

APPROVAL

**Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1**

APPROVAL HOLDER: SCOTIAN MATERIALS LIMITED

SITE PID: 00505941

APPROVAL NO: 2016-095664-03

EXPIRY DATE: June 19, 2027

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 s.1 as amended from time to time, approval is granted to the Approval Holder subject to the Terms and Conditions attached to and forming part of this Approval, for the following activity:

Industrial - Construction - Quarry



Administrator: Norma Bennett

Effective Date: June 3, 2020

The Minister's powers and responsibilities under the Act with respect to this Approval have been delegated to the Administrator named above. Therefore, any information or notifications required to be provided to the Minister under this Approval can be provided to the Administrator unless otherwise advised in writing.

TERMS AND CONDITIONS OF APPROVAL

Nova Scotia Environment

Approval Holder: SCOTIAN MATERIALS LIMITED

Project: Scotian Materials Limited (Goffs Quarry) - Complaint

Site:

PID	Civic #	Street Name	Street Type	Community	County
00505941	171	RESOURCE	RD.	GOFFS	HALIFAX COUNTY

Approval No: 2016-095664-03

File No: 92100-30-BED-2016-095664

Reference Documents

- Application submitted December 17, 2019 and attachments.
- Letter: Golder Associates, Response to NSE Letter Dated July 19, 2016, dated August 16, 2016, signed by Phyllis McCrindle, P.Geo.;
- Technical Memorandum: Golder Associates, Golder and Dyno Response to NSE Blast Questions Received on December 9, 2016, dated December 16, 2016, signed by Phyllis McCrindle, P.Geo. and Daniel Corkery, B.Sc.
- Design Point Engineering and Surveying Project 15-022 Sedimentation Pond Plan', Goffs Nova Scotia, Dwg. No. C-PD-EA Sheet 3 of 4, stamped and dated May 5, 2020.
- Design Point Engineering and Surveying Project 15-022 'Existing Conditions Plan', Goffs Nova Scotia, Dwg. No. C-EC-EA Sheet 4 of 4, stamped and dated May 5, 2020.
- Report: Golder Associates, Proposed Water Handling Plan for Goffs Quarry, dated August 2016, signed by Melanie Kennedy, P.Eng. and Kevin MacKenzie, P.Eng.;
- Letter: Scotian Material's Proposed Consultation Program, Revision 2, dated December 11, 2015 (Revision 2), signed by Robert MacPherson, P.Eng.;
- Letter: Golder Associates, Hydrogeological Assessment for Goffs Quarry, dated February 29, 2016, signed by Phyllis McCrindle, P.Geo. and Sean McFarland, P.Geo.;
- Technical Memorandum: Golder Associates, March 2016 Wetland Monitoring Event

- for Goffs Quarry, NS, dated April 5, 2016, signed by Glen Merkley, B.Eng. and Phyllis McCrindle, P.Geo.;
- Letter: Golder Associates, Response to NSE Comments Dated October 21, 2016 - Application No. 2016-095664, Proposed Goffs Quarry, dated October 31, 2016, signed by Melanie Kennedy, P.Eng. and Sean McFarland, P.Geo.;
 - Golder Associates Corporation Project No. 1777778 'Figure 1 - Monitoring Locations: Scotian Materials Goffs Quarry Industrial Approval Amendment Application' dated 2019-11-18.
 - Design Point Engineering and Surveying Project 15-022 Erosion and Sedimentation Control Plan and Storm Drainage Plan Phase 1 & 2', Goffs Nova Scotia, Dwg. No. C-ESCP-EA Sheet 2 of 4, stamped and dated May 5, 2020.
 - Report: Golder Associates, Industrial Approval Application for Goffs Quarry, report number: 1531421-Rev 0, dated January 2016;
 - Technical Memorandum: Golder Associates, Monitoring Program for Effects of Quarry Development on Wetland Habitat, Goffs Quarry, Nova Scotia, dated February 29, 2016 and signed by Glen Merkley, B.Eng. and Phyllis McCrindle, P.Geo.;
 - Technical Memorandum: Golder Associates, Golder and Dyno Responses to NSE Blast Questions, Blast Graphs Design, dated November 24, 2016, signed by Phyllis McCrindle, P.Geo. and Daniel Corkery, B.Sc.;
 - Technical Memorandum: Golder Associates to Rob MacPherson, Scotian Materials Limited 'Acid Rock Drainage and Metal Leaching Potential Evaluation - Goffs Quarry', dated January 10, 2018, signed by Phyllis McCrindle, P.Geo. and David Brown, M.Sc., P. Geo.
 - Report: Scotian Materials Public Notice Correspondence Report, dated February 2016;
 - Letter: Golder Associates, Response to NSE Comments - Meeting November 14, 2016, dated November 18, 2016, signed by Melanie Kennedy, P.Eng. and Phyllis McCrindle, P.Geo.;
 - Report: Golder Associates, Monitoring Plan for Effects of Quarry Development on Wetland Habitat, dated July 21, 2015 and signed by Janice Roy, B.Sc. Eng. and Phyllis McCrindle, P.Geo.;
 - Report: Scotian Materials Report for Consultative Process for the Goffs Quarry dated

February 2016, signed by Robert MacPherson, P.Eng.;

- Survey Plan: Allnorth, Lease SM-1, Lands of Scotian Materials Limited, PID 00505941, revised April 11, 2016, signed by Mark MacMillan, NSLS#611;

- Report: Golder Associates, Hydrogeological Assessment - Proposed Goffs Quarry, dated July 11, 2016, signed by Phyllis McCrindle, P.Geo and Sean McFarland, P.Geo;

- Design Point Engineering and Surveying Project 15-022 'Site Plan Showing Quarry Limits EA Phase 1 & 2', Goffs Nova Scotia, Dwg. No. C-SP-EA Sheet 1 of 4, stamped and dated May 5, 2020.

1. Definitions

- a. Abandonment means cessation of production of aggregate for a period of twelve (12) months, unless authorized by the Minister.
- b. Act means Environment Act, Chapter 1 of the Acts of 1994-95, and includes, unless the context otherwise requires, all regulations made pursuant to the Act.
- c. Active Area means the area required to operate the approved designated activity and includes the working face and associated works.
- d. Administrator means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.
- e. Approval means an Approval issued pursuant to this Act with respect to an activity.
- f. Associated Works means any building, structure, processing facility, pollution abatement system, (waste containment structure) or stockpiles of aggregate (material) associated with the Facility.
- g. Benthic Invertebrate means an organism that lives in or on the bottom sediments of watercourses.
- h. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Central Region, Bedford Office
30 Damascus Road, Suite 115
Bedford, Nova Scotia B4A 0C1

Phone: (902) 424-7773

Fax: (902) 424-0597

- i. Disturbed Area means any area on the site of the approved designated activity that has been stripped of vegetation and is susceptible to erosion.
- j. Extension means an increase in size, volume or other physical dimensions of an activity such that the increase may cause an adverse effect if not properly mitigated.
- k. Facility means the Quarry and associated works.
- l. Grab Sample means an individual sample collected in less than 30 minutes and which is representative of the substance sampled.
- m. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.
- n. Modification means a change to an activity that may cause an adverse effect if not properly mitigated and includes, but is not limited to, the expansion of the same process, addition of product lines and replacement of equipment with different technology other than that presently in use.
- o. Reclamation means work performed or to be performed in accordance with an authorized plan, and includes rehabilitation of a site or facility.
- p. Site means the lands where an activity or proposed activity will take place.
- q. Structure includes but is not limited to a private home, a cottage, an apartment building, a school, a church, a commercial building or a treatment facility associated with the treatment of municipal sewage, industrial or landfill effluent, an industrial building, infrastructure or construction, a hospital, and a nursing home, etc.
- r. Water Resource means all fresh and marine waters comprising all surface water, groundwater, and coastal water.
- s. Watercourse means the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.
- t. Wetland means land commonly referred to as marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions.

2. Environmental Assessment Approval

- a. The Facility shall be constructed and operated in conformance with the Environmental Assessment Approval for the Goffs Quarry Expansion Project, dated October 25, 2019, and supporting documentation, NSE reference number

3. Scope

- a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and all documentation submitted to the Department prior to the issuance of this approval for the Industrial Quarry situated at or near Lot 1, Perrin Drive, Goffs, Halifax Regional Municipality (the "Site").
- b. This Approval supersedes previous approval number 2016-095664-02, which is now null and void.
- c. The Site and/or Facility shall not exceed the area as outlined in the application and supporting documentation.
- d. It is the Approval Holder(s)'s responsibility to ensure applicable legislation, approvals, and codes of practice are met for all other aspects of the operation of the Facility.
- e. This Approval is restricted to the construction, operation and reclamation of the Facility only. No other alteration or infill of a watercourse, water resource or wetland is permitted by this Approval. Works associated with the alteration or infill of a watercourse, water resource or wetland will require separate approval from the Department.

4. General

- a. The Approval Holder(s) shall construct, operate and reclaim the Facility in accordance with the following provisions:
 - i. Environment Act S.N.S. 1994-1995, c.1, s.1 as amended from time to time
 - ii. Regulations pursuant to the above Act, as amended from time to time
 - iii. Nova Scotia Environment and Labour Pit and Quarry Guidelines, 2003, or latest revision unless otherwise varied by condition of approval
- b. No authority is granted by this Approval to enable the Approval Holder(s) to construct or operate the Facility on lands which are not in the control or ownership of the Approval Holder(s). It is the responsibility of the Approval Holder(s) to ensure that such a contravention does not occur.
- c. If there is a discrepancy between the reference documents and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.
- d. Any request for renewal or extension of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.
- e. This Approval is not transferable without the consent of the Minister.

- f. The Minister may modify, amend or add conditions to this Approval at any time pursuant to Section 58 of the Act.
- g. The Approval Holder(s) shall notify the Department prior to any proposed extensions or modifications to the Facility, including, but not limited to, the active area, operating area, processing changes or waste disposal practices which are not granted under this Approval. An amendment to this Approval may be required before implementing any change.
- h. Extensions or modifications to the Facility may be subject to the Environmental Assessment Regulations. Written approval from the Minister may be required before implementing a change.
- i. Pursuant to Section 60 of the Act, the Approval Holder(s) shall submit to the Minister any new and relevant information respecting any adverse effect that actually results, or may potentially result, from any activity to which the Approval relates and that comes to the attention of the Approval Holder(s) after the issuance of the Approval.
- j. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.
- k. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.
- l. Unless specified otherwise in this Approval, all samples required to be collected by this Approval shall be collected, preserved and analysed, by qualified personnel, in accordance with recognized industry standards and procedures.
- m. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analysed by a laboratory that meets the requirements of the Department's Policy on Acceptable Certification of Laboratories as amended from time to time.
- n. The Approval Holder(s) shall ensure that this Approval, or a copy, is kept on Site at all times and that personnel directly involved in the Facility operation are made fully aware of the terms and conditions which pertain to this Approval.
- o. The Approval Holder(s) may be required to register their project under Part IV of the Environment Act should the Facility and associated works including access roads exceed an area of four (4) hectares.
- p. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department.
- q. If the Minister determines that there has been non-compliance with any or all of the terms and conditions contained in this Approval, the Minister may cancel or

suspend the Approval pursuant to subsections 58A(1) and 58A(2) of the Act, until such time as the Minister is satisfied that all terms and conditions have been met.

- i. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations.

5. Separation Distances

- a. The Approval Holder(s) shall not locate the Active Area of the Site within the following separation distances unless otherwise exempted or varied by conditions of this approval:
 - i. 30 m of the boundary of a public or common highway;
 - ii. 30 m of the bank or ordinary high water mark of any watercourse, wetland or water resource;
 - iii. 30 m of the property boundary that does not form part of the Site Active Area.
- b. The Approval Holder(s) shall not blast within the following separation distances unless the Approval Holder(s) has obtained written letters of permission from the property owner of the structure on or before the date of Approval:
 - i. 800 m from the foundation or base of a structure located off site. This shall not apply to structures which are placed within the 800 metre separation distance following the date of which an application for approval is received from the Approval Holder(s).

6. Particulate Emissions (Dust)

- a. Particulate emissions shall not contribute to an ambient concentration of total suspended particulate matter that exceed the following limits (in micrograms per cubic metre of air) at or beyond the Site property boundaries:
 - i. Daily Average (24 hr.) 120 μ /m³
 - ii. Annual Geometric Mean 70 μ /m³
- b. The use of oil as a dust suppressant is prohibited.
- c. Monitoring of ambient total suspended particulate matter shall be conducted at the request of the Department. The location of the monitoring station(s) for suspended particulate matter will be established by a qualified person retained by the Approval Holder(s) and submitted to the Department for approval; this may include point(s) beyond the property boundary of the Site.
- d. When requested, ambient total suspended particulate matter shall be measured in accordance with EPA standard; EPA/625/R-96/010a; Sampling of Ambient Air

for Total Suspended Particulate Matter (SPM) and PM10 shall be done using a High Volume (HV) Sampler.

7. Sound Levels

- a. Sound levels measured at the Site property boundaries shall not exceed the following equivalent sound levels (Leq):
 - i. 65 dBA 0700-1900 hours
 - ii. 60 dBA 1900-2300 hours
 - iii. 55 dBA 2300-0700 hours
- b. Monitoring of sound levels shall be conducted at the request of the Department. The location of the monitoring station(s) for sound will be established by a qualified person retained by the Approval Holder(s) and submitted to the Department for approval, this may include point(s) beyond the property boundary of the Site.

8. Surface Water

- a. The Site shall be developed and maintained to prevent surface water contaminants from being discharged into a watercourse, wetland, water resource, or beyond the property boundary, in excess of the following criteria:
 - i. Total Suspended Solids, Clear Flows (Normal Background Conditions):
 - (a) Maximum increase of 25 mg/l from background levels for any short term exposure (24 hour or less);
 - (b) Maximum average increase of 5 mg/l from background levels for longer term exposure (inputs lasting between 24 hours and 30 days).
 - ii. Total Suspended Solids, High Flow (Spring Freshets and Storm Events):
 - (a) Maximum increase of 25 mg/l from background levels at any time when background levels are between 25 mg/l and 250 mg/l.
 - (b) Maximum increase of 10% over background levels when background is >250 mg/l.
 - iii. pH (Outfall):
 - (a) Maximum 5 to 9 in grab sample;
 - (b) Maximum 6 to 9 as a Monthly Arithmetic Mean.
- b. Erosion and sedimentation control devices shall be installed prior to construction

at the Site and shall remain in place and be maintained until disturbed areas are stabilized.

- c. No authority is granted by this Approval to enable the Approval Holder(s) to discharge surface water onto adjoining lands without the authorization of the affected landowner(s). It is the responsibility of the Approval Holder(s) to ensure authorizations are current and valid.
- d. The Approval Holder(s) shall immediately contact the Department should sulphide bearing material be encountered on the Site and shall include planned remedial measures in conformance with the Sulfide Bearing Material Disposal Regulations.
- e. During periods of construction and operations, erosion and sediment controls shall be inspected weekly, at a minimum, and prior to and after precipitation or flow events. These inspections shall ensure the erosion and sedimentation controls are working as designed and intended. Work at the site shall only take place when erosion and sedimentation controls are functional. Records outlining results of these inspections, including general observation regarding site activity, site conditions, and actions taken to correct any deficiencies, shall be kept for the duration of the approval and made available to the Department upon request.

9. Surface Water Monitoring

- a. The Approval Holder(s) shall monitor surface water as indicated in Appendix A, which specifies the locations, parameters and frequencies. Results of water quality monitoring shall be included in the annual report, and made available to the Department upon request.
- b. The Department reserves the right to require modifications including, but not limited to, monitoring locations, monitoring frequency, contaminants of concern, and surface water criteria.
- c. Water quality, surface water level and flow direction sampling locations (SW1, SW2, SW3, SW4, Streams 4 & 5 Upstream and Streams 4 & 5 Downstream) are to be established as per Figure 4 (Monitoring Location), Golder Associates Hydrogeological Assessment - Proposed Goffs Quarry, report dated July 11, 2016, as indicated in the reference documents.
 - i. The Approval Holder(s) shall not alter a sampling location(s) without prior written authorization by the Administrator. An amendment to the Approval may be required.
- d. Surface water quality results shall be compared to the latest revision of the CCME Fresh Water Aquatic Life Guidelines. If upstream water quality exceeds these Guidelines, the upstream sample is to be used for comparison purposes to the downstream samples.

- i. An exceedance(s) at a downstream location of Stream 4 and/or Stream 5 shall be reported to the Department within 48 hours of the Approval Holder(s) becoming aware of the exceedance. An explanation and/or corrective action shall be provided, within 7 days of the notification, to the satisfaction of the Department.
- e. The Approval Holder(s) shall ensure that the natural flow of water within Stream 4 and Stream 5 is not impacted by quarry activity.
- f. The Approval Holder(s) shall ensure that weather conditions are recorded at the time of sampling. Sampling shall be undertaken under a variety of weather conditions.
- g. The Approval Holder(s) shall collect baseline data to characterize the existing condition and variability of the benthic invertebrate communities in Stream 4. Baseline data to be collected shall include: abundance (total number of organisms/m²), taxon richness (the number of distinct taxa per sample), Simpson's Diversity and Equitability (related to the proportion of total organisms contributed by each taxon), and EPT Index (a measure of the percent of organisms belonging to the taxa Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). Multiple individual samples within Stream 4 shall be collected. A map showing the locations of where these samples are collected from and results of this monitoring shall be included with the annual report. Results from this monitoring shall be related to water quality in Stream 4 and in association to any connected wetlands or wetlands potentially influenced by this watercourse on this property.
- h. Methods to monitor, analyze data and information, make inferences and recommendations and reporting shall adhere to recognized scientific method and based on empirical and measurable(ed) evidence. Annual monitoring reports shall include a statement(s) of the limitations associated with the methods used for sampling, analyzing data and information and for drawing conclusions and making recommendations.
- i. Monitoring invertebrate communities, analyzing data and reporting shall be undertaken by a qualified person. A qualified person has obtained accredited relevant training and experience monitoring aquatic invertebrate communities, interpreting results of monitoring and reporting about the results as they relate to water quality and potential impacts to receiving environments, including wetlands.
- j. Additional (future) benthic invertebrate monitoring shall be conducted at the request of the Department.

10. Wetlands Monitoring

- a. The Approval Holder(s) shall monitor wetlands as indicated in Appendix A, which specifies the locations, parameters and frequencies. Results of water quality

monitoring shall be included in the annual report, and made available to the Department upon request.

- b. The Approval Holder(s) shall implement a wetland monitoring program on wetlands described as WL3, WL4 and WL5 in the report dated July 21, 2015 prepared by Golder Associates and entitled Monitoring Plan for Effects of Quarry Development on Wetland Habitat, as indicated in the reference documents. This monitoring program shall be undertaken annually. Results of annual wetland monitoring shall be compared and evaluated against baseline wetland conditions and shall include evaluation of any changes to the extent, function and structure of these wetlands including evaluation of standing water. Where changes are identified, these shall be analyzed in association with and considering operations here and the results of other monitoring required under this Approval.
- c. The Approval Holder(s) shall complete baseline wetland monitoring prior to commencement of blasting operations.
- d. Methods to monitor, analyze data and information, make inferences and recommendations and reporting shall adhere to recognized scientific methods and based on empirical and measurable(ed) evidence. Annual monitoring reports shall include a statement(s) of the limitations associated with the methods used for sampling, analyzing data and information and for drawing conclusions and making recommendations.
- e. Where the Approval Holder(s) or qualified person(s) become aware of indirect or direct impacts to wetlands (i.e. change in the extent, structure or function), watercourses (i.e. changes in water quantity or quality including benthic invertebrate communities) or water resources (i.e. change in water quality or quantity) from activities here, the Approval Holder(s) shall notify the Department within 48 hours.
- f. The Department reserves the right to modify monitoring methods and programs and require wetland, watercourse and water resource restoration and/or compensation.
- g. Monitoring wetlands, analyzing data and reporting shall be undertaken by a qualified person. A qualified person has obtained accredited relevant training and experience in monitoring wetlands, interpreting results of monitoring and reporting about the results as they relate to the extent, function and structure of wetlands. Results from other monitoring required as part of this Approval (i.e. groundwater and surface water) shall be considered.
- h. The Approval Holder(s) shall complete wetland water level measurements and report results chronologically in spreadsheet format.
- i. Should the results of wetland monitoring indicate that an alteration in wetland habitat and/or function and/or extent has occurred, the Approval Holder(s) shall

provide the necessary wetland mitigation measures and/or compensation specified by the Department. Any wetland mitigation measures and/or compensation shall be completed to the satisfaction of the Department.

11. Groundwater

- a. The Approval Holder(s) shall replace at their expense any water supply which has been lost or damaged as a result of extracting aggregate.

12. Groundwater Monitoring

- a. The Approval Holder(s) shall monitor groundwater as indicated in Appendix A, which specifies the locations, parameters and frequencies. Results of water quality monitoring shall be included in the annual report, and made available to the Department upon request.
- b. The Department reserves the right to require modifications including, but not limited to, monitoring locations, monitoring frequency, contaminants of concern, and groundwater criteria.
- c. The Approval Holder(s) shall monitor and record daily withdrawal rates from the quarry. Records, in a format acceptable to the Department, shall be included in the annual report and made available to the Department upon request.
- d. The Approval Holder(s) shall install two additional monitoring wells located near points A and B on Figure 1 (Proposed New Groundwater Monitoring Locations), Golder Associates Letter dated October 31, 2016, as indicated in the reference documents. The monitoring wells shall be at sufficient depth to monitor the aquifer to the entire depth of the quarry cut. The monitoring well located near point A shall be identified as BH17-6 and the monitoring well located near point B shall be identified as BH17-7.
- e. Baseline water level and water quality (general chemistry, metals, BTEX and PHC's) shall be collected from BH17-6 and BH17-7 prior to blasting at the Site.
- f. BH17-6 and BH17-7 shall be monitored for significant decreases in water level at the frequency indicated in Appendix A. Water level decreases greater than one (1) metre from baseline conditions shall be considered significant at these locations. Any instances of significant water level decreases shall be reported to the Department within 48 hours.
- g. The Approval Holder(s) shall investigate and report on the cause of a significant water decrease, to the satisfaction of the Department. This investigation shall be completed by a qualified hydrogeologist, registered as a Professional Geoscientist or Professional Engineer licensed to practice in Nova Scotia. The report shall be submitted, to the Department, within 45 days of the significant decrease in water level(s).

- h. Sampling locations (BH16-1, BH16-2, BH16-3, BH16-4) shall be situated as reported in Figure 4 (Monitoring Location), Golder Associates Hydrogeological Assessment - Proposed Goffs Quarry, report dated July 11, 2016, as indicated in the reference documents.
- i. All nested wells are to be monitored during the required monitoring event for each location.
- j. If monitoring wells are consistently dry, the monitoring well shall be replaced or modified. Monitoring wells shall be determined to be consistently dry if 4 or more attempts to monitor water quality fails.
- k. The Approval Holder(s) shall compare results from the groundwater monitoring sampling program to the baseline monitoring results. If significant increase in the level of any of the analyzed constituents has occurred, the Department shall be notified within 48 hours of receipt of results. An explanation and/or corrective action shall be provided, within 7 days of the notification, to the satisfaction of the Department. The groundwater sampling results shall also be compared to the Guidelines for Canadian Drinking Water Quality.

13. Process Water Effluent

- a. The Approval Holder(s) shall monitor process water effluent as indicated in Appendix A, which specifies the locations, parameters and frequencies. Results of water quality monitoring shall be included in the annual report, and made available to the Department upon request.
- b. The Department reserves the right to require modifications including, but not limited to, monitoring locations, monitoring frequency, contaminants of concern, and groundwater criteria.
- c. The Approval Holder(s) shall establish process water effluent monitoring stations at the outlet of Sedimentation Pond A and Sedimentation Pond B.
- d. Process water effluent discharge from the sedimentation ponds shall not exceed the design rate of 7.8 litres per second.
- e. Analytical results of process water effluent discharge from the sedimentation ponds shall be compared to the freshwater baseline results, except where limits are specified otherwise by section 7(a). If a significant increase in the levels of any analyzed constituent has occurred, the Department shall be notified within 48 hours of receipt of results. An explanation and/or corrective action shall be provided, within 7 days of the notification, to the satisfaction of the Department. The process water effluent discharge sampling results shall also be compared to the CCME Water Quality Guidelines for the Protection of Aquatic Life for Freshwater.

14. Blasting

- a. The Approval Holder(s) shall conduct a pre-blast survey of all structures within 800 metres of the point of blast including a water quality analysis of any wells serving these structures. The survey shall be conducted in accordance with the Department's "Procedure For Conducting a Pre-Blast Survey" and the results of this survey sent to the Department prior to blasting on the Site. Additional water quality parameters may be required by the Department staff.
- b. The Approval Holder(s) shall call the nearest weather office, to assess and record the climatic conditions prior to conducting any blasting. No blasting will be permitted if thermal inversion conditions are anticipated at the time of the proposed blast.
- c. No blasting shall occur on Sunday, on a statutory holiday prescribed by the Province, or on any day between 1800 and 0800 hours.
- d. The Approval Holder(s) shall have a technical blast design prepared by a qualified person which ensures the ground vibration and air concussion limits in this Approval can be achieved.
 - i. At the request of the Department, the Approval Holder(s) shall submit a copy of the blast design.
 - ii. At the direction of the Department, the Approval Holder(s) shall modify or cease blasting.
- e. The Approval Holder(s) shall monitor all blasts for concussion and ground vibration to ensure that the limits identified in the Blasting Limits Table identified in this Approval are not exceeded (see page 21). Any exceedance of the Blasting Limits Table parameters shall be reported to the Department within 48 hours of the blast.
 - i. Monitoring at the natural gas pipeline underground structure(s) shall include only ground vibration; concussion monitoring is not required at such structures.
- f. The monitoring station for blasting shall be as indicated in the Blasting Limits Table (see page 21). Additional monitoring stations for blasting may be specified as required by the Department.
- g. An annual summary of results of monitoring shall be submitted to the Department.

- i. The Approval Holder(s) shall submit a record of individual blast results if so directed by the Department.
- h. The Approval Holder(s) shall submit a detailed monitoring plan, and full blast damage response policy, upon Department request.

15. Reporting

- a. The Approval Holder(s) shall submit an Annual Operations Report, to the Department, by February 15th of each calendar year, documenting the following information:
 - i. Records of blasting events and pre-blast surveys conducted;
 - ii. Quantities of rock removed from the site for the year;
 - iii. Rehabilitation undertaken during the year;
 - iv. Summary of complaints received and corrective actions taken;
 - v. Any spills at the site and corrective actions taken;
 - vi. Updates to the contingency plan, if applicable;
 - vii. Results of sulphide bearing material samples, including collection method, if applicable;
 - viii. Status update on the Community Liaison Committee (CLC), including, but not limited to, meeting minutes, attendees, issues identified and actions taken to resolve.
- b. The Approval Holder(s) shall submit an Annual Environmental Monitoring Report to the Department, by February 15th of each calendar year, in a format acceptable to the Department. The report shall include, but is not limited to, the following information:
 - i. A review of field monitoring methodologies, including sampling techniques and methods to analyze data including any statistical methods used;
 - ii. A description of and map showing the monitoring network (i.e. the locations of where samples were collected and comment about how these are related to the interpretation of results);
 - iii. A review of the current monitoring programs (i.e. water storage and use, water quality and quantity, groundwater, benthic invertebrate and wetland and any other monitoring, as applicable) and recommendations for modifications, as applicable;
 - iv. Current and historical static water elevation data in tabular and graphical

- form;
- v. Current and historical groundwater and surface water quality including an analysis of spatial and temporal trends with comparison to applicable guidelines and historical (baseline) data with data being provided in tabular format;
 - vi. Laboratory certificates of analysis;
 - vii. The identification of any adverse impacts, potential adverse impacts or changes to groundwater, surface water, benthic invertebrate communities and wetlands resulting from operations and activities on this property and associated recommendations, if applicable;
 - viii. The identification of any instances of significant water level decreases, along with an analysis into the cause and any additional mitigation measures, as applicable;
 - ix. Results of benthic invertebrate monitoring and analysis (i.e. interpretation of results);
 - x. Results of wetland monitoring and analysis (i.e. interpretation of results);
 - xi. Tabular summary of water withdrawal rates, in litres per day, including daily withdrawal rates, average withdrawal rate per month and total amount of water extracted per month;
 - xii. A summary and interpretation of analytical results from the monitoring program for groundwater, surface water and outlet of sedimentation, including the identified constituents with significant increase in concentration;
 - xiii. Any other information requested by the Department.
- c. The Annual Environmental Monitoring Report shall be prepared by or under the direction of a Professional Geoscientist or Professional Engineer licensed to practice in Nova Scotia and in collaboration with other required qualified person(s) identified in sections 8(j) and 9(f).
- d. The Approval Holder(s) shall submit, to the Department, a Comprehensive Environmental Report on or before February 15th, 2022 for the previous 5+ years of data collected at the Site. The purpose of this assessment is to provide a holistic interpretation of results. Where monitoring indicates changes to environmental conditions before and after quarrying began, relationships between operations and damages to environmental conditions shall be clearly described and demonstrated. The assessment shall include, but is not limited to, the following information:

- i. An analysis of the accuracy and relevancy of groundwater modeling completed as part of the application;
 - ii. An analysis of the amount of water extracted from the quarry, including but not limited to, any changes observed as a result of discharging into the environment (to wetlands and watercourses), updated water balances, and a comparison between the amount of water predicted to be extracted and the amount of water actually extracted. Any deviations shall be rationalized;
 - iii. Detailed analysis of water level measurements and any changes observed within the aquifer, watercourse(s) and wetlands;
 - iv. Summary of any mitigation measures taken at the Site to reduce or eliminate impacts to watercourses (including benthic invertebrate communities), groundwater and wetlands.
- e. The Comprehensive Environmental Report shall be prepared by a qualified hydrogeologist, registered as a Professional Geoscientist or Professional Engineer licensed to practice in Nova Scotia and in collaboration with other required qualified person(s) identified in sections 8(j) and 9(f).

16. Releases

- a. Spills or releases shall be reported in accordance with the Act and the Environmental Emergency Regulations.
- b. Spills or releases shall be cleaned up in accordance with the Act and the Contaminated Site Regulations.

17. Reclamation

- a. The Approval Holder(s) shall submit a reclamation plan to the Department for review by July 1, 2020. The reclamation plan shall be revised and updated every three years thereafter, and submitted for review. The reclamation plan shall include the estimated total cost for labour, equipment, supplies and services of a third party contractor to undertake the following activities:
 - i. Surface contouring;
 - ii. Establishing proper drainage;
 - iii. Re-vegetation work;
 - iv. Any work necessary to reclaim the Site.
- b. The Approval Holder(s) shall post a reclamation security which shall be calculated using the reclamation plan and factors listed above. The reclamation security shall be revised every three years in accordance with the revised reclamation plan.

- i. The reclamation security shall be posted in a form and value which is acceptable to the Department. In no case shall the value be less than \$6250 per hectare.
- c. The Approval Holder(s) shall reclaim the Site within twelve (12) months of abandonment and in accordance with the latest reclamation plan submitted by the Approval Holder(s), unless an alternative time frame is provided, in writing, by the Department.
- d. The Department shall release the security to the Approval Holder(s) after final reclamation of the Site has been completed to the satisfaction of the Minister. The Approval Holder(s) shall notify the Department when reclamation has been completed.
- e. The Approval Holder(s) shall ensure that any security posted for reclamation be kept valid for the term of the Approval.

18. Site Specific Conditions

- a. The boundaries of the Facility will be adequately marked, cut out and/or clear of new growth. Permanent visible markers shall be placed at changes in direction and be no more than 100 metres between markers along the Facility boundary.
- b. Refueling and vehicle maintenance shall only be carried out in a designated refueling area, where conditions will allow the containment of any accidental spills.
- c. The surface of the refueling area shall be comprised of low permeability material and shall be sloped or bermed in such a way that spills will be captured prior to encountering a watercourse or water resource.
- d. The Approval Holder(s) shall ensure that any repairs or refueling of vehicles does not take place within 30 metres of any watercourse, water resource or wetland.
- e. The Approval Holder(s) shall establish a Community Liaison Committee (CLC), as per the latest revision of the Nova Scotia Environment Guide for the Formation and Operation of a Community Liaison Committee. The Approval Holder must operate the CLC for the duration of the Undertaking and until released in writing by the Department.
- f. The Approval Holder(s) shall collect representative rock samples and analyze it for sulphide concentration and acid generating potential if sulphide bearing material is or maybe present on the Site outside of the areas previously tested. Additional sampling shall be done as requested by the Department.
- g. The Approval Holder(s) shall notify the Department, within 24 hours, of any sulphide bearing material sampling results which exceed 0.4% sulphide by

weight.

Blasting Limits			
Parameters	Maximum	Monitoring Frequency	Monitoring Station
Concussion (Air Blast)	128 dBL	Every Blast	Within 7 m of the nearest structure not located on the Site
Ground Vibration	0.5 in/sec (12.5 mm/s)	Every Blast	Below grade or less than 1 m above grade in any part of the nearest structure not located on the Site

APPENDIX A

SURFACE WATER, WETLAND, GROUNDWATER, AND PROCESS WATER EFFLUENT MONITORING		
Parameter	Location	Frequency
SURFACE WATER		
General Chemistry, Metals, TSS and pH	Stream 4 - Upstream, Stream 4 – Downstream A, Stream 5 - Upstream, Stream 5 – Downstream	Quarterly
General Chemistry**, Metals**, TSS** and pH**	Stream 5 at Outlet of Wetland 4	Quarterly – until January 1, 2022 **For observation only**
Surface Flow	SW1, SW2, SW3, SW4	Monthly
Benthic Invertebrates	Stream 4	Upon Department Request
WETLAND		
Wetland Water Level	WL3-P1, WL3-P2, WL3-SG1, WL4-P1, WL4-P2, WL4-SG1, WL5-P1, WL5-P2, WL5-SG1	Automatic level logger recording an hourly time interval; Quarterly manual measurement
Wetland extent, structure and function	WL3, WL4, WL5	Annual at the same time every year using standardized methods.
GROUNDWATER		
Water Level	BH16-1*, BH17-6*, BH17-7*	Monthly
Water Level	BH16-2*, BH16-3*, BH16-4*	Semi-Annual (2 times per year)
General Chemistry, Metals	BH16-1*, BH16-2*, BH16-3*, BH16-4*	Semi-Annual (2 times per year)
General Chemistry, Metals	BH17-6, BH17-7	Upon Department request.
BTEX and PHCs	BH16-1*, BH16-2*, BH16-3*, BH16-4*, BH17-6, BH17-7	Upon Department request.
PROCESS WATER EFFLUENT		
TSS & pH	Outlet of Sedimentation Ponds A and B	Prior to discharge to the environment; Monthly , while discharge is occurring
General Chemistry, Metals	Outlet of Sedimentation Ponds A and B	Prior to discharge to the environment; Quarterly , while discharge is occurring, and aligning with TSS & pH sampling events

* All nested wells are to be included in monitoring event

** For observation only