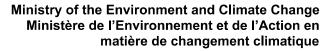
# **APPENDIX**

A SITE DATA

## **APPENDIX**

# A-1 PERMITS





#### AMENDED PERMIT TO TAKE WATER

Surface and Ground Water NUMBER 7725-AACS54

Pursuant to Section 34.1 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Walker Aggregates Inc.
Post Office Box 100
Thorold, Ontario, L2V 3Y8
Canada

For the water

taking from: Sump #1

Located at: Lot 24, Concession 12, Geographic Township of Nottawasaga

Clearview, County of Simcoe

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

#### **DEFINITIONS**

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment and Climate Change.
- (d) "District Office" means the Barrie District Office.
- (e) "Permit" means this Permit to Take Water No. 7725-AACS54 including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.
- (f) "Permit Holder" means Walker Aggregates Inc..
- (g) "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

#### **TERMS AND CONDITIONS**

#### 1. Compliance with Permit

- 1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated August 12, 2014 and signed by Kevin Kehl, and all Schedules included in this Permit.
- 1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.
- 1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.
- 1.4 This Permit is not transferable to another person.
- 1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.
- 1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.
- 1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

#### 2. General Conditions and Interpretation

#### 2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

#### 2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

- (a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or
- (b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

#### 2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

- (a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or
- (b) acceptance by the Ministry of the information's completeness or accuracy.

#### 2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

#### 2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

#### 2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

#### 3. Water Takings Authorized by This Permit

#### 3.1 Expiry

This Permit expires on **December 31, 2026**. No water shall be taken under authority of this Permit after the expiry date.

#### 3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

#### Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:		Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Sump #1	Pond Dugout	Pits and Quarries	Dewatering	15,000	24	21,600,000	365	17 559860 4914550
						Total Taking:	21,600,000		

#### **Notes:**

- This Permit allows water taking for quarry de-watering purposes at the "existing" quarry located on Lot 24, concession 12, Clearview as well as Phase 1 of the "expansion" quarry located on Lot 25, concession 12, Clearview.
- Dewatering of the quarry is achieved by pumping from Sump # 1. Water management at the site also includes pumping for various **on-site** uses including: aggregate washing, dust suppression and watering of landscaped areas. Water is also pumped from the sump locations to the on-site reservoir for storage. Pumps at the new sump established within Phase 1 of the "expansion" area (Sump 3) are used to transfer water from Phase 1 of the expansion area to the sump locations within the "existing" quarry (Sump 1 and Sump 2). In addition, water collecting in various parts of the quarry may be directed to the sump locations by temporary pumps and/ or via gravity.
- The rate and amount restrictions reflected in Table 1 above apply only to the taking of water from Sump 1 **for off-site discharge** purposes. All other internal uses and transfers of water within the quarry are not considered water takings for purposes of this Permit and are not required to be metered as a condition of this Permit. The rate and amount of water taken and discharged off-site is monitored using a meter installed on the pipe that conveys the dewatering effluent to the off-site discharge location, within the adjacent wetland designated as Rob Roy Wetland 6 (RR6). The outflow from RR6 joins a small headwater tributary to the Beaver River.
- 3.3 Notwithstanding Table A, the taking of water from Sump 1 for purposes of discharge into the RR6 wetland shall be adjusted as necessary, in accordance with any recommendation resulting from the assessments required under Condition 4.4 of this Permit (below). The adjustment may include <u>lowering</u> of the maximum rate, amount and/ or duration of taking from those shown in Table A. Seasonally adjusted rates and amounts may also be applied, if necessary.

#### 4. Monitoring

- 4.1 The Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter installed on the discharge pipe. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder shall submit, on or before March 31<sup>st</sup> in every year, the daily water taking data collected and recorded for the previous year to the Ministry's Water Taking Reporting System.
- 4.2 The Permit Holder shall implement the groundwater monitoring and well interference investigation & mitigation programs as described in Items 2 (i) and 2 (ii) of Schedule A of this Permit.
- 4.3 The Permit Holder shall monitor stream flows and water levels at appropriate locations, including locations SW1, SW2, SW02 and SW4 (a historical stream flow monitoring location on the tributary stream, located upstream of SW02) and drive point piezometers DP2 and DP4 within the wetland designated as RR6. The monitoring type and frequency shall be consistent with the descriptions provided in Table 3.4 of Item No. 4 of Schedule A of this Permit (i.e. the Adaptive Management Plan or AMP).
- 4.4 The Permit Holder shall engage relevantly qualified persons to periodically analyse the water taking and discharge, stream flow and groundwater monitoring data, along with any other relevant information/ data, to:
  - evaluate if conditions within the RR6 wetland receiving the discharge and within the Beaver River tributary stream have been altered beyond their historical ranges as a result of the taking and discharge. The assessment shall consider the historical range of flows in the stream as described in Table 3.5 of Item No. 4 of Schedule A of this Permit (the AMP). If values significantly different from those in the AMP are used to describe historical ranges, the rationale shall be provided. A record of the evaluation undertaken by the qualified person(s) shall be maintained; and
  - ii) determine the significance of any observed changes and make recommendations on necessary adjustments to lower the the rate, amount and/ or duration of the taking and discharge from those shown in Table A. Seasonally adjusted rates and amounts may also be recommended, if necessary.
- 4.5 The Permit Holder shall prepare an annual monitoring report which includes the following:
  - i) all monitoring data collected under this Permit. The data shall be presented in

appropriate format (graphical and tabular) along with the historical data. Maps prepared at appropriate scales that clearly identify the various monitoring locations, including historical ones, shall also be included;

- ii) details of the periodic evaluations undertaken by qualified persons and the recommendations made as well as details on how the recommendations were implemented;
- iii) any proposed changes to the monitoring program or the Permit, along with the justification for the modification;
- iv) an evaluation of the quarry operation and analysis and interpretation of all monitoring data collected under this Permit to determine if the operation has resulted in any undesirable environmental impacts. The report shall contain conclusions with respect to any effects of quarry operation on groundwater resources; surface water resources and wells.

The report shall be prepared by qualified individual(s), and submitted to the Director and the District no later than May 31<sup>st</sup> of the each year.

#### 5. Impacts of the Water Taking

#### 5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

#### 5.2 For Surface-Water Takings

The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

#### For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their

reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

#### 6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

*The reasons for the imposition of these terms and conditions are as follows:* 

- 1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
- 2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
- 3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

- The portions of the Permit or each term or condition in the Permit in respect of which the 1. hearing is required, and;
- 2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

- 3. The name of the appellant;
- The address of the appellant; 4.
- 5. The Permit to Take Water number:
- 6. The date of the Permit to Take Water;
- 7. The name of the Director:
- 8. The municipality within which the works are located;

#### This notice must be served upon:

AND

The Secretary Environmental Review Tribunal 655 Bay Street, 15th Floor Toronto ON

M5G 1E5 Fax: (416) 326-5370 Email: ERTTribunalsecretary@ontario.ca The Director, Section 34.1, Ministry of the

Environment and Climate Change

8th Floor 5775 Yonge St Toronto ON M2M 4J1

Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at

by Fax at (416) 326-5370 by e-mail at

(416) 212-6349 Toll Free 1(866) 448-2248

Toll Free 1(844) 213-3474

www.ert.gov.on.ca

This Permit cancels and replaces Permit Number 1168-665NHB, issued on 2005/11/21.

Dated at Toronto this 22nd day of September, 2016.

Karoly Tajnay

Director, Section 34.1

Ontario Water Resources Act, R.S.O. 1990

#### Schedule A

This Schedule "A" forms part of Permit To Take Water 7725-AACS54, dated September 22, 2016.

- 1. Application for Permit To Take Water, signed signed by Kevin Kehl on August 8, 2014.
- 2. Report entitled "Permit To Take Water Amendment Application, Duntroon Quarry..." prepared by WSP and dated July 2014. Section of this report have been revised by the following documents:
  - i. "Permit To Take Water Amendment Application, CLARIFICATION DOCUMENT, Duntroon Quarry..." prepared by WSP and dated April 2016;
  - ii. "Permit To Take Water Amendment Application, CLARIFICATION DOCUMENT, Duntroon Quarry..." prepared by WSP and dated May 2016;
- 3. E-mail from Sara Watts of WSP to Ted Belayneh of MOECC dated June 16, 2016 and containing responses to questions regarding pumping rates and proposed PTTW conditions.
- 4. Report entitled: "Adaptive Management Plan (AMP), Duntroon Expansion Quarry...", Prepared for Walker Aggregates Inc., and dated December 6, 2013.



Ministry of the Environment and Climate Change Ministère de l'Environnement et de l'Action en matière de changement climatique

#### ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 1521-A4VJ4X Issue Date: October 17, 2016

Walker Aggregates Inc. Post Office Box, No. 100 Thorold, Ontario L2V 3Y8

Site Location:

Duntroon Quarry 9881 County Road 91

Township of Clearview, County of Simcoe

L9Y 3Z7

You have applied under section 20.2 of Part II.1 of the <u>Environmental Protection Act</u>, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

proposed and existing sewage Works for collection, transmission, treatment and disposal of up to 130 L/s of water that accumulates within the confines of existing 47.1 hectares the Duntroon Quarry (a total land area of approximately 57.5 hectares located on Part Lot 24 and Expansion Property located on Lot 25, Concession XII in the Township of Clearview (former Township of Nottawasaga), County of Simcoe) aggregate extraction area from direct precipitation, surface runoff, snow melt and groundwater inflow, discharging to a wetland located at the west side of the property, and then to the twin culverts at Grey Road 31 and ultimately to Beaver River South Tributary, consisting of the following:

#### Proposed Works

• a future sump no. 3 equipped with a submersible pump, located on the quarry floor within the Phase 1 of the expansion property discharging via a gravity sewer line to sump no.1 and/or sump no.2 as described below.

#### **Existing Works**

- sump no. 2 equipped with a submersible pump, located at the western part of the aggregate extraction area (near the water storage reservoir) discharging via a gravity sewer line to sump no.1, or pumped directly to the adjacent water storage reservoir during extreme wet weather events;
- sump no. 1, approximately 17,050 m³ in capacity and located south of the sump no. 2, equipped with a submersible pump and a 300 mm diameter forcemain laid on ground and traversing in a westerly direction, discharging to a wetland located and then to the twin culverts at Grey Road 31 which drains to Beaver River

South Tributary,

all other controls, electrical equipment, instrumentation, piping, valves and appurtenances essential for the proper operation of the aforementioned sewage Works.

all in accordance with the supporting documents listed in Schedule 'A'.

For the purpose of this environmental compliance approval, the following definitions apply:

"Approval" means this entire document and any schedules attached to it, and the application;

"District Manager" means the District Manager of the Barrie District Office of the Ministry;

"Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

"EPA" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

"Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

"Owner" means Walker Aggregates Inc. and its successors and assignees;

"OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O.40, as amended;

"Works" means the sewage works described in the Owner's application and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

#### TERMS AND CONDITIONS

#### 1. GENERAL PROVISIONS

- (1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- (2) Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.
- (3) Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and

where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

- (4) Where there is a conflict between the documents listed in the Schedule A, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
- (5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.
- (6) The issuance of, and compliance with the conditions of, this Approval does not:
  - (a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority/MNR or any other agency necessary to construct or operate the sewage Works; or
  - (b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

#### 2. CHANGE OF OWNER

- (1) The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within 30 days of the change occurring:
  - (a) change of Owner;
  - (b) change of address of the Owner;
  - (c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the <u>Business Names Act</u>, R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or
  - (d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the <u>Corporations Information Act</u>, R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.
- (2) In the event of any change in ownership of the Works, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.
- (3) The Owner shall ensure that all communications made pursuant to this condition will refer to this Approval's number.

#### 3. OPERATION AND MAINTENANCE

- (1) The Owner shall ensure that at all times, the Works and related equipment and appurtenances which are installed or used to achieve compliance with this Approval are properly operated and maintained. The Owner shall also ensure that all monitoring programs and maintenance schedules for the Works and related equipment are complied with.
- (2) The Owner shall ensure that the maximum discharge rate from these Works does not exceed 250 L/s.
- (3) Within three (3) months of the issuance date of this Approval, the Owner shall prepare an operations manual for the operation of the Works that includes, but is not necessarily limited to, the following information:
  - (a) operating procedures for routine operation of the Works; including reduction or termination of discharge during major rain events, if necessary;
  - (b) inspection programs, including frequency of inspection for the Works and the methods or tests employed to detect when maintenance is necessary, as well as downstream receiver inspections for the occurrence of erosion and flooding;
  - (c) repair and maintenance programs, including the frequency of repair and maintenance for the Works;
  - (e) contingency plans and procedures for dealing with potential spill, bypasses and any other abnormal situations and for notifying the District Manager; and
  - (f) complaint procedures for receiving and responding to public complaints.
- (4) The Owner shall maintain the operations manual up to date through revisions undertaken from time to time and retain a copy at the location of the sewage Works. Upon request, the Owner shall make the manual available for inspection and copying by Ministry personnel.

#### 4. EFFLUENT LIMITS

(1) The Owner shall design, construct, operate and maintain the Works such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent discharge from the Works.

Table 1 Effluent Limits								
Effluent Parameter	Concentration Limit (milligrams per litre unless otherwise indicated)							
Column 1	Column 2							
Oil & Grease	15							
Total Suspended Solid (TSS)	25							
	ween 6.0 to 9.5, inclusive, at all times							

- (2) For the purposes of determining compliance with and enforcing subsection (1):
  - (a) For purposes of determining compliance with and enforcing subsection (1), non-compliance with respect to the parameters concentration limit as outlined in Column 1 is deemed to have occurred

when any single sample analyzed for Oil & Grease and Total Suspended Solids, (along with a follow-up confirmation sample collected within 7 days of the receipt of the original sample result that indicated that an exceedance had occurred), is greater than the corresponding maximum concentration set out in Column 2 of subsection (1).

(b) non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

#### 5. **EFFLUENT - VISUAL OBSERVATIONS**

Notwithstanding any other condition in this Approval, the Owner shall ensure that the treated effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen or foam on the receiving waters.

#### 6. <u>EFFLUENT QUALITY MONITORING AND RECORDING</u>

The Owner shall, upon commencement of operation of the Works, carry out the following monitoring program:

- (1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.
- (2) Samples shall be collected and analyzed at the following sampling locations, at the sampling frequencies and using the sample type specified for each parameter listed:

	Table 2 - Effluent Monitoring									
Sampling Location	The outlet channel discharge point to the wetland									
Sampling Frequency	once each month during periods of effluent discharge									
Sampling Type	Grab									
Sampling Parameters	Total Suspended Solids, Oil and Grease, Nitrite Nitrogen,									
, p	Nitrate Nitrogen, Total Ammonia Nitrogen, pH (field),									
**	Temperature (field), Total Phosphorus, Conductivity (field),									
•	Chloride, Sulphate, Sodium, Potassium, Boron, Cadmium,									
	Total Chromium, Cobalt, Copper, Iron, Lead, Nickel, Silicon,									
	Silver, Zinc, Alkalinity, Total Dissolved Solids, Phenols									
	(4AAP), Hardness and Turbidity									

- (4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:
  - (a) the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only)", as amended from time to time by more recently published editions;

- (b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions; and
- (c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.
- (5) Conductivity, Temperature and pH shall be measured and recorded in the field at the time of sampling. The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives (PWQO)" dated July 1994, as amended, for ammonia (un-ionized).
- (6) The Owner shall measure, record and calculate the discharge rate and volume of water pumped from the quarry sump on a daily basis during the discharging period and separately water not discharged from the Works but taken for other uses on a daily basis.
- (7) The Owner shall undertake monthly inspections of the pumping sump and the outlet channel, and have excess settled material cleaned-out on a regular basis with results recorded in a log book to be made available for review by the Ministry upon request. The log shall include the name of the inspector, date of inspection and description of cleaning and maintenance measures undertaken for the sewage Works.
- (8) The measurement frequencies and analytical parameters specified in subsections (2), in respect of any parameter are minimum requirements which may, after twelve (12) months of monitoring in accordance with this Condition, be modified by the District Manager in writing from time to time.
- (9) The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

#### 7. REPORTING

- (1) The Owner shall report to the District Manager or designate, of any exceedence of any parameter specified in Conditions 4 or 5 orally, as soon as reasonably possible, and in writing within seven (7) days of the exceedence, as defined in Condition 4(2).
- (2) In addition to the obligations under Part X of the *Environmental Protection Act*, the Owner shall, within 10 working days of the occurrence of a reportable spill, bypass or loss of any product, by product, intermediate product, oils, solvents, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.
- (3) The Owner shall prepare and submit a performance report to the District Manager on an annual basis within ninety (90) days following the end of the period being reported upon. The reports shall contain, but shall not be limited to, the following information:

- (a) a summary and interpretation of all monitoring data collected pursuant to Condition 6 and a comparison to the effluent limits outlined in Condition 4 and the Provincial Water Quality Objective and/or Ontario Drinking Water Objective for the monitored parameter, including an overview of the success and adequacy of the Works and recommendations of monitoring program changes. The report should provide an interpretation of the data as to the impact of the discharge of treated effluent form the quarry to the receiver with respect to water quality and quantity during periods of low/high flows and periods of discharge/no discharge;
- (b) a tabulation of the total daily discharge rate and volume from the quarry sump and the total daily volume of water not discharged from the Works but taken for other uses;
- (c) a description of any operating problems encountered and corrective actions taken;
- (d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;
- (e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and
- (f) any other information the District Manager may require from time to time.

Schedule 'A' forms part of this Approval and contains a list of supporting documentation/information received, reviewed and relied upon in the issuance of this Approval.

#### **SCHEDULE 'A'**

- Environmental Compliance Approval Application submitted by Was Foebel, Environmental Specialist Walker Aggregates Inc. dated June 3, 2013
- Design Report entitled "Environmental Protection Act (R.S.O. 1990) Environmental Compliance Approval Application (Industrial Sewage Works) Duntroon Quarry, Part of Lot 24, Concession XII, Township of Clearview, County of Simcoe" dated May 2013 submitted under covering letter dated May 29, 2013 signed by Was Foebel, Environmental Specialist, Walker Aggregates Inc. and supporting information.

The reasons for the imposition of these terms and conditions are as follows:

- 1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which Approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.
- 2. Condition 2 is imposed to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.
- 3. Condition 3 is imposed to ensure that a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Work.
- 4. Conditions 4 and 5 are imposed to ensure that the effluent discharged from the Works meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver.
- 5. Condition 6 is imposed to require the Owner to demonstrate on a continual basis that the quality of the effluent from the approved Works is consistent with the effluent limits specified in the Approval and that the approved Works do not cause any impairment to the receiving watercourse.
- 6. Condition 7 is imposed to provide a performance record for future references and to ensure that the Ministry is made aware of problems as they arise, so that the Ministry can work with the Owner in resolving the problems in a timely manner.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

- The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- 2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

#### The Notice should also include:

- 3. The name of the appellant;
- 4. The address of the appellant;
- 5. The environmental compliance approval number;

- 6. The date of the environmental compliance approval;
- 7. The name of the Director, and;
- 8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary\*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

\* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 17th day of October, 2016

Fariha Parnu.

Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

HV/

c: District Manager, MOECC Barrie Jason Murchison, GENIVAR Inc.

### **APPENDIX**

# A-2 MONITORING NETWORK DETAILS

Table A-1 Monitoring Well Details

	GPS Co	ordinates		Well Pipe	Measuring Point	Ground	Screened	Geologic	
Well ID	(NAD 83	Zone 17)	Туре	Diameter	Elevation	Elevation	Interval	Formation	Monitoring Program
	Easting	Northing		mm	mASL	mASL	mASL or m	Monitored	1109.4
Old Quarry Monitoring Wells									
1. 98-8	559,631	4,914,368	0	102	517.25	516.50	Open Hole 35.1 m	Amabel/Fossil Hill	LTT
2. 98-9	559,354	4,914,817	0	102	526.35	525.90	Open Hole 48.5 m	Amabel/Fossil Hill	LTT
98-10			0	102	519.55	519.40	Open Hole 37.9 m	Amabel/Fossil Hill	Historical
98-11			0	102	522.58	522.20	Open Hole 41.2 m	Amabel/Fossil Hill	Historical
3. 98-12	560,373	4,915,090	0	102	527.22	526.70	Open Hole 42.4 m	Amabel/Fossil Hill	LTT
98-13			0	102	522.44	522.30	Open Hole 38.0 m	Amabel/Fossil Hill	Historical
OW99-1			0	102	519.38	519.10	Open Hole 29.5 m	Amabel	Historical
OW99-2			0	102	500.78	500.60	Open Hole 19.7 m	Amabel/Fossil Hill	Historical
4. PW99-1	559,630	4,914,385	0	152	513.98	513.90	Open Hole 32.9 m	Amabel/Fossil Hill	LTT
PW99-2			0	152	519.33	519.20	Open Hole 34.4 m	Amabel	Historical
PW99-3			0	152	501.13	500.90	Open Hole 21.4m	Amabel/Fossil Hill	Historical
MW2			0	102	524.86	523.20	Open Hole 20.8 m	Amabel	Historical
MW3 (R)			0	102	514.98	514.40	Open Hole 15.4 m	Amabel	Historical
MW4			0	102	522.45	521.90	Open Hole 39.9 m	Amabel/Fossil Hill	Historical
MW5			0	102	529.43	529.40	Open Hole 46.1 m	Amabel/Fossil Hill	Historical
5. MW6	559,545	4,914,893	0	102	534.87	533.60	Open Hole 36.4 m	Amabel	LTT
E2			0	203	520.97	521.00	Open Hole	Amabel	Historical
QUARRY HOUSE			0	102	529.38	528.72	Open Hole 14.6m	Amabel	Historical
SHOP WELL			0	102	523.50	522.49	Not Measured	Amabel	Historical
OFFICE WELL			0	152	532.52	532.40	Open Hole 24.7m	Amabel/Fossil Hill	Historical
OFFICE WELL (NEW)			0	152	532.04	531.35	Open Hole 37.2m	Amabel	Historical

Notes: • PITM - Performance Indicator Trigger Monitoring

<sup>•</sup> LTTWM - Long Term Groundwater and Surface Water Monitoring

<sup>•</sup> Elevations provided in metres above sea level (mASL)

<sup>•</sup> Type 'O' indicates Open Hole

<sup>• (</sup>R) indicates Replacement Monitoring Well • Type 'S' indicates Standpipe • N/A indicates information not available

<sup>•</sup> Shading indicates well is decommissioned / no longer monitored.

Table A-1 Monitoring Well Details

	GPS Cod	ordinates		Well Pipe	Measuring Point	Ground	Screened	Geologic	BA it
Well ID	(NAD 83	Zone 17)	Туре	Diameter	Elevation	Elevation	Interval	Formation	Monitoring Program
	Easting	Northing		mm	mASL	mASL	mASL or m	Monitored	
Extension Quarry Monitoring	ng Wells								
BH02-1			0	102	523.30	522.64	Open Hole 39.5 m	Amabel/Fossil Hill	LTT
1. BH02-2	559,915	4,915,535	0	102	523.18	522.46	Open Hole 39.5 m	Amabel/Fossil Hill	LTT
BH02-3			0	102	530.58	529.64	Open Hole 9.5 m *	Amabel/Fossil Hill	LTT
BH02-4			0	102	530.70	530.02	Open Hole 50.1 m	Amabel/Fossil Hill	LTT
2. BH02-5			0	102	513.89	513.24	Open Hole 31.9 m	Amabel/Fossil Hill	LTT
3. BH02-5 (mid)	559,587	4,915,585	0	102	514.20	513.24	Open Hole 12.4 m	Amabel	LTT
4. BH02-5 (shallow)			0	102	514.17			Overburden	LTT
5. BH02-6	559,707	4,915,008	0	102	530.25	529.50	Open Hole 48.5 m	Amabel/Fossil Hill	LTT
6. BH03-7-I			0	102	511.01	510.27	502.9 - 501.1	Amabel	LTT
7. BH03-7-II	559,356	4,915,510	0	102	511.03	510.27	508.7 - 504.8	Overburden	LTT
8. BH03-7-III			0	102	511.72	510.56	Open Hole 30.7 m	Amabel/Fossil Hill	LTT
9. BH03-8	558,971	4,915,324	0	102	520.79	520.22	Open Hole 37.9 m	Amabel/Fossil Hill	LTT
10. BH03-9	559,106	4,914,893	0	102	518.93	518.45	Open Hole 39.5 m	Amabel/Fossil Hill	LTT
11. TW04-1	559,080	4,914,912	0	152	517.53	517.05	Open Hole 34.1 m	Amabel/Fossil Hill	LTT
12. TW04-2	559,084	4,914,928	0	152	518.11	517.46	Open Hole 34.1 m	Amabel/Fossil Hill	LTT
13. TW04-3	559,096	4,914,916	0	152	518.63	517.97	Open Hole 37.5 m	Amabel/Fossil Hill	LTT
14. BH08-1	560,485	4,915,410	0	102	512.32	511.51	Open Hole 27.4 m	Amabel/Fossil Hill	LTT
15. BH08-2	560,500	4,915,390	0	102	512.00	511.15	Open Hole 25.8 m	Amabel/Fossil Hill	LTT
16. BH08-3	560,462	4,915,414	0	102	513.41	512.57	Open Hole 28.8 m	Amabel/Fossil Hill	LTT
17. IW1	560,548	4,915,270	0	152	512.12	511.52	Open Hole 27.3 m	Amabel/Fossil Hill	LTT
18. IW1a	560,551	4,915,272	0	152	511.96	511.35	Open Hole 27.3 m	Amabel/Fossil Hill	N/A
19. IW2	560,519	4,915,490	0	152	509.22	508.66	Open Hole 24 m	Amabel/Fossil Hill	LTT
20. IW3	560,210	4,915,929	0	152	519.13	518.53	Open Hole 33.7 m	Amabel/Fossil Hill	LTT
21. IW4	560,026	4,916,230	0	152	511.02	510.36	Open Hole 25.4 m	Amabel/Fossil Hill	LTT
22. NW1	560,056	4,915,117	0	152	526.19	525.67	Open Hole 42.7 m	Amabel/Fossil Hill	LTT
NW2			0	152	531.99	531.35	Open Hole 54.7 m	Amabel/Fossil Hill	LTT

<sup>•</sup> LTTWM - Long Term Groundwater and Surface Water Monitoring

<sup>•</sup> Elevations provided in metres above sea level (mASL)

<sup>•</sup> Type 'O' indicates Open Hole

<sup>• (</sup>R) indicates Replacement Monitoring Well

Type 'S' indicates Standpipe

N/A indicates information not available

<sup>•</sup> Shading indicates well is decommissioned / no longer monitored.

Table A-1 Monitoring Well Details

	GPS Cod	ordinates		Well Pipe	Measuring Point	Ground	Screened	Geologic	<b>8.6</b> 14 1
Well ID	(NAD 83	Zone 17)	Туре	Diameter	Elevation	Elevation	Interval	Formation	Monitoring Program
	Easting	Northing		mm	mASL	mASL	mASL or m	Monitored	
Extension Quarry Monitorin	g Wells (continue	ed)							
NW3			0	152	515.13	514.44	Open Hole 29.6 m	Amabel/Fossil Hill	LTT
NW4			0	152	529.86	529.00	Open Hole 48.9 m	Amabel/Fossil Hill	LTT
23. NW5	559,648	4,915,410	0	152	521.68	520.95	Open Hole 39.7 m	Amabel/Fossil Hill	LTT
24. NW6	559,523	4,915,360	0	102	521.99	520.68	Open Hole 41.2 m	Amabel/Fossil Hill	LTT
25. NW7	559,474	4,915,175	0	152	523.92	523.18	Open Hole 42.1 m	Amabel/Fossil Hill	LTT
26. NW8	559,254	4,915,016	0	152	531.87	531.07	Open Hole 43 m	Amabel/Fossil Hill	LTT
27. NW9	559,032	4,914,979	0	152	521.45	520.86	Open Hole 41.7 m	Amabel/Fossil Hill	LTT
28. NW10-DP			S	152	511.18	509.69	509.6 - 509.1	Overburden	LTT
29. NW10-Shallow	558,939	4,915,604	0	152	510.31	509.69	Open Hole 3.8 m	Amabel	LTT
30. NW10-Deep	7		0	152	510.45	509.69	Open Hole 29.5 m	Amabel/Fossil Hill	LTT
HA1								Overburden	N/A
HA2								Overburden	N/A
HA3								Overburden	N/A
Drivepoints									
1. DP1	559,561	4,914,433	S	51	513.05	511.80	511.3 - 510.8	Overburden	LTT
2. DP2	559,302	4,914,600	S	51	512.94	512.10	511.3 - 510.8	Overburden	PITM
3. DP3	560,307	4,914,281	S	51	514.65	513.60	511.9 - 511.4	Overburden	LTT
4. DP4	559,084	4,914,245	S	51	512.11	511.40	510.4 - 509.9	Overburden	PITM
5. DP5	559,094	4,915,562	S	51	510.49	509.66	509.6 - 508.7	Overburden	PITM
6. DP6	559,788	4,915,730	S	51	512.20	511.45	511.0 - 510.1	Overburden	PITM
7. DP7	559,282	4,915,583	S	51	509.91	509.18	507.4 - 506.9	Overburden	PITM
8. DP8	559,105	4,914,573	S	51	511.88	511.12	510.9 - 510.5	Overburden	PITM
9. DP9	560,274	4,915,622	S	51	508.88	507.74	507.2 - 506.6	Overburden	PITM
DP10			S	51				Overburden	PITM
DP11			S	51				Overburden	PITM
10. BRIDSON DP	560,371	4,915,534	S	38	511.30	510.40	509.6 - 508.8	Overburden	PITM

<sup>•</sup> LTTWM - Long Term Groundwater and Surface Water Monitoring

<sup>•</sup> Elevations provided in metres above sea level (mASL)

<sup>•</sup> Type 'O' indicates Open Hole

<sup>•</sup> Type 'S' indicates Standpipe

<sup>• (</sup>R) indicates Replacement Monitoring Well

N/A indicates information not available

<sup>•</sup> Type 'DW' indicates Domestic Well

<sup>·</sup> ND indicates Not Determined

<sup>•</sup> Shading indicates well is decommissioned / no longer monitored.

**Table A-1 Monitoring Well Details** 

	GPS Cod	ordinates		Well Pipe	Measuring Point	Ground	Screened	Geologic	
Well ID	(NAD 83	Zone 17)	Туре	Diameter	Elevation	Elevation	Interval	Formation	Monitoring Program
	Easting	Northing		mm	mASL	mASL	mASL or m	Monitored	riogiani
Domestic Wells									
1. RW1	560,654	4,915,472	DW	Drilled 152	508.75	508.57	Depth: 16.1 m	Amabel	LTT
2. RW2	560,955	4,915,330	DW	Drilled 152	505.20	504.50	Depth: 29.0 m	Amabel	LTT
3. RW3	559,271	4,916,187	DW	Drilled 152	519.00	518.70	Depth: 16.5 m	Amabel	LTT
RW4			DW	Drilled 152	510.50	509.80	Depth: 55.5 m	Amabel/Fossil Hill/	LTT
4. RW5	561,414	4,915,373	DW	Drilled 152	478.60	478.00	Depth: 35.0 m	Manitoulin/Shale	LTT
RW6			DW	Dug 800	451.00	451.00	Depth: 8.2 m	Overburden	LTT
5. RW7	561,701	4,914,943	DW	Drilled 152	453.00	452.30	Depth: 10.1 m	Overburden/Shale	LTT
6. RW8	560,669	4,917,079	DW	Dug 750	431.00	431.00	Depth: 3.5 m	Overburden	LTT
RW9			DW	Drilled 152	524.00	524.00	Depth: 27.4 m	Amabel	LTT
RW10			DW	Dug 750	494.50	Not surveyed	N/A	N/A	Historical
RW11			DW	Drilled 152	453.10	453.00	Depth: 48.8 m	Overburden/Shale	Historical
RW11 DUG			DW	Dug 750	453.00	453.00	Depth: 6.0 m	Overburden	Historical
7. RW12	561.826	4,915,816	DW	Dug	425.80	Not surveyed	Depth 3.7 m	Overburden	Historical
8. RW13	501,820	4,915,816	DW	Dug	425.80	Not surveyed	Depth 3.7 m	Overburden	Historical
RW15			DW	Drilled 152	529.74	529.19	Depth: 24.4 m	Amabel	Historical
9. RW16	560,474	4,915,397	DW	Drilled 152	513.32	512.48	Depth: 16.2 m	Amabel	LTT
10. RW17	558,976	4,915,443	DW	Drilled 127	514.70	Not surveyed	Depth: 8.5 m	N/A	LTT
RW18			DW	Dug 1000	513.80	513.00	Depth: 2.7 m	Overburden/Amabel	LTT
RW19			DW	Drilled 152	523.80	Not Surveyed	Depth: 36.3 m	Amabel	LTT

- Type 'O' indicates Open Hole
- Type 'S' indicates Standpipe
- Type 'DW' indicates Domestic Well
- (R) indicates Replacement Monitoring Well
  N/A indicates information not available
- ND indicates Not Determined
- Shading indicates well is decommissioned / no longer monitored.

<sup>•</sup> LTTWM - Long Term Groundwater and Surface Water Monitoring

<sup>•</sup> Elevations provided in metres above sea level (mASL)

**Table A-1 Monitoring Well Details** 

Well ID		ordinates	Туре	Well Pipe Diameter	Measuring Point Elevation	Ground Elevation	Screened Interval	Geologic Formation	Monitoring
Well ID	(NAD 83 Zone 17)  Easting Northing		i ype	mm	mASL	mASL	mASL or m	Monitored	Program
Carmarthen Lake Farms Moni	toring Wells								
CLF1			DW	152	521.05	520.76	Open Hole 36.6 m	Amabel/Fossil Hill	LTT
CLF2			DW	152	519.23	519.57	Open Hole 49.4 m	Amabel/Fossil Hill	LTT
1. CLF3	559,156	4,913,134	DW	152	517.62	517.11	Open Hole ND	Amabel	LTT
2. CLF4	559,380	4,913,266	DW	152	509.96	509.48	Open Hole 15.2 m	Amabel	LTT
3. CLF5	559,526	4,913,347	DW	152	509.16	508.80	Open Hole ND	Amabel	LTT
Offsite Monitoring Wells									
1. 101-B	557,929	4,914,109	0	152	502.98	502.51	Open Hole 6.1 m	Amabel	LTT
2. 102-C	558,319	4,914,489	0	102	511.39	510.53	Open Hole 7.0 m	Amabel	LTT
3. 103-D	558,523	4,914,172	0	152	513.40	513.18	Open Hole 7.9 m	Amabel	LTT
4. 104-A	558,215	4,914,020	0	152	517.67	516.89	Open Hole 9.6 m	Amabel	LTT
5. OW1-4	558,477	4,914,250	0	102	514.40	513.21	Open Hole 28.6 m	Amabel/Fossil Hill	LTT
OW1-6			0	102	514.96	513.92	Open Hole 30.0 m	Amabel/Fossil Hill	N/A
OW3-1			0	102	508.75	508.01	Open Hole 29.3 m	Amabel/Fossil Hill	LTT
6. OW5-2	557,888	4,914,245	0	102	504.21	502.84	Open Hole 27.9 m	Amabel/Fossil Hill	LTT
7. OW6-3	558,317	4,914,465	0	102	511.12	510.63	Open Hole 5.3 m	Amabel	LTT

- Type 'O' indicates Open Hole
- Type 'S' indicates Standpipe
- (R) indicates Replacement Monitoring WellN/A indicates information not available
- Type 'DW' indicates Domestic Well ND indicates Not Determined
- Shading indicates well is decommissioned / no longer monitored.

<sup>•</sup> LTTWM - Long Term Groundwater and Surface Water Monitoring

<sup>•</sup> Elevations provided in metres above sea level (mASL)

Table A-1 Monitoring Well Details

	GPS Cod	GPS Coordinates		Well Pipe	Measuring Point	Ground	Screened	Geologic	
Well ID	(NAD 83	Zone 17)	Туре	Diameter	Elevation	Elevation	Interval	Formation	Monitoring Program
	Easting	Northing		mm	mASL	mASL	mASL or m	Monitored	<b></b>
St. Mary's Cement Osprey Qu	arry Monitoring	Wells							
1. OW1-I					513.29	512.22	507.7 - 506.2	Amabel	
2. OW1-II					513.29	512.22	503.1 - 501.6	Amabel	
3. OW1-III					513.21	512.18	487.0 - 485.5	Amabel	
4. OW1-IV					513.21	512.18	482.8 - 481.3	Fossil Hill	
5. OW2-I					523.42	522.24	512.2 - 510.7	Amabel	
6. OW2-II					523.42	522.24	503.1 - 501.6	Amabel	
7. OW2-III	]				523.18	522.14	500.3 - 498.8	Amabel	
8. OW2-IV					523.18	522.14	480.2 - 478.7	Fossil Hill/Cabot Head	
9. OW3-I					516.34	515.57	511.1 - 509.6	Amabel	
10. OW3-II					516.34	515.57	500.2 - 498.7	Amabel	
11. OW3-III					516.58	515.53	494.7 - 493.2	Amabel	
12. OW3-IV					516.58	515.53	486.5 - 485.0	Amabel	
13. OW4-I					519.76	518.87	513.4 - 511.9	Amabel	
14. OW4-II	]				519.76	518.87	510.8 - 509.3	Amabel	
15. OW4-III					519.72	518.85	498.3 - 496.8	Amabel	
16. OW4-IV					519.72	518.85	492.9 - 491.4	Amabel	
17. OW5-I					510.75	510.01	503.5 - 502.0	Amabel	
18. OW5-II					510.75	510.01	499.3 - 497.8	Amabel	
19. OW5-III					510.85	510.06	493.8 - 492.3	Amabel	
20. OW5-IV					510.85	510.06	481.8 - 480.3	Fossil Hill/Cabot Head	
21. OW6-I					528.51	526.28	514.6 - 513.1	Amabel	
22. OW6-II					528.51	526.28	503.1 - 501.6	Amabel	
23. OW6-III					528.08	526.21	482.4 - 480.9	Amabel	
24. OW6-IV					528.08	526.21	477.3 - 475.8	Fossil Hill/Cabot Head	

<sup>•</sup> LTTWM - Long Term Groundwater and Surface Water Monitoring

<sup>•</sup> Elevations provided in metres above sea level (mASL)

<sup>•</sup> Type 'O' indicates Open Hole

<sup>•</sup> Type 'S' indicates Standpipe

<sup>• (</sup>R) indicates Replacement Monitoring Well • N/A indicates information not available

<sup>•</sup> Type 'DW' indicates Domestic Well

<sup>·</sup> ND indicates Not Determined

<sup>•</sup> Shading indicates well is decommissioned / no longer monitored.

**Table A-2 Surface Water Station Details** 

Designation		ordinates Zone 17)	Ground Elevation	Description	Culvert Dimensions	Monitoring	Measurement
	Easting	Northing	mASL		Dimensions	Program	Туре
1. SW1	559,117	4,914,254	513	Twin culverts located at southwest corner of quarry wetland at Grey County Road 31 (Townline Road)	South culvert dia. 0.62m, North culvert dia. 0.60m	PITM	V, M
2. SW2	559,070	4,914,769	515	Single culvert located at northwest corner of quarry wetland	Oblong shaped culvert	PITM	V,M
SWB-1			513	Single culvert located at southwest corner of quarry; outlet into quarry wetland	Oblong shaped culvert	Historical	-
QFSW1			500	Quarry floor influx from west face	Stream Channel Flow	Historical	-
3. QFSW2	559,825	4,914,595	499	Quarry floor surface water flow in channel prior to main sump pond	Stream Channel Flow	LTTWM	V
4. SW0-2	558,329	4,914,495	510	Stream Channel west of SW1 on Osprey Quarry Property	Stream Channel Flow	PITM	V,M
5. SW3	558,890	4,915,581	510	Single culvert located across Grey Rd 31 at north edge of proposed quarry property	Oblong shaped culvert	PITM	V,M,E
SW3A			511	Single culvert located under Grey Rd 31, just south of intersection with 26/27 Sideroad	Oblong shaped culvert	Historical	V,B,E
6. SW4	558,893	4,913,962	515	Single culvert located on Osprey 10th Line, east of Kenwell farm buildings	Culvert Diameter: 0.57 m	PTTW	E,V
SW5			499	Single concrete culvert located on Osprey 10th Line	4.91 m wide square concrete culvert	Historical	V
SW6			500	Single concrete culvert located on Osprey 10th Line	4.78 m wide square concrete culvert	Historical	V
7. SW6A	555,263	4,912,697	495	Double culvert on Osprey Sideroad 30, south of Osprey 10th Line	Stream Channel Flow	PITM	V
SW7			512	Millar pond outlet	Stream Channel Flow	LTTWM	V,E
8. SW8	560,355	4,915,502	510	Bridson pond outlet	Bucket Capture of Flow out of partial culvert	LTTWM	V,E
9. SW9	560,454	4,915,647	508	Channel flow beneath walking path into sinkhole on Bridson property	Stream Channel Flow	PITM	V,M,E
10. SW10	561,200	4,915,641	477	Seep uphill of B. Franks' well tile catchment	Stream Channel Flow	PITM	V,M,E

- LTTWM Long Term Groundwater and Surface Water Monitoring
- PTTW Permit to Take Water Monitoring
- Elevations provided in metres above sea level (mASL)
- Ground Elevation data approximated from Ontario Base Map elevation contours
- \* indicates historical surface water station that is not included in the PITM

- V indicates Valeport Electronic Flow Velocity Meter measurement
- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement
- Shading indicates surface water station is no longer monitored

**Table A-2 Surface Water Station Details** 

Designation		ordinates Zone 17)	Ground Elevation	Description	Culvert	Monitoring	Measurement
	Easting	Northing	mASL		Dimensions	Program	Туре
11. SW11	561,151	4,916,011	445	Culmination of B. Franks' seeps into a stream; taken near toe of scarp where stream passes beneath path	Stream Channel Flow	PITM	V,M,E
12. SW11A	561,128	4,916,011	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	PITM	V,M,E
13. SW11B	561,098	4,916,018	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	PITM	V,M,E
14. SW11C	561,079	4,916,034	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	PITM	V,M,E
15. SW11D	561,052	4,916,043	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	PITM	V,M,E
16. SW11E	561,238	4,915,997	435	Stream from B. Franks' seeps into pond; downstream from SW11 and just upstream of pond	Stream Channel Flow	PITM	V,E,B
SW12			435	Single culvert into B. Franks' pond from south	Bucket capture of flow out of culvert	Historical	V,E,B
SW12A			450	Single culvert near B. Franks' barn	Stream Channel Flow	Historical	V,E
17. SW13	561,288	4,916,042	427	B. Franks' pond outlet	Bucket capture of flow out of culvert	LTTWM	V,E,B
18. SW14	561,526	4,916,249	410	Channel flow east of Conc. 10, from culvert crossing Conc. 10 south of H. Franks' driveway	Stream Channel Flow	PITM	V
19. SW15	561,495	4,916,432	420	Channel flow east of Conc. 10, from culvert crossing Conc. 10 north of H. Franks' driveway	Stream Channel Flow	PITM	V
20. SW16	561,198	4,916,724	415	Single culvert under 26/27 Sideroad east of F. Sestito's property	Stream Channel Flow	PITM	Е
21. SW17	560,607	4,916,532	431	Sestito pond outlet channel on south side of 26/27 Sideroad, measured just west Sestito property driveway	Stream Channel Flow	PITM	V,M,E
22. SW17A	560,603	4,916,543	430	Stream channel on north side of 26/27 Sideroad, measured across from Sestito property driveway	Stream Channel Flow	PITM	V
SW17B			431	Stream channel on south side of 26/27 Sideroad, measured west of Sistito property driveway, upstream of where 17/17B join.	Stream Channel Flow	Historical	V
23. SW18	561,401	4,917,002	390	Single culvert on Concession 10, north of 26/27 Sideroad	Stream Channel Flow	PITM	V
24. SW19	564,257	4,915,492	335	Single large diameter culvert for Batteaux Creek on County Rd. 124	Stream Channel Flow	LTTWM	V
25. SW20	560,066	4,916,392	495	Concrete crib north of 26/27 sideroad adjacent to Pretty River Provincial Park/Bruce Trail	Stream Channel Flow	LTTWM	V,E

- LTTWM Long Term Groundwater and Surface Water Monitoring
- Elevations provided in metres above sea level (mASL)
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- · Shading indicates surface water station is no longer monitored

- V indicates Valeport Electronic Flow Velocity Meter measurement
- M indicates manual velocity measurement
- · indicates SW location not currently monitored for discharge volumes
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement



#### **Table A-2 Surface Water Station Details**

Designation	· / /			Description	Culvert Dimensions	Monitoring Program	Measurement Type
	Easting	Northing	mASL		2 monorene		. , , ,
26. SW21	560,308	4,916,284	430	H. Franks' pond outlet	Bucket capture of flow out of culvert	LTTWM	V,E,B
27. SW21A	561,246	4,916,261	433	H. Franks' pond inlet	Stream Channel Flow	LTTWM	V,E,B
28. SW21B	561,039	4,916,193	449	Cistern overflow channel uphill of H. Franks' pond, feeds pond inlet	Stream Channel Flow	LTTWM	V,M,E
29. SW21C	560,708	4,916,241	470	H. Franks' water supply system cistern inlet/overflow culvert	Stream channel Flow	PITM	V,E
SW21D			450	Single culvert under H. Franks field access trail at base of scarp	Bucket capture of flow out of culvert	Historical	V,B,E
30. SW22	560,686	4,914,713	492	Single culvert under ski trail west of Sampson fields	Bucket capture of flow out of culvert	LTTWM	V,B
31. SW22A	560,952	4,915,039	485	Seep feeding small stream in northwest corner of Sampson fields	Stream Channel Flow	LTTWM	В,Е
SW22B			477	Swamp/seep area on north side of access trail from Sampson fields to ski trails	Stream Channel Flow	Historical	-
32. SW22C	560,977	4,914,876	477	Culvert on south side of access trail from Sampson fields to ski trails. Culvert is infilled with sediment and channel is relatively flat. Treated as stream flow.	Stream Channel Flow just downstream of culvert	LTTWM	V
SW23			410	Single culvert crossing 26/27 Sideroad west of Concession 10	Bucket capture of flow out of culvert	Historical	-
SW24			445	F. Sestito's pond inlet from H. Franks' property	Stream Channel Flow	Historical	V,M,E
33. SW24A	560,566	4,916,379	460	F. Sestito's water supply: barrel overflow and pipe discharges (below Manitoulin formation outcrop)	Bucket capture of flow out of pipes, Valeport measurement of stream channel	PITM	V,B,E
SW24B			445	Seep channel just up from F. Sestito's garden	Bucket capture of flow out of pipes, Valeport measurement of stream channel	Historical	V,B,E
SW24C			442	Stream just east of where SW24A and SW24B combine and upstream of outlet into Sistito pond.	Stream Channel Flow	Historical	V
SW25			507	Single culvert outlet into swamp southwest of Edward Lake; fed by Edward Lake and open grate in the ditch north of SW25	Culvert Diameter: 0.62 m	Historical	-
SW25A			508	Channel outlet from Edward Lake into a culvert which crosses beneath Grey Road 31. Only monitored when input from open grate/ditch is observed when monitoring SW25.	Stream Channel Flow	Historical	-

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- Elevations provided in metres above sea level (mASL)
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- Shading indicates surface water station is no longer monitored

- V indicates Valeport Electronic Flow Velocity Meter measurement
- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement



**Table A-2 Surface Water Station Details** 

	GPS Coordinates (NAD 83 Zone 17)		Ground Elevation	Description	Culvert Dimensions	Monitoring Program	Measurement Type
Designation							
	Easting	Northing	mASL		2	i regram	.,,,,,
SW26			507	Channel flow upstream of sinkhole on ski trails near unopened road allowance for 21/22 Sideroad	Stream Channel Flow	Historical	-
SW26A			512	Two culverts upstream of SW26 sinkhole	East Culvert Diameter: 0.38 m West Culvert: Oblong Shaped	Historical	-
SW27			462	Culmination of SW27A and SW27B	Stream Channel Flow	Historical	-
SW27A			492	Groundwater seep, located east of SW28, east of Bruce Trail	Stream Channel Flow	Historical	-
SW27B			497	Groundwater seep, located north-west of SW27A, east of Bruce Trail	Stream Channel Flow	Historical	-
34. SW77	560,150	4,916,292	494	Groundwater seep, located south-east of SW20, west of Bruce Trail	Stream Channel Flow	PITM	V
SW3B (RR3 KARST)			510	RR3 Wetland Karst Sink Point Channel, west of Grey County Road 31, downstream of SW3 and SW3C.	Stream Channel Flow	PITM	V
SW3C (RR3 OUT)			510	RR3 Wetland outflow from pond that is downstream of SW3. West of Grey County Road 31.	Stream Channel Flow	LTTWM	V
35. PR Control	558,059	4,918,224	360	Pretty River Control Station on 30/31 Sideroad. Flow measured on south side of road, upstream of culvert.	Stream Channel Flow	PITM	V
36. BC Control	563,251	4,914,197	405	Batteaux Creek Control Station on 21/22 Sideroad. Flow measured on north side of road, downstream of culvert.	Stream Channel Flow	PITM	V
37. BH03-7 SG1	559,349	4,915,519	510.5	Pretty River Control Station on 30/31 Sideroad. Flow measured on south side of road, upstream of culvert.	Stream Channel Flow	PITM	V
38. BH03-7 SG2	559,323	4,915,530	310.5	Batteaux Creek Control Station on 21/22 Sideroad. Flow measured on north side of road, downstream of culvert.	Stream Channel Flow	PITM	V

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- Elevations provided in metres above sea level (mASL)
- Ground Elevation data approximated from Ontario Base Map elevation contours
- \* indicates historical surface water station that is not included in the PITM
- · Shading indicates surface water station is no longer monitored

- V indicates Valeport Electronic Flow Velocity Meter measurement
- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement

## **APPENDIX**

## A-3 BOREHOLE LOGS

#### BOREHOLE LOG EXPLANATION FORM

This explanatory section provides the background to assist in the use of the borehole logs. Each of the headings used on the borehole log, is briefly explained.

#### **DEPTH**

This column gives the depth of interpreted geologic contacts in metres below ground surface.

#### STRATIGRAPHIC DESCRIPTION

This column gives a description of the soil based on a tactile examination of the samples and/or laboratory test results. Each stratum is described according to the following classification and terminology.

<u>Soil Cla</u>	ssification *	<u>Terminology</u>	<u>Proportion</u>
Clay	<0.002 mm		
Silt	0.002 to 0.06 mm	"trace" (eg. trace sand)	<10%
Sand	0.06 to 2 mm	"some" (eg. some sand)	10% - 20%
Gravel	2 to 60 mm	adjective (eg. sandy)	20% - 35%
Cobbles	60 to 200 mm	"and" (eg. and sand)	35% - 50%
Boulders	>200 mm	noun (eg. sand)	>50%

<sup>\*</sup> Extension of MIT Classification system unless otherwise noted.

The use of the geologic term "till" implies that both disseminated coarser grained (sand, gravel, cobbles or boulders) particles and finer grained (silt and clay) particles may occur within the described matrix.

The compactness of cohesionless soils and the consistency of cohesive soils are defined by the following:

#### **COHESIONLESS SOIL**

#### COHESIVE SOIL

Compactness	Standard Penetration Resistance "N", Blows / 0.3 m	Consistency	Standard Penetration Resistance "N", Blows / 0.3 m
Very Loose	0 to 4	Very Soft	0 to 2
Loose	4 to 10	Soft	2 to 4
Compact	10 to 30	Firm	4 to 8
Dense	30 to 50	Stiff	8 to 15
Very Dense	Over 50	Very Stiff	15 to 30
•		Hard	Over 30

The moisture conditions of cohesionless and cohesive soils are defined as follows.

#### COHESIONLESS SOILS

#### COHESIVE SOILS

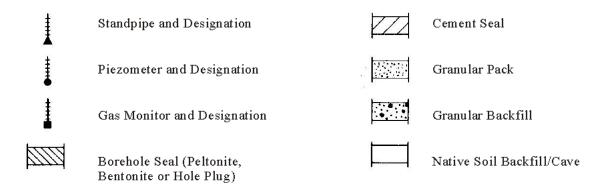
Dry	DTPL	-	Drier Than Plastic Limit
Moist	APL	-	About Plastic Limit
Wet	WTPL	-	Wetter Than Plastic Limit
Saturated	MWTPL	-	Much Wetter Than Plastic Limit

#### **STRATIGRAPHY**

Symbols may be used to pictorially identify the interpreted stratigraphy of the soil and rock strata.

#### **MONITOR DETAILS**

This column shows the position and designation of standpipe and/or piezometer ground water monitors installed in the borehole. Also the water level may be shown for the date indicated.



Where monitors are placed in separate boreholes, these are shown individually in the "Monitor Details" column. Otherwise, monitors are in the same borehole. For further data regarding seals, screens, etc., the reader is referred to the summary of monitor details table.

#### SAMPLE

These columns describe the sample type and number, the "N" value, the water content, the percentage recovery, and Rock Quality Designation (RQD), of each sample obtained from the borehole where applicable. The information is recorded at the approximate depth at which the sample was obtained. The legend for sample type is explained below.

```
SS =
        Split Spoon
                                        GS =
                                                Grab Sample
ST =
        Thin Walled Shelby Tube
                                        CS =
                                                Channel Sample
        Auger Flight Sample
                                        WS =
                                                Wash Sample
        Continuous Core
                                       RC =
                                                Rock Core
% Recovery
                 Length of Core Recovered Per Run x 100
```

% Recovery = Length of Core Recovered Per Run x 100

Total Length of Run

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundness of the rock mass. It is obtained from the rock cores by summing the length of core recovered, counting only those pieces of sound core that are 100 mm or more in length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

RQD Classification	<u>RQD (%)</u>
Very poor quality	< 25
Poor quality	25 - 50
Fair quality	50 - 75
Good quality	75 - 90
Excellent quality	90 - 100

#### TEST DATA

The central section of the log provides graphs which are used to plot selected field and laboratory test results at the depth at which they were carried out. The plotting scales are shown at the head of the column.

Dynamic Penetration Resistance - The number of blows required to advance a 51 mm diameter, 60° steel cone fitted to the end of 45 mm OD drill rods, 0.3 m into the subsoil. The cone is driven with a 63.5 kg hammer over a fall of 750 mm.

Standard Penetration Resistance - Standard Penetration Test (SPT) "N" Value - The number of blows required to advance a 51 mm diameter standard split-spoon sampler 300 mm into the subsoil, driven by means of a 63.5 kg hammer falling freely a distance of 750 mm. In cases where the split spoon does not penetrate 300 mm, the number of blows over the distance of actual penetration in millimetres is shown as  $\frac{xBlows}{}$ 

Water Content -	The ratio of the mass of water to the mass of oven-dry solids in the soil expressed as a percentage.
$W_P$ -	Plastic Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.
W <sub>L</sub> -	Liquid Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

#### REMARKS

The last column describes pertinent drilling details, field observations and/or provides an indication of other field or laboratory tests that were performed.

PROJECT NO.: 930521.50

**DATE: DECEMBER 14,15 1998** 

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: ESTIMATED 516 mASL REVIEWER: AJC

			ST			SAN	PLE	RATE OF	HYDRAULIC	
DEP		STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR	₹ .	% 22		DRILL PENETRATION	CONDUCTIVITY  m / sec	REMARKS
(m	1)		3RAPI	DETAILS	)   TAE	RECOVERY	RQD	, .		
0			¥			꼭	8	m / min		
		OVERBURDEN: MEDIUM TO DARK BROWN CLAYEY SILT TILL, BECOMING SANDY BELOW			AS					ORIGINAL GROUND SURFACE ELEVATION HAS
		3.1 m.								CHANGED DUE TO QUARRY OPERATIONS. LOCATED IN SOUTHWEST
2		- CUTTING RETURNS WET BELOW 1.8 m								CORNER OF EXISTING QUARRY.
				102				]		108 mm ID HOLLOW
			0	2 mm						STEM AUGERS USED IN OVERBURDEN.
			OVERBURDEN	=						CASING STICKUP
4			BUR	CASING						102 mm CASING SET TO
			ΩĘ	ဂ						8.4 m.
			_							
6										
	7.6			Щ ,	H	400				
8		<u>DOLOSTONE</u> : LIGHT BROWNISH GREY TO VERY LIGHT GREY COLOUR, CHALKY			RC	100	69	⊢ N/A		
		APPEARANCE, MEDIUM GRAINED, FOSSIL REMNANTS. (AMABEL FORMATION, UNIT 2)								
		- 230 mm VERTICAL FRACTURE AT 9.1 m.			RC	100	16	0.29	5	
10		- VUGS 1-2% UNIFORMLY DISTRIBUTED		OPEN				_	1.7X10 <sup>-5</sup>	
				HQ HQ	RC	100	88	0.28		
			Þ							
12			AMABEL	BOREHOLE	RC	100	83	0.28		
		- HORIZONTAL TO SUBHORIZONTAL BEDDING		im					7.8X10	,
			FORI							
14					RC	100	10	0.29		
			ᅙ							
			MATION UNIT		RC	100	97	0.31		
16			IT 2			100				,
									1.5X10	
					RC	100	10	0.31		
18										
					RC	100	97	0.27		NOTE:
								··[	1.3X10 <sup>±6</sup>	AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
					RC	100	97	0.32		FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION
20 Tecomo T				LIDDATE				_		

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: ESTIMATED 516 mASL

PROJECT NO.: 930521.50

**DATE: DECEMBER 14,15 1998** 

GEOLOGIST: KJF

REVIEWER: AJC

			s,		SAMPLE	RATE OF	HYDRAULIC			
DE	EPTH .	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR		%		DRILL PENETRATION	CONDUCTIVITY m / sec	REMARKS
	(m)		GRAP	DETAILS	JYPE	RECOVERY	RQD	_	E-"	
20			¥			ÉRY	(%)	m / min		
		DOLOSTONE: (CONT) 150 mm REEFAL FACIES BED AT 19.9 m							1.3×10	ORIGINAL GROUND SURFACE ELEVATION HAS
										CHANGED DUE TO QUARRY OPERATIONS. LOCATED IN SOUTHWEST
22			≥		RC	100	95	0.28		CORNER OF EXISTING QUARRY.
			AMABE						6 3.0×10	
					RC	100	100	0.26		
			FOR							
24			ORMATION UNIT							
			ᅙ		RC	100	87	0.28		
			Ž						8.0x10 -7	
26			IT 2	OPEN	RC	100	100	N/A	0.000	
				HQ B						
				BOREHOLE	RC	100	92	0.26		
28		- GRADATIONAL LOWER CONTACT OVER ±1 m.		E	, KC	100	82	0.26		
		– FIRST STYLOLITE AT 28.3 m.								
	29.1				RC	100	63	N/A	2.6x10 /	
		DOLOSTONE: CREAMY GREY TO GREY BROWN COLOURED, FINE TO MEDIUM GRAINED,	Ţ		RC	100	89	N/A		
30		STYLOLITES AND SHALE 1 mm TO 10 mm THICK INCREASING FREQUENCY WITH DEPTH.	SSO							
			SIL H		RC	100	68	0.15		
			HILL						-8	
32			FORMATION		RC	100	83	0.13	6.9×10	
			MAI							
			N N		RC	100	11	0.13		
34	34.0		_							
		SHALE: GREENISH GREY, CALCAREOUS. (CABOT HEAD FORMATION)	СН							
	35.1	BOREHOLE TERMINATED AT 35.1 m IN			-					
36		SHALE.				<u> </u>				
					ļ					
38					ļ	ļ				
										NOTE:
					ļ					AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
										FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION
40										

PROJECT NO.: 930521.50

**DATE: DECEMBER 15,16 1998** 

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

	PLE TYPE: HQ SIZED (64 mm) ROC		GEOLOGIST						
ROUND	ELEVATION: 525.9 mASL							_ REVIEWER:	AJC
		STF			SAMPI	.E	RATE OF	HYDRAULIC	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONIT DETAI	ТҮРЕ	% RECOVERY	RQD (%)	DRILL PENETRATION  m / min	CONDUCTIVITY  m / sec  E-" E-4	REMARKS
0.6	OVERBURDEN: MEDIUM BROWN CLAYEY SILT TILL.		102				N. /A		LOCATED IN NORTHWE
	DOLOSTONE: LIGHT BROWNISH GREY TO VERY LIGHT GREY, MEDIUM TO COARSE GRAINED WITH A CRAGGY APPEARANCE, IRREGULAR BEDDING. (AMABEL FORMATION, UNIT 1)		mm ID CAS	RC	47 95	65	N/A 0.26		QUARRY.  102 mm CASING SET AT 1.7 m.
	- FOSSILS THROUGHOUT		CASING	RC	100	55	0.23		
	- IRREGULARLY SHAPED VUGS 2-3% - OCCASIONAL FLANK FACIES UNITS INTERBEDDED UP TO 300 mm THICK.			RC	100	66	0.24		
	- BROWN CLAYEY SILT INFILLING WITH RUSTY STAINING ON FRACTURES AND VUGS								
		AMA		RC	100	88	0.23		
		AMABEL F		RC	100	88	0.24	-6:	
		FORMATION UNIT		RC	100	100	0.25	6.7X10	
		ON UNII							
			OPEN HQ	RC	100	93	0.28	7.8X10 <sup>-6</sup>	
			BOREHOLE	RC	100	73	0.27		
				RC	100	88	0.28	6	
				RC	100	89	0.37	2.2X10 <sup>-6</sup>	
				RC	100	79	0.23		
								1.0X10 <sup>-6</sup>	

0.27

0.27

NOTE:

AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION

RC 100 85

RC 100 92

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: 525.9 mASL

PROJECT NO.: 930521.50

**DATE: DECEMBER 15,16 1998** 

GEOLOGIST: KJF

REVIEWER: AJC

		2		SAMPLE		RATE OF	HYDRAULIC		
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION  m / min	CONDUCTIVITY	REMARKS
20 20.1	DOLOSTONE: (CONT)				~				LOCATED IN NORTHWEST
20.1	DOLOSTONE: LIGHT GREY, MEDIUM GRAINED WITH A DULL CHALKY APPEARANCE, SLIGHT RUSTY STAINING THROUGHOUT, UNIFORM DISTRIBUTION OF VUGS, 1–2%, HORIZONTAL TO SUBHORIZONTAL BEDDING. (AMABEL FORMATION, UNIT 2)			RC	100	95	0.22	3.2X10 <sup>-7</sup>	CORNER OF EXISTING QUARRY.
24	- BECOMING DARKER GREY WITH DEPTH	AMABEL FO		RC	100	95	0.25	8.5X10	
	- 0.2 m REEFAL FACIES AT 25.9 m AND 34.7 m.	FORMATION UNIT		RC RC	100	100	0.20 0.28		
26		UNIT 2	OPEN HQ BOR	RC	100	90	0.34	8.5X10 <sup>-7</sup>	
28			BOREHOLE	RC	100	92	0.29		
30				RC	100	85	0.26	6.3x10 <sup>-7</sup>	
32				RC	100	90	0.29		
34					100	95	0.28	3.4x10 <sup>-7</sup>	
36				RC	100	93	0.31		
				RC	100	92	0.26	1.4X10 <sup>-6</sup>	
38				RC	100		0.23	5-7	NOTE:  AMABEL FORMATION:  UNIT 1: REEFAL FACIES
40				RC	100	95	N/A	1.7810	UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: 525.9 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 15,16 1998

GEOLOGIST: KJF

REVIEWER: AJC

			v,		SAMPLE			.E	RATE OF	HYDRAULIC	
DE	PTH	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MON	ITOR		% 70		DRILL PENETRATION	CONDUCTIVITY  m / sec	REMARKS
'	(m)		SRAPI	DET	AILS	ТҮРЕ	RECOVERY	RQD (	m / min		
40		DOLOSTONE: (CONT)	₹				₹	(%)	111 / 111111		LOCATED IN NORTHWEST
		DOLOSTONE: (CONT)	UNIT							1.7X10	
		<ul> <li>GRADATIONAL LOWER CONTACT OVER</li> <li>±1 m INTERVAL</li> </ul>	IT 2			RC	100	85	0.22		FIRST STYLOLITE AT 40.6 m.
42	41.8										
		DOLOSTONE: MEDIUM GREY TO BUFF GREY WITH A CREAMY APPEARANCE, FINE GRAINED.	П			RC	100	73	0.17	3.1X10	3
		- STYLOLITES AND OCCASIONAL THIN SHALE	OSSIL		2					3.1810	
44		INTERBEDS UP TO 2 mm THICK	F	7 7 2		l 					
			₽	2		RC	100	75	0.17		
			FORMATION	מטאנידטני	) H38						
46			MA		<u> </u>	RC	43	41	0.19	4.1X10	3
			S S							4.1710	
						RC	N/A	N/A	0.01		
	48.0	- 105 mm SHALE BED AT 47.5 m.									
48	48.0 48.5	SHALE: GREENISH GREY, CALCAREOUS.	오	1							
		(CABOT HEAD FORMATION)  BOREHOLE TERMINATED AT 48.5 m IN									
		SHALE.									
50											
52											
54											
56											
58						ļ					
											NOTE:
											AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
60											FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: JANUARY 18,19 1999

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: 519.4 mASL REVIEWER: AJC

			٥.				s	AMPL	E				
	PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY		NITOR TAILS	ТҮРЕ			% RECOVERY	RQD	DRILL PENETRATION	WATER CONTENT % 10 20 30	REMARKS
0			¥						ERY	8	m/min	W <sub>P</sub> W <sub>L</sub>	
2	2.3	OVERBURDEN: MEDIUM BROWN FILL AND SILTY CLAY TILL.	OVERBURDEN		102 mm ID CASING	AS							LOCATED IN CENTRAL PART OF EXISTING QUARRY ON QUARRY FLOOR.  102 mm ID CASING SET TO 3.1 m.
-	2.3	DOLOSTONE: INTERBEDDED REEFAL AND		₩;	ਫ਼ ┌┼	RC			100	0 58	N/A N/A		CASING STICKUP 230 mm.
4		FLANK FACIES, LIGHT GREY TO BUFF GREY WITH A FAINT RUSTY TINGE, CHALKY APPEARANCE, MEDIUM TO COARSE GRAINED, IRREGULARLY SHAPED VUGS 1-4%, FOSSILS AND FOSSIL REMNANTS.											BROKEN BEDROCK AT SURFACE 1.8 m TO 2.3 m.
		(AMABEL FORMATION, UNIT 2/1)	AMABEL			RC			100	100	0.17		
6						RC			100	97	0.29		
			FORMATION UNIT										
8			INU NC			RC			100	68	0.30		
			「2/1			RC			100	92	0.26		
10	11.0				OPEN	RC			100	90	0.37		
12		DOLOSTONE: LIGHT TO MEDIUM GREY, WITH A RUSTY TINGE TO 27.7 m, MEDIUM GRAINED, HORIZONTAL TO SUBHORIZONTAL		;	둉	RC			100	82	0.28		
		BEDDING. (AMABEL FORMATION, UNIT 2)	Þ		BOREHOLE								
14		- VUGS 1-2%, UNIFORMLY DISTRIBUTED  - OCCASIONAL REEFAL FACIES BEDS UP TO 0.1 m THICK FROM 11.0 m TO 16.1 m.	AMABEL			RC			100	82	0.27		
		- FOSSIL REMNANTS	т			RC			100	95	0.25		
16			ORMATION UNIT								0.74		
			UNIT 2			RC			100	88	0.34		
18						RC			100	100	0.32		NOTE: AMABEL FORMATION:
													AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION
20						RC			100	81	0.31		

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: JANUARY 18,19, 1999

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: 519.4 mASL REVIEWER: AJC

			s			S	AMPL	E				
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	ТҮРЕ			% RECOVERY	RQD (	DRILL PENETRATION	WATER CONTENT % 10 20 30	REMARKS
20			*					- <del>2</del> 2	8	m/min	W <sub>P</sub> W <sub>L</sub>	
		DOLOSTONE: (CONT)			RC			100	100	0.29		LOCATED IN CENTRAL PART OF EXISTING QUARRY ON QUARRY FLOOR.
22			AM.		RC			100	95	0.29		
24			AMABEL FO		RC			100	92	0.37		
26			FORMATION UNIT	OF	RC			100	98	0.27		
			UNIT 2	OPEN HQ BOR	RC			100	92	N/A		
28				BOREHOLE	RC			100	94	0.22		
30		- FIRST STYLOLITE AT 30.6 m.			RC			100	100	0.26		
32	31.9	GRADATIONAL LOWER CONTACT OVER ±1 m.  DOLOSTONE: LIGHT TO MEDIUM GREY TO			RC			100	93	N/A		
		CREAMY BUFF GREY, BECOMING DARKER WITH DEPTH, FINE GRAINED.  - OCCASIONAL STYLOLITES AND THIN SHALE BEDS UP TO 2 mm	FOSSIL		RC			100	87	0.14		
34		- ARGILLACEOUS BELOW 37.5 m	HLL		RC			100	88	0.17		
36			FORMATION		RC			98	55	0.26		
38	37.8	- 110 mm SHALE BED AT 37.3 m.  SHALE: GREENISH GREY, CALCAREOUS. /	_		RC			30		0,20		
	37.9	(CABOT HEAD FORMATION)  BOREHOLE TERMINATED AT 37.9 m IN SHALE.	СН									NOTE:  AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES UNIT 2: FLANK FACIES
40						ļ						FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: 522.2 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 22,23 1998

GEOLOGIST: KJF

REVIEWER: AJC

			v,			:	SAMPL	.E					
	PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE			% RECOVERY	RQD	DRILL PENETRATION	10 2	TER ENT % 20 30	REMARKS
0			PΗΥ		"			)VERY	8	m/min	⊢ W <sub>P</sub>	WL	
		OVERBURDEN: GRAVEL FILL, LIGHT GREY, DRY TO MOIST.			AS						117	1 1	LOCATED IN CENTRAL PART OF EXISTING
		(FOUNDATION FOR PLANT)											QUARRY ON QUARRY
		,	9	102									102 mm ID CASING SET TO 5.6 m.
2			ER.	3 3									
			OVERBURDEN	D C									
			DEV	CASING									
1			_	,									
	4.0												
	4.9	DOLOSTONE: LIGHT GREY BROWN TO BUFF			RC			73	0	N/A			
6		GREY WITH A MOTTLED APPEARANCE, MEDIUM TO COARSE GRAINED.											BROKEN BEDROCK SURFACE.
		(AMABEL FORMATION, UNIT 1)  - IRREGULAR SHAPED VUGS INCREASING TO			RC			100	76	0.22			
		5-6% BELOW 17.4 m.											
		- BROWN CLAYEY SILT INFILLING WITH			RC			100	48	0.25			
3		RUSTY STAINING ON FRACTURES AND VUGS.											
					RC			100	82	0.00			
					, RC			100	02	0.22			
0		- FOSSILS THROUGHOUT			-								
				유	RC			100	92	0.22			
				OPEN H									
 2			M	HQ BC									
			AMABEL	BOREHOLE	RC			100	82	0.21			
			П										
4			ORMATION UNIT		RC			100	46	0.27			
			IΑ										
			2		RC			100	53	0.25			
			<u>Z</u>										
6			<b>T</b> 1										
					RC			100	58	0.26			
							ļ	ļ	ļ				
8					50	ļ		100		0.05			
					RC			100	83	0.25			NOTE: AMABEL FORMATION:
													UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
20					RC		ļ	100	65	0.26			FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATIO

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: DECEMBER 22,23 1998

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: 522.2 mASL REVIEWER: AJC

			οį			8	SAMPL	E				
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	ТҮРЕ	'N' VALUE	% WATER	% RECOVERY	RQD	DRILL PENETRATION	WATER CONTENT % 10 20 30	REMARKS
20			НҮ			Æ		ERY	%	m/min	W <sub>P</sub> W <sub>L</sub>	
		DOLOSTONE: (CONT)	AΜ									LOCATED IN CENTRAL PART OF EXISTING
			AMABEL		RC			100	55	N/A		QUARRY ON QUARRY FLOOR.
			E									
22			TINU									
	22.9											
		DOLOSTONE: LIGHT BUFF GREY TO A MEDIUM			RC			100	68	N/A		
24		GREY WITH A CHALKY APPEARANCE, MEDIUM TO FINE GRAINED, HORIZONTAL TO										
		SUBHORIZONTAL BEDDING. (AMABEL FORMATION, UNIT 2)			RC			100	48	0.23		
		- FAINT RUSTY STAINING THROUGHOUT										
		- FAINT ROSTI STAINING THROUGHOUT	A									
26			AMABE	OPEN	RC			100	84	0.26		
			FORMATION	HQ B	RC			98	95	0.27		
			<b>√</b> M2	BOREHOLE								
28			TIC	E								
		-VUGS 1-2% WITH A UNIFORM DISTRIBUTION	ž									
			TINU		RC			100	93	0.23		
30			2									
										0.00		
		- FOSSIL REMNANTS THROUGHOUT			RC			98	94	0.26		
32		- GRADATIONAL LOWER CONTACT OVER ±1 m			RC			98	95	0.25		
		- FIRST STYLOLITE AT 32.7 m.								0.25		
	33.4	TIMON GYTESENE 711 SE.7 III.										
34		DOLOSTONE: LIGHT GREY TO MEDIUM		1	RC			100	55	0.22		
34		CREAMY GREY TO BROWN, FINE TO MEDIUM GRAINED.										
			F					100	100	0.20		
			FOSSIL		RC			100	100	0.20		
36		- OCCASIONAL STYLOLITES AND SHALE										
		INTERBEDS UP TO 2 mm THICK	HILL		RC	ļ	ļ	100	87	0.19		
			П					100		0,13		
			ORMATION									
38			ΑTI		RC			100	98	0.29		
			8		1.0				-55			NOTE: AMABEL FORMATION:
		- PYRITE CRYSTALS AT 39.0 m.										UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
40					RC	ļ	ļ	100	N/A	0.20		FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION
40	Ham I	<u> </u>		LIDDATE		Ц				-::		1

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: DECEMBER 22,23 1998

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: 522.2 mASL REVIEWER: AJC

			S		SAMPLE							
DE	EPTH .	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR				% 70		DRILL PENETRATION	WATER CONTENT %	REMARKS
	(m)		GRAP	DETAILS	TYPE			RECOVERY	R Q		10 20 30	
40								ERY	%	m/min	W <sub>P</sub> W <sub>L</sub>	
	40.6	DOLOSTONE: (CONT)  – 80 mm SHALE BED AT 40.1 m.	포	OPEN HQ BOREHOLE								LOCATED IN CENTRAL PART OF EXISTING
	41.2	SHALE: GREY GREENISH, CALCAREOUS. (CABOT HEAD FORMATION)	CH	HOLE								QUARRY ON QUARRY FLOOR.
		BOREHOLE TERMINATED AT 41.2 m IN		11'1 1								
42		SHALE.										
44												
46												
48												
50												
52												
54												
						ļ			ļ			
56												
						ļ			ļ			
58					ļ	<b> </b>			<u> </u>			NOTE:
												AMABEL FORMATION: UNIT 1: REEFAL FACIES
						ļ						UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION
60						ļ						CH: CABOT HEAD FORMATION
	Hns L			UPDATE								

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: 526.7 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 21, 1998

GEOLOGIST: KJF

			s.				SA	MPL	<u> </u>				
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE				% RECOVERY	RQD	DRILL PENETRATION	WATER CONTENT %	REMARKS
0			НҮ						ERY	(%)	m/min	W <sub>P</sub> W	L
		OVERBURDEN: CLAYEY SILT, MEDIUM BROWN.			AS								LOCATED IN NORTHEAST CORNER OF EXISTING
			0	102									QUARRY.  102 mm ID CASING SET
			VER	mm									TO 5.6 m.
2			≀BU				+						BOREHOLE SET INTO BERM
			OVERBURDEN	CASING									BONEROLE SET INTO BENIE
			Ë	ର									
4	4.0				RC				77	0	N/A		
		DOLOSTONE: LIGHT GREYISH BROWN TO MOTTLED GREYISH BUFF BROWN			RC				100	46	N/A		
		APPEARANCE. MEDIUM TO COARSE GRAINED, CRAGGY APPEARANCE, FOSSILS THROUGHOUT.			1.0								
		(AMABEL FORMATION, UNIT 1)							100		0.00		
6		- IRREGULARLY SHAPED VUGS 2-3%			RC		+		100	82	0.29		
		- SOME CLAYEY SILT INFILLING AND RUSTY											
		STAINS ON FRACTURES			RC				100	83	0.16		
8													
			ΑM		RC				100	93	0.16		
10			AMABI				+						
			ELF	OPEN	RC				100	80	0.30		
			ÖR	HQ HQ									
12			ORMATION UNIT										
			ΠO	BOREHOLE	RC				100	88	0.30		
			2	OLE									
			1		RC				100	97	0.31		
14			_				+						
					RC				100	95	0.26		
16													
	16.7								100	100	0.71		
	10.7	DOLOSTONE: LIGHT TO MEDIUM BROWN GREY	Ą		RC				100	100	0.31		
		WITH FAINT RUSTY STAINING THROUGHOUT, MEDIUM GRAINED, CHALKY APPEARANCE.	AMABEL FORMATION UNIT 2										
18		(AMABEL FORMATION, UNIT 2)	SE.		RC	ļ			100	100	0.26		
					i NC	1			100		0.20		NOTE: AMABEL FORMATION:
			MAT		DC.				100	0.7	1 1		UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
20			NO.		RC				100	97	N/A		FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION
	TT T			-									

PROJECT NO.: 930521.50

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: DECEMBER 21, 1998

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: 526.7 mASL REVIEWER: AJC

		οί			s	AMPL	E.				
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE			% RECOVERY	RQD	DRILL PENETRATION	WATER CONTENT % 10 20 30	REMARKS
20		폭					YERY	8	m/min	W <sub>P</sub> W <sub>L</sub>	
	DOLOSTONE: (CONT)										LOCATED IN NORTHEAST CORNER OF EXISTING
				RC			100	96	0.37		QUARRY.
22											
	- VUGS 1-2% WITH A UNIFORM DISTRIBUTION			RC			100	90	0.34		
	- FOSSIL REMNANTS										
24	- HORIZONTAL TO SUBHORIZONTAL BEDDING	AMABEL									
		BEL		RC			100	52	0.29		
26		Ř.		RC			100	52	0.37		
		FORMATION	유								
		ž	OPEN +	RC			100	80	0.29		
		UNIT	HQ Bg								
28		2	BOREHOLE								
			[튜	RC			100	95	0.32		
							ļ	ļ			
30											
				RC			100	87	0.29		
	- FIRST STYLOLITE AT 30.9 m.										
32				RC			100	97	0.28		
	- BECOMING FINER GRAINED AND LESS										
	VUGGY BELOW 32.5 m.			RC			100	92	0.25		
34											
				BC.			100		0.29		
	- GRADATIONAL LOWER CONTACT OVER ±2 m INTERVAL			RC			100	90	0.28		
36 36.0											
	DOLOSTONE: MEDIUM GREY TO LIGHT CREAMY GREY, MEDIUM TO FINE GRAINED,	FOSSIL		RC	ļ		100	97	0.17		
	OCCASIONAL THIN SHALE LAMINAE OR STYLOLITE UP TO 2 mm THICK.	II									
38	- INCREASING SHALE CONTENT BELOW 37.5 m.	를		ļ	<u> </u>		<u> </u>	<u> </u>			
		FOR		RC			100	89	N/A		NOTE:
	- MINOR PYRITE MINERALIZATION AT 39.5 m AND 40.8 m.	FORMATION					ļ	ļ			AMABEL FORMATION: UNIT 1: REEFAL FACIES
		NO.		RC			100	97	N/A		UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION
40 Has			UPDATE					<u> </u>			CH: CABOT HEAD FORMATION

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: 526.7 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 21, 1998

GEOLOGIST: KJF

		S.			s	AMPL	E				
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	ТҮРЕ			% RECOVERY	RQD (	DRILL PENETRATION  m/min	WATER CONTENT % 10 20 30	REMARKS
40		~					~	8		W <sub>P</sub> W <sub>L</sub>	
	DOLOSTONE: (CONT)										LOCATED IN NORTHEAST CORNER OF EXISTING
	50 CUM 5 DED AT 44.0	포	OPEN				0.7	0.7	N/A		QUARRY.
	- 50 mm SHALE BED AT 41.6 m.	_	₩	RC			97	97	N/A		
42 42 1	- PYRITE CRYSTALS AT 41.8 m IN 20 mm VUG.		모								
72.1	SHALE: GREENISH GREY, CALCAREOUS.	СН	+	RC			100	0	0.17		
42.4	(CABOT HEAD FORMATION)	7		1							
	BOREHOLE TERMINATED AT 42.4 m IN SHALE.										
	STIPLE.										
44											
46											
48											
50											
52				ļ	ļ			ļ			
					······			·····			
54								·····			
					ļ						
					ļ		ļ	ļ			
							ļ				
56											
				ļ	ļ			ļ			
				ļ	·····						
					·····						
58					İ						
											NOTE:
											AMABEL FORMATION: UNIT 1: REEFAL FACIES
				ļ	ļ		ļ				UNIT 2: FLANK FACIES
					ļ		ļ	ļ			FH: FOSSIL HILL FORMATION CH: CABOT HEAD FORMATION
60 Ham I			LIDDATE				L				

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE

GROUND ELEVATION: 522.3 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 17,18,19 1998

REVIEWER: AJC

			S				SAMPLE						
	:PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONIT DETAI		TYPE			% REC	RQD	DRILL PENETRATION	WATER CONTENT % 10 20 30	REMARKS
0			АРНҮ			PE			RECOVERY	D (%)	m/min	W <sub>P</sub> W <sub>L</sub>	
		OVERBURDEN: MEDIUM BROWN SILTY CLAY TILL, OCCASIONAL BOULDERS.				AS							LOCATED ON EAST SIDE OF EXISTING QUARRY.
													102 mm ID CASING SET
													TO 9.7 m.
2													
				102									
4			0	2 mm									
			RB	5									
			OVERBURDEN	CASING									
6			ğ	K									
8		BOULDERS ENCOUNTERED 0.5 m ABOVE BEDROCK.											
	8.6	DOLOSTONE: LIGHT GREY TO VERY LIGHT			$\mathbf{f}$	RC			66	41	N/A		
		GREY, MEDIUM TO COARSE GRAINED. (AMABEL FORMATION, UNIT 1)				RC			96	50	0.22		
10		<ul> <li>IRREGULAR BEDDING WITH AN OVERALL CRAGGY AND WEATHERED APPEARANCE</li> <li>FOSSILS AND FOSSIL REMNANTS</li> </ul>											
		- FUSSILS AND FUSSIL REMINANTS				RC			80	100	N/A		
12			MA	OPEN									
		<ul> <li>RUST STAINED FRACTURES WITH CLAYEY</li> <li>SILT INFILLING</li> </ul>	AMABEL	N HQ		RC			100	88	0.20		
			. FORM										
14		- IRREGULARLY SHAPED VUGS 3-5% WITH LOCAL ZONES TO 10%		BOREHOI		RC	ļ		83	61	N/A		
		– 250 mm VOID AT 14.3 m.	ATION	OLE									
			Ž			RC			100	92	N/A		
			UNIT										
16		- SOME FLANK FACIES INTERBEDDED, 0.6 m											
		BED AT 13.7 m AND 1.2 m BED AT 17.1 m, LIGHT GREY WITH A CHALKY				RC			100	35	0.16		
		APPEARANCE											
18						- BC			100	70	0.20		NOTE
						RC	ļ		100	78	0.20		NOTE:  AMABEL FORMATION:
													UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION
20						RC	ļ		100	100	0.29		CH: CABOT HEAD FORMATION

PROJECT NAME: ROCK QUALITY INVESTIGATION - DUNTROON QUARRY PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: DECEMBER 17,18,19 1998

BOREHOLE TYPE: HQ SIZED (64 mm) ROCK CORE GEOLOGIST: KJF

GROUND ELEVATION: 522.3 mASL REVIEWER: AJC

			<b>,</b>		SAMPLE							
			STRATIGRAPHY					*		DRILL PENETRATION	WATER CONTENT %	
DEP (m		STRATIGRAPHIC DESCRIPTION	TIGR	MONITOR DETAILS	ТҮРЕ	z.	%   %	REC	RQD	FENETRATION	10 20 30	REMARKS
			APH)		] A	'N' VALUE	WATER	RECOVERY	Ö (%)	mm/sec		
20		DOLOSTONE: (CONT)				<u> </u>		۲۲	۳		W <sub>P</sub> W <sub>L</sub>	LOCATED ON EAST SIDE
		DOLOSTONE. (CONT)	_									OF EXISTING QUARRY.
			TINU		RC			93	43	0.18		
			7.									
	22.1	DOLOSTONE: LIGHT TO MEDIUM GREY,										
		MEDIUM GRAINED, CHALKY APPEARANCE, FAINT RUSTY TINGE.			RC			100	78	0.23		
		(AMABEL FORMATION, UNIT 2)										
		- VUGS 2-3% WITH A UNIFORM DISTRIBUTION										
24		- HORIZONTAL TO SUBHORIZONTAL BEDDING			RC			100	45	0.27		
			_									
26		- 0.7 m SILT INFILLED VERTICAL FRACTURE AT 25.6 m.	/M/		RC			100	68	0.30		
			AMABEL	OPEN								
				M E N	RC			100	62	0.19		
			FORMATION					100	02	0.19		
28		- OCCASIONAL REEFAL FACIES INTERBEDS ±1 m BED AT 28.0 m	M	BOREHOLE								TWO 100 mm ZONES OF
			OII	E								BROKEN RECOVERY AT 28.7 m AND 30.2 m.
			Z		RC			100	53	0.30		20.7 III AND 30.2 III.
			TINU									
30			ν.									
					RC			100	75	0.26		
		- FIRST STYLOLITE AT 31.0 m.										
32		- GRADATIONAL LOWER CONTACT OVER			RC			100	85	0.20		
	32.8	±2 m INTERVAL			, RC				65	0.28		
	J2.U	DOLOSTONE: LIGHT TO MEDIUM BUFF GREY										
		TO CREAM COLOURED, FINE GRAINED.	FOS		RC			100	76	0.28		
34		- STYLOLYTES AND OCCASIONAL THIN SHALE	SSIL									
		INTERBEDS UP TO 2 mm INCREASING WITH DEPTH.			ļ							
			HILL		RC			100	98	0.23		
			FOF									
36			ORMATION							-		
			Ή		RC			100	65	N/A		
		- 35 mm SHALE BED AT 37.6 m.	ž									
38		- PYRITE CRYSTALS AT 37.7 m.			ļ		ļ					
_	38.0	SHALE: GREENISH GREY, CALCAREOUS. (CABOT HEAD FORMATION)	-CH-		<u> </u>	<u> </u>						NOTE:
		BOREHOLE TERMINATED AT 38.0 m IN SHALE.				ļ	ļ					AMABEL FORMATION: UNIT 1: REEFAL FACIES
		5. p sec.										UNIT 2: FLANK FACIES FH: FOSSIL HILL FORMATION
40					<u> </u>	<u>L</u>	ļ					CH: CABOT HEAD FORMATION

#### **BOREHOLE NO. OW99-1**

PROJECT NAME: DUNTROON QUARRY	PROJECT NO.: 930521.08
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: MAY, 1999
BOREHOLE TYPE: 150 mm AIRTRACK HOLE	GEOLOGIST:
GROUND ELEVATION: 519.0 mASL	CONTRACTOR: GEORGIAN

		ST			S	AMPL	E		CONE PENETRATION	14/4	TEP.	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	'N' VALUE	% WATER	% RECC	RQD	"N" VALUE 10 20 30	CONT	TER ENT % 20 30	REMARKS
		γH4		m	Ę	쭚	RECOVERY	8	SHEAR STRENGTH	⊢ W <sub>P</sub>	WL	
	DOLOSTONE BEDROCK			<b></b>								100 mm ø PVC PROTECTIVE CASING
			HH	ļ								CASING
												4.00
			i i									100 mm Ø OPEN HOLE
)												
			i i									
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+												
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4												
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29.5	HOLE TERMINATED AT 29.5 m BELOW			ļ								
	GRADE											
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1			1		1	I		l		:	: :	

### **BOREHOLE NO. OW99-2**

PROJEC	F NAME: DUNTROON QUARRY									PROJ	ECT N	10.:	930521.08
CLIENT:	GEORGIAN AGGREGATES AND C	ONST	RUCTION	INC	•					DATE	: <u>MA</u>	Y, 19	99
BOREHO	LE TYPE: 100 mm AIRTRACK HOL	E								GEOL	ogis	T: _	
GROUND	ELEVATION: 500.6 mASL									CONT	RACT	OR:	GEORGIAN AGGREGATES
		STE			,	SAMPL	т	r	CONE PENETRATIO	ON	/ATER		
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	ЗЧҮТ	'N' VALUE	% WATER	% RECOVERY	RQD	"N" VAL	UE CO	20 30		REMARKS
0		폭			Æ	70	/ERY	8	SHEAR STRENGTH	ŀ— W <sub>P</sub>	WL	_	
	DOLOSTONE BEDROCK											100 CASIN	mm ø PROTECTIVE (G
5									<b>'</b>				
-												100	mm ø OPEN HOLE
10							,						
15													
15													
19.7													
20 13.7	HOLE TERMINATED AT 19.7 m BELOW GRADE												
						********							
25													
						.,	-1-311*-1-						
						,							
30													
35													
40				-					-				
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JACGER HIMS I	AMITED												

#### **BOREHOLE NO. PW99-1**

PROJECT NAME: DUNTROON QUARRY	PROJECT NO.: 930521.50
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: _ JULY 09, 1999
BOREHOLE TYPE: 150 mm ROTARY WATER WELL	GEOLOGIST:
GROUND ELEVATION: 513.9 mASL	CONTRACTOR: HIGHLAND WATERWELLS

				SAMPLE					CONE			WATERWELLS
		STRATIGRAPHY							PENETRATION	WAT		
DEPTI	H STRATIGRAPHIC DESCRIPTION	I A	MONITOR	_	ž	%   ~	% RI	_	"N" VALUE 10 20 30	10 2		REMARKS
(m)		₽Ř	DETAILS	ТҮРЕ	'N' VALUE	WATER	RECOVERY	RQD	10 20 30		U 30	
	WELL PRILLEDGE OF	꽃			E	R	VER'	%	SHEAR STRENGTH	⊢ W <sub>P</sub>	WL	
0	BROWN SANDY CLAY WITH GRAVEL		7 7				_		STRENGTH	WP : :	VV L	150 mm Ø STEEL CASING
	BROWN SANDI CLAI WITH GRAVEL			1								130 HIII W STEEL CASING
				]								
	4.7			ļ								BENSEAL PLUG
5	LIGHT BROWN BROKEN LIMESTONE		Y/									
	(OVERBURDEN)			1								150 mm Ø OPEN HOLE WELL
				]								
10 9	3.4		K4 K									
	LIGHT BROWN LIMESTONE, HARD											
					ļ	ļ						
15												
			l i i									
			1 1									
20												
			l i i									
25			1 1									
29	9.0		4 i i									
30	GREY LIMESTONE		i i									
31	11.4											
	BROWN LIMESTONE											
	WELL TERMINATED AT 32.9 m BELOW			1								
35	GRADE											
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### **BOREHOLE NO. PW99-2**

PROJECT NAME: DUN	ITROON QUARRY	PROJECT NO.: 930521.08	
CLIENT: GEORGIAN A	AGGREGATES AND CONSTRUCTION INC.	DATE: MAY, 1999	
BOREHOLE TYPE:	150 mm AIRTRACK HOLE	GEOLOGIST:	
GROUND ELEVATION	519.2 mASL	CONTRACTOR: GEORGIAN AGGREGAT	ES

		w			S	AMPL	E		CONE			AGGREGATES	
DEPTH	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR		_;	%	*		"N" VALUE	CON	ATER	REMARKS	
(m)	CHANGIA HIS DESCRIPTION	GRA	DETAILS	JYPE	'N' VALUE	WATER	RC0	RQD	10 20 30	10	20 30		
		籽		'''	틆	55	RECOVERY	8	SHEAR STRENGTH	⊢ W <sub>P</sub>	W <sub>L</sub>		
	DOLOSTONE BEDROCK											150 mm Ø PROTECTIVE CASING	
			HH									CASING	
			i i									150 mm ø OPEN HOLE	
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34.4													
5	HOLE TERMINATED AT 34.4 m BELOW GRADE												
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### **BOREHOLE NO. PW99-3**

PRO	DJECT	NAME: DUNTROON QUARRY									PROJ	ECT	NO.: <u>930521.08</u>
CLI	ENT: (	GEORGIAN AGGREGATES AND C	ONST	RUCTION	INC	-					DATE	: <u>M</u> A	Y, 1999
воі	REHO	LE TYPE: 150 mm AIRTRACK HO	LE							(	GEOL	OGIS	ST:
GR	DUND	ELEVATION: 500.9 mASL									CONT	RAC	TOR: GEORGIAN AGGREGATES
			ST				SAMPL	E		CONE PENETRATIO	ON .	/ATED	
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	'N' VALUE	% WATER	% RECOVERY	RQD (	"N" VALU	DE COI	VATER NTENT 20 30	% REMARKS
0		DOLOGIONE DEDDOOK				m		RY	8	SHEAR STRENGTH	WP	\	N <sub>L</sub>
5		DOLOSTONE BEDROCK											150 mm ø PROTECTIVE CASING
													130 IIIII P OI EN NOLE
10													
15													
20													
	20.8 21.4	SHALE BEDROCK											SHALE INTERPOLATED FROM BH98-1
		HOLE TERMINATED AT 21.4 m BELOW GRADE IN SHALE											puao- 1
25													
30													
35													
40													
45													

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 4, 2002

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 522.6 mASL REVIEWER: AJC

			رب د			SAMP	LE	RATE OF	HYDRAULIC	
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY m / sec E" E	REMARKS
2	3.6	SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST.	OVERBURDEN	H.Q. CASING						LOCATED IN S.E. CORNER OF EXPANSION PROPERTY
4	3.0	DOLOSTONE: WHITE TO CREAMY, UNIFORM MEDIUM GRAINED WITH SACCHAROIDAL TEXTURE. WEAKLY BEDDED. 2%-5% VUGS UP TO 16 mm IN SIZE 5.5 m TO 5.7 m LIGHT GREY TO CREAMY, CHAOTIC BEDDED MEDIUM TO	AMABEL	5.2 m	RC	98	98	0.15		
8		COARSE GRAINED DOLOSTONE WITH CHRINOIDAL FOSSIL FRAGMENTS UP TO 4 cm.	AMABEL FORMATION UNIT 2	OPEN	RC	100	100	0.15		
10	8.2	DOLOSTONE: LIGHT GREY, WITH WHITE "SPECKLED" APPEARANCE, MEDIUM TO COARSE TEXTURE. WEAKLY BEDDED CRINOIDAL FOSSIL FRAGMENTS UP TO 3 cm.  - 9.0 m TO 9.9 m IRREGULAR VERTICAL FRACTURE WITH SLIGHT RUST STAINING	AMABEL FORMATION UNIT 1	H.Q. BOREHOLE	RC	98 98	76 90	0.18	4.3E-6	
12	12.6	-BELOW 10.7 m LIGHT GREY TO CREAMY WHITE, CHAOTIC BEDDING, FOSSILIFEROUS, 2%-3% VUGS UP TO 3 cm WITH CRYSTALLINE CALCITE INFILL.	MATION		RC	100	100	0.27	2.5E6	
14		DOLOSTONE: MOTTLED LIGHT/ MEDIUM GREY, UNIFORM MEDIUM GRAINED WITH SACCHAROIDAL TEXTURE. WEAKLY DEVELOPED BEDDING. 3%-5% VUGS UP TO 9 mm WITH BROWN SEDIMENT INFILL. BECOMING FINE GRAINED WITH DEPTH.	AMABI		RC	98	100	0.24	5.16-08	
16		FRACTURES HAVE BROWN SEDIMENT ON FACES.	EL FORMATION		RC	100	100	0.19	7.0É-08	
18		-BELOW 17.4 m UNIFORM FINE TO MEDIUM GRAINED, AND OCCASIONAL POORLY DEVELOPED BROWN STYLOLITE.	N UNIT 2		RC RC	100	97	0.23	5.8E-08 7.6E-08	NOTE  AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM

REVIEWER: AJC

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50 **CLIENT: GEORGIAN AGGREGATES LIMITED** DATE: DECEMBER 4, 2002 BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR **GROUND ELEVATION: 522.6 mASL** 

		SA SA		SAMP	LE	RATE OF	HYDRAULIC		
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	.	% RE	RQD	DRILL PENETRATION	CONDUCTIVITY m / sec E-" E-4	REMARKS
		RAPHY		TYPE	RECOVERY	) (%)	m / min		
	DOLOSTONE CONTINUED								LOCATED IN S.E. CORNER OF EXPANSION PROPERTY
				RC	100	100	0.25	1,1E+07	OF EXPANSION PROFERIT
22				RC	97	95	0.25		
	-21.9 m GREY, UNIFORM MEDIUM GRAINED WITH								
	SACCHAROIDAL TEXTURE AND "SPECKLED" APPEARANCE. UP TO 5% CRINOIDAL FOSSIL FRAGMENTS, WEAKLY BEDDED.							4.0E-7	
24	- 24.0 TO 24.8 m			RC	100	78	0.30		
	VERTICAL FRACTURES WITH WEAK RUSTY ORANGE STAINING, PARTIALLY RESEALED WITH							5.8E÷7	
	CARBONATE. FRACTURES OCCUR DOMINANTLY PARALLEL TO BEDDING.			RC	100	100	0.27	3.62-7	
26		AM							
		AMABEL		RC	98	100	0.25	7.9E-7	
28		FORMATION UNIT	OPEN	RC	100	100	0.13		
		TIOI	H.O.					6.9E-08	
		S	BOREHOLE	RC	100	100	0.19		
30		<b>IT 2</b>	HOLE					8.1E+08	
	- 30.4 m TO 31.1 m MOTTLED  MEDIUM GREY TO BROWN FINE GRAINED DOLOSTONE			RC	97	100	0.22		
	STAINED DOESSTONE								
32				RC	98	100	0.19	1.3E-07	
33.4	DOLOSTONE:						0.45		
34	MOTTLED BLUE-GREY/ GREY FINE GRAINED WITH SACCHAROIDAL TEXTURE. INCREASING STYLOLITES, BECOMING GREY IN COLOUR	FO		RC	100	100	0.15	2.9E-09	
	WITH DEPTH. OCCASIONAL PARTING OF PALE GREEN TO GREY SHALE UP TO 2 mm THICK. OCCASIONAL PINCH—AND—SWELL	SSIL		RC	100	100	0.12		
36	TYPE BEDS AND NODULES OF WHITE TO	H							
	PINKISH—BROWN BELOW 35.7 m WITH UP TO 2% PATCHY MASSIVE PYRITE.	L FM		RC	100	100	0.12	9.0E-09	NOTE AMABEL FORMATION: UNIT 1: REEFAL FACIES
37.4	FRACTURES OCCUR DOMINANTLY AT STYLOLITES/ PARTINGS.			, RC	100	100	0.12		UNIT 2: FLANK FACIES FH: FOSSIL HILL FM
38	SHALE:  GREENISH-GREY SHALE, VARIABLE SOFT TO								CH: CABOT HEAD FM
	HARD, FISSILE.	유		RC	100	100	0.15	4.8E→08	CIRCULATION MAINTAINED FOR ENTIRE BOREHOLE.
39.5									
40	BOREHOLE TERMINATED AT 39.5 m IN SHALE.								

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 10, 2002

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 522.5 mASL REVIEWER: AJC

DEPTH (m) STRATIGRAPHIC DESCRIPTION PATEUR (m) S			HYDRAULIC	RATE OF	.E	SAMPL			ST			
SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST.  OVER TRACE  DOLOSTONE: MOTILED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: WEAKLY BEDDED.  DOLOSTONE: WEAKLY BEDDED.  DOLOSTONE: MEDIUM GRAINED WITH "SPECKLED" RC 93 100 0.28	S	REMARKS	m / sec				Ţγ		RATIGRA	STRATIGRAPHIC DESCRIPTION		
SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST.  OVERBUTA  OVE				m / min	(%)	OVERY	m		PHY		n	0
TRACE CLAY, MOIST.  OVERBELL  PROBLEM  FAC. 93 100 0.28  TRACE CLAY, MOIST.  OVERBELL  FAC. 93 100 0.28	ROPERTY									BROWN SILT, SOME SAND, TRACE GRAVEL,		
6 6.2  DOLOSTONE: MOTILED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH GREY/ LIGHT BROWN, MEDIUM GRAINED WITH SPECKLED" APPEARANCE CRINQUID SPECKLED RC 93 100 0.28									0	TRACE CLAY, MOIST.		
6 6.2  DOLOSTONE: MOTILED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH GREY/ LIGHT BROWN, MEDIUM GRAINED WITH SPECKLED" APPEARANCE CRINQUID SPECKLED RC 93 100 0.28									RBU			
6 6.2  DOLOSTONE: MOTILED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH GREY/ LIGHT BROWN, MEDIUM GRAINED WITH SPECKLED" APPEARANCE CRINQUID SPECKLED RC 93 100 0.28								н.				
6 6.2  DOLOSTONE: MOTTLED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINOIDIAL FORSUL FRACMENTS									Ë			
6 6.2  DOLOSTONE: MOTTLED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINOIDAL FOSSIL FRACMENTS								SING				ı
6 6.2  DOLOSTONE: MOTTLED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINQUIDAL FOSSIL FRACMENTS												
6 6.2  DOLOSTONE: MOTTLED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINOIDAL FOSSIL FRACMENTS												
6.2  DOLOSTONE: MOTTLED LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED UNIFORM TEXTURE, WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINOIDUAL FOSSIL FRACMENTS											5	ı
MEDIUM GRAINED UNIFORM TEXTURE,  WEAKLY BEDDED.  DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINOIDAL FOSSIL FRACMENTS				0.79					⊊		6.2	
B DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN, MEDIUM GRAINED WITH "SPECKLED" APPEARANCE CRINOIDAL FOSSIL FRACMENTS				0.76	96	92	, KC	7.0 m	<u>~</u> ≡	MEDIUM GRAINED UNIFORM TEXTURE,	7.0	
MEDIUM GRAINED WITH "SPECKLED"  APPEARANCE CRINQIDAL FOSSIL FRACMENTS  RC 93 100 0.28										DOLOSTONE:		
UP TO 5%, WEAKLY DEVELOPED BEDDING.				0.28	100	93	RC			MEDIUM GRAINED WITH "SPECKLED"		
									AMA			
FRACTURES MAINLY PARALLEL TO BEDDING. RC 98 100 0.20				0.20	100	98			M	FRACTURES MAINLY PARALLEL TO BEDDING.		
									пΙ			
ORWATION CNIT BOOK RC 100 100 0.27    12				0.27	100	100			AMA			
7TION   OPEN   1,1E-7			1,1E-7						T O		2	12
La L				0.00				🌣	Ş			
BORR C 100 98 0.28 3.1E-7				0.28	98	100	RC	BORE				
   14     3.1E-7			3.1E-7					HOLE			4	14
RC 100 100 0.23				0.23	100	100	RC					
DOLOSTONE:										DOLOSTONE:		
MEDIUM GRAINED WITH SACCHAROIDAL   RC   100   97   0.22   1.1E-6			1.1E-6	0.22	97	100			N	MEDIUM GRAINED WITH SACCHAROIDAL TEXTURE. NUMEROUS CRINOIDAL FOSSIL	6	16
FRAGMENTS WITH WEAKLY DEVELOPED No.										BEDDING.		
DOLOSTONE: 4.7E-7			4.7E-7	0.24	92	98			P	DOLOSTONE: MOTTLED LIGHT GREY/ MEDIUM GREY,		
MEDIUM TO COARSE GRAINED WITH CHAOTIC   S									MAE	MEDIUM TO COARSE GRAINED WITH CHAOTIC APPEARANCE AND FOSSIL FRAGMENTS.		
OCCASIONAL BROWN STYLOLITE.	ION:	<del></del>							₽		0	18
RC 100 100 0.26 UNIT 1: REEFAL FA	FACIES FACIES	UNIT 1: REEFAL FAUNIT 2: FLANK FA	2.7E-7	0.26	100	100			N.			 
TH: FOSSIL HILL CH: CABOT HE.			1,2E-7	0.25								

PROJECT NAME: DUNTROON QUARRY EXPANSION

CLIENT: GEORGIAN AGGREGATES LIMITED

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE

GROUND ELEVATION: 522.5 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 10, 2002

SUPERVISOR: PFR

REVIEWER: AJC

			IS	STF		SAMPLE		RATE OF	HYDRAULIC	
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY m / sec E-" E	REMARKS
20	21.2	DOLOSTONE CONTINUED	UNIT						1.2E÷7	LOCATED IN NE QUADRANT OF PROPERTY
22		DOLOSTONE: PATCHY LIGHT GREY/ LIGHT BROWN MEDIUM TO FINE GRAINED, WITH SACCHAROIDAL TEXTURE. MODERATE TO WEAKLY DEVELOPED BEDDING WITH 1-2 mm CRINOIDAL FOSSIL			RC	98	100	0.24	4.7E-7	
		FRAGMENTS PRODUCING LOCAL "SPECKLED" TEXTURE. OCCASIONAL BROWN MODERATE TO WELL DEVELOPED STYLOLITE, INCREASING WITH DEPTH.			RC	100	95	0.30		
24			AMABEL		RC	100	100	0.24	5.0E-7	
26			т		RC	100	100	0.31	2.4E-7	
			ORMATION UNIT		RC	98	100	0.29		
28			N UNIT 2	OPEN H.Q.	RC	98	100	0.26	5.8E-7	
30				BOREHOLE					2.7E-7	
				m	RC	100	100	0.21		
32	70.0				RC	100	100	0.20	3.7É-7	
	32.6	DOLOSTONE: MOTTLED BLUE-GREY TO GREY FINE TO MEDIUM GRAINED WITH SACCHAROIDAL TEXTURE. OCCASIONAL STYLOLITE, BECOMING			RC	100	100	0.18	1.8E÷07	
34		GREY IN COLOUR. OCCASIONAL 10 mm—SCALE PINCH—AND—SWELL TYPE BEDS/ NODULES OF LIGHT GREY CHERT.	FOSSIL		RC	100	100	0.14		
36		- AT 34.9 m BECOMING PINKISH-BROWN, FINE GRAINED WITH OCCASIONAL FAINT PARTINGS/ LAMINAE OF SHALE UP TO 3 mm THICK WITH UP TO 5 mm AGGLOMERATIONS OF PATCHY	нісь го						5.9E-09	
		MASSIVE PYRITE. FRACTURES OCCUR MAINLY ALONG STYLOLITES/ LAMINAE.	FORMATION						1.2E-07	CIRCULATION MAINTAINED
38	38.4	- 37.6 m TO 37.9 m SHALE INTERBED  SHALE:								FOR ENTIRE BOREHOLE.  NOTE  AMABEL FORMATION: UNIT 1: REEFAL FACIES
40	39.5	GREENISH-GREY, SOFT TO HARD, FISSILE.  BOREHOLE TERMINATED AT 39.5 m IN SHALE.	СН							UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 12, 2002

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 529.7 mASL REVIEWER: AJC

			(0				AMPL	E					
			STRATIGRAPHY	MONITOR				%		RATE OF DRILL PENETRATION		ATER NTENT %	
DEPT (m)		STRATIGRAPHIC DESCRIPTION	IGRA	MONITOR DETAILS	TYPE			RECO	RQD	LINEMONION		20 30 I I	REMARKS
0			뫔		"			RECOVERY	(%)	m / min	⊢ W <sub>P</sub>	WL	
		SILT: BROWN SILT, SOME SAND, TRACE GRAVEL,	0										LOCATED NEAR CENTRE OF PROPERTY.
		TRACE CLAY, MOIST.	\ ER										
			BUF										
2			OVERBURDEN										
	3.1		_	н.ф. с									
		DOLOSTONE: LIGHT GREY MEDIUM TO COARSE GRAINED		CASING	RC			88	96	0.24			
4		DOLOSTONE, CHAOTIC APPEARANCE WITH UP TO 10% WHITE FOSSIL FRAGMENTS,											
		"HONEYCOMB" TEXTURE (CORAL) UP TO 30 mm. 2%-3% VUGS UP TO 13 mm.		4.6 m						0.75			
			≥		RC			98	86	0.30			
6		<ul> <li>5.8 m TO 6.7 m IRREGULAR VERTICAL FRACTURE WITH MODERATE ORANGE</li> </ul>	AMABEL										
		RUSTY STAINING ON FACES.		OPEN	RC			100	93	0.33			
			P S	N H.Q.									
8			FORMATION UNIT		RC			100	88	0.35			
			ᅙ	BOREHOLE									
			Ē										
10			1	(64 r	RC			56	76	0.41			
				mm)									
					RC			0	N/A	0.53			
12 1	2.0	BOREHOLE TERMINATED AT 12.0 m IN DOLOSTONE.		DRY									NO CORE RECOVERY IN LAST RUN. LOST CIRCULATION AT
		DOLOSTONE.											9.5 m BELOW GROUND SURFACE.
14													
						ļ							
16													
18													NOTE
													NOTE  AMABEL FORMATION: UNIT 1: REEFAL FACIES
													UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM
20													CII. CABOT FIEAD FW

PROJECT NAME: DUNTROON QUARRY EXPANSION

CLIENT: GEORGIAN AGGREGATES LIMITED

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE

GROUND ELEVATION: 530.0 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 13, 2002

SUPERVISOR: PFR

REVIEWER: AJC

		SI		:	SAMPL	E	RATE OF	HYDRAULIC	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY  m / sec  E" E	REMARKS
1.3	SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST.	OVER- BURDEN	н.о.						LOCATED NEAR CENTRE OF PROPERTY
2	DOLOSTONE: LIGHT GREY, MEDIUM TO COARSE GRAINED DOLOSTONE, CHAOTIC BEDDING WITH LOCALLY UP TO 7% WHITE FOSSIL FRAGMENTS (POSSIBLY CORAL) WITH "HONEYCOMB" TEXTURE, UP TO 30 mm.		2. CASING s.	RC	100	67	0.22		
4	3%-5% VUGS UP TO 30 mm.  FRACTURES DOMINANTLY SUBHORIZONTAL, IRREGULAR.		3.0 m	RC	100	100	0.25		
				RC	100	100	0.31		
6		AMABEL I		RC	100	90	0.26		
8		FORMATION UNIT	OPEN H.Q.	RC	98	100	0.30		
10		ON UNIT 1	BOREHOLE	RC	97	100	0.31		
				RC	94	98	0.30		AT 11.0 m TEMPORARY LOSS OF CIRCULATION. (RECOVERED)
12				RC	94	100	0.30	2.5E-06	
14	DOLOSTONE: MOTTLED LIGHT GREY/ LIGHT BROWN, WITH OCCASIONAL CREAM COLOURED BANDS, UNIFORM, MEDIUM GRAINED. OCCASIONAL CRINOIDAL FOSSIL FRAGMENTS, WEAKLY	Þ		RC	100	100	0.31	5.3E-07	
	BEDDED. 1%-2% VUGS UP TO 20 mm WITH CRYSTALLINE CALCITE INFILLING.	AMABEL F		RC	100	100	0.28	4.5E-07	
		FORMATION		RC	100	100	0.30		
18		ON UNIT 2		RC	100	35	0.30	2.2E÷06	NOTE AMABEL FORMATION: UNIT 1: REEFAL FACIES
20	- 19.0 m TO 20.0 m IRREGULAR VERTICAL FRACTURE WITH MODERATE TO STRONG RUST STAINING.			RC	100	100	0.30	4.8E-07	UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM

PROJECT NAME: DUNTROON QUARRY EXPANSION

CLIENT: GEORGIAN AGGREGATES LIMITED

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE

GROUND ELEVATION: 530.0 mASL

PROJECT NO.: 930521.50

DATE: DECEMBER 13, 2002

SUPERVISOR: PFR

REVIEWER: AJC

		ST		8	SAMPL	E	RATE OF	HYDRAULIC	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	ONITOR ETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY   m / sec   E -	REMARKS
	DOLOSTONE CONTINUED							4.8E-07	LOCATED NEAR CENTRE
	FRACTURES BECOMING DOMINANTLY PARALLEL TO SUB-HORIZONTAL BEDDING.			RC	100	62	0.35	8.5E-06	OF PROPERTY
	22.4 m TO 22.6 m GREY FINE GRAINED DOLOSTONE WITH WEAKLY DEVELOPED, CREAMY "STRIPED" APPEARANCE, BRITTLE.			RC	98	100	0.30		
24	- AT 23.2 m BECOMING UNIFORM WITH SACCHAROIDAL TEXTURE.			RC	100	100	0.30	1.2E-05	
				RC	100	97	0.31	1.3E-06	
	– 27.5 m TO 27.6 m	AMAB	OPEN	RC	98	100	0.30	9.0E-08	
28	DIAGONAL FRACTURE WITH WEAK RUSTY STAINING.	EL FORM	H.Q. BOREHOLE	RC	100	100	0.30		
30	- 30.1 m TO 31.0 m GREY FINE GRAINED DOLOSTONE WITH POORLY DEVELOPED,	FORMATION UI	HOLE	RC	100	100	0.21	1.5E-06	
	DISCONTINUOUS CREAMY "STRIPES". BRITTLE, CRUMBLY. LOCALLY UP TO 10% PATCHY VUGS WITH CALCITE CRYSTALS UP TO 2 mm.	UNIT 2		RC	100	95	0.23	7.45-06	
32	- 33.1 m TO 35.3 m MOTTLED			RC	98	100	0.23		
34	BROWN/ LIGHT BROWN FINE GRAINED DOLOSTONE WITH OCCASIONAL WISPY PARTING OF DULL GREEN SHALE. OCCASIONAL POORLY DEVELOPED BROWN STYLOLITE. INCREASING FREQUENCY WITH DEPTH.			RC	100	100	0.26	1.2E-05	
36				RC	98	100	0.29	9.3E-06	
	- 35.3 TO 37.0 m GREY, UNIFORM, MEDIUM GRAINED DOLOSTONE WITH			RC	100	100	0.30	8:1E-07	
38	"SPECKLED" APPEARANCE. OCCASIONAL CRINOID FOSSIL FRAGMENTS, WEAKLY BEDDED.			RC	100	100	0.24	9:9E-07	NOTE  AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM
40									ONDOT TIEAD TW

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50 CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 13, 2002 BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR GROUND ELEVATION: 530.0 mASL REVIEWER: AJC

		ST			SAMPL	E	RATE OF	HYDRAULIC	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY  E"	REMARKS
40	DOLOSTONE CONTINUED			RC	100	100	0.31		LOCATED NEAR CENTRE
42	FRACTURES OCCUR DOMINANTLY AT PARTINGS/LAMINAE.	AMABEL		RC	100	85	0.24	7.6E-Q8	OF PROPERTY
44 44.0	43.2 m TO 44.0 m MOTTLED     BROWN/ GREY-BROWN FINE GRAINED     DOLOSTONE. OCCASIONAL GREY     SHALE PAPTINGS UP TO 2 mm	. UNIT 2		RC	98	100	0.21	5.4E-08	
	SHALE PARTINGS UP TO 2 mm THICK.  DOLOSTONE: MOTTLED BLUE-GREY/GREY FINE GRAINED DOLOSTONE, OCCASIONAL GREY SHALE PARTINGS UP TO 3 mm THICK INCREASING	FOS	OPEN H.Q. E	RC	100	100	0.18	6.1E-09	
46	WITH DEPTH. OCCASIONAL PINCH-AND-SWELL TYPE BEDS UP TO 3 cm THICK, OCCASIONAL NODULES OF LIGHT GREY CHERT TO 30 mm.  - AT 46.3 m BECOMING PINKISH-BROWN DOLOSTONE WITH 1%-2% PATCHY PYRITE.	SIL HILL	BOREHOLE	RC	100	100	0.20	8.0E-09 2.8E-08	
48.8		¥.		RC	100	100	0.11	20.369	
50 50.1	SHALE: GREENISH-GREY, SOFT TO HARD, FISSILE.	오							
52	BOREHOLE TERMINATED AT 50.1 m IN SHALE.								
									CIRCULATION MAINTAINED FOR ENTIRE BOREHOLE.
56									
58									
									NOTE  AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM
Jacon Ham I	Дитер	 UPDAT	ED NOVEMBE	R 12	, 200	1			

# LOG OF BOREHOLE BH02-5 (deep)



Lab Data

project no. | 111-53312-00 project | Duntroon Quarry

2014/10/09 client | Walker Aggregates Inc. rig type | CME 75, track-mounted date started |

Penetration Test Values (Blows / 0.3m)

Iocation | Duntroon, Ontario BTC method | Rock coring supervisor | position | E: 559585 N: 4915584 (17T, Geodetic) coring | HQ core, OD=96mm, ID=64mm reviewer | **KJF** 

SAMPLE

SUBSURFACE PROFILE

Readings Scale Plot X Dynamic Cone Water Content (%) Depth Scale Elevation Sca (mASL) Comments 30 40 Number 1.0 20 N-Value & Plasticity Graphic Undrained Shear Strength (kPa) Depth (m) STRATIGRAPHY GRAIN SIZE DISTRIBUTION (%) (MIT) 딢 Core Recovery 20 **GROUND SURFACE** GR SA SI OVERBURDEN - 2 511 - 3 510 509 - 5 508 - 6 507 506 - 8 505 **DOLOSTONE** (Amabel Formation) R1 504 Creamy white with a dull appearance; uniform; fine to medium grained; fossiliferous, strong core with a rough cut texture, thickly bedded, scratched by a - 10 knife; slightly weathered with muddy TCR = 96% RQD = 80% reddish brown staining on fracture surfaces, ~5%, vugs typically 1 mm to 3 mm, poor to fair RQD. (Flank facies) 503 502.6 10 cm void at 10.7 m 502 TCR = **92**% RQD = **34**% R3 - 12 501 **END OF BOREHOLE** Borehole was open upon completion. Open hole well installed in borehole. Casing cemented in bedrock at 9.24 m

# **LOG OF BOREHOLE BH02-5 (mid)**



project | Duntroon Quarry

rig type | CME 75, track-mounted

2014/10/09 date started |

Iocation | Duntroon, Ontario

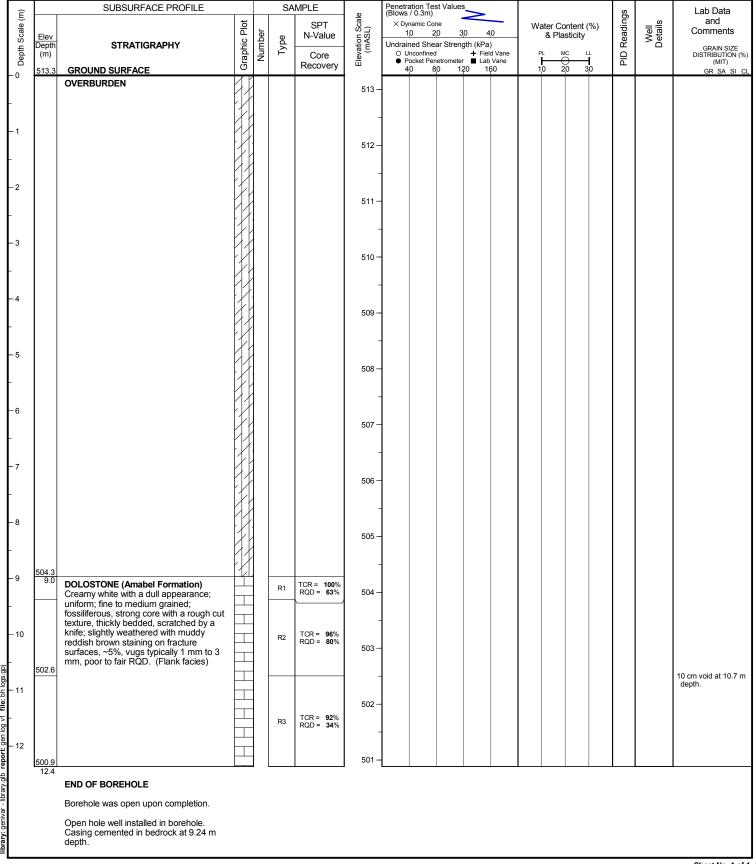
client | Walker Aggregates Inc.

project no. | 111-53312-00

method | Rock coring

BTC supervisor |

reviewer | **position** | E: 559585 N: 4915584 (17T, Geodetic) coring | HQ core, OD=96mm, ID=64mm **KJF** 



PROJECT NAME: DUNTROON QUARRY EXPANSION	PROJECT NO.: 930521.50
CLIENT: GEORGIAN AGGREGATES LIMITED	DATE: <u>DECEMBER 18, 2002</u>
BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE	SUPERVISOR: PFR
GROUND ELEVATION: 513.2 mASI	REVIEWER: A.IC

		တ			SAMPL	.E	RATE OF	HYDRAULIC	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY  m/sec  E" E	REMARKS
0	SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST.	OVERBURDEN	H.Q. CASING		*				LOCATED IN NORTH—CENTRAL PART OF PROPERTY
9.3 10  12  14 13.9	DOLOSTONE: LIGHT GREY, MEDIUM TO COARSE GRAINED DOLOSTONE, CHAOTIC BEDDING, OCCASIONAL WHITE FOSSIL FRAGMENTS WITH "HONEYCOMB" TEXTURE UP TO 30 mm. 2%-5% VUGS UP TO 20 mm.  11.6 TO 12.2 m SUBHORIZONTAL FRACTURES, IRREGULAR WITH WEAK ORANGE RUSTY STAINING.	AMABEL UNIT 1	13.4 m	RC RC	100	93 44	0.23		LOST CIRCULATION AT 11.2 m AND 12.8 m, ADVANCED CASING TO 13.4 m. CIRCULATION RECOVERED
16	DOLOSTONE:  PATCHY LIGHT GREY/LIGHT BROWN, UNIFORM, MEDIUM GRAINED DOLOSTONE WITH SACCHAROIDAL TEXTURE. OCCASIONAL CRINOIDAL FOSSIL FRAGMENT, WEAKLY BEDDED. 1%—2% VUGS UP TO 2 cm. OCCASIONAL BROWN STYLOLITE, INCREASING FREQUENCY WITH DEPTH.  - 19.5 m TO 20.7 m WHITE "SPECKLED" APPEARANCE WITH INCREASING CRINOIDAL FOSSIL FRAGMENTS, WEAKLY BEDDED.	AMABEL UNIT 2	OPEN H.Q. BOREHOLE	RC RC RC	100	92 100 100 97	0.29 0.29 0.28	2.9E-06 2.9E-06 3.6E-07 2.8E-07	NOTE  AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 18, 2002

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 513.2 mASL REVIEWER: AJC

		ST			SAMPI	.E	RATE OF	HYDRAULIC	
<b>DEPTH</b> (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY  m / sec  E-"  E-"  E	REMARKS
	DOLOSTONE CONTINUED			RC	100	100	0.31	3.7E→07	LOCATED IN NORTH-CENTRAL PART OF PROPERTY
		AMABEL						3.7E=07	
				RC	100	100	0.38		
		UNIT 2		RC	100	100	0.32	1.3E=06	
24 24.0	DOLOSTONE:  MOTTLED BLUE-GREY/ GREY FINE GRAINED		OPEN					5.1E-08	
	DOLOSTONE. STYLOLITES BECOMING GREY IN COLOUR. OCCASIONAL WISPY PARTING OF GREY SHALE UP TO 2 mm THICK,		H.Q. BC	RC	100	100	0.31	3.112-00	
26	INCREASING FREQUENCY WITH DEPTH.  - AT 24.9 m DISCOLORED BROWN HALO AT FRACTURE.	FOS	BOREHOLE						
		H TISSO:		RC	100	95	0.28	4.1E-08	
28	FRACTURES OCCUR DOMINANTLY AT SHALE PARTINGS WITH GREY SEDIMENT ON FACES.	HILL FO		RC	100	73	0.24	6.8E-08	
		FORMATION							
30	- AT 29.6 m BECOMING PINKISH-BROWN	<u>N</u>		RC	100	88	0.26	3.8E-06	
30.9	WITH 2%-3% PATCHY MASSIVE PYRITE. LOCALLY UP TO 15% WHITE FOSSIL FRAGMENTS AT UPPER CONTACT.							5.02-00	
31.9	- 30.4 m TO 30.5 m GREEN SHALE INTERBED.	운		RC	100	76	0.16		
	SHALE:  GREENISH-GREY, SOFT TO HARD, FISSILE.  BOREHOLE TERMINATED AT 31.9 m IN								
	SHALE.								
34									
36									
38									NOTE
									AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM
40									CH: CABOT HEAD FM

UPDATED NOVEMBER 12, 2004

JACCER HIMS LIMITED

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 20, 2002

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 529.5 mASL REVIEWER: AJC

			ST			SAMP	LE.	RATE OF	HYDRAULIC	
(r	PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOI DETAILS		% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY m / sec E-" E-	REMARKS
0	2.0	SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST.	OVERBURDEN							LOCATED SOUTH CENTRAL PROTION OF PROPERTY
4		DOLOSTONE: GREY, MEDIUM TO COARSE GRAINED WITH WHITE FOSSIL FRAGMENTS, "HONEYCOMB" TEXTURE AND CHAOTIC BEDDING. 2%—3% VUGS WITH WHITE CHALKY APPEARANCE.  — 3.3 m TO 4.2 m CREAMY WHITE, UNIFORM, MEDIUM GRAINED DOLOSTONE WITH OCCASIONAL CRINOIDAL FOSSIL FRAGMENTS, WEAKLY BEDDED.  WEAK BROWN SEDIMENT STAIN ON FRACTURE FACES.	AMABEL FORMATION UNIT 1	H.Q. CASING	RC	98	88 98 80	0.29 0.30 0.30		LOST CIRCULATION AT 7.0 m. ADVANCE CASING TO 8.2 m.
	8.8	- 8.7 m TO 9.1 m VERTICAL UNDULATING FRACTURE WITH WEAK RUSTY STAINING AND BROWN SEDIMENT ON FACES.  DOLOSTONE: MOTTLED GREY/ LIGHT GREY, UNIFORM, MEDIUM GRAINED WITH UP TO 10% WHITE CRINOIDAL FOSSIL FRAGMENTS, WEAKLY BEDDED. "SPECKLED" APPEARANCE. 3%-5% VUGS UP TO 9 mm.	UNIT 2	8.2 m OPEN H	RC	98	82 100 83	0.25 0.29 0.26		
14		DOLOSTONE: GREY, FINE GRAINED DOLOSTONE. HARD, BRITTLE WITH PATCHY VUGS UP TO 11 mm WITH FINE GRAINED CALCITE ± DOLOMITE INFILL.  - 13.6 m TO 17.9 m BECOMING MOTTLED LIGHT BROWN/ LIGHT GREY.	AMABEL FORMATION UNIT 1	I.Q. BOREHOLE	RC RC RC	100	100	0.31 0.31 0.34	1.7E=06 1.3E=06	NOTE AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM CH: CABOT HEAD FM

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: DECEMBER 20, 2002

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 529.5 mASL REVIEWER: AJC

		ST			SAMPL	E	RATE OF	HYDRAULIC	
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / min	CONDUCTIVITY m / sec E" E	REMARKS
	DOLOSTONE CONTINUED	→ UNIT						1.0E-06	LOCATED SOUTH CENTRAL
20.	DOLOSTONE:	=							PROTION OF PROPERTY
	MOTTLED LIGHT BROWN/ LIGHT GREY DOLOSTONE, UNIFORM, FINE GRAINED WITH			RC	100	84	0.27	7.3E-07	
22	SACCHAROIDAL TEXTURE. OCCASIONAL CRINOIDAL FOSSIL FRAGMENTS, WEAKLY							7.3E-07	
	BEDDED. <2% VUGS UP TO 20 mm. OCCASIONAL POORLY DEVELOPED BROWN								
	STYLOLITE, INCREASING FREQUENCY WITH DEPTH.			RC	100	76	0.37		
	- 23.4 m TO 23.7 m IRREGULAR VERTICAL, FRACTURE WITH BROWN RUSTY STAINING							1.5E-06	
24	ON FACES.			RC	100	100	0.35		
					100		0.55		
								2.0E-06	
				RC	100	100	0.28		
26				I KC	100	100	0.28		
		≱							
	FRACTURES DOMINANTLY PARALLEL TO SUB-HORIZONTAL BEDDING.	AMABEL	OPEN	RC	100	100	0.24	5.8E-07	
28	SOB HOMZONIAL BEBBING.	Ē	т. О				0.24		
		FO	1 1 1						
ļ		RS	BOREHOLE	RC	100	100	0.28		
		Ā	OLE					4.1E-07	
30		FORMATION UNIT							
		<u>≥</u>		RC	100	100	0.31		
		T 2						1.3E÷06	
32	- 32.1 m TO 32.7 m MOTTLED LIGHT			RC	100	73	0.32		
	GREY/ GREY FINE GRAINED, HARD, BRITTLE.								
				RC	100	100	0.37	2.7E-06	
34									
				RC	100	100	0.30		
								2.0E-06	
36									
				RC	100	100	0.29		
					ļ			125.06	
				RC	100	100	0.31	1.2E-06	
38					1				NOTE
					ļ				AMABEL FORMATION:
				RC	100	100	0.29	7.8É-07	UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
									FH: FOSSIL HILL FM CH: CABOT HEAD FM
40									

PROJECT NAME: DUNTROON QUARRY EXPANSION	PROJECT NO.: 930521.50		
CLIENT: GEORGIAN AGGREGATES LIMITED	DATE: DECEMBER 20, 2002		
BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE	SUPERVISOR: PFR		
GROUND ELEVATION: 529.5 mASL	REVIEWER: AJC		

DEPTH (m)		STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY				S.		SAMPLE		RATE OF DRILL PENETRATION m / min	HYDRAULIC	
				MONITOR DETAILS		TYPE	% RECOVERY	RQD (%)	CONDUCTIVITY m / sec E-" E4	REMARKS			
40		DOLOSTONE CONTINUED	·	Н			~				LOCATED SOUTH CENTRAL		
		BOLOSTONE CONTINUED	⊊			RC	100	100	0.26		PROTION OF PROPERTY		
			UNIT							6.4E-07			
	41.8		2										
42		DOLOSTONE:		1		RC	100	100	0.22				
		MOTTLED BLUE-GREY/ GREY, FINE GRAINED DOLOSTONE. OCCASIONAL WISPY GREY	FO		OPEN					2.7E-09			
		SHALE PARTINGS INCREASING WITH DEPTH, UP TO 3 mm THICK. OCCASIONAL	FOSSIL		z I								
		PINCH—AND—SWELL TYPE BEDS, NODULES OF LIGHT GREY CHERT UP TO 30 mm	Ţ		Ö	RC	100	100	0.17				
44		THICK. FRACTURES OCCUR DOMINANTLY AT	픋		BOREHOLE								
		STYLOLITE/ PARTINGS WITH GREY SHALE.	تر										
		<ul> <li>43.7 m TO 44.2 m LIGHT BROWN DISCOLORATION, WITH WEAKLY</li> </ul>	ᇫ		m	RC	100	100	0.17	1.7E-08			
		DEVELOPED HALO.	FORMATION										
46			₫				400	400	0.40				
			Z			RC	100	100	0.16	9.0E-09			
	177												
	47.3	SHALE:		1									
48		GREENISH-GREY, SOFT TO HARD, FISSILE.	유										
	48.5												
		BOREHOLE TERMINATED AT 48.5 m IN SHALE.											
50													
ļ													
52													
54													
56													
58													
											NOTE AMABEL FORMATION:		
											UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES		
											FH: FOSSIL HILL FM		
60											CH: CABOT HEAD FM		

## LOG OF BOREHOLE BH03-7 (deep)



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | CME 75, track-mounted date started | 2014/10/03

Iocation | Duntroon, Ontariomethod | Rock coringsupervisor | BTCposition | E: 559353 N: 4915510 (17T, Geodetic)coring | HQ core, OD=96mm, ID=64mmreviewer | KJF

SUBSURFACE PROFILE SAMPLE Penetration Test Values (Blows / 0.3m) Lab Data Readings Scale and Plot X Dynamic Cone Water Content (%) Depth Scale Elevation Sci (mASL) Comments 40 1.0 20 3.0 Number N-Value & Plasticity Elev Graphic Undrained Shear Strength (kPa) Depth (m) STRATIGRAPHY GRAIN SIZE DISTRIBUTION (%) Core B (MIT) Recovery 20 **GROUND SURFACE** 8.0 120 GR SA SI CI OVERBURDEN 510 ¥ 509 - 2 508 - 3 507 506 - 5 505 -6 504.0 504 **DOLOSTONE (Amabel Formation)** Creamy white with a dull appearance; uniform; fine to medium grained; thickly R1 bedded: fossiliferous (fossil debris): strong core with a rough cut texture, 503 scratched with a knife; slightly weathered 502.6 appearance with minor rusy staining on fracture surfaces; vugs up to 5%, typically 1 mm to 2 mm. Poor to very poor RQD - 8 502 to 10.1 m depth, then good RQD. (Flank R2 facies) - 9 501.2 Reefal facies with an open vuggy appearance from 6.4 m to 10.1 m depth, 501 broken core recovered as fragments and numerous vertical fractures. Reddish brown muddy infilling to 13.1 m depth. R3 Core becoming darker bluish grey with a 500 decrease in vugs below 16.2 m and finer 499.6 Thin stylolytes (<1 mm) below 22.9 m depth, 2 to 3 per 0.3 m. 499 TCR = 100% RQD = 78% R4 White chert bed 25 mm thick at 24.6 m 12 depth and 50 mm nodule at 25.3 m 498.1 498 Gradational lower contact at 25.6 m 13 depth at change in colour and texture. TCR = 100% RQD = 63% R5 497 496.6 496 TCR = 100% RQD = 78% R6 - 15 495.1 495 16 R7 494

493 6

# LOG OF BOREHOLE BH03-7 (deep)



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | CME 75, track-mounted date started | 2014/10/03

Iocation | Duntroon, Ontariomethod | Rock coringsupervisor | BTCposition | E: 559353 N: 4915510 (17T, Geodetic)coring | HQ core, OD=96mm, ID=64mmreviewer | KJF

SUBSURFACE PROFILE SAMPLE Penetration Test Values (Blows / 0.3m) Lab Data Readings Scale and Plot X Dynamic Cone Water Content (%) Scale Elevation Sci (mASL) Comments 30 40 1.0 20 Number N-Value & Plasticity Elev Graphic Undrained Shear Strength (kPa) Depth (m) **STRATIGRAPHY** Depth GRAIN SIZE DISTRIBUTION (%) Core B (MIT) Recovery 20 (continued) 8.0 120 GR SA SI 493 TCR = 98% RQD = 86% R8 18 492.0 492 TCR = 98% RQD = 98% R9 491 490.5 -20 490 TCR = 98% RQD = 98% R10 -21 489.0 489 - 22 R11 488 -23 487.4 487 TCR = 100% RQD = 95% - 24 486.0 486 - 25 TCR = 100% RQD = 88% 485 **DOLOSTONE** (Fossil Hill Formation) 484.5 Light pinkish brown to greyish brown; fine -26 grained, stylolytes 10 to 12 per 0.3 m, 1 mm thick. 484 Sharp lower contact on change in 27 texture. 482.9 483 -28 TCR = \* R15 Dark coloured fine grained dolostone bed from 28.6 m to SHALE (Cabot Head Formation) 482 Greenish grey calcareous shale; completely weathered, plastic texture. -29 481.4 28.9 m depth. Some reddish coloured beds up to 0.3 m thick, very poor RQD. Core barrel not 481 catching core. TCR = \* R16 30 RQD = \* file: bh 480 479.9 **END OF BOREHOLE** WATER LEVEL MONITORING Elevation (m) Date Depth (m) Borehole was open upon completion. Oct 8, 2014 509 9 0.7 Open hole well installed in borehole Casing cemented in bedrock at 10.51 m

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50 CLIENT: GEORGIAN AGGREGATES LIMITED DATE: APRIL 10, 2003 BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR GROUND ELEVATION: 510.3 mASL REVIEWER: AJC

						5	AMPL	 E				
			STRATIGRAPHY			<u> </u>		*		RATE OF DRILL	WATER CONTENT %	
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	TIGR	MONITOR DETAILS	TYPE	z.	% W		R Q	PENETRATION	10 20 30	REMARKS
			APH		PΕ	VALUE	% WATER	RECOVERY	(%)	m / min		
0	ĺ	CLAYEY SILT:			SS	3		-2√ 50			Wp WL	
		LIGHT BROWN, MOTTLED BROWN, TRACE SAND, TRACE GRAVEL. OCCASIONAL LAMINAE			33	3		50				LOCATED NEAR WETLAND NORTHWEST QUADRANT OF PROPERTY
	1.4	OF FINE TO MEDIUM SAND.	9		SS	6		42				
2		SILTY SAND: LIGHT BROWN, TRACE GRAVEL, TRACE CLAY.	OVERBURDEN		SS	10		54				
		WET, COMPACT, OCCASIONAL LAMINAE OF FINE TO MEDIUM SAND.	8									
			DE		SS	23		58				
			_		SS	19		75				
4				<b>*</b>	SS	27		71				
	5.5				SS	11		75				
6		SANDY SILT TILL: GREY SANDY SILT, TRACE CLAY. VERY STIFF			SS	35		54				
	6.6	TO HARD.			SS	24		79				
	7.5	<u>DOLOSTONE:</u>   LIGHT BROWN TO LIGHT GREY, MEDIUM   GRAINED WITH SACCHAROIDAL TEXTURE,	2NI									
8		WEAKLY BEDDED, 3-5% VUGS UP TO 20 mm, BROKEN.	·		RC	-		100	90	0.21		
		DOLOSTONE:	UNIT									
	9.2	PATCHY GREY TO LIGHT GREY, FINE GRAINED DOLOSTONE, UNIFORM TEXTURE, BROKEN TO BLOCKY.			RC			81	77	0.15		
		- AT 8.0 m FRACTURE WITH 5 mm THICK / RED-BROWN SEDIMENT INFILL.										
10		BOREHOLE TERMINATED AT 9.2 m IN										
		DOLOSTONE.										
12											:	
14												
16												
18												·
												NOTE AMABEL FORMATION:
												UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
												FH: FOSSIL HILL FM CH: CABOT HEAD FM
20 TAGGER	Has I	Juitza	IDOA	IEO NOVEMOS	D 12	300						
Javan			UMUA	LED NOVEWBE	r 12,	2004	+					

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES LIMITED DATE: APRIL 11, 2003

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR

GROUND ELEVATION: 520.2 mASL REVIEWER: AJC

			IS		;	SAMPLE RQD (%) RECOVERY TYPE		RATE OF	HYDRAULIC	
0	DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE			DRILL PENETRATION m / mln	CONDUCTIVITY m / sec	REMARKS
		SILT TILL: DARK BROWN, SILT SOME SAND, SOME GRAVEL, TRACE CLAY, OCCASIONAL COBBLE/BOULDER, VERY STIFF, DTPL.			SS	41				LOCATED ON WEST SIDE OF PROPERTY
2	_		OVER	H. Q.	SS					
			OVERBURDEN	Q. CASING						
4			DEN	ING	SS					
	_									
					SS					
6	6.2				RC	84	75	0.29		
		<u>DOLOSTONE:</u> PATCHY GREY/LIGHT GREY, MEDIUM TO COARSE GRAINED DOLOSTONE, CHAOTIC	٨A	77						
8		TEXTURE, 3-5% VUGS UP TO 40 mm.	AMABEL	7.3 m	RC	95	51	0.14		
			FM.						1.7E-06	
10			UNIT 1		RC	98	81	0.16		
		- BELOW 10.5 m BECOMING FINE GRAINED, 1-2% VUGS UP TO 20 mm.			RC	82	87	0.18	2.0E⊣07	
	11.8									
12	- 11.0	DOLOSTONE: MOTTLED LIGHT BROWN/LIGHT GREY,	MA	9	RC	100	100	0.29	2.5E-07	
		UNIFORM MEDIUM GRAINED DOLOSTONE WITH SACCHAROIDAL TEXTURE, MODERATE TO WELL DEVELOPED BEDDING.	AMABEL	OPEN H.Q.						
14			FM.		RC	100	83	0.25	3. <b>4</b> E-07	
			TINU	OREHOLE	RC	98	92	0.30		
			2		, KC	96	92	0.30	9.0E-07	
16	16.3	DOLOSTONE:			RC	100	100	0.15		
		PATCHY GREY/LIGHT GREY, FINE GRAINED DOLOSTONE, CHAOTIC TEXTURE, 1-2% VUGS UP TO 50 mm.	AMABEL				100		1.9E-07	
18			3EL F		RC	100	93	0.21		NOTE
			FM. UNIT							AMABEL FORMATION: UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES
20			NIT 1		RC	100	100	0.18	2.2E-06	FH: FOSSIL HILL FM CH: CABOT HEAD FM

REVIEWER: AJC

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50 **CLIENT: GEORGIAN AGGREGATES LIMITED DATE: APRIL 11, 2003** BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE SUPERVISOR: PFR GROUND ELEVATION: 520.2 mASL

			S		SAMPLE		RATE OF	HYDRAULIC		
'	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / mln	CONDUCTIVITY	REMARKS
20		DOLOSTONE:			RC	98	100	0.25		LOCATED ON WEST SIDE
		CONTINUED.								OF PROPERTY
			_						3.9E-07	
22			AMABEL		RC	97	100	0.22		
			BE							
					RC	100	97	0.26	1.3E-06	
			FM. (					0.20		
24			TINU							
			7		RC	100	97	0.29		
				유		100		0.23	9.1E-07	
	25.8			OPEN						
26		DOLOSTONE:		Д. О.	RC	100	100	0.31		
		LIGHT GREY, UNIFORM, MEDIUM GRAINED DOLOSTONE WITH "SPECKLED" APPEARANCE,		BOR				0.5	4.0E-07	
		WEAKLY BEDDED, 3-5% WHITE CRINOIDAL FOSSIL FRAGMENTS, BROKEN TO MASSIVE,		BOREHOLE						
28		RARE BROWN STYOLITES, OCCASIONAL GREY SHALE LAMINAE/PARTING UP TO 2 mm.			RC	100	89	0.31		
			AMABEL						3.1E-07	
		<ul> <li>BELOW 31.4 m INCREASING BROWN STYLOLITES.</li> </ul>	ABE		RC	100	95			
		STILULITES.	-			100	95	_		
30			_ ≤							
			TINU						1.7E-06	
			Т2		RC	98	88	0.29		
32					RC	100	100	0.22		
									1.5E-06	
	33.2									
7.4		DOLOSTONE: BLUE—GREY, FINE GRAINED WITH	_		RC	93	100	0.22		
34		SACCHAROIDAL TEXTURE, INCREASING STYLOLITES, BECOMING GREY IN COLOUR.	FOSSIL						7.65 03	
		AT 74.4 DECOMING DISTRICT DECIMA	SIL						3.6E-07	
		- AT 34.1 m BECOMING PINKISH-BROWN WITH OCCASIONAL cm SCALE PINCH-AND	HILL		RC	93	100	_		
36		-SWELL TYPE BEDS AND NODULES OF GREY CHERT, OCCASIONAL PYRITE	т 1							
		$-$ AT 34.7 m FRACTURE WITH LIGHT BROWN HALO $\pm$ 30 mm.	≅						6.2E-10	
	37.4	SHALE:	C			l				CIRCULATION MAINTAINED FOR ENTIRE HOLE.
38	37.9	GREENISH-GREY, SOFT TO HARD, FISSILE.	НЭ							NOTE
		BOREHOLE TERMINATED AT 37.9 m IN SHALE.								AMABEL FORMATION: UNIT 1: REEFAL FACIES
										UNIT 2: FLANK FACIES FH: FOSSIL HILL FM
						ļ				CH: CABOT HEAD FM
40				ED NOVEMBE						

PROJECT NAME: DUNTROON QUARRY EXPANSION

CLIENT: GEORGIAN AGGREGATES LIMITED

DATE: APRIL 14, 2003

BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE

GROUND ELEVATION: 518.5 mASL

REVIEWER: AJC

			ST		,	SAMPLE		RATE OF		HYDR	AULI	3		
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	% RECOVERY	RQD (%)	DRILL PENETRATION m / mln	E-"	COND			REMARKS	
0								,		1 1	1 1	1 1		
		SILT TILL: DARK BROWN, SILT, SOME SAND, SOME GRAVEL, TRACE CLAY, OCCASIONAL	OVER- BURDEN	H.Q.	SS	90							LOCATED IN SOUTHEAST PART OF PROPERTY.	
	1.6	BOULDER/COBBLE.	DEN.											
	1.6	DOLOSTONE:		CASING										
2		PATCHY LIGHT BROWN/LIGHT GREY, MEDIUM TO COARSE GRAINED DOLOSTONE WITH			RC	85	76	0.24					TEMPORARILY LOST CIRCULATION AT 1.8 m mBGS. LOST CIRCULATION AT	
		CHAOTIC TEXTURE, FREQUENT FOSSIL FRAGMENTS UP TO 60 mm, 3-5% VUGS											7.9 mBGS.	
		UP TO 30 mm WITH OCCASIONAL CALCITE INFILL.				45	19	0.16						
4				4.0 m	RC	45	19	0.16						
					RC	100	76	0.14						
					C	100		0.14						
6														
					RC	100	100	0.12						
			<b>&gt;</b>							9.9E-	-07			
8			AMABEL		RC	95	96	0.18						
			BEI											
10			₽N		RC	100	100	0.17		4	.1E-0	5:		
10			FORMATION UNIT											
			N N		RC	100	95	0.15						
			S											
12			T 1							9.2E-	07			
				OPEN	RC	100	88	0.18						
				H.Q.										
14				BORE	RC	93	85	0.21		2.3E	-06			
				OREHOLE								1		
				m	RC	100	100	0.22						
										8.6	6E-06			
16														
					RC	100	100	0.21				1		
18										8.9E-	-07			
					RC	98	92	0.19			Ц,		NOTE  AMABEL FORMATION:	
													UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES	
					RC	95	100	0.19		4.3E	-06		FH: FOSSIL HILL FM CH: CABOT HEAD FM	
20														

PROJECT NAME: DUNTROON QUARRY EXPANSION	PROJECT NO.: 930521.50
CLIENT: GEORGIAN AGGREGATES LIMITED	DATE: APRIL 14, 2003
BOREHOLE TYPE: H.Q. (64 mm) ROCK CORE	SUPERVISOR: PFR
GROUND ELEVATION: 518.5 mASL	REVIEWER: AJC

			ST			SAMPLE		RATE OF	HYDRAULIC	
	EPTH	STRATIGRAPHIC DESCRIPTION	TRATIGRAPHY	MONITOR		% R	RQD	DRILL PENETRATION	CONDUCTIVITY m / sec E <sup>-11</sup> E <sup>-4</sup>	REMARKS
'	(m)		ЭRАРІ	DETAILS	TYPE	RECOVERY	עג (%)			
20			<u>∓</u>			籽	<u> </u>	m / mln		
		DOLOSTONE: CONTINUED.	_							LOCATED IN SOUTHEAST PART OF PROPERTY.
		- 21.0 TO 21.3 m VERTICAL FRACTURE	TINU		RC	100	100	0.21	4.3E-07	
		WITH MODERATE ORANGE STAINING.							+.3L=0/	
22	22.3									
		DOLOSTONE: LIGHT GREY, MEDIUM GRAINED DOLOSTONE,			RC	100	95	0.19	5.3E-06	
		UNIFORM WITH "SPECKLED" TEXTURE. WEAKLY BEDDED, 3-5% CRINOIDAL FOSSIL								
24		FRAGMENTS (CRÍNOIDS), RARE BROWN STYLOLITES.			RC	100	95	0.18		
		- BREAKS DOMINANTLY	≥						5.2E-06	
		PARALLEL TO BEDDING, MODERATE ORANGE STAINING,	AMABE	OPEN	RC	100	100	0.19		
26		23.8 m AND 26.5 m.		V н.Q						
			FOR						1.7E-06	
			ÑA.	BOREHOLE	RC	100	88	0.18		
28			FORMATION UNIT							
20			Ş		RC	100	100	0.20	7.3E-07	
			IIT 2							
30					RC	100	97	0.20	1.5E-05	
					RC	100	100	0.21		
32										
					RC	100	95	0.16	1.3E-06	
	33.0	DOLOCTONIC.						0.10		
		DOLOSTONE: BLUE-GREY, FINE TO MEDIUM GRAINED DOLOSTONE WITH SACCHAROIDAL TEXTURE,	Б							
34		INCREASING STYLOLITES, BECOMING GREY.	SSIL		<u> </u>				5.2E-07	
		- AT 33.7 m FRACTURE WITH LIGHT BROWN HALO ±100 mm.	<u></u>		RC	100	100	0.16		
		- AT 34.6 m PINKISH-BROWN, FINE GRAINED DOLOSTONE WITH SACCHAROIDAL TEXTURE OCCASIONAL SHALE LAMINAE LIR	П							
36		TEXTURE, OCCASIONAL SHALE LAMINAE UP TO 3 mm THICK, OCCASIONAL PINCH—AND—SWELL TYPE BED OR NODULE	ORMATION		RC	05	100	0.17	7.9E=09	
		OF GREY CHERT, OCCASIONAL PYRITE.  - AT 33.7 m FRACTURE WITH LIGHT	IATIC		, KC	95	100	0.13		
		BROWN HALO ±100 mm.	Š							
38									4.9E-09	NOTE
										NOTE  AMABEL FORMATION:
	38.9	SHALE:								UNIT 1: REEFAL FACIES UNIT 2: FLANK FACIES FH: FOSSIL HILL FM
	39.5	GREENISH-GREY, SOFT TO HARD, FISSILE.	요							CH: CABOT HEAD FM
40	J9.5	BOREHOLE TERMINATED AT 39.5 m IN SHALE								

PAGE 1 of 2

PROJECT NAME: DUNTROON EXPANSION - BRIDSON MONITORS

PROJECT NO.: 04-930521.52

CLIENT: WALKER INDUSTRIES HOLDINGS

BOREHOLE TYPE: HQ CORE

DATE COMPLETED: Dec 02, 2008

SUPERVISOR: SLW

GROUND ELEVATION: 511.5 mASL REVIEWER: AGH

GRO	UND	ELEVATION: 511.5 mASL								REVIE	EWER	: AG	<u>iH                                    </u>
			TS			,	SAMPL	E		CONE PENETRATION	WATER CONTENT %		UTM CO-ORDINATES UTM Zone: 17 NAD: 27
	PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE 10 20 30			Easting: <u>560471</u> Northing: <u>4915197</u>
0.0			‡			П	Ä	ERΥ	3	SHEAR STRENGTH	W <sub>P</sub>	W <sub>L</sub>	REMARKS
1.0		SILT: BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST. 50 mm SEAM OF COARSE GRAVEL AT 1.8 m.			SS1	29		54		_			
1.0		ONVERAL I.UIII.			SS2	18		46					
2.0	2.1 —	DOLOSTONE:	Ш		SS3	63		54		63			AUGER REFUSAL AT 2.1 m.
3.0		LIGHT GREY TO WHITE DOLOSTONE BANDED IN DARK GREY, MEDIUM HARD, FRACTURED TO VERY BROKEN, WEATHERED.			RC4			75	0				ASSUMED BEDROCK. CASING SEATED TO 2.6 m. OPEN HOLE INSTALLATION.
		- VUGGY - FOSSILIFEROUS			RC5			100	54				
4.0	4.3 —	DOLOSTONE:											
5.0		GREY DOLOSTONE, BECOMING YELLOW TINGED WITH DEPTH, MEDIUM HARD, FRACTURED TO MASSIVE, SOME WEATHERING AND SEDIMENT INFILLING IN FRACTURES.			RC6			100	92				
6.0		- VUGGY - FOSSILIFEROUS											
7.0					RC7			100	97				
8.0	7.4 ——	DOLOSTONE: LIGHT GREY TO WHITE DOLOSTONE WITH DARK GREY MOTTLING, MEDIUM HARD, FRACTURED TO MASSIVE, SLIGHT WEATHERING.			RC8			100	79				
9.0		- NUMEROUS SMALL VUGS - FEW FOSSILS											
10.0					RC9			97	95				
11.0					RC10			98	99				
12.0													
13.0					RC11			100	95				
14.0	13.7 ——	DOLOSTONE: GREY DOLOSTONE WITH INCREASING DARK GREY BANDING AND MOTTLING WITH DEPTH. BRONZE COLOURED, INCLUSIONS BEGINNING AT 18 m. MEDIUM HARD, FRACTURED TO MASSIVE,			RC12			100	88				
15.0		SOME STAINING AND WEATHERING IN FRACTURES. - VUGGY											
17.0					RC13			100	82				
18.0					RC14			100	90				
19.0					RC15			100	92				
20.0													
													GENIVAI

PAGE 2 of 2

PROJECT NAME: DUNTROON EXPANSION - BRIDSON MONITORS	PROJECT NO.: 04-930521.52
CLIENT: WALKER INDUSTRIES HOLDINGS	DATE COMPLETED: Dec 02, 2008
BOREHOLE TYPE: HQ CORE	SUPERVISOR: SLW
GROUND ELEVATION: 511 5 mASI	REVIEWER: AGH

GROUND	ELEVATION: 511.5 mASL								_ REVIE	EWER: A	GH
		STF			5	SAMPLI			CONE PENETRATION	WATER	UTM CO-ORDINATES UTM Zone: 17 NAD: 27
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	% RECOVERY % WATER N VALUE TYPE		RQD (%)	"N" VALUE 10 20 30	10 20 30	Easting: 560471 Northing: 4915197		
20.0		₹			т	Ä	ΞRΥ	٠	SHEAR STRENGTH	W <sub>P</sub> W <sub>L</sub>	REMARKS
21.0	DOLOSTONE; CONTINUED.  DOLOSTONE: BLUE-GREEN MOTTLED DOLOSTONE, WHITE INCLUSIONS, MEDIUM HARD, TEXTURE IS SMOOTH, FRACTURED TO MASSIVE. (FOSSIL HILL FORMATION) - VUGS (MINOR)			RC16			100	93			
23.0				RC17			100	92			
24.0				RC18			100	89			
25.0 24.8 ====================================	SHALE: BLUE-GREEN GREY SHALE, VARIABLE SOFT TO HARD.  DOLOSTONE: BLUE-GREEN MOTTLED DOLOSTONE, MEDIUM			RC19			100	70			
27.0	HARD, FRACTURED TO MASSIVE.  SHALE: BLUE-GREEN GREY SHALE, VARIABLE SOFT TO HARD. (CABOT HEAD FORMATION)			RC20			100	20			
28.0	BOREHOLE TERMINATED AT 27.4 m IN SHALE.										BOREHOLE TERMINATED AT 27.4 m IN BLUE-GREEN SHALE.  WATER LEVEL 2.49 mBGL MEASURED ON DEC. 5, 2008.  FINAL STICK-UP 1.83 m ABOVE
30.0											GROUND LEVEL.
31.0											
29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0											
34.0											
35.0											
37.0											
38.0											
39.0 40.0											GENIVA

PAGE 1 of 2

PROJECT NAME: DUNTROON EXPANSION - BRIDSON MONITORS	PROJECT NO.: 04-930521.52
CLIENT: WALKER INDUSTRIES HOLDINGS	DATE COMPLETED: Dec 03, 2008
BOREHOLE TYPE: HQ CORE	SUPERVISOR: SLW
GROUND FI EVATION: 511 2 mASI	REVIEWER: AGH

GK	טאטכ	ELEVATION: 511.2 mASL								_ REVI	-WER	: AG	iH
			ST		SAMPLE			E		CONE PENETRATION	WA <sup>-</sup>	TER	UTM CO-ORDINATES
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	% WATER N VALUE TYPE		% RECOVERY	RQD (%)	"N" VALUE 10 20 30	10 2	ENT % 0 30 L L	UTM Zone: <u>17</u> NAD: <u>27</u> Easting: <u>560484</u> Northing: <u>4915175</u>	
0.0			¥			m	H	ΈRΥ	6)	SHEAR STRENGTH	⊢ W <sub>P</sub>	WL	REMARKS
1.0		SILT: DARK BROWN TO BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST, DENSE. ORGANIC MATTER AT GROUND SURFACE.		[O.O. O.O. O.O. O.O. O.O. O.O. O.O. O.O	SS1 SS2	33 43		38 21		43_			
2.0	1.8 —	DOLOSTONE: CREAMY WHITE DOLOSTONE, MOTTLED WITH LIGHT AND DARK GREY, MEDIUM HARD, BROKEN			SS3 RC4	50		100 100	0				AUGER REFUSAL AT 1.8 m. ASSUMED BEDROCK.
3.0		BECOMING MASSIVE WITH DEPTH, WEATHERED FRACTURES FOSSILIFEROUS - VUGGY			RC5			100	0				CASING SEATED TO 2.7 m. OPEN HOLE INSTALLATION.
4.0		- SOME CALCITE INFILL WITHIN LARGER VUGS			RC6			100	52				
6.0					RC7			100	60				
7.0	7.5 —	DOLOGTON'S			RC8			100	84				
9.0		DOLOSTONE: LIGHT GREY DOLOSTONE BANDED AND MOTTLED WITH DARK GREY, SOME RUST COLOURED MOTTLING, MEDIUM HARD, FRACTURED TO MASSIVE. FRACTURES SHOWING RUST STAINING WITH DEPTH.			RC9			100	89				
10.0		- NUMEROUS SMALL VUGS - FEW FOSSILS			RC10			100	79				
11.0 12.0 13.0 14.0 15.0 17.0 18.0	10.5 ——	DOLOSTONE: LIGHT GREY DOLOSTONE MOTTLED WITH DARK GREY, BROWN SPOTS, MEDIUM HARD, SMOOTH TEXTURE, MASSIVE VUGS (MINOR)			RC11			100	100				
13.0	12.3	DOLOSTONE: LIGHT GREY DOLOSTONE, VERY DARK GREY MOTTLING AND BANDING, MEDIUM HARD, MASSIVE VUGGY			RC12			100	98				
15.0					RC13			100	92				
16.0	16.6				RC14			100	97				
17.0		DOLOSTONE: LIGHT GREY TO MEDIUM GREY DOLOSTONE, DARK GREY MOTTLING, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE TO FRACTURED VUGGY			RC15			100	98				
19.0					RC16			100	98				
20.0	19.7	DOLOSTONE:											

PAGE 2 of 2

PROJECT NAME: DUNTROON EXPANSION - BRIDSON MONITORS	PROJECT NO.: 04-930521.52
CLIENT: WALKER INDUSTRIES HOLDINGS	DATE COMPLETED: Dec 03, 2008
BOREHOLE TYPE: HQ CORE	SUPERVISOR: SLW
GROUND ELEVATION: 511.2 mASL	REVIEWER: AGH

			Si			S	AMPLI	E		CONE PENETRATION	WAT	TER	UTM CO-ORDINATES
	PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE  10 20 30	10 20	ENT %	UTM Zone: <u>17</u> NAD: <u>27</u> Easting: <u>560484</u> Northing: <u>4915175</u>
0.0		DOLOSTONE: CONTINUED.	,					~		STRENGTH	W <sub>P</sub>	W <sub>L</sub>	REWARKS
21.0		BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, BROWN SPOTS AND MOTTLING, WHITE INCLUSIONS, SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION) - VUGS (MINOR)			RC17			100	83				
23.0					RC19			100	78				
24.0													
	25.8 —	SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)			RC20			100	40				BOREHOLE TERMINATED AT :
7.0		BOREHOLE TERMINATED AT 25.8 m IN SHALE.											m IN BLUE-GREEN SHALE.  WATER LEVEL 2.26 mBGL  MEASURED ON DEC. 5, 2008.  FINAL STICK-UP 1.82 m ABOV
8.0													GROUND LEVEL.
29.0													
31.0													
2.0													
33.0													
4.0													
5.0													
7.0													
8.0													
9.0													

PAGE 1 of 2

PROJECT NAME: DUNTROON EXPANSION - BRIDSON MONITORS	PROJECT NO.: 04-930521.52
CLIENT: WALKER INDUSTRIES HOLDINGS	DATE COMPLETED: Dec 04, 2008
BOREHOLE TYPE: HQ CORE	SUPERVISOR: SLW
GROUND FLEVATION: 512.6 mASI	REVIEWER: AGH

•		ELEVATION. 512.0 IIIA3L								_ '\_	•	WER. AC	
			ST.			S	SAMPL	E	ı	CONE PENETRATIO	ON	WATER	UTM CO-ORDINATES
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALU		10 20 30 1 1 1	UTM Zone: <u>17</u> NAD: <u>27</u> Easting: <u>560447</u> Northing: <u>4915198</u>
0.0			₹	Yo. 27 Yo. 2		""	ת	RY		SHEAR STRENGTH		W <sub>P</sub> W <sub>L</sub>	REMARKS
1.0		SILT: DARK BROWN TO BROWN SILT, SOME SAND, TRACE GRAVEL, TRACE CLAY, MOIST, DENSE. ORGANIC MATTER AT GROUND SURFACE.			SS1 SS2	18 27		42 50					
2.0					SS3	44		58			44		
3.0					SS4	27		58		•			
4.0	3.0 —	DOLOSTONE: CREAMY WHITE DOLOSTONE, MOTTLED WITH LIGHT AND DARK BLUE-GREY, MEDIUM HARD, BROKEN BECOMING MASSIVE WITH DEPTH, WEATHERING OF FRACTURES DECREASING WITH			RC5			100	84				AUGER REFUSAL AT 3.0 m. ASSUMED BEDROCK. CASING SEATED TO 3.2 m. OPEN HOLE INSTALLATION.
5.0		DEPTH VUGGY - FOSSILIFEROUS - SOME CALCITE INFILL WITHIN LARGER VUGS			RC6			100	78				
7.0					RC7			100	83				
8.0					RC8			95	91				
9.0	9.0 —	DOLOSTONE:											
11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 17.0 18.0 19.0 19.0 19.0 19.0 19.0 19.0 19.0 19		LIGHT GREY DOLOSTONE BANDED AND MOTTLED WITH DARK GREY, MEDIUM HARD, FRACTURED TO MASSIVE. FRACTURES SHOWING STAINING AND SILTY INFILLING WITH DEPTH.  - NUMEROUS SMALL VUGS			RC9			98	84				
11.0		- FEW FOSSILS			RC10			100	86				
12.0	12.5 ——	DOLOSTONE: LIGHT GREY DOLOSTONE MOTTLED WITH DARK			RC11			100	95				
13.0	14.0	GREY, BROWN SPOTS, MEDIUM HARD, SMOOTH TEXTURE, MASSIVE FEW VUGS											
15.0	15.1	DOLOSTONE: LIGHT TO MEDIUM GREY DOLOSTONE WITH DEPTH, DARK GREY BANDING, MEDIUM HARD, MASSIVE.  DOLOSTONE:			RC12			100	93				
16.0		DOLOSTONE: MEDIUM GREY DOLOSTONE BECOMING LIGHT GREY WITH DEPTH. DARK GREY MOTTLING, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE.			RC13			100	98				
17.0		- NUMEROUS SMALL VUGS			RC14			100	92				
18.0					RC15			100	93				
20.0	19.7	DOLOSTONE:											
													GENIVAI

PAGE 2 of 2

PROJECT NAME: DUNTROON EXPANSION - BRIDSON MONITORS	PROJECT NO.: 04-930521.52
CLIENT: WALKER INDUSTRIES HOLDINGS	DATE COMPLETED: Dec 04, 2008
BOREHOLE TYPE: HQ CORE	SUPERVISOR: SLW
GROUND ELEVATION: 512.6 mASL	REVIEWER: AGH

		STI			5	AMPLI	E		CONE PENETRATION			UTM CO-ORDINATES UTM Zone: 17 NAD: 27
PTH m)	STRATIGRAPHIC DESCRIPTION	RATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE  10 20 30  I I I  SHEAR STRENGTH	10 2	0 30	Easting: 560447 Northing: 4915198
	DOLOSTONE: CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING			RC16			100	91		VVP	٧٧١	
	LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE.											
22.1 ——				RC17			100	93				
	BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, INCREASING WHITE BANDING WITH DEPTH.											
	DEPTH. SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION)			RC18			100	88				
	, , , ,			RC19			100	90				
				RC20			100	84				
27.5 ——	SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)			RC21			100	11				
28.8 ——	BOREHOLE TERMINATED AT 28.8 m IN SHALE.											BOREHOLE TERMINATED AT m IN BLUE-GREEN SHALE.
												WATER LEVEL 3.53 mBGL MEASURED ON DEC. 5, 2008.
												FINAL STICK-UP 1.55 m ABOVI GROUND LEVEL.
	22.1	DOLOSTONE: CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS  DOLOSTONE: BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, INCREASING WHITE BANDING WITH DEPTH. WHITE INCLUSIONS AND BROWN SPOTTING WITH DEPTH. SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION) - VUGS (MINOR)  SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)	DOLOSTONE: CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS  DOLOSTONE: BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, INCREASING WHITE BANDING WITH DEPTH. WHITE INCLUSIONS AND BROWN SPOTTING WITH DEPTH. SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION) - VUGS (MINOR)  SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)	DOLOSTONE: CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS  DOLOSTONE: BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, INCREASING WHITE BANDING WITH DEPTH. WHITE INCLUSIONS AND BROWN SPOTTING WITH DEPTH. SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION) - VUGS (MINOR)  SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)	DOLOSTONE: CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS   POLOSTONE: BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, INCREASING WHITE BANDING WITH DEPTH. WHITE INCLUSIONS AND BROWN SPOTTING WITH DEPTH. SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION) - VUGS (MINOR)  RC19  SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)  RC21	PTH (n))    STRATIGRAPHIC DESCRIPTION   STRATIGRAPHIC DESC	PTH (n))    STRATIGRAPHIC DESCRIPTION   STRATIGRAPHIC DESCRIPTION   PT   T   T   T   T   T   T   T   T	DOLOSTONE: CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS   DOLOSTONE: BLUE GREEN MOTTLED GREY DOLOSTONE, DARKER BLUE-GREEN THIN BANDING, INCREASING WHITE BANDING WITH DEPTH. WHITE INCLUSIONS AND BROWN SPOTTING WITH DEPTH. SMOOTH TEXTURE, MEDIUM HARD, MASSIVE TO FRACTURED. (FOSSIL HILL FORMATION) - VUGS (MINOR)  RC19  100  RC20  100  RC21  SHALE: BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)  RC21  100	PTH n) STRATIGRAPHIC DESCRIPTION    STRATIGRAPHIC DESCRIPTION   STRATIGRAPHIC DESCRIPT	PTH N)  STRATIGRAPHIC DESCRIPTION  STRATIGRAPHIC DESCRIPTION  DOLOSTONE; CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING WITH DEPTH, RUST COLOURED THIN BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS  PENETRATION  PREFERRATION  N' VALUE 10 20 30  RC16  RC16  100 91  RC17  DOLOSTONE; CONTINUED. LIGHT GREY DOLOSTONE WITH INCREASING LIGHT/DARK BANDING, MEDIUM HARD, MASSIVE NUMEROUS SMALL VUGS  RC17  DOLOSTONE; CONTINUED. RC18  RC18  RC18  RC18  RC19  RC19  RC20  RC21  SHALE; BLUE GREEN SHALE, SOFT, VERY BROKEN. (CABOT HEAD FORMATION)  RC21  RC21  100 111	PTH STRATIGRAPHIC DESCRIPTION    STRATIGRAPHIC DESCRIPTION   STRATIGRAPHIC DESCRIPTION   PTH   STRENGTH   PTH   PTH   STRENGTH   PTH   PTH   PTH   PTH   STRENGTH   PTH   PTH	PTH STRATIGRAPHIC DESCRIPTION    STRATIGRAPHIC DESCRIPTION   PROPERTION   PROPERTIO



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/26

| Iocation | Duntroon, Ontario | method | Rock coring | supervisor | KMT

**position** | E: 560059 N: 4915125 (17T, Geodetic) **coring** | PQ core, OD=123mm, ID=85mm **reviewer** | KJF

È		SUBSURFACE PROFILE	_		SA	MPLE I	e e	Penetration (Blows / 0.3)		values	$\geq$					gs		Lab Data
De	lev epth m)	STRATIGRAPHY	Graphic Plot	Number	Туре	SPT N-Value Core	Elevation Scale (mASL)	× Dynamic 10 Undrained S O Unconfi	20 Shear ined		th (kPa) + Field Vane	Wa	& Pla	ontent ( sticity	(%) L	PID Readings	Well Details	and Comments GRAIN SIZE DISTRIBUTION
S [ `	25.7	GROUND SURFACE	Gra	~		Recovery	l iii	<ul> <li>Pocket</li> <li>40</li> </ul>	Penetr 80	ometer 12	■ Lab Vane 20 160	1	0 2	0 3	<b>1</b> 80	곱		(MIT) GR SA SI
02	-0.7	OVERBURDEN	И				1 -											ar or or
			11	]			525 -											
	24.5		K															
	1.2	DOLOSTONE (Amabel Formation)		-			524 -											
		Creamy white with a dull appearance; uniform; fine to medium grained; strong core with a rough texture, scratched by a					] ".											
		core with a rough texture, scratched by a knife, slightly weathered with rusty		1		TOD 790/	500											
		orange staining on fracture surfaces:		1	R1	TCR = <b>73</b> % RQD = <b>47</b> %	523 -											
		thickly bedded, good to excellent RQD, vugs <5%, 2 to 4 mm. (Flank facies)																
-0				-			522 -											
52	21.4	Reefal facies texture with more open cavities and increased fossil content from					-											
		1.2 m to 5.1 m, 11.0 m to 12.8 m and	$\vdash$				521 -											
		from 17.0 m to 18.2 m depth.			R2	TCR = 64%	-											
		Core becoming darker bluish grey in colour below 17.1 m. Mottled grey and				RQD = 31%	520 -											
51	19.3	white appearance from 25.9 m to 37.0 m	H	1			-											
		depth.					519 –											
		Gradational lower contact at change in					-											
		texture at 37.0 m depth.		-		TCD 000/	518 -											
					R3	TCR = 99% RQD = 85%	-											
			H				517 -											
							]											
51	16.3						516 –											
,				-			310											
				1	R4	TCR = 100% RQD = 99%	515 -											
			$\perp$			1100 = 33/6												
2							514 -											
	13.2						-											
,							513 -										_	
'							-										<u></u>	
			H			TCR = 98%	512 -											
1					R5	RQD = 96%	-											
							511 -											
5	10.2						-											
31	10.2						510 -											
3							-											
			H				509 -											
'					R6	TCR = <b>77</b> % RQD = <b>74</b> %	-											
							508 -											
3							-											
50	)7.1						507 -											
,																		
							E06 -											
					R7	TCR = 98%	506 -											
			$\vdash$	1	11/	RQD = <b>94</b> %	·											
							505 -											
50	04.1		L				-											
,	$\neg$		$\vdash$				504 –											Vertical for the f
50				1			-											Vertical fracture fr 22.0 m to 22.6 m
,			Ш		R8	TCR = 100% RQD = 70%	503 -											depth.
`			H			1.02 - 10/6	-											
				1		1	502 -					1				1		l

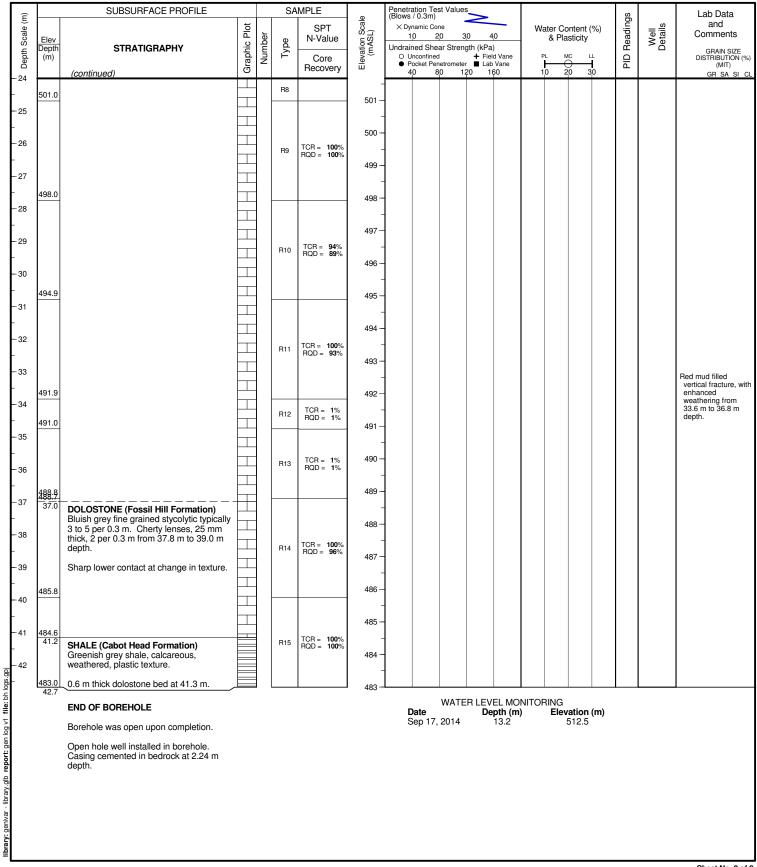


project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/26

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

**position** | E: 560059 N: 4915125 (17T, Geodetic) **coring** | PQ core, OD=123mm, ID=85mm **reviewer** | KJF





project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc.rig type |date started | 2014/08/12

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | TKC

 position | E: 560108 N: 4915311 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

_		SUBSURFACE PROFILE				MPLE	ormg <sub>i</sub>	Penetration Te (Blows / 0.3m)						1	1101	Lab Data
Depth Scale (m)			į	İ, I		SPT	Elevation Scale (mASL)	X Dynamic Co  Co  Co  Co  Co  Co  Co  Co  Co  Co	ne		Water (			PID Readings	= is	and Comments
h Sca	Elev Depth	STRATIGRAPHY	Graphic Plot	Number	Туре	N-Value	ation (	Undrained She		th (kPa)	& P	lasticit	у	Rea	Well Details	
Dept	(m)	ODOLIND SUBFACE	Grap	N	_	Core Recovery	Eleva (		netrometer	+ Field Var ■ Lab Vane 0 160	PL 1,0	мс 20	30	PID		GRAIN SIZE DISTRIBUTION (%) (MIT)
-0	531.4	GROUND SURFACE OVERBURDEN	П	Н		,	531	40	30 12	.0 100	10	20	30			GR SA SI CL
-1							-									
- -2			11				530 -									
-							529 -									
-3	527.7						528 —									
-4	3.7	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance;	Ш	1			- 527 –									
- -5		uniform; fine to medium grained; strong core with a rough cut texture, scratched			R1	TCR = 99%	527 -									
ŀ		by a knife; slightly weathered with rusty orange staining on fractures, vuggy			NI.	RQD = <b>90</b> %	526									
-6 -	524.8	tunically E0/ thickly hadded everall good	$\vdash$				525									
-7		Reefal facies texture with vugs and					- 524									
-8		cavities up to 10 cm and increased fossil content from 12.2 m to 13.4 m and 36.7			R2	TCR = 100% RQD = 95%	=									
- -9	522.4	m to 37.4 m.					523 – -									
-		Core becoming darker bluish grey below 24.2 m. Mottled grey and white to light	Ħ				522 -									
- 10 -		pinkish brown below 42.1 m.			R3	TCR = 100% RQD = 100%	521 –									
-11		Gradational lower contact on change in texture.					520 <del>-</del>									
- -12	519.7						-									
-						TOD 900/	519 -									
13 			$\perp$		R4	TCR = <b>98</b> % RQD = <b>79</b> %	518 -									
- 14	516.9						517 <del>-</del>									
- 15							-									
- - 16			$\vdash$		5.5	TCR = 99%	516 <del>-</del>									
ŀ			$\vdash$		R5	RQD = <b>72</b> %	515 -									
- 17 -	513.7		H				514 -									
- 18			Ħ	1			513 <del>-</del>									Some reddish mud infilling on vertical
- 19							-									fracture from 18.1 m to 18.3 m.
- 20					R6	TCR = 95% RQD = 71%	512 -									
-	E10.0						511 -									
- 21 -	510.3						510 –									
-22							509 –									
- -23					R7	TCR = 95% RQD = 90%	-									
F							508 <del>-</del>									
- 24	507.1		H				507 -									
25 			H				506								_	
- 23 - 24 - 25 - 26 - 27 - 28 - 29			H		R8	TCR = 97% RQD = 87%	-								<u></u>	
- -27			H				505									
<b> </b>	503.8		H				504 -									
- 28 -						TCR = 100%	503 -									
- 29					R9	RQD = <b>97</b> %	502 –									
	500.7		$\vdash$													



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/12

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | TKC

 position | E: 560108 N: 4915311 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

	SUBSURFACE PROFILE			SA	MPLE	_	Penetration Te (Blows / 0.3m)	st Value	s_						S		Lab Data
		lot	L		SPT	Elevation Scale (mASL)	X Dynamic Co	ne		_	Wa	ter Co	ntent	(%)	PID Readings	III SIIR	and Comments
Elev Depth	STRATIGRAPHY	ic P	Number	Туре	N-Value	tion a	1,0 2 Undrained She		30 40 gth (kPa)			& Pla	sticity		Rea	Well Details	
(m)	• · · · · · · · · · · · · · · · · · · ·	Graphic Plot	Nur	1	Core Recovery	Eleva (r	<ul><li>Unconfined</li><li>Pocket Per</li></ul>	l etromete	+ Field r ■ Lab \	Vane Vane	PL	_		LL.	吕		GRAIN SIZ DISTRIBUTION (MIT)
	(continued)	10			necovery		40 8	0 1	20 16	0	10	) 2	0	30	+		GR SA S
500.7				R9		501 —											
						500 —											
				R10	TCR = 98%	400											Broken core reco
				NIU	RQD = <b>74</b> %	499 —											from 32.3 m to 3
497.5						498 —											
437.3						- 497 —											
		$\vdash$				437											
				R11	TCR = 89%	496 —											
					RQD = <b>76</b> %	- 495 —											
						-											
494.0						494 —											
						493 —											
				R12	TCR = 96% RQD = 93%	-											
						492 — _											
490.8						491 —											
						- 490 —											
					TCR = 89%	-											
				R13	RQD = <b>85</b> %	489 —											
						- 488 —											
487.6						-											
						487 —											
				R14	TCR = 100% RQD = 70%	486 —											
						- 485 —											
484.8 46.6	DOLOSTONE (Fossil Hill Formation)	士				400 -											
	Dark pinkish brown fine grained, stylolytes typically 3 to 5 per 0.3 m,					484 —											
	typically 3 mm thick, stylolytes increasing with depth.			R15	TCR = 100% RQD = 90%	483 —											
	10 cm coral fossil at lower contact.				HQD = 90%	-											
481.5						482 -											
	Charp lower contact at mot shale bed.					481 —											
470.0					TOD 400%	400											
479.9 51.5	SHALE (Cabot Head Formation)			R16	TCR = 100% RQD = 89%	480 <del>-</del>											
	Greenish grey calcareous, weathered, plastic texture. 10 cm thick at contact					479 —											
478.4	overlying 0.33 m thick dolostone bed. Reddish fossiliferous sandstone beds 25					- 478 —											
	mm to 100 mm thick comprise 20% of recovered core.			R17	TCR = 100% RQD = 82%	-											
476.7						477 —											
54.7	END OF BOREHOLE						Data	WATE	RLEVE				-4:	(\			
	Borehole was open upon completion.						<b>Date</b> Sep 2,	2014	Dep	oth (m) 25.9		⊏iev !	<b>ation</b> 505.5	(111)			
	Open hole well installed in borehole.																
	Casing cemented in bedrock at 3.66 m depth.																
	чори.																



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/12

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | TKC/SLW

 position | E: 560217 N: 4915465 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

Œ	<u> </u>	SUBSURFACE PROFILE	Τ.	$\vdash$	SA	MPLE	ile ile			st Value	5				sgi		Lab Data
Depth Scale (m)	Elev Depth (m)	STRATIGRAPHY	Graphic Plot	Number	Type	SPT N-Value	Elevation Scale (mASL)	Undrai	ined She Inconfine Pocket Pe	20 3 ear Stren d netromete	30 40  igth (kPa)  + Field Vane  r ■ Lab Vane	& Pla	$\sim$	LL J	PID Readings	Well Details	and Comments GRAIN SIZE DISTRIBUTION (9 (MIT)
	514.4	GROUND SURFACE	U	Щ		Recovery	ш				20 160	10	20 3	30	L"		GR SA SI
		OVERBURDEN					514 -	-									
							513 -	-									
							512 -	-									
	510.4						511 -									Ţ	
	4.0	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance; uniform; fine to medium grained; fossiliferous, strong core with a rough cut texture, scratched by a knife; porous to		-			510 - -										
		vuggy with vugs representing 10% to 20% of recovered core. Reddish muddy infilling to 11.4 m. Minor weathering with rusty stained fracture surfaces, thickly bedded, overall fair to good RQD.			R1	TCR = 97% RQD = 46%	509 -										
	507.8	Reefal facies appearance from 4.0 m to 13.6 m and from 14.9 m to 15.0 m with a more open vuggy texture and significant fossil debris, lower RQD values.					508 <del>-</del>	-									
		Core darker in colour below 12.2 m. Core becoming mottled grey/white below 23.8 m with a wispy stylolytic texture.  Gradational lower contact on change in			R2	TCR = 99% RQD = 76%	507 -	-									
	505.6	texture.					506 -	-									
0				-			505 - -	-									Vertical fractures from 10.1 m to 11 m, 16.0 m to 16.3
1					R3	TCR = 97% RQD = 55%	504 <del>-</del>	-									and 18.3 m to 18. m depth.
2	502.4						503 -	-									
3				-			502 -	-									
4					R4	TCR = 98% RQD = 86%	501 -	-									
2 3 4	499.2						500 - - 499 -										
	496.1		I		R5	TCR = <b>88</b> % RQD = <b>69</b> %	499 -										



KJF

reviewer |

project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc.rig type |date started |2014/09/12

coring | PQ core, OD=123mm, ID=85mm

 location | Duntroon, Ontario
 method | Rock coring
 supervisor | TKC/SLW

position | E: 560217 N: 4915465 (17T, Geodetic)

SUBSURFACE PROFILE SAMPLE Penetration Test Values (Blows / 0.3m) Lab Data Readings Scale and Plot X Dynamic Cone Water Content (%) Depth Scale Elevation Sca (mASL) Comments 30 40 Number 1.0 20 N-Value & Plasticity Elev Graphic Undrained Shear Strength (kPa) Depth (m) STRATIGRAPHY GRAIN SIZE DISTRIBUTION (%) (MIT) Core B Recovery 20 (continued) GR SA SI 16 498 497 496.1 496 495 TCR = 98% RQD = 78% R6 - 20 494 -21 493.2 493 - 22 492 TCR = 98% RQD = 86% R7 - 23 491 - 24 489.9 490 DOLOSTONE (Fossil Hill Formation)
Light greyish brown to pinkish brown, fine - 25 grained with stylolytic to shaley partings 2 489 to 5 mm thick, typically 5 per 0.3 m. Sharp lower contact on first shale bed. 26 488 -27 487 486.7 -28 486 SHALE (Cabot Head Formation) TCR = 100% RQD = 57% file: bh Greenish grey calcareous shale, weathered, plastic texture, thin reddish coloured fossiliferous sandstone beds - 29 from 28.7 m to 29.4 m depth. 485 484.8 29.6 **END OF BOREHOLE** WATER LEVEL MONITORING Date Depth (m) Elevation (m) Borehole was open upon completion. Sep 17, 2014 Open hole well installed in borehole. Casing cemented in at least 1 m of competent bedrock.



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/28

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559674 N: 4915228 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

<u> </u>		SUBSURFACE PROFILE		<u> </u>	SA	MPLE	<u> </u>	Penetra (Blows	tion Tes (0.3m)	st Value	s					gs		Lab Data
			Graphic Plot	اـِ		SPT	Elevation Scale (mASL)		amic Co	ne	80 40	-	Water	Conte	ent (%)	PID Readings	Well Details	and Comment
	Elev Depth	STRATIGRAPHY	i F	Number	Type	N-Value	tion ASI	_			gth (kPa)		&	Plastic	city	Rea	Deta V	
	(m)	SHAHARAFIII	aph	l a	Ļ	Core	levat (π	O Ur	confined	ı	+ Field V r ■ Lab Va	ane	PL	мс	LL			GRAIN SI DISTRIBUTIO (MIT)
	529.0	GROUND SURFACE	ā			Recovery	□ 529	40			r <b>■</b> Lab va 20 160	ne	10	20	30	Ь		(MII) GR SA
Ī		OVERBURDEN	И				329 -											
				1			528											
			11	11			-											
			W	1			527 -											
ļ	526.3		W	1			-											
	2.7	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance;	$\vdash$	1			526 -											
ŀ		uniform: fine to medium grained:		1			525 –											
1		fossiliferous, slightly brittle rock core with					525 -											
1		fossiliferous, slightly brittle rock core with a rough cut texture, scratched by a knife; porous texture with interconnected vugs		-		TCR = <b>97</b> %	524 -											
1		up to 50 mm. Reetal tacles appearance		1	R1	RQD = 89%	-											
1		(fossil debris) with a poorer RQD from contact to 28.5 m. Flank facies	$\vdash$	+			523											
ļ	522.1	appearance below 28.5 m with less vugs and higher RQD. Minor weathering with mud infilling to 13.1 m, thickly bedded,		1			-											
ſ		mud infilling to 13.1 m, thickly bedded,		1			522											
		fair to good RQD. (Flank facies)	Ė		R2	TCR = 98%	E01											
		Core becoming darker bluish grey in colour below 14.9 m. Mottled grey/white	H	1		RQD = <b>90</b> %	521 -											
ŀ	520.1	appearance below 34.1 m. shaley to	F	1			520											
1		wispy stylolytes (typically 5 per 0.3 m) below 41.5 m.		1			-											
			$\vdash$	+		TCR = 100%	519 –											
		Gradational lower contact on change in texture at 43.2 m.		1	R3	RQD = <b>87</b> %	-										<u></u>	
		texture at 40.2 m.	$\vdash$	1			518 –											
4	517.1						517 –											
							517-											
			$\vdash$	+			516											
				1	R4	TCR = 100% RQD = 92%	-											
				1			515											
إ	514.0						-											
ľ							514											
1			$\vdash$	+			513 -											
					R5	TCR = 98%	_ 515											
1			$\vdash$	1	no	RQD = 98%	512-											
1				1			-											
ŀ	510.8			1			511 -											
				1			510 -											
			$\vdash$	+	R6	TCR = 99% RQD = 87%	509 –											
			$\Box$	1			_											
ļ	507.7		$\vdash$	1			508 -											
f				- 1			-											
				1			507 -											
			Щ	+	R7	TCR = 100%												
			П	1	111	RQD = <b>94</b> %	506 -											
			$\vdash$	+			505 –											
	504.5		Ė	1			-											
			H	1			504											
				$  \cdot  $			-											
				1	R8	TCR = 98% RQD = 95%	503											
-			$\vdash$	+			-											
	501.4			1			502 -											
ľ			$\vdash$	1			501 –											
				1														
			$\vdash$	1	R9	TCR = 100% RQD = 100%	500 -											
							300											



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/28

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559674 N: 4915228 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

POO		E. 559674 N. 4915226 (171, G	-	7110	-		oring					,	1-00				-	wer	
Œ		SUBSURFACE PROFILE	T		SA	MPLE I	ale			st Values							sbı		Lab Data
Depth Scale (m)	Elev		Graphic Plot	er	40	SPT N-Value	Elevation Scale (mASL)		namic Co 0 2	ne (0 3	0 4	0	Wa	ater Co & Pla	ntent ( sticity	%)	Readings	Well Details	and Comments
th S	Depth		) Sic	Number	Туре		atior (mA		ned She	ar Strenç	gth (kPa)		1.		IC L		Re	≥ o	GRAIN SIZE
	(m)	(continued)	Grap	ž		Core Recovery	Ele	● P	ocket Per	etrometer	■ Lab	Vane	1	-	<del>)                                    </del>	0	PID		GRAIN SIZE DISTRIBUTION (%) (MIT)
-30	498.4		Ť		R9	-	499 –			12	-0 10		<u>'</u>	0 2	0 3				GR SA SI CL
-31	100.1						498 –												
-							-												
-32					R10	TCR = 99% RQD = 96%	497 -												
-33							496												
-	495.2						-												
-34							495 —												
-35						TCR = 98%	494 –												
ŀ					R11	TCR = 98% RQD = 98%	-												
-36	492.3		$\vdash$				493												
-37	102.0						492 -												
ŀ							-												
- 38 -			I		R12	TCR = 98% RQD = 98%	491 -												
-39							490 -												
ł.,	489.1						-												
-40 -							489 —												
-41						TCR = 100%	488 —												
<b> </b>					R13	RQD = <b>84</b> %	407												
-42 -	100.4						487												
- 43	486.1 485.8 43.2		F				486												
- 44	43.2	DOLOGIONE (FOSSII FIII FOI II attori)					- 485 –												
F**		Light pinkish grey to greenish grey, fine grained, stylolytic to shaley minor pyrite mineralization.			R14	TCR = 100% RQD = 94%	400 -												
- 45		Sharp lower contact on first appearance					484 —												
- -46	483.2	of shale.					483 —												Vertical fracture from 45.8 m to 47.1 m
-							-												depth.
-47	481.9 47.1				R15	TCR = 100% RQD = 49%	482 —												Dolostone bed from 47.1 m to 47.5 m
- - 48		SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin reddish			1110	RQD = <b>49</b> %	- 481 –												depth.
-	190.1	coloured fossiliferous sandstone beds					-												
	480.1 48.9	below 48.6 m.		]			l			\\/ATE			NITOE				I		
		END OF BOREHOLE							Date		R LEVE <b>De</b>	oth (m	)	Elev	ation	(m)			
		Borehole was open upon completion.						;	Sep 5,	2014		10.6			518.4				
1		Open hole well installed in borehole.																	
		Casing cemented in bedrock at 3.66 m depth.																	
<u>e</u>		·																	
- logs.																			
<b>e:</b> ph																			
<u>~</u>																			
len loc																			
ort:																			
library: genivar - library.glb report: gen log v1 file: bh logs.gpj																			
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a. -≝																			
geniv																			
brary																			
-∟																			Shoot No. 2 of 2



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/27

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559641 N: 4915406 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

		SUBSURFACE PROFILE			SΔ	MPLE		Penetration Te (Blows / 0.3m)	st Values							
Depth Scale (m)		GOBGOTT AGE I TIOTIEE	T #	Н	57	SPT	Elevation Scale (mASL)	(Blows / 0.3m) × Dynamic Co		_	Moto	Cantant	(0/)	PID Readings	s	Lab Data and
Scale	Elev		Graphic Plot	Je.	Φ	N-Value	on Sc (SL)	10	20 30	40	wate &	Content Plasticity	(%) '	eadi	Well Details	Comments
pt 8	Depth (m)	STRATIGRAPHY	phic	Number	Туре	Core	vatic (m/	Undrained She		(Pa) Field Vane	PL	MC	LL	D R		GRAIN SIZE DISTRIBUTION (%) (MIT)
	521.0	GROUND SURFACE	Gra			Recovery	Ele	<ul> <li>Pocket Pe</li> </ul>	netrometer  30 120	Lab Vane 160	10	20	30	Ш		(MIT) GR SA SI CL
-0	321.0	OVERBURDEN	Иľ.													dit 3A 31 CE
ŀ			111				-									
-1							520 —									
ŀ			N				-									
-2			1//				519 —									
L			W.				_									
-3			11/				518 —									
ľ			1//													
			W	1												
-4			1/1				517 —									
ŀ			И				_									
-5							516 —									
ŀ							-								<u></u>	
-6			11/				515 —									
ŀ							-									
-7			11/				514 —									
L			111				_									
-8			И				513 —									
L							_									
-9			W.				512 —									
Γ			111				012									
			1/1				F11									
-10	510.6			1 [			511 —									
ŀ	10.4	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance;	$\vdash$													
-11		uniform; fine to medium grained; strong					510 —									
ŀ		core with a rough texture, scratched by a knife; slightly weathered with light rusty				TCR = 99%	-									
-12		orange staining on fractures and some reddish mud staining to 27.1 m, thickly			R1	RQD = 94%	509 —									
ŀ		bedded, good to excellent RQD. Vugs					-									
- 13		<5%, typically 2 to 4 mm. (Flank facies)					508 —									
ŀ	507.6	Reefal texture with more open cavities and increased fossil content from 15.0 m					-									
- 14		to 18.0 m and 18.8 m to 19.6 m.					507 —									
ļ.		Core becoming darker grey below 17.7	$\vdash$		R2	TCR = 100% RQD = 94%	-									
- 15		m.				1100 = 34/6	506 —									
	505.5	Mottled apeparance below 25.9 m with increasing vugs (15%). Less vuggy					_									
- 16		below 30.8 m.					505 —									
		Gradational lower contact on change in					_									
 		texture at 34.1 m.				TOD 4004	504 —									
80 − 17 -					R3	TCR = 100% RQD = 97%	304									
:   																
- 18 5							503 —									
gen lc	502.4		H				-									
<del>!</del> – 19							502 —									
<u>ව</u> _							-									
رة 9 – 50					R4	TCR = 100% RQD = 75%	501 —									
≘ -			$\vdash$			11QD = 13%	-									Vertical fracture with red mud infilling
							500 -									from 20.7 m to 23.3 m and 24.0 m 24.6
rary:	499.4						-									m.
ੂ∟	496.8		$\perp$		R5											



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/27

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559641 N: 4915406 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

_	T .	CURCUREACE PROFILE			C 4	MDLE	31	Penetration Tes	Values		Г			1	1	
Ξ		SUBSURFACE PROFILE	Τ	Н	SA	MPLE I	ale R	Penetration Tes (Blows / 0.3m)						sg		Lab Data and
Depth Scale (m)	<u>_</u> .		Graphic Plot	₩		SPT N-Value	Elevation Scale (mASL)	× Dynamic Con 1,0 20		40	Wa	ter Conte & Plastic	ent (%)	PID Readings	Well Details	Comments
h Sc	Elev Depth	STRATIGRAPHY	je.	Number	Type	in-value	ation n AS	Undrained Shea			1	α Γιαδιι	Jily	Re	Del	GRAIN SIZE
Sept	(m)		rap	킬	Ę.	Core	ileva (r	<ul> <li>Unconfined</li> <li>Pocket Pene</li> </ul>	+ F etrometer ■ L	ield Vane ab Vane	PL	. MC	LL.	₽		GRAIN SIZE DISTRIBUTION (%) (MIT)
-22		(continued)	σ̄			Recovery	Ш.	40 80		160	10	) 20	30	ш		GR SA SI CL
ŀ																
- 23					R5	TCR = 100%	498 —									
ŀ						RQD = <b>29</b> %	_									
<b>1</b>							497 —									
-24	496.8						437									
ŀ							-									
- 25							496 —									
L							_									
l					R6	TCR = 100% RQD = 86%	405									
-26							495 —									
ŀ			Ш				-									
-27	400.7						494 —									
l	493.7															
-28							493 —									
ŀ							-									
-29					R7	TCR = 99% RQD = 94%	492 —									
-																
ļ																
-30	400.0						491 —									
ŀ	490.6						-									
-31							490 —									
							.00									
ŀ							_									
-32					R8	TCR = 98% RQD = 89%	489 —									
ļ.							_									
							488 —									
-33	407 E		$\vdash$				400									
ŀ	487.5						-									
-34	486.9		Н				487 —									
L	34.1	DOLOSTONE (Fossil Hill Formation)					_									
		Bluish grey, fine grained, stylolytes typically 1 to 2 per metre. Rare shale					400									
-35		partings up to 1 cm thick.	$\vdash$		R9	TCR = 98% RQD = 91%	486 —									
ŀ		Sharp lower contact at first shale bed.					-									
-36		Onarp lower contact at mist shale bed.					485 —									
l	484.3						_									
	404.3															
-37							484 —									
ŀ	483.5 37.5						-									
-38	37.5	SHALE (Cabot Head Formation) Greenish grey calcareous, weathered				TCR = 99%	483 —									
		plastic shale, thin reddish coloured			R10	RQD = 88%										
		fossiliferous sandstone bed below 39.2 m depth.														
<u> </u>		чериі.					482 —									
١	481.3						-									
39 39 39 39 39 39 39 39 39 39 39 39 39 3	39.7								A/ATED : =	VEL 140	AUTOS	INIC				·
0		END OF BOREHOLE						Date	WATER LE	VEL MC <b>epth (m</b>		ING Elevati	on (m)			
		Borehole was open upon completion.						Sep 8, 2		5.4	,	51	5.5			
		Open hole well installed in borehole.														
		Casing cemented in bedrock at 10.36 m														
5		depth.														
5																
į																
Ė																
L																
																Sheet No. 2 of 2



project no. | 111-53312-00

project | Duntroon Quarry

rig type | CME 75, track-mounted

client | Walker Aggregates Inc.

date started | 2014/09/29

Iocation | Duntroon, Ontario

method | Rock coring

supervisor | BTC

coring | HQ core, OD=96mm, ID=64mm position | E: 559515 N: 4915354 (17T, Geodetic) reviewer | KJF

_	T	CURCUREACE PROFILE				MDLE	<u> </u>	Penetration Test Values				-	
Ξ		SUBSURFACE PROFILE	Ι		SA	MPLE I	e g	Penetration Test Values (Blows / 0.3m)			Readings		Lab Data and
Depth Scale (m)			Graphic Plot	-		SPT	Elevation Scale (mASL)	X Dynamic Cone 1,0 2,0 3,0 4,0	Water Co	ontent (%) asticity	ğ	Well Details	Comments
Sc	Elev Depth		.E	Number	Туре	N-Value	tion	Undrained Shear Strength (kPa)	α Για	islicity	Reć	Del≪	CDAIN CIZE
ept	(m)		ap	킬	$\vdash$	Core	leva (r	O Unconfined	PL I	NC LL	PID		GRAIN SIZE DISTRIBUTION (%) (MIT)
	520.7	GROUND SURFACE	ਹੱ			Recovery	Ш	40 80 120 160	10	<b>→  </b> 20 30			(MII) GR SA SI CL
-0		OVERBURDEN	И				-						
ŀ			ИI				520 -						
-1			M				320						
			ИŁ	1			-						
ŀ			M				519 -						
-2			K	1			_						
Į.			И	]									
1.	517.9		<u> 14</u>				518 -						
-3	2.8	DOLOGIONE (Alliabel Formation)	$\vdash$	1			-						
ŀ		Creamy white with a chalky dull appearance; uniform; fine to medium			R1	TCR = <b>81</b> % RQD = <b>44</b> %	517 –						
-4		grained: strong core with a rough texture.	$\vdash$			HQD = 44%	317						
1	516.4	scratched by a knife; slightly weathered with red mud infilling to 12.5 m then light	$\vdash$	1			-						
Ī		rusty orange staining on fractures, thickly bedded, overall good to excellent RQD,			R2	TCR = 100% RQD = 100%	516						
-5		bedded, overall good to excellent RQD,	Н	1									
ŀ		vugs <5% with cavities up to 20 mm, vugs are poorly interconnected. (Flank			R3	TCR = 95% RQD = 73%						Ţ	
_	E145	facies)	$\vdash$				515	1					
-6	514.5	Minor reefal texture 20.7 m to 21.6 m with		1			-						
1		a more open, fossiliferous appearance.	$\vdash$				514						
-7		Core becoming darker blue grey with a	Ë		R4	TCR = 100% RQD = 82%							
	513.1						-						
ſ	010.1	vuggy below 23.3 m. Core has mottled	Н	1			513 -						
-8		grey/white appearance below 23.3 m.					_						
ŀ		Gradational lower contact at change in	$\vdash$	1	R5	TCR = 98% RQD = 80%							
-9	511.5	texture at 35.1 m.		1			512						
Γ	311.3		$\vdash$				-						
ŀ				1			511 –						
- 10			$\perp$	1	R6	TCR = 100% RQD = 85%							
L	510.0		$\Box$	1			_						
	310.0						510 —						
-11			H	1			-						
╁				1	R7	TCR = <b>100</b> % RQD = <b>72</b> %	509 —						
- 12	508.5		$\vdash$				309						
-	300.5						-						
Ī						TOD 4004	508 -						
- 13					R8	TCR = 100% RQD = 50%	_						
-	507.0		H										
<del>-</del> 14	-						507 —						
[ ' <sup>+</sup>						TCD 4000/	-						
t			Н	1	R9	TCR = 100% RQD = 87%	506						
- 15	505.4												
L	1		$\vdash$				_						
				1		TCR = 100%	505 —						
- 16			$\vdash$		R10	RQD = 100%	-						
<u>-</u>	503.9			1			504 —						
5 - 17		1	$\vdash$	1			554						
h P					D11	TCR = 100%	_						
ij			H		R11	RQD = <b>0</b> %	503 —						
<u>- 18</u>	502.5			j			_						
00 L													
: de			$\vdash$		D10	TCR = 100%	502 -						
ا ا					R12	RQD = <b>0</b> %	-						
ا ۾	500.9		$\vdash$				501 —						
çi —20				1									
<u>ā</u>			$\vdash$		D10	TCR = 100%	_						
ivar				1	R13	RQD = <b>83</b> %	500 —						
library: genivar - ilbrary.glb report: gen log v1 file: bh logs.gpj	499.4		$\mathbb{H}$				-						
- Tary				1	R14	TCR = 100%	499						
≝∟	497.8				1114	RQD =	499 -						



project | Duntroon Quarry

rig type | CME 75, track-mounted

client | Walker Aggregates Inc.

date started | 2014/09/29

Iocation | Duntroon, Ontario

method | Rock coring

project no. | 111-53312-00

position | E: 559515 N: 4915354 (17T, Geodetic)

coring | HQ core, OD=96mm, ID=64mm

supervisor | BTC reviewer | KJF

	Π	SUBSURFACE PROFILE			SA	MPLE		Penetration Test (Blows / 0.3m)	Values		m		Lab Data
Depth Scale (m)			₫			SPT	Elevation Scale (mASL)		е	Water Content (%)	PID Readings	= <u>s</u>	and
Scal	Elev	CTRATICRADUV	Graphic Plot	Number	Туре	N-Value	ion S ASL	1,0 2,0 Undrained Shea		& Plasticity	Зеас	Well Details	Comments
epth	Depth (m)	STRATIGRAPHY	aphi	Nur	Ţ	Core	evati (m	<ul> <li>Unconfined</li> </ul>	+ Field Vane	PL MC LL	D F		GRAIN SIZE DISTRIBUTION (%)
		(continued)	ğ	ı		Recovery	□	Pocket Pene 40 80		10 20 30	Д		(MIT) GR SA SI CL
					R14	92% TCR = 100%	-						
t	497.8				NI4	RQD = <b>92</b> %	498 –	-					
-23							-						
ŀ					R15	TCR = 100% RQD = 96%	497 –						
-24	496.5												
1													
- 25					R16	TCR = 98%	496 –						
23					1110	RQD = <b>98</b> %	-	1					
	494.9						495 –	-					
-26							-	-					
ŀ					R17	TCR = 100% RQD = 88%	494						
-27	493.4						_						
-							493 -						
-28					R18	TCR = 100%	493 -						
						RQD = <b>94</b> %	=						
000	491.9						492 -						
-29							-	-					
t					R19	TCR = 100% RQD = 96%	491 -	-					
-30	1						-						
ŀ	490.1						490 –						
-31						TOD 100%							
-					R20	TCR = 100% RQD = 93%							
-32	488.6						489 –						
L -							-	1					
[					R21	TCR = 100% RQD = 0%	488 –	-					
-33	407.4					HQD = 0/6	-	-					
ŀ	487.1						487 –	-					
-34						TCR = 100%	_						
ŀ					R22	RQD = 95%	486 -						
-35	485.6						100						
1	35.1	DOLOSTONE (Fossil Hill Formation) Bluish grey, fine grained, stylolytic					-						
-36		typically 4 to 5 per 0.3 m up to 3 mm			R23	TCR = 100% RQD = 72%	485 -						
	484.0	thick, chert as 1 cm thick veins 35.6 m to 36.1 m depth.				1100 - 1270	-						
[	404.0	Sharp lower contact at first shale bed					484 -	-					
-37		appearance.			504	TCR = 100%	-						
ŀ					R24	RQD = <b>83</b> %	483 -						
- 38	482.5												
<u>.</u>	482.0		Ш				482 -	]					
g – 39	38.7	SHALE (Cabot Head Formation)			R25	TCR = <b>35</b> % RQD = <b>27</b> %	702						
Hq.	481.0	Greenish grey calcareous shale, weathered, plastic texture, thin reddish						]					
<u>=</u> −40		coloured fossiliferous sandstone beds from 40.2 m to 40.8 m depth.					481 –	1					
> gol	1	1.6.1. 40.2 III to 40.0 III deptil.			R26	TCR = 93%	-						
: gen						RQD = <b>0</b> %	480 -						
#1 – 41	479.6 41.2					<u> </u>	l				L		
ag g		END OF BOREHOLE							WATER LEVEL MOI	NITORING			
orary.		Borehole was open upon completion.						<b>Date</b> Oct 1, 20	<b>Depth (m)</b> 014 5.5	Elevation (m) 515.2			
ar - iii		Open hole well installed in borehole.											
geniv		Casing cemented in bedrock at 4.88 m											
Ilbrary: genivar - ilbrary.glb report: gen log vf file: bh logs.gpi		depth.											
ੂ∟													
													Sheet No. 2 of 2



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/04

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559466 N: 4915175 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

Second   Company   Compa	Ė			SUBSURFACE PROFILE			٥٨	MDIE	- 31	Penetration Test Values					
0 2822 GROUND SURFACE		Ē		SUBSUNFACE PROFILE	Τ.		SA		ale	Penetration Test Values (Blows / 0.3m)			SbL	"	Lab Data and
2022 GROUND SURFACE  OVERBURDEN  503  503  504  505  505  505  506  507  Commy white with a dull appearance; uniform, fine to medium grander, strong or with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture, sordative or more with a rough to texture with open prorous structure surprobe biohors and abundant losses from 12.5 m to 18.7 m dependence of the more prorous structure surprobe biohors and abundant losses from 12.5 m to 18.7 m dependence or more provided with a rough to the more prorous structure surprobe biohors and abundant losses from 12.5 m to 18.7 m dependence or more provided with a rough to the more provided with a rough to	Т	cale	Flev		음	ē	an.	SPT N-Value	n Sc SL)		Wate	er Content (%) & Plasticity	adii	Vell stails	
0 2822 GROUND SURFACE		₽ E	Depth	STRATIGRAPHY	hic	qur	ype		ation (m.A.			·	Re	> 9	GRAIN SIZE
OVERBURDEN  522 -					3rap	ž	_		Elev	<ul> <li>Pocket Penetrometer</li> <li>Lab Vane</li> </ul>	1 F	——————————————————————————————————————	PID		DISTRIBUTION (%) (MIT)
Section   Sect	F	)	523.2		12 1	$\vdash$		Tiodovory		40 80 120 160	10	20 30			GR SA SI CL
Size   Size	L			OVERBURDEN	1/1	1			523 —	]					
Size   Size	Ι.	.			$\mathcal{M}$				-	1					
S21	Г	'			W	1			522 -	1					
S21	ŀ				M				-	4					
Secondary   Seco	-	2			[1]	1			521	]					
520	ŀ				H	1			<u></u>						
520	Ŀ	<sub>3</sub>			1//	1				]					
Sis   Sis	L					1			520 —						
Sis   Sis		.			$\mathcal{U}$	1			-	-					
518-5  7	T'	1				]			519 —	-					
518-5  7	ŀ				H.	1			_						
516.5  7 DOLOSTONE (Amabel Formation) Creamy white with a dull appearance; uniform; fine to medium grained; strong core with a rough cut texture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly beddered good to excellent ROD, vugs typically 5%, 2 to 5 mm. (Flank faciles)  Rectal faciles texture with open porous structure surged biohorns and abundant fossits from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Gradational lower contact on change in texture.  Fig. 100.9  Fig	-	5				1			518 —						
516.5  ODLOSTONE (Amabel Formation) Creamy white with a dull appearance; uniform; fine to medium grained; strong core with a rough cut texture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded; good to excellent ROD, yags typically 5%, 2 to 5 mm. (Flank faciles)  Reefal facies texture with open porous structure slumped biohoms and abundant lossis from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. White below 27.1 m.  Gradational lower contact on change in texture.  Bas TCR = 100% ROD = 91% SOD = 91%	ŀ					1			0.0					<b>_</b>	
516.5  -7  DOLOSTONE (Amabel Formation) Creamy while with a dull appearance: uniform; fine to medium grained; strong core with a rough cut lexture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good to excellent ROO, vugs typically 5%, 2 to 5 mm. (Flank faciles)  Refal facies texture with open porous structure slumped biohoms and abundant tossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Gradational lower contact on change in texture.  Refal facies texture with open porous structure slumped biohoms and depth.  TCR = 100%, FOD = 100%, FOD = 100%, FOD = 91%, FOD	L	,			H	1				]				_	
-7 Creamy wither with a cult appearance; uniform; fine to medium grained; strong core with a rough cut exture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good to excellent RDD, wugs typically 5%, 2 to 5 mm. (Flank faces)  -9 S13.9 Reefal facies texture with open porous structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -10 Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  -12 S10.9 Gradational lower contact on change in texture.  -13 Fig. 10.9 Sor. 9  -16 Sor. 9  -16 Sor. 9  -17 Sor. 9  -18 Sor. 9  -19 S13.9 Sor. 9  -10 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -19 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -10 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -10 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -10 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -11 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -12 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -13 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -14 Significant structure slumped biohoms and abundant lossils from 12.5 m to 18.7 m depth.  -15 Significant structure structure structure structure structure structure structure structure structure.  -16 Significant structure stru			F40 F		111	]			517 —	1					
Creamy white with a dull appearance; uniform; fine to medium grained; strong core with a rough cut texture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good to excellent ROD, vugs typically 5%, 2 to 5 mm. (Flank facies)  Refal facies texture with open porous structure slumped biohorns and abundant lossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m. Mottled blue/grey and white below 27.1 m. Mottled blue/grey and white below 27.1 m. Mottled blue/grey and white below 27.1 m. Mottled blue/grey and white below 27.1 m. Mottled blue/grey in texture.  Fig. 76%, ROD = 43%  515 - TCR = 76%, ROD = 43%  514 - TCR = 100%, ROD = 100%  Fig. 76%, ROD = 100%  Fig.	1.	- 1		DOLOSTONE (Amabel Formation)		1			-	1					
core with a rough out texture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good to excellent RQD, vugs typically 5%, 2 to 5 mm. (Flank facies)  Realfal facies texture with open porous structure slumped biohoms and abundant fossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  TCR = 76%, ROD = 43%  515 - 1514 - 1514 - 1514 - 1514 - 1514 - 1514 - 1514 - 1514 - 1514 - 1514 - 1515 - 15	Γ			Creamy white with a dull appearance:	$\vdash$	1			516 —	-					
by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good to excellent RQD, ugs typically 5%, 2 to 5 mm. (Flank facies)  Refal facies texture with open porous structure sumped biohorns and abundant lossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Fig. 100% RQD = 100% RQD	Ī			core with a rough cut texture, scratched				TOD ====	-	-					
thickly bedded, good to excellent RQD, wugs typically 5%, 2 to 5 mm. (Flank facies)  Refal facies texture with open porous structure slumped biohorns and abundant fossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Gradational lower contact on change in texture.  Faz TCR = 100% ROD = 100% FOD = 10	ŀ۱	3		by a knife; slightly weathered with rusty		1	R1	RQD = <b>43</b> %	515 —						
Signature   Sign	ŀ			thickly bedded, good to excellent RQD,	$\perp$				_						
Reefal facies texture with open porous structure slumped biohorns and abundant fossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Gradational lower contact on change in texture.  R3 TCR = 100% ROD = 100% FROD = 100% F	Ŀ	9	513 9			1			E14						
structure slumped biohorns and abundant fossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Gradational lower contact on change in texture.  R3 TCR = 100% ROD = 100% S12 - 100% S12 - 100% S12 - 100% S13 - 100%	╁		0.0.0	•	$\vdash$	1			314-						
abundant fossils from 12.5 m to 18.7 m depth.  Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  Gradational lower contact on change in texture.  R2  R2  R2  R2  R2  R2  R2  R2  R2  R	L	, l		structure slumped biohorns and					-	1					
Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white below 27.1 m.  -12 -13 -14 -15 -15 -16 -16 -17 -18 -18 -19 -19 -19 -19 -19 -19 -19 -19 -19 -19		'		abundant fossils from 12.5 m to 18.7 m					513 —	1					
12.5 m. Mottled blue/grey and white below 27.1 m.  12.5 m. Mottled blue/grey and white below 27.1 m.  13.5 m. Mottled blue/grey and white below 27.1 m.  512	ſ			·	Н		R2	TCR = 100%	-	-					
below 27.1 m.  Gradational lower contact on change in texture.  Fig. 510.9  Fig. 507.9	T.	11		Core becoming darker bluish grey below 12.5 m. Mottled blue/grey and white		1		HQD = 100%	512 —						
13	ŀ			below 27.1 m.		1			_	_					
- 13	┢	12	510 9		$\vdash$	$\mid \cdot \mid$			511 —						
-14	ŀ		0.0.0	texture.		1			0						
-14	L.	13								]					
-14	L					1			510 —	1					
-15 507.9 -16 507.9	1.	ا ہ				1	R3	TCR = 100%	-	1					
507.9	Γ					1		1105 - 0170	509 —	-					
507.9	Ī				$\vdash$	1			-	-					
	<b> </b>	15	507.9			1			508 —	1					
	ŀ				H	1			_	1					
	╌	16				1			507						
80 - 17	_					1			007						
506 - 506 -	gs.gr	17				1	R4	TCR = 100% RQD = 96%							
## 18 504.8 505 -	d P				$\vdash$	$\mid \cdot \mid$			506 —	1					
504.8 504.8 505.0 19 10 10 10 10 10 10 10 10 10 10 10 10 10	ij ij	.							-	1					
B TCR = 88% RQD = 74% 503 - 502 - 50	og v1	۱٥	504.8		H	1			505 —	1					
TCR = 88% ROD = 74% SO2 - 1 SO	gen				$\perp$				-	4					
8 TCR = 88% ROD = 74% 503 - 502 - 502 - 66 TCR = 98% ROD = 94% - 502 - 66 TCR = 98% ROD = 94% - 502 - 66 TCR = 98% ROD = 94% - 502 - 66 TCR = 98% ROD = 94% - 502 - 66 TCR = 98% ROD = 94% - 502 - 66 TCR = 98% ROD = 94% - 502 - 66 TCR = 98% ROD = 94% - 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 98% ROD = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR = 96 TCR		19				1			504 —	1					
70 RQD = 74% 503 — 502 — 502 — F6 TCR = 98% RQD = 94% — 502	<u>e</u>					1	De.	TCR = 88%	_	1					
502-1 105	ary.g	20				$  \  $	НD	RQD = <b>74</b> %	500	]					
TCR = 98%   RQD = 94%   TCR	₽-					1			303 -						
502 — R6 TCR = 98% RQD = 94%	eniva	<sub>21</sub>	502.1		L	1				1					
8	ry: g				H			TCB = 98%	502 —	1					
- I   TOU.U  -	libra		499.0		I	1	R6	RQD = <b>94</b> %	-	1					

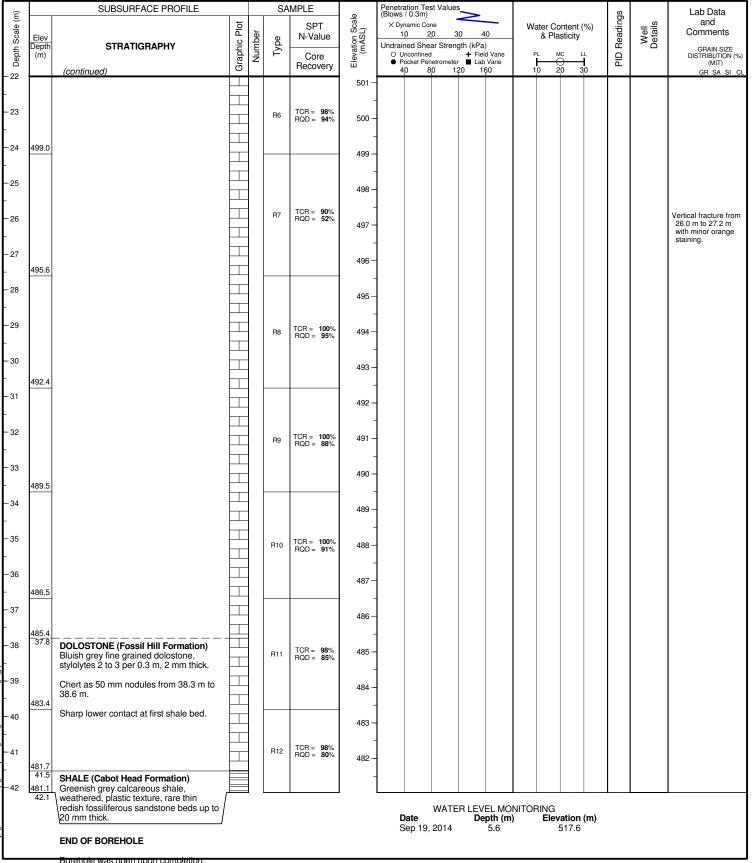


project no. | 111-53312-00 project | Duntroon Quarry

2014/09/04 client | Walker Aggregates Inc. rig type | date started |

location | Duntroon, Ontario method | Rock coring supervisor | **KMT** 

position | E: 559466 N: 4915175 (17T, Geodetic) coring | PQ core, OD=123mm, ID=85mm reviewer | **KJF** 





project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/15

| Iocation | Duntroon, Ontario | method | Rock coring | supervisor | BTC

 position | E: 559244 N: 4915009 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

	T	SUBSURFACE PROFILE			SΔ	MPLE		Penetration Te	st Values		T			T			
Depth Scale (m)		SOBSOTII AGET HOTIEE	T #		- 07	SPT	Elevation Scale (mASL)	Penetration Te (Blows / 0.3m) × Dynamic Co		≥	10/6	tor Co	ntant (0/		PID Readings	v	Lab Data and
Scale	Elev		Graphic Plot	Ser	Φ	N-Value	on Sc (SL)	1,0 2	0 30		VVa	ater Co & Pla	ntent (% sticity	)	eadi	Well Details	Comments
ta ta	Depth (m)	STRATIGRAPHY	phic	Number	Type	Core	watic (m/	Undrained She	i	+ Field Vane	Р		C LL		a o		GRAIN SIZE DISTRIBUTION (%) (MIT)
	531.1	GROUND SURFACE	Gra			Recovery	Ele	<ul> <li>Pocket Per</li> </ul>	netrometer 0 12	Lab Vane	1 1	0 2	3,0		≣∣		(MIT) GR SA SI CL
-0	001.	OVERBURDEN	И				531 —										art ox or oz
-			11/				-										
-1							530 —										
ŀ				1			-										
-2							529										
ŀ				1			=										
-3			1//				528 -									<u></u>	
t			W.	1			-									₹.	
-4	<del>527.0</del> 4.1			1			527 —										
Ī		Creamy white with a dull appearance; uniform; fine to medium grained;	$\vdash$				-										
-5		fossiliferous, strong core with a rough cut	Ė			TOD 050/	526 -										
Ť.		texture, scratched by a knife; slightly weathered with minor rusty orange	Ħ	1	R1	TCR = 95% RQD = 60%	-										
-6		staining and pitting, and vugs ~5% with vugs up to 1 cm, but locally greater 15%					525 -										
Ι,	524.0	to 20% from 27.9 m to 33.2 m. 3 mm to 5					-										
-7	02	RQD, except 37.0 m to 38.7 m where					524										
_8		recovered core pieces are smaller. (Flank facies)															
L°		Reefal facies texture with higher porosity			R2	TCR = 100% RQD = 100%	523 -										
-9		and more fossiliferous from 7.6 m to 9.4					-										
Ľ	521.7	m, 11.3 m to 11.4 m, 13.9 m to 14.3 m and 18.3 m to 20.6 m.	$\vdash$				522 -										
- 10		Core becoming darker bluish grey below		1			521 —										
		13.4 m. Becoming less vuggy and mottled grey-white below 27.7 m.		1			521-										
-11					R3	TCR = 98% RQD = 88%	520 —										
ŀ		Gradational lower contact on change in texture at 37.8 m.	$\vdash$			HQD = <b>00</b> %	320 -										
- 12							519										
ŀ	518.6						-										
- 13							518										
ŀ							-										
- 14					R4	TCR = 100% RQD = 90%	517										
ŀ				1		1105 = 0070	-										
- 15				1			516 -										
ŀ	515.6		H	1			-										
- 16							515 —										
ŀ							-										
- 17					R5	TCR = <b>94</b> % RQD = <b>92</b> %	514 -										
ŀ							-										
							513 -										
- logs	512.5			1			-										
호 — 19 <b>호</b>							512 -										
<u>-</u>			Ħ				-										
<u>ŏ</u> – 20 ਙ			#		R6	TCR = 100% RQD = 84%	511 -										
:: 0			H				-										
21	509.5						510 —										
ary.gl.	509.5																
₫[							509 —										
enivai					R7	TCR = 95% RQD = 87%											
Ilbrary: genivar - library.glb report: gen log v1 file: bh logs.gpj						2.70	508 -										
<u>ة</u>	506.4		H														



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc.rig type |date started | 2014/09/15

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | BTC

 position | E: 559244 N: 4915009 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

Start   Star	_		SUBSURFACE PROFILE			SA	MPLE		netration Test Values ows / 0.3m)		Ι.,		Lab Data
Continued	th Scale (m)	Depth		ohic Plot	ımber		SPT N-Value	ration Scale (mASL)	⟨ Dynamic Cone 10 20 30 40	Plasticity	) Readings	Well Details	and Comments
100   100		(111)	(continued)	Gray	Ž	'	Recovery	Ele	Pocket Penetrometer ■ Lab Vane		PIC		(MIT)
25   10   10   10   10   10   10   10   1	24		(commueu)	П		R7		507 —		7 7			GR SA SI C
27	) E	506.4											
Fig.   Fig.	23							506 —					
101	26						TCR - 100%	505					
29 303.4 503.5 503						R8	RQD = <b>97</b> %	-					
28	27							504					
10		503.4						-					
10   10   10   10   10   10   10   10	28							503 —					
10   10   10   10   10   10   10   10	o a							-					
33 497.3  34 497.3  35	-5					R9	TCR = 100% RQD = 98%	502 -					
10	80							501 —					
10		500.3						-					
33  497.3  498.  499.  4	31							500 -					
Age and the state of the state								=					
497.3  497.4  497.4  497.4  498.6  494.2  494.2  493.3  37.8  DOLOSTONE (Fossil Hill Formation) Pinish grey to greenish grey, fine grained, styloyles 3 to 5 per 0.3 m, up to 3 m thick, glauconile "blebs" associated with styloyles below 41.0 m.  491.2  Sharp lower contact at first shale bed.  491.2  Sharp lower contact at first shale bed.  491.2  Sharp lower contact at first shale bed.  491.3  FIG. 815  R0D = 4273  R13  TCR = 815  R0D = 4273  R10  A89.6  FIG. 815  R10  A89.6  A89.6  FIG. 815  R10  A89.6  A89.6  FIG. 815  A89.6  A89.6  FIG. 815  A89.6  A89.6  FIG. 815  A89.6  A89.6  A89.6  FIG. 815  A89.6  A	32					R10	TCR = 100% RQD = 100%	499 —					
497.3  497.3  498.2  498.1  50	33							498					
33		497.3						-					
Agy 2  494.2  7  494.2  7  494.2  7  495.  Bright Formation (Agy of the principle) (Agy of	4							497 —					
A94.2  494.2  7 494.2  7 493.3  8 DOLOSTONE (Fossil Hill Formation) 9 Pinkish grey to greenish grey, fine grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated with stylolytes below 41.0 m.  8 491.2  8 Sharp lower contact at first shale bed.  491.2  Sharp lower contact at first shale bed.  491.2  Sharp lower contact at first shale bed.  492.  491.2  Sharp lower contact at first shale bed.  493.  494.  495.  495.  496.  497.  498.  499.  491.  491.  488.1  489.  480.  489.	_							-					
493.3  8 37.8 DOLOSTONE (Fossil Hill Formation) Pirkish grey to greenish grey, fine grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  491.2 Sharp lower contact at first shale bed.  813 TCR = 81% R13 TCR = 81% R14 TOR = 499  491  492  491  491  490  488.1 STALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous 488.1 sandstone beds below 41.9 m.  END OF BOREHOLE Borehole was open upon completion. Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	5					R11	TCR = 95%	496					
494.2  494.2  493.3  37.8  DOLOSTONE (Fossil Hill Formation) Pinkish grey to greenish grey, fine grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  491.2  Sharp lower contact at first shale bed.  Fits a stylolyte shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured lossiliferous wandstone beds below 41.9 m.  END OF BOREHOLE  Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	6						1145 = 3070	495					
DOLOSTONE (Fossil Hill Formation) Pinkish grey to greenish grey, fine grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  491  493  493  493  494  494  494  494		404.2						-					
37.8 DOLOSTONE (Fossil Hill Formation) Pinkish grey to greenish grey, fine grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  491.2 Sharp lower contact at first shale bed.  813 TCR = 81% RDD = 62%  491.2 Sharp lower contact at first shale bed.  814 489.6 SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  815 END OF BOREHOLE Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	37	454.2						494 -					
Pinkish grey to greenish grey, fine grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m		493.3		H				-					
3 mm thick, glauconite 'blebs' associated with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  Sharp lower contact at first shale bed.  Sharp lower contact at first shale bed.  R13 TCR = 81% ROD = 42%  490 490 490 490 490 490 490 490 490 490	8	37.0	Pinkish grey to greenish grey fine			R12	TCR = 100%	493 —					
with stylolytes below 41.0 m.  Sharp lower contact at first shale bed.  Sharp lower contact at first shale bed.  R13 TCR = 81% RQD = 42%  491  491  491  489.6  SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	9		grained, stylolytes 3 to 5 per 0.3 m, up to 3 mm thick, glauconite "blebs" associated				HQD = <b>62</b> %	402					
1 489.6 41.5 SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m			wtih stylolytes below 41.0 m.	H				492 -					
489.6  41.5  SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	0	491.2	Sharp lower contact at first shale bed.	H				491 —					
489.6 41.5 SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m								-					
Greenish grey calcareous shale, weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE  Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	1	489.6				D40	TCR = 81%	490 —					
weathered, plastic texture, thin typically 5 to 10 cm reddish coloured fossiliferous sandstone beds below 41.9 m.  END OF BOREHOLE  Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	2	41.5				nis	RQD = <b>42</b> %	400					
#88.1 sandstone beds below 41.9 m.  END OF BOREHOLE  Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m	_		weathered, plastic texture, thin typically 5					489 -					
END OF BOREHOLE  Borehole was open upon completion.  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m  WATER LEVEL MONITORING Date Depth (m) Elevation (m) Sep 25, 2014 3.5 527.6		488.1 43.0	sandstone beds below 41.9 m.										
Borehole was open upon completion.  Sep 25, 2014  3.5  527.6  Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m			END OF BOREHOLE										
Casing cemented in bedrock at 3.96 m			Borehole was open upon completion.						Sep 25, 2014 3.5				
			Open hole well installed in borehole. Casing cemented in bedrock at 3.96 m depth.										
	_												Sheet No. 2 o



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/11

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559031 N: 4914966 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

			SUBSURFACE PROFILE				MPLE	ormig	Penetration Te		,	1						
	Depth Scale (m)		OGBOOTH NOT THOUSE	Τŧ	П	0/1	SPT	Elevation Scale (mASL)	Penetration Te (Blows / 0.3m) × Dynamic Co		≥	l w	ater Co	ntent (	(%)	PID Readings	_ <u>s</u>	Lab Data and
ı	Scale	Elev		Graphic Plot	Number	e	N-Value	on S	10	20 3,0			& Pla	sticity	/0)	ead	Well Details	Comments
ı	tig.	Depth (m)	STRATIGRAPHY	aphi	L L	Type	Core	evati (m,	Undrained She	ď	+ Field Vane		PL N		Ļ	D R		GRAIN SIZE DISTRIBUTION (%)
		520.9	GROUND SURFACE	ğ	-		Recovery	ă		netrometer 30 120	Lab Vane	1	0 2	0 3	1 80			(MIT) GR SA SI CL
-	'		OVERBURDEN	I				_										
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L-7	.			1				514										
[				W!	1			-										
_{8		513.0		<u> </u>	1			513 -										
Ľ	'	7.9	DOLOSTONE (Amabel Formation) Creamy white with a chalky dull					-										
L			appearance; uniform; fine to medium	$\perp$	1			512-										
Ĺ			grained; fossiliferous, strong core with a rough cut texture (drilling method artifact),	$\Box$	1	R1	TCR = 98% RQD = 80%	-										
L	٨		scratched by a knife; slightly weathered, vugs (5%) typically 2 mm to 5 mm but up		1		RQD = <b>80</b> %	511 -										
L	۱		to 32 mm, vugs are interconnected, overall good to excellent RQD. (Flank	$\vdash$	1			-										
L	,	509.9	facies)		}			510										
	.		Reefal facies texture, with higher		1			-										
L	2		Reefal facies texture, with higher porosity, lower RQD and more fossiliferous 9.1 m to 9.4 m, 11.6 m, to		1			509 —										
L	-		14.3 m, 15.8 m to 20.4 m and 23.5 m to	$\vdash$	1		TCR = 91%	-										
-1	3		23.8 m.	H	-	R2	RQD = <b>68</b> %	508 -										
			Core becoming darker bluish grey in colour below 14.9 m and less vuggy		1			-										
L	4	506.7	below 23.8 m. Becoming mottled gery/white below 32.3 m.					507 —										
L		000.7		$\vdash$	1 1		TOD 4004	-										
-	5	505.7	Gradational lower contact at 26.6 m at change in colour and texture.		1	R3	TCR = 100% RQD = 98%	506										
L		505.7	5	Ħ	1			-										
L	6				1			505 —										
ŀ						R4	TCR = 100% RQD = 99%	-										
-	7			H			RQD = <b>99</b> %	504										
ŀ					]			-										
<u>_</u> -1	8	502.9		$\perp$	1			503 —										
gs.gr -					1			-										
- 1 - 1	9			$\vdash$	$  \  $			502 -										
<b>₽</b>					1	R5	TCR = 99% RQD = 83%	-										
> bo - 2	0 0			H	1		.1QD = <b>03</b> %	501 -										
: gen				$\vdash$				-										
	1	499.8		F				500 -										
gg.					1			-										
ibrary	2				1			499 -										
var -				Ш	1	R6	TCR = 100% RQD = 78%	-										
library: genivar - library.glb report: gen log v1 file: bh logs.gpj	:3			$\vdash$	$\mid \cdot \mid$			498 —										
brary		106.0		Ħ	]			-										
⁻∟		496.9		$\vdash$				497 –										

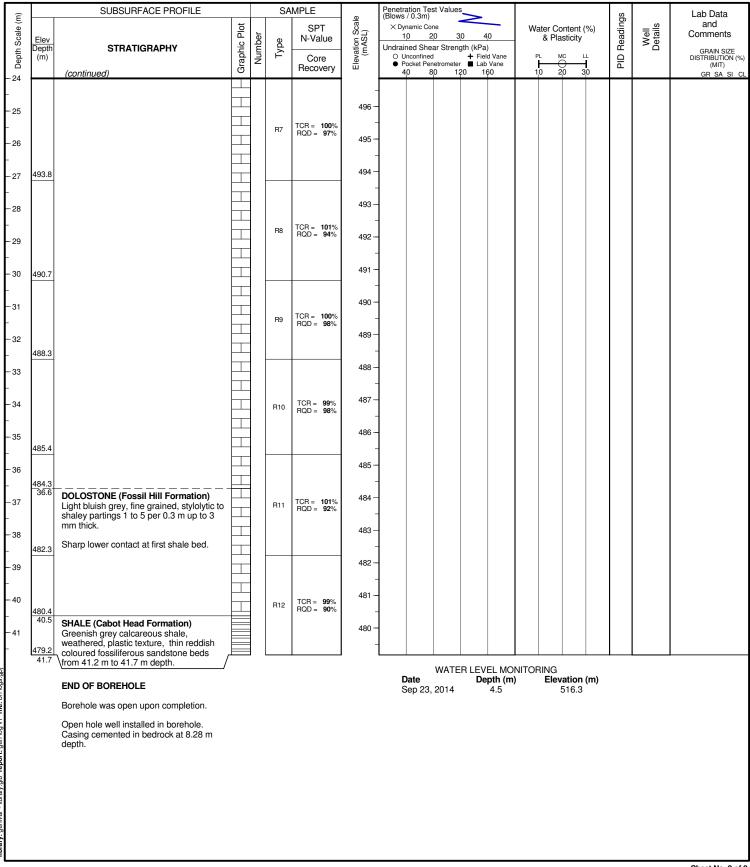


project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/11

 location | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 559031 N: 4914966 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF





project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 0214/09/09

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

**position** | E: 558938 N: 4915593 (17T, Geodetic) **coring** | PQ core, OD=123mm, ID=85mm **reviewer** | KJF

Ξ	<u> </u>	SUBSURFACE PROFILE	1		SA	MPLE	ale ale	Penetra (Blows			<b>`</b>					sg	_	Lab Data and
Depth Scale (m)	Elev Depth	STRATIGRAPHY	Graphic Plot	Number	Type	SPT N-Value	Elevation Scale (mASL)	1( Undrain		0 3 ar Stren	80 40 gth (kPa) <b>+</b> Field Vane		& Pla	ontent ( sticity		PID Readings	Well Details	and Comments GRAIN SIZE DISTRIBUTION
Dep	(m)		Grap	ž	_	Core Recovery	Elev	<ul><li>Pc</li></ul>	cket Per	etromete	r 🔳 Lab Vane			0 3		믭		(MIT)
)	509.7	GROUND SURFACE OVERBURDEN	17	$\vdash$		,		40	) 8	0 1	20 160	<u>'</u>	0 2	0 3	0			GR SA SI
1		OVERBURDEN					509 -										Ĩ	
							- 508 -											
	507.7 2.0	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance; uniform; fine to medium grained;					-											
		fossiliferous, strong core with a rough cut texture, scratched by a knife; vugs 2% to 3% typically 1 mm to 4 mm, slightly weathered (noticably less weathered than					507 <del>-</del> -											
		adjacent boreholes), thickly bedded, overall good to excellent RQD. (Flank facies)			R1	TCR = 90% RQD = 53%	506 -											
i	504.6	Reefal texture with large vugs and fossiliferous from 4.3 m to 8.8 m.  Core becoming darker grey in colour					505 -											
	50-7.0	below 14.6 m, becoming mottled grey- white below 20.4 m.  Gradational lower contact at change in					504											
		texture at 25.6 m.					-											
					R2	TCR = 100% RQD = 94%	503 -											
	501.4						502 -											
)	501.4				R3	TCR = <b>96</b> % RQD = <b>74</b> %	501 –											
	500.4						500 -											
0							499 –											
1					R4	TCR = 100% RQD = 89%	-											
2	497.2						498 -											
3							497 -											
4					R5	TCR = 100%	496 –											
					5	RQD = <b>97</b> %	495 <b>-</b>											
2 3 4	494.2						-											
	491.2		$\vdash$		R6	TCR = 100% RQD =	494 -											

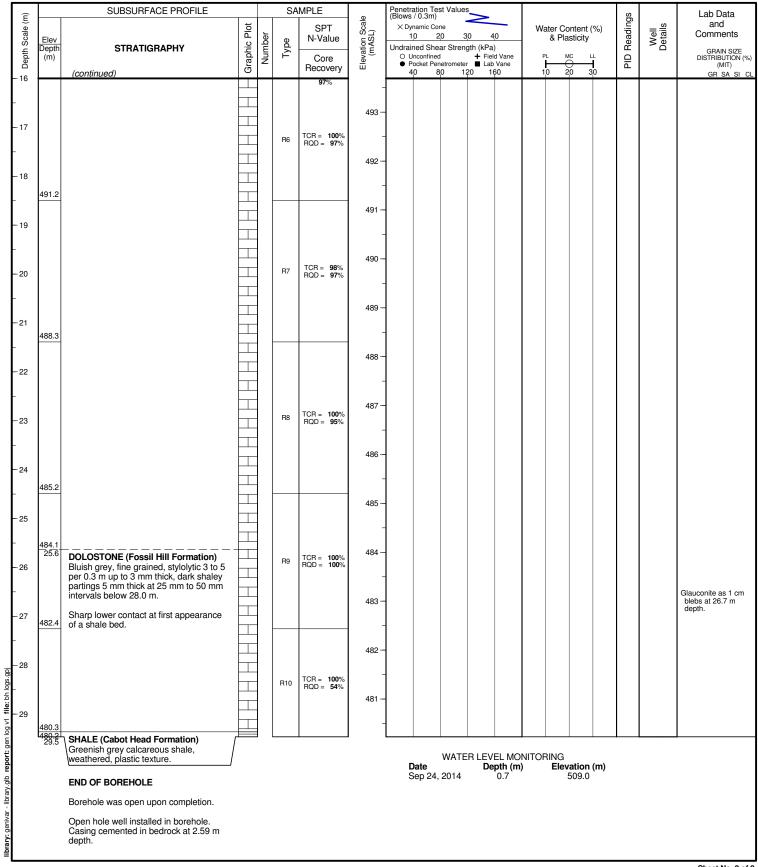


project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 0214/09/09

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

**position** | E: 558938 N: 4915593 (17T, Geodetic) **coring** | PQ core, OD=123mm, ID=85mm **reviewer** | KJF





#### **BOREHOLE NO. NW10 Shallow**

PAGE 1 of 1

PROJECT NAME: DUNTROON EXPANSION	PROJECT NO.: 111-53312-00 52.1
CLIENT: WALKER AGGREGATES INC.	DATE COMPLETED: Sep 18, 2014
BOREHOLE TYPE: 123 mm OD PQ CORE	SUPERVISOR: BTC
GROUND ELEVATION: 509.7 mASL	REVIEWER: SLW

	3L)		ST			5	SAMPLI	E		CONE PENETRATION	WA	TER	UTM CO-ORDINATES
DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE 10 20 30	CONT	20 30	UTM Zone: <u>17</u> NAD: <u>83</u> Easting: <u>558940</u> Northing: <u>4915376</u>
0.0	509.7		РНҮ		М	<u> </u>	TER.	VERY	(%)	SHEAR STRENGTH	⊢ W <sub>P</sub>		REMARKS
0.0	000.1	OVERBURDEN	7/1/										
			7.77										
			17. 11/										
			4.34										
			7.17										
			1/ 1/2										
			7 7 7										
			<u> </u>										
			1/ 1//										
			1/2 / 1/2										
			1, 11/										
			1, 1, 1,										
91/4			<u> </u>										
2.0	507.7	DOLOSTONE (AMABEL FORMATION):	1/ 1/1/										
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		CREAMY WHITE WITH A DULL APPEARANCE; UNIFORM: FINE TO MEDIUM GRAINED:											
≥   		FOSSILIFÉROUS; STRONG CORE WITH A ROUGH CUT TEXTURE.											
NG WELL. GPJ WSP_ENV_V1.GD1 //14/16													
MEL.													
Y N													
N 00-7													
1-5331													
7													
Σ Σ													
WSP GEOLOGIC (ME IAIC) WITH MASE 111-55372-00 MIONITORI 8 8													
Σ L L													
) 2000													
3.8	505.9	MONITOR TERMINATED AT 3.82 m IN DOLOSTONE.											
ASS.													



#### **BOREHOLE NO. NW10-DP**

PAGE 1 of 1

PROJECT NAME: DUNTROON EXPANSION	PROJECT NO.: 111-53312-00 52.1
CLIENT: WALKER AGGREGATES INC.	DATE COMPLETED: Sep 18, 2014
BOREHOLE TYPE: 1 1/4" HAND AUGER	SUPERVISOR: BTC
GROUND ELEVATION: 509.7 mASL	REVIEWER: SLW

3NC	UND	ELEVATION: 509.7 mASL								_ KEVIE	EWER: SL	, v
_	)r)		S			5	SAMPLI	E		CONE PENETRATION	WATER	UTM CO-ORDINATES
DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE 10 20 30	10 20 30	UTM Zone: <u>17</u> NAD: <u>83</u> Easting: <u>558940</u> Northing: <u>4915376</u>
0.0	509.7						الد	~~	Ŭ	SHEAR STRENGTH	W <sub>P</sub> W <sub>L</sub>	REMARKS
0.2	509.5	TOP SOIL  BROWN SILT AND SAND, TRACE GRAVEL. MOIST.	17 - 21-14									
		BROWN GILL AND GARD, HAGE GRAVEL MOG.										
0.8	508.9											
		DRIVEPOINT TERMINATED AT 0.8 m.										



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc.rig type |date started |2014/08/05

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | BTC/TKC

**position** | E: 560551 N: 4915269 (17T, Geodetic) **coring** | PQ core, OD=123mm, ID=85mm **reviewer** | KJF

Ê	<u> </u>	SUBSURFACE PROFILE	SAMPLE			Penetration Test Values (Blows / 0.3m)									Lab Data		
Depth Scale (m)	Elev Depth (m)	STRATIGRAPHY	Graphic Plot	Number	Type	SPT N-Value Core Recovery	Elevation Scale (mASL)	X Dynamic Cone   1,0			Water Content (%) & Plasticity  PL MC LL 10 20 30			PID Readings	Well Details	and Comments GRAIN SIZE DISTRIBUTION (% (MIT)	
0	511.5	GROUND SURFACE OVERBURDEN	h	廾		-	-	-	. 0	<u> </u>	- 100	'	, 2	30	+		GR SA SI
1							511 - - 510 -										
2							509 <b>-</b>										
4	507.1						508 -										
5	4.4	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance; uniform; fine to medium grained; strong core with a rough cut texture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good RQD, vugs typically 5%, 2 to 6 mm. (Flank facies)					507 - - 506 -										
6		Reefal facies texture with open cavities and increased and mounded fossil content from 4.6 m to 6.1 m and 10.1 m			R1	TCR = 100% RQD = 32%	- 505 -										
7	504.2	to 11.9 m.  Core becoming darker bluish grey below 7.6 m. Mottled pinkish grey appearance below 17.1 m.					- 504 –										Broken core recov from 7.0 m to 7.5 depth.
8	500.4	Gradational lower contact on change in texture.			R2	TCR = 99% RQD = 64%	503 <b>-</b>									Ţ	
9	502.4						502 <del>-</del>										
11					R3	TCR = 98% RQD = 78%	501 -										
12	499.4						500 <del>-</del> -										Broken core recov from 11.8 m to 13 m depth with min
12 13							499 <b>-</b> -										red mud infilling.
14					R4	TCR = 98% RQD = 80%	498 - -										
	496.3						497 –										

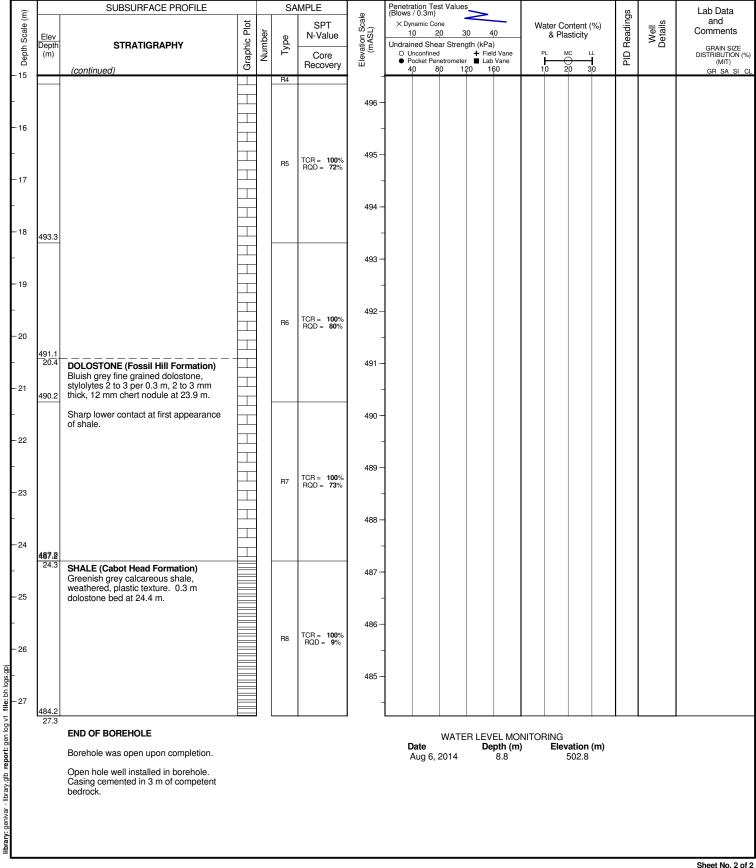


project | Duntroon Quarry project no. | 111-53312-00

2014/08/05 client | Walker Aggregates Inc. rig type | date started |

Iocation | Duntroon, Ontario BTC/TKC method | Rock coring supervisor |

position | E: 560551 N: 4915269 (17T, Geodetic) coring | PQ core, OD=123mm, ID=85mm reviewer | KJF





project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc.rig type |date started |2014/08/06

 location | Duntroon, Ontario
 method | Rock coring
 supervisor | BTC/TKC

 position | E: 560554 N: 4915269 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

Ê	<u> </u>	SUBSURFACE PROFILE			SA	MPLE	<u>o</u>	Penetr (Blows	ation Te	st Value	s_				٤	2		Lab Data
Depth Scale (m)	Elev Depth (m)	STRATIGRAPHY	Graphic Plot	Number	Type	SPT N-Value Core	Elevation Scale (mASL)	X Dy  1  Undrai	namic Co 0 2 ned She Inconfined	ne 20 3 ar Stren	gth (kPa)  + Field Vane  r ■ Lab Vane	P	& Pla	ontent (%)	yilood Old	TID DEAGIIIGS	Well Details	and Comments GRAIN SIZE DISTRIBUTION ( (MIT)
0	511.4	GROUND SURFACE	٥	$\perp$		Recovery					20 160	1	0 2	0 30		4		GR SA SI
		OVERBURDEN					511 -											
1							510 –											
2							509											
3							-											
							508 -											
4	507.0 4.4	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance:		,    -  -  -			507 –											
5		Creamy white with a dull appearance; uniform; fine to medium grained; strong core with a rough cut texture, scratched by a knife; slightly weathered with rusty orange staining on fracture surfaces, thickly bedded, good RQD, vugs typically 5%, 2 to 6 mm. (Flank facies)					506 -											
3		Reefal facies texture with open cavities and increased and mounded fossil content from 4.6 m to 6.1 m and 10.1 m to 11.9 m.		-			505 -											
7		Core becoming darker bluish grey below 7.6 m. Mottled pinkish grey appearance below 17.1 m.		-			504 –	-										
3		Gradational lower contact on change in texture.		-			503 -											
9				-			502 <b>-</b>										Ţ	
10							- 501 –											
11							-											
12							500 -											
12							499 <del>-</del> -											
13				-			498 –											
14							497 –											



KJF

reviewer |

project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/08/06

coring | PQ core, OD=123mm, ID=85mm

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | BTC/TKC

position | E: 560554 N: 4915269 (17T, Geodetic)

file: bh logs.gpj

SUBSURFACE PROFILE SAMPLE Penetration Test Values (Blows / 0.3m) Lab Data Readings Scale and Plot X Dynamic Cone Water Content (%) Depth Scale Elevation Sca (mASL) Comments 10 30 40 Number 20 N-Value & Plasticity Elev Graphic Undrained Shear Strength (kPa) Depth (m) STRATIGRAPHY GRAIN SIZE DISTRIBUTION (%) (MIT) Core B Recovery 20 (continued) GR SA SI 15 496 16 495 - 17 494 - 18 493 - 19 492 -20 491 **DOLOSTONE (Fossil Hill Formation)** Bluish grey fine grained dolostone, stylolytes 2 to 3 per 0.3 m, 2 to 3 mm 21 thick, 12 mm chert nodule at 23.9 m. 490 Sharp lower contact at first appearance of shale. - 22 489 -23 488 -24 487 SHALE (Cabot Head Formation) Greenish grey calcareous shale, weathered, plastic texture. 0.3 m - 25 dolostone bed at 24.4 m. 486 -26 485 -27 484. **END OF BOREHOLE** WATER LEVEL MONITORING Date Depth (m) Elevation (m) Borehole was open upon completion. Sep 15, 2014 8.8 502.6 No samples collected. Stratigraphy inferred from adjacent borehole IW1. Open hole well installed in borehole. Casing cemented in 3 m of competent



KJF

reviewer |

project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc.rig type |date started |2014/08/11

coring | PQ core, OD=123mm, ID=85mm

 location | Duntroon, Ontario
 method | Rock coring
 supervisor | SLW/TKC

		-	SUBSURFACE PROFILE		T -		MPLE	Jg					,					I		
	E)		SUBSUNFACE PROFILE	<del> </del>		ъA		äle	Penetra (Blows /	0.3m) amic Co		2	_	,,,	.ta :: ^	t ' '	(0/)	ngs	s	Lab Data and
	Depth Scale (m)	Elev		Graphic Plot	Ser	Φ	SPT N-Value	Elevation Scale (mASL)	1,0	) 2	0 3	0 4		l Wa	er Co & Pla	ntent ( sticity	(%)	PID Readings	Well Details	Comments
	pth 5	Depth (m)	STRATIGRAPHY	phic	Number	Type	Core	watio (m.A	Undrain O Un	ed She confined	ar Stren	gth (kPa)		F	'L N	IC L	.L	) Re	7 5	GRAIN SIZE DISTRIBUTION (%) (MIT)
		508.7	GROUND SURFACE	Gra			Recovery	E E	● Po	cket Per	etromete	Lab	Vane			$\overline{}$	<b>1</b> 30	PIE		(MIT) GR SA SI CL
		306.7	OVERBURDEN	И	$\Box$			<b>†</b>					,,,	_						GR SA SI CL
L			- C	11	1															
ı				M				508 —												
-1					1															
ı				И				-												
ŀ				W	1			507											Ţ	
-2				111	1															
[				1/1				-												
ŀ					1															
ı				$\mathbb{R}$	1			506												
-3				Иľ	1			_												
L				1//	1															
ı				111	1			505 —												
-4				H	1															
				H																
Ī		504.0			1			504												
-5		4.7	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance;	H	1															
ı			uniform: fine to medium grained: strong					-												
ŀ			core with a rough texture, scratched by a knife, slightly weathered with minor light		1			503												
-6			rusty orange staining on fracture surfaces; thickly bedded, good to																	
١			excellent RQD, vugs <5%, typically 2 to 4 mm. (Flank facies)	$\vdash$	1	R1	TCR = 100% RQD = 84%	-												
ŀ				F	1		RQD = <b>84</b> %	502 —												
Ι.			Rare thin reefal facies beds 50 mm thick with open, fossiliferous appearance.					302 -												
-7								-												
ŀ			Core becoming darker bluish grey in colour below 7.3 m. Becoming mottled	$\vdash$	$\  \cdot \ $															
ı		500.8	grey white below 15.5 m.		1			501												
-8			Gradational lower contact at change in texture.		1			_												
L			texture.	$\vdash$	1															
ı					1	R2	TCR = 100%	500 —												
-9				Ė	1		RQD = <b>100</b> %													
				H																
Ī		498.9		$\vdash$	$\mid \cdot \mid$			499 —												
-1	0				}															
				I	1			-												
ŀ					1			498 —												
-1	1			$\vdash$	$\mid \cdot \mid$															
1				H	1	R3	TCR = 100% RQD = 98%	-												
ogs.gr				Ħ	1		11QD = 90%	407												
ua .	_			$\vdash$	$\mid \mid$			497 —												
<u></u>	2			F	$\mid \cdot \mid$			-												
log v.				П	1															
: gen		495.9						496 —												
	3				$  \  $			_												
glb -					1															
orary.(				H	1		TCD 070/	495 —												
≝  -1	4			$\vdash$	1	R4	TCR = 97% RQD = 78%													
Ilbrary: genivar - library.glb report: gen log v1 file: bh logs.gp)					1			-												
ary:					1			494												
≅		492.7		$\vdash$	+			1												

**position** | E: 560521 N: 4915489 (17T, Geodetic)



**KJF** 

reviewer |

project | Duntroon Quarry project no. | 111-53312-00

 client | Walker Aggregates Inc.
 rig type |
 date started |
 2014/08/11

coring | PQ core, OD=123mm, ID=85mm

 location | Duntroon, Ontario
 method | Rock coring
 supervisor | SLW/TKC

position | E: 560521 N: 4915489 (17T, Geodetic)

SUBSURFACE PROFILE SAMPLE Penetration Test Values (Blows / 0.3m) Lab Data Readings Scale and Plot X Dynamic Cone Water Content (%) Depth Scale Elevation Sca (mASL) Comments 30 40 1.0 20 Number N-Value & Plasticity Elev Graphic Undrained Shear Strength (kPa) Depth (m) **STRATIGRAPHY** GRAIN SIZE DISTRIBUTION (%) (MIT) B Core Recovery 20 120 (continued) 8.0 160 GR SA SI CI TCR = **97**% RQD = **78**% R4 493 492.7 492 - 17 R5 TCR = 97% RQD = 87% 491 - 18 490 489.8 - 19 489 **DOLOSTONE (Fossil Hill Formation)** -20 Bluish grey fine grained stycolytic typically 6 per 0.3 m. Broken core recovery from 20.4 m to 20.4 TCR = **97**% RQD = **56**% Sharp lower contact on first appearance 488 m depth. of shale. -21 Vertical fracture from 21.5 m to 21.7 m 487 depth. -22 486.6 486.3 22.4 SHALE (Cabot Head Formation) 486 Greenish grey calcareous, weathered, plastic shale bed 25 mm thick. -23 Dolostone bed from 22.4 m to 23.2 m R7 depth. Three 25 m reddish coloured fossiliferous sandstone beds below 23.5 485 m depth. 484.7 - 24 **END OF BOREHOLE** WATER LEVEL MONITORING Date Depth (m) Elevation (m) Borehole was open upon completion. Sep 16, 2014 507.0 Open hole well installed in borehole. Casing cemented in bedrock at 4.27 m depth.



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/05

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 560214 N: 4915919 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

Г			SUBSURFACE PROFILE			67	MPLE		Penetration Test Values			-	
ı	Depth Scale (m)		SUBSURI ACE PROFILE	ΤĘ		JA.		Elevation Scale (mASL)	Penetration Test Values (Blows / 0.3m) × Dynamic Cone		PID Readings	<sub>ω</sub>	Lab Data and
ı	cale	Elev		Graphic Plot	ē	ø.	SPT N-Value	n Sc SL)	1,0 2,0 3,0 4,0	Water Content (%) & Plasticity	adi	Well Details	Comments
ı	₽ H	Depth	STRATIGRAPHY	) je	Number	Type		atio	Undrained Shear Strength (kPa)  O Unconfined	•	Re	> 9	GRAIN SIZE
Т	Dep	(m)		3rap	ž		Core Recovery	Elev	<ul> <li>Pocket Penetrometer</li> <li>Lab Vane</li> </ul>	$\overline{}$	PIC		GRAIN SIZE DISTRIBUTION (%) (MIT)
┢	0	518.5	GROUND SURFACE OVERBURDEN	17 7	Н			-	40 80 120 160	10 20 30			GR SA SI CL
ı			OVERBURDEN	N	1			540					
ſ				W				518 -	1				
┢	1			ИŁ	1			-					
L				111				F17					
Т				[L]	1			517 —					
ŀ	2			W	1			-					
L				W				516 —					
ı				W	1			310					
ŀ	3			Иľ	1			-					
ŀ					1			515 —					
ı		514.7 3.8		μГ				0.0					
t	4	0.0	DOLOSTONE (Amabel Formation) Creamy white with a dull appearance; uniform fine to medium grained;		1			-					
ŀ			uniform fine to medium grained;	$\vdash$				514 —					
ı	_		fossiliferous; strong core with rough texture; scratched with a knife; thickly		1								
Γ	5		bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs	Н		R1	TCR = 99% RQD = 65%	_					
ŀ			throughout (~5%), 2 to 4 mm; fair to good				1105 - 0070	513 —					
L	6		RQD. (Flank facies)		1								
ı			Reefal facies with an open vuggy	$\vdash$									
ŀ		511.9	chalky texture, minor reddish muddy					512 —					
L	7		infilling with poor RQD from 3.8 m to 8.5 m and from 15.6 m to 16.8 m depth.					_					
ı													
ŀ			Core becoming darker greyish brown in colour below 24.4 m, finer grained texture		1	R2	TCR = 100%	511 —					
F	В		with wispy stylolytic contacts and a	$\vdash$			RQD = <b>55</b> %	_					
Т			decrease in vugs (~1%).		1								
ſ		509.6	Gradational lower contact at change in					510 —					
┢	9		colour and texture.					-					
L					1			509 —					
ı				H				509					
ŀ	10							-					
L					1	R3	TCR = 99% RQD = 89%	508 —					
ı				Н	-		1105 - 0070	000					
r	11							-					
ŀ								507 —					
ŀ	10	506.5		$\vdash$									
ſ													
ŀ					1			506 -					
ŀ	13							_					
					1		TOD ***						
ig i				$\vdash$		R4	TCR = 99% RQD = 82%	505 —					
logs.	14							-					
e: ph					1			Fa.					
5 [				$\vdash$				504 —	1				
g –	15	503.4			1			-					
: ger				H				503 —					
epor								505				<u></u>	
	16							-					
orany.				$\vdash$		R5	TCR = 100% RQD = 85%	502					
<u>≓</u>					1		HQD = 85%						
library: genivar - library.glb report: gen log v1 file: bh logs.gpj	17			H				-					
ary:				H				501 —					
₫		500.3											



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/05

 location | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 560214 N: 4915919 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

<b>₽</b>		SUBSURFACE PROFILE		Щ	SA	MPLE	o o	Penetration Test Values (Blows / 0.3m)		Sc		Lab Data
Deptil Code (III)			Graphic Plot	ř		SPT N-Value	Elevation Scale (mASL)	× Dynamic Cone 1.0 20 3.0 4.0	Water Content (%) & Plasticity	PID Readings	Well Details	and Comments
Ī	Elev Depth (m)	STRATIGRAPHY	ohic	Number	Type		/ation (mAS	Undrained Shear Strength (kPa)  O Unconfined	PL MC LL	) Re	Pel≪	GRAIN SIZE
- 1	(111)	(continued)	Gra	ž	•	Core Recovery	Ele e	● Pocket Penetrometer ■ Lab Vane 40 80 120 160	10 20 30	PIC		GRAIN SIZE DISTRIBUTION (MIT) GR SA SI
` <b> </b>		,		П	R5		-					
							500 —					
,							-					
					Do.	TCR = 100%	499					
,					R6	TCR = 100% RQD = 67%	_					
							498 —					
	107.0						400					
ľ	197.3						_					
							497 —					
1							-					
					R7	TCR = 100% RQD = 87%	496 —					
3							-					
							495 —					
.	194.3						_					
							494 —					
			H				_					
					R8	TCR = 99% RQD = 96%	493 —					
٠ [	192.1						-					
	26.4	DOLOSTONE (Fossil Hill Formation) Light grevish brown to pinkish brown: fine					492 —					
,	191.2	Light greyish brown to pinkish brown; fine grained with wispy to wavy stylolytes (2 to 5 per 0.3 m), up to 2 mm thick, minor	$\vdash$				-					
		pyrite mineralization.					491 —					
3			H				_					
			H				490 —					
,			H		R9	TCR = <b>100</b> % RQD = <b>72</b> %	_					
			H				489 —					
				1			405					
	188.1		H	1								
			H	1			488 —					
			Ė	]			-					
							487 —					Lower 1.8 m of co lost to drilling. Cabot Head Sha
:					R10	TCR = <b>56</b> % RQD = <b>44</b> %	-					not recovered, b confirmed by ret water fragments
							486 —					water tragments
3							_					
3	184.8						485 —					
_	33.7	END OF BOREHOLE	•	. '		•		WATER LEVEL MO	ONITORING	•		-
		Borehole was open upon completion.						Date Depth (r Sep 29, 2014 15.7				
		Open hole well installed in borehole.						οσμ 29, 2014 15.7	502.5			
		Casing cemented in bedrock at 6.86 m depth.										



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/08

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

position | E: 560023 N: 4916216 (17T, Geodetic) coring | PQ core, OD=123mm, ID=85mm reviewer | KJF

Œ l		SUBSURFACE PROFILE	_		SA	MPLE I	횰			st Value	<u>`</u>						gs		Lab Data
Depth Scale (m)			Graphic Plot	ĕ		SPT N-Value	Elevation Scale (mASL)		namic Co		3,0	40	Wa	ater Co	onten	t (%)	Readings	Well Details	and Comments
ų Š	Elev Depth	STRATIGRAPHY	je Pi	Number	Туре	IN-Value	ation m AS	Undrair	ned She	ar Stren	gth (kPa	a)	1			,	Re	Dei≪	GRAIN SIZE
Jept	(m)		rap	₹	-	Core	levs)		nconfined ocket Per	i netromete		eld Vane b Vane	F	-	ис <del>) —</del>	LL.	PID		GRAIN SIZE DISTRIBUTION ( (MIT)
	510.4	GROUND SURFACE	0	Щ		Recovery	"	4	3 0	0 1	20 1	60	1	0 2	20	30	<u> </u>		GR SA SI
	ı	OVERBURDEN		1			510 –												
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	ıl		W	1			_												
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	ı		W	1			300												
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	ı		K)	1															
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	ı		$ \mathcal{Y} $	1			505												
	ı		M	1			505 -												
	ı		$ \mathcal{X} $				_												
	ı		И	1															
	ı		II	1			504 –												
	ı		$ \mathcal{Y} $	1															
٠	ı		И	1			-												
	ı		[4]	1			503												
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•	ı		$\mathcal{A}$	1															
	ı		1//				501 –												
	500.5		Иł	1															
0	9.9	DOLOSTONE (Amabel Formation)	Ш	1															
	,	Creamy white with a dull appearance; uniform fine to medium grained;	$\vdash$				500												
ļ	ı	fossiliferous; strong core with rough	F	1	R1	TCR = * RQD = *													
l i		texture; scratched with a knife; thickly	$\vdash$	1			-												* 0
,	1	bedded; slightly weathered with minor	$\vdash$	1 1															* Core barrel not
- 1	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; yugs					۱ ،۰۰												catching core.
	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good					499 -												catching core.
	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; yugs					499 <del>-</del> -												catching core.
	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies) Slight reefal facies appearance (11.0 m -					499 <del>-</del> -												catching core.
	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy.				TCR = *	499 - - 498 -												catching core.
	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.			R2	TCR = * RQD = *	-												catching core.
2	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.  Core becoming darker bluish in colour below 18.1 m depth with shaley stylolytes			R2		-												catching core.
2	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.  Core becoming darker bluish in colour below 18.1 m depth with shaley stylolytics (2 mm to 3 mm) and wispy stylolytic		-	R2		- 498 – -												catching core.
2		bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.  Core becoming darker bluish in colour below 18.1 m depth with shaley stylolytes (2 mm to 3 mm) and wispy stylolytic contacts typically 1 per 0.3 m.			R2		-												catching core.
2	499.0	bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.  Core becoming darker bluish in colour below 18.1 m depth with shaley stylolytes (2 mm to 3 mm) and wispy stylolytic contacts typically 1 per 0.3 m.  Gradational lower contact at 20.7 m			R2		- 498 – -												catching core.
2		bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.  Core becoming darker bluish in colour below 18.1 m depth with shaley stylolytes (2 mm to 3 mm) and wispy stylolytic contacts typically 1 per 0.3 m.			R2	RQD = *	- 498 – - 497 –												catching core.
2		bedded; slightly weathered with minor rusty staining on fracture surfaces; vugs throughout (~5%) up to 1 cm but typically 2 mm to 4 mm. Overall fair to good RQD. (Flank facies)  Slight reefal facies appearance (11.0 m - 13.9 m depth) with poor recovery, vuggy, reddish mud staining and poor RQD.  Core becoming darker bluish in colour below 18.1 m depth with shaley stylolytes (2 mm to 3 mm) and wispy stylolytic contacts typically 1 per 0.3 m.  Gradational lower contact at 20.7 m			R2		- 498 – -												catching core.



project | Duntroon Quarry project no. | 111-53312-00

client | Walker Aggregates Inc. rig type | date started | 2014/09/08

 Iocation | Duntroon, Ontario
 method | Rock coring
 supervisor | KMT

 position | E: 560023 N: 4916216 (17T, Geodetic)
 coring | PQ core, OD=123mm, ID=85mm
 reviewer | KJF

posit	ן ווטו	E: 560023 N: 4916216 (171, Ge	Joue	tiiC	)		orning				123mm, IL	)=03			revie	wer	NOI
Ê		SUBSURFACE PROFILE			SA	MPLE	Φ	Peneti (Blows	ration Te	st Values	· >				gs		Lab Data
Depth Scale (m)			Plot	ř		SPT	Elevation Scale (mASL)	× D <sub>3</sub>	namic Co			Wa	ater Co	ontent (%) sticity	Readings	Well Details	and Comments
th Sc	Elev Depth	STRATIGRAPHY	Graphic Plot	Number	Туре	N-Value	ation	Undra	ined She	ar Stren	gth (kPa)			,	Rea	W Det	
Dep	(m)		Grap	ž	_	Core Recovery	Elev	● F		etrometer	+ Field Vane Lab Vane	P		0 30	PID		GRAIN SIZE DISTRIBUTION (%) (MIT)
- 15		(continued)				,		<u> </u>	10 8	0 12	20 160	'	0 2	0 30			GR SA SI CL
			Н				495 –										
- 16							-										
							494 –										Vertical fracture 16.3
					R4	TCR = 100% RQD = 66%											m to 16.9 m.
- 17							-										
							493 -									<u></u>	
- 18	492.3						-										
							492 -										
- 19							-										
							491 -										
ļ l					R5	TCR = 100% RQD = 93%											
-20							-										
							490 -										Durite unique disentia a
	489.7		Н														Pyrite mineralization for 5 cm at 20.4 m.
-21	489:4	DOLOSTONE (Fossil Hill Formation) Light grevish brown to pinkish brown: fine					-										
		Light greyish brown to pinkish brown; fine grained with wispy blue stylolytes typically 3 mm to 5 mm thick; minor pyrite					489 -										
<b> </b>		mineralization; occasional chert as white															
-22		crystals 2 mm to 3 mm.					-										
		30 mm reddish calcareous sandstone bed at 21.9 m depth.					488 -										
<b> </b>		Sharp lower contact on change in			R6	TCR = 90% RQD = 76%											
-23		texture.					-	-									
							487 -										
F																	
-24	486.2		$\vdash$				-	-									
							486 -										
<b> </b>	485.7 24.7					TCR = <b>97</b> %											
- 25	24.7	SHALE (Cabot Head Formation) Greenish grey calcareous shale; soft,			R7	RQD = <b>77</b> %	-										
	485.0	muddy appearance.					485 -										
	25.4	END OF BOREHOLE								\A/A T.	D   E\/E\ \$40	NUTOS	חוור סואור				
		Borehole was open upon completion.							Date		R LEVEL MO Depth (m		Elev	ation (m)			
<u>G</u>								(	Sep 30,	2014	17.4			493.0			
sbo		Open hole well installed in borehole. Casing cemented in bedrock at 6.86 m															
: :		depth.															
<u>~</u>																	
library: genivar - library.glb report: gen log vf file: bh logs.gp.																	
ort:																	
<b>е</b> О																	
ırary.g																	
ar - IIb																	
geniv																	
rary:																	
=∟																	Sheet No. 2 of 2

PROJECT NAME: DUNTROON QUARRY

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.

BOREHOLE TYPE: 60 mm ID HAND AUGER

PROJECT NO.: 930521.08

DATE: JUNE 29, 1999

GEOLOGIST: WDN

GROUND ELEVATION: 511.8 mASL REVIEWER: AGH

			TS				AMPL	E		CONE PENETRATION	14/4-	
DEPTH (m)	4	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	'N' VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE 10 20 30	WATER CONTENT %  10 20 30	REMARKS
0		<u>ORGANICS</u>	~			М		- ₹	<u> </u>	SHEAR STRENGTH	W <sub>P</sub> W <sub>L</sub>	
		BLACK SILTY, FIBROUS ORGANICS, SATURATED										
	.4											
.5		SILT, SOME CLAY BROWN, MOTTLED WITH ORANGE, RED, AND GREEN SILT, SOME CLAY, STONY, WET										
.0 1.	.0											0.45 m SLOT 10 SCREEN
		AUGER REFUSAL AT 1.0 m ON ASSUMED BEDROCK										0.50 m SAND PACK
.5												
.0												
5												
.0												
.5												
.0												
.5												
5.0												

PROJECT NAME: DUI	NTROON QUARRY	PROJECT NO.: 930521.08
CLIENT: GEORGIAN A	AGGREGATES AND CONSTRUCTION INC.	DATE: JUNE 29, 1999
BOREHOLE TYPE:	60 mm ID HAND AUGER	GEOLOGIST: WDN
GROUND ELEVATION	l: 512.1 mASL	REVIEWER: AGH

					9	AMPL			CONE			
		STRATIGRAPHY					- %		PENETRATION		TER	
DEPTH	STRATIGRAPHIC DESCRIPTION	ΔΠG	MONITOR	  -	z	<b>%</b> ₩		70	"N" VALUE 10 20 30		ENT % 20 30	REMARKS
(m)		RAP	DETAILS	TYPE	'N' VALUE	WATER	RECOVERY	RQD	<del></del>		1 1	
0		₹			F	~	ERY	8	SHEAR STRENGTH	W <sub>P</sub>	WL	
	ORGANICS											
ļ	DARK BROWN TO BLACK SILTY FIBROUS ORGANICS, BECOMES PEATY WITH DEPTH, SATURATED		////									
	SATURATED											
0.5												
ļ												
1.0												0.45 m SLOT 10 SCREEN
												0.50 m SAND PACK
1.3	CALCAREOUS AUGER CUTTINGS		<u> </u>									
	AUGER REFUSAL AT 1.0 m ON ASSUMED BEDROCK											
1.5	BESTOOK											
2.0												
2.5												
3.0												
ļ												
ļ												
3.5												
				l								
4.0									-			
4.5												
4.5												
ļ												
5.0				l				l				
JACCER HIME I	Arren		UPDATED N	OVEME	RFR 1	2 20	04			· · ·		

PROJECT NAME: DUNTROON QUARRY	PROJECT NO.: 930521.08
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: <u>JULY 21, 1999</u>
BOREHOLE TYPE: 60 mm ID HAND AUGER	GEOLOGIST: AGH
GROUND ELEVATION: 513.6 mASL	REVIEWER:

ROUND	ELEVATION: 513.6 mASL							RE	VIEV	VER:		
		ST				AMPL	E		CONE PENETRATION			
DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	ТҮРЕ	'N' VALUE	% WATER	% RECO	RQD	"N" VALUE 10 20 30	CONT	TER ENT % 20 30	REMARKS
0		γHΥ		П	LUE	뜄	RECOVERY	8	SHEAR STRENGTH	₩ <sub>P</sub>	WL	
	ORGANICS DARK BROWN TO BLACK SILTY FIBROUS											
	ORGANICS, SOME ORGANIC SILT, ROOTLETS AND WOOD VEGETATION, SOFT, MOIST TO											
	WET, BECOMING SATURATED AT ABOUT 1.5 m											
5												
0												0.45 m SLOT 10 SCREEN
												0.50 m SAND PACK
.5												
			[1] ( <b>本</b> ) ( )									
.0												
2.14	GREY SILTY SAND, SATURATED											
	HOLE TERMINATED AT 2.20 m IN GREY SILTY SAND											
 5												
0					ļ							
5												
.0					<u> </u>							
					ļ <u>.</u>							
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.5					ļ							
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.o   seer Hose I					ļ	l						

PROJECT NAME: DUNTROON QUARRY	PROJECT NO.: 930521.08
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: JUNE 30, 1999
BOREHOLE TYPE: 60 mm ID HAND AUGER	GEOLOGIST: WDN
GROUND ELEVATION: 511 4 mASI	REVIEWER: AGH

			S			s	AMPL	E		CONE			
			STRATIGRAPHY				%	%		"N" VALUE		TER ENT %	
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	IGRA	MONITOR DETAILS	TYPE	z,	WATER	REC	RQ O	10 20 30	10 2	20 <b>3</b> 0	REMARKS
			뫔		m	'N' VALUE	뛵	RECOVERY	8	SHEAR STRENGTH	<del> </del>		
0		<u>ORGANICS</u>						~	<u> </u>	STRENGTH	W <sub>P</sub>	WL	
		BLACK FIBROUS ORGANICS, PEAT, SATURATED											
						ļ							
0.5													
				era tua tua tua tu									
1.0				17.00 18.00 25									0.45 m SLOT 10 SCREEN 0.50 m SAND PACK
						ļ							
	1.35	SILT, SOME FINE SAND:				ļ							
1.5	1.50	GREENISH GREY SILT, SOME FINE SAND, RANDOM PEBBLES, SATURATED		<b>*</b>									
		AUGER REFUSAL AT 1.5 m ON ASSUMED BEDROCK											
2.0													
2.5													
3.0						ļ				-			
3.5													
									ļ				
						İ							
4.0													
						ļ			ļ				
						ļ							
4.5						<u> </u>							
5.0													

PAGE 1 of 1

REVIEWER: MJL

PROJECT NAME: PROPOSED DUNTROON QUARRY EXPANSION PROJECT NO.: 04 930521.52

CLIENT: WALKER AGGREGATES INC. DATE COMPLETED: Jul 03, 2007

BOREHOLE TYPE: HAND AUGER SUPERVISOR: SLW

**GROUND ELEVATION: 509.5 NOT DETERMINED** 

			ST			S	AMPLE	≣		C( PENET	ONE RATION	w	ATER	UTM CO-ORDINATES
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	l	/ALUE		20 30	UTM Zone: 17 NAD: <u>83</u> Easting: <u>559086</u> Northing: <u>4915559</u>
0.0		ORGANIC SILT: DARK BROWN ORGANIC SILT, TRACE CLAY,	~		AS1			100		STRE	NGTH	W <sub>P</sub>	WL	REMARKS  ROB ROY PSW WETLAND
	0.2 —	ORGANICS, WET TO SATURATED.  CLAYEY SILT: LIGHT BROWN CLAYEY SILT, TRACE SAND,			AS2			100						COMPLEX UNIT 2
	0.4	WTPL.  SAND: LIGHT BROWN FINE SAND, TRACE TO SOME SILT TO FINE TO MEDIUM SAND, TRACE TO SOME			AS3			100						
		SILT WITH DEPTH, SATURATED.			AS4			100						
1.0	1.0	HAND AUGER HOLE TERMINATED AT 1.0 m DUE			AS5			100						
		TO REFUSAL.												
2.0														
9/7/07														
3.GDT 9/7														
MS BASIC														
JAGGER HIMS BASIC.GDT														
POINTS.GPJ JA														
/E POINT														
2152 DRI														
M 4-9305														
ALD HELM														
(METRIC)														
GIC B/W														
JHL GEOLOGIC BW (METRIC) WITH UTM 4-93052152 DRIVE														
<u> 5.0</u>	11.													

PAGE 1 of 1

PROJECT NAME: PROPOSED DUNTROON QUARRY EXPANSION PROJECT NO.: 04 930521.52

CLIENT: WALKER AGGREGATES INC. DATE COMPLETED: Jul 03, 2007

BOREHOLE TYPE: HAND AUGER SUPERVISOR: SLW

GROUND ELEVATION: 511.3 NOT DETERMINED REVIEWER: MJL

			S			S	AMPLE	<b>=</b>		C( PENET	ONE RATION	W.	ATER	UTM CO-ORDINATES
	EPTH	STRATIGRAPHIC DESCRIPTION	RATIO	MONITOR		z	%	% RI	Z.	ı	/ALUE		ITENT %	UTM Zone: <u>17</u> NAD: <u>27</u> Easting: <u>559774</u> Northing: <u>4915513</u>
	(m)	CHANGE AND BESSELL FISH	STRATIGRAPHY	DETAILS	TYPE	N VALUE	% WATER	RECOVERY	RQD (%)		20 30	10 I	20 30	- -
0.0			₹			т	R		٠	SHE STRE	EAR NGTH	W <sub>P</sub>	WL	REMARKS
	0.1 —	ORGANIC SILT: DARK BROWN ORGANIC SILT, ORGANICS, MOIST.			AS1 AS2 AS3			100 100 100						EXPANSION LANDS ESCARPMENT ANSI A WETLAND
	_	SILT: LIGHT BROWN SILT, SOME TO TRACE FINE			AS4			100						/MOI/WEIEMB
		SAND, TRACE CLAY, DTPL TO APL AT 0.6 m.			AS5			100						
					AS6			100						
					AS7			100						
1.0	_				A37			100						
					AS8			100						
	1.4 —	HAND AUGER HOLE TERMINATED AT 1.4 m DUE TO REFUSAL.		•										
2.0														
9/7/07														
DT 9/7														
JAGGER HIMS BASIC.GDT														
TIMS B														
3.0 3.0														
POINTS.GPJ														
52 DRI														
330521														
4.0 ¥ 4.0														
U HLIV														
JHL GEOLOGIC BW (METRIC) WITH UTM 4-93052152 DRIVE														
W (ME														
OGIC B.														
GEOLC														
북 <sub>5.0</sub>	***													



PAGE 1 of 1

PROJECT NAME: DUNTROON EXPANSION PROJECT NO.: 111-53312-00 52.1

CLIENT: WALKER AGGREGATES INC. DATE COMPLETED: Jul 10, 2014

BOREHOLE TYPE: 1 1/4" HAND AUGER SUPERVISOR: TKC

GROUND ELEVATION: 509.2 mASL REVIEWER: SLW

								_		00115			
DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	CONE PENETRATION  "N" VALUE  10 20 30	CON	ATER TENT %	UTM CO-ORDINATES UTM Zone: 17 NAD: 83 Easting: 559345 Northing: 4915351
0.0	509.2		=			m	쀯	₽	) ©	SHEAR STRENGTH	W <sub>P</sub>	W <sub>L</sub>	REMARKS
0.0	509.2	TOPSOIL	7/ 1/N -7										
			1/ - 7 - 1/										
0.2	509.0	FINE SAND, SOME SILT	1, 1										
0.8	508.4	SILTY TILL, TRACE SAND	////										
				Ħ									
2.5													
5	506.7	DRIVEPOINT TERMINATED AT 2.5 m.											
$\Box$													
$\exists$													
			1 1										



CLIENT: WALKER AGGREGATES INC.

## **BOREHOLE NO. DP8**

PAGE 1 of 1

DATE COMPLETED: Jul 10, 2014

PROJECT NAME: DUNTROON EXPANSION PROJECT NO.: 111-53312-00 52.1

BOREHOLE TYPE: 1 1/4" HAND AUGER SUPERVISOR: BTC

GROUND ELEVATION: 511.1 mASL REVIEWER: SLW

,,,,	OND	ELEVATION: 511.1 mASL								_	EWEF		
	Ĺ)		ς.			S	SAMPLI	E		CONE PENETRATION	WΔ	TER	UTM CO-ORDINATES
DEPTH (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE 10 20 30	CONT	ENT %	UTM Zone: <u>17</u> NAD: <u>83</u> Easting: <u>559094</u> Northing: <u>4914360</u>
0.0	511.1		₹			ш	ä	RΥ	ေ	SHEAR STRENGTH	W <sub>P</sub>	WL	REMARKS
		TOPSOIL	7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4										
0.5	510.6	DARK BROWN SOIL	1/2 - 1/1/										
0.9	510.2	DRIVEPOINT TERMINATED AT 0.9 m.											



PAGE 1 of 1
PROJECT NAME: DUNTROON EXPANSION PROJECT NO.: 111-53312-00 52.1

CLIENT: WALKER AGGREGATES INC. DATE COMPLETED: Sep 10, 2014

BOREHOLE TYPE: 1 1/4" HAND AUGER SUPERVISOR: KMT

GROUND ELEVATION: 507.7 mASL REVIEWER: KJF

GRC	DUND	ELEVATION: 507.7 mASL								REVI	EWER: KJ	F
_	3L)		ST				SAMPLI	E		CONE PENETRATION	WATER	UTM CO-ORDINATES
DEРТН (m)	ELEV (mASL)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	N VALUE	% WATER	% RECOVERY	RQD (%)	"N" VALUE 10 20 30	10 20 30	UTM Zone: <u>17</u> NAD: <u>83</u> Easting: <u>560273</u> Northing: <u>4915407</u>
0.0	507.7		꽃		тĭ	E	Ē	/ERY	(%)	SHEAR STRENGTH	W <sub>P</sub> W <sub>L</sub>	REMARKS
0.0	307.7	BROWN SATURATED TOPSOIL	7/1/2									
0.1	507.6	BROWN AND GREYISH CLAYEY SILT, SATURATED. RUST STAINING.										WATER PONDED AT 0.12 m ABOVE GROUND.
0.5	507.2	BROWN CLAYEY SILT TO SILTY CLAY. TRACE GRAVEL.										
1.3	506.4	DRIVEPOINT TERMINATED AT 1.33 m.	pa444									

WSP GEOLOGIC (METRIC) WITH MASL 111-53312-00 DRIVEPOINTS.GPJ WSP\_ENV\_V1.GDT 7/19/16

# **BOREHOLE NO. DP-5 (BRIDSON PROPERTY)**

PAGE 1 OF 1

PROJECT NAME: DUNTROON QUARRY EXPANSION	PROJECT NO.: 930521.50
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: SEPTEMBER 26, 2003
BOREHOLE TYPE: HAND AUGER	SUPERVISOR: AGH
GROUND ELEVATION: ESTIMATED 510 mASL	REVIEWER:

GRO	DUND	ELEVATION: ESTIMATED 510 n	nASL	-						_ REVI	EWE	R:	
			ST			;	SAMPL	E		CONE PENETRATION		TER	
	:PTH m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	z <u>.</u>	% W.	% REC	RQD	"N" VALUE 10 20 30	10 2	TENT % 20 30	REMARKS
0			APHY		M	VALUE	% WATER	RECOVERY	D (%)	SHEAR	W <sub>P</sub>	WL	
0		SILT:			AS					STRENGTH	144	111	LOCATED ON BRIDSON PROPERTY
		DARK BROWN ORGANIC SILT, TOPSOIL, ROOTLETS, APL TO WTPL.								-			T NOT ENT
0.2					AS					-			
0.2	0.26									- -			
		SILT:								_			
0.4		LIGHT BROWN/MOTTLED GREYISH BROWN SILT, TRACE TO SOME SAND, TRACE CLAY, TRACE GRAVEL, MOIST.			AS					-			
0.4										<del>-</del> -			
					AS								
0.6													
	0.67				AS								
		SILTY FINE SAND:								-			
0.8		LIGHT BROWN /MOTTLED GREYSIH BROWN SILTY FINE SAND TO FINE SANDY SILT, TRACE CLAY, MOIST			AS					-			
				#	AS								
				<b>+</b>						-			
1.0				<b>+</b>	AS					-			
	1.06				AS					-			
		SILT: LIGHT BROWN TO GREYISH BROWN SILT,		<u> </u>						-			
1.2		SOME SAND, TRACE CLAY, APL TO WTPL.			AS								
				<b>+</b>						-			
				<b>=</b>	AS					-			
1.4					AS					-			
				<u> </u>						-			
				#	AS					-			
1.6					A3					-			
	1.72	HAND AUGER HOLE TERMINATED AT		<b>—</b>	AS								
1.8		1.72 m IN SILT.											
2.0		3 Lingred		JPDATED NO									

## **BOREHOLE NO. HA1**

PAGE 1 OF 1

PROJECT NAME: DUNTROON QUARRY EXPANSION PROJECT NO.: 930521.50

CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC. DATE: SEPTEMBER 11, 2003

BOREHOLE TYPE: HAND AUGER SUPERVISOR: MJL

GROUND ELEVATION: ESTIMATED 510 mASL REVIEWER: AGH

<b>U</b>	) (III)	ELEVATION: ESTIMATED 510 m/	·OL							_	.,	•				AGH
			TS			s	AMPL	E		PEI	CONE	E ATION	w	ATE	R	
	EPTH	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR	_	ż	%	% RE	70		N" VA 0 20			20	IT %	REMARKS
	(m)		RAPH	DETAILS	TYPE	'N' VALUE	% WATER	RECOVERY	RQD (9	-	-	7				
0			-			т	ת	ÄΫ́	(%)	SHE	EAR RENGT	Н	W <sub>P</sub>		WL	
		SILT: DARK BROWN ORGANIC SILT, TOPSOIL,			AS											LOCATED ON BRIDSON PROPERTY
		ROOTLETS, DTPL TO APL.														
0.2																
	0.23				AS											
		SILT:														
		SILT: LIGHT BROWN MOTTLED SILT, SOME SAND, TRACE CLAY BECOMING SANDY SILT WITH			AS											
0.4		DEPTH, MOIST.														
					AS											
0.6					AS											
					AS											
					A.5											
	0.76				AS											
8.0		HAND AUGER HOLE TERMINATED AT 0.76 m IN SILT.														
1.0																
1.2																
1.4																
1.6																
1.8																
2.0																

# **BOREHOLE NO. HA2**

PAGE 1 OF 1

PROJECT NAME: DUNTROON QUARRY EXPANSION	PROJECT NO.: 930521.50
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: SEPTEMBER 26, 2003
BOREHOLE TYPE: HAND AUGER	SUPERVISOR: AGH
GROUND ELEVATION: ESTIMATED 511 mASL	REVIEWER:

GRO	DUND	ELEVATION: ESTIMATED 511 n	nASL	-						_ REVII	EWE	R:	
			S.			5	SAMPL	E		CONE PENETRATION	WA	TER	
	EPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	TYPE	Ż. VA	% WATER	% RECOVERY	RQD	"N" VALUE 10 20 30	10 :	TENT % 20 30	REMARKS
			PHY		""	VALUE	ĒŖ	VER)	(%)	SHEAR	⊢ W <sub>P</sub>	W <sub>L</sub>	
0		SILT:			AS					STRENGTH	WP		LOCATED IN WETLAND,
		DARK BROWN TO BROWN ORGANIC SILT (PEATY), MOIST BECOMING APL.											NORTHWEST CORNER OF EXPANSION LANDS
	0.15				AS					-			
0.2		SILT: BROWN/MOTTLED BROWN-GREY ORGANIC											
		SILT, TRACE CLAY BECOMING SILT, TRACE TO SOME CLAY, APL TO WTPL.			AS								
		-GRADES TO FINE SANDY SILT, TRACE TO SOME CLAY			AS					-			
0.4					AS					-			
	0.50									-			
		SILTY SAND: BROWN SILTY SAND, TRACE CLAY, WET TO											
0.6		SATURATED.  THIN LAYER OF CLAYEY SILT AT BASE.			AS					-			
		THIN EATER OF CLATET SIET AT BASE.								-			
0.8					AS					-			
0.0													
	0.90	REFUSAL ON BOULDER OR BEDROCK			AS					-			
		HAND AUGER HOLE TERMINATED AT 0.90 m DUE TO AUGER REFUSAL ON								-			
1.0		BOULDER OR BEDROCK.								-			
										-			
1.0										-			
1.2										-			
										-			
										-			
1.4													
										-			
1.6										-			
1.8										]			
										-			
2.0		s Lucrep		UPDATED NO	) /E: 15	ED 41							

# **BOREHOLE NO. HA3**

PAGE 1 OF 1

PROJECT NAME: DUNTROON QUARRY EXPANSION	PROJECT NO.: 930521.50
CLIENT: GEORGIAN AGGREGATES AND CONSTRUCTION INC.	DATE: SEPTEMBER 26, 2003
BOREHOLE TYPE: HAND AUGER	SUPERVISOR: AGH
GROUND ELEVATION: ESTIMATED 511 mASL	REVIEWER:

GRO	DUND	ELEVATION: ESTIMATED 511 r	nASL	-						_ REVI	EWE	R:						
			S.			,	SAMPL	E		CONE PENETRATION	WA	TER						
DE	PTH	STRATIGRAPHIC DESCRIPTION	RATI	STRATIGRAPHY		ż	\o	% F		"N" VALUE		TENT %	REMARKS					
	(m)	CINATIONAL THE BESSELF HON			DETAILS	DETAILS	R DETAILS	DETAILS	G DETAILS	G DETAILS	TYPE	J' VALUE	% WATER	RECOVERY	RQD	10 20 30	10 20 30	
0			并		'''	<u> </u>	Ę,	VERY	(%)	SHEAR STRENGTH	⊢ W <sub>P</sub>	W <sub>L</sub>						
		SILT:			AS								LOCATED IN WETLAND, NORTHWEST CORNER OF					
		DARK BROWN ORGANIC SILT (PEATY), BECOMING BROWN-GREY ORGANIC SILT			AS					-			EXPANSION LANDS					
	0.15	(LESS PEATY), MOIST.		-	7.0													
0.2		SILT: BROWN GREY SILT, SOME CLAY, TRACE			AS					4								
		SAND, APL TO WTPL.			AS					-								
	0.75																	
	0.35	SILTY SAND:		_	AS					-								
0.4		MOTTLED BROWN TO BROWN SILTY SAND, TRACE TO SOME CLAY. TRACE GRAVEL AT								1								
		BASE, APL TO WTPL, WET TO SATURATED.			45					-								
					AS					1								
0.6					AS													
					AS					-								
										-								
0.8					AS					1			GRAIN SIZE SAMPLE					
													MIT CLASSIFICATION GRAVEL 11 %					
					AS					-			SAND 61 % SILT 23 % CLAY 5 %					
1.0													FINE SAND 31 % MED. SAND 18.5 %					
										-			COARSE SAND 11.5 %					
					AS													
		SILT LAYERS AT DEPTH.																
1.2	1.20	HAND AUGER HOLE TERMINATED AT								-								
		1.20 m IN BROWN SILTY SAND.																
										-								
1.4																		
										]								
										-								
1.6										-								
										1								
1.8										-								
										1								
										-								
										1								
2.0		s Lucresp																

#### **OW1 NEST**

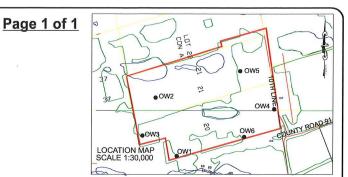
Drill Date: August 2004

Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 512.2 masl



Deptl (m)	h Strat.		ology n Member	Stratigraphic Description	Transmissivity Profile (m²/s)	Monitoring Well I    III IV
	1-0 -01	Щ		Overburden		The state of the s
4	2   0   0   0   0   0   0   0   0   0			Dolostone Light grey to beige, fine crystalline, occasional fossils (brachiopods), low porosity, vuggy (vugs lined with fine calcite crystals)		
12		97		Massive dolostone between 8 and 12.2 m, mottled, fossiliferous (crinoids, bivalves, brachiopods)		
	9 3 9 5	9		Less dense dolostone between 12.2 and 20.7 m		
	### ##################################	ation		Below 12.2 m - iron staining in vugs		
16	2	Amabel Formation		Between 18 and 19 m - blue / white mottling		
	2			Massive dolostone		
24				Blue / white mottling from 20.7 m to bottom of hole Vug frequency decreasing with depth Stylolites between 22 and 29 m		
28			Lions Head	Dolostone Massive, light to dark grey, occasional tan beds, aphanitic, low fossil content		
		Fossil Hill		Dolostone, mottled blue-grey, low fossil content occasional shale interbeds		
<u>32</u>	~   =   a			Bottom of Borehole = 31.93 m		<u>                                      </u>

NOTES:

Borehole OW1-04 was logged by John Emery Geotechnical Engineering Limited For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data

Water levels measured on:

**X** April 13,2005

**November 15,2005** 



# **Observation Well Nest 1**

Date Issued:	December 2005
Geologist:	TLW
Project No.	04-015
File Name:	OW1-page 1.cdr

### **OW2 NEST**

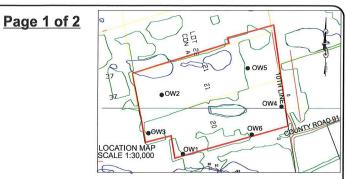
Drill Date: August 2004

Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 522.2 masl



Dept (m)	h Strat.	Geology	Stratigraphic Description	Transmissivity Profile (m²/s)	Monitoring Well I II III IV
յանականականականականականականականականականա		Amabel Formation	Overburden Brown, silty sand, occasional gravel  Dolostone  Light grey to beige, slightly mottled, fine crystalline fossiliferous (brachiopods), medium bedded, vuggy fractures between 1.6 and 3.7 m are weathered  At 8.5 m - highly fractured for 0.4 m, weathered (iron staining)		
24			Light grey to bluish grey, iron staining in vugs Weathered fractures between 24 and 27 m		
28			Dolostone Light grey, massive, fine crystalline with aphanitic sections		

NOTES:
Borehole OW2-04 was logged by John Emery Geotechnical Engineering Limited
For a detailed description of the geological units refer to Section 5.0 of the report
Information on well construction details refer to Appendix A: Methodology
Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics
Information on transmissivity profiles refer to Appendix F: Packer Testing Data

Water levels measured on:

**X** April 13,2005

**November 15,2005** 



# **Observation Well Nest 2**

Date Issued:	December 2005
Geologist:	TLW
Project No.	04-015
File Name:	OW2-page 1.cdr

## **OW2 NEST**

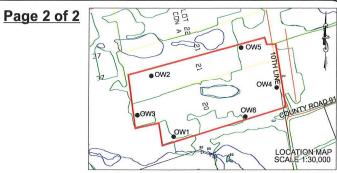
Drill Date: August 2004

Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 522.2 masl



Depth (m)	Strat.	Geol Formation	ogy Member	Stratigraphic Description	Transmissivity Profile (m²/s)	Monitoring Well
-		Amabel Formation	Weines.	(Continued from previous page)	100,	
40		Am	Lions Head	<b>Dolostone</b> Light grey, stylolites, occasional pyrite, filled fracture and tan beds		
	0   0   0   0   0   0   0   0   0   0	Fossil Hill		<u><b>Dolostone</b></u> Mottled blue-grey, low fossil content, occasional shale interbed		
44	A more pressure construction of the control of the	Cabot Head		Shale Dark green, thin bedded, massive to brittle		
36 40 44 48 60 64				Bottom of Borehole = 44.46 mbgl		

#### OTES

Borehole OW2-04 was logged by John Emery Geotechnical Engineering Limited For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data

Water levels measured on:



November 15,2005



# **Observation Well Nest 2**

Date Issued:	December 2005
Geologist:	TLW
Project No.	04-015
File Name:	OW2-page 2.cdr

#### **OW3 NEST**

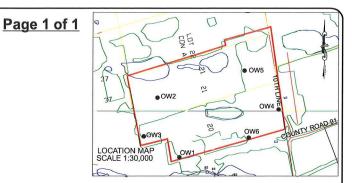
Drill Date: August 2004

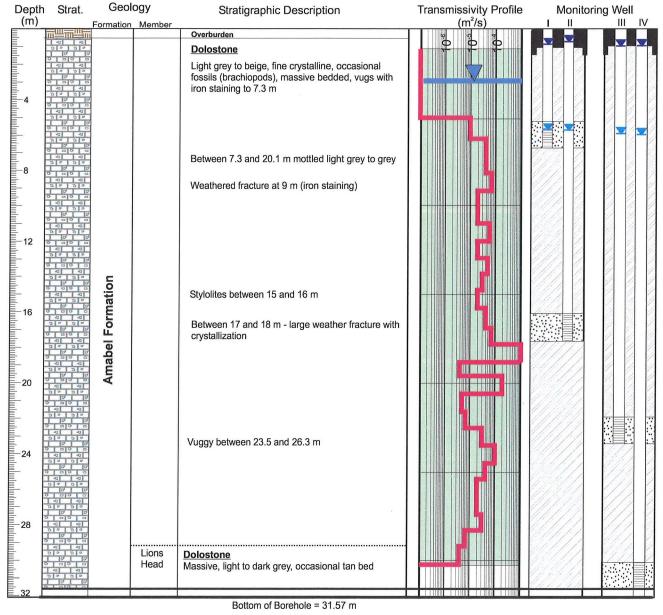
Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 515.5 masl





#### NOTES:

For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data

Water levels measured on:



November 15,2005



# **Observation Well Nest 3**

Date Issued:	December 2005
Geologist:	TLW
Project No.	04-015
File Name:	OW3-page 1.cdr

### **OW4 NEST**

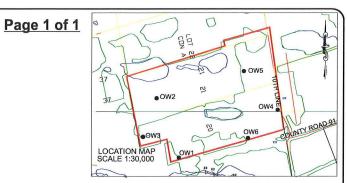
Drill Date: August 2004

Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 518.8 masl



Dept (m)		Geology	Stratigraphic Description	Transmissivity Profile (m²/s)	Monitoring Well I II III IV
		Formation Member	Overburden Brown, silty sand, some gravel	0 0 0	
			Dolostone		
4	2 2 2 2 D 2 D 0 D 2 D 0		Light grey to beige, fine crystalline, occasional fossils (brachiopods), medium bedded, mottled		
	9 0 0 0 0 0 0 0		Large weathered fracture at 6.4 m		000000
	D 8 D 8		Between 6.4 and 10.6 m - blue and grey mottling		
8 Harding 12			Large weathered fracture between 10.4 and 10.6 m		
		Amabel Formation	Between 17.3 and 19.0 m - white-tan in colour with occasional grey mottling		
24			Large weathered fracture at 22.2 m and at 23.1 m		
28					
=_32_	1401 1401		Bottom of Borehole = 32.9 m		Colod dille

#### OTES:

Borehole OW4-04 was logged by John Emery Geotechnical Engineering Limited For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data

Water levels measured on:

X April 13,2005

**November 15,2005** 



## **Observation Well Nest 4**

Date Issued:	December 2005
Geologist:	TLW
Project No.	04-015
File Name:	OW4-page 1.cdr

#### **OW5 NEST**

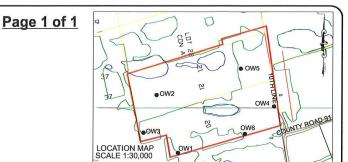
Drill Date: August 2004

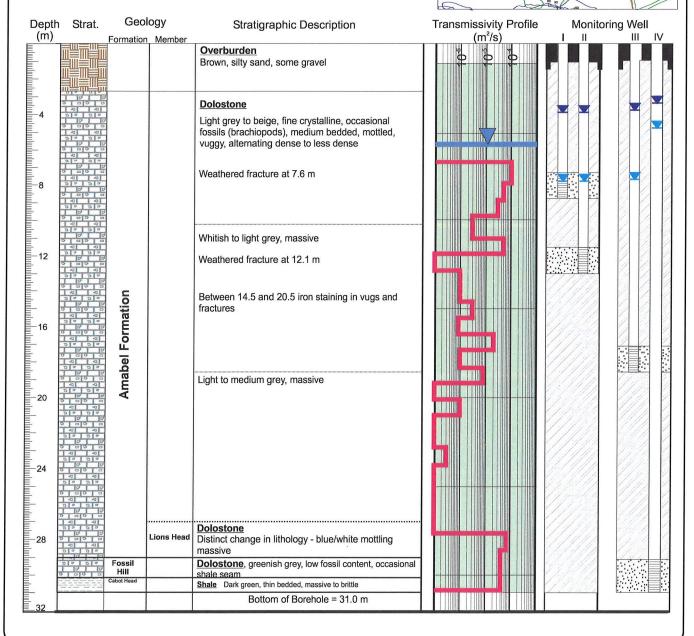
Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 510.8 masl





#### NOTES:

For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data

Water levels measured on:

**X** April 13,2005

November 15,2005



## **Observation Well Nest 5**

December 2005	
TLW	
04-015	
OW5-page 1.cdr	_
	TLW 04-015

#### **OW6 NEST**

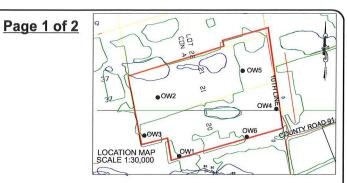
Drill Date: August 2004

Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 526.2 masl



Depth Strat.	Geology	Stratigraphic Description	Transmissivity Profile (m²/s)	M&Moitoitorgn&MAMell I II IV
4	ive inter	Overburden Brown, silty sand, occasional gravel  Dolostone  Light grey to beige, slightly mottled, fine crystalline fossiliferous (brachiopods), medium bedded, vuggy, dense fractures between 1.6 and 3.7 m are weathered		
	uo	Weathered fractures at 11.5, 12.8, 13.4, 14.2 m (fracture at 14.2 is on a 45 degree angle)		
16   10   10   10   10   10   10   10	Amabel Formation	Light grey, less dense, vuggy, weathered fracture at 18.2 m		
24   3   5   5   5   5   5   5   5   5   5	A	Highly fractured and weathered between 23.5 and 27.0 m (drill rods dropped between 24.5 - 25.5 m)		
32 0 0 0 0		Whitish-grey, dense		

#### OTES

For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data Water levels measured on:



November 15,2005

\*Represents zone of packer communication t
no analysis possible



# **Observation Well Nest 6**

Date Issued:	December 2005	
Geologist:	TLW	
Project No.	04-015	
File Name:	OW6-page 1.cdr	

## **OW6 NEST**

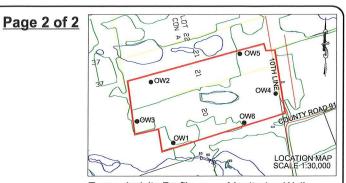
Drill Date: August 2004

Drilling Method: Continuous Core

**Driller: Lantech Drilling** 

Geologist: TLW

Ground Surface Elevation: 526.2 masl



Depth	Strat.	Geol	ogy	Stratigraphic Description	Transmissivity Profile	Monitoring Well
(m)		Formation	Member		(m²/s)	III IV
ամակականակակակակակակակակակակակակակակակակ		Amabel Formation		(Continued from previous page)		
48			Lions Head	Dolostone Light grey, mottled, occasional tan bed, low fossil content	*	
		Fossil Hill		Dolostone Greenish grey, shale seams, thin bedded, low fossil content		
52	PARAMETER STATES AND AND AND AND AND AND AND AND AND AND	Cabot Head		Shale Dark green, thin bedded, massive to fissile		
				Bottom of Borehole = 51.19 mbgl		

#### NOTES:

For a detailed description of the geological units refer to Section 5.0 of the report Information on well construction details refer to Appendix A: Methodology Information on stratigraphic contacts refer to Appendix D: Borehole Geophysics Information on transmissivity profiles refer to Appendix F: Packer Testing Data Water levels measured on:



November 15,2005

\*Represents zone of packer communication to an alysis possible



## **Observation Well Nest 6**

Date Issued:	December 2005	
Geologist:	TLW	
Project No.	04-015	
File Name:	OW6-page 2.cdr	

# **APPENDIX**

# A-4 SURFACE WATER STATION INSTRUMENTATION DETAILS

#### **Station SW1**

115

Project Name: Duntroon Quarry Date: July 30, 2015

Client:Walker Aggregates Inc.Supervisor:JHLProject Number:111-53312-05Scale:NTS

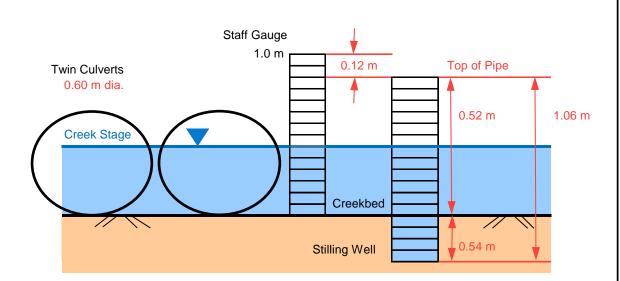




Photo taken on October 26, 2022.

#### Notes:

Twin culverts outflow from RR6 west of Main Quarry west of Grey County Road 31. GPS Coordinates 559,117 E 4,914,254 N (NAD 83 Zone 17).

Approximate ground elevation is 513 masl (estimated from Ontario Base Mapping).

#### **Station SW2**

Project Name: July 30, 2015 **Duntroon Quarry** Date:

Client: JHL Walker Aggregates Inc. Supervisor: Project Number: 111-53312-05 Scale: NTS

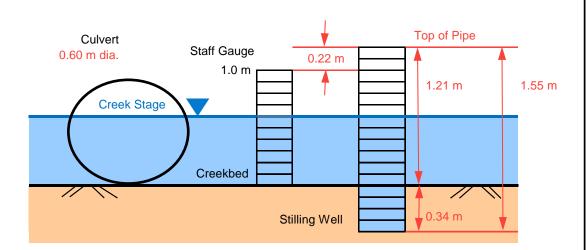




Photo taken on October 26, 2022.

#### Notes:

Upstream flow to RR6 west of Main Quarry south of Grey County Road 91. GPS Coordinates 559,070 E 4,914,769 N (NAD 83 Zone 17).

Approximate ground elevation is 515 masl (estimated from Ontario Base Mapping).

#### **Station SW0-2**

112

Project Name: Duntroon Quarry Date: July 30, 2015

Client:Walker Aggregates Inc.Supervisor:JHLProject Number:111-53312-05Scale:NTS

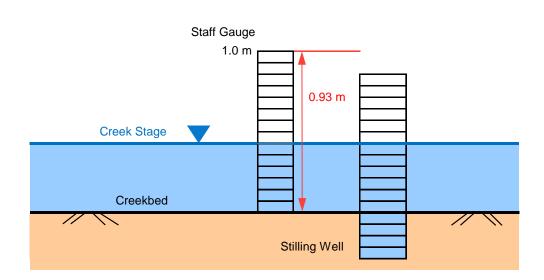




Photo taken on September 27, 2022.

#### Notes:

Outflow from RR6 west of Main Quarry west of Grey County Rd 31 GPS Coordinates 558,329 E 4,914,495 N (NAD 83 Zone 17).

Approximate ground elevation is 510 masl (estimated from Ontario Base Mapping).

#### **Station SW3**

115

Project Name: Duntroon Quarry Date: July 31, 2015

Client:Walker Aggregates Inc.Supervisor:JHLProject Number:111-53312-05Scale:NTS

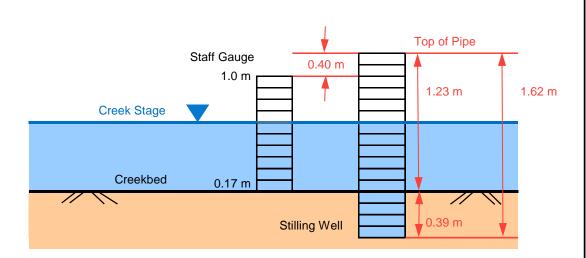




Photo taken on September 29, 2022.

#### Notes:

Outflow from RR2 northwest of Extension Quarry west of Grey County Rd 31 GPS Coordinates 558,890 E 4,915,581 N (NAD 83 Zone 17).

Approximate ground elevation is 510 masl (estimated from Ontario Base Mapping).

#### **Station SW4**



Project Name: Duntroon Quarry Date: November 21, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

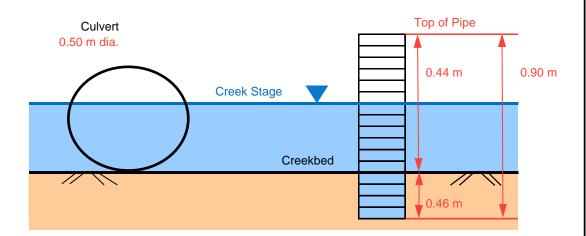




Photo taken on November 21, 2022.

#### Notes:

RR6 inlet at southwest along north of 10th Conc.

GPS Coordinates 558,893 E 4,913,962 N (NAD 83 Zone 17).

Approximate ground elevation is 515 masl (estimated from Ontario Base Mapping).

#### **Station SW6A**



Project Name: Duntroon Quarry Date: July 16, 2015

Client:Walker Aggregates Inc.Supervisor:JHLProject Number:111-53312-05Scale:NTS

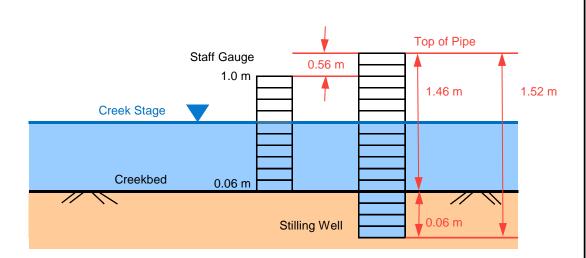




Photo taken on September 27, 2022.

#### Notes:

Beaver River southwest of Main Quarry west of Osprey Sideroad 30. GPS Coordinates 555,263 E 4,912,697 N (NAD 83 Zone 17).

Approximate ground elevation is 495 masl (estimated from Ontario Base Mapping).



Project Name: **Duntroon Quarry** November 23, 2022 Date:

Client: Walker Aggregates Inc. Supervisor: BC Project Number: 111-53312-05 Scale: NTS

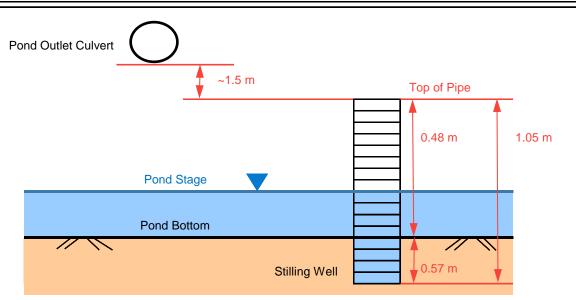




Photo taken on November 23, 2022.

### Notes:

Bridson Pond outlet culvert.

GPS Coordinates 560,355 E 4,915,502 N (NAD 83 Zone 17).

115

Project Name: Duntroon Quarry Date: July 31, 2015

Client:Walker Aggregates Inc.Supervisor:JHLProject Number:111-53312-05Scale:NTS

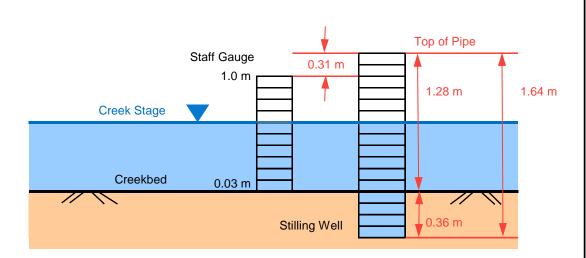




Photo taken on October 28, 2022.

### Notes:

Outflow from ANSI Wetland B east of Extension Quarry to sinkhole area. GPS Coordinates 560,454 E 4,915,647 N (NAD 83 Zone 17).



Project Name:Duntroon QuarryDate:October 27, 2022Client:Walker Aggregates Inc.Supervisor:BC / SRF / BC

Project Number: 111-53312-05 Scale: NTS

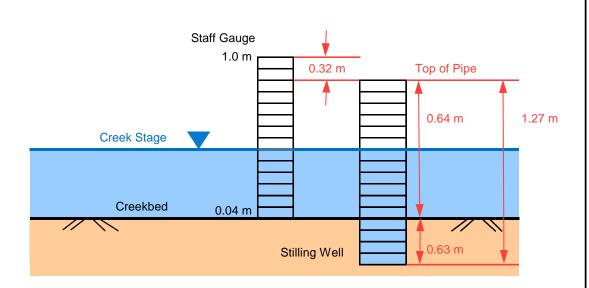




Photo taken on October 27, 2022.

### Notes:

Escarpment seep east of Extension Quarry, upgradient of farm well tile collection system. GPS Coordinates 561,200 E 4,915,641 N (NAD 83 Zone 17).



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

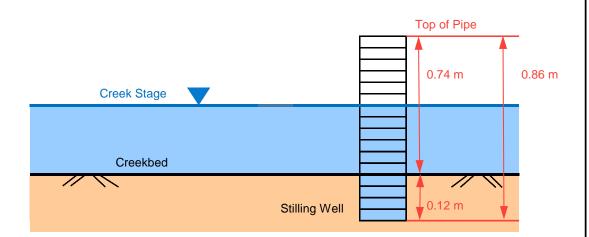




Photo taken on November 22, 2022.

### Notes:

Culmination of escarpment seeps SW11A-D on Franks property east of Extension Quarry. GPS Coordinates 561,151 E 4,916,011 N (NAD 83 Zone 17).

### **Station SW11A**



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

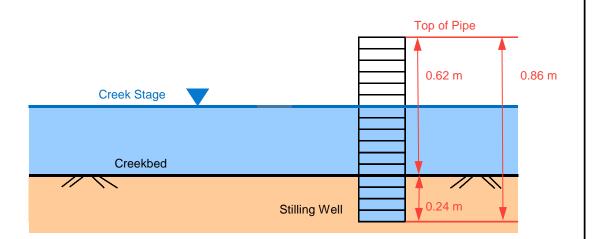




Photo taken on November 22, 2022.

### Notes:

Escarpment seep on Franks property east of Extension Quarry.

GPS Coordinates 561,128 E 4,916,011 N (NAD 83 Zone 17).

### **Station SW11B**



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

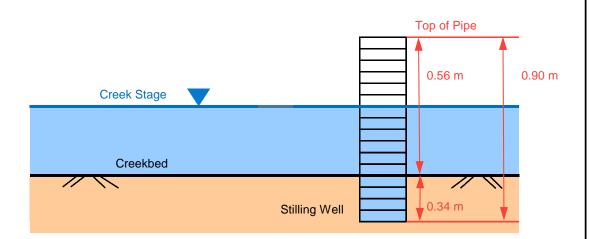




Photo taken on November 22, 2022.

### Notes:

Escarpment seep on Franks property east of Extension Quarry.

GPS Coordinates 561,098 E 4,916,018 N (NAD 83 Zone 17).

### **Station SW11C**



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

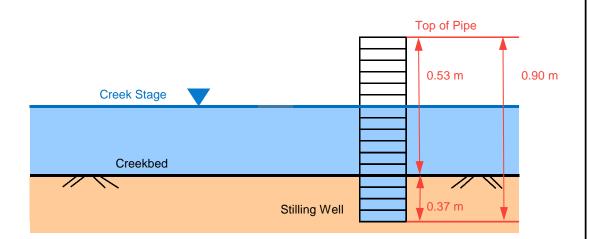




Photo taken on November 22, 2022.

### Notes:

Escarpment seep on Franks property east of Extension Quarry.

GPS Coordinates 561,079 E 4,916,034 N (NAD 83 Zone 17).

### **Station SW11D**



Duntroon Quarry Project Name: November 22, 2022 Date:

Client: Walker Aggregates Inc. Supervisor: BC Project Number: 111-53312-05 Scale: NTS

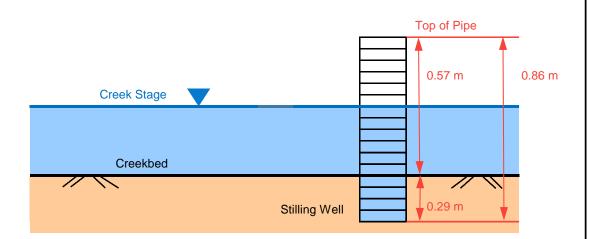




Photo taken on November 22, 2022.

### Notes:

Escarpment seep on Franks property east of Extension Quarry. GPS Coordinates 561,052 E 4,916,043 N (NAD 83 Zone 17).

### **Station SW11E**

Project Name: October 27, 2022 **Duntroon Quarry** Date: Client: BC / SRF / BC Walker Aggregates Inc. Supervisor:

Project Number: 111-53312-05 Scale: NTS

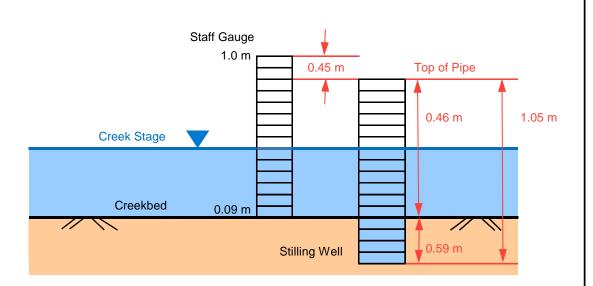




Photo taken on October 27, 2022.

### Notes:

Escarpment seep northeast of Extension Quarry, upstream of in-line pond. GPS Coordinates 561,238 E 4,915,997 N (NAD 83 Zone 17). Approximate ground elevation is 435 masl (estimated from Ontario Base Mapping).



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

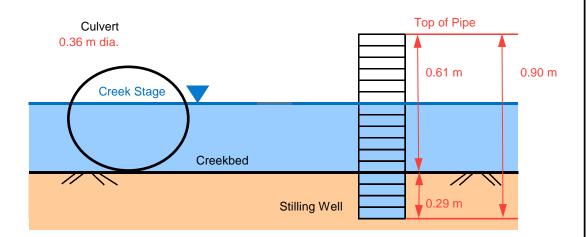




Photo taken on November 22, 2022.

### Notes:

Franks Pond outlet culvert east of Extension Quarry.

GPS Coordinates 561,288 E 4,916,042 N (NAD 83 Zone 17).

115

Project Name:Duntroon QuarryDate:October 27, 2022Client:Walker Aggregates Inc.Supervisor:BC / SRF / BC

Project Number: 111-53312-05 Scale: NTS

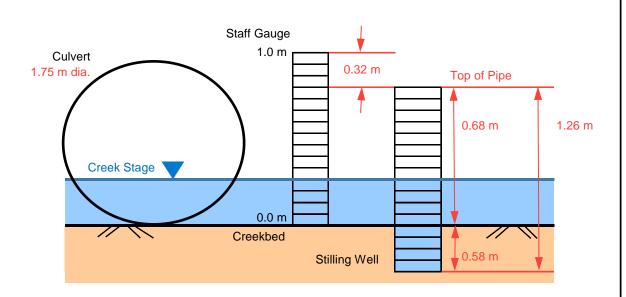




Photo taken on October 27, 2022.

### Notes:

Batteaux Creek northeast of Extension Quarry east of Conc 10.

GPS Coordinates 561,526 E 4,916,249 N (NAD 83 Zone 17).

Approximate ground elevation is 410 masl (estimated from Ontario Base Mapping).



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

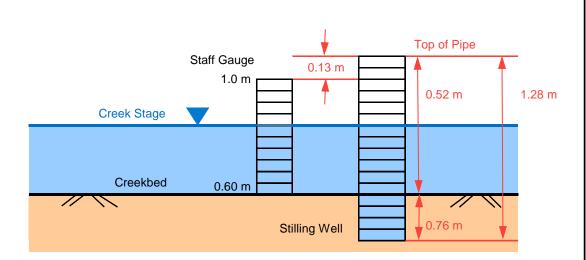




Photo taken on October 27, 2022.

### Notes:

Pretty River tributary northeast of Extension Quarry at 26/27 Sideroad. GPS Coordinates 561,198 E 4,916,724 N (NAD 83 Zone 17).

115

Project Name: Duntroon Quarry Date: July 31, 2015

Client:Walker Aggregates Inc.Supervisor:JHLProject Number:111-53312-05Scale:NTS

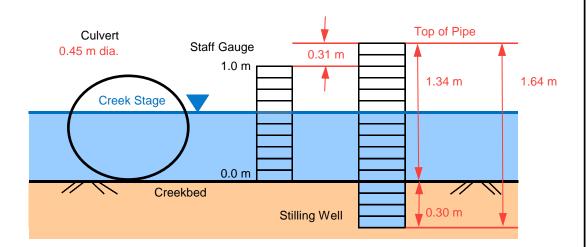




Photo taken on September 29, 2022.

### Notes:

Pretty River in-line pond outlet northeast of Extension Quarry south of 26/27 Sideroad. GPS Coordinates 560,607 E 4,916,532 N (NAD 83 Zone 17).

### **Station SW17A**



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

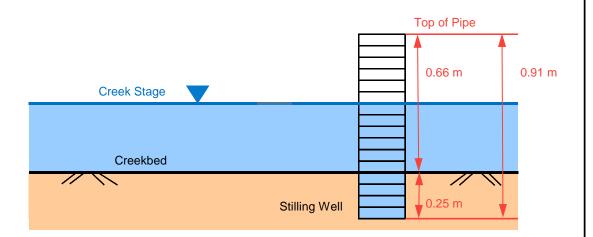




Photo taken on November 23, 2022.

### Notes:

Pretty River tributary northeast of Extension Quarry north of 26/27 Sideroad.

GPS Coordinates 560,603 E 4,916,543 N (NAD 83 Zone 17).

Approximate ground elevation is 430 masl (estimated from Ontario Base Mapping).



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

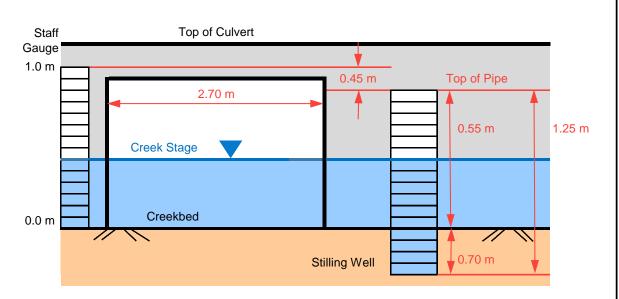




Photo taken on November 22, 2022.

### Notes:

Pretty River tributary northeast of Extension Quarry west of Conc 10.

GPS Coordinates 561,401 E 4,917,002 N (NAD 83 Zone 17).

Approximate ground elevation is 390 masl (estimated from Ontario Base Mapping).



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

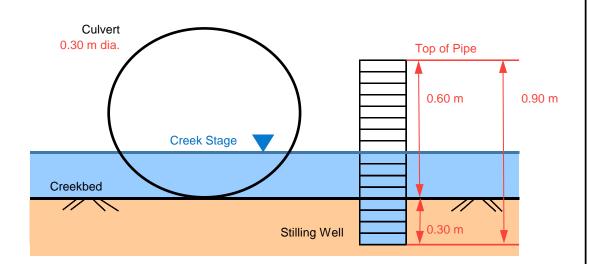




Photo taken on November 22, 2022.

### Notes:

In-line pond discharge below escarpment east of Extension Quarry.

GPS Coordinates 560,308 E 4,916,284 N (NAD 83 Zone 17).

### **Station SW21A**



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

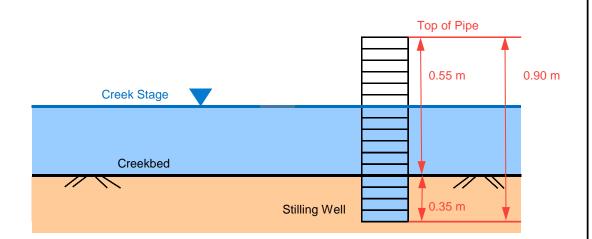




Photo taken on November 22, 2022.

### Notes:

In-line pond inlet below escarpment east of Extension Quarry.

GPS Coordinates 561,246 E 4,916,261 N (NAD 83 Zone 17).

### **Station SW21B**



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

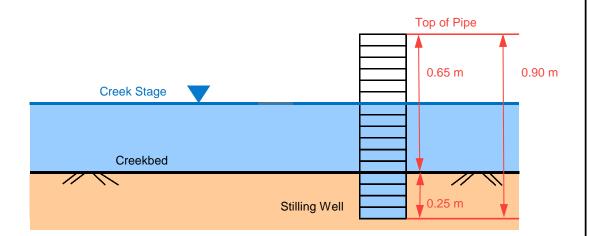




Photo taken on September 29, 2022.

### Notes:

Residential cistern overflow outlet below escarpment east of Extension Quarry. GPS Coordinates 561,039 E 4,916,193 N (NAD 83 Zone 17).

### **Station SW21C**



Project Name:Duntroon QuarryDate:October 27, 2022Client:Walker Aggregates Inc.Supervisor:BC / SRF / BC

**Project Number:** 111-53312-05 **Scale:** NTS

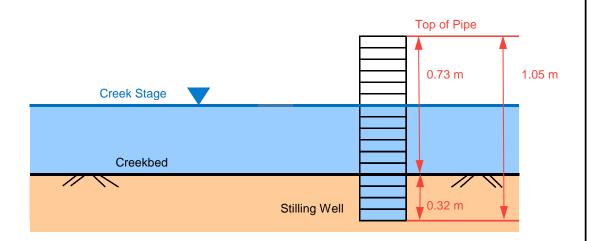




Photo taken on October 27, 2022.

### Notes:

Escarpment seep northeast of Extension Quarry, upgradient of cistern inlet pipe. GPS Coordinates 560,708 E 4,916,241 N (NAD 83 Zone 17).

WSD

Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

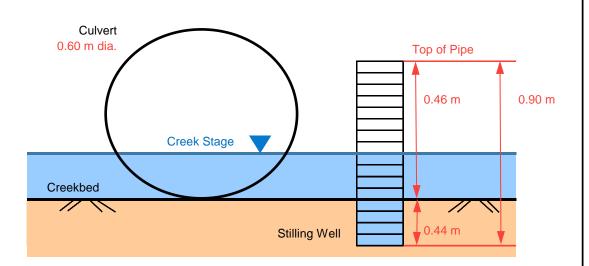




Photo taken on November 23, 2022.

### Notes:

Escarpment seep culvert beneath ski trail east of Main Quarry.

GPS Coordinates 560,686 E 4,914,713 N (NAD 83 Zone 17).

### Station SW22A



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

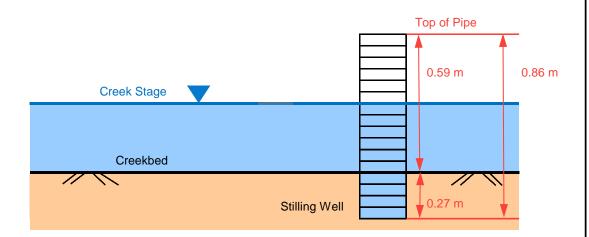




Photo taken on November 23, 2022.

### Notes:

Escarpment seep east of Main Quarry.

GPS Coordinates 560,952 E 4,915,039 N (NAD 83 Zone 17).

### **Station SW22C**



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

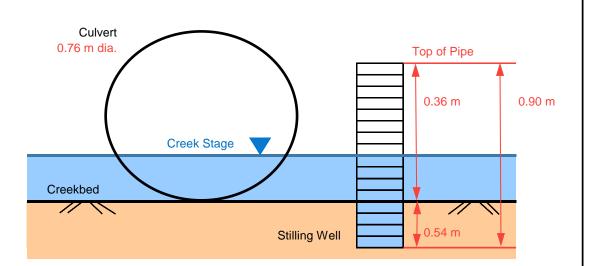




Photo taken on November 23, 2022.

### Notes:

Escarpment seep flow channel culvert east of Main Quarry.

GPS Coordinates 560,977 E 4,914,876 N (NAD 83 Zone 17).

### **Station SW24A**



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

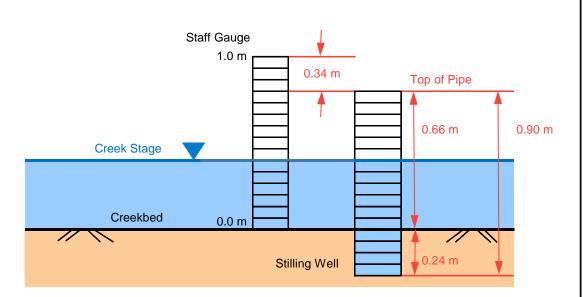




Photo taken on November 23, 2022.

### Notes:

Escarpment seep channel at water supply collection system northeast of Extension Quarry. GPS Coordinates 560,566 E 4,916,379 N (NAD 83 Zone 17).



Project Name: Duntroon Quarry Date: November 21, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

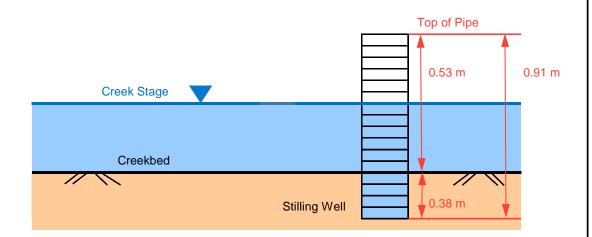




Photo taken on November 21, 2022.

### Notes:

Escarpment seep northeast of Extension Quarry.

GPS Coordinates 560,150 E 4,916,292 N (NAD 83 Zone 17).

# **Station PR Control**



Project Name:Duntroon QuarryDate:October 28, 2022Client:Walker Aggregates Inc.Supervisor:BC / SRF / BC

Project Number: 111-53312-05 Scale: NTS

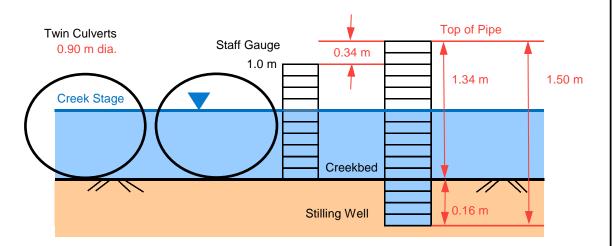




Photo taken on October 28, 2022.

### Notes:

Pretty River Control Station identified with NVCA north of Quarry on 30/31 Sideroad. GPS Coordinates 558,059 E 4,918,224 N (NAD 83 Zone 17).

### **Station BC Control**



Project Name: Duntroon Quarry Date: November 22, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

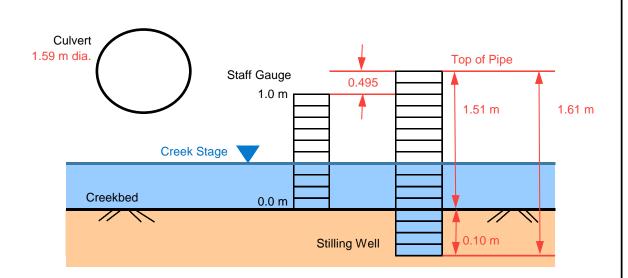




Photo taken on November 22, 2022.

### Notes:

Batteaux Creek Control Station identified with NVCA southeast of Quarry on 21/22 Sideroad GPS Coordinates 563,251 E 4,914,197 N (NAD 83 Zone 17).

### BH03-7 SG1



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

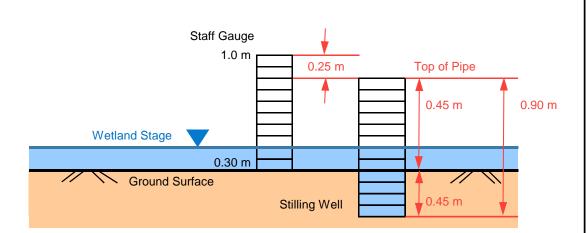




Photo taken on November 23, 2022.

### Notes:

RR2 north of BH03-7 well nest

GPS Coordinates 559,349 E 4,915,519 N (NAD 83 Zone 17).

Approximate ground elevation is 510.5 masl (estimated from April 2022 LIDAR survey).

## BH03-7 SG2



Project Name: Duntroon Quarry Date: November 23, 2022

Client:Walker Aggregates Inc.Supervisor:BCProject Number:111-53312-05Scale:NTS

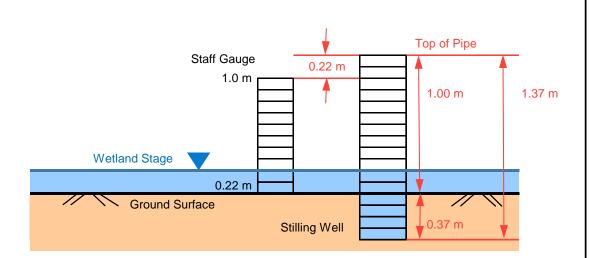




Photo taken on November 23, 2022.

### Notes:

RR2 northwest of BH03-7 well nest

GPS Coordinates 559,323 E 4,915,530 N (NAD 83 Zone 17).

Approximate ground elevation is 510.5 masl (estimated from April 2022 LIDAR survey).