

**Table 4. Bird species heard or observed during dawn bird surveys conducted May 29, 2022, between 05:30 and 08:55 hrs at the Colpton Quarry study site. For locations of observation points, see Figure 17.**

	White Pine, Red Maple, Heath (Sites 1, 2 and 3)		Mixed Black Spruce, Larch, Balsam Fir, Red Maple (Sites 4 and 5)		Mixed Red Spruce, White Pine, Red Maple (Site 6)		Red Maple Swamp, Beaver Meadow (Site 7)		Clear-cut White Pine, Red Maple, Red Oak, Beech (Sites 8, 9, and 10)	
	No. of sites	Average/ 10 mins	No. of sites	Average/ 10 mins	No. of sites	Average/ 10 mins	No. of sites	Average/ 10 mins	No. of sites	Average / 10 mins
Black-Backed Woodpecker	1	0.33	1	0.50	0	0.00	0	0.00	0	0.00
Downy Woodpecker	0	0.00	0	0.00	0	0.00	1	1.00	0	0.00
Northern Flicker	3	1.00	0	0.00	0	0.00	0	0.00	2	0.67
Pileated Woodpecker	1	0.33	1	0.50	0	0.00	0	0.00	0	0.00
Yellow-Bellied Sapsucker	1	0.33	0	0.00	1	1.00	1	1.00	1	0.33
SUMMARY										
<b>Average Abundance</b>	<b>26.0</b>		<b>27.5</b>		<b>30.0</b>		<b>38.0</b>		<b>25.0</b>	
<b>Total Species per Habitat</b>	<b>27</b>		<b>25</b>		<b>22</b>		<b>24</b>		<b>21</b>	
<b>Average Species/Site</b>	<b>14.3</b>		<b>18.5</b>		<b>18.0</b>		<b>19.0</b>		<b>13.3</b>	

**Table 5. Bird communities at the Colpton Quarry, May 30, 2022. For locations see Figure 17. Dominant species are those which are most common and abundant in the habitat type. Dominant species are bolded.**

Observation Points	Type of Forest	General Location	Species and Relative Abundance	Abundance and Diversity
1,2,3	White Pine, Red Maple and Heath	West, Northwest and North of Existing Quarry	<b>Hermit Thrush, Blue Jay, Black-and-White Warbler, Ovenbird, Olive-sided Flycatcher</b> (2-4 individuals per 10-min).  Co-dominants (2 individuals per 10-min): Northern Flicker, Mourning Dove, Red-eyed Vireo, American Robin and Black-capped Chickadee.	27 species, 26 individuals per 10 min.
4,5	Mixed softwood habitat with Black Spruce, Larch, Balsam Fir and Red Maple	North and east of existing quarry	<b>Hermit Thrush (most abundant), American Robin, Magnolia Warbler, Ovenbird, Blue-Headed Vireo, Least Flycatcher, and Olive-Sided Flycatcher (2 -5 individuals per 10-min).</b>  Co-dominants (2 individuals per 10-min): Palm Warbler, American Redstart, Northern Parula, Blue Jay, Common Yellowthroat, Red-Eyed Vireo, and, Yellow-Rumped Warbler	25 species, 27.5 individuals per 10 min.
6	Mixed Softwood (Red Spruce and White Pine) and Red Maple	Woods on both sides of access road	<b>Magnolia Warbler, Ovenbird, Red-Eyed Vireo, and Veery</b> (3 to 4 individuals per 10-min).  Co-dominants (2 per 10-min): Alder Flycatcher, Black-and-White Warbler, Northern Parula, Ruffed Grouse and Yellow-Rumped Warbler	22 species, 20 individuals per 10 min.

**Table 5. Bird communities at the Colpton Quarry, May 30, 2022. For locations see Figure 17. Dominant species are those which are most common and abundant in the habitat type. Dominant species are bolded.**

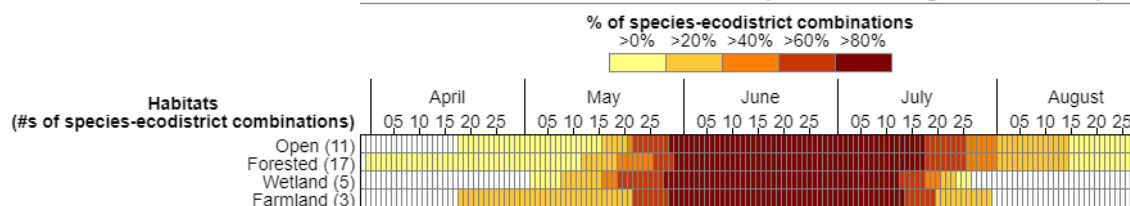
Observation Points	Type of Forest	General Location	Species and Relative Abundance	Abundance and Diversity
7	Mixed softwood forest / open beaver meadow maple swamp	Access road at stream crossing.	<b>Black-and-White Warbler, Red-Eyed Vireo, Alder Flycatcher, American Redstart, and Ovenbird</b> (3 to 4 individuals per 10-min).  Co-dominants (1-2 individuals per 10-min): American Robin, Blue Jay, Black-Throated Green Warbler, Dark-Eyed Junco, Least Flycatcher, Northern Parula, Ruffed Grouse, Veery and Yellow-Rumped Warbler	24 species; highest abundance (38 individuals per 10-min).
8, 9, 10	Mature White Pine, Spruce, Exposed Rock Barren, Recent Clearcut.	South end of study area.	<b>American Robin, Dark-Eyed Junco, Red-Eyed Vireo, and Palm Warbler</b> (2 to 5 individuals per 10-min).  Co-dominants (1 to 2 individuals per 10-min): Blue Jay, White-throated Sparrow, Lincoln's Sparrow, Olive-Sided Flycatcher, Black-and-White Warbler, Hermit Thrush, Common Yellowthroat, Mourning Dove, Northern Flicker, Black-capped Chickadee, and Blue-Headed Vireo.  Dark-Eyed Junco were numerous (12 individuals per 10 min) within 50 m of Point 8.	21 species; 25 individuals per 10 min.

**Table 6. Birds potentially breeding in the Colpton area of Lunenburg County (Maritime Breeding Bird Atlas-Online 2023). Map 20LQ52.**

SWANS, GEESE & DUCKS (ANSERIFORMES: ANATIDAE)	
Canada Goose	Ring-necked Duck
Wood Duck	Common Merganser
American Black Duck	Hooded Merganser
Mallard	
PHEASANTS, GROUSE, TURKEYS & LOONS (GALLIFORMES, PHASIANIDAE)	
Ruffed Grouse	Common Loon
Spruce Grouse	
PETRELS & CORMORANTS (PROCELLARIIFORMES, SULIFORMES)	
Double-crested Cormorant §	
BITTERNS, EGRETS & HERONS (PELECANIFORMES)	
American Bittern	
HAWKS & FALCONS (FALCONIFORMES: ACCIPITRIDAE, FALCONIDAE)	
Bald Eagle ¶	Broad-winged Hawk
Northern Harrier	Red-tailed Hawk
Northern Goshawk	
SHOREBIRDS	
PLOVERS, SANDPIPERS, SNIPES & GULLS (CHARADRIIFORMES, SCOLOPACIDAE)	
Spotted Sandpiper	Wilson's Snipe
PIGEONS, DOVES & CUCKOOS (COLUMBIFORMES: COLUMBIDAE, CUCULIFORMES)	
Mourning Dove	
OWLS (STRIGIFORMES)	

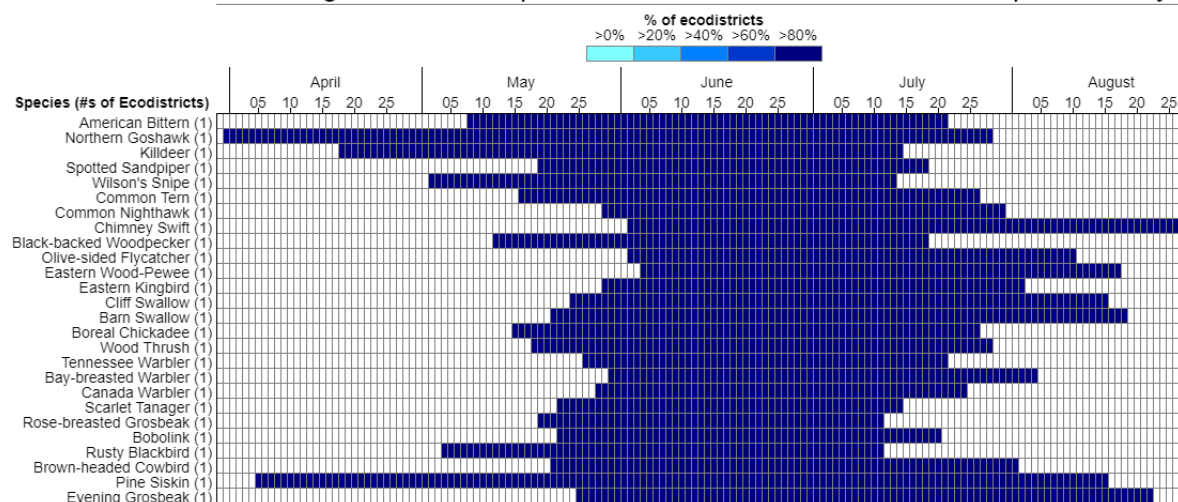
Barred Owl	
SWIFTS (APODIFORMES, APODIDAE) AND HUMMINGBIRDS (APODIFORMES, TROCHILIDAE)	
Ruby-throated Hummingbird	
KINGFISHERS (CORACIIFORMES, ALCEDINIDAE)	
Belted Kingfisher	
WOODPECKERS (ORDER PICIFORMES, PICIDAE)	
Downy Woodpecker	Northern Flicker
Hairy Woodpecker	Pileated Woodpecker
Black-backed Woodpecker	
SONGBIRDS (PASSERIFORMES)	
Olive-sided Flycatcher †	Black-and-white Warbler
Eastern Wood-Pewee	Tennessee Warbler
Yellow-bellied Flycatcher	Nashville Warbler
Alder Flycatcher	Common Yellowthroat
Least Flycatcher	American Redstart
Eastern Phoebe	Northern Parula
Eastern Kingbird	Magnolia Warbler
Blue-headed Vireo	Blackburnian Warbler
Red-eyed Vireo	Yellow Warbler
Gray Jay	Black-throated Blue Warbler
Blue Jay	Palm Warbler
American Crow	Yellow-rumped Warbler
Common Raven	Black-throated Green Warbler
Tree Swallow	Canada Warbler †
Cliff Swallow	Chipping Sparrow
Barn Swallow	Savannah Sparrow
Black-capped Chickadee	Song Sparrow
Boreal Chickadee	Swamp Sparrow
Red-breasted Nuthatch	White-throated Sparrow
Brown Creeper	Dark-eyed Junco
Winter Wren	Scarlet Tanager
Golden-crowned Kinglet	Bobolink
Ruby-crowned Kinglet	Red-winged Blackbird
Swainson's Thrush	Common Grackle
Hermit Thrush	Purple Finch
American Robin	White-winged Crossbill
European Starling	American Goldfinch
Cedar Waxwing	Evening Grosbeak
Ovenbird	House Sparrow
<p>This list includes all species found during the Maritimes Breeding Bird Atlas (1st atlas: 1986-1990, 2nd atlas: 2006-2010) in the region #19 Mersey-LaHave (Lunenburg County). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), † (rare in the Maritimes) or † (rare in the Maritimes, documentation only required for confirmed records). Current as of 21/03/2022. 20LQ52.</p>	

### Ecodistrict 740: LaHave Drumlins (Lunenburg Drumlins) Ecodistrict



**Figure 26. Nesting periods for various habitats in the LaHave Drumlins Ecodistrict (740), previously known as the Lunenburg Drumlins Ecodistrict (Rousseu and Drolet 2015).**

### Nesting Periods for Species of Concern Within 5 km of Colpton Quarry



**Figure 27. Nesting periods for bird Species of Concern found within five kilometers of Colpton Quarry (Canada Jay and Red Crossbil are not included) (Rousseu and Drolet 2015).**

#### 4.2.7 MAMMALS

Various mammal species, both large and small, including game and furbearing species, are found in Lunenburg County and may occur periodically at the quarry site. Mammals expected to occur regularly or occasionally reflect the dominant terrestrial habitat in the surrounding area, which includes mixedwood forests with interspersed wetlands; the majority of which has been cutover at the site. White-tail Deer, Eastern Coyote, Snowshoe Hare, American Mink, Beaver, and Red Squirrel occur at the site, based on observations during the designated mammal survey (Appendix C); and Bobcat are likely present in small numbers due to the presence of Snowshoe Hare within the study area, although they were not observed during the designated wildlife survey. Barren Meadow Brook and its tributaries which flow adjacent to the study area, are large enough to be used for travel by River Otter and Mink with areas of wetland and stillwaters adjacent to the study area that would provide habitat for Otter, Muskrat, Mink and Short-tailed Weasel (Pulsifer 2022, Appendix C). These species and others may utilize the study area seasonally as part of their home range. Moose have been reported in the general area of the study site, the closest record being 11 kilometers from the property, although no sign of moose was observed during the May 17-18, 2022 wildlife survey. The area features both regenerating forest and wetland habitats that could support moose as a part of their home range; however the Colpton Quarry is not within the designated core habitat

identified for Mainland Moose in Nova Scotia (Pulsifer 2022; NSNRR 2021). Black Bear may also utilize portions of the regenerating, cutover forest and other forested areas as part of their home range. Other mammals that may occur in the general area include Fisher and American Marten, although neither have been documented within 10 kilometers of the study area and no suitable habitat occurs within the study area. Rodents and other small mammals potentially occurring include Deer Mouse (*Peromyscus maniculatus*), White-footed Mouse (*P. leucopus*), shrews, Eastern Chipmunk and Raccoon.

Three endangered bats (Little Brown Bat, Northern Myotis Bat and the Tri-coloured Bat) which were formerly relatively common throughout Nova Scotia, are now federally and provincially listed as endangered with recent population declines due to a fungus infection (White Nose Syndrome). Distributions are centred in areas where there are overwintering sites (hibernacula – where bats overwinter and raise young) which are not infected. Hibernacula are typically abandoned mine shafts, caves and old buildings. There is potential for hibernacula to occur in the vicinity of the Colpton Quarry due to former gold-mining activity at the site and in the immediate environs. Six (6) abandoned mine openings / mine shafts have been located within the study area, predominantly in the recently cutover area within the southern two-thirds of the study site; and an additional 43 other abandoned mine openings within a two kilometer radius (Nova Scotia 2023; CRA 2022). At least some, and possibly all of the mine openings are filled in. From hibernacula<sup>5</sup> bats range widely in the summer, localizing in areas with a good food supply. The presence of wetlands and watercourses within the study area and immediate surrounding area suggests potential roosting (overnight stays) and foraging habitat if bats were present (NSNRR 2020). Because of low population numbers overall, occurrences of significant numbers of roosting and feeding individuals in any areas in particular are unlikely, although due to the presence of old mine shafts if used for hibernacula, additional numbers may occur in the area over an extended period of the year (e.g. nesting, roosting and swarming). An acoustic bat detector was deployed for a short time on the evening of May 17, 2022 as part of the wildlife survey but no bats (expected to be those embarking on nightly feeding if present) were detected. Two of the three endangered bat species have been recorded within 3.8 kilometers from the quarry site, while the third species was recorded within 7 kilometers (ACCDC 2022). The Colpton Quarry is not within critical habitat that has been mapped for the recovery plan for bats (NSDNRR 2020 as cited in Pulsifer 2022).

#### 4.2.8 REPTILES AND AMPHIBIANS

Some of the common Nova Scotian amphibians and reptiles, as some which are more uncommon or rare, are expected to occur at the site. The small watercourses, intermittent flowages, ponds and vernal pools, wetlands and riparian areas likely support amphibian species. During a designated wildlife survey on May 17-18, 2022, the calls of a Green Frog, Pickerel Frog, and Northern Spring Peeper were heard. A site reconnaissance survey conducted on July 6-7, 2022 observed an American Bullfrog, and tadpoles were noted in the quarry sump. Although not observed during the site surveys, salamanders (e.g. Red-spotted Newt, Blue-spotted Salamander, Yellow-spotted Salamander, and Eastern Redback Salamander) are also likely occur through the study area. The exposed and weathered bedrock within the quarry create numerous talas

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<sup>5</sup> The Province of Nova Scotia does not release the location of locally known and active hibernacula for bats in order to avoid them being disturbed by the public.

slopes that provide protection and overwintering for small reptiles such as snakes including the Maritime Garter Snake, Eastern Smooth Green Snake and Northern Redbelly Snake.

A Snapping Turtle was observed swimming through the culvert under the quarry access road on unnamed tributary 1 during a site reconnaissance survey on July 7, 2022 (Figure 28), and Blanding's Turtle and Eastern Ribbonsnake have also been observed within one kilometer of the study area suggesting that these three species may occasionally be present seasonally, principally in wetlands within and around the Colpton Quarry area (ACCDC 2022; Pulsifer 2022). Blanding's Turtle, Snapping Turtle, and Eastern Ribbonsnake occupy similar habitats, which include shallow, vegetated and slow-moving bodies of water, slow streams and wetlands. These important habitat features can be found in or immediately adjacent to the area to the north, west and east, including within Unnamed Tributary 1, Unnamed Tributary 2 and their respective surrounding wetland habitats (Pulisfer 2022). The study area contains designated critical habitat for both Blanding's Turtle and Eastern Ribbonsnake, both of which have centres of population west of the site. Recovery plans in Nova Scotia for the Blanding's Turtle includes approximately 12 hectares of the Colpton Quarry study area located in the northwest corner of the property, and falls within the Pleasant River critical habitat parcel (NSDLF 2020<sub>2</sub>). Likewise, critical habitat for Eastern Ribbonsnake has also been mapped within the northern part of the quarry property and has been identified in the Nova Scotia recovery plan as the Barren Meadow-Keddy Brook parcel (NSDLF 2020<sub>3</sub>). Additional Eastern Ribbonsnake critical habitat can be found within 1.5 kilometers of the quarry, identified as "Fox Lake" and "Seven Mile Lake" parcels.



**Figure 28. Snapping turtle observed in the inflow of culvert under the quarry access road on Unnamed Tributary 1, July 6-7 2022.**

#### 4.2.9 SPECIES AT RISK

**Background:** Species at Risk are plants or animals whose existence is threatened, or which are in danger of being threatened, by human activities or natural events. The Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC) presently recommends species to be listed for legal federal protection under the federal *Species at Risk Act* (SARA). At the provincial level, the Nova Scotia Species at Risk Working Group completes assessments and recommendations for a species' status. Nova Scotia maintains a list of legally protected species under the *Nova Scotia Endangered Species Act* (ESA). A third



status list is the *sub-national ranks* (S-ranks), which is a provincial system used for ranking species rarity or conservation status as a tool for identifying gaps in knowledge for species for which occurrence data are maintained. S-ranks are specific to a province and consider a variety of factors including number of occurrences, distribution, population size, abundance trends, and threats. Species listed as “S1” (any species known to be, or believed to be critically imperiled due to extreme rarity or steep declines), and “S2” (any species known to be, or believed to be, imperiled due to restricted ranges, few populations, or steep declines) are considered priority species<sup>6</sup>, and “S3” species (any species known to be, or believed to be, vulnerable due to restricted ranges, few populations, or steep declines). Species listed as “S3” are uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations (21 to 100 occurrences). Species that may be at risk of extirpation or extinction are candidates for a detailed risk assessment by COSEWIC, or provincial or territorial equivalents. The Nova Scotia *Biodiversity Act* sets guidelines for activities in the vicinity of species at risk on Crown Land and also provides guidance for private land owners for working near these species.

**Survey Results:** Species of plants and animals which are of conservation concern and which were found in the study area during surveys are presented in Table 7. The Atlantic Canada Conservation Data Centre (ACCDC) maintains a database of records of species of conservation concern listed under federal or provincial legislation as well as with general status. Species of conservation concern in the database that occur within five and 10 kilometres of the Colpton Quarry (Tables 8 and 9 respectively) include both animals and plants. No plants of conservation concern were identified during spring and fall botany surveys of the site<sup>7</sup>. Smooth Alder (*Alnus serrulate*) (S3 rank), Bog Willow (*Salix pedicellaris*) (S3 rank), and Blunt-leaved Bedstraw (*Galium obtusum*) (S2S3 rank) have been observed on site near the edge of the shrub bog/fen complex in the northeast corner of the study area (ACCDC 2022). In addition, Philadelphia Panic Grass (*Panicum philadelphicum*) (S3S4 rank) and Bicknell's Crane's-bill (*Geranium bicknellii*) (S3 rank) have been observed on the active quarry's southeast edge and Toothed-leaved Nitrogen Moss (*Tetraplodon angustatus*) (S3 rank) has been observed near the southwest corner of the study area (ACCDC 2022). Black Ash (*Fraxinus nigra*), a location-sensitive plant species, is listed as threatened by COSEWIC and NS ESA and has been reported within 1.6 kilometers of the study site (ACCDC 2022). Black Ash are typically found in poorly drained areas that are often seasonally flooded, such as wetlands (COSEWIC 2018; NSNRR 2015). A designated lichen survey conducted on September 19, 2022 found two lichen species of concern within the study area. Two separate observations of both Wrinkled Shingle Lichen (*Pannaria luida*) (S2S3 rank) and Blistered Tarpaper Lichen (*Collema nigrescens*) (S3 rank) were observed in the treed swamp habitat near the northeastern corner of the quarry property. Hibernia Jellyskin Lichen (*Leptogium hibernicum*) (S1 rank) has also been observed within five kilometers of the study area (ACCDC 2022).

The softwood and mixed wood habitats within the study site potentially support many bird species of conservation concern from time to time. Federally listed bird species of conservation concern occurring within five kilometers of the study site include Olive-sided Flycatcher, Canada Warbler, Bobolink, Barn

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<sup>6</sup> Definitions of all S-Ranks are presented in Table 5.

<sup>7</sup> A small number of variegated Horsetail (*equisetum variegatum*) plants were found on the northern edge of the open quarry. This species has been listed by the 2015 Wild Species of Canada Report as a S3 (vulnerable/yellow) but has been more recently listed by the ACCDC as S4 (apparently secure)

Swallow, Rusty Blackbird, Chimney Swift, Common Nighthawk, Wood Thrush, Evening Grosbeak, and Eastern Wood Pewee. Of the species listed, Olive-sided Flycatcher and Canada Warbler typically are found in wetland habitats, including treed and shrubby grassy swamps around bog/fen wetlands for Canada Warbler, and treed (black spruce) sphagnum bogs for Olive-sided Flycatcher, both habitats which can be found at the site. Open fields, marshes, swamps, etc. are typical habitat for Barn Swallow and Bobolink, and therefore may occasionally occur at the site. Rusty Blackbird are typically associated with forest wetlands such as slow-moving streams, peat bogs, sedge meadows, marshes, swamps, beaver ponds and pasture edges during breeding season, and may occur within the wetlands within the study area. Chimney Swifts prefer wetland habitats, including areas with large hollow trees for nesting; and Common Nighthawk nest in open areas with little ground vegetation including logged or burned over areas, forest clearings, rocky outcrops and peat bogs, and both may potentially occur at the site. Wood Thrush prefer habitat in moist deciduous hardwood forests or mixed stands, that have often previously been disturbed by small scale logging or ice storms, and may be present on the quarry site. Evening Grosbeak and Eastern Wood Pewee prefer open, mature, mixed wood forests where fir species or white spruce are dominant, and are unlikely to occur as most areas proposed for the expansion contain cutover previously mixed or hardwood stands. Common Nighthawk may nest at the site and two pairs were heard at the quarry. Olive-sided Flycatcher were relatively abundant in the treed swamp wetland north of the active quarry pit and off property in the softwood forest adjacent to the east of the clearcut area (refer to Section 4.2.6).

Other animals of conservation concern in this part of Nova Scotia includes Mainland Moose (listed provincially as endangered), which has been observed as occurring within 11 kilometers of the study site; however, no moose or sign of moose were seen during the May 2022 mammal survey (Appendix C). The combination of aquatic habitats with abundant browse, and areas with high production of mast [the edible parts of woody plants], may be attractive to Moose at specific times of year, and therefore, Moose may use this area to meet some of their seasonal life-cycle needs. Snapping Turtle (listed as special concern by COSEWIC and SARA, and vulnerable by the ESA) was observed in Unnamed Tributary 1 near the quarry access road during the July 2022 survey and may occur within other watercourses and wetlands within the study area. Wood Turtle (federally and provincially listed) have been observed within 15 kilometers of the study site; however the species is considered location-sensitive (NSNRR personal communication 2022) and may potentially occur at or near the quarry site (ACDC 2022). Blanding's Turtle and Eastern Ribbonsnake have been observed within one kilometer of the study area and occupy similar habitats, which include shallow, vegetated and slow-moving waterbodies and wetlands. These important habitat features can be found in or immediately adjacent to the Colpton Quarry, suggesting potential habitat for these species (Pulisfer 2022). The Harlequin Darner (S3S4 rank) (a dragonfly) has been recorded as occurring within the quarry site and the preferred habitat for these insects includes wetlands, wooded swamps and ponds, which can be found within the study area (ACDC 2022). Although Canada Lynx and American Marten, which are both currently listed as "endangered" under the *NS Endangered Species Act*, have not been observed within 39 and 26 kilometers of the study site, respectively, these species are of concern due to low numbers and may occasionally occur. No sign of these species was found on the wildlife survey of the site (Appendix C). The Little Brown Myotis (*Myotis lucifugus*), Long-eared Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) (all federally and provincially listed as endangered) are species of concern potentially occurring within the area. Little Brown Myotis and Long-eared Myotis have been recorded within four kilometers of the Colpton Quarry, while the Tricoloured Bat has been reported within 7 kilometers of the study area (NSDNRR 2020 as cited in Pulsifer 2022). The presence of mature trees and snags for roosting



cover, as well as open water and bog wetland types within the study area can be utilized for a source of aerial insects and suggests any of the three endangered bat species could use the Colpton Quarry site during the year. Bats typically overwinter in abandoned mine shafts, natural caves, and old buildings. There are six (6) abandoned mine openings within the study area with an additional 43 located within a two kilometer radius (Nova Scotia 2023). Numbers of bats are exceedingly low in most areas of Nova Scotia due to the White-Nose Syndrome, and occurrences are extremely unlikely at the quarry site due to the low overall numbers; nonetheless, there is potential for bats to occur, due to the presence of ideal roosting, foraging, and hibernacula habitat.

A list of plants and animals of concern within a 5, 10 and 100 kilometer radius of the study site is included in Appendix C.

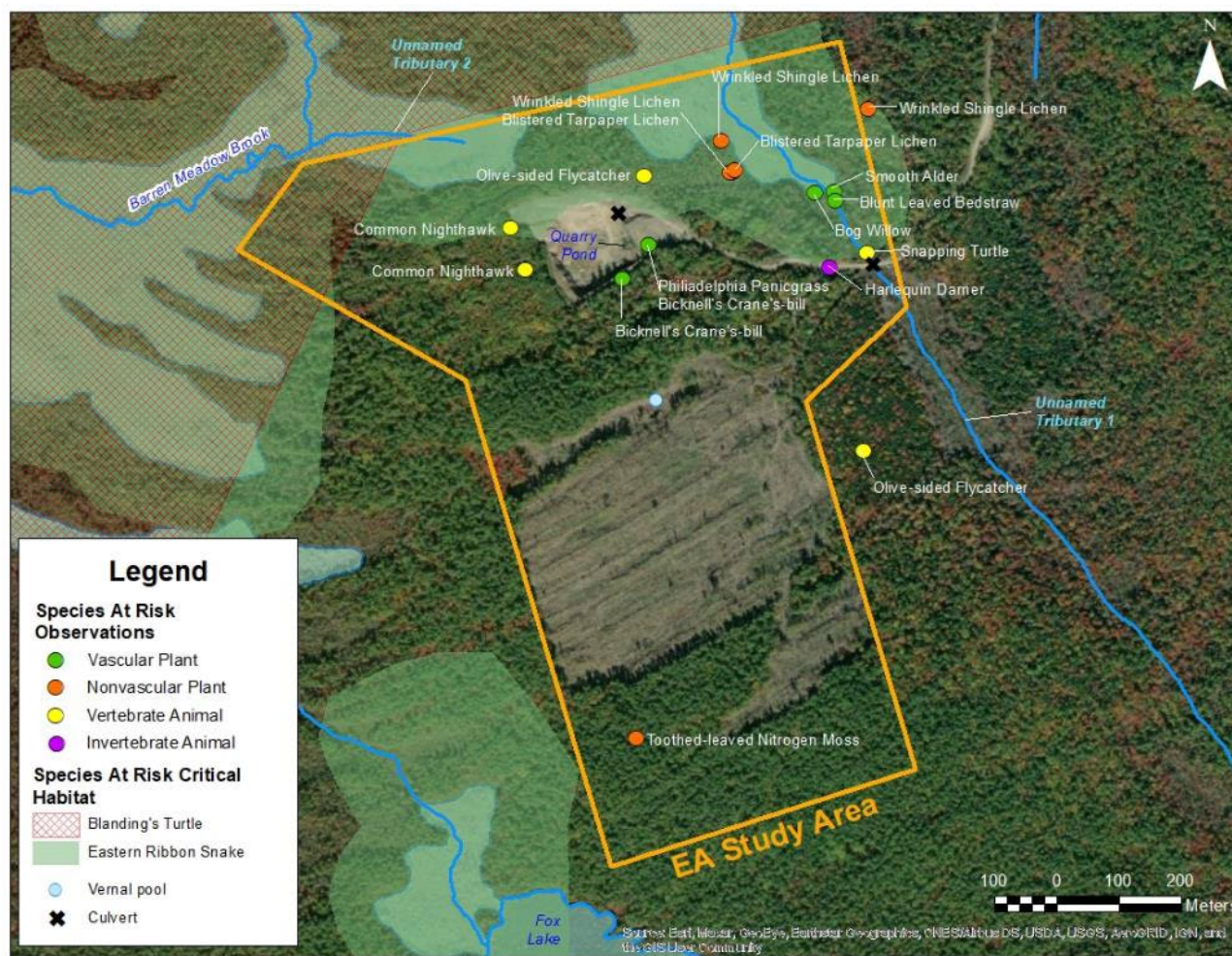


Figure 29. Species at risk observed within the study area.

**Table 7. Conservation status of species of concern observed during site surveys of Colpton Quarry, 2022.**  
An explanation of the rankings is presented in Table 8.

Family/Scientific Name	Common Name	Status/Rank					
		SARA	COSEWIC (NPROT <sup>1</sup> )	NS ESA (SPROT <sup>2</sup> )	SUB-NATIONAL RARITY RANK (SRANK) <sup>3</sup>	GLOBAL RARITY RANKING OF SPECIES (GRANK) <sup>4</sup>	
FLORA							
Betulaceae	<i>Alnus serrulata</i>	Smooth Alder	-	-	Vulnerable	S3	G5
Collembataceae	<i>Collema furfuraceum</i>	Blistered Tarpaper Lichen	-	-	Secure	S5	G5
Geraniaceae	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill	-	-	Vulnerable	S3	G5
Pannariaceae	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	G4
Poaceae	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass	-	-	No Status	S3S4	G5
Rubiaceae	<i>Galium obtusum</i>	Blunt-leaved Bedstraw	-	-	Imperiled	S2S3	G5
Salicaceae	<i>Salix pedicellaris</i>	Bog Willow	-	-	Vulnerable	S3	G5
ANIMALS-BIRDS							
Caprimulgidae	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	G5
Tyrannidae	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	G4
ANIMALS-OTHER							
Aeshnidae	<i>Gomphaeschna furcillata</i>	Harlequin Darner	-	-	Vulnerable	S3S4	G5
Chelydridae	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	G5

**Table 8. Records of species of concern within a five-kilometer radius of Colpton Quarry, Lunenburg County.**  
Atlantic Canada Conservation Data Centre (ACCDC) Database, April 2022.

Family/Scientific Name	Common Name	Status/Rank					
		SARA	COSEWIC (NPROT <sup>1</sup> )	NS ESA (SPROT <sup>2</sup> )	SUB-NATIONAL RARITY RANK (SRANK) <sup>3</sup>	GLOBAL RARITY RANKING OF SPECIES (GRANK) <sup>4</sup>	
FLORA							
Betulaceae	<i>Alnus serrulata</i>	Smooth Alder	-	-	-	S3	G5
	<i>Betula michauxii</i>	Michaux's Dwarf Birch	-	-	-	S3	G5
Caryophyllales	<i>Mononeuria groenlandica</i>	Greenland Stitchwort	-	-	-	S3	G5
Collembataceae	<i>Leptogium hibernicum</i>	Hibernia Jellyskin Lichen	-	-	-	S1	GNR
	<i>Leptogium milligranum</i>	Stretched Jellyskin Lichen	-	-	-	S3	G5

**Table 8. Records of species of concern within a five-kilometer radius of Colpton Quarry, Lunenburg County. Atlantic Canada Conservation Data Centre (ACDC) Database, April 2022.**

	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen	-	-	-	S3S4	G4
Cyperaceae	<i>Scirpus longii</i>	Long's Bulrush	-	Special Concern	Vulnerable	S3	G3
	<i>Carex haydenii</i>	Hayden's Sedge	-	-	-	S1S2	G5
	<i>Carex cryptolepis</i>	Hidden-scaled Sedge	-	-	-	S3	G4
	<i>Schoenoplectus torreyi</i>	Torrey's Bulrush	-	-	-	S1	G5
Fagaceae	<i>Fagus grandifolia</i>	American Beech	-	-	-	S3S4	G5
Gentianaceae	<i>Bartonia virginica</i>	Yellow Bartonia	-	-	-	S3S4	G5
Geraniaceae	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill	-	-	-	S3	G5
Haloragaceae	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed	-	-	-	S3S4	G5
Iridaceae	<i>Sisyrinchium atlanticum</i>	Eastern Blue-Eyed-Grass	-	-	-	S3S4	G5
Lamiaceae	<i>Trichostema dichotomum</i>	Forked Bluecurls	-	-	-	S1	G5
Lentibulariaceae	<i>Utricularia resupinata</i>	Inverted Bladderwort	-	-	-	S3	G4
Liliaceae	<i>Lophiola aurea</i>	Goldcrest	Special Concern	Special Concern	Vulnerable	S2	G4
Oleaceae	<i>Fraxinus nigra</i>	Black Ash	-	Threatened	Threatened	S1S2	G5
Orchidaceae	<i>Platanthera obtusata</i>	Blunt-leaved Orchid	-	-	-	S3S4	G5
Pannariaceae	<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	Threatened	Threatened	Threatened	S2S3	G4
	<i>Fuscopannaria leucosticta</i>	White-rimmed Shingle Lichen	-	-	-	S3	G4
Physciaceae	<i>Heterodermia squamulose</i>	Scaly Fringe Lichen	-	-	-	S3	G4
	<i>Anaptychia palmulata</i>	Shaggy Fringe Lichen	-	-	-	S3S4	G4
Poaceae	<i>Piptatheropsis pungens</i>	Slender Ricegrass	-	-	-	S2	GNR
	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panicgrass	-	-	-	S3	G5
	<i>Piptatheropsis canadensis</i>	Canada Ricegrass	-	-	-	S3	G4
	<i>Coleataenia longifolia</i>	Long-leaved Panicgrass	-	-	-	S3S4	GNR
	<i>Panicum philadelphicum</i>	Philadelphia Panicgrass	-	-	-	S3S4	G5
Potamogetonaceae	<i>Potamogeton pulcher</i>	Spotted Pondweed	-	-	Vulnerable	S3	G5
Rosaceae	<i>Amelanchier spicata</i>	Running Serviceberry	-	-	-	S3S4	G5
Rubiaceae	<i>Galium obtusum</i>	Blunt-leaved Bedstraw	-	-	-	S2S3	G5

**Table 8. Records of species of concern within a five-kilometer radius of Colpton Quarry, Lunenburg County. Atlantic Canada Conservation Data Centre (ACDC) Database, April 2022.**

	<i>Cephalanthus occidentalis</i>	Common Buttonbush	-	-	-	S3	G5
Salicaceae	<i>Salix pedicellaris</i>	Bog Willow	-	-	-	S3	G5
Splachnaceae	<i>Tetraplodon angustatus</i>	Toothed-leaved Nitrogen Moss	-	-	-	S3	G5
Ulmaceae	<i>Ulmus americana</i>	White Elm	-	-	-	S3S4	G4
<b>ANIMALS-BIRDS</b>							
Accipitridae	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk	-	-	S3S4	T5
Apodidae	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2S3B, S1M	G4
Ardeidae	<i>Botaurus lentiginosus</i>	American Bittern	-	-	-	S3S4B, S4S5M	G5
Caprimulgidae	<i>Chordeiles minor</i>	Common Nighthawk	Special Concern	Threatened	Threatened	S3B	G5
Cardinalidae	<i>Piranga olivacea</i>	Scarlet Tanager	-	-	-	S2B, SUM	G5
	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	-	-	-	S3B	G5
Charadriidae	<i>Charadrius vociferus</i>	Killdeer	-	-	-	S3B	G5
Corvidae	<i>Perisoreus canadensis</i>	Canada Jay	-	-	-	S3	G5
Fringillidae	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern	Special Concern	Vulnerable	S3B, S3N, S3M	G5
	<i>Spinus pinus</i>	Pine Siskin	-	-	-	S3	G5
	<i>Pinicola enucleator</i>	Pine Grosbeak	-	-	-	S3B, S5N, S5M	G5
	<i>Loxia curvirostra</i>	Red Crossbill	-	-	-	S3S4	G5
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	Special Concern	Threatened	Endangered	S3B	G5
	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	-	-	-	S2S3B	G5
Icteridae	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	Threatened	Vulnerable	S3B	G5
	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	G4
	<i>Molothrus ater</i>	Brown-headed Cowbird	-	-	-	S2B	G5
Laridae	<i>Sterna hirundo</i>	Common Tern	Not At Risk	-	-	S3B	G5
Paridae	<i>Poecile hudsonicus</i>	Boreal Chickadee	-	-	-	S3	G5
Parulidae	<i>Cardellina canadensis</i>	Canada Warbler	Special Concern	Threatened	Endangered	S3B	G5
	<i>Setophaga castanea</i>	Bay-breasted Warbler	-	-	-	S3S4B, S4S5M	G5
	<i>Leiothlypis peregrina</i>	Tennessee Warbler	-	-	-	S3S4B, S5M	G5
Picidae	<i>Picoides arcticus</i>	Black-backed Woodpecker	-	-	-	S3S4	G5
Scolopacidae	<i>Gallinago delicata</i>	Wilson's Snipe	-	-	-	S3B, S5M	G5
	<i>Actitis macularius</i>	Spotted Sandpiper	-	-	-	S3S4B, S5M	G5



**Table 8. Records of species of concern within a five-kilometer radius of Colpton Quarry, Lunenburg County. Atlantic Canada Conservation Data Centre (ACDC) Database, April 2022.**

Turdidae	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened	Threatened	-	SUB	G4
Tyrannidae	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Special Concern	Threatened	Threatened	S3B	G4
	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern	Special Concern	Vulnerable	S3S4B	G5
	<i>Tyrannus tyrannus</i>	Eastern Kingbird	-	-	-	S3B	G5
<b>ANIMALS-OTHER</b>							
Aeshnidae	<i>Gomphaeschna furcillata</i>	Harlequin Darner	-	-	-	S3S4	G5
Colubridae	<i>Thamnophis saurita</i>	Eastern Ribbonsnake	Threatened	Threatened	Threatened	S2S3	G5
Chelydridae	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	G5
Emydidae	<i>Chrysemys picta picta</i>	Eastern Painted Turtle	Special Concern	Special Concern	-	S3	G5
	<i>Emydoidea blandingii</i>	Blanding's Turtle	Endangered	Endangered	Endangered	S1	G4
Libellulidae	<i>Nannothemis bella</i>	Elfin Skimmer	-	-	-	S3S4	G4
Plethodontidae	<i>Hemidactylium scutatum</i>	Four-toed Salamander	Not At Risk	-	-	S4	G5
Vespertilionidae	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	G3
	<i>Myotis septentrionalis</i>	Northern Myotis	Endangered	Endangered	Endangered	S1	G2

1. NPROT, National conservation status of species, as designated by COSEWIC.

Extinct (X) - A wildlife species that no longer exists.

Extirpated (XT) - A wildlife species that no longer exists in the wild in Canada but exists elsewhere.

Endangered (E) - A wildlife species facing imminent extirpation or extinction.

Threatened (T) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Data Deficient (DD)- A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

Not at Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

2. SPROT=Provincial Rank/Status of Taxon.

3. SRANK, Sub-National (Provincial) Rarity Ranks

S1 Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.

S2 Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.

S3 Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations (21 to 100 occurrences).

S4 Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).

S5 Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.

S#S# Numeric range rank: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the Element (e.g., S1S2).

SH Historical: Element occurred historically throughout its range in the province (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 - 70 years (depending on the species) and suspected to be still extant.

SU Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information.

SX Extinct/Extirpated: Element is believed to be extirpated within the province.

S? Unranked: Element is not yet ranked.

**Table 8. Records of species of concern within a five-kilometer radius of Colpton Quarry, Lunenburg County. Atlantic Canada Conservation Data Centre (ACDC) Database, April 2022.**

SA	Accidental: Accidental or casual in the province (i.e., infrequent and far outside usual range). Includes species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded.
SE	Exotic: An exotic established in the province (e.g., Purple Loosestrife or Coltsfoot); may be native in nearby regions.
SE#	Exotic numeric: An exotic established in the province that has been assigned a numeric rank.
SP	Potential: Potential that Element occurs in the province, but no occurrences reported.
4. <u>GRANK, Global rarity rank of species, using CDC/NatureServe methods</u>	
G1	<b>Critically Imperiled</b> —At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
G2	<b>Imperiled</b> —At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
G3	<b>Vulnerable</b> —At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
G4	<b>Apparently Secure</b> —At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
G5	<b>Secure</b> —At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
GU	<b>Unrankable</b> —Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.
GNR	<b>Unranked</b> —Global rank not yet assessed.
G#G#	<b>Range Rank</b> —A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).
Q	<b>Questionable taxonomy that may reduce conservation priority</b> —Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.
C	<b>Captive or Cultivated Only</b> —Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The “C” modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to “Extinct” in the Wild (EW) in IUCN’s Red List terminology (IUCN 2001).
T	<b>Infraspecific Taxon</b> (trinomial)—The status of infraspecific taxa (subspecies or varieties) are indicated by a “T-rank” following the species’ global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species. For example, a G1T2 subrank should not occur. A vertebrate animal population, (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T-rank; in such cases a Q is used after the T-rank to denote the taxon’s informal taxonomic status.
SR	Reported: Element reported in the province but without persuasive documentation, which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report.
SRF	Reported falsely: Element erroneously reported in the province and the error has persisted in the literature.
SZ	Zero occurrences: Not of practical conservation concern in the province, because there are no definable occurrences, although the species is native and appears regularly. An NZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations) or transitory. In other words, the migrant regularly passes through the province, but enduring, mappable Element Occurrences cannot be defined.



**Table 9. Provincially listed species of concern with potential to occur in the vicinity of the project site (~10 kilometers). Nova Scotia Museum records (Nova Scotia Communities, Culture and Heritage 2022).**

Scientific Name	Common Name	SARA	COSEWIC (NPROT <sup>1</sup> )	NS ESA (SPROT <sup>2</sup> )	SUB-NATIONAL RARITY RANK (SRANK) <sup>3</sup>	GLOBAL RARITY RANKING OF SPECIES (GRANK) <sup>4</sup>
<b>FLORA</b>						
<i>Alnus serrulata</i>	Brookside Alder	-	-	-	S3	G5
<i>Anaptychia palmulata</i>	Shaggy-fringe Lichen	-	-	-	S3S4	G4
<i>Betula michauxii</i>	Newfoundland Dwarf Birch	-	-	-	S3	G5
<i>Cephalanthus occidentalis</i>	Common Buttonbush	-	-	-	S3	G5
<i>Geranium bicknellii</i>	Bicknell's Northern Crane's-bill	-	-	-	S3	G5
<i>Lophiola aurea</i>	Goldencrest	Special Concern	Special Concern	-	S2	G4
<i>Mononeuria groenlandica</i>	Mountain Sandwort	-	-	-	S3	G5
<i>Neottia bifolia</i>	Southern Twayblade	-	-	-	S3	G4
<i>Pannaria lurida</i>	Wrinkled Shingle Lichen	-	-	-	S2S3	G4
<i>Podostemon ceratophyllum</i>	Threadfoot	-	-	-	S1	G5
<i>Proserpinaca pectinata</i>	Combleaf Mermaidweed	-	-	-	S3S4	G5
<i>Salix pedicellaris</i>	Bogwillow	-	-	-	S3	G5
<i>Salix sericea</i>	Silky Willow	-	-	-	S3	G5
<i>Scirpus longii</i>	Long's Bulrush	Special Concern	Special Concern	Vulnerable	S3	G3
<i>Trichostema dichotomum</i>	Forked Bluecurls	-	-	-	S1	G5
<i>Woodwardia areolata</i>	Netted Chainfern	-	-	-	S3S4	G5
<i>Utricularia resupinata</i>	Northeastern Bladderwort	-	-	-	S3	G4

1. [NPROT, National conservation status of species, as designated by COSEWIC.](#)

Extinct (X) – A wildlife species that no longer exists.

Extirpated (XT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.

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Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

2. SPROT, Provincial Rank/status of taxon & Provincial GS Rank.

3. SRANK, Sub-National (Provincial) Rarity Rank.

4. GRANK, Global rarity rank of species, using CDC/Nature Serve methods

#### 4.2.10 NATURAL AREAS & WILDERNESS

The Colpton area where the quarry is located is a relatively remote and undeveloped location in Nova Scotia. Situated inland from the coast along the central backbone of the Province, the area is comparatively undeveloped and has a relatively high proportion of wilderness and natural areas. Although settlement and consequent expansion and logging in the past changed the character of the landscape, much of the land has returned to forest in most areas. A high proportion of Crown Land in the area has been devoted to protected and managed wildlife areas, leaving many natural and untouched areas, including Pu'tlaqne'katik Wilderness Area and Barren Meadow Conservation Lands 1, 2, 3 and 4 (refer to Figure 30). Wild land allows preservation for conservation, wildlife, hunting and outdoor recreation which are important to locals and visitors to the area. People living in these areas are exposed to the natural environment day-to-day and appreciate the presence of, and access to, undeveloped land and nature, while accepting the usual activities needed to use the resources (e.g. aggregate quarries, forestry operations) on which many of them depend for their livelihood.

### 4.3 HUMAN USES OF THE ENVIRONMENT

#### 4.3.1 MI'KMAQ

The Mi'kmaq maintain aboriginal claim to all of the landmass of Nova Scotia, and the Province of Nova Scotia maintains a policy that proponents of industrial development projects engage with the Mi'kmaq concerning their activities. The nearest Mi'kmaq communities are Bear River First Nation and Annapolis Valley First Nation. Bear River First Nation is located in Digby County and is situated approximately 90 kilometers northwest of the study site. Among various community activities and pastimes are hunting and fishing, and harvesting wild foods for sustenance and traditional ceremonial activities. The Annapolis Valley First Nation was founded in 1880 and is located in the Annapolis Valley, Nova Scotia. The community historically hunted and fished in Mi'kma'ki and owns 300 acres of uninhabited land in St. Croix, Nova Scotia. Acadia First Nation, which includes the Southwestern Region of Nova Scotia, spanning five counties from Yarmouth to Halifax. Wildcat First Nation Reserve No. 12 is located approximately 12.5 kilometers southwest of the Colpton Quarry in Queens County and is the closest reserve to the study area; Gold River First Nation Reserve is located approximately 35 kilometers northeast of the study area. Among various community activities and pastimes at each of these communities are hunting and fishing, and harvesting wild foods for sustenance and traditional ceremonial activities.

The Colpton Quarry is in what was once was the Mi'kmaw territory known as *Kespukwitk*, meaning 'end of flow' or 'Lands End', and traditional place names near the study area include *Awiatkweknk*, translating to 'at the round place or surrounding place' (currently known as Hog Lake); *Kwesawkuowikek* translating to 'point where pine grows' (currently known as Black Rattle Lake); *Miawnikanik*, translating to 'the middle ground' (currently known as Beavertail Basin and Lake); and *Kwejipuk*, meaning 'flows from' (currently known as Wildcat)(CRM 2022). These traditional Mi'kmaw place names reflect resources available and landscape features in the area. River systems and connected lakes were particularly key features in traditional Mi'kmaw land use as they offered a multitude of food resources as well as access to inland terrestrial habitats and their resources. Southwest of the study area, the Mersey River, called *Oqomkikiaq*, is an historic overland travel route between the Atlantic coast and the Bay of Fundy. The LaHave River, *Pijinuiskaq*, and Medway

River, *Mekwamkipukwek*, have also retained many traditional names that surround the broader landscape near the study area (CRM 2022).

There are no registered Mi'kmaq archaeological sites within the study area, however three registered archaeological sites have been identified within 8.5 kilometers of the study site: BcDe-01 (Late Archaic – Isolated Find) and BcDf-03 (Woodland – Isolated Find). Site BcDe-01 represents a grooved axe as an isolated find with no additional information on the exact location, who recovered it and when. Site BcDf-03 represents a small, corner-notched point that was found on a western beach of Baker Point. Presently, no significant Mi'kmaq cultural activities occur in or around the study area, although traditional fishing and hunting likely continues in the general area.

In current times, two tribal councils exist in Nova Scotia: The Confederacy of Mainland Mi'kmaq (CMM) and Union of Nova Scotia Mi'kmaq (UNSM). CMM is a not-for-profit organization incorporated in 1986, whose mission is to promote and assist Mi'kmaq communities. The UNSM, created in 1969, was formed *to provide a cohesive political voice for Mi'kmaq people*. The Native Council of Nova Scotia (NCNS) represents Mi'kmaq living off reserve. The NCNS is a self-governing agency located in Truro. The Office of N'Lu Affairs (formerly Office of Aboriginal Affairs) in Nova Scotia estimates that approximately 35% of Mi'kmaq live off reserve. The goal of NCNS is “to operate and administer a strong and effective Aboriginal Peoples Representative Organization that serves, advocates and represents our community.”

The Mi'kmaq Rights Initiative (Kwilmu'kw Maw-klusuaqn; KMK) also represent a number of the First Nations in Nova Scotia. The mission of KMK—whose name means, “we are seeking consensus”— is “to address the historic and current imbalances in the relationship between Mi'kmaq and non-Mi'kmaq people in Nova Scotia and secure the basis for an improved quality of Mi'kmaq life.” KMK's objective is to negotiate between the Mi'kmaq of Nova Scotia whom it represents, the Province and the Government of Canada, and operates from its main office in Millbrook. The Atlantic First Nations Environmental Network (AFNEN) is an environmental organization of Mi'kmaq communities and organizations. The CMM and UNSM are members of the AFNEN, with the Mi'kmaq Confederacy of PEI in Charlottetown currently the acting coordinator. The AFNEN includes a representative from each Mi'kmaq organization and community interested in environmental issues. The Network meets regularly during the year through meetings, conferences, and the Internet to discuss environmental matters or concerns. Two First Nations—Millbrook First Nation, and Sipekne'katik (Indian Brook) operate independently of these organizations. Millbrook is situated outside Truro and includes activities in Cole Harbour, Sheet Harbour, and Beaver Dam. Sipekne'katik First Nation is one of 13 First Nations and is the second largest Mi'kmaq band in Nova Scotia. Sipekne'katik First Nation includes the communities of Indian Brook, New Ross, Pennal, Dodd's Lot, Wallace Hills and Grand Lake.

#### 4.3.2 POPULATION AND ECONOMY

Municipal's Colpton Quarry is located in the Municipality of the District of Lunenburg, which occupies the eastern half of Lunenburg County, Nova Scotia. The Municipality of the District of Lunenburg had a population of approximately 25,545 in 2021, one that has been slowly increasing—overall 2.7% positive population percentage change since 2016 when the population was approximately 24,863 (Statistics Canada 2022). Also occurring are the Towns of Bridgewater, Lunenburg and Mahone Bay, which are not included in the Municipality of the District of Lunenburg statistics. In 2021, the Town of Bridgewater has a population of 8,790 (approximately 23 kilometers southeast of the quarry); the Town of Lunenburg population was 2,396

(approximately 37 kilometers east-southeast); and the Town of Mahone Bay had 1,604 residents (approximately 31 kilometers east of the quarry). There are no First Nation reserves within the Municipality of the District of Lunenburg; the closest reserve is Wildcat First Nation Reserve No. 12 in Queens County, which had a population of 49 in 2021 (12.5 kilometers southwest of the quarry) (Statistics Canada 2023).

The Municipality of the District of Lunenburg is home to almost 100 businesses across a variety of sectors including arts, culture and recreation, business services, construction, green industry, industrial development and niche manufacturing/value-added (District of Lunenburg 2023). Statistics Canada reports that the sectors with greatest employment are health care, manufacturing, retail, and construction (Statistics Canada 2023). Manufacturing activity is concentrated near the Atlantic Coast, at or near principal roadways connecting to Highway 103. Tourism is also an important local industry, with scenic attractions and activities including the Bluenose II, Smith Lake Nature Reserve, Pinehurst Provincial Park, Oak Island and the Oak Island Mystery, and a number of museums and artisan shops. Lunenburg County is also ranked second in Nova Scotia for the number of people actively working in arts and culture (The Municipality of the District of Chester 2015).

#### **4.3.3 WATER SUPPLY AND RESIDENTIAL WELLS**

Drinking water for the Municipality of the District of Lunenburg is supplied by both public and private water systems. Water is supplied to the Town of Bridgewater from three lakes including Hebb Lake, Milipsigate Lake and Minamkeak Lake located approximately 20 kilometers southeast of the study site (Town of Bridgewater 2023). Other Public water supplies within the municipality support the communities of Lunenburg and Mahone Bay operating out of Dares Lake and Oakland Lake, respectively, and are located approximately 35 kilometers east of the study area (Town of Lunenburg 2023). The Municipality maintains three wastewater treatment plants and five sewer collection system at New Germany, Cookville, Hebbville, and Conquerall Bank; and operates a septage disposal and treatment facility for the use of licensed septic tank waste haulers at the Lunenburg Regional Community Recycling Centre (Municipality of the District of Lunenburg 2023).

Both drilled and dug wells are used as drinking water sources in The Municipality of the District of Lunenburg, and drilled wells are used as the primary drinking water sources in the Colpton area. There are no water supply wells located within one kilometer of the Colpton Quarry. The nearest groundwater well in Lunenburg County is located approximately two kilometers away from the study area near Seven Mile Lake Road, and four privately owned wells are approximately 1.5 kilometers from the quarry site, however their exact locations are unconfirmed<sup>8</sup>.

#### **4.3.4 LAND USE**

Land in the vicinity of the quarry is predominantly wilderness and undeveloped forest land, with rural residential use concentrated along Highway 325. Additional residences are located along Seven Mile Lake Road, a side street intersecting Highway 325 approximately two kilometers south of the quarry entrance and oriented north-south. Businesses and associated buildings are also located along Route 325, including K Norwood Auto Repair located four kilometers south of the quarry, and LJ Beck Excavating Limited, located

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<sup>8</sup> The four wells with unconfirmed locations appear to be within 1.5 kilometers of the Colpton Quarry (according to geographic coordinates in the Nova Scotia Well Logs Database, Nova Scotia Department of Environment and Climate Change), but do not have accurate or completed civic address information to match the coordinates provided.

4.5 kilometers south of the quarry. There has been limited forestry and large operation commercial use (e.g. quarries) in the area and there are a few residences, small woodlots, and home-operated businesses found nearby. Travel routes are used by tourists and outdoor recreational enthusiasts. Hunting, trapping and fishing based in Lunenburg are important local activities. Land in the immediate vicinity of the quarry is primarily Crown Land (Map A-2).

#### 4.3.5 AQUACULTURE AND SHELLFISH HARVESTING

Aquaculture is an important industry, which takes place along the coast of Lunenburg County and therefore is distant from the study area. Mahone Bay is an integral location in the evolution of aquaculture in Nova Scotia, being the location of one of the first mussel farming sites in 1982, and the location of the first finfish lease in the province in 1988 (Kraly 2019). Currently, there are four issued commercial marine shellfish licenses along the coast of the Municipality of the District of Lunenburg, three in Lunenburg Bay and one in Mahone Bay. These leases are for oysters (European Oyster and American Oyster), scallops (Bay Scallop and Sea Scallop) and Blue Mussels. The nearest shellfish aquaculture site is located approximately 37 kilometers from the study site in Lunenburg Bay off the coast of Corkums Island (NSDFA 2022). One finfish aquaculture site is located in Mahone Bay near the community of Sunnybrook, and cultivates Atlantic Salmon and Rainbow Trout. Two land-based aquaculture facilities are operated within the Municipality of the District of Lunenburg in the communities of Sunnybrook and Indian Pont. The Sunnybrook facility raises trout (Brook and Rainbow) and Atlantic Salmon, while the Indian Point facility cultivates Horsetail Kelp and Sugar Kelp. There are a total of 11 marine shellfish leases, one marine finfish lease, and two land based facilities located in the greater Lunenburg county. Shellfish harvesting is restricted in several areas along the coast including near the LaHave River, Petite Riviere, Romkey Brook, and parts of the coast near the towns of Lunenburg and Mahone Bay, due to fecal contamination.

#### 4.3.6 HUNTING AND TRAPPING

Lands in the vicinity of the Colpton Quarry site support many of the common game and fur-bearing species characteristic of Nova Scotia in general. Hunting or trapping activity may take place in the general vicinity of the site. Trapping statistics (Table 10) indicate that Lunenburg County has an intermediate harvest of most species compared to other counties. White-tailed deer are common and the county typically ranks among the highest for deer harvest in Nova Scotia. The main furbearers trapped in the five-year period (2017 to 2022) were Beaver and Eastern Coyote. No American Marten or Canada Lynx were trapped within the county in the last five years. Snowshoe Hare are the most commonly hunted upland game animal in Lunenburg County (Table 10).

<b>Animal</b>	<b>Lunenburg County Reported Harvest</b>	<b>Provincial Reported Harvest</b>	<b>Percent (%) of total for province</b>
<b>LARGE MAMMALS</b>			
Deer (Zone 103)	6,248	50,485	12.38%
Bear	82	1,927	4.26%
<b>UPLAND GAME</b>			
Snowshoe Hare	8,650	138,627	6.24%

<b>Table 10. Five-year summary of wildlife harvested in Lunenburg County and Nova Scotia (NSDLF 2023).</b>			
<b>Animal</b>	<b>Lunenburg County Reported Harvest</b>	<b>Provincial Reported Harvest</b>	<b>Percent (%) of total for province</b>
Ruffed Grouse	2,852	88,105	3.24%
Ring-necked Pheasant	88	8,860	0.99%
<b>FUR HARVEST</b>			
Beaver	1,080	8,123	13.30%
Muskrat	411	16,625	2.47%
Otter	162	1,266	12.80%
Mink	109	1,608	6.77%
Bobcat	392	3,659	10.71%
Fox	59	1,426	4.13%
Raccoon	345	4,045	8.53%
Skunk	19	121	15.70%
Squirrel	69	1,786	3.86%
Weasel	39	588	6.63%
Coyote	943	10,528	8.95%
Canadian Lynx*	0	8	0.00%
American Marten*	0	6	0.00%
Fisher	59	447	13.20%
<b>Total Furbearers</b>	<b>3,687</b>	<b>50,236</b>	<b>7.34%</b>
*Trapped incidentally. Trappers Association of Nova Scotia prepares incidental pelts for auction and all proceeds go to the NS Species at Risk Conservation Fund.			

#### 4.3.7 FORESTRY & AGRICULTURE

Forestry and agriculture contribute to the economy of Lunenburg County, but the influence is relatively small compared with the rest of Nova Scotia. Small private woodlots comprise of nearly half (approximately 49.2%) of the total productive forest area of Western Nova Scotia, which includes Kings, Annapolis, Yarmouth, Shelburne, Queens and Lunenburg Counties; public land accounts for 37%, private industrial lands, 6.3% and 7.7% is non-forested (WWSC 2020). Forest and wood production today employs locals in various segments of the industry, including resource harvesting, lumber production sawmills, biomass production, and trucking. A review of harvest volumes by county shows a relatively consistent volume of non-industrial, private harvesting has occurred in Lunenburg County; however, there was a decline in volume from 2006 to 2009, but more recently a strong recovery (Williams 2018). Both logging of natural stands and plantations takes place in the general vicinity of the quarry (Map A-3).

Agriculture is not a prominent activity in the general vicinity of the site and adjacent coastal areas; nevertheless a wide range of agricultural operations take place in Lunenburg County. Overall, farming here is a small but significant activity in relation to Provincial levels. In 2011, there were 342 farms in the County, making up almost nine percent of the province total. A large proportion of farms in Lunenburg County (49.4%) are involved in greenhouse, nursery and floriculture production. Other predominant farm types in the County include other crop and other animal production with smaller numbers involved in cattle ranching and farming, hog and pig farming, poultry and egg production, sheep and goat farming, vegetable and melon



farming, and fruit and tree nut farming. Lunenburg County farms reported farm receipts of approximately \$25.3 million in 2011, making up 4.25% of total provincial receipts. Farms in the County are operating at a deficit of \$0.03 million as operating expenses are reported at \$1.16 million (NSFA 2011). The low interest in agriculture in the area partly stems from geographical limitations including terrain and lack of agricultural land, although in the early days of settlement, local agriculture was more important. Other reasons include climate, focus on other industries, as well as a small agri-tourism sector compared to those found in other provinces. No agricultural lands currently being used for agricultural production in Lunenburg County are located near the study site.

#### **4.3.8 RECREATIONAL, COMMERCIAL, AND MI'KMAQ FISHING**

Historically, Lunenburg County has supported marine fisheries including lobster, scallops, and groundfish. In the 2020-2021 fishing season, 680 fishing licences were held for lobster fishing from Halifax to Shelburne County (LFA 33) (DFO 2022). Fishing effort in this area is controlled with restrictions on the number of licenses, number of traps per licence, season length, Minimum Legal Size (MLS) and non-retention of berried females (Cook et al. 2020; DFO 2022). RBN Fisheries Limited and LaHave Seafoods Limited are two commercial fishing operations in Lunenburg County that operate out of Mill Cove, Nova Scotia, and LaHave, Nova Scotia approximately 37 kilometers south and 38 kilometers southeast of the study site, respectively.

The Confederacy of Mainland Mi'kmaq (CMM) represents eight Mi'kmaw communities in Nova Scotia, including Bear River First Nation and Annapolis Valley First Nation, the two communities located closest to the study site. CMM has a branch called the Mi'kmaw Conservation Group, which focuses specifically on the conservation of aquatic environments that have historic ties to Mi'kmaw communities. Multiple different species have been harvested by Mi'kmaq people for many years.

Recreational fishing provides an important resource and pastime for residents and visitors to Lunenburg County and marine fisheries are the mainstay of coastal communities. The study area itself is not particularly important for freshwater recreational fishing but rivers and lakes in the area including Fish Weir Lake, Seven Mile Lake, Hirtle Lake and Shingle Lake, in Lunenburg County are fished recreationally during the freshwater fishing season of April 1 and September 30. Mi'kmaq residing in the area likely use the recreational fishing resource as well. Other streams in the area are either too small, are not accessible, or have too steep a gradient to promote fishing. Commonly fished freshwater species in Lunenburg County include trout (speckled, rainbow, lake (grey) and brown), white and yellow perch, brown bullheads, landlocked salmon, smallmouth bass and chain pickerel. Smallmouth bass fishing is among the most popular fishing in accessible lakes in Lunenburg County with a number of fishing tournaments hosted regularly through the summer months. Fishing recreationally for Chain Pickerel (an invasive predator species) year-round is also popular in Wentzell's Lake near the LaHave River and Bridgewater (NSDFA 2019). Mackerel are the most targeted marine species recreationally fished in the Lunenburg Bay, Chester Basin and Mahone Bay in addition to cod, pollock and flounder from both boats and boat launches (Backroad Mapbooks 2023)

#### **4.3.9 HISTORICAL, ARCHAEOLOGICAL AND PALAEOONTOLOGICAL RESOURCES**

The study area is a part of the greater Mi'kmaw territory known as *Kespukwitk* meaning 'end of flow' or 'Lands End'. Mi'kmaq originally occupied the area and virtually all waterbodies of Mi'kma'ki, both marine and freshwater, and their shores until the colonization by European settlers. Several Mi'kmaw settlements were noted during Samuel de Champlain's 1604 exploration along Nova Scotia's coastline, including the

north side of the LaHave River, at Petite Rivière, *Miriligueche*, located at present day Lunenburg Bay, and areas throughout Mahone Bay and toward Cape Sable Island. Substantial archaeological evidence remains along the shores such as dense shell middens recorded near Port Joli and among Mahone Bay islands and inlets, and Mi'kmaq burial grounds have been noted along inland watercourses and the coastline of Lunenburg County.

The first record of European presence in Lunenburg County appears in 1630 when Sir William Alexander gave Sir Claude de St Etienne de la Tour legal authority to establish a colony in the region. In 1685, settlement occurred primarily along the coast with very few expanding inland by 1749 (DesBrisay 1895 – as cited by CRM 2022). Coastal Acadian sites were eventually abandoned and later re-occupied in the eighteenth century by the English, Germans, and Swiss. Lunenburg was first established in 1753 by German-speaking Protestants, and along with Chester, New Dublin and New Germany, were eventually incorporated into Lunenburg County (CRM 2022). Expansion inland was slower, with the construction of Bridgewater's first home in 1812 by Ralph Hotchkiss, beginning the establishment of a permanent community. A bridge was later constructed over the LaHave River as more families moved onto either side. The communities of Lunenburg, Chester and New Dublin continued to grow throughout the nineteenth century with Lunenburg County's population nearly doubling between the years 1851 and 1891.

Inland travels were first recorded in 1686 by an early European passing into and through the Mersey River system, and as more migration inland occurred in later decades, an interest toward accessing more remote natural resources and better agricultural land as well as further exploration and development grew. Beginning in 1801, concerted efforts were taken in mapping the interior of the Province and during provincial survey in 1834, a road was mapped between Pleasant River and Chelsea that passes along the shore of Shingle Lake (CRM 2022). The Burke family was one of the first to settle inland as a result of growing coastal population's requirements for food and other resources. Poor agricultural land in Queens County and further Southwest encouraged settlement in Lunenburg County. An 1883 county map of Lunenburg County shows that the study area is in a region marked as *Barrens*, with only the Barren Meadow Brook and one household, S. Connell in close proximity (CRM 2022).

Terrain was challenging to clear for agriculture and for constructing roads between coastal communities and inland settlements. Many roads were poorly maintained and appeared more trail-like. An initiative by Governor Kempt in 1820 to improve Nova Scotia's roads brought more people to townships south of Halifax and cross province roads began to develop including the route between Liverpool and Annapolis in the early-to mid-nineteenth century. A map from 1878 shows Pleasant River, the first important community in the general vicinity of the study area, located west of Colpton (CRM 2022). The nineteenth century history of the study area involves temporary resource exploitation rather than intensified settlement. There is no evidence of historic infrastructure in the vicinity of the study area prior to the creation of the Colpton Quarry after 1992. The study area is also located a distance from the more substantial river systems that either feed into the Medway or Mersey rivers further south and the LaHave River to the north, that would have been utilized more frequently by European settlers and Mi'kmaq.

The community of Colpton derives its name from the Colp family who obtained the land around the community in 1902 and 1904 (Public Archives of Nova Scotia, 1967 – as cited in CRM 2022). The land was previously granted to John Keddy Sr and four others in 1830, with farming and lumbering being the main industries (CRM 2022). Logging became more extensive along key watercourses such as Mersey and LaHave

Rivers as industry grew in the early nineteenth century, to generate lumber and pulp for both commercial interests and for Britain to supplement the war. Rapid deforestation occurred in the second half of the nineteenth century and by 1851, a total of 156 sawmills were reported operating in Lunenburg County, clogging and polluting many of the riverways (DesBrisay, 1895 – as cited in CRM 2022). Towards the end of the nineteenth century, the timber trade waned and mill production dwindled, leaving only substantial mills such as the Davison Lumber Mill in LaHave, which served as the primary place of employment in LaHave for many years until its closure in 1921.

In the early to mid- 1800s, mineral exploration, particularly for gold, became prominent with the slowing of the lumber trade. Discoveries of gold were made in Lunenburg County shortly after the first discovery of gold in Nova Scotia in 1858 (Dawson 2007 – as cited in CRM 2022). The study area falls within the boundaries of the Pleasant River Gold Barrens where gold veins were discovered in 1886 scattered throughout the site. Ore was hauled from the Brookfield Gold Mine to the Pleasant River Gold Barrens for crushing and processing during an exploration phase in 1886. Several other leads were followed during the Pleasant River Gold Barrens' period including some exploratory work conducted within the study area (CRM 2022). Typically mines in the district were shafts, none of which reached deeper than 85 feet (26 m) or longer than 180 feet (54.9 m) (Geological Survey of Canada 1914 – as cited in CRM 2022).

Near the end of the nineteenth century, a rail line was constructed connecting Caledonia and New Germany to support the rapidly expanding population and the mining operations. The route of the former line passes within 4.8 kilometers north of the study area and operated into the 1970s.

#### **4.3.10 PARKS AND PROTECTED AREAS**

Both the Province of Nova Scotia and the Government of Canada, as well as private conservation organizations, actively protect natural environments in the general vicinity of the site, and there are a relatively large number of parks and protected areas near the Colpton Quarry (Figure 30). These include: two wilderness areas, three nature reserves and 10 conservation lands (Figure 30) (Nova Scotia Environment and Climate Change 2022). The Pu'tlaqne'katik Wilderness Area, Pu'tlaqne'katik Wilderness Area (pending) and Barren Meadow Conservation Lands 1 are the closest features to the Colpton Quarry - Pu'tlaqne'katik Wilderness Area is located to the west and south of the quarry with a pending section located adjacent to the east and the Barren Meadow Conservation Lands 1 is located adjacent to the north of the study area. Parks and protected areas in the general area are listed in Table 11, and include:

Wilderness Areas are provincially-significant areas that protect representative examples of natural landscapes, native biological diversity, and outstanding natural features of Nova Scotia. They are used for scientific research, education and a variety of recreation and nature-tourism related activities such as hiking, canoeing, sea-kayaking, sport-fishing and hunting. These areas are designated under Nova Scotia's *Wilderness Areas Protection Act*.

Nova Scotia Nature Trust's Conservation Lands are protected areas that are safeguarded and stewarded for the purposes of nature conservation. The properties have come under the care of the Nature Trust through donation, part-donation, purchase, or conservation easement. A goal of the Nature Trust is to protect Nova Scotia's rare, outstanding and unique natural areas, but also to help fulfill the interests of landowners who have stewarded the lands and wish to permanently protect them.

Nova Scotia Nature Reserves are established to preserve and protect areas representative of natural ecosystems and associated plant and animal species. Scientific research and education are the primary uses of nature reserves and recreation is generally restricted. These areas are protected under the *Special Places Protection Act*.

**Table 11. Parks and protected areas within a 15 kilometer radius of the Colpton Quarry in Lunenburg County. Province of Nova Scotia, Nova Scotia Environment Database, 2022.**

Name of Site	Primary Type of Protection	Protection Status	Area (ha)
Barren Meadow 1 Conservation Lands	Land Trust Property	Considered Protected	14
Barren Meadow 2 Conservation Lands	Land Trust Property	Considered Protected	46
Barren Meadow 3 Conservation Lands	Land Trust Property	Considered Protected	56
Barren Meadow 4 Conservation Lands	Land Trust Property	Considered Protected	22
Bull Moose Meadow Conservation Lands	Land Trust Property	Considered Protected	16
Deep Brook Bog Conservation Lands	Land Trust Property	Considered Protected	4
Hog Lake Conservation Lands	Land Trust Property	Considered Protected	23
Molega Lake Conservation Lands	Land Trust Property	Considered Protected	14
Pleasant River Conservation Lands	Land Trust Property	Considered Protected	58
Pleasant River Woodlands Conservation Lands	Land Trust Property	Considered Protected	7
Ponhook Lake Nature Reserve	Nature Reserve	Designated (1992)	43
Ponhook Lake Nature Reserve Addition	Nature Reserve	Pending Cabinet Submission	160
Pu'tlaqne'Katik Wilderness Area	Wilderness Area	Designated (2020)	2,994
Pu'tlaqne'Katik Wilderness Area (Subject to mineral interests)	Wilderness Area	Approved by Cabinet	235
Smith Lake Nature Reserve	Nature Reserve	Designated (2015)	645

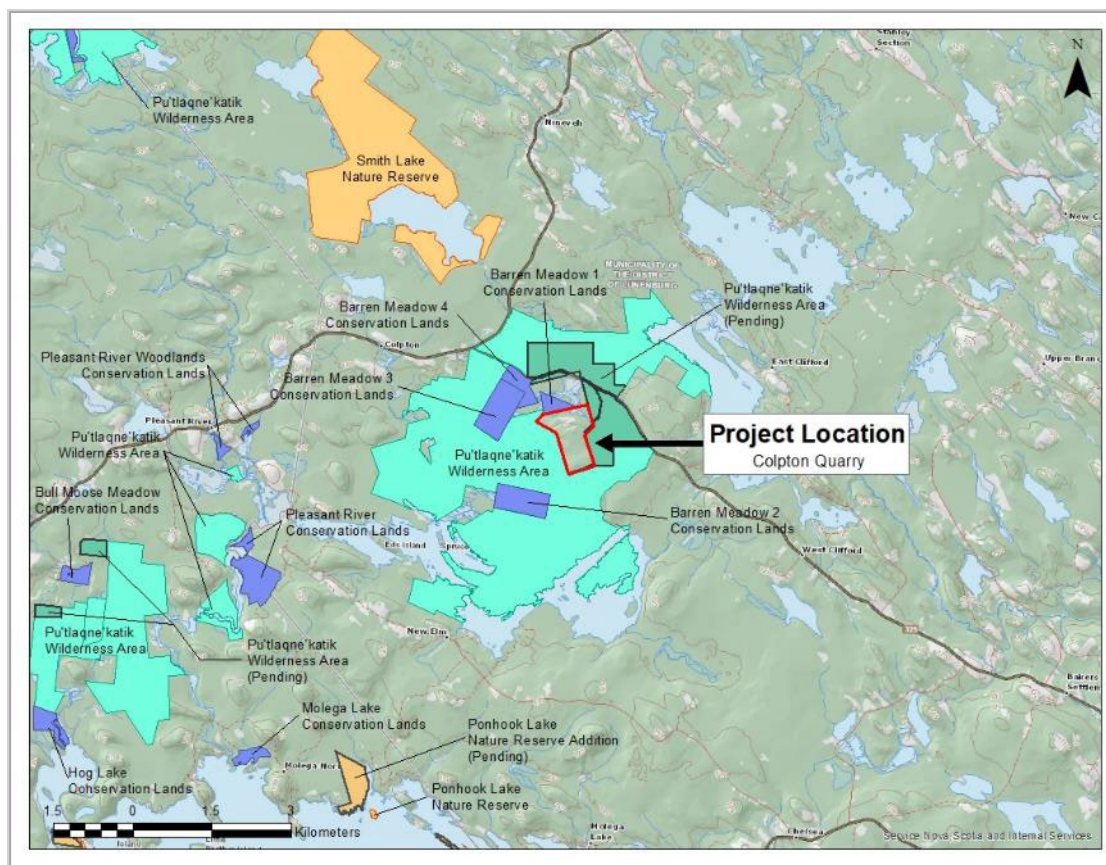


Figure 30. Parks and protected areas in the general vicinity of the Colpton Quarry.

#### 4.3.11 RECREATIONAL/CULTURAL FEATURES

Residents and visitors to Lunenburg County access natural areas for a wide range of outdoor recreation activities. In the Colpton area, the predominant outdoor recreational activities are sightseeing, walking/hiking, birding, camping, boating (i.e., kayaking and canoeing), hunting, ATV and snowmobiling and angling. Pu'tlaqne'katik Wilderness Area protects three disjunct parts of the Pleasant River watershed (immediately west of the study area) and is utilized for fishing, hunting, trapping, canoeing, camping via three existing campsite leases, species at risk research and other activities. The Pu'tlaqne'katik Wilderness Area is adjacent to the study area to the west and south with and pending addition to the east and northeast. The South Shore Annapolis Valley Trail is a 122 kilometer shared-use trail that runs between New Germany and the Annapolis Valley, and passes through community of Colpton adjacent to Smith Lake north of the study area (Municipality of the District of Lunenburg 2023). The trail was developed from an abandoned railway bed and can be used for ATV and snowmobiling, biking, crosscountry skiing, walking and horseback riding. Several rental cottages occur on many of the lakes in the Colpton area including Hirtle Lake east of the quarry (Rocky Mountain Lakehouse and Hirtle Lodge), and Shingle Lake west of the quarry (Guesthouse Skylarke). Cemeteries that occur in nearby communities include Lone Oak Cemetery in the community of New Elm as well as Lake View Cemetery in Pleasant River.



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#### **4.3.12 RESIDENTIAL USE**

There are few residences in the vicinity of the Colpton Quarry, located mainly along Highway 325 (Map A-3). In the community of West Clifford and in subdivisions on lakes in the area. Lot sizes are large and may include surrounding tracts of forested land. Some residents occupy the area seasonally; while others are permanent residents working locally. Residents use the area for a variety of purposes including gardening, harvesting wild foods, farming, hiking, hunting and fishing, ATV, and snowmobile use year round. Lifestyles of the residents of the general area include retirees maintaining their homes and properties, residents working locally, seasonal cottage home owners and younger individuals engaged in economic activities such as fishing in the area. As in other forested parts of rural Nova Scotia near the ocean, residents use the area and backcountry for recreation such as walking or hiking, canoeing or kayaking, and use ATVs and snowmobiles, as well as for access to natural resources (e.g. firewood). The quarry is 22 kilometers from the Town of Bridgewater, where residents can access various local services such as entertainment venues, shopping malls, and local business services, as well as recreational facilities.

#### **4.3.13 COMMERCIAL/INDUSTRIAL DEVELOPMENT**

There are no businesses within the immediately vicinity of the Colpton Quarry. Logging is an important activity on private property and Crown Land in the vicinity. Small enterprises that operate in nearby communities near include the Community Hall in Pleasant River approximately six kilometers west of the study area and No Problem Plumbing and Electrical, Zinck's Auto Supply and Towing and Four Muddy Paws Grooming in the Community of Chelsea approximately 7.5 kilometers south of the study area. Businesses in the Town of Bridgewater, Town of Lunenburg and the surrounding area center on fishing (e.g, RBN Fisheries Ltd., LaHave Fisheries Ltd.); and tourism, including artisan and antique shops, rental cottages and restaurants. South Canoe Wind Farm is located between Vaughan and New Russell, Nova Scotia approximately 45 kilometers northeast of the study area in Lunenburg County and is considered Nova Scotia's largest wind farm with 34 wind turbines.

Commercial activity in the Town of Bridgewater includes shopping malls, convenience stores, banking, fast food outlets and other outlets, as well as shops (i.e., DesBrisay Museum, Argyll inn, Nova Scotia Crafters) focused on both locals and visitors. The Town is a centre for access to the many parks and protected areas (e.g., Second Peninsula Provincial Park, Rissers Beach Provincial Park, and Wentzells Lake Provincial Park) making tourism a growing industry in the immediate vicinity of the study area.

#### **4.3.14 TOURISM AND VIEWSCAPE**

The travel routes in the vicinity of Colpton Quarry offer experience of nature while enroute to major attractions such as Kejmkujik National Park located west of the site, and to popular destinations including the Annapolis Valley and Bay of Fundy. Tourists can rent cabins locally and participate in outdoor recreational activities, including angling, birding, camping, hiking, paddling and boating and ATV and snowmobiling. The area has a number of protected areas including Pu'tlaqne'Katik Wilderness Area, Smith Lake Nature Reserve and Ponhook Lake Nature Reserve, that offer opportunities for camping, hiking, bird watching, and sight-seeing. A public trail in the area—the South Shore Annapolis Valley Trail—is a 122 kilometer shared-use trail that runs through the community of Colpton between New Germany and Annapolis Valley, used for hiking, off-road bicycling, bike, or ATV. Natural lakes and river systems in protected landscapes within the area also draws a number of locals and visitors to experience boating, canoeing kayaking and fishing.



The Colpton Quarry is not visible from adjacent areas along the road network but activities and lights if the quarry operates night may be visible at certain elevations along Highway 325 and Highway 208 (Figure 31).



**Figure 31. Entrance to the Colpton Quarry along Highway 325, facing southwest, July 7, 2022.**

#### **4.3.15 TRANSPORTATION**

Highway 325 which runs past the quarry site, is a collector highway connecting Highway 208 (the main route from New Germany to Caledonia) to Highway 103 at Bridgewater, which is the main 100-series highway along the Atlantic coast in the area. Highway 325 supports a combination of local and cross-province traffic linking the Annapolis Valley and the South Shore. It has a low to moderate traffic volume compared with other Highways in the Province, with an annual average daily traffic (AADT) of 3,761 per day east and west combined in the years 2015-2021 (Nova Scotia Open Data Portal 2022), compared to 11,070 per day on Highway 103 near the community of Chester. In comparison, 37,100 vehicles per day was recorded on Highway 101, one of the main 100-series highways near Halifax, in the same periods (Nova Scotia Open Data Portal 2022). Average daily traffic (ADT) in the same spring-summer period of the same years is similar (3,680 vehicles per day) and a comparable relative pattern and traffic volumes are observed on Highway 103 (Nova Scotia Open Data Portal 2022).

When operating, the quarry will contribute truck traffic and some heavy equipment traffic (e.g. crushers, asphalt trucks etc.) in the vicinity of the site, typically in the summer/fall construction season. Access to the quarry from Highway 325 is unobstructed with good sight lines, and the Highway 103 intersection is an overpass and interchange, and neither are expected to be hazardous.

## 5 ENVIRONMENTAL IMPACTS, SIGNIFICANCE, AND MITIGATION

### 5.1 ASSESSMENT APPROACH AND METHODS

Information for the assessment was obtained from consultants' personal knowledge, from reviews of available information, and knowledge of the purpose and proposed design of the project. The environmental assessment follows *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* (NSE September 2009) and uses assessment methodology typical for environmental assessment screenings of this kind. For this assessment a list of valued environmental components (VECs)<sup>9</sup> (also known as VCs)<sup>10</sup>, and project activities and outcomes for the proposed expansion of the existing quarry were developed, and the potential for interactions of these activities with VECs was identified. Where interactions were identified, and there was potential for significant impacts if mitigation was not undertaken, 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 potentially significant impacts on VECs are identified and potential impacts on them have been considered, and sufficient mitigation planned.

### 5.2 VALUED ENVIRONMENTAL COMPONENTS

The list of Valued Environmental Components considered for the assessment, and interactions with project components, are presented in Table 12. The environmental effects and potential impacts of the project along with their significance and suggested mitigations are outlined in the following and are summarized in Tables 13 and 14.

<b>Biophysical</b>	<b>Socio-economic</b>
Air Quality, Noise and Light	Mi'kmaq
Groundwater	Recreation, Tourism & Viewscape
Hydrology	Recreational, Commercial & Mi'kmaq Fishing
Water Quality	Archaeological, Cultural and Historical
Freshwater Aquatic Environments and Wetlands	Economy, Land Use and Value
Terrestrial Environments	Transportation
Fish & Fish Habitat	Residential Use
Flora & Fauna & Habitat	Commercial /Industrial Use
Species at Risk	Water Supplies & Residential Wells
Natural Areas & Wilderness	Parks & Protected Areas
	Forestry, Hunting & Trapping

<sup>9</sup> Valued Environmental Components (VECs) are features or things in the environment, which are particularly important either ecologically, socially, economically or culturally. The environmental assessment addresses potential interactions of the project with each VEC identified and assesses potential impacts. The process followed involves identifying all the activities or outcomes of the project, which interact with each VEC, and then determining and rating the magnitude of the impact in a standard way, in this case in a manner guided by standard approaches that have been developed for environmental assessments.

<sup>10</sup> Valued Environmental Components (VECs) and Valued Components (VCs) are equivalent. Use of the acronym VC was used in environmental assessments carried out under the federal environmental assessment process under the Canadian Environmental Assessment Act (2012) and is recommended to be used in assessments carried out under its replacement, the federal Impact Assessment Act (IAA) (2019).

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### 5.3 SOCIOECONOMIC IMPACTS

#### 5.3.1 MI'KMAQ

The Mi'kmaq maintain a general interest in all lands in Nova Scotia which they claim to have never surrendered, ceded, or sold the Aboriginal title. 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, as noted in Sections 4.3.1 and 4.3.8. In more recent times, treaties made with the British and continued through Canadian law have maintained their rights. The Atlantic Coast was used by Mi'kmaq, both as a source of food and as a transportation corridor; however, there is low potential for occurrence of Mi'kmaq archaeological resources at the quarry site (CRM 2022).

The quarry is not near established Mi'kmaq First Nations in Southwestern Nova Scotia and no First Nation activities are expected to be directly affected by the Colpton Quarry. Best management practices used at the site will reduce any potential impacts quarry activities may have on water quality and quantity and fish habitat, and will be validated through a surface water management and monitoring program that will be established through the subsequent Industrial Approval process. Land around the existing Colpton Quarry may be used by Mi'kmaq living in the area and /or other local 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 quarry operations are not expected to change in scope or to increase in frequency or intensity from past use, there is unlikely to be a change from current operations; consequently none of these effects are considered significant.

#### 5.3.2 RECREATIONAL ACTIVITIES

Lands in the general vicinity have been managed by the Province of Nova Scotia, the federal government, and conservation organizations and groups mainly to protect natural environment values and associated wildlife and species of conservation concern and to provide the public with opportunities to experience them. 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 and population centres 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 in relation to other industrial activities including logging, which operate trucks and equipment; and general high-volume traffic along Highway 325 to which locals are exposed. Noise from routine operations at the Quarry would not be heard in the nearby communities of West Clifford, Colpton or Pleasant River. Noise from blasting is likely to be heard over a wide area, one to two times a year. Unlike the 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, and 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 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.

### **5.3.3 TOURISM AND VIEWSCAPE**

Expansion of the existing Colpton Quarry is not expected to have a significant impact on tourism and viewscape. The level of activity at the quarry would remain the same as at present. The principal interactions would be noise, and truck traffic transporting aggregate to job sites. Some operations at the quarry may be heard nearby but would likely not be noticeable by tourists in vehicles passing by. Blasting, which may be heard at greater distances, is of short duration and occurs infrequently—one to two times a year. The expansion will not result in a change in annual or daily activity, or visibility. Overall, the impacts on viewscape and tourism are expected to be negligible.

### **5.3.4 RECREATIONAL, COMMERCIAL & MI'KMAQ FISHING**

Recreational fishing in watercourses near the Quarry is not expected to be affected by activities at the quarry. The amount of runoff from the quarry is small and high quality, and will have a negligible impact on the watercourses and fish habitat downstream. Surface waters at the site have high quality, including low turbidity and neutral pH, which would lead to good quality of waters downstream for fish. Overall, a negligible impact of the quarry on recreational, commercial, and Mi'Kmaq fishing is expected.

### **5.3.5 ARCHAEOLOGICAL/CULTURAL/HISTORICAL**

The land proposed for the quarry expansion has low potential for pre-contact and/or early historic First Nations or European archaeological resources (CRM 2022). The site is not expected to have been a prime area used by Mi'Kmaq pre-contact. If an archaeological feature of significance is encountered during quarry activities, particularly evidence of Mi'kmaq occupation, operations will be stopped, and experts in the field including the Department of Communities, Culture and Heritage, will be consulted to ensure the artifact or feature is not disturbed and is adequately documented and preserved.

### **5.3.6 ECONOMY, LAND USE AND VALUE**

Activities at the Colpton Quarry do not restrict forestry in the area. Aggregate from the quarry is used in projects in the general vicinity at a competitive cost due to the proximity of the quarry. Employees working at the quarry use local services which generates tax revenue. The existing quarry has been operating at the site with little to no impact, while providing economic development and a source of aggregate for local construction projects.

### **5.3.7 TRANSPORTATION**

The Colpton Quarry currently generates a comparatively low level of truck traffic on highways in the area, and activity levels are not expected to increase. Consequently, the quarry is not expected to change existing traffic volumes. The intersection of the Quarry access road with Highway 325 has good sightlines but may lead to hazardous encounters due to the long stretch of highway on either side which do not have significant on-turning traffic; this effect can be mitigated by applicable warning signs placed far in advance of the access road to indicate the likely presence of heavy equipment and trucks turning. Safe use of the road and avoidance of accidents is essential, both for the avoidance of human impacts and the potential impacts of vehicle accidents and spills on the local watercourses and environments. Equipment and truck operators for the quarry will be given instruction on safe and environmentally acceptable procedures. With suitable

foresight and care, the impact of the project on transportation and safety is expected to be minimal, with little or no change from previous operations at the quarry.

#### **5.3.8 RESIDENTIAL USE**

There are no permanent residences within 800 meters of the Quarry and the nearest residence is in the community of West Clifford some two kilometers distant. Sky-shine from the quarry, on rare occasions when the quarry may be operated at night, might be seen residents in West Clifford, Colpton or Pleasant River, but would be controlled by proper environmental management practices at the site (i.e. downward directional lighting).

Blasting could be heard by residents in nearby areas, but would be instantaneous and infrequent (e.g., one to two times per year during years in which the quarry is active). All blasting events will continue to be monitored for concussion and ground vibration to ensure blasting limits are achieved.

Most operations at the site occur during daylight hours. On rare circumstances when they are undertaken at night, activities will involve minimal lighting, which is unlikely to be seen by locals. The quarry includes signage with phone numbers should any members of the community have inquiries. A complaint resolution procedure will be put in place by Municipal to address complaints and concerns.

#### **5.3.9 COMMERCIAL/INDUSTRIAL USE**

There are no businesses in the vicinity of the Quarry which could be affected. The quarry contributes to net economic benefit in the community through supporting local trucking operations and providing access to aggregate and other quarry products.

#### **5.3.10 WATER SUPPLIES AND RESIDENTIAL WELLS**

Surface water and drilled wells associated with the nearest residences are too far from the quarry and in different groundwater regimes, to be affected by blasting at the quarry. Groundwater recharge generated by the quarry is likely to be of high quality (low conductivity and dissolved solids and neutral in pH). Best management practices surrounding blasting will be followed, established operational procedures for fueling will be followed, and a contingency plan will be maintained to mitigate reasonable impacts on aquifers at the site.

#### **5.3.11 PARKS AND PROTECTED AREAS**

The proposed expansion of the Colpton Quarry site will not change the intensity or frequency of activity at the site, and therefore the degree of any interactions with the managed conservation and protected areas in the immediate vicinity is not expected change. With no expected change in the scope or frequency of quarry activity due to the expansion, road traffic activity due to the quarry is not expected to change, or be high enough in volume to disrupt tourist traffic. Occasional blasting (one to two times a year) may be heard by local residents, 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 those 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. Overall, the change due to the expansion of the quarry on the IBA will be negligible.



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### **5.3.12 RESOURCE USE—FORESTRY, HUNTING & TRAPPING**

Use of the land in the 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.

## **5.4 BIOPHYSICAL IMPACTS—IMPACTS OF THE PROJECT ON THE ENVIRONMENT**

### **5.4.1 AIR QUALITY, NOISE, AND LIGHT**

The intensity, frequency, and scope of quarry activities are not expected to change from present levels, which is governed by the amount of local demand for aggregate, which does not change appreciably from year to year, and which in a rural area such as Lunenburg County, is not typically high. Operation of a quarry has the potential to generate dust, combustion emissions, noise, and light. In particular, operation of heavy equipment (e.g., earth movers, crushers), rock drilling and blasting, as well as onsite routine operations contribute to increased dust and particulate levels. Dust management will be undertaken, including use of water spray and covering working and laydown areas with blasted rock, dust suppression systems on crushing equipment, reducing vehicle speeds, and using tarpaulins on truck boxes. Airborne particulate emissions are monitored in accordance with the site Industrial Approval, the Pit and Quarry Guidelines, and the Nova Scotia Air Quality Regulations. Industry standards and best practices will be followed during all phases of operations.

Exhaust emissions are generated by the operation of vehicles and equipment. Vehicles and heavy equipment are expected to follow efficient operating procedures such as not idling unnecessarily when not in use. Given the relatively small size 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 crushers and asphalt plant) 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 NSECC, in accordance with the terms and conditions of the Industrial Approval.

With no anticipated change in scope or frequency of operation, noise levels from the expanded quarry are expected to be similar to those already produced at the site. Noise mitigation will include maintaining vehicles and heavy equipment in proper working order; planning traffic flow patterns around the site to reduce the need for heavy equipment to back up (thus reducing the frequency of backup signals); and ensuring that parts of equipment capable of causing noise (e.g., dump doors on truck boxes) are secured. Municipal 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 per year). All blasting events will be monitored for concussion and ground vibrations to confirm adherence to regulated levels. Noise monitoring will be conducted at the request of NSECC, in accordance with the terms and conditions of the Industrial Approval.

Nighttime operations will only occur if necessary, and will adhere to time of day conditions in the Industrial Approval from NSECC. Light during nighttime 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. If



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nighttime operations are required then directional lighting will be used to minimize emanation of light upward and laterally over the horizon.

#### **5.4.2 GROUNDWATER**

Activities associated with the project including forest clearing, grubbing and removal of overburden, and blasting, 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 small in relation to the overall size of the aquifers in the general vicinity; the water table in bedrock below the quarry floor will continue to recharge at approximately the same rate as at present. A contingency plan will be established to manage emergency response in the unlikely event of spills or releases of fuels or hazardous chemicals potentially impacting groundwater in the area. Following EA Approval, a groundwater monitoring program will be developed as part of the subsequent Industrial Approval Amendment process. The groundwater monitoring program will establish baseline groundwater quality, elevations, and flow direction prior to the quarry expansion, and will provide regular monitoring to ensure that any potential impacts associated with the quarry expansion are identified. Overall, the effect on overall groundwater distribution and flow are expected to be negligible.

#### **5.4.3 HYDROLOGY**

Due to the relatively small area of the expanded quarry, and its position in the upper headwaters of the local catchments, the Quarry will have a negligible effect on surface waters in the immediate vicinity. The proposed expansion area is small and consequently the effect on supply to surface waters in the vicinity is not expected to be disrupted significantly. Surface water runoff from the quarry is inherently intermittent due to the dominance of precipitation in water balance, and most is expected to enter the water table directly through percolation through cracks and fissures in the bedrock; however, surface flows will be moderated by the surface water management system and will ensure that flow characteristics in downstream areas are not affected significantly. Runoff will be managed to ensure that it meets limits noted in the Industrial Approval.

#### **5.4.4 WATER QUALITY**

Water quality leaving the quarry via surface or groundwater is not expected to be impacted significantly outside the expansion area, in particular watercourses in the area which are tributaries of Barren Meadow Brook, Shingle Lake, Pleasant River, Molega Lake and Medway River. Water Quality at the site is high, because of the management measures to reduce erosion and sedimentation on the quarry floor; and the low-contaminant characteristics of the bedrock and location of the site high in the local catchment area. Quarry rock is within acceptable limits for sulphur and acid-generating potential. Blasting is not expected to result in groundwater quality changes. Forest clearing and grubbing activities can lead to releases of fines from the soil, resulting locally in elevated suspended sediment levels but little surface water flow from grubbed areas is expected off the site in part due to the small area involved and the presence of coarse soils, and sediments will be removed during flow through the adjacent landscapes. Possible release of other contaminants such as oils and lubricants from operating equipment is expected to be mitigated by normal precautions on equipment operations and fuelling locations. Contaminants arising from operations of the quarry are expected to be exceedingly low. All activities will conform to the Nova Scotia Erosion and Sedimentation Control Handbook (NSE 1988) and the Nova Scotia Pit & Quarry Guidelines (NSE 1999). A surface water

management and monitoring program will be established through the subsequent Industrial Approval Amendment process following the Environmental Assessment Approval.

#### **5.4.5 FRESHWATER AQUATIC ENVIRONMENTS AND WETLANDS**

There are no streams or watercourses in the proposed 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, product storage piles, and grubblings 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. Due to the presence of significant wetland habitat and wetlands of special significance to the north of the site, the quarry will not be developed in these areas. Wetland management plans will be developed and implemented to ensure these wetlands remain unaffected, as well as ensuring development will not encroach any further on wetlands. Development is intended to be to the south which will therefore avoid valuable wetlands and aquatic habitat at the north end of the study area.

#### **5.4.6 TERRESTRIAL ENVIRONMENTS**

Proposed expansion will utilize areas which are mainly cutover medium-aged deciduous and mixed forest—types which are common in the general vicinity, and in particular locally at the site—and the quarry will not remove a large proportion of either type. Because the forest was recently logged, the forest removed in future will be a regenerated one. Dust from operations may affect adjacent undeveloped forest communities although the impacts are likely to be negligible.

#### **5.4.7 FISH AND FISH HABITAT**

None of the proposed project activities will physically impact potentially fish bearing streams. There is no fish habitat on site in the proposed expansion area. Surface runoff from the site mostly enters groundwater. Runoff from the active quarry enters a quarry sump. Overflow from the sump exits via a culvert into catchments north of the quarry. No fish were found in the quarry sump and fish habitat in watercourses nearby are unlikely to be impacted. The Water Balance Assessment indicates that the expansion will not affect the supply of water to adjacent areas significantly. Water quality typically found in runoff from the quarry will be monitored and is expected to meet NSECC guidelines and limits stipulated in the Industrial Approval. The working face of the current active quarry is more than 200 meters from the nearest fish-bearing stream which is considered a safe separation from blasting activities. All guidelines for activities and timing of blasting in the quarry will be followed. Overall, the effects of the quarry construction and operations on fish and fish habitat are expected to be negligible.

#### **5.4.8 FLORA AND FAUNA AND HABITAT**

Expanding the Colpton Quarry will remove existing terrestrial ecosystem (plants and animals) in the footprint of the quarry. With time, areas no longer suitable for quarry operations will be remediated, through a site reclamation plan which will be established as a condition of quarry Industrial approval. Plant and animal communities that arise in remediated areas will likely differ to some degree from those at present; however, a goal of remediation will be to ensure that conditions (e.g., soil types and topography) are reasonably restored 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. 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 harm to nesting birds in forest areas. Due to recent tree harvesting efforts by the previous landowner, expansion of the Colpton Quarry will result in a comparatively small loss of less than 4 ha 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 normal 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. Quarry employees should 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. Night operations and use of lights have various effects, including attracting insects which otherwise would need darkness to mate and reproduce; light pollution is considered to be an important factor globally in decline of songbird populations, through declines in populations of some insects. Many migrating birds follow the Atlantic coast on their southward migration; if night-time operations are required, in particular during fall migration periods (August-September) when lights have the potential to attract migrating birds, downward directional lighting will be used which focuses downward and below the normal horizon, to limit visibility by birds and insects from a distance.

#### **5.4.9 SPECIES AT RISK**

The Colpton Quarry is near a complex of wetlands and terrestrial environments which are largely in a natural condition, and as well support a relatively large number of species of conservation concern, ranging from non-flowering plants (e.g. lichens) to higher level organisms of vertebrate groups including birds (e.g. Olive-sided Flycatcher) and herpetiles (Blanding's Turtle, Eastern Ribbonsnake, Snapping Turtle). The proposed quarry expansion area has been adjusted as necessary to avoid the adjacent designated critical habitat for these species. Common Nighthawk, a ground-nesting bird species, occurs in the area and potentially will nest in open areas of the quarry and in newly-cutover areas south of the quarry, which at some point in future will be developed. Olive-sided Flycatcher habitat is found within the area, and the species is relatively common, north and east of the existing quarry, but will be avoided by the quarry expansion will be to the south. No American Marten or Canada Lynx (both provincially listed as Endangered and which can occur in Queens County) have been recorded within 25 kilometers of the site and neither have been trapped recently in the area, and therefore the quarry will not have a significant potential for impacting them or their habitat. Development of the quarry will include preparation of a Wildlife Management Plan that will take into account the Species at Risk and associated habitat. Site preparation activities such as logging and site clearing should be scheduled outside the April to mid-September nesting period for breeding birds. Lights used during night-time operations during nesting and migration periods would attract various bird species and insects, which could include species at risk. Lighting used at the site should focus downward and below the normal horizon, to limit visibility from a distance.

#### **5.4.10 NATURAL AREAS & WILDERNESS**

Natural areas in the vicinity of the site 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 experience. The proposed expansion of the Colpton Quarry will affect a small proportion of the natural landscape at the site at any given time, is a modified environment in the sense that it has experienced past and recent logging, and is not likely to have effects via

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the atmosphere, or through ground and surface water on adjacent relatively pristine areas. Consequently, it will have a negligible effect both on ecosystems and on human use and interests in adjacent environments. Municipal is committed to minimizing potential effects of the quarry, in particular to minimize traffic, noise, dust and light from operations to the extent possible. The quarry expansion is not expected to change the frequency, intensity, or scope of operations, and consequently the already negligible impact on natural areas and wilderness is expected to continue to be low. Restoration will also consider values important in conservation of biological communities and ecosystems, as well as changes in physical conditions that could affect those communities. Normal procedures such as dust control and light management will help to minimize impacts on natural and wilderness values at the site.

## **6 IMPACTS OF THE ENVIRONMENT ON THE PROJECT**

Colpton Quarry will not be impacted to a significant degree by weather, including extreme weather events expected to occur around the world as a result of climate change. Quarry design, which includes site water management, will allow flows generated by extreme rainfall events to be managed. As part of the subsequent Industrial Approval Amendment process, a Stormwater Management Plan and Erosion and Sediment Control Plan will be developed, which will help to control the effects of extreme rainfall events. 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 water balance of the nearby important wetlands. The site is comparatively well-protected from high winds due to its central location in Nova Scotia, but wind will be considered in contingency planning for the site. Aggregate and other rock products produced and stored at the site are stable under varying conditions of rainfall. Although extreme rainfall events may currently lead to high flows in watercourses near the site, such flows will be manageable through site design and infrastructure.

**Table 13. Potential interactions between project activities and operations and Valued Environmental Components (VECs) for Colpton Quarry expansion.**

General Category of VEC	Biophysical									Socioeconomic										
	Air Quality, Noise and Light	Groundwater & Hydrology	Water Quality	Freshwater Aquatic Environments and Wetlands	Terrestrial Environments	Natural Areas & Wilderness	Fish and Fish Habitat	Flora & Fauna Species & Habitat	Species at Risk	Mi'kmaq	Cultural/Historical	Recreation, Tourism & Viewscape	Residential Use	Recreational, Commercial & Mi'kmaq Fishing	Water Supplies/ Residential Wells	Economy, Land Use, and Value	Transportation	Commercial /Industrial Use	Parks & Protected Areas	Forestry Hunting /Trapping
Project Component (potential interactions shown by ✓)																				
<b>CONSTRUCTION</b>																				
Site Acquisition, Use/Removal of Resources	✓		✓		✓	✓		✓		✓	✓	✓				✓	✓	✓		✓
Site Clearing/Grubbing	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓						✓	✓
Drilling	✓	✓	✓			✓		✓		✓		✓			✓				✓	
Blasting	✓	✓	✓			✓	✓		✓		✓	✓		✓	✓				✓	
Lights & Noise	✓					✓		✓		✓		✓							✓	
<b>OPERATION</b>																				
Moving/Transporting Rock and Product	✓					✓		✓		✓		✓	✓			✓	✓	✓	✓	
Crushing	✓					✓		✓	✓	✓		✓			✓				✓	
Washing		✓	✓	✓			✓		✓				✓							
Lights & Noise	✓					✓		✓	✓	✓		✓							✓	
Site Runoff Management		✓	✓	✓			✓						✓							
Portable Asphalt Plant	✓					✓		✓		✓		✓			✓	✓			✓	
Onsite Materials Storage			✓															✓		
Accidents (Fires/Oil & Fuel Spills)	✓	✓	✓	✓		✓	✓	✓				✓	✓		✓				✓	✓

<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>							
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>	
<b>BIOPHYSICAL COMPONENTS</b>							
Air Quality, Noise & Light	Construction	Noise and dust from heavy equipment during site clearing and grubbing.	Significant	Negative	Take steps to reduce noise sources such as engine braking. Maintain vehicles and equipment to reduce noise and emissions generated from worn parts.	Not significant.	
		Drilling and blasting.	Significant	Negative	Monitor noise levels and undertake to avoid exceedances of regulatory levels.	Not significant.	
		Light from the quarry can be seen in neighbouring areas.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry during night operations.	Not significant.	
	Operation	Noise from drilling and blasting; crusher; heavy equipment operation; dust.	Significant	Negative	Monitor noise levels and undertake to avoid exceedances of regulatory levels. Institute measures for dust control.	Not significant.	
		Noise from engine braking of trucks on access road and Hwy 325 interfering with local enjoyment.	Significant	Negative	Instruct truck operators to avoid use engine braking leaving the quarry and in populated areas.	Not significant.	
		Light from the quarry can be seen in neighbouring areas.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry at night.	Not significant.	
		Dust from crushing operations and site activities.	Significant	Negative	Water spray systems on crushing spreads to reduce dust. Water spray on access road. Avoid use of chemical dust suppressant to avoid impacts on adjacent wetlands.	Not significant	
	Groundwater/ Hydrology	Construction	Forest and soil removal changes surface and ground water flow levels and patterns.	Negligible	Negative	Use site runoff management to minimize impacts. Likely changes in groundwater and runoff patterns will be small.	Not significant.
		Operation	Blasting fractures bedrock, disturbs till, and changes groundwater flow patterns. Drilled wells in bedrock and surface wells can be disturbed	Significant	Negative	Analyze groundwater quality and movement to determine changes.	Not significant.



<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>						
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>
	Operation	Quarry and work areas change surface water flows. Increased peak stormwater flows. Washing product creates silt-laden surface flows.	Significant	Negative	Onsite water management to moderate extreme surface water runoff and suspended sediment levels; measures to maintain normal flow regime. Aggregate washing arranged in closed loop system to retain all wash water onsite.	Not significant.
	Operation	Accidental hydrocarbon spills and blasting residues contaminate groundwater.	Significant	Negative	Measures to minimize danger of spills; monitor and control nitrates from blasting; proper fuel handling strategies, onsite emergency numbers, spill kits etc.. Avoid refueling near watercourses.	Not significant.
Water Quality	Construction	Altered surface water flows and turbidity in watershed flowages from site runoff.	Negligible	Negative	Erosion and sedimentation controls in work areas. Onsite water management to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Dust & suspended sediment from operations potentially enters local watershed. Chemicals (e.g., nitrates) from explosives entering runoff.	Significant	Negative	Onsite dust control and water management to moderate surface water runoff and suspended sediment levels. Erosion & sedimentation controls. Closely monitor chemical residues after blasting.	Not significant.
	Operation	Water chemistry changes in runoff from stockpiles stored on site.	Negligible	Negative	Best management practice allows leaving piles exposed to the environment. Monitor settling ponds; storm-water management.	Not significant.
Natural Areas & Wilderness	Construction & Operation	Presence of quarry, emissions, dust etc., detracts from public perception of wild quality of area. Disturbance of wildlife including species of conservation concern in adjacent wild areas.	Negligible	Negative	Area affected is small in relation to remaining natural areas, and previous development and logging has occurred in the area, diminishing value of natural areas and wilderness. Minimize footprint. Manage releases of dust and light, and control noise.	Not significant.

<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>						
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>
Freshwater Aquatic Environments	Construction	Potential for local high suspended sediments and nutrient levels from grubblings, road construction, and locally-diverted flows.	Negligible	Negative	Preserve wooded buffer areas for quarry. Onsite water management and sedimentation controls to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Surface runoff with dust, nutrients and contaminants. Residues from aggregate washing. Reduced water availability from evaporation from pit floor and exposed surfaces.	Negligible	Negative	Maintain forested buffers. Onsite water management. Use sedimentation ponds and store wash water during off peak season. Minimize unvegetated areas.	Not significant.
	Operation	Higher peak flows and suspended sediment during activities.	Significant	Negative	Onsite water management to store wash water. Preserve woodland in buffer areas of quarry.	Not significant.
	Operation	Releases of chemicals from blasting and runoff from materials stored on site.	Negligible	Negative	Isolate and treat runoff from work areas and stored materials piles.	Not significant.
	Construction & Operation	Accidental spills of hydrocarbons on site.	Significant	Negative	Provide pollution prevention and emergency measures including spill kits on site.	Not significant.
Terrestrial Environments	Construction	Grubbing, road construction, pit preparation. Damage to natural forest ecosystem, and associated species.	Significant	Negative	Maintain property boundary buffers. Conduct species specific breeding bird surveys prior to development stages. Monitor species-at-risk birds. Monitor for invasive and exotic plant species. Conduct forest removal in small stages corresponding to site development and not in breeding period for birds.	Not significant.
	Operation	Dust, nutrient inputs from runoff, changes to environment and functioning of forest communities.	Negligible	Negative	Maintain property boundary buffers. Conduct species specific breeding bird surveys prior to excavation. Be aware of critical times for rare species which might occur.	Not significant.

<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>						
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>
Fish & Fish Habitat	Construction	Change runoff patterns at site in local and adjacent watersheds.	Negligible	Negative	Runoff management to maintain flow to natural watersheds and to avoid sudden runoff events.	Not significant.
	Operation	Site runoff management and water use affects hydrological and groundwater regime.	Negligible	Negative	Ensure runoff from the site is managed to avoid sudden runoff events.	Not significant.
	Construction & Operation	Small releases of oils, hydraulic fluids etc. from operating equipment. Accidental spills of hydrocarbons on site.	Negligible	Negative	Maintain equipment to minimize loss of lubricants and fuels. Provide pollution prevention and emergency measures including spill kits.	Not significant.
	Operation	Accidental spills into watercourses due to vehicle accidents on roads in area.	Negligible	Negative	Recommend safe driving practices for truckers and staff and reduce speed in vicinity of quarry key intersections. Provide pollution prevention and emergency measures.	Not significant.
Terrestrial Flora & Fauna & Habitat	Construction	Removal of Existing Forest Communities	Negligible	Negative	Restore damaged and unused parts of the site (e.g. grubblings and waste rock piles) as soon as possible. Long-term site rehabilitation plan developed with NSECC. Cut forest short term only as needed to expand quarry. Conduct species specific breeding bird surveys prior to new excavation.	Not significant.
	Construction & Operation	Accidental contaminant releases, contamination of habitat.	Significant	Negative	Provide pollution prevention and emergency measures & response capability. Remediate areas affected by spills.	Not significant.
		Artificial light from operations influences movements of birds, insects and herpetiles.	Significant	Negative	Use directional lighting with downward focus to minimize light leaving the quarry.	Not significant.
		Removal of potential forest and wildlife resource (i.e. wildlife habitat)	Negligible	Negative	Small area affected relative to total available. Minimize footprint of quarry. Restore and rehabilitate areas not used. Leave mature standing trees where possible as nest cavities.	Not significant.

<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>						
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>
		Quarry affects wildlife movement patterns and connectivity of habitats.	Negligible	Negative.	Restoration should include consideration for wildlife movement through the restored site.	Not significant.
Species at Risk	Construction	Removal of potential habitat for SAR occurring in the area.	Negligible	Negative	Small area affected relative to total available. Minimize footprint of quarry. Exclude development into critical habitat areas.	Not significant.
	Operation	Sound from blasting can harm bats and birds.	Negligible	Negative	Minimize blasting activity and concentrate in summer (outside breeding and migratory periods for birds and bats). Survey for presence of bats potentially associated with abandoned mine shafts.	Not significant.
		Light influences movements of species at risk birds migrating overland.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry.	Not significant.
		Open and revegetated areas and grubblings piles may be occupied by nesting species such as nighthawks.	Significant	Negative	Educate personnel to look for bird life prior to activities; periodically conduct nesting bird survey at site to identify bird issues.	Not significant.
<b>SOCIOECONOMIC COMPONENTS</b>						
Mi'kmaq	Construction and Operation	Any land use conflicts with Mi'kmaq Right to Use land	Significant	Neutral	Engage with Mi'kmaq in developing quarry.	Not significant.
		Contamination of surface waters may affect fish populations in area watercourses	Negligible	Negative	Employ surface water monitoring program. Use Best Management Practices for quarries. Avoid accidental releases of contaminants. Avoid vehicle accidents.	Not significant.
Archaeological, Cultural and Historical Significance	Construction	Expansion may affect undiscovered artifacts.	Not significant	Negligible	Unlikely that artifacts occur at site. Stop work and report discoveries. Minimize project footprint.	Not significant.
Recreation	Construction & Operation	Quarry traffic interacts with both resident and tourist use on Highway 325.	Not significant	Negative	Users will be aware of activity at quarry but will not be otherwise impacted by it. Signage of truck use, dangers, and quarry activity.	Not significant.

<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>						
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>
Tourism and Viewscape	Construction & Operation	Presence of quarry affects public perception of wilderness values.	Negligible	Negative	Cannot be seen from Highway 325 or other nearby areas. Maintain entrance to quarry access road in natural condition.	Not significant.
Residential Use	Construction & Operation	Noise; light pollution perceived by rural residents in West Clifford, Colpton and Pleasant River; operation of trucks and transportation of heavy equipment along highways used by locals.	Significant	Negative	Use best management practice. Provide community with safety information for truck traffic and quarry operations. Inform residents of imminent blasting.	Not significant.
Recreational and Mi'kmaq Hunting and Fishing	Construction & Operation	Accidental hydrocarbon spills and blasting residues contaminate surface waters.	Negligible	Negative	Not an important local activity. Provide pollution prevention, emergency measures & response capability. Identify and control contaminant releases.	Not significant.
	Construction	Loss of forested area under quarry footprint.	Not significant	Negative	Small area affected. Rehabilitate areas no longer needed for activity and future development. Minimize cutting to area needed for active quarry.	Not significant.
Water Supplies & Residential Wells	Construction and Operation	Blasting potentially impacts local aquifers.	Negligible	Negative	No wells within 1 km and aquifers not connected. Develop groundwater-monitoring plan in consultation with NSECC.	Not significant.
Economy, Land Use and Value	Construction & Operation	Removal of potential forest and wildlife resource (e.g. forestry & trapping).	Not significant	Negative	Small area affected relative to total land available. Minimize footprint of quarry. Restore and rehabilitate areas not used.	Not significant.
Transportation	Operation	Wear on Hwys 325 and 208	Negligible	Negative	Current levels are low and will not increase.	Not significant.
	Operation	Collisions with trucks and equipment on Hwys 325 and 208.	Not significant	No Change	Use good signage, have speed policy in vicinity of quarry. Safety training for truck drivers.	Not significant
Industrial & Commercial Use	Operation	Use of access road for forestry.	Negligible	Neutral	Quarry helps to maintain access roads for forestry and general site access.	Not significant.
Resource Use Forestry, Hunting & Trapping	Construction & Operation	Removes woodland; game habitat.	Not significant	Negative	Relatively small area is used. Minimize footprint.	Not significant.

<b>Table 14. Summary of impacts and mitigation on Valued Environmental Components, Colpton Quarry Expansion.</b>						
<b>VEC</b>	<b>Project Component</b>	<b>Nature of Effect</b>	<b>Significance</b>	<b>Nature of Impact</b>	<b>Suggested Mitigation</b>	<b>Significance after Mitigation</b>
Parks and Protected areas	Construction & Operation	Noise and blasting not likely to be heard at parks and nature areas in the general vicinity.	Not significant	Neutral	Employ best management practices for all aspects of quarry operation, in particular control of noise, light, & dust.	Not significant.

## 7 MONITORING

As part of the subsequent Industrial Approval Amendment application (following successful EA approval) Municipal will establish several management and monitoring programs to validate the environmental mitigation strategies that will be implemented at the site. Monitoring programs will include:

- Surface water monitoring for water quality in local water resources which may be impacted by the quarry;
- Groundwater monitoring of hydrogeological conditions and groundwater quality;
- Blast monitoring (noise and concussion) for all blasting events conducted at the site;
- Noise monitoring (at NSECC request through Industrial Approval);
- Dust monitoring (at NSECC request through Industrial Approval); and
- Additional monitoring for select species and/or other environmental features (as necessary).

## 8 PUBLIC CONSULTATION

Informing the public and Mi'kmaq about proposed industrial activities which potentially affect them is an important part of environmental and project management. Potential benefits include exposure to local knowledge, which may improve environmental performance, and overall operations of the project; and public involvement and support in subsequent operations. In addition to contacts already made in developing this assessment and in conducting operations in the area, Municipal will be undertaking consultations with the local community through public notices, contacts with municipal and provincial government officials, and engagement with the Mi'kmaq about the project and its implications; as well as the plans for using the resources at the site in an environmentally acceptable manner.

## 9 PERSONAL COMMUNICATIONS

Mr. Peter Kydd, Regional Biologist, Nova Scotia Department of Natural Resources and Renewables, December 2022

Mr. Rhett Thompson, Municipal Group of Companies, 2023.

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## 11 LIMITING CONDITIONS

The American Society for Testing and Materials Standards of Practice and the Canadian Standards Association state that no environmental assessment can wholly eliminate uncertainty regarding the recognition of potential environmental liabilities. The intent of the assessment is to reduce, but not eliminate, uncertainty regarding projects, giving reasonable limits of time and costs.

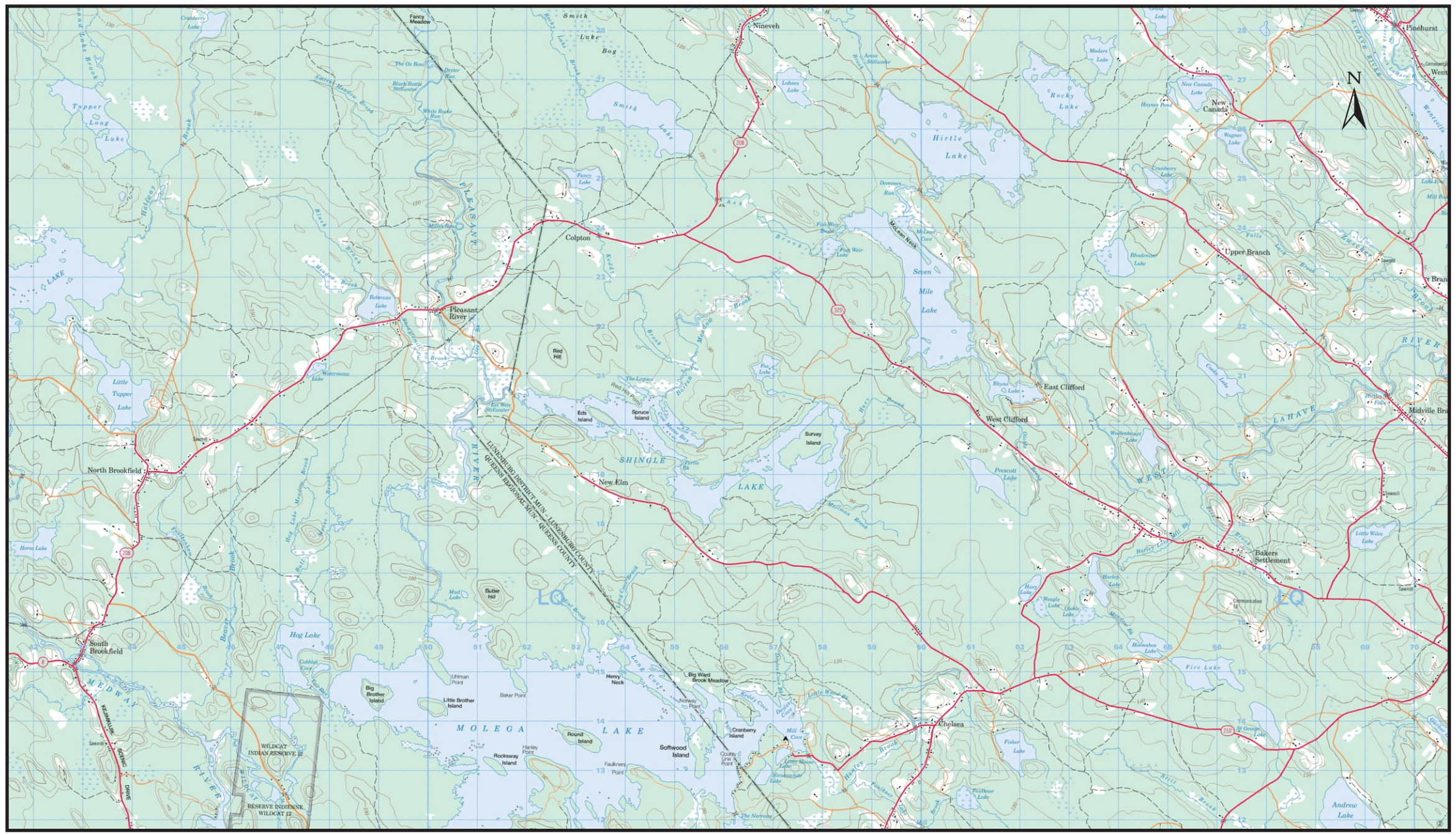
The conclusions of this report are based in part on the information provided by others, which is assumed to be correct. The potential exists that unexpected environmental conditions may be encountered at the site and with the project, not specifically investigated. Should this occur, the proponent and regulatory authorities must be notified so that we may decide if modifications to our conclusions are necessary.

The findings of this investigation are based on research and investigations carried out in May 2022 – April 2023 and the generally accepted assessment practices of our industry. No other warranty is made.

# APPENDIX A

## MAPS





**THE MUNICIPAL GROUP  
OF COMPANIES**

**MUNICIPAL ENTERPRISES  
LIMITED**

**COLPTON QUARRY  
EXPANSION**

**Lunenburg County,  
Nova Scotia**

**Site Location and  
Features**

 EA Study Area

Mapping by:  
Envirosphere Consultants Ltd.  
Windsor, Nova Scotia  
May 2023

Base Map: NTS 1:50,000, 21 A7

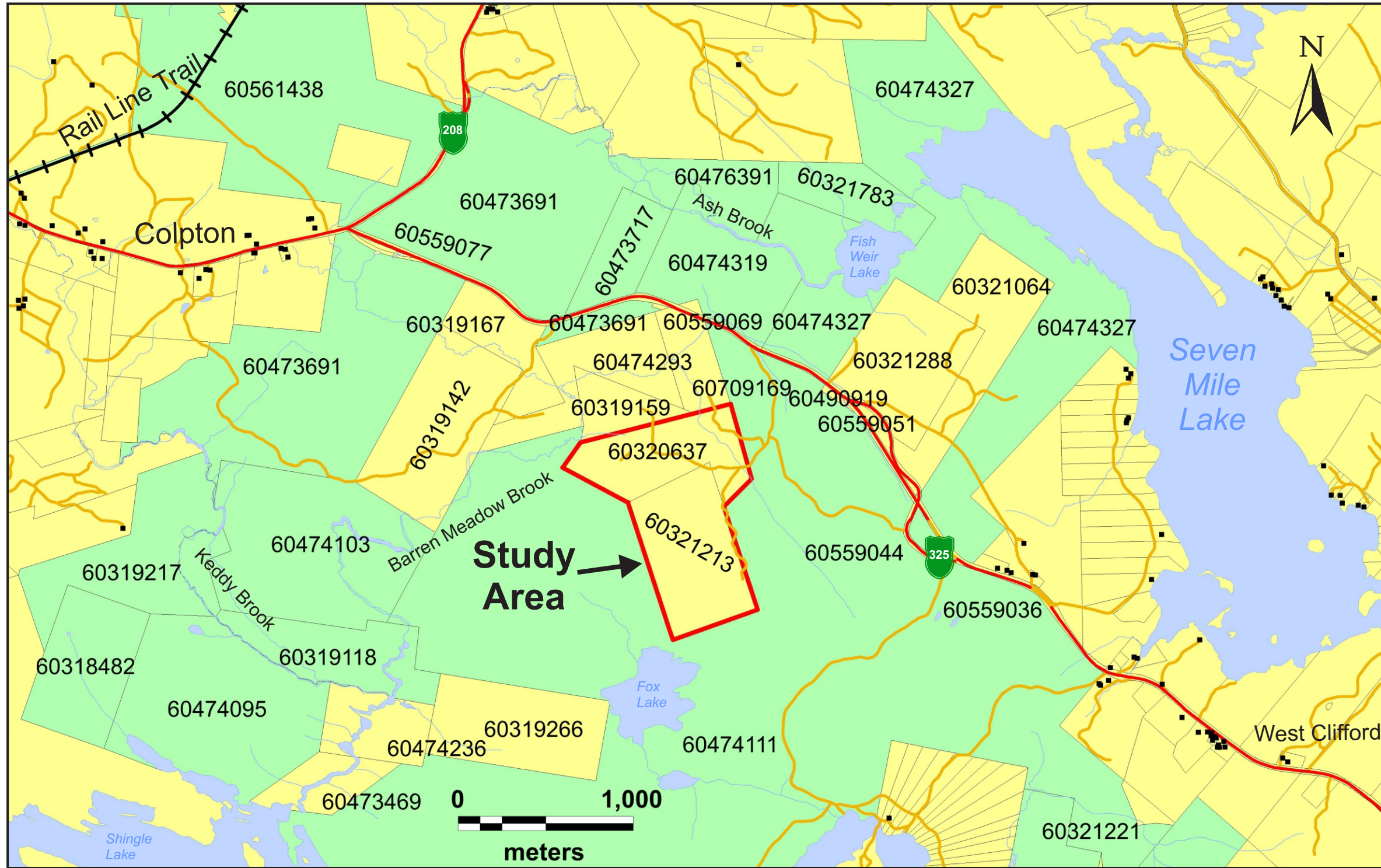


Map A-1



**MUNICIPAL  
ENTERPRISES LTD**





**THE MUNICIPAL GROUP OF COMPANIES**

MUNICIPAL ENTERPRISES LIMITED

**COLPTON QUARRY EXPANSION**

Lunenburg County, Nova Scotia

**Property Ownership**

- Crown Land
- EA Study Area
- Property Boundaries
- Major Roads
- Secondary Roads and Trails
- 50209980 Property Identification Number (PID)
- Building

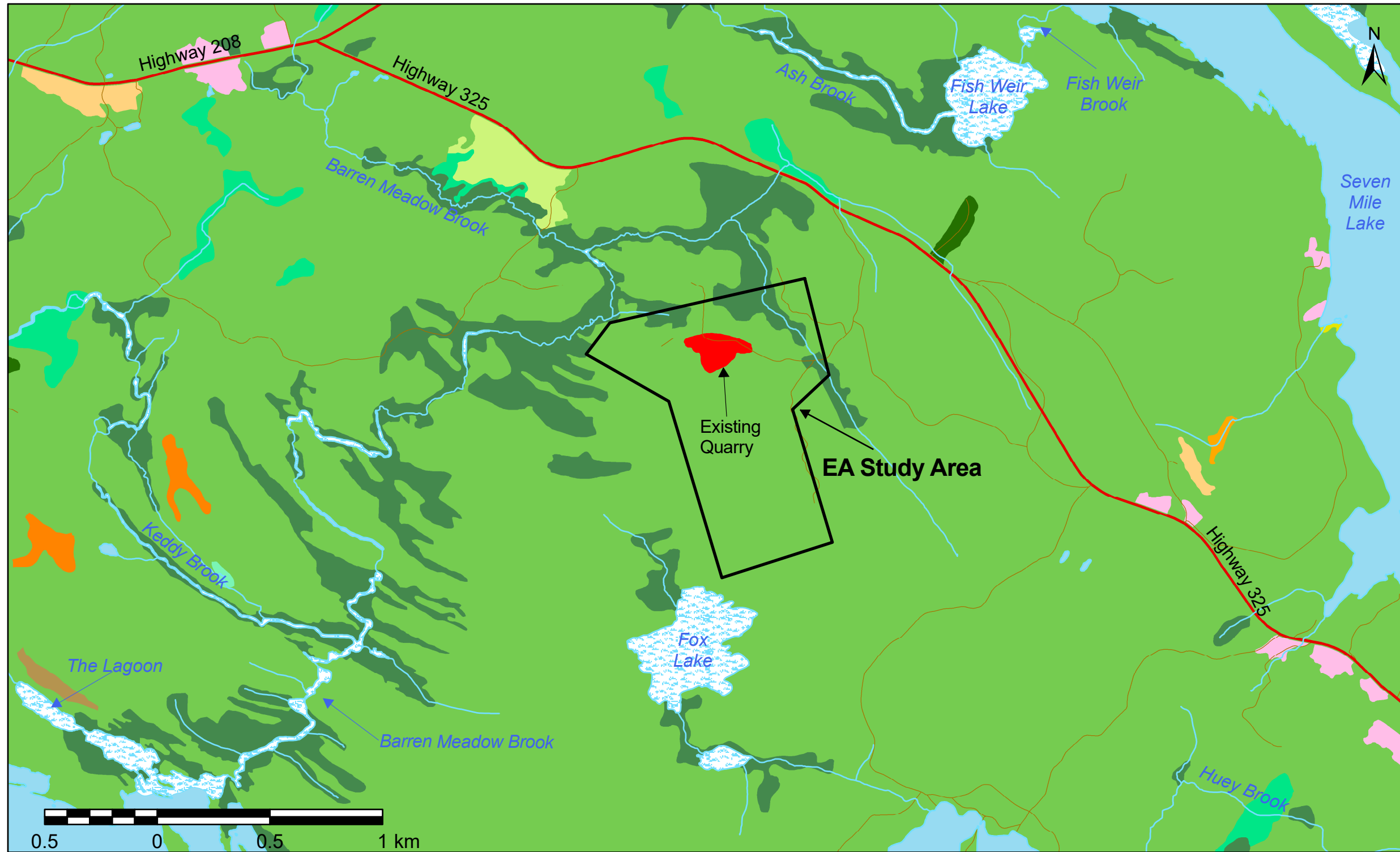
Mapping by:  
 EnviroSphere Consultants Ltd.  
 Windsor, Nova Scotia  
 May 2023

Property Mapping: Province of  
 Nova Scotia, Updated March 2022



**MUNICIPAL ENTERPRISES LTD**

Map A-2



**THE MUNICIPAL GROUP  
OF COMPANIES**

**DEXTER CONSTRUCTION  
COMPANY LIMITED**

**COLPTON  
QUARRY EXPANSION**

Lunenburg County,  
Nova Scotia

**Forest  
Classification**

- Natural Stand
- Christmas Trees
- Plantation
- Stand c/w Dead Trees
- Brush
- Wetlands General
- Open Bogs
- Treed Bogs
- Rock Barren
- Barren
- Agriculture
- Urban
- Gravel Pit
- Lake Wetland
- Inland Water
- Watercourse
- Trunk Highway
- Secondary Roads & Trails

Map by:  
Envirosphere Consultants Limited.  
Windsor, Nova Scotia, April 2023



**MUNICIPAL  
ENTERPRISES LTD**

Map A-3