MUNICIPAL
ENTERPRISES LTD

MUNICIPAL ENTERPRISES LIMITED
NEW ANNAN QUARRY EXPANSION,
3967 TRURO ROAD, EAST NEW ANNAN,
COLCHESTER COUNTY
NOVA SCOTIA

Registration Document for a Class 1 Undertaking Under Section 9 (1)
of the Nova Scotia Environmental Assessment Regulations

DECEMBER 2024

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1.0 INTRODUCTION

Municipal Enterprises Limited (herein referred to as "MEL") of Bedford, Nova Scotia is proposing to expand the existing New Annan aggregate pit located in the East New Annan area of Colchester County, Nova Scotia, and transition the site into a quarry. The existing pit is located at 3967 Truro Road, approximately 15 km south of the Village of Tatamagouche in Colchester County, Nova Scotia at approximately NAD83 UTM Zone 20, Easting 476801 and Northing 5047387 and is located on PID 20098935. The pit is currently operating under an Industrial Approval (IA), No. 2003-035702-04 issued to MEL, for a pit of less than four (4) hectares. An approval to expand the footprint of the site is required under the Nova Scotia Environmental Assessment Regulations. The registration of this Environmental Assessment ("EA") is in response to Schedule A of the Environmental Assessment Regulations, Undertaking B.2., "*A pit or quarry that is larger than 4 ha. in area for extracting building or construction stone*."

MEL is a private Canadian company. It is incorporated under the laws of Nova Scotia and registered to do business in Nova Scotia under the Nova Scotia Corporations Registration Act. MEL's Company Profile Report from the Nova Scotia Registry of Joint Stock Companies is attached in **Appendix A** "Property Information." Dexter Construction Company Limited is an affiliated company of MEL and therefore references to Dexter and MEL in this document are interchangeable.

Proponent Address:

927 Rocky Lake Drive,
P.O. Box 48100
Bedford, NS, B4A 3Z2
Phone: 902-835-3381

Proponent Contact:

Gary Rudolph, P. Eng.
Director of Aggregates and Pavement Rehabilitation
927 Rocky Lake Drive,
P. O. Box 48100
Bedford, NS, B4A 3Z2
Phone: 902-835-3381

Consultant Contact:

Mr. J. H. Fraser, M. A. Sc., P. Geo.
Consulting Hydrogeologist
Phone: 772-812-1981 (Cell)

The New Annan pit operates under an existing Nova Scotia Environment and Climate Change (NSECC) IA (Approval No. 2003-035702-04), which has a current expiry date of October 12, 2033. A copy of the IA is attached in **Appendix A** "Property Information".

2.0 THE UNDERTAKING

2.1 Description of the Undertaking

MEL proposes to expand the working footprint of the existing New Annan pit, and transition the site into a quarry to produce aggregate, primarily used in the local highway and construction

industry. The proposed undertaking ("*the quarry")* involves the expansion of the existing NSECC approved pit from a less than four-hectare pit to a 17.42-hectare quarry. Other than the proposed increase in size and the addition of blasting to the scope of site activities, it is expected that continued use of the site will be identical, or very similar, to historic use of the pit. A plan showing the existing NSECC approved pit permit area and the 17.42-hectare boundary of the proposed quarry expansion area is illustrated in **Appendix B**.

2.2 Location

The quarry and proposed expansion area is located on MEL owned land (PID # 20098935), approximately 23.9 hectares) at 3967 Truro Road in East New Annan, Colchester County, Nova Scotia, NAD83 UTM ZONE 20, 5047390 Northing, 476810 Easting. The site is shown in **Figures 1 & 2** (below) and **Drawing 1, Appendix B**). There is no designated municipal zoning in this area of New Annan, Colchester County.

Figure 1 – Project Location

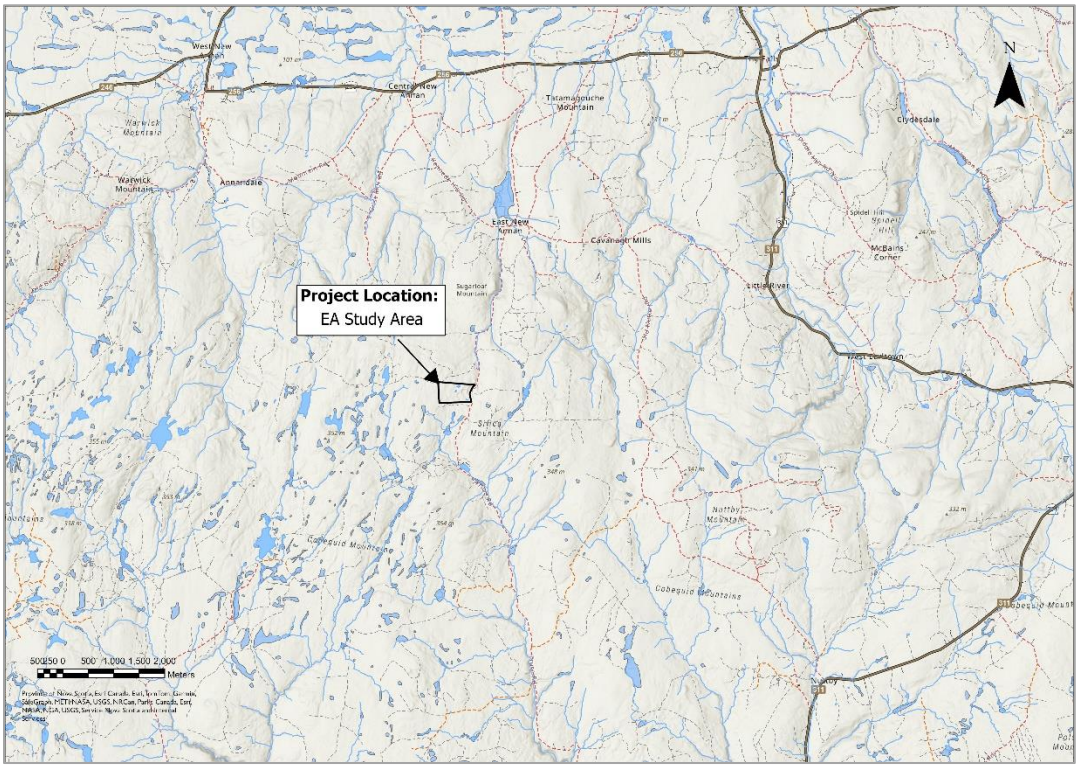
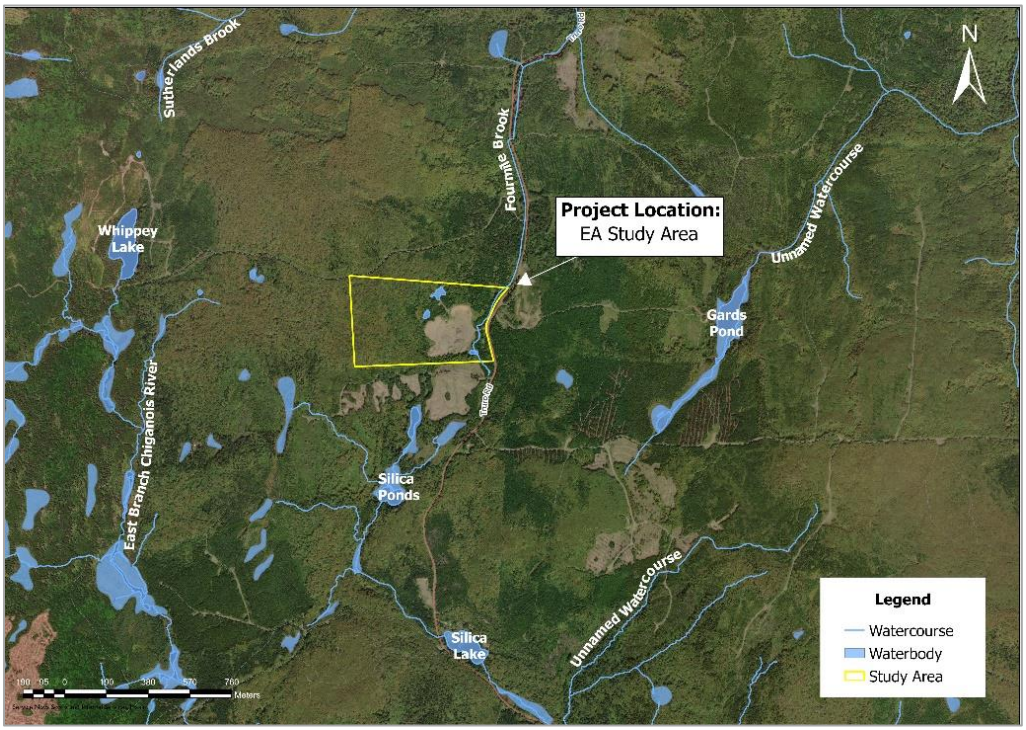


Figure 2 – Site Location and Adjacent Land Use.



3.0 SCOPE OF THE UNDERTAKING

MEL proposes to expand the working footprint of the existing New Annan pit, and transition the site into a quarry for the continuing purpose of extracting and supplying aggregate for the local construction industry. Other than the proposed increase in size and the addition of blasting to the scope of site activities, it is expected that continued use of the site will be identical, or very similar, to historic use of the pit.

The existing pit was originally developed by others in the early 2000's and has been operated as a NSECC approved pit since 2003. When the pit was initially developed, the property was owned by Hazel Reader, who was the approval holder. In 2019 MEL acquired the existing pit property and the lands associated with the proposed quarry expansion area. A working pit slope has been developed in the eastern portion of the property and will be advanced to the west. The site is operated periodically during the road construction season to provide construction aggregates for local projects as well as Nova Scotia Department of Public Works (NSDPW) projects in the area. The pit is currently operating under a NSECC IA (2003-035702-04) for a less than four-hectare pit. The scope of this application is for expansion of the existing site footprint to a maximum 17.42-hectare area. Future quarry activities will include clearing and grubbing of vegetation and overburden, drilling and blasting of bedrock, use of a portable crusher and/or screener for crushing and screening of aggregate products, stockpiling of aggregate products, operation of a portable truck scale and scale house, trucking of aggregate products and the operation of a portable asphalt plant (with separate a NSECC approval). The existing pit slope is approximately 10 meters high. The quantity of aggregate produced at the site each year will be dependent on demand and activity within the local construction industry. Site access is via a gated, 50-meter gravel driveway off Truro Road. There are no off-site related support facilities, other than the provincial highway network.

It is anticipated that future operations will involve the extraction of up to 50,000 tonnes/year during years in which the quarry is active. However, the annual quantity may vary depending on local demand and associated project requirements.

3.1 Purpose/Need of the Undertaking

MEL proposes to expand the existing New Annan pit to produce aggregate, primarily used in the road and local construction industry. Continued development and operation of the site will ensure that a quality aggregate supply is available to support local infrastructure needs in the future. The primary benefit will be to the people of Nova Scotia via the continued construction and maintenance of the Provincial highway system.

3.2 Consideration of Alternatives

Quarries are established where quality aggregate reserves are identified, and applicable environmental and logistical considerations are satisfied. MEL maintains a strategic network of NSECC approved aggregate quarries around the province to support local infrastructure projects. The development of an aggregate quarry is an important asset to the local community. An alternative to the proposed quarry expansion is to develop a new quarry nearby. Considering quality, environmental, and logistical constraints, it is preferred to proceed with an expansion of the existing site rather than the development of a new quarry nearby.

MEL operates rock quarries throughout Nova Scotia and Atlantic Canada and uses modern, industry standard methodologies in all phases of the extraction, processing, and delivery of aggregates. Alternative processes are considered in terms of their efficiency, cost effectiveness and environmental mitigation advantages. Operations at the New Annan quarry will be assessed on an on-going basis to ensure that the best available techniques are being utilized in all phases of operations.

3.3 Scope of the Environmental Assessment

The scope of the environmental assessment is in keeping with the NSECC document entitled “Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia” as well as MEL’s experience with respect to similar projects over the past several decades. The NSECC guidance document states that an “Environmental Assessment (EA) is a planning and decision-making tool used to promote sustainable development. By predicting and evaluating the environmental effects of an undertaking before it begins there is the opportunity to mitigate potential impacts of the undertaking on the environment”.

The scope takes into consideration that the pit is already developed and subject to an existing IA (**Appendix A**). It is noted that the existing IA includes conditions related to operational sound levels, separation distances, particulate emissions, surface water quality, groundwater management, reclamation, regulatory reporting as well as site-specific conditions. Prior to quarry expansion, the existing IA will be amended based on the results derived from the various studies and assessments that form this EA, and EA Approval conditions. The amended IA will outline the operational requirements of the future quarry operation.

It is also noted that the proposed quarry expansion will not change the scope of operations at the site, other than the addition of drilling and blasting. Other than this and the proposed increase in area, it is expected that continued use of the quarry will be very similar to historic use of the site

The following sections of this document provide a description of the project and an overview of the human uses and biophysical features of the local environment; outline the key "Valued Environmental Components" addressed by the EA document; and present an evaluation and summary of the benefits and potential impacts to the environment during all phases of the proposed undertaking. In support of the EA, a Biophysical Assessment (**Appendix D**), an Archaeological Resource Impact Assessment (ARIA) **(**a letter Nova Scotia Communities, Culture, Tourism and Heritage concerning findings is presented in **Appendix E**); a Water Balance Assessment (**Appendix F);** and a Geological Evaluation of the Potential of Uranium Occurrences **(Appendix G)** were conducted.

Envirosphere Consultants Limited (Envirosphere) was retained by MEL to undertake a Biophysical Assessment as part of the proposed expansion of the New Annan Quarry. Information for the Biophysical Assessment (**Appendix D**) was obtained from consultants' personal knowledge, from various field surveys, from reviews of available information and knowledge of typical quarry operations. The environmental assessment follows *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* (NSECC September 2009) and uses assessment methodology typical for environmental assessment screenings of this kind. For this assessment a list of Valued Environmental Components (VECs), and project activities and outcomes for the expansion of the existing quarry were developed. Potential for interactions of these activities with VECs was identified. Where interactions were identified, and there was potential for significant impacts, mitigating actions or activities have been suggested that will avoid the impact or reduce it to acceptable levels before the project proceeds. The process ensures that all potentially significant impacts on VECs are identified and all potential impacts on them have been considered, and sufficient mitigation planned. These aspects of the project are fully dealt with in Section 6 – Valued Environmental Components and Effects Management.

Cultural Resource Management Group Limited (CRM Group) was retained by MEL to undertake an ARIA as a part of the proposed expansion of the New Annan quarry. The assessment involved background research, Mi'kmaw engagement and field reconnaissance to identify, document, interpret and make management recommendations for potential cultural resources within the proposed impact area (a letter from Nova Scotia Communities, Culture, Tourism and Heritage accepting the findings of the ARIA and recommendations is presented in **Appendix E**).

The ARIA was conducted according to the terms of Heritage Research Permit A2023NS210 (Category "C") issued to CRM through the Special Places Program of the NS Department of Communities, Cultural, Tourism and Heritage. The report describes the ARIA of the New Annan quarry expansion study area, presents the results of these efforts and offers cultural resource management recommendations. Based on these results, CRM provided the following specific recommendations for the study area:

1. It is recommended that the study area, as defined in the CRM report be cleared of any requirement for future archaeological investigation.
2. If any further changes are made to the layout of the study area beyond the area assessed in this report, it is recommended that those proposed areas be subjected to an Archaeological Resource Impact Assessment.
3. In the event that archaeological deposits or human remains are encountered during construction activities associated with the New Annan Quarry, all work in the associated area(s) should be halted and immediate contact made with the Special Places Program (John Cormier: 902-424-4542).

Consulting Hydrogeologist J. H. Fraser prepared a Water Balance Assessment for the proposed New Annan Quarry expansion area. This Water Balance presents an assessment of the estimated effects on the surrounding water features resulting from the proposed quarry expansion. The analysis is intended to identify potential changes in the surface and groundwater flow regime and to provide input for the design and implementation of surface water control infrastructure as the site is further developed. The Water Balance Assessment for the New Annan Quarry is included as **Appendix F**.

Mercator Geological Services (2024) conducted a Geological Evaluation of the Study area to better understand the potential for uranium occurrences in the local bedrock. The associated report outlining their findings in included in this document, as **Appendix G**.

3.4 Other Approvals Required

The existing New Annan pit is subject to an existing IA (**Appendix A**), which includes conditions related to operational sound levels, separation distances, particulate emissions, surface water quality, groundwater management, reclamation, regulatory reporting as well as several site-specific conditions. Prior to quarry expansion, the existing IA will be amended based on the results derived from the various studies and assessments that form this Environment Assessment, and the EA Approval conditions. The amended IA will outline the operational requirements of the future quarry operation. It is expected that the amended IA will include additional conditions for specific surface water monitoring and groundwater monitoring. Environmental monitoring information that is collected from the site will be provided to NSECC as part of an annual report.

It is understood that additional environmental approvals, permits, and/or authorizations may be required in the future. Wetland alteration approvals will be obtained prior to the removal of wetland habitat identified within the proposed quarry expansion. At this time, no other approvals, permits, and/or authorizations are expected to be required in support of this application.

In addition to the respective site approvals, MEL also operates the pit in accordance with applicable environmental laws and regulations, including the NSECC Pit and Quarry Guidelines. If MEL fails to comply the conditions of approval, the IA may be suspended or revoked. Failure to comply may also result in penalties as set out in the *Nova Scotia Environment Act* and associated regulations.

MEL is required to notify NSECC of any adverse effect or the potential for adverse effect which the Company becomes aware of while operating under the IA and must notify NSECC if any of the conditions specified in the IA are violated or exceeded.

MEL is required to bear all costs associated with meeting the requirements of the approval; no cost is borne by the Nova Scotia taxpayer.

4.0 PUBLIC CONSULTATION AND FIRST NATIONS ENGAGEMENT

4.1 Methods of Involvement

MEL has engaged the public and the Mi'kmaq of Nova Scotia, as outlined below. Community and First Nations engagement to date has focused on notifying local elected officials and community representatives. Engagement efforts have included email correspondence and in person meetings.

MEL has followed guidance from the "Proponent's Guide: The Role of Proponents in Crown Consultation with the Mi'kmaq of Nova Scotia". In this regard MEL sent an early engagement letter to the nearest First Nation communities, the Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO), and the Native Council of Nova Scotia (NCNS) summarizing the Project and advising of the tentative timeline to register the Project for Environmental Assessment. The Nova Scotia Office of L'nu Affairs was copied on all correspondence. A follow-up notification letter was also sent to all noted First Nation representatives on January 6, 2025 advising of the EA registration date, public viewing locations, and timelines for the submission of comments. A copy of First Nations correspondence is included in **Appendix H**.

Table 1. New Annan Quarry Environmental Assessment - Public, First Nations, and Regulatory Engagement Summary.

First Nations Contact	Description of Engagement	Summary of Engagement
Pictou Landing First Nation Chief Tamara Young	May 31, 2024 Engagement Letter – sent via email	• Engagement letter, including Project Summary, anticipated timeline, and offer to discuss the project. Commitment to send follow up notification letter prior to EA registration.
	January 6, 2025 Notification Letter – sent via email	• Notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss.
Kwilmu'kw Maw-klusuaqn Negotiation Office Ms. Twila Gaudet Director of Consultation Mr. Shawn Taylor Consultation Projects Support Officer	March 13, 2024 Virtual Meeting (with Shawn Taylor)	• Meeting to discuss the New Annan Quarry expansion project. • Discussed the scope of existing operations and the proposed expansion. • Reviewed select constraint mapping (property boundaries, provincial wetlands and watercourses, and species of interest) and drone photos. Proposed expansion area TBD following environmental field studies. • Discussed ARIA and noted that CRM Group completed the draft ARIA, which is currently under review by CCTH Special Places. KMKNO requested a copy of the ARIA. • Dexter to provide a copy of the ARIA once approved by CCTH Special Places. • Discussed suggested approach for engagement with the Mi'kmaq of Nova Scotia. KMKNO suggested that notification should be provided to all First Nation groups. • Agreed to meet in June to discuss future projects.
	May 31, 2024 Engagement Letter – forwarded via email	• Forwarded Pictou Landing First Nation notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss.
	January 6, 2025 Notification Letter – forwarded via email	• Forwarded Pictou Landing First Nation notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss.
Millbrook First Nation Chief Robert Gloade Mr. Gerald Gloade, Consultation Manager	May 31, 2024 Engagement Letter – sent via email	• Engagement letter, including Project Summary, anticipated timeline, and offer to discuss the project. Commitment to send follow up notification letter prior to EA registration.
	January 6, 2025 Notification Letter – sent via email	• Notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss.
Native Council of Nova Scotia Chief Lorraine Augustine	May 31, 2024 Engagement Letter – sent via email	• Engagement letter, including Project Summary, anticipated timeline, and offer to discuss the project. Commitment to send follow up notification letter prior to EA registration.

First Nations Contact	Description of Engagement	Summary of Engagement
Ms. Vanessa Mitchell Executive Director, MAARS & Projects Ms. Christina Davis Habitat Impact Advisor	October 2, 2024 Meeting (with Vanessa Mitchell and Christina Davis)	• Meeting to discuss New Annan Quarry Expansion Project. Reviewed site maps and photos. • Discussed the scope of existing operations, scope of the proposed expansion, and transition from pit to a quarry. • Discussed key findings of completed environmental studies (5 wetlands identified, 3 wetlands potentially impacted, no watercourses). • Discussed uranium potential and geological assessment completed (low risk). • Confirmed that Dexter will follow up with a Notification Letter when environmental studies have been complete and EA registration date has been confirmed.
	January 6, 2025 Notification Letter – sent via email	• Notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss.
Office of L'Nu Affairs Ms. Gillian DesRoche Consultation Advisor	May 31, 2024 Engagement Letter – forwarded via email	• Forwarded Pictou Landing First Nation notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss
	January 6, 2025 Notification Letter – forwarded via email	• Forwarded Pictou Landing First Nation notification letter, including EA registration date, copy of draft public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments, offer to meet to discuss.

Public Stakeholder	Description of Engagement	Summary of Engagement
Municipality of Colchester Ms. Sherry Martell Deputy Mayor Councilor – District 7	October 28, 2024 Email	• Email to notify of Project and upcoming EA Registration, including an offer to meet to discuss.
	December 2, 2024 Meeting	• Provided a hard copy of an information package about Dexter quarries and the New Annan Quarry Expansion Project. • High level history of the site. Developed approximate 20-years ago by others, acquired by Dexter 5-years ago. Reviewed the location of the Quarry in relation to the other aggregate sites in the area. • High level overview of NSECC Quarry Approvals (Industrial Approval (<4 ha) vs. Environmental Assessment Approval (>4 ha), including summary of T&C's in a typical Industrial Approval, and anticipated T&C's in an EA Approval. • Discussed the scope of the expansion (proposed expansion from 4-hectares to 17.42-hectares, and transition to quarry). Noted that there are no anticipated operational changes (frequency, duration, level of activity, etc.) other than an increase in the site footprint and addition of blasting. Site will continue to be seasonally operated on an as needed basis to support Dexter work in the area. • Noted that Dexter intends to register the project for Environmental Assessment on January 15, 2025. Aligned with this will be a newspaper notice inviting comments from the public, and public viewing locations. The document will also be available electronically.
	January 6, 2025 Notification Email	• Forwarded copy of public notice and publish locations, location of hard and electronic copies available for review, deadline for submission of comments.

Provincial Representative Mr. Tom Taggart MLA – Colchester North	October 28, 2024 Email	• Email to notify of Project and upcoming EA Registration, including an offer to meet to discuss.

Regulatory Stakeholder	Description of Engagement	Summary of Engagement
NSECC EA Branch Mr. Jeremy Higgins EA Officer **NSECC ICE Division** Mr. Mark MacDonald Inspector Specialist **NSECC ICE Division** Mr. Jeffrey MacDonald Regional Engineer **NSECC Wetlands Branch** Ms. Marina Dulmage Wetland Specialist **NSNRR** Ms. Jolene Laverty Regional Biologist	October 24, 2024 Site Visit	• Site visit and tour of the New Annan Pit (site inactive). Site visit offered to EA Branch and regulatory review stakeholders. • Discussed the history of the site, the quarrying process, scope of site activities (as and when needed), and scope of proposed expansion (other than the addition of blasting, no change in frequency or activities). • Confirmed environmental field work and assessments that have been completed, including spring and fall botany survey, owl and breeding bird surveys, wildlife survey, wetland, water quality, and fish habitat assessments, lichen survey, water balance assessment, geological assessment, and archaeological resource impact assessment. • Noted that the project is located within a mainland moose special management practice zone. • Indicated that the depth to groundwater table is unknown, however historic site development has not encountered groundwater, and future development is expected to maintain the current floor elevation. • Confirmed that there is one seasonal structure within 800m, signoff already obtained. • Confirmed that the following plans will be developed during the Industrial Approval process: Surface and Groundwater Monitoring Plan, Erosion and Sediment Control Plan, Wildlife Management Plan. • Discussed geological mapping and uranium potential. Noted that Geological Assessment has been completed and uranium mineralization is not expected to be an issue. Follow-up monitoring throughout development will be completed to confirm this assumption. • Observed each wetland in the field. NSECC Wetland Specialist suggested formal delineation and functional assessment should be completed for all wetlands for future EA's. Confirmed that separate Wetland Alteration Approvals will be obtained prior to impacting wetlands. • Confirmed that First Nations engagement has been initiated, including letters sent to KMK, NCNS, Millbrook First Nation, and Pictou Landing First Nation, and follow-up meetings with the KMKNO and NCNS. A notification letter will be sent to these First Nation groups to notify of the registration date once it is determined.

Stakeholder Comments

No written stakeholder feedback regarding the project has been received to date. General questions regarding the project have been discussed with local elected officials, First Nations representatives, and regulatory stakeholders. MEL will document any concerns received during the public consultation portion of the EA process and provide a copy to NSECC.

4.2 Future Steps

On the date of Registration, the public will be notified of the EA Registration by a Notice in the Chronicle Herald and the Casket. A copy of the newspaper advertisement is included in **Appendix H.**

5.0 DESCRIPTION OF THE UNDERTAKING

5.1 Existing Pit Operations

Existing pit operations involve excavation, crushing and stockpiling of aggregate, and associated trucking on an as required basis. The pit is operated in accordance with an existing IA (Approval No. 2003-035702-04). A copy of the IA is attached in **Appendix A.** The pit operates in accordance with applicable environmental laws and regulations, including the Nova Scotia Pit and Quarry Guidelines. These Guidelines apply to all pit and quarry operations in the province and provide separation distances for operations, including blasting, surface water discharge limits, suspended particulate matter limits, sound level limits and requirements for a reclamation plan and security bond. MEL is committed to using Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust, and water quality, and will operate in accordance with applicable Federal and Provincial legislation and standards.

Operation of the pit occurs on an as-required basis when MEL has contract work in the area. Off-site activities and facilities that support the New Annan pit include the use of the provincial highway network. The existing pit highwall slope is approximately 10 m in height.

Site operations and historic aggregate excavation has not encountered the water table as evidenced by the lack of water ponding on the pit floor and no upwelling of water through the pit floor.

With respect to the characteristics of the future quarry bedrock, a rock sample from the quarry was analysed for sulphur content to determine if the material was sulphide bearing. The results of this analysis yielded a sulphur concentration of < 0.001% (< 0.03 kg H_2SO_4/tonne), which is below the minimum (0.4 % S; 12.51 kg H_2SO_4/tonne) defined by NSECC as sulphide bearing material. The laboratory results of this sample are included in **Appendix C.**

5.2 Future Quarry Operations

MEL proposes to expand the New Annan quarry for the extraction, production, storage, and removal of aggregate, primarily used in the road and local construction industry. MEL is proposing to expand the existing quarry to a maximum 17.42 hectares, which includes the existing production and operational footprint, set-up and storage (stockpiles) areas, and provisions for surface water control.

Although totally dependent on local market conditions, it is anticipated, at this time, that future development will involve the production of up to approximately 50,000 tonnes of aggregate per year, during years in which the site is active. A quarry highwall would be established in the western portion of the proposed expansion area. **Drawing # 2, Appendix B** identifies the proposed 17.42-hectare expansion area.

Quarry operations will generally coincide with the road construction season; therefore, it is reasonable to anticipate periodic, seasonal operations within a similar time frame (April – December). The quarry will operate when and as required within the typical 32-week construction season, depending on local demand and project requirements. A typical project (often an NSDPW Contract) will require crushing activities at the quarry for a period of two to three weeks at a time. Although uncommon, during crushing activities the site may be operated 24 hours per day, possibly 7 days per week. Following crushing activities, aggregate products would be loaded and hauled from the quarry for several weeks, or as required by the project. During load and haul

activities the site is typically operated during daylight hours (approx. 12 hours per day), possibly 7 days per week. MEL is committed to using Best Management Practices in all phases of their operations, including the on-site management of air quality, greenhouse gas emissions, noise, dust, and water quality, and will operate in accordance with applicable Federal and Provincial legislation and standards.

Aggregate production would commence with drilling and blasting, utilizing a qualified blasting contractor to conduct this work. The blasting contractor would be responsible for blast designs and methods in accordance with the General Blasting Regulations contained in the Nova Scotia Occupational Health and Safety Act, 1996. Blasting would also be conducted in accordance with the Pit and Quarry Guidelines. Blasting restrictions for time of day, and day of the week will be followed and blast monitoring will be conducted for every blast event. The existing IA stipulates blasting control and monitoring requirements.

The blasted rock will be transported by a wheel loader to a portable crushing spread for processing. Produced aggregate products will be stockpiled in designated areas within the quarry. Material within the quarry will be hauled and moved with a front-end loader. Products will be transported from the quarry by tandem and tractor trailer trucks approximately 50 metres via a gravel road to the Truro Road and will be routed as necessary through the provincial highway and roadway network to support local projects. The number of trucks hauling aggregate will be determined on a job-by-job basis, however as the site is not expected to increase in level of activity, trucking activity is not expected to increase from past use.

Aggregate excavation will not take place below the deep bedrock water table. If aggregate extraction below the groundwater table is required in the future, a Hydrological Study will be completed and an application to amend the IA will be submitted to NSECC. Prior to quarry expansion, a network of groundwater monitoring wells will be installed around the quarry to confirm the local groundwater quality, baseline elevations and flow direction.

6.0 VALUED ENVIRONMENTAL COMPONENTS AND EFFECTS MANAGEMENT

6.1 Evaluation and Categorization of VEC's

The Environmental Assessment for this project involved review of the IA for the existing quarry (**Appendix A**), testing for Potential Acid Rock Production (**Appendix C**), preparation of a Biophysical Assessment (**Appendix D**), an Archaeological Resource Impact Assessment **(Appendix E**), Water Balance Assessment (**Appendix F**), a Geological Evaluation for the Potential Occurrence of Uranium (**Appendix G**), and Stakeholder Engagement as outlined in **Table 1** and **Appendix H**. The environmental assessment follows the "Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia" (NSECC September 2009). For this assessment a list of VECs and project activities for the proposed quarry expansion were developed and the potential for interactions of these activities with VECs were identified. Where interactions were identified and there was potential for significant impacts, mitigating actions or activities have been identified that will avoid the impact or reduce it to acceptable levels before the project proceeds. This process ensures that potentially significant impacts on VECs are identified and potential impacts on them have been considered and sufficient mitigation planned and implemented.

The list of Valued Environmental Components considered for the assessment are presented in **Table 2**. The environmental effects and potential impacts of the project along with their significance and suggested mitigations are outlined in the following sections.

TABLE 2- Valued Environmental Components (VECs) for New Annan Quarry Expansion.	
BIOPHYSICAL	SOCIO-ECONOMIC
Air Quality, Noise and Light Groundwater Hydrology Water Quality Freshwater Aquatic Environments Wetlands Fish and Fish Habitat Flora and Fauna Habitat Species at Risk Natural Areas and Wilderness	Mi'kmaq Human Health Recreational Activities Tourism and Viewscape Recreational, Commercial & Mi'kmaq Fishing Archaeological, Cultural and Historical Land Use and Value Transportation Residential Use Commercial/Industrial Use Water Supplies & Residential Wells Parks & Protected Areas Forestry, Hunting and Trapping

6.2 Socio-economic Components

6.2.1 Mi'kmaq

Background

The Mi'kmaq maintain a general interest in all lands in Nova Scotia. As co-owners of the land and its resources, they expect that any potential impacts to rights and title be addressed. Mi'kmaq occupied much of Nova Scotia prior to European contact, and lands were used to varying degrees for habitation, hunting and fishing. In more recent times, treaties made with the British and continued through Canadian law have maintained their rights.

The Mi'kmaq used access to the Atlantic Coast, coastal areas of the Bay of Fundy and Northumberland Strait and rivers and their valleys, to supply them with food and as transportation corridors. Two important early routes connecting the Bay of Fundy and Northumberland Strait are along rivers which cut through the Cobequid Hills in the general vicinity of the study site. Overall, there is low potential for occurrence of Mi'kmaq archaeological resources at the site (CRM, 2024).

The study area is approximately 25 kilometres from the nearest Mi'kmaq First Nations Reserve and First Nations activities are not expected to be directly affected by activities associated with the New Annan quarry expansion. Best management practices used at the site will reduce potential impacts quarry activities may have on water quality, quantity and/or fish habitat. The subsequent IA for the project is expected to include measures to manage and monitor the quality of surface waters in the vicinity of the site. Land around the New Annan Quarry may be used by Mi'kmaq living in the area and/or other residents for nature-based activities such as walking, ATV use, bird watching and hunting or fishing (either recreationally or for subsistence). The land area affected is small in relation to the available wildlife habitat in the area and would not likely affect wildlife or fish populations, potentially used by Mi'kmaq. Activities are seasonal and therefore would not interfere with other uses such as hunting, trapping and snowmobile and recreational vehicle use during the winter and spring. Since site operations are not expected to change in

scope or increase in frequency from past use, there is unlikely to be a change in the cumulative effects of other activities in the area; consequently, none of these effects are considered significant.

Significance and Mitigation

There is low potential for occurrence of Mi'kmaq archaeological resources within the quarry site as outlined in the ARIA (CRM, 2024). In the unlikely event that artifacts are uncovered at the site, all work will stop, and discoveries will be reported to the appropriate authorities and mitigation will be enacted to the satisfaction of all parties involved. There is also a low potential for impacts to surface water or groundwater that may affect fish resources or water quality. The quarry will use Best Management practices to avoid accidental release of contaminants as well as vehicle accidents. Surface and groundwater monitoring programs will be established. The proponent will continue to engage with the Mi'kmaq as the quarry operates in the future.

6.2.2 Recreational Activities

Background

There is limited recreational use of the environment in the vicinity of the study area, which includes use by locals of roads for walking and ATVs and road access to trails in the Gully Lake Wilderness Area and other protected areas. Cycling on Highways 256 and 311 would interact with truck traffic originating in and destined to the Quarry but would likely be only a small portion of traffic already present. Residents of the area also have the opportunity to live in a relatively untouched natural environment with a low population density leading to local uses such as hunting and fishing, walking/hiking and home-based recreation (e.g. gardening) concentrated around roads in the area.

The principal effects of the quarry on tourists and locals using the area for recreation would be from truck and vehicle traffic and noise associated with the operation of heavy equipment; however, these interactions are a small component of a range of other industrial activities including logging trucks and equipment. Unlike other activities, the effects of the quarry would occur principally when the quarry is operating, while other activities in the area could occur year-round. Operations at the quarry would be cyclic, likely occupying several weeks to months during the construction season during the years in which the site is active. The site is regulated and monitored through an Industrial Approval issued by the Province. Although quarry operations could likely be heard near the quarry and residents would experience truck traffic and other effects of the quarry operations, the frequency and scope of the quarry is not expected to increase from past use and any impact on normal activities of residents as a result of the proposed quarry expansion are expected to be negligible.

Significance and Mitigation

Although quarry operations may be heard and residents may experience truck traffic and other effects of quarry operations, the frequency and scope of activities within the quarry is not expected to increase from past use, and any impact on normal activities of residents because of the proposed quarry expansion are expected to be negligible.

Signage will be in place at the entrance to the quarry during periods of site activity to ensure that passersby are aware of on-going activities. Road users will be informed of temporary increased trucking activity by signage placed along the Truro Road, in accordance with NSDPW requirements.

6.2.3 Tourism and Viewscape

Background

Expansion of the existing New Annan quarry is not expected to have a significant impact on tourism and viewscape. The principal interactions with tourists would be noise and truck traffic transporting aggregate to job sites. Some operations at the quarry may be heard at the nearby Gully Lake Wilderness Area or other protected areas. Blasting, which may be heard at greater distances, is of short duration and occurs infrequently – one to two times a year during years in which the site is active. The expansion will not result in a change in the frequency of activity, or visibility of the quarry. Truck and equipment traffic accessing and exiting the site onto Truro Road, Highway 256, Highway 311 and Highway 104 is expected to be the main interaction with tourists. The traffic is expected to be seasonal and occasional and will be similar to that in the past and therefore would likely be only a minor impediment to tourist vehicle traffic in the area. Overall, the impacts on viewscape and tourism are expected to be negligible.

Significance and Mitigation

Overall, the effects on tourism and viewscape are expected to be negligible. The quarry is remote and cannot readily be seen from the Truro Road. Signage will be in place during periods of site activity to ensure that residents are aware of seasonal quarry activities and associated trucking and transportation routes.

Other on-site mitigation to control and mitigate potential nuisance impacts will include Best Management Practices, including dust and noise control, and the on-going progressive rehabilitation of quarry areas no longer required for activity and/or future development.

6.2.4 Recreational, Commercial, and Mi’kmaq Fishing

Background

Recreational fishing in watercourses near the quarry is not expected to be affected by activities at the quarry. There are no major watercourses, except Fourmile Brook, within 2 km of the site and the amount of runoff from the quarry is small and high quality and will have a negligible impact on local surface waters. Surface waters at the site have high quality, including low turbidity and neutral pH, which would lead to good water quality downstream for fish. Vehicle accidents along roads in the area pose a small potential risk in the vicinity of road crossings, which will be mitigated by safe driving practices of truck and equipment operators. In addition, the proposed quarry expansion is not expected to significantly change flows in local watercourses based on a Water Balance Assessment (Fraser, 2024; **Appendix F**). Overall, a negligible impact of the quarry on recreational, commercial and Mi’Kmaq fishing is expected.

Significance and Mitigation

The effects of the quarry expansion are expected to have a negligible impact on recreational, commercial and Mi’kmaq fishing. Mitigation will include the use of Best Management Practices (i.e., pollution prevention, emergency response procedures, dust control, progressive rehabilitation). It is expected that a condition of EA approval will be to develop a surface water management plan for the site. A surface water management plan will be developed as part of the Industrial Approval process and will include specific surface water controls. Surface water, groundwater, and blasting will be monitored as per the Terms and Conditions of the amended IA.

6.2.5 Archaeological / Cultural / Historical

Background

The land proposed for the quarry expansion has low potential for pre-contact and/or early historic First Nations or European archaeological resources (CRM 2024). The site is not expected to have been a prime area used by Mi'kmaq pre-contact.

Significance and Mitigation

The impact of the proposed quarry expansion on archaeological, cultural, or historical features is expected to be negligible. If an archaeological, cultural, or historical feature of significance is encountered during quarry activities, the impact will be reduced by halting operations and consulting with the Province and experts in the field to ensure the artifact or feature is not disturbed and is adequately documented and preserved. If the feature is suspected to be of Mi'kmaq origin, the appropriate Mi'kmaq authorities will be contacted.

6.2.6 Land Use, and Value

Background

The New Annan pit and proposed quarry expansion are fully located on private lands. Activities at the site do not restrict forestry in the area except by removing available forest lands on the property. During the proposed life of the quarry, most of the existing forest will be harvested at least once, if not more and the rehabilitated parts of the quarry will also allow replanting and future harvesting. The quarry supports construction activities through the use of aggregate from the quarry for projects in the area. When the quarry is operating, construction crews will typically use local accommodations and services as well as local trucks. The existing pit has been operating at the site for many years with little or no impact, while providing economic development and a source of aggregate for local construction projects. Overall, the proposed quarry is expected to have a negligible impact on land use and value.

Significance and Mitigation

Overall, due to the small land area affected relative to the total land area available in the vicinity, the lack of restriction on industrial activities, as well as no expected change in traffic levels, the proposed quarry expansion is expected to have a negligible impact on land use and value. Mitigation including minimizing the quarry footprint within the NSECC approved quarry permit area, and the progressive rehabilitation of areas no longer required for aggregate production or site related activities, will minimize impacts on land use and value.

6.2.7 Transportation

Background

During its previous operations, the New Annan Pit has generated a moderate level of truck traffic on highways in the area, and activity levels are not expected to increase from current levels as the expanded operation will be servicing approximately the same level of demand for aggregate as in the past. Existing traffic volumes on the Truro Road are low and vehicle traffic from the quarry would not constrain local traffic significantly. Transport of production and mobile equipment to and from the site prior to and after periods of site activity may lead to short term delays in traffic caused by the often-slower moving transport trucks; however, the duration will be

less than experienced during typical roadwork projects and will be therefore insignificant. Heavy trucks moving through the area and trucks turning can be a hazard to local traffic. The entrance road has good sightlines but a long stretch of road on either side which does not have significant on-turning traffic, which could lead to vehicles along the Truro Road encountering quarry traffic unexpectedly.

Significance and Mitigation

Overall, the impact of the project on transportation is expected to be minimal, with little or no change from previous operations at the site. During periods of site operation, signage for truck and equipment operators, as well as the surrounding communities, will be placed to help inform the public that the quarry is active. Safe use of the road and avoidance of accidents is essential, both for human impacts and the potential impacts of vehicle accidents and spills on the local watercourses and environments. When the site is active, warning signs and speed limits can be placed in areas leading to the quarry. Equipment and truck operators for the quarry will be given instruction on safe procedures.

6.2.8 Residential Use

Background

Residents in the immediate vicinity of the quarry including Truro Road and along Highway 256 would be affected by noise from quarry operations, principally noise from heavy equipment operation such as loaders and trucks and periodic blasting; operation of crushers; and ground vibration from blasts, as well as dust and noise from truck traffic and accidental spillage of aggregate products from trucks during transport.

Blasting will be heard by local residents, but would be instantaneous and infrequent (e.g. one to two times per year), when the quarry is operating. Increasing distance from residents reduces the noise and ground vibration and consequently the potential effect on groundwater wells or impacts of blasting on building structures are likely negligible. There are no permanent residences within 800 meters of the study area and one seasonal residence approximately 520 m from the site. Blasting authorization has been obtained from the owner of the seasonal residence.

Truck traffic generates noise and dust and increases the potential for vehicle accidents and accidental loss of gravel and rock products from trucks during transport, which can be hazardous. Although quarry operations could likely be heard near the quarry and residents would experience truck traffic and other effects of quarry operations, the frequency and scope of activities at the quarry is expected to continue at present levels and any impact on normal activities of residents as a result of the proposed quarry expansion are expected to be negligible.

Skyshine from the quarry, on rare occasions when the quarry may be operated at night, will likely not be seen by local residents, but would be controlled by proper environmental management practices such as the use of downward direction lighting. The effects of the quarry would occur principally when the quarry is operating in the April to November period. Operations at the quarry would be cyclic, likely occupying several weeks to months during the construction season during the years in which the site is active.

The quarry occupies a small area in relation to the local groundwater aquifer and will have a negligible impact on groundwater supply to local residents

Significance and Mitigation

Overall, the impact of the project on residential use is expected to be minimal, with little or no change from previous operations at the quarry. However, mitigation measures such as maintaining appropriate operational buffers, controlling vehicle speed and engine braking, securing equipment to prevent banging (e.g., doors and chains), covering loads, wetting working areas, etc. will be implemented, ensuring that quarry operations comply with noise and dust limits according to the Pit and Quarry Guidelines. Attention will be given to dust management through standard dust mitigation strategies (water spray, reducing speeds, gravelling working areas, etc.). Noise and dust monitoring will be conducted as per the terms and conditions of the Industrial Approval for the approved quarry. Portable light towers, if required, may be seen by immediate residents, but would be controlled by proper environmental management practices (i.e., downward directional lighting).

Quarry activities such as blasting, are not expected to impact residential water supplies, as homes are located at a significant distance from the site. All blasting events will be monitored for concussion and ground vibration to ensure blasting limits are achieved as per the Industrial Approval. It is expected that a condition of EA approval will be to develop a groundwater monitoring program for the site. As part of the subsequent IA process, a groundwater monitoring program will be developed, and a network of groundwater monitoring wells will be constructed to establish baseline groundwater quality as well as existing groundwater table elevations. The monitoring well network will allow for on-going monitoring to ensure that any potential groundwater impacts are identified.

The quarry will include signage with company contact information. A complaint resolution procedure will be put in place by MEL to address any complaints and concerns received.

6.2.9 Commercial and Industrial Use

Background

The existing New Annan pit is located near a gravel pit operated along Truro Road by another contractor. The proposed quarry will introduce competition for the supply of aggregate products in the general vicinity. The Nuttby Mountain Wind Farm is located 6 km east of the quarry and is accessed by other road networks and would not be impacted. Otherwise, there are no businesses in the vicinity of the quarry which could be affected. The quarry contributes to the net economic benefit in the community through supporting local trucking operations and providing access to aggregate and other quarry products.

Significance and Mitigation

The impact of the project on commercial and industrial use is expected to be minimal, with little or no change from previous operations at the quarry. The continued use of Best Management Practices as well as strict adherence to the terms and conditions of the Industrial Approval will ensure that a non-impacting environment is maintained through future operations.

6.2.10 Water Supplies and Residential Wells

Background

One seasonal residence is located approximately 520 meters from the existing pit. Drinking water wells associated with the nearest residences along Truro Road in the same aquifer as the quarry could be affected by periodic blasting. Groundwater recharge generated by the quarry is likely to be of high quality (low conductivity and dissolved solids and neutral in pH).

Significance and Mitigation

The impact of the project on water supplies and residential wells is expected to be minimal, with little or no change from previous operations at the pit. Best management practices and Industrial Approval conditions for all operations, including blasting will be followed. Established operational procedures for fuelling will be followed and a contingency plan will be maintained to mitigate reasonable impacts on aquifers at the site. It is expected that a condition of EA approval will be to develop a groundwater monitoring program for the site. As part of the subsequent IA process, an on-site groundwater monitoring program will be developed, and a network of groundwater monitoring wells will be constructed to establish baseline groundwater quality as well as existing groundwater table elevations. The monitoring well network will allow for on-going monitoring to ensure that any potential groundwater impacts are identified.

6.2.11 Parks and Protected Areas

Background

Other that the addition of blasting and the gradual increase in the total operational footprint of the site, site activities are not planned to change in scope or increase in frequency from past use. The proposed expansion of the New Annan quarry site will not increase overall levels of noise beyond those historically experienced during periods of previous activity. The degree of any interactions with the Gully Lake Wilderness Area or other nearby protected areas are not expected to change. The pit and its expanded quarry area will not be visible to visitors travelling by road; or to ATV enthusiasts using parks and protected areas. Road traffic activity associated with the quarry is expected to be consistent with historic levels. Occasional blasting (one to two times per year, during which the quarry is active) may be heard as far as the Gully Lake Wilderness Area, but noise levels generated from routine operations at the quarry are not expected to be heard. Occurrences of blasting are brief and infrequent and not likely to be a significant concern to visitors/users of these areas. The quarry will be reclaimed at the end of its useful life. Expansion of the quarry will not affect the integrity of any nearby protected areas.

Significance and Mitigation

The impact of the project on parks and protected areas is expected to be minimal, with little or no change from previous operations at the quarry. Mitigation will include the use of Best Management Practices for all aspects of the quarry operation. Monitoring of surface water, groundwater, and blasting events will be conducted as per the terms and conditions of the IA.

6.2.12 Resource Use – Forestry, Hunting, and Trapping

Background

The proposed quarry expansion is located on private lands. Use of the land in the proposed expansion area will remove the potential for future forestry use of the site, at least until after the quarry is closed and rehabilitated in future; however, the area occupied by the quarry is relatively small in relation to the available forest resources in the area, and the overall impact on economic return is expected to be small. The quarry will occupy a relatively small area of habitat for furbearing and game species and will not have a significant impact on hunting and trapping.

Industrial operations, including quarries, generate low-level releases to the environment including vehicle and equipment exhaust and dust, although at typically low levels and comparable to effects of equipment use elsewhere and which have been acknowledged and managed.

Significance and Mitigation

The impact of the project on resource use such as forestry, hunting and trapping is expected to be minimal, with little or no change from previous operations at the quarry. Mitigation will involve the minimization of the footprint of the quarry footprint within the NSECC approved quarry permit area, and the progressive rehabilitation of areas no longer required for aggregate production or site related activities.

6.2.13 Human Health

Background

Potential hazardous materials that may be present in bedrock geological formations may lead to exposures if dust generated during quarrying and processing is inhaled; or when surface water or groundwater exposed to rock containing hazardous materials is consumed. Dust from road traffic will typically not contain hazardous materials, so the main potential exposure route arising from bedrock is through drinking water.

The potential presence of uranium has been noted in the rock formations in the area. Uranium is a heavy metal which has the potential to cause health effects. Mercator Geological Services were retained to conduct a geological assessment of the study area to better understand the potential for uranium occurrences (**Appendix G**). This report concluded that “No bedrock uranium occurrences have been identified to date in the project area and no obvious indicators of significant risk of uranium presence in the proposed quarrying area were identified during the current study”. The reported indicated, however, that the rock formation at the site—the Early Carboniferous Byers Brook Formation—had potential for uranium occurrence, noting that “based on review and interpretation of publicly available information for this study”, the Byers Brook Formation “is deemed prospective for occurrence of uranium mineralization.”

Significance and Mitigation

In keeping with the recommendation arising from the Mercator report, MEL will conduct regular and ongoing testing for uranium of the rock being extracted from the quarry, In addition, MEL geologists will conduct inspections of the rock face for mineralization following blasting operations. Surface and groundwater will also be monitored for uranium and other heavy metals as part IA stipulations.

6.3 Biophysical Components

6.3.1 Air Quality, Noise, and Light

Background

Other than the addition of blasting and the gradual increase in the total operational footprint resulting from the expansion, quarry activities are not expected to change from the previous scope of operations. Various project activities have the potential to generate dust, emissions, noise, and light. The operation of heavy equipment (e.g., earth movers, crushers), rock drilling and blasting, as well as onsite routine operations contribute to noise, dust, and particulate levels. Dust emissions are expected to be localized and short term and are expected to be minimal from routine operations. Exhaust emissions will occasionally be generated by the operation of vehicles and equipment.

As the amount of site activity at the site is not expected to increase, noise, dust, and emission levels from the expanded quarry are expected to be similar to those already produced at the site. Blasting is expected to occur infrequently (1-2 times per year during years in which the site is active).

Occasional night-time operations may be required. Light during night-time operations—particularly during times of low-hanging cloud and fog—can attract migrating birds traveling over water towards the rest of the mainland of Nova Scotia.

Significance and Mitigation

Overall, the impact of the project on air quality, noise and light is expected to be similar to the existing operation, with little or no change from previous operations at the quarry. With appropriate mitigation applied, potential impacts on air quality, noise, and light are expected to be minimal.

Dust management will be achieved through the use of water spray systems designed to reduce air borne dust originating from crushing operations and construction vehicle movement, by gravelling working areas, and reducing vehicle and equipment speed. Monitoring of airborne particulate emissions will be conducted at the request of NSECC and in accordance with the Pit and Quarry Guidelines and the Industrial Approval for the quarry. Industry standards and best practices will be followed during all phases of operations.

Noise mitigation will include maintaining appropriate operational buffers, maintaining vehicles and heavy equipment in operational order, and giving attention to traffic patterns around the site to reduce the need for heavy equipment to use back-up signals. The operation will ensure that heavy equipment does not exceed the noise limits specified in the Nova Scotia Pit and Quarry Guidelines. Blasting is expected to occur infrequently (1-2 times year, during years in which the site is active). All blasting events will be monitored for concussion (noise) and ground vibration. Noise monitoring will be conducted at the request of NSE, in accordance with the terms and conditions of the IA.

Vehicles and heavy equipment will follow efficient operating procedures such as not idling unnecessarily when not in use and avoiding use of engine braking. Given the location of the quarry and the scope of the planned operations, these emissions will be minimal (i.e., restricted to several pieces of heavy equipment, earth movers, trucks etc. as well as operation of portable crushers) and will be localized and similar in type and amount to those produced during previous

operations. Ambient air quality monitoring will be conducted at the request of NSE, in accordance with the terms and conditions of the IA.

With respect to light emanating from the site during infrequent night-time operations, measures will be taken to ensure use of directional lighting, which minimizes emanation of light upward and laterally over the horizon.

6.3.2 Groundwater

Background

Activities associated with the project including forest clearing, grubbing and removal of overburden, and blasting, can influence groundwater flow locally in the vicinity of the quarry, but are not expected to influence groundwater aquifers over a broader area. The amount of recharge area involved in project activities is moderate in relation to the overall size of the aquifers in the general vicinity. The quarry floor will continue to add recharge in approximately the same amount as at present. Groundwater can potentially be impacted by spills and/or leaks from operating equipment; however, activities will be managed to reduce the likelihood of spills.

Site operations and historic aggregate excavation has not encountered the deep bedrock water table as evidenced by the lack of water ponding on the pit floor and no upwelling of water through the pit floor.

Future excavation is not expected to take place below the deep bedrock water table. In addition, there will be no pumping of groundwater and therefore no dewatering of the associated bedrock aquifer.

Significance and Mitigation

Overall, the impact of the project on groundwater is expected to be similar to the existing operation, with little or no change from previous operations at the quarry. With appropriate mitigation applied, potential impacts on groundwater are expected to be negligible.

The quarry excavation will not enter the groundwater table, so on-going pumping will not be required. If aggregate extraction below the groundwater water table is required in the future, a Hydrological Study will be completed and an application to amend the IA will be submitted to NSECC.

It is expected that a condition of EA approval will be to develop a groundwater monitoring program for the site. As part of the subsequent Industrial Approval process, an on-site groundwater monitoring program will be developed, and a network of groundwater monitoring wells will be constructed to establish baseline groundwater quality as well as existing groundwater table elevations. The monitoring well network will allow for on-going monitoring to ensure that any potential groundwater impacts are identified. MEL has developed a Contingency Plan for pit and quarry operations. The Contingency Plan includes procedures and processes for responding to environmental emergencies including spill or release occurrences that could potentially impact groundwater in the area. Spill response, clean-up, and reporting will be in accordance with applicable NSECC Regulations. The Contingency Plan will be included with subsequent IA applications for review by NSECC.

6.3.3 Hydrology / Water Quality

Background

Expansion of the quarry will modify the existing hydrology at the site, resulting in an artificial though managed regime of surface water movement and runoff at the site. The proposed expansion area and its potential effect on flow to local surface water will be minimal, as noted in the Water Balance Assessment (Fraser, 2024 – **Appendix F**) which estimated the change in surface water flows resulting from the proposed expansion. The water balance estimated that the change in surface water runoff in Fourmile Brook, which is the watercourse fed by the catchment, will be from 0 to 5.2%.

If aggregate washing is required, wash water will be managed within the site itself such that all wash water is retained on-site and can be re-used in the aggregate washing process. Surface water runoff from the quarry is inherently intermittent and is not expected to affect overall flow characteristics in downstream areas significantly.

With respect to the characteristics of the quarry bedrock, a rock sample from the quarry was analysed for sulphur content to determine if the material was sulphide bearing. The results of this analysis yielded a sulphur concentration of <0.001 % (<0.03 kg H_2SO_4/tonne), which is below the minimum (0.4 % S; 12.51 kg H_2SO_4/tonne) defined by NSECC as sulphide bearing material. The laboratory results of this sample are included in **Appendix C** along with a duplicate sample, which was also below the minimum requirement. The quarry rock to be excavated is not acid producing and therefore will not have a negative effect on surface water or groundwater quality.

Significance and Mitigation

Overall, the impact of the proposed quarry expansion on the local hydrology (i.e., flow and quality) is expected to be similar to the existing operation. With appropriate mitigation applied, potential impacts on local hydrology are expected to be minimal.

The Water Balance Assessment estimates that the proposed quarry expansion will generate a minimal increase in runoff volume. It is expected that a condition of EA approval will be to develop a surface water management plan for the site, which will include consideration for a progressive increase in the amount of runoff from the quarry. The surface water management plan will be developed as part of the subsequent IA process and will include specific surface water controls and erosion and sediment control strategies. A monitoring program will be included with the surface water management plan. Surface water monitoring locations will be identified and monitored to establish baseline surface water quality. The surface water monitoring network will allow for on-going monitoring to ensure that any potential hydrology impacts are identified. Water usage will be primarily for dust control via spray systems on crushing spreads and application of water on roads. Water will either be sourced onsite through retained surface water in the fractured quarry floor or imported from offsite. The application of water for dust control will be at a rate that does not produce significant amounts of runoff that need to be managed. Anticipated water usage at the site is not expected to be at a frequency or volume that would require a water withdrawal approval.

As noted, the Project Area has been deemed prospective for occurrence of uranium mineralization and since this rock will be quarried in the Project Area, systematic monitoring for uranium as production progresses will be completed.

6.3.4 Freshwater Aquatic Environments

Background

A small headwater tributary of Fourmile Brook is present along the eastern boundary of the current development area, and several ponds and associated wetlands occur in the eastern portion of the site (surrounding the current gravel pit). The stream and associated wetland areas are outside the present and future proposed development area and these will be left as is. There are no permanent streams within the proposed quarry expansion area. Intermittent watercourses downstream from the quarry are not expected to be impacted significantly. Quantities of runoff arising from the site in future from the outer slopes of berms and grubbings piles will be approximately the same as at present and will remain in the same watershed. The quarry is unlikely to generate significant quantities of contaminants or suspended sediments that could impact any freshwater habitat.

Significance and Mitigation

Overall, the impact of the project on the local freshwater aquatic environments is expected to be negligible.

Potential impacts to local freshwater aquatic environments will be mitigated by maintenance of forested buffer zones and using surface water and sediment control and monitoring procedures as outlined in the Hydrology and Water Quality Section. MEL has developed a Contingency Plan for pit and quarry operations. The Contingency Plan includes procedures and processes for responding to environmental emergencies including spill or release occurrences that could potentially impact surface water and groundwater in the area. Spill response, clean-up, and reporting will be in accordance with applicable NSECC Regulations. The Contingency Plan will be included with subsequent IA applications for review by NSECC.

6.3.5 Wetlands

Several wetlands are present, two of which (Wetland 3 and Wetland 4) contain plant species of conservation concern. Both are located outside of the proposed expansion area and will not be altered by the project. A surface water management plan will be developed to meet requirements of the Industrial Approval to ensure runoff from active areas does not contribute to indirect impacts to these wetlands. Two marsh wetlands northwest of the existing gravel pit (Wetland 1 and Wetland 2) and small swamp/marsh wetland west of the existing pit are within the proposed expansion area and may need to be removed to facilitate practical development of the quarry. Prior to physical disturbance, separate wetland alteration approvals will be obtained for each wetland that will be impacted and appropriate compensation for the loss will be arranged.

Significance and Mitigation

Overall, the impact of the project on the local wetlands is expected to be negligible.

Potential impacts to local wetlands will be mitigated via the maintenance of forested buffer zones and using surface water and sediment control and monitoring procedures as outlined in the Hydrology and Water Quality Section and as per the pending Industrial Approval. Prior to any physical disturbance, separate wetland alteration approvals will be obtained for each wetland that will be impacted and appropriate compensation for the loss will be arranged.

It is expected that a condition of EA Approval for the site will include the development of a Wetland Monitoring Plan to monitor for indirect impacts to nearby wetland habitat.

MEL has developed a Contingency Plan for pit and quarry operations. The Contingency Plan includes procedures and processes for responding to environmental emergencies including spill or release occurrences that could potentially impact surface water and groundwater in the area. Spill response, clean-up, and reporting will be in accordance with applicable NSECC Regulations. The Contingency Plan will be included with subsequent IA applications for review by NSECC.

6.3.6 Fish and Fish Habitat

Background

None of the proposed project activities will physically impact fish habitat. The headwater tributary of Fourmile Brook which is located east of the existing gravel pit and an associated pond, is the only fish habitat at the site and these areas are outside of the proposed development area. Most precipitation is expected to infiltrate the quarry floor and not directly reach the watercourse as runoff. The Water Balance Assessment for the project indicates that the development will not reduce the supply of water to adjacent areas (Fraser, 2024 – **Appendix F**).

Significance and Mitigation

It is expected that a condition of EA approval will be to develop a surface water management plan for the site. The surface water management plan will be developed as part of the subsequent Industrial Approval process and will include specific surface water controls. A monitoring program will be included with the surface water management plan. Surface water monitoring locations will be identified and monitored to establish baseline surface water quality. The surface water monitoring network will allow for on-going monitoring to ensure that runoff from the quarry meets guidelines for maintenance of Freshwater Aquatic Life and the limits stipulated in the IA.

MEL has developed a Contingency Plan for pit and quarry operations. The Contingency Plan includes procedures and processes for responding to environmental emergencies including spill or release occurrences that could potentially impact fish and fish habitat in the area. Spill response, clean-up, and reporting will be in accordance with applicable NSECC Regulations. The Contingency Plan will be included with subsequent IA applications for review by NSECC. In addition, safe driving practices for all vehicle operators will be implemented to minimize the potential of accidents, especially in the vicinity of key quarry intersections.

6.3.7 Flora and Fauna Habitat

Background

Development of the New Annan Quarry will progressively remove existing terrestrial ecosystem (plants and animals) from the footprint of the quarry. With time, areas no longer suitable for quarry operations will be remediated following a site reclamation plan. Plant and animal communities that arise in the remediated areas will likely differ to some degree from those at present; however, a goal of remediation will be to restore conditions (soil types and topography) that are reasonably similar to pre-existing conditions, to allow natural communities to re-establish. During recovery and revegetation of abandoned areas, the seeding in and succession of forest species will provide habitat for a moderate diversity of species which will change with time.

Removal of forest cover is a feature that quarry development shares with logging activities, which affects local ecosystems to a moderate degree, and is allowed in Nova Scotia. Development of the New Annan Quarry will result in only a comparatively small change in the coverage of natural and mature forest stands in the area and is expected to have comparatively small impact on interior forest birds and wildlife. During operations, modified areas of the quarry offer potential nesting sites for certain species of birds and other wildlife, including hunting spaces for species such as owls and nesting for ground nesting birds such as nighthawks. Night operations and use of lights have various effects, including attracting insects which otherwise would need darkness to mate and reproduce. Other quarry activities such as blasting and vehicular operation and movement are not expected to interact significantly with wildlife and therefore are not a concern.

Significance and Mitigation

The effects of quarry construction and operations on flora and fauna habitat with appropriate mitigation are expected to be negligible. Potential impacts will be mitigated as outlined below.

Areas no longer suitable for quarry operations will be progressively remediated. A Reclamation Plan has been established and updating the Plan every three years is a condition of the quarry Industrial Approval. Normal management practices regarding forest clearing, such as avoidance of cutting or major clearing activities during critical breeding periods of songbirds from mid-April to mid-September, will reduce loss of nesting birds in forest areas. Quarry employees will be educated on the need to check areas for activity and nests including both ground- and tree-nesting birds, before undertaking activities which would disturb established surfaces. Lighting used at the site should focus downward and below the normal horizon, to limit visibility by birds and insects from a distance.

It is expected that a condition of the Industrial Approval for the quarry, will be to develop a Wildlife Management Plan for the site. The Wildlife Management Plan will establish appropriate mitigation measures to manage wildlife resources (avian species and their nests, species at risk, non-native plant species, moose, etc.). MEL has also developed a Contingency Plan for its pit and quarry operations. The Contingency Plan includes procedures and processes for responding to environmental emergencies including spill or release occurrences that could potentially impact flora and fauna in the area. Spill response, clean-up, and reporting will be in accordance with applicable NSECC Regulations. The Contingency Plan will be included with subsequent IA applications for review by NSECC.

6.3.8 Species at Risk

Background

No federally or provincially-listed species at risk, or species more sensitive than S3 ranking (vulnerable), were found in the study area. Two provincially listed S3 species (Rosy Sedge and Blunt Broom Sedge) were present in wetland areas within the property but outside the current developed area and the area proposed for quarry development; and two lichen species with a conservation status of S3S4. No fur-bearing mammals of conservation importance have been recorded within the vicinity of the site although Canada Lynx (Provincially listed as endangered) has been trapped incidentally in the broader Colchester County area. The quarry is not expected to have a significant potential for impacting fur-bearing mammals or their habitat. One exception is Mainland Moose (listed Provincially as endangered) which have been observed occurring within 4.6 km of the study area and a track was observed during one of the surveys in May. The study

area is within a Special Management Practice Zone for moose (i.e. a moose concentration area and area of core moose habitat).

Common Nighthawk, a ground-nesting bird species, which potentially could nest in grubbed and marginal but open areas of the quarry, was not detected at the site; periodic nighthawk surveys during operation of the quarry would aid in mitigating potential impacts. Lights during night operations during migration periods (April – June, August – September) would attract various bird species and insects, which could include species at risk. Blasting events, although infrequent (1-2 times/year during years in which the quarry is active) are also of concern to species at risk.

Significance and Mitigation

Overall, the effects of the quarry construction and operations on species at risk are expected to be negligible. Potential impacts will be mitigated as outlined below.

Employees will be made aware of the need to check areas for activity and nests before undertaking activities which would disturb established surfaces. Activities such as logging, and site clearing should be scheduled outside the April to mid-September nesting period for breeding birds. Lighting used at the site should focus downward and below the normal horizon, to limit visibility from a distance. Blasting will be minimized (i.e. 1-2 blasts per year, during years in which the site is active) planned for the spring and fall (if possible) when species are generally absent (i.e., outside breeding and migratory periods).

It is expected that a condition of EA approval will be to develop a Wildlife Management Plan through the Industrial Approval process. The Wildlife Management Plan will establish appropriate mitigation measures to manage interactions with wildlife resources such as Mainland Moose, avian species and their nests, species at risk, non-native plant species, etc. If wildlife and/or species at risk concerns arise for which potential mitigation is unknown, MEL staff will liaise with the appropriate regulatory groups and knowledgeable consultants to determine appropriate action.

6.3.9 Natural Areas and Wilderness

Background

Natural areas in the vicinity of the site, such as the Gully Lake Wilderness Area, are important for conservation of a wide range of species and ecosystem types and the comparative absence of development is appreciated by locals, tourists and Nova Scotians with an interest in conservation and outdoor experiences. The proposed development of the New Annan quarry is located on private lands and will only affect a small proportion of the natural landscape at the site, in an area that has been actively logged and is not in any protected area. Consequently, it will have a negligible effect both on ecosystems and on human use and interests in adjacent environments. The proposed expansion of the New Annan Quarry will affect a small proportion of the natural landscape at the site and will have a limited effect on visitors to the area who are looking for nature experiences. It is noted that site operations which generate noise and dust will have some, but limited, effects on natural areas and wilderness.

Significance and Mitigation

Overall, the effects of the quarry construction and operations on natural areas and wilderness are expected to be negligible. Potential impacts will be mitigated as outlined below.

Mitigation to reduce potential impacts of the quarry on Air Quality, Noise, and Light, will be applied to reduce potential impacts on Natural Areas and Wilderness. This will include routine procedures and best management practices such as dust control and light management will help to minimize impacts on natural and wilderness values at the site. A quarry Reclamation Plan will be maintained, including provisions for progressive reclamation where appropriate, to rehabilitate areas no longer required for aggregate production. In addition, quarry reclamation will also consider values important in conservation of biological communities and ecosystems, as well as changes in physical conditions that could affect those communities.

7.0 IMPACTS OF THE ENVIRONMENT ON THE PROJECT

The New Annan quarry will be affected in general by weather, including extreme weather events expected to occur more frequently as a result of climate change. This may potentially lead to erosion and high flows in adjacent watercourses; high winds leading to resuspension of dust and elevated temperatures. Quarry design, which includes site water management will allow flows generated from extreme rainfall events to be managed accordingly. Aggregate products produced and stockpiled at the site are stable under varying conditions of rainfall and wind.

As part of the subsequent Industrial Approval process, a surface water management plan and Erosion and Sediment Control Plan will be developed for the site, which will include consideration for extreme rainfall events. Integrity of any runoff management structures at the site will be inspected on a regular basis, in particular following major weather events. Corrective action will be undertaken, if needed, in a timely manner. Dry conditions, if encountered, however, may require access to outside water sources for dust control and routine operations which will be sourced from distant locations which will not impact the water balance or the adjacent wetlands.

Changing climate may increase the operating season for transportation projects, and the need for aggregates produced by the quarry.

8.0 POTENTIAL CUMULATIVE IMPACTS

Cumulative effects are effects of the project that may result in combination with other physical activities that have been or will be conducted (IAA 2023). Relative importance of particular cumulative effects is determined using similar criteria to those of individual impacts of projects, which are often socially perceived limits, such as acceptable geographic extent of the effect relative to available land or habitat type in a particular area.

Development of the New Annan quarry will have minimal cumulative effects on most environmental features (Valued Environmental Components, VECs), in part because of the small size of the development relative to other similar uses of the area and because the quarry will be reclaimed at the end of its useful life. One other aggregate pit operates occasionally on Old Truro Road near the New Annan quarry site. Other than the addition of blasting and the gradual increase in the total operational footprint of the site, site activities are not planned to change in scope or increase in frequency from past use. Considering the limited aggregate demand within the local market, it is unlikely that both would be active at the same time. Reduction in forest cover at the site will compound the overall effects of forestry and land-clearing for the area. Planned restoration of the quarry site to natural conditions after its useful life will, in the long term, counteract the effect of present forest loss.

At the proposed 17.42 ha maximum size of the New Annan quarry, it will occupy less than 0.1% of the land within 10 km, and would represent approximately 21% of the 84.7 ha already developed for industrial purposes within a 10 km radius of the site (e.g. gravel pits, quarries,

gypsum mines or other areas which involve modifying the landscape for industrial development) (Nova Scotia Forest Inventory, 2013). The development area would remove previously clear-cut and regenerating forest, which will result in a reduction of about 0.1% of the approximately 22,779 ha of forest (natural or clear-cut) occurring within the same 10 km radius (NS Forest Inventory 2013). Together the adjacent gravel pit and several other abandoned gravel pits along the Old Truro Road within 1 km, occupy 5.6 ha. In comparison, land developed for agriculture, which includes sugar bush, old field and blueberry fields, occupies 474 ha, which is more than 20 times that of the proposed New Annan quarry development area of 17.42 ha. Apart from the increased footprint of the proposed quarry, the combined operations would be at current activity levels and associated impacts on air quality, noise and traffic experience by residents on Old Truro Road and Balmoral Road will be small. Therefore, the cumulative effect of the quarry expansion and other local activity is not expected to change and will be negligible.

9.0 INDUSTRIAL APPROVAL CONDITIONS, MONITORING, AND REPORTING

Environmental monitoring is dictated by the Pit and Quarry Guidelines and the Industrial Approval (IA) for the site. Typical monitoring at quarry sites includes surface water monitoring, groundwater monitoring, and blast monitoring (concussion and vibration). Noise and dust monitoring is typically conducted at the request of NSECC.

Surface water monitoring will be conducted as per the terms and conditions of the IA and is expected to include both background (upstream) and downstream water quality in watercourses potentially affected by quarry operations. It is expected that a condition of EA approval will be to develop a surface water management plan for the site, through the IA process. A surface water monitoring program will be included with the surface water management plan. Surface water monitoring locations will be identified and monitored to establish baseline surface water quality. The surface water monitoring network will allow for on-going monitoring to verify that surface water runoff from the quarry does not have an impact of downgradient receptors.

Groundwater monitoring will be conducted as per the terms and conditions of the IA. It is expected that a condition of EA approval will be to develop a groundwater monitoring program for the site under the IA process, and a network of groundwater monitoring wells will be constructed to establish baseline groundwater quality as well as existing groundwater table elevations. The monitoring well network is expected to include three industry standard monitoring wells. The monitoring well network will allow for on-going monitoring to ensure that potential groundwater impacts are identified.

Blast monitoring will be conducted as per the terms and conditions of the IA. Blast monitoring is required for all blasting events and includes measurement of air concussion and ground vibration at the nearest structures located around the quarry. Additionally, seismographs may be setup at other selected locations in the surrounding community to ensure that the blast parameters meet with those dictated by the stipulations in the IA.

Other specific parameters that may be monitored will be included in the amended IA.

All monitoring results are maintained by MEL and provided to NSECC as part of an Annual Report for the Quarry. If a monitored parameter exceeds a limit noted in the IA, MEL is required to immediately notify NSECC of the exceedance.

10.0 FUTURE PUBLIC AND FIRST NATIONS INVOLVEMENT

Public consultation and First Nation engagement efforts undertaken to date are documented in Section 4 of this EA Registration Document. Project stakeholders, the general public, and the Mi'kmaq of Nova Scotia will have an opportunity to provide feedback on the proposed quarry expansion project by providing written comments to the NSECC EA Branch during the project review period.

It is expected that a condition of EA approval will be to develop a Complaint Resolution Procedure for receiving, documenting, and responding to feedback received related to the quarry.

Quarry approvals typically include provisions to implement a Community Liaison Committee (CLC) at the request of NSECC. If a CLC is required, MEL will seek participation from the local community as well as First Nations representatives.

11.0 PROJECT CLOSURE / RECLAMATION

The quarry will be reclaimed in accordance with NSECC requirements and industry standards. MEL maintains a Reclamation Plan for the quarry. As per the Terms and Conditions of the Industrial Approval, the Reclam tion Plan is updated every three years and submitted to NSECC for review. The Reclamation Plan includes provisions for progressive reclamation of areas that are no longer required for aggregate production or supporting activities. A quarry permit bond which reflects the total site disturbed area is maintained. The value of the bond is updated every three years in accordance with the updated Reclamation Plan to ensure that the bond value reflects the size and scope of future reclamation efforts at the site.

12.0 APPROVAL OF UNDERTAKING

MEL will comply with all provisions of the Nova Scotia Environment Act and Regulations. Following successful EA approval, an application for an amendment to the existing Industrial Approval will be submitted to NSECC.

13.0 FUNDING

No public or other government funding is involved in the execution of this undertaking. All costs are borne by MEL.

14.0 PROPONENT SIGNATURE

DEC. 23, 2024
Date

Gary Rudolph
Garyudolph, P.Eng.
Director of Aggregates and Pavement Rehabilitation
Municipal Enterprises Limited

APPENDIX A
PROPERTY INFORMATION

Environmental Assessment Registration Document:
New Annan Quarry Expansion
East New Annan, Colchester County
Nova Scotia

NOVA SCOTIA

71 East Victoria St.
Amherst NS
Canada B4H 1X7

902-667-6205 P
902-667-6214 F
www.novascotia.ca

APPROVAL

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

APPROVAL HOLDER: MUNICIPAL ENTERPRISES LIMITED

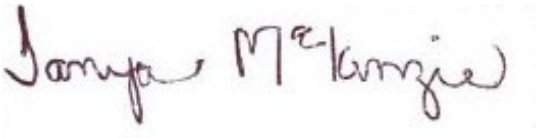
SITE PID: 20098935

APPROVAL NO: 2003-035702-04

EXPIRY DATE: October 12, 2033

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 - Pit



Administrator: Tanya MacKenzie

Effective Date: October 12, 2023

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 Department of Environment and Climate Change

Approval Holder: MUNICIPAL ENTERPRISES LIMITED

Project: East New Annan, Colchester Co.; PID 2008935

Site:

PID	Civic #	Street Name	Street Type	Community	County
20098935	3967	TRURO	RD.	EAST NEW ANNAN	COLCHESTER COUNTY

Approval No: 2003-035702-04

File No: 92100-30-TRU-2003-035702

Grid Reference: Easting - 476,980, Northing - 5,047,410

Reference Documents

- Application submitted May 1, 2023 and attachments.
- SITE PLAN SHOWING PROPOSED PERMIT AREA OVER A PORTION OF PID 20098935 LAND REGISTERED TO MUNICIPAL ENTERPRISES LIMITED - Completed By Highland Geomatics & Engineering Inc, Dated: August 11, 2023 (PLAN No.: H23081)

1. Definitions

a. 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.

b. 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.

c. Active Area means the area occupied by the working face, disturbed areas, rehabilitated areas, any structure, processing facility, pollution abatement system, settling pond, stockpiles and/or overburden associated with the Pit and Pit activities.

d. Department means the Nova Scotia Department of Environment and Climate Change, and the contact for the Department for this approval is:

Nova Scotia Department of Environment and Climate Change
Central Region, Truro Office
36 Inglis Place
Truro, Nova Scotia B2N 4B4

Phone: (902) 893-5880
Fax: (902) 893-0282

e. Disturbed Area means an area in an unnatural state, affected by human activity associated with the Pit.

f. Minister means the Minister of Environment and Climate Change and includes any person delegated the authority of the Minister.

g. Overburden means material, including organics, overlying a deposit of aggregate.

h. Qualified Person as it relates to noise, means one who has certified post-secondary education and/or professional training in acoustics, and a minimum of 5 years of experience in the field of environmental noise, or as otherwise authorized by the Department.

i. Qualified Person as it relates to air quality, means one who has certified post-secondary education and/or professional training related to ambient (outdoor) air quality, and a minimum of 5 years of experience in the field of ambient (outdoor) air quality, or as otherwise authorized by the Department.

j. Site means a place where a designated activity and/or undertaking is occurring or may occur.

k. Surface Watercourse means a watercourse as defined in the Environment Act, excluding groundwater.

l. 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 Pit situated at or near East New Annan, Colchester Co.; PID 2008935.

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.

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;

iii. Guidelines for Environmental Noise Measurement and Assessment; and,

iv. 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.

l. 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 (5) 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

v. Other off-site structure - 90 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 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.

6. Noise

a. The Approval Holder(s) shall ensure that noise generated from the designated activity complies with the 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.

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 site 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;

c. Additional surface water monitoring may be required at the request of the Department.

d. 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).

e. 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.

f. The Approval Holder(s) shall immediately contact the Department should sulphide bearing material be encountered on the Site.

g. 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.

h. Erosion and sediment controls shall be inspected yearly as a minimum, and after a minimum 50 mm/24-hour or 75 mm/48-hour rain event to confirm that controls are working as designed and intended. Records outlining results of the inspections and actions taken to correct any deficiencies shall be kept for the duration of the approval and shall be made available to the Department upon request.

i. 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.

j. 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.

k. 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.

l. The Approval Holder(s) shall ensure that the following activities take place at a distance of a minimum of thirty (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.

8. Groundwater Monitoring

a. Within sixty days (60) of request by the Department, the Approval Holder(s) shall prepare and submit to the Department, a groundwater monitoring plan, which includes, but is not limited to the following:

i. the location and design of monitoring well(s);

ii. monitoring parameters (groundwater quality and/or water table elevations);

iii. sampling methodologies;

iv. baseline and regular monitoring; and

v. a monitoring schedule.

b. The groundwater monitoring plan shall be designed 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 Nova Scotia.

c. The groundwater monitoring plan shall be deemed acceptable by the Department.

d. Once the groundwater monitoring plan has been deemed acceptable by the Department, the Approval Holder(s) shall implement the accepted groundwater monitoring program.

9. 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 1.0 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.

10. 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.

11. Construction

a. An emergency spill-kit must be kept on site when vehicles (including machinery), equipment, or petroleum products are present on site.

b. Upon completion of construction, modification, or maintenance work all debris resulting from the work must be removed from the work site.

12. Blasting

a. Blasting is prohibited at the Site.

13. Reporting

a. 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. any other information requested by the Department.

b. The annual report described herein shall be submitted to the Department on or before March 1 of the following year.

c. 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 by December 1, 2023 and at a minimum of every three years thereafter, and update the plan accordingly based on current conditions. Updates to the rehabilitation plan shall be submitted to the Department for acceptance.

b. The Approval Holder(s) shall review the amount of financial security provided to the Department by December 1, 2023 and at a minimum of every three years thereafter, 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.

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. Site Specific

a. The Approval Holder(s) shall rehabilitate all active areas outside of the proposed active area (or "permit area") as shown in the Reference Documents by no later than November 1, 2024. Rehabilitation must include, at a minimum, placement of topsoil to a thickness necessary to support vegetation, seeding using native grass mix, and contouring for long-term erosion control and drainage management (using a grade no steeper than 3:1 (Horizontal:Vertical)). If not completed by November 1, 2024, the Approval Holder(s) shall obtain an Environmental Assessment Approval (or other authorization from the Department's Environmental Assessment Branch) and an amended Industrial Approval for extension of the Pit.

i. The Approval Holder(s) shall complete rehabilitation to the satisfaction of the Department.

ii. The Approval Holder(s) shall implement corrective actions to meet rehabilitation criteria in parts of the site where the Department deems rehabilitation unsatisfactory.

16. Air Emissions

a. When required by the Department, the Approval Holder(s) shall conduct source testing in accordance with a standard deemed acceptable to the Department.

NOVA SCOTIA
Registry of Joint Stock Companies

Profile Report

Entity details

Information as of	29 October 2024
Registry ID	3251748
Business/Organization Name	MUNICIPAL ENTERPRISES LIMITED
Incorporation Date	01 February 2011
Annual Return due Date	28 February 2025
Type	Limited Company
Status	Active
Registered Office	927 ROCKY LAKE DRIVE, BEDFORD, NOVA SCOTIA, B4A 3Z2, CANADA
Mailing Address	927 ROCKY LAKE DRIVE, BEDFORD, NOVA SCOTIA, B4A 3Z2, CANADA

Directors and Officers

Name	Position	Civic Address	Mailing Address
CARL B. POTTER	Director	927 ROCKY LAKE DRIVE BEDFORD NOVA SCOTIA B4A 3Z2 CANADA	
CARL B. POTTER	CHAIRMAN	927 ROCKY LAKE DRIVE BEDFORD NOVA SCOTIA B4A 3Z2 CANADA	
DAVID A. WOOD	VP, CFO & TREASURER	927 ROCKY LAKE DRIVE BEDFORD NOVA SCOTIA B4A 3Z2 CANADA	
DAVID PANGMAN	VICE PRESIDENT, FINANCE	927 ROCKY LAKE DRIVE BEDFORD NOVA SCOTIA B4A 3Z2 CANADA	
HAROLD JOHNSON	Vice-president	927 ROCKY LAKE DRIVE BEDFORD NOVA SCOTIA B4A 3Z2 CANADA	
KEN MACLEAN	VP AND SECRETARY	927 ROCKY LAKE DRIVE BEDFORD NOVA SCOTIA B4A 3Z2 CANADA	

NOVA SCOTIA
Registry of Joint Stock Companies

Recognized Agent

Name	Position	Civic Address	Mailing Address
CHRISTINE C. POUND	Recognized Agent	600-1741 LOWER WATER STREET HALIFAX NOVA SCOTIA B3J 0J2 CANADA	PO BOX 997 HALIFAX NOVA SCOTIA B3J 2X2 CANADA

Activity

Activity	Date
Company Annual Renewal Statement	01 March 2024
Company Notice Filing - Notice of Increase In Share Capital	09 February 2024
Company Special Resolution - Change in Share Structure	09 February 2024
Company Notice Filing - Notice of Shares Redemption/Acquisition	19 July 2023
Company Notice Filing - Notice of Increase In Share Capital	19 July 2023
Company Special Resolution - Change in Share Structure	19 July 2023
Company Special Resolution - Reduction of Paid Up Capital - Without Court Order	03 May 2023
Company Notice Filing - Notice of Shares Redemption/Acquisition	03 May 2023
Company Notice Filing - Notice of Increase In Share Capital	03 May 2023
Company Special Resolution - Change in Share Structure	03 May 2023
Company Annual Renewal Statement	21 February 2023
Company Annual Renewal Statement	16 February 2022
Company Annual Renewal Statement	03 March 2021
Annual Statement Filed	06 March 2020
Annual Renewal	06 March 2020
Change of Directors	17 May 2019
Filed Document	18 March 2019
Filed Document	18 March 2019
Special Resolution	18 March 2019
Annual Renewal	28 February 2019
Annual Statement Filed	28 February 2019
Annual Renewal	16 February 2018
Annual Statement Filed	16 February 2018
Change of Directors	18 October 2017
Annual Renewal	08 February 2017
Annual Statement Filed	08 February 2017

Annual Renewal	08 March 2016
Annual Statement Filed	08 March 2016
Change of Directors	10 July 2015
Filed Document	25 March 2015
Special Resolution	25 March 2015
Annual Renewal	10 March 2015
Annual Statement Filed	10 March 2015
Annual Renewal	03 February 2014
Annual Statement Filed	03 February 2014
Change of Directors	12 September 2013
Change of Directors	18 March 2013
Annual Renewal	18 February 2013
Annual Statement Filed	18 February 2013
Change of Directors	22 June 2012
Annual Statement Filed	29 February 2012
Annual Renewal	29 February 2012
Change of Directors	10 November 2011
Change of Directors	20 June 2011
Appoint an Agent	16 June 2011
Special Resolution	10 February 2011
Date of Filing Amalgamation	01 February 2011
Address Change	01 February 2011
Appoint an Agent	01 February 2011
Change of Directors	01 February 2011

NOVA SCOTIA
Registry of Joint Stock Companies

Related Registrations

Relationship	Name
Amalgamated From	MUNICIPAL ENTERPRISES LIMITED
Amalgamated From	GIBRALTAR ENVIRONMENTAL INCORPORATED
Amalgamated From	MUNICIPAL PIPELINE CONSTRUCTION INCORPORATED
Amalgamated From	DALSAAN INVESTMENTS LIMITED
Amalgamated From	WARD AGGREGATES LIMITED
Amalgamated From	3102991 NOVA SCOTIA LIMITED
Amalgamated From	3104179 NOVA SCOTIA LIMITED
Amalgamated From	GRAY ROCK CONSTRUCTION LIMITED
Amalgamated From	DEXTER MARITIMES LIMITED
Business Name	ROCKY LAKE QUARRY
Amalgamated From	A.C.L. CONSTRUCTION LIMITED
Business Name	DEXTER ASPHALT PLANT
Is Partner of	SOUTH SHORE DEVELOPMENT PARTNERSHIP
Is Partner of	MEL MILL RENTAL PROPERTIES
Business Name	MUNICIPAL GROUP OF COMPANIES
Business Name	CARL B. POTTER
Amalgamated From	R. B. PAVING COMPANY LIMITED
Business Name	BERNARD L. MAILMAN PROJECTS
Business Name	HIGHLAND ASPHALT
Business Name	GIBRALTAR CONSTRUCTION
Business Name	DEBERT MINING
Business Name	RHODES CORNER QUARRY
Is Limited Partner of	MI'KMA'KI-MUNICIPAL LIMITED PARTNERSHIP
Business Name	EARTHWORKS CONSTRUCTION

APPENDIX B
DRAWINGS

Environmental Assessment Registration Document:
New Annan Quarry Expansion
East New Annan, Colchester County
Nova Scotia

New Annan Pit / Quarry
Proposed Quarry Expansion Area

Sketch Date: September 27, 2024

POL Property Boundaries
- Municipal Group Owned Lands
- Other Lands

Legend
- Proposed Expansion Area (17.42 ha)
- Wetlands (surveyed)

0 100 200 m

Appendix B - Drawing 1

MUNICIPAL ENTERPRISES LIMITED

NEW ANNAN QUARRY EXPANSION

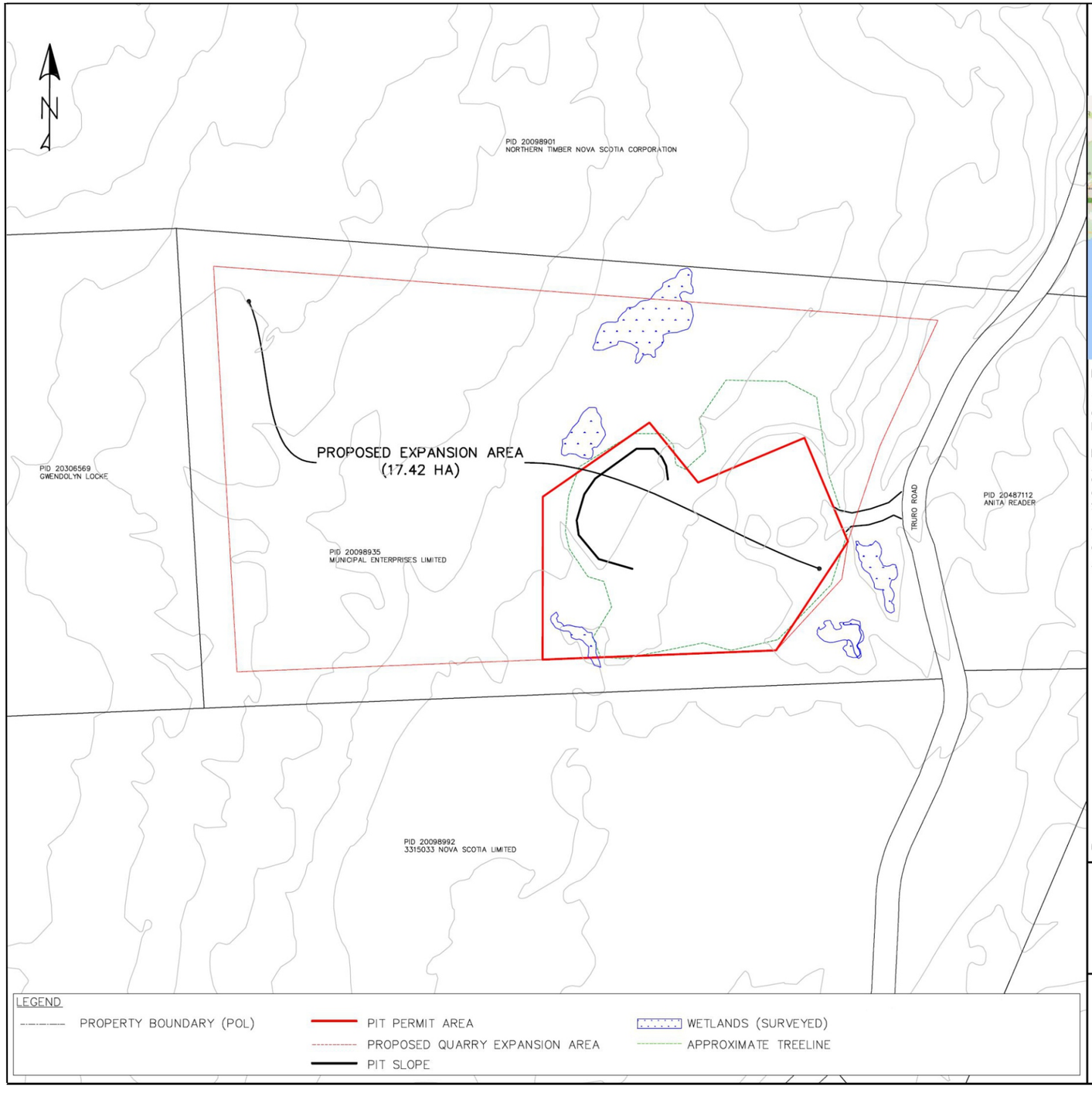
East New Annan,

Colchester County

Nova Scotia

SITE DETAILS & PROPOSED EXPANSION AREA

MUNICIPAL ENTERPRISES LTD

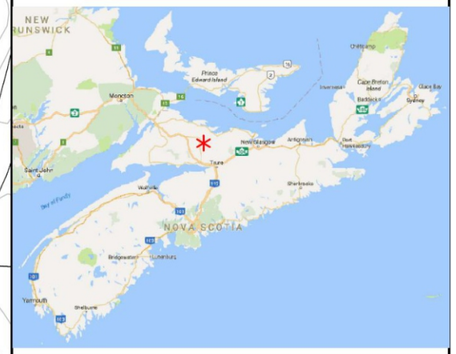


EAST NEW ANNAN PIT

SITE PLAN

COLCHESTER COUNTY, NOVA SCOTIA

DATE: DEC. 6, 2024 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

PROPERTY BOUNDARIES SHOWN ARE AN APPROXIMATE GEOGRAPHICAL REPRESETNATION ONLY, OBTAINED FROM NOVA SCOTIA PROPERTY ONLINE, AND ARE SUBJECT TO A LEGAL BOUNDARY SURVEY FOR VERIFICATION.

WETLAND BOUNDARIES SURVEYED BY ENVIROSPHERE CONSULTANTS (NEW ANNAN QUARRY BIOPHYSICAL ASSESSMENT, 2024)

NOTE: THIS IS NOT A LEGAL SURVEY

0 100 200 Meters

MUNICIPAL ENTERPRISES LTD

MUNICIPAL ENTERPRISES LIMITED

NEW ANNAN QUARRY EXPANSION

East New Annan,

Colchester County

Nova Scotia

APPROVED QUARRY SITE PLAN

MUNICIPAL ENTERPRISES LTD

Appendix B - Drawing 2

APPENDIX C
ROCK SULPHUR CONTENT ANALYSIS RESULTS

Environmental Assessment Registration Document:
New Annan Quarry Expansion
East New Annan, Colchester County
Nova Scotia

DALHOUSIE UNIVERSITY
Inspiring Minds

Minerals Engineering Laboratory

Dalhousie University
1360 Barrington Street
5273 DaCosta Row
Chemical Engineering Bldg. Rm. 3305
PO Box 15000, Halifax, NS
B3H 4R2

minerals.engineering.dal.ca
Tel: 902.497.3958
Email: mec@dal.ca

11-Dec-24

Dexter Construction
927 Rocky Lake Drive
P.O. Box 48100
Bedford, NS
B4A 3Z2
Atten: Chris Mullins

RUSH

Re: Results of analysis on submitted samples.
Acid producing potential based on total sulphur, or sulphide sulphur content if available.

Project :
PN# 2401026-7610
PO#

	Wt. %			kg H2SO4/t
Sample	S(Total)	Sulphate	Sulphide	Acid Prod. Potential
New Annan Pit-Slope	<0.001			<0.03

	Wt. %
Certified Ref. Sa.	S(Total)
KZK-1 (0.80% S)	0.796

Daniel Chevalier, MASc
Manager, Minerals Engineering Laboratory

APPENDIX D
BIOPHYSICAL ASSESSMENT REPORT
(Envirosphere Consultants Limited, 2024)

Environmental Assessment Registration Document:
New Annan Quarry Expansion
East New Annan, Colchester County
Nova Scotia

Biophysical Assessment:
New Annan Quarry Expansion, Colchester County, Nova Scotia – PID 20098935
3967 Truro Road, East New Annan

November 2024

Prepared for:

Municipal Enterprises Limited
Bedford, Nova Scotia

Prepared by:

Envirosphere Consultants Limited
P.O. 130 | Unit 5 – 120 Morison Drive
Windsor, Nova Scotia B0N 2T0
Tel: (902) 798-4022 | Fax: (902) 798-2614
www.envirosphere.ca

P.O. 130, Unit 5 – 120 Morison Drive
Windsor, Nova Scotia B0N 2T0
Tel: (902) 798-4022
Fax: (902) 798-2614
Email: enviroco@ns.sympatico.ns.ca
www.envirosphere.ca

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1 INTRODUCTION

Municipal Enterprises Limited (MEL), an affiliated company of Dexter Construction Company Limited (Dexter), is proposing to expand an existing gravel pit off Truro Road, East New Annan, Colchester County, Nova Scotia and transition the site into a quarry. The existing gravel pit currently operates with a Nova Scotia Environment and Climate Change (NSECC) approved area of 3.99 hectares. The proposed expansion area encompasses 17.42 hectares. Other than the addition of blasting and the gradual increase in the total operating footprint of the site, site activities are not planned to change in scope or increase in frequency from past use. Municipal Enterprises Limited contracted Envirosphere Consultants Limited of Windsor, Nova Scotia, to prepare a biophysical and socio-economic overview and assessment for the proposed expansion in support of an Environmental Assessment Registration approval application. This report contains the results of the overview and assessment, and is consistent with current standards for quarry expansion projects in Nova Scotia. It presents a description of the methodology and scope, existing environment, environmental effects, cumulative effects, discussion, and conclusions. The assessment provides a sufficient level of detail to ensure that all information necessary to allow adequate review of the project is provided; to demonstrate how the assessment was conducted; and to document the information on which the conclusions were based.

2 INFORMATION SOURCES

Information for the biophysical and socio-economic overview and assessment was collected from various sources, including interviews with representatives of the Nova Scotia Department of Natural Resources and Renewables (NSNRR); contacts with organizations, businesses and individuals in the area; review of published information including soil surveys, reports on geology, archaeology, and natural history (e.g. *Natural History of Nova Scotia*); use of relevant websites and databases (e.g. Nova Scotia Open Data Portal; NSNRR Significant Habitat and Wetland Databases, Atlantic Canada Conservation Data Centre, and Nova Scotia Museum of Natural History); and use of maps, digital data on land use, and property ownership, aerial photos, and 1:50,000 topographic maps.

Site visits and walkovers by project personnel were conducted on:

- October 3, 2023, and June 19, 2024: Ruth Newell (M.Sc.) for fall and late spring/early summer botany surveys.
- May 12, 2024, and June 5 & 22, 2024: Fulton Lavender and Richard Hatch for owl and breeding bird's surveys.
- May 22, 2024: Mark Pulsifer (M.Sc.) for a wildlife survey.
- August 13-14, 2024: Patrick Stewart (M.Sc.), Kyra Scott (B.Sc.), and Leah Mymin, (B.Sc. student) for site reconnaissance and wetland, water quality & fish habitat assessments.
- July 22, 2024: Chris Pepper for a lichen survey.

3 SITE LOCATION AND STUDY AREA

The New Annan Pit is located at 3967 Truro Road, East New Annan, in Colchester County, Nova Scotia, at approximately NAD83 UTM Zone 20, Easting 476801 meters and Northing 5047387 meters. The study area for the assessment encompasses the current gravel pit and the proposed expansion area as shown on Figure 1; on Google Earth satellite imagery from May 18, 2024 (Figure 2); Figure 3; and on Map A-1 (Appendix A). The proposed quarry expansion area will be located within the property lot (PID 20098935) and will occupy approximately 17.42 ha of the larger 23.9 ha property.

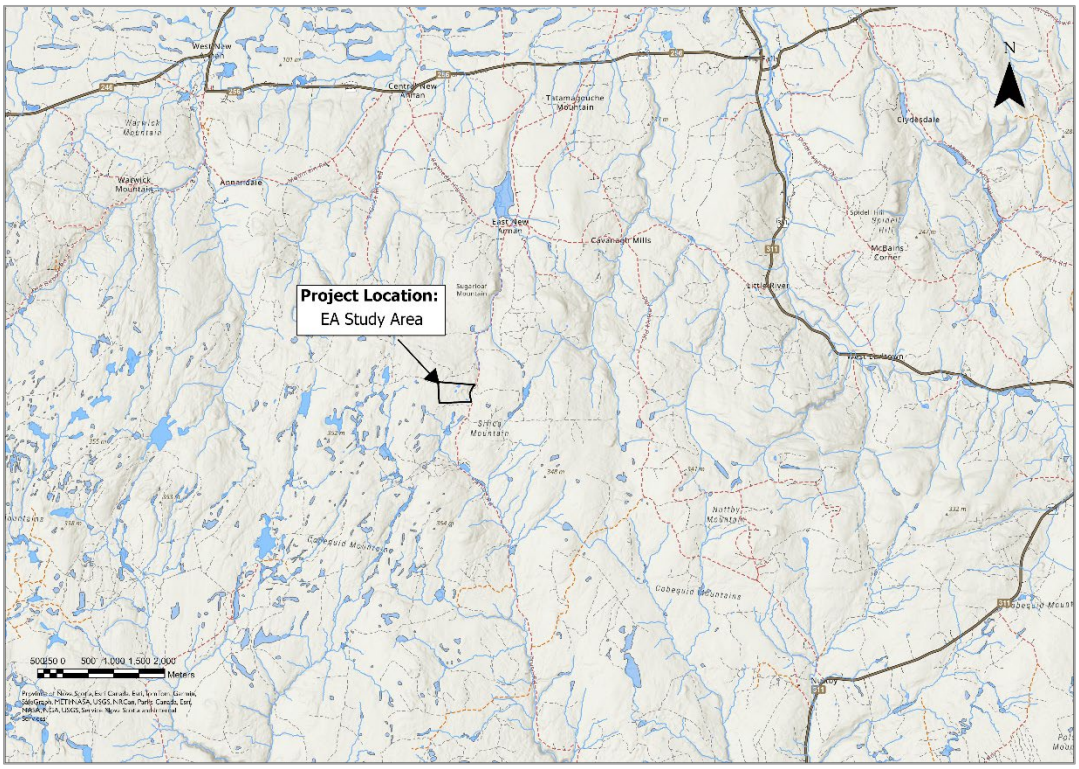

Figure 1. Project location shown on NTS 1:50,000 mapping (011E11).

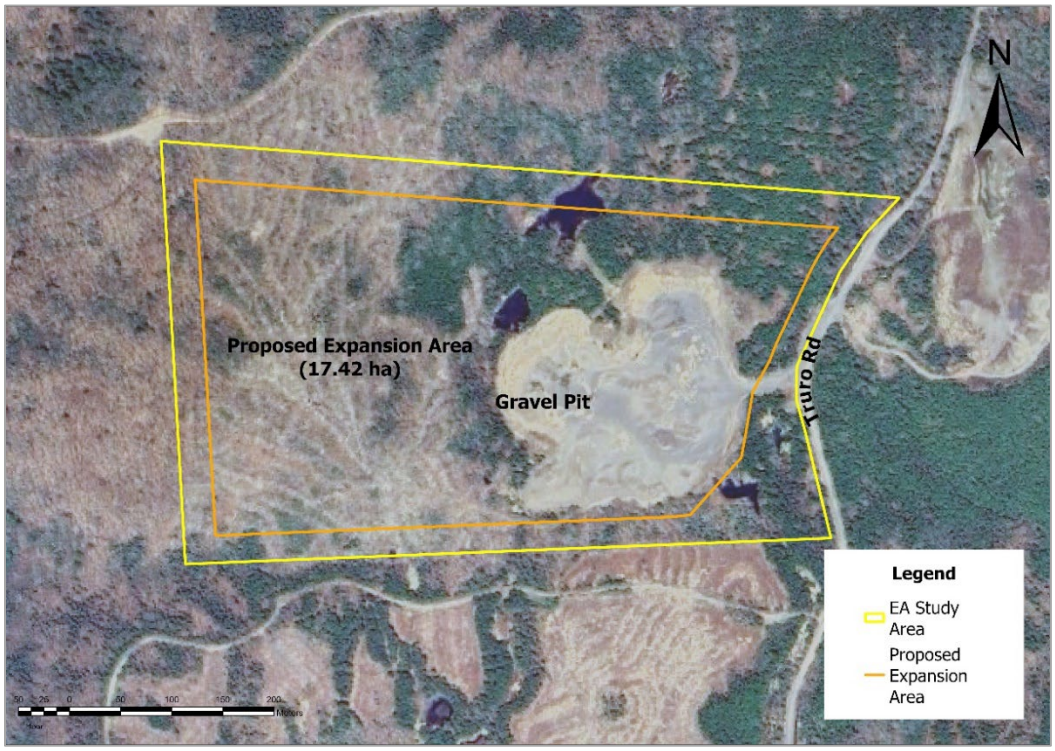

Figure 2. View of the New Annan Pit and proposed expansion area for quarry.

Figure 3. View of the New Annan Pit facing south, August 13, 2024.

4 EXISTING ENVIRONMENT

4.1 PHYSICAL ENVIRONMENT

4.1.1 Climate and Winds

The New Annan Pit is located inland but has some marine influence on climate from the Northumberland Strait, 25 kilometers to the north. Proximity to the ocean results in a cool, humid, temperate climate in which the weather displays variability during all seasons. Winters are cold with high snowfall, and springs are late, cool, and cloudy and summers are warm and humid. Highest levels of precipitation as rain are experienced in the fall.

Average temperatures range from -6.7 degrees Celsius in January to 18.9 degrees Celsius in July (Figure 4) and mean annual precipitation from 1991-2020 averages 1,178.5 mm. Frost-free days average around 134 days per year (Canadian Climate Normals 2024). Wind direction and air pressure tend to remain consistent throughout the entire year, wind direction predominantly from the west and the average sea level pressure sits consistently at around 101.4 kPa. The site is expected to experience winds which are above average in severity due to the elevation and position of the site in the Cobequid Highlands which forces winds upward, and consequently these areas are also prone to local cloud and thunderstorm formation and shower activity (Nav Can 2013).

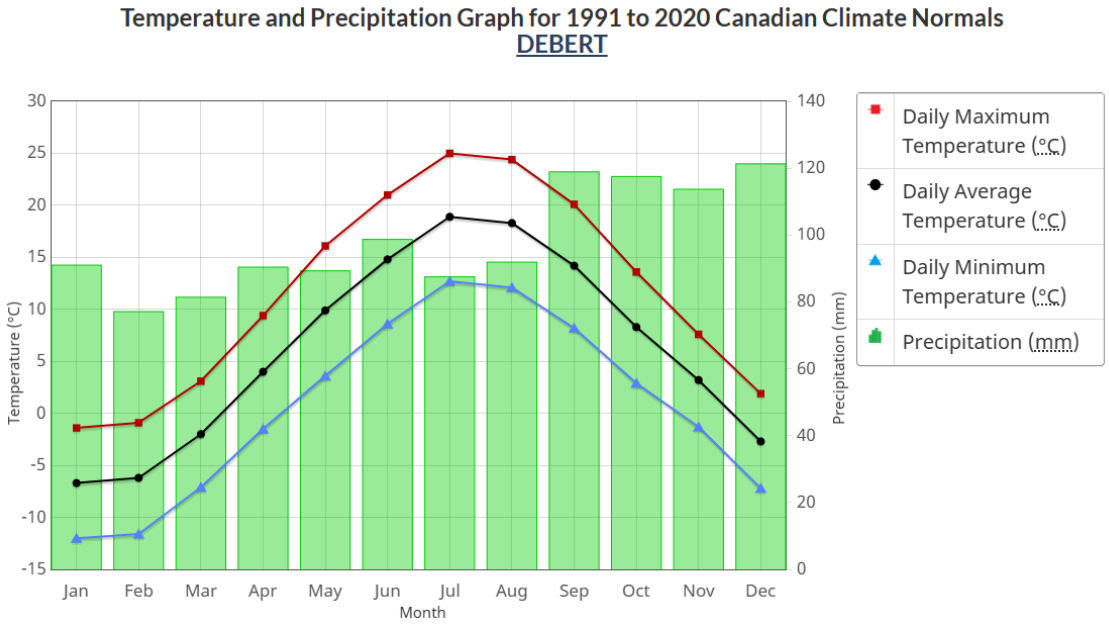

Figure 4. Annual temperature and precipitation cycle for New Annan Pit using observations from Debert (1981-2020) located about 20 km southwest of the site (Canadian Climate Normals 2024).

4.1.2 Topography and Geology

4.1.2.1 Landscape

The New Annan Pit and associated study area are located in the Cobequid Hills, a prominent landscape feature which forms the focal point of EcoDistrict 340—a roughly 150 km long northwest-southeast

oriented ellipsoid stretching from west of Pictou to near Cape Chignecto (Bush and Baldo 2019). This area is characterised by a gently rolling hills to steeply-sloped terrain and soils which provide good to moderate

Figure 5. Looking northwest toward pit bordered by forested areas (i.e., dominated by mixed woodland, softwood and hardwood stands) (top left photo) while non-forested areas are present with the western portion of the study area (top right photo). Several wetland areas with the eastern end of the property are also present (bottom photos). August 13-14, 2024.

drainage. Elevations are generally 200 to 300 m above sea level, including one of the highest points in mainland Nova Scotia, Nuttby Mountain at 360.6 m located approximately 6.4 km southeast of the quarry.

Hardwood forest cover predominates (about 66%), with smaller amounts of mixed forest and softwood forest and a small proportion (1.5%) occupied by wetlands. Predominant hardwoods are Sugar Maple, Yellow Birch, White Ash, and American Beech on hilly topography and slopes with well-drained soils (Bush and Baldo 2019). Softwood dominants are Red Spruce and Black Spruce on hummocky terrain and plateaus with imperfectly drained soils. Mixed woods include all the species present in the hardwood and softwood forests and typically occupy hummocky uplands.

Topography at the site is comparatively level, sloping gradually (approximately 3-6% slope) from northwest to the south and southeast within the study area. In the southeast corner of the property, slope is south to north. The typical landscape within the study area is illustrated in Figure 5. Forested areas surrounding the pit are dominated by mixed woodland, softwood and hardwood stands while non-forested areas are present with the western portion of the study area (i.e. the area was formerly dominated by hardwood and had been clearcut in 2021/2022). Several wetlands occurring in the eastern end of the study area (see Section 4.2.4) include a riparian shrub swamp, two graminoid marshes, a shrub swamp, and a swamp/marsh complex. Soils in the area are well to moderately well-drained. Hardwood, softwood, and mixed wood forms the land cover in the general of the study site, and recent logging in the surrounding area of the study area has reduced overall natural forest cover there.

4.1.2.2 Bedrock Geology

The New Annan Pit study site is located over the early Carboniferous Byers Brook Formation (Figure 6), which consists dominantly of rhyolite with lesser amounts of basalt and interbedded conglomerates (Pe-Piper and Piper 2003). The Byers Brook Formation is conformably overlain by the basalts, conglomerates, and sandstones of the Diamond Brook Formation to the northeast. The Wentworth Pluton intrudes the Byers Brook Formation to the southwest. The youngest portions of the Wentworth Pluton are of the same age as the Byers Brook Formation and likely represent the subvolcanic magma chamber from which the Byers Brook rhyolites erupted (Piper 1999). The Byers Brook Formation has potential for occurrence of uranium mineralization. Mercator Geological Services (Mercator) conducted a geological assessment at the site on behalf of Dexter, including drilling and examination of surface features, to better understand the potential for uranium occurrence within the proposed expansion area. No bedrock uranium occurrences were identified in the proposed expansion area, and no obvious indicators of significant risk for uranium presence were found (Mercator 2024). The study recommended, however, that systematic monitoring for uranium be carried out, and Dexter has indicated that monitoring will be conducted as the quarry is developed.

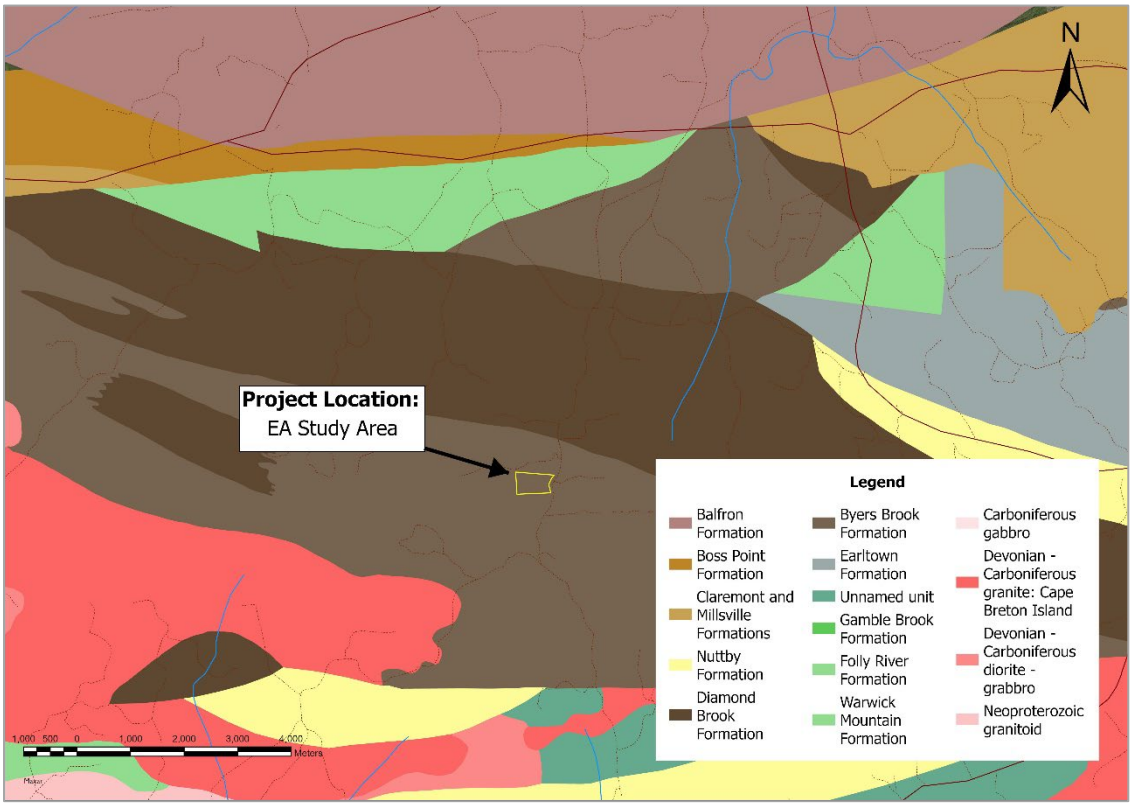

Figure 6. Bedrock geology in the vicinity of the EA Study Area (Keppie 2000).

4.1.2.3 Surficial Geology

The landscape near the New Annan Pit is gently rolling with moderate elevation. The gravel deposit which supports the present pit operation was produced by a subglacial water flow. The proposed expansion would extend operations into an area dominated by bedrock both exposed and covered by a thin layer of stony basal till derived from local sources, with a lesser extent of silty basal till in the north and south. These materials are generally well drained; however, on steep slopes, basalt till, bedrock fragments, soil, and organic material are mixed by downslope creep and mass wasting events to produce more recent mixed deposits. The resulting sediments are poorly drained, nutrient poor, and generally poor prospects for agriculture or building, with the exception of the small areas of silty basal till (Stea *et al.,* 1992) (Figure 7).

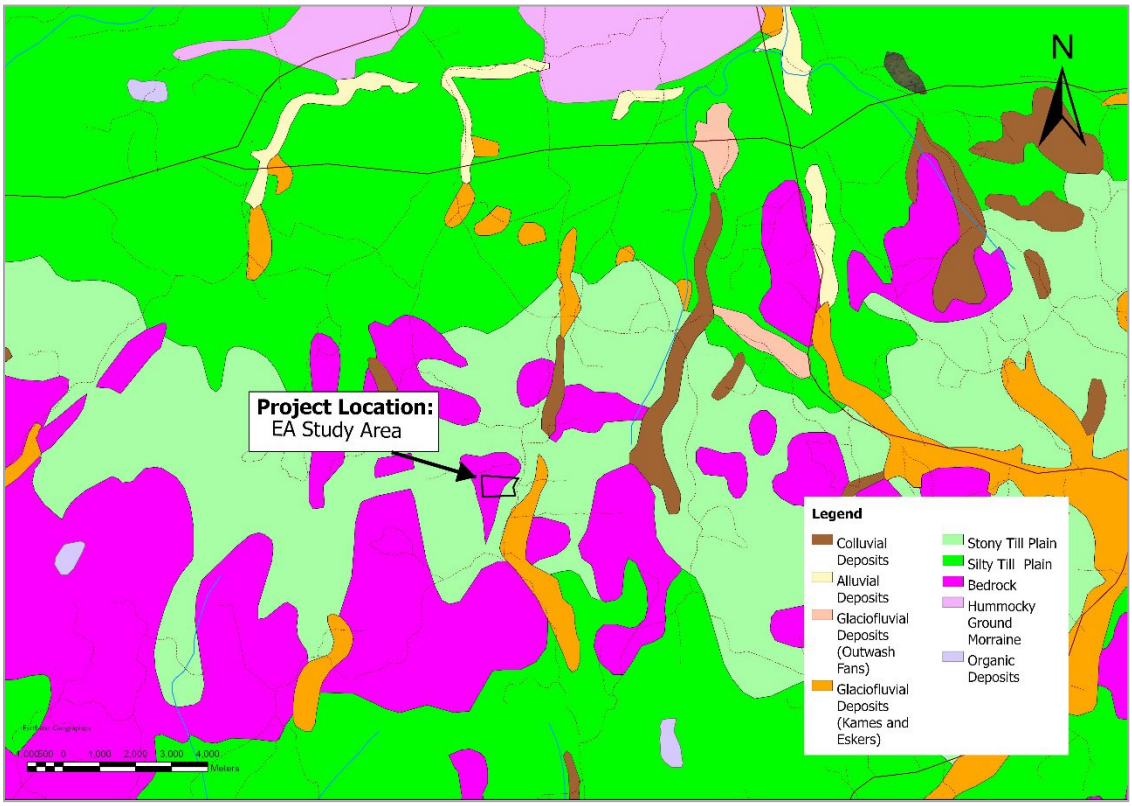

Figure 7. Surficial geology in the vicinity of the EA Study Area (Stea et al., 1992).

4.1.3 Air Quality, Noise, and Light

The East New Annan area experiences low levels of artificial light, high air quality, and low levels of ambient noise. No large urban centers occur in the area which could be a source for artificial light. The Debert weather station reports an air quality rating of 2 (low risk) for the area and air quality is expected to be good due to the remote rural location and predominantly natural setting. Ambient noise levels at the pit reflect traffic and operation noise along the Truro Road, as well as noise from traffic and operations of the pit.

Vehicle lights from nearby Highways 256 and 311, Truro Road, adjacent pit/quarry and logging sites, and yard lights from residences in the vicinity, would be the main sources of artificial light at the area, and due to the low population density, light levels are expected to be low. If lighting was used at the quarry for nighttime operations, 'sky shine' from operations when low cloud occurs might be seen from adjacent communities of area (i.e., East New Annan).

The surrounding area of the study site is expected to have a relatively high natural baseline air quality typical of areas with a high proportion of natural landscapes such as neighboring forested areas. Low levels of human activity, including vehicle traffic along Highways 256 and 311, Truro Road, as well as that associated with pit/quarry as well as logging activities in the area, have little impact on overall air quality at the site. Dust and vehicle exhaust emissions from pit and quarry activities as well as regular residential and other industry vehicle traffic are the main contributors to particulates and exhaust emissions, which are expected to be at low levels as a result of these activities.

The quarry and associated movement of trucks and equipment would continue to provide a minor and periodic source of noise in the area. Operations at the quarry will be temporary and occasional, when Dexter has work in the local area, and are likely one of the main noise sources in the area. Operational noise would not be heard in the closest community to the site—East New Annan. Blasting is expected to occur one to two times per year during years in which the quarry is active.

Operation of a portable crusher, asphalt plant, and heavy equipment may take place periodically and temporarily add to noise levels when the quarry is in operation. Trucks are used to transport aggregate products and move the portable equipment as required. Typical noise includes blasting and sounds from the crusher, asphalt plant and other heavy equipment operations (e.g. motors, generators, back-up signals etc.). Other than the addition of blasting and the gradual increase in the total operational footprint, site activities are not planned to change in scope or increase in frequency. Ambient noise levels in general are expected to be low due to the relatively isolated location of the quarry. All trucks leaving the site are required to follow best operational practices established by Truckers Association of Nova Scotia (TANS) and the Nova Scotia Road Builders Association (NSRBA), to minimize emissions. Noise levels arising from the quarry in the future will continue to meet the limits established in the Nova Scotia Pit and Quarry Guidelines and are expected to be consistent with those produced by the existing pit operations at the site.

4.1.4 Hydrology

Land at the site slopes to the southeast, east and north in a small catchment (90.1 ha, Fraser 2024)(Figure 8) in the headwaters of Fourmile Brook, a tributary of Waughs River. Waughs River originates near West Earltown and flows to meet Tatamagouche Bay, Northumberland Strait near the community of Waughs River. Only a small permanent watercourse—a headwater tributary of Fourmile Brook—was identified at the site during the August survey, flowing north through the southeast corner (Figures 8-10).

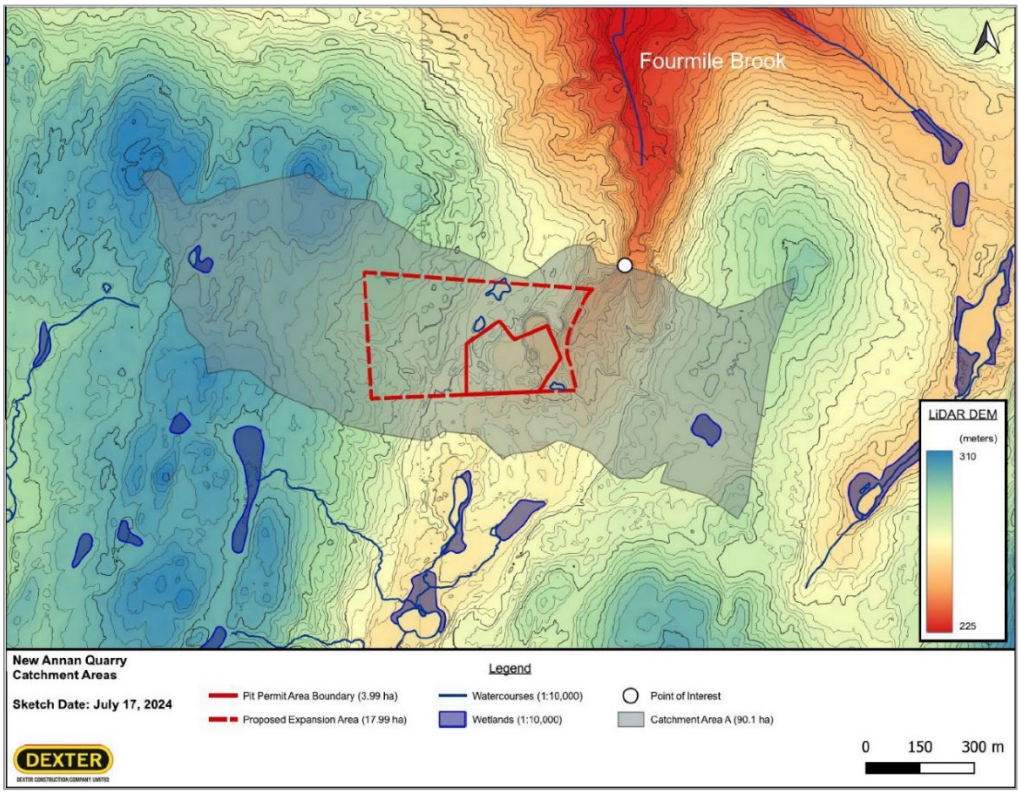

Figure 8. Catchment area for proposed New Annan Quarry Expansion. From Fraser (2024). Note: "Point of Interest" = discharge point of catchment.

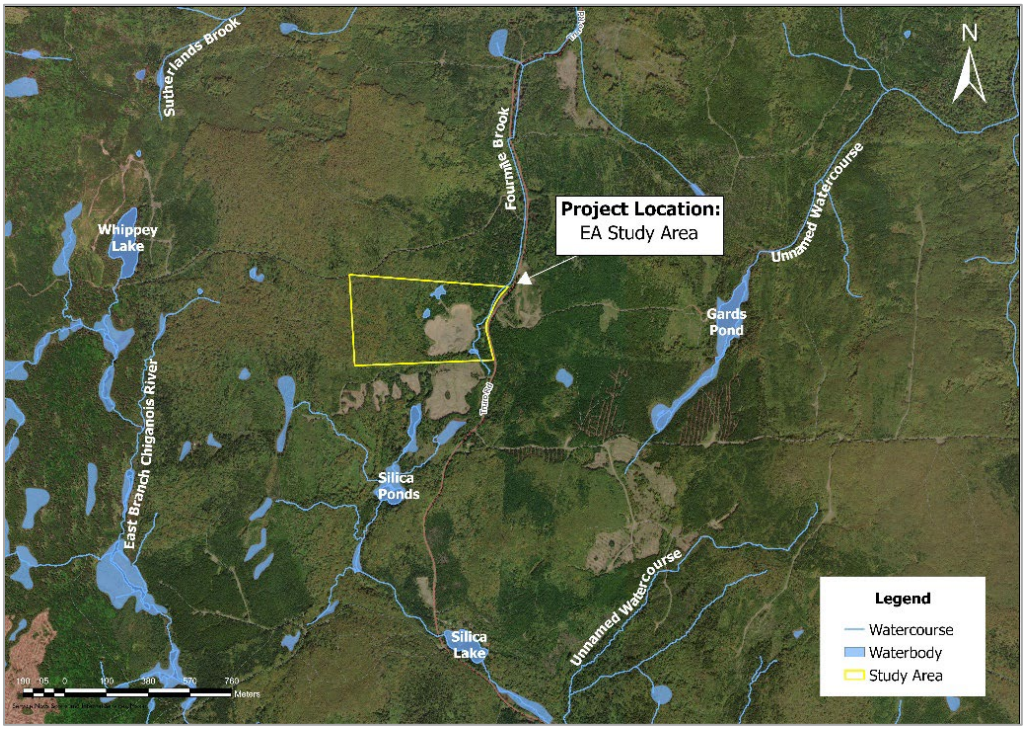

Figure 9. Streams and water bodies near and within the proposed New Annan Quarry Expansion.

Figure 10. A tributary of Fourmile Brook, flowing north through the southeast corner of the property, August 13, 2024.

4.1.5 Hydrogeology

The site is underlain predominantly by basalts, conglomerates, and sandstones of the Diamond Brook Formation, with a thin veneer of stony glacial till and surface soil over much of the site, and with a deposit of sand and gravel on the northeast side. Groundwater develops mainly in cracks and fractures, on horizontal surfaces between strata in bedrock, as well as in shallow till and deeper surficial sand and gravel at the site. The bedrock water table at the site is below the floor of the existing pit based on site observations and the current understanding of drainage characteristics of the study area. The actual depth of the bedrock water table at the quarry site is not known, but it has not been encountered during previous pit operations, and it is not anticipated that the quarry expansion will reach the bedrock water table. Surficial and shallow groundwater flow is anticipated to mirror the topographic slope that flows predominantly east.

Precipitation reaching the quarry is expected to infiltrate the quarry floor or to leave via ditches and outflows towards the unnamed headwater tributary of Fourmile Brook, while some is expected to enter groundwater as seepage through cracks and fractures.

4.1.6 Soils

Soils within the Cobequid Hills area generally consist of sandy loams, with high fertility zones associated with the mixed hardwood portions, and low to medium fertility areas producing the spruce dominated portions (Bush and Baldo 2019). Overall, the soils in Cobequid hills are characterized by a relatively thin till layer, and much exposed bedrock; these features largely contribute to soil development. Glaciofluvial sand and gravel deposits are relatively common along the ridges and valleys (Bush and Baldo 2019).

The predominant soil type is Wyvern, a gravely sandy loam over shallow stony till derived from granite (Webb *et al.* 1991). Lower quality podzolic soils are the dominant soil type surrounding the New Annan Pit; identified soil components being 60% Humo-Ferric Podzol and 5% unspecified gleisoil. The soils in the area are well to moderately well drained. Podzolic soils are common overlaying igneous rock bodies and are sourced from sandy parent material. Examination of the podzol present on site indicated it is a Humo-Ferric Podzol which tends to be acidic and contain significant amounts of Fe and Al.

4.2 BIOLOGICAL RESOURCES AND HABITAT

4.2.1 Terrestrial Environment

Primary terrestrial habitats within the study area include mixed woodland, coniferous woodland and deciduous woodland. A newly-regenerating clear-cut area occurs in the western end of the property; and other habitats include the existing gravel pit and several wetlands which are situated in the eastern portion of the property (i.e., small ponds and associated marshes and swamp) (Map A-3).

No invasive species were present in terrestrial habitats, and the majority consisted of both native species with secure populations in Nova Scotia, as well as exotic species. One invasive species and two species of conservation of concern did occur in wetland habitats (see section 4.2.4). Plant species found at the site during October 3, 2023, and June 19, 2024 (fall and late spring/early summer) botany surveys, are presented in the survey report (Appendix B).

Woodlands present within the survey area consist of mixed stands (Figure 11), occasional, small, primarily coniferous stands (Figure 12) and a deciduous stand (Figure 13). Vascular plant species observed within mixed woodland occurring north and west of the pit include Red and Sugar Maple (*Acer rubrum*, *A. saccharum*), White and Yellow Birch (*Betula papyrifera*, *B. alleghaniensis*), Red Spruce (*Picea rubens*), Balsam Fir (*Abies balsamea*), Beaked Hazelnut (*Corylus cornuta*), Alternate-leaved Dogwood (*Cornus alternifolia*), Red Elderberry (*Sambucus racemosa*), Eastern Hay-scented Fern (*Dennstaedtia punctilobula*), Black Sedge (*Carex arctata*), Hairy Flat-topped White Aster (*Doellingeria umbellata*), Rough Goldenrod (*Solidago rugosa*), Whorled Wood Aster (*Oclemena acuminata*), Calico Aster (*Symphyotrichum lateriflorum*), Bunchberry (*Cornus canadensis*), Yellow Bluebead Lily (*Clintonia borealis*), Dwarf Red Raspberry (*Rubus pubescens*), Tall Meadow-rue (*Thalictrum pubescens*), Wild Sarsaparilla (*Aralia nudicaulis*), Lady Fern (*Athyrium filix-femina*), Zigzag Goldenrod (*Solidago flexicaulis*), Canada Fly Honeysuckle (*Lonicera canadensis*), Northern Beech Fern (*Phegopteris connectilis*), Intermediate Wood Fern (*Dryopteris intermedia*), European Mountain Ash (*Sorbus aucuparia*), Beech (*Fagus grandifolia*), Wild lily-of-the-valley (*Maianthemum canadense*), and Common Winterberry (*Ilex verticillata*) (Figure 11).

Figure 11. Open, mixed woodland, north of the pit (20T 0476809, 5047577).

Vascular plant species observed within small coniferous stands (Figure 12) north of the pit, include Balsam Fir (*Abies balsamea*), Red Spruce (*Picea rubens*), Red Maple (*Acer rubrum*), Bunchberry (*Cornus canadensis*) and Evergreen Woodfern (*Dryopteris intermedia*).

The relatively undisturbed woodland (Figure 13) occurring immediately south of the pit is primarily deciduous. Tree species present include Sugar Maple (*Acer saccharum*), Red Maple (*Acer rubrum*), Mountain Maple (*Acer spicatum*), White Birch (*Betula papyrifera*) and Yellow Birch (*Betula alleghaniensis*). Shrubs occurring here include Hazelnut (*Corylus cornuta*), Alternate-leaved Dogwood (*Cornus alternifolia*), Red Raspberry (*Rubus idaeus ssp. strigosus*) and Canada Fly Honeysuckle (*Lonicera canadensis*). Herbaceous species present include Meadow-rue (*Thalictrum pubescens*), Rough Goldenrod (*Solidago rugosa*), Zigzag Goldenrod (*Solidago flexicaulis*), Fowl Manna Grass (*Glyceria striata*), Wild Sarsaparilla (*Aralia nudicaulis*), Lady Fern (*Athyrium filix-femina*), Bunchberry (*Cornus canadensis*), Beech Fern (*Phegopteris connectilis*), Rose Twisted Stalk (*Streptopus lanceolatus*), Trout Lily (*Erythronium americanum*), Brownish Sedge (*Carex brunnescens*) and Fringed Sedge (*Carex crinita*).

Figure 12. Coniferous stand north of the pit (20T 0476779 5047563).

Figure 13. Deciduous woodland located immediately south of the pit.