

APPROVAL

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

APPROVAL HOLDER: DEXTER CONSTRUCTION COMPANY LIMITED

SITE PID: 40832503

APPROVAL NO: 2020-2718380-00

EXPIRY DATE: February 15, 2031

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: Kevin G Garroway

Effective Date: February 15, 2021

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: DEXTER CONSTRUCTION COMPANY LIMITED

Project: Sheet Harbour Quarry

Site:

| PID | Civic # | Street Name | Street Type | Community | County |
|------------|----------------|--------------------|--------------------|------------------|----------------|
| 40832503 | | | | SHEET HARBOUR | HALIFAX COUNTY |

Approval No: 2020-2718380-00

File No: 92100-30-BED-2020-2718380

Reference Documents

- Application submitted August 26, 2020 and attachments.
- Environmental Assessment Approval issued November 8, 2019
- Correspondence from Dexter Construction Company Limited dated September 11, 21, 22, 2020
- Additional Information submitted November 11, 2020
- Correspondence from Dexter Construction Company Limited dated December 17, 2020 and January 18, 2021
- Correspondence from EA Branch of Nova Scotia Environment regarding Request for Variance dated February 26, 2020

1. Definitions

- Abandonment means cessation of production of aggregate for a period of 36 months or notification of abandonment has been received by the Department in accordance with the Approval and Notification Procedures Regulations.
- Act means Environment Act, 1994-95, c.1, s.1, and includes, unless the context otherwise requires, the regulations made pursuant to the Act, as amended from time to time.
- Active Area means the area occupied by the working face, disturbed areas, rehabilitated areas, any structure, processing facility, pollution abatement system, settling pond, aggregate stockpile and/or overburden associated with

the Quarry and Quarry activities. The active area excludes the scale, scale house, and access roads.

- d. 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
- e. Disturbed Area means an area in an unnatural state, affected by human activity associated with the Quarry.
- f. Minister means the Minister of Environment and includes any person delegated the authority of the Minister.
- g. Overburden means material, including organics, overlying a deposit of aggregate.
- h. Site means a place where a designated activity and/or undertaking is occurring or may occur.
- i. Surface Watercourse means a watercourse as defined in the Environment Act, excluding groundwater.
- j. Undisturbed means in a natural state, unaffected by human activity, or rehabilitated to the satisfaction of the Department.

2. 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 Sheet Harbour Quarry situated at or near Marine Gateway Road, PID # 40832503, Sheet Harbour, HRM.
- b. The Approval Holder(s) shall ensure the designated activity is carried out in accordance with this Approval and reference documents, including the application and supporting documentation.
- c. The Approval Holder shall limit the quarry development to that identified in the survey plan H20175-00 entitled Proposed Quarry Permit Area, Dexter Construction Company Limited, prepared by Highland Geomatics and Engineering Inc., dated November 10, 2020.

3. General

- a. The Approval Holder(s) shall conduct the Designated Activity in accordance with the following provisions:

- i. The Act, as amended from time to time;
- ii. Any standard adopted by the Department, as amended from time to time, which includes but is not limited to the following:
 - (a) Nova Scotia Environment and Labour Pit and Quarry Guidelines, 2003, as amended from time to time.
- b. Nothing in this Approval relieves the Approval Holder(s) of the responsibility for obtaining and paying for all licenses, permits, approvals or authorizations necessary for carrying out the work authorized to be performed by this Approval which may be required by municipal by-laws, provincial or federal legislation, or other organizations. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.
- c. No authority is granted by this Approval to enable the Approval Holder(s) to commence or continue the designated activity 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. The Approval Holder(s) shall provide, to the Department, proof of such control or ownership upon expiry of any relevant lease or agreement. Failure to retain said authorization may result in this Approval being cancelled or suspended.
- d. 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.
- e. Any request for renewal or amendment of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.
- f. The Approval Holder(s) shall not transfer, sell, lease, assign or otherwise dispose of this Approval without the written consent of the Minister. The sale of a controlling interest of a business or a transfer of the approval from a parent company to a subsidiary or an affiliate is deemed to be a transfer requiring consent.
- g. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act.
- h. The Approval Holder(s) shall advise the Department in writing prior to any proposed extensions or modifications to the Activity and/or the Site. An amendment to this Approval may be required before implementing any extension or modification.
- i. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.
- j. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.
- k. 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 that are all deemed acceptable to the Department.

- I. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analyzed by a laboratory that meets the requirements of the Department's "Policy on Acceptable Certification of Laboratories" as amended from time to time.
- m. The Approval Holder(s) shall ensure that this Approval, or a copy, is present on Site while personnel are on Site.
- n. The Approval Holder(s) shall ensure that personnel directly involved in the designated activity are made fully aware of the terms and conditions of this Approval.
- o. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department within five business days.

4. Separation Distances

- a. The Approval Holder(s) shall not conduct the designated activity within the following separation distances unless otherwise exempted or varied by conditions of this approval:
 - i. Public or common highway - 30 m
 - ii. Watercourse (top of watercourse bank) or Wetland (boundary) - 30 m undisturbed
 - iii. Property line (of PID) including property lines abutting a public or common highway - 30 m undisturbed
 - iv. Dug or Drilled well not including site monitoring wells or non-potable process water wells located on the site - 90 m
- 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. All water supplies and other off-site structure - 800 m

5. Air Quality

- a. The Approval Holder(s) shall ensure that air emissions from the designated activity do not contribute to an exceedance of the maximum permissible ground level concentrations of contaminants specified in Schedule A of the Air Quality Regulations.
- b. Monitoring of ambient air contaminants shall be conducted at the request of the Department. The number and location of the monitoring station(s) shall be established by a qualified person retained by the Approval Holder(s) and the

proposed plan submitted to the Department for acceptance; this may include point(s) beyond the property boundary of the Site.

- c. The use of oil as a dust suppressant is prohibited.
- d. The Approval Holder(s) shall retain a qualified person to develop a plan to monitor ambient total suspended particulate matter at the request of the Department, in accordance with the EPA standard: EPA/625/R-96/010a, "Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Method IO-2.1 Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 Using High Volume (HV) Sampler", as amended from time to time.
 - i. The plan shall be deemed acceptable by the Department and implemented upon request.
 - ii. At a minimum the plan shall include stations A1, A2, and A3 situated along the Mushaboom Road, HRM and as identified in Figure 7, by GHD, dated January 17, 2019 and entitled Dexter Construction Company Limited, Mushaboom, Nova Scotia, Sheet Harbour Quarry, Baseline Monitoring Locations.

6. Noise

- a. The Approval Holder(s) shall ensure that noise generated from the designated activity complies with the equivalent sound level criteria identified in the Nova Scotia Environment and Labour "Guidelines for Environmental Noise Measurement and Assessment" dated May 18, 2005, as amended from time to time.
- b. The Approval Holder(s) shall monitor noise at the request of the Department. The number and location of the monitoring station(s) for noise measurement shall be established by a qualified person retained by the Approval Holder(s). The proposed plan must be deemed acceptable by the Department.
 - i. At a minimum the plan shall include stations N1, N2, and N3 situated along the Mushaboom Road, HRM and as identified in Figure 7, by GHD, dated January 17, 2019 and entitled Dexter Construction Company Limited, Mushaboom, Nova Scotia, Sheet Harbour Quarry, Baseline Monitoring Locations.

7. Surface Water

- a. The Approval Holder(s) shall ensure the Site is developed and maintained to prevent contaminants from being discharged into a water resource or beyond the property boundary.
- b. The Approval Holder(s) shall ensure that the following water quality limits are met in the water resource downstream of construction activities:
 - 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 shall be limited to
 - pH 5-9 units for a grab sample at SW-01
 - pH 6-9 units on average at SW-01.
- iv. The following stations shall be established for the purpose of compliance evaluation unless otherwise varied by the Department:
 - Background monitoring station is established as SW-05U
 - Downstream monitoring station is established as SW-01
- 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).
- d. The Approval Holder(s) shall install and maintain erosion and sediment controls in line with industry best practices (e.g., Nova Scotia Environment Erosion and Sediment Control Handbook for Construction Sites) with the following considerations:
 - i. The controls shall be installed prior to the commencement of the construction activities;
 - ii. The controls shall remain in place until areas disturbed by construction activities are stabilized so that the risk of release of sediment to a water resource has been mitigated;
 - iii. Control features shall be installed as per applicable product specifications or manufacturer's directions; and
 - iv. Control materials shall be clean, non-erodible, non-ore-bearing, non-watercourse derived and non-toxic.
- e. The Approval Holder(s) shall immediately contact the Department should sulphide bearing material be encountered on the Site.

- f. The Approval Holder(s) shall ensure that surface water runoff that may be impacted by petroleum hydrocarbons from the Site is collected and directed for necessary treatment prior to discharge from Site.
- g. Erosion and sediment controls shall be inspected weekly, at a minimum while active operations are occurring, and the day after precipitation or flow events exceeding 60 mm rainfall occur. Otherwise, inspections shall occur semi-annually during periods of quarry inactivity. These inspections shall confirm the erosion and sediment controls are working as designed and intended. Records outlining results of these inspections and actions taken to correct any deficiencies shall be kept for the duration of the approval and made available to the Department upon request.
- h. Work at the site shall only take place when erosion and sediment controls are functional. Contingency erosion and sediment control materials shall be kept on Site in case of failure.
- i. Any silted water pumped from work areas shall be directed to vegetated areas, settling ponds, or other treatment devices that mitigate the risk of release of sediment to a water resource.
- j. The Approval Holder(s) shall limit the size of the disturbed area and the removal of riparian vegetation to the area of construction activities as outlined in the supporting documentation.
- k. The Approval Holder(s) shall ensure that the following activities take place at a distance of a minimum of 30 metres from a surface watercourse or wetland in an area such that a release will not enter a surface watercourse or wetland:
 - i. Fuel storage, refueling, and/or lubrication of equipment;
 - ii. Washing of machinery or equipment; and
 - iii. Storage of equipment, excavated/stockpiled materials, and potential contaminants.
- l. The Approval Holder shall provide written notification to the Department that settling pond(s) and storm drainage systems are installed in accordance with the Storm Water Management Plans prior to the following:
 - i)the commencement of aggregate extraction for quarry development, and
 - ii)the extension of the quarry disturbed area beyond 2 hectares.
- m. The Approval Holder shall submit to the Department for review and approval, plans for settling pond(s) and storm drainage systems prior to the quarry disturbance extending beyond 4 hectares as identified in the Storm Water Management Plans.
 - i. Written notification shall be submitted to the Department by a professional engineer indicating that storm water management systems are installed in

accordance with the approved plans prior to extension of the quarry disturbance beyond 4 hectares.

8. Surface Water Monitoring

- a. The Approval Holder(s) shall establish surface water monitoring stations as indicated in Appendix A. Surface water stations shall be monitored at the locations, parameters, frequencies and initiation time as indicated in Appendix A and Appendix C. Results of water quality monitoring shall be included in the annual report, and made available to the Department upon request.
- b. The Approval Holder shall monitor surface water stations at locations as identified in the appended plan entitled "Dexter Construction Company Limited, Sheet Harbour Quarry, Water Monitoring Locations, dated September 30, 2020." Station SW-06 location is identified in Figure 7, Baseline Monitoring Locations, Appendix 7 of the Environmental Assessment Registration.
- c. The Approval Holder shall submit a revised surface water monitoring plan to the Department for approval, at least three months prior to the quarry disturbance advancing within the East Mushaboom Lake catchment area.
- d. The Approval Holder shall update quarry disturbance mapping after each stage of overburden removal and prior to each blast. This mapping shall be compared to the catchment areas identified in the above referenced plan to determine when surface water monitoring programs are to be activated in accordance with Appendix A and the terms and conditions of Approval.
- e. The Approval Holder shall conduct fish and fish habitat monitoring in Big Eastern Lake on an annual basis once the quarry disturbed area or quarry runoff enters Big Eastern Lake catchment area.
- f. Monitoring of fish and fish habitat, including interpretation of results and reporting shall be conducted by a qualified person who has obtained accredited relevant training and experience.
- g. Additional surface water monitoring and/or fish and fish habitat surveys may be required at the request of the Department.
- h. Surface water monitoring may also be modified by the Department as a result of limitations on monitoring location access and/or safety.

9. Groundwater Monitoring

- a. The Approval Holder(s) shall establish groundwater monitoring stations as indicated in Appendix B. Groundwater stations shall be monitored at the locations, parameters, frequencies and initiation time as indicated in Appendix B and Appendix C. Results of water quality monitoring shall be included in the annual report, and made available to the Department upon request.
- b. The Approval Holder shall monitor groundwater stations at locations as identified in the appended plan, entitled Dexter Construction Company Limited, Sheet Harbour Quarry, Water Monitoring Locations, dated September 30, 2020.

- c. The Department reserves the right to modify groundwater monitoring well locations, parameters and frequency, and to require remedial measures based on the results of monitoring data and/or site inspections.
- d. Groundwater monitoring may also be modified by the Department as a result of limitations on monitoring location access and/or safety.

10. Groundwater

- a. The Approval Holder(s) shall replace, at their expense, any water supply which has been lost or damaged as a result of the designated activity, as authorized and required by the Department.
- b. The Approval Holder shall not excavate within 0.5 metres above the measured maximum annual water table elevation unless an amendment to this Approval is received, or unless otherwise authorized in writing by the Department.

11. Operation

- a. The Approval Holder(s) shall ensure that legible signage is posted at the entrance to the Site that includes, but is not limited to,
 - i. information pertaining to the days and hours of operation;
 - ii. and emergency contact numbers.
- b. The Approval Holder(s) shall cease site work and contact the Department immediately if it is determined that an area of historical, archaeological or paleontological importance may exist or is discovered at the site.
- c. The boundaries of the Active Area shall be either:
 - i. Marked with permanent visible markers placed at changes in direction, with no more than 100 metres between the permanent markers; or
 - ii. mapped on a scale drawing with a list of UTM NAD83 coordinates (with sub-meter accuracy) for each corner of the Site.

12. Blasting

- a. 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.
- b. At the request of the Department, the Approval Holder(s) shall submit a copy of the blast design.
- c. At the direction of the Department, the Approval Holder(s) shall modify or cease blasting.
- d. 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.

- e. No blasting will be performed if thermal inversion conditions are anticipated at the time of the proposed blast.
- f. No blasting shall occur on Sunday, on a statutory holiday prescribed by the Province, or on any day between 1800 and 0800 hours.
- g. The Approval Holder(s) shall ensure that all blasts are monitored for concussion and ground vibration to ensure that the limits in the Blasting Limits Table are not exceeded.
- h. The Approval Holder(s) shall provide the Department with UTM NAD83 coordinates for the blast monitoring stations prior to the initial blast and again if the blast monitoring station locations change.
- i. The monitoring station for blasting shall be as indicated in the Blasting Limits Table. Additional monitoring stations for blasting may be specified as required by the Department.
- j. Records of individual blast results shall be maintained by the Approval Holder(s) and made available to the Department upon request.

13. Reporting

- a. The Approval Holder shall immediately report any incidents of non-compliance with the Approval within 48 hours of becoming aware of the non-compliance.
- b. The Approval Holder shall provide sixty (60) days advance written notification to the Department and representatives of the Mi'kmaq KMKNO, First Nations of intended plans to alter a watercourse or wetland.
- c. The Approval Holder(s) shall provide an Annual Report summarizing the following information, as required by the terms and conditions of this Approval, for each calendar year:
 - i. all groundwater and surface water monitoring data and reports;
 - ii. a description of any complaints received and the follow up actions taken;
 - iii. a summary and interpretation of analytical results obtained in accordance with this Approval;
 - iv. a summary and interpretation of any instances of non-compliance with this approval and corrective action taken.
 - v. hectares disturbed and rehabilitated to date;
 - vi. estimates of hectares planned for disturbance or rehabilitation in the upcoming year;

- vii. a summary of any communication with the Mi'kmaq of Nova Scotia;
 - viii. quarry plans depicting the areas of disturbance and the drainage catchment zones at the end of the calendar year;
 - ix. the quantity of hectares disturbed in each drainage catchment zone at the end of the calendar year;
 - x. any other information requested by the Department.
- d. The annual report described herein shall be submitted to the Department on or before February 26 of the following year.
- e. The groundwater monitoring report in the Annual Report shall include, but is not limited to, the following information:
- i. a review of field methodologies, including sampling techniques;
 - ii. a description of the groundwater monitoring network;
 - iii. a review of the current groundwater monitoring program and recommendations for modifications, as applicable;
 - iv. current and historical static water elevation data in tabular format; groundwater gradients and flow direction.
 - v. description of the location of any blasting or excavation that occurred at the site including the depth and measured elevation of such activity;
 - vi. current and historical groundwater quality including an analysis of spatial and temporal trends with comparison to applicable guidelines and historical (baseline) data in tabular format, as applicable;
 - vii. laboratory certificates of analysis, as applicable; and
 - viii. the identification of any adverse impacts to groundwater as a result of site activities and associated recommendations, as applicable.
- f. The groundwater report shall be prepared and signed by a qualified professional who has hydrogeology training and experience, and is licensed to practice in Nova Scotia by the Association of Professional Geoscientists of Nova Scotia (APGNS) or Engineers of Nova Scotia. The report shall be submitted in hard copy and digital format.
- g. All monitoring results shall include interpretation by a qualified person deemed acceptable by the Department.

14. Rehabilitation and Closure

- a. The Approval Holder(s) shall review the most recent version of the rehabilitation plan for the designated activity at a minimum of every three years and update

the plan accordingly based on current conditions. Updates to the rehabilitation plan must be acceptable to the Department.

- i. The next update to the rehabilitation plan shall be submitted to the Department on or before February 26, 2024.
- b. The Approval Holder(s) shall review the amount of financial security provided to the Department at a minimum of every three years and adjust the amount accordingly based on the estimated costs of rehabilitation provided in the most recent version of the rehabilitation plan.
- c. The amount of financial security shall be equal to the cost estimate of the site rehabilitation plan as amended from time to time and shall be no less than \$6,250 per hectare of actual and planned disturbed area.
- d. The Approval Holder(s) shall maintain for the site a financial security in a form and amount acceptable to the Department.
 - i. Based on the updated rehabilitation plan the next security revision shall be submitted on or before May 27, 2024.
- e. The Approval Holder(s) shall have completed rehabilitation of the designated activity within twelve (12) months of abandonment and in accordance with the final rehabilitation plan unless an alternate time frame has been provided and/or accepted by the Department.
- f. The Approval Holder(s) shall submit a final rehabilitation plan to the Department for approval at least sixty (60) days prior to abandonment of the designated activity.
- g. The rehabilitation plan shall include but not be limited to the following:
 - i. objectives for final land use;
 - ii. contouring and drainage patterns;
 - iii. soil stabilization methods including but not limited to revegetation and slope grades;
 - iv. objectives for existing structures and access roads; and
 - v. a detailed cost estimate including unit cost breakdown of labor, equipment, supplies, and services to perform the rehabilitation activities as completed by an outside service provider (third party).
- h. The rehabilitation plan shall be implemented by the Approval Holder(s) once deemed acceptable by the Department.
- i. Unless otherwise approved by the Department, updated rehabilitation plans shall meet the following criteria :
 - i. The site shall be contoured and stabilized:

- (a) for long term erosion control;
 - (b) to mitigate impacts of offsite drainage to adjacent lands, wetlands, and watercourses; and
 - (c) to blend with natural topography.
- ii. Except for engineered features (i.e., wetlands, ponds), all disturbed areas shall be returned to at least one metre above the water table.
 - iii. If an open pond is to remain on the site, at least 2 exit ramps shall be constructed, on opposite sides of the pond with maximum slope of 5:1 to enable safe exit.

15. Acid Rock Drainage Contingency

- a. The Approval Holder shall conduct the following sampling and analyses to determine the acid generating potential of rock and aggregate associated with Quarry activities:
 - i. i)a minimum of one bedrock sample from every groundwater monitoring well,
 - ii)a minimum of one bedrock sample from every resource exploration well,
 - iii)a minimum of two bedrock samples from previous testing pitting,
 - iv)a minimum of two bedrock samples from every blast zone,
 - v)a minimum of two bedrock samples taken from aggregate which exhibits a distinct visual change in quarry geology of the blasted aggregate and/or working face.
- b. The Approval Holder may be required to provide and implement plans to mitigate potential acid rock drainage if so directed by the Department.
- c. The Approval Holder shall use the Sobek Method, or equivalent methods acceptable to the Department, for evaluation of acid base accounting.

| 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 Monitoring (*Appendix C)

| Station | Description | Parameters | Frequency | Initiation Time |
|---------|---|---|--|--|
| SW-01 | Site discharge from settling pond toward Lawrence Lake catchment area | Total Suspended Solids (TSS), pH, temperature, General Chemistry and Metals, BTEX-TPH | TSS/pH - Monthly All other Parameters Quarterly | Upon initial quarry development |
| SW-02 | Big Eastern Lake | TSS, pH, temperature, General Chemistry and Metals, BTEX-TPH, Water Level | Water Level Daily All other Parameters Quarterly | Upon Approval |
| SW-03 | Unnamed watercourse, crossing Mushaboom Road, Discharge from Powers Cove NE catchment area | TSS, pH, General Chemistry and Metals | NSE Request | Quarry Flow or Disturbance in Catchment |
| SW-04 | Unnamed watercourse, crossing Mushaboom Road, discharge from Big Eastern Lake and East Mushaboom Lake catchment area | TSS, pH, General Chemistry and Metals | NSE Request | Quarry Flow or Disturbance in Catchment |
| SW-05D | Unnamed watercourse, crossing access road. | TSS, pH, General Chemistry and Metals | NSE Request | Access Road Construction |
| SW-05U | Unnamed watercourse, upstream of watercourse crossing on access road | TSS, pH, General Chemistry and Metals | Quarterly | Upon Approval |
| SW-06 | Little West River, crossing Marine Gateway Road, discharge from surface water network in northern portion of property | TSS, pH, General Chemistry and Metals | NSE Request | Access Road Construction |
| SW-07 | Unnamed watercourse, crossing Mushaboom Road, discharge from Powers Cove SE catchment area | TSS, pH, General Chemistry and Metals | NSE Request | Quarry Flow or Disturbance in Catchment |
| SW-08 | Site discharge from settling pond toward Big Eastern Lake Watershed | TSS, pH, temperature, General Chemistry and Metals, BTEX-TPH | Quarterly | Quarry Flow or Disturbance in Catchment |
| SW-09 | Watercourse 2 / East Mushaboom Lake catchment area. Station to be determined (TBD) | TBD | TBD | Prior to quarry extending into catchment |

Appendix B

Groundwater Monitoring (*Appendix C)

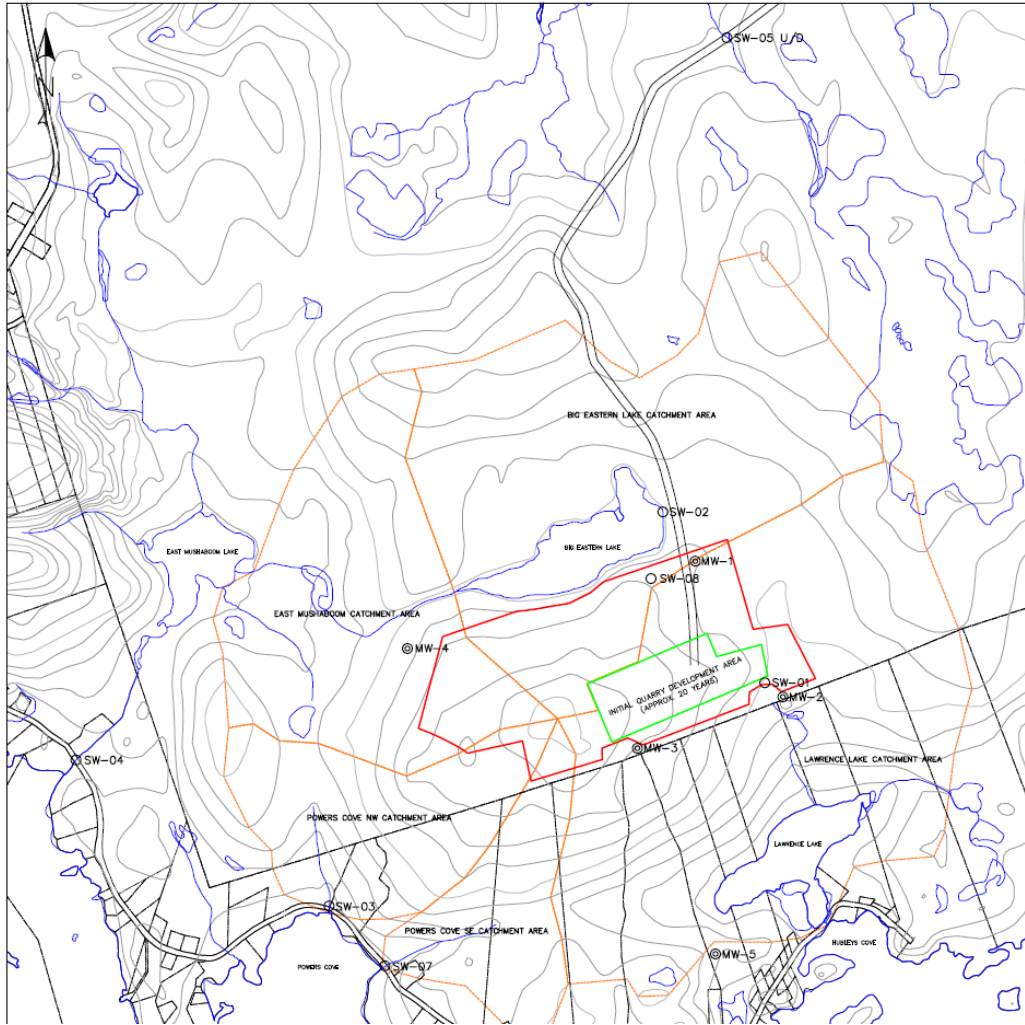
| Monitoring Stations | Description | Parameters | Monitoring Frequency | Initiation Time |
|---------------------|--|--|--|-------------------------------------|
| MW1S/D | North of initial active quarry area between quarry and Big Eastern Lake | General Chemistry, Metals, BTEX-TPH, Water Elevation | Elevation Monthly All other Parameters Quarterly for first 2 years Thereafter, all other Parameters Annually | Prior to quarry development |
| MW2S/D | South of initial quarry development area between quarry and Lawrence Lake | General Chemistry, Metals, BTEX-TPH, Water Elevation | | Prior to quarry development |
| MW3S/D | South of quarry development area between quarry and groundwater supply wells | General Chemistry, Metals, BTEX-TPH, Water Elevation | | Prior to quarry development |
| MW4S/D | Northwest of future quarry development area, between quarry and groundwater supply wells | General Chemistry, Metals, BTEX-TPH, Water Elevation | | Before August 31, 2022 ** |
| MW5S/D | South of quarry development area adjacent to groundwater supply wells | General Chemistry, Metals, BTEX-TPH, Water Elevation | | Within 6 months of date of Approval |

** Well to be installed prior to quarry disturbance advancing within 800 meters of well station.

Appendix C

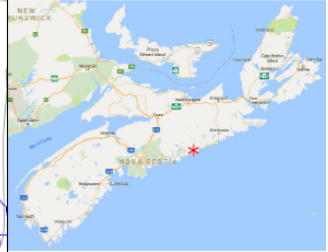
Water Monitoring Parameters

| General Chemistry | Metals | BTEX |
|--|-------------------|-----------------------|
| active Silica as SiO ₂ | Total Aluminum | Atlantic RBCA Tier 1 |
| Chloride | Total Antimony | Hydrocarbons |
| Fluoride | Total Arsenic | Benzene |
| Sulphate | Total Barium | Toluene |
| Alkalinity | Total Beryllium | Ethylbenzene |
| True Color | Total Bismuth | Xylene (Total) |
| Turbidity | Total Boron | C6-C10 (less BTEX) |
| Electrical Conductivity | Total Cadmium | >C10-C16 Hydrocarbons |
| Nitrate + Nitrite as N | Total Chromium | >C16-C21 Hydrocarbons |
| Nitrate as N | Total Cobalt | >C21-C32 Hydrocarbons |
| Nitrite as N | Total Copper | Modified TPH (Tier |
| Ammonia as N | Total Iron | 1) |
| Total Organic Carbon | Total Lead | |
| Ortho-Phosphate as P | Total Manganese | |
| Total Sodium | Total Molybdenum | |
| Total Potassium | Total Nickel | |
| Total Calcium | Total Phosphorous | |
| Total Magnesium | Total Selenium | |
| Bicarb. Alkalinity (as CaCO ₃) | Total Silver | |
| Carb. Alkalinity (as CaCO ₃) | Total Strontium | |
| Hydroxide | Total Thallium | |
| Calculated TDS | Total Tin | |
| Hardness | Total Titanium | |
| Langelier Index (@20C) | Total Uranium | |
| Langelier Index (@ 4C) | Total Vanadium | |
| Saturation pH (@ 20C) | Total Zinc | |
| Saturation pH (@ 4C) | | |
| Anion Sum | | |
| Cation sum% Difference/ Ion Balance % | | |



SHEET HARBOR QUARRY
WATER MONITORING LOCATIONS
 HALIFAX COUNTY, NOVA SCOTIA

DATE: SEPTEMBER 30, 2020 DRAWN BY: RHETT THOMPSON, P.ENG



NOTES:

TOPOGRAPHIC DATA OBTAINED FROM NS GEOMATICS CENTER 1:10,000 TOPOGRAPHIC MAP. TOPOGRAPHY LINES ARE AT 5 METER INTERVALS.

APPROXIMATE PROPERTY LINES FROM SERVICE NOVA SCOTIA.

WATERSHED CATCHMENT AREAS FROM SHEET HARBOR QUARRY ENVIRONMENTAL ASSESSMENT REGISTRATION DOCUMENT (GHD, 2019)

LEGEND:

- 81.5 HECTARE QUARRY PERMIT AREA
- WATERSHED CATCHMENT AREAS
- SURFACE WATER MONITORING LOCATIONS
- ⊙ GROUNDWATER MONITORING STATION

Subject to changing site conditions, this plan may be updated, revised, or amended throughout the construction and operation phases to better align with the scope of the Quarry Modifications to this plan shall be at the discretion of the Quarry Superintendent, in consultation with the Dexter Environmental Management Team.

