

APPENDIX A

LOGS

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Upper Bank (See Site Plan)
DRILLING METHOD 200 mm ø Hollow Stem Auger, Continuous Sampling

JOB NO. 10-0107-03
GROUND ELEV. 231.72 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 02-09-2010
UTM (m) N 5,524,232
 E 633,712

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆			
									20	40	60	80
231			TOPSOIL - Black, dry, some organics, trace sand, trace clay.									
230.7	1		- Frozen to 0.92 m.									
230	5		SILTY CLAY (CH) - Brown, dry, stiff, high plasticity, lacustrine, trace organics, trace oxidation. - First 1.52 m drilled with plug on.									
229	2		- Possible slickenside at 2.13 m.									
228	3		- Trace silt pockets (2-5 mm diameter), silt appears white and grey/tan in colour below 2.44 m.									
228	4		- Damp to moist, trace silt nodules, trace white gypsum pockets (1-5 mm diameter) below 3.05 m. - Fine to medium grained sand pocket (10 mm diameter) at 3.10 m. - Possible slickenside (45 degrees) at 3.28 m. - Trace silt laminations at 3.66 m.			S1	100					
227	15					ST1	96					
226	6		- Possible slickenside at 5.18 m. - Large gypsum lamination at 5.49 m.			S3	100					
225	20		- Grey below 6.10 m.			S4	100					
224	7		- Grain size distribution: Gravel (0.0%), Sand (4.4%), Silt (27.6%) and Clay (68.0%) at 6.9 m.		6.6	S5	100					
224	8		- Trace coarse grained gravel, decreased gypsum content below 7.62 m.			S6	100					
223	9		- Decreasing stiffness below 8.50 m.			ST2	77					
222	30		- Moist, firm, trace silt nodules (1-3 mm diameter), decreased silt laminations, decreased oxidation below 9.14 m. - Piece of fine grained gravel at 9.75 m.									

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER**

APPROVED **DEA** DATE **12/10/10**

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
	(m)	(ft)									PL	MC
221	35	11		- Soft, some sand, increased silt content below 12.19 m.		11.6	S7	100				
220	40	12										
219	40	13		- Grain size distribution: Gravel (0.0%), Sand (14.8%), Silt (32.9%) and Clay (52.3%) at 12.8 m.								
218.3	45	13.7		SILT TILL (ML) - Grey/tan, low plasticity, some fine grained gravel.								
218	45	13.7		- Drilled with plug on below 13.72 m.		14.0	S10	100				
217.7	45	14		AUGER REFUSAL AT 14.02 m.								
217	50	15		Notes: 1. Approximately 0.15 m of water in test hole at end of drilling. 2. Installed SI to 14.02 m depth. 3. Installed PN 33119 at 6.55 m depth. 4. Installed PN 33116 at 11.58 m depth. 5. Backfilled test hole with cement bentonite grout.								
216	50	16										
215	55	17										
214	60	18										
213	60	19										
212	65	20										
211	70	21										
210	70	21										

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER** APPROVED **DEA** DATE **12/10/10**

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Upper Bank (See Site Plan)
DRILLING METHOD Solid Stem Auger

JOB NO. 10-0107-03
GROUND ELEV. 231.70 m
TOP OF PVC ELEV. 232.77 m
WATER ELEV.
DATE DRILLED 02-09-2010
UTM (m) N 5,524,232
 E 633,714

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
									PL	MC
231			TOPSOIL - Black, dry, some organics, trace sand, trace clay.							
230.8	1		- Frozen to 0.92 m.							
230	5		SILTY CLAY (CH) - Brown, dry, stiff, high plasticity, trace organics, trace oxidation. - First 1.52 m drilled with plug on.							
229	2		- Possible slickenside at 2.13 m.							
228	3		- Trace silt pockets (2-5 mm diameter), silt appears white and grey/tan in colour below 2.44 m.							
227	10		- Damp to moist, trace silt nodules, trace white gypsum pockets (1-5 mm diameter) below 3.05 m. - Fine to medium grained sand pocket (10 mm diameter) at 3.10 m. - Possible slickenside (45 degrees) at 3.28 m. - Trace silt laminations at 3.66 m.							
226	4		- Possible slickenside at 5.18 m. - Large gypsum lamination at 5.49 m.							
225	15		- Grey below 6.10 m.							
224	20		- Grain size distribution: Gravel (0.0%), Sand (4.4%), Silt (27.6%) and Clay (68.0%) at 6.9 m. - Trace coarse grained gravel, decreased gypsum content below 7.62 m.							
223	25		- Decreasing stiffness below 8.50 m.							
222	30		- Moist, firm, trace silt nodules (1-3 mm diameter), decreased silt laminations, decreased oxidation below 9.14 m. - Piece of fine grained gravel at 9.75 m.							

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE

CONTRACTOR Paddock Drilling Ltd. **INSPECTOR** D. GARBER

APPROVED *DEA* **DATE** 12/10/10

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★		Cu TORVANE (kPa) ◆		
										20	40	60	80	PL
221	35		- Soft, some sand, increased silt content below 12.19 m.											
220	40													
219	45		- Grain size distribution: Gravel (0.0%), Sand (14.8%), Silt (32.9%) and Clay (52.3%) at 12.8 m.											
218.3	45.3		SILT TILL (ML) - Grey/tan, low plasticity, some fine grained gravel.											
218	45		- Drilled with plug on below 13.72 m.											
217	50				14.9									
215	55		AUGER REFUSAL AT 15.85 m.		15.8									
215	55		Notes: 1. TH10-01B drilled beside TH10-01A for standpipe installation. 2. Logging and field/lab testing are from TH10-01A. 3. Installed standpipe with 25 mm diameter Casagrande tip. 4. Backfilled test hole with silica sand from 15.85 m to 14.94 m and cement bentonite grout from 14.94 m to ground surface.											
214	60													
213	65													
212	70													
211	75													
210	80													

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-08\DESIGN\GEOLOG\GCHURCH HILL DRIVE PARK.GPJ

SAMPLE TYPE _____

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER**

APPROVED **DEA** DATE **12/10/10**

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Upper Bank (See Site Plan)
DRILLING METHOD 200 mm ø Hollow Stem Auger, Continuous Sampling

JOB NO. 10-0107-03
GROUND ELEV. 230.77 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 02-10-2010
UTM (m) N 5,524,251
 E 634,097

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft Δ	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆			
									PL	MC	LL	
230.7			TOPSOIL - Black, frozen, some organics, trace sand. SILT (ML) - Tan/brown, frozen, trace sand, trace organics.									
229.7	1		- Frozen to 0.91 m.									
229	5		SILTY CLAY (CH) - Brown, damp to moist, stiff, high plasticity, trace organics, trace silt laminations. - Plug on for the first 1.52 m.			S1						
228.3	2											
228.2			SILT (ML) - Tan, damp, crumbly/ loose, low plasticity, trace oxidation.									
228	3		SILTY CLAY (CH) - Brown, damp to moist, stiff, high plasticity, trace organics, trace silt laminations. - White gypsum laminations below 3.05 m.			S2	100					
227	4											
226	15		- Trace silt nodules (1-3 mm diameter), trace oxidation below 4.57 m. - Possible slickenside at 4.81 m. - Very thin silt partings (1 mm thick) at 4.83 m, 4.88 m, 5.03 m and 5.13 m. - Some silt laminations below 5.18 m.									
225	5		- Grain size distribution: Gravel (0.0%), Sand (1.1%), Silt (18.7%), Clay (80.2%) at 5.6 m.			ST1	73					
224	6											
223	7		- Silt, oxidation and gypsum laminations end at 7.62 m. - Some silt pockets (2-15 mm diameter), trace fine to coarse grained gravel below 7.62 m.		6.9	S4	100					
222	8											
221	9		- Becomes grey below 8.84 m. - No organics below 9.45 m.			S5	100					
						S6	100					
						S7	100					

SPT & TORVANE 2 P:PROJECTS\2010\10-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER**

APPROVED DATE **12/10/10**

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★		Cu TORVANE (kPa) ◆	
									20	40	60	80
220	35		- Decreasing stiffness below 10 m.									
219	40		- Firm, trace silt nodules (1-3 mm diameter), trace sand nodules (2-10 mm diameter) below 10.67 m. - Grain size distribution: Gravel (0.0%), Sand (3.1%), Silt (23.2%), Clay (73.7%) at 10.80 m.		11.9	ST2	81					
218						S8	100					
217	45		- Grain size distribution: Gravel (0.0%), Sand (6.7%), Silt (30.4%), Clay (62.9%) at 13.0 m.			S9	100					
216.8	46.3		SILT TILL (ML) - Grey/tan, moist, low plasticity, trace fine to coarse grained gravel.			S10	100					
216.1	46.63		AUGER REFUSAL AT 14.63 m.		14.6	S11	100					
216	50		Notes: 1. Installed SI to 14.63 m depth. 2. Installed PN 33121 at 6.86 m depth. 3. Installed PN 33117 at 11.89 m depth. 4. Backfilled test hole with cement bentonite grout.									
215	55											
214	60											
213	65											
212	70											
211												
210												
209												

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGICAL\LOGS\CHURCH HILL DRIVE PARK.GPJ

SAMPLE TYPE  Auger Grab  Split Barrel  Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER**

APPROVED  DATE **12/10/10**

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Upper Bank (See Site Plan)
DRILLING METHOD Solid Stem Auger

JOB NO. 10-0107-03
GROUND ELEV. 230.75 m
TOP OF PVC ELEV. 231.82 m
WATER ELEV.
DATE DRILLED 02-10-2010
UTM (m) N 5,524,251
 E 634,095

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★		Cu TORVANE (kPa) ◆	
									20	40	60	80
230.7			TOPSOIL - Black, frozen, some organics, trace sand. SILT (ML) - Tan/brown, frozen, trace sand, trace organics.									
229.7	1		- Frozen to 0.91 m.									
229	5		SILTY CLAY (CH) - Brown, damp to moist, stiff, high plasticity, trace organics, trace silt laminations. - Plug on for the first 1.52 m.									
228.3			SILT (ML) - Tan, damp, crumbly/ loose, low plasticity, trace oxidation.									
228.2			SILTY CLAY (CH) - Brown, damp to moist, stiff, high plasticity, trace organics, trace silt laminations. - White gypsum laminations below 3.05 m.									
227	10											
226	15		- Trace silt nodules (1-3 mm diameter), trace oxidation below 4.57 m. - Possible slickenside at 4.81 m. - Very thin silt partings (1 mm thick) at 4.83 m, 4.88 m, 5.03 m and 5.13 m. - Some silt laminations below 5.18 m.									
225	20		- Grain size distribution: Gravel (0.0%), Sand (1.1%), Silt (18.7%), Clay (80.2%) at 5.6 m.									
224	25											
223	30		- Silt, oxidation and gypsum laminations end at 7.62 m. - Some silt pockets (2-15 mm diameter), trace fine to coarse grained gravel below 7.62 m.									
222			- Becomes grey below 8.84 m.									
221			- No organics below 9.45 m.									

SPT & TORVANE 2 P:PROJECTS\201010-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
D. GARBER

APPROVED **DEA** DATE 12/10/10

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★		Cu TORVANE (kPa) ◆	
									20	40	60	80
220	35		- Decreasing stiffness below 10 m.									
219	40		- Firm, trace silt nodules (1-3 mm diameter), trace sand nodules (2-10 mm diameter) below 10.67 m.									
218	45		- Grain size distribution: Gravel (0.0%), Sand (6.7%), Silt (30.4%), Clay (62.9%) at 13.0 m.									
216.7	14		SILT TILL (ML) - Grey/tan, moist, low plasticity, trace fine to coarse grained gravel.									
216	15				14.9							
215	50				15.8							
214	55		AUGER REFUSAL AT 15.85 m.									
213	60		Notes: 1. TH10-02B drilled beside TH10-02A for stand pipe installation. 2. Logging and field/lab testing are from TH10-02A. 3. Installed stand pipe with 25 mm Casagrande tip. 4. Backfilled testhole with silica sand from 15.85 to 14.94 m and cement bentonite grout from 14.94 m to ground surface.									
212	65											
211	70											
210												
209												

SPT & TORVANE 2 P:\PROJECTS\2010\10-01\07-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
D. GARBER

APPROVED **DEA** DATE **12/10/10**

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Upper Bank (See Site Plan)
DRILLING METHOD 200 mm ø Hollow Stem Auger, Continuous Sampling

JOB NO. 10-0107-03
GROUND ELEV. 231.07 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 02-11-2010
UTM (m) N 5,524,261
 E 633,869



ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆		
									PL	MC	LL
231.0			TOPSOIL - Black, frozen.								
230.8			SAND - Light brown, dry, loose, fine to coarse grained sand, trace clay.			S1					
230.2	1		- Frozen to 0.92 m.								
230			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity.								
229.0	5		- Silt and silty clay laminations at 1.52 m. - Trace fine grained sand, trace oxidation below 1.52 m.								
229.0			SILT (ML) - Tan, damp, crumbly/loose, low plasticity, trace oxidation.			S2	60				
228.5			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.								
228	2		- Silt layer (2-3 mm thick) at 2.13 m. - Trace (white) gypsum nodules (5-10 mm diameter) below 2.44 m.								
228			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.			S3	100				
228	3		- Trace silt nodules (1-3 mm diameter) below 3.05 m.								
227	4		- Grain size distribution: Gravel (0.0%), Sand (0.5%), Silt (17.2%), Clay (82.3%) at 3.4 m.			S4	100				
227			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.								
226	5		- Large gypsum pocket (25 mm x 50 mm), broke along a straight plane at 4.19 m. - Trace rootlets below 4.19 m.			S5	100				
226			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.			S6	100				
225	6		- Trace silt nodules (2-5 mm diameter) below 6.10 m. - Varved silts and clays from 6.10 to 6.65 m. - Very thin silt partings (1 mm thick) at 6.25 m, 6.30 m, 6.43 m and 6.55 m.			S7	100				
225			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.			S8	83				
224	7		- Trace silt pockets (5-25 mm diameter) below 6.71 m. - Grey below 7.09 m.			S9	100				
224			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.			S10	100				
223	8		- Decreasing stiffness below 7.5 m.								
223			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.			S11	100				
222	9		- Piece of coarse gravel at 8.93 m.								
222			SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace fine grained sand, trace oxidation.			S12	100				
222			- Firm, no silt pockets below 9.75 m.								

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGICAL\CHURCHILL DRIVE PARK.GPJ




SAMPLE TYPE Auger Grab Shelby Tube Split Barrel


CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **C. FRIESEN**

APPROVED **DEA** DATE **12/10/10**

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆						
	(m)	(ft)								PL	MC	LL				
221				<p>- Trace silt till, trace sand, trace gravel below 11.58 m.</p> <p>- Grain size distribution: Gravel (4.3%), Sand (22.0%), Silt (39.0%), Clay (34.7%) at 12.7 m.</p> <p>SILT TILL (ML) - Light grey, moist, firm, low plasticity, some to with sand, trace gravel.</p>												
220	11	35							S13	100						
219	12	40							S14	100						
218	13	45							S15	100						
217.7	13	45							S16	100						
217	14	45							S17	100						
216.4	14	45							S18	11						
216	15	50					<p>AUGER REFUSAL AT 14.63 m.</p> <p>Notes: 1. Installed SI to 14.63 m depth. 2. Installed PN 33124 at 7.47 m depth. 3. Installed PN 33118 at 12.50 m depth. 4. Backfilled test hole with cement bentonite grout.</p>									
215	16	55														
214	17	60														
213	18	65														
212	19	70														
211	20	75														
210	21	80														

SPT & TORVANE 2 P:\PROJECTS\2010\10-01\07-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE  Auger Grab
  Shelby Tube
  Split Barrel


CONTRACTOR **Paddock Drilling Ltd.**
 INSPECTOR **C. FRIESEN**
 APPROVED  DATE **12/10/10**

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Upper Bank (See Site Plan)
DRILLING METHOD Solid Stem Auger

JOB NO. 10-0107-03
GROUND ELEV. 230.61 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 02-11-2010
UTM (m) N 5,524,256
 E 633,975

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft ▲	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
							PL	MC LL
						20 40 60	20 40 60 80	20 40 60 80
230.5			TOPSOIL - Brown, dry, loose, frozen.					
230.3			SILTY CLAY FILL (CI-CH) - Brown, moist, loose, frozen, intermediate to high plasticity, trace fine to coarse grained sand, trace fine grained gravel.					
230			SILT (ML) - Tan, damp, soft/loose.					
229.1	1			S1				
229	5		SILTY CLAY (CH) - Brown, moist, very stiff, high plasticity, trace silt nodules (2-10 mm diameter), trace gypsum nodules (2-10 mm diameter).	S2				
228.2	2							
228.0			SILT (ML) - Tan, damp, soft, low plasticity.					
228	3		SILTY CLAY (CH) - Brownish grey, moist, very stiff, high plasticity, trace silt nodules (1-3 mm diameter), trace gypsum nodules (1-3 mm diameter).	S3				
227	10		- Trace oxidation, increased gypsum content below 3.66 m.					
226	4			S4				
225	15							
225	5							
224	6		- Grain size distribution: Gravel (0.0%), Sand (3.0%), Silt (25.8%), Clay (71.2%) at 5.8 m.	S5				
224	20							
223	7		- Decreased gypsum content below 7.01 m.	S6				
222	25							
222	8		- Grey, no oxidation below 8.23 m.					
221	9		- Decreasing stiffness below 9.0 m. - No gypsum below 9.14 m.	S7				
221	30							

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE  Auger Grab

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **C. FRIESEN**

APPROVED  DATE 12/10/10

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
							PL	MC LL
220	35		- Firm, trace sand, trace gravel below 11.28 m.	S8			40	50
219	40		- No sand, no gravel below 12.19 m.	S9			45	55
218	45		- Grain size distribution: Gravel (0.0%), Sand (2.3%), Silt (28.2%), Clay (69.4%) at 13.3 m.	S10			50	60
217	45		SILT TILL (ML) - Light grey, moist to damp, loose, low plasticity, some sand, some gravel.					
216.7	45							
216	50		AUGER REFUSAL AT 15.09 m.	S11				
215.5	50							
215	55							
214	60							
213	65							
212	70							
211	70							
210	70							
209	70							

Note:
1. Backfilled test hole with half a bag of bentonite at bottom, auger cuttings in the middle, and half a bag of bentonite at surface.

SPT & TORVANE 2 P:\PROJECTS\2010\10-0107-03\DESIGN\GEOLOGICAL\URCHILL DRIVE PARK.GPJ

SAMPLE TYPE Auger Grab

CONTRACTOR **Paddock Drilling Ltd.**

INSPECTOR **C. FRIESEN**

APPROVED DATE **12/10/10**

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Mid Bank (See Site Plan)
DRILLING METHOD 200 mm ø Hollow Stem Auger, Continuous Sampling

JOB NO. 10-0107-03
GROUND ELEV. 227.22 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 02-11-2010
UTM (m) N 5,524,241
 E 633,867

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆		
	(m)	(ft)								PL	MC	LL
227				SILTY CLAY (CH) - Brown, frozen to 0.9 m, becomes moist, stiff to very stiff, high plasticity, trace silt nodules.								
226	1	5										
225	2			- Some organics/rootlets at 2.13 m. - 25 mm thick band of organics at 2.34 m. - Trace silt nodules (1-3 mm diameter), trace organics below 2.44 m. - Grain size distribution: Gravel (0.0%), Sand (3.7%), Silt (38.7%), Clay (57.6%) at 2.7 m.								
224.5				SILT (ML) - Tan, damp, soft, low plasticity.								
224.3	3	10		SILTY CLAY (CH) - Brown, moist, stiff to very stiff, high plasticity, trace silt nodules. - Trace gypsum nodules (2-5 mm diameter), trace silt nodules (2-5 mm diameter) below 3.05 m. - Possible slickenside at 3.68 m (45 degrees), shiny and smooth surface. - Possible slickenside at 4.09 m (45 degrees), shiny and smooth surface.		3.8						
224												
223	4											
222	5	15		- Grey, trace fine grained sand nodules (2-12 mm diameter), trace medium to coarse grained sand below 4.57 m. - Grain size distribution: Gravel (0.0%), Sand (9.3%), Silt (27.2%), Clay (63.5%) at 4.83 m. - Large silt inclusion (25 mm x 50 mm) at 5.26 m.								
221	6	20										
220	7			- Decreasing stiffness below 7.0 m. - Trace fine grained gravel below 7.47 m.		5.8						
219	8	25										
218	9	30		- Grain size distribution: Gravel (4.1%), Sand (20.7%), Silt (34.8%), Clay (40.4%) at 8.4 m. - Soft below 9.14 m.								
217.5				TILL - Light grey/tan, moist, trace coarse grained gravel, trace fine								

SPT & TORVANE 2 P:PROJECTS\2010\10-0107-03\DESIGN\GEOLOGS\CHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR Paddock Drilling Ltd. **INSPECTOR** C. FRIESEN

APPROVED DATE 12/10/10

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★		Cu TORVANE (kPa) ◆	
										20	40	60	80
217			grained gravel.		10.4		S12	100					
216.7	35		AUGER REFUSAL AT 10.52 m.										
216	11		Notes: 1. Installed SI to 10.36 m depth. 2. Installed PN 33127 at 3.81 m depth. 3. Installed PN 33123 at 6.81 m depth. 4. Backfilled test hole with cement bentonite grout.										
215	12												
214	13												
213	14												
212	15												
211	16												
210	17												
209	18												
208	19												
207	20												
206	21												

SPT & TORVANE 2 P:\PROJECTS\2010\10-01\07-09\DESIGN\GEOLOG\SCHURCHILL DRIVE PARK.GPJ

SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **C. FRIESEN**

APPROVED DATE 12/10/10

CLIENT CITY OF WINNIPEG
PROJECT CHURCHILL DRIVE PARK
SITE Churchill Drive Park
LOCATION Mid Bank (See Site Plan)

JOB NO. 10-0107-03
GROUND ELEV. 227.39 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 02-12-2010
UTM (m) N 5,524,215
 E 633,714

DRILLING METHOD 200 mm ø Hollow Stem Auger, Continuous Sampling

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆		
	(m)	(ft)								PL	MC	LL
227				TOPSOIL - Black, frozen, trace sand, trace gravel.								
226.8				SILTY CLAY (CH) - Brown to black, damp, frozen, high plasticity, trace sand, trace organics. - Frozen to 0.91 m.			S1					
226	1	5		- Becomes brown, stiff, high plasticity, trace silt pockets (2-10 mm diameter), trace white gypsum pockets (2-5 mm diameter), trace silt laminations below 1.52 m.								
225	2	10		- Grain size distribution: Gravel (0.0%), Sand (2.8%), Silt (31.0%), Clay (66.2%) at 2.3 m. - Some silt laminations below 3.05 m.			S2	100				
224	3	15		- Becomes grey below 3.66 m.								
223	4	20		- No silt laminations, no gypsum, silt pockets (2-15 mm diameter) below 4.27 m.		4.2	S3	100				
222	5	25										
221	6	30		- No organics below 6.40 m.			S4	100				
220	7			- Grain size distribution: Gravel (0.0%), Sand (2.8%), Silt (22.9%), Clay (74.3%) at 6.9 m. - Decreasing stiffness below 7.0 m.		6.9	S5	100				
219	8			- Moist, firm, high plasticity, trace sand below 7.62 m.			ST1	77				
218.5	9			- Grain size distribution: Gravel (3.0%), Sand (20.0%), Silt (33.0%), Clay (44.0%) at 7.98 m.			S6	100				
218				TILL - Light grey/tan, moist, trace gravel, trace sand.			S7	100				
227.8				AUGER REFUSAL AT 9.45 m.		9.4						

Notes:

SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER**

APPROVED DATE 12/10/10

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ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	PIEZ. LOG	DEPTH (m)	SAMPLE TYPE	NUMBER	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △	Cu POCKET PEN (kPa) ★ Cu TORVANE (kPa) ◆	
										PL	MC
217	35		1. Installed SI to 9.45 m depth. 2. Installed PN 33126 at 4.17 m depth. 3. Installed PN 33122 at 6.86 m depth. 4. Backfilled test hole with cement bentonite grout.								
216	40										
215	45										
214	50										
213	55										
212	60										
211	65										
210	70										
209											
208											
207											
206											

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SAMPLE TYPE Auger Grab Split Barrel Shelby Tube

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. GARBER**

APPROVED  DATE 12/10/10