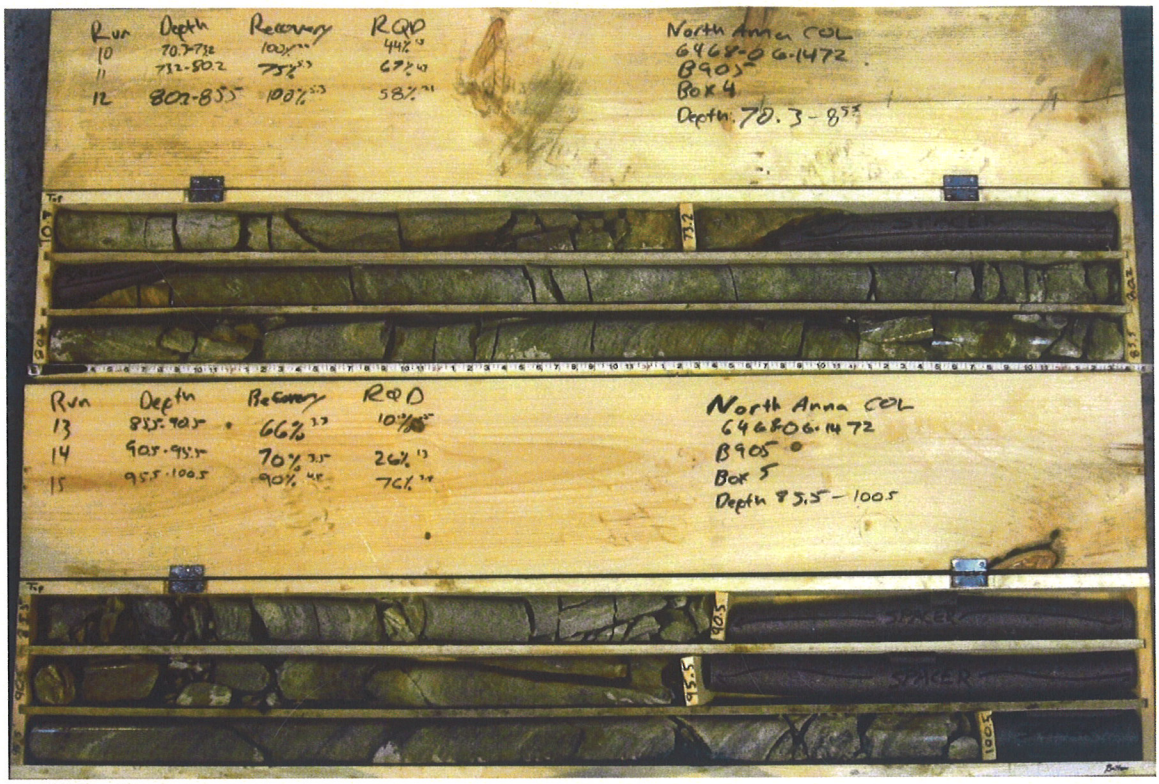
NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07



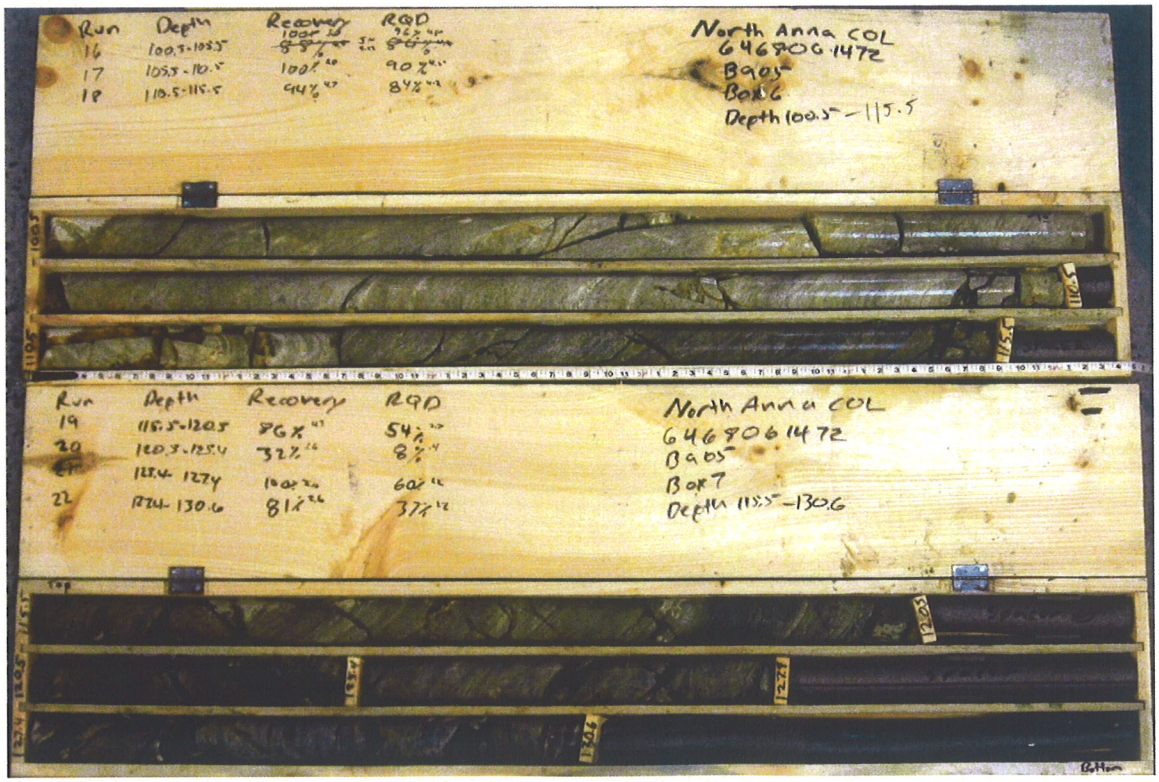
B-905 – Box 1



B-905 – Box 2
B-905 – Box 3



B-905 – Box 4
B-905 – Box 6



B-905 – Box 5
B-905 – Box 7

B-905 – Box 8
B-905 – Box 9