



Appendix G.4

Fifteen Mile Stream Gold Project -
Preliminary Wetland Compensation Plan,
McCallum Environmental Ltd.

Atlantic Mining NS Corp., a fully owned subsidiary of St. Barbara Limited (the Proponent), is committed to implementing primary (on the ground) and secondary methods of wetland compensation to satisfy the Nova Scotia Wetland Conservation Policy's (2019) objective of preventing no net loss of wetland habitat and function. The Proponent acknowledges that Nova Scotia Environment (NSE) considers restoration of wetland function as a focus of wetland compensation in Nova Scotia, and as such, this objective will be integral to wetland compensation efforts associated with the Fifteen Mile Stream Gold Project (the Project).

Wetland compensation will be designed to run concurrent with the wetland alteration timeline and be implemented via an adaptive approach. The Proponent is committed to implementing valuable, and functionally significant wetland restoration opportunities. The objective of the restoration site selection process will be to secure valuable Projects, which aim to replace wetland function and extend over multiple years, concurrent with wetland alteration activities.

The Proponent proposes that annual wetland alteration and compensation updates be provided to NSE throughout the lifetime of the Project. The annual update will include the following information:

- The Proponent will complete an annual survey of the Project site to identify the exact alteration footprint as a result of Project related activities completed that year;
- An updated schedule for the alteration areas expected for the forthcoming year will be provided;
- Wetland Compensation Plan (WCP): The WCP will exist as a living document and will be updated annually. In its infancy (i.e. years 1-2), the WCP will focus on identification of suitable wetland restoration activities, and project design (see details in section below). Implementation of the wetland restoration projects would be initiated within 3 years of the first wetland alteration activity occurring on the site; and,
- The Proponent is committed to engaging one (or more), wetland restoration professionals (WRP), to support them in fulfilling the wetland restoration tasks associated with this Project. Details related to the agreements between the Proponent and the WRP will be provided in the annual update.

Based on recent consultation with NSE, the Proponent understands that NSE's preferred method of compensation is restoration of highly degraded wetland habitats or wetlands previously lost to historic alteration in close proximity to the wetland losses (within the same or adjacent watersheds). The Proponent will endeavor to ensure that the restoration objectives are upheld as part of the site identification process.

The following sections identify the main steps the Proponent will implement during the wetland restoration process.

- 1) **Engagement:** As part of the wetland compensation process, the Proponent will engage with key stakeholders to ensure avenues have been explored in the site identification process. Stakeholder engagement presents opportunity for the Proponent to understand what opportunities there may be in the local area, and to learn about other interest groups who may have concepts and objectives related

to wetland restoration. Stakeholder engagement could involve the following types of groups and organizations:

- Nova Scotia Environment;
- Nova Scotia Department of Lands and Forestry;
- Mi'kmaq communities and First Nations Groups;
- Private Forestry Lands Groups and Cooperatives;
- Local Municipalities; and,
- Environmental Non-Governmental Organizations.

- 2) **Site Identification Process:** The process to select a suitable wetland compensation site will initiate during the provincial alteration permitting process (i.e. during the first year of wetland alteration). With the support of a WRP, the Proponent will complete feasibility studies and preliminary design concepts to determine the scope of work, and wetland compensation objectives. An evaluation of the value of the project will be determined by comparing the proposed outcomes of the project to the broader objectives of the Nova Scotia Wetland Conservation Policy, as well as local watershed benefits and support of any initiatives of stakeholders and local communities that the project would provide.

In tandem with defining project objectives and a preliminary concept, collaboration and discussions with landowners of potential compensation sites will take place. This process is a crucial element of determining the feasibility of a site for wetland compensation purposes. The process includes written agreements with landowners which outline agreed upon project goals and objectives, and in some cases, could include land purchase agreements.

- 3) **Project Design:** Preliminary project design will initiate during the site selection process concurrent with engagement activities. However, as discussions with landowners advance, and securing of land appears feasible to implement the project, project design will advance into a more detailed stage.

Preliminary Design

A desktop review process will be initiated on potential sites to determine existing characteristics (i.e. level of historical disturbance), hydrological conditions (inflows and outflows of water), and soil characteristics. The desktop review process is followed up with a field assessment and feasibility study to identify landscape characteristics and refine the preliminary design further. As well as evaluating the Project site for characteristics discussed above, details relating to vegetative composition, habitat, species at risk presence and potential fish habitat is also evaluated. In addition, information regarding adjacent land use and its potential interaction with a compensation project is obtained. Based on these conditions, a preliminary project design can be put in place.

Detailed Design

The detailed design process includes the modelling of specific hydrological conditions and detailing the ground work activities that are required to be implemented at the site to meet the objectives of the restoration Project. Tasks completed as part of this process include water budgeting and design, construction methodology, seeding and planting techniques, management of herbivory challenges and monitoring requirements. Utilization of a hydrograph will aid this process by facilitating the determination of available water to the restoration site and water should be managed on the site to

restore conditions that resemble pre-degraded conditions. The exact scope required for the detailed design process will be determined in consultation with NSE.

Areas of Interest

The Proponent will prioritize identification of functionally valuable wetland restoration projects within the affected watershed, or where restoration would restore shoreline stabilization functions (see below). Stakeholder engagement may also prioritize some project locations over others.

Ideally, wetland restoration would occur at the site of impact. However, the nature of the alteration at the FMS Mine Site (open pit and stockpiles) may limit the overall opportunity for on-site restoration. On-site options for wetland restoration will be considered during the reclamation process and could include restoration of wetlands once infilled by temporary stockpiles (for example). Other opportunities could include expansion of unaltered, existing wetlands, which could aim to detain water previously stored by wetlands and since lost (altered) by mine activities. This process would satisfy restoring wetland function.

Most wetlands within the FMS Mine Site proposed for alteration drain into the Fifteen Mile Stream (East River Sheet Harbour). Restoration of wetlands which provide shoreline stabilization functions will therefore be investigated along these aquatic features, including their tributaries and wetlands which drain into them. Much of the surrounding landscape comprises undeveloped forested land, and it appears that most landscape degradation has likely occurred as a result of timber harvesting activities. Wetland degradation as a result of tree harvesting often occurs by disturbing soils, vegetation, and altering hydrological inflows, outflows and wetland hydrological surface conditions. Installation of artificial drainage ditches, rutting and alteration of natural flow paths can often interrupt shoreline stabilization functions of a wetland, especially when they drain into, or lie adjacent to natural tributaries or open water features. A concerted effort will be afforded by the Proponent to determine whether instances such as described above have occurred in aquatic features draining into the East River Sheet Harbour, and restoration opportunities investigated.

Should it be determined that valuable wetland restoration opportunities do not exist within the affected watersheds, with support of the WRP and in consultation with NSE, the Proponent will identify other areas within the province where valuable wetland restoration opportunities are required. As can be expected, wetland degradation occurs in areas of concentrated development and land disturbance. Urban development acts as the largest contributor to wetland degradation and associated decline in watershed health. Wetland restoration within urban areas is challenging due to lack of available space, availability of land, and in some cases municipal infrastructure requirements. Through the wetland compensation process associated with the FMS Mine Site, the Proponent is eager to explore the challenges facing urban wetland restoration and are committed to investigating ways to work with local municipalities to implement valuable wetland restoration on the ground. The Proponent is open to consider any other wetland compensation projects as identified by NSE, ECCC, First Nations groups, or consultation with stakeholders.

Historical water management and wetland degradation within agricultural areas has also contributed to watershed health issues in rural areas of Nova Scotia. The Proponent will investigate restoration opportunities in the Musquodoboit River Secondary watershed as well as other areas such as the Shubenacadie Secondary Watershed in lands adjacent to the Stewiacke River.

*Fifteen Mile Stream Gold Project
Preliminary Wetland Compensation Plan*



This Preliminary Wetland Compensation Plan has been completed to support the EIS for the Fifteen Mile Stream Gold Project. A detailed compensation plan will be prepared and submitted to NSE at the wetland alteration permitting phase.

Respectfully Submitted,

A handwritten signature in blue ink that reads "Meghan Milloy". The signature is written in a cursive, flowing style.

Meghan Milloy, MES
Vice President
McCallum Environmental Ltd.