# SCATLIFF + MILLER + MURRAY Inc

## Red River Community Centre Proposed Playground and Skatepark Geotechnical Investigation and Evaluation

FINAL REPORT February 2010

Prepared By

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Approved By

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Kontzamanis Graumann Smith MacMillan Inc.



February 8, 2010

File No. 09-0109-04

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ATTENTION: Ms. Jennifer Wagner

RE: Red River Community Centre Proposed Playground and Skatepark Geotechnical Investigation and Evaluation Final Report

Dear Ms. Wagner:

KGS Group is pleased to submit our final report summarizing the geotechnical investigation and evaluation of the proposed playground and skatepark at the Red River Community Centre.

Included in the final report are the site plan and summary soil logs completed as part of the investigation.

We thank you for the opportunity to provide geotechnical engineering services for this project. Please call the undersigned if you have any questions on the enclosed.

Yours truly,

Mark Jamieson, P.Eng. Senior Geotechnical Engineer

NCP/jr Enclosure



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#### 1.0 INTRODUCTION

KGS Group was authorized by Scatliff + Miller + Murray Inc. to undertake a geotechnical investigation and evaluation, as well as a topographic survey, of the proposed playground and skate park development at the Red River Community Centre. This report provides a summary of the field investigation results performed to date, as well as geotechnical considerations that should be incorporated into the design of the proposed works.

The geotechnical engineering services provided for this project are outlined below:

- **Geotechnical Investigation** A subsurface drilling investigation program consisting of power auger drilling at the proposed playground and skate park area to determine the subsurface stratigraphy and foundation conditions. Representative soil samples were collected for material identification and laboratory testing.
- **Topographic Survey** A topographic survey of existing facilities, trees/vegetation and existing ground elevations.
- **Laboratory Testing** Diagnostic laboratory index testing on select soil samples to identify engineering soil properties relevant to the assessment.
- **Geotechnical Evaluation** A geotechnical engineering evaluation of the site conditions at the proposed skate park for consideration in the design.
- **Summary Report** A comprehensive report outlining the work conducted, laboratory test results and geotechnical considerations for incorporation into the proposed design and construction.



#### 2.0 BACKGROUND

The development of a playground and skate park has been proposed for the northeast corner of the Red River Community Centre on Main Street between Murray and Ridgecrest Avenues in Winnipeg, Manitoba, as shown on Figure 1. The site is currently a green space, but was previously the location of the Red River School and parking lot. The site was leveled with fill as part of the demolition of the school, and turn into soccer fields. In general, the proposed playground will be located within and around the footprint of the removed school. The skate park will be located west of the demolished school, close to Main Street. The travel surface and features of the skate park will generally consist of cast-in-place concrete.

The existing community centre and parking lot to the south and west of the proposed skate park (see Figure 1) was recently constructed (2006). An investigation by M. Block and Associates Ltd. conducted in 2004 titled "Geotechnical Investigation for the Proposed Red River Community Centre Redevelopment Project", reported the drilling of six test holes within the footprints of the community centre building and parking lot. In addition, the report made recommendations for pile, slab on grade and pavement designs.



#### 3.0 INVESTIGATION PROGRAM

#### Site Survey

A topographic site survey was performed by KGS Group in August 2009 to determine ground elevations and locate the existing infrastructure and trees on the site. The existing site conditions and proposed works overlaid on an air photo background are included on Figure 1. This information was provided electronically to Scatliff+Miller+Murray separately.

#### Drilling Program

A drilling and sampling program consisting of eight test holes was completed on August 5, 2009, with drilling services performed by Paddock Drilling Ltd. of Brandon, Manitoba, with on-site supervision and sampling by KGS Group. The locations of the test holes are shown on Figure 1. The test holes were completed using a truck mounted Canterra 250 drill rig, equipped with 125 mm diameter solid stem augers. Soil samples were recovered from the auger flights, with all soils visually inspected in the field for material type and classification according to the Unified Soil Classification System (USCS). Detailed test hole logs incorporating field observations and subsequent laboratory test data are included in Appendix A.

#### Laboratory Testing

Laboratory testing was performed on select soil samples to determine the relevant engineering properties of the subsurface soils. The laboratory testing was completed by National Testing Laboratories Ltd., and included 46 moisture content analyses and 2 Atterberg Limits tests. The results of the testing are shown on the summary logs in Appendix A.

#### Stratigraphy

In general, the stratigraphy at the site has been interpreted by KGS Group to consist of topsoil/clay fill at surface over high plasticity silty clay with a silt layer, occurring within the upper few metres from ground surface, and silt till at depth.



Topsoil was encountered in 2 test holes, with clay fill observed in the other 6 test holes; the topsoil and clay fill supported grass vegetation. The topsoil was of high plasticity and contained organic matter. The clay fill typically contained trace sand and gravel and was of high plasticity. The thickness of both materials was typically less than 0.5 m from ground level. The topsoil and fill was underlain by a deposit of high plasticity silty clay of glaciolacustrine origin. The upper portion of the silty clay was generally stiff and moist, and contained a trace of organic matter. The silty clay was typically soft to firm in consistency with depth, and moist. From the M. Block and Associates Ltd. report, the silty clay extended to an approximate depth of 17.5 m below ground where it was underlain by silt till. The silt layer within the silty clay varied in depth from 1.5 to 2.3 m below ground surface, and was typically moist, soft, of low plasticity and up to 1.5 m in thickness. Minor groundwater infiltration from the silt was observed in 5 of the 8 test holes.

Two key considerations of the encountered soils relative to the skatepark and playground development include:

- The silt layer may be susceptible to frost action / heave and ice lensing.
- The high plasticity silty clay is typically compressible, and susceptible to swelling and shrinking with changes to moisture content.



#### 4.0 DESIGN CONSIDERATIONS

This section is intended to identify general geotechnical considerations for incorporation into the design and construction of the proposed playground and skateboard park. The final design of the proposed works should be reviewed by a qualified geotechnical engineer familiar with the local soil conditions and behavior to ensure that the geotechnical considerations relative to structure performance are effectively incorporated into the design.

#### 4.1 GEOTECHNICAL

#### Structural Design

Although the details of the design have not been finalized, it is understood by KGS that the proposed playground and skate park will include several concrete features and travel surfaces including stairs and ramps at different levels. If the structures are supported on shallow foundations, which is typical for other skate parks in Winnipeg, there will be variable loading applied to the foundation soil. This variable loading may induce differential settlements, potentially causing cracking of the cast-in-place concrete with resulting movements that could affect the serviceability of the proposed works. Structural design of the features to allow for this potential cracking at preferred locations is prudent to minimize their potential impacts on the structure performance and serviceability.

#### Subgrade Preparation

Preparation of the subgrade is necessary to provide a suitable and stable surface for the various structures. The subgrade preparation should include excavation to intact mineral soil, and disposal of topsoil and organic-rich material. The stripped surface should then be compacted to a minimum of 95% of the Standard Proctor Maximum Dry Density (SPMDD). The typical depth of stripping is estimated to be approximately 0.5 m, based on the test hole drill results. Where additional unsuitable subgrade material is encountered (e.g. wet silt, soft clay, organic material, etc.), additional sub-excavation to a minimum depth of 0.6 m should be performed and backfilled with compacted granular fill.



To further improve foundation conditions, a layer of woven geotextile could be placed overtop of the stripped and compacted subgrade. This will help distribute the applied load more uniformly, and bridge over any potential weaker zones. Installation should follow manufacturer's guidelines, with care to protect against tears, folds or wrinkles in the fabric.

The silt layer found across the site will typically be susceptible to frost action, potentially causing heaving and ice lensing during winter below the structures. Typical local practice is to excavate and replace the silt with crushed rockfill, while providing improved subsurface drainage. However, it is likely impractical and cost prohibitive to remove all the silt material, given the observed depth and thickness. An alternative to excavation and replacement would be to reduce the risk of frost penetration into the silt below the concrete structures. This could be achieved by either building up the ground surface around and below the skate park to increase the depth of burial, or by placement of a rigid thermal insulation to reduce the depth of frost penetration. If insulation is used, it would have to be designed for the overlying structure loading.

The foundation preparation below the concrete features should include placement and compaction of at least 600 mm of granular sub-base material. The sub-base should be placed in lifts not exceeding 150 mm compacted. The sub-base material should consist of durable, free draining sand and gravel. All granular material used as sub-base should be compacted to a minimum of 98% SPMDD.

#### Subsurface Drainage Control

Changes to the moisture content of the silty clay foundation soil can lead to shrinkage (drying) or swelling (wetting), which could affect the performance of the structures. Construction practices used in the design of the skate park should include methods to control subsurface drainage, and in particular excessive water that could lead to swelling. This will also reduce excess free water that could be available for ice lensing during winter. The following measures should be incorporated into the design to help control the subsurface drainage:

• The excavated subgrade should be positively sloped to promote runoff and minimize ponding below the structures.



- A granular sub-drainage system should be installed below the structures, consisting of a free draining granular fill. To improve subsurface water collection perforated drains could be installed within the granular fill or within excavated trenches.
- The drainage system should be sloped such that all collected water can be removed from the site. The water can be drained either into the municipal drainage system, or to a sump for pump discharge.

#### 4.2 CONCRETE

The concrete travel surface and skate features of the skate park should be constructed with control joints and articulation at locations that could tolerate minor movements. This will reduce the risk of potential cracking of the cast-in-place concrete at undesirable locations. All concrete should be designed in accordance with CSA A23.1 and A23.2.



#### 5.0 CONCLUSIONS

The stratigraphy at the site consisted of topsoil and clay fill overlying high plasticity silty clay and silt till. A silt layer was encountered within the upper few metres of ground surface, from which water infiltration was observed entering some test holes. This stratigraphy could pose some general concerns related to shallow foundation support for the proposed skate park structures, primarily related to swelling of the silty clay and frost heave / ice lensing associated with the wet silt layer.

The design and construction of the proposed skate park should include features to minimize the risk of adverse movement causing unacceptable performance of the structures associated with the geotechnical conditions at the site. This includes subgrade preparation, placement and compaction of granular fill over the prepared subgrade, and control of subsurface drainage underneath the skate park and playground structures. In addition, measures to minimize the risk of frost action should be considered, including placement of insulation or additional fill to limit frost penetration into the silt layer.



#### 6.0 STATEMENT OF LIMITATIONS AND CONDITIONS

#### Third Party Use of Report

This report has been prepared for Skatliff + Miller + Murray Inc. and any use a third party make of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

#### Statement of Limitations

The geotechnical investigation findings and recommendations of this report were prepared in accordance with generally accepted professional engineering principles and practice. The findings and recommendations are based on the results of field and laboratory investigations, combined with an interpolation of soil and groundwater conditions found at and within the depth of the test holes drilled by KGS at this site. If conditions encountered during construction appear to be different from those shown by the test holes drilled by KGS or if the assumptions stated herein are not in keeping with the design, this office should be notified in order that the recommendations can be reviewed and modified if necessary.

KGS Group makes no representation concerning the legal significance of its finding or the value of the property investigated.

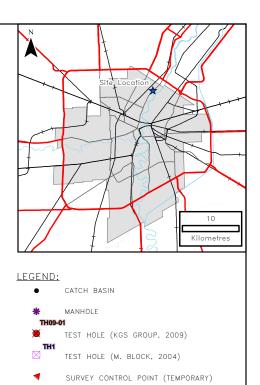


FIGURE









- × GROUND ELEVATION (m)
- FENCE LINE
- BH-BH- BURIED HYDRO LINE
  - DITCH MAILBOX
  - 1 m INDEX CONTOUR
  - - PROPOSED CONTOUR
  - PROPOSED CONCRETE
  - TREE, EXISTING

10		0		10		20
			Metres			
	SCALE:	1.600	METRIC		11"×17"	

#### NOTES:

 ALL UNITS ARE METRIC AND IN METRES UNLESS OTHERWISE SPECIFIED.
 TRANSVERSE MERCATOR PROJECTION, NAD 1983, ZONE 14, CSRS. ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MSL), (CGVO 28).
 SURVEY COMPLETED BY KGS GROUP AUG 07/2009.
 AIRPHOTO SUPPLIED BY SCATLIFF + MILLER + MURRAY.
 PROPOSED SKATE PARK OUTLINE PROVIDED BY SCATLIFF + MILLER + MURRAY.

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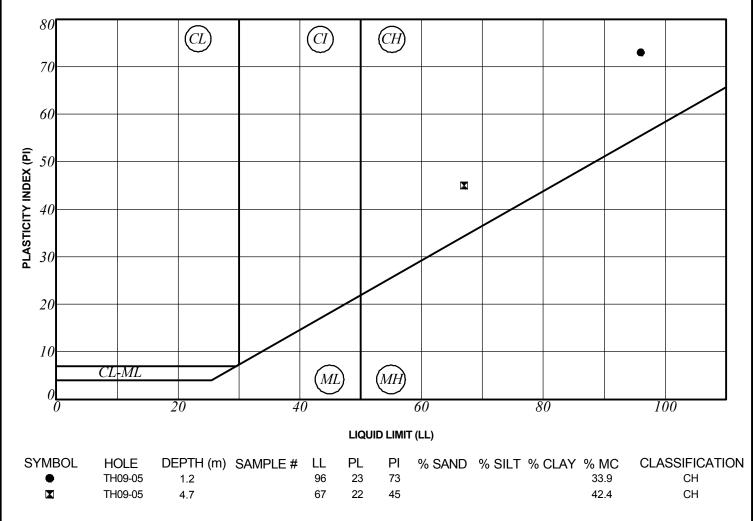
**APPENDICES** 



APPENDIX A

### **TEST HOLE LOGS**





Notes: ML - Low Plasticity Silt MH - High Plasticity Silt CL-ML - Silty Clay CL - Low Plasticity Clay CI - Intermediate Plasticity Clay CH - High Plasticity Clay LL - Liquid Limit PL - Plastic Limit PI - Plastic Limit PI - Plasticity Index MC - Moisture Content

**NP** - Non-Plastic

 KCSS
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 Red River Community Centre Proposed Skate Park Development

 A-LINE PLOT

 Feb 2010

 Figure A

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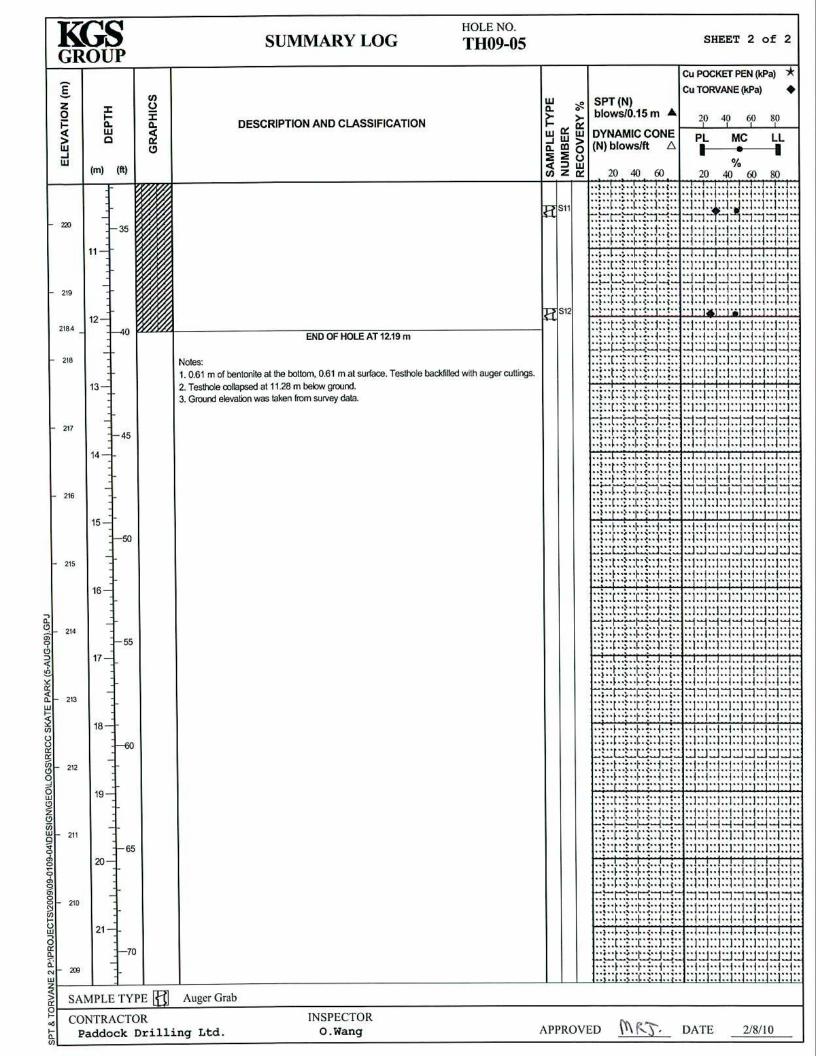
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DRI	ATION 5	8 m So	er of Main St. & Ridgecrest Ave. uth of Ridgecrest Ave., 58 m West of Main St. (See Figure 1) ø Solid Stem Auger, CT 250 Canterra				WATER ELEV. DATE DRILLED UTM (m)	N	5/2009 5,535,380 636,340	
ELEVATION (m)	HLA (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER	<b>RECOVERY %</b>	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu POC	KET PEN (kPa)         *           VANE (kPa) $\blacklozenge$ $40^{\circ}$ $60^{\circ}$ $80^{\circ}$ MC         LL           % $40^{\circ}$ $60^{\circ}$ $80^{\circ}$	
230.3 _ - 230 - 229	1-1-5		TOPSOIL       - Black, moist, firm, high plasticity, trace rootlets.         - Trace silt from 0 m to 0.30 m.         SILTY CLAY (CH) - Brownish grey, moist, stiff, high plasticity.         - Trace silt lenses (3 mm diameter) below 1.52 m.	स स	S1 S2					
2286 - 228			SILT (ML) - Tan, moist, soft, low plasticity. - Water infiltration below 2.29 m. - 50 mm clay layer at 2.74 m. - Trace clay below 3.05 m. - Increased moisture content between 3.05 m and 3.35 m.	R	54	and a state of the				
227.1 - 227 - 227 - 226	4		<u>SILTY CLAY</u> (CH) - Grey, moist, firm, high plasticity. - Trace silt nodules below 4.42 m.	R						
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SIGNIGEO/LOGS/RR	7		Notes: 1. 0.61 m of bentonite at the bottom and 0.61 m bentonite at surface. Testhole backfilled with auger cuttings. 2. Testhole collapsed at 2.44 m below ground surface. 3. Ground elevation was taken from survey data.							
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LOCATION 43 m South of Ridgecrest Ave, 41 m West of Main St. (See Figure 1) DRILLING 125 mm # Solid Stem Auger, CT 250 Canterra	CLII PRO	ENT DJECT	S R	ed Riv	ver Community Centre Proposed Skate Park Development				GROUND ELEV. TOP OF PVC ELE	230.8 m
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228.7       6       -20       END OF HOLE AT 6.10 m         1       1.0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.       1.0.61 m of bentonite at the bottom depth of 6.10 m at end of drilling.         228.7       7       -       2. No water in testhole at end of drilling.         3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.         229       -       -       -         220       -       -         3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       4. Ground elevation was taken from survey data.         8       -       -         9       -       -         30       -       -         8       -       -         -       -       -         21       -       -         9       -       -         -       -       -         22       9       -         -       -       -         -       -       -         -       -       -         -       -       -         -       -       -         -       -	Ϋ́ΥΫ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́Ϋ́	-	1							
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224       7       1       0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.         224       7       2       1       0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.         23       7       2       1       0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.         23       -25       3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       4. Ground elevation was taken from survey data.         22       9       -30       -25       -25         3       7       -25       -25         3       7       -25       -25         3       7       -25       -25         3       -25       -25         3       -25       -25         3       -25       -25         3       -25       -25         3       -25       -25         4       -25       -25         5       -25       -25         3       -25       -25         4       -25       -25         5       -26       -26         5       -26       -26      <	224.7	- 6-	-20		END OF HOLE AT 6.10 m	-				······································
224       7       1.0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.         23       7       -       -       1.0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.         23       -       -       -       -       -       -         23       -       -       -       -       -       -         23       -       -       -       -       -       -         23       -       -       -       -       -       -         3.1 testhole stayed open to bottom depth of 6.10 m at end of drilling.       -       -       -       -         3.3       Testhole stayed open to bottom depth of 6.10 m at end of drilling.       -       -       -       -         4. Ground elevation was taken from survey data.       -       -       -       -       -         2000000000000000000000000000000000000	SCC	_	-		Notes:					
7       auger outlings.         2. No water in testhole at end of drilling.         3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.         4. Ground elevation was taken from survey data.         9         -22         8         -22         8         -22         8         -23         8         -24         9         -30         -27         9         -30         -21         9         -30         -21         9         -30         -21         9         -30         -21         9         -30         -21         9         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30         -30 <t< td=""><td>12/SS- 224</td><td></td><td></td><td></td><td>1. 0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with</td><td></td><td></td><td></td><td>······································</td><td></td></t<>	12/SS- 224				1. 0.61 m of bentonite at the bottom and 0.61 m of bentonite at surface. Testhole backfilled with				······································	
3. Testhole stayed open to bottom depth of 6.10 m at end of dnlling.         4. Ground elevation was taken from survey data.         8         9         -30         9         10         10	DILOC	7-			2. No water in testhole at end of drilling.					
A Ground deviation was been normality data.	IGEO	1	k T							:: :: :: :: :: :: :: :: :: :: :: :: ::
B       Image: Constractor       Image: Constractor       Image: Constractor         SAMPLE TYPE       Auger Grab         CONTRACTOR       INSPECTOR         Paddock Drilling Ltd.       O.Wang	SIGN		- 25		4. GIULIN EEValuit was loken north survey data.					
9       -	223	8-	-							
000000000000000000000000000000000000	109-(	-	-							•••••••••••••••••••••••••••••••••••••••
000-222       0-30         0-30       -30         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-30       -4         0-4       -4         0.Wang       APPROVED         MRT-       0.Wang	0-60/6		-							
SAMPLE TYPE     Auger Grab       CONTRACTOR     INSPECTOR       Paddock Drilling Ltd.     O.Wang	222	3	-							
SAMPLE TYPE     Auger Grab       CONTRACTOR     INSPECTOR       Paddock Drilling Ltd.     O.Wang	ECTS	9-	-30	6						•••••••••••••••••••••••••••••••••••••••
SAMPLE TYPE     Auger Grab       CONTRACTOR     INSPECTOR       Paddock Drilling Ltd.     O.Wang	ROJ	1								비미미미미미미미미
SAMPLE TYPE     Auger Grab       CONTRACTOR     INSPECTOR       Paddock Drilling Ltd.     O.Wang	2 P.IP		1							
SAMPLE TYPE []]     Auger Glab       CONTRACTOR     INSPECTOR       Paddock Drilling Ltd.     O.Wang   APPROVED (MRT) DATE 2/8/10	ANE	-			Augor Crob	1				
Paddock Drilling Ltd. O.Wang APPROVED MSJ DATE/8/10	SA SA						-	-	0	
						APF	PRO	OVI	D WED	DATE <u>2/8/10</u>

K	<b>GS</b>		SUMMARY LOG	HOLE NO. <b>TH09-03</b>				SH	EET 1 of 1	3
CLI PRO	ENT DJECT	SCATL	FF+MILLER+MURRAY ver Community Centre Proposed Skate Park	Development			Job No. Ground Elev. Top of PVC Ele	230	0109-04 ).8 m	
SIT LOC			er of Main St. & Ridgecrest Ave. outh of Ridgecrest Ave., 30 m West of Main St. (	See Figure 1)			WATER ELEV. DATE DRILLED UTM (m)		5,535,373	
	LLING THOD	125 mm	ø Solid Stem Auger, CT 250 Canterra					Ε (	636,356	
ELEVATION (m)	DEPTH (m) (ft	4.0	DESCRIPTION AND CLASSIFICATION		SAMPLE TYPE	NUMBER	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		KET PEN (kPa)         XANE (kPa)           40         60         80           MC         LL           %         40         60         80	*
	-	1999-1999 1997-1997 1997-1997 1997-1997	TOPSOIL - Black, moist, firm, crumbly, high plasticity, trace fine to a	parse grained sand.	प्त	S1		:: :: ::		
230.3 - 230			SILTY CLAY (CH) - Brown, moist, stiff, high plasticity, trace silt nodule	es (1 - 5 mm diameter).	-s-L					
					R	82			<pre>ki::::::::::::::::::::::::::::::::::::</pre>	
- 229 2288	- 2-		SILT (ML) - Tan, moist, soft, low plasticity.		स	ങ		<ul> <li></li></ul>		: : : : : : : : : : : : : : : : : : : :
- 228 227.6	3-1-1	0	- Firm, trace clay below 2.74 m. SILTY CLAY (CH) - Mottled brown/grey, moist, firm, high plasticity, tr	neo olik podulog (4 E						
- 227	4		<u>SILTY CLAY</u> (CH) - Motuled brown/grey, moist, firm, nigh plasucity, tr mm diameter).	ace sin noquies (1-5	स	54		·····		
AUG-09).GPJ	5-1	5			स्र	S5			◆•	
41E PAKK (1) 226 – 226 224.7					प्त	56			•	::::
EO/LOGS/RRCC SK	7		END OF HOLE AT 6.10 m Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. auger cuttings. 2. Water level measured at 5.49 m below ground at end of drilling. 3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.	Testhole backfilled with						
-0109-04/DESIGN/GI	8	25	<ol> <li>Testrole stayed open to octorn deput of 0.10 martend of draining.</li> <li>Ground elevation was taken from survey data.</li> </ol>							
T & TORVANE 2 P.IPROJECTS/2009/09-0109-04/DESIGN/GEO/LOGS/RRCC SKATE PARK (3-AUG-09) 147	9	30								
14 Z = 221										1
S/	MPLE T		Auger Grab							
CC 1	ONTRACT Paddock		INSPECTOR ing Ltd. O.Wang	2	APP	ROV	ED WGJ.	DATE	2/8/10	

LOCATION 61 m South of Ridgecrest Ave., 11 m West of Main St. (See Figure 1)       DATE DRILLED       8/5/2009         DRILLING       125 mm ø Solid Stem Auger, CT 250 Canterra       UTM (m)       N 5,535,358         E       636,372         OUTM (m)       N 5,535,358       E         ØUTM (m)       E       OUTM (m)	KGR	<b>GS</b> OUP		SUMMARY LOG HOLE NO. TH09-04					SHF	EET 1 d	of 1	4
GU DOULUI IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	PROJ SITE LOC/ DRIL	JECT F E N ATION 6	Red Riv NE corn 61 m So	ver Community Centre Proposed Skate Park Development ner of Main St. & Ridgecrest Ave. outh of Ridgecrest Ave., 11 m West of Main St. (See Figure 1)			נ ד א ו	GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED	230. EV. 8/5/2 N 5, E 63	).7 m /2009 5,535,358 536,372	58	
280	ELEVATION (m)				SAMPLE		RECOVERY ?	blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		ANE (kPa)	)	*
20       Image: Strict CLAY (CH) - Black, moist, stiff, high plasticity.         20       - Brown below 0.76 m.         21       - Trace sand layers (1 mm thick), brace silt layers (1 mm thick) below 1.52 m.         22       - Trace conduction below 2.13 m.         228       - Trace conduction below 2.13 m.         228       - Trace conduction below 2.13 m.         228       - Trace conduction below 2.14 m.         228       - Trace conduction below 2.44 m.         229       - No conduction below 2.44 m.         230       - No conduction below 2.44 m.         241       - No conduction below 2.44 m.         255       - Strict CLAY (CH) - Molified brownigney, moist, firm, high plasticity, trace of silt nodules (1-3)         256       - Strict CLAY (CH) - Molified brownigney, moist, firm, high plasticity, trace of silt nodules (1-3)         256       - Strict CLAY (CH) - Molified brownigney, moist, firm, high plasticity, trace of silt nodules (1-3)         257       - Strict CLAY (CH) - Molified brownigney, moist, firm, high plasticity, trace of silt nodules (1-3)         268       - Strict CLAY (CH) - Molified brownigney, moist, firm, high plasticity, trace of silt nodules (1-3)         268       - Strict CLAY (CH) - Molified brownigney, molist, firm, high plasticity, trace of silt nodules (1-3)         269       - Strict CLAY (CH) - Molified brownigney, molist, firm, high plasticity, trace	230.4										1::1::1	
<ul> <li>Brown below 0.76 m.</li> <li>Trace sand layers (1 mm thick), trace sill layers (1 mm thick) below 1.52 m.</li> <li>Trace sand layers (1 mm thick), trace sill layers (1 mm thick) below 1.52 m.</li> <li>Trace oxidation below 2.13 m.</li> <li>Sill T (ML) - Tan, moist to vet, soft, low plasifoly, trace oxidation.</li> <li>Water hittstation below 2.44 m.</li> <li>Sill T (ML) - Tan, moist to the vet, soft, low plasifoly, trace oxidation.</li> <li>Water hittstation below 2.44 m.</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sill T CLAY (CH) - Motified brown/grey, motified with auger or firm, firm, high plasticity, trace of silt nodules (1-3 mm diameter), trace sill lenses (1 mm thick).</li> <li>Sint T CL</li></ul>	230.4			sand, trace fine grained gravel.	-1	1	ŀ			그리고고	199	Ē
23 24 25 264 27 3 10 285 284 285 284 284 285 284 285 284 285 284 285 284 285 284 285 285 286 286 287 3 10 287 3 10 287 3 10 287 3 10 287 3 10 281	220						1			:::::::::::::::::::::::::::::::::::::::	<u>inn</u>	<u>(</u>
229 230 240 241 251 251 251 264 277 3 - 10 3 - 10 3 - 10 3 - 10 5 - 10 6 - 20 END OF HOLE AT 6.10 m Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with 26 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 8 - 20 8 - 20 8 - 20 8 - 20 8 - 20 8 - 20 9 - 20	~	11		- Brown below 0.76 m.	<b>\$1</b>	-	ł				<b>R</b>	Ä
229 230 240 241 251 251 251 264 277 3 - 10 3 - 10 3 - 10 3 - 10 5 - 10 6 - 20 END OF HOLE AT 6.10 m Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with 26 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 8 - 20 8 - 20 8 - 20 8 - 20 8 - 20 8 - 20 9 - 20	)			à	1		ł					
229 230 240 241 251 251 251 264 277 3 - 10 3 - 10 3 - 10 3 - 10 5 - 10 6 - 20 END OF HOLE AT 6.10 m Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with 26 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 7 - 25 8 - 20 8 - 20 8 - 20 8 - 20 8 - 20 8 - 20 9 - 20	)	5		The send layon (1 mm thick) trace silt layers (1 mm thick) below 1.52 m.			F			4997	199	E
284 284 284 284 284 284 284 284 284 284 284 285	229						1					í
284 - Trace addition below 2.13 m. St S	1	2-			Ł	5 83	ł					
28 28 29 20 20 20 20 20 20 20 21 22 23 24 24 24 25 25 25 26 26 27 3 3 3 3 3 4 5 6 4 6 7 6 7 6 7 6 7 6 7 7 7 7 7 7 7 7 7 7 7 8 9 9 10	228.4											£
<ul> <li>No oxidation below 2.74 m.</li> <li>3 - 10</li> <li>SILTY CLAY (CH) - Mottled brown/grey, moist, firm, high plasticity, trace of silt nodules (1-3) mm diameter), trace silt lenses (1 mm thick).</li> <li>4 - 15</li> <li>5 - 15</li> <l< td=""><td>1</td><td></td><td></td><td></td><td>Ł</td><td><b>7</b> S4</td><td>T</td><td></td><td></td><td>1.1.1.1.</td><td>inini</td><td>(···</td></l<></ul>	1				Ł	<b>7</b> S4	T			1.1.1.1.	inini	(···
27 28 26 26 27 4 4 4 4 4 4 4 4 4 4 4 5 6 20 END OF HOLE AT 6.10 m 8 86 <		1			1	1	ľ			1111.1.	1	
$\mathbb{R} = \mathbb{R}$	227.7 _	3-10		SILTY CLAY (CH) - Mottled brown/grey, moist, firm, high plasticity, trace of silt nodules (1	-3		T				dista:	1::
28 28 5 5 5 6 7 24 7 - 22 23 23 24 7 - 25 25 25 25 25 25 25 25 25 25	1	-		mm diameter), trace silt lenses (1 mm thick).			ľ		-Heiser		1.1.1	;:: <u> </u>
28 28 5 5 5 6 7 24 7 - 22 23 23 24 7 - 25 25 25 25 25 25 25 25 25 25		1			Ţ	<b>3</b> S5			. Hinney			1::
225       -15         225      15         226	221			â	1	11	1		<u>.            </u>			<u>f</u>
225       -15         225      15         226		4					1		. Einer		.i:::::	1::
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25	- 226	- 15		â			1				4:1:P	£:]
225 224.6 6 - 20 END OF HOLE AT 6.10 m Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings. 2. Testhole stayed open to bottom depth of 6.10 m at end of drilling. 3. Ground elevation was taken from survey data.		5-		Â			1			<u>-1.1.1.</u>	<u></u>	1
224.6       -       6       -       20       END OF HOLE AT 6.10 m         224       -       -       Notes:       1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.       2. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       3. Ground elevation was taken from survey data.       -		1 1		Ź.			1				diale;"	
224.6       -       6       -       20       END OF HOLE AT 6.10 m         224       -       -       Notes:       1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.       2. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       3. Ground elevation was taken from survey data.       -		4					ł				4:::::	13
END OF HOLE AT 6.10 m       224     Notes:       7     1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.       2. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       3. Ground elevation was taken from survey data.	- 225	]		Å			1				dinini dinini	1::
END OF HOLE AT 6.10 m Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings. 2. Testhole stayed open to bottom depth of 6.10 m at end of drilling. 3. Ground elevation was taken from survey data.	224.6	6-1_2			₹	₹ <sup>56</sup>	1				<u></u>	. <del>[</del> ]
<ul> <li>224</li> <li>7</li> <li>-25</li> <li>1. 0.61 m of bentonite at the bottom, 0.61 m of bentonite at surface. Testhole backfilled with auger cuttings.</li> <li>2. Testhole stayed open to bottom depth of 6.10 m at end of drilling.</li> <li>3. Ground elevation was taken from survey data.</li> </ul>	- 226 - 225 - 224 - 224 - 223 - 222 - 221 - 221			END OF HOLE AT 6.10 m			1				111117	
7     auger cuttings.       2. Testhole stayed open to bottom depth of 6.10 m at end of drilling.       3. Ground elevation was taken from survey data.		-			1020		ţ		1999			1.
223 223 2. Testhole stayed open to bottom depth of 6.10 m at end of drilling. 2. Testhole stayed open to bottom depth of 6.10 m at end of drilling. 3. Ground elevation was taken from survey data.	- 224	Ē			th		1				444	
		7		2. Testhole stayed open to bottom depth of 6.10 m at end of drilling.			J					1::
		1		3. Ground elevation was taken from survey data.			1				1:1:1:	1::
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	223						1				: <u>]::]::</u>	1::
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	- 221	1					1	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	. Elizier			
								<u></u>	·		<u>.ii.</u>	<u> </u>
SAMPLE TYPE 🔂 Auger Grab	SA	MPLE TY	7PE 🖁	Auger Grab								
CONTRACTOR INSPECTOR		NTRACT	ГOR	INSPECTOR				nor		210		Ì
Paddock Drilling Ltd. 0.Wang APPROVED 11/25 DATE 2/8/10	Pa	addock	Drill?	ing Ltd. O.Wang	AP	PROV	VE	<u>. ראויו</u> מ	DATE	2/8/	10	-

LOCATION 39 m South of Ridgecrest Ave., 25 m West of Main St. (See Figure 1)       DATE DRILLED       8/5/2009         DRILLING METHOD       125 mm ø Solid Stem Auger, CT 250 Canterra       UTM (m)       N 5,535,384         E       636,375         OUTV II       DESCRIPTION AND CLASSIFICATION       II       SPT (N)         DIATE DRILLED       SPT (N)       DIATE DRILLED       Cu POCKET PEN (kPa)         UTM (m)       N 5,535,384       E       636,375         OUTV II       OUTV III       DESCRIPTION AND CLASSIFICATION       III       SPT (N)         DIATE DRILLED       SPT (N)       DIATE DRILLED       SPT (N)         DIATE DRILLED       OUTV IIII       OUTV IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	KG GRO	SUP		SUMMARY LOG	HOLE NO. <b>TH09-05</b>				SHE	ET 1 d	of 2
Up DUDUC 3         SP E         SP E         DESCRIPTION AND CLASSIFICATION         UP SPT (0) To TOWANE (PAR) DESCRIPTION AND CLASSIFICATION         UP SPT (0) TO TOWANE (PAR) D	PROJE SITE LOCAT DRILLI	CT R N N NON 3	ted Riv E corno 9 m So	er Community Centre Proposed Skate Park I er of Main St. & Ridgecrest Ave. uth of Ridgecrest Ave., 25 m West of Main St. (				GROUND ELEV. TOP OF PVC ELE WATER ELEV. DATE DRILLED	230. V. 8/5/2 N 5, E 62	6 m 2009 535,384 36,375	4
200       1       Use fire gained gravel.         201       1       Use fire gained gravel.         202       -       -         203       -       -         204       -       -         205       -       -         205       -       -         205       -       -         205       -       -         205       -       -         206       -       -         207       -       -         208       -       -         209       -       -         201       -       -       -         202       -       -       -         203       -       -       -         204       -       -       -         205       -       -       -         206       -       -       -         207       -       -       -       -         208       -       -       -       -         209       -       -       -       -         201       -       -       -       -         202 </th <th>ELEVATION (m)</th> <th></th> <th>GRAPHICS</th> <th></th> <th></th> <th></th> <th>RECOVERY</th> <th>blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60</th> <th>Cu TORV# 20 4 PL ∎</th> <th>NE (kPa)</th> <th>80 LL</th>	ELEVATION (m)		GRAPHICS				RECOVERY	blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu TORV# 20 4 PL ∎	NE (kPa)	80 LL
20       Image: state of the s	220.2	-			coarse grained sand,	₽ st			:: :: :: *	1	:: ::
22	230			SILTY CLAY (CH) - Black, moist, stiff, high plasticity, trace medium g	rained sand.	₽≈	2			_ 	
221	238	-		- Brown below 1.07 m.		प्त्र	3		·····	1:1:1:1:1	
27       -10       SHTY CLAY (CH) - Brown, moist, stiff, high plasticity.         27       -Firm below 305 m.         28       -Trace oxidation between 3.66 m and 3.75 m.         28       -Grey, tace sit noticities (1-3 mm diameter) below 4.57 m.         29       -Increased sit content between 4.57 m and 4.72 m.         28       -Grey, tace sit noticities (1-3 mm diameter) below 4.57 m.         29       -Increased sit content between 4.57 m and 4.72 m.         28       -Grey, tace sit noticities (1-3 mm diameter) below 4.57 m.         29       -Increased sit content between 4.57 m and 4.72 m.         20       -Trace fine gravel below 9.14 m.         29       -Trace fine gravel below 9.14 m.         20       -Trace fine gravel below 9.14 m.         21       -Trace fine gravel below 9.14 m.         22       -Trace fine gravel below 9.14 m.         23       -Trace fine gravel below 9.14 m.	0896995	-									
3       -0       - Fim below 306 m.         27       - Trace oxidation between 3.66 m and 3.75 m.         28       - Trace oxidation between 3.66 m and 3.75 m.         28       - 115         5       - Gray, trace sit notules (1-3 mm diametar) below 4.57 m.         5       - Increased sit content between 4.57 m and 4.72 m.         28       - 115         6       - 20         7       - 115         7       - 115         7       - 115         7       - 115         7       - 115         7       - 115         8       - 115         9       - 30         20       - 25         8       - 115         9       - 30         - 1000 fine grained gravel below 9.14 m.         20       - 1000 fine grained gravel below 9.14 m.         21       - 1000 fine grained gravel below 9.14 m.         22       - 1000 fine grained gravel below 9.14 m.         23       - 1000 fine grained gravel below 9.14 m.         24       - 1000 fine grained gravel below 9.14 m.         25       - 1000 fine grained gravel below 9.14 m.         26       - 1000 fine grained gravel below 9.14 m. <td< td=""><td>273 _</td><td>la la l</td><td></td><td>CILITY CLAY/CHA Brown moist stiff high plasticity</td><td></td><td>स्ट<sup>\$</sup></td><td>1</td><td></td><td></td><td></td><td></td></td<>	273 _	la l		CILITY CLAY/CHA Brown moist stiff high plasticity		स्ट <sup>\$</sup>	1				
27       -Trace oxidation between 366 m and 3.75 m.         28       -Grey, trace sill nodules (1.3 mm diameter) below 4.57 m.         5       -Increased sill content between 4.57 m and 4.72 m.         28       -Increased sill content between 4.57 m and 4.72 m.         29       -Trace fill gravel between 4.57 m and 4.72 m.         29       -Trace fill gravel between 4.57 m and 4.72 m.         29       -Trace fill gravel between 4.57 m and 4.72 m.         29       -Trace fill gravel between 4.57 m and 4.72 m.         29       -Trace fill gravel between 4.57 m and 4.72 m.         29       -Trace fill gravel between 4.57 m and 4.72 m.         20       -Trace fill gravel between 4.57 m and 4.72 m.         20       -Trace fill gravel between 4.57 m and 4.72 m.         20       -Trace fill gravel between 4.57 m and 4.72 m.         20       -Trace fill gravel between 4.57 m and 4.72 m.         20       -Trace fill gravel between 4.57 m and 4.72 m.         20       -Trace fill gravel between 4.57 m and 4.72 m.         21       -Trace fill gravel between 4.57 m and 4.72 m.         21       -Trace fill gravel between 4.57 m and 4.72 m.         23       -Trace fill gravel between 4.57 m and 4.72 m.         24       -Trace fill gravel between 4.57 m and 4.72 m.         25       -Trace fill gravel	3	3-10				Rs	5			<b>A</b>	
28       -15       - Grey, trace sill nodules (1-3 mm diameter) below 4.57 m.         100       - Increased sill content between 4.57 m and 4.72 m.         28	227										
23		'		- Grey, trace silt nodules (1-3 mm diameter) below 4.57 m. - Increased silt content between 4.57 m and 4.72 m.							
234     7       7     -25       8     -25       8     -25       9     -30       - Trace fine grained gravel below 9.14 m.       SAMPLE TYPE     Auger Grab							•				
223     -25       8     -25       9     -30       - Trace fine grained gravel below 9.14 m.       221       SAMPLE TYPE       Auger Grab		6				±t °	0				
222     9     -30     - Trace fine grained gravel below 9.14 m.       221     - Trace fine grained gravel below 9.14 m.     - Trace fine grained gravel below 9.14 m.       SAMPLE TYPE     Auger Grab       CONTRACTOR     INSPECTOR						सः	9				
- 221     - Trace fine grained gravel below 9.14 m.       SAMPLE TYPE     Auger Grab       CONTRACTOR     INSPECTOR		8									
SAMPLE TYPE Auger Grab				- Trace fine grained gravel below 9.14 m.		₽s	10		•		
CONTRACTOR INSPECTOR	- 221										
CONTRACTOR INSPECTOR	SAMP	PLE TY	PE R	Auger Grab							
	CONT	FRACTO	OR	INSPECTOR		1000	01/	en mer	DATE	2/0/	10



K	GS	P		SUMMARY LOG HOLE NO. TH09-06				SHEET 1 of 1				
	ENT DJECT	R	ed Riv	FF+MILLER+MURRAY ver Community Centre Proposed Skate Park Development			JOB NO. GROUND ELEV. TOP OF PVC ELE	09-0109-04 230.5 m ∨.				
DR		27	7 m So	er of Main St. & Ridgecrest Ave. outh of Ridgecrest Ave., 25 m West of Main St. (See Figure 1) ø Solid Stem Auger, CT 250 Canterra			WATER ELEV. DATE DRILLED UTM (m)	8/5/2009 N 5,535,387 E 636,387				
ELEVATION (m)	DEPTH	(ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60	Cu POCKET PEN (kPa)         ★           Cu TORVANE (kPa)         ◆           20         40         60         80           PL         MC         LL           0         40         60         80				
	1			CLAY FILL (CH) - Brown/black, moist, firm, crumbly, high plasticity, trace fine to coarse grained sand, trace fine grained gravel, trace rootlets.	स	S1						
- 2300				SILTY CLAY (CH) - Black, moist, stiff, high plasticity.	- 	82						
- 2289		-5		SILT (ML) - Tan, moist, soft, low to no plasticity.								
228.5	2-1			SILTY CLAY (CH) - Mottled brown/grey, moist, firm, high plasticity, trace silt nodules. - Increased silt content between 2.13 m and 2.44 m.	100	S4		••••••••••••••••••••••••••••••••••••••				
- 22239		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		SILT (ML) - Tan, moist, soft, low plasticity, trace clay nuggets (2-5 mm diameter).								
227.4	- 3			SILTY CLAY (CH) - Mottled brown/grey, moist, firm, high plasticity, trace silt nodules (2-5 mm diameter).								
AUG-09).GPJ	4		- 15			स	S5					
SKATE PARK (5- 88 88 88		—20		END OF HOLE AT 6.10 m	_R	56		· · · · · · · · · · · · · · · · · · ·				
NIGEOILOGSIRRCC	7-			<ul> <li>Notes:</li> <li>1. 0.61 m of bentonite at bottom, 0.61 m at surface. Testhole backfilled with auger cuttings.</li> <li>2. No water in testhole at end of drilling.</li> <li>3. Testhole stayed open to bottom depth of 6.10 m at end of drilling.</li> <li>4. Ground elevation was taken from survey data.</li> </ul>								
9-0109-04\DESIG	8	- 25 - -										
SPT & TORVANE 2 P./PROJECTS/2009/09-0109-04/DESIGN/GEO/LOGS/RRCC SKATE PARK (5-AUG-09), GP. D S R R R R R R R R R R R R R R R R R R	9 9											
ANE 2												
& TORVI	AMPLE ONTRA	стс	DR	Auger Grab INSPECTOR		n er	Mon					
LISPI	Paddoo	ck I	Drill	ing Ltd. 0.Wang	APP	PROV	ED WCJ.	DATE				

K	GS			SUMMARY LOG TH09-					SI	HEET 1	of 1
CLIE	NT JECT	S R	ed Riv	FF+MILLER+MURRAY ver Community Centre Proposed Skate Park Developmen ver of Main St. & Ridgecrest Ave.	t			JOB NO. GROUND ELEV. TOP OF PVC ELE WATER ELEV.	23	-0109-04 0.6 m	
LOC	ATION			outh of Ridgecrest Ave., 21 m West of Main St. (See Figure 1)	i.			DATE DRILLED		5/2009	
	LING HOD	1:	25 mm	ø Solid Stem Auger, CT 250 Canterra				UTM (m)	E	5,535,37 636,381	
ELEVATION (m)	3 DEPTH	ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION		SAMPLE I YPE	RECOVERY %	SPT (N) blows/0.15 m ▲ DYNAMIC CONE (N) blows/ft △ 20 40 60		AUDIC         AUDIC <th< td=""><td></td></th<>	
	-			CLAY FILL - Black, dry, stiff, some fine to coarse grained sand, trace fine grained gravel							
230.2 _ - 230				SILTY CLAY (CH) - Mottled black/brown, moist, stiff, high plasticity, trace silt nodules (1 mm diameter).	5	₹ <sup>s</sup>					
229.0	1	5		SILT (ML) - Tan, moist, soft, low to no plasticity.							
228.7				SILTY CLAY (CH) - Mottled brown/grey, moist, stiff, high plasticity, trace silt nodules (1-	2	<b>1</b> s					
228.4	2-			mm diameter). <u>SILT (ML)</u> - Tan, moist, soft, low to no plasticity.		₹ <sup>s</sup>	4			1111	1
- 228				SILT (ML) - Tan, molst, son, low to no plasucity.							
227.7			mm	SILTY CLAY (CH) - Mottled brown/grey, moist, stiff, high plasticity, trace silt nodules (1-	2				····	1	
	3-	-10		mm diameter).							
- 227				- Firm below 3.05 m. - Increase silt content between 3.55 m and 3.66 m.	<	E .	5				
- 226 - 225 - 225 - 2245	5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	· 15			-	E .	36				
CSK	1 1	-20		END OF HOLE AT 6.10 m							
24 Received				Notes: 1. 0.61 m of bentonite at the bottom, 0.61 m at the surface. Testhole backfilled with aug cuttings. 2. Water level measured at 4.27 m below ground at end of drilling.	er						
		- 25		<ol> <li>Water level measured at 4.27 m below ground at end of drilling.</li> <li>Testhole stayed open to bottom depth of 6.10 m at end of drilling.</li> <li>Ground elevation was taken from survey data.</li> </ol>							
& TORVANE 2 P.IPROJECTS/2009/09-0109-04/DESIGN/GEO/LOGS/RRCC SKATE PARK (3-AUG-U9)/07/ D VS     R     R       0 VS     VS     R     R	8 	30									
NE 2											······
SA SA	MPLE			Auger Grab							
CO E	NTRA(			INSPECTOR ing Ltd. O.Wang	A	PPF	ROV	ED WEZ	DATE	2/8/	10

	K	<b>GS</b> OUP			SUMMARY LOG TH09-08					SH	HEET 1 of 2
1	CLIE PROJ	NT			FF+MILLER+MURRAY er Community Centre Proposed Skate Park Development				JOB NO. GROUND ELEV. TOP OF PVC ELE	23	-0109-04 0.4 m
	SITE		NE c	orn	er of Main St. & Ridgecrest Ave.				WATER ELEV.	۷.	
	LOCA	TION	15 m	So	uth of Ridgecrest Ave., 19 m West of Main St. (See Figure 1)				DATE DRILLED		5/2009
	DRIL METI	LING HOD	125 ı	nm	ø Solid Stem Auger, CT 250 Canterra				UTM (m)	Е	5,535,394 636,401
	ELEVATION (m)	DEPTH			DESCRIPTION AND CLASSIFICATION	E TYPE	2	ERY %	SPT (N) blows/0.15 m A	Cu TOR	KET PEN (kPa) ★ VANE (kPa) ◆
	ELEVI	⊡ (m) (ft		2		SAMPLE TYPE	NUMBE	RECOVE	(N) blows/ft △	PL 1	MC LL % 40 60 80
-	230.1	-		$\otimes$	CLAY FILL (CH) - Black, damp to moist, firm, high plasticity, trace rootlets, trace fine to coarse grained sand.	स				********	
-	230	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			SILTY CLAY (CH) - Mottled black/brown, moist, stiff, high plasticity.	म					
	220	}									
	2289 _	2-5			SILT (ML) - Tan, moist, soft, no plasticity.	स					
	228.2	-			SILTY CLAY (CH) - Mottled brown/grey, moist, stiff, high plasticity, trace silt lenses (1 mm hick).	, <b>F</b>	<b>S</b> 4			::::::::	l::! <b>*</b>  ::!: <b>!</b> ∳ :: ::
-	228	1			SILT (ML) - Tan, moist, soft, low plasticity.			1000			
	227.5 _	3-1-1	•		SILTY CLAY (CH) - Mottled brown/grey, moist, stiff, high plasticity, trace silt nodules.			1000 - 1000		········ ·······	
-	227	** + + + + + + + + + + + + + + + + + +			- Firm below 3.66 m.						
G-09).GPJ	226	5 5	5			R	<b>S</b> 5				
ATE PARK (5-AL	225					स	<b>S</b> 6				
EOILOGSIRRCC SKI	- 224										
0109-04/DESIGN/G	- 223	8	25		- Grey below 7.62 m.	R	S7				
SPT & TORVANE 2 P:IPROJECTS/2009/09-0109-04/DESIGNIGEO/LOGS/RRCC SKATE PARK (5-AUG-09).GPJ	- 222 - 221	8 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	30		- Trace fine grained gravel below 9.14 m.	स	58				
ANE					August Grah					1	1
T & TORV	CON	MPLE T	FOR	<u>}</u>	Auger Grab INSPECTOR .ng Ltd. 0.Wang	APP	RO	VE	D MRJ.	DATE	2/8/10
S	FC		211								

