

DUCK POND COPPER-ZINC PROJECT ENVIRONMENTAL IMPACT STATEMENT

EXECUTIVE SUMMARY

Introduction

The Duck Pond Copper – Zinc Project is being proposed by Thundermin Resources Inc. and Queenston Mining Inc., who have entered into a 50-50 joint-venture to explore and develop high grade copper – zinc mineralization on the Duck Pond Property. Thundermin is the operator of the joint-venture.

This Environmental Impact Statement (EIS) presents information about the proposed Project and the results of its environmental assessment. The environmental assessment has been undertaken to meet the requirements of Newfoundland's *Environmental Assessment Act (NEAA)*, as well as to meet the provisions of the *Canadian Environmental Assessment Act (CEAA)* for an environmental screening. The EIS provides the necessary information to allow for an informed decision regarding the environmental acceptability of the Project.

The Proposed Project

Overview

The proposed Duck Pond Project is located in west-central Newfoundland, approximately 30 km southeast of the community of Buchans and 25 km south of Millertown. The Duck Pond Property hosts the Duck Pond and Boundary volcanogenic massive copper-zinc-lead-silver-gold deposits. The Duck Pond deposit consists of the Upper Duck, Sleeper and Lower Duck Lenses, and the Boundary deposit consists of the North, South and Southeast Zones. The Lower Duck Lens and the Southeast Zone are not part of the current mine plan. The location and main features of the Project are illustrated in Figure 1.

The Project is planned as a 1,500 tonne per day mining/milling complex, initially producing copper and zinc concentrates. It is anticipated that lead concentrates will also be produced, commencing in year 2, when Duck Pond ores will be mined and milled. Approximately 5.5 million tonnes of mineable ore has been located in the Boundary and Duck Pond deposits, resulting in an anticipated mine life of 10 to 12 years. Exploration for additional mineable reserves will continue throughout the life of the Project, which may result in a longer mine life.

The Boundary deposit will be mined first using open pit methods while access is gained to the Duck Pond deposit. The Duck Pond deposit will be mined using underground drift and fill methods. Concentrates will be trucked to the port of Botwood for storage and eventual shipment to markets.

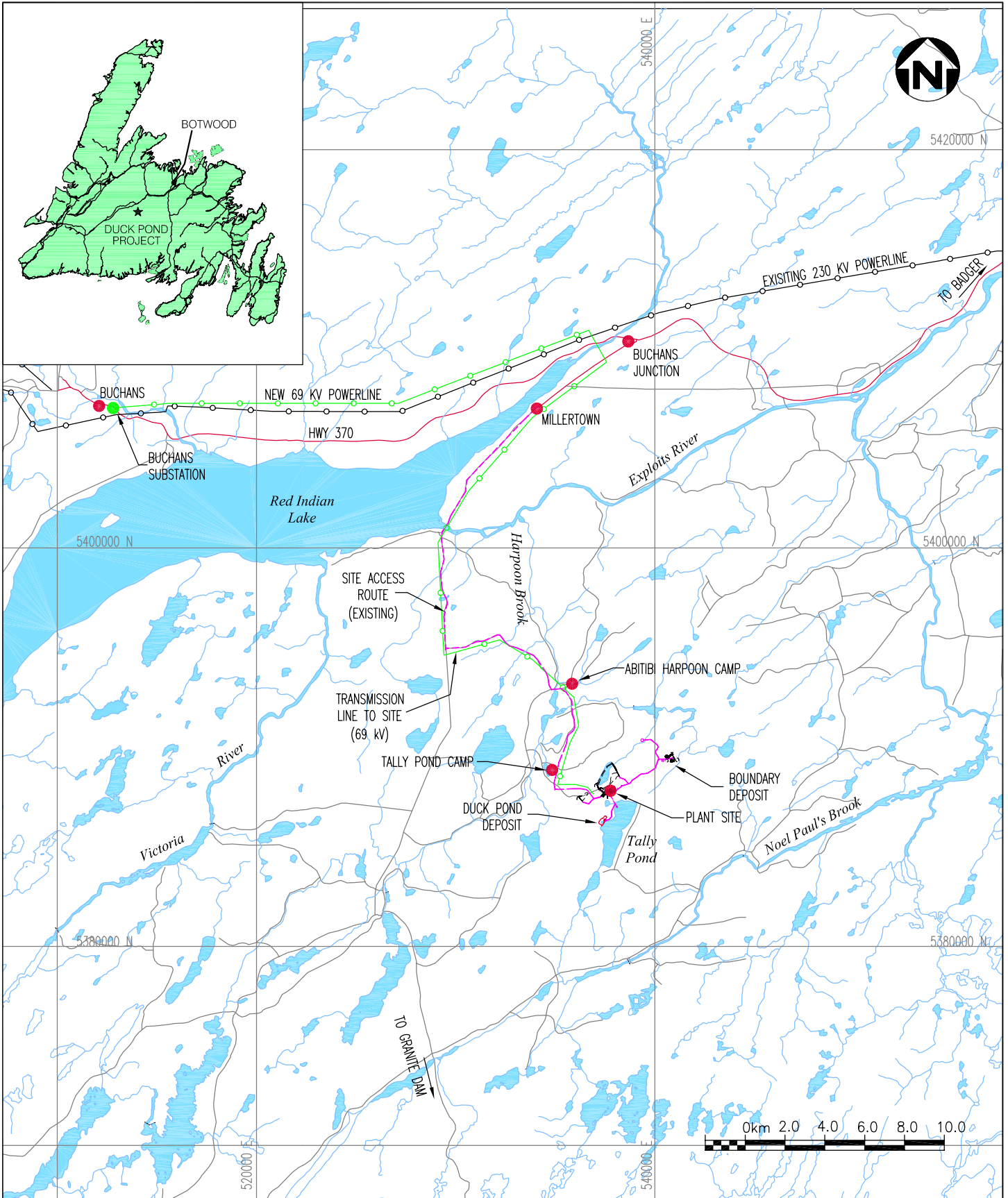


Figure 1
PROJECT LOCATION AND MAIN FEATURES

Alternatives

Thundermin has completed a detailed positive feasibility study on the Project. A number of alternative means of carrying out the Project were evaluated on the basis of technical, economic and environmental considerations. These evaluations were completed early in the Project planning stages to allow for a focussed and thorough environmental assessment of the Project. Alternatives in the following areas were fully considered:

- mining method;
- production rate;
- selection of the Tailings Management Area (TMA);
- underground access;
- use of paste backfill for tailings disposal;
- the location of the mill complex; and
- the location of the port facility.

Mining

The Boundary deposit is located approximately 4 km northeast of the proposed mill complex. Mining will commence at Boundary using open pit methods prior to commissioning the mill. Ore will be transported by haul trucks to the mill site and temporarily stockpiled prior to milling. Overburden that covers the Boundary deposit will be stockpiled for use in reclamation, and mineralized rock (potentially acid generating) will be temporarily stockpiled on low permeability pads until it can be re-deposited in the excavated pits.

The pits will be allowed to flood when mining ceases, to ensure the mineralized rock is permanently stored underwater to prevent acid rock drainage (ARD). Excess mineralized rock from the Boundary deposit will be placed in the TMA under permanent water cover. During open pit mining, pit water and mineralized rock stockpile drainage will be controlled, collected and pumped to the TMA for treatment prior to release to the environment. Drilling and blasting will occur at the Boundary deposit, as well as heavy equipment operation and movement at the pits and between the pits and the mill complex. These activities will occur over an 18 month period until the Boundary deposit is completely mined out.

The Duck Pond deposit will be mined using underground (drift and fill) methods. Access to the deposit will be via a portal located at the mill complex area in the TMA watershed and away from Tally Pond. A ramp will be constructed to the Duck Pond deposit and ore will be hauled to the mill using diesel trucks. Underground mining will commence approximately nine months through the Boundary deposit mining schedule. A paste backfill plant, using tailings with cemented as binder, will be commissioned approximately 10 months following the start up of Boundary pit operations and 2 to 3 months after initiating underground operations. Paste backfill will be used for fill in underground mined out areas.

Approximately 45% of all tailings produced during the life of the Project will be returned underground as paste backfill. Mineralized rock removed during ramp construction will be temporarily stored near the portal on a low permeability pad. Once secondary stopes are available for filling, this waste material will be returned underground on the back haul portion of the haul truck cycle. Clean, or non-mineralized rock that does not have ARD potential, will remain on the surface in the TMA watershed. An underground mine ventilation raise will be constructed near Tally Pond. Mine water will be collected and pumped to the TMA.

Milling

Ore processing will consist of crushing, grinding, conventional flotation and thickening, and filtration. A semi-autogenous grinding mill and ball mill will be used to reduce crushed ore to the designed particle size for the copper and zinc flotation circuits. The flotation circuits will require the addition of reagents (collectors and frothers) as well as air to collect the minerals which will float to the surface of the cells. Additional reagents such as small amounts of sodium cyanide will be required to separate lead from copper in the Duck Pond ore. Water will be recycled in the mill to the extent possible to achieve efficient use of reagents in the process and to reduce the release of reagents to the TMA.

Concentrates will be trucked to the port of Botwood for storage and eventual shipment to markets. There will be storage capacity for two days of concentrate production at the mill complex and for up to two months at Botwood. Approximately 10 truckloads per day of concentrate will be taken to Botwood. Existing concentrate storage and ship loading facilities will be renovated to meet the needs of the Project. No dredging or marine construction is required at Botwood for the Project. Ships will be loaded approximately once every four weeks.

Tailings Management Area

The TMA principally comprises Trout Pond, a portion of the Trout Pond watershed, and a portion of the tributary to Gill's Pond Brook. Both watersheds are part of the larger Harpoon Brook watershed. The TMA will require dams at both the north and south ends of Trout Pond for tailings placement and water cover management. A small dam will be required on the tributary to Gill's Pond Brook to form a sedimentation basin for treated effluent from the tailings pond. Dam heights are low and will not exceed 8 m. They are designed with a factor of safety for inherent stability and will be the focus of performance monitoring throughout the mine life cycle. The point of release of treated tailings effluent to the environment will be below the sedimentation pond. Tailings will be placed underwater in the tailings pond to reduce acid generation and eliminate tailings dust. Tailings water will require the simple addition of lime for pH adjustment prior to release to the sedimentation pond and the environment. Water will be recycled from the TMA for use in the mill process to reduce the fresh water demand from Tally Pond.

General Infrastructure

An extensive network of roads and trails already exists in the Project area. As a result, no new roads are anticipated to be required for the Project, and existing roads will need upgrading and realignment only. Two existing bridges near the Project site will require upgrading to accommodate construction loads and concentrate trucks, but no in-stream work is required. No new culverts are required for stream crossings for Project roads. Power will be supplied to the mill complex area by a 69 kV transmission line that will be placed adjacent to existing roads. The electricity is expected to be provided by Newfoundland Power from Newfoundland Hydro's electrical substation at Buchans.

The mill complex will be located in the TMA watershed, enabling site drainage to be easily controlled and contained within the TMA.

Fuel and other hazardous materials required during construction and operation will be stored pursuant to all applicable regulations. Fuel storage areas will be dyked with low permeability liners for leak containment. Thundermin has developed an Environmental Protection Plan (EPP) to address both routine activities associated with Project construction as well as contingency plans to respond to emergency and unplanned events.

Construction will occur over a 15 month period and the peak construction labour force is anticipated to be 200 persons. A temporary construction camp will be established to meet the construction period requirements for worker accommodations. During operation there will not be any permanent accommodation facilities required, as workers will commute to the site. The sewage treatment system installed to meet the requirements of the construction work force will adequately serve the reduced, commuting workforce during operation. The work force during the operation phase will comprise 44 salaried staff and approximately 122 hourly workers and contractors.

Environment, Health and Safety

Thundermin has included in this environmental assessment an outline of its approach to managing the environment, health and safety (EH&S) issues related to the Project. The EH&S Management System comprises the following plans, which will be developed prior to the start of construction:

- EPPs;
- Emergency Response and Contingency Plans;
- Occupational Health and Safety Plans;
- Reclamation Plan;
- Education and Orientation Plan;
- Communication Plan;

- Monitoring and Follow-up Plan; and
- Auditing and Continuous Improvement Plan.

Thundermin has adopted the Environmental Management Framework developed by the Mining Association of Canada, which includes four aspects of environmental management: leadership and commitment; planning; implementation and monitoring; and assessment and improvement. Such a framework will promote consistent integration of EH&S considerations into Project planning and operation. The results of the environmental assessment are a key aspect of Thundermin's approach to EH&S management planning.

Employment and Business Opportunities

The construction labour force will peak at approximately 200 workers. During operation, the total on-site personnel will be approximately 166. Thundermin anticipates that the supply of many of the goods and services required by the Project can largely be met by suppliers in the communities near the Project site. Potential business opportunities related to the Project include the supply of:

- explosives;
- drilling and blasting services;
- a construction camp, as well as catering and maintenance;
- fuels, lubricants, and reagents;
- building and construction materials;
- mobile equipment;
- trucking/hauling services; and
- mill consumables.

Project Schedule

It is anticipated that, pending release from environmental assessment in the fall of 2001, detailed engineering, project permitting and EH&S Management System completion will occur over the following several months. This should enable construction to commence as early as practical in 2002. The mill should therefore be commissioned by mid-2003.

Environmental Overview

The environmental overview section of the EIS presents a summary discussion of the region's physical, biological, and socio-economic environments. This is followed by an identification of known information gaps, as well as a description of the likely future condition of the environment within the lifespan of the Project should it not proceed.

Scope of the Environmental Assessment

Effective and efficient environmental assessment is largely dependent upon scoping to define the Project components and activities which are to be assessed, identify the key environmental issues of concern, and to set the spatial and temporal bounds of the assessment. All phases of the proposed Project, including construction, operation, and decommissioning, are considered part of the Project scope. Accidental events which may occur in relation to the Project's various activities and components are also considered within its scope.

The Proponent conducted an extensive issues scoping process in order to identify the environmental issues associated with the proposed Project, and thus to determine the Valued Environmental Components (VECs) upon which the environmental assessment would be focussed. This issues scoping exercise included consultation with appropriate regulatory agencies and the interested public.

Based on the results of this process, the following VECs are considered in this environmental assessment:

- Water Quality;
- Fish and Fish Habitat;
- Avifauna;
- Aquatic Furbearers; and
- Land and Resource Use.

Although the effects assessment focuses primarily upon these components of the environment, other potential issues are also addressed elsewhere in the EIS, as required.

Environmental Assessment Approach and Methods

The potential environmental effects of the proposed Project are assessed, including the potential effects of each of its components/phases and any malfunctions or accidents that may occur, as well as any likely cumulative environmental effects. The significance of these predicted environmental effects is also evaluated as part of the assessment. The specific steps involved in the assessment approach and methodology are as follows:

- determining study boundaries;
- describing the existing environment;
- identifying potential interactions between VECs and project components/activities;
- identifying issues and concerns;
- outlining existing knowledge regarding the potential Project-VEC interactions and identified issues and concerns;

- identifying mitigation measures;
- assessing and evaluating environmental effects;
- assessing and evaluating cumulative environmental effects; and
- identifying monitoring and follow-up requirements.

Environmental Effects Assessment

For each VEC, the effects assessment includes the establishment of spatial and temporal assessment boundaries. This is followed by a description of the existing (baseline) environment for each VEC within these established boundaries (summarized below).

The proposed Project is located within the Exploits River watershed in central Newfoundland. The site straddles two subwatersheds that form tributaries to the Exploits River (i.e., the Harpoon Brook and Noel Paul's Brook watersheds). The north side of the site features Trout Pond, which drains to East Pond Brook and into Harpoon Brook that enters the Exploits River approximately 4 km downstream of Red Indian Lake. Just southwest of Trout Pond is Gills Pond Brook, which also drains to Harpoon Brook. The southern portion of the site features Tally Pond that drains to Noel Paul's Brook, which in turn enters the Exploits River 22.5 km downstream of Red Indian Lake. The natural water quality of the Exploits River watershed reflects conditions typical of central Newfoundland. The pH is slightly acidic and varies seasonally. Alkalinity (buffering capacity) is low but variable within the watershed. Low conductance and low productivity reflect low levels of dissolved solids. Different locations on the Exploits River show different levels of trace metals, with the lower values generally being found in the headwater areas.

Fish species present in the Exploits River watershed include: introduced and indigenous Atlantic salmon (*Salmo salar*), non-anadromous or landlocked salmon (ouananiche), brook trout (*Salvelinus fontinalis*), Arctic charr (*Salvelinus alpinus*), American eel (*Anguilla rostrata*), and the three-spine stickleback (*Gasterosteus aculeatus*). Both Harpoon Brook (including Trout Pond, Trout Pond Brook, and the unnamed brook draining the wetland south of Trout Pond) and Noel Paul's Brook (including Tally Pond, Tally Pond Brook, West Tally Pond, and West Tally Pond Brook) contain brook trout and Atlantic salmon, although anadromous salmon and Arctic char have not been reported in the ponds at the Project site. The total area of stream habitat in the Exploits watershed has been estimated to be 349,000 units of all habitat types (where 1 unit = 100 m²). Noel Paul's Brook comprises an estimated 16,000 units of productive salmonid habitat, while Harpoon Brook consists of approximately 5,700 units of productive habitat.

Marine fish species that are likely present in Botwood Harbour are those typical of coastal Newfoundland waters, and include finfish such as flounder (*Pseudopleuronectes americanus*), smelt (*Osmeridae sp.*), and other inshore and pelagic species such as Atlantic mackerel (*Scomber scombrus*), herring (*Clupeidae sp.*), toad crab (*Hyas araneus*), rock crab (*Cancer irroratus*), blue mussel (*Mytilus*

edulis), horse mussel (*Modiolus modiolus*), and other aquatic invertebrates. In addition, seals and a variety of seabirds visit the harbour, although they may not routinely reside within the harbour itself. The substrate near the wharf is comprised of fine sediment, sand, pebbles, sawdust, wood chips, small pieces of coal and sulphur, tar and trash.

A variety of species of avifauna are known to occur in the Duck Pond area. These include a range of waterfowl and shorebirds (e.g., green-winged teal (*Anas crecca*), black duck (*Anas rubripes*), northern pintail (*Anas acuta*), ring-necked duck (*Aythya collaris*), common goldeneye (*Bucephala clangula*), common merganser (*Mergus merganser*), red-breasted merganser (*Mergus serrator*), Canada goose (*Branta canadensis*), common loon (*Gavia immer*), greater yellow-legs (*Tringa melanoleuca*), common snipe (*Gallinago gallinago*), and spotted sandpiper (*Actitis macularia*)). Raptors that may be found in the region include merlin (*Falco columbrius*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), great horned owl (*Bubo virginianus*), northern goshawk (*Accipiter gentilis*), sharp-shinned hawk (*Accipiter striatus*), boreal owl (*Aegolius funereus*), and northern hawk owl (*Surnia ulula*), as well as others. A total of 58 species of avifauna have been observed in the area over the past decade, including a variety of songbirds, such as warblers, thrushes, finches, and woodpeckers, as well as waterfowl and raptors.

Aquatic furbearers such as beaver (*Castor canadensis*), otter (*Lutra canadensis*), and mink (*Mustela vison*) are known to be present in the area. Muskrat (*Ondatra zibethicus*) are also likely present in low densities. Other furbearer species likely to be present include: lynx (*Lynx lynx*); short-tailed weasel (*Mustela erminea*), red fox (*Vulpes vulpes*), and coyote (*Canis latrans*). American marten (*Martes americana*) are found in the general area, although bait stations placed in and near the Project site on several occasions over the past 10 years failed to attract any marten.

The local area is used for recreational and commercial land and resource use activities. A variety of large and small game are hunted throughout the general region in season, and angling is also an important recreational activity. Cabins are located throughout the area, and there are several commercial outfitters in the general area. Other consumptive resource use activities, such as domestic wood cutting and berry picking, as well as a range of other recreational activities, also take place. The economy of the local area has traditionally been based on natural resource-based industries, particularly forestry and mining activity. Logging has taken place in the region since the turn of the century. The general area is presently an important logging and silviculture area for Abitibi-Consolidated, although no commercial forestry activity is currently planned in the vicinity of the Duck Pond Project. Although there are currently no active mines in the area, mineral exploration activity does take place throughout the general region. Botwood has been used as a commercial port for nearly 100 years, and is presently the site of a range of shipping activities.

Following the description of the existing environment for each VEC, potential Project-VEC interactions are identified, VEC-specific issues and concerns are discussed, and existing knowledge concerning the potential interactions and the identified issues and concerns is reviewed and summarized.

Based on the Project-VEC interactions and issues and concerns identified, and existing knowledge regarding these interactions and issues, mitigation measures to reduce or eliminate the potential adverse effects of the Project were identified. Mitigation included the incorporation of environmental considerations into Project design and planning, the implementation of the Proponent’s EH&S Management System, and mitigation measures specific to particular VECs.

Residual environmental effects predictions were made taking into consideration the identified mitigation measures. Predicted adverse effects were evaluated as significant (major or moderate effects) or not significant (negligible or minor effects) based on VEC-specific significance definitions.

The residual effects of each Project phase on each of the five VECs under consideration are summarized in Table 1 and discussed below.

Table 1 Summary of Residual Environmental Effects*

VEC	Construction	Operation	Decommissioning	Accidental Events
Water Quality	Minor	Minor	Minor	Moderate
Fish and Fish Habitat	Minor	Minor	Minor	Moderate
Avifauna	Minor	Minor	Negligible	Minor/Moderate
Aquatic Furbearers	Minor	Minor	Negligible	Minor
Land and Resource Use	Minor	Minor	Negligible	Minor

* Effect ratings are defined in the main text.

The residual environmental effects of the Project’s construction, operation and decommissioning phases on water quality and fish and fish habitat are evaluated as minor (not significant), with potential moderate (significant) effects in the case of accidental events. Minor (not significant) effects to avifauna (including waterfowl, passerine birds and raptors) and aquatic furbearers are predicted during Project construction and operation, with negligible (not significant) effects to these VECs as a result of the decommissioning phase. Depending on the species group, the potential effects of accidental events on avifauna are predicted to range from minor (not significant) to moderate (significant). The effect of an accidental event on aquatic furbearers is evaluated as minor (not significant). Similarly, minor (not significant) effects to land and resource use are predicted during Project construction and operation, with negligible (not significant) effects during the decommissioning phase and minor (not significant)

effects in the case of accidental events. The proposed Project is therefore not likely to result in significant adverse environmental effects.

The environmental assessment also considers the likely cumulative environmental effects of the Project in combination with other projects and activities in the area. The proposed Duck Pond Project will not occur in a pristine environment. The natural and human environments in the Duck Pond area and at Botwood have been affected by past and on-going human activities, such as forestry, mining and mineral exploration, recreational resource harvesting, and commercial vessel traffic. These existing effects were considered as part of the baseline environment, and the assessment and evaluation of the cumulative environmental effects of the proposed Project in combination with other projects and activities considers the nature and degree of change from these existing environmental conditions. The cumulative environmental effects of the Project in combination with other projects and activities in the area will not be significant.

Environmental monitoring (or follow-up) programs ensure that any unforeseen environmental problems can be identified and addressed in an effective and timely manner. Anticipated monitoring includes the following:

- precipitation and surface flows will be monitored for determining structural design implications, available water in Tally Pond and available water downstream of the effluent discharge point and seepage area;
- monitoring wells will be used to monitor groundwater quality downstream of the TMA;
- water quality will be monitored in the receiving environment for treated effluent;
- the marine environment will be monitored at Botwood for concentrate dust emissions; and
- progressive site reclamation measures, including the use of native plant species to enhance site revegetation, will be monitored throughout the Project.

Other biological monitoring such as fish body burden analysis for contaminants and toxicity testing on aquatic organisms may be required. These requirements will be further defined in consultation with key regulatory agencies during the Project permitting stage following release from the environmental assessment process.

Conclusion

This EIS has been prepared for the proposed Duck Pond Project in accordance with the requirements of *NEAA*, as well as fulfil the provisions of *CEAA* for an environmental screening. The EIS presents information about the proposed Project and the results of its environmental assessment. Significant adverse environmental effects are not predicted in relation to the Project's construction, operation and decommissioning phases. Although significant effects could potentially occur in the case of accidental events, the probability of such an event occurring is low, and the Proponent's emergency response and

contingency plans will ensure that any such effects are reduced. The proposed Duck Pond Project is therefore not likely to cause significant adverse environmental effects. A monitoring and follow-up program will be undertaken to assess the accuracy of the effects predictions made in the environmental assessment, and to determine the effectiveness of mitigation measures.

The Project will, however, result in considerable socio-economic benefits. It will create considerable direct and indirect employment and business opportunities, and contribute substantially to the economy of the local area, as well as that of the province of Newfoundland and Labrador as a whole.