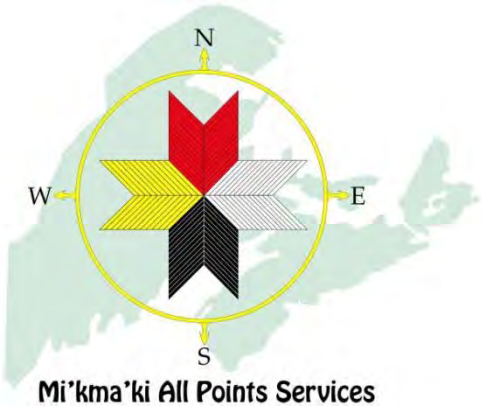
Appendix H.1

Mi'kmaw Ecological Knowledge Study - Fifteen Mile Stream Gold Development Project, Mi'kma'ki All Points Services Inc.

Mi’kmaw Ecological Knowledge Study

Fifteen Mile Stream Gold Development Project by Atlantic Gold Corporation

Fifteen Mile Stream, Nova Scotia



Mi’kmaw Ecological Knowledge Study

Fifteen Mile Stream Gold Development Project by Atlantic Gold Corporation

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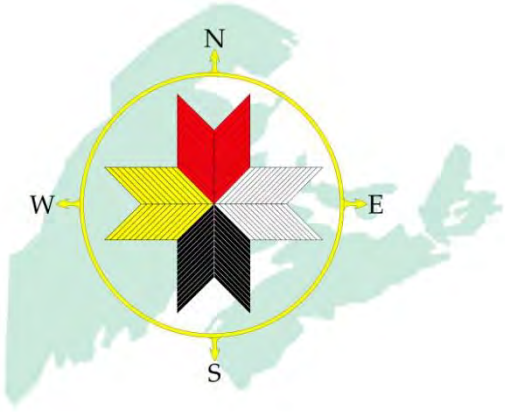

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1. Introduction

1.1. Mi'kma'ki All Points Services Inc.

Mi'kma'ki All Points Services Inc. (MAPS) is a not-for-profit research institution whose Board of Directors are those of the Union of Nova Scotia Indians (UNSI).

The objects of MAPS are to provide assistance and support to Mi'kmaq Bands, First Nation groups and organizations on the collection, preservation and promotion of Mi'kmaq history, traditions and culture in a manner that fosters First Nation capacity and resources in areas of education, research, environment, resource management, community land use and development.

MAPS was selected to prepare a Mi'kmaq Ecological Knowledge Study (MEKS) for the Fifteen Mile Stream gold development project proposed by Atlantic Gold Corporation.

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1.2. Project Description

Project description as given by Atlantic Gold Corporation on its website http://www.atlanticgoldcorporation.com/projects/overview (Aug. 2017):

"Atlantic currently holds four gold development projects in Nova Scotia, Canada: the Moose River Consolidated Project (MRC Project) comprising the Touquoy and the Beaver Dam gold deposits, the Cochrane Hill gold deposit, and the Fifteen Mile Stream deposit, as highlighted in the map below.

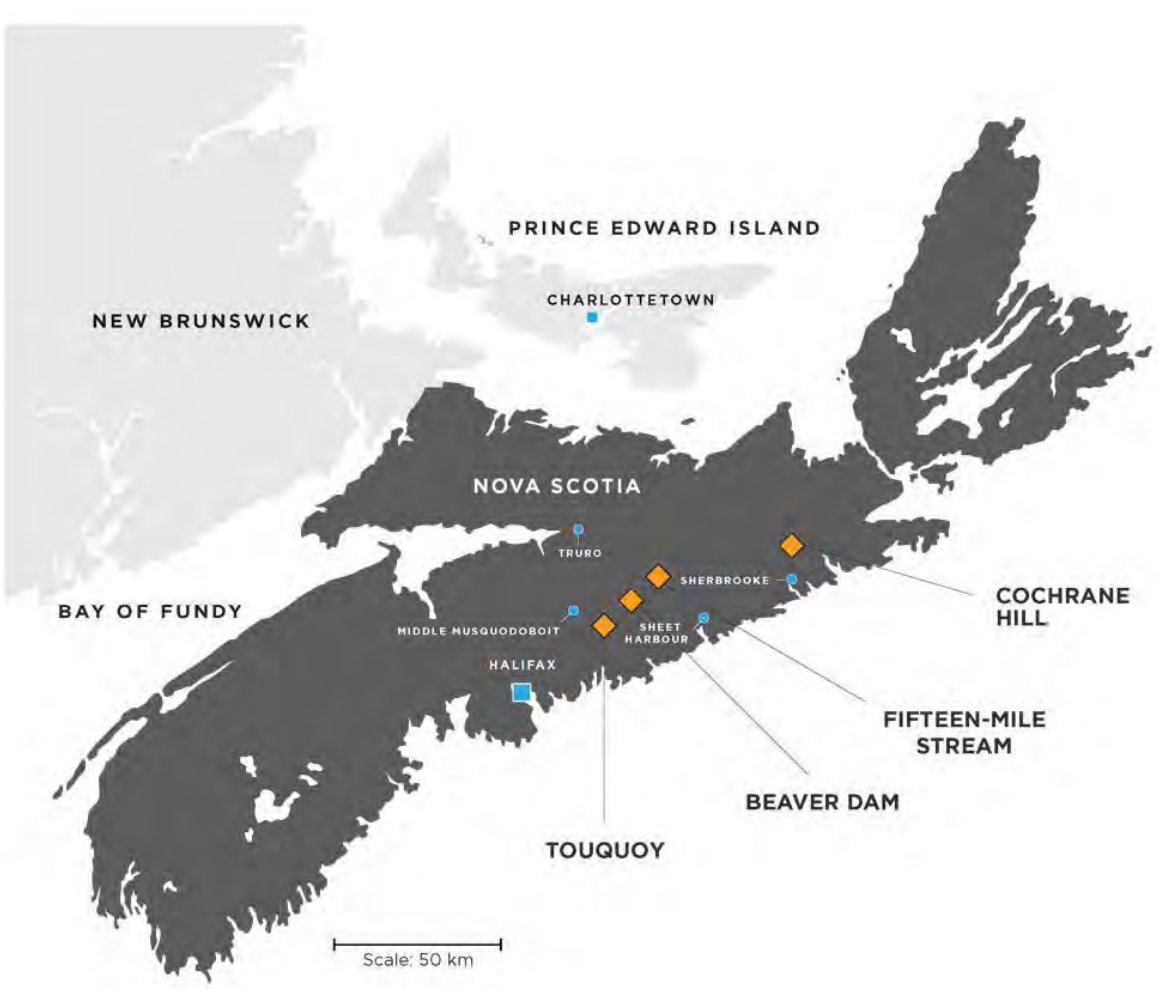

Figure 1: Atlantic Gold Corporation Projects (Atlantic Gold 2017)

The Touquoy gold project is the most advanced with all major permits in place. Beaver Dam is now in the permitting phase following the release of the results of a Feasibility study, while the Cochrane Hill project is now at the feasibility stage following the publishing of a PEA in October 2014, while the Fifteen Mile Stream project is at an earlier stage of development, with a Mineral Resource estimate in place. ...

FIFTEEN MILE STREAM PROJECT

Location

Fifteen Mile Stream is located approximately 57km northeast of the central milling facility at Touquoy and is readily accessible by highway. The project lies along the same

geological trend as the Company's other related deposits – Touquoy, Beaver Dam and Cochrane Hill – and all are hosted within the same critical stratigraphy and structure, over a strike length of 80 km.

History

Gold was discovered at Fifteen Mile Stream in 1867 with production of about 19,400oz documented during 1883-1911. During 1985-88 Pan East Resources drilled 134 diamond drill holes (26,612m) with a further 29 holes (3,741m) drilled in 2011 by Acadian Mining Corporation, now a wholly-owned subsidiary of Atlantic.

Mineral Resource Estimate

The drill database underpinning the current resource estimate in relation to Fifteen Mile Stream comprises 335 diamond drill holes from which a dataset of 17,310 two-metre composites have been created.

The composite dataset incorporates drilling from the Egerton-MacLean, Hudson and Plenty Zones, which are located at the eastern and western ends of an anticlinal dome and approximately 300m south of the dome respectively. At Egerton-MacLean and Hudson, mineralization is localized within a north-dipping sequence of sediments around and within the hinge zone of the anticline with mudstones bearing thin layer-parallel quartz veins being the preferred host. At Plenty, mineralization is localized in similar host rocks in what is interpreted to be an up-faulted limb of the same anticline.

These resource estimates for Fifteen Mile Stream have an effective date of July 20, 2017 and were prepared by Mr. Neil Schofield, a principal of FSSI Consultants (Australia) Pty Ltd. The tables below provide the current resource estimate prepared in accordance with NI 43-101 for a range of cut-off grades. The cut-off grades for the Mineral Resources below are based on Touquoy operating costs where the Company has been actively pre-production mining since July 2016. Other technical parameters and cost assumptions are listed in the Technical Disclosure section of this release. At a selected cut-off grade of 0.35 g/t Au the optimized pit shell for Fifteen Mile Stream contains Measured and Indicated Resources of 10.58 Mt at an average grade of 1.33 g/t Au and 6.64 Mt of material at 1.12 g/t Au in the Inferred category with a 2.2:1 strip ratio" (Atlantic Gold Corporation 2017).

2. Methodology

2.1. Purpose, Scope and Ethics of this MEKS

Mi'kmaw Ecological Knowledge (MEK) has been defined in the Mi'kmaq Ecological Knowledge Study Protocol (Protocol) as "…the collection and adaptation of knowledge that Mi'kmaq people have with all components of the natural environment and the interrelationships between all life forms from a unique historical, cultural and spiritual level." Outlining specific guidelines and conditions on the development of a MEKS in the province, the Protocol was ratified by the Assembly of Nova Scotia Mi'kmaq Chiefs on November 22, 2007 and updated in 2014.

The purpose of an MEKS is to foster the integration of Mi'kmaw environmental knowledge into the environmental assessment process and development decisions. It also aims to identify and report any ecological concerns regarding the Project's impact on Mi'kmaw use of land, resources and special places within the Project Study Area.

This study does not include an archaeological screening and is not an Archaeological Resource Impact Assessment, but does include some archaeological information based on existing data and literature.

This, as with any other MEKS, may not be considered consultation for justifying a potential adverse impact on Mi'kmaw aboriginal and treaty rights. However, the MEKS will recommend appropriate action should it identify possible infringements on Mi'kmaw constitutional rights. The MEKS does not intend to inform Mi'kmaw of the Project nor promote the Project to Mi'kmaw communities.

MAPS' methodological approach includes the adherence to the Mi'kmaq Ecological Knowledge Study Protocol (2nd edition) as ratified by the Assembly of Nova Scotia Mi'kmaw Chiefs (Appendix). Accordingly, this research initiative and its methodological approach were communicated to the Mi'kmaw Ethics Watch Committee in 2017 whose mandate is to ensure research activities with the Nova Scotia Mi'kmaw community comply with the Mi'kmaq Research Ethics Protocol of 1999.

MAPS informed the Union of Nova Scotia Indians as well as the Confederacy of Mainland Mi'kmaw and the Native Council of its intention to carry out this MEKS.

2.2. Definition of Terms

Environmental assessment: Environmental assessment is the process of identifying, predicting, evaluating, and mitigating the biophysical, social, and other relevant effects

of development proposals prior to major development decisions being taken and commitments made[1].

Cumulative effects: Cumulative effects are the accumulated spatial and temporal impacts to environmental and socio-economic values from multiple projects and other activities[2].

Mi'kmaw Land and Resource Use: Includes any type of resource harvesting such as hunting and fishing of wildlife resources, gathering of plant (food/medicinal plants, wood, etc.) and mineral resources (stones, clays, etc.), as well as occupancy categories such as camp sites, travel routes, spiritually significant sites, burials, etc.

Current or Contemporary Mi'kmaw Land and Resource Use: Respective activities occurring presently and recalled within living memory.

Historic Mi'kmaw Land and Resource Use: Respective activities that occurred before living memory, including the pre-contact era.

Living Memory: Living memory often extends to the knowledge and experiences of the parents and grandparents of the knowledge holder interviewed thus potentially reaching back two or three generations.

Mi'kmaw Ecological Knowledge (MEK): The collective body of knowledge which Mi'kmaq possess based on their intimate relationship with their natural surroundings, which encompasses a distinct world view and environmental ethic, including harvesting, conservation and spiritual concepts, and has been passed on orally from generation to generation. In general, and outside Mi'kma'ki, such knowledge systems are generally referred to as Indigenous Traditional or Traditional Environmental Knowledge (ITK or TEK).

Mi'kmaq / Mi'kmaw: 'Mi'kmaq' is an undeclined form meaning 'the family' or 'the/our people', and the plural of the singular term 'Mi'kmaw'. 'Mi'kmaw' is also an adjective preceding a noun.

Mi'kma'ki: The homeland or territory of the Mi'kmaq covering the Maritime Provinces plus the Gaspé peninsula and Newfoundland.

Comprehensive Land Claim: Comprehensive land claims arise from a First Nation's underlying Aboriginal Title to its traditional territory as long as it has not been dealt with by treaty or some other legal cessation. Aboriginal title to lands exists as a legal right flowing from a First Nation's historical occupation, use and possession of its traditional

[1] IAIA 1999:2
[2] Steffensen 2012:iii

lands. Aboriginal title is a recognized right contained in the Canadian Constitution under section 35 and the United Nations Declaration on the Rights of Indigenous Peoples. Through the negotiation and settlement of comprehensive claims, often referred to as modern-day treaty making, the First Nation and Crown seek to clarify ownership of, and access to, land and resources. Never having ceded any of their territory, Mi'kmaq have unextinuished aboriginal title to all lands as well as inland and adjacent waters within the Province of Nova Scotia and beyond.

Specific Land Claim: These claims deal with grievances of a First Nation arising from a failure of the federal government to honour its treaties, agreements or legal responsibilities. Various Bands are currently pursuing several specific claims within Nova Scotia.

Significance: In general, the term denotes the extent to which something matters. In the contexts of social and environmental impact assessments, a newly introduced phenomenon, event, structure or activity that has a 'significant' effect if it impacts or alters in some way other pre-existing social or natural phenomena, structures, processes or conditions.
In the context of an MEKS, the term significance is understood to evaluate the degree of potential project impacts on Mi'kmaw rights, culture or economy based on the following criteria: a) Mi'kmaw constitutionally protected rights regarding land and resources; b) the nature of Mi'kmaw use of particular lands and resources; c) the uniqueness of such lands and resources; and d) the cultural or spiritual meaning of those lands and resources.

2.3. Research Methodology

The research involved in the preparation of this MEKS is based on several components:

- An assessment of the study area's archaeological resources or potential based on existing reports and archaeological records of the Nova Scotia Museum.
- A survey of archival, published and unpublished material relating to historic Mi'kmaw land uses and occupancy in the study area housed at the Nova Scotia Public Archives, the Nova Scotia Museum; as well as the internal archive of Mi'kma'ki All Points Services.
- A two-season ground survey in the fall of 2017 and spring of 2018 of local plant resources of special significance to the Mi'kmaw community.
- Community-based research on current Mi'kmaw land and resource uses, carried out between October 2017 and August 2018 in the neighbouring Mi'kmaw First

Nations at Paqtnkek, Sipekne'katik and Eskasoni with Mi'kmaw knowledgeable about the Study Area, its resources and current Mi'kmaw land uses.
A detailed interview guide was developed specifically for this study in order to insure a consistent approach in the interviewing and recording of data by the interviewers in the above-mentioned communities.
No members of Millbrook First Nation were included in the interview survey as the community was in the process of preparing its own study.

- A regionally relevant compilation of existing current Mi'kmaq land/resource use and occupancy data out of the Traditional Use data base of Mi'kma'ki All Points Services Inc.

- Collected information has been compiled and digitized in order to allow for an analysis of potential impacts on current Mi'kmaw land and resource uses. Due to the sensitive nature of much of the information, it is reported in a generalized format only.

2.4. Limitations

- Little archaeological work has been carried out so far in the region of Guysborough County surrounding the project site. A scarcity of pre-contact archaeological evidence in this region does therefore not allow the conclusion of low Aboriginal use and occupancy during that period;

- Despite the Centralization policy in Nova Scotia interrupting during the first half of the 20th century traditional patterns of Mi'kmaw land use and occupancy, Mi'kmaw use continued to encompass all of Nova Scotia;

- Land and resource use information, both those stemming from MAPS' general data base as well as those collected for this study specifically, are based on interviews of samples of Mi'kmaw Elders and active land users. The land use data represented here therefore cannot be comprehensive. It serves as positive proof of Mi'kmaw land and resource use in the study region, but does not allow any conclusions as to the intensity of land use, nor does it imply that locations or resources not identified here are indeed not utilized by Mi'kmaq.

- The land/resource use survey carried out specifically for this study did not include members of the Millbrook First Nation.

2.5. Study Area

The study area for current Mi'kmaw land and resource use activities consists of the Project Area itself and a buffer of a five-kilometre radius surrounding the Project Area, and a corridor of two kilometres along the haul road sections extending beyond the core Project Area. Historical information and cumulative effects may relate to a wider surrounding area.

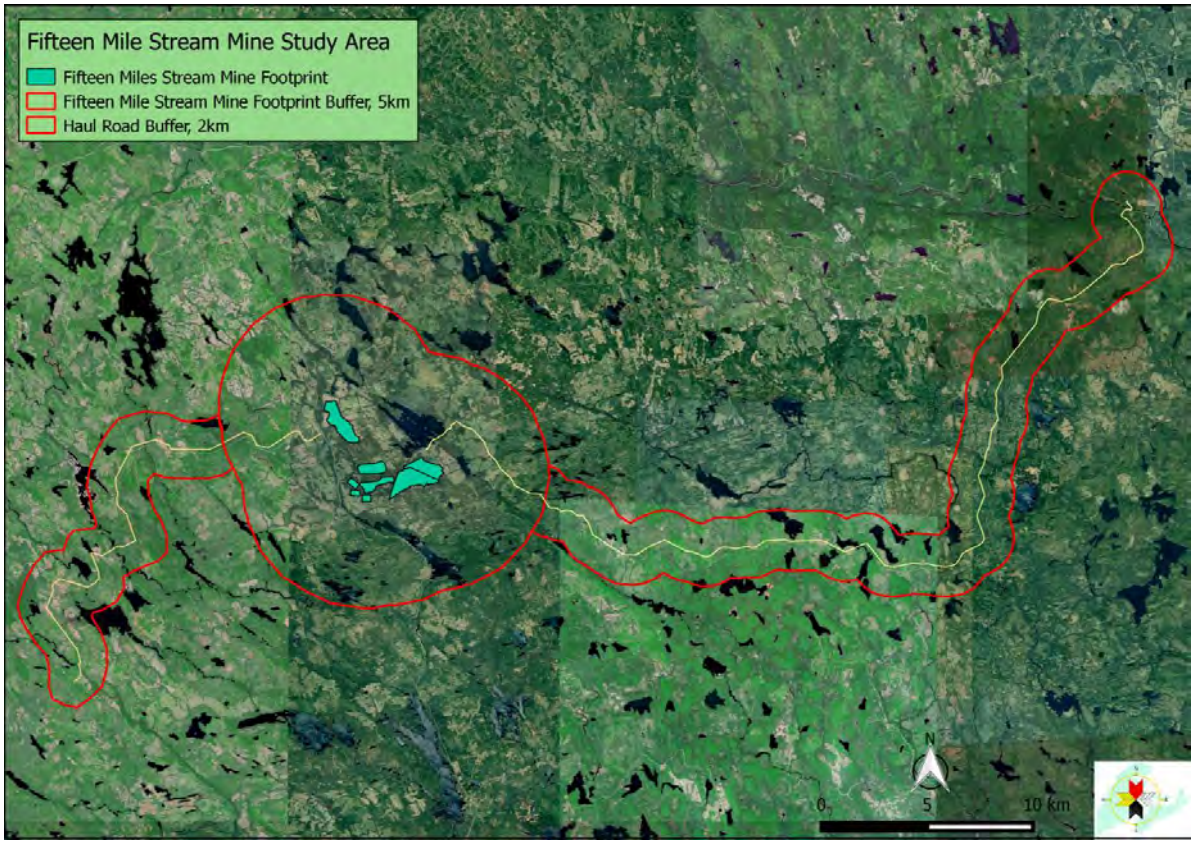

Figure 2: Fifteen Mile Stream Mine Project and Study Areas (Google base)

3. Section I: THE SETTING

In administrative terms, the project footprint lies on the eastern edge of Halifax County and Regional Municipality with the eastern haul road to the Cochrane Hill mine site extending into Guysborough County. The western haul road running past Ten Mile Lake and Creelmans Crossing links the project area with the Beaver Dam mine site and highway 224.

The Project Area is situated in the centre of the Liscomb Game Sanctuary, between Seloam Lake and Antidam Flowage as the area's main waterbodies.

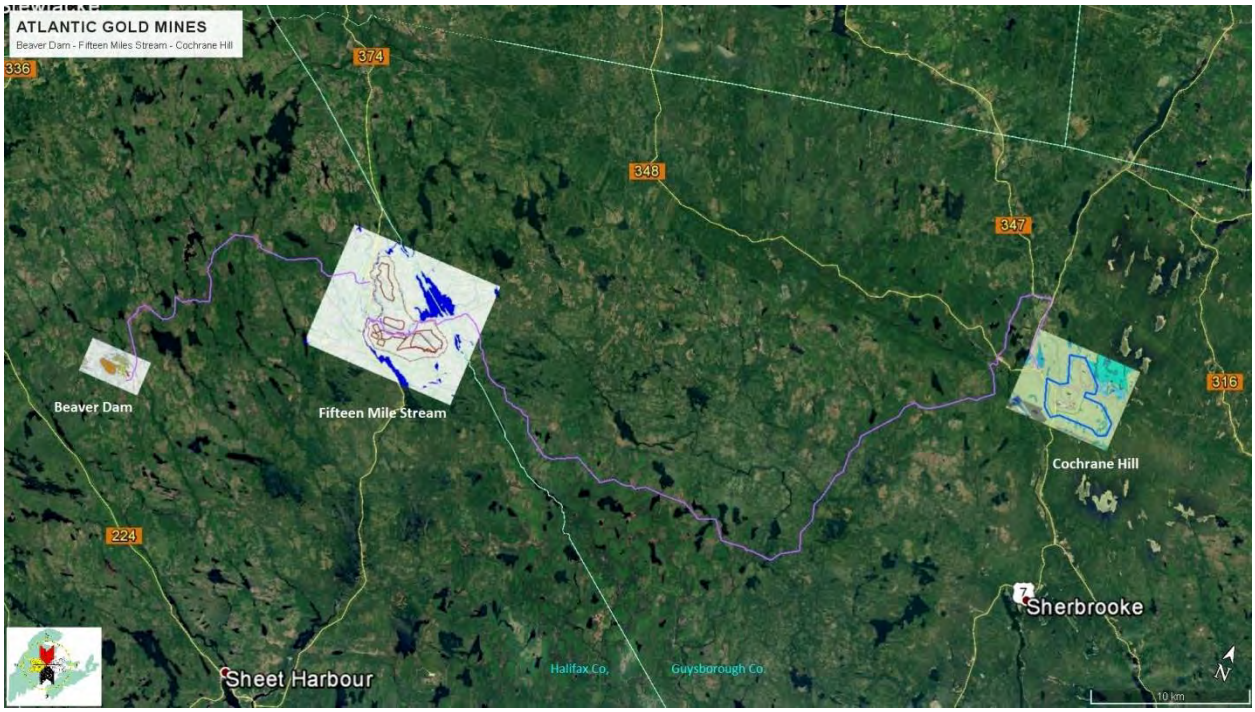

Figure 3: Locations of Beaver Dam, Fifteen Mile Stream and Cochrane Hill Mine Sites with Connecting Haul Roads (Google base)

3.1. The Biophysical Environment

The biophysical characteristics of the Project Area and surroundings can briefly be described as an undulating (elevation ca. 110-170 m), forested landscape. The terrain is interspersed with numerous lakes, brooks and wetlands forming part of the East River Sheet Harbour watershed.

The main drainage basin in the immediate Study Area is that of Seloam Lake and Seloam Brook, a tributary of Fifteen Mile Stream. Around Seloam Brook the terrain is low-lying and boggy.

The general flow pattern is northeast to southwest into the Atlantic Ocean near Sheet Harbour.

3.1.1. Surface Geology

The Study Area's surface geology is characterized by rolling stony till plains, exposed bedrock and drumlins with many surface boulders. The hummocky type terrain is interspersed with numerous lakes, streams, bogs and other wetlands.

3.1.2. Vegetation, Habitats and Fish/Wildlife Resources

The region is part of Nova Scotia's Eastern Interior's ecodistrict typified with a generally forested landcover of red and black spruce in areas of marginal, thin glacial till, and mixed forests including red maple, yellow and white birch, balsam fir, white pine, beech and hemlock in areas with thicker, more nutrient rich soils.

The terrestrial fauna common in this ecodistrict includes mammal species such as Mainland Moose, American Black Bear, Whitetail Deer, Coyote, Bobcat, Red Fox, Porcupine, Snowshoe Hare, Red Squirrel, River Otter, Beaver, Muskrat, American Mink, Weasel and others.
Among those, the Mainland Moose has been NSESA classified as endangered.
The Project Area is located in one of the few remaining areas of relative concentration of the Mainland (Eastern) Moose[3].

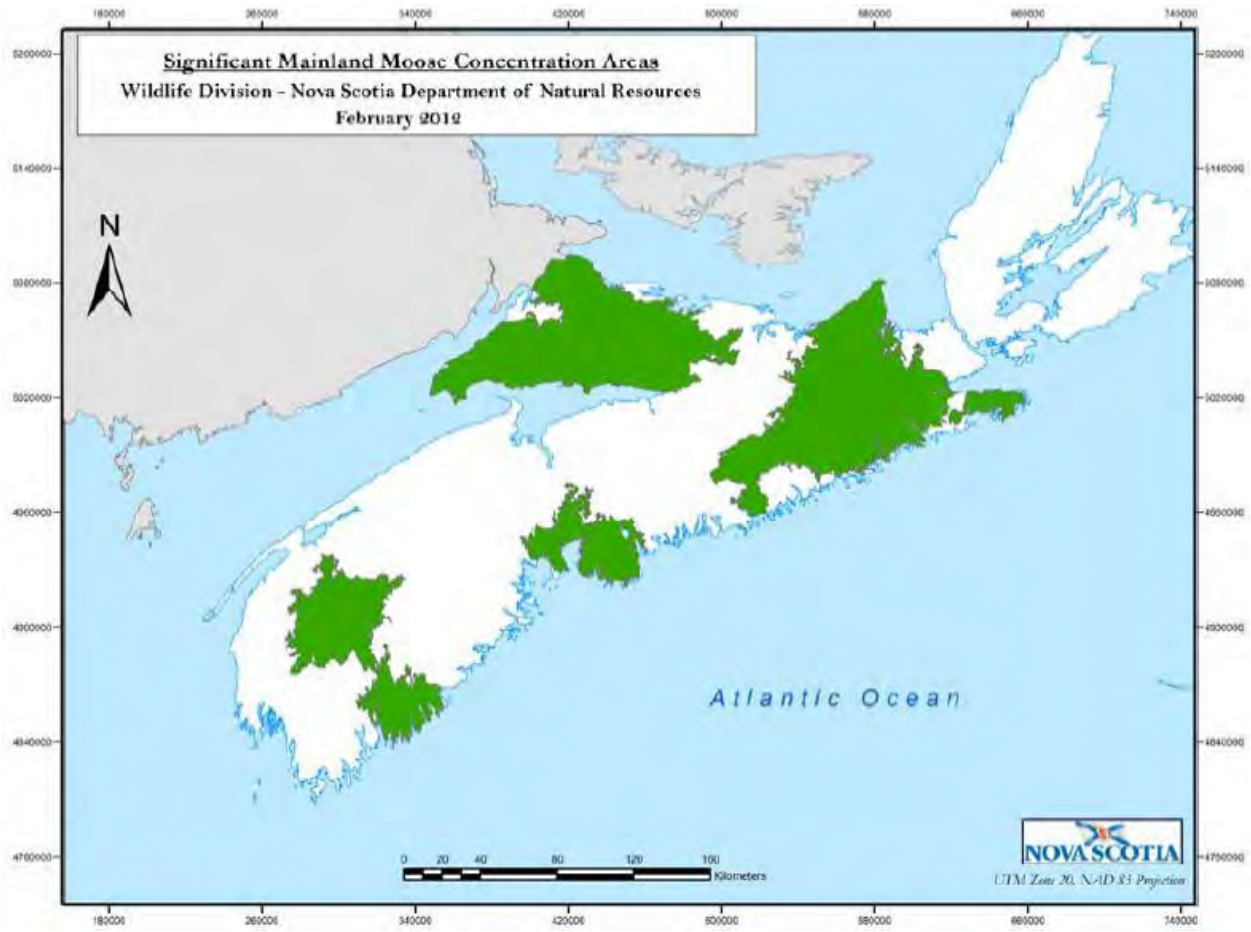

Figure 4: Significant Mainland Moose Concentration Areas (NS Dept. of Natural Resources 2012:1)

[3] DNR 2012:1, DNR 2007, Parker 2003, McNeil 2013

Numerous waterbodies and wetlands, including bogs and fens, are interspersed throughout the Study Area.
The presence of fish species with a precarious population status have been reported in the study area, such as Brook Trout (S3)[4], American Eel (COSEWIC threatened)[5] and Atlantic Salmon (COSEWIC endangered).
The area's waterbodies also provide important breeding or staging habitat to a variety of migratory bird species.

The region's avifauna include a significant list of species with conservation concerns, i.e.: American Kestrel, Northern Goshawk, Red-breasted Merganser, Greater Yellowlegs, Wilson's Snipe, and Common Nighthawk.

3.2. Project Location Within Mi'kma'ki

Mi'kma'ki, the traditional Mi'kmaq territory, is comprised of seven districts and includes Nova Scotia, Prince Edward Island, the eastern portion of New Brunswick, the Gaspé region of Quebec, northern Maine and southern Newfoundland. Each district had its own independent government with a district chief (Saqmaw) and council. An overarching Grand Council (Santé Mawiomi) composed of representatives from each district was headed by a Grand Chief (Kji'saqmaw).

The Fifteen Mile Stream gold mining project is located near the western boundary of the district Eskikewa'kik which extends inland from the Eastern Shore east of Sheet Harbour.

The Mi'kmaw district name "*Eskikewa'kik*" translates to "Skin Dressers Country" and refers to the region's historic richness in furbearers and other terrestrial mammals. Much of this region, particularly the interior, is still in a fairly undeveloped state and contains large areas of intact ecosystems and habitats.
It is, and has been since time immemorial, an important resource area for the Mi'kmaq of Nova Scotia.

[4] Conservation status ranking by the Atlantic Canada Conservation Data Centre (ASSDC).
[5] Conservation status ranking by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

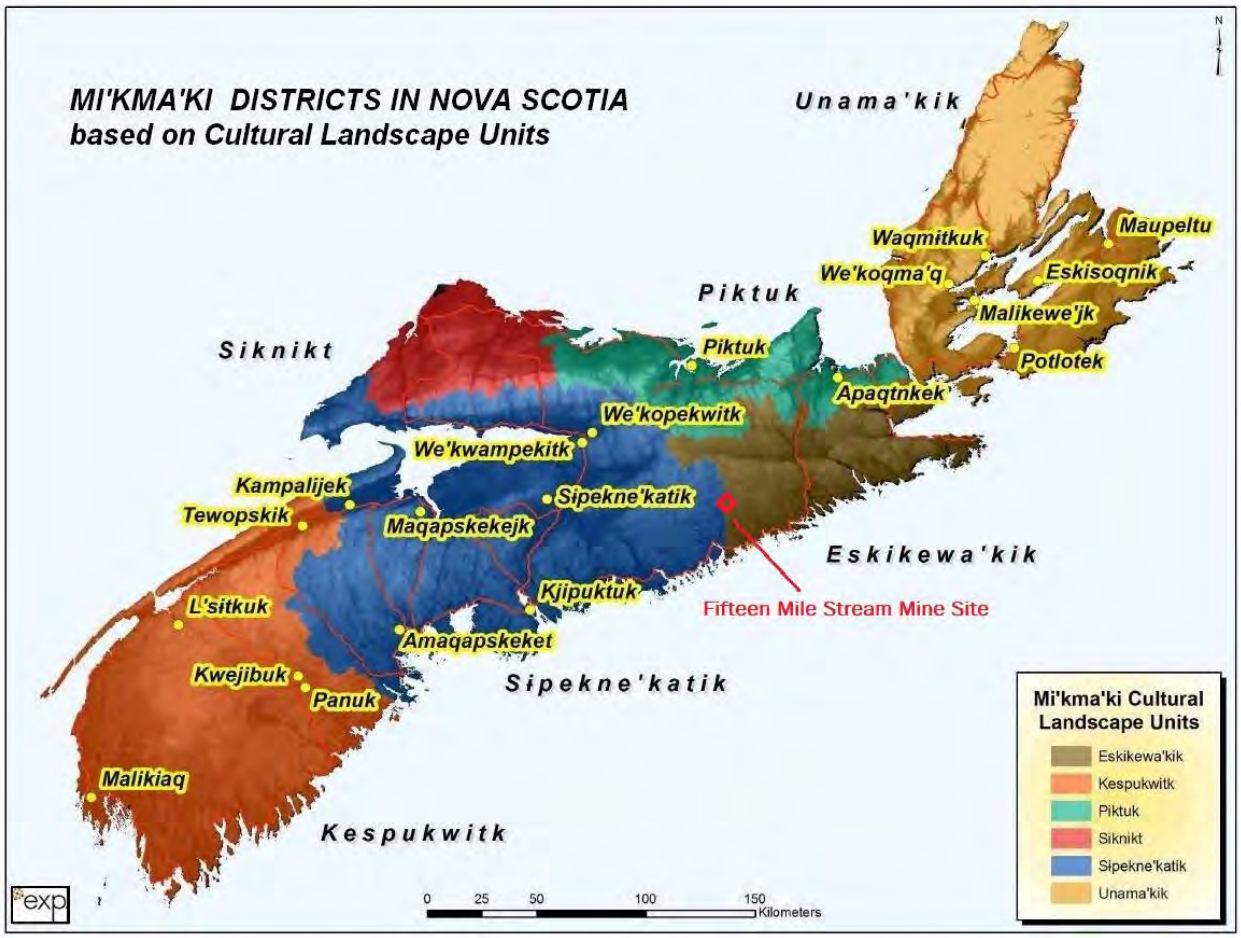

Figure 5: Mi'kma'ki Districts of Nova Scotia (source: Roger Lewis, NS Museum of Natural History) and Fifteen Mile Stream Mine Site

The Mi'kmaw First Nations and communities closest to the Project Area are Paqtnkek, Pictou Landing, Millbrook and Sipekne'katik First Nations on the Nova Scotia mainland, and Potlotek and We'koqma'q on Cape Breton Island (Unama'ki).

3.3. Reserve Lands and Specific Claims

No currently recognized Mi'kmaw reserve lands are located within, or overlap with, either the Project or Study Areas. The two closest reserve lands are Beaver Lake Indian Reserve #17 and Sheet Harbour Indian Reserve #36, both about 33 km from the Project Area.

Beaver Lake Indian Reserve #17 is a 49.4 ha parcel situated to the southwest of the project Area at Lower Beaver Lake, between Highway 224 and the West River Sheet

Harbour. Belonging to Millbrook First Nation, it currently has a population of 21 people and an infrastructure of five homes and 4 cottages/hunting camps.

Sheet Harbour Indian Reserve # 36, also belonging to Millbrook First Nation, is located south of Sheet Harbour and borders on Highway 7. At a size of 32.7 ha it is currently occupied by about 25 residents living in nine homes.

No specific claims are presently active within the Project or Study Areas.

4. Section II: HISTORIC MI'KMAW LAND USE & OCCUPATION

4.1. Pre-Contact Mi'kmaw Land Use and Occupancy

Mi'kma'ki, the district of Eskikewa'kik, and the Study Area identified for this gold mining proposal have been occupied by Mi'kmaq and their ancestors since the deglaciation some 12,000 years ago. The so far earliest physical traces of the presence of Mi'kmaq and their ancestors are archaeological finds unearthed at Debert, NS dating from 11,500 BP[6], a period labelled as Paleo-Indian by archaeologists or Sa'giwe'k L'nuk by Mi'kmaq[7].

The vast majority of archaeological discoveries in Nova Scotia have been incidental rather than the result of targeted archaeological surveys. More often than not they have been made in the context of some sort of development – agricultural development or residential, industrial or infrastructural construction. The Study Area has so far not seen much of such development activities. The archaeological record for most of Eskikewa'kik is therefore very sparse and consists mostly of sporadic surface finds.

It is obvious therefore, and important to note, that the relative lack of archaeological evidence in the Study Area cannot be construed as proof of a lack of pre-contact Mi'kmaw occupancy[8].

The archaeological potential of the Study Area and surrounding region, however, is judged as being high. The area has a long history of Mi'kmaw occupancy, harvesting/gathering and guiding[9].

The three most significant factors for determining the archeological potential of a site or area are: food resources, access and suitability for habitation.

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6 Robinson 2011.
7 Mi'kmaw term for the pre-contact cultural period as given in Lewis 2012, 2018.
8 Lewis 2011, Sheldon 2000:12.
9 Lewis 2018

In general, Mi'kmaw land use and occupancy involved semi-permanent and permanent settlement at resource-rich locations. Based on the overlapping seasonal fluctuations in the local availability and abundance terrestrial and aquatic resources, Mi'kmaw groups exploited singular or multiple resources in a succession of habitats throughout their territory.
At the time of contact Mi'kmaw occupied the shores of virtually all water bodies, both marine and freshwater. River systems and connected lakes were particularly important 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.
Villages were usually situated at a navigable body of water. Preferred summer locations were coastal sites at the mouths of rivers with significant spawning runs of salmon, eel, gaspereau and other fish species as well as waterfowl. Such sites provided ready access to a variety of freshwater and marine resources, plus a waterway into the interior.
East Sheet Harbour River and what are today the Marshall and Anti-Dam Flowages represented such waterways, as well as Moser and Liscomb Rivers.
Among the most important coastal resources were migratory fish species such as salmon, eel, gaspereau, striped bass, smelts and sturgeon, marine species such as mackerel, skates, cod, marine mammals such as seals and porpoise, ducks and geese, various sea- and shore birds, clams, quahogs, limpids and other shellfish and whelks, lobster and crab.

At the time of early contact, reports of large summer villages along the Eastern Shore with easy access to the interior included *Nipmanegatik* at Beaver Bank in Halifax Bay, *Esgegeogagig* at Indian Point in Ship Harbour (at the time the residence of the District Chief), *Goimotijig* ("little harbour") at Spry Harbour, *Megateoig* ("big eels") at Liscomb Harbour, *Gamsog* ("rock on the other side") at Canso, *Notogeteoalneg* at the mouth of the Salmon River emptying into Chedabucto Bay, and *Oalamgoaganeg* ("lobster ground") at Port Mulgrave[10].
Similarly, summer villages were located along the opposite coast, the Northumberland Strait, for example *Piktuk* ("from great fire") at Pictou Harbour, at Merigomish (*Maligomitjk* or "Many Coves"), Antigonish (*Naligitgonietjg* or "broken branches"), Pomquet (*Pogomgeg* or "dry sand") and Tracadie harbours (*Tlagatig* or "encampment")[11].

Several long-distance travel (canoe) routes though the interior connected these settlements along the two shores.

[10] Hoffman 1955:536-537, MacDonald 1999
[11] Hoffman 1955: 537, 539, 548; Denys 1908:172: Patterson 1877:22, 27; Speck 1915; MacDonald 1999; Allen 2006

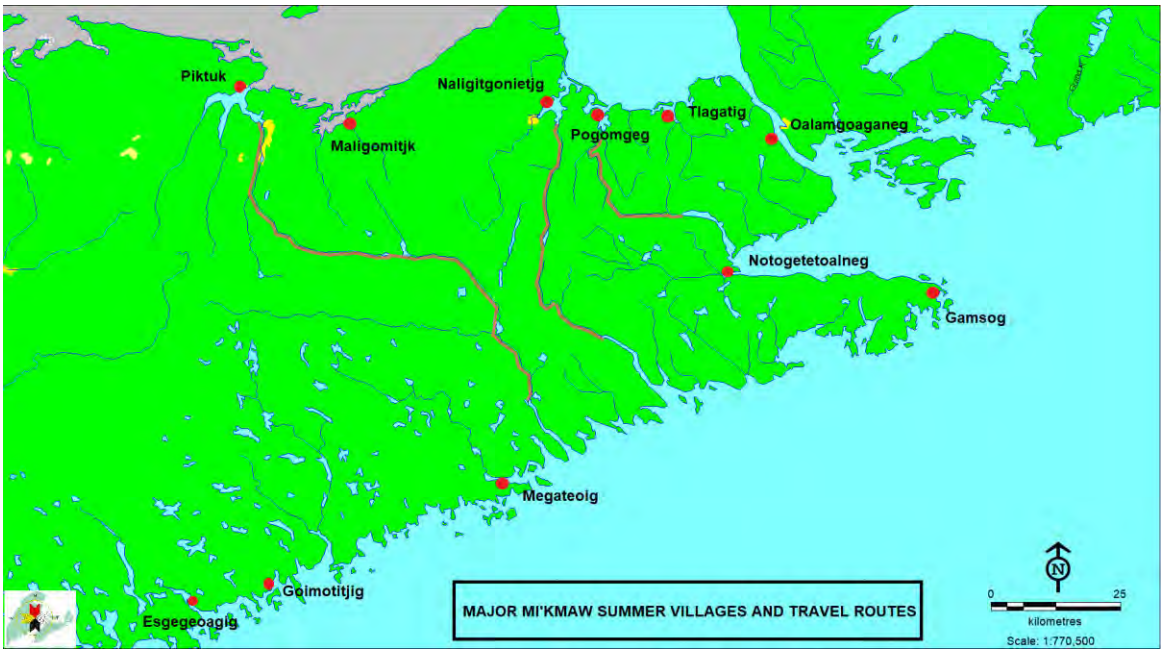

Figure 6: Major Historic Mi'kmaw Summer Villages and Travel Routes

Two of the main regional coast-to-coast travel routes connected Country Harbour with Antigonish Harbour via the South River, and Sherbrooke with Pictou and via the East River St. Mary's and the East River Pictou (*Ogoasgog* or "drawing up canoes").

During fall and winter, terrestrial and other wildlife resources of the interior generally drew Mi'kmaw families into the region -including the Study Area- whenever their abundance favoured inland food resources.

Mainland moose as well as the woodland caribou herds roaming the open inland areas, and in particular the barrens, black bear, beaver and other furbearers, the ubiquitous snowshoe hare and grouse, waterfowl, as well as fish species such as eel, salmon and gaspereau would have been able to support relatively large groups during the winter months. The district's name "*Eskikewa'kik*" or "Skindresser's Country" highlights the region's richness in terrestrial and semi-aquatic mammals[12].

In both inland and coastal areas a large variety of plant species were utilized for food, medicines, housing, crafts and tool production[13], as well as stones and minerals for tools and implements[14].

[12] The 'skins' referred to include the furbearers whose skins became trade items during the historic period (beaver, otter, marten, fox, etc.), but also moose, caribou and others whose hides were equally valuable in the manufacture of clothing and many other items.

[13] E.g.: fiddleheads and groundnut/wild potato (Apios americana) for food, black ash for baskets,

Besides providing a rich wildlife habitat, Nova Scotia's original Acadian forests offered an astounding palette of plant resources. The various varieties of maple, birch, spruce, fir, pine, beech, ash, yew as well as tamarack and hemlock were used in housing (wigwam frame and covering) and tool making (tool handles, baskets, traps), for nutritional (syrup, beverage, nuts) and medicinal (tea, poultice) purposes.
A large variety of edible berries, fruits (crabapple, service berry), roots (sweetflag, dandelion), tubers (groundnuts, cattails), shoots (fiddleheads), bulbs (wild leek) and leaves (lambsquarters) provided high-quality food resources some of which could be preserved by drying.
In addition to their nutritional qualities, many of those plants possess medicinal properties which were known and utilized by the Mi'kmaq.
A large number of plant species were also used primarily for medicinal purposes (e.g. alder, wild sarsaparilla, gold thread, jewelweed, labrador tea, sheep laurel).

Figure 7: Currently Known Archaeological Sites, source Nova Scotia Museum of Natural History (Google base)

birch bark for wigwams, canoes, containers)

[14] E.g.: cherts and quarts for projectiles and cutting implements, clays

Two known archaeological sites attest to pre-contact Mi'kmaw occupancy of this part of the interior of mainland Nova Scotia, one being site BhCp-01[15], located within the Study Area on an island in Seloam Lake. Just outside the Study Area on Liscomb River, 11 km further to the east, lies BhCo-01, another archaeological site.
An additional cluster of sites, BgCp-01 to BgCp-04, are located at the north end of Marshall Flowage, about 8-9 km south of the Study Area. Some of those sites contain both pre- and post-contact components.

4.2. Post-Contact Mi'kmaw Land Use & Occupancy prior to 1950

During the first half of the 18th century, Britain was seeking to end the French influence in, and claim, to the region, and to establish its dominance in Nova Scotia. To that end it expelled the Acadians, the first small but significant wave of European immigrants who managed to maintain good relations to the indigenous population, and enticed settlers from New England to relocate to Nova Scotia and New Brunswick with grants of 'free wild lands'. As a result, over 8000 newcomers heeded the call and settled there in the 1760s, particularly in the few fertile agricultural areas such as the Annapolis River, Minas Basin and the lower Shubenacadie River basin.

Although Nova Scotia has, since the 18th century, increasingly been settled by predominantly European immigrants, no portion of Mi'kma'ki has ever been formally and legally ceded. Quite to the contrary, several treaties between the sovereign indigenous nations and the British Crown were signed between 1725 and 1779 and affirmed Mi'kmaw rights to their territory and its resources, and pledging peaceful coexistence and Mi'kmaw loyalty to the British Crown[16]. This covenant chain of treaties include the 1752 and 1760/01 treaties that were affirmed by the Supreme Court of Canada as legal and binding.

During the 1800s and1900s, European settlement expanded and increasingly appropriated the most accessible and for their economic interests most productive areas - the safe harbours, resource-rich estuaries and near-shore fishing grounds all around the Nova Scotia coast as well as the few fertile agricultural regions.
In order to minimize Mi'kmaw interference in the settler economy, the government of Nova Scotia government began in 1812 to relocate Mi'kmaw families onto a number of small reserves set up in areas deemed less productive.

[15] Official Borden site registration number by the Nova Museum of Natural History.
[16] Wicken & Reid1996

To the Mi'kmaw population, the less disturbed inland areas and their resources gained in relative importance as a result, and the focus of much of their traditional harvesting activities was pushed into the Province's more remote regions.

The Liscomb region in particular was a favoured hunting, fishing and trapping area for Mi'kmaw, well-known for its wildlife resources[17].

But even in this relatively secluded region, resource competition for wildlife resources gradually increased through subsistence and recreational hunting by the surrounding settler population and, between the late 1800s and early 1900s, sport hunting by wealthy visitors from New England[18]. With alternative sources for employment and cash incomes extremely scarce, some local Mi'kmaw found seasonal work as guides in the new sport hunting/fishing industry.
Joe Cope, James Cope, John Thomas and Mattio Salome were three famous Mi'kmaq guides active in and near the Study Area during that period[19].

Prince Arthur Lake, located just south of Big Liscomb Lake, received its name through one such sport hunting excursion when in 1869 Prince Arthur, Duke of Connaught and Stratham (and later Governor General of Canada), and Colonial Indian Commissioner William Chearnley travelled to, and camped in, that location with James Cope as their guide[20].

Seloam Lake is named after well-known Mi'kmaw hunter Mattio Selome. He and his family were one of the Mi'kmaq groups active in the Study Region during the late 1800s. He used to camp most frequently at Seloam and Ladle lakes. Mattio Selome buried his wife on an island in Seloam Lake (site BhCp-01)[21].

Typhus Lake is another one of the locations whose name relates to the presence of Mi'kmaw families in the area. Situated about 15 km east of Seloam Lake, it received its name when several Mi'kmaw died of typhoid fever at their camp and were buried at this location in the mid-1800s[22].

There are records of Mi'kmaw guides providing moose meat to miners in the Fifteen Mile Stream area during the historic period of gold mining in the early 20th century[23].

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17 Lewis 2018
18 Parker 1990, Dodds 1993:23-61
19 Lewis 2018a, Parker 1990
20 Lewis 2018
21 Jerry Lonecloud to Harry Piers 23 Dec 1921, NS Museum Archives, Whitehead 1991:317, Lewis 2018:11
22 Lewis 2018
23 Jeremiah Lonecloud to Harry Piers (NS Museum of Natural History) 1918, as cited in Lewis 2018

Indigenous place names are a strong testimonial to long-term Mi'kmaw occupancy in the region. Proven to be very persistent through the generations many, if not most, of those traditional toponyms were in existence prior to settlement by Europeans[24]. Most of the ones recorded by the newcomers relate to locations of early contact and colonization along the coast and estuaries. Of the Mi'kmaw names for geographic features or sites of Mi'kmaw occupancy in the inland relatively few have been documented thus far.

Several of the documented Mi'kmaq place names are found in the surrounding region. Two of these relate to locations or landscape features in, or immediately adjacent to, the Study Area[25].
The western haul road crosses the Killag River whose official toponym is a derivation of its Mi'kmaw name Gileg. This haul road meets highway 224 near Beaver Lake, called Oaitjoig in Mi'kmaw.

Mi'kmaw Toponym	***Translation***	***Official Toponym***
Gileg		Killag River
Oaitjoig		Beaver Lake (at IR 17)
Emtegen		Montague (Gold Mines)
Kukwesuee'katik	Haunt of the Giants	Middle River Sheet Harbour
Weijooik		Sheet Harbour
Migtjosgog		Mill Lake (near Upper Musquodoboit)
Usoogomus oogwedamk	Wading-across Place	West Lake (near Dufferin Mines)
Oagametgog	Clear Water	West River Pictou
Piktuk	From Great Fire	Pictou
Poogunikpechk		Pictou Harbour
Pogumkek		Pomquet Harbour
Tlaqatik	At the Encampment	Tracadie
Amasipogoek		Pomquet River

Table 1: Mi'kmaw Toponyms

During the early 1900s, Frank G. Speck recorded what he described as 'Micmac family hunting territories', with the caveat that his records may not be complete[26].
These territories generally centre around waterbodies or watersheds. Their boundaries were, as Speck notes, rather vague and not exclusionary to trespassers. The individuals associated with them were not the 'owners' in the European sense of private property ownership, but persons who, with their extended families, were generally recognized as the primary users of these areas and their resources. The hunting territories identified by Speck were thus core areas used not only by the named

[24] Weiler 2008
[25] Frame 1892; Allen 2006 (orthography following primary sources Pacifique 1934, Ganong 1914); Sable & Francis 2012; see also fig. 6 above
[26] Speck1922:93-94, also Speck 1915, Chute 1999

individuals and their immediate families, but provided resources and sustenance, and likely a seasonal abode to members of their extended families and close friends.

The Project Area is located in what was identified by Speck at the time as the core territory of Peter Joe Cope. The Study Area otherwise intersects with the territories ascribed to Mattio Selome, Jim Paul, Michael Toney, Andrew Paul and Frank Cope.

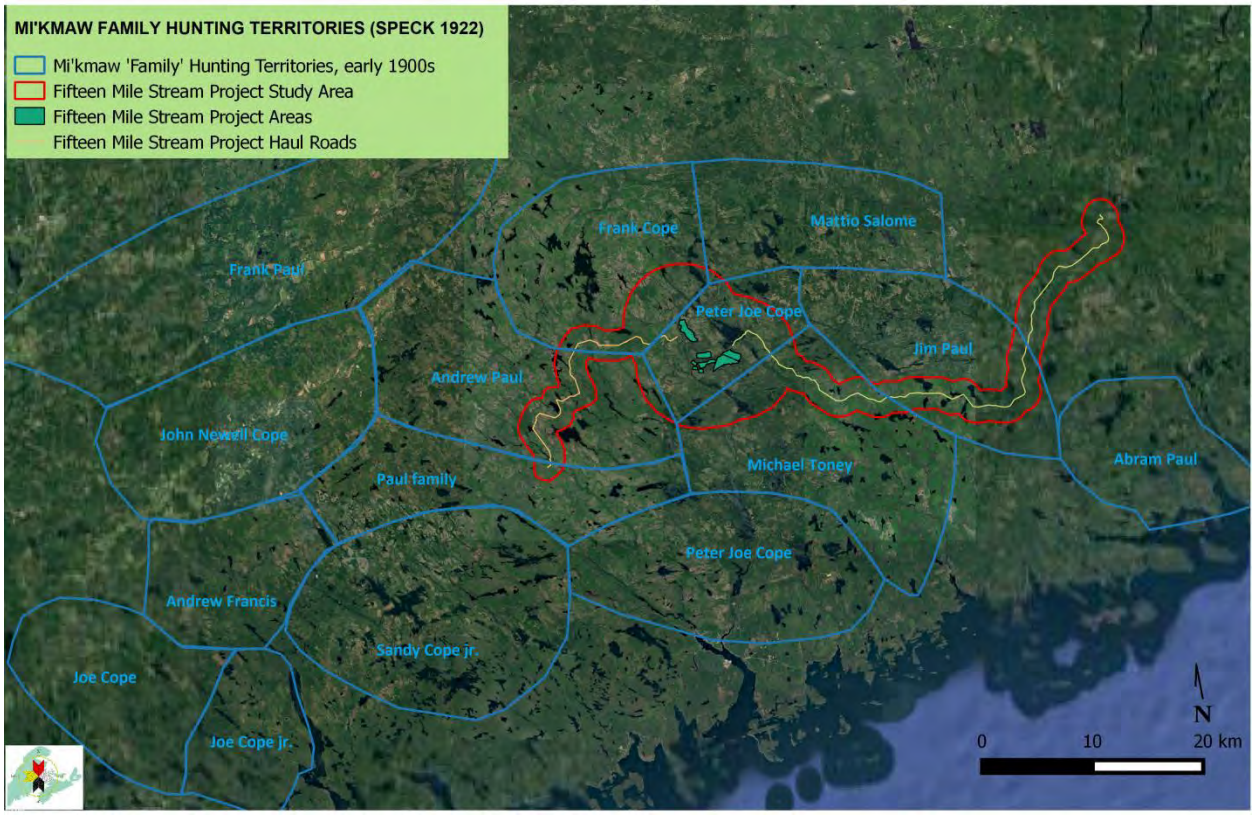

Figure 8: Mi'kmaw 'Family Hunting Territories', early 1900s, according to F.G. Speck (base Google)

Among today's non-indigenous residents, older individuals remember Mi'kmaw families criss-crossing the region, maintaining hunting camps or cabins throughout. It wasn't until the 1940s when they reported observing a noticeable drop in the presence and extended stays of Mi'kmaw family groups in the region[27].
This appears to have been the result of the Federal Government's Centralization policy[28], an attempt to further concentrate the Mi'kmaw population onto only two large reserves, Shubenacadie Indian Reserve on the Nova Scotia mainland and Eskasoni Indian Reserve on Cape Breton Island.

27 Lewis 2018a
28 Lewis 2018a, Bernard 2018

The policy ultimately failed[29], was abandoned in 1949, and the majority of Mi'kmaq today live in 18 communities spread out over the province. Most of the families that were active in the Study Area eventually relocated to the Indian Brook (Shubenacadie), Millbrook and Paqtnkek reserves.

The decline in the visibility of Mi'kmaw families or groups in the inland in terms of seasonal camps by no means implies that the importance of their traditional lands and resources began to decline, nor harvesting activities were being abandoned.

The general pattern of Mi'kmaw land and resource uses in the area gradually changed during this period from extended seasonal inland stays, often by complete families, to briefer, frequent hunting/fishing excursions. This trend was facilitated, possibly even stimulated, by increasing accessibility through a growing network of country roads and the use of motorized vehicles.
Mi'kmaw families were thus able to re-connect with their traditional harvesting areas, as far as they had not in the meantime become subject to competing uses by the dominant society such as municipal, agricultural or industrial development, or parks and protected areas.
Despite progressive developments and forced centralization the Mi'kmaw never voluntarily or wilfully abandoned any part of their traditional territory.

5. Section III: CONTEMPORARY MI'KMAW LAND AND RESOURCE USES

The use of Mi'kmaw traditional lands and resources continues across Nova Scotia, and so does the in-depth knowledge of the interdependent relationships between the territory's natural elements, plant, animal and human beings. This knowledge and the spiritual understanding of a proper balance between humans and their environment are expressed in the principles of Netukulimk, a code of conduct of ethical living[30].

The pattern of Mi'kmaw land use has changed, as indicated above, from that of a seasonally shifting residence between fluctuating resource-rich coastal and inland locations or areas to one of a permanent residential base with shorter-term harvesting excursions to specific seasonally productive resource areas.
The regional road network facilitates quick year-round access for harvesting excursions of one or several days by Mi'kmaw from the surrounding First Nation communities on the Eastern and Northumberland shores, the Shubenacadie River and Cape Breton, whether they reside on-reserve or not. Motorized transportation such as pick-up trucks

[29] Upton 1979:174-175, CMM & Peabody Museum 2001:51, 58, 69,Tobin 1999
[30] Prosper & al. 2011, Barsh 2002

all-terrain vehicles snowmobiles, engine-powered boats put the Study Area's resources within relatively easy reach from any of these communities.
A number of Mi'kmaw residents maintain or regularly use cabins or cottages in the region. However, no Mi'kmaw owned or utilized cottages or cabin have so far been recorded in the Study Area.

The significance of 'traditional' land use activities to most Mi'kmaq today goes far beyond the aspects of recreation or sport. Traditional land use activities include hunting, fishing and gathering for food, social and ceremonial purposes, and for earning a livelihood.
The traditional land use activities of hunting, fishing, trapping and gathering are an essential form of expression of their cultural identity. The relationships to the land itself and its non-human inhabitants are the foundation of the Mi'kmaq traditional economy and lifestyle, world view, philosophy, and even language[31].
These land use activities are an integral part of the domestic economy of many households and make an important contribution to their food security. Of the sample of Mi'kmaw individuals interviewed 84% identified the traditional sector of their domestic economy, the harvesting of wildlife and plant resources, as an indispensable component of their families' food security.
Both those aspects, the economic and cultural motivations for traditional land and resource uses, feed into a third impetus: the need to express, confirm and exercise their Indigenous rights to live their cultural heritage within Mi'kma'ki, and their treaty rights to continue harvesting the resources of their traditional territory.

Mi'kmaq individuals or families from all surrounding communities were involved in harvesting and other land use activities in the region including the Study Area.

The following two maps of recorded activities (figs. 9, 10) represent a mere sample of Mi'kmaw land use in the area, since only a portion of the active land users were interviewed and respondents reported only a portion of the land use activities they have carried out.
One also has to keep in mind that the importance of the discrete harvesting sites displayed on the map goes beyond the actual, distinct locations, but encompasses the habitats required to support the particular resources harvested at that location. The significance of a reported moose hunting site, for example, is not limited to the spot where the animal was killed but includes the entire range and habitat that supported this individual moose.

[31] Sable & Francis 2012, Hornborg 2001

Figure 9: Reported Mi'kmaw Land and Resource Uses, overview (base Bing)

Figure 10: Reported Mi'kmaw Land and Resource Uses, detail (base Bing)

It follows, consequently, that the map does not allow the conclusion that areas or locations that do not show land use are indeed not being used by Mi'kmaq. It does, however, illustrate clearly that both the Study Area as well as the Project Area itself are being utilized by the Mi'kmaw First Nation, and that these lands and resources are integral parts of its traditional economic sector.

The pattern of reported activities shows three major spatial clusters within, or overlapping, the defined Study Area[32]:

a) One of those areas of concentration of recorded traditional land use is located between Lower Rocky Lake, Seloam Lake and Antidam Flowage, at the centre of which lies the proposed Project Area.
b) The western haul road towards Beaver Dam traverses the second cluster of reported land use activities.
c) The third cluster is found along the eastern haul road towards Cochrane Hill.

The following table (Table 2) lists the sample of contemporary land and resource use activities reported to occur within the Study Region.
It needs to be kept in mind, indicated above, that these are merely a reported selection of ongoing activities by a sample of the Mi'kmaw land users active in the region.

Land & Resource Use Category	Reported Resources & Activities
Hunting & Trapping	Whitetail deer (*Odocoileus virgianus*), Eastern moose (*Alces alces americana*) [sighting], Snowshoe hare (*Lepus americanus*), Porcupine (*Erethizon dorsatum*), Groundhog (*Marmota monax*), Black bear (*Ursus americanus*), Red fox (*Vulpes vulpes*), Bobcat (*Felis rufus*), Lynx (*Felis lynx*), Coyote (*Canis latrans*), Beaver (*Castor canadensis*), Muskrat (*Ondatra zibethica*), Otter (*Lutra canadensis*), Fisher (*Martes pennanti*), Mink (*Mustela vison*), Raccoon (*Procyon lotor*), Ruffed grouse (*Bonasa umbellus*),

[32] Figures 9 & 10

	Ducks (*Anas rubripes* & al.), Canada goose (*Branta canadensis*), Barred owl (*Strix varia*)
Fishing	Speckled trout (*Salvelinus fontialis*), Atlantic salmon (*Salmo salar*), American eel (*Anguilla rostrata*), White sucker (*Catostomus commersoni*), Yellow perch (*Perca flavenscens*), Gaspereau (*Alosa pseudoharengus*), Smallmouth bass (*Micropterus dolomieui*), Freshwater mussels (*Margaritifera margaritifera* & al.)
Food, Medicinal & Decoration Plants Collection	Blueberries (*Vaccinium angustifolium*), Cranberries (Vaccinium macrocarpon), Fiddleheads (*Matteuccia struthiopteris*), Chokecherries (*Prunus virgiana*), Goldenrod (*Solidago canadensis*), Gold thread (*Coptis trifolia*), Sphagnum moss (*Sphagnum spp*), Labrador tea (*Ledum groenlandicum*), Hazelnuts (*Corylus cornuta*), Mushrooms (*Cantharellus, Agaricus campestris & al.*), Mayflower (*Epigaea repens*), Lion's paw (*Prenanthes trifoliolata*), Bloodroot (*Sanguinaria canadensis*), Golden seal (*Hydrastis canadensis*), Flag root (*Acorus calamus*)
Wood & Wood Products Harvesting	White ash (*Fraxinus americana*), Black ash (*Fraxinus nigra*), Balsam fir (*Abies balsamea*), Hemlock (*Tsuga canadensis*), Juniper (*Juniperus communis*), White cedar (*Thuja occidentalis*), Birch bark (*Betula papyfera*), Red oak (*Quercus rubra*)
Ceremonial / Spiritual Activities & Sites	Sacred site
Burial & Birth Places	Burial
Habitation & Camp Sites	Cabin, travel route

Table 2: Reported Contemporary Mi'kmaw Land & Resource Uses within the Study Region

The two-season plant surveys conducted by Mi'kma'ki All Points Services at sampling points throughout the Study Area identified a significant number of species considered of specific cultural importance to the Mi'kmaw community.

The following table (Table 2) displays the results of the surveys, with the number of species broken down into the categories of food/beverage and medicinal plants as well as plant species used for arts and crafts applications.
None of the plant species identified in the surveys are threatened or limited to local distribution.
As the harvesting and use of traditional medicines embodies a spiritual component beyond the practical medicinal applications, many Mi'kmaw are reluctant to publicise the respective species names, specific harvesting locations and medicinal uses. Plant uses are therefore given here in a generalized format only.

Fifteen Mile Stream Plant Surveys		
Fall (2017)	Food/Beverage	14
	Medicinal	47
	Arts/Crafts	11
Spring (2018)	Food/Beverage	6
	Medicinal	28
	Arts/Crafts	11

Table 3: Number of Identified Plant Species of Special Significance to Mi'kmaw according to Type of Use

While all above-mentioned wildlife and plant species are of economic significance to Mi'kmaw harvesters, moose, salmon, eel, black ash, and various medicinal plants are of special cultural and/or spiritual importance as well.
The threatened status of the mainland moose population further heightens the significance of the fact that its presence in the Study Area has been confirmed during the data collection for this study.

The evidence presented above clearly shows Mi'kmaw occupancy and land/resource use in the Study area and wider region of Eskikewa'kik – a changing but uninterrupted use from pre-contact times to today.

The influx of Euro-Canadian settlers with competing land and resource uses and the resulting changes in the landscape of the coastal and more fertile regions of Nova Scotia. The interior of eastern Nova Scotia has so far been one of the two remaining regions of relatively large contiguous forests and terrestrial wildlife habitats on the mainland portion of the Nova Scotia Mi'kmaq traditional territory, with the second one located in the interior of southwestern Nova Scotia.
This enhanced the relative significance of the hitherto lightly settled and less transformed region of Eastern Shore interior to the Mi'kmaw of mainland Nova Scotia.
The continuation of traditional land and resource uses, both in principle and in this

specific region, are thus of utmost importance to virtually all interviewees for economic as well as cultural reasons.

As was touched upon earlier, the relationship of the Mi'kmaw to their traditional lands extends far beyond economic interests. It provides the basis of Mi'kmaw philosophy and spirituality, therefore is the very foundation of Mi'kmaw cultural identity[33].

6. Section IV: IMPACTS AND RECOMMENDATIONS FOR MITIGATION

6.1. Anticipated or Potential Project Impacts on Mi'kmaw Land and Resource Uses

6.1.1. Anticipated or Potential Direct Impacts

As with any new industrial development in a hitherto fairly 'quiet', sparsely settled area, the proposed mining activities will result in an influx of people and increased human activity in the region, both industrial and recreational – additional stresses on wildlife habitat and populations.

The most obvious and unavoidable impacts of the proposed developments are the loss of the wildlife habitat and its resources within, and in the immediate vicinity of, the project's footprint. This includes the project's entire infrastructure such as the mine pit, waste rock deposits, tailings pond/storage facilities, processing plant, the cleared areas surrounding these facilities, and the new or widened transportation corridors between the proponent's other existing or proposed neighbouring processing or transshipment facilities.

The resulting loss of harvesting area necessarily also includes the legislated 'no-shooting' buffers surrounding those industrial complexes and work areas, and along roads.
Equally unavoidable appear to be the increased noise and dust levels generated by the blasting, processing and trucking activities involved.

Such emissions are impacting directly Mi'kmaw land use and resource harvesting by disturbing, dispersing or expelling wildlife, or by coating and contaminating local food and medicinal plants with dust.

Other types of emissions threaten to impact wildlife and plant resources or harvesting within, and even beyond, the Study Area. It is appears unreasonable to assume that effluents containing arsenic, mercury and other chemical components used in ore processing, whether stored in tailings ponds or leaching out of waste rock stock piles, can reliably be prevented from entering surface water features like streams, lakes and wetlands, and possibly even local aquifers. Discharge of such effluents into the local freshwater system may disperse for

[33] Hornborg 2008, Sable & Francis 2012, Lewis 2018

considerable distances through the downstream portion of the respective watershed and contaminate water bodies, soils, aquatic fauna[34] and flora, and other wildlife depending on those habitats[35]). As experience has shown, the discharge and resulting contamination from the proposed mine's tailings ponds and waste rock piles may outlast the productive life of the mine itself by decades or more[36].
These impacts will remove affected habitats and their wildlife or plant resources from Mi'kmaw use and further narrow both the useable land base and the spectrum of the resources of the traditional sector of their economy.

It can also not be ignored that the increasing industrialization and contamination of the natural environment can also not remain without impacts on Mi'kmaw culture in general. Secularizing the living world and reducing its meaning and purpose to its utilitarian aspects, it disrupts the philosophical relationship with it and contributes to the erosion of the Mi'kmaw world view and values, self-understanding and culture.

6.1.2. Potential Cumulative Impacts

It is generally accepted today that environmental or socio-cultural impacts of industrial developments are neither always direct nor can they be understood without their historical context or in isolation from other ongoing changes. Cumulative effects are thus the accumulated spatial and temporal impacts to environmental and socioeconomic values from multiple projects and other activities[37].

With respect to the proposed project assessed here, several external factors and developments concur to potentially amplify impacts on the Mi'kmaw communities and their operational environment[38] .

With respect to population and development density, this region, the interior of eastern Nova Scotia, has so far been one of the two remaining areas of large contiguous forests and terrestrial wildlife habitats on the mainland portion of the Nova Scotia Mi'kmaq traditional territory.
In the second one, located in the interior of southwestern Nova Scotia, harvesting access to the resources of the traditional economic sector of Mi'kmaw domestic or

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34 Including fish, aquatic and waterborne insects and other invertebrates, mussels
35 E.g. amphibians, beaver, muskrat, otter, mink, moose, ducks, geese, heron, bald eagle, osprey, insectivorous birds, bats
36 Campbell & al. 2018, Willick 2018a,b, Laroche 2018, Parsons & al. 2012
37 Steffensen 2016:iii, CEAWG 1999
38 A society's operational environment includes the natural setting, economic resources, laws

community economy has already been largely withdrawn through the protected lands status of Kejimkujik National Park and Historic Site and the Tobeatic Wilderness Area. Similarly, Mi'kmaw access to the resources of the once rich harvesting area of the interior of the eastern mainland has increasingly been restricted over the recent past.

The Liscomb Game Sanctuary, established in 1928 in part to protect the dwindling population of mainland moose, severely impacted Mi'kmaw access to the area's varied and once plentiful resources[39] .

Over the past few years, a marked increase in large-scale clearcutting of the region's forests[40], including the Liscomb Game Sanctuary, has drastically altered wildlife habitats and reduced or locally eliminated populations of forest-dependent wildlife as well as plant species.

Small-scale historic gold mining activities between the mid-19th and mid-20th centuries has left a legacy of contaminated sites[41]. Due to the modest scale of mining activities during this period, these sites are generally relatively small, concrete and localised. Nevertheless, they do still adversely impact animal and plant communities in the immediate surroundings and harvesting around these sites is generally avoided.

Osprey Gold Development Ltd. is proposing to re-develop several of the historic mine sites to extract remaining ore deposits in the near future. Its Caribou Gold Project site is located approximately 8 km north of Atlantic Gold's Moose River Consolidated mill site and 34 km southwest of its Fifteen Mile Stream Project Area. Its Gold Lake site is situated about 40 km to the southwest and the Miller Lake site approximately 30 km to the southeast of the Fifteen Mile Stream Project Area[42].

Atlantic Gold's Fifteen Mile Stream Mine proposal is also merely one of several proposed projects. As outlined in the Project Description above, the Fifteen Mile Stream Gold Mine is one of a string of four mines in various stages of development.

To assess community impacts in any meaningful manner, the combined effects of all these recent and proposed developments and resulting environmental changes need to be considered.
The combined area anticipated to undergo significant environmental changes, and the lands and resources that, as a result, will be withdrawn from current Mi'kmaw use, is considerable.

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39 Sanctuary regulations: *https://www.novascotia.ca/just/regulations/regs/wiliscom.htm*
40 See Appendix 3
41 See Appendix 1
42 Osprey Gold Development Ltd 2018, see Appendix 2

This loss of accessible and uncontaminated lands and resources necessarily result in an increased concentration of, and competition amongst, individual Mi'kmaw land users in the remaining harvesting areas as well as heightened pressure on the resource base of those reduced areas.

The Fifteen Mile Stream Mine in itself will represent a significant agent of change and contributor to the collective of anticipated environmental and social impacts.

Over the past years, Atlantic Gold has begun to clear the project areas, build access roads, set up an on-site field office and restrict entry into the area for non-employees.

6.2. Conclusions

While the cumulative impacts of the Fifteen Mile Stream mining proposal on the Mi'kmaq of Nova Scotia can not be quantified, the conclusion is inescapable that adverse impacts will flow from it, and those impacts will indeed be significant.

As additional, formerly productive, portions of the Mi'kmaw territory and resource base will be removed from harvesting access, the anticipated impacts felt on an economic level include:

- being barred physical access by property boundaries surrounding the mine site,
- the additional buffer created by provincial legislation prohibiting the discharge of firearms in proximity to residences, work sites, roads, etc.,
- displacement of wildlife resources through noise pollution and other human disturbances,
- contamination of terrestrial and aquatic habitat through dust generated by blasting, crushing and transportation,
- contamination of terrestrial and aquatic habitat and consequently local wildlife and plant resources by chemical effluent discharge,
- increased concentration of harvesting activities on remaining resource areas, greater competition amongst active harvesters, and intensified harvesting pressure on the resources of those areas.

These losses in harvesting areas and resources, and the potential contamination of 'country foods' and traditional medicines are expected to weaken the domestic economy of Mi'kmaw families, potentially threatening food security and health.

It will also add to the corrosion of traditional Mi'kmaw world views, values and religious concepts, that is Mi'kmaw culture and identity as a whole, through the disruption of their relationship with the land and its non-human inhabitants.

With these multitudes of recent, ongoing and proposed developments impacting the eastern interior region and significantly impacting Mi'kmaw access to what many consider to be the last contiguous natural area and its resources, there is little opportunity left to them to sustain their traditional economic sector and lifestyle.

It therefore stands to argue that this proposed project, as part of a larger-scale development push and its cumulative impacts may infringe on Mi'kmaw aboriginal and treaty rights. It may indeed contribute significantly to the adverse impacts of Mi'kmaw constitutionally protected rights to continue their traditional economic sector of natural resources harvesting and being meaningfully consulted on issues impacting the environmental integrity of their traditional territory.

6.3. Recommendations

Should permission be granted that Atlantic Gold Corporation's proposed Fifteen Mile Stream Mine be developed, MAPS issues the following set of recommendations in consideration of the above discussion and in order to minimize the potential and anticipated adverse impacts of the Fifteen Mile Stream Gold Mine project:

1. It is recommended that the details of the infrastructure layout (e.g. locations of waste rock deposits and tailings ponds) be developed in cooperation with Mi'kmaw environmental research institutions and experts such as the Unama'ki Institute of Natural Resources and the Mi'kmaq Conservation Group (Confederacy of Mainland Mi'kmaq).

2. It is also recommended that an environmental protection committee be established to develop environmental impact mitigation protocols, oversee monitoring procedures and evaluate test results. This committee should have an equal tri-partite composition of environmental experts of the proponent, Mi'kmaw representatives the Unama'ki Institute of Natural Resources and the Mi'kmaq Conservation Group, and the NS Department of the Environment.

3. Further, it is recommended that Atlantic Gold cease all on-site activities that significantly alter the local environment (e.g.: clearcutting, road construction, ground leveling or excavating, wetland draining) until the environmental assessment process is concluded and licences and permits are granted. This recommendation applies to all of Atlantic Gold's proposals under review, and become accepted policy for all future large-scale industrial developments.

4. It is recommended that the proponent and the Province be open to address the issue of Mi'kmaw access to impacted lands and resources.

5. Following the principles of the United Nations Declaration on the Rights of Indigenous Peoples[43], it is recommended that future development planning by the Province of Nova Scotia be carried out with early-stage planning involvement by the Mi'kmaw, rather than attempts at late-stage consultation.

[43] United Nations 2007

7. REFERENCES:

Allen, Gillian S.

2006 Preliminary Historical Research on Mi'kmaq Place-Names in Nova Scotia. A Report Prepared for the Aboriginal Title Project, Shubenacadie. Halifax, January 2006

Assembly of Nova Scotia Mi'kmaq Chiefs

2014 Mi'kmaq Ecological Knowledge Study Protocol. 2nd edition. Truro: Mi'kmaq Rights Initiative

2009 Tia'muwe'l Netukulimk'ewe'l – Unama'ki Moose Harvesting According to Netukulimk. Eskasoni/Truro

Atlantic Gold Corporation

2018 Atlantic Mining NS Corp. Fifteen Mile Stream Gold Project, Highway 374 Trafalgar, Nova Scotia – Project Description. Vancouver, May 22, 2018

2018a Atlantic Mining NS Corp. Fifteen Mile Stream Gold Project, Highway 374 Trafalgar, Nova Scotia – Project Description Summary. Vancouver, 22 May 2018

2017 Atlantic Gold Projects, http://atlanticgoldcorporation.com/projects/overview, retrieved Aug. 2017

Barsh, Russell L.

2002 "Netukulimk Past and Present: Mi'kmaw Ethics and the Atlantic Fishery". In: Journal of Canadian Studies, 37/1:15-38.

Bartlett, Cheryl M.

2011 "Integrative Science / Toqwa'tu'kl Kjijitaqn: The Story of Our Journey in Bringing Together Indigenous and Western Scientific Knowledge". In: Bernard, T./ Rosenmeier, L.M./ Farrell, S. (eds.), Ta'n Wetapeksi'k: Understanding From Where We Come. Proceedings of the 2005 Debert Research Workshop, Debert, Nova Scotia, Canada. Pp.179-186. Truro, NS: Eastern Woodland Print Communications

Campbell, Linda & al.
2018 “Approaching a century-old legacy of arsenic and mercury contamination”. Dynamic Environment & Ecosystem Health Research - Nova Scotia Gold Mine Contaminants, Saint Mary’s University. h*ttp://www.ap.smu.ca/~lcampbel/Gold.html*

CEARC (Canadian Environmental Assessment Research Council)
1988a The Assessment of Cumulative Effects: A Research Prospectus. Ottawa: Supply & Services

CEAWG (Cumulative Effects Assessment Working Group)
1999 Cumulative Effects Assessment Practitioners Guide. Prepared for the Canadian Environmental Assessment Agency by The Cumulative Effects assessment Working Group & Axys Environmental Consulting Ltd. Hull: Canadian Environmental Assessment Agency, Feb 1999

1988b Mitigation and Compensation Issues in the Environmental Assessment Process: A Research Prospectus. Ottawa: Supply & Services

1988c Evaluating Environmental Impact Assessment: An Action Prospectus. Ottawa: Supply & Services

Chandler, R.F.; Freeman, L.; Hooper, S.N.
1979 “Herbal Remedies of the Maritime Indians”. In: Journal of Ethnopharmacology, 1:49-68

Chute, Janet E.
1999 “Frank G. Speck’s Contributions to the Understanding of Mi’kmaq Land Use, Leadership, and Land Management”. In: Ethnohistory, 46/3: 481-540

CMM & Peabody Museum (Confederacy of Mainland Mi’kmaq & Peabody Museum of Archaeology)
2001 Mikwite’lmanej Mikmaqi’k – Let Us Remember the Old Mi’kmaq. Andover: Robert S. Peabody Museum of Archaeology

Denys, Nicholas
1908 The Description and Natural History of the Coasts of North America (orig. 1650). New York: Champlain Society Publications

DNR (Nova Scotia Dept. of Natural Resources)
2012 Endangered Mainland Moose Special Management Practices. Halifax: Dept. of Natural Resources, July 2012

2007 Recovery Plan for Moose (*Alces alces americana*) in Mainland Nova Scotia. Nova Scotia Endangered Species Act Recovery Plan Series. Halifax: DNR

Dodds, Donald
1993 Challenge & Response – A History of Wildlife and Wildlife Management in Nova Scotia. Halifax: Province of Nova Scotia, Dept. of Natural Resources

Ellis, Stephen C.
2005 "Meaningful Consideration? A Review of Traditional Knowledge in Environmental Decision Making". In: Arctic 58/1:66-77, March 2005

Frame, Elizabeth
1892 List of Micmac Names of Places, Rivers, etc, in Nova Scotia. Cambridge: John Wilson & Son

Ganong, William F.
1914 An Organization of the Scientific Investigation of the Indian Place-Nomenclature of the Maritime Provinces of Canada. Transactions of the Royal Society of Canada, Sect. II, 3 volumes Ottawa 1911-14

Hoffman, Bernard G.
1955 The Historical Ethnography of the Micmac of the 16th and 17th Centuries. Ph.D. thesis, University of California, Berkeley

Hornborg, Anne.-Christine
2008 Mi'kmaq Landscapes – From Animism to Sacred Ecology. Vitality of Indigenous Religions Series. Aldershot GB: Ashgate Publ. Ltd.

2001 A Landscape of Left-Overs – Changing Conceptions of Place and Environment Among Mi'kmaq Indians of Nova Scotia. Ph.D. thesis. Lunds Studies in History of Religions, vol.14. Lund: Almqvist & Wiksell

IAIA (International Association for Impact Assessment)
1999 'Principles of Environmental Impact Assessment Best Practices'. Fargo: IAIA. *http://www.iaia.org/uploads/pdf/principlesEA_1.pdf*

Kenny & Parenteau Research Associates
2000 Historical Report: Centralization of Nova Scotia's Mi'kmaq 1918-65. Prepared for the Specific Claims Branch, Dept. of Indian and Northern Affairs. Ottawa, Nov. 2000

Lacey, Laurie
1977 Micmac Indian Medicine: A Traditional Way of Health. Antigonish: Formac

Laroche, Jean
2018 "Mining companies no longer face 12-months cleanup deadline". In: CBC News, 22 Nov. 2018, *https://www.cbc.ca/news/canada/nova-scotia/mining-natural-resources-clean-up-remedition-law-regulations-1.4916140*

Lewis, Roger
2018 Fifteen Mile Stream Gold Project, Halifax County, Nova Scotia / Cochrane Hill Gold Project, Guysborough County, Nova Scotia – Archaeological/Cultural Aspects Review. Prepared for Mi'kma'ki All Points Services. Prepared by Roger J. Lewis, MA, Mi'kmaq Archaeological Services. Halifax, 23 Aug 2018

2018a Roger Lewis, Archaeologist and Ethnology Curator, Nova Scotia Museum of Natural History, Halifax, NS. Personal communication, July/Aug. 2018

2012 Roger Lewis, Archaeologist and Ethnology Curator, Nova Scotia Museum of Natural History, Halifax, NS. Personal communication, June 2012

2011 Erdene Resources Development Corporation Black Point Quarry Project, Cultural Aspects Review. Report prepared for Mi'kma'ki All Points Services Inc. Dartmouth, Nov 2011

MacDonald, Alistair
2014 Cumulative Effects on the Aboriginal Rights and Interests of the carrier Sekani Tribal Council First Nations: A Preliminary Re-assessment of the Coastal GasLink Project. Extended Summary of Main Project. Prepared for the Carrier Sekani Tribal Council (CSTC). Victoria: The Firelight Group

Macdonald, Eliana
2016 Atlas of Cumulative Landscape Disturbance in the Traditional territory of Blueberry First Nations, 2016. Vancouver: Ecotrust Canada, June 2016

MacDonald, Lindiwe
1999 Mi'kmaq Land Use and Associated Traditional Land Use Practices. Report prepared under the auspices of the Nova Scotia Aboriginal Treaty Project. March 1999

Macnab, Paul A.
1996 Traditional Knowledge Mapping in Support of a Proposed National Marine Conservation Area. Submitted to the Partnership Program, Habitat Action Plan, Dept. of Fisheries & Oceans, March 31, 1996. Gloverton: P.A. Macnab, Terra Nova National Park

McNeil, Jeffie
2013 Action Plan for the Recovery of Eastern Moose (*Alces americana*) in Mainland Nova Scotia. Mainland Moose Recovery Team and Mersey Tobeatic Research Institute. Kempt, NS.

Nadasdy, Paul
1999 "The Politics of TEK – Power and the 'Integration' of Knowledge". In: Arctic Anthropology, 36/1-2:1-18

Osprey Gold Development Ltd
2018 "Osprey Gold Development Ltd.: First Results from Caribou Trenching Program Include Argillite Intercept Returning 8.0 Meter of 1.2 G/T Gold at Surface". *https://ca.finance.yahoo.com/news/osprey-gold-development-ltd-first-131200463.html*

Pacifique, Père (Father Pacifique Buisson d'Valigny, ofmcap)
1934 Le Pays des Micmacs. Études Historiques et Géographiques 10, 11 & 14. Bonaventure Qc

Parker, Gerry
2003 Status Report on the Eastern Moose (*Alces americana*, Clinton) in Mainland Nova Scotia. Sackville, NB, 06 June 2003

Parker, Mike.
1990 Guides of the North Woods- Hunting and Fishing Tales from Nova Scotia 1860-1960. Halifax: Nimbus Publishing

Patterson, George
1877 History of the County of Pictou. Montreal: Dawson Brothers

Parsons, M.B.; LeBlanc, K.W.G.; Hall, G.E.M. & al.
2012 Environmental Geochemistry of Tailings, Sediments and Surface Waters Collected from 14 Historical Gold Mining Districts in Nova Scotia. Geological Survey of Canada, Open File 7150, 2012, *https://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/downloade.web&search1=R=291923*

Patterson, Lisa
1986 “Centralization in Nova Scotia- An Adventure in Canadian Indian Policy”. Paper presented at the Canadian Historical Association, Learned Societies Conference, Univ. of Manitoba, Winnipeg, June 1986

Penaluna, Brooke E. / Olson, Deanna H. & al.
2017 “Aquatic Biodiversity in Forests – A Weak Link in Ecosystem Services Resilience”. In: Biodiversity Conservation 26:3125-3155

Peterson, Lee Allan
1977 A Field Guide to Edible Wild Plants of Eastern and Central North America. Boston & New York: Houghton Mufflin Co.

Prosper, K.; McMillan, K.J.; Davis, A.A.; Moffitt, M.
2011 “Returning to Netukulimk: Mi’kmaq Cultural and Spiritual Connections with Resource Stewardship and Self-Governance”. In: The International Indigenous Policy Journal, 2/4. *http://ir.lib.uwo.ca/iipj/vol2/iss4/7*

Robinson, Brian S.
2011 “Bull Brook and Debert: The Original Large Paleoindian Sites in Northeast North America”. In: Bernard, T./Rosenmeier, L./Farrell, S. (eds.), Ta’n Wetaeksik – Understanding From Where We Come. Proceedings of the 2005 Debert Research Workshop, Debert, Nova Scotia, Canada. Pp 133-143. Truro: Confederacy of Mainland Mi’kmaq

Sable, Trudy & Francis, Bernie
2012 The Language of this Land, Mi’kma’ki. Sydney: Cape Breton University Press

Sato Estrada, Engelberth; Aguirre Saldivar, Rina; Schmidt, Michael
2005 Cultural Integrity As Criterion of Strategic Environmental Assessment (SEA)’. In: Schmidt, M., João, E., Albrecht, E. (eds.), Implementing Strategic Environmental Assessment, pp.409-420. Berlin: Springer Verlag

Sheldon, Helen L.
2000 Aboriginal Archaeological Sites of Nova Scotia: An Analysis. Aboriginal Archaeological Sites Project. Indian Brook, NS: Treaty and Aboriginal Rights Research Centre

Sonntag, N.C., Everitt, R.R., Rattie, L.P./ Colnett, D.L. & al.
1987 Cumulative Effects Assessment: A Context for Further Research and Development. A Background Paper Prepared for the Canadian Environmental Assessment Research Council. Ottawa: Supply & Services

Speck, Frank G.
1922 Beothuk and Micmac. Indian Notes and Monographs 22. New York: Museum of the American Indian

1915 "The Family Hunting Band as the Basis of Algonquian Social Organization". In: American Anthropologist, 17/3: 492-508

Statistics Canada
2018 Censuses of Canada 1665 to 1871. *https://www150.statcan.gc.ca/n1/pub/98-187-x/4151278-eng.htm*, retrieved June 2018

Steffensen, Marina
2016 Evaluating Cumulative Effects Assessment Within Environmental Impact Assessment: A Case Study on the LNG Canada Export Terminal. Master of Resource Management thesis. Report 653, School of Resource and Environmental management, Simon Fraser University

Tobin, Anita M.
1999 The Effects of Centralization on the Social and Political systems of the Mainland Nova Scotia Mi'kmaq (Case Studies: Millbrook-1916 & Indian Brook-1941). MA thesis, Atlantic Canada Studies, St. Mary's University, Halifax, NS

UINR (Unama'ki Institute of Natural Resources)
2012 Mi'kmaq Ecological Knowledge. Distribution of Culturally Significant Plants. http://www.uinr.ca/wp-content/uploads/2010/03/Plant-Report-WEB.pdf, retrieved June 2018

United Nations
2007 United Nations Declaration on the Rights of Indigenous Peoples. Adopted 13 Sept. 2007. *https://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf*

Upton, Leslie F.S.
1979 Micmac and Colonists. Indian-White Relations in the Maritimes, 1713-1867. Vancouver: University of British Columbia Press

Usher, Peter J.
2000 “Traditional Ecological Knowledge in Environmental Assessment and Management”. In: Arctic, 53/2:183-193, June 2000

Voshell, Reese J. Jr.
2009 “Sustaining America’s Aquatic Biodiversity: Aquatic Insect Biodiversity and Conservation”. Virginia Tech University, VCE Publications / 420-531, 01 May 2009, *https://pubs.ext.vt.edu/420/420-531/420-531.html*

Wallis, Wilson D. & Wallis, Ruth S.
1955 The Micmac Indians of Eastern Canada. Minneapolis: University of Minnesota Press

Weiler, Michael H.
2008 Cultural Analysis of Mi’kmaq Place Names on Prince Edward Island. Mi’kmaq Place Names Cultural Preservation Project. Final Report Prepared for the Mi’kmaq Confederacy of PEI. Springfield: M. Weiler Research & Consulting

Whitehead, Ruth H.
1991 The Old Man Told Us- Excerpts from Micmac History 1500-1950. Halifax: Nimbus Publ.

Wicken, William C. & Reid, John G.
1996 An Overview of the Eighteenth Century Treaties Signed between the Mi’kmaq and Wuastikwiuk Peoples and the English Crown, 1693-1928. Report Submitted to Land and Economy, Royal Commission on Aboriginal Peoples 1996.

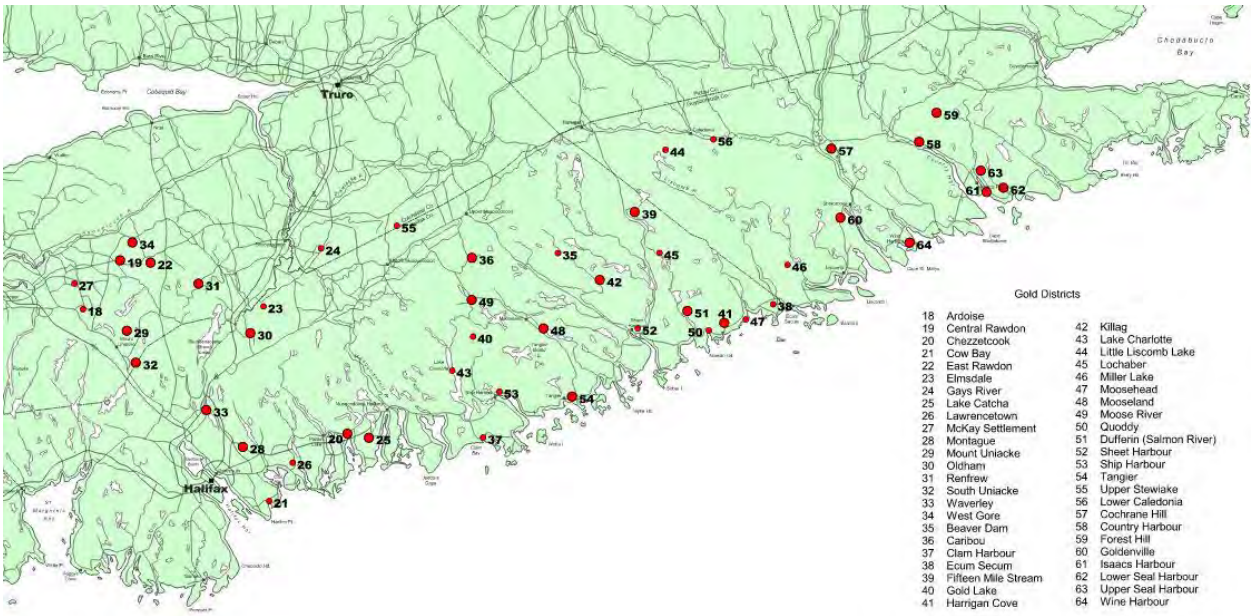
Willick, Frances
2018a “Gold mining’s toxic legacy raises concerns about Eastern Shore project”. In: CBC News, 23 Sept. 2018, *https://www.cbc.ca/news/canada/nova-scotia/goldboro-gold-mine-anaconda-mercury-arsenic-1.4834762*

2018b “N.S. plans to close 2 sites contaminated by old gold mines”. In: CBC News, 13 Oct. 2018, *https://www.cbc.ca/news/canada/nova-scotia/gold-mine-tailings-cleanup-nova-scotia-1.4854787*

Winds & Environmental Services Inc.
2000 Determining Significance of Environmental Effects: An Aboriginal Perspective. Prepared for the Research and Development Monograph Series, 2000, Canadian Environmental Assessment Agency, Ottawa

APPENDIX 1

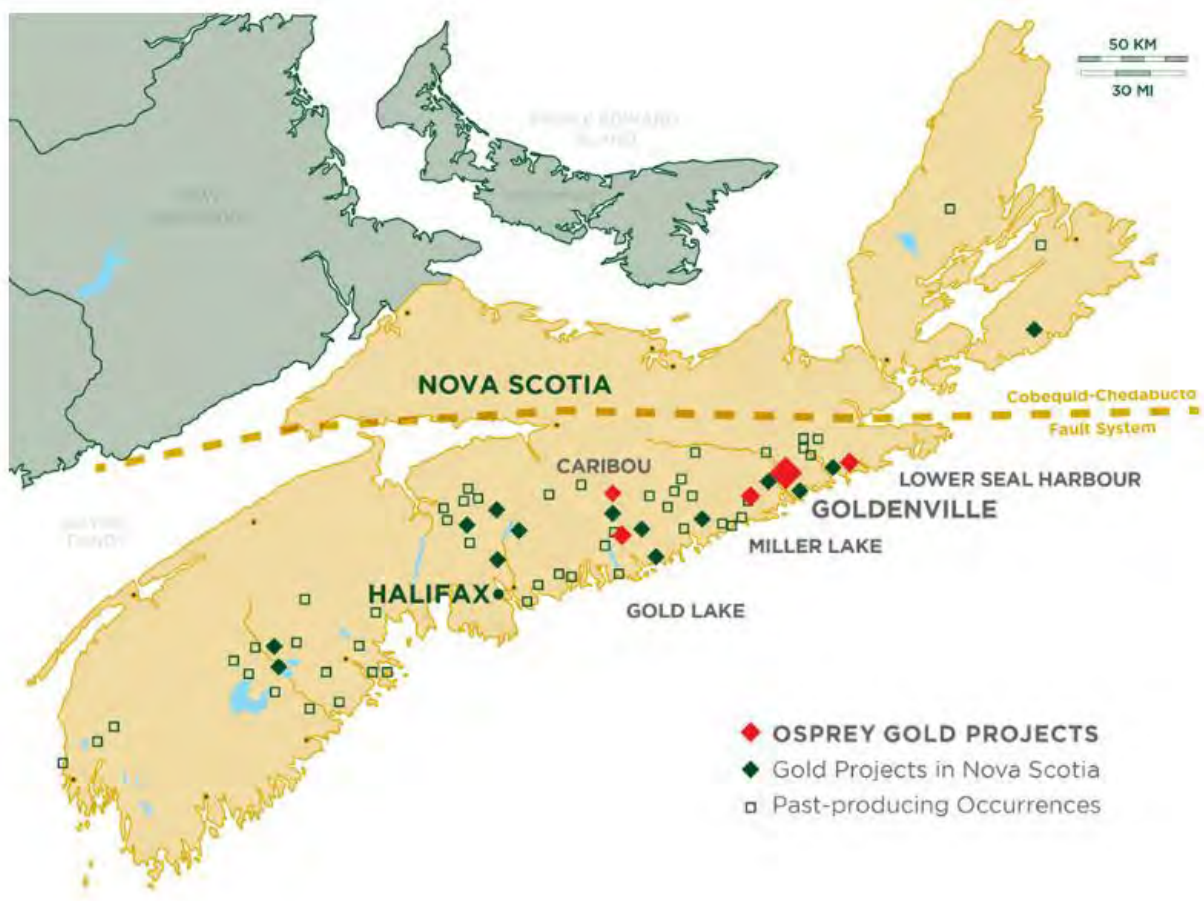
Historical Gold Districts in Eastern Nova Scotia



Source: NS Dept. of Lands and Forestry
https://www.novascotia.ca/nse/contaminatedsites/docs/golddistricts.pdf

APPENDIX 2

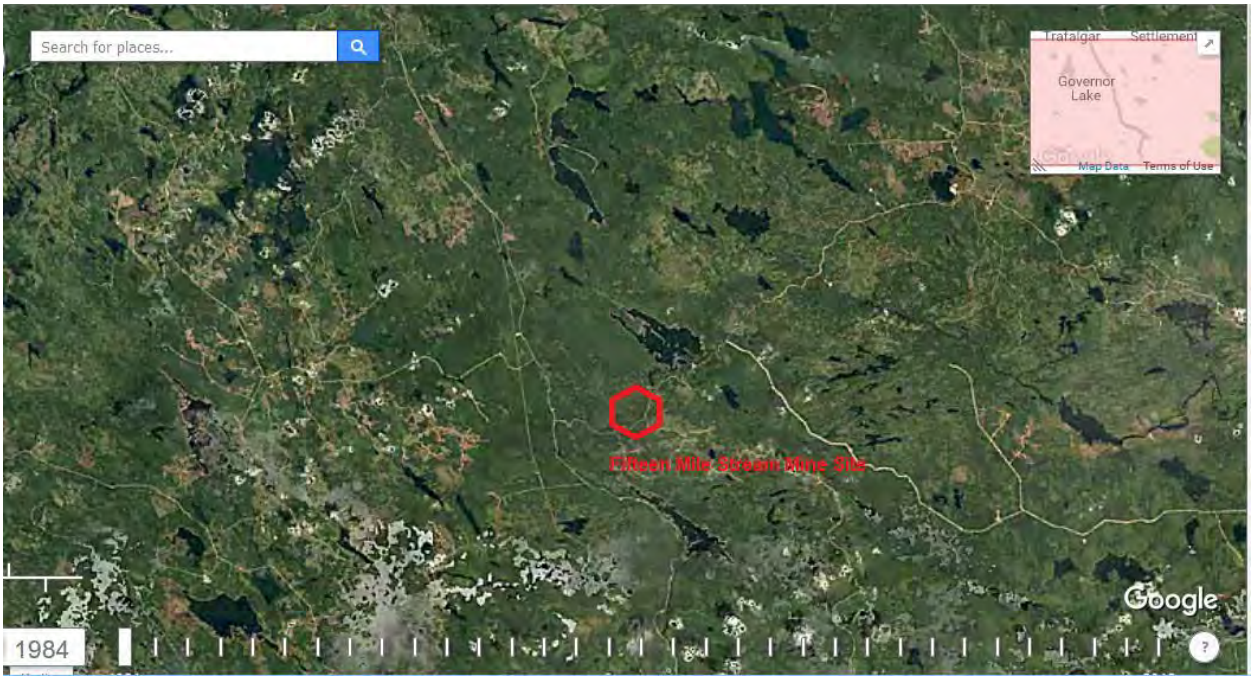
Osprey Gold Development Ltd Exploration/Project Sites



Source: Osprey Gold Development Ltd
https://www.ospreygold.com/projects/project-location-map/

APPENDIX 3

Forest Clear-Cut Progression 1984-2016

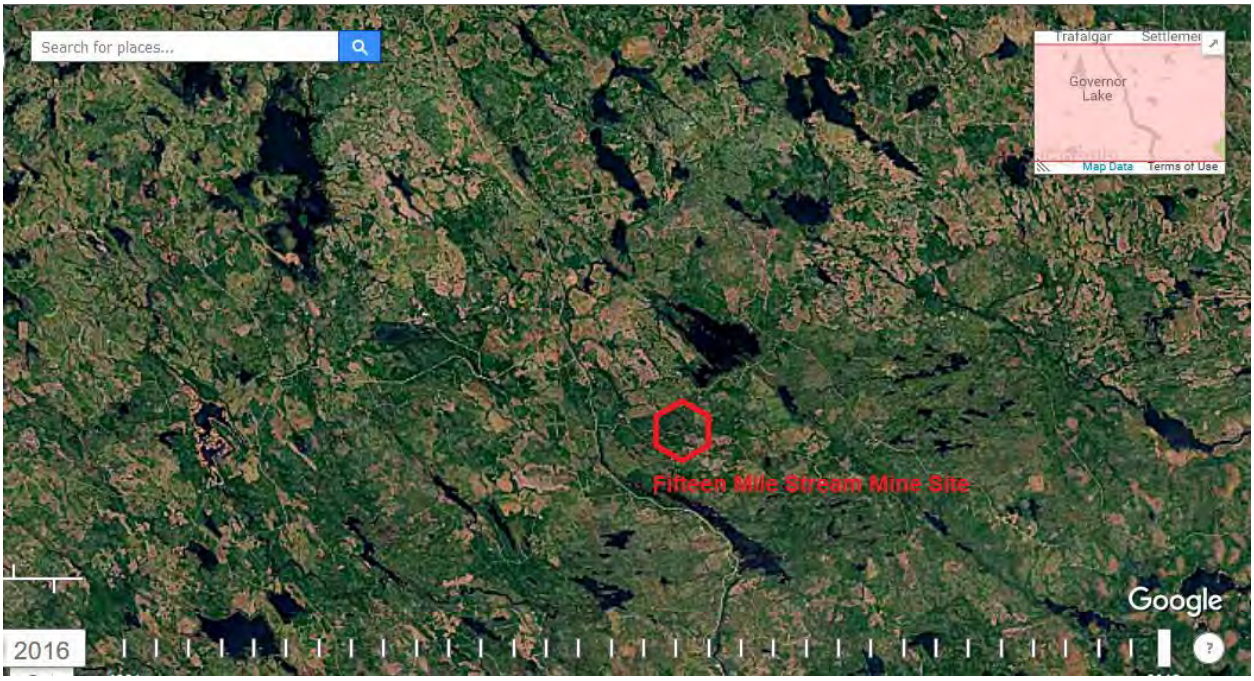


Forest Clear-Cut Status 1984 (source Google Timelaps)

Forest Clear-Cut Status 1990 (source Google Timelaps)

Forest Clear-Cut Status 2000 (source Google Timelaps)

Forest Clear-Cut Status 2010 (source Google Timelaps)



Forest Clear-Cut Status 2016 (source Google Timelaps)

APPENDIX 4

Archaeological/Cultural Aspects Review

ARCHAEOLOGICAL/CULTURAL ASPECTS REVIEW

FIFTEEN MILE STREAM GOLD PROJECT
HALIFAX COUNTY, NOVA SCOTIA

COCHRANE HILL GOLD PROJECT
GUSBOROUGH COUNTY, NOVA SCOTIA

Prepared for: Mi'kma'ki All Points Services

P.O. Box 63
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Prepared By: Roger J. Lewis, MA
Mi'kmaq Archaeological Services

August 23, 2018

INTRODUCTION:

This report represents an Archaeological/Cultural Aspects Review prepared to provide better understanding of Mi'kmaq land and resource use activities in and around the Fifteen Mile Stream and Cochrane Hill Gold Project Sites. This assessment considers a detailed review of all current archaeological, historical, ethnological and other relevant cultural resource materials.

Cultural heritage is the legacy of physical artifacts and/or intangible attributes of a group or society that are inherited from past generations, with the intent to be maintained in the present and preserved for the benefit of future generations.

Archaeology is the study of human activity through the recovery and analysis of material culture. The archaeological record may consist of such things as artifacts, architecture, biofacts, ecofacts, geofacts and cultural landscapes features.

Values considered for this report are:

- Site Location Data
- Archaeological Site Data
- Historical Data
- Landscape – Diversity and Productivity
- Archaeological Potential

Not all things that have heritage value are visible

MI'KMAQ CULTURAL LANDSCAPE

Fundamentally, cultural landscapes are landscapes that have been affected, influenced, or shaped by human involvement. A cultural landscape can be associated with a person or event or a combination of both. Collectively, cultural landscapes are narratives of culture, and expressions of identity.

Most historical descriptions of Mi'kmaq society tend to focus on describing early Mi'kmaq-European relations (Wicken 1993). Rarely fused within these narratives are descriptions of a Mi'kmaq cultural landscape.

Recently, studies have moved towards a more comprehensive understanding of the ecological, socio-cultural, and economic values of a traditional Mi'kmaq cultural landscape of which rivers and associated landscapes have always been of principal importance.

Cultural geographer, Carl Sauer, provided the initial discourse for the term '*cultural landscape*' in the 1920's stating that '*cultural landscape is fashioned out of a natural landscape by a culture group*' (Sauer 1925, 25).

R.G. Matson (1983) in his publication '*Intensification and Development of Cultural Complexities: The Northwest vs. the Northeast Coast*' argued that societies focused settlements and resource use areas in locales that allowed them control and access to critical resources which were not only abundant, but localized and predictable.

According to David Jacques the rise in the recognition of cultural landscape became associated with the recognition of differing value systems inherent in cultural landscapes (*Defining Cultural Landscapes - 1995, 91-101*).

Amos Rapoport purports that all landscapes are modified through human action and that they have been lived in and have meaning makes them cultural. He further states that they have unmistakable and easily identifiable characteristics (*Rapoport 1992, 33-47*). Rapoport also defines cultural landscapes as consisting of a system of settings.
The historical narrative as we know it, which is more about 'great events and great people', cannot communicate this. Within each of these systems of settings, are systems of activities and underlying characteristics that make them distinctive.

These settings or systems incorporate proximities, linkages, and even cultural memories tied closely to a traditional cultural landscape that is often overlooked (*Rapoport 1992, 33-47*).

Kenneth Taylor (2008) proposed that one of people's deepest needs is for a sense of identity and belonging. The one common denominator which influenced human attachment to land is determined by how one identifies within landscape and with place. He also adds that landscape is not simply what we see, but is a way of

seeing. We not only see cultural landscape with our eyes but interpret it with our mind and an ascribed set of values

Ludimir R. Lonzy (2006) states that two themes central to understanding a cultural landscape are landscape history and the concept of place examined in the time-space context of human activity. He defines landscape history as the study of past relationships between groups of people and their environment. He goes further to define '*cultural landscape*' as being composed of places filled symbolically with diverse meanings and encompassing details of human past activities that can be captured.

The concept of place is not just about material objects, but other, intangible things such as memories, feelings, and sense of belonging. Landscape, has two distinct realms: cultural (recognized/meaningful) and natural. In any case, both can be experienced simultaneously (Lonzy 2006).

For Mi'kmaq peoples, '*place*' becomes significant and is symbolically filled with specific meaning. **This is often unrecognizable to researchers, government officials and industry.** For example, a cultural landscape is a living entity with a yesterday, today and tomorrow. It has a consciousness and its own will towards life that cannot be taken away under the pretext of economic exploitation.

Land therefore, to the Mi'kmaq people is NOT an accidental find. In other words, they didn't discover it. They viewed and continue to view it as a gift and the abundance offered by it is all part of that gift.

How the Mi'kmaq experience and perceive the landscape can be seen through legends, stories, music, and spiritualism. These are all filled with knowledge and references relating to the landscape and includes how one conducts oneself in relation to it.

SUBSISTENCE MODELS

From an archaeological point of view, several subsistence models have been hypothesized for a traditional Mi'kmaw economy (Hoffman 1955; Christianson 1979; Davis 1986; Nash, Deal and Stewart 1991).

Many of these models result from a review and interpretation of 17th century literature, but reinforce the reciprocal and continuous relationship Mi'kmaq had

and continue to have with their environment. Since then much of that interpretation has been expanded upon and complemented by a range of archaeological research.

Mi'kmaq often chose landscape areas that offered outstanding biodiversity and an overlapping seasonal availability of resources for settlement and resource use. This strategy of land and resource use has long linked Mi'kmaq and environment. Archaeologists continue to verify that specific locations have been used consistently over thousands of years.

Watersheds and associated river units are **high priority** land use areas for the Mi'kmaq. These locations have given rise to variability in archaeological site types, temporal range and use patterns. At the time of first European contact Mi'kmaq populations were living along each of the forty-two rivers and using and accessing the myriad of lakes found therein.

In fact, Marc Lescarbot in 1607, and Father Pierre Biard in 1610 ((Biard 1616; in JR. Vol. 3:87-95), noted that the Sagamies (Chiefs) divided up the country their territories identifiable according to bays or rivers.

Lescarbot (1607) noted the knowledge Mi'kmaq had of the overlapping resource sites;

> '*…when the winter was over and the mildness of the weather allured the fish to seek fresh water, upon the 14th of April, men were sent out fishing. There are a great many streams at Port Royal, and among them three or four where the fish swarm in the spawning season. One contains vast numbers of Smelts in April. Another, Herring, another, Sturgeon and Salmon, etc. So some were then sent to the river at the [30] back of Port Royal, to see if the Smelts had come. When they reached the place, Membertou (who was encamped there), received them hospitably, regaling them with meat and fish. Thence they went to the stream called Liesse by Sieur des Noyers, an Advocate in Parliament, where they found so many fish that they had to send and get some salt, to lay in a store of them. These fish are very tempting and delicate, and are not so injurious as shellfish are apt to be. They remain about six weeks in this stream; after that there is another small river near Port Royal, where Herring is found, also another to which Sardines come in great abundance. But as to the river of the Port, which is the river Equille, since named the Dauphin, at the time of which we speak it furnished Sturgeon and Salmon to anyone who would take the trouble to fish for them. When the Herrings came, the Savages (with their usual good-nature) let the French know it by signaling from their quarters*

> *with fires and smoke. The hint was not neglected, for this kind of hunting is much surer than that of the woods*. (Lescarbot, Jesuit Relations 1968, 165, 167).

Most archaeological sites today continue to be identified as being evenly distributed along shore districts, rivers, streams, and interior lakes and are contiguous in nature.

The defining qualities of landscapes and site locations are bio-diversity, localization, as well as the abundance and availability of overlapping seasonal resources. These landscape areas were also flexible and dynamic with generational changes in resource availability (populations /ecological cycles).

Aquatic and terrestrial resources associated with a myriad of lakes, rivers and forests were, and continue to be, basic to Mi'kmaq existence. Recent archaeological investigations (Lewis 2001-2006) support this hypothesis, as well as a long tenure of land and resource use by Mi'kmaq.

It is now accepted that Mi'kmaq people extended and modified plans and strategies to exploit singular or multiple resources in a succession of habitats throughout the province. For example, archaeological investigations have shown stone fish weir technology as having been used regularly on most rivers in Nova Scotia.

Four types of fish weir architecture were identified. The overlapping seasonal availability of resources allows for the seasonal harvesting of a river. Fence-stake weirs located at the mouth of rivers were utilized to harvest larger fish species that enter the river to spawn or feed such as sturgeon, bass, and shad. Their effectiveness was dictated by the rise and fall of tides.

Smaller (v-shaped) upstream oriented stone weirs at located at the heads of tide. These were used to harvest the smaller fish species such as mackerel, gaspereau, bass, and male eels.

Rectangular-ovate stone weirs were located on the intermittent portion of a river above the head of tide and designed to harvest salmon and larger (v-shaped) downstream-oriented stone weirs were located at the outflows of interior lakes. These were used to harvest out migrating female eels during a 4-5-week window of opportunity from mid-September to mid-October.

With increased infringement on their territories by newly arriving settlers, a new strategy was needed to deal with the loss of access to resource areas. That new colonial strategy came in the form of '*Licenses of Occupation'*. It can be assumed this new strategy was implemented recognizing the importance of ancient landscapes to traditional Mi'kmaq life ways.

OVERVIEW OF ARCHAEOLOGICAL SITES HALIFAX COUNTY AND GUYSBOROUGH COUNTY:

There are approximately 100 Mi'kmaq related archaeological sites in Halifax County while 29 have been identified in Guysborough County (NSM 2018). The temporal range of land and resource use ranges from *Mu Awsami Sagiwe'k* (10,000 -3,000 years ago) to *Kiskukewe'k L'nuk* (3000 years ago – present) and includes historical period sites. (Lewis 2006).

The current project areas (Fifteen Mile Stream and Cochrane Hills) are in close vicinity of known archaeological sites.

MAPS:

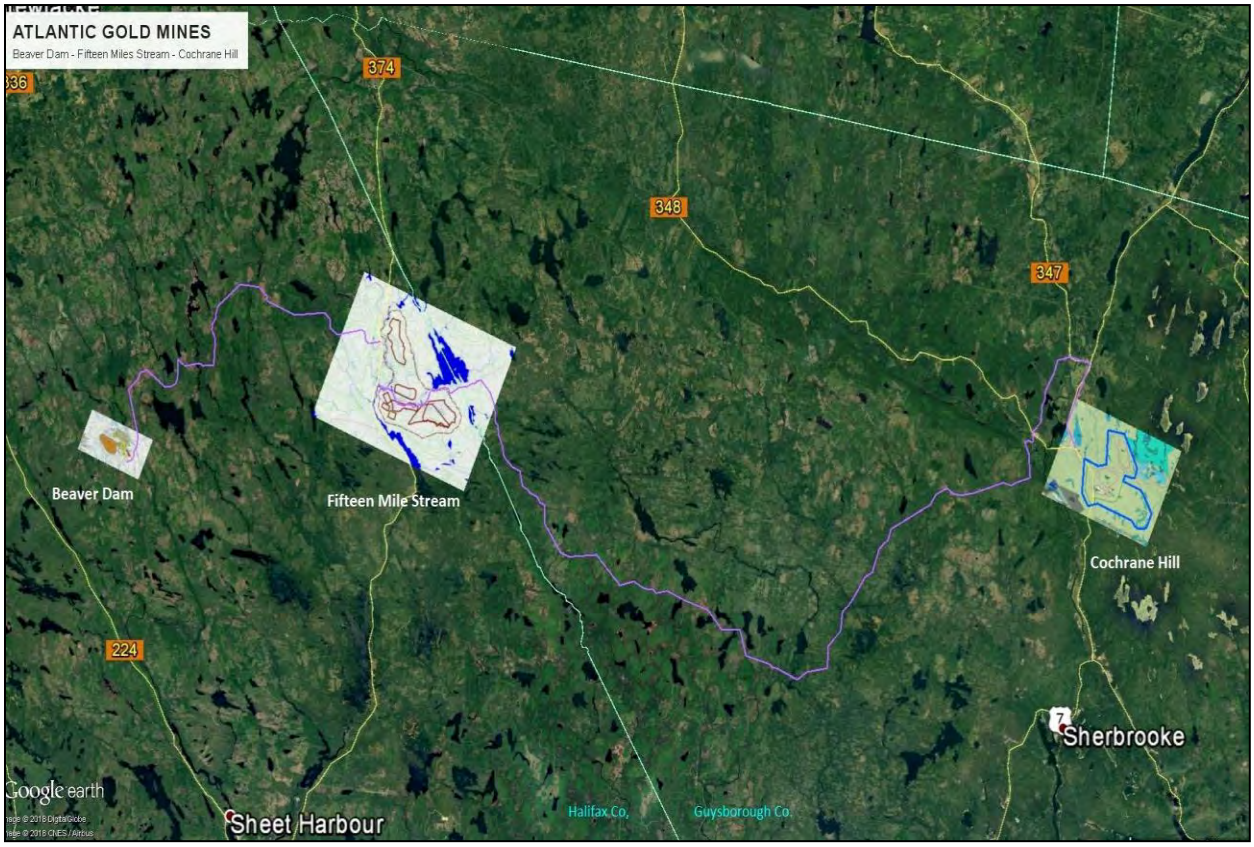

Figure 1: Map provided by MAPS (2018) of the proposed Atlantic Gold Mines projects areas relative to Beaver Dam Site NNW of Sheet Harbour, Nova Scotia.

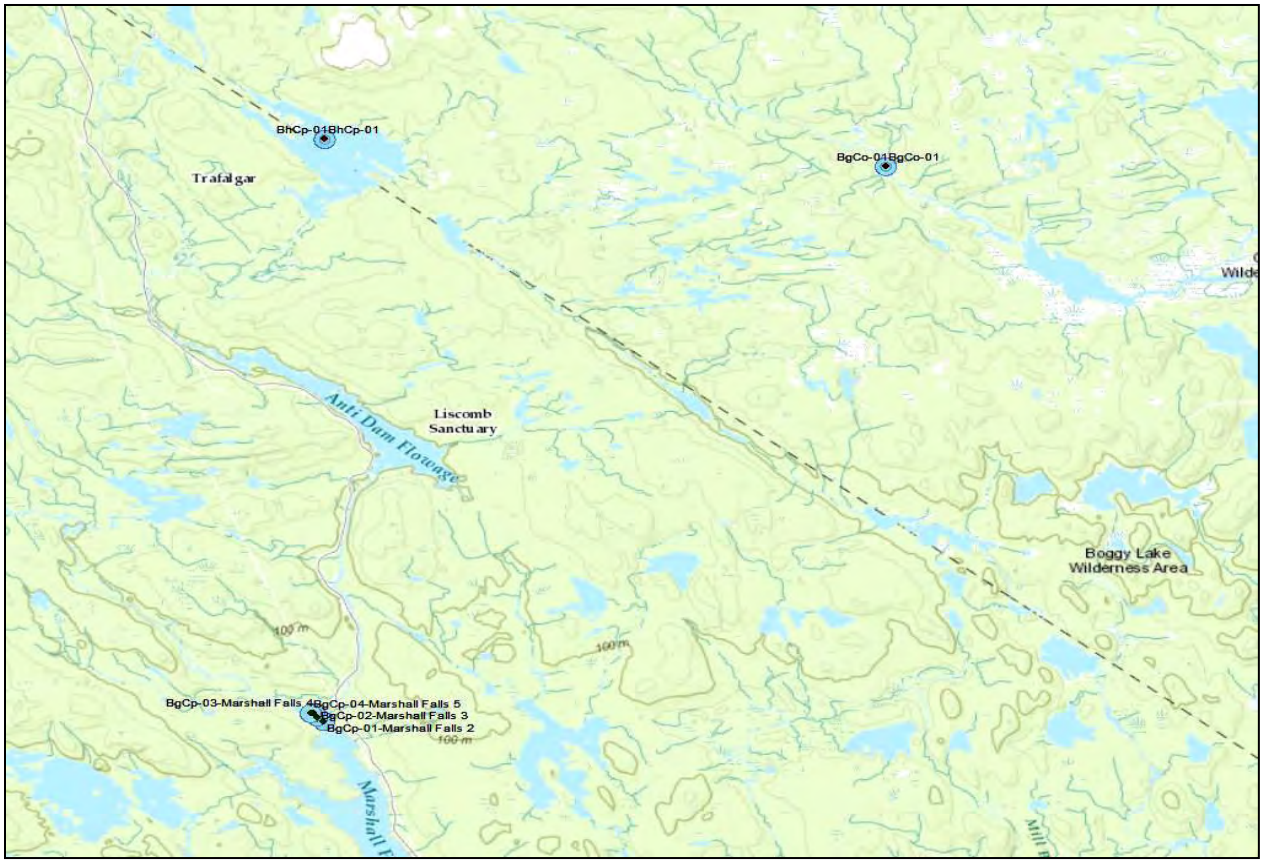

Figure 2: Archaeological Sites –Fifteen Mile Stream

Figure 3: Archaeological Sites – Cochrane Hills

Fifteen Mile Stream Area (Figure 2):

A combination of both pre-contact and historic period Mi'kmaq sites have been identified in the immediate vicinity of the proposed Fifteen Mile Stream Gold Projects. More specifically, six (6) historic/precontract sites are identified immediately south of the Anti Dam Flowage at Marshall Falls. A historic period Mi'kmaq burial site is located at Seloam Lake.

According to Harry Piers Notes and Geological Survey (GSC) maps annotated by Mr. Piers, it is reported that 'old Matteo Selome (sic) buried his wife on an island in the lake'.

Approximately 15 kilometers east of Seloam Lake at Typhus Lake … 'an Indian burying ground of Indians who took sick and died …' (Fenian Raid about 1866).

Approximately 8 kilometers 'northeast' of Seloam Lake and immediately 'south' of Big Liscomb can be found Prince Arthur Lake. This was a favoured hunting and fishing area of the Mi'kmaq. Prince Arthur, the Duke of Connaught and Stratheam and later Governor General of Canada visited Nova Scotia in 1869 and travelled to that location in the company of James Cope and William Chearnley, then Colonial Indian Commissioner.

Cochrane Hills (Figure 3):

Eight (8) archaeological sites have been identified in the immediate vicinity of Glenelg, Melrose and Wallace Lake area at Aspen. One (1) of these sites has been identified as a potential Mi'kmaq Burial Site location (Harry Piers notes and annotated GSC map).

Three (3) precontract period sites are located at Glenelg at the forks of the East/West Branch St. Mary's River, at Wallace Lake and Silver's Garden.

ARCHAEOLOGICAL POTENTIAL

The cultural heritage and cultural landscapes of the Mi'kmaq people dates back many thousands of years ago, to early post-glacial Indigenous occupation and encompasses the later arrival of immigrants and settlers from cultures worldwide.

Identifying and protecting cultural heritage values, as well as respecting cultural landscapes preserves a still living archive of this province's history for future generations to study and enjoy. Cultural heritage values and cultural landscapes are especially important to Indigenous people and intimate to their beliefs and society.

Modelling for areas of archaeological potential is often conducted using assessment tools that frequently overlook actual heritage and landscape values. Too often these models are based on statistical testing and disregard the Mi'kmaq experience.

In many instances areas protected for other identified values, also overlap with areas of high archaeological potential for cultural heritage and landscape values.

The Fifteen Mile Stream and Cochrane Hills project sites identified in this summary report are suggestive as being of **'HIGH POTENTIAL'** to contain Mi'kmaq heritage resources and form part of a greater Mi'kmaq cultural landscape.

These locations are known for both primary and secondary water sources critical to Mi'kmaq lifeways. They are known to contain topographical features that could be the sites of known/unknown Mi'kmaq burials. These areas also had a long history of Mi'kmaq harvesting/gathering and guiding (see Whitehead. R.H.: The Old Man Told Us, 1991) – at Liscomb River, Hunting Lake, Indian Rips, Squaw Point, Ladle Lake, Dreadnaught Dam, Lookout Hill.

There are recorded instances of Mi'kmaq guides selling Moose meat to the Fifteen Mile Gold mine when it was an active operation in the early 20th century (Jeremiah Lonecloud to Harry Piers 1918)[44].

The family of Ned Isidore were born and lived at St. Mary's Forks, Guysborough County circa 1806 (Harry Piers Notes 2003)[45]. In fact, a significant Mi'kmaq population resided in what they called the 'Eastern District' of the province throughout the 1800s (William Nixon Accts)[46].

Of note, this writer spoke to many elderly non-Mi'kmaq residents of the Eastern Shore in the years 2005/06 and a common statement made by same was '*many Micmac lived down here, and we remember them, but all of sudden they disappeared*'. Further enquiries indicated the disappearance of the Mi'kmaq coincided with the failed Centralization efforts of the 1940s.

RECOMMENDATIONS

Based on all available information and the proximity of these projects to existing heritage resources it is recommended that prior to any wide spread land alterations or deep disturbance that a '**High Potential**' archaeological assessment be undertaken.

There should also be a reasonable expectation that 'cultural importance' of the landscape throughout the 'Eastern District' be considered in any assessment considerations.

[44] Nova Scotia Museum of Natural History, archive
[45] Nova Scotia Museum of Natural History, archive
[46] PANS RG1, Vol 430, #109

Appendix I.1

Fifteen Mile Stream Historical Tailings and Waste Rock Management Plan, Stantec Consulting Ltd.

Fifteen Mile Stream Historical Tailings & Waste Rock Management Plan

September 25, 2019

Prepared for:

Atlantic Mining NS Corp
409 Billybell Way, Mooseland
Middle Musquodoboit, Nova Scotia, Canada
B0N 1X0

Prepared by:

Stantec Consulting Ltd.
102-40 Highfield Park Drive
Dartmouth, NS B3A 0A3

Tel: 902-468-7777
Fax: 902-468-9009

Job No.: 121619250

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LIST OF APPENDICES

1.0 INTRODUCTION

At the request of Atlantic Mining NS (AMNS) Corp, a Historical Tailings and Waste Rock Management Plan has been developed to address historical tailings and waste rock identified at the Fifteen Mile Stream (FMS) site as part of the mine re-development. This also includes the sediments potentially impacted from the tailings and waste rock associated with historical mining activities.

1.1 PROJECT OVERVIEW

The Fifteen Mile Stream Gold Project (hereafter referred to as the "Project") is located in Trafalgar, NS, and is a proposed open pit mine located in a historical gold mining district located 57 km northeast of the currently operating Touquoy mine. As a result, historical tailings and waste rock (HTWR) are known to be present on site due to the existence of at least one historical stamp mill and various mine related infrastructure as well as mine workings. Recent Environmental Site Assessment (ESA) studies conducted at the site revealed that proposed site infrastructure related to the mine re-development are located within HTWR areas.

1.2 GOALS AND PURPOSE OF THE PLAN

The purpose of this plan is to provide a methodology for managing HTWR at the Project site through the life of operations and throughout reclamation. To achieve this purpose, this management plan has been developed with the following goals:

1. Define procedures for the identification, and if required, delineation and assessment of HTWR prior to Project development.
2. Provide a methodology for the selection of HTWR management and disposal technologies as required.
3. Define responsibilities for the notification and reporting for issues related to HTWR management.
4. Provide a summary of the current understanding of HTWR within the Project footprint.
5. Provide a summary of proposed management and mitigation for known areas of HTWR that may be disturbed by potential Project activities.
6. Provide recommendations for further assessment of background conditions of the Site to support the understanding and proposed management strategies applicable to future HTWR management activities.

These goals lay out the basis for achieving the purpose of this plan in a safe, cost effective manner. The historical tailings delineation and remediation work conducted as part of the Touquoy Project has been reviewed and methods as well as lessons learned incorporated into the preparation of this management plan. The documents reviewed in this context are presented in Section 7.0, References.

2.0 IDENTIFICATION OF HISTORICAL TAILINGS AND WASTE ROCK

Due to the nature of historical mining within the Project area, the extent of HTWR has been poorly documented prior to the development of the site. This is a result of the age of the deposition of these HTWR (approximately 100 years old) and is inherent to the nature of tailings deposition by stamp mills themselves, dependent on unknown piping layouts and local topography; the location of trenching work; and placement of historical tailings and waste rock piles. The historical mill tailings appear to be concentrated in the flood plain around and in Seloam Brook identified in the Phase I and II ESA investigations conducted by Stantec (Stantec 2018a; Stantec 2019). This section outlines the current understanding of HTWR distribution at the Project site and provides a methodology for future identification of areas suspected to contain HTWR prior to development.

2.1 HISTORICAL TAILINGS AND WASTE ROCK DISTRIBUTION ON SITE

2.1.1 Known Historical Tailings and Waste Rock Investigations

This section gives a summary of known studies and investigations that quantify the presence of HTWR, and stamp mills, and where possible delineates the extent of known tailings. Several previous reports and studies have been conducted for FMS, including:

- *Jacques Whitford (now Stantec), 1989. Design Brief for Flood Protection Levee and Effluent Retention Structure at Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. February 1989.*
- *Hudgtec Consulting Limited, 2008. NI 43-101 Technical Report and Resource Estimate on the Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. Prepared for 6179053 Canada Inc., Acadian Mining Corporation, Annapolis Gold Corporation. May 27, 2008.*
- *Acadian Mining Corporation, 2012. NI 43-101 Technical Report on Updated Mineral Resource Estimate – Fifteen Mile Stream Property, Halifax County, Nova Scotia, Canada. August 29, 2012.*
- *Stantec Consulting Ltd., 2018. Final – Phase I Environmental Site Assessment, Fifteen Mile Stream.*
- *Stantec Consulting Ltd., 2019. Limited Phase II Environmental Site Assessment - Fifteen Mile Stream.*

More recently, to build upon the continued work to delineate the HTWR at the Project site, AMNS commissioned a Phase I Environmental Site Assessment (ESA) to identify environmental considerations (Stantec, 2018a), which was followed by a Phase II ESA (Stantec, 2019). Further details of those investigations and analytical results are provided in those reports, which are available upon request, with findings summarized in this report.

2.1.2 Summary of Historical Operations

Stantec completed a Phase I ESA at Fifteen Mile Stream (FMS) in 2018. A summary of the findings included a review of historical operations and site conditions as follows:

- Stantec conducted an historical overview and LIDAR analysis to produce a Digital Elevation Model (DEM) of the Project site. The DEM was used to approximately delineate potential HTWR storage areas.
- Between 1865 and 1940s there were various surface excavations, mine shafts of various depths, and stamp mill(s) or crushers utilized for the extraction of gold from the quartzite ore.
- The nearby outflows from Seloam Lake to the northeast were historically modified with diversions, dams, and flumes to provide wash water and power for the gold mining operations. Extensive tailings and WR were observed in and along the existing Seloam Brook.
- The 1947 aerial photographs show the dams along Seloam Lake are no longer in operation with the lake level appearing lower and exposed ground around the perimeter, and at Seloam Brook. Flooding which appears to have occurred, based on Department of Natural Resources (DNR) records, would account for the possible wide distribution of the tailings.
- Based on the information reviewed there were at least four mine operations in the area of Fifteen Mile Stream; the largest was Egerton Workings located in the area of the currently proposed pit. Several other mines and pits extended westward approximately 1 km along what is now the gravel access road to the current development.
- Between the 1940s and the 1980s, the area of the Site was allowed to become overgrown with trees.
- During a site visit completed on November 13, 2018, the foundations of a suspected stamp mill and other mine related features were located.

2.1.3 Determination of Suspected Tailings and Waste Rock Areas

Stantec completed a Phase II ESA at FMS in 2018, which included intrusive test pits and surface water sampling to determine tailings and WR distribution and potential impacts across the Project site. Figure 1 (Appendix A) displays test pit locations, surface water sample locations and highlighted areas of identified tailings and WR. Further details of the investigation and analytical results can be found in the Phase II ESA report completed by Stantec in 2019. A summary of the findings for the identified tailings and WR during the Limited Phase II investigation are as follows:

- Based on the amount of ore crushed it was estimated that there were 51,000 tonnes of tailings produced at Fifteen Mile Stream between the 1860s and 1940s. Test pits conducted during the Phase II ESA extended to depths ranging from 0.21 to 0.57 metres below ground surface.
- Work completed by Jacques Whitford (now Stantec) as part of a geotechnical project in the late 1980s identified WR and tailings on the site along Seloam Brook to a depth of 1.5 to 2 metres.
- Estimated bedrock depths range from approximately 2 to 3 metres below grade,
- The tailings material found was well sorted, firm, and ranged from a light grey to a brown. Typically, deposited tailings material was stratified, and few clasts/cobbles were present.
- Areas of possible tailings and WR were generally located to the north and northwest of the field identified WR storage area along Seloam Brook. It should be noted that at the time of site assessment, test pits could not be excavated in the northern portion of the proposed open pit along Seloam Brook due to high water levels.
- A WR storage area was observed in the southwestern portion of the proposed open pit that covers an approximate area of 12,500 m² and consists of several large piles of WR.
- WR was also identified along several trenches located to the south and east of the proposed open pit (historical mine workings), and along the access road to the west of the proposed open pit.
- Analytical results from the Limited Phase II ESA revealed concentrations of arsenic in soil exceeding the applicable Nova Scotia Environment (NSE) Tier 1 Environmental Quality Standards (EQS) for an Industrial Site in multiple test pit locations. The highest concentrations of arsenic, lead, and mercury

were found to be localized to the southwestern portion of the proposed open pit, in the area of identified WR storage and probable tailings storage (Appendix A – Figures 2, 3, 4, respectively).

- Concentrations of aluminum, arsenic, cadmium, chromium, and iron exceeding the applicable NSE Tier 1 EQS were identified in one or more surface water samples analyzed. The highest concentration of arsenic was detected in the surface water sample collected immediately north of the WR storage area (Appendix A - Figure 5). The detected metals concentrations did not exceed the applicable Metal and Diamond Mining Effluent Regulations (MDMER) Authorized Limits, where such guidelines exist. Complete analytical results, figures and methodologies are included in Stantec's Limited Phase II ESA and can be provided by request.

2.2 METHODOLOGY FOR DELINEATION AND CHARACTERIZATION OF HISTORICAL TAILINGS AND WASTE ROCK

HTWR identification have specific considerations to the Project site and background characteristics that should be accounted for when delineating and assessing HTWR. The following is a general methodology for identifying HTWR including visual and material sampling and chemical analysis techniques. It should be noted that HTWR delineation can be highly site specific, and as such professional judgement is a key component of any impact delineation exercise.

A review of available guidance from NSE and academic sources was undertaken with regards to the identification of tailings and is summarized herein:

- Tailings are a sand-like material, generally with no rocks mixed in;
- The color of them can vary between light brown and dark grey;
- Tailings often look like a 'fine sand beach' but inland without the water.

The bullets above are consistent with observations of historical tailings in the Touquoy Gold District (Stantec, 2018b), Cochrane Hill Gold District (Mosher, 2004), and the Montague and Goldenville Gold Districts (Parsons et al., 2015).

Visual delineation methods, while useful, need to be combined with sampling and chemical analysis. Using visual observation methods alone is not necessarily indicative of elevated metals concentrations as noted during Stantec's investigation and Limited Phase II ESA report. Within Nova Scotia, gold deposits tend to occur in areas with high incidences of arsenopyrite. Historical milling operations have used mercury in processing, as it was a common technology applied at that time. A general understanding of background concentrations of arsenic, mercury and lead is essential in quantifying tailings and WR.

Site specific approaches need to be applied when undertaking tailings and WR impact investigations. A combination of physical visual identification (where possible) and chemical analysis methods are used for delineating the tailings/WR and their associated impacts.

Physical identification is the primary method to initially ascertain whether an area contains historical tailings. Due to the primary method of processing used historically (stamp mills), there are physical characteristics common to tailings deposited in the late 19th/early 20th century. Physical samples are compared to the following general physical criteria:

- Fine grained sand-like, well sorted material, generally less than 1mm in size. Few or no large cobbles (or clasts) present.
- Highly bedded deposition, with visually identified depositional layers. Some areas may not display this layering depending on how the stamp mill and tailings deposition occurred.
- Color ranging from light grey, through to a brownish red. The characteristics of the local ore body should be considered in this evaluation.

In conjunction with the physical identification of tailings and WR, chemical characterization is also required. Metals and acid generating potential are to be considered when dealing with HTWR. Not all tailings and/or WR are identified to have negative effects on the receiving environment. To determine the potential for adverse downstream impact, a series of geochemical tests are conducted including static analyses (acid base accounting (ABA) tests) and short-term leach tests to assess the potential for acid rock drainage and metals mobilization from historical tailings. The following analysis should be conducted to help determine the potential impact of tailings and/or WR on the receiving environment:

- Total metals analysis
- Acid base accounting (ABA)
- Shake flask extraction tests

Background samples should be collected near the area of suspected tailings deposition. However, there are several considerations that should be observed when selecting a background location, including:

- Selecting a location that overlays the same host rock as the area of potential tailings deposition.
- Background samples should be collected in undisturbed areas that have not been recently worked or show signs of historical activities.
- Collection of samples at a similar depth to the tailings impact delineation samples, to account for historical weathering and the potential for arsenic transport.

When background samples have been collected and analyzed for chemical characteristics, an appropriate value for background parameters of interest should be selected, reflecting risk exposures (human health and ecological) that exist already on the site and in the area, regardless of whether there are tailings or WR. For example, there can be naturally elevated arsenic in soils that overlie or are adjacent to an ore deposit that is enriched in arsenic.

2.3 REPORTING

The results of studies, whether externally commissioned or internally completed shall be provided to the Site Environmental Department for their review. Information regarding the known location, chemical makeup and extent of tailings and WR on the Project site shall be integrated into this plan as part of this Plan's ongoing adaptive management and updating process. Where appropriate or required, reporting should be directed to NSE for their review as well.

3.0 SELECTION OF REMEDIAL OPTIONS FOR HISTORICAL TAILINGS AND WASTE ROCK

Studies completed to date have shown that HTWR have been deposited by a variety of mining endeavors throughout the history of the Project site. The chemistry of HTWR can be variable, due to the primitive nature of the processing at the time and the effects of natural attenuation. The following section outlines the available remedial options for HTWR at the Project site. It should be noted that any permanent or temporary placement of HTWR material outside of an approved tailings management facility (TMF) will likely require the approval of NSE. Options for permanent disposal methods and locations within the TMF are expected to be included in conditions of the Industrial Approval for the site.

3.1 AVAILABLE REMEDIAL OPTIONS

3.1.1 Re-Processing

The re-processing of HTWR may be an option, depending on the variability of the tailings/WR and milling capacity. During the reprocessing of old tailings and WR material, the metal(s) of interest are extracted using modern mill technology, and the residual material processed and deposited within the TMF. No special engineered containment would be required within the TMF and the residual material would be mixed in with the tailings originating from the ore processing. The material would be permanently encapsulated within the TMF.

While this option can be attractive due to the possibility of enhanced revenue generation (assuming gold is present in the HTWR), in practice the re-processing of tailings and WR can be difficult. Mill processes are tuned to the expected chemistry of the material being processed. Appropriate metallurgical and other testing would be implemented as required to proceed with this option. Tailings of the age expected to be found on the Project site commonly contain organic materials and other substances that can be detrimental to an efficient re-processing of tailings. Also, if mercury is present in the HTWR a mercury abatement strategy may be required during reprocessing.

3.1.2 Short Term Storage

Short term storage options for tailings disposal will be required during the initial stages of site construction prior to TMF or Process Plant construction. The type of storage facility required would be based on analytical test results and comparison of the results to applicable provincial or site based regulatory criteria. Considerations for temporary short-term storage on-site are as follows:

1. Site specific locations should be reviewed such as new WR storage facilities (WRSF) where material could be deposited at designated locations. WRSFs will typically include water management structures such as ditches and ponds that contain and manage mine contact water.
2. Physical characteristics of proposed site locations (i.e., away from potential flooding, or within similar background conditions).
3. Apply appropriate measures for the construction and maintenance of containment areas.

If tailings and/or WR are tested and are confirmed to be below applicable provincial or site-based criteria, the tailings and WR material could be used as site overburden and/or for construction purposes.

3.1.3 Long Term Storage

It is currently proposed that a TMF will be constructed at FMS as part of the mining operation. Placement of material within this facility with the regular tailings stream may be an appropriate remedial option if the HTWR from the Project site are chemically and physically consistent with the current design of the TMF.

For tailings and WR material to be placed within the TMF, it must meet the following two criteria:

1. The HTWR are chemically similar to the design tailings criteria for the TMF.
2. A geochemical study has shown that no adverse chemical reactions will occur between the HTWR and the geochemical conditions within the TMF.

If HTWR material are not appropriate for direct disposal within the TMF, cell encapsulation within the facility will be an option. Cell encapsulation involves the design and construction of a capped cell, either impermeable or semi-impermeable, within the footprint of the TMF at the Project site. The design goal of the cell is to increase the level of containment provided by the TMF, and limit the infiltration of water into the tailings and WR, and out into the environment. There are other potential technologies available including dry-stacking, or remedial technologies that would also require appropriate testing to ensure selected methods are cost effective and environmentally protective.

3.1.4 Off-Site Disposal

Off-site disposal is an option, in particular for historical tailings for material for which no other suitable remedial measures are feasible, which could be the case for high levels of mercury if found in historical tailings. There are currently no facilities located in Nova Scotia or New Brunswick that can receive solid materials that contain high levels of mercury. The nearest facilities are located at Quebec and have limits on the levels of arsenic and mercury for material acceptance. For FMS, the available analytical mercury results for historical tailings indicate that such high levels of mercury will not likely be encountered.

3.2 REMEDIAL OPTION SELECTION

The following section outlines some of the general considerations when selecting a preferred remedial option for HTWR, should remedial options be pursued at the Project site. The guiding principles for the selection of a remedial option are:

1. The risk of adverse environmental impacts is minimized and improved from existing conditions.
2. The risk to human health is minimized and improved from existing conditions.
3. The remedial option is technically feasible and cost effective.
4. The remedial option selected is permanent to the degree practicable and minimizes future liability to AMNS and the Province.
5. Any HTWR disturbed by AMNS operations must be remediated.
6. Requirements of the Nova Scotia Industrial Approval for the site are met.

4.0 PROCEDURES FOR THE REMEDIATION OF HISTORICAL TAILINGS AND WASTE ROCK

4.1 TAILINGS AND WASTE ROCK EXCAVATION

HTWR within the project disturbance footprint will be excavated to delineated extents or to bedrock via excavator, with a trained environmental professional directing the removal of material. The material identification methodology described in Section 2.2 will be used to identify tailings and WR during excavation, with special emphasis placed on ensuring the vertical extent of the tailings and WR are identified. Systematic exploratory trenching of a portion of the suspected areas of tailings and WR is an effective method of visually and analytically identifying the vertical and horizonal extent of the HTWR (AECOM, 2019; Stantec, 2018c).

Tailings and WR will be placed directly in trucks for transport. The volume of material transported by trucks should be recorded, and photos should be taken both during excavation and material placement for record keeping purposes.

Soil samples will be collected along the final horizontal and vertical extents of the excavation for confirmatory sampling (where the excavation has not been extended to bedrock). Sufficient samples should be taken to be representative of the soil remaining in place. Where arsenic, lead, or mercury contaminated soil is excavated in conjunction with HTWR, confirmatory sampling will be completed by a trained environmental professional (AMNS, 2018). If impacted soil or HTWR conditions have been identified which are not compatible with the design of the TMF, these materials should be segregated so that they can be dealt with appropriately.

The vertical (if not extended down to bedrock) and horizontal extents of the excavation should be surveyed once excavation activities are complete.

4.2 WATER MANAGEMENT

Due to the nature of historical tailings deposition, tailings material is typically found close to the existing ground surface, often saturated in water, and on or along the Seloam Brook as observed during investigations at the Site. Therefore, any water associated with the HTWR that are to be excavated must be controlled at the Site and during potential movement or remedial activities, as it has the potential for the mobilization and transport of contaminants. Regional undisturbed surface drainage appears to be to the west following Seloam Brook toward Fifteen Mile Stream. To minimize potential contaminant transport, prior to the start of construction, a section of Seloam Brook that overlies the proposed pit footprint is planned to be diverted, which will re-route the upstream water north and then west through a diversion channel. The diversion channel will allow for the HTWR to be excavated in relatively dry conditions. In addition, it is understood that post-diversion, residually impacted waters may still remain within the saturated HTWR as well as additional water from groundwater seepage. Potentially impacted effluent coming from these features will be collected and stored in engineered containment and settling

ponds, and treated passively or with a modular water treatment facility, if required to meet the applicable water quality criteria prior to discharge to the receiving environment.

Regional undisturbed surface drainage is to the west following Seloam Brook toward Fifteen Mile Stream. Anticipated shallow groundwater flow is also to the west but may, in limited areas, also be influenced by the presence of underground mine workings.

A water management plan and further confirmatory delineation and groundwater assessment of these locations should be investigated and included as part of removal, placement or remediation of tailings prior to development of infrastructure and design of open pit operations at the site.

4.3 TAILINGS AND WASTE ROCK TRANSPORT AND PLACEMENT

If tailings and WR are to be transported, they should be deposited directly into available trucks via excavator for transport to selected areas for remediation. If the material is dry and dust generation is a concern during transport, the material in the trucks will be covered.

If the material is excessively wet, the material will be dewatered prior to placement in the truck boxes. Alternatively, truck boxes can be sealed to minimize discharge of water from the trucks during transport. Existing access roads will be used to the extent possible; new temporary roads may be constructed to facilitate remediation if required.

If material is to be transported off site, the material should be assessed to see if it falls under the Transportation of Dangerous Goods Regulation. If the material does meet the requirements under the regulation, appropriate permits shall be obtained prior to transportation.

4.4 MONITORING AND REMEDIAL VERIFICATION

All confirmatory samples should be sent to an accredited laboratory and tested for, at minimum, total metals in soil. These samples should be compared to the Tier 1 EQS for an industrial site, and any site specific (i.e., background) criteria developed. If the confirmatory samples exceed the relevant soil quality guidelines, additional assessment should be completed to ensure the remedial objectives are met.

Installation of groundwater wells will be required in areas of HTWR and sampled prior to removal of the bulk of the HTWR material. Groundwater wells will be monitored in order to assess whether source removal and/or dewatering of the open pit mine have an impact on downgradient groundwater quality.

4.5 REPORTING

4.5.1 Internal

The following information should be reported internally, and where appropriate, integrated into this Plan, as well as provided to the Site Environmental Department for record keeping and planning purposes, when or if remedial activities occur:

- Confirmatory sampling results and laboratory certificates.

- The surveyed delineated extents of the HTWR excavation.
- Photos of the excavation, placement and transport of the material.
- Groundwater sampling results and water levels, both preliminary and ongoing results.
- Volumes of removed material, and placement location if an on-site remedial option is chosen.
- Any contractor disposal certificates if an off-site remediation method is chosen.
- Any reprocessed tailings quality results, if re-processing is selected as a remedial option.

4.5.2 External

The external reporting requirements to NSE will be outlined in the future Industrial Approval and approved HTWR Management Plans. The types of information to be provided could include:

- Confirmatory sampling results and laboratory certificates.
- Surveyed delineated extents of the excavation.
- Groundwater sampling results and water levels, both preliminary and ongoing results.
- Volumes of removed material, and placement locations (on and off-site)
- Contractors' disposal certificates if an off-site remediation method is chosen.
- Reprocessed tailings quality results, if re-processing is selected as a remedial option.
- Design of the containment cell, if selected as a remedial option.

5.0 CLOSURE

The FMS Gold Project is still in the early stages of development and as such, tailings and WR identification and delineation are on-going. This Management Plan describes the understanding, proposed procedures and methodologies on how HTWR material at the Project site may be managed, assessed, delineated, and remediated. As further information becomes available, the plan may be amended and improved to include these items.

6.0 LIMITATIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

Limitations
September 25, 2019

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

Submitted by,

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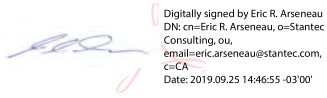

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7.0 REFERENCES

Acadian Mining Corporation, 2012. NI 43-101 Technical Report on Updated Mineral Resource Estimate – Fifteen Mile Stream Property, Halifax County, Nova Scotia, Canada. August 29, 2012.

AECOM, 2019. Atlantic Mining NS Corp. Historic Tailings and Associated Contaminated Soil Remediation Touquoy Gold Site, Moose River, Nova Scotia – Final Report. April 11, 2019.

Atlantic Mining NS Corp. 2018. Arsenic Contaminated Soil Management for Open Pit Mining Disturbance, Touquoy Gold Project, Moose River, Nova Scotia. Letter to Rachel Bower (NSE). August 23, 2018.

CSA Group, 2013. CAN/CSA-Z769-00 (R2013)

Hudgtec Consulting Limited, 2008. NI 43-101 Technical Report and Resource Estimate on the Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. May 27, 2008.

Jacques Whitford (now Stantec Consulting Ltd.), 1989. Design Brief for Flood Protection Levee and Effluent Retention Structure at Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. February 1989.

Mosher, Andrea L. 2004. Environmental Impacts of Historical Mine Tailings Disposal at Cochrane Hill Gold District, Nova Scotia. Dalhousie University, Dept. of Earth Sciences.

Nova Scotia Environment, 2013. Contaminated Sites Regulations. July 6, 2013.

Parsons, Michael B. and Little, Megan E. 2015. Establishing geochemical baselines in forest soils for environmental risk assessment in the Montague and Goldenville gold districts, Nova Scotia, Canada. Atlantic Geology 51. 364-386. 2015.

Stantec Consulting Limited. 2018a. Final - Phase I Environmental Site Assessment - Fifteen Mile Stream, Route 374, Trafalgar, NS. December 10, 2018.

Stantec Consulting Limited. 2018b. Background Update for Phase II Environmental Site Assessment at the Former Moose River and Former G&K Mining Stamp Mills, Touquoy Gold Project, Moose River, NS. June 22, 2018.

Stantec Consulting Ltd. 2018c. Final Historic Tailings Management Plan, Touquoy Gold Project, Moose River, NS. June 29, 2018.

Stantec Consulting Limited. 2019. Limited Phase II Environmental Site Assessment - Fifteen Mile Stream, Route 374, Trafalgar, NS. February 21, 2019.

Appendix A FIGURES

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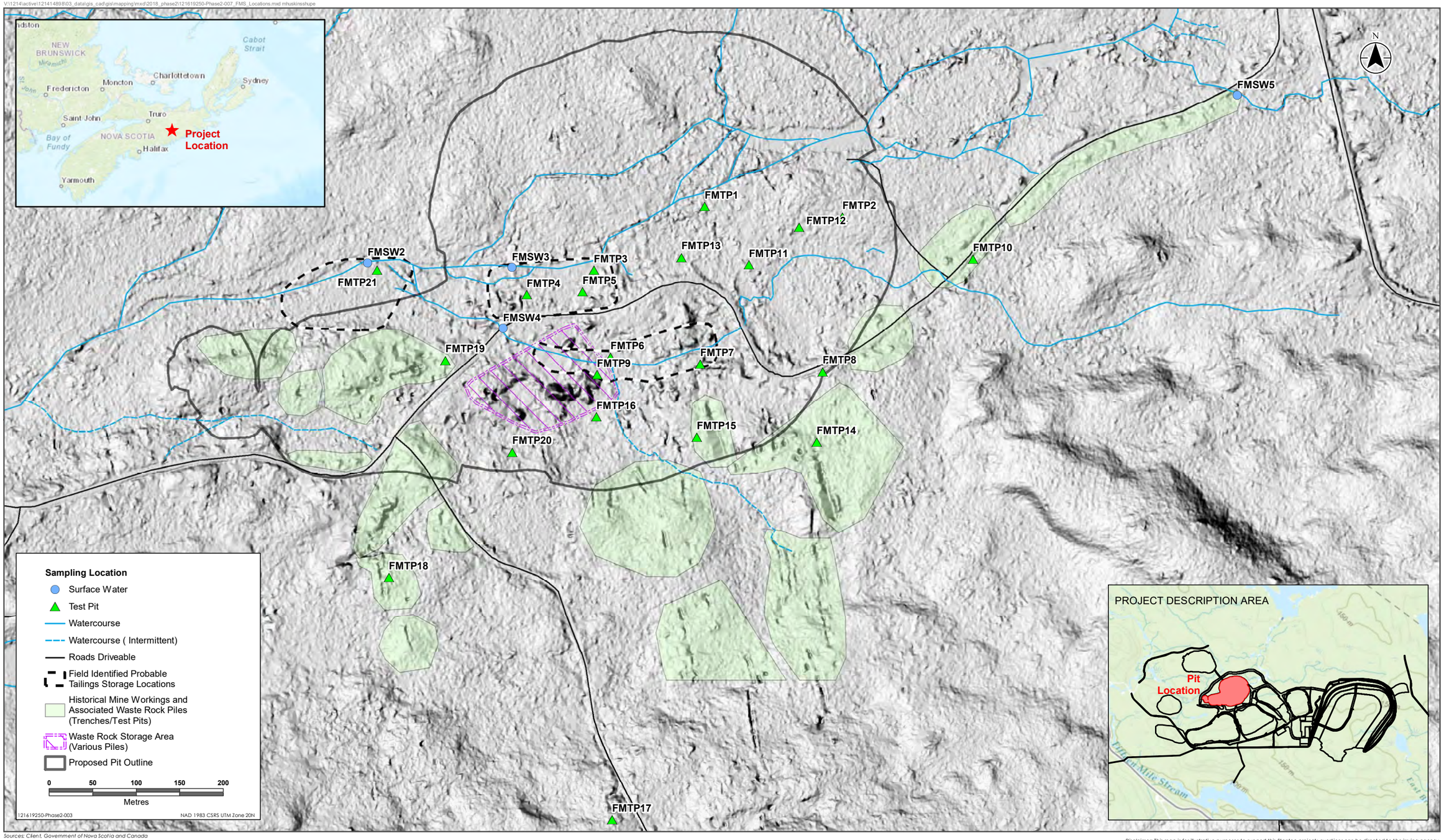

Sources: Client, Government of Nova Scotia and Canada

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Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Test Pit and Surface Water Sampling Locations
Atlantic Mining NS - Fifteen Mile Stream Project

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Figure 1

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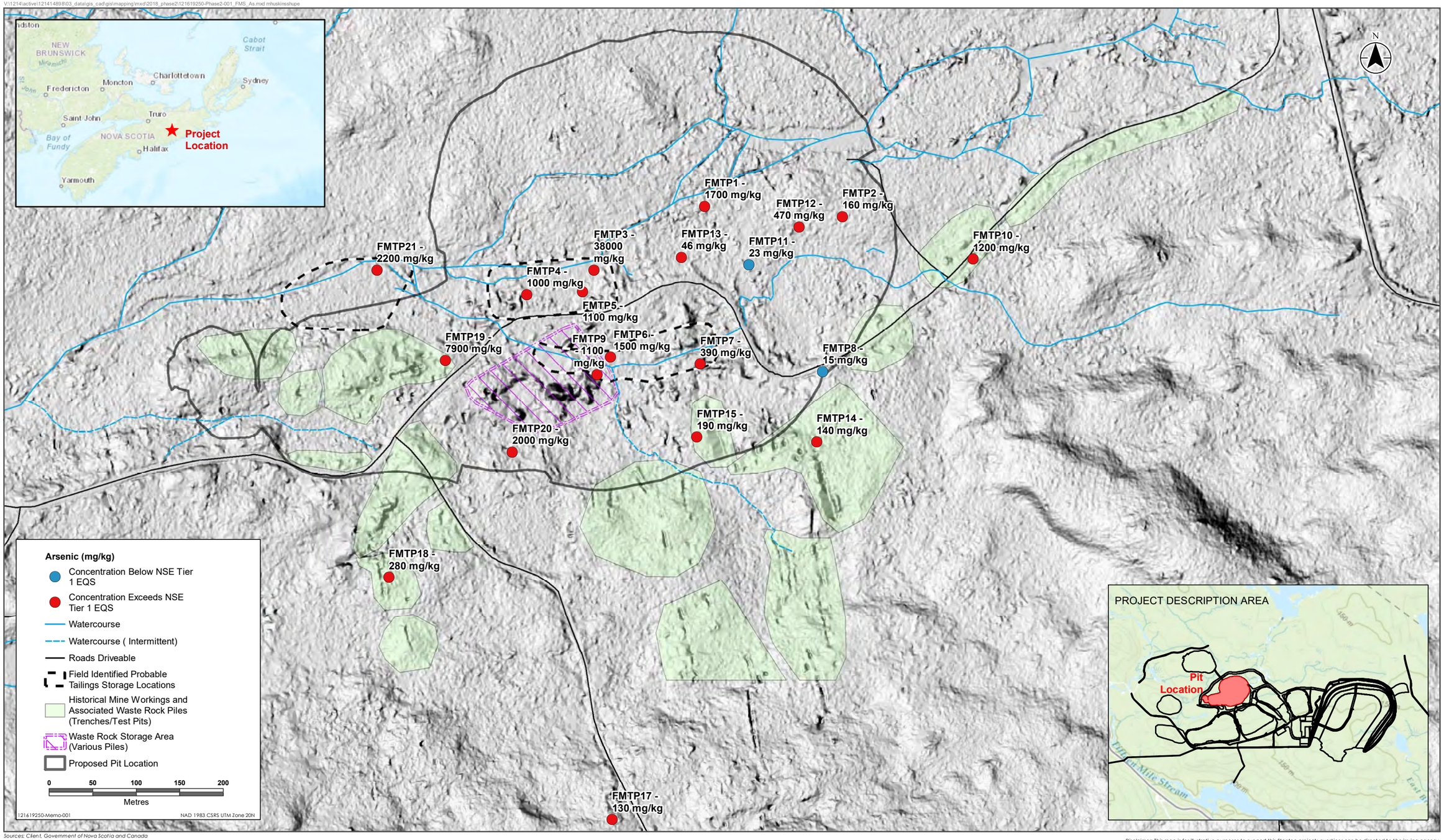

Sources: Client, Government of Nova Scotia and Canada

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Arsenic Concentrations in Soil
Atlantic Mining NS - Fifteen Mile Stream Project

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Figure 2

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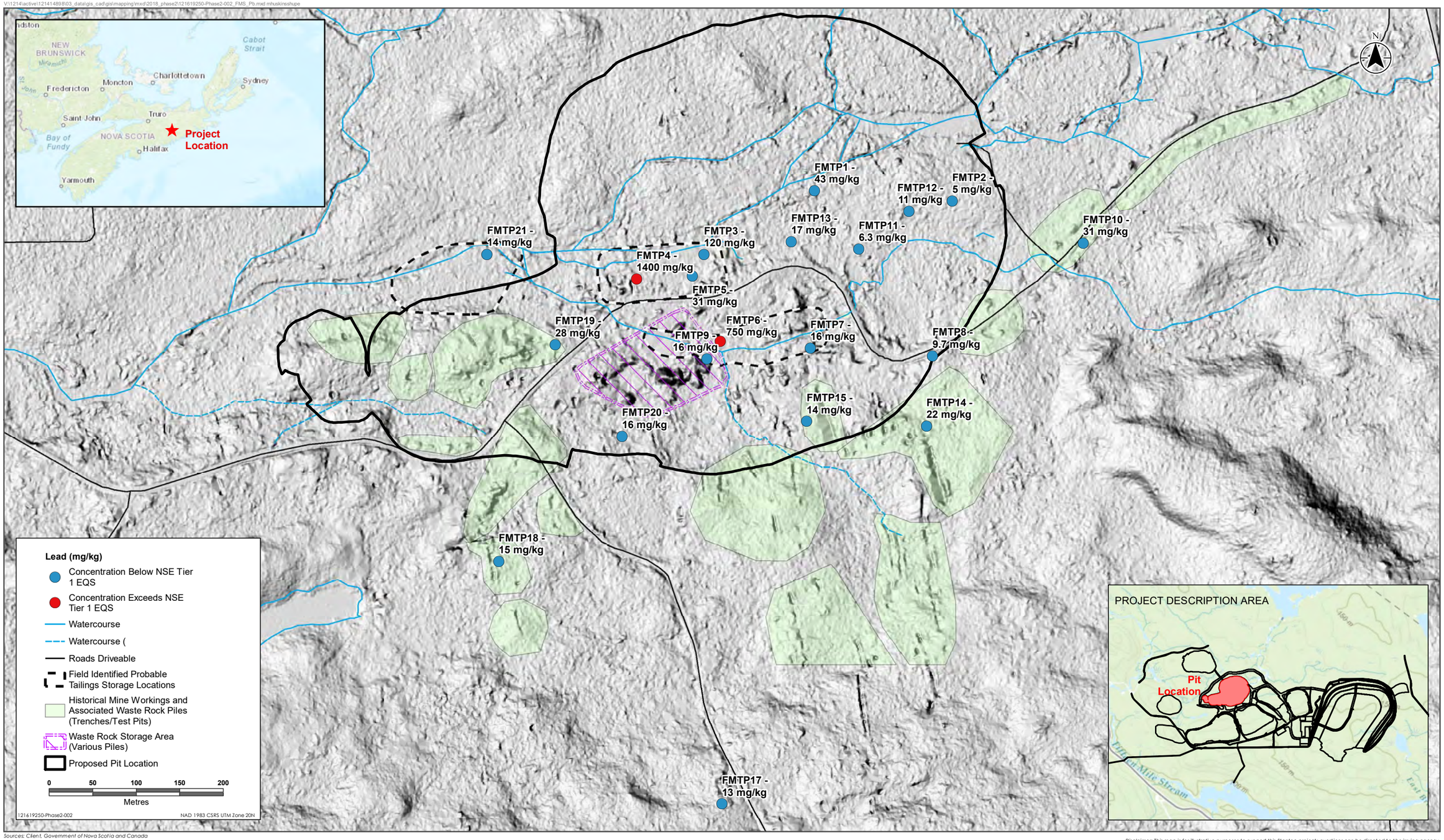

Sources: Client, Government of Nova Scotia and Canada

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Lead Concentrations in Soil
Atlantic Mining NS - Fifteen Mile Stream Project

Figure 3

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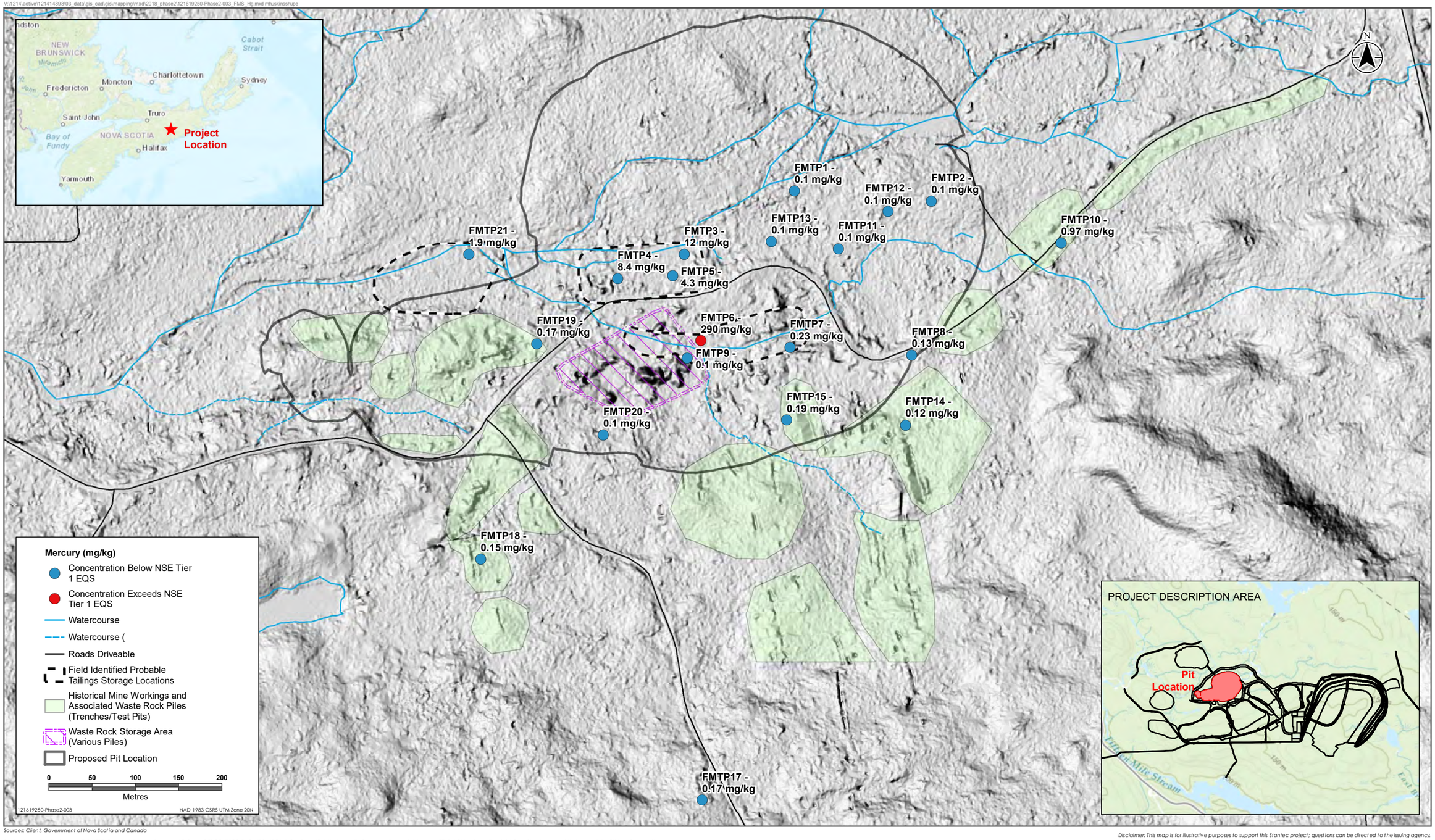

Sources: Client, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Mercury Concentrations in Soil
Atlantic Mining NS - Fifteen Mile Stream Project

Stantec

ATLANTIC MINING NS

Figure 4

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FM SW2:
Aluminum 220 ug/L
Arsenic 18 ug/L
Cadmium 0.014 ug/L
Iron 360 ug/L

FM SW3:
Aluminum 180 ug/L
Cadmium 0.013 ug/L

FM SW4:
Aluminum 270 ug/L
Arsenic 40 ug/L
Cadmium 0.015 ug/L
Iron 590 ug/L

FM SW5:
Aluminum 320 ug/L
Chromium 7.6 ug/L
Iron 460 ug/L

N

Project Location

Surface Water Sample
Watercourse
Watercourse (
Roads Driveable
Field Identified Probable Tailings Storage Locations
Historical Mine Workings and Associated Waste Rock Piles (Trenches/Test Pits)
Waste Rock Storage Area (Various Piles)
Proposed Pit

0 50 100 150 200
Metres

121619250-Phase2-002 NAD 1983 CSRS UTM Zone 20N

PROJECT DESCRIPTION AREA

Pit Location

Fifteen Mile Stream

Sources: Client, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Surface Water Quality Exceeding NS Tier 1 EQS
Atlantic Mining NS - Fifteen Mile Stream Project

Stantec

ATLANTIC MINING NS

Figure 5

Appendix I.2

Revised Phase 1 Environmental Site Assessment - Fifteen Mile Stream Project, Stantec Consulting Ltd.

FINAL -
Revised Phase I Environmental Site Assessment

Fifteen Mile Stream
Route 374, Trafalgar, NS

Prepared for:Prepared for:
Atlantic Mining NS Corp

Prepared by:
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Job No.: 121619250.2500.905

September 27, 2019

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Executive Summary

Executive Summary

Site Description and Current Operations

Stantec Consulting Ltd. (Stantec) conducted a Phase I Environmental Site Assessment (Phase I ESA) of the historical tailings areas located at the Atlantic Gold Fifteen Mile Stream Project property located in Trafalgar, Nova Scotia, herein referred to as the "Site". The Phase I ESA was conducted as part of project feasibility due diligence underway for the potential re-development of the gold mine at this location. The purpose of the Phase I ESA was to assess if evidence of potential or actual environmental contamination exists in connection with the Site, as a result of current or past activities on the Site or neighbouring properties.

The site area is currently woodland /overgrown, and is within the area to be occupied by the proposed future extent of the Fifteen Mile Stream open pit mine 2018 (refer to Figure 1, attached). In September 2019, the revised proposed future extent of the mine was provided to Stantec which extended the proposed operations to the west and north (refer to Figure 2, attached). At the time of the site visit there was a drill program underway on the Site to further delineate the resources. A site visit was not completed in 2019 as the revised area of the proposed open pit was within the area assessed in 2018.

Records Review

Based on the historical information gathered during the Phase I ESA, the site areas and the surrounding greater area were developed in 1860s when gold was discovered in Nova Scotia. Between 1865 and 1940s there were various surface excavations, mine shafts of various depths, and numerous stamp mills or crushers utilized for the extraction of gold from the quartzite ore. The nearby outflows from Seloam Lake to the northeast was modified with diversions, dams, and flumes to provide wash water and power for the gold mining operations. Based on the information reviewed there were at least four mine operations in the area of Fifteen Mile Stream; the largest was Egerton Workings which was located in the area of the currently proposed pit. Several other mines and pits extended westward approximately 1 km along what is now the gravel access road to the current development. The historical practice of gold mining in the 1800s/early 1900s used crushers to render the ore into sand size particles. The sand size particles were then washed with water and mercury to recover the fine gold particles. The resulting tailings mixture was allowed to flow from the stamp mills into adjoining low lying areas in an uncontrolled manner with alternating amounts of water to push the tailings further from the stamp mill as needed. The base rock from which the gold was extracted was sandstone and slate of the Meguma Group Goldenville Formation; this formation is also known to be high in natural concentrations of arsenopyrite (FeAsS) which is associated with gold deposits in Nova Scotia. The tailings areas may contain both mercury and arsenic. Mapping provided by the Nova Scotia Department of Natural Resources illustrate numerous excavations, shafts and mining operations on the Site and surrounding areas.

Between the 1940s and the 1980s, the area of the Site was allowed to become overgrown with trees. In the late 1980s there was renewed interest in the presence of gold in the area of the Site. This included various prospecting activities including drilling boreholes to assess the mineral content. Stantec (then Jacques Whitford) completed geotechnical work at the Site related to proposed dyke and diversion channels. Based on this work there was evidence of extensive tailings and waste rock present on the Site along the existing Seloam Brook. A photograph from the 1980s of the camp setup reveals several mobile trailers with propane tanks. Based on the aerial photographs around this time a large test sample of rock was excavated approximately 200 metres west-southwest of the proposed pit (this later infilled with water). This rock was reportedly processed at Gays River to extract the gold.

For this property no previous environmental reports were identified. A report prepared by the Department of Natural Resources titled Review of the Environmental Impacts of Historic Gold Mine Tailings in Nova Scotia from October 2015 indicated the following general information about tailings impacts from historical gold mining areas. There are an estimated 3 million tonnes of tailings from historical gold mines in Nova Scotia. In some areas the tailings have been reported to be several metres thick and have migrated in rivers and streams for more than 2 km. Based this document there were no available test results for arsenic or mercury concentrations in the tailings at Fifteen Mile Stream. Based on the amount of ore crushed it was estimated that there was 51,000 tonnes of tailings produced at Fifteen Mile Stream between the 1860s and 1940s.

A request was made to Nova Scotia Government for information related to waste rock or tailings management through the Freedom of Information process. According to the administrator the department has several boxes of information related to the potential opening of the mine in the 1980s. Records relate to our specific request are pending.

Executive Summary (continued)

Records Review (continued)

The presence of the tailings and associated waste rock represent a potential environmental concern to the Site.

Site Visit/Interviews

During the site visit completed on November 13, 2018, the foundations of the suspected stamp mill and other mine related features were located along with Department of Natural Resources signs warning of the presence of historical mine operations. At each of the former mine sites there were also piles of waste rock and in a few locations areas of surface debris (rusted metal cans, debris, etc.). During the site visit, Stantec staff discussed with the Atlantic Gold representative if there were obvious signs of tailings noted during the exploration drilling. It was reported that overburden was cased and they did not report on the nature of the overburden, only depth to bedrock. However, he did note that there was apparent tailings observed from a temporary bridge constructed to cross Seloam Brook. Further visual evidence of tailings was observed in various areas after excavation of a shallow (5 to 10 cm) layer of organics further; details are part of a concurrent Phase II ESA (reported under separate cover).

Conclusions

The Phase I ESA has revealed evidence of potential environmental contamination associated with the Site.

Based on the information gathered there are apparent tailings and waste rock both within the area of the proposed open pit development as well as adjacent to the proposed open pit operations which are potentially impacted with arsenic, mercury and have an acid generating potential. Further delineation of the historical tailings areas and waste rock is currently underway to determine the extent of the materials.

A reply from Nova Scotia related to previous assessment and management of waste rock and tailings is pending.

The statements made in this Executive Summary are subject to the same limitations included in the Closure (Section 7.0) and are to be read in conjunction with the remainder of this report.

Phase I Environmental Site Assessment

1.0 General Information

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Site Information:
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Site Visit Date: 11/13/2018
Report Date: 09/27/2019
Site Assessor: Patrick Turner, B.Sc, P.Eng.
Report Preparer: Patrick Turner, B.Sc, P.Eng.
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Senior Reviewer:

Don Carey, M.Sc., P.Eng.
Senior Technical Reviewer

The environmental site assessment and preparation of this report were completed in general accordance with the objectives, requirements or standards of the CSA Phase I Environmental Site Assessment Standard Z768-01 (R2016).

2.0 Introduction

2.1 Objectives

Stantec Consulting Ltd. (Stantec) conducted a Phase I Environmental Site Assessment (Phase I ESA) of the historical tailings areas located at the Atlantic Gold Fifteen Mile Stream Project property located in Trafalgar, Nova Scotia, herein referred to as the "Site". The Phase I ESA was conducted as part of project feasibility due diligence underway for the potential re-development of the gold mine at this location. The purpose of the Phase I ESA was to assess if evidence of potential or actual environmental contamination exists in connection with the Site, as a result of current or past activities on the Site or neighbouring properties. The Site has been defined as the proposed extent of the open pit mine for this Phase I ESA due to the lack of defined property boundaries. The assessment was originally completed on the proposed open pit layout from 2018 (Figure 1 attached); in September 2019 a revised pit boundary was provided (Figure 2 attached). The area provided as part of the revised proposed pit extent falls within the area that was assessed in 2018.

Site plans are included in Appendix A and selected photographs of the Site are included in Appendix B.

2.2 Scope of Work

The Phase I ESA carried out by Stantec on this property was conducted in general accordance with Stantec's Proposal Number 121619250 dated September 12, 2018 and the Canadian Standards Association's (CSA) Phase I Environmental Site Assessment Standard Z768-01 (R2016) and consisted of the following:

- records review including, but not limited to, publicly available city directories, aerial photographs, fire insurance plans, geological and topographic maps
- provincial government regulatory search
- review of available environmental databases and records
- review of previous environmental reports and existing title searches, if made available
- interviews with persons having knowledge of the Site
- a site visit
- evaluation of information and preparation of the report provided herein

A Phase I ESA does not include sampling or testing of air, soil, groundwater, surface water or building materials. For this Phase I ESA, no enhancements to the CSA standard were made.

This assessment did not include a review or audit of operational environmental compliance issues, or of any environmental management systems, which may exist for the Site.

The assessment of the Site for the potential presence of hazardous building materials was based on the age of the building(s) and components, and a non-intrusive visual review of the Site. No sampling of materials was conducted. A Phase I ESA does not constitute a Hazardous Materials Survey or Designated Substances Survey.

The assessment of the Site for microbial contamination and moisture damage was made during the walk through of the building(s). This assessment was visual only and not every area was assessed. No sampling or intrusive investigation was conducted.

The professional qualifications of the project team are provided in Appendix C.

The site visit was conducted by Patrick Turner, P.Eng., of Stantec, on November 13, 2018. The Site and readily visible and publicly accessible portions of adjoining and neighbouring properties were observed for the presence of potential sources of environmental contamination. Stantec was unaccompanied during the site visit.

Interviews were carried out with David Lowe, geologist with Atlantic Gold to obtain or confirm information on the historical operations and activities on the Site. Mr. Lowe had limited information about the site prior to the current exploration program. Pertinent information gathered from the interviews is presented within the appropriate sections of this report.

Due to the size of the property (approximately 900 acres), the wooded areas to the north (across Seloam Brook), east, and south of the proposed pit which were outside the area of historical mine development in the 1800s were assessed by driving portions of the available woods road and through review of historical aerial photographs, LIDAR imagery, and topographical and geologic maps of the area. It should be noted that

portions of the Site are covered by thick vegetation which prevented a thorough assessment of the ground surface in those areas of the Site during the site visit. As noted above northern portions of the Site were inaccessible due to the presence of Seloam Brook which runs east / west across the area of the proposed pit development. At the time of the site visit the temporary crossing had been removed due to a high water safety concern.

As noted above a revised proposed open pit layout was provided in September 2019 (Figure 2) and the revised pit area was compared to the areas assessed in 2018 (Figure 1). The revised 2019 proposed pit location is within the areas assessed in 2018 and a site visit was not completed as part of this reassessment/ update of the Phase I ESA completed for this Site.

2.3 Regulatory Framework

In Nova Scotia, the Contaminated Site Regulations and associated Ministerial Protocols (effective on and after July 6, 2013), prescribe the regulatory process and time frames to notify the Department, assess the site, remediate the impacts and obtain "Closure" for a contaminated site. The first step in the full property remediation process is completing a Phase I ESA as prescribed in the applicable Ministerial Protocol. A Phase I ESA may identify potential environmental concerns on the property which may lead to additional assessment and remediation.

During a Phase I ESA samples are not collected, however, if there are previous soil or groundwater sample results available, the results are compared to applicable federal and provincial regulations and guidelines.

A Phase I ESA involves a review of any site buildings for the potential presence of hazardous materials related to building components and materials. Specific federal or provincial regulations, guidelines or codes of practice exist for these individual hazardous materials. Where required, this documentation was utilized to determine appropriate conclusions and formulate appropriate recommendations.

3.0 Records Review

3.1 Information Sources

The applicable search distance for the records review included the Site, properties immediately adjoining the Site and other neighbouring properties where activities considered to be potential sources of environmental contamination were apparent. Information sources obtained and reviewed as part of the records review are listed below.

SOURCE	INFORMATION/CONTACT
Aerial Photographs	1931, 1947, and 1954 - National Airphoto Library 1966, 1974, 1982, 1992 and 2004 - Stantec Aerial Photography collection September 2007 - GoogleEarth Pro Imagery accessed November 2018
Fire Insurance Plans	None available
City Directories	Nova available
Previous Environmental Reports	None provided
Company Records	NI 43-101 Technical Report on Updated Mineral Resource Estimate - Fifteen Mile Stream Property, Halifax, County, Nova Scotia, Canada, prepared by Acadian Mining Corporation, Effective Date August 29, 2012. NI 43-101 Technical Report and Resource Estimate on the Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. Prepared for 6179053 Canada Inc., Acadian Mining Corporation, Annapolis Gold Corporation by A. Bruce Hudgins, P.Geo, Hudgtec Consulting Limited, Effective date May 27, 2008. This report referred to reports prepared by Jacques Whitford (now Stantec) from 1980s including: Design Brief for Flood Protection Levee and Effluent Retention Structure at Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. February 1989. Jacques Whitford Project No. M1335.
Geological and Geotechnical Reports	Surficial Geology Map of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Map 92-3, 1992. Geological Map of the Province of Nova Scotia, Nova Scotia Department of Natural Resources, Map ME2000-1, 2000. Map Showing Potential Radon in Indoor Air in Nova Scotia, Province of Nova Scotia, Department of Natural Resources. Accessed interactive map in November 2018.

Department of Natural Resources report titled Review of

3.0 Records Review (continued)

3.1 Information Sources (continued)

SOURCE	INFORMATION/CONTACT
Geological and Geotechnical Reports	the Environmental Impacts of Historic Gold Mine Tailings in Nova Scotia dated October 2015
Regulatory Infractions	Due to the absence of a civic address it was not possible to search for records related to Regulatory Infractions.
Reportable Spill Occurrences	Due to the absence of a civic address it was not possible to search for records related to Reportable Spill Occurrences.
Contaminated Sites	Site is identified as a former gold mine based on DNR records and potential source of arsenic and mercury.
Landfill Records	Site is identified as a former gold mine based on DNR records and potential source of tailings and waste rock.
Underground & Aboveground Storage Tanks	Due to the absence of a civic address it was not possible to search for records related to tank registrations.
Other Available Information	A review of the DNR electronic library was completed for various plans and documents related to operation of the mine in the late 1800s to the mid 1940s. These included photographs of the buildings on the site, survey plans of the mines in the area as well as a detailed plan of the Egerton Mine.
Water Well Records	Based on a review of the interactive mapping provided by DNR there are no wells on the Site. Information accessed November 2018.
Mapping	Smith, PK, and Goodwin TA 2009, Historical Gold Mining, Fifteen Mile Stream Area, Part of NTS Sheets 11E/02 and 11E/01, Halifax and Guysborough Counties, Nova Scotia. Nova Scotia Department of Natural Resources, Mineral Resources Branch, Open file map ME 2009-1 (Sheet 39 of 64), scale 1:9000. East Lake Topographic Map Sheet No. 10 451000 62500, Prepared by Service Nova Scotia and Municipal Relations, scale 1:10,000 based on aerial photography taken May 2006.

3.2 Previous Reports

Stantec obtained a copy of a Technical Report and Resource Estimate on the Fifteen Mile Stream Gold Property, Halifax County, Nova Scotia. This report was prepared by Hudgtec Consulting Limited for 6179053 Canada Inc, Acadian Mining Corporation and Annapolis Gold Corporation. Acadian Mining Corporation is now a portion of Atlantic Gold. This report refers to an MGI Limited report from 2004 (not provided) which identified potential environmental liabilities including:

- acid generation potential from waste rock piles (based on a single sample);
- possible unreclaimed trenches;

3.0 Records Review (continued)

3.2 Previous Reports (continued)

- possible safety hazards related to open shafts and diamond drill casings; and
- possible contaminant pathways related to improperly abandoned diamond drill holes.

Other potential liabilities discussed in this report from the late 1980s identified by Jacques Whitford and MPH include possible salmon spawning habitat and historical mill tailings in the flood plain of and in Seloam Brook.

This report included a brief history of the mining operations which reports various pits and shallow mines/shafts were excavated on the site and areas to the west. The deepest was reported to be 73 meters. Like other mining operations in Nova Scotia these were not worked continuously, but instead were worked for various short periods of time between 1875 and 1902. Each time an operation ceased it was renamed. Common names that reappear include New Egerton, Old Egerton, Egerton Gold Mining Group, Mother Seigal Mine, Island Mine, etc.

A report prepared by the Department of Natural Resources titled Review of the Environmental Impacts of Historic Gold Mine Tailings in Nova Scotia from October 2015 indicated the following general information about tailings impacts from historical gold mining areas. There are an estimated 3 million tonnes of tailings from historical gold mines in Nova Scotia. In some areas the tailings have been reported to be several metres thick and have migrated in rivers and streams for more than 2 km. Based on this document there were no available test results for arsenic or mercury concentrations in the tailings at Fifteen Mile Stream. Based on the amount of ore crushed DNR estimated that there was 51,000 tonnes of tailings produced at Fifteen Mile Stream between the 1860s and 1940s.

The presence of the historical mining operations represent a potential environmental concern to the Site which is being delineated under separate cover.

3.3 Regulatory Information

We have not received Nova Scotia Environment 's response to our inquiry for the subject site and adjoining properties. It must be noted that our request to Nova Scotia Environment was limited due to the lack of civic addresses on the property records, and absence of dwellings with civic numbers (NSE files are based on civic addresses). Due to the lack of civic numbers a traditional Environmental Registry request was not made, instead a Freedom of Information request was made for information related to previous work completed by the Department related to reclamation of historical operations from the 1980s or earlier. We specifically did not request information about the development of the current proposed gold mine. A copy of the request is attached in Appendix D.

3.4 Physical Setting

3.4.1 Surficial Geology

Based on an available surficial geology map, the native surficial soils of the Site consist of glacial till. The characteristic permeability of these soils is moderate. A site-specific determination would be required in order to obtain detailed soil profile and permeability information. Previous subsurface investigations conducted on the Site indicate the subsurface soil profile at the Site to consist of glacial till, as well as historical tailings and waste rock in some areas between 2 and 3 metres thick. Bedrock was encountered between 2 and 3 metres below grade.

3.4.2 Surface Water Drainage

The surfaces of the Site consist of a combination of open wetland, rock piles and woodland. Stormwater is anticipated to drain by infiltration and/or overland flow. Seloam Brook crosses the site from the east to the west and there are various pools and ponds on the Site.

3.0 Records Review (continued)

3.4 Physical Setting (continued)

3.4.3 Topography and Regional Drainage

The site areas are woodland which have re-grown after historical gold mining in the 1800s to mid-1900s, which included construction of various dams along local water ways, surface mining, water washing, and excavation of numerous mine shafts/pits.

Based on an available topographic map and the observed site topography, regional undisturbed surface drainage (anticipated shallow groundwater flow direction) appears to be to the west following Seloam Brook toward Fifteen Mile Stream.

It should be noted that the direction of the shallow groundwater flow in limited areas can also be influenced by the presence of underground mine workings and is not necessarily a reflection of regional or local groundwater flow or a replica of the Site or area topography.

3.4.4 Bedrock Geology

Based on an available bedrock geology map, bedrock in the area of the Site consists of slate and quartzite of the Goldenville Formation.

4.0 Site Description

4.1 Property Information

The Site is located in a rural forest area near Trafalgar, a region of Halifax Regional Municipality. The Site is located 1 km east of Route 374 along an unnamed gravel road which is located approximately 30 km north of Sheet Harbour, Nova Scotia.

The Site consists of portions of several different properties owned by MacGregor Properties Limited; Property Identification Numbers (PID Nos.) include:

- PID 40202020, 101 acres known as "The Hudson Lot";
- PID 40201998, 100 acres known as "The Fish Lot";
- PID 40202004, 120 acres known as "The Chipman Lot";
- PID 40202012, 100 acres known as "The McDougald Lot";
- PID 00565101, 100 acres known as "The Hattie Lot";

In addition to the MacGregor lands, part of the greater proposed development of the mine operation includes undeveloped land to the south and east of the proposed pit area owned by the Province of Nova Scotia, including portions of the following PIDs:

- PID 40750796, 50 acres
- PID 40750622, 13729 acres (approximately 400 acres of the northern portion of this PID are in the proposed development area for the Fifteen Mile Stream Project.

The PIDs are not currently serviced being in a rural portion of the province. A summary of the property information is provided below.

Current Site Owner:	MacGregor Properties Limited and the Province of Nova Scotia
Legal Description:	Refer to PIDs above
Property Area:	Approximately 900 acres
Utility Providers:	
Water:	None
Storm and Sanitary Sewers:	None; the camp is serviced by temporary toilet facilities
Electricity:	The camp is serviced by portable diesel generators
Natural Gas:	None

4.2 On-Site Buildings and Structures

There are no permanent buildings on the Site, only temporary camp buildings associated with the exploration project which are located to the west of the proposed pit location. Foundation of a suspected former stamp mill along with other mine workings were located during the site visit along with several DNR signs indicating the presence of underground mine workings.

4.3 Historical Land Use

Historical land use for the Site was determined through historical records listed in Section 3.0. A summary of the historical information is presented below.

4.0 Site Description (continued)

4.3 Historical Land Use (continued)

Period/Date:	Land Use:
pre-1865	The area was undeveloped woodland
1866 to early 1900s	The area was actively mined for gold. Based on the reviewed information sources, there were numerous stamp mills operating on the Site and in the surrounding area. The stamp mills or crushers were either water or steam powered. In the records reviewed there was mention of various engine house and power generation systems to supply the various shafts, mining equipment and stamp mills. Mine operations reportedly started and stopped frequently during this period with various operations operating under similar names. The waste rock and tailings generated represent a potential environmental concern.
Early 1900s to late 1930s	After the early 1900s the area was not actively mined again until the late 1930s. There was limited information available for this period of time. Based on the available aerial photograph there is a disturbed area in the general vicinity of the currently proposed pit which aligns with the mapping showing the various pits, shafts and general mine operations in the area. The eastern area of the Site including Seloam Lake shows evidence of dams which are retaining water as the lake is visibly larger than in later aerial photographs.
Between the late 1930s and early 1980s	Between 1939 and 1942 the Provincial government rehabilitated the mine. During this time the underground workings were expanded and some gold was produced. Due to the on-going World War II further development of the mine ceased. In the 1947 aerial photographs the dams along Seloam Lake are no longer in operation as the lake is lower and there is an obvious area of exposed ground around the perimeter of the lake and Seloam Brook toward Fifteen Mile Stream. This action resulted in flooding of the Seloam Brook which based on the DNR records would account for the possible wide distribution of the tailings. Between the late 1940s and early 1980s there was limited use of the site although the gravel access road was maintained as passage to woodland areas for harvesting lumber.
Early 1980s to present	Based on the reviewed records, there was a renewed interest in the gold potential of the area. This included exploratory drill holes, resurveying the area, and in the late 1980s to the west southwest, the excavation of a test sample to confirm the quantity of gold in base rock. This excavated material was processed at Gays River, off-site. Work completed by Jacques Whitford as part of a geotechnical project in the late 1980s identified waste rock and tailings on the site along Seloam Brook to a depth of 1.5 to 2 metres. No reported environmental testing of the tailings was completed at this time. There were surface water samples collected. Based on the file review completed total oil and grease was detected in the surface water. This was attributed to the use of an oil based drilling mud. It was indicated that this was reported to NSE at the time. There may be isolated pockets of limited hydrocarbons near drill sites from the 1980s. A map of the area indicates that in the 1980s the camp was located along the gravel road near the eastern edge of the proposed pit development. A photograph of the camp from the late 1980s shows a cluster of portable buildings with propane cylinders for heating. The presence of the camp in the late 1980s is not anticipated to represent a concern to the Site. By the early 1990s the Site was vacant and again became over grown. The current drilling reportedly started in late 2017 / early 2018 and is on going.

5.0 Site Visit Findings

5.1 Current Site Operations

The Site is currently occupied by historical tailings and waste rock covered by a brook, wetlands, trees, shrubs and other vegetation. A gravel access road runs east-west through the proposed open pit location. There are several mobile drill crews operating on the Site as part of the exploration process. These mobile setups include portable power generation, diesel powered water pumps, and mobile drill equipment. It was reported that drilling muds are not being used, only water which is being direct to collection areas on the Site.

5.2 Waste Generation and Storage

5.2.1 Solid and Liquid Wastes

No hazardous waste generation or storage was identified to be conducted on the Site. There were areas of waste rock from the historical mining activies noted during the site visit along with occasional surface metal debris.

5.2.2 Drains, Sumps, Septic Systems and Oil Water Separators

No floor drains, sumps, septic systems, interceptors, or separators were identified on the Site.

5.2.3 Air Discharges and Odours

No sources of air emissions that are suspected to result in residual contamination to the property were identified on the Site. Further, no strong, pungent, or unusual odours were identified during the site visit.

5.3 Fuel and Chemical Storage

5.3.1 Underground Storage Tanks (USTs)

No chemical or fuel storage USTs were identified on the Site. Further, no vent or fill pipes indicating the potential presence of an abandoned or decommissioned UST were observed.

5.3.2 Aboveground Storage Tanks (ASTs)

No permanent chemical or fuel storage ASTs were identified on the Site. There are mobile tanks associated with the exploration process that are not considered to be a potential environmental concern to the Site.

5.3.3 Other Storage Containers

No permanent chemical storage was observed on the Site. There are pails and other supplies associated with the mobile exploration operations that are not considered an environmental concern to the Site.

5.4 Building Systems/Equipment

5.4.1 Heating and Cooling Systems

No heating or cooling systems are on the Site, as the Site is undeveloped.

5.4.2 Hydraulic Equipment

No in-ground hydraulic equipment is on the Site, as the Site is undeveloped. There are hydraulics associated with the mobile exploration operations that are not considered an environmental concern to the Site.

5.0 Site Visit Findings (continued)

5.5 Exterior Site Observations

5.5.1 Surface Features

No hydrocarbon stained surficial materials were observed on the Site. It was noted that in locations there are exposed historical tailings present at the surface and there is no vegetation in these areas; similarly there are areas of waste rock piled at the surface and no vegetation is growing in these areas. During the site visit, several DNR warning signs were noted indicating the presence of historical mine workings several of which were present as noticeable pits with debris present in the openings. As noted previously the historical tailings and waste rock are being delineated as part of other reports, and are to be managed during the development of the proposed open pit mine.

5.5.2 Fill Materials

There are areas of exposed historical mine tailings at the Site. Based on information obtained during the site visit, the average depth was around 30 centimetres with deeper areas extending 1.5 to 2 metres according to the reviewed reports. Based on the history of the area, the surficial soils have been reworked numerous times between 1866 and 1940 with tailings, waste rock and other materials placed on native till layers.

5.5.3 Wells

No abandoned or existing wells (water, oil, gas or disposal) were identified on the Site. There were records for a number of drilled exploration holes as part of the assessment of the area for development of a mine both on the Site and in the surrounding area in a grid pattern. It is unknown how the historical drilled holes, which extended several hundred feet in some cases, were backfilled. It was reported that current boreholes are grouted at the bedrock interface. If exploration wells are encountered during tailings management operations (e.g., removal of the historical tailings to the new tailings management areas), they should be properly decommissioned, in accordance with provincial regulations.

5.6 Hazardous Building Materials

5.6.1 Asbestos-Containing Materials (ACMs)

The common use of friable (crumbles easily by hand pressure) asbestos-containing materials (ACMs) in construction generally ceased voluntarily in the mid 1970s but was only banned through legislation in the mid-late 1980s. Asbestos was used in thousands of building products and the common uses of friable ACMs included boiler and pipe insulation, and spray-on fireproofing. Asbestos was also used in many manufactured products such as floor tiles, ceiling tiles, transite cement products and various other construction materials. Some cement drain piping currently used in the construction of buildings still contains asbestos (non-friable). Vermiculite used as insulation may be contaminated with asbestos fibres.

As the Site is undeveloped, no suspected ACMs were identified on the Site during the site visit.

5.6.2 Polychlorinated Biphenyls (PCBs)

From the 1930s to the 1970s, PCBs were widely used as coolants and lubricants for electrical equipment, including transformers and capacitors, and in a number of industrial materials, including sealing and caulking compounds, inks and paint additives. The use of PCBs was prohibited in heat transfer and electrical equipment installed after September 1, 1977, and in transformers and capacitors installed after July 1, 1980. Regulations now require that PCB containing equipment be taken out of service prior to regulated deadlines.

No oil-filled transformers or lamps ballasts were observed on the Site.

5.0 Site Visit Findings (continued)

5.6 Hazardous Building Materials (continued)

5.6.3 Lead-Based Materials

In 1976, the lead content in interior paint was limited to 0.5% by weight under the federal Hazardous Products Act. Lead based water supply pipes were used greater than 50 years ago. Between 1930 and 1986, most buildings used copper pipe with lead-solder joints. Other lead-based products include wall shielding (x-ray rooms).

As the Site is undeveloped, no lead-based materials were identified on the Site.

5.6.4 Urea Formaldehyde Foam Insulation (UFFI)

Urea Formaldehyde Foam Insulation (UFFI) was used as an insulation product for existing houses between the mid-1970s and its ban in Canada in 1980. It was not commonly used for commercial or industrial buildings.

As the Site is undeveloped, no UFFI was identified on the Site.

5.6.5 Ozone-Depleting Substances (ODSs)

Refrigeration and air conditioning equipment in place before 1998 may contain refrigerants containing Ozone-depleting Substances. Non-ODS refrigerants have been developed and are available to replace these materials in newer equipment.

As the Site is undeveloped, no equipment containing ozone-depleting substances (ODSs) was identified on the Site.

5.7 Special Attention Items

5.7.1 Radon Gas

Radon is a radioactive gas associated with uranium rich black shale and/or granite bedrock. Radon emits alpha particles and produces several solid radioactive products called radon daughters. Harmful levels of radon and radon daughters can accumulate in confined air spaces, such as basements and crawl spaces.

Based on a the online map supplied by the Nova Scotia Department of Natural Resources, the Site is in an area of low radon potential.

5.7.2 Microbial Contamination (Mould) and Indoor Air Quality

The growth of mould in indoor environments is typically due to a moisture problem related to building envelope or mechanical systems deficiencies or design, and can produce adverse health effects. There is no practical way to eliminate all mould and mould spores in the indoor environment. The way to control mould is to control moisture.

No visual evidence of suspected indoor mould growth was observed on the Site, at the time of the site visit, as no buildings or structures exist.

5.7.3 Electromagnetic Frequencies (EMFs)

Electrical currents induce electromagnetic fields. No scientific data supports definitive answers to questions about the existence or non-existence of health risks related to electromagnetic fields.

No high-voltage transmission lines or electrical substations, which could generate significant electromagnetic fields, were identified on or adjacent to the Site.

5.0 Site Visit Findings (continued)

5.7 Special Attention Items (continued)

5.7.4 Noise and Vibration

The effects of noise and vibration on human health vary according to the susceptibility of the individual exposed, the nature of the noise/vibration and whether exposure occurs in the working environment or in the home.

The site activities involve drilling which generates significant intermittent and non-permanent noise/vibration, however given the proposed industrial nature of the surrounding area this is not considered to be a concern to the Site.

5.8 Neighbouring Property Information

The current activities on neighbouring properties observed at the time of the site visit and a summary of historical information gathered through the records review are presented in the following sections.

The greater area of the proposed open pit mine encompasses the former historical mining operations. Located to the west and south of the proposed pit were numerous open pits, mine shafts, stamp mills and engine houses for the processing of rock for the extraction of gold between 1866 and the early 1940s. The majority of the adjoining property based on the aerial photographs has been woodland since the 1920s.

The historical mining operations in the area of the Site represent a potential concern due to the use of mercury in recovery of gold in mining practices from the late 1800s/early 1900s. The source of power for the steam engines used is also unknown, although given the lack of a rail connection it is likely that these were wood fired rather than coal fired owing to the difficulties of transporting coal to the mine sites. The native rock in the area has a high concentration of arsenic based on mapping provided by DNR which could be considered an environmental concern. The presence of tailings, waste rock and former mining operations represents a potential environmental concern.

5.9 Client-Specific Items

No specific client requests were made with respect to this Phase I ESA.

6.0 Conclusions

The Phase I ESA has revealed evidence of potential environmental contamination associated with the Site.

Based on the information gathered there are apparent tailings and waste rock both within the area of the proposed open pit development as well as adjacent to the proposed open pit operations which are potentially impacted with arsenic, mercury and have an acid generating potential. Further delineation of the historical tailings areas and waste rock is currently underway to determine the extent of the materials.

A reply from Nova Scotia related to previous assessment and management of waste rock and tailings is pending.

7.0 Closure

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

- *Due to the size of the property (approximately 900 acres), the wooded areas to the north (across Seloam Brook), east, and south of the proposed pit which were outside the area of historical mine development in the 1800s were assessed by driving portions of the available woods road and through review of historical aerial photographs, LIDAR imagery, and topographical and geologic maps of the area. It should be noted that portions of the Site are covered by thick vegetation which prevented a thorough assessment of the ground surface in those areas of the Site during the site visit. As noted above northern portions of the Site were inaccessible due to the presence of Seloam Brook which runs east / west across the area of the proposed pit development. At the time of the site visit the temporary crossing had been removed due to a high water safety concern.*
- *In September 2019 a revised proposed open pit area was provided to Stantec. The revised location of the proposed pit extended the pit to the west and north of the area of the 2018 proposed pit location. Stantec reviewed the revised location with the areas that were assessed in 2018 and determined that the assessment encompassed the revised location and a site visit was not completed in 2019 as part of the revision of this report.*

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

7.0 Closure (continued)

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Patrick Turner, P.Eng. and reviewed by Don Carey, M.Sc., P.Eng.

Appendix A

Site Plans

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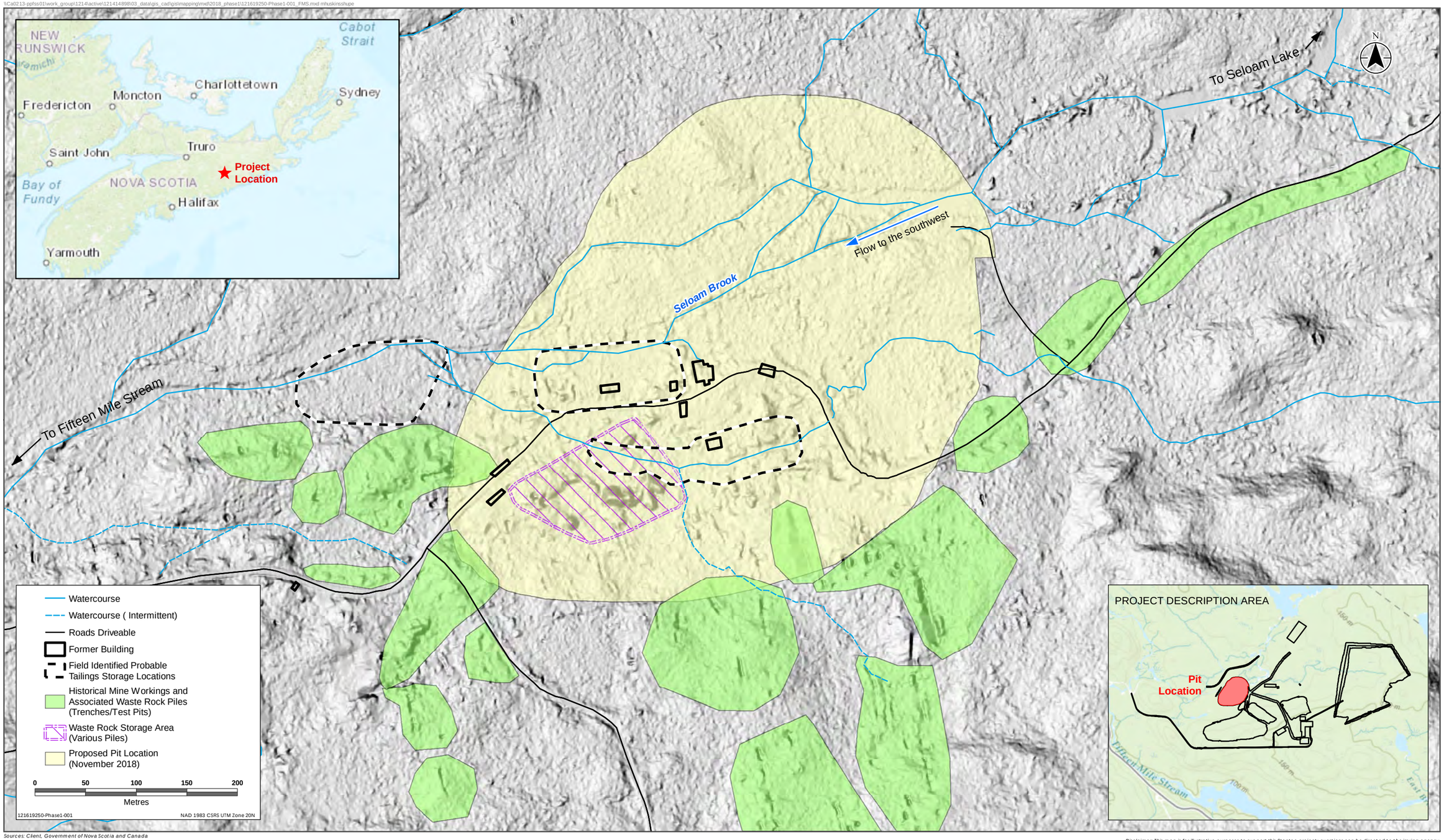

Sources: Client, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreet Map contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

Stantec

ATLANTIC MINING NS

Atlantic Mining NS
Fifteen Mile Stream Project

Figure 1

Sources: Client, Government of Nova Scotia and Canada

Service Layer Credits: Sources: Esri, HERE, Garmin, intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreet Map contributors, and the GIS User Community

Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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ATLANTIC MINING NS

Atlantic Mining NS
Fifteen Mile Stream Project

Figure 2

Appendix B

Photographs

Seloam Brook which runs through the proposed pit location

Typical drill operation setup in the area of the proposed pit

Wetland in the central area of the proposed pit location - apparent tailings along the edges

Typical moss covered waste rock piles on the Site

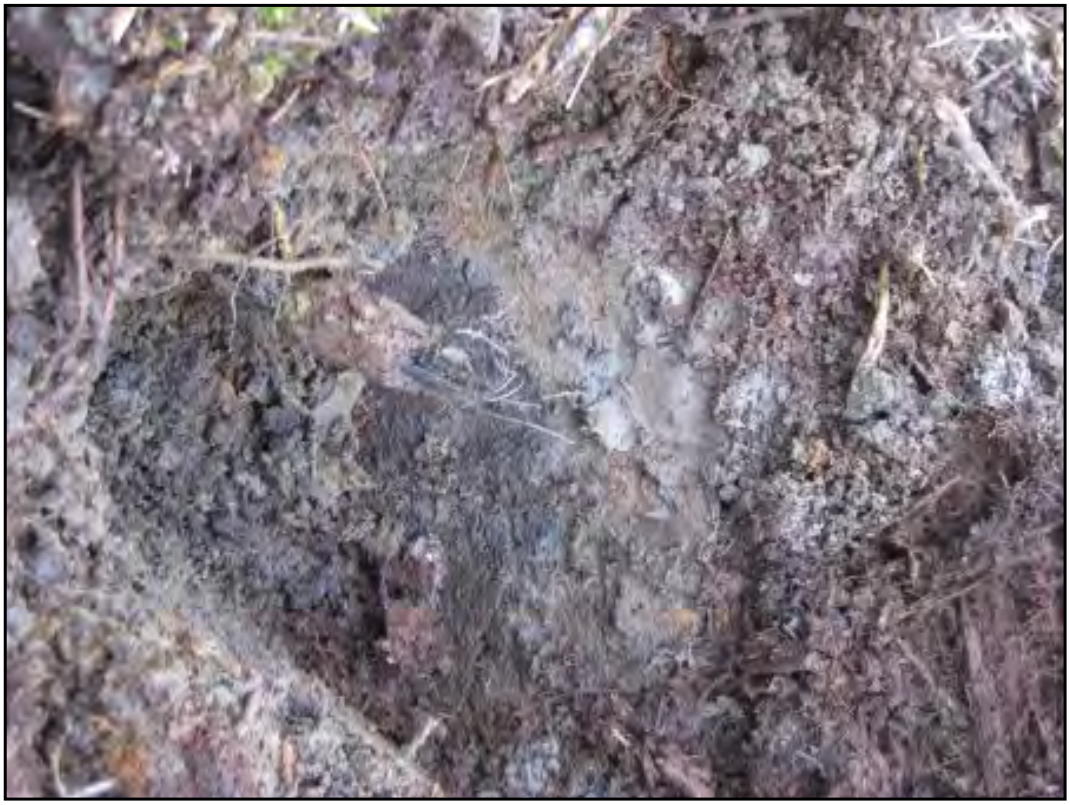
Typical historical mine working / trench with moss covered waste rock

Exposed waste rock in the area of the proposed Pit

Typical water filled excavation, potential shaft

Typical metal debris present on the Site

Concrete foundation to the south of the gravel access road



Typical grey / dark grey sand apparent tailings under a layer of organic material

Exposed waste rock pile several metres high to the south of the gravel access road

Stressed vegetation (dead trees) adjacent to the waste rock pile and wetland

Iron staining in the pond adjacent to the waste rock pile

Graded waste rock along the western edge of the proposed pit

Typical exploration borehole location from the 1980s

Foundation remains adjacent to the gravel road next to Seloam Brook and exposed apparent tailings

Typical access road constructed for current exploration program

Appendix C

Assessor Qualifications

Patrick Turner, B.Sc., P.Eng.
Associate Environmental Services

Profile

Patrick Turner, B.Sc., P.Eng., has been with Stantec since 2000. Mr. Turner has conducted over 500 Phase I, II and III Environmental Site Assessments (ESAs) in Nova Scotia, New Brunswick, Newfoundland, Ontario and Quebec. These environmental assessments and remediation projects dealt with metal, hydrocarbon, polycyclic aromatic hydrocarbon, polychlorinated biphenyl and chlorinated solvent impacts in soil and/or groundwater. Properties assessed have ranged from single family dwellings to industrial oil refineries.

EDUCATION

B.Sc. – Dalhousie University – Math, 1997

Bachelor of Engineering (Civil) –
Technical University of Nova Scotia 1998

COMPENTENCY

Site Visit

Report Writer

Technical Report Review

PHASE I ENVIRONMENTAL SITE ASSESSMENT
ASSESSOR QUALIFICATIONS – Don Carey

Donald A. Carey, M.Sc., P.Eng.

Principal

Profile

Don Carey, M.Sc., P.Eng., is a Principal and Senior Hydrogeologist in the Dartmouth office of Stantec. He is also the Technical Leader for Site Investigation for Stantec's Canadian operations, and has been and continues to have responsibility for the development of standard operating procedures and quality for Phase I ESAs. Mr. Carey has more than 35 years' experience at Stantec in environmental site assessments, including senior technical review on more than 1,000 Phase I ESAs, for a wide variety of projects, from small residential properties, to large, complex industrial facilities.

Education M.Sc. – University of Waterloo – Hydrogeology, 1985
B.A.Sc. – University of Toronto – Geotechnical Enginering, 1977

Associations **Engineers of Nova Scotia**

Competencies Senior Review

Appendix D

Supporting Documentation

Application for Access to a Record

Province of Nova Scotia
Freedom of Information and Protection of Privacy Act
Subsection 6(1)

To: Information Access and Privacy (IAP) Services
Information, Communications and Technology Services
Department of Internal Services
12th floor, 5161 George Street
PO Box 72
Halifax, NS B3J 2L4

1. This is an application pursuant to the *Freedom of Information and Protection of Privacy Act* for access to: *Check one*
   - ☐ (a) applicant's own personal information; or
   - ☒ (b) other information; or
   - ☐ (c) both applicant's own personal information and other information.

2. I am applying for access to the following record: *(Below, precisely identify the material applied for by including particulars such as the specific event or action to which it refers, the date of the record or the date or period to which it relates, the type of record (document, report, letter et cetera), names of department personnel who prepared or may have knowledge of the information, or citations to newspapers or publications which are known to have referred to the record. Attach additional pages if required.)*

   Fifteen Mile Stream Gold Mine proposed reopening of the mine in the 1980s Gunnar Gold Inc. Former Egerton Mine 1870-1940. DNR records related to waste rock or Tailings management

3. I wish to: *Check one*
   - ☐ examine the record; or
   - ☒ receive a copy of the record

4. I understand that a cheque in the amount of $5 made payable to the Minister of Finance should accompany the application and that I may be required to pay an additional fee before obtaining access to the record.

Date: Nov 18, 2018 Signature of Applicant: [signature]

Full Name of Applicant *(Print)*: Patrick Turner

Mailing Address of Applicant: Stantec Consulting Ltd. 102-40 Highfield Park dr
(Street/Apartment No./R.R. No.)

Dartmouth, NS B3A 0A3
(Community/County) *(Postal Code)*

Telephone Numbers of Applicant: _____
(Residence) *(Business)* *(Fax)*

Request to Waive Fees

I hereby request to be excused from paying fees related to the above application because:
- ☐ (a) I cannot afford to pay fees; or
- ☐ (b) *(specify any other reason - attach additional pages if required)*

_____

_____

For office Use Only

Date Received: _____ Application No. _____

Revised: July 2015