

**DATE** November 4, 2016**PROJECT No.** 1523044/7000**TO** Mr. Jim Burghout  
Claridge Homes (South Nepean) LP**FROM** Brian Henderson  
Brian Byerley**EMAIL** brian\_henderson@golder.com  
brian\_byerley@golder.com**DESKTOP HYDROGEOLOGICAL ASSESSMENT  
PROPOSED RESIDENTIAL DEVELOPMENT, BURNETT LANDS  
GREENBANK ROAD AT THE JOCK RIVER, OTTAWA, ONTARIO**

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This report presents the results of a desktop hydrogeological assessment carried out for the proposed residential development site to be located west of Greenbank Road, adjacent to the Jock River, in Ottawa, Ontario. The hydrogeological assessment is required by the City of Ottawa (City) prior to draft plan approval. Prior to development of the scope for the hydrogeological assessment, we reviewed correspondence regarding the request from the Planner at the City and had a telephone conversation with Michel Kearney from the City.

The purpose of this hydrogeological assessment was to determine the general soil and groundwater conditions across this site, by means of existing on-site borehole information and data from nearby sites, and to address possible construction-related impacts to private water supply wells. The on-site information was enhanced with published mapping and publicly available information. The water well records in the Ministry of the Environment and Climate Change (MOECC) Water Well Information System (WWIS) for nearby water wells were used to provide further information regarding hydrogeological conditions in the area and identify where nearby water well users are taking their water.

## **1.0 DESCRIPTION OF PROJECT AND SITE**

A residential subdivision is planned to be developed on a site located west of Greenbank Road, adjacent to the Jock River, in Ottawa, Ontario. The approximate location of the site is shown on the Key Map insert provided on the Site Plan, Figure 1.

The following is known about the site and project (Figure 1):

- The site is located immediately west of Greenbank Road, approximately 400 metres south of the intersection with Jockvale Road. The southwest boundary of the site is adjacent to the Jock River and consists of a low-lying flood plain.
- The site is trapezoid-shaped and measures approximately 500 metres by up to 400 metres long.
- The site topography is relatively flat with a gentle downward slope from east to west. A shallow ditch (Burnett Municipal Drain) running north-south crosses the middle of the site.
- The majority of the site is currently undeveloped and predominately consists of agricultural land with localized vegetation and trees.



- It is understood that the proposed development will include conventional residential dwellings (semi-detached and townhouse) as well as access roads and services within the subdivision.
- Greenbank Road will be shifted to the west and will cross the eastern portion of the site.

## **2.0 GEOLOGY AND HYDROGEOLOGY**

The following sections describe the published local geology and hydrogeology in the vicinity of the site.

### **2.1 Surficial Geology**

Based on published mapping (Figure 2), topography and the ground conditions encountered during previous investigations in the area, the study area can be roughly divided into two sections, as follows:

- Western and northern portions of the site: A thick deposit of silty clay which extends to depths of up to more than 8.2 metres below the existing ground surface.
- Central and eastern portions of the site: Very stiff to stiff layer of silty clay overlying glacial till, or glacial till near the ground surface.

Published mapping indicates the bedrock surface to be at depths in the range of 5 to 15 metres below the ground surface in the vicinity of the site (Figure 3).

### **2.2 Bedrock Geology**

The Ontario Geological Survey bedrock geology mapping indicates that the study area is underlain by interbedded dolostone, shale and sandstone of the Oxford Formation (Figure 4).

### **2.3 Hydrogeology**

#### **2.3.1 Overburden Aquifer**

The clay and glacial till deposits in the area are generally not capable of supplying sufficient quantities of groundwater to be considered an aquifer. As a result, the principal aquifer within the vicinity of the site is considered to be the underlying bedrock formations.

#### **2.3.2 Bedrock Aquifers**

The Oxford formation is considered to be a highly transmissive aquifer, and well yields in this formation have been reported between 45 and 115 L/min. Generally, the Oxford Formation provides an adequate resource for domestic water supplies. Groundwater flow in the Oxford formation is controlled predominately by fractures, as the primary porosity has been reduced by cementation.

#### **2.3.3 Local Water Supply Wells**

There are a total of 4 water wells identified in the MOECC Water Well Information System (WWIS), with a location accuracy of 300 metres or less, located within 100 metres of the site. The WWIS indicates that all of the wells were constructed to be used as water supply (domestic or livestock). The depth of the wells ranges from 21 to 67 metres, and the depth to the static water level water ranges from 2 to 5 metres (for wells where depth information is available in the WWIS).

## **3.0 SITE SPECIFIC GEOLOGY AND HYDROGEOLOGY**

### **3.1 General**

Golder Associates completed a preliminary geotechnical investigation at this site in 2011, as part of the “due diligence” process associated with Claridge Homes acquiring this property. That investigation included a limited number of very widely spaced testholes.

Golder Associates also previously completed several geotechnical investigations within or in the vicinity of the site, including a preliminary investigation for a residential development to be located immediately north of this property and for the proposed South Nepean Collector sewer, which is proposed to cross the site.

Based on a review of those previous studies and published geological mapping, the subsurface conditions on northern and western portions of the site are expected to consist of a thick deposit of clay, but the clay is expected to thin towards the central and southern portions of the site where glacial till is expected at shallow depths. Available borehole logs are included in Attachment A.

### **3.2 Site Specific Geology**

#### **Fill and Topsoil**

Topsoil exists at the ground surface at all of the borehole locations. With the exception of borehole BH15-17. The topsoil varies from about 150 to 370 millimetres in thickness. About 2.0 metres of fill exists at borehole BH15-17. The fill consists of sandy silt and clayey silt, with varying amounts of gravel and organic matter. Topsoil exists below the fill at borehole BH15-17.

#### **Sensitive Silty Clay**

The topsoil is underlain by a deposit of silty clay. The upper 0.6 to 3.1 metres of the silty clay deposit have been weathered to a grey brown crust. The silty clay below the depth of weathering is grey in colour. The silty clay deposit in boreholes 16-102, BH11-2, BH11-5, and BH15-9/15-9A was fully penetrated and extends to depths ranging from about 3.1 to 4.3 metres below the existing ground surface. The unweathered grey silty clay in the remaining boreholes was not fully penetrated but was proven to depths of about 3.4 to 8.2 metres below the ground surface prior to the boreholes being terminated.

#### **Upper Sandy Silt to Silty Sand**

A layer of silty sand with some silt exists beneath the silty clay at borehole 16-103. A possible sand layer was also encountered at the ground surface at boreholes BH16-301 and BH16-302. The sandy soil is about 0.3 to 0.9 metres thick.

#### **Glacial Till**

Glacial till was encountered beneath the silty clay and silty sand deposits or below the topsoil in all boreholes with the exception of BH11-1, BH11-2, BH11-3, BH11-6, BH03-3, BH15-11, BH15-10, 16-101 and 16-104 at depths of about 0.3 to 4.3 metres below the ground surface. The glacial till consists of a heterogeneous mixture of gravel, cobbles, and boulders in a matrix of silty sand to sandy silt. The glacial till was proven to depths of about 5.2 to 7.6 metres below the ground surface.

A layer of sandy soil was encountered below or within the glacial till in boreholes BH11-2, BH11-3, BH15-7, BH15-9A, 15-10 and 16-106. The sandy layer was proven to be at least about 0.3 and 1.4 metres thick, extending to depths of at least 9.1 metres below the ground surface.

## Auger Refusal and Bedrock

Refusal to auger advancement was encountered at boreholes 16-103, 16-105, 16-106, 16-107/16-107A, BH15-17A, and PH15-103 at depths of about 1.7 to 7.3 metres below the ground surface. Refusal may indicate the bedrock surface, but it likely reflects the presence of cobbles and/or boulders in the glacial till deposit.

Bedrock was encountered at boreholes BH15-7, BH15-8, BH16-301 and BH16-302. The boreholes were extended into the bedrock to depths of about 1.8 to 3.2 metres below the top of bedrock using rotary diamond drilling techniques while retrieving NQ or HQ sized core.

The following table summarizes the bedrock surface depths and elevations encountered at the borehole locations.

| Borehole Number | Ground Surface Elevation (masl) | Depth to Bedrock (m) | Bedrock Surface Elevation (masl) |
|-----------------|---------------------------------|----------------------|----------------------------------|
| BH15-7          | 92.84                           | 6.20                 | 86.64                            |
| BH15-8          | 92.19                           | 8.89                 | 83.30                            |
| BH16-301        | 93.16                           | 9.80                 | 83.36                            |
| BH16-302        | 93.06                           | 8.02                 | 85.04                            |

The bedrock encountered in the boreholes consists of grey limestone and dolomite, with black shale interbeds. The bedrock is fresh and thinly to medium bedded.

## 3.3 Hydrogeology

A number of hydrogeological investigations have been completed on and nearby the site. Monitoring wells were sealed into various boreholes to allow for hydraulic response testing and measurements of the groundwater level. Estimates of hydraulic conductivity in monitoring wells where testing was completed as well as measured groundwater levels are provided in the following table.

| Borehole Number | Geologic Unit                                   | Ground Surface Elevation (masl) | Groundwater Depth (m) | Groundwater Elevation (masl) | Date of Measurement | Estimated Hydraulic Conductivity (m/s) |
|-----------------|---|---------------------------------|-----------------------|------------------------------|---------------------|--|
| BH11-1A         | Silty Clay                                      | -                               | 1.23                  | -                            | Feb 7, 2011         | -                                      |
| BH11-2A         | Silty Clay                                      | -                               | 0.95                  | -                            | Feb 7, 2011         | -                                      |
| BH11-3          | Glacial Till                                    | -                               | 1.53                  | -                            | Feb 7, 2011         | -                                      |
| BH15-7          | Bedrock   | 92.84                           | 2.17                  | 90.67                        | Apr 24, 2015        | $5 \times 10^{-7}$                     |
| BH15-9A         | Gravelly sand (interbedded within glacial till) | 92.27                           | 0.92                  | 91.35                        | Aug 25, 2015        | $3 \times 10^{-5}$                     |
| 16-101          | Silty Clay                                      | 91.82                           | 1.09                  | 90.73                        | Mar 7, 2016         | -                                      |
| 16-103          | Silty Clay/<br>Clay/Silty Sand Till             | 93.51                           | 0.91                  | 92.60                        | Mar 7, 2016         | -                                      |

Water levels across the area surrounding the site range from 0.91 to 2.17 metres depth. It should be noted that groundwater levels are expected to fluctuate seasonally. Higher groundwater levels are expected during wet periods of the year, such as spring.

#### 4.0 POTENTIAL IMPACTS TO EXISTING GROUNDWATER USERS

There are a total of 4 wells in the WWIS database that were constructed as water supply wells, located within 100 metres of the site. Details regarding the water supply wells are presented in the following table. Refer to Figure 1 for the well locations.

| Well ID | Depth of Well (m) | Depth to Static Water Level (m) | Depth to Water Found (m) | Available Drawdown (m) | Type of Well |
|---------|-------------------|---------------------------------|--------------------------|------------------------|--------------|
| 1506043 | 20.7              | 3.0                             | 15.8                     | 17.7                   | Bedrock      |
| 1510111 | 32.6              | 1.8                             | 32.0                     | 30.8                   | Bedrock      |
| 7156858 | 67.1              | 4.9                             | 64.0                     | 62.2                   | Bedrock      |
| 7165137 | --                | --                              | --                       | --                     | --           |

The well record associated with Well ID 7165137 is for an extension of the well casing (above ground). As such no details regarding the original construction of the well are available. The original well record for the well is not available. From the available well records, water supply wells in the area generally obtain water from the bedrock aquifer. As such it is likely that Well ID 7165137 is completed in a similar fashion.

The available drawdown in the wells, calculated as the difference between the static water level and the depth of the well) ranges from 17.7 to 62.2 metres. Considering that the overburden thickness in the area is mapped between 5 and 15 metres in thickness, a temporary drawdown, due to construction dewatering for the installation of services, could temporarily reduce the available drawdown in the wells, but not likely to the degree that could negatively impact water supply. It is understood that there are no structures or land uses planned for the site that would permanently lower the groundwater levels in the area surrounding the site (i.e., deep drained foundations).

Prior to construction at the site, it is recommended that a well survey be completed of the residences with wells located within approximately 100 metres of the property boundary. Information to be collected during the well survey could include the depth of the well, type of pump, and static water level. Water quality samples could be collected and analyzed for a typical suite of parameters (i.e. the 'subdivision package' as per MOECC Procedure D-5-5).

#### 5.0 LIMITATIONS AND USE OF MEMORANDUM

This technical memorandum was prepared for the exclusive use of Claridge Homes (South Nepean) LP. The technical memorandum, which specifically includes all tables, figures and appendices, is based on data gathered by Golder Associates Ltd., and information provided to Golder Associates Ltd. by others. The information provided by others has not been independently verified or otherwise examined by Golder Associates Ltd. to determine the accuracy or completeness. Golder Associates Ltd. has relied in good faith on this information and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the information as a result of omissions, misinterpretation or fraudulent acts.


The services performed as described in this technical memorandum were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this technical memorandum, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken based on this technical memorandum.

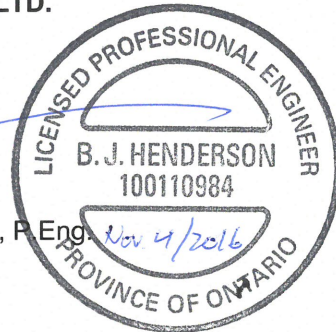
## 6.0 CLOSURE

We trust this submission satisfies the requirements for a desktop hydrogeological assessment of the proposed Burnett Lands residential development, in Ottawa, Ontario. If you have any questions regarding this report, please contact the undersigned.

### GOLDER ASSOCIATES LTD.



Brian Henderson, M.A.Sc., P.Eng.  
Environmental Engineer



Brian Byerley, M.Sc., P.Eng.  
Senior Hydrogeologist/Principal

BH/BTB/sg

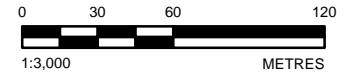
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Attachments:    Figures 1 to 4  
                     Attachment A – Borehole Logs    ↘



**LEGEND**

- APPROXIMATE BOREHOLE LOCATION, PREVIOUS INVESTIGATION
- MOECC LISTED WATER WELL
- WATERCOURSE
- WATERBODY
- STUDY AREA
- 100 m BUFFER



**NOTE(S)**  
 1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1523044-7000.

**REFERENCE(S)**  
 1. BASE PLAN PROVIDED IN DIGITAL FORMAT BY NOVATECH ENGINEERING CONSULTANTS LTD.  
 2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014  
 3. PROJECTION: TRANSVERSE MERCATOR; DATUM: NAD 83  
 4. COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

**CLIENT**  
 CLARIDGE HOMES CORPORATION

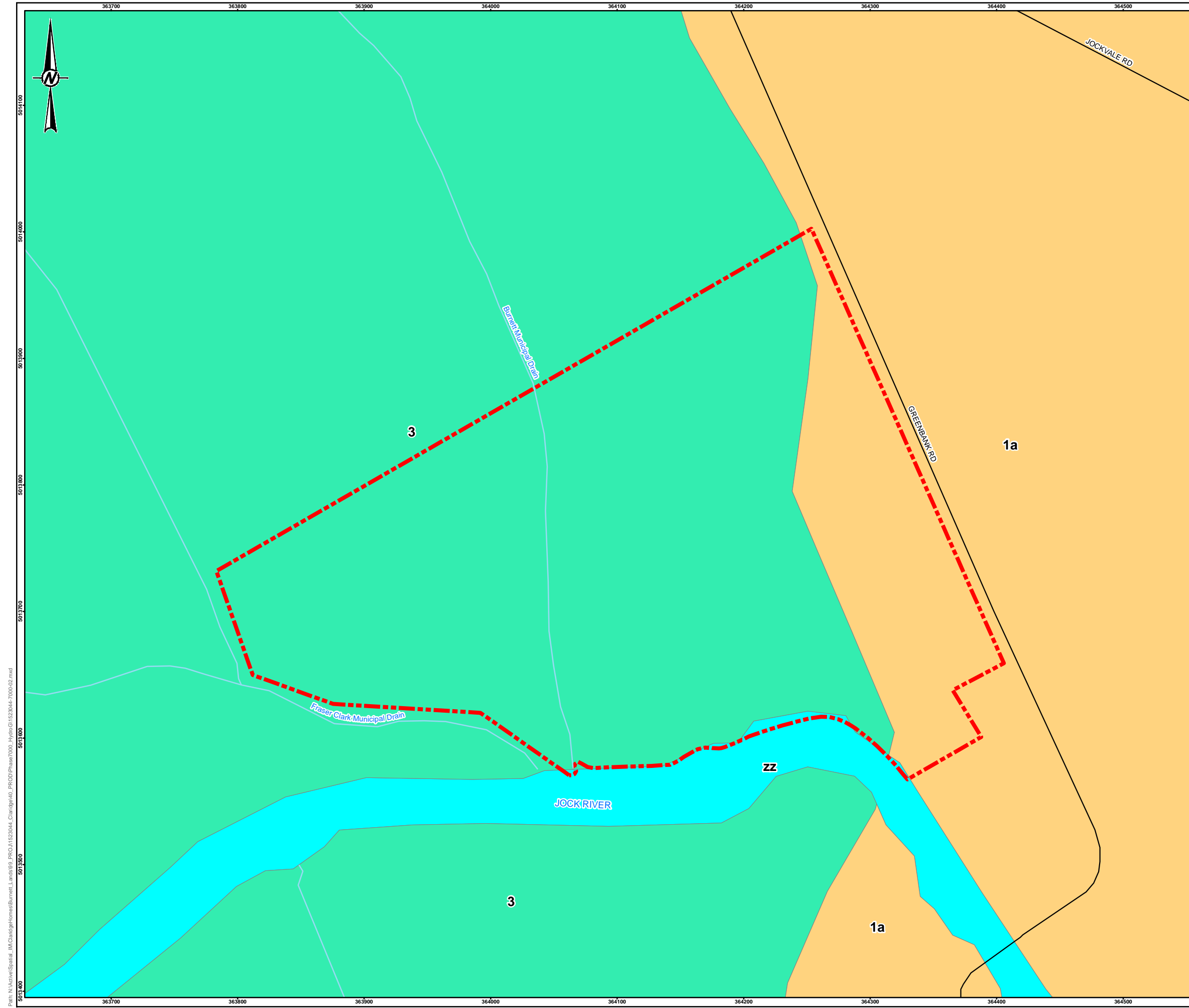
**PROJECT**  
 HYDROGEOLOGICAL ASSESSMENT  
 BURNETT LANDS, OTTAWA, ONTARIO

**TITLE**  
 SITE PLAN

|                   |            |            |
|-------------------|------------|------------|
| <b>CONSULTANT</b> | YYYY-MM-DD | 2016-11-01 |
|                   | DESIGNED   | ---        |
|                   | PREPARED   | JEM        |
|                   | REVIEWED   | BH         |
|                   | APPROVED   | BTB        |

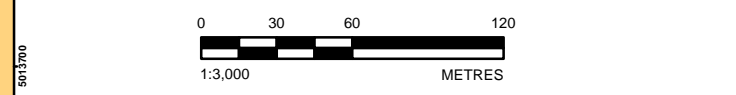
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 26mm



**LEGEND**

- ROADWAY
- WATERCOURSE
- STUDY AREA
- 3. OFFSHORE MARINE DEPOSITS: CLAY, SILTY CLAY & SILT
- 1a. TILL, PLAIN WITH LOCAL RELIEF <5 m
- zz. WATERBODY



**NOTE(S)**  
 1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1523044-7000.

**REFERENCE(S)**  
 1. BÉLANGER, J. R. 2008 URBAN GEOLOGY OF THE NATIONAL CAPITAL AREA, GEOLOGICAL SURVEY OF CANADA, OPEN FILE 5311, 1 DVD.  
 2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014  
 2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83  
 COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

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PROJECT  
**HYDROGEOLOGICAL ASSESSMENT  
 BURNETT LANDS, OTTAWA, ONTARIO**

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TITLE  
**SURFICIAL GEOLOGY**

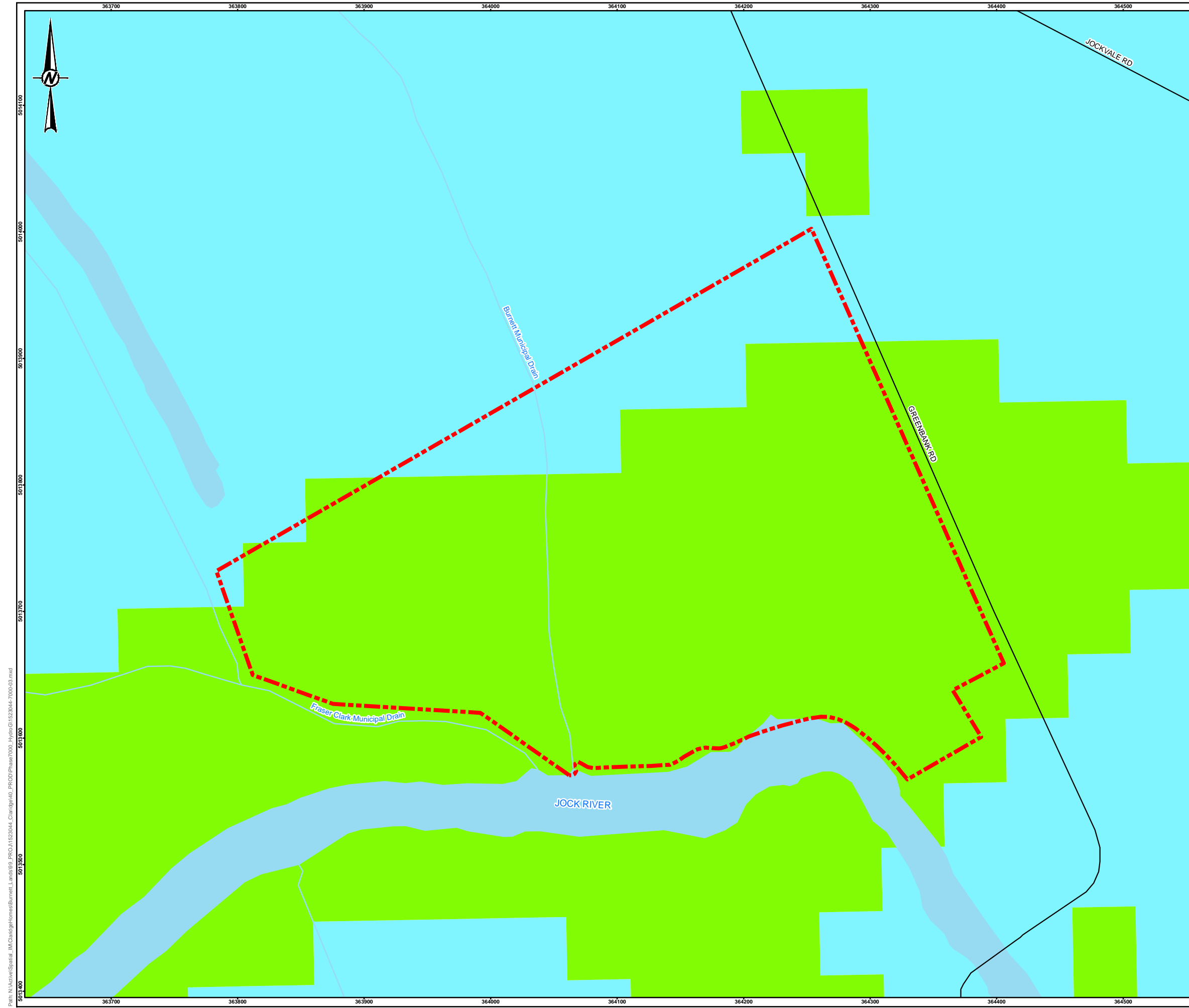
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| PREPARED   | JEM        |            |
| REVIEWED   | BH         |            |
| APPROVED   | BTB        |            |

PROJECT NO. 1523044      PHASE 7000      REV. 0      FIGURE 2

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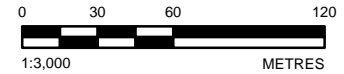
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- LEGEND**
- ROADWAY
  - WATERCOURSE
  - WATERBODY
  - STUDY AREA

- TREND IN DEPTH TO BEDROCK (METRES)**
- 0 to 1
  - 1 to 2
  - 2 to 3
  - 3 to 5
  - 5 to 10
  - 10 to 15
  - 15 to 25
  - 25 to 50
  - 50 to 100
  - 100 to 200



**NOTE(S)**  
 1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT NO. 1523044-7000.

**REFERENCE(S)**  
 1. 2010 BÉLANGER, J. R., URBAN GEOLOGY OF THE NATIONAL CAPITAL AREA, GEOLOGICAL SURVEY OF CANADA, OPEN FILE D3256, 2001  
 2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014  
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 COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

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PROJECT  
**HYDROGEOLOGICAL ASSESSMENT  
 BURNETT LANDS, OTTAWA, ONTARIO**

TITLE  
**DRIFT THICKNESS**

|            |            |            |
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| CONSULTANT | YYYY-MM-DD | 2016-11-01 |
| DESIGNED   | ----       |            |
| PREPARED   | JEM        |            |
| REVIEWED   | BH         |            |
| APPROVED   | BTB        |            |



PROJECT NO. 1523044      PHASE 7000      REV. 0      FIGURE 3

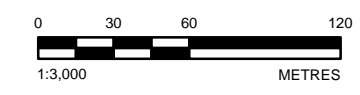
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**LEGEND**

- ROADWAY
- WATERCOURSE
- WATERBODY
- STUDY AREA
- 5: OXFORD FORMATION - DOLOSTONE, MINOR SHALE AND SANDSTONE



**NOTE(S)**  
 1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDBER ASSOCIATES LTD. REPORT NO. 1523044-7000.

**REFERENCE(S)**  
 1. ARMSTRONG, D.K. AND DODGE, J.E.P. 2007. PALEOZOIC GEOLOGY OF SOUTHERN ONTARIO; ONTARIO GEOLOGICAL SURVEY, MISCELLANEOUS RELEASE-DATA 219  
 2. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDBER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2014  
 2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83  
 COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

CLIENT  
**CLARIDGE HOMES CORPORATION**

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PROJECT  
**HYDROGEOLOGICAL ASSESSMENT  
 BURNETT LANDS, OTTAWA, ONTARIO**

TITLE  
**BEDROCK GEOLOGY**

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| CONSULTANT | YYYY-MM-DD | 2016-11-01 |
| DESIGNED   | ----       |            |
| PREPARED   | JEM        |            |
| REVIEWED   | BH         |            |
| APPROVED   | BTB        |            |



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| PROJECT NO.<br>1523044 | PHASE<br>7000 | REV.<br>0 | FIGURE<br><b>4</b> |
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# ATTACHMENT A

## Borehole Logs

PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 25, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |   |                         | HYDRAULIC CONDUCTIVITY, k, cm/s |   |  |               | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |  |
|--------------------|---|---|-------------|-----------------|--------|--|----------------|---|-------------------------|---------------------------------|---|--|---------------|-------------------------|--------------------------------------|--|
|                    |   | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH |   |                         |                                 | WATER CONTENT PERCENT   |  |               |                         |                                      |  |
|                    |   |   |             |                 |        |  | 20 40 60 80    |   | nat V. + rem V. ⊕ U - ○ |                                 | 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> |  | Wp         WI |                         |                                      |  |
| 0                  |   | GROUND SURFACE  |             | 0.00            |        |  |                |   |                         |                                 |   |  |               |                         |                                      |  |
|                    |   | TOPSOIL   |             | 0.23            |        |  |                |   |                         |                                 |   |  |               |                         |                                      |  |
|                    |   | Very stiff grey brown SILTY CLAY, some silty fine sand layers (Weathered Crust) |             |                 |        |  |                |   |                         |                                 |   |  |               |                         |                                      |  |
| 1                  |   |   |             |                 | 1      | 50 DO                                      |                |   |                         |                                 |   |  |               |                         |                                      |  |
| 2                  |   |   |             |                 | 2      | 50 DO                                      |                |   |                         |                                 |   |  |               |                         |                                      |  |
| 3                  |   | Firm grey SILTY CLAY  |             | 3.05            | 3      | 50 DO                                      |                |   |                         |                                 |   |  |               |                         |                                      |  |
| 4                  | Power Auger<br>200 mm Diam. (Hollow Stem) |   |             |                 |        |  | ⊕              | + |                         |                                 |   |  |               |                         |                                      |  |
| 5                  |   |   |             |                 | 4      | 50 DO                                      | ⊕              | + |                         |                                 |   |  |               |                         |                                      |  |
| 6                  |   |   |             |                 |        |  | ⊕              | + |                         |                                 |   |  |               |                         |                                      |  |
| 7                  |   |   |             |                 | 5      | 50 DO WH                                   | ⊕              | + |                         |                                 |   |  |               |                         |                                      |  |
| 8                  |   | End of Borehole   |             | 7.62            |        |  | ⊕              | + |                         |                                 |   |  |               |                         |                                      |  |
| 9                  |   |   |             |                 |        |  |                |   |                         |                                 |   |  |               |                         |                                      |  |
| 10                 |   |   |             |                 |        |  |                |   |                         |                                 |   |  |               |                         |                                      |  |

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE

1 : 50



LOGGED: PAH

CHECKED: \_\_\_\_\_

PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-1A

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 25, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |             |                        |  | HYDRAULIC CONDUCTIVITY, k, cm/s |  |                       |  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |    |  |
|--------------------|---|---|-------------|-----------------|--------|--|-------------|------------------------|--|---------------------------------|--|-----------------------|--|-------------------------|--------------------------------------|----|--|
|                    |   | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | BLOWS/0.30m | SHEAR STRENGTH Cu, kPa |  |                                 |  | WATER CONTENT PERCENT |  |                         |                                      |    |  |
|                    |   |   |             |                 |        |  |             | 20                     |  | 40                              |  | 60                    |  |                         |                                      | 80 |  |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE  |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
|                    |   | TOPSOIL   |             | 0.00            |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
|                    |   | Very stiff grey brown SILTY CLAY, some silty fine sand layers (Weathered Crust) |             | 0.23            |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 1                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 2                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 3                  |   | Firm grey SILTY CLAY  |             | 3.05            |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 4                  |   | End of Borehole   |             | 3.66            | 1      | 76 TP                                      | PH          |                        |  |                                 |  |                       |  |                         |                                      |    |  |
|                    |   | Note:<br>Soil profile inferred from RECORD OF BOREHOLE BH 11-1.                 |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 5                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 6                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 7                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 8                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 9                  |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 10                 |   |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |

Native Backfill

Bentonite Seal

Silica Sand

Standpipe

W.L. in Standpipe at 1.23 m depth below ground surface on February 7, 2011

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM



PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-2

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 28, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |   |                   | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |   | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                         |
|--------------------|---|--|-------------|-----------------|--------|--|----------------|---|-------------------|---------------------------------|-----------------------|--|---|-------------------------|--------------------------------------|-------------------------|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH |   |                   |                                 | WATER CONTENT PERCENT |  |   |                         |                                      |                         |
|                    |   |  |             |                 |        |  | 20 40 60 80    |   | nat V. + rem V. ⊕ |                                 | Q - U - ● ○           |  | 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> |                         |                                      | Wp  -----  W  -----  WI |
| 0                  |   | GROUND SURFACE   |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
|                    |   | TOPSOIL  |             | 0.00            |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
|                    |   | Very stiff to stiff grey brown SILTY CLAY (Weathered Crust)                |             | 0.30            |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 1                  |   |  |             |                 | 1      | 50 DO                                      | 7              |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 2                  |   |  |             |                 | 2      | 50 DO                                      | 4              |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 3                  | Power Auger<br>200 mm Diam. (Hollow Stem) |  |             |                 |        |  |                | ⊕ |                   |                                 |                       |  |   |                         |                                      |                         |
|                    |   | Firm grey SILTY CLAY   |             | 3.05            | 3      | 50 DO                                      |                | ⊕ | +                 |                                 |                       |  |   |                         |                                      |                         |
| 4                  |   |  |             |                 |        |  |                | ⊕ |                   |                                 |                       |  |   |                         |                                      |                         |
|                    |   | Loose to compact grey SILTY SAND, some gravel, with cobbles (GLACIAL TILL) |             | 3.96            | 4      | 50 DO                                      | 8              | ⊕ | +                 |                                 |                       |  |   |                         |                                      |                         |
| 5                  |   |  |             |                 | 5      | 50 DO                                      | 22             | ⊕ |                   |                                 |                       |  |   |                         |                                      |                         |
|                    |   | Loose grey fine to medium SAND   |             | 5.18            | 6      | GRAB                                       | -              |   |                   |                                 |                       |  |   |                         |                                      |                         |
|                    |   | End of Borehole  |             | 5.49            |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 6                  |   |  |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 7                  |   |  |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 8                  |   |  |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 9                  |   |  |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
| 10                 |   |  |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE

1 : 50



LOGGED: PAH

CHECKED: \_\_\_\_\_

PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-2A

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 28, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD  | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |             |                        |  | HYDRAULIC CONDUCTIVITY, k, cm/s |  |                       |  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |    |  |
|--------------------|--|---|-------------|-----------------|--------|--|-------------|------------------------|--|---------------------------------|--|-----------------------|--|-------------------------|--------------------------------------|----|--|
|                    |  | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | BLOWS/0.30m | SHEAR STRENGTH Cu, kPa |  |                                 |  | WATER CONTENT PERCENT |  |                         |                                      |    |  |
|                    |  |   |             |                 |        |  |             | 20                     |  | 40                              |  | 60                    |  |                         |                                      | 80 |  |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem)  | GROUND SURFACE  |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
|                    |  | TOPSOIL   |             | 0.00            |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 1                  |  | Very stiff to stiff grey brown SILTY CLAY (Weathered Crust) |             | 0.30            |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 2                  |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 3                  | Firm grey SILTY CLAY   |   | 3.05        | 1               | 88 TP  | PH   |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 4                  | End of Borehole<br><small>Note:<br/>Soil profile inferred from RECORD OF BOREHOLE BH 11-2.</small> |   | 3.56        |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 5                  |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 6                  |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 7                  |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 8                  |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 9                  |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |
| 10                 |  |   |             |                 |        |  |             |                        |  |                                 |  |                       |  |                         |                                      |    |  |

Native Backfill

Bentonite Seal

Silica Sand

Standpipe

W.L. in Standpipe at 0.95 m depth below ground surface on February 7, 2011

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE  
1 : 50



LOGGED: PAH  
CHECKED: \_\_\_\_\_

PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-3

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 25, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |          |       | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |       |
|--------------------|---------------|--|-------------|-----------------|--------|--|------------------------|----|----|---------------------------------|-----------------------|----------|-------|-------------------------|--------------------------------------|-------|
|                    |               | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |          |       |                         |                                      |       |
|                    |               |  |             |                 |        |  | 20                     | 40 | 60 | 80                              | nat V. +              | rem V. ⊕ | Q - ● |                         |                                      | U - ○ |
| 0                  |               | GROUND SURFACE   |             | 0.00            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | TOPSOIL  |             | 0.00            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | Very stiff grey brown SILTY CLAY (Weathered Crust)                               |             | 0.25            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 1                  |               |  |             | 1.22            | 1      | 50 DO                                      |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | Loose to compact grey brown SANDY SILT, some gravel, with cobbles (GLACIAL TILL) |             | 1.22            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 2                  |               |  |             | 2.29            | 2      | 50 DO                                      |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | Loose grey SANDY SILT, some gravel, with cobbles (GLACIAL TILL)                  |             | 2.29            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 3                  |               |  |             | 2.29            | 3      | 50 DO                                      |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | Loose grey SANDY SILT, some gravel, with cobbles (GLACIAL TILL)                  |             | 2.29            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 4                  |               |  |             | 4.57            | 4      | 50 DO                                      |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | Loose grey fine to medium SAND   |             | 4.57            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 5                  |               |  |             | 4.88            | 5      | 50 DO                                      |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | Loose to compact grey SANDY SILT, some gravel, with cobbles (GLACIAL TILL)       |             | 4.88            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 6                  |               |  |             | 5.79            | 6      | 50 DO                                      |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |               | End of Borehole  |             | 5.79            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |

Power Auger  
200 mm Diam. (Hollow Stem)

Native Backfill

Bentonite Seal

Silica Sand

Standpipe

W.L. in Standpipe at 1.53 m depth below ground surface on February 7, 2011

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE

1 : 50



LOGGED: PAH

CHECKED: \_\_\_\_\_



PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-4

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 28, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE  |   | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |  |                             | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |   | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |    |
|--------------------|---|---|---|-----------------|--------|--|----------------|--|-----------------------------|---------------------------------|-----------------------|--|---|-------------------------|--------------------------------------|----|
|                    |   | DESCRIPTION   | STRATA PLOT                                       | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH |  |                             |                                 | WATER CONTENT PERCENT |  |   |                         |                                      |    |
|                    |   |   |   |                 |        |  | Cu, kPa        |  | nat V. + rem V. ⊕ - ● U - ○ |                                 | Wp                    |  | W |                         |                                      | Wi |
| 0                  |   | GROUND SURFACE  |   | 0.00            |        |  |                |  |                             |                                 |                       |  |   |                         |                                      |    |
|                    |   | TOPSOIL   |   | 0.00            |        |  |                |  |                             |                                 |                       |  |   |                         |                                      |    |
|                    |   | Very stiff to stiff grey brown SILTY CLAY (Weathered Crust) |   | 0.22            |        |  |                |  |                             |                                 |                       |  |   |                         |                                      |    |
| 1                  | Power Auger<br>200 mm Diam. (Hollow Stem) |   |   |                 | 1      | 50 DO                                      |                |  |                             |                                 |                       |  |   |                         |                                      |    |
| 2                  |   |   |   |                 | 2      | 50 DO                                      |                |  |                             |                                 |                       |  |   |                         |                                      |    |
| 3                  |   |   |   |                 | 3      | 50 DO                                      |                |  |                             |                                 |                       |  |   |                         |                                      |    |
|                    |   |   | Loose grey SANDY SILT, some gravel (GLACIAL TILL) |                 | 2.51   | 4  | 50 DO          |  |                             |                                 |                       |  |   |                         |                                      |    |
| 4                  |   | End of Borehole   |   | 3.66            |        |  |                |  |                             |                                 |                       |  |   |                         |                                      |    |

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE

1 : 50



LOGGED: PAH

CHECKED: \_\_\_\_\_

PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-5

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 25, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |  | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |   |                   | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |    | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |   |
|--------------------|---|--|--|-----------------|--------|--|------------------------|---|-------------------|---------------------------------|-----------------------|--|----|-------------------------|--------------------------------------|---|
|                    |   | DESCRIPTION  | STRATA PLOT                            | ELEV. DEPTH (m) | NUMBER | TYPE                                       | BLOWS/0.30m            |   |                   |                                 | WATER CONTENT PERCENT |  |    |                         |                                      |   |
|                    |   |  |  |                 |        |  | SHEAR STRENGTH Cu, kPa |   | nat V. + rem V. ⊕ |                                 | Q - U - ● ○           |  | Wp |                         |                                      | W |
| 0                  |   | GROUND SURFACE   |  |                 |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
|                    |   | TOPSOIL  |  | 0.00            |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
|                    |   | Very stiff to stiff grey brown SILTY CLAY, some sand seams (Weathered Crust) |  | 0.25            |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
| 1                  | Power Auger<br>200 mm Diam. (Hollow Stem) |  |  |                 | 1      | 50 DO                                      |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
|                    |   |  |  |                 | 2      | 50 DO                                      |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
| 2                  |   |  |  |                 |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
|                    |   |  | Stiff grey SILTY CLAY, some silt seams |                 | 2.59   | 3  | 50 DO WH               |   | ⊕                 |                                 | +                     |  |    |                         |                                      |   |
| 3                  |   |  |  |                 |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
|                    |   | Loose to very loose grey SANDY SILT, some gravel (GLACIAL TILL)              |  | 3.51            | 4      | 50 DO                                      |                        | ⊕ |                   | +                               |                       |  |    |                         |                                      |   |
| 4                  |   |  |  |                 |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
| 5                  |   |  |  |                 | 5      | 50 DO                                      |                        |   |                   |                                 |                       |  |    |                         |                                      |   |
| 5.18               |   | End of Borehole  |  |                 |        |  |                        |   |                   |                                 |                       |  |    |                         |                                      |   |

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE

1 : 50



LOGGED: PAH

CHECKED: \_\_\_\_\_

PROJECT: 10-1121-0264

# RECORD OF BOREHOLE: BH 11-6

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 28, 2011

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE<br>METRES | BORING METHOD                             | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |   |                   | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |   | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                         |
|-----------------------|---|---|-------------|-----------------|--------|--|----------------|---|-------------------|---------------------------------|-----------------------|--|---|-------------------------|--------------------------------------|-------------------------|
|                       |   | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH |   |                   |                                 | WATER CONTENT PERCENT |  |   |                         |                                      |                         |
|                       |   |   |             |                 |        |  | 20 40 60 80    |   | nat V. + rem V. ⊕ |                                 | Q - U - ● ○           |  | 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> |                         |                                      | Wp  -----  W  -----  Wl |
| 0                     | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE  |             | 0.00            |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
|                       |   | TOPSOIL   |             | 0.25            |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |
|                       |   | Very stiff to stiff grey brown SILTY CLAY (Weathered Crust) |             |                 |        | 1  | 50 DO          | 5 |                   |                                 |                       |  |   |                         |                                      |                         |
| 3.35                  |   | End of Borehole   |             |                 |        |  |                |   |                   |                                 |                       |  |   |                         |                                      |                         |

MIS-BHS 001 1011210264.GPJ GAL-MIS.GDT 03/01/16 JEM

DEPTH SCALE

1 : 50



LOGGED: PAH

CHECKED: \_\_\_\_\_

PROJECT: 1523645

# RECORD OF BOREHOLE: 15-7

SHEET 1 OF 2

LOCATION: N 5013739.7 ; E 364291.3

BORING DATE: August 12, 2015

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |   | SAMPLES         |        |      | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |  |                             | HYDRAULIC CONDUCTIVITY, k, cm/s |   |  |                         | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |  |
|--------------------|---|--|---|-----------------|--------|------|--|----------------|--|-----------------------------|---------------------------------|---|--|-------------------------|-------------------------|--------------------------------------|--|
|                    |   | DESCRIPTION  | STRATA PLOT   | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.30m                                | SHEAR STRENGTH |  |                             |                                 | WATER CONTENT PERCENT   |  |                         |                         |                                      |  |
|                    |   |  |   |                 |        |      |  | 20 40 60 80    |  | nat V. + Q - rem V. ⊕ U - ○ |                                 | 10 <sup>-8</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-2</sup> |  | Wp  -----  W  -----  WI |                         |                                      |  |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE   |   | 92.84           |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
|                    |   | TOPSOIL - (ML/SM) sandy SILT to SILTY SAND; dark brown; moist  |   | 0.00            | 1      | AS   | -  |                |  |                             |                                 |   |  |                         |                         | Native Backfill                      |  |
|                    |   | (SM) gravelly SILTY SAND; grey brown, with oxidation staining, presence of cobbles and boulders inferred from auger resistance (GLACIAL TILL); non-cohesive, moist to wet, compact to very dense |   | 0.28            | 2      | SS   | >50  |                |  |                             |                                 |   |  |                         |                         | Bentonite Seal                       |  |
| 1                  |   |  |   |                 | 3      | SS   | 17   |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 2                  |   |  |   |                 | 4      | SS   | 46   |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 3                  |   |  | (SM) SILTY SAND, fine, trace gravel; brown; non-cohesive, wet, compact    |                 | 89.64  | 5    | SS   | 12             |  |                             |                                 |   |  |                         |                         | Native Backfill                      |  |
|                    |   |  |   | 3.20            |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 4                  |   |  | (SM) gravelly SILTY SAND; grey (GLACIAL TILL); non-cohesive, wet, compact |                 | 88.72  | 6    | SS   | 22             |  |                             |                                 |   |  |                         | M                       |                                      |  |
|                    |   |  |   | 4.12            |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 5                  |   | (ML) gravelly sandy SILT; grey (GLACIAL TILL); non-cohesive, wet, compact  |   | 87.81           | 7      | SS   | 21   |                |  |                             |                                 |   |  |                         |                         |                                      |  |
|                    |   |  | 5.03  |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 6                  |   |  |   | 86.64           | 9      | SS   | >50  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
|                    |   |  | 6.2   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 7                  |   | Borehole continued on RECORD OF DRILLHOLE 15-7   |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 8                  |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 9                  |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 10                 |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 11                 |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 12                 |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 13                 |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 14                 |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |
| 15                 |   |  |   |                 |        |      |  |                |  |                             |                                 |   |  |                         |                         |                                      |  |

MIS-BHS 001 1523645.GPJ GAL-MIS.GDT 09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523645

# RECORD OF DRILLHOLE: 15-7

SHEET 2 OF 2

LOCATION: N 5013739.7 ;E 364291.3

DRILLING DATE: August 12, 2015

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: Marathon Drilling

| DEPTH SCALE METRES | DRILLING RECORD         | DESCRIPTION                                    | SYMBOLIC LOG | ELEV. DEPTH (m) | RUN No. | COLOUR FLUSH | RECOVERY     |              | R.Q.D. % | FRACT. INDEX PER 0.25 m | HYDRAULIC CONDUCTIVITY K, cm/sec |          |  | BR - Broken Rock |
|--------------------|-------------------------|--|--------------|-----------------|---------|--------------|--------------|--------------|----------|-------------------------|----------------------------------|----------|--|------------------|
|                    |                         |  |              |                 |         |              | TOTAL CORE % | SOLID CORE % |          |                         | 10                               | 10       | 10   |                  |
|                    |                         |  |              |                 |         |              | 88888888     | 88888888     |          |                         | 88888888                         | 88888888 | 88888888                                       |                  |
|                    |                         | BEDROCK SURFACE                                |              | 86.64           |         |              |              |              |          |                         |                                  |          |  |                  |
| 7                  | Rotary Drill<br>NQ Core | Fresh, thinly to medium bedded, grey LIMESTONE |              | 6.20            | 1       | 85-100       |              |              |          |                         |                                  |          |  | Peltonite Seal   |
| 8                  |                         |  |              | 2               | 85      |              |              |              |          |                         |                                  |          | Granitic Sand                                  |                  |
| 9                  |                         |  |              | 3               | 85      |              |              |              |          |                         |                                  |          | 32 mm Diam. PVC #10 Slot Screen                |                  |
|                    |                         | End of Drillhole                               |              | 83.54<br>9.30   |         |              |              |              |          |                         |                                  |          | Cave   |                  |
| 10                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          | WL in Screen at Elev. 90.67 m on Aug. 24, 2015 |                  |
| 11                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 12                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 13                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 14                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 15                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 16                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 17                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 18                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 19                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 20                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |
| 21                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |  |                  |

MIS-RCK 004B 1523645.GPJ GAL-MISS.GDT 09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523645

# RECORD OF BOREHOLE: 15-8

SHEET 1 OF 2

LOCATION: N 5013747.0 ; E 364141.5

BORING DATE: August 11-12, 2015

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE  |             | SAMPLES         |        |      | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |                  |                  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---------------|---|-------------|-----------------|--------|------|--|------------------------|----|----|---------------------------------|-----------------------|------------------|------------------|-------------------------|--------------------------------------|------------------|
|                    |               | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.30m                                | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 |        |      |  | 20                     | 40 | 60 | 80                              | 10 <sup>-8</sup>      | 10 <sup>-5</sup> | 10 <sup>-4</sup> |                         |                                      | 10 <sup>-2</sup> |
| 0                  |               | GROUND SURFACE  |             | 92.19           |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               | TOPSOIL - (CL/ML) CLAYEY SILT; dark brown; moist  |             | 0.00            | 1      | AS   | -  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               | (CI) sandy SILTY CLAY; grey brown, contains silty sand seams (WEATHERED CRUST); cohesive, w>PL, very stiff  |             | 0.20            |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 1                  |               |   |             | 90.88           | 2      | SS   | 6  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               | (SM) gravelly SILTY SAND; grey brown, presence of cobbles and boulders inferred from auger resistance (GLACIAL TILL); non-cohesive, wet, compact            |             | 1.31            |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 2                  |               |   |             | 90.06           | 3      | SS   | 19   |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               | (SM) gravelly SILTY SAND; grey (GLACIAL TILL); non-cohesive, wet, compact   |             | 2.13            |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               | (SM) gravelly SILTY SAND; grey (GLACIAL TILL); non-cohesive, wet, very loose to compact   |             |                 | 4      | SS   | 2  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 3                  |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 | 5      | SS   | 3  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 4                  |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 | 6      | SS   | 1  |                        |    |    |                                 |                       |                  |                  |                         | MH                                   |                  |
| 5                  |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 | 7      | SS   | 2  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 6                  |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 | 8      | SS   | 5  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 7                  |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 | 9      | SS   | 5  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 8                  |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               | (SM) gravelly SILTY SAND; dark grey, presence of cobbles and boulders inferred from auger resistance (GLACIAL TILL); non-cohesive, wet, dense to very dense |             | 84.57           |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             | 7.62            | 11     | SS   | 48   |                        |    |    |                                 |                       |                  |                  |                         | M                                    |                  |
|                    |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             |                 | 12     | SS   | 90   |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 9                  |               | Borehole continued on RECORD OF DRILLHOLE 15-8  |             | 83.30           |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |               |   |             | 8.89            |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 10                 |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 11                 |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 12                 |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 13                 |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 14                 |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 15                 |               |   |             |                 |        |      |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |

MIS-BHS 001 1523645.GPJ GAL-MIS.GDT 09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523645

# RECORD OF DRILLHOLE: 15-8

SHEET 2 OF 2

LOCATION: N 5013747.0 ;E 364141.5

DRILLING DATE: August 11-12, 2015

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: Marathon Drilling

| DEPTH SCALE METRES | DRILLING RECORD         | DESCRIPTION                                    | SYMBOLIC LOG | ELEV. DEPTH (m) | RUN No. | COLOUR FLUSH | RECOVERY     |              | R.Q.D. % | FRACT. INDEX PER 0.25 m | HYDRAULIC CONDUCTIVITY K, cm/sec |          |          |
|--------------------|-------------------------|--|--------------|-----------------|---------|--------------|--------------|--------------|----------|-------------------------|----------------------------------|----------|----------|
|                    |                         |  |              |                 |         |              | TOTAL CORE % | SOLID CORE % |          |                         | 10                               | 10       | 10       |
|                    |                         |  |              |                 |         |              | 88888888     | 88888888     |          |                         | 88888888                         | 88888888 | 88888888 |
|                    |                         | BEDROCK SURFACE                                |              | 83.30           |         |              |              |              |          |                         |                                  |          |          |
| 9                  | Rotary Drill<br>NQ Core | Fresh, thinly to medium bedded, grey LIMESTONE |              | 8.89            | 1       | 100          |              |              |          |                         |                                  |          |          |
| 10                 |                         |  |              | 2               | 100     |              |              |              |          |                         |                                  |          |          |
|                    |                         | End of Drillhole                               |              | 81.52<br>10.67  |         |              |              |              |          |                         |                                  |          |          |
| 11                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 12                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 13                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 14                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 15                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 16                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 17                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 18                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 19                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 20                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 21                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 22                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |
| 23                 |                         |  |              |                 |         |              |              |              |          |                         |                                  |          |          |

MIS-RCK 004B 1523645.GPJ GAL-MISS.GDT 09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523645

# RECORD OF BOREHOLE: 15-9

SHEET 1 OF 1

LOCATION: N 5013812.4 ; E 364008.0

BORING DATE: August 10, 2015

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |                  |                  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---|--|-------------|-----------------|--------|--|------------------------|----|----|---------------------------------|-----------------------|------------------|------------------|-------------------------|--------------------------------------|------------------|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |                  |                  |                         |                                      |                  |
|                    |   |  |             |                 |        |  | 20                     | 40 | 60 | 80                              | 10 <sup>-8</sup>      | 10 <sup>-5</sup> | 10 <sup>-4</sup> |                         |                                      | 10 <sup>-2</sup> |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE   |             | 92.27           |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | TOPSOIL - (ML) sandy SILT; dark brown; moist   |             | 0.00            |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | (CI) sandy SILTY CLAY; grey brown, contains silty sand seams (WEATHERED CRUST); cohesive, w>PL, very stiff |             | 0.22            | 1      | SS   | 4                      |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   |  |             |                 | 2      | SS   | 1                      |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   |  |             |                 | 3      | SS   | 2                      |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 3                  |   | (CI/ML) SILTY CLAY to CLAYEY SILT; grey; cohesive, w>PL, firm to stiff                                     |             | 89.83           |        |  | ⊕                      |    |    | +                               |                       |                  |                  |                         |                                      |                  |
|                    |   |  |             | 2.44            |        |  |                        |    |    | +                               |                       |                  |                  |                         |                                      |                  |
| 4                  |   |  |             | 87.95           |        |  | ⊕                      |    |    | +                               |                       |                  |                  |                         |                                      |                  |
|                    |   |  |             | 4.32            |        |  |                        |    |    | +                               |                       |                  |                  |                         |                                      |                  |
| 5                  |   | Probable Glacial Till  |             | 4.50            |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | End of Borehole<br>Auger Refusal on Probable Boulder   |             |                 |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | Note:<br>Refer to Record of Borehole 15-9A for deeper stratigraphy.  |             |                 |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |

MIS-BHS 001 1523645.GPJ GAL-MIS.GDT 09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD



PROJECT: 1523645

# RECORD OF BOREHOLE: 15-9A

SHEET 1 OF 1

LOCATION: N 5013812.4 ; E 364008.0

BORING DATE: August 10-11, 2015

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |  | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |     |     | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |       |     |    |
|--------------------|---|--|-------------|-----------------|--|--|------------------------|----|----|---------------------------------|-----------------------|-----|-----|-------------------------|--------------------------------------|-------|-----|----|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER   | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |     |     |                         |                                      |       |     |    |
|                    |   |  |             |                 |  |  | 20                     | 40 | 60 | 80                              | nat V. rem V.         | + ⊕ | - ⊖ |                         |                                      | Q - U | ● ○ | Wp |
| 0                  |   | GROUND SURFACE   |             | 92.27           |  |  |                        |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
|                    |   | Refer to Record of Borehole 15-9 for stratigraphy  |             | 0.00            |  |  |                        |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
| 1                  | Power Auger<br>200 mm Diam. (Hollow Stem) | (ML) gravelly sandy SILT; grey, presence of cobbles and boulders inferred from auger refusal and auger resistance (GLACIAL TILL); non-cohesive, wet, very loose to compact |             | 87.70           | 1  | SS   | 1                      |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
| 2                  |   |  |             | 4.57            | 2  | SS   | 2                      |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
| 3                  |   |  |             |                 |  |  | 3                      | SS | 2  |                                 |                       |     |     |                         |                                      |       |     |    |
| 4                  |   |  |             |                 |  |  | 4                      | SS | 17 |                                 |                       |     |     |                         |                                      |       |     |    |
| 5                  |   |  |             |                 |  |  | 5                      | SS | 6  |                                 |                       |     |     |                         |                                      |       |     |    |
| 6                  |   |  |             |                 |  |  | 6                      | AS | -  |                                 |                       |     |     |                         |                                      |       |     |    |
| 7                  |   |  |             |                 |  |  | 84.80                  |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
| 8                  |   |  |             |                 | (SP) gravelly SAND; grey; non-cohesive, wet, loose |  | 7.47                   |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
| 9                  |   |  |             |                 |  |  | 83.13                  |    |    |                                 |                       |     |     |                         |                                      |       |     |    |
| 10                 |   |  |             |                 | End of Borehole                                    |  | 9.14                   |    |    |                                 |                       |     |     |                         |                                      |       |     |    |

Bentonite Seal

Native Backfill

Bentonite Seal

Native Backfill and Granitic Sand

M

38 mm Diam. PVC #10 Slot Screen

WL in Screen at Elev. 91.35 m on Aug. 24, 2015

MIS-BHS 001\_1523645.GPJ\_GAL-MIS.GDT\_09/23/15\_JM



PROJECT: 1523645

# RECORD OF BOREHOLE: 15-17

SHEET 1 OF 1

LOCATION: N 5013731.1 ; E 364221.7

BORING DATE: August 11, 2015

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |             |  |  | HYDRAULIC CONDUCTIVITY, k, cm/s |  |  |  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |  |  |
|--------------------|---|--|-------------|-----------------|--------|--|-------------|--|--|---------------------------------|--|--|--|-------------------------|--------------------------------------|--|--|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | BLOWS/0.30m | SHEAR STRENGTH Cu, kPa                                   |  |                                 |  | WATER CONTENT PERCENT  |  |                         |                                      |  |  |
|                    |   |  |             |                 |        |  |             | 20    40    60    80<br>nat V. + Q - ●<br>rem V. ⊕ U - ○ |  |                                 |  | 10 <sup>-8</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-2</sup><br>Wp  -----  W  -----  WI |  |                         |                                      |  |  |
| 0                  |   | GROUND SURFACE   |             | 93.79           |        |  |             |  |  |                                 |  |  |  |                         |                                      |  |  |
|                    | Power Auger<br>200 mm Diam. (Hollow Stem) | FILL - (ML) gravelly sandy SILT; dark brown and red brown, contains organic matter; non-cohesive, moist, compact                                 |             | 0.00            | 1      | SS   | 15          |  |  |                                 |  |  |  |                         |                                      |  |  |
| 1                  |   |  |             | 92.57           | 2      | SS   | 15          |  |  |                                 |  |  |  |                         |                                      |  |  |
|                    |   | FILL - (ML) CLAYEY SILT, some gravel; dark grey; cohesive, w>PL  |             | 1.22            | 3      | SS   | 7           |  |  |                                 |  |  |  |                         |                                      |  |  |
| 2                  |   | TOPSOIL - (OL) ORGANIC SILT; black; moist  |             | 91.75           | 4      | SS   | 11          |  |  |                                 |  |  |  |                         |                                      |  |  |
|                    |   | (ML) gravelly sandy SILT; grey brown, presence of cobbles and boulders inferred from auger resistance (GLACIAL TILL); non-cohesive, wet, compact |             | 2.04            | 5      | SS   | 24          |  |  |                                 |  |  |  |                         |                                      |  |  |
| 3                  |   |  |             | 2.23            | 6      | SS   | 29          |  |  |                                 |  |  |  |                         |                                      |  |  |
|                    |   | (SM) gravelly SILTY SAND; grey, presence of cobbles and boulders inferred from auger resistance (GLACIAL TILL); non-cohesive, wet, compact       |             | 90.13           | 7      | SS   | 20          |  |  |                                 |  |  |  |                         |                                      |  |  |
| 4                  |   |  |             | 3.66            | 8      | SS   | 13          |  |  |                                 |  |  |  |                         |                                      |  |  |
| 5                  |   | End of Borehole  |             | 88.91           |        |  |             |  |  |                                 |  |  |  |                         |                                      |  |  |
|                    |   |  |             | 4.88            |        |  |             |  |  |                                 |  |  |  |                         |                                      |  |  |

MIS-BHS 001\_1523645.GPJ\_GAL-MIS.GDT\_09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523645


# RECORD OF PROBEHOLE: 15-17A

SHEET 1 OF 1

LOCATION: N 5013728.8 ; E 364221.0

BORING DATE: August 12, 2015

DATUM: CGVD28

| DEPTH SCALE<br>METRES | BORING METHOD                             | SOIL PROFILE                                       |   | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |             |                        |    | HYDRAULIC CONDUCTIVITY, k, cm/s |    |                  |                  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|-----------------------|---|--|---|-----------------|--------|--|-------------|------------------------|----|---------------------------------|----|------------------|------------------|-------------------------|--------------------------------------|
|                       |   | DESCRIPTION  | STRATA PLOT   | ELEV. DEPTH (m) | NUMBER | TYPE                                       | BLOWS/0.30m | SHEAR STRENGTH Cu, kPa |    | WATER CONTENT PERCENT           |    | Wp I — W — WI    |                  |                         |                                      |
|                       |   |  |   |                 |        |  |             | 20                     | 40 | 60                              | 80 | 10 <sup>-8</sup> | 10 <sup>-6</sup> |                         |                                      |
| 0                     | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE                                     |   | 93.62           |        |  |             |                        |    |                                 |    |                  |                  |                         |                                      |
|                       |   | Refer to Record of Borehole 15-17 for stratigraphy |   | 0.00            |        |  |             |                        |    |                                 |    |                  |                  |                         |                                      |
| 5                     |   | Probable Glacial Till                              |  | 88.74<br>4.88   |        |  |             |                        |    |                                 |    |                  |                  |                         |                                      |
| 6                     |   | End of Probehole Auger Refusal                     |   | 88.08<br>5.54   |        |  |             |                        |    |                                 |    |                  |                  |                         |                                      |

MIS-BHS 001\_1523645.GPJ\_GAL-MIS.GDT\_09/23/15\_JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523645

# RECORD OF PROBEHOLE: 15-103

SHEET 1 OF 1

LOCATION: N 5013713.1 ; E 364379.7

BORING DATE: August 13, 2015

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |                  |                  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---|---|-------------|-----------------|--------|--|------------------------|----|----|---------------------------------|-----------------------|------------------|------------------|-------------------------|--------------------------------------|------------------|
|                    |   | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |                  |                  |                         |                                      |                  |
|                    |   |   |             |                 |        |  | 20                     | 40 | 60 | 80                              | 10 <sup>-8</sup>      | 10 <sup>-5</sup> | 10 <sup>-4</sup> |                         |                                      | 10 <sup>-2</sup> |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE  |             | 94.22           |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | TOPSOIL   |             | 0.00            |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | Probable Silty Clay (Weathered Crust)   |             | 93.92           |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | Probable Glacial Till, presence of cobbles and boulders inferred from auger refusal and auger resistance  |             | 0.30<br>93.61   |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 1                  | DCPT                                      | Probable Glacial Till   |             | 90.87           |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   |   |             | 3.35            |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 2                  |   |   |             | 88.43           |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
|                    |   | End of Probehole<br>Auger Refusal at 3.35 m<br>Dynamic Cone Refusal at 5.79 m   |             | 5.79            |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |
| 3                  |   | Note:<br>The AW drill rods used to advance the DCPT were angled upon completion at an incline of about 10 degrees from vertical and were immovable/stuck. The top 1.5 metres was removed, but about 4.5 metres of the drill rods remain in the ground from about 1.5 to 6 metres depth. |             |                 |        |  |                        |    |    |                                 |                       |                  |                  |                         |                                      |                  |

MIS-BHS 001 1523645.GPJ GAL-MIS.GDT 09/23/15 JM

DEPTH SCALE

1 : 75



LOGGED: PAH

CHECKED: SD

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-101

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 23, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |   |         | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |    |
|--------------------|---|---|-------------|-----------------|--------|--|------------------------|----|----|---------------------------------|-----------------------|---|---------|-------------------------|--------------------------------------|----|
|                    |   | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |   |         |                         |                                      |    |
|                    |   |   |             |                 |        |  | 20                     | 40 | 60 | 80                              | nat V. rem V.         | + | Q - U - |                         |                                      | Wp |
| 0                  |   | GROUND SURFACE  |             | 91.82           |        |  |                        |    |    |                                 |                       |   |         |                         |                                      |    |
|                    |   | TOPSOIL - (ML) sandy SILT; brown  |             | 0.00            | 1      | GRAB                                       | -                      |    |    |                                 |                       |   |         |                         |                                      |    |
|                    |   | (CI/CH) SILTY CLAY to CLAY, trace sand; grey brown (Weathered Crust); cohesive, w>PL, stiff to very stiff |             | 0.15            | 2      | GRAB                                       | -                      |    |    |                                 |                       |   |         |                         |                                      |    |
| 1                  |   |   |             |                 | 3      | SS   | 4                      |    |    |                                 |                       |   |         |                         |                                      |    |
| 2                  |   |   |             |                 | 4      | SS   | 4                      |    |    |                                 |                       |   |         |                         |                                      |    |
| 3                  |   |   |             |                 |        |  |                        |    |    |                                 |                       |   |         |                         |                                      |    |
|                    |   | (CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, firm  |             | 88.77           | 5      | SS   | 1                      |    |    |                                 |                       |   |         |                         |                                      |    |
| 4                  | Power Auger<br>200 mm Diam. (Hollow Stem) |   |             | 3.05            |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
|                    |   |   |             |                 |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
| 5                  |   |   |             |                 | 6      | SS   | PH                     |    |    |                                 |                       |   |         |                         |                                      |    |
| 6                  |   |   |             |                 |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
|                    |   |   |             |                 |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
| 7                  |   |   |             |                 | 7      | SS   | WH                     |    |    |                                 |                       |   |         |                         |                                      |    |
|                    |   |   |             |                 |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
|                    |   |   |             |                 |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
| 8                  |   | End of Borehole   |             | 84.20           |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |
|                    |   |   |             | 7.62            |        |  |                        | +  |    |                                 |                       |   |         |                         |                                      |    |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE  
1 : 50



LOGGED: CG  
CHECKED: CK

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-102

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 22, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        |      | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |  |                               | HYDRAULIC CONDUCTIVITY, k, cm/s |   |  |                         | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |  |
|--------------------|---|--|-------------|-----------------|--------|------|--|----------------|--|-------------------------------|---------------------------------|---|--|-------------------------|-------------------------|--------------------------------------|--|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.3m                                 | SHEAR STRENGTH |  |                               |                                 | WATER CONTENT PERCENT   |  |                         |                         |                                      |  |
|                    |   |  |             |                 |        |      |  | 20 40 60 80    |  | nat V. + Q - rem V. ⊕ U - ● ○ |                                 | 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> |  | Wp  -----  W  -----  WI |                         |                                      |  |
| 0                  |   | GROUND SURFACE   |             | 92.01           |        |      |  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
|                    |   | TOPSOIL - (ML) CLAYEY SILT; dark brown   |             | 0.00            | 1      | GRAB | -  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
|                    |   | (CI/CH) SILTY CLAY to CLAY; grey brown (Weathered Crust); cohesive, w>PL, very stiff                                       |             | 0.23            | 2      | GRAB | -  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 1                  |   |  |             |                 | 3      | SS   | 6  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
|                    |   | (CI/CH) SILTY CLAY to CLAY; grey; cohesive, w-PL, firm   |             | 1.52            | 4      | SS   | 1  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 2                  |   |  |             |                 |        |      |  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 3                  |   |  |             |                 |        |      |  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
|                    |   | (SM) SILTY SAND, some gravel; grey; contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, very loose to compact |             | 3.05            | 5      | TP   | PH   |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 4                  | Power Auger<br>200 mm Diam. (Hollow Stem) |  |             |                 | 6      | SS   | 7  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 5                  |   |  |             |                 | 7      | SS   | 4  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 6                  |   |  |             |                 | 8      | SS   | 8  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 7                  |   |  |             |                 | 9      | SS   | 17   |                |  |                               |                                 |   |  |                         |                         |                                      |  |
|                    |   |  |             |                 | 10     | SS   | 2  |                |  |                               |                                 |   |  |                         |                         |                                      |  |
| 8                  |   | End of Borehole  |             | 7.62            |        |      |  |                |  |                               |                                 |   |  |                         |                         |                                      |  |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: DG

CHECKED: CK

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-102A

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 22, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |  |               | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |       | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |    |
|--------------------|---|--|-------------|-----------------|--------|--|----------------|--|---------------|---------------------------------|-----------------------|--|-------|-------------------------|--------------------------------------|----|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH |  |               |                                 | WATER CONTENT PERCENT |  |       |                         |                                      |    |
|                    |   |  |             |                 |        |  | Cu, kPa        |  | nat V. rem V. |                                 | +                     |  | Q - U |                         |                                      | Wp |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE   |             | 92.01           |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
|                    |   | TOPSOIL - (ML) CLAYEY SILT; dark brown   |             | 0.00            |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
|                    |   | (CI/CH) SILTY CLAY to CLAY; grey brown (Weathered Crust); cohesive, w>PL, very stiff |             | 0.23            |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 1                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 2                  |   | (CI/CH) SILTY CLAY to CLAY; grey; cohesive, w~PL, firm                               |             | 90.49           |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
|                    |   |  |             | 1.52            |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 3                  |   | End of Borehole  |             | 89.27           |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
|                    |   | Note: Soil stratigraphy inferred from BH 16-102                                      |             | 2.74            |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 4                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 5                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 6                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 7                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 8                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 9                  |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |
| 10                 |   |  |             |                 |        |  |                |  |               |                                 |                       |  |       |                         |                                      |    |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: DG

CHECKED: CK

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-103

SHEET 1 OF 1

LOCATION: See Site Plan

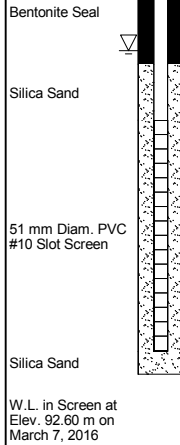
BORING DATE: February 19, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |  |  | HYDRAULIC CONDUCTIVITY, k, cm/s                                     |                       |  |  | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |
|--------------------|---|--|-------------|-----------------|--------|--|------------------------|--|--|---|-----------------------|--|--|-------------------------|--------------------------------------|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |  |  |   | WATER CONTENT PERCENT |  |  |                         |                                      |
|                    |   |  |             |                 |        | 20 40 60 80                                |                        |  |  | 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> |                       |  |  |                         |                                      |
|                    |   |  |             |                 |        | nat V. + Q - ●<br>rem V. ⊕ U - ○           |                        |  |  | Wp  -----  W  -----  WI   |                       |  |  |                         |                                      |
| 0                  |   | GROUND SURFACE   |             | 93.51           |        |  |                        |  |  |   |                       |  |  |                         |                                      |
|                    |   | TOPSOIL - (ML) CLAYEY SILT; dark brown   |             | 0.00            | 1      | GRAB                                       |                        |  |  |   |                       |  |  |                         |                                      |
|                    |   | (CI/CH) SILTY CLAY to CLAY; grey brown (Weathered Crust); cohesive, w>PL, very stiff                                     |             | 0.15            | 2      | GRAB                                       |                        |  |  |   |                       |  |  |                         |                                      |
| 1                  |   |  |             |                 | 3      | SS   | 10                     |  |  |   |                       |  |  |                         |                                      |
| 2                  |   | (SM) SILTY SAND, some gravel; brown; non-cohesive, wet, loose  |             | 91.69           | 4      | SS   | 4                      |  |  |   |                       |  |  |                         |                                      |
|                    |   | (SM) SILTY SAND, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, loose to very dense |             | 1.82            |        |  |                        |  |  |   |                       |  |  |                         |                                      |
|                    |   |  |             | 91.38           |        |  |                        |  |  |   |                       |  |  |                         |                                      |
|                    |   |  |             | 2.13            | 5      | SS   | 11                     |  |  |   |                       |  |  |                         |                                      |
| 3                  |   |  |             |                 | 6      | SS   | 4                      |  |  |   |                       |  |  |                         |                                      |
| 4                  | Power Auger<br>200 mm Diam. (Hollow Stem) |  |             |                 | 7      | SS   | 25                     |  |  |   |                       |  |  |                         |                                      |
| 5                  |   |  |             |                 | 8      | SS   | 33                     |  |  |   |                       |  |  |                         |                                      |
| 6                  |   |  |             |                 | 9      | SS   | 40                     |  |  |   |                       |  |  |                         |                                      |
| 7                  |   |  |             |                 | 10     | SS   | 58                     |  |  |   |                       |  |  |                         |                                      |
|                    |   |  |             |                 | 11     | SS   | >50                    |  |  |   |                       |  |  |                         |                                      |
|                    |   | End of Borehole<br>Auger Refusal   |             | 86.25           |        |  |                        |  |  |   |                       |  |  |                         |                                      |
|                    |   |  |             | 7.26            |        |  |                        |  |  |   |                       |  |  |                         |                                      |



MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: DG

CHECKED: CK



PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-104

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 23, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |   | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |    | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---|--|---|-----------------|--------|--|------------------------|----|----|---------------------------------|-----------------------|--|----|-------------------------|--------------------------------------|------------------|
|                    |   | DESCRIPTION  | STRATA PLOT   | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |  |    |                         |                                      |                  |
|                    |   |  |   |                 |        |  | 20                     |    | 40 |                                 | 60                    |  | 80 |                         |                                      | 10 <sup>-6</sup> |
| 0                  |   | GROUND SURFACE   |   | 91.25           |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | TOPSOIL - (ML) CLAYEY SILT to CLAY; dark brown   |   | 0.00            | 1      | GRAB                                       | -                      |    |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | (CI/CH) SILTY CLAY, trace sand; grey brown, with red mottling (Weathered Crust); cohesive, w>PL, stiff to very stiff |   | 0.30            | 2      | GRAB                                       | -                      |    |    |                                 |                       |  |    |                         |                                      |                  |
| 1                  |   |  |   |                 | 3      | SS   | 4                      |    |    |                                 |                       |  |    |                         |                                      |                  |
| 2                  |   |  |   |                 | 4      | TP   | PH                     |    |    |                                 |                       |  |    |                         |                                      |                  |
| 3                  |   |  |   |                 |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | (CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, soft to firm   |   | 3.05            | 5      | SS   | PH                     |    |    |                                 |                       |  |    |                         |                                      |                  |
| 4                  | Power Auger<br>200 mm Diam. (Hollow Stem) |  |   |                 |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
| 5                  |   |  |   |                 | 6      | SS   | PH                     |    |    |                                 |                       |  |    |                         |                                      |                  |
| 6                  |   |  |   |                 |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
| 7                  |   |  |   |                 |        | 7  | SS                     | PH |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |  | (CI/CH) SILTY CLAY, trace to some sand, trace gravel; grey; cohesive, w>PL, stiff to very stiff |                 | 6.71   |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
| 8                  |   |  |   |                 |        | 8  | SS                     | PH |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |  |   |                 |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |  |   |                 |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
| 9                  |   | End of Borehole  |   | 8.24            |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |
| 10                 |   |  |   |                 |        |  |                        |    |    |                                 |                       |  |    |                         |                                      |                  |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM



PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-104A

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 23, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |    |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |          |       | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |       |
|--------------------|---|--|-------------|-----------------|--------|--|------------------------|----|----|---------------------------------|-----------------------|----------|-------|-------------------------|--------------------------------------|-------|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |    |    |                                 | WATER CONTENT PERCENT |          |       |                         |                                      |       |
|                    |   |  |             |                 |        |  | 20                     | 40 | 60 | 80                              | nat V. +              | rem V. ⊕ | Q - ● |                         |                                      | U - ○ |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE   |             | 91.25           |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |   | TOPSOIL - (ML) CLAYEY SILT to CLAY; dark brown   |             | 0.00            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |   | (CI/CH) SILTY CLAY, trace sand; grey brown, with red mottling (Weathered Crust); cohesive, w>PL, stiff to very stiff |             | 0.30            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 3                  |   | (CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, soft to firm   |             | 88.20           |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |   |  |             | 3.05            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |
| 5                  |   | End of Borehole  |             | 86.12           | 1      | TP   | PH                     |    |    |                                 |                       |          |       |                         |                                      |       |
|                    |   | Note: Soil stratigraphy inferred from BH 16-104  |             | 5.13            |        |  |                        |    |    |                                 |                       |          |       |                         |                                      |       |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: CG

CHECKED: CK

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-105

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 22, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE  |   | SAMPLES         |        |      | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |  |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |    | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---|---|---|-----------------|--------|------|--|------------------------|--|----|---------------------------------|-----------------------|--|----|-------------------------|--------------------------------------|------------------|
|                    |   | DESCRIPTION   | STRATA PLOT   | ELEV. DEPTH (m) | NUMBER | TYPE | BLOWS/0.30m                                | SHEAR STRENGTH Cu, kPa |  |    |                                 | WATER CONTENT PERCENT |  |    |                         |                                      |                  |
|                    |   |   |   |                 |        |      |  | 20                     |  | 40 |                                 | 60                    |  | 80 |                         |                                      | 10 <sup>-6</sup> |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE  |   | 92.39           |        |      |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | TOPSOIL - (ML) CLAYEY SILT; dark brown  |   | 0.00            | 1      | GRAB | -  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | (CL/CI) SILTY CLAY; grey brown (Weathered Crust); cohesive, w>PL, stiff to very stiff |   | 0.15            | 2      | GRAB | -  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 1                  |   |   |   |                 | 3      | SS   | 5  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |   |   |                 | 4      | SS   | 3  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 2                  |   |   |   |                 |        |      |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |   | (SM) SILTY SAND, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, loose to compact |                 | 90.03  |      |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |   |   |                 | 2.36   | 5    | SS   | 7                      |  |    |                                 |                       |  |    |                         |                                      |                  |
| 3                  |   |   |   |                 |        | 6    | SS   | 3                      |  |    |                                 |                       |  |    |                         |                                      |                  |
| 4                  |   |   |   |                 |        | 7    | SS   | 6                      |  |    |                                 |                       |  |    |                         |                                      |                  |
| 5                  |   |   |   |                 | 8      | SS   | 7  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 6                  |   |   |   |                 | 9      | SS   | 7  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |   |   |                 | 10     | SS   | 26   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 7                  |   | End of Borehole Auger Refusal   |   | 85.38           |        |      |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |   |   | 7.01            |        |      |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: CG

CHECKED: CK

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-106

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 18, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD | SOIL PROFILE  |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |  |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |    | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---------------|---|-------------|-----------------|--------|--|------------------------|--|----|---------------------------------|-----------------------|--|----|-------------------------|--------------------------------------|------------------|
|                    |               | DESCRIPTION   | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |  |    |                                 | WATER CONTENT PERCENT |  |    |                         |                                      |                  |
|                    |               |   |             |                 |        |  | 20                     |  | 40 |                                 | 60                    |  | 80 |                         |                                      | 10 <sup>-6</sup> |
| 0                  |               | GROUND SURFACE  |             | 92.78           |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               | TOPSOIL - (ML) CLAYEY SILT; dark brown  |             | 0.00            | 1      | GRAB                                       |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               | (CL/CI) SILTY CLAY; grey brown (Weathered Crust); cohesive, w>PL, stiff to very stiff   |             | 0.15            | 2      | GRAB                                       |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 1                  |               |   |             |                 | 3      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               |   |             |                 | 4      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 2                  |               |   |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               | (SM) SILTY SAND, some gravel; grey brown to grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, very loose |             | 90.49           | 5      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 3                  |               |   |             | 2.29            |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               |   |             |                 | 6      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 4                  |               | (ML) SANDY SILT, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, compact                  |             | 88.97           | 7      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               |   |             | 3.81            |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 5                  |               | (SM) SILTY SAND, fine; grey; non-cohesive, wet, compact   |             | 88.21           | 8      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               |   |             | 4.57            |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               |   |             |                 | 9      | SS   |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 6                  |               | (SM) SILTY SAND, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet                           |             | 86.84           |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               |   |             | 5.94            |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |               | End of Borehole<br>Auger Refusal  |             | 6.10            |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 7                  |               |   |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 8                  |               |   |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 9                  |               |   |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 10                 |               |   |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |

DEPTH SCALE

1 : 50



LOGGED: CG

CHECKED: CK

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-107

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 18, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |  |    | HYDRAULIC CONDUCTIVITY, k, cm/s |                       |  |    | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |                  |
|--------------------|---|--|-------------|-----------------|--------|--|------------------------|--|----|---------------------------------|-----------------------|--|----|-------------------------|--------------------------------------|------------------|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |  |    |                                 | WATER CONTENT PERCENT |  |    |                         |                                      |                  |
|                    |   |  |             |                 |        |  | 20                     |  | 40 |                                 | 60                    |  | 80 |                         |                                      | 10 <sup>-6</sup> |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE   |             | 93.14           |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | TOPSOIL - (ML) CLAYEY SILT; dark brown   |             | 0.00            | 1      | GRAB                                       |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   | (CL/CI) SILTY CLAY; grey brown (Weathered Crust); cohesive, w>PL, stiff to very stiff              |             | 0.15            | 2      | GRAB                                       |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 1                  |   | (SM) SILTY SAND; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, very dense |             | 91.77           | 3      | SS   | 4                      |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |  |             | 1.37            | 5      | SS   | >50                    |  |    |                                 |                       |  |    |                         |                                      |                  |
| 2                  | End of Borehole Auger Refusal             |  | 91.16       |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
|                    |   |  | 1.98        |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 3                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 4                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 5                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 6                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 7                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 8                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 9                  |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |
| 10                 |   |  |             |                 |        |  |                        |  |    |                                 |                       |  |    |                         |                                      |                  |

MIS-BHS 001\_1523044.GPJ\_GAL-MIS.GDT\_05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: CG

CHECKED: CK

PROJECT: 1523044-1000

# RECORD OF BOREHOLE: 16-107A

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: February 18, 2016

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

| DEPTH SCALE METRES | BORING METHOD                             | SOIL PROFILE   |             | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                |  |                               | HYDRAULIC CONDUCTIVITY, k, cm/s |   |  |               | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |  |
|--------------------|---|--|-------------|-----------------|--------|--|----------------|--|-------------------------------|---------------------------------|---|--|---------------|-------------------------|--------------------------------------|--|
|                    |   | DESCRIPTION  | STRATA PLOT | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH |  |                               |                                 | WATER CONTENT PERCENT   |  |               |                         |                                      |  |
|                    |   |  |             |                 |        |  | 20 40 60 80    |  | nat V. + Q - rem V. ⊕ U - ● ○ |                                 | 10 <sup>-6</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-3</sup> |  | Wp I — W — WI |                         |                                      |  |
| 0                  | Power Auger<br>200 mm Diam. (Hollow Stem) | GROUND SURFACE   |             | 93.14           |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
|                    |   | TOPSOIL - (ML) CLAYEY SILT; dark brown   |             | 0.00            |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
|                    |   | (CL/CI) SILTY CLAY; grey brown (Weathered Crust); cohesive, w>PL, stiff to very stiff              |             | 0.15            |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 1                  |   |  |             |                 | 91.77  |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
|                    |   | (SM) SILTY SAND; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, very dense |             | 1.37            |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 2                  |   | End of Borehole<br>Auger Refusal   |             | 91.46           |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
|                    |   | Note: Soil stratigraphy inferred from BH 16-107  |             | 1.68            |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 3                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 4                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 5                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 6                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 7                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 8                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 9                  |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |
| 10                 |   |  |             |                 |        |  |                |  |                               |                                 |   |  |               |                         |                                      |  |

MIS-BHS 001 1523044.GPJ GAL-MIS.GDT 05/24/16 JEM

DEPTH SCALE

1 : 50



LOGGED: CG



CHECKED: CK

PROJECT: 1523645  
 LOCATION: N 5013712.6 ; E 364379.1

# RECORD OF BOREHOLE: 16-301

BORING DATE: March 4-7, 2016

SHEET 1 OF 2  
 DATUM: CGVD28

| DEPTH SCALE METRES | BORING METHOD            | SOIL PROFILE                                     |  | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |  |                           | HYDRAULIC CONDUCTIVITY, k, cm/s |   |  |                         | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION   |  |
|--------------------|--------------------------|--|--|-----------------|--------|--|------------------------|--|---------------------------|---------------------------------|---|--|-------------------------|-------------------------|--|--|
|                    |                          | DESCRIPTION                                      | STRATA PLOT  | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |  |                           |                                 | WATER CONTENT PERCENT   |  |                         |                         |  |  |
|                    |                          |  |  |                 |        |  | 20 40 60 80            |  | nat V. + rem V. ⊕ U - ● ○ |                                 | 10 <sup>-8</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-2</sup> |  | Wp  -----  W  -----  WI |                         |  |  |
| 0                  |                          | GROUND SURFACE                                   |  | 93.16           |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
|                    |                          | Probable Sand                                    |   | 0.00            |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 1                  |                          | Probable Glacial Till                            |  | 92.25<br>0.91   |        |  |                        |  |                           |                                 |   |  |                         |                         | ▽  |  |
| 2                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 3                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 4                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 5                  | Wash Boring<br>NW Casing |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 6                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 7                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 8                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 9                  |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 10                 |                          | Borehole continued on RECORD OF DRILLHOLE 16-301 |  | 83.36<br>9.8    |        |  |                        |  |                           |                                 |   |  |                         |                         | WL in open borehole at 0.78 m depth below ground surface upon completion of drilling |  |
| 11                 |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 12                 |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 13                 |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 14                 |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |
| 15                 |                          |  |  |                 |        |  |                        |  |                           |                                 |   |  |                         |                         |  |  |

MIS-BHS 001 1523645.GPJ GAL-MIS.GDT 05/13/16 JM

DEPTH SCALE  
 1 : 75



LOGGED: DWM  
 CHECKED:

PROJECT: 1523645

# RECORD OF DRILLHOLE: 16-301

SHEET 2 OF 2

LOCATION: N 5013712.6 ;E 364379.1

DRILLING DATE: March 4-7, 2016

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: CCC

| DEPTH SCALE METRES | DRILLING RECORD     | DESCRIPTION  | SYMBOLIC LOG | ELEV. DEPTH (m) | RUN No. | COLOUR FLUSH | RECOVERY     |              | FRACT. INDEX PER 0.25 m | DISCONTINUITY DATA |                              |                     | HYDRAULIC CONDUCTIVITY |           |    | Diametral Point Load Index (MPa) | RMC -Q' AVG. |    |
|--------------------|---------------------|--|--------------|-----------------|---------|--------------|--------------|--------------|-------------------------|--------------------|------------------------------|---------------------|------------------------|-----------|----|----------------------------------|--------------|----|
|                    |                     |  |              |                 |         |              | TOTAL CORE % | SOLID CORE % |                         | R.Q.D. %           | TYPE AND SURFACE DESCRIPTION |                     |                        | K, cm/sec |    |                                  |              |    |
|                    |                     |  |              |                 |         |              | 88888888     | 88888888     |                         | 88888888           | B Angle                      | DIP w/ ZL CORE AXIS | Jo                     | on        | Jr |                                  |              | Ja |
|                    |                     | BEDROCK SURFACE  |              | 83.36           |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 10                 |                     | Fresh, thinly to thickly bedded, grey DOLOMITE BEDROCK |              | 9.80            | 1       |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 11                 | Relay Drill NQ Core |  |              |                 | 2       |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 12                 |                     |  |              |                 | 3       |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 13                 |                     | End of Drillhole                                       |              | 80.16           |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 14                 |                     |  |              | 13.00           |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 15                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 16                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 17                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 18                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 19                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 20                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 21                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 22                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 23                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 24                 |                     |  |              |                 |         |              |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |

WL in open borehole at 0.78 m depth below ground surface upon completion of drilling

MIS-RCK 004 1523645.GPJ\_GAL-MISS.GDT\_05/13/16\_JM

DEPTH SCALE  
1 : 75



LOGGED: DWM  
CHECKED:





PROJECT: 1523645  
 LOCATION: N 5013746.6 ; E 364217.4

# RECORD OF BOREHOLE: 16-302

BORING DATE: March 4, 2016

SHEET 1 OF 2  
 DATUM: CGVD28

| DEPTH SCALE METRES | BORING METHOD            | SOIL PROFILE                                     |  | SAMPLES         |        | DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m |                        |  |                             | HYDRAULIC CONDUCTIVITY, k, cm/s |   |  |                         | ADDITIONAL LAB. TESTING | PIEZOMETER OR STANDPIPE INSTALLATION |  |
|--------------------|--------------------------|--|--|-----------------|--------|--|------------------------|--|-----------------------------|---------------------------------|---|--|-------------------------|-------------------------|--------------------------------------|--|
|                    |                          | DESCRIPTION                                      | STRATA PLOT  | ELEV. DEPTH (m) | NUMBER | TYPE                                       | SHEAR STRENGTH Cu, kPa |  |                             |                                 | WATER CONTENT PERCENT   |  |                         |                         |                                      |  |
|                    |                          |  |  |                 |        |  | 20 40 60 80            |  | nat V. + Q - rem V. ⊕ U - ○ |                                 | 10 <sup>-8</sup> 10 <sup>-5</sup> 10 <sup>-4</sup> 10 <sup>-2</sup> |  | Wp  -----  W  -----  WI |                         |                                      |  |
| 0                  |                          | GROUND SURFACE                                   |  | 93.06           |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
|                    |                          | Probable Sand                                    |   | 0.00            |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 1                  |                          | Probable Glacial Till                            |  | 92.15<br>0.91   |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 2                  |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 3                  |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 4                  | Wash Boring<br>NW Casing |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 5                  |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 6                  |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 7                  |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 8                  |                          | Borehole continued on RECORD OF DRILLHOLE 16-302 |  | 85.04<br>8.02   |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 9                  |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 10                 |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 11                 |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 12                 |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 13                 |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 14                 |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |
| 15                 |                          |  |  |                 |        |  |                        |  |                             |                                 |   |  |                         |                         |                                      |  |

MIS-BHS 001 1523645.GPJ GAL-MIS.GDT 05/13/16 JM

DEPTH SCALE  
 1 : 75



LOGGED: DWM  
 CHECKED:

PROJECT: 1523645

# RECORD OF DRILLHOLE: 16-302

SHEET 2 OF 2

LOCATION: N 5013746.6 ;E 364217.4

DRILLING DATE: March 4, 2016

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: CCC

| DEPTH SCALE METRES | DRILLING RECORD     | DESCRIPTION  | SYMBOLIC LOG | ELEV. DEPTH (m) | RUN No. | COLOUR % RETURN | RECOVERY     |              | FRACT. INDEX PER 0.25 m | DISCONTINUITY DATA |                              |                     | HYDRAULIC CONDUCTIVITY |           |    | Diametral Point Load Index (MPa) | RMC -Q' AVG. |    |
|--------------------|---------------------|--|--------------|-----------------|---------|-----------------|--------------|--------------|-------------------------|--------------------|------------------------------|---------------------|------------------------|-----------|----|----------------------------------|--------------|----|
|                    |                     |  |              |                 |         |                 | TOTAL CORE % | SOLID CORE % |                         | R.Q.D. %           | TYPE AND SURFACE DESCRIPTION |                     |                        | K, cm/sec |    |                                  |              |    |
|                    |                     |  |              |                 |         |                 | FLUSH        |              |                         |                    | B Angle                      | DIP w/ ZL CORE AXIS | Jo                     | on        | Jr |                                  |              | Ja |
|                    |                     | BEDROCK SURFACE  |              | 85.04           |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
|                    |                     | Fresh, thinly to thickly bedded, grey DOLOMITE BEDROCK |              | 8.02            | 1       | 100             |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 9                  | Relay Drill NQ Core |  |              |                 | 2       | 0               |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 10                 |                     |  |              | 3               | 0       |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 11                 |                     | End of Drillhole                                       |              | 81.86<br>11.20  |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 12                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 13                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 14                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 15                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 16                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 17                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 18                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 19                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 20                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 21                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 22                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |
| 23                 |                     |  |              |                 |         |                 |              |              |                         |                    |                              |                     |                        |           |    |                                  |              |    |

MIS-RCK 004 1523645.GPJ GAL-MISS.GDT 05/13/16 JM

DEPTH SCALE

1 : 75



LOGGED: DWM

CHECKED: