Appendix A.1

Registry of Joint Stocks

Electronically signed by:
Office of the Registrar of Joint Stock Companies
Date: 25 May 2022 15:47 ADT
Location: Nova Scotia, Canada
Contact: rjsc@novascotia.ca

Certificate of Registration

Corporations Registration Act

Registry ID
4423631

Name of Corporation
SIGNAL GOLD INC.

I hereby certify that SIGNAL GOLD INC., a corporation formed under the laws of ONTARIO, is registered under the provisions of the Corporations Registration Act.

Registrar of Joint Stock Companies

May 25, 2022
Date of Registration

NOVA SCOTIA

SIGNAL GOLD INC.

Profile | Relationships | Events (1)

Name: KEVIN BULLOCK

Relationship: Director

Effective From: 25-May-2022

Name: LEWIS LAWRICK

Relationship: Director

Effective From: 25-May-2022

Name: MARY-LYNN OKE

Relationship: Director

Effective From: 25-May-2022

Name: TED KAVANAGH

Relationship: Director

Effective From: 25-May-2022

Name: RICK HOWES

Relationship: Director

Effective From: 25-May-2022

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Documents (2) | Reports (2)

Type to filter

Entity Profile Report

SIGNAL GOLD INC.

Profile | Relationships | Events (1)

Name: KEVIN BULLOCK

Relationship: Officer(President and Chief Executive Officer)

Effective From: 25-May-2022

Name: ROBERT DUFOUR

Relationship: Officer(Chief Financial Officer)

Effective From: 25-May-2022

Name: MATTHEW DORREEN (1500-1625 GRAFTON STREET, HALIFAX, NOVA SCOTIA, B3J 0E8, CANADA)

Relationship: Recognized Agent

Effective From: 25-May-2022

Items per page 5 6 - 8 of 8

Documents (2) | Reports (2)

Type to filter

Entity Profile Report

Standard $12.45

Certified $12.45

Certificate of Status - EP

Standard $12.45

Certified $12.45

Appendix A.2

EA Study Team

Contact information for the GHD Environmental Assessment study team is provided in Table 1.

Table 1 GHD EA Study Team

Position	GHD Limited
Environmental Assessment Lead	Callie Andrews, M.Sc. 120 Western Parkway, Bedford, NS T: (902) 499-0321 E: Callie.Andrews@ghd.com
Senior Impact Assessment Specialist	Nancy Griffiths, MCIP
Intermediate Environmental Engineer	Glen Merkley, P.Eng.
Water Resource Engineer	Andrew Betts, P.Eng.
Quantitative Hydrogeologist	Philip Sheffield, M.A.Sc.., P.Eng. (BC)
Senior Environmental Geoscientist	Jeff Parks, P.Geo.
Senior Risk Assessor	Troy Small, M.Sc., CE
Air Quality Engineer	Matt Griffin, P.Eng. (ON)
Noise Specialist	Michael Masschaele, BES LEL

Other consultants who contributed supporting information for the preparation of the EARD are included in Table 2.

Table 2 Consultants Providing Supporting Information

Consultant	Contributing Role
McCallum Environmental Ltd.	Valued Components: Wetlands, Fish and Fish Habitat, Terrestrial Environment Consultation and Stakeholder Engagement Wetlands Baseline Report Wetland Compensation Plan Fish and Fish Habitat Baseline Report Fish Offsetting Plan Avifauna Baseline Report Flora and Fauna Baseline Report Vegetation Communities Assessments Baseline Report Lichen Monitoring Plan Wildlife Management Plan
Lorax Environmental Services Ltd.	Geochemical Source Terms Geochemistry Report Mine Rock Management Plan
Nordmin Engineering Ltd.	NI 43-101 Technical Report and Feasibility Study for the Goldboro Gold Project Project Infrastructure Design
Knight Piésold Ltd.	TMF Design
Ausenco Engineering Canada Inc.	Process Engineering and Site Infrastructure
Membertou Geomatics Solutions	Mi'kmaq Ecological Knowledge Study
Davis McIntyre & Associates Limited	Archaeological Screening and Reconnaissance Study
Group ATN Consulting Inc.	Socio-Economic Impact of the Goldboro Gold Project

Appendix B.1

Conceptual Reclamation & Closure Plan

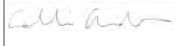
Conceptual Reclamation & Closure Plan

Goldboro Gold Project

Signal Gold

20 May 2022

→ The Power of Commitment

Project name		Signal Gold- Goldboro EA Support, NS					
Document title		Conceptual Reclamation & Closure Plan | Goldboro Gold Project					
Project number		11222385 (20)					
File name		11222385-RPT20-Reclamation Plan.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S3	00	Jeff Parks	Callie Andrews		Jeff Parks		Apr 28, 2022
S4	01	Jeff Parks	Callie Andrews		Jeff Parks		May 20, 2022

GHD

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1. Introduction

The Goldboro Gold Project (the Project) is located approximately 175 kilometres (km) northeast of Halifax, 60 km southeast of Antigonish, and 1.6 km northeast of the community of Goldboro on the eastern shore of Isaacs Harbour, in Guysborough County, Nova Scotia (NS), Canada. Anaconda Mining Inc. (Anaconda) proposes to develop the Project as a 4,000-tonne per day (tpd) mine and processing facility. For the purposes of the environmental assessment underway for the Project, a Project Area (PA) was defined as the footprint of Project related infrastructure plus a buffer of 100 to 200 m. The Project includes two proposed open pits (East Pit and West Pit), an ore processing facility, a tailings management facility (TMF), three waste rock storage areas (WRSAs), overburden and organic material stockpiles, support buildings, and associated infrastructure. The anticipated mine life for extraction of ore is approximately 11 years.

The scope of the Project includes activities associated with construction, operation, and closure. Project construction activities will include clearing vegetation and grubbing the overburden, construction of organic material stockpiles, WRSAs, open pits, processing, and TMF areas, and construction of the initial lift of the TMF, plant site, secondary access roads, construction laydowns, Run-of-Mine (ROM) pad, surface water management and other Project infrastructure. The operation phase will include conventional ore extraction methods (drilling, blasting, loading, and hauling), ore processing, and waste management. ROM ore will go directly to the crusher while stockpiled high-grade and low-grade ore will be progressively processed throughout the mine life. Non-ore bearing waste rock, not used for construction or backfill, will be stockpiled at its final disposal point, managed, and reclaimed in place. The closure phase will include earthworks and demolition required to return the PA to a safe, stable, and vegetated state, and all monitoring and treatment, if required. Reclamation and Closure Plan requirements are governed by the NS *Mineral Resources Act*.

1.1 Reclamation Goals and Objectives

The goals for the Reclamation and Closure Plan (the Plan) are to return the physical, chemical, and biological qualities of the land and water regimes disturbed by mining and exploration activities to an acceptable state as determined by regulators. The success of the Plan will be defined by the PA being left in a state that will be safe, stable, and compatible with the surrounding landscape and final land use (rolling hills, mixed forest). Specifically, the goals are to:

– Mitigate impacts of the Project upon the PA or surrounding areas.
– As soon as possible, make the PA accessible to the local community and wildlife.
– Leave the PA in a similar ecological/environmental state than prior to commencement of the Project.
– Maintain as small of a Project footprint as possible to minimize the impact upon the local ecosystems.

The general objectives of the Plan are:

– Restoration of the land to a condition that meets pre-Project activity and is in keeping with the surrounding habitat that supports flora and fauna.
– Long-term, flexible, land-use options that benefit the regional and local economy and Crown landowner needs.
– Minimize visual impacts to or improve upon view planes that are in keeping with surrounding vistas, as applicable.
– Maintain the PA in a safe condition and remove potential hazards, such as sources of pollution, risks of fire, and unstable slopes that could affect public safety.
– Protect the environment against significant adverse effects and minimize impacts on adjoining lands from Project operations.

Several key objectives of the Plan are:

– Eliminate the need for active treatment of any effluent sources associated with the Project.
– Cap, contour the surface, and vegetate the TMF.

– Strategically establish 5H:1V slope “beachheads” around the rim of the open pits to provide safe egress options for wildlife.
– Cover and revegetate all exposed rock, soil, and organic surfaces, except for roads that are necessary to maintain key access points for long-term monitoring or to facilitate potential post-closure recreational and commercial uses.

1.2 Regulatory Requirements

The Plan will be designed to satisfy the requirements of the NS *Mineral Resources Act* and *Mineral Resources Regulations*, and the provisions of any approval granted to the Project with respect to reclamation.

The Guide for Surface Coal Mine Reclamation Plans (NSE 2009), the only guidance for reclamation in NS, provides general guidance on mine reclamation and key principles of reclamation that can be incorporated into the Project Plan are:

– Best practices in reclamation planning and management.
– Applied principles of ecological restoration.
– Compatibility in land use, land cover and landscape design.
– Public consultation and informed decision making.
– To source as much reclamation materials from the PA as possible, avoiding the trucking/transportation of materials wherever possible.

The Plan will be a living document that is updated throughout the Project to reflect changing conditions and input from regulators. Updates to the Plan are required to be submitted every three years or when there is a change in operations that will result in a departure from the Plan filed with the provincial regulators. A detailed final Plan will be made available for review and approval at least six months before the scheduled end of production (NS Reg 196/2018 75 (5))..

The Plan will be developed in consultation with the public stakeholders, Rightsholders, Community Liaison Committee, Nova Scotia Departments of Natural Resources & Renewables (NSDNRR) and Environment & Climate Change (NSECC). The Reclamation and Post-Closure Management Plans will be reviewed and approved by the appropriate regulatory agencies.

The Plan will incorporate programs to make the PA compatible with the surrounding area. The Post-Closure Management Plan will specify monitoring and maintenance measures for management of the decommissioned Project.

In addition to regulatory requirements, Signal Gold has committed to the preservation of selected roadways within the PA. In accordance with regulatory requirements, one of the elements of the Plan is to verify that all slopes are stable in the long term and that risks of failure are minimized. Slopes are created by rock and earth works through general mining activities that may include waste and stockpiles, pit slopes and walls, berms, and water control structures/dams. Over the long term these features must be stabilized to minimize the impacts of natural forces on the environment (i.e., rain, wind) thus reducing the potential for the effects of erosion and sedimentation to escape to the surrounding environment. Dynamic events such as earthquakes are not considered here due to the documented low risk of occurrence (NR Can 2015).

1.3 Conceptual Plan

The general concept for reclaiming the PA will be to remove all buildings, infrastructure, and facilities that can be dismantled. All other infrastructure including the open pits, WRSAs, and TMF (including ditching, settling ponds) will be contoured to blend with the natural landscape and revegetated. The TMF will be capped with a dry cover.

Re-sloping disturbed areas to 2.6H:1V slope or less is intended to create surface contours that blend into the surrounding terrain, flatten the landscape as much as possible to prevent erosion, and enable easy access by wildlife and humans.

The pits will be permitted to flood to 50.75 metres above sea level (masl), creating lakes with 5H:1V sloped shorelines built into the final design. Wetland habitat may establish itself on the pit rims over time. Other opportunities to develop wetland habitat onsite will be sought out during rehabilitation activities.

Removal of facilities and remediation of the PA, including revegetation, would require approximately two to three years from initiation of closure activities. Some trees may be planted to establish visual barriers, or assist with slope stabilization; however, the area will generally be allowed to reforest naturally.

Monitoring will be undertaken during reclamation and post-closure with maintenance and remedial action taken, as required, to ensure that the results of reclamation are sustainable.

2. Site History

Gold mineralization was first discovered in 1862 by Howard Richardson of the Geological Survey of Canada in quartz veins within the Isaac's Harbour anticline. The gold bearing Boston-Richardson Belt (slate and quartz) was subsequently discovered by Howard Richardson in 1892. The Richardson Gold Mining Company (Richardson Gold Mining) began production from the belt in 1893 at an average reported grade of 13.03 grams per tonne (g/t) gold milled. Milling recoveries were reported to be in the 50% to 60% range (Nordmin Engineering Ltd. [Nordmin] 2021).

From 1901 to 1905, three gold bearing belts were intersected in the Dolliver Mountain mine, located 2 km west of the Boston Richardson Mine. In 1904, 7,195 tonnes were milled at a grade of 0.87 g/t to produce 205 ounces (oz) of gold. In 1905, several bodies of quartz and slate were intersected by a 152 metres (m) deep drill hole at the bottom of the main shaft along the anticlinal axis, but results were unsatisfactory, and mining at Dolliver Mountain mine ceased (Nordmin 2021).

From 1909 to 1910, the West Goldbrook exploration shaft intersected five gold bearing belts. Three of these were mill tested, but the milling results were considered unsatisfactory, and the mine was abandoned (Nordmin 2021).

The total gold recovery from 1893 to 1910 has been estimated to be 376,303 tonnes at an average recovered gold grade of 4.11 g/t to produce 54,871 oz. However, mill recovery is reported to be approximately 67%. Operations at the mine continued on a small scale in 1911 and 1912 (Nordmin 2021).

In 1981, Patino Mines (Québec) Ltd. completed a geophysical program covering the Upper Seal Harbour district. In 1984, Onitap Resources Inc. (Onitap) acquired 37 claims. Between 1984 and 1988, Onitap conducted diamond drilling programs, airborne Very Low Frequency Electromagnetic (VLF-EM) surveys, and surface Induced Polarization surveys. During this period, several new mineralized belts were discovered (Nordmin 2021).

Orex Exploration Inc. (Orex) acquired the exploration licences from Onitap in 1988. Excepting a period of inactivity from 1996 to 2004, Orex pursued both surface and underground exploration programs, including large amounts of core drilling, metallurgical testing programs, resource estimation programs, and economic assessments (Nordmin 2021).

Osisko Mining Corporation, under the terms of an agreement with Orex, carried out an extensive core drilling assessment during the 2010 to 2012 period (Nordmin 2021).

In March of 2017, Anaconda Mining Inc (Anaconda) acquired control of the exploration licences under the terms of a court approved Plan of Arrangement whereby Orex became a wholly owned subsidiary of the Anaconda. Work programs carried out in all years since 2017 to 2021 by Anaconda primarily focused on expansion and infill drilling of the Goldboro Gold Deposit as well as conducting an underground bulk sample in 2018. Anaconda changed its name to Signal Gold Inc in May 2022.

Historic underground mine workings from these programs remain within the PA. Many entrances to old underground workings and caved portions of the surface overlying these workings have been backfilled or otherwise sealed and should, therefore, not present a risk to animals and humans; however there are also many “Open Hole” warning signs posted throughout the PA. Signal Gold had received an indemnification letter from the Province of Nova Scotia releasing the Company from any liabilities related to the past mining and milling activities if those areas that are not disturbed with new or proposed activities.

3. Baseline Conditions

3.1 PA Features

Goldbrook Road passes directly through the PA and connects to a network of unpaved resource roads that are used by the public to access to a large parcel of crown land. The land beyond the PA is used locally for hunting, fishing, and other recreational activities. The road is also used by Port Hawkesbury Paper as a means for reaching their timber claims.

The PA appears to be typical for the region in the sense of ecological appearance, with the local area being made up of a mix of scrubby brush (alders/ cherry trees), boggy/swamp areas, and young (<50 years) forest consisting of spruce, fir, and birch over glacial till 3-10 n thick and with rare bedrockexposures.

3.2 Existing Infrastructure

Goldbrook Road, the access roads to the existing core shack and power lines are the only surface infrastructure present within the current limits of the PA. All existing roads will require partial clearing, minor granular refilling, culvert additions and/or repairs, and to be levelled with a grader. The existing core shack will be removed, as the current location is within the proposed open pit area.

A natural gas pipeline, cathodic protection, and corresponding easement are located near Goldbrook Road and the western side of the Project. The pipeline extends adjacent to the PA to access a pumping station at the end of the existing road. All Project infrastructure must be constructed outside of this right of way.

3.3 Historic Tailings

Records indicate that a large portion of the material brought to the surface from the historic underground workings was milled at the Goldboro. More than 385,000 tonnes of ore are reported to have been crushed from 1893 to 1912 in a stamp mill capable of production rates of up to 1,800 tonnes per month.

Early gold production was mainly through mercury (Hg) amalgamation (Parsons et al, 2012). Gold concentrate was obtained by gravity methods using Wilfley tables until 1906, after which a bromo-cyanide plant was built. The continued use of gravity methods thereafter is uncertain.

The mill produced more than 1,700 kg of gold. Records also show that at least 775 tonnes of arsenical concentrate were produced for shipment to Belgium and Wales.

Old foundations suggest the principal mill building was located immediately west of Gold Brook Lake, north of Gold Brook Road. The presence of another mill is suggested, based on the location of the tailings area, to the south of Goldbrook Road and Gold Brook Lake. The locations of past waste rock storage and ore storage areas are unknown.

Historically, tailings were deposited into streams and wetland areas with no provisions for containment or control of leachates. Consequently, tailings migrated along Gold Brook. Stream water samples collected downstream of the southernmost historic tailings areas have shown elevated levels of arsenic (As) and iron. The PA has been subject to numerous, well documented research activities. Sampling by the Geological Survey of Canada (Parsons et al. 2012)

showed elevated As and Hg levels within tailings of the Upper Seal Harbour area. Elevated As and Hg are also present along Gold Brook where tailings from mill processing from 1893 to 1912 were deposited within or adjacent to natural watercourses. The Hg amalgamation noted for gold recovery led to Hg enrichment within the tailings.

Other areas that may be subject to continued effects from past activities include the old mill sites and unidentified waste rock and ore storage sites. These are areas where leachate may have infiltrated into the bedrock although water analyses, such as those taken in Gold Brook Lake, show no evidence of such effects.

A Limited Phase I and Phase II Environmental Site Assessment (ESA) has demonstrated tailings have been deposited by historic mining operations in the vicinity of Gold Brook Lake and Gold Brook. The ESA was conducted to characterize environmental contamination remaining from historical mining activity in the area. The purpose of this characterization was to ensure proper management of elevated metal concentrations and the potential surface water and groundwater impacts associated with disturbing historic tailings.

The Phase I ESA consisted of a records review, site visit observations, an evaluation of information available from previous site work, and a screening of known areas of historic tailings within the area of Upper Seal Harbour. The Phase II ESA included an estimate of the spatial extent and volume of material that exists within the footprint that will require handling or treatment, as well as collection of surface soils samples from five previously identified historic tailings areas and review of analytical data. Concentrations of arsenic, selenium, and zinc in exceedance of the NS Tier 1 Environmental Quality Standards (EQS) were present in the historic tailing areas assessed.

Five historic tailings areas are likely to be disturbed by proposed Project activities and will require remedial action prior to Project development. A Historic Tailings Management Plan (GHD 2022a) has been developed to manage both direct and indirect impacts to areas of historic tailings. All historic tailings disturbed by the development of the Project will be excavated and disposed of in the TMF. Surface water and groundwater in the vicinity of the historic tailings areas is proposed to be monitored over the duration of the Project as detailed in the Water Monitoring Plan (GHD 2002g).

3.4 Soil Descriptions

The PA is primarily underlain by Danesville and Halifax soils, with Aspotogan and Peat soils in the eastern and western extents of the PA. Danesville soils, derived from sandy loam quarzitic till, are found on gentle to moderately undulating topography, and provide imperfect drainage and are extremely stony and shallow. This soil is unsuitable for agriculture and generally supports forested land use. Halifax series soils are found on gently undulating to hilly topography, are well drained, and support fair to good stands of mixed forest. Aspotogan soils are similar in nature to the Danesville series except the topography is more level and drainage is poor. This series is comprised of medium and moderately coarse-textured glacial tills derived from granite or quartzite materials (Hilchey et al., 1964). Regionally, significant peat deposits have developed in poorly drained topographic depressions located on the northwest shore of Gold Brook Lake, to the west and east of the PA, and within the flood plain of Gold Brook.

In general, the surficial geology of the PA is composed of stony till material originating from the underlying area bedrock. This material is described as a cobbly, silty sand till with frequent cobbles and boulders. The till is typically very sandy and can contain pebble to cobble sized clasts. Up to 95% of these clasts are the product of local erosion events. With increasing proximity to the coastline, the sand component of the till decreases and the silt content increases. Silt and clay content of the till typically increases with depth. Depth to bedrock from the surface has been reported to be between 1 and 7 metres. Bedrock outcrops are rarely observed (Orex, 1990).

3.5 Material Characterization

Geochemical characterization aims to understand the potential for and effects of metal leaching and acid rock drainage (ML/ARD) that result from the exposure of sulphide minerals contained in geologic materials (i.e., waste rock, ore, tailings, and overburden) during the construction and operation of the Project. A preliminary ML/ARD investigation was conducted in 2017 in which 86 samples were submitted for static test analysis. Building on this information, a comprehensive geochemical baseline program was initiated in 2020 considering the current open pit dimensions and

associated sampling gaps. During the 2020 sampling program, 229 samples comprising different material types were collected and analyzed for geochemical parameters (Acid Based Accounting, Solid Phase Metals, Net Acid Generating, pH, Shake Flask Extraction.

Total sulphur contents contributing to the acid potential (AP) of the materials and neutralization potential (NP) were found to be relatively low across the deposit with median values for waste rock being 0.05% S and 9.1 kg $CaCO_3$/t, respectively. Operationally, the distinction and quantification of potentially acid generating (PAG) and non-PAG (NPAG) material is important for mine planning since the exposure of PAG mine rock or tailings is expected to have negative impacts on contact water quality. The ARD characteristics of Project geologic materials was defined through the Net Potential Ratio (NPR = NP/AP) as follows:

– PAG1 – NPR < 1 or 1 ≤ NPR ≤ 2 and total S ≥ 0.2 wt. %
– PAG2 – 1 ≤ NPR ≤ 2 and total S < 0.2 wt. %
– NPAG – NPR > 2

According to this classification, PAG (PAG1 and PAG2) proportions were calculated to amount to 38%, 93%, and 100% for waste rock, ore, and tailings, respectively. There is no significant geochemical trend with respect to PAG proportions across the different lithological units. Solid phase Ca/S ratios provide a good surrogate for NPR and, as a result, PAG tonnages were derived via geologic block modelling using the full exploration assay database. These tonnages were used for the development of contact water chemistry predictions (source terms) and ML/ARD management strategies (Lorax 2022).

To date, pH in kinetic test leachates from waste rock, ore, and tailings samples have remained circumneutral. Under these conditions, release rates of sulphate and most pH-sensitive metals are relatively low in waste rock and ore. Tailings are an exception where fine grain size and residual mill process reagents cause elevated concentrations of multiple species including sulphate, cyanide, iron, copper, and cobalt. Arsenic is enriched across the Deposit and is expected to be mobile under a range of geochemical conditions including neutral pH. In waste rock and ore, arsenic was found to be primarily hosted in arsenopyrite which is susceptible to dissolution under toxic conditions. Long-term pH and its effects on metal leaching rates is being investigated through ongoing testing (Lorax 2022).

Geochemical source terms were developed for contact water associated with the different Project facilities. Predictions are based on the geochemical characteristics of mine rock and tailings assessed through scaled static and kinetic experiments described above as well as analogue data. Modelled Project facilities include the WRSA, pit walls, TMF embankments and contact water, and overburden stockpiles (soil and till).

Geochemical source terms and the resulting water quality model results were used to inform material handling and water management/treatment strategies to minimize the water quality impacts on the receiving environment. Briefly, all PAG1 waste rock will be co-deposited and ultimately submerged in the TMF to inhibit sulphide oxidation and the onset of ARD from these materials. Similarly, a water cover will be maintained over the tailings throughout operations for the same purpose. At closure, the TMF water cover will be drained and replaced with a soil cover to shield tailings beaches from contact with the atmosphere. PAG2 waste rock produced during the life of mine was identified through geologic block modelling to be minor in tonnage (<1 Mt) and will be interlayered operationally with NPAG waste rock in the various WRSAs such that ARD from these facilities is prevented. The exposure time of PAG rock in the pit walls will be minimized via accelerated pit filling at closure (Lorax 2022).

3.6 Ecological Context

3.6.1 Wetlands

A total of 222 freshwater wetlands are present within the PA, totaling 329 ha and representing a land cover of 27%. Delineated wetlands range in size from 0.01 ha to 72.5 ha and are predominantly soft or mixedwood treed wetlands. Various wetlands within the PA have been subject to historic anthropogenic disturbances, most notably historic mining activities (e.g., setting ponds, waste rock), timber harvesting, associated road networks and cutlines. However, many wetlands are largely intact and were observed to retain natural functions. Several wetlands continue beyond the

boundary of the PA and thus the area noted do not reflect the full extent of some wetlands. Impacts to wetland habitat will be required for the development of Project infrastructure. Through the Alternatives Assessment process, the Project design and infrastructure layout has been revised to reduce impacts to wetlands, while considering other valued components, engineering constraints, regulatory requirements, etc. Specifically, additional consideration and all reasonable attempts to avoid species at risk (SAR) occurrences and associated wetlands were made (GHD 2022h).

To mitigate and reduce overall loss of wetland habitat and function, the following actions will be implemented within wetlands where direct impacts and potential indirect impacts to wetland habitat are expected:

– Ensure all wetlands are visually delineated (i.e., flagged).
– Acquire and adhere to wetland alteration approvals prior to alteration of any wetland habitat.
– Complete detailed design of road alignments and culvert to maintain flow and avoid or minimize impacts.
– Leave buffers or revegetate disturbed slopes adjacent to wetlands to limit erosion and sediment release.
– Develop and implement an Erosion and Sediment Control Plan.
– Direct runoff through natural vegetation, wherever practicable.
– Ensure contractors and site personnel are aware of wetland locations and avoid all activities within wetland boundaries during Project construction, operations, and closure.

Wetland alteration permits that specify any timing windows in which alterations are permitted will be approved by NSECC. Signal Gold will adhere to site specific conditions of that approval. A Wetland Monitoring Plan for partially altered and potentially indirectly impacted wetlands has been developed for all phases of the Project. The effectiveness of mitigation measures will be confirmed through monitoring requirements.

Signal Gold is committed to engaging in wetland compensation activities for permanent wetland loss associated with the Project as required by the provincial wetland alteration process. A preliminary Wetland Compensation Plan has been developed and with proposed wetland compensation options to offset wetland losses required to support the Project. The plan will be refined through the life cycle of the permitting process. Local compensation opportunities will be targeted whenever practicable. The plan outlines the preliminary identification of primary and secondary compensation projects, which are already underway with the goal of identifying viable opportunities prior to Project construction. Three sites have been reviewed for primary compensation opportunities, two of which are bogs located locally in Port Bickerton (approximately 8 km southwest of the PA). It is expected that 40-60 ha of each of the Port Bickerton sites have been anthropologically disturbed and presently exist in an unnatural state through historic peat harvesting and heavy ATV use. Three additional secondary compensation opportunities have also been identified to support provincial wetland research and assessment advancement (GHD 202h).

3.6.2 Aquatic Habitat

Watercourses within the PA have habitat ranging from flats to rapids. The dominant habitat type watercourse within the Project is riffle, runs, and flats with the presence of pools in a handful of watercourses. Substrate within watercourses consists of primarily muck/detritus or boulder, however some systems are characterized by rubble and cobble substrate. Gravel, sand, and silt substrate is generally lacking in aquatic habitats within the PA. The habitats present within Gold Brook Lake and associated watercourses within the PA support various life history stages of the fish species identified. Species observed within the PA include yellow perch, American eel, brook trout, golden shiner, banded killifish, and blacknose dace.

Priority species observed within the PA include the American eel and brook trout. American eel is listed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Threatened and by the Atlantic Canada Conservation Data Centre (ACCDC) as Vulnerable; however, this species is not currently listed under provincial or federal endangered species legislation. Brook trout is assessed by the ACCDC as Vulnerable. The PA is within the Southern Uplands designated unit for Atlantic salmon; however, it is not expected that Atlantic salmon are present within this watershed (Salmon Atlas, n.d.). Multi-season surveys did not result in detection of Atlantic salmon; furthermore, preferred habitat for Atlantic salmon is generally lacking throughout the PA. Fisheries and Oceans Canada (DFO)

states that freshwater habitat for Atlantic salmon should be composed of “clear, cold, fast-moving water with a gravel bottom for spawning and rocky areas for juvenile fish. Salmon are often found in pools that offer protection from predators and warm temperatures and where water flow conditions enable them to rest”. Although fast water (runs, rapids, and falls) is present in a few watercourses within the Project, the substrate is not conducive to Atlantic salmon and eDNA testing has shown that salmon are not present in this system. DFO also states that Atlantic salmon fry have a significant mortality rate when pH is below 5.4 and smolts have a significant mortality rate below 5.0. Approximately half of the streams within the PA have pH recorded below 5.4 (Nordmin 2021).

3.6.3 Habitat and Flora

The Project lies in two Ecodistricts – the Eastern Interior and the Eastern Shore. These Ecodistricts are within the Eastern and Atlantic Coastal Ecoregion, respectively. In general, the Project is primarily disturbed by historical and current mining activities and timber harvesting. Soils are generally nutrient poor and acidic which supports softwood stand types such as spruce and balsam fir. Areas located in the southern PA and in close proximity to Gold Brook generally consist of mature undisturbed conifer dominant stands.

Considering the size of the PA, vascular plant, and bryophyte diversity is low with a total of approximately 179 species observed. Five priority vascular plant species were observed in the PA including northern comandra, Wiegdand’s sedge, variegated scouring rush, Nova Scotia agalinis and southern twayblade. The majority of these species, with the exception of variegated scouring rush, were found in the wetland habitat.

No rare or uncommon vegetation communities were identified within the PA and therefore, none are expected to be directly impacted. The Project landscape primarily consists of cutovers, regenerative, and mature softwood stands. Rare plants and lichens will be avoided where practicable.

The lichen community consisted primarily of species associated with mature conifer and hardwood stands, as well as lichens usually observed along trails, clearings, and open woodlands. Seven priority lichen species were observed which include two species at risk: blue felt lichen and frosted glass whiskers and five Species of Conservation Concern (SOCI): slender monk’s hood lichen, corrugated shingles lichen, shingle lichen, appressed jellyskin lichen and peppered moon lichen (GHD 2022h).

3.6.4 Fauna and Birds

The PA is located within a mainland moose concentration area. Mainland moose were the only priority terrestrial fauna species observed as having used areas in the surveys. Moose are associated with mature coniferous and deciduous forests and require large tracts of forest for shelter, thermoregulation, and foraging.

All potential bat hibernacula were visited during the field surveys and no bats were observed. Although, a potential bat roosting area was observed in a core shack in 2017, no evidence of this was observed in the subsequent surveys. No snapping turtles were observed, but potential overwintering and nesting habitat was observed within the PA.

Observations of general wildlife species were observed incidentally within the PA during biophysical surveys. All identified species are common, widespread, and abundant in the province and are expected given the habitat and geographic location of the PA.

One SAR species (evening grosbeak) and nine SOCI species (black-backed woodpecker, blackpoll warbler, boreal chickadee, gray jay, pine siskin, red-breasted nuthatch, ruby-crowned kinglet, Swainson’s thrush, and yellow-bellied flycatcher) were observed during the spring migration surveys.

Three SAR species (Canada warbler, wood thrush and olive-sided flycatcher) and 11 SOCI species (boreal chickadee, fox sparrow, gray jay, greater yellowlegs, northern harrier, red-breasted nuthatch, ruby-crowned kinglet, spotted sandpiper, Swainson’s thrush, Wilson’s warbler, and yellow-bellied flycatcher were observed during the breeding bird surveys.

Eight SOCI species (American kestrel, bay-breasted warbler, boreal chickadee, gray jay, gray catbird, red-breasted nuthatch, ruby-crowned kinglet, and turkey vulture) were observed during the fall migration surveys.

Boreal owl, great-horned owl and northern saw-whet owl have been observed in the PA during 2017 surveys but not during 2021 surveys. Despite the habitat being present, common nighthawks were not observed in surveys (GHD 2022h).

4. Project Infrastructure

The location of the planned infrastructure is preliminary and based on information from site visits and existing geographic data that includes field delineated wetlands, watercourses, and roads and as then developed as part of Project's Feasibility Study (Nordmin 2021). Actual infrastructure siting was determined at the detailed design stage. Figure A1 shows the general mine arrangement for the Project.

4.1 Buildings and Facilities

The mine and process facilities will include the following:

- Process plant
- Truck shop / wash facility
- Fuel storage facility
- Propane storage facility
- Explosive storage magazine
- Emulsion transfer tank
- Warehouse and laydown areas
- General office building
- Plant office building
- Mine dry building
- Core storage and core yard
- Emergency response transport (ERT) facility
- Helipad
- Hazardous waste storage facility
- Employee accommodations
- Wastewater treatment plants
- Potable water treatment plant

The main operational and support buildings are located on a prepared granular pad, northwest of the West Pit, outside of the 500 m buffer zone for blasting. The section of land gently slopes uphill to the west. The process plant, specifically the conveyor next to the ROM stockpile, are closest to the West Pit. These buildings are intended to be pre-engineered steel structures. Preliminary geotechnical recommendations indicate that the soil in this area is a compacted till with fines. At the time of this report geotechnical recommendations advise that the ancillary buildings may be founded on conventional spread footings placed at a depth great enough to avoid frost heave (Nordmin 2021).

4.2 Road Network

Haulage roads will be built to withstand frequent heavy traffic between the open pits, ROM stockpile and TMF. The roads will be wide enough to accommodate two haul trucks passing between the pits and ROM stockpile at 16.5 m with a grade no greater than 10%. The road to and from the TMF will be 11 m wide for one-way traffic by haul trucks.

Service roads other than those used by haul trucks can be approximately 8 m wide and less resistant to heavy loads. The location of the new buildings and infrastructure areas were selected to maximize the use of the existing Goldbrook Road and other access roads within the PA. The current layout of Goldbrook Road will intercept the proposed open pit and will therefore be realigned and offset at least 30 m from the open pits. Approximately 510 m of Goldbrook Road will require widening, including clearing and grubbing, grading, and granular refilling. An estimated 3,200 m of roads will also be required within the PA. In addition, an estimated 5,500 m of new public access roads will also be constructed to maintain public access to the adjacent areas beyond the PA.

4.3 Power Supply and Distribution

Power for the Project will be provided from a nearby Nova Scotia Power 25 kV distribution line installed along Highway 316. A 1.6 km tap line would be installed along a new right of way to the mill area main substation. Nova Scotia Power Inc. (NSPI) would upgrade their existing distribution system as necessary to be able to provide the additional power required. The construction of the distribution line is the responsibility of NSPI and NSPI will obtain all necessary approvals and permits. Signal Gold will be responsible for obtaining any easements or licenses required for right of way construction. Peak power demand for the Project is estimated to be 10 MW, with the average demand estimated to be 7.5 MW. A network of 13.8 kV overhead distribution lines would be installed in the PA to provide power sourced from the main substation.

4.4 Petroleum Storage Facilities

A cardlock diesel fuel station will be installed in the mill area to refuel haul trucks and other mining equipment. The station will be located just off the main haul road, near the truck shop. The station will consist of two 100,000 L fuel storage tanks, each outfitted with high flow suction dispensers, fuel cardlock system, and environmental monitoring system. In addition to the leak detection instruments that make up the environmental monitoring system, the dispensing data can be used to reconcile fuel consumption with the delivery quantities and the fill level of the tank to ensure no fuel is unaccounted for. The maximum safe capacity of the storage tanks will allow for 190,000 L of diesel fuel to be stored.

A storage and distribution system for liquefied petroleum gas (LPG) will be required to provide heating fuel for the surface infrastructure and process buildings, as well as provide fuel to the process plant for the operation of the furnace and kiln in the gold room and carbon elution areas. A 68,137 L LPG storage tank will be installed. LPG will be distributed from the storage tank to the buildings via buried piping. Vaporizers will be located near the buildings to supply propane gas to the equipment.

4.5 Open Pits

Two open pits will be developed south of Gold Brook Lake. Conventional open pit mining methods will be used to extract a portion of the deposit. This method was selected considering the deposit’s size, shape, orientation, and proximity to the surface. Drilling, blasting, loading, and hauling will be used to mine the open pit material within the designed pit to meet the mine production schedule. A pit design (Figure 1) was created using the pit limit analysis pit shell as a guide and slope design parameters. The dimensions of the pits are: East 775 m by 410 m by 190 m deep and West 1,025 m by 520 m by 250 m deep. The pit entrances are on the south side of each pit.

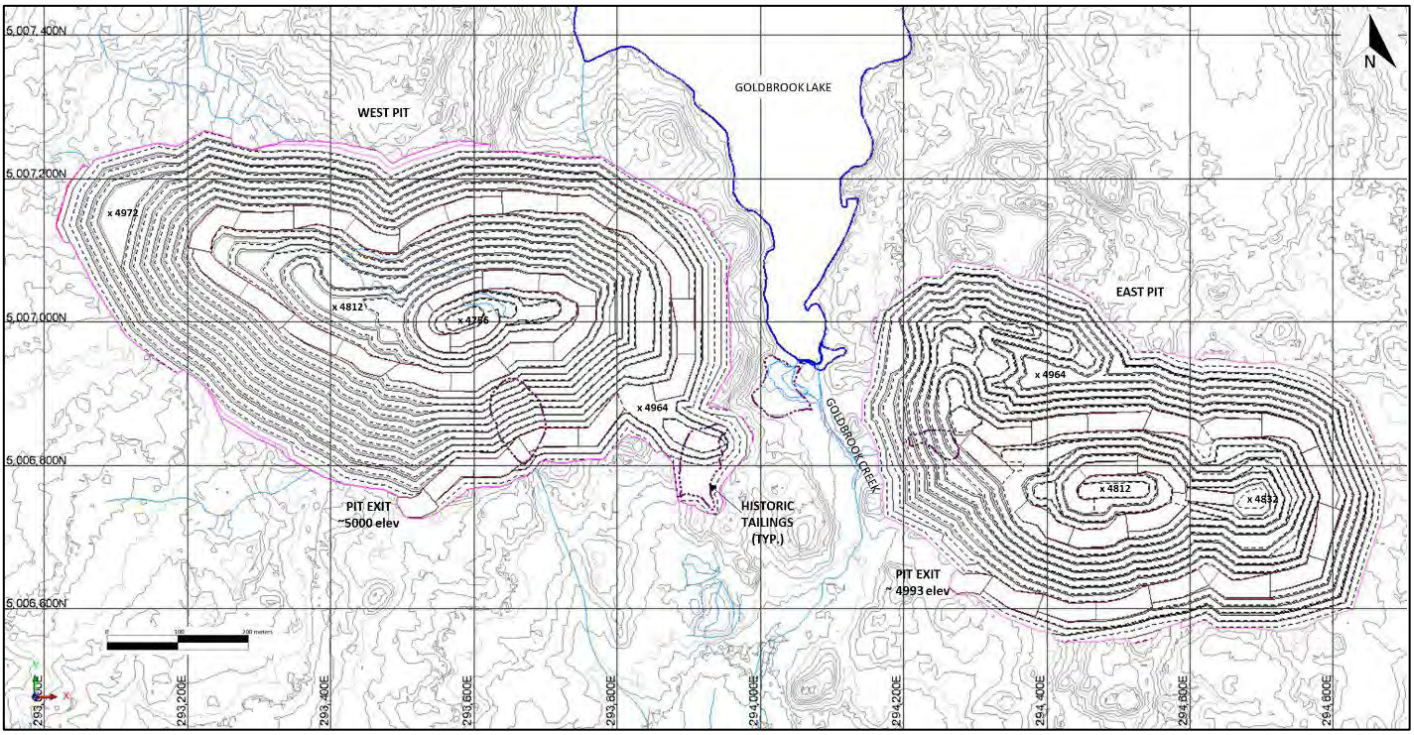

Figure 1 Ultimate pit design (Nordmin 2021)

4.6 Waste Rock Storage Areas

Waste rock generated from the open pits will require the development of WRSAs. The waste generated from the open pit includes waste rock, till, historical tailings, and topsoil and organics.

The proposed mine plan will generate approximately 126.8 million tonnes of waste material, which includes overburden. Assuming a swell factor of 30%, a volume of 61.7 million m^3 of waste storage is required. The stockpile size requirements are provided in Table 1. The storage capacity has been designed to accommodate waste rock generated from the open pit operations.

Table 1 Material Stockpile Storage Capacities

Area	Description	Volume (M m^3)	Top Elevation (m)
NW WRSA	Material from West Pit, Year 4 to Year 8	11.5	150
NE WRSA	Material from East Pit, Years 5 to 8	6.3	145
SE WRSA	Material from East and West Pits, Year -1 to 5	14.3	165
East Pit Backfill	Waste material from West Pit, Year 8 to Year 11 (following completion of East Pit)	10.1	N/A
NE Till	Till from East & West Pits, Year -1 to Year 3	2.8	110
SW Till	Till from East & West Pits, Year 2 to Year 7	1.8	95
Organics	Organics Material to Organic Material Stockpiles	0.5	N/A

The WRSAs are located in proximity to the mining areas to minimize waste haulage distances. To prepare the area, topsoil is removed and stockpiled in an organic material stockpile area for long term storage and later use during reclamation. The foundation is prepared to address any geotechnical concerns. Waste rock is then end dumped from the haul trucks forming lifts. Trucks dump near, but at a safe distance from, the edge of the lift. Lifts will be constructed

such that the final WRSAs have an overall slope angle that does not require rework at closure (< 27 degrees in design), thus reducing reclamation costs.

Waste rock labelled PAG1 is to be deposited in the TMF, co-placed with tailings. Historic Tailings mined within the footprint of the pits is to be deposited in the TMF.

NPAG waste rock, waste rock labelled PAG2, and till overburden are designed to be deposited in the WRSAs (NE, SE, NW). The NE and SW WRSAs are currently designed to be segregated till stockpiles.

Where possible, waste rock material would be used in road construction, pad construction, and tailings embankment, thus reducing the footprint required for the WRSAs.

Design footprints for the WRSAs will be optimized in detailed design phase to balance among other things, open pit haulage times and environmental objectives.

4.7 Tailings Management Facility and Polishing Pond

The TMF will be constructed as a paddock style, single cell facility located on a side hill northeast of Gold Brook Lake (Figure 2). Co-disposal will include management of both 16.2 million tonnes of PAG tailings and 10.5 million tonnes PAG1 waste rock in the TMF. Historic Tailings excavated within the footprint of the open pits will also be deposited in the TMF. Tailings and PAG1 waste rock would be transported to the TMF independently and placed in separate locations within the fully lined TMF basin (i.e., co-placement). Following placement, the PAG1 waste rock will become inundated with ongoing thickened tailings slurry deposition and tailings supernatant water. This will maintain both the tailings and the PAG1 waste rock below a water cover and in a saturated state. Maintaining these PAG1 waste materials below the long-term phreatic surface within the TMF will prevent the onset of ARD conditions and help reduce ML from the material.

The TMF embankments will be constructed using NPAG waste rock from mining operations. The embankment will be constructed of zoned earth-fill and rockfill with a geosynthetic lining system installed along the TMF basin floor and on the upstream face of the perimeter embankments to minimize seepage exiting the facility. Transition/filter zones will be established between the liner and the embankment rockfill to ensure internal stability. The downstream slopes will be 2.5H:1V. The upstream slopes will be 2.5H:1V with 3 m of the previous stage’s crest left as a bench when the next stage is constructed, to facilitate and tie-in the geomembrane liner, resulting in an overall slope for the ultimate embankment of 2.8H:1V. The crest width will be 15 m and the maximum embankment height above original ground is approximately 49 m.

A seepage collection system, consisting of drains and sumps, will be installed in the foundation along the upstream toe of the TMF embankment to collect potential seepage below the embankment and route it to the nearest downstream seepage collection sump, located adjacent to the downstream toe of the embankment. Seepage will be transferred back into the TMF using a pump-back system.

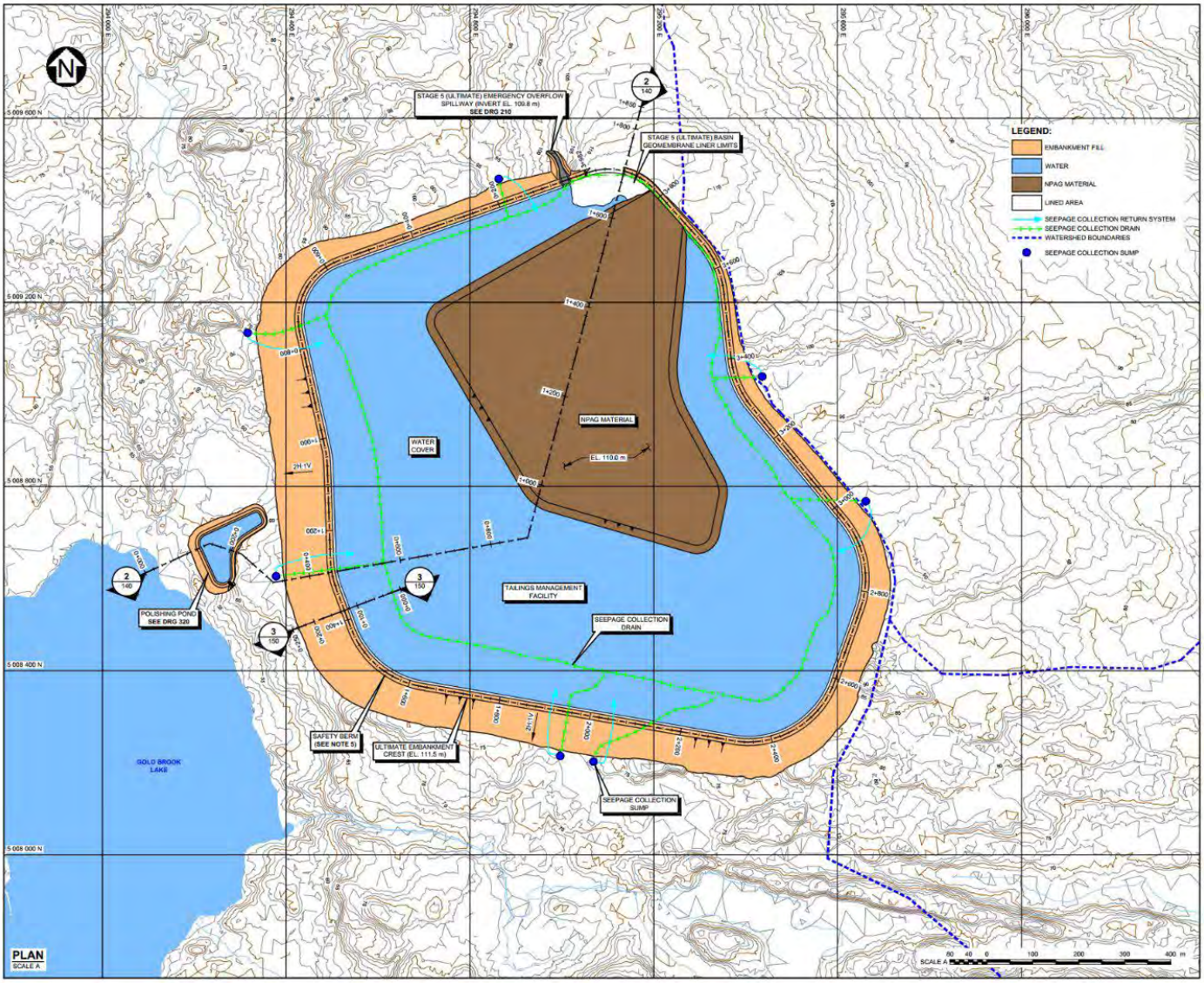

Figure 2 TMF – General arrangement – ultimate facility (Nordmin 2021)

A polishing pond, designed to store approximately 20,000 m^3 of water, will be constructed southwest of the TMF to store water for the TMF Water Treatment Plant (WTP) operations. The capacity is equivalent to roughly four days of TMF WTP discharge capacity plus contingency capacity.

The polishing pond embankment will be constructed in one stage as zoned rockfill dam. The bulk fill within the embankment will consist of NPAG material, sourced from the open pits. The zoned embankment will be constructed with filter graded materials consisting of a liner bedding layer and one filter/transition zone (processed mine rock). The downstream slopes will be 2.25H:1V. The upstream slopes will be 2.5H:1V. The crest width will be 6 m and the maximum embankment height above original ground is 6.5 m.

4.8 Water Management Facilities

Water management infrastructure will include water treatment systems, collection ditches, settling ponds, a freshwater distribution network, dewatering pumps for the East and West Pits, and a sewage system.

The conceptual TMF Water Treatment System (WTS) designed for the Project to remove residual cyanide compounds through an oxidation process, metal precipitation through a high-density sludge (HDS) process, and biological nitrification/denitrification to address ammonia, nitrate and nitrite exceedances.

The effluent of the conceptual TMF WTS will be stored in a line polishing pond for further clarification before discharging into Gold Brook Lake. The polishing pond has been designed to store approximately 20,000 m^3 of water, which is equivalent to roughly four days of TMF WTS discharge capacity plus some extra capacity contingency. The polishing pond embankment will be constructed in one stage as a zoned rockfill dam. The bulk fill within the embankment will consist of NPAG material, sourced from the open pits. The zoned embankment will be constructed with filter graded materials consisting of a liner bedding layer and one filter/transition zone (processed mine rock) (GHD 2022h).

The surface water ditches include contact water ditches, which collect runoff from all mine infrastructure, and clean water ditches. Clean water (e.g., runoff from the outside TMF embankment) will be collected from areas that do not come in contact with mine waste. Clean surface water ditches will collect storm water runoff from the TMF embankment, which will be constructed from NPAG rockfill, and direct it away from the PA. Culverts will be dispersed throughout the PA to convey stormwater below mine infrastructure (i.e., haul roads). The contact water ditches drain to one of five settling ponds located across the PA.

Contact water ditches will be lined with a HDPE liner, underlain by geotextile, followed by a layer of sand and a layer of riprap to prevent infiltration of stormwater into the surficial groundwater and protect the ditch from erosion. The outlet of the effluent ditch into the receiving watercourse will be lined with an HDPE liner followed by a layer of sand and a layer of riprap to prevent erosion.

Five settling ponds will be constructed to collect and treat contact water prior to discharging to Gold Brook Lake and Gold Brook. Settling ponds will be constructed during the construction phase prior to WRSA development. Ponds will continue to be constructed during the operations phase when new WRSAs and stockpiles are constructed.

The progressive development of the open pits will result in increasing water infiltration from precipitation and groundwater inflows. As the pit deepens and increases in footprint, it will be necessary to control water inflow through construction of in-pit dewatering systems such as drainage ditches, sumps, pipelines, and pumps.

A transmission watermain from Gold Brook Lake to the process plant buildings will provide a freshwater source to support process operations and potable water, hence the watermain was estimated based on the potable and process water demands.

Two separate wastewater treatment plants will service the employee accommodations and mill area. Two containerized sewage wastewater treatment units will be installed. Treated wastewater from the employee accommodations wastewater treatment plant will be directed to the southwest settling pond. The mill area wastewater treatment plant will discharge to the central settling pond (GHD 2022h).

5. Progressive Reclamation Activities

Progressive reclamation activities will be undertaken wherever possible throughout the life of the Project with the goal of minimizing the overall active footprint at any given time.

During operations, the WRSAs will be progressively reclaimed to closure configuration through resloping so at closure this activity will be complete. Monitoring of vegetative growth on reworked slopes during operations will help to improve methodologies of plantings, soil thickness, fertilizing, erosion resistance that are specific to the microclimate of the PA.

Areas of the open pit rims may be sloped to closure requirements during pit development if not required specifically for mining or safety factors during mining. Shallow shorelines will be developed and recapped with appropriate materials and revegetated as necessary (*e.g.* above the “waterline”). During the final years of mining, resloping of the TMF and

Polishing Pond may begin to reduce rehandling of the waste rock required for the task. Revegetation trials will begin in the final year of operation and native vegetation species selection will be based on the results of other Project-related revegetation trials. Suitable species for revegetation could be derived from the NS Ecological Land Classification, NS Forest Ecosystem Classification, and surveys of other disturbances in the PA, and in consultation with the appropriate federal and provincial agencies. The outlet structure of the Polishing Pond will remain accessible for water sampling and monitoring.

6. Decommissioning Project Infrastructure

Decommissioning activities must be compliant with all applicable federal, provincial, and local regulations. The Final Reclamation and Closure Plan will contain a decommissioning and demolition assessment for the Project.

Figure A2 shows the conceptual plan for the reclaimed PA.

6.1 Buildings and Built Infrastructure

All buildings and built infrastructure used throughout the Project will be dismantled/removed except for those deemed necessary for the continual long-term monitoring of the condition or those left behind in agreement with the community's long-term aims for the PA.

6.1.1 Environmental Site Assessment Plan

An Environmental Site Assessment (ESA) will be conducted prior to the start of demolition and other reclamation activities to assess the potential for contamination associated with the storage and use of chemicals, petroleum, and other materials that are regulated under provincial and federal legislation. The ESA will identify areas where remediation of impacts soils is required. A New Glasgow based facility has been identified as a suitable hazardous waste disposal site for any concrete, soil, or equipment that has been contaminated with fuel, oils, or other chemicals.

6.1.2 Removal of Buildings and Process Structures

All buildings and stationary equipment no longer required at closure will be dismantled and will be resold, salvaged, or disposed of in an approved construction debris landfill. All equipment and pipelines in the process plant will be disconnected, drained, and cleaned to ensure all hazardous chemicals are removed.

All foundations and concrete slabs remaining from decommissioned structures, made from inert materials such as concrete, will be broken up and buried in place. Any broken concrete or complete foundations (below 0.5 m grade) left, will be buried a minimum of 0.5 m below the final site grade. Before burial, any remaining exposed rebar, that has a potential to protrude through the completed backfill, will be cut off level with the remaining concrete. Concrete that is considered as contaminated (*e.g.*, process plant, truck shop) will be trucked to an approved hazardous waste disposal site.

6.1.3 Site Security

When travelling to the PA via Goldbrook Road, personnel will report in at the security checkpoint located approximately 1.5 km from the Route 316 turn off. A security office and guardhouse will be located near the employee accommodations area which will restrict the general public's access to the haul roads and pit areas. This structure will have offices for security guards and a security system for monitoring personnel coming to and leaving site. The security structure will be staffed continuously. Perimeter fencing will be built around the infrastructure area, explosive storage areas and other sensitive areas as required.

During the closure activities phase the security detail will continue to staff the guardhouse and conduct routine site inspections. Additional security measures will be required that may include gates on access roads to open pits and the TMF to prevent public access, and signage that details risks to the public related to open pits and the tailings dam.

Fencing will be removed as areas of the PA become safe and stable.

6.1.4 Petroleum Storage and Hazardous Materials

Petroleum storage tanks have the potential to impact the environment with products leaking from a storage tank system. All petroleum tanks must be properly decommissioned prior to or in conjunction with demolition. All petroleum storage tanks used during the Project will be removed during the closure phase when no longer required. Soil sampling will be completed within the vicinity of the storage tank locations to check for potential contamination. Appropriate cleanup measures will be taken if any petroleum contaminants are present. The remedial program will be completed at the same time as other earthworks associated with final closure as the necessary equipment will be onsite. The removal and decontamination of all petroleum storage facilities (tanks, pumps, delivery connections) must comply with all applicable provincial and federal regulations, including the *Petroleum Management Act* N.S. Regulations 44/2002, Department of Justice Canada – *Canadian Environmental Protection Act* (CEPA), Canadian Standards Association (CSA) International, Canadian Council of Ministers of Environment (CCME), and Transport Canada – *Transportation of Dangerous Goods Act*.

Reagents and other chemicals used in the mining/milling process will be returned to the supplier or disposed of offsite at an approved facility.

Explosives will be removed once no longer required. Infrastructure associated with explosive storage will be removed following removal of explosives.

6.1.5 Pipelines and Powerlines

The main pipelines associated with the Project will consist of water and process slurry pipelines passing between the processing plant and the TMF. There will also be pit dewatering lines running from the pit to the water treatment facilities, as well as a freshwater makeup pipe passing from the processing mill to the Gold Brook Lake for supplementing the reclaimed water from the TMF. Above ground pipes will be dismantled, cleaned, and removed for resale or disposal in an approved construction debris landfill. Some buried pipes may be left in place. These will be flushed and sealed prior to abandonment.

The network of onsite 13.8 kV overhead distribution lines will be removed except where required for long term treatment/monitoring facilities. The remaining lines will be removed as those facilities are decommissioned.

6.1.6 Roads

Except for the roads necessary to maintain long-term access for monitoring, haulage and access roads will be ripped, capped with overburden and topsoil/organics material, and hydroseeded. A variety of local flora that may be dormant as seed from the organics stockpile will encouraged to grow in some areas. This will facilitate the local area to recover as rapidly as possible and minimize the appearance of disturbance. The timing to reclaim roads will depend on the necessity to access particulars area during reclamation. For example, mill roads will be reclaimed once the process plant is dismantled and removed.

6.2 Pit Rehabilitation

6.2.1 Shoreline Development

At closure, the open pits will be allowed to flood naturally over time with a combination of groundwater inflow, direct precipitation, and surface run-off, to create permanent lakes with shallow shorelines, and spillways to Gold Brook

Lake. Access to the pits will be maintained by existing ramps to allow safe access during pit flooding and post-closure phases. The closure activities for the pit consists of the following:

– Blasting and grading the pit rims to a 5H:1V shoreline to a minimum 2 m below and 1 m above the predicted pit water elevation. Shoreline will not be modified for closure where modifying the pit geometry would interfere with Gold Brook.
– Revegetate the shoreline for erosion control prior to the pit being fully refilled.
– Exposed overburden above the shoreline will be graded to of 2.6H:1V and revegetated.
– Maintain pit ramps and safety berms during the pit flooding period for access /egress and for post-closure monitoring.
– Maintain barrier berms and fencing around the perimeter of the pits.
– Constructing engineered spillways and channels to Gold Brook Lake.

The overall slope angles used in the pit limit analysis were in the range of 42˚ and 46° during operations. The pit slopes have been designed for long term stability and all final slopes will be approved by a geotechnical engineer prior to final closure to confirm that minimum factors of safety in the long term are achieved.

6.2.2 Geotechnical Parameters

The greatest slopes that will be present within the PA will be the WRSAs, TMF, and the pit walls. Whereas the slopes of the TMF and the WRSA are built from placed material and can be altered to mitigate the possibility of a slope failure, the walls of the pit are subject to the natural geotechnical conditions of the deposit and the mining methods required to remove the ore. Some geotechnical investigation has already been carried out in this area but must also be carried forward during/following pit production to maintain safe working conditions and a final Project state. Geotechnical drilling has been completed in each of the planned pit walls and will be supplemented by the geotechnical mapping once the faces are exposed. Together, these sources of data will allow quantifying of the geotechnical parameters to be completed to ensure long-term stability of the pit walls. The development of the open pit mine will, wherever possible, be developed with final slope requirements considered in its construction. The final pit configuration will be a flooded lake with a shallow shoreline as described herein.

During and after surface production the slope stability of each of the predominant pit sides will be monitored by visual inspections, surveying, and instrumentation as recommended by a geotechnical engineer. Any identified areas of concern will be mitigated as necessary to maintain safe working conditions in and around the pit for the duration of operations. The overburden will be stripped back from the edge of the pit to a minimum distance of 5 meters and the walls will be monitored for localized ground stability concerns such as joint planes and dominating faults intersecting the rock faces. All local structures observed will be mapped by a geologist and added to a geotechnical database.

6.2.3 Pit Flooding

Once operations of each pit have ceased, dewatering activities will no longer occur allowing for the pits to naturally fill with water. Pit inflows will include direct precipitation, groundwater inflows, treated TMF water, and overflow from adjacent settling ponds to help reduce the time required to fill the pit lakes and stabilize the groundwater flow patterns. The only outflow from the pits will be evaporation while they are filling. The East Pit and West Pit have maximum capacities of 17.4 million (M) m^3 and 29.3 Mm^3, respectively, corresponding to an elevation of 50.75 masl. The East Pit will be backfilled with 9.5 Mm^3 of waste rock over 4 years beginning at the East end-of-mine phase. Assuming a waste rock void space ratio of 0.30, the volume of water required to fill the East Pit is reduced from 17.4 Mm^3 to 10.8 Mm^3 (GHD 2022b).

The modelling predicts the filling of the East and West Pit will be complete in Years 19 and 35, respectively. Once the water surface in each of the pits has reached an elevation of 50.75 masl, additional water will overflow through an engineered outlet structure directly into Gold Brook Lake (GHD 2022b).

6.2.4 Water Quality

The main concern related to water quality within the pits are the potential for exposed mineralized material within the pit walls to begin to oxidize and initiate ARD and ML. The *Metal and Diamond Mine Effluent Regulations* (MDMER) criteria are applicable at all discharge points during operations while CCME and Tier 1 EQS guidelines are applicable at assessment points within Gold Brook Lake and Gold Brook during all stages of closure.

The predictive water quality assessment determined the potential for exceedances of the site-specific limits for arsenic, cadmium, cobalt, copper, lead, zinc, ammonia, unionized ammonia, nitrite, and cyanide in Gold Brook Lake and/or Gold Brook over the course of operations and reclamation. This water quality assessment demonstrates the need for treatment of the mine effluent water prior to discharge into Gold Brook Lake and Gold Brook during phases of mine development and reclamation to Year 19 for the East Pit and Year 31 for the West Pit (GHD 2022c).

During closure, mineralized material will be submerged sufficiently below the static water level to prevent the redox reactions from occurring which would lead to ARD and ML. If this is not possible, areas with high potential for ARD/ML in the vicinity of the highwater line will be resloped to ensure reduced exposure of the mineralized material to the pit water with higher oxygen content. Monitoring of the pit water quality will continue to ensure that these measures are sufficient.

In addition, mitigation methods at closure such as rapid filling of the open pits and redirecting site runoff to settling ponds could be employed to mitigate effluent quality concerns if they are identified.

Surface and groundwater monitoring is planned to continue for 17 years post-closure or until released by the regulators.

6.2.5 Groundwater Conditions

The water table in the PA is typically close to ground surface (1.9 meters below ground surface, average groundwater depth in shallow monitoring wells measured in 2021). The bedrock forms a fractured rock aquifer system, which is overlain by a thin aquifer in the overburden. The groundwater flow system is topographically driven with recharge occurring in areas of high elevation and discharge occurring to low lying streams, rivers, and bogs. (GHD 2022d)

6.3 Waste Rock Storage Areas

All WRSAs are completed by Year 8 of operations and progressive reclamation will limit the infiltration/ oxidation of the waste rock. During construction and operations, the WRSA side slopes will be recontoured to a closure configuration. Benches will be left between each lift to allow for a final overall slope from toe to crest.

Closure activities will include:

– Re-sloping of the final lift of the WRSA.
– Contouring the ultimate top surface of the pile.
– Providing a vegetated cover for closure.
– Grading and contouring the collection ditches and ponds.

Geotechnical investigations of the WRSA slopes will confirm the long-term stability for the planned slope geometry.

The re-sloping of the final lift, placement of a soil cover and revegetation treatments will be completed following end of mining. Surface water run-off from the WRSA will continue to be directed towards the settling ponds. The north and southeast settling ponds will remain functional until the water quality is stable and meets applicable guidelines. During post-closure, east and central WRSA runoff will be directed to the east and west pits, respectively (GHD 2022e). At that point, the water can be released to the environment or potentially directed to the open pits to accelerate flooding. Collection ditches and ponds will be removed, and areas graded and vegetated once they are no longer required.

6.4 Tailings Management Facility

Reclamation and closure of the TMF will be based on the following:

– The TMF design phase will consider the reclamation goals and objectives.
– Reclamation goals and objectives will be periodically updated during construction and operations.
– Progressive reclamation will be implemented wherever possible.
– At the end of operations, the TMF will be decommissioned and reclaimed to allow for future land use as guided by regulators, with input from Rightsholders and stakeholders.
– Reclamation and closure construction will be designed to meet long-term physical and chemical stability objectives.

The conceptual TMF closure plan includes removing the tailings supernatant water and encapsulating the tailings and PAG1 waste rock with a closure cover during the final years of operation and active closure (approximately 2 years) to maintain the tailings and PAG1 material in a saturated state to prevent the onset of ARD conditions. Small collection ditches will be constructed on the cover to route precipitation runoff from the cover and minimize erosion.

Generally, the closure work will consist of decommissioning and dismantling of all tailings delivery and distribution pipework, all water reclaim pipelines and the pump barge, all seepage recycle pipework and pumps, assuming that the seepage water meets water quality objectives and removal of the tailings supernatant water (including the water cover and operating cover).

The closure cover over the tailings and PAG1 material will consist of a combination of a geosynthetic reinforcement layer, NPAG waste rock (nominal 2 to 3 m thick), till (0.45 m thick), and topsoil (0.15 m thick). The NPAG waste rock cover will be placed over the PAG1 material during the final years of operations.

Small riprap lined collection ditches will be constructed on the cover to route precipitation runoff from the cover and minimize erosion. Vegetation will be planted or allowed to naturally occur on the cover soil to improve site aesthetics and erosion protection.

Ongoing monitoring will be performed for a period of time sufficient to confirm suitable water quality and ongoing stability for the facility.

The need for effluent treatment during post-closure will be fully assessed during the operation and early closure phases through sampling; however, current modelling predicts that treatment will not be required. The potential need for effluent treatment will be based on geochemical source terms that will be undergoing revision as additional information is collected and becomes available. During the 2 years of active closure, the water released from the TMF will be treated and discharged into Gold Brook Lake to maintain baseflow into the lake. Additional water will be pumped to the East Pit to assist with filling.

6.5 Water Management Facilities

Based on the predictive water quality analysis completed for the Project, active water treatment is anticipated to be required to remove metals and cyanide from effluent in the first two years of the closure phase (Years 12 and 13). Passive water treatment methods are proposed for Years 14 through 18 and will be applied at the TMF, north settling pond, and southeast settling ponds.

During post-closure, east and central WRSA runoff will be directed to the East and West pits, respectively. The overflow of the pits will then be discharged into the Gold Brook Lake by gravity. Passive anoxic limestone drains (ALDs) are assumed to provide sufficient treatment for each settling pond overflow present during Years 14 through 18. The ALDs involve the burial of limestone in oxygen-depleted trenches. An ALD consists of a trench containing limestone encapsulated in an impermeable liner that is covered with clay or compacted soil. Surrounding the limestone with an impervious liner would assist in maintaining anoxic conditions in the drain. The cap would prevent water infiltration and prevent carbon dioxide from escaping. Pit water quality must be characterized to determine if water treatment is required and ensure effective system design. The pits overflow water will convey into these

trenches. ALDs will generate alkalinity and will increase the water pH which will precipitate metals such as zinc. Each drain will be followed by an aerated cascade at its end followed by a settling/polishing pond to remove precipitated/oxidized metals before discharge to the environment (GHD 2022h).

The other water treatment systems such as TMF, north pond and southeast pond's will be operational until water quality monitoring demonstrates that the systems are no longer required to treat discharge prior to entering Gold Brook Lake or Gold Brook (GHD 2022e).

6.6 General Project Rehabilitation

This section describes the general rehabilitation for all other infrastructure/aspects of the Project.

6.6.1 Targeted Safety Factor

A factor of safety in slope stability analysis can be defined as the ratio of the available shear strength to that of the applied shear stresses along a potential failure plane. A factor of safety of 1 or greater indicates stable conditions and a value of less than 1 represents unstable conditions. Typically, a target factor of safety higher than 1, and in the range of 1.3 to 1.5, is considered reasonable for long-term slope stability analyses in order to account for the uncertainties in the assumed shear strength parameters and subsurface soil and groundwater conditions. Targeted safety factors applicable to high vertical slopes (pit walls, WSRAs, TMF etc.), effluent quality and large bodies of open water. All slopes will be designed to this targeted safety factor during detailed design for closure.

6.6.2 Erosion and Sediment Control Plan

An Erosion and Sediment Control Plan (ESCP) (GHD 2022f) is being developed to provide measures and best management practices for the Mine Water Infrastructure to minimize erosion and protect nearby waterbodies from sedimentation. Objectives and targets are established to drive continuous improvement in environmental performance and to be consistent with the overall strategic goals of the Project.

Project infrastructure will be designed to minimize erosion during construction and operations so as to preserve the stability of the ground surface surrounding Project infrastructure, surface water management ditches, settling ponds and conveyance pathways, dykes, berms, and any other installations. The potential for scouring downstream of structures and the potential impacts of sudden changes in flow volume will also be considered. Lessons learned from construction and operation will be addressed in an updated ESCP that details closure and post-closure controls.

In general, control measures will remain active until 1) no further activities resulting in disturbance of soil and earthwork is expected in this area; 2) the upstream area has been sufficiently stabilized and there are no signs of active erosion; and 3) compliance with provincial guidelines for TSS in runoff can be met (GHD 2022f).

Regular monitoring of established erosion and sediment control measures is essential to prevent failure and minimize the chance of significant erosion or sediment transport offsite. Erosion control measures in the contact water ditches and settling ponds are to be maintained during operations and closure.

6.6.3 Surface Contouring

Contouring is a process of creating as gentle a slope as possible in areas of topographical relief. Performing this lessens the risk of runoff due to precipitation carving runoff channels into buried material and exposing material to oxidation and mobilization that was meant to be contained within a permanent cover. It also lessens hazards associated with large piles of material by removing steep slopes that people or animals could fall from, as well as obscuring a large pile of exposed rock by turning it into a gentle hill which once covered in vegetation would be largely indistinguishable from the surrounding countryside.

All exposed areas of mine operation such as the pit, laydown areas, and operating maintenance and access roads will be torn up and covered in organic material to facilitate revegetation. This organic material will then be contoured to provide a surface for runoff control and promote the growth of vegetation.

6.6.4 Revegetation

Revegetation is the process of facilitating the regrowth of vegetation to cover exposed areas disturbed due to the operation/construction of a facility. This process will be employed on many key pieces of former site infrastructure such as the TMF, WRSAs, till stockpiles, access roads, mill area, and employee accommodation area.

The objective of revegetation efforts, as part of reclamation, will be to produce a site with typical vegetation and wetlands as occur naturally in the area. The revegetation program will commence with the seeding of the reshaped areas that have been stabilized. Areas in which natural vegetation has not established sufficiently to control erosion will be reseeded with appropriate species.

Areas disturbed during development, once covered with overburden and topsoil, will be seeded with self-sustaining vegetative cover that ecologically matches the area. This will be achieved through the use of local topsoil with native seed and plant mixtures. A list of specific soil amendments, seed, and plants to be used will be provided in the Final Reclamation Plan.

A seed mix approved for reclamation and rehabilitation will be used to stabilize an area quickly and inhibit erosion and sedimentation. The proposed seed mix contains red fescue, birdsfoot trefoil, grasses, and clover. This will also make use of seeds from plant species native to the local area. Amendments may be required to provide essential nutrients that can improve overall plant growth.

A seed mix will also make use of seeds from plant species native to the local area. References, such as an “Integrated Roadside Vegetation Manual”, will be consulted. All assumptions made in the preliminary revegetation plan will be confirmed before finalization.

Vegetation will stabilize over several years. The goal for the PA will be for native species to succeed the initial seed mix resulting in herbaceous perennials and low growing shrubs to dominate as in non-disturbed areas of the region. The natural vegetation in and around the PA will propagate over time and may be supplemented by additional planting, as required, during the post-closure monitoring program to minimize erosion potential. Progressive reclamation and observation of revegetation will provide information to help predict the best approach for succession planting and reforestation.

Reforestation efforts will focus on encouraging the growth of a diversity of species with observed success. This may require the planting of some species or transplanting from one area of the Project to another. NS has numerous excellent examples of reforestation at mine sites and Signal Gold will seek to benefit from these past successes through site visits and discussions with NSDNRR staff and other local experts. A number of organizations such as Forests without Borders, Scouts Canada, and Tree Canada will be contacted to explore how they may assist as well in tree planting programs.

Given the coastal/near-coastal conditions of the Project, the forested communities are predominately conifers (black spruce, red spruce, balsam fir), speckled alder, and red maple. In the early stages of reclamation, regenerative stands would provide foraging habitat for moose. Mature, conifer forests are important for moose in NS during late winter due to protection from extreme weather and lack of accumulating of snow to depths that hinder moose movement.

6.6.5 Summary of Material Management

The method in which materials are handled depends upon their nature and associated hazard. Useable materials will be separated according to their usefulness and order of planned use while waste materials will be separated by their type and degree of hazard.

Useable materials such as non-acid generating waste rock, the till and soil layers within the overburden, and organic material will be stockpiled until needed for their respective phases of reclamation.

Waste rock not used for infrastructure construction or as mine backfill will be placed in the WRSAs permanently. The material will be trucked and consolidated into a tiered stockpile denoted by benches for long term stability. As the WRSAs are completed, the exposed rock will be covered by organic material, fertilized, and seeded to facilitate revegetation.

Overburden material will be used in reclaiming the PA. Overburden piles will naturally revegetate prior to reclamation. Completed material stockpiles that remain in storage will have the natural revegetation process augmented by applying seed or other mitigation measures if erosion and/or dust generation becomes a concern. Areas that are disturbed by the construction of Project facilities or structures necessary for the operation of the mine will be covered, as necessary, with a minimum of 50 cm of overburden (till/soil) at closure to support revegetation. This includes the area surrounding the processing plant and buildings infrastructure.

It is recognized that the use of local topsoil containing organic material promotes active growth of native species that will inhibit erosion and accelerate the return of the PA to a naturally revegetated condition. Care must be taken to move organic material as little as possible, as each time they are moved and reaerated the microorganisms within the material may be killed and their propensity to facilitate revegetation is lessened. For this reason, the organics stockpile locations have been chosen so that once placed they will not have to be relocated within the foreseen development of the Project.

7. Post-Closure Monitoring Plan

The main components of the Plan consist of capping the TMF, allowing the pit to naturally fill with water, and dismantling/removing all buildings and infrastructure not necessary for the ongoing monitoring. The primary goal of post-closure monitoring activities will be to determine the progress being made in restoring the PA and to make maintenance measures, if required, that lead to a successful conclusion of reclamation.

After mining ceases, monitoring will initially be an extension of the operational monitoring programs used to support production activities. These will include monitoring physical and chemical parameters for surface and ground water. In addition, routine surveys and field observations will be conducted with regard to flora and fauna on and around Project. The status of various valued ecological components such as woodlands, wetlands, and watercourses will be assessed. Existing monitoring programs will be reviewed after production ceases to assess the status of created habitats in the pits and water management areas and the success of revegetation.

Post-closure monitoring activities will document, through inspection, which decommissioned structures, such as the open pit shorelines and WRSAs, are not subject to damage from erosion or settlement and that spillways and ditches remain functional. Post-closure monitoring will also document any area damaged from erosion, and the quality of water released to the environment from the created lakes. The monitoring program will be linked to remedial action plans in the event that reclamation measures require enhancement. Rehabilitation of the PA will be deemed complete on the approval by NSDNRR and NSECC.

Details of the monitoring and maintenance programs to be implemented during and after decommissioning and reclamation will be found in a Post-Closure Monitoring Plan which will be developed as part of the Final Reclamation Plan. Essentially, the onsite properties of water and soil quality will be continually monitored for a period of time post-reclamation to confirm that the Project meets it’s intended environmental goals, is safe and stable and that any impacts from mining are thoroughly mitigated.

7.1 Air Monitoring

Operational air monitoring programs will continue during the active reclamation period (2 years) until the resloping earthworks activities and the TMF cover are completed.

7.2 Water Monitoring

Surface water quality and quantity monitoring will continue for three years following the completion of the operations phase. One surface water station will be monitored for three years after mining operations are complete, while the remainder will be monitored until three years following the proposed discharge of the West Pit (to Year 38).

Monitoring at MDMER compliance locations can be decommissioned following completion of the operations phase. CCME/NS EQS monitoring locations at the settling and polishing pond discharge points (in the receiving water bodies) will likely continue for another three years, to confirm compliance.

Discharge to the receiving waterbody from the East Pit Lake is anticipated to begin in Year 19 and from the West Pit Lake is anticipated to begin in Year 35. New monitoring stations will be commissioned to confirm CCME/NS EQS compliance and will be monitored for three years on the commencement of discharge.

During the first three years of the closure phase the mine will be remediated, and the pits will commence filling with water from both ground and surface sources. Quarterly groundwater monitoring will continue at all remaining monitoring wells.

Following building demolition and earthworks activities, groundwater quality and elevation monitoring will continue on a bi-annual basis for 33 years, during which time the East and West Pits will be allowed to flood creating two open waterbodies. Groundwater monitoring may be further reduced over this period as the mine stabilizes. Termination of the groundwater monitoring program would be expected following a satisfactory review of the monitoring data collected during all Project phases and as directed by and/or in consultation with NSECC (GHD 2022g).

7.3 Slope Stability and Vegetation Monitoring

Slope stability monitoring will begin on following completion of resloping and vegetation activities on the PA on an annual basis for 3 years or until all reclaimed slopes are deemed stable. WRSA slopes will be progressive reclaimed prior to the cessation of mining and may not require monitoring post-closure. Monitoring of the TMF dam slopes will continue as required by the Dam Safety Regulations, Dam performance and any future changes in dam classification.

Vegetation monitoring will begin during operations when areas of the PA are progressively reclaimed and continue annually through reclamation and post-closure. The program will be completed on an annual basis for a minimum of three years and may be reduced in frequency as areas of coverage and quality meet the monitoring plan goals.

7.4 Environmental Effects Monitoring

The MDMER mandated Environmental Effects Monitoring (EEM) Program is used to determine potential environmental effects to fish and fish habitat as a result of discharge of mine effluent to the receiving environment. The mine is subject to MDMER regulations on the first release of effluent to the environment and will continue until released under section 32 of the MDMER. Final EEM studies will be undertaken for effluent from all final discharge points during a three-year period after a notice of intent to close is submitted to the Minister of Environment & Climate Change Canada.

7.5 Adaptive Management

Adaptive management systems are ideal in the management of uncertainty as they provide the ability to respond based on increasing awareness. These types of systems enable an organization to learn as they go and then actively respond. Adaptive systems are more than “implement, fail, learn and change” model to alter management direction and responses as they allow for the juggling of multiple options.

An adaptive approach involves the evaluation of several options towards meeting goals and objectives, with emphasis on the prediction of the outcomes for each option based on the current knowledge base. This positions an organization to implement one or more options, within a performance evaluation framework for monitoring to learn about the impacts of and requirements for management actions. The information gained is incorporated into the overall body of knowledge and enhance adaptive management response ability.

For the Final Reclamation Plan, key areas of uncertainty will be identified and assessed to develop multiple options. An evaluation framework will be developed that will enhance the ability to anticipate changes.

8. Stakeholder Engagement

Mining requires access to land and natural resources, which could potentially compete with other land uses (i.e. industrial or recreational) (Ashton et al., 2002). The land in which the Project will operate is both privately and publicly (Crown) owned. Land access or restrictions of these areas following the closure of the mine will return to pre-Project conditions, with exceptions as imposed by the landowner.

In addition to environmental and ecological impacts which occur post-mine reclamation and closure, there are also positive and negative social impacts related to closure of an operating mine. Signal Gold is committed to engaging with stakeholders and Rightsholders regarding the closure strategy that will not only become an ecologically neutral area but will also provide some form of benefit to local communities. Open and responsive communication with stakeholders will be the basis of the engagement. The objectives of the program will be to:

– Provide information to stakeholders about reclamation planning and seek input on final closure configurations.
– Understand stakeholder concerns and requests for post-closure land-use activities.
– Identify, document, and monitor issues and concerns arising from the engagement process.
– Identify the need for planning, design and management measures that will mitigate or resolve the
– issues raised through the engagement process.

A Community Liaison Committee (CLC) will be an important vehicle for the identification, scoping, and resolution or mitigation of potential issues or concerns related to closure, and for the exchange of information in respect of the Project.

The final Reclamation Plan will consider a broader consultation plan, allowing participation from local community members and the general public, a Community Liaison Committee, municipal representatives, provincial /federal regulatory agencies, the Mi'kmaq of Nova Scotia, and other stakeholders that may be identified through the life-of-mine.

9. Reclamation Schedule

The majority of reclamation activities (Table 2) will occur in the first three years after closure. Year -1 represents a year before the end of operation.

Table 2 Reclamation Schedule

Activity / Year	-1	0	0.5	1	1.5	2	2.5	3	4	5	10	15	20	25	30
Progressive Reclamation	■	■													
Final Closure/Reclamation Plan	■														
Decommission of Infrastructure		■	■	■	■										
Site contouring		■	■	■	■	■									
Revegetation			■	■	■	■	■	■							
Reforestation							■	■	■	■	■	■	■	■	■
Pit Shore line development	■	■	■	■											
Flooding Pits	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Monitoring															
Monthly (Year 1 – 2)	■	■	■	■	■	■									
Quarterly (Year 2 – 5)							■	■	■						

Activity	Year	-1	0	0.5	1	1.5	2	2.5	3	4	5	10	15	20	25	30
Annual (Year 5 – 10)																
Post Reclamation Land Use																
Public Access																
Recreational Use																
Commercial (Forestry)																

10. Reclamation Cost

The costs associated with the Reclamation and Closure Plan will be secured with a financial bond posted by the Signal Gold and held by the Province of NS. The bond amount will be determined prior to the issuance of a Mining Lease by the Province. This will ensure there are sufficient funds to reclaim the Project at each Project phase in the unlikely event that the company defaults on its commitment to reclaim the PA. The Plan and agreement of the costs requires approval of NSDNRR and NSECC.

The reclamation cost estimate is based upon the disturbed surface areas and infrastructure to be reclaimed, site conditions, and experience Signal Gold has had with reclamation of other mine sites.

The key costs will include decommissioning and demolition of the Project infrastructure, capping the TMF, resloping earthworks and vegetating, water treatment, post reclamation monitoring, engineering / management, and contingency.

This cost estimate will be based on preliminary engineering conducted for the Project and will be updated over time as the Project progresses through the stages of construction and operation. Costs for earthworks will be based on decommissioning estimates, planned mining activities the Nova Scotia Road Builders Suggested General Equipment Rental Rates, and the Caterpillar Performance Handbook.

The reclamation cost estimates assume that all of the organics and overburden material collected during construction and pre-stripping is collected and properly stockpiled for use as reclamation materials and is still available and deemed acceptable for resurfacing and recontouring of the PA.

Following the completion of rehabilitation activities, the PA will be monitored for a minimum of two years, on a monthly basis, to ensure that revegetation is successful, and to make enhancements, if required, that lead to a successful conclusion of reclamation. Monitoring will continue quarterly until year 5 and annually as required. Post reclamation monitoring will document, through inspection, any damage from erosion and the quality of water released to the environment from the pit lakes. The monitoring program will be linked to remedial action plans in the event that reclamation measures require enhancement. Rehabilitation of the PA will be deemed complete on the approval by NSDNRR and NSECC.

11. Closing

This Conceptual Reclamation and Closure Plan is considered a living document and will evolve throughout the life of the Project.

12. References

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GHD 2022f. Erosion and Sediment Control Plan. Report 11 prepared for Anaconda Mining Inc. Dated April 12, 2022.

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Legend
- Project Area
- Open Pits
- Mill Site
- Employee Accomodations
- Explosives Storage
- Tailings Pipeline Emergency Catchment
- Mill Infrastructure
- Tailings Management Facility
- Waste Rock Storage Area (WRSA)
- Till Stockpile
- Organics Strockpile
- Settling Pond
- Site Roads
- Bypass Road
- Natural Gas Pipeline
- Property (Crown)
- Private Property

EXPLOSIVES STORAGE
POLISHING POND
TAILINGS MANAGEMENT FACILITY
Gold Brook Lake
NORTHWEST WRSA
MILL AREA (See Inset)
NORTHEAST TILL STOCKPILE
NORTHEAST WRSA
WEST PIT
EAST PIT
SOUTHWEST TILL STOCKPILE
EMPLOYEE ACCOMMODATIONS
SOUTHEAST WRSA
Gold Brook
Isaacs Harbour

INSET
Mill Area
Mining Contractor Building
Helicopter Pad
Core Yard
Core Storage
Warehouse Ext Storage
Fuel Storage and Dispensing
Truck Stop
Warehouse
Mining Contractor Building
Mine Dry
Parking
General office
Propane Storage
Hazardous Waste Storage
Water Tank
Water Treatment
CRT Facility
Stockpile Area
Mill
Switchyard
Laydown Area
Plant
Plant office
Warehouse
Precrushed Stockpile
ROM Stockpile

Paper Size ANSI B
0 200 400 600 800
Meters
N

Map Projection: Transverse Mercator
Horizontal Datum: North American Datum of 1983 (CSRS) version 6
Grid: NAD 1983 (CSRS) v6 UTM Zone 20N

GHD

SIGNAL GOLD INC
GOLDBORO GOLD PROJECT
CONCEPTUAL RECLAMATION & CLOUSRE PLAN

GENERAL MINE ARRANGEMENT

Project No. 11222385
Revision No. -
Date 12/04/2022

FIGURE A1

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Data source: . Created by: jjparks

Legend
- Pit Lakes
- TMF Covered and Vegetated
- Polishing Pond
- Reclaimed Areas
- Settling Ponds
- WRSA Vegetated
- Remaining Roads
- Site Elevations

Covered TMF
Gold Brook Lake
NW WRSA
NE WRSA
West Pit Lake
East Pit Lake
SE WRSA
Isaacs Harbour
Gold Brook

Paper Size ANSI B

0 200 400 600 800

Metres

N

Map Projection: Transverse Mercator
Horizontal Datum: North American Datum of 1983 (CSRS) version 6
Grid: NAD 1983 (CSRS) v6 UTM Zone 20N

SIGNAL GOLD INC
GOLDBORO GOLD PROJECT
CONCEPTUAL RECLAMATION & CLOSURE PLAN

CONCEPTUAL RECLAMATION PLAN

Project No. 11222385
Revision No. -
Date 20/04/2022

FIGURE A2

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Data source: GHD, GeoNova, Anaconda . Created by: jjparks

Appendix B.2

Environmental Management Plan

Environmental Management Plan

Goldboro Gold Project

Signal Gold Inc.

24 May 2022

The Power of Commitment

GHD Limited

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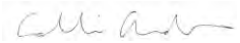
Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4		Jessica Romo Emma Rivard	Callie Andrews		Callie Andrews		24-May-2022

Contents

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Acronyms

Acronym	Expanded Use
ARD	Acid Rock Drainage
DFO	Fisheries and Oceans Canada
EARD	Environmental Assessment Registration Document
ECCC	Environment and Climate Change Canada
EMP	Environmental Management Plan
GHD	GHD Limited
IA	Industrial Approval
KMKNO	Mi'kmaq Rights Initiative
ML	Metal Leaching
MDMER	Metal and Diamond Mining Effluent Regulations
MODG	Municipality of District of Guysborough
NSECC	Nova Scotia Department of Environment and Climate Change
NSDNRR	Nova Scotia Department of Natural Resources and Renewables
PA	Project Area
QA/QC	Quality Assurance / Quality Control
SARA	Species at Risk Act, 2002
Signal Gold	Signal Gold Inc.
SOCI	Species of Conservation Interest
TMF	Tailings Management Facility
TSS	Total Suspended Solids
WRSA	Waste Rock Storage Area

1. Introduction

The Goldboro Gold Project (the Project) is a proposed 4,000 tonne per day mine located near Goldboro, Guysborough County, Nova Scotia (NS) being developed by Signal Gold Inc. (Signal Gold). The Project includes two open pits, an ore processing facility, an engineered tailings management facility (TMF), three waste rock storage areas (WRSAs), till and organic material stockpiles, and associated buildings. The area in which the Project will occur is referred to as the Project Area (PA). Signal Gold is committed to implementing management programs and procedures to mitigate and reduce potential environmental impacts of the Project.

This Environmental Management Plan (EMP) has been prepared for Signal Gold in support of the Environmental Assessment Registration Document (EARD) and Class I EA required for the Project under the *Environment Act* and Environmental Assessment Regulations. The EMP is a living document that ensures the Project will be reflective of legislative and environmental responsibilities but will be sensitive to any changes that might arise during its implementation. At a high level it describes each component and the plan to protect and mitigate/manage/minimize any negative environmental effects throughout the Project.

1.1 Purpose and Objectives of the EMP

The EMP is a controlled document for use by all Project personnel to demonstrate compliance with the relevant environmental legislation, policies and permitting requirements, and to ensure that the environment is protected throughout the life of the Project.

This EMP will apply to all phases of the Project and will provide a framework for the environmental management through construction, operations, and closure. If changes to the Project occur, or if changing or unexpected conditions are encountered, the EMP will be reviewed and modifications made to ensure the EMP remains current and comprehensive.

The EMP includes requirements and commitments set out in the EARD (GHD 2022) and provides plans to ensure the planning and execution of the Project also incorporate the core principles of environmental protection, best management practices, and comply with all relevant legislation and guidelines.

The objectives of the EMP are as follows:

– Act as a reference document for Project personnel working in specific areas or conducting specific activities to ensure environmental protection measures are enforced and commitments to minimize and/or avoid environment effects are met;
– Document environmental concerns and ensure appropriate mitigation measures are implemented;
– Act as a training document during implementation; and,
– Provide a reference for applicable legislation, regulatory requirements and guidelines.

2. Adaptive Management

The EMP has been developed with an adaptive management approach and will be reviewed and revised as required to incorporate new information, updated legislation and/or industry standards, conditions of applicable authorizations, permits, and approvals, and changes to the Project design, scope, or schedule.

Management plans will be implemented during construction and operations. Monitoring will be conducted to aid in assessing the effectiveness of the management plans and mitigation measures proposed below and identifying any changes to the environment as the Project progresses. If environmental impacts are identified, mitigation measures

will be reviewed and additional measures implemented as necessary, and the relevant management plan will be revised to incorporate the additional required measures.

3. Regulatory Approvals, Authorizations and Permits

The Project is regulated under various federal, provincial, and municipal legislation as well as related policies and/or guidelines and industry codes of practice. An overview of key applicable federal, provincial, and municipal regulatory requirements is outlined in Table 3.1, below. Regulatory requirements will be reviewed on a regular basis as the Project advances, to ensure appropriate approvals and permits are obtained. Signal Gold will maintain a regulatory permits and approvals register to ensure that all legal requirements and commitments are tracked and managed. The register will be developed following the EARD approval.

Table 3.1 Applicable Legislation

Legislation	Physical Activity and/or Trigger	Regulatory Authority
Federal		
Fisheries Act	Authorization required for any direct or indirect disturbance of fish or fish habitat.	Fisheries and Oceans Canada (DFO)
Fisheries Act - Metal and Diamond Mining Effluents Regulations (MDMER)	Discharge of deleterious substances into waters frequented by fish.	Environment and Climate Change Canada (ECCC)
Migratory Birds Convention Act – Migratory Birds Regulations	Project activities such as clearing and grubbing with the potential to interact with migratory birds.	ECCC
Species at Risk Act	Physical disturbance or destruction of SARA and/or habitat.	DFO/ECCC
Canadian Environmental Protection Act	Pollution prevention measures to protect the environment and human health associated risks.	ECCC
Canadian Environmental Protection Act - Environmental Emergency Regulations (E2)	Usage of any substance listed under Schedule 1 of the E2 regulations.	ECCC
Transportation of Dangerous Goods Act and Regulations	Transportation and use of dangerous goods associated with the Project.	Transport Canada (TC)
Canada Wildlife Act and Regulations	Project activities with the potential to adversely affect wildlife.	Canadian Wildlife Services (CWS)
Provincial		
Environment Act – Environmental Assessment Regulations	EA required due to the construction, operations and decommissioning of a facility that extracts or processes metallic or non-metallic minerals.	Nova Scotia Department of Environment and Climate Change (NSECC)
Environment Act – Activities Designation Regulations	Industrial Approval is required for the construction, operation or reclamation of a surface mine using explosives and procuring mineral bearing ore. Water approval and/or notifications will be required for any water withdrawal and watercourse or wetland alterations.	NSECC
Environment Act - Dangerous Goods Management Regulations	Transportation and use of dangerous goods associated with the Project.	NSECC

Table 3.1 Applicable Legislation

Legislation	Physical Activity and/or Trigger	Regulatory Authority
Environment Act – Environmental Emergency Regulations	The potential for spills or releases associated with the Project activities.	NSECC
Environment Act – Petroleum Management Regulations	Applicable to the above ground fuel storage tanks to be installed for the Project.	NSECC
Environment Act - Used Oil Regulations	Applicable to used oil generated from equipment maintenance.	NSECC
Environment Act - Contaminated Sites Regulations	Outline the requirements for any contamination which occurs as a result of Project activities.	NSECC
Nova Scotia Endangered Species Act and Regulations	The act prohibits killing, injuring, disturbing, taking or interfering with endangered or threatened species and/or their habitat.	Nova Scotia Department of Natural Resources and Renewables (NSDNRR)
Mineral Resources Act and Regulations	The Project will require a mineral lease and a bond for mining and the collection of royalties.	NSDNRR
Crown Lands Act	Crown Lands lease is required for mining related activities occurring on Crown Lands	NSDNRR
Wildlife Act and Regulations	Prohibits the taking, hunting, killing, or possessing eagles, osprey, falcons, hawks, owls, and any other protected wildlife species.	NSDNRR
Nova Scotia Occupational Health and Safety Act (1996) and Codes of Practice	Provides labour standards for which the Project will operate.	Department of Labour, Skills and Immigration
Municipal		
National Building Code of Canada as administered through the municipal building permit process.	Approval for construction and occupation of buildings.	Municipality of the District of Guysborough (MODG)

4. Roles and Responsibilities

The EMP will be managed and implemented by Signal Gold and will ensure that the activities associated with the Project are undertaken in a way that protects and sustains the ecosystem and meets the spirit and letter of all applicable legislated requirements and commitments.

Applicable Project team members and their roles and responsibilities related to the implementation of the EMP are detailed below.

4.1 Project Director

The Project Director is responsible for:

– Demonstrating a commitment to ensuring Project is in compliance with permit requirements, authorizations, and applicable guidelines.
– Providing oversight to Construction Managers, Project Superintendents and Supervisors.
– Participating in risk assessments for all phases of the Project.

– Ensuring environmental protections and commitments are incorporated into the Project design and execution.

4.2 Construction Manager

The Project Construction Managers are responsible for:

– Ensuring the implementation of environmental mitigations, controls, procedures during the construction of the Project.
– Knowledgeable of the approval conditions, environmental assessment commitments, and permits
– Evaluating potential risk associated with Project activities and implement controls, as required.
– Ensuring any contractors working on the Project are in compliance with all conditions, permits and approvals and are adhering to the environmental controls established as part of detailed design.
– Ensuring all personnel and contractors are aware of the objectives and content of the EMP.

4.3 Project Superintendents and Supervisors

The Project Superintendents and Supervisors are responsible for:

– Ensuring work tasks performed are planned and completed in accordance with the EMP.
– Ensuring all staff and Project personnel have attended environmental training as part of the site orientation.
– Ensuring spill kits are readily available in designated locations.
– Ensuring personal protective equipment is available and worn by workers, as required.
– Reviewing environmental best practices with workers on a regular basis.
– Ensuring all environmental events are reported.

4.4 Project Environment Department

The Environmental department for the Project will consist of an Environment, Compliance and Social Responsibility Manager, an on-site Environmental Manager and advisors and monitors. The Environmental Manager will report directly to the Environmental, Compliance and Social Responsibility Manager and indirectly to the Project Director.

4.4.1 Environment, Compliance and Social Responsibility Manager

The Environment, Compliance and Social Responsibility Manager is responsible for:

– Ensuring that Signal Gold's corporate environmental policies are implemented at all phases of the Project.
– Ensuring that all permits, approvals and authorizations are obtained for the construction phase of the Project.
– Developing and managing the permit register/tracker for the Project.
– Participating in risk assessment meetings to ensure environmental risks are considered and the appropriate mitigation for all phases are identified.
– Advising the Project Director of environmental commitments and legal obligations for all phases of the Project.
– Interfacing with the regulatory authorities and stakeholders.

4.4.2 Site Environmental Manager

The Site Environmental Manager is responsible for:

– Ensuring staff, and any other Project personnel (i.e., sub-contractors, supplies, and/or visitors) are informed of the environmental requirements and best management practices for environmental management.
– Maintaining the permit register/tracker for the Project at the construction phase of the project.

– Ensuring that all permits, approvals and authorizations are obtained for the operational and closure phases of the Project.
– Conducting applicable training and maintain training documentation for Project personnel.
– Performing environmental audits on various management plans.
– Reporting any instance of environmental damage and/or violation of permit requirements or applicable guidelines to Project Director.
– Completing incident and non-compliance investigations and follow up documentation and reporting.

4.4.3 Environmental Advisor and Monitors

The Environmental Advisors and Monitors are responsible for:

– Conducting applicable training and maintain training documentation for all Project personnel.
– Performing environmental inspections and monitoring.
– Maintaining environmental records (i.e., inspection reports, monitoring results, waste manifests, hazard materials registers, etc.).
– Conducting monthly inventories of spill kits and restocking all supplies and spill kits that were used following a spill.
– Performing checks of vehicles and storage areas to confirm proper storage and handling of petroleum products, bulk chemicals, and/or other hazardous materials.
– Supporting incident and non-compliance investigations and follow up documentation and reporting.

4.5 All Other Project Personnel

All other staff and Project personnel are responsible for:

– Conducting work in a manner that ensures protection of the environment, minimizes environmental effects and uses best practices while conducting works in adherence to the EMP.

Notifies the Environment Department of any non-compliances or potential non-compliances with this EMP, permits or approvals.

5. Environmental Awareness Training

Prior to any Signal Gold personnel or contractors entering the site, a review of this EMP will be completed as part of the Project orientation. Personnel and contractors will be required to sign and acknowledge that they will adhere to the contents of the EMP prior to engaging in work activities. A copy of the most recent version of the EMP and any plans referenced in Section 6 will be made available on-site at all times. In addition, information will be provided to ensure staff are aware of the process to report an environmental incident or a new identified risk.

The Signal Gold Site Environment Manager is responsible for developing and implementing the initial environmental awareness training to ensure that all personnel are aware of the environmental sensitivities associated with their actions; their roles and responsibilities in protecting the environment; and mechanisms available to them to carry out their environmental protection responsibilities.

Signal Gold's Environmental Awareness Training Program must satisfy the following three main objectives:

– Educate workers and visitors about the importance of environmental protection.
– Inform staff and visitors of their responsibilities regarding the environment and provides them with the necessary educational tools to fulfil these responsibilities.

– Provide workers with a firm understanding of the environmental sensitivities associated with the Project and the role they play in protecting the environment, as outlined in this EMP.

The Signal Gold Site Environment Manager is responsible for ensuring that all personnel have undergone the initial environmental awareness training before working on the Project. Proof of completion of the training programs must be kept on file on site and digitally by Signal Gold.

The awareness training must include, as a minimum, the following key factors:

– The Project overview and timetable.
– Overview of the environmental regulatory requirements and an overview of the existing environmental conditions and sensitivities.
– Identification of the activities that could negatively affect the environment; the resultant environmental effects; and the required mitigation measures that must be implemented and maintained to avoid or minimize these effects (e.g., proper installation and maintenance of erosion and sediment control procedures).
– All aspects of the EMP including the roles and responsibilities of staff.
– Environmental inspection and QA/QC procedures.
– Component Management Plans.
– Contingency and Emergency Response Plans.
– Documentation and Reporting Procedures.

6. Management and Monitoring Plans

6.1 Component Management Plans

Component Management Plans are developed to address areas of specific areas of concern identified thorough the EARD process and are intended to provide additional guidance on mitigations required for specific Project activities. The purpose of this section is to provide an overview of the Component Management Plans. The relevant Plan should be consulted as needed. General mitigation measures not captured under the Component Management Plans are presented in Section 7.

6.1.1 Hazardous Materials Handling Plan

The Hazardous Materials Handling Plan will outline the procedures for storage and handling of hazardous or potentially hazardous substances. The plan will include measures to mitigate health, safety and environmental risks associated with the transportation, storage, use and disposal of hazardous materials. The plan will outline purchasing and shipping/receiving procedures for all hazardous materials entering the PA. The Environment Department will maintain a database of all hazardous materials used on-site and approval from the Department will be required prior to any material entering the PA.

All hazardous materials and dangerous goods associated with the Project will be managed and accounted for under the applicable regulations, including the NS *Dangerous Goods Management Regulations*. All persons involved in handling or usage of hazardous materials and dangerous goods will be required to complete adequate training. All hazardous materials and dangerous goods storage will require regular inspection, completed by a qualified person.

A specific environmental emergency plan will be prepared to meet the requirements for any substance listed under Schedule 1 of the E2 regulations.

6.1.2 Wildlife Management Plan

The primary goals of the Wildlife Management Plan are to provide strategies for reducing human-wildlife interactions, promote safety of both wildlife and site personnel and to provide best management practices for the management of vegetation. This document is intended to be a living document, revised as necessary to reflect current construction activities. This plan covers the following topics:

– Education and Awareness Training Plan;
– Communication protocol for wildlife observations;
– Sensitive wildlife time periods throughout the year;
– General wildlife mitigation strategies;
– Avifauna mitigation strategies;
– Herpetofauna mitigation strategies;
– Species at Risk mitigation strategies; and,
– Vegetation and weed management protocol including invasive species.

6.1.3 Erosion and Sediment Control Plan

The Project Erosion and Sediment Control Plan (ESCP) provides measures and best management practices for the Mine Water Infrastructure to minimize erosion and protect nearby waterbodies from sedimentation. The ESCP's key objectives include:

– Prevent the uncontrolled release of sediment to natural watercourses
– Compliance with the environmental inspection criteria established as a part of the environmental approvals process
– Effectively minimize the potential impact of earthwork and other activities on the surrounding environment by:
  - Managing surface water runoff across the PA
  - Designing Mine Water Infrastructure to include erosion and sediment control measures where necessary
  - Identifying potential impacts of erosion and sedimentation
  - Identifying mitigation measures for erosion and sedimentation
  - Sequence mitigation measures with required work to prevent erosion and sedimentation issues

The ESCP identifies a series of erosion and sediment control measures related to the Mine Water Infrastructure that will be put in place including location, design, and construction sequencing for each measure.

Contingency measures related to erosion and sediment control are outlined in Section 8.1.3.

6.1.4 Fugitive Dust Best Management Practices Plan

The Fugitive Dust Best Management Practices Plan (BMPP) provides details about the best management practices that will be in place to control potential fugitive dust emissions, as well as planned response strategies for fugitive dust issues.

The potential sources of fugitive dust emissions that have been identified for the Project include the following:

– Clearing, grubbing, and stripping;
– Till and organic material stockpiles;
– East Pit and West Pit operations;
– Mobile equipment sources;
– Mill area operations;

– WRSAs;
– Material loading/unloading; and,
– TMF.

The Fugitive Dust BMPP will identify control measures to reduce fugitive dust emissions, considering the source of the dust emissions, the dispersion conditions, and the location of sensitive areas to avoid relevant impacts of dust emissions on receptors. In addition, the Fugitive Dust BMPP outlines monitoring requirements to determine the effectiveness of the controls.

Preventative procedures will be implemented, including design and installation of structures and regular operating procedures to prevent the generation of dust and/or the dispersion of dust emitted from reaching sensitive areas. The Fugitive Dust BMPP also identifies reactive control measures to be implemented in the event of unexpected circumstances which lead to the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.

The Fugitive Dust BMPP will be subject to ongoing reviews throughout all phases of the Project to evaluate the effectiveness of the dust control practices and focus on the identification of improvement opportunities that can reduce the risk of fugitive dust emissions.

6.1.5 Historic Tailings Management Plan

The Historic Tailings Management Plan outlines Signal Gold's approach to assessing, remediating and monitoring areas of historic tailings directly and indirectly impacted by the Project. Areas where there is direct disturbance of historic tailings, these tailings will be disposed of in the lined TMF. Historic tailings within the footprint of Project infrastructure, including the East Pit, West Pit, and haul road, will be removed via excavator. Tailings will be excavated to the delineated extents or to bedrock and under the supervision of a trained environmental professional.

Management of historic tailings within the PA will be completed in accordance with the NS Contaminated Sites Regulations as well as the Ministerial Protocols pursuant to those regulations. External reporting provided to the NSECC will be completed in accordance with the Confirmation of Remediation Protocol (PRO-700). A Remedial Action Plan in accordance with NS PRO-600 will also be completed prior to Project development.

6.1.6 Mine Rock Management Plan

The Mine Rock Management Plan provides the handling and monitoring strategies for waste rock, ore, overburden and tailings produced during construction and operations of the Project. The plan is intended to minimize the impacts associated with metals leaching and acid rock drainage (ML/ARD) on water quality in the receiving environment. The plan outlines the following:

– Placement of waste rock in the WRSAs including non-potentially acid generating (NPAG) and potentially acid generating two unit (PAG2)
– Management of the open pit wall run-off
– Maintaining the necessary water cover for the TMF to inhibit sulphide oxidation, ARD onset and minimization of the associated ML
– Management of the overburden material during operations and closure.

The Mine Rock Management Plan includes monitoring requirements for all materials listed.

6.1.7 Traffic Management Plan

A Traffic Management Plan will be developed prior to mobilizing equipment to the PA and will be implemented for all phases of the Project to mitigate any identified risks. The Traffic Management Plan will be communicated to all affected parties and will cover all project modes of transportation and shall include the following: driver training, competency assurance, and vehicle selection and maintenance, at a minimum. In addition, Signal Gold, in conjunction

with contractors, will conduct a Risk Assessment on equipment/vehicle movement for each area potentially impacted by the Project.

6.2 Environmental Monitoring

Environmental monitoring will be conducted according to the requirements outlined in the management plans detailed in 6.1. In addition, a Water Monitoring Plan and a Lichen Monitoring Plan were developed for all phases of the Project.

6.2.1 Water Monitoring Plan

Proposed project activities including development of the open pits, WRSAs, and TMF may have the potential to affect groundwater and surface water quality. Given the potential impacts associated with the proposed Project activities, monitoring groundwater and surface water elevations, flows and quality will document the impact of Project activities on the environment.

A series of groundwater monitoring wells were installed to collect baseline quality and quantity data. Additional wells may be installed at various phases of the Project depending on the monitoring requirements. The monitoring plan outlines the wells to be monitored at each phase of the Project for both quantity and quality.

Surface water monitoring locations were established in the Gold Brook Lake and Gold Brook catchments to collect baseline quality and quantity data. The baseline monitoring of continuous water level at six existing locations and manual flow data at five of these locations is proposed to continue on a monthly frequency until the end of operations.

Visual monitoring of erosion and sediment control measures to identify pathways to surface water bodies and wetlands will be conducted through all phases.

As the pits are allowed to fill, most of the watercourses that would have been impacted during operations will begin to recover and the water table will begin to rise, resulting in drawdown losses to the watercourses being lessened. During closure, water quantity monitoring will likely continue at four existing locations initially and may be reduced to three locations three years after mine closure is finished, the frequency at which can likely reduce from monthly to quarterly events.

Surface water quality monitoring will adhere to the Industrial Approval (IA) to be obtained for the Project. The Project proposes four final discharge points during operations under the *Metal and Diamond Mine Effluent Regulations*. An Environmental Effects Monitoring program will be developed in consultation with ECCC. Surface water monitoring will be compliant with provincial and federal requirements.

6.2.2 Lichen Monitoring Plan

A Lichen Monitoring Plan was developed to monitor for potential Project related effects on observed Species at Risk (SAR) and Species of Conservation Interest (SOCI) lichens. The plan describes proposed mitigations, adaptive management strategies as well as the translocation efforts to be undertaken to reduce the impacts to SAR/SOCI lichens.

The plan outlines a monitoring plan which will consist of the following:

– Monitoring of lichen health to detect changes due to edge effects or changes in air quality
– Monitoring of the effectiveness of Project setbacks (100 m)
– Monitoring the effectiveness of lichen translocations

7. General Environmental Protection Measures

The following section is intended to outline general environmental protection measures not captured by the Component Management Plans to minimize adverse environmental effects during Project related activities.

7.1 Air Emissions

The key potential effects resulting from the Project on air quality include potentially elevated levels of dust and particulate matter from clearing and grubbing, general earthworks, blasting/extraction operations, crushing, vehicle and haul traffic on unpaved roadways. Dust is commonly considered a concern from mining operations.

A Fugitive Dust BMPP will be implemented for the Project, which includes specific mitigation measures to manage and reduce fugitive dust emissions during all phases of the Project. General environmental protection measures that will be implemented to address potential effects to air emissions may include the following:

- During dry periods, water and/or dust suppressants will be applied to the access road, site roads and haul roads as needed to mitigate dust emissions. Watering may be repeated several times a day if required, depending on surface and meteorological conditions. Water used for dust suppression will be sourced from Project contact water (with suitable water chemistry) and not sourced from natural waterbodies.
- Reduced drop height when dumping waste rock and/or organic material/ till to reduce dust.
- Stabilize and cover surfaces of organic material and till stockpiles during extended periods where they are not being used.
- Conduct regular equipment maintenance and inspections to ensure all equipment, vehicles, and haul tracks are in good working order.
- Reduce engine idling and cold starts where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions.
- Design haul roads and infrastructure to reduce haul distances, where possible.
- Implement and enforce reduced speed zones for Project vehicles. Speed limits will be set in accordance with provincial regulations and industry standards.
- Haul roads and infrastructure will be designed to reduce haul distances where possible.
- Any non-essential internal combustion engines will be shut off when not in use, and idling shall be in compliance with the Project idling policy.
- Low sulphur gasoline and low sulphur diesel fuel shall be used for vehicles and heavy equipment wherever possible.

7.2 Light

The potential effect resulting from the Project on changes (i.e., increases or changes to occurrence / timing) to ambient light levels have the potential to adversely affect flora, fauna, general population and sensitive receptors in the area.

General environmental protection measures that will be implemented to address potential effects to light will include the following, where possible:

- Restrict vehicles and equipment to defined work areas and roads, and specified corridors between work areas.
- Project-related lighting will be limited to that which is necessary for safe and efficient activities.
- Any lights not in use will be turned off.
- Install shielded downward facing lights and direct lights close to work area
- Install lights with light spectrums that have less effect on wildlife.

– Install, wherever possible, floodlights and asymmetric beams.
– Install lights as far from the Project boundaries as possible and directed inward to minimize off site light trespass.

7.3 Noise Emissions

The potential effect resulting from the Project on noise is potentially elevated sound levels resulting from increased use of milling activities, heavy equipment, truck traffic, and blasting.

General environmental protection measures that will be implemented to address noise include the following:

– Blasting will be conducted by a certified contractor who will develop a Blast Management Plan and Blast Designs for review and approval prior to carrying out the work. Blasts will be designed to meet vibration and overpressure limits at appropriate distances from any existing structures (i.e., pipeline, residential receptors), Project infrastructure, and fish habitat. A monitoring plan will be implemented to record vibration and overpressure for each blast.
– Blasting will typically occur twice a week during daylight hours.
– Blasting schedule will be communicated to the local community.
– Equipment, vehicles and haul trucks will be maintained in good working order and equipped with appropriate mufflers to reduce noise.
– Haul roads and infrastructure will be designed to reduce haul distances where possible.
– Project infrastructure will be designed to limit noise emissions.
– Wherever possible, trees and other vegetation will be left in place to muffle nuisance noise.

7.4 Erosion and Sedimentation

Potential adverse effects resulting from the Project related to erosion and sedimentation are impacts to fish and fish habitat from sediment laden run-off and mobilization of contaminants.

A ESCP will be implemented for the Project, which includes specific mitigation measures to manage and reduce erosion and sedimentation during all phases of the Project. General environmental protection measures that will be implemented to address potential erosion and sedimentation include the following:

– Disturbed areas will be limited to the extent practical.
– Clearing associated with road construction will be limited, where possible, to the width required for the road embankment and drainage areas.
– Erosion and sediment control measures will be established around all disturbed areas as per the Erosion and Sediment Control Plan.
– Disturbed areas will be monitored to ensure erosion and sediment control measures are maintained/effective and to identify if additional mitigation is required.
– Road and site grading will be directed away from wetlands and watercourses, where possible.
– Organic material and till will be separated and stockpiled separately during stripping activities.
– Organic material and till will be separated from grubbed material and stored for use during progressive reclamation and closure.
– Organic and till stockpiles will be developed with appropriate buffers (30 m) to wetlands and watercourses where practical. Ditching around stockpiles will collect all run-off for treatment of total suspended solids (TSS) prior to discharge.
– Sediment control fences will be installed in areas (e.g., slopes and embankments) where organic materials and till are exposed to potential erosion. Sediment control fences will be inspected and maintained until the disturbed areas have stabilized and revegetation has occurred.

- Surfaces of organic material and till stockpiles will be stabilized during extended periods between usage by means of vegetating or covering exposed surfaces.
- Duration of instream work will be minimized. Any instream work will be completed free of flowing water (i.e., temporary cofferdam to allow for work in the dry) to minimize TSS. When possible, machinery will be operated above the high-water mark or inside isolated areas.
- Design of stockpiles will include perimeter ditches to direct water to settling ponds prior to discharge.
- Settling ponds will be used to minimize peak discharges to the environment.
- All ditching will be designed to reduce erosion and sedimentation through use of rock check dams, sediment fences, plunge pools, and grading as appropriate. All contact water ditching will be lined to mitigate contaminant leaching into the receiving environment.
- A maintenance schedule will be developed and implemented to provide for regular maintenance and inspection of Project mine water management infrastructure.
- Disturbed areas will be graded and/or scarified, covered with organic material and till, where required, and seeded with native seed mix to promote natural plant colonization and succession.

7.5 Groundwater Resources

Groundwater quantity and/or quality may be changed due to the activities associated with Project construction, operations, and closure. During various Project activities, there is a potential for direct adverse effects to groundwater quantity and quality. Project activities such as dewatering the proposed pits, have the potential to drawdown (lower) the groundwater table adversely impacting the quantity of groundwater available. Project activities including construction of WRSA and blasting to develop the open pits have the potential to increase concentrations of metals and nitrogen species in groundwater which may adversely impact groundwater quality.

General environmental protection measures that will be implemented to address potential degradation of groundwater quality include the following:

- Disturbed areas will be limited to the extent possible.
- Boundaries of areas to be cleared will be identified prior to disturbance.
- Sensitive areas (e.g., wetlands, watercourses, SAR habitat) will be identified prior to construction and appropriate buffers will be flagged and maintained around these areas, where possible.
- Clearing associated with road construction will be limited, where possible, to the width required for the road embankment and drainage areas.
- Equipment and vehicles will be restricted to defined work areas and roads, and specified corridors between work areas.
- Spill kits will be available in the vehicles and machinery circulating in the Project area and at various places throughout the PA to facilitate the management of accidental spills. Spill kits will include a quantity of sufficient absorbent materials as well as watertight containers intended to collect petroleum products and other hazardous residual materials. Section 7.12.
- Blasting will be conducted by a certified contractor who will develop a Blast Management Plan and Blast Designs for review and approval prior to carrying out the work. Blasts will be designed to meet vibration and overpressure limits at appropriate distances from any existing structures (i.e., pipeline, residential receptors), Project infrastructure, and fish habitat.
- Storage, parking, washing, minor mechanical maintenance and refuelling of machinery and equipment will be completed at least 30 m from any watercourse and, where possible, in a designated area. For non-mobile equipment, e.g., cranes, additional mitigation measures shall be required.
- Contingency plans, including spill prevention and response, training, outline of roles and responsibilities, clean-up equipment and materials, and contact and reporting procedures, will be implemented.

- Appropriate Project personnel will be trained in fuel handling, equipment maintenance and fire prevention and response measures.
- Waste will be transported from the Project to licensed/approved facilities.
- A Historic Tailings Management Plan will be developed and implemented to provide guidance for the proper handling and disposal of historic tailings located withing the limits of Project infrastructure.
- Reagents will be stored and handled within designated containment areas. Where required, reagent storage will be located within a designated containment area to avoid mixing of incompatible chemicals. Storage tanks will be equipped with level indicators, instrumentation, and alarms to prevent spills. Refer to Section 7.11 for additional details.
- Runoff from mine pit walls and groundwater seepage will be collected, with water pumped to the water treatment unit associated with the northwest WRSA prior to entering the settling pond and discharging.
- Disturbed areas will be graded and/or scarified, covered with organic material and till, where required, and seeded with native seed mix to promote natural plant colonization and succession.

7.6 Work Near In or Near Waterbodies

Work in or near surface water features including watercourses and wetlands has the potential to affect the quantity and quality of water resulting to changes to fish habitat. Project activities such as clearing and grubbing, WRSA development, and dewatering of the open pits have the potential to change the quantity of run-off entering adjacent watercourses and wetlands. In addition, effluent discharge from mine contact water has the potential to change water quality.

Mitigation measures that will be implemented to address potential degradation of surface water quality include the following:

- Fuelling of equipment and/or vehicles will occur in designated areas, away from potential water receptors. Spills kits will be maintained on Site in the event of an accidental spill or release. Any release of fuel or other fluid will be dealt with effectively and immediately, as per Section 7.11.
- Settling ponds will be utilized to treat surface runoff and pit water for total suspended solids (TSS). Treated water will be discharged to the environment.
- All surface water discharges from settling ponds to the natural environment will be sampled as per requirements listed in IA and MDMER to ensure water quality conforms to applicable regulations and guidelines.
- A seepage collection system will be implemented at the TMF.
- Effluent from the TMF will be treated to applicable discharge criteria via a Water Treatment System (WTS) and polishing pond prior to being discharged to Gold Brook Lake.
- Design of stockpiles will include perimeter ditches to direct water to settling ponds prior to discharge.
- An Erosion and Sediment Control Plan will outline stormwater management protocols during all Project phases.
- A Mine Rock Management Plan will be implemented, including mitigation and monitoring procedures to address potential ML/ARD impacts.
- The TMF will be covered in the closure phase with a combination of a geosynthetic reinforcement layer, NPAG waste rock, till, and organic material to prevent infiltration into the tailings.
- Seepage and surface runoff from the WRSAs, till stockpiles, organic material stockpiles, East Pit, and West Pit will be collected in settling ponds located through the PA and will be treated as required prior to being discharged to Gold Brook Lake and Gold Brook.
- The WRSAs will be covered with till and organic material upon closure.
- A Fuel and Hazardous Material Contingency Plan will include information on incident prevention, response procedures, and response training in the case of accidental spills.
- A Wetland Compensation Plan will be developed for all direct and indirect impacts of the Project. The plan will outline inspection and monitoring requirements for wetlands within the PA.

- Progressive water management will be implemented over the life of Project. This includes construction of water management infrastructure as areas are developed.
- Existing drainage patterns will be maintained to the extent feasible with the use of culverts and bridges.
- Settling ponds will be used to minimize peak discharges to the environment.
- Perimeter grading will divert non-contact water from entering the mine pits to reduce the amount of dewatering required.
- A maintenance schedule will be developed and implemented to provide for regular maintenance and inspection of Project mine water management infrastructure.

Mitigation measures that will be implemented to address potential adverse effects to wetlands, include the following:

- Wetland avoidance through the alternatives assessment process.
- A Wetland Compensation Plan will be implemented.
- All wetlands will be visually delineated prior to construction.
- Riparian wetland and watercourse buffers (where practical) will be maintained to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work.
- Implement erosion and sediment control measures as necessary, to ensure site runoff is not directed towards wetlands to maintain habitat integrity and existing drainage patterns.
- Minimize erosion of wetland soils by limiting flow velocities by means of hydraulic dissipation techniques and directing runoff through natural upland vegetation, wherever practicable.
- Minimize the rutting of wetland habitat by limiting the use of machinery within wetland habitat and use of swamp mats/corduroy bridges as required.
- Follow NSECC watercourse crossing guidelines, for temporary and permanent crossings.
- Project personnel will complete pre-construction meetings with relevant construction staff to educate personnel and/or sub-contractors on the locations of wetlands and policies related to working around wetlands and watercourses.
- Project personnel will identify and communicate the schedule of construction activities to the Environment Department to ensure proper timing windows and permit conditions are adhered to.
- Fuelling of equipment and/or vehicles will occur in designated areas, away from potential water receptors. Spills kits will be maintained in the event of an accidental spill or release. Any release of fuel or other fluid will be dealt with effectively and immediately.

Mitigation measures that will be implemented to address potential adverse effects to fish and fish habitat, include the following:

- Best efforts will be made by a qualified biologist to capture and relocate fish from watercourses prior to the watercourse alteration. Fish screens and/or other barriers will be installed and maintained to prevent fish from re-entering these areas.
- Duration of instream works will be minimized. Any instream work will be completed free of flowing water (i.e. temporary cofferdam to allow for work in the dry) to minimize TSS. When possible, machinery will be operated above the high-water mark or inside of isolated areas.
- Appropriate erosion and sediment control measures will be incorporated for all phases of the Project and will be checked regularly and prior to and after storm events to ensure they are continuing to operate properly to prevent the undue release of suspended sediments into water as a result of the Project activities and minimize potential effects to fish and fish habitat.
- The Project was designed to avoid fish habitat to the extent possible. Where Harmful Alteration, Disruption or Destruction (HADD) of fish habitat cannot be avoided, the impacted fisheries habitat will be offset through the development and implementation of a Fish Habitat Offsetting Plan.
- In-water work will be planned to respect DFO timing windows to protect fish in NS.

– Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat. No herbicides shall be used near possible fish habitat.
– Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to DFO direction and approval.
– Emergency spill kits will be maintained on-site and all staff will be trained on how to use them. All spills or leaks shall be promptly contained, cleaned up and reported as outlined in Section 7.12.

7.7 Clearing and Grubbing

Clearing and grubbing for the Project has the potential to result in loss of vegetative cover, landscape disturbance and habitat fragmentation as well as disturbance to nesting birds and species at risk. There is also the potential for invasive species to be introduced to the area through the transfer of seeds and roots from equipment, vehicles, or Project personnel during Project activities.

The Wildlife Management Plan and the Lichen Monitoring Plan contain further details on mitigation measures to be implemented to reduce the risks to species at risk and species of special concern.

Mitigation measures that will be implemented to address potential effects to the terrestrial environment include the following:

– Disturbed areas will be limited to the extent practical.
– Boundaries of areas to be cleared will be identified prior to disturbance.
– Disturbed areas will be monitored to ensure erosion and sediment control measures are maintained/effective and to identify if additional mitigation is required.
– Sensitive areas (i.e., SAR habitat) will be identified by trained personnel prior to construction and appropriate buffers will be flagged and maintained around these areas, where possible.
– A riparian wetland and watercourse buffers will be maintained to reduce adverse effects to wetlands, watercourses, and downstream receiving environments, where practical.
– Dust emissions will be managed through the use of water and dust suppressants as detailed in the Fugitive Dust BMPP.
– To minimize the risk of introducing exotic or invasive plant species, equipment will be cleaned prior to arriving on site. Equipment will be inspected to ensure it is in appropriate condition prior to entering the Project Area.
– Known locations of plants/lichens species of conservation interest will be avoided where possible.
– Equipment and vehicles will be restricted to defined work areas and roads, and specified corridors between work areas.
– Native seed mix will be used for erosion control on exposed soils and stockpiles during reclamation and closure activities.

Mitigation measures that will be implemented to address potential effects to the nesting birds include the following:

– Project personnel shall comply with regulations outlined in the *Migratory Birds Convention Act.* If any nest is identified or behaviour observed which suggests a nest is present, work is to be immediately halted and the Environment Advisor/Monitor must be notified, so steps can be taken to identify the species and determine appropriate mitigation or avoidance if required.
– Nests used by non-migratory birds that are protected under the *Nova Scotia Wildlife Act* that are discovered will be avoided and undisturbed until breeding activities are determined to be over. Signal Gold will consult with NSDNRR (and ECCC in the case of migratory birds) to establish appropriate vegetated buffer zones prior to clearing that will be maintained.
– No nests will be disturbed by Project personnel, regardless of occupancy.
– Identified nests will not be marked with flagging tape, as this can increase the risk of predation. Instead, the vegetated buffer may be flagged.

– Clearing and grubbing activities will be completed outside the accepted breeding bird window (April 15 to August 15), where possible. If clearing is required within the breeding bird window, Signal Gold will consult with NSECC, NSDNRR and ECCC for authorization and a qualified professional will be retained to conduct pre-clearing nest sweeps.

7.8 Fuel Storage and Handling

A diesel fuel station consisting of two 100,000 L storage tanks with high flow dispensers will be installed in the mill area to refuel haul trucks. Improper handling of fuels during delivery, fuelling and refuelling of mobile equipment, vehicles and equipment malfunction have the potential to negatively impact the environment resulting from accidental release and spills. Environmental impacts caused by the release of fuels or spills have the potential to negatively impact soil, surface water, and groundwater resources, aquatic habitat, vegetation and wildlife. Further, spills could negatively affect the health and safety of Project personnel.

Mitigation measures that will be implemented to address potential effects of fuel storage and handling include the following:

– Diesel tanks will be equipped with the proper secondary containment and will be constructed with a leak detection instrumentation.
– Project Supervisors will be responsible for reconciling fuel consumption.
– Spill kits will be available at the fuelling state and on all mobile equipment.
– Any Project personnel who will be completing fuel transfer activities or refueling vehicles, equipment and machinery will be trained appropriately.
– Fuel transfers and refueling activities will be always monitored and attended to by Project personnel.
– All repairs, fuel transfers or any other activity that could result in a fluid release will be completed with adequate spill containment measures, i.e., use of spill tray or drip pan.
– Any fuel delivery trucks providing service will be parked within or equipped with secondary containment when not actively performing fuel transfers.
– Vehicles, equipment, and machinery that carry fuel, hydraulic oil, and other petroleum products will carry spill kits, clean-up equipment, and fire extinguishers.
– Proper fuelling procedures shall be followed, and fuelling shall occur in designated areas, away from potential water or sensitive receptors.
– All petroleum storage tank systems with a total capacity of more than 4,000 L must be registered under and in compliance with the Petroleum Management Regulations.
– All storage tanks regulated under the Petroleum Management Regulations are required to be installed by a certified installer.
– Any above-ground fuel container with a capacity of 230 litres or more will have secondary containment to hold not less than 110% of the capacity of the tank, plus 150 mm (6 inches) of freeboard. When more than one tank is enclosed within a dyked area, this area will be of sufficient volume to contain 110% of the capacity of the largest tank or 100% of the capacity of the largest tank and 10% of the aggregate capacity of all the other tanks, whichever is greater, plus 150 mm (6 inches) of freeboard. This includes tanks on skids or wheels.
– Fuels and hazardous materials will only be handled by personnel who are trained in the WHMIS and are qualified in handling these materials in accordance with manufacturer's instructions and applicable regulations.
– Oil, grease, gasoline, diesel and other fuels will be stored at least 30 m from any surface waters or wetlands.
– Fuel storage areas will be clearly marked or barricaded to ensure that they are not damaged by moving vehicles. The markers will be visible under adverse weather conditions.
– Waste oils and lubricants will be retained in a tank or closed container and disposed of at approved facilities in accordance with provincial requirements.
– Smoking will be prohibited within 10 m of a fuel storage area.

7.9 Explosive Storage and Handling

The explosives storage pad will be located north of Gold Brook Lake. The necessary size of this magazine will abide by the *Nova Scotia Blasting Regulations* as well as the *Canadian Federal Explosives Regulations* regarding quantity-distance requirements and construction parameters. Explosives can also impact the health and safety of Project personnel through the noise and dust associated with the use of explosives. Further, explosives also have the potential to impact wildlife and fish through increased noise. Blasting can result in changes to water chemistry potentially impacting fish and fish habitat.

Mitigation measures that will be implemented to address potential effects of explosive storage and handling include the following:

- No ANFO (ammonium nitrate-fuel oil) mixtures or blends should be used near water. Thickened 100% homogenized bulk emulsion product will be used to reduce the risk of product seeping through cracks and voids and entering the adjacent waterbodies.
- Engineering controls will be put in place to minimize fly-rock from the blast area.
- All blast holes should be filled completely (stemmed) with the appropriate size and type of material that meets local legislation.
- Blasts designed to limit charge size/charge weight and detonation velocity to keep instantaneous pressure (overpressure) and peak particle velocity (PPV) below levels that would impact fish or fish habitats (100kPa overpressure & 13 mm/s PPV).
- Setback distances from the center of detonation of a confined explosive to a fish habitat to achieve overpressure and vibration limits can be found in “Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters – D.G. Wright and G.E. Hopky – 1998”.
- Blasts designed with sufficient delay between charges to reduce the overall detonation to a series of smaller explosions. This may be achieved with the use of electronic detonators which have an accuracy of <1 millisecond (product information attached).
- All shock tubes and lead wires recovered and removed after each blast.
- Explosive storage and magazines will be constructed with separation distances from nearby infrastructure as per applicable legislation.
- Signal Gold will utilize a qualified blasting professional to conduct all blasts.
- Signal Gold will develop a communication plan to info local residence of the blast schedule.

7.10 Non-Hazardous Waste Management

A variety of non-hazardous waste streams will be generated through Project activities. Non-hazardous waste includes food scraps, paper, cardboard, etc. Storing, handling, disposing of, and transporting waste improperly has the potential to negatively impact the environment (i.e., soil and water quality), attract wildlife, and/or cause a health and safety concern for Project.

Mitigation measures that will be implemented to address potential effects of waste management include the following:

- Signal Gold will retain a licensed waste disposal company to collect and transport non-hazardous waste to an appropriate disposal facility. Copies of the waste contractor’s license certificates will be maintained by the Environment Department.
- Considerations will be taken to minimize waste (i.e., construction material, debris, and waste). Waste will be avoided, reused, reduced, or recycled wherever feasible.
- All non-hazardous wastes will be segregated from hazardous wastes. If wastes are mixed, combined material will be handled as hazardous waste.
- Signal Gold will provide appropriate waste and recycling bins for the collection, sorting and disposal of their waste. Project personnel will be provided training on waste segregation procedures.

– Waste storage containers, with the exception of waste bins (i.e., scrap metal and wood) will be covered at all times and emptied regularly to avoid issues associated with not closing properly as a result of overfilling. Oversized or overweight non-hazardous waste that are unable to fit in the provided container, will be stored near the designated location in a safe manner.
– Waste and recycling containers will be colour-coded, where practicable, and appropriate signage will be posted indicating the type of waste to be stored.

Signal Gold will dispose of non-hazardous waste during regular scheduled waste pick up for disposal or recycling. Organic waste will be monitored and removed when necessary. There will be no long-term storage of non-hazardous waste materials. Any non-hazardous waste that is recyclable will be transported to an external location for material recovery as applicable.

7.11 Hazardous Materials Storage, Handling and Management

Hazardous materials and dangerous goods will be required to conduct Project activities. Hazardous materials will be managed from the time a hazardous material need is identified, through the use and ultimately to the time the product is fully consumed or disposed of as hazardous waste. The primary issue associated with the storage, handling, and management of hazardous materials is the potential for an uncontrolled and unplanned release of these materials to the environment through spills, which could negatively impact the environment (i.e., soil and water quality), wildlife and/or fish habitat, and cause a health and safety concern for Project personnel.

A Hazardous Materials Management Plan will be developed for the Project. At a minimum the plan will contain the following mitigation measures that will be implemented to address potential effects associated with hazardous materials storage, handling and management include the following:

– Safety data sheets (SDS) will be available, and the locations of such materials will be identified in the Emergency Response Plan. All hazardous materials and dangerous goods storage will require regular inspection, completed by the Environment Advisor/Monitor.
– Project personnel trained in hazardous waste handling will collect and transport hazardous waste to the hazardous waste storage area. Hazardous waste will be collected and transported off-site to a licensed hazardous waste disposal facility by a licensed hazardous waste disposal contractor. Copies of the waste contractor's license certificates and manifests will be maintained by the Environment Department.
– All hazardous waste materials will be secured and appropriately labelled according to WHMIS standards, with the contents and associated hazards, and accompanied by a shipping manifest before loaded onto transport vehicles.
– Vehicles being used for the collection and transport of waste shall be kept in good working order, and must be suitable for the type, volume, characteristics, and condition of the waste being transported.
– Hazardous materials will be handled by trained personnel to avoid leaks or accidental release into the environment.
– All chemicals being used for Project activities will be approved by the Environment Department prior to being brought on-site. The safety department will maintain alphabetical record of SDSs for all approved hazardous materials.
– Chemicals shall be stored in metal or approved plastic containers, have tight closures with screw or spring covers, and shall be equipped with spouts or other means to allow transfer and/or pouring without spilling.
– All hazardous materials shall be stored safely in appropriate drums and/or containers according to the SDS requirements. Where possible, hazardous materials should be stored in their original containers.
– All hazardous materials shall be property identified and labelled.
– All hazardous materials should be stored in approved secondary containment sized for 110% container capacity, or 25% of the total storage capacity, whichever is greater.

- Containers used for storage should be in good condition, and visually inspected for damage and deterioration before use, and periodically during use, as practicable.
- All hazardous materials delivered in accordance with the requirements of the Canadian Transportation of Dangerous Goods Act (TDGA).
- Hazardous materials will be managed in accordance with WHMIS requirements, including appropriate hazard identification and classification, labelling, and SDSs.
- Contents of hazardous material storage containers should not exceed original fill volume or 95% of their maximum capacity, to prevent overfilling and accidental release.
- Storage containers of hazardous materials will be kept closed, except when material is being added or removed.
- Containers will be stored safely in an upright position, in an area with adequate ventilation, and arranged to prevent the risk of damage, and to allow for easy access during inspections.

Signal Gold will construct a designated hazardous storage area located northwest of the mill area, which will adhere to the following requirements:

- Storage area secured with controlled access.
- Incompatible wastes will be stored in separate areas/containments to prevent comingling or contact.
- Safety Data Sheets (SDS) for all hazardous wastes stored should be available at all times in the storage area.
- Waste should be spaced sufficiently to allow for easy access and monitoring of leaks and/or spills.
- Hazardous wastes should be stored in sealed containers away from environmental conditions (i.e. direct sunlight, wind, and rain).
- Secondary containment of at least 110% of the storage container, or 25% of the total storage capacity, whichever is greater.
- Provide adequate ventilation if volatile wastes are stored.

The following items will be maintained in the hazardous materials storage area for easy access;

- Fire extinguisher
- Eye wash station
- Spill kill
- Spill response equipment as indicated in material specific SDS

7.12 Spills

This Project will require the use and handling of petroleum products such as fuel oil, gasoline, and lubricants. Possible malfunctions or accidents from heavy equipment, vehicle traffic, vehicle and equipment fuelling, maintenance or transportation of petroleum products could result in spills. All spills have the potential to negatively impact health and safety of Project personnel, contaminate soils and groundwater, and through runoff contaminate watercourses and surrounding wildlife habitat. Contaminants may adversely affect the vegetation, local habitat, migratory birds, and aquatic resources. Loss of petroleum, oil and lubricants may also volatilize and adversely impact the ambient air quality.

Mitigation measures that will be implemented to address potential effects associated with spills include the following:

- Relevant Project personnel will be made aware of and trained in spill response during Project orientation. An overview of spill prevention procedures, spill response activities, and reporting requirements will be provided during Project orientation.
- Environmental Advisor/Monitors will conduct monthly inventories of spills kits.
- Following a spill, Project personnel will restock all supplies and spill kits that were used.
- Environmental Advisor/Monitors will perform checks of vehicles and storage areas to confirm proper storage and handling of petroleum products, bulk chemicals and/or other hazardous materials.

- Project personnel who undertake refueling and maintenance activities will do so on level terrain in designated areas and away from potential water receptors and sensitive environments.
- Appropriate spill kits, absorbent material, empty drums, and shovels will be provided near all storage of fuel and bulk chemicals.
- All repairs, fuel transfer or any other activity that could result in a fluid release will be completed with adequate spill containment measures (i.e., use of spill tray or drip pan).
- Environmental Department will maintain a bulk chemical inventory (>55 gallons) including information related to bulk chemical storage locations, contents, type, size of containers, secondary containment, and location of spill kits as per provincial and federal regulations.
- All bulk chemicals will be located within a bermed containment area.
- Fuel storage tanks will be double-walled and located in appropriately sized secondary containment, including slip tanks or other portable fuel tanks.
- Drums and totes containing petroleum products that are brought or delivered onsite are visually inspected for signs of leaks and corrosion.
- Project personnel who handle drums will ensure the lids are always secured, with the exception of adding and/or removing product.
- All used oil will be managed in accordance with the NS Used Oil Regulations.

7.13 Disturbance of Cultural and Heritage Resources

Project activities have the potential to result in adverse effects on cultural and heritage resources. Construction activities, excavation of the pits and related works, and other Project-related activities involving ground disturbance could potentially result in disturbance or destruction of known or unknown cultural or heritage resources.

Mitigation measures that will be implemented to address potential adverse effects to cultural and heritage resources include the following:

- In the unlikely event that archaeological resources not previously identified are encountered, all work in the associated area(s) will be halted. The Environment, Compliance and Social Responsibility Manager will contact the Coordinator of the Special Places Program of the NS Department of Communities, Culture, Tourism and Heritage to determine a suitable method of mitigation.
- Signal Gold will maintain ongoing discussion and engagement with Mi'kmaw organizations, including KMKNO, to avoid or minimize any potential impacts on cultural and heritage resources. In the event of an accidental discovery of heritage resources of Indigenous provenance, KMKNO will be notified.
- Personnel involved in all ground disturbance related to site preparation, construction and excavation will be made aware of the potential for cultural and/or heritage resources throughout the PA. Site personnel will be provided with direction on appropriate actions including reporting procedures in case of accidental discovery of cultural and/or heritage resources.

8. Contingency Plans

The objectives of this contingency plan are to minimize:

- Danger to persons
- Pollution of watercourses
- Any areas affected by spills or fires
- Degree of disturbance to the area and watercourses during clean-up
- Degree of disturbance to wildlife

Signal Gold will implement preventative measures wherever possible and minimize the potential of accidents/unplanned situations.

8.1.1 Pit Slope Failure

During the operations phase, the ground condition and inspection procedures described below will be followed. Signal Gold will take all precautions necessary ensure the safety of employees. These include but not limited to:

- Ground support standards reviewed regularly by a qualified engineer.
- Regular inspections of ground conditions and records of inspections kept on file.
- Project personnel will be adequately trained in ground support installation and general inspections.
- Signal Gold will commit to training a rescue team and provide necessary equipment.
- All failures should be reported immediately to the Project Director. The following information will be provided:
  - Name of the person reporting the failure.
  - Location of the failure.
  - Time of the failure detection.
  - Estimate size of failure.
  - Events leading up to the failure.
  - If applicable, names of injured persons.

Any failure occurring that includes injured persons should have the following procedure followed:

- Initiate warning system and evacuate the mine (isolate affected areas).
- Contact the emergency response team and 911 if required.
- Transport injured persons to first-aid room.
- Treat injuries as best as possible with the available supplies in the first-aid room.
- Await arrival of the ambulance.

8.1.2 Fire Response Contingency Plan

There exists the potential for fires on all work sites that involve mechanical equipment and fuels; however, mitigative measures can be taken to minimize the potential for fires at the work site. All precautions necessary shall be taken to prevent fire hazards when working at the Site. These include, but not exclusive to:

- All flammable waste shall be removed on a regular basis and disposed of at an approved disposal site.
- All fire equipment on the work site will be to be checked on a routine basis, in accordance with local fire safety regulations, to ensure the equipment is in proper working order at all times.
- All potential fire hazards will be to be identified by the Project personnel prior to beginning work in an area. If a fire hazard exists, all Project personnel working in the vicinity will be to be property notified and trained in how to mitigate the risk.
- A meeting location (i.e., muster point) shall be established by Project Superintendents or Supervisors for each working area, such that in the event of an emergency, on-site workers will know where to gather.
- Fire extinguishers shall be available at the work site as per OHS regulations. Such equipment shall comply with, and be maintained to, the manufacturers standards.
- All workers shall be instructed in fire safety and emergency response protocols.

In the event that an incident involving fire does occur, the following safety protocols shall be followed:

- In the event of any fire, large or small, on-site personnel shall immediately notify the appropriate Fire Department.

– If, and only if, the fire poses no immediate threat to human safety and only after help from the fire department is on the way, on-site personnel shall take immediate steps to extinguish the fire using the appropriate fire extinguishing equipment.
– If the fire cannot be contained, all on-site personnel shall vacate the area. All warnings shall be delivered in such a way that the safety of vacating workers is not jeopardized.
– On site workers who have vacated the area of the fire shall gather at a safe location, identified by the Contractor(s), who will also ensure all workers who had been working in that area will be accounted for. All missing persons shall be reported to the appropriate Fire Department personnel upon their arrival to the scene.
– No worker is to re-enter the vacated area until a safety clearance has been issued by Fire Department personnel to the Contractor(s).
– All incidents involving fire shall be reported to the safety department, Signal Gold, and all appropriate emergency personnel. The Environment Manager shall inform the regulatory authorities of the reported incident, if warranted.
– In the event that a fire event leads to a spill of contaminated material, the procedures and reporting protocol outlined in Section 7.12 shall be implemented.
– In the event of personal injury or a near miss involving on-site workers, all incidents will be to be reported to the Project Director.

8.1.3 Erosion and Sediment Control Contingency Plan

Surface runoff, drainage and flows resulting from precipitation may contain suspended solids that can cause sedimentation of a watercourse, wetland, and affect aquatic resources by reducing feeding success, reproduction, and habitat. The following environmental protection measures will be implemented prior to the initiation of construction activities:

– Sediment mitigation measures will be established and maintained in accordance with the Erosion and Sediment Control Plan.
– Minimize the size of the disturbed area and duration of soil exposure where possible.
– Drainage installations shall be designed, constructed, and maintained to an appropriate standard.
– Surface water runoff from mine infrastructure must be managed and all runoff directed to the nearest settling pond and/or WTS.
– Appropriate erosion and sediment control measures will be implemented and may include a combination of silt fences, silt curtains, sediment traps, settling ponds, collection ponds and berms.
– Access and haul roads shall be constructed with gradients and drainage systems designed to manage run-off and limit erosion potential.
– Limit borrow activities that can cause disturbance, where possible.
– Project Personnel shall maintain, as required, all sediment and erosion control measures prior to, during and following rain or storm events to minimize environmental damage. All repairs shall be undertaken to the satisfaction of the Environment Department.

If there is visual discoloration, turbidity, or deleterious substances identified in a watercourse and/or wetland notify the Environment Department for further assessment. In addition, the following key actions will be required:

– Immediately determine the point source of sedimentation.
– Halt all construction activities if necessary.
– Ensure that all erosion and sedimentation controls are working effectively.
– Correct any issues that need attention or maintenance.
– Determine if additional controls such as the installation of trenches, berms or pumps are needed.

– A follow-up investigation to determine whether additional corrective actions will be needed to prevent future sediment release events. Results of follow-up investigations will be reported to regulators by the Environment Department.

The Environment Department will determine if the incident is reportable as an uncontrolled discharge of a deleterious substance under MDMER and will report to the incident to the Canadian Coast Guard if appropriate to do so.

8.1.4 Fuel and Hazardous Material Spills Contingency Plan

This Fuel and Hazardous Material Contingency Plan presents a response system in the event of the release of petroleum, oils, or lubricants (POLs) or other hazardous liquids on-site. Release of fluids from a spill may damage flora, fauna, surface water, groundwater, and aquatic organisms.

If a spill occurs in the mill, it will be contained within the mill in the self-contained drainage basins. The floor of the mill will be constructed so that all fluids spilled in the mill will drain to the drainage basins. The spilled fluids may then be pumped back into the circuit.

The objectives of the Plan are to:

– Generate awareness of potential spill situations.
– Establish protocols to protect persons from danger and adverse health effects.
– Ensure everyone is well trained and equipped in the event of a spill.
– Minimize impairment to the quality of the natural environment (air, water or land).
– Contain the extent of affected area and outline clear spill clean-up procedures.
– Control degree of disturbance during the work.
– Decrease risk of damage to property.
– Set out what notifications and reporting is required in the event of a spill.

As soon as it is safe to do so, the Environmental Advisors/Monitors shall report any unauthorized release of contaminants over 100L or ANY spill to a waterbody, wetland, watercourse, etc. by calling the 24-hour spill reporting number: 1-800-565-1633. Using this number will ensure that both the federal and provincial governments will be made aware of the spill.

The following information should be recorded in the event of a spill and reported to the 24-hour spill reporting centre:

– Location of spill
– Time of observation of spill
– Reported by
– Probable (or known) sources of the spill
– Probable (or known) time of the spill
– Nature of material spill
– Probable (or known) volume of spill
– Probable (or known) duration of spill
– Area affected
– Mobility of spill
– Weather, water, or geographic conditions
– Action being taken to contain and/or control the spill
– Personnel at the scene of the spill
– Resources threatened (e.g., water supply, bird colony, fish kills, etc.)
– Other agencies contacted

– Any other pertinent information.

In the event of a spill or leak, the following procedure shall be followed:

– The activity causing the spill will be stopped. If the spill or leak is minor and the individual who discovers the spill or leak is aware of the properties of the spilled substance, this individual shall attempt to stop and contain the leak or spill. Following containment, arrangements for clean-up shall be made.
– If the spill or leak is significantly large that it cannot be cleaned, controlled, or contained by the individual who discovers it or if this individual is unaware of the properties of the substance that has leaked or spilled, that person shall immediately vacate the area and notify the Environment Department. Visible warnings, such as signs or pylons, shall be positioned surrounding the area of the spill and all workers shall evacuate the area.
– In the event that the spill or leak enters a freshwater body (with or without fish habitat), Signal Gold shall report the incident to the NSECC, DFO and ECCC and coordinate a clean-up according to regulatory requirements, as dictated by the indicated regulatory authorities.
– All spills, whether major or minor shall be documented and reported to the Environment Department immediately, along with a mitigative measures program.
– In the event of a spill, leak or discharge, Signal Gold will work with the authorities (NSECC and others, as required) in coordinating a clean-up, which will include the following actions, where appropriate:
    - Deploy on-site personnel to contain the spilled material using absorbent material or booms, as appropriate.
    - Assess site conditions and environmental impact of various clean-up procedures; choose and implement an appropriate clean-up procedure.
    - Deploy on-site personnel to mobilize pumps and empty drums (or other appropriate storage) to the spill site.
    - Apply absorbents as necessary; remove any contaminated sediment/soil, as required.
    - Dispose of all contaminated debris, water, soil, cleaning materials and absorbents generated by the clean-up operation to approved disposal site.
    - Take all necessary precautions to ensure that the incident does not recur.
– During on-site activities, the following spill response resources shall be available close to potential sources of fuels and/or hazardous materials in readiness to respond to accidental releases:
    - Absorbent materials (e.g., sorbent pads, Sorb-All, vermiculite)
    - Small hand equipment (e.g., shovels, tool kit, sledgehammer, buckets, tarpaulins, one empty drum, personal protective equipment (PPE)
    - A fire extinguisher

In the event of personal injury or a near miss involving on-site workers, incidents will be to be reported to the safety department. The Site Environment Manager will be responsible for reporting any incident to the appropriate authorities.

8.1.5 Archaeology Contingency Plan

In the event that archaeological/cultural resources are encountered during Project activities, all pertinent work will be halted and Environment Department is to be notified. The Environment Department will immediately contact the Coordinator of the Special Places Program.

In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw klusuaqn Negotiation Office (KMKNO).

In the event that archaeological resources are encountered during ground disturbing activities, the following procedures need to be followed in order to comply with the *Special Places Protection Act*:

1. Cease work in the area and notify personnel to stay clear of the resource. Secure a 50 m buffer around the area.
2. Contact a Project Supervisor and the Env Dept.

3. Env Dept will contact the consultant archaeologist.
4. Leave the findspot as is. No more work is to continue in the area.
5. Do not remove any material from the findspot.

9. Project Contact Information

A detailed list of contact information will be developed for the Project. The EMP will be updated once the contact information is available.

10. Inspections and Audits

Signal Gold shall maintain all communications and records associated with activities related to the EMP. The Signal Gold Environment Department will communicate directly with the other team members on a regular basis through attendance at project meetings, through telecoms and correspondence and involvement in key decisions.

10.1 Site Inspections

Signal Gold will conduct regular inspections to ensure environmental protection procedures and commitments outlined within the EMP are implemented. Environmental Advisors/Monitors will complete site inspections on a daily basis during construction and weekly during operations, to ensure work is conducted in a manner consistent with this EMP and other requirements such as permit, approvals or authorization conditions.

All inspections completed will be documented on a site inspection form and records maintained. Any non-conformance observed will be recorded, corrective actions identified, action parties assigned with identified completion dates, and findings tracked through to rectification.

10.2 Audits

Signal Gold will conduct internal audits on an annual basis in relation to effective compliance with environmental procedures against this EMP. Audits include field visits, examination of records, and interviews with Project personnel. The following records will be maintained by the Environment Department and readily available in the event an audit is conducted:

– Environmental inspection forms;
– Applicable permits;
– Training Records;
– Vehicle/equipment inspection checklists;
– Spill incidents/reports;
– Waste tracking manifests;
– Water discharge monitoring record; and,
– Bulk chemical inventory and/or explosives inventory.

All audit records will be maintained by the Environment Department. Any non-conformance observed will be recorded, corrective actions identified, action parties assigned with identified completion dates, and findings tracked through to rectification.

11. EMP Updates

Maintenance of this EMP will be the responsibility of the Environment, Compliance and Social Responsibility Manager or designate to ensure that the most current and comprehensive version of this EMP is available to Project personnel, regulating agency representatives, stakeholders, interested parties and others. A EMP revision log is provided in Table 11.1, below.

Table 11.1 EMP Revision Log

Revision	Date	Name	Description
Rev A	May 27, 2022	Deidre Puddister, Environment, Compliance and Social Responsibility Manager	EMP issued as final

12. Closing

This EMP has been prepared to provide a framework for avoidance and mitigation of environmental impacts associated with the Goldboro Gold Project. The commitments outlined herein are based on the Project information available at the time of production and will require adaptation to changes in design, approach, and/or schedule and once the Project has received formal approval.

This report should be read in conjunction with construction drawings and project specifications. In the case of discrepancy between these documents, the more stringent approach/threshold will be implemented to mitigate impacts to the natural environment.


GHD

Appendix C.1

Regulator Engagement Log

Appendix C.1 - Regulator Engagement Log

Date	Department/Agency	Activity	Purpose of Meeting/Topics Discussed
03-05-2022	Signal Gold (formerly Anaconda Mining) McCallum Environmental	Virtual	Project EARD summary of Wetlands Valued Component (VC) chapter, results, and proposed mitigation measures and compensation
26-04-2022	Signal Gold NS Environment and Climate Change	One Window/ Virtual	Presentation regarding Project EARD to be submitted May 2022 Project Description Significant resource discovery since acquisition Feasibility Study Reclamation Permit Timeline and Project Description EARD VCs: Air, Noise, Light, Geology, Soils and Sediment, Groundwater, Surface Water, Wetlands, Fish and Fish Habitat, Terrestrial Environment, Socio-economic Conditions, Indigenous Peoples, Cultural and Heritage Resources Predicted Impacts: Wetland and Fish Habitat, Offsetting and Compensation, Socio Economic Impact, Mi'kmaq Rights and Engagement, Public Engagement Questions on surface water, ground water, fish and fish habitat. Reiterated status of American Eel and asked if offsetting options would be presented in the EARD.
22-04-2022	Signal Gold GHD McCallum Environmental Fisheries and Oceans Canada Impact Assessment Agency of Canada NS Environment and Climate Change, Environmental Assessment Branch NS Environment and Climate Change, Inspection	One Window	Presentation regarding Project EARD to be submitted May 2022 Project Description Significant Resource Growth since Acquisition Feasibility Study Reclamation Permit Timeline & Project Description EARD VCs: Air, Noise, Light, Geology, Soils and Sediment, Groundwater, Surface Water, Wetlands, Fish and Fish Habitat, Terrestrial Environment, Socio-economic Conditions, Indigenous Peoples, Cultural and Heritage Resources Predicted Impacts: Wetland and Fish Habitat, Offsetting and Compensation, Socio Economic Impact, Mi'kmaq Rights and Engagement, Public Engagement

Appendix C.1 - Regulator Engagement Log

Date	Department/Agency	Activity	Purpose of Meeting/Topics Discussed
20-04-2022	Signal Gold MODG	In-person	Project update for the Goldboro Gold Project. Warden and Council were provided with a binder containing all Poster Boards to be used at the Open House in Goldboro the following day and copies of the Socio-Economic Impact Report and the Position Descriptions document. Council reiterated that they would like to see wetland compensation projects occur within the municipality.
07-04-2022	Signal Gold NS Natural Resource and Renewables NS Office of L'nu Affairs	Virtual	Provide an overview of Mi'kmaq Engagement regarding the Goldboro Gold Project since 2017, as well as additional planned engagement leading up to the submission of the EARD in late May 2022. Documentation requirements regarding Mi'kmaq Engagement for EARD
07-04-2022	Signal Gold NS Economic Development	Virtual	Provide update on Signal Gold's Goldboro Gold Project including findings of independent Socio-Economic Impact Report Department referenced importance of economic development in rural Nova Scotia and programs for families who want to move/return to Nova Scotia to work.
30-03-2022	Signal Gold NS Geoscience and Mines	In Person	Introductory meeting with new Executive Director, Geoscience and Mines Provide overview of Goldboro Gold Project including proposed infrastructure and mining methods
30-03-2022	Signal Gold MLA – Guysborough Tracadie	In Person	Provide overview of Goldboro Gold Project including Community Engagement, relationship with MODG and Socio-Economic Impacts
30-03-2022	Signal Gold NS Environment and Climate Change	In Person	Provide an overview of Project to be submitted for EARD Request clarification regarding wetland of special significance
8-03-2022	Signal Gold McCallum Environmental Environment and Climate Change Canada (ECCC)	Virtual	Project update, review of Schedule 2 triggers and the Multiple Accounts Analysis (MAA) process, update on Indigenous engagement efforts

Appendix C.1 - Regulator Engagement Log

Date	Department/Agency	Activity	Purpose of Meeting/Topics Discussed
11-02-2022	Signal Gold MODG	News Release	Signature of Signal Gold Inc. is pleased to announce that it has signed a Community Benefits Agreement with the Municipality of the District of Guysborough to support local benefits: employment and training, business ~Kevin Bullock, President & CEO, Signal Gold The Agreement establishes a framework for a long-term relationship between Signal Gold and the Municipality of the District of Guysborough over the life of the Goldboro Gold Project, confirming the Municipality's support for the Project and Anaconda's commitment to bring sustainable social and economic benefits to the members of the Guysborough community support, education, work terms, apprenticeships, local offices, and housing incentives.
08-12-2021	Signal Gold NS Environment and Climate Change NS Office of L'nu Affairs	Virtual	Discuss Anaconda's EARD submission and the best way to meet regulator/reviewer expectations, specifically as they relate to Mi'kmaq communities and Traditional Indigenous Knowledge.
07-12-2021	Signal Gold NS Office of L'nu Affairs	Virtual	Introductory meeting with new Minister L'nu Affairs to provide an overview and status of Goldboro Gold Project To highlight: early and ongoing engagement with Mi'kmaq, commitment to respect Indigenous Rights, ensure meaningful participation in the Project, and social and economic benefits. Interest in learning from and incorporating Traditional Indigenous Knowledge Concerns regarding timeline for an updated MEKS (delays related to Covid)
04-11-2021	Signal Gold MODG	Virtual	Land Zoning and Municipal Permits required for Project
01-10-2021	Signal Gold NS Natural Resources and Renewables NS Geoscience and Mines	Virtual	Provide an overview and status update of Goldboro Gold Project
15-09-2021	Signal Gold MLA – Guysborough Tracadie	In-person	Introductory meeting
14-09-2021	Signal Gold McCallum Environmental Environment and Climate Change Canada (ECCC)	Virtual	Project update and introduction to the expected MDMER Schedule 2 amendment
08-06-2021	Signal Gold Department of Energy and Mines	Virtual	Introductory meeting with new Minister to provide overview and status update regarding Signal Gold's Goldboro Gold Project

Appendix C.1 - Regulator Engagement Log

Date	Department/Agency	Activity	Purpose of Meeting/Topics Discussed
20-04-2021	Signal Gold McCallum Environmental Nova Scotia Department of Lands and Forestry	Virtual	Project update and review of proposed baseline studies and survey methodologies to support EARD
13-04-2021	Signal Gold McCallum Environmental Nordmin Engineering Ausenco Knight Piesold Lorax Environmental Fisheries and Oceans Canada Environment and Climate Change (ECCC) Canada NS Environment and Climate Change - Environmental Assessment Branch, Inspection, Compliance and Enforcement Division NS Labour and Advanced Education - Occupational Health and Safety N S Office of L'nu Affairs NS Lands and Forestry, Land Services Branch, Renewable Resources Branch, Regional Services Branch NS Dept of Energy and Mines NS Inclusive Economic Growth	One Window Virtual	Presentation to introduce scope of new Project Introduce new Consultant Group Significant Increase in Mineral Resource Potential Change in approach to development Regional Site Plan Context Site Plan Alternatives Valued Components Mi'kmaq Engagement Community Engagement Path to development
09-12-2020	Signal Gold MODG	Virtual	Project Status update as requested by MODG
24-11-2020	Signal Gold Consultants NS Departments and Agencies Canada Departments and Agencies	One Window In-person	Project Status Update
05-03-2000	Signal Gold GHD McCallum Environmental	In-person	Project introduction and expected MDMER Schedule 2 amendment requirement

Appendix C.1 - Regulator Engagement Log

Date	Department/Agency	Activity	Purpose of Meeting/Topics Discussed
21-01-2020	Signal Gold Consultants NS Departments and Agencies Canada Departments and Agencies	One Window In-person	Project Status Update
16-10-2019	Signal Gold Consultants NS Departments and Agencies Canada Departments and Agencies	One Window In-person	Project Status Update
04-12-2018	Signal Gold Consultants NS Departments and Agencies Canada Departments and Agencies	One Window In-person	Project Status Update
14-11-2018	Signal Gold Consultants NS Departments and Agencies Canada Departments and Agencies	One Window In-person	Project Status Update
05-05-2017	Signal Gold Consultants NS Departments and Agencies Canada Departments and Agencies	One Window In-person	Introduction to Signal Gold and potential Goldboro Gold Project

Appendix C.2

Public Engagement Log

Appendix C.2 – Stakeholder/Public Engagement Log

Date	Names/Organization	Nature of Communication	Activity
2017	Community Liaison Committee	Meeting	Quarterly CLC Meeting
June 2017	Mining Association of Nova Scotia	Presentation	Presentation to MANS 130th AGM
July 2017	Canso Superport Days	Presentation	Presentation at Canso Superport Days
June 2018	Mining Association of Nova Scotia	Presentation	Presentation to the MANS 131st AGM
July 2018	Canso Superport Days	Presentation	Presentation at Canso Superport Days
2018	Community Liaison Committee	Meeting	Quarterly CLC Meeting
September and October 2019	Maritimes and Northeast Pipeline (MNP)	Email	Correspondence regarding existing pipeline, underground mining and blasting
October 17, 2019	Public, Goldboro NS	Public Information Session	Public information session on the proposed 2019 EA re-submission (40 attendees)
2019	Community Liaison Committee	Meeting	Quarterly CLC Meeting
2020	Community Liaison Committee	Meeting	Quarterly CLC Meeting
2021	Community Liaison Committee	Email and Telephone	Information sharing through emails and phone calls
May 4, 2021	Community Member	Email	Expressed concern about speed limit on Goldbrook Road. Anaconda posted a speed limit sign in July 2021
October 20, 2021	Port Hawkesbury Paper (PHP)	Email	Email from Anaconda to PHP to notify of drilling activities in the area
November 26, 2021	Port Hawkesbury Paper (PHP)	Email	Email from Anaconda to PHP to notify of drilling activities in the area
February-April 2022	Cabin Owners on Ocean Lake	Telephone, In-person	Multiple conversations with cabin owners on Ocean Lake
March-April 2022	Local Residents	Telephone	Telephone conversations and in-person meetings with residents within 1-2 km radius of proposed Project (along Goldbrook Road and Highway 316)

Appendix C.2 – Stakeholder/Public Engagement Log

Date	Names/Organization	Nature of Communication	Activity
March 8, 2022	Nova Scotia Off-Road Riders Association	Telephone	Provided a project overview and discussed trails. Club indicated that they had no members in the area and no concerns.
March 8, 2022	Nova Scotia Federation of Anglers and Hunters	Telephone	Initial phone call to introduce Anaconda and the proposed project
March 8, 2022	Chedabucto Snowmobile Club	Telephone	Initial phone call to introduce Anaconda and the proposed project
March 8, 2022	Local land user	In-person Conversation	Discussion of existing land use for hunting, trapping, fishing and ATV/trail use. User identified importance of continued trail use
March 13, 2022	Local land user	In-person conversation and Site Visit	Discussion of existing land use for hunting, fishing and ATV/trail use. User identified importance of continued trail use for accessing crown lands and visiting community members via trails
March/April 2022	Property owner	Telephone Conversation	Multiple conversations to coordinate meeting and invitation to virtual open house
April 5, 2022	Ocean Lake ATV Club	In-person Discussion	Shared project description and maps showing Project Area and proposed bypass road related to local trail systems and potential impacts to trail users
April 20, 2022	Local Residents	Flyer	Flyer advertising open-house on April 21, 2022
April 20, 2022	Public	Digital Communication/Advertisement	Information flyer posted to local Facebook Groups to advertise Open House on April 21, 2022.
April 2022	Public	Newspaper Advertisement	Advertisement shared in regional/local newspapers for two weeks prior to Open House on April 21, 2022
April 21, 2022	Public, Goldboro NS	In-person Public Information Sessions	Two public information sessions (an afternoon and an evening session) for the 2022 EA (53 attendees)
April 22, 2022	MNP (Maritimes & Northeast Pipeline)	Informal Conversation	Shared a Project Description and had an informal conversation about site access for the pipeline, which crosses through the Project Area.
April 22, 2022	PHP (Port Hawkesbury Paper)	Informal Conversation	hared a Project Description and had an informal conversation about forestry harvesting in and around the Project Area.

Appendix C.2 – Stakeholder/Public Engagement Log

Date	Names/Organization	Nature of Communication	Activity
May 3, 2022	Public	Virtual Public Information Session	Anaconda distributed poster boards from April 21, 2022 information session in Goldboro to attendees, provided a brief project update and a question and answer period as well as contact information for follow-up questions (12 attendees)
April and May 2022	Atlantic Salmon Federation/Nova Scotia Salmon Association	Email	Virtual meeting to be scheduled

Appendix C.3

Indigenous Engagement Log

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
2022			
06-05-2022	Mi'kmaq Rights (KMKNO) Signal Gold	E-mail	Signal Gold is on track to submit the EARD at the end of May, 2022. Does KMKNO require any information? Reminder that Signal Gold will be changing its name to **Signal Gold** prior to submission of the EARD.
02-05-2022	Separate emails sent to Millbrook First Nation Membertou First Nation Sipekne'katik First Nation Signal Gold	Email	Signal Gold is in the process of completing a series of engagement sessions to inform the Environmental Assessment Registration Document that will be submitted toward the end of this month, May 2022. The Company intends to maintain Mi'kmaq engagement throughout the life of the Project, however it is the preference of the Company to identify matters of concern for Rights Holders prior to the submission of the EARD so that they can be discussed and addressed accordingly. Offer to schedule a virtual meeting to discuss the Goldboro Gold Project. Attached a series of information poster boards and other documents that were shared at recent in-person Open House Sessions in Paqtnkek and Goldboro. - Poster Boards used at in-person engagement sessions - Position Description for some of the Employment Opportunities at the Project - Social & Economic Impacts of the Goldboro Gold Project
21-04-2022	Paqtnkek Community Members Paqtnkek Council Members Paqtnkek Council Staff Signal Gold McCallum Environmental GHD Davis MacIntyre & Associates	Open House Paqtnkek Mi'kmaw Nation (In-Person)	Upon the invitation of Paqtnkek Chief & Council, Signal Gold Senior Management and Project Consultants participated in an Open House style event. Assurance of Reclamation Opportunities for Youth Employment Opportunities Employee Accommodations – Positive if built with woman and safety in mind Feedback from Paqtnkek Council Staff is that the engagement opportunity was well received by community members who participated.
21-04-2022	Paqtnkek Council Members Paqtnkek Council Staff Signal Gold McCallum Environmental GHD Davis MacIntyre & Associates	Invitation to present to Chief & Council Paqtnkek Mi'kmaw Nation (In-Person)	Infrastructure Size & depth of open pits, time expectation to fill post closure Impacts on fish particularly eel Health of fish in current system Duration of no access to land Reclamation Plans Assurance of Reclamation Employment Opportunities Transition training to overcome barriers to employment and plan for success Opportunities for Mi'kmaq Business
19-04-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Sent link to Open House Poster Boards used in Paqtnkek & Goldboro Community Meetings

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
11-04-2022	Assembly of Nova Scotia Mi'kmaq Chiefs Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Energy/Benefits Meeting Presentation by Signal Gold
05-04-2022	Paqtnkek Chief & Council Signal Gold	Virtual Meeting	Presentation by Signal Gold Purpose: To provide an overview of the project, to outline environmental studies and seek feedback regarding their question and/or concerns.
24-03-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Discuss Benefits Agreement
17-03-2022	Mi'kmaq Conservation Group (MCG) Signal Gold	Email	Environmental Baseline and Impact Studies have been led by McCallum Environmental and GHD. It has been determined through these studies that there will be impacts to fish habitat and wetland habitat. Signal Gold would like to include The Mi'kmaw Conservation group in upcoming discussions regarding **Conceptual Fish Offsetting Options** and **Wetland Offsetting Options.** In advance of those conversations, presentations can be arranged with Signal Gold staff and Environmental Consultants regarding baseline studies and effects assessments. The Company is also interested in discussing opportunities to incorporate Mi'kmaw science into **environmental monitoring** practices as well as discuss opportunities to support Mi'kmaw capacity for future employment opportunities related to environmental monitoring at the Project.
16-03-2022	UINR Signal Gold McCallum Environmental	Email Exchange	**Wetland Compensation Project** for consideration
11-03-2022	UINR Signal Gold McCallum Environmental	Virtual Meeting	**Conceptual Fish Offsetting Options** and **Wetland Offsetting Options**
01-03-2022	UINR Signal Gold	Email	Guardian Program Moose Survey Participation
15-02-2022	UINR Signal Gold	Email	**Conceptual Fish Offsetting Options** and **Wetland Offsetting Options**
14-02-2022	UINR McCallum Environmental Signal Gold	Email	Expression of Interest (EOI), being sent on behalf of Signal Gold, for winter and spring moose tracking surveys to support on-going environmental baseline work at the Goldboro Mine Project, in Goldboro, Nova Scotia. Moose surveys are planned for February to April 2022 and we would be pleased to work with your organization to collaborate to implement these surveys.

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
03-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Resent Copy of **MEKS** that was completed in 2017
03-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Proactive Information & technical Data Sharing Shape Files** Please see attached shape files for the Goldboro Gold Project. The Company expects that any modification going forward would be minor. But of course these are "draft" until the EARD is submitted.
03-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Information and document sharing** This is the link to the actual 43-101 Technical Report. The link would have been in the news release about Feasibility Study, but here it is directly. NI 43-101 TECHNICAL REPORT AND FEASIBILITY STUDY FOR THE GOLDBORO GOLD PROJECT, https://cdn-dms-issuerservices.s3.amazonaws.com/3135/100443/1642699787/19JAN2022%2020048-02%20NI%2043%20101%20FS%20FINAL.pdf
03-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**MEKS** MEKS was completed in September 2017. (Document provided) Membertou Geomatics has been engaged to provide a new/updated report since this report is 4 years old. due to Covid19 Membertou Geomatics has a backlog of MEKS to be completed. Goldboro Gold Project site visit in December 2021 Meeting scheduled with Membertou Geomatics tomorrow to discuss next steps. Membertou Geomatics aware Signal Gold intends to submit the EARD in May 2022.
03-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Share summary of Signal Gold/ Mi'kmaq engagement activity from 2017-2020 for reference for new KMKNO staff
03-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Information and document sharing** **Archaeology** Thanks for the informative and collaborative conversation yesterday regarding Mi'kmaq Archaeological Priorities and how they apply to the Goldboro Gold Project. As committed in our meeting yesterday, please find attached the Preliminary Infrastructure Shapefiles for the proposed Goldboro Gold Project. As discussed, we believe this to be the final proposed infrastructure footprint of the project. However, until all appropriate studies have been completed changes are possible. If that happens, we will promptly share revisions with you.

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
01-03-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email Exchange	Advance sharing for review and comments of Group ATN Socio-Economic Impact Report
01-03-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email Exchange	Provision of updated Project Description Summary
02-02-2022	Mi'kmaq Rights (KMKNO) Signal Gold McCallum Environmental Davis McIntyre	Virtual Meeting	**Information and document sharing** **Archaeology**
27-01-2022	Millbrook Signal Gold	Email	Confirmation receipt last email
25-01-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Meeting to "check in" and discuss next steps including meeting to be planned with Chief & Council Paqtnkek
10-01-2022	Mi'kmaq Rights (KMKNO) Paqtnkek Mikmaw Nation Signal Gold	Email	Advance notice regarding News Release which will announce a Community Benefits Agreement with Municipality of the District of Guysborough. The Company took precautions to ensure that the agreement with MODG would not infringe on a Benefits Agreement with Mi'kmaq. Signal Gold remains steadfast in its commitment toward the development of a Mutual Benefits Agreement with the Nova Scotia Mi'kmaq.
10-01-2022	Mi'kmaq Rights (KMKNO) Unama'ki Institute of Natural Resources (UINR) Signal Gold	Email	After four years of extensive studies, Signal Gold is moving forward with the permitting process for the Goldboro Gold Project. In December 2022 the Company announced a positive Feasibility Study with staff and consultants working toward an Environmental Assessment Registration Document to be submitted in May 2022. The full news release can be found here: https://www.Signal Goldmining.com/prviewer/releaseonly/id/4975225 A presentation by CEO Kevin Bullock can be found here https://m.youtube.com/watch?v=oizuWSbJzDo Environmental Baseline and Impact Studies - It has been determined through these studies that there will be impacts to fish habitat and wetland habitat. Signal Gold would like to include Unama'ki Institute of Natural Resources in upcoming discussions regarding Conceptual Fish Offsetting Options (February) and Wetland Offsetting Options (Mid-April). In advance of those conversations, presentations can be arranged with Signal Gold staff and Environmental Consultants regarding baseline studies and effects assessments. The Company is also interested in discussing opportunities to incorporate Mi'kmaw science into environmental monitoring practices as well as discuss opportunities to support Mi'kmaw capacity for future employment opportunities related to environmental monitoring at the Project.

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			Signal Gold respects the Consultation Process between Nova Scotia Mi'kmaq and the Government of Nova Scotia, however that process formally commences after the EARD has been submitted. The Company has placed a high priority on Mi'kmaq Engagement. This includes taking meaningful actions to understand and address Mi'kmaq priorities prior to the submission of the EARD and Consultation. The goal is to ensure that matters of concern for Mi'kmaq, and opportunities to better inform the project, are incorporated in the EARD document.
27-01-2022	Separate emails sent to Millbrook First Nation Membertou First Nation Sipeknekatik First Nation Signal Gold	Email	On December 16, 2021, Signal Gold reported a positive phase 1 open pit feasibility study for the Goldboro Gold Project. Link to the full news release. As indicated in an email of November 18, 2021, if you would like to receive additional information about the project or baseline studies and discuss priorities and/or concerns, I would be happy to coordinate meetings with the Signal Gold project team and Environmental Consultants. We will defer to your preference and direction regarding how you would like to proceed. To ensure ample opportunity to address matters raised during engagement and incorporate actions in the EARD propose that engagement meetings take place in February and March as the Company now intends to submit the EARD in May. Baseline scientific studies, combined with modelling efforts, shall inform project planning and provide the required information for various authorizations and permits. The following studies are in progress: Wetland delineation; Archaeological resource impact assessment Mi'kmaq Ecological Knowledge Study ("MEKS") Aquatic biology and fisheries Aquatic effects Climate and hydrology Mine rock and water geochemistry Ground water and surface water modelling Water quality Air quality Noise and light Species at risk habitat suitability Human Health and Ecological Risk Assessment Phase I/II Environmental Site Assessment Country foods Wildlife
27-01-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Provide advance notice that a News Release that will come out from Signal Gold tomorrow morning January 11, 2022 which will announce a Community Benefits Agreement with Municipality of the District of Guysborough. I want to assure you in advance that the Company took precautions to ensure that the agreement with MODG would not infringe on a Benefits Agreement with Mi'kmaq. The Company remains steadfast in its commitment to continue working toward a Benefits Agreement with Nova Scotia Mi'kmaq that recognizes environmental and cultural priorities, and provides meaningful social and economic opportunities throughout the life of the Project.
20-01-2022	Signal Gold Mikmaw Conservation Group	Email	Environmental Baseline and Impact Studies have been led by McCallum Environmental and GHD. It has been determined through these studies that there will be impacts to fish habitat and wetland habitat. Signal Gold would like to include

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			Mi'kmaw Conservation Group in upcoming discussions regarding Conceptual Fish Offsetting Options (February) and Wetland Offsetting Options (Mid-April). In advance of those conversations, presentations can be arranged with Signal Gold staff and Environmental Consultants regarding baseline studies and effects assessments. The Company is also interested in discussing opportunities to incorporate Mi'kmaw science into environmental monitoring practices as well as discuss opportunities to support Mi'kmaw capacity for future employment opportunities related to environmental monitoring at the Project.
10-01-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Benefits Agreement Discussion
10-01-2022	Mi'kmaq Rights (KMKNO) Signal Gold	Email	On December 21, 2021, Signal Gold Announced a positive Feasibility Study for the Goldboro Gold Project. The Company intends to submit an Environmental Assessment Registration Document (EARD) in May 2022. McCallum Environmental has provided a proposed list of meetings that includes topics that are required as part of the EARD process. We certainly welcome additional meetings to this list. Suggested schedule has been proposed to align with data collection and analysis to ensure we can share the most comprehensive data possible. Signal Gold's goal is to ensure that all information has been made available to you prior to the EARD submission. Furthermore the Company wishes to ensure opportunity for meaningful Mi'kmaq engagement so that priorities can be addressed and reflected in the EARD and throughout the life of the project. Please let me know if you have any questions or additions to the proposed list. A presentation by CEO Kevin Bullock can be found here. https://m.youtube.com/watch?v=oizuWSbJzDo <https://m.youtube.com/watch?v=oizuWSbJzDo> The overall permitting process will take 12-24 months (depending on Regulator requirements) during which the Company is committed to working in collaboration with KMKNO and the Assembly of Nova Scotia Mi'kmaq Chiefs to address any matters of concern regarding Mi'kmaq Rights (including fishing, hunting and other country food harvesting) as well as other priorities that you wish to raise. The Company has also extended its target date for the submission of an Environmental Assessment Registration Document to May 2022. This provides additional time for us to schedule meetings with you and your colleagues at KMKNO and the Assembly of Chiefs to receive information that Environmental Consultants have collected to date, contribute to analysis, raise matters of concern etc. McCallum Environmental has provided a proposed list of meetings that includes topics that are required as part of the EARD process. We certainly welcome additional meetings to this list. The suggested schedule has been proposed by Meghan to align with data collection and analysis to ensure we can share the most comprehensive data possible. Our goal is to ensure that all information has been made available to you prior to the EARD submission. Furthermore the Company wishes to ensure opportunity for

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			meaningful Mi'kmaq engagement so that priorities can be addressed and reflected in the EARD and throughout the life of the project. Schedule 2 follow up with detailed methodology Schedule 2 results Summary of Fish Baseline Summary of Terrestrial Baseline Summary of Effects Assessment for Fish Conceptual Fish Offsetting Options Summary of Effects Assessment Terrestrial Environment Summary of Effects Assessment for GW/SW/Wetlands Wetland Compensation Options Atmospheric Effects Assessment and Human Health/Ecological Health
2021			
21-12-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Information Sharing** Signal Gold announced a positive Feasibility Study for Goldboro Gold project. The Company can demonstrate 11 years of open pit operations Expected to recover over a million ounces of gold at about 100,000 oz per year. There will be 345 direct full time jobs during construction with 215 direct full time jobs during operations. A Social & Economic Impact Assessment completed by Group ATN will be released in January that will outline further social and economic benefits to for Mi'kmaq, the municipality, the region, and the province. Company remains committed to the MOU to develop a Benefits Agreement that will build upon opportunities already anticipated and ensure meaningful opportunities for Mi'kmaq to participate in and benefit from the project. The full news release can be found here: https://www.Signal Goldmining.com/prviewer/release_only/id/4975225 A presentation by CEO Kevin Bullock can be found here. https://m.youtube.com/watch?v=oizuWSbJzDo https://m.youtube.com/watch?v=oizuWSbJzDo The overall permitting process will take 12-24 months (depending on Regulator requirements) during which the Company is committed to working in collaboration with KMKNO and the Assembly of Nova Scotia Mi'kmaq Chiefs to address any matters of concern regarding Mi'kmaq Rights (including fishing, hunting and other country food harvesting) as well as other priorities that you wish to raise. The Company has also extended its target date for the submission of an Environmental Assessment Registration Document to May 2022. This provides additional time for us to schedule meetings with you and your colleagues at KMKNO and the Assembly of Chiefs to receive information that Environmental Consultants have collected to date, contribute to analysis, raise matters of concern etc.

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			Proposed list of meetings that includes topics that are required as part of the EARD process. We certainly welcome additional meetings to this list. Our goal is to ensure that all information has been made available to KNKNO prior to the EARD submission. Furthermore, the Company wishes to ensure opportunity for meaningful Mi'kmaq engagement so that priorities can be addressed and reflected in the EARD and throughout the life of the project.
06-12-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Signal Gold will announce a Feasibility Study this week that will describe the new design for the Goldboro Gold Project. This will be the project design that the Company will seek to permit through the submission of a Provincial Environmental Assessment Registration Document in March 2022. As previously discussed, Signal Gold is committed to meaningful, ongoing engagement with Nova Scotia Mi'kmaq, not just informing after the fact. Indeed matters such as wetlands, wildlife impact, watershed, historic tailings and other priorities raised by KMK, the Assembly of Chiefs and Paqtnkek Chief and Council, since 2017, have been integrated into the project design. The Company would like to ensure that ample opportunity is provided to KMK to review information, ask questions, raise concerns, and collaborate on solutions over the next few months. The Company would also like to ensure that Paqtnkek has been appropriately engaged in the process. Propose schedule of meetings from mid-January to the end of February to ensure opportunity matters can be addressed and reflected in the EARD submission. Propose KMKNO set the schedule based on your priorities and availability. Signal Gold is also very committed to advancing the Benefits Agreement. The Company recognizes that environmental matters and Mi'kmaq Rights are the first priority, however a workplan with a schedule of meetings specific to the Benefits Agreement also commencing mid-January would ensure that all parties can move forward in a collaborative way to ensure that Mi'kmaq receive meaningful social and economic benefits throughout the life of the project.
02-12-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Employee Accommodations** Thank you for meeting with members of the Signal Gold team last week to discuss proposed employee accommodations at the Goldboro Gold Project. We have held comprehensive conversations with all members of the project development team and there is firm consensus that Mi'kmaq concerns regarding employee accommodations will be integrated into the development and operational plans of the facility. We have reviewed the Calls for Justice in the final report of The National Inquiry on Missing and Murdered Indigenous Women and Girls including Section 13 which specifically addresses Extractive and Development Industries, as well as materials that you have shared with us. The Company would welcome an opportunity to hear from and engage with whomever you feel is appropriate on this matter. Signal Gold is committed meaningful Mi'kmaq engagement in the process, not simply informing after decisions have been made. We look forward to these discussions over the coming months. As discussed, we anticipate that the accommodations facility will have 300-350 employees at the peak construction phase and 150-175 employees during ongoing

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			operations. At Signal Gold's project in Newfoundland, employees are able to live in the nearby community of Baie Verte. However, there are not enough accommodations available for employees to rent or purchase in Goldboro and surrounding communities. The project location is approximately an hour drive from Paqtnkek, Antigonish and Guysborough, which would be a difficult commute before and after a 12-hour shift, so even employees living in the region will use the facility. The facility will also include cafeteria and recreational/social spaces for employees. Signal Gold will announce the details of the Definitive Feasibility Study on (or close to) December 9, 2021. Signal Gold's CEO welcomes the opportunity to meet with the Assembly of Nova Scotia Mi'kmaq Chiefs (virtually or in person) to share details about the project, respond to questions, and listen to concerns. Safety is our top priority at Signal Gold and it extends to the communities in which we work. All employees are contractually obligated to respectful behaviour which extends beyond the work site and includes zero tolerance for racism, sexism, bullying/intimidation, etc. As previously discussed, Signal Gold has also committed to the development of **Mi'kmaq Cultural Awareness Training** for all employees that work at the Goldboro Gold project. I will follow up soon with some ideas about how we approach the development of that training, ensuring that it is developed and delivered by Mi'kmaq.
30-11-2021	Mi'kmaq Rights (KMKNO) Cape Breton University Paqtnkek Mi'kmaw Nation Signal Gold	Email	**Employment** Community Relations Coordinator position for the Goldboro Gold Project.
25-11-2021	Mitacs Signal Gold	Email Exchange	Initiate conversation for future consideration Through our ongoing engagement with Nova Scotia Mi'kmaq over the past four years we have repeatedly heard references to Traditional Mi'kmaq Knowledge and Science. We would be interested in discussing participation in research that would help companies like Signal Gold to better incorporate this knowledge into the project planning, construction, and reclamation processes. The Company is also committed to ensuring that every employee working at the Goldboro project takes mandated Mi'kmaq Cultural Awareness training. We feel this should be developed and supported by Mi'kmaq.
22-11-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Discussion regarding **Employee Accommodations**
09-11-2021	Mining Matters Paqtnkek Mi'Kmaw Nation Signal Gold	Email exchange	Free **Educational Resources** Kits for Youth - Geology, Engineering, Mining and Sustainability Mining Matters, a charitable organization dedicated to educating young people to develop knowledge and awareness of Earth sciences, the minerals industry, and their

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			roles in society. Provide current information about rocks, minerals, metals, mining and the diverse career opportunities available in the minerals industry. "Mining Matters has received funding to create and distribute educational resource kits called GEMS - an acronym for geology, engineering, mining and sustainability. GEMS kits are geared for youth in Grades 7 to 9 and contain everything needed to complete 13 hands-on learning activities. GEMS kits also correlate to the Nova Scotia curriculum. It is our hope that GEMS kits will be of great interest to Paqtnkek youth. Possibility for geologists from Signal Gold to support the project by working though some of the activities with youth. Up to 36 kits are available. There is no cost to the community."
18-11-2021	Millbrook First Nation Membertou First Nation Sipekne'katik First Nation Signal Gold	Emails sent separately but identical content	Email recognizing (Community) prefers direct engagement on resource projects. "The Company welcomes an opportunity to engage with Membertou First Nation regarding this project. To ensure ample opportunity to address matters raised during engagement and incorporate actions in the EARD we propose that engagement meetings take place in February and March as the Company intends to submit the EARD in May."
15-11-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Conversation regarding **Employee Accommodations**
15-11-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Email exchange regarding **Employee Accommodations**
09-11-2021	Mining Matters Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Education** Introduction of Mining Matters initiative to Mi'kmaq Rights (KMKNO) Educational Resources Kits for Youth - Geology, Engineering, Mining and Sustainability
09-11-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Information Sharing** Letter that CEO of Signal Gold, sent to each of the 13 Chiefs in recognition of his commitment and the commitment of Signal Gold toward Truth and Reconciliation. All letters were identical but personally addressed to each Chief.
05-11-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email Exchange	**Employee Accommodations** Recognition that Employee Accommodations are an issue of concern Fully acknowledge those concerns and propose work together to ensure that policies, procedures, respectful workplace training and cultural awareness training is in place well in advance of construction. Schedule a meeting that includes Signal Gold Senior Management to ensure that the company understands and addresses any Mi'kmaq concerns regarding employee accommodations.
02-11-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email Exchange	Company Seeking information about Mi'kmaq Cultural Diversity Training

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
29-09-2021	Nova Scotia Mi'kmaq Chiefs 13 individual letters from CEO Signal Gold	Email	"At Signal Gold we respectfully acknowledge that Nova Scotia Mi'kmaq possess Aboriginal and Treaty rights within your traditional territory. We recognize your rights and responsibilities to respect and protect the lands, waters, animals, habitat, and natural resources. We understand that you are committed to protect and enhance the resource-based economy which essential to maintain your way of life, culture, and the well-being of future generations. On September 30, all Signal Gold employees will be encouraged to recognize the National Day for Truth and Reconciliation by learning about and reflecting on the legacy of Residential Schools. On that day, Signal Gold will not make any corporate public announcements and will refrain from any corporate social media posting, to reserve that space for Indigenous voices and supportive allies. As President and CEO of Signal Gold, I acknowledge the critical importance of providing leadership to all employees, consultants, and others associated with our Goldboro Gold Project in recognizing the historical effects of the resource industry as it relates to Nova Scotia Mi'kmaq and First Nations Peoples throughout Canada and ensuring that these negative impacts are not repeated. I make this commitment to you not just on September 30 but every day in the true spirit of Truth and Reconciliation. In recognition of my personal responsibility and that of our company to contribute to the advancement of Truth and Reconciliation, and with your support, Signal Gold would like to implement a Mi'kmaq developed and Mi'kmaq lead educational module as a requirement for every person employed at the Goldboro Gold Project. As well, we will seek a review of our corporate policies and practices including those related to respectful workplace and environmental monitoring, to ensure the consideration of Mi'kmaq culture. Our company has actively engaged with Kwilmu'kw Maw-klusuaqn (KMK) and the Assembly of Nova Scotia Mi'kmaq Chiefs since 2017 on a variety of matters including but not limited to fish, birds, animals, plants, archaeology, and social and economic benefits for Mi'kmaq. These conversations are ongoing. In 2018, a Memorandum of Understanding to develop a Benefits Agreement was signed, and we continue to engage with KMK on that process. A Mi'kmaq Ecological Knowledge Study was completed in 2017, with an updated version to be completed this year. For Signal Gold this engagement is an opportunity to build meaningful and sustained relationships that will extend the full life of the project from development to environmental reclamation. I welcome an opportunity to speak with you personally and/or for Signal Gold's team to engage with your Council and staff."
17-08-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Water** – **Fish** AS requested: This is a link to the list of water bodies in Canada that the been listed under Schedule 2 of MDMER. https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/page-8.html#h-684982
15-07-2021	Mi'kmaq Rights (KMKNO)	Email	**Archaeology**

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
	Signal Gold		Sincere thanks for the informative and collaborative conversation yesterday regarding Mi'kmaq Archaeological Priorities and how they apply to the Goldboro Gold Project. As committed in our meeting yesterday, please find attached the Preliminary Infrastructure **Shapefiles** for the proposed Goldboro Gold Project. As discussed, we believe this to be the final proposed infrastructure footprint of the project. However, until all appropriate studies have been completed changes are possible. If that happens, we will promptly share revisions with you. Please note that this information is not yet within the public domain. We welcome an opportunity to share the documents with KMKNO so that you have the information necessary to inform your analysis and recommendations. However, as a publicly traded company Signal Gold has obligations regarding the disclosure of material information, so please treat as confidential and limit distribution accordingly.
15-07-2021	Mi'kmaq Rights (KMKNO) Signal Gold McCallum Environmental	Email	**Fish** Thank you for your participation this morning in a collaborative conversation regarding fisheries related priorities for Mi'kmaq and how they relate to the proposed Goldboro Gold Project. In recognition of Justin's explanation of the importance of integrating **Mi'kmaq Based Science** and **Indigenous Traditional Knowledge** in our study programs, Signal Gold would like to prioritize engagement of MCG, CMM and/or UNIR in the following: Participation in baseline water monitoring (surface and groundwater quality) Participation in fish collection surveys Summary of Valued Components Baseline Summary of Effects Assessment for Fish (with priority focus on Eel/Elver) Conceptual Offsetting Options Signal Gold recognizes that there would be a commitment to capacity funding to support that engagement.
15-07-2021	Mi'kmaq Rights (KMKNO) Signal Gold McCallum Environmental	Virtual Meeting	**Fish** Project baseline studies related to fish and fish habitat Significance of eel to Mi'kmaq Incorporation of Mi'kmaq Based Science Indigenous Traditional Knowledge Mi'kmaq participation in environmental monitoring
14-07-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Mi'kmaq business and employment database may qualify under this initiative. https://www.canada.ca/en/atlantic-canada-opportunities/campaigns/covid19/jgf.html
00-07-2021	Mi'kmaq Rights (KMKNO) Signal Gold Davis MacIntyre Inc	Email	**Archaeology** Archaeology meeting planning As previously discussed Signal Gold recognizes the Aboriginal Rights and Treaty Rights of Nova Scotia Mi'kmaq which includes cultural resources. Committed to full disclosure and a collaborative relationship with KMKNO regarding Archaeology. Looking forward to our conversation and identifying ways to improve how we share information and discuss matters related to Mi'kmaq Archaeology

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
10-06-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Presentation to Benefits Committee
18-05-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Email	Signal Gold proposing meeting about **Archaeology** soon to ensure that KMKNO has all of the access and information they need now and in the future. **Fisheries** Matters Goldboro Will likely be late October before we will be ready to do a meeting on fish & fish habitat for the Goldboro Gold Project. Over the past two months while processing the data from the new drill program working with a new engineering consultant, changes in the **Project Footprint** have been contemplated.
27-04-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	Discussion regarding Benefits Agreement
22-03-2021	Mi'kmaq Rights (KMKNO) Paqtnkek Mi'kmaq Nation Signal Gold	Email	**Environmental Studies & Permitting Process** Signal Gold is progressing with Environmental Impact Studies regarding the Goldboro Gold Project. Over the past year the project has significantly expanded and is very different than previous project descriptions considered. With Spring comes an opportunity to get back on the land to expand upon environmental baseline work done over the past four years. We anticipate submitting a new Environmental Assessment Registration Document in December 2021. As previously discussed, Signal Gold would like to host virtual meetings with representatives of KMKNO & Paqtnkek Mi'kmaw Nation. The goals of these meetings is to provide a proactive information sharing process that will ensure that you have ample opportunity to provide recommendations, raise any questions or concerns, and provide meaningful input in the development of the project including how potential environmental impacts can mitigated, managed, and where appropriate habitat compensation programs planned. Overview of Proposed Project, Environmental Studies & Permitting Process Fish & Fish Habitat Plants & Wetlands Animal & Bird Surveys Fish Habitat Compensation Project Options & MDMER Schedule 2 Wetland Compensation Project Options Animal Habitat Compensation Project Options Preliminary Economic Assessment
	Mi'kmaq Rights (KMKNO) Signal Gold	Email	**Archaeology** I would like to share Signal Gold's most recent archaeological resource impact assessment, as prepared by Davis MacIntyre and Associates. This 2021 assessment included both desktop studies and field reconnaissance. This report also reiterates recommendations from studies completed in 2017, 2019, and 2020.

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
			As noted in the report, Davis MacIntyre covered an extensive area between Gold Book Lake and Ocean Lake, not all of which ended up in our current project area, however, all of the findings/data are included in this report for completeness. In addition to this current report, Signal Gold engaged Davis MacIntyre (Fall 2021) for a shovel testing program that reflects recommendations outlined in this and previous reports. Unfortunately, they were unable to initiate the program before snowy conditions prevailed, but the goal is to complete ASAP. Prior to any shovel testing, Davis MacIntyre will contact KMKNO to ensure an opportunity for Mi'kmaq participation.
01-03-2021	Mi'kmaq Rights (KMKNO) Signal Gold Bluedrop Performance Learning (Tech Company)	Virtual Meeting	To discuss a potential opportunity to leverage federal funding opportunity to develop database and education platform
26-02-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Phone call	Discussion regarding database
22-02-2021	Mi'kmaq Rights (KMKNO) Group ATN Paqtnkek Mi'kmaw Nation Signal Gold	Virtual Meeting	Introductory meeting to discuss a Social & Economic Impact Study that Group ATN is leading for the Goldboro Gold Project.
16-02-2021	Mi'kmaq Rights (KMKNO) Group ATN Paqtnkek Mi'kmaw Nation Signal Gold	Email	Request a meeting to discuss a Social & Economic Impact Study that Group ATN is leading for the Goldboro Gold Project.
13-01-2021	Mi'kmaq Rights (KMKNO) Signal Gold	Virtual Meeting	
2020			
09-12-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Virtual Meeting	Matters related to Benefits Agreement
02-12-2020	Signal Gold Mi'kmaq Rights (KMKNO	Email	Matters related to Benefits Agreement
16-11-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Email	To advise that Davis MacIntyre & Associates Archaeological Consultants will be reaching out to KMKNO's Archaeology Research Division to discuss an expansion of the Archaeology Study for the Goldboro Gold Project.

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
20-10-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Email	Exploration & infill drilling is continuing at Goldboro. This drilling along with the work of our new Engineering Consultant has provided new information about the deposit. We are expecting changes in the overall footprint and mine which will be larger Changes will be announced with the release of the Feasibility Study. Signal Gold will be expanding the scope environmental testing. With an increased footprint we will also have to expand on the previous MEKS & Archaeological Studies. This new footprint will trigger a Schedule 2 exemption application under the federal MDMER regulations, because there are waters frequented by fish within the footprint
10-07-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Email	Signal Gold Employment Posting – Junior Environmental Advisor
10-09-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Virtual meeting	Project Status update
08-09-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Email	**Fish & Fish Habitat** It will likely be late October before we will be ready to do a meeting on fish & fish habitat for the Goldboro Gold Project. Over the past two months while processing the data from the new drill program working with a new engineering consultant, changes in the footprint have been contemplated.
09-11-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Site Visit Goldboro	Site visit for KMKNO and representatives of Paqtnkek
06-03-2020	Chief (Mining) CEO Signal Gold Signal Gold Mi'kmaq Rights (KMKNO)	In person meeting PDAC, Toronto	Changes to senior staff at Goldboro Gold Project. Committed to maintaining an open and honest relationship based on mutual respect and reiterated Signal Gold's commitment to best practices in environmental protection and compliance to environmental regulations.
18-02-2020	Signal Gold Mi'kmaq Rights (KMKNO)	Millbrook KMKNO office	Benefits discussion
02-02-2020	CEO Signal Gold Signal Gold Mi'kmaq Rights (KMKNO)	In person meeting Halifax	Meeting requested by Signal Gold to provide advance notice to KMKNO regarding to changes to senior staff and provide project status update
2019			
05-12-2019	Chief (Mining) CEO Signal Gold Signal Gold Mi'kmaq Rights (KMKNO)	Membertou First Nation In person meeting	First meeting of Chief (Mining) and CEO CEO affirmed Signal Gold's commitment to a respectful and cooperative relationship with Nova Scotia Mi'kmaq as Partners in the Goldboro Gold Project
20-10-2019	Paqtnkek Council Signal Gold Mi'kmaq Rights (KMKNO)	Paqtnkek Mi'kmaq Nation	ANX team provided an update on the status of the project. Signal Gold's corporate culture including commitment to environmental responsibility and hiring as local as possible.

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
	GHD McCallum Environmental	In person meeting	Project Footprint, Processing, Tailings Management Facility, Historic Tailings, Water, Fish Studies & Habitat Compensation, Wetland Habitat Studies and Compensation, Reclamation
18-10-2019	Mi'kmaq Rights (KMKNO) GHD McCallum Environmental Signal Gold	GHD Office Bedford, NS In person meeting	Project Footprint, Processing, Tailings Management Facility, Historic Tailings, Water, Fish Studies & Habitat Compensation, Wetland Habitat Studies and Compensation, Flora & Fauna Studies, Reclamation, Reclamation Bond
03-09-2019	Sipekne'katik First Nation	Email	Recognition that Sipekne'katik also prefers to engage with natural resource project proponents directly. Inquire regarding preference for approach to engagement
01-08-2019	Mi'kmaq Rights (KMKNO) GHD McCallum Environmental Signal Gold	GHD Office Bedford, NS In person meeting	Project Footprint, Processing, Tailings Management Facility, Historic Tailings, Water, Fish Studies, Wetland Habitat Studies, Flora & Fauna Studies, Reclamation
01-08-2019	Paqtnkek Council Mi'kmaq Rights (KMKNO) Signal Gold	Goldboro, NS Site visit In person	Meeting and Site Tour Issues discussed included: 7 Generations Consideration of Impact, Project Footprint, Processing, Tailings Management Facility, Historic Tailings, Water, Fish Studies, Wetland Studies, Flora & Fauna Studies, Reclamation, Employment & Business Opportunities for Mi'kmaq (especially Paqtnkek)
22-07-2019	Assembly of Nova Scotia Mi'kmaq Chiefs Mi'kmaq Rights (KMKNO) Signal Gold	News Release	Joint public announcement of MOU TORONTO, July 22, 2019 /CNW/ -Signal Gold Inc. ("Signal Gold" or the "Company") (TSX: ANX) (OTCQX: ANXGF) is pleased to announce that on July 2, 2019, Signal Gold and the Assembly of Nova Scotia Mi'kmaw Chiefs (the "Assembly") signed a Memorandum of Understanding (the "MOU") that will govern the process by which the parties shall negotiate a Mutual Benefits Agreement (the "MBA") regarding the Goldboro Gold Project in Nova Scotia. "Since Signal Gold acquired the Goldboro Gold Project over two years ago, we have forged a positive, working relationship with the Assembly of Nova Scotia Mi'kmaw Chiefs. Signal Gold acknowledges that the Mi'kmaq of Nova Scotia are committed to protect and enhance the land and resource-based economy within its Traditional Territory. We feel that signing a memorandum of understanding is an important milestone that demonstrates our collective desire to pursue mutually beneficial social and economic opportunities while respecting the principles of environmental stewardship. We look forward to working through a Mutual Benefits Agreement." ~ Dustin Angelo, President, Signal Gold Inc. The MOU outlines the process for Signal Gold and the Assembly to work together in good faith to resolve a Mutual Benefits Agreement in a way that reflects a desire to build a mutually beneficial relationship that will be sustained for the life of the Goldboro Gold Project. "The Mi'kmaq have long-held traditions of management and protection of our lands and resources. A fundamental way to continue those traditions today is to have good communication with companies working in our territory. Development must be done in a responsible manner, with environmental considerations that reflect the Mi'kmaq perspective. This MOU with Signal Gold will provide an opportunity for Mi'kmaq

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
			participation and involvement in the development of these lands." ~ Chief Terrance Paul, Co-Chair for the Assembly of Nova Scotia Mi'kmaw Chiefs
13-06-2019	Paqtnkek Chief & Council Mi'kmaq Rights (KMKNO) Signal Gold	Paqtnkek Mi'kmaw Nation In person meeting	Discussion included educational opportunities, employment and business opportunities for the community of Patqnkek
06-06-2019	Mi'kmaq Rights (KMKNO) Signal Gold	Phone call	Discussion regarding MOU
04-06-2019	Indigenous Service Canada (Atlantic) Economic Development Indigenous Service Canada (Atlantic) ACOA Atlantic Indigenous Unit Service Canada MANS Mi'kmaq Rights (KMKNO) Signal Gold	Antigonish, NS	This meeting was initiated by Signal Gold with federal government departments and agencies to seek opportunities to work with Nova Scotia Mi'kmaq to avail of federal funding to build capacity for participation and employment in the mining industry. The intent of the meeting was to pursue an initiative similar to the Labrador Training Initiative which is a $23M federally funded program that aims to create skills, and on-the-job training for the Indigenous Peoples of Labrador. In Labrador the initiative is led by the Labrador Aboriginal Training Partnership (LATP). Federal officials advised that such an initiative must be initiated by an Indigenous group, organization or community. Signal Gold committed to participate if a proposal were brought forward by KMKNO.
19-03-2019	Mi'kmaq Rights (KMKNO) Signal Gold	Phone call	Discussion regarding MOU
06-02-2019	Chief (Mining) CEO Signal Gold Mi'kmaq Rights (KMKNO) Signal Gold	Millbrook, NS	Mi'kmaq History (Chief) Mi'kmaq Rights (Chief) Discussion regarding MOU
2018			
19-12-2018	13 Mi'kmaq Chiefs Mi'kmaq Rights (KMKNO) Signal Gold	Email	Introduction by Vice President Public Relations with Signal Gold. My role includes responsibility for engagement with the Mi'kmaq of Nova Scotia with a goal of information sharing about the Project and Signal Gold's commitment to environment stewardship. Through this letter my goal is to extend an opportunity for Mi'kmaq across the province to contribute to the dialogue regarding the development of the Project, throughout the process. I am also available to work with you to discuss opportunities for Mi'kmaq people, communities, and companies to benefit from the long-term economic impact. Signal Gold Inc. respectfully recognizes that the Mi'kmaq of Nova Scotia possess Aboriginal rights, including asserted Aboriginal title, and Treaty rights in relation to the lands and natural resources that may be affected by the Goldboro Gold Project. We also recognize that the Mi'kmaq of Nova Scotia hold rights and responsibilities to

Appendix C.3 – Indigenous Engagement Log

Date	Organization/Contact	Nature of Communication	Key Issues Raised
			respect and protect the lands, waters, fish, wildlife, habitat and other natural resources within their traditional territory, these rights and title being affirmed in the Constitution of Canada. Signal Gold is committed to the goal of sustainable development and strives to balance social, environmental and economic considerations in how it manages its business. Signal Gold is committed to providing opportunity for the Mi'kmaq of Nova Scotia to be actively engaged throughout the development of the Project. To date, our primary engagement has been directly with KMKNO, as well as several meetings with Chief Terry Paul and one meeting with Chief Paul Prosper, however we welcome discussion from Mi'kmaq representatives throughout Nova Scotia. Signal Gold has completed extensive environmental studies in the Goldboro area with additional work ongoing. Initial information is available in the Preliminary Economic Assessment that was filed earlier this year and can be viewed at the following link: https://novascotia.ca/nse/ea/goldboro-gold/ Information regarding additional studies will be available over the next several months, however if you have any specific environmental concerns that you would like to raise, we welcome your input. A Mi'kmaq Ecological Knowledge Study was also completed and is available for your review upon request.
19-07-2018	Chief of Paqtnkek Mi'kmaq Rights (KMKNO) Signal Gold	Millbrook, NS In-person meeting	Introductory meeting with Chief of Paqtnkek and Band Council Staff Signal Gold team provided an update on the status of the Project. Signal Gold's corporate culture including commitment to environmental responsibility and hiring as local as possible. Chief and Paqtnkek representatives spoke about growth and development in their community and interest in working cooperatively.
08-03-2018	Chief (Mining) Mi'kmaq Rights (KMKNO) Signal Gold	Toronto, ON In-person meeting	Signal Gold team provided an update on the status of the project. Chief (Mining) proposed that the timing was appropriate to move forward with the development of a Memorandum of Understanding for the development of a Mutual Benefits Agreement. Discussion regarding next steps
02-02-2018	Assembly of Nova Scotia Mi'kmaw Chiefs Mi'kmaq Rights (KMKNO) Signal Gold	Millbrook, NS In-person meeting	Signal Gold presentation regarding the Preliminary Economic Assessment of the Goldboro Gold Project. Members of the Benefits Committee asked questions regarding opportunities for Mi'kmaq to participate in employment and supply opportunities for the Project. Members of the Benefits Committee asked the company to sign an MOU to commit to benefits for Nova Scotia Mi'kmaq.
2017			
23-08-2017	Membertou Geomatics Mi'kmaq Traditional Knowledge Adviser Signal Gold	Goldboro, NS Site-visit	Signal Gold representatives participated in the land study portion of the Mi'kmaq Ecological Knowledge Study. Observation and discussion of plant and animal species that are traditionally found in that region and their traditional use by Mi'kmaq.
07-07-2017	Chief (Mining) Mi'kmaq Rights (KMKNO) Signal Gold	Millbrook, NS In-person meeting	Opportunity for Chief (Mining) and Signal Gold CEO to meet. CEO discussed Signal Gold's corporate culture including commitment to environmental responsibility and hiring as local as possible. Chief reinforced an interest in training and employment opportunities for Mi'kmaq. Chief raised the importance of the Mi'kmaq Ecological Knowledge Study

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Date	Organization/Contact	Nature of Communication	Key Issues Raised
24-05-2017	Chief (Mining) Mi'kmaq Rights (KMKNO) Signal Gold	Millbrook, NS In-person meeting	Introductory Meeting, Signal Gold Operations in NL, expectations for Goldboro Project, goals for working together for mutual benefit

Appendix C.4

Open House Poster Boards

Anaconda Mining

Anaconda Mining is a TSX and OTCQX-listed gold mining, development, and exploration company, focused in the top-tier Canadian mining jurisdictions of Newfoundland and Nova Scotia.

The Company is seeking input from Rights Holders, Community Members, and other Stakeholders about the Goldboro Gold Project in Nova Scotia, a significant growth project in the Eastern Gold Fields Mining.

Engagement activities will inform an Environmental Assessment Registration Document (EARD) that will be submitted in late May 2022.

For more than a decade Anaconda has operated environmentally compliant gold mining and milling operations in the Baie Verte Mining District of Newfoundland which includes the fully permitted Pine Cove Mill, tailings facility and deep-water port, as well as ~15,000 hectares of highly prospective mineral property, including those adjacent to the past producing, high-grade Nugget Pond Mine at its Tilt Cove Gold Project.

NOTICE OF COMPANY NAME CHANGE

Anaconda Mining will change its name and logo in May 2022 to SIGNAL GOLD. This was necessary to better represent the company as one that has roots in Atlantic Canada. This is not a change in company ownership or leadership. When the EARD is submitted it will be under the name SIGNAL GOLD.

POINT ROUSSE PROJECT

GOLDBORO GOLD PROJECT

CONTACT
Info@AnacondaMining.com
902-418-4566 (ext 4566)

PROJECT DESCRIPTION

- The Goldboro Gold Project is located in Guysborough County, Municipality of the District of Guysborough, Nova Scotia, 1.6 km northeast of the village of Goldboro on the eastern shore of Isaac's Harbour.

- Paqtnkek Mi'kmaw Nation is the closest Mi'kmaq community, which is 75 km northeast. The Project is located in the Eskikewa'kik District.

- Anaconda Mining Inc. currently holds Exploration Licence No. 05888, which is approximately 592 hectares.

- The Project will be accessed by Goldbrook Road, a secondary gravel road, which is linked to Highway 316 with connections to Highway 7 and Highway 104.

- The Goldboro Gold Project is subject to regulation under the Nova Scotia Environmental Act, Part IV. An Environmental Assessment Registration Document (EARD) for the proposed Project will be submitted for Class 1 Environmental Assessment in May, 2022.

- The EARD will be authored by Anaconda and GHD, utilizing extensive baseline data collected at the Project site by Anaconda and its consultants since 2017.

- Project activities include construction, operations, and closure.

- Anaconda proposes to develop the Project as a surface gold mine with a 4,000-tonne per day extracted via two open mine pits: East Pit and West Pit, with associated mine infrastructure.

- The construction phase will take approximately 2 years.

- An ore processing facility will receive extracted material to produce gold doré bars for a period of approximately 11 years.

- Mine tailings will be stored in an engineered and fully lined tailings management facility (TMF) located northeast of Gold Brook Lake.

- Waste rock storage areas (WRSAs) will be located in three areas proximal to the pits.

- Organic and till stockpiles will be maintained for future use in reclamation.

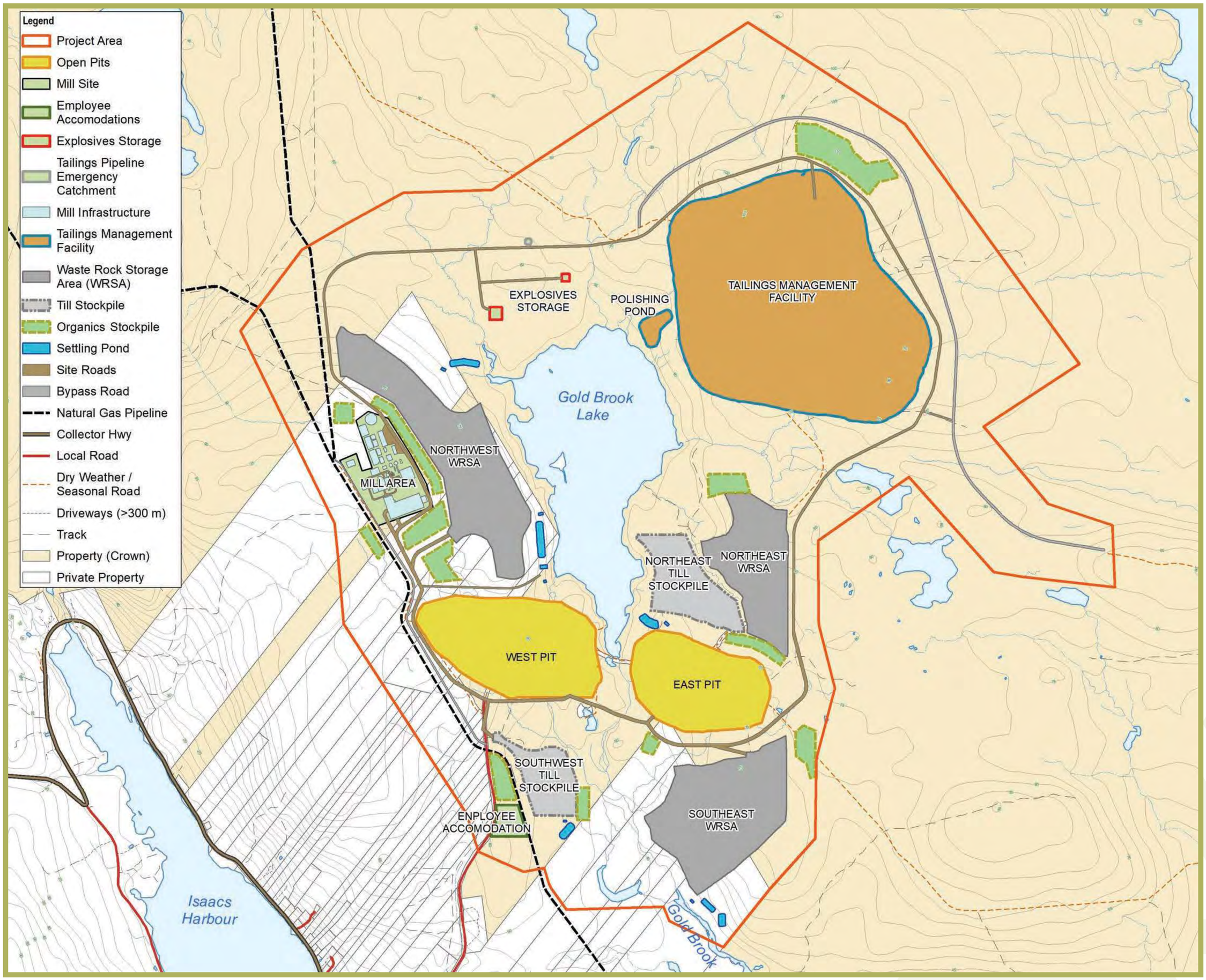
- The detailed reclamation plan will be developed with input from Rights Holders, residents, the municipality, and other stakeholders.

- A post-closure monitoring period will occur following active closure of the Project.

Anaconda Mining

PROJECT INFRASTRUCTURE

Anaconda Mining



RECLAMATION

Like all mining operations in Canada, the Goldboro Gold Project is a temporary use of the land.

Anaconda is committed to minimizing the environmental impact while working on a site, and then to reclaiming it for future use.

The Government of Nova Scotia requires that all new mines provide financial assurance that the funds to cover the cost of reclamation are available. This is provided before construction can start.

Reclamation is done on an ongoing basis as areas are completed. This ensures that environmental considerations are a daily concern for companies, not just an afterthought.

Reclamation ensures that future generations can use the area safely after the mining process has been completed.

The reclamation plan addresses key issues such as surface contouring, proper drainage, and re-vegetation.

A conceptual reclamation plan will be submitted with the Environmental Assessment Registration Document.

During operations the reclamation plan will be updated every 3 years.

A final reclamation plan will be submitted to the Government of Nova Scotia for approval at least 12 months prior to the end of operations.

The final reclamation plan and associated future land use will be decided in consultation with Rights Holders, Community Residents, Regulators, and other Stakeholders.

At the end of operations, Active Reclamation & Closure is expected to take 2 to 3 years.

Post-Closure Monitoring will continue until the site is deemed safe and stable.

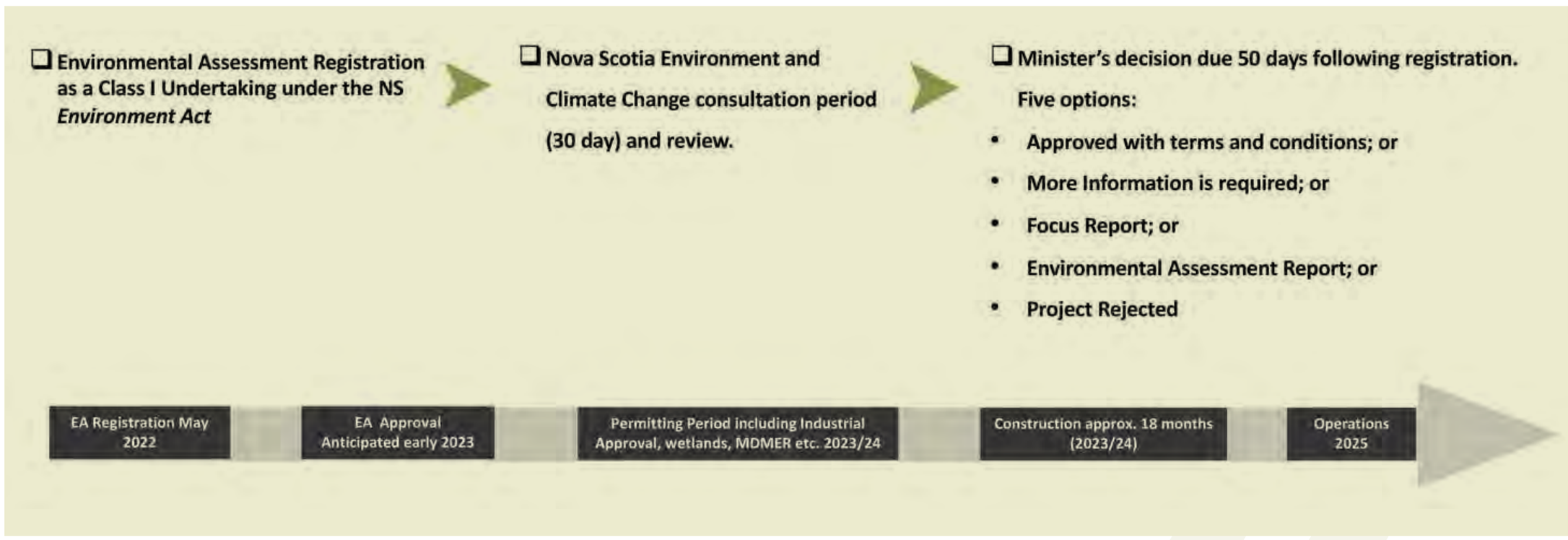
Anaconda Mining

PERMIT TIMELINE & PROJECT SCHEDULE

The Goldboro Gold Project is subject to regulation under the Nova Scotia Environmental Act, Part IV. An Environmental Assessment Registration Document (EARD) for the proposed Project will be submitted for Class 1 Environmental Assessment in Q2 2022. The EARD will be authored by Anaconda and GHD, utilizing extensive baseline data collected at the Project site by Anaconda and its consultants since 2017.

Anaconda will also apply for a provincial Industrial Approval to Operate, planned for early 2023, and make applications for various permits associated with Mining and Crown Land access, mining, and milling permits, water use, watercourse/wetland alteration, and sewage treatment to support authorization for the construction and operation of the Project.

Applications to federal authorities are also required, including but not limited to a Fisheries Act Authorization through Fisheries and Oceans Canada (DFO) for alteration and destruction of fish habitat, as well as an amendment to Schedule 2 of the Metal and Diamond Mining Effluent Regulations associated with tailings placement. These applications may be made in early 2023, as regulations and associated timelines dictate.



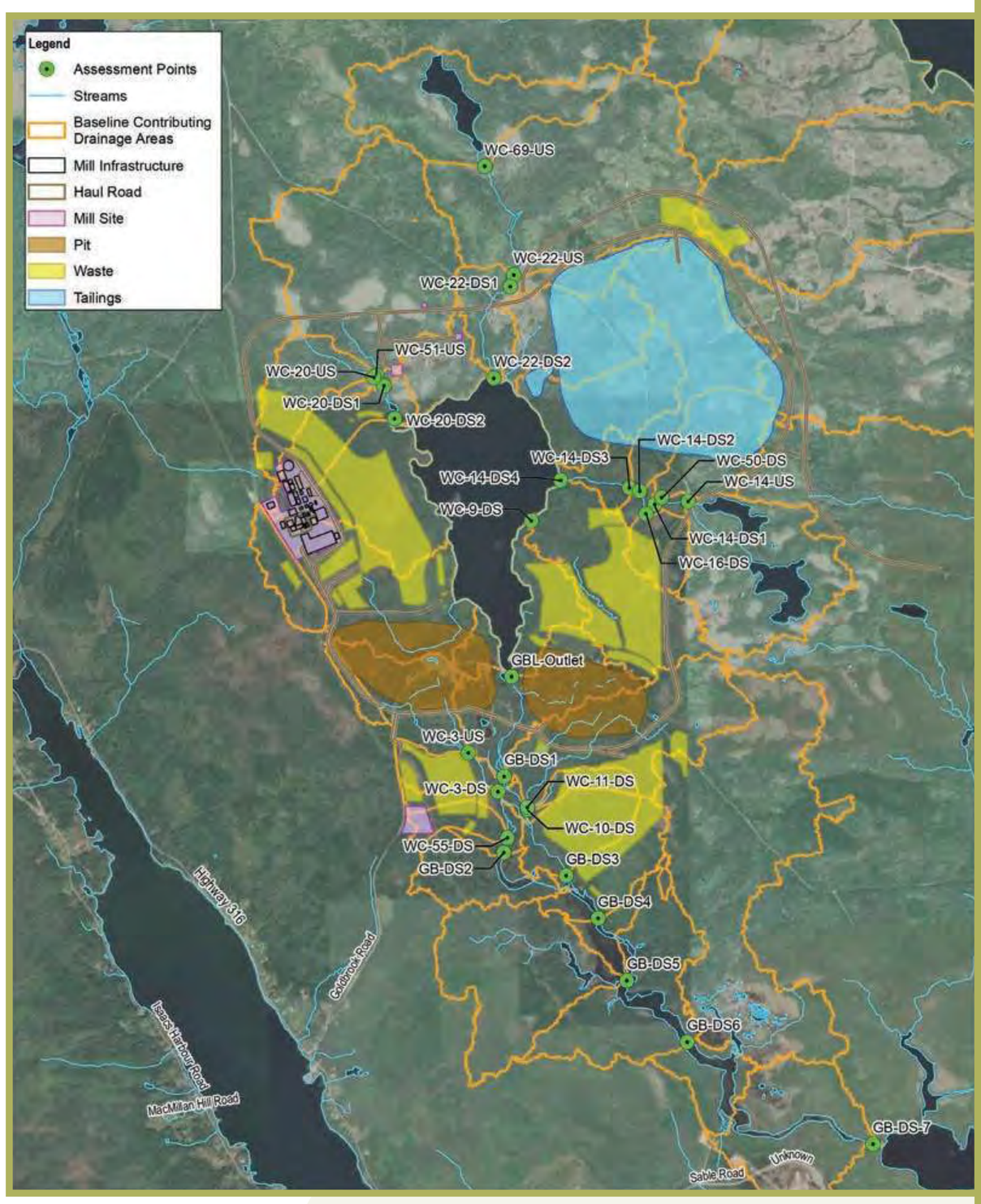
Anaconda Mining

SURFACE WATER

Potential surface water impacts are being assessed at close to 30 locations throughout the Project Area. Several surface water predictive models were developed to assess the potential Project related impacts to the receiving environment. Models were developed using surface water baseline monitoring data, outputs from the groundwater model and local long-term climate data. The models include:

- Water Balance Model: to quantify the impacts to stream flow, groundwater recharge and lake levels
- Predictive Water Quality Model: to quantify the impacts to water quality within the receiving water bodies and streams
- Mixing Zone Model: to identify the extent of the mixing zone within the receiving water body and watercourses to quantify the distance to fully mixed water column
- Hydrologic and Hydraulic Model: to establish the sizing and space requirements of mine water management infrastructure

In addition, a detailed surface water monitoring plan is also being developed that is currently collecting baseline water quality, streamflow and water level. Monitoring will continue through construction, operations, and closure. Data collected in this monitoring program will be used to validate predictive models and to inform adaptive water management strategies.



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GROUNDWATER

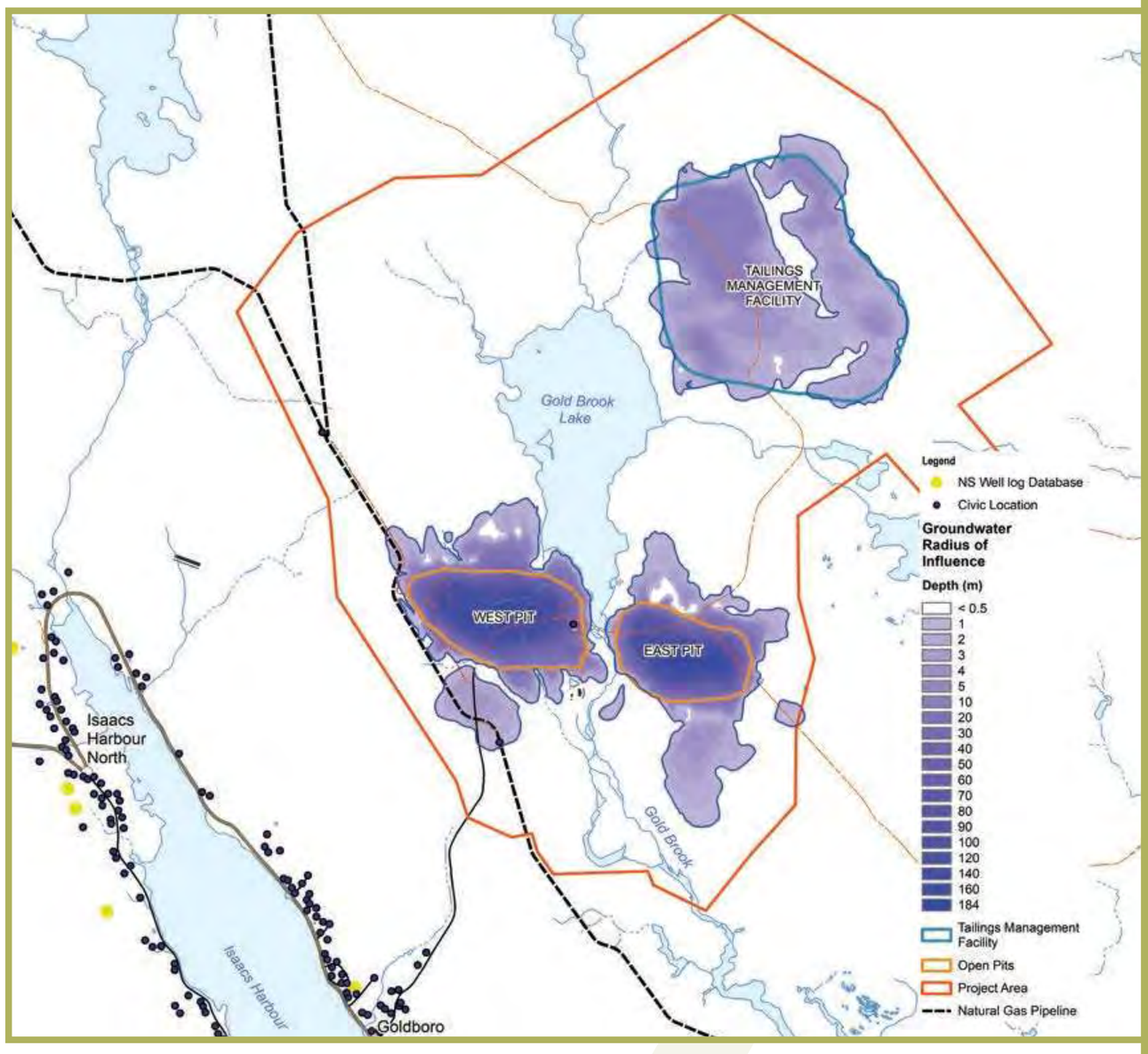
- GHD developed a three-dimensional groundwater flow and transport model to predict potential Project related impacts on groundwater resources. GHD developed the groundwater model using baseline water quality and quantity data collected through various baseline monitoring and drilling programs. The model predicts the radius of influence (drawdown) based on the development of the open pits and the TMF. The radius of influence is dependent on the bedrock geology, bedrock and overburden hydraulic conductivity (how easily water moves within the subsurface) and depth/extent of the open pits. This radius of influence is used to determine any potential interactions with potable wells and surface water features such as Goldbrook Lake, Gold Brook and wetland habitats.

- The predicted maximum extent of the radius of influence is approximately 500 m from the pit limits.

- The nearest residence from the open pits is 1.4 km. The Project is not anticipated to impact any potable well users.

- No groundwater quality impacts are predicted beyond the Project Area.

A series of groundwater monitoring wells are being installed to monitor any changes to groundwater levels and groundwater quality throughout the life of the Project.



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AIR, NOISE AND LIGHT

AIR QUALITY

- Air emissions estimates and dispersion modelling were completed to estimate concentrations of particulate matter, carbon monoxide (CO), sulfur dioxide (SO2), and oxides of nitrogen (NOx)
- Project-related air contaminant concentrations are predicted to be below the limits set by the Nova Scotia Air Quality Regulations

GREENHOUSE GASES

- Project-related greenhouse gas emissions were calculated from equipment quantities and estimated fuel consumption rates
- Peak annual greenhouse gas emissions from the Project are estimated to total 33.08 kilotonnes of carbon dioxide equivalent, approximately 0.26% of the total amount emitted in Nova Scotia in 2020

LIGHT

- Light levels were calculated from equipment quantities and power outputs proposed for the Project
- Project-related light levels are predicted to be below the Institute of Lighting Engineers (ILE) pre- and post-curfew limits

NOISE

- Acoustical modelling software was used to assess noise impacts based on Project activities and equipment
- Noise levels produced by the Project are predicted to be within the Nova Scotia Pit and Quarry Guidelines limits

MITIGATION

- Water and/or dust suppressants will be applied to all on-site roads to reduce dust generation
- Surfaces of organic material and till stockpiles will be stabilized by vegetation between usage
- Equipment, vehicles, and haul trucks will be maintained in good working order, and to reduce emissions, idling times and cold starts will be minimized to the extent possible.
- Project-related lighting will be limited to that which is necessary for safe and efficient work activities
- Lighting will be angled downwards and placed as far from site boundaries as possible
- Blasting is anticipated to occur twice per week and will be limited to daylight hours on weekdays
- Blasting schedule will be communicated to community in advance

MONITORING

- Air quality sampling will occur throughout the life of the Project and results will be compared to baseline conditions and to the Nova Scotia Air Quality Regulations
- Annual greenhouse gas emissions from the Project will be reported to the National Pollutant Release Inventory
- Noise monitoring will take place at several locations within Goldboro over the life of the Project
- Anaconda will maintain a clear line of communication for air, light, and/or noise complaints to be recorded and addressed

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STUDY AREA MAP

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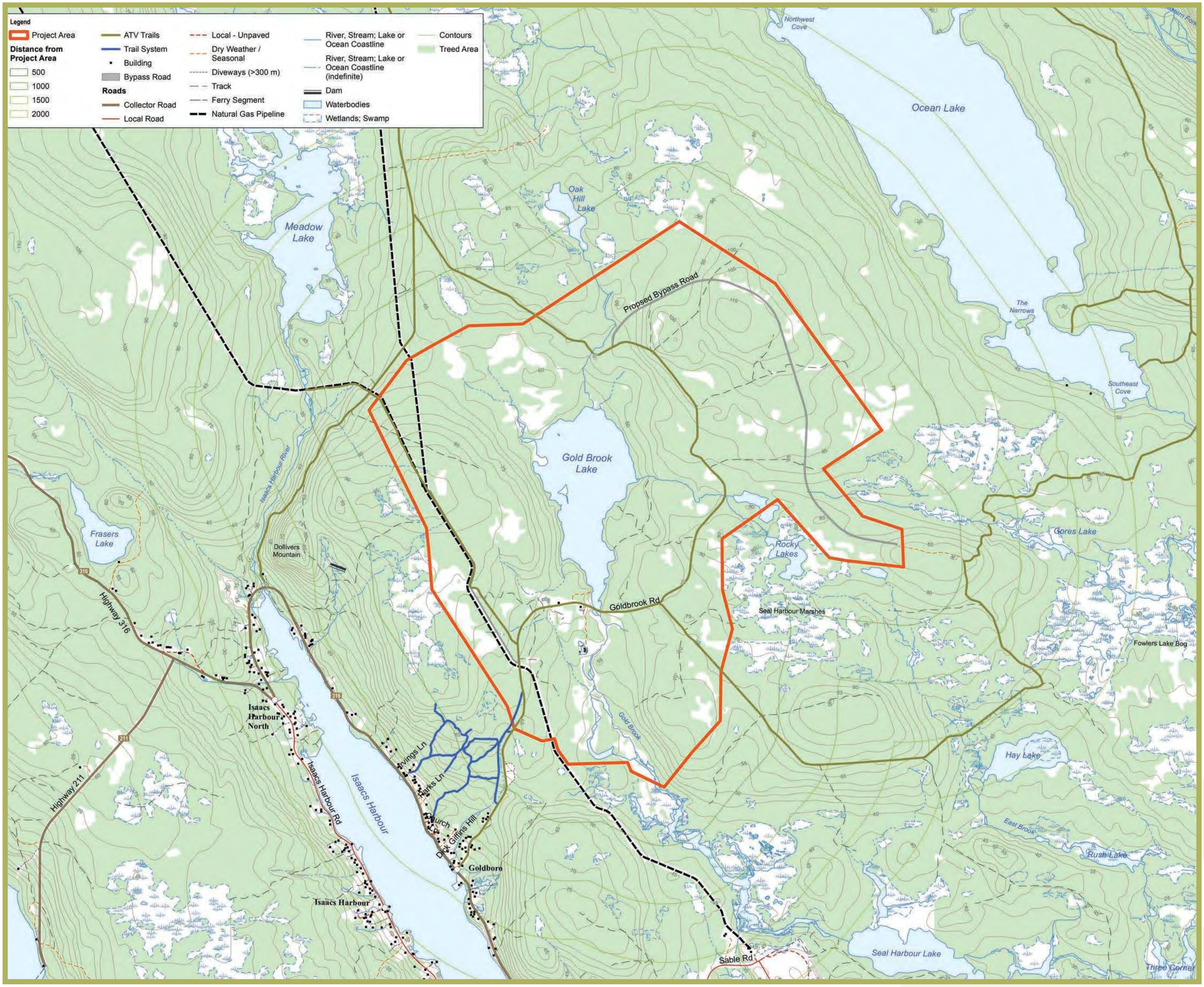

WETLANDS

- Wetlands in Nova Scotia are protected under the Nova Scotia Wetland Conservation Policy (2011b) and the Environment Act (1994) and its Activities Designation Regulations (1995).

- Baseline assessment involved field delineation and functional assessment summaries on 222 identified wetlands within the Goldboro Project Area.

- MEL biologists delineated 329 total hectares of wetland habitat, representing 27% of land cover within the Project Area.

- Of the 222 wetlands identified within the Project Area, 110 (49.5% of wetlands) will be avoided by Project infrastructure.

- A total of 112 wetlands (representing 35.3% of wetland area in the Project Area) are proposed for alteration.

- Of the 112 wetlands proposed for alteration, 56 wetlands are proposed for partial alteration, and 56 are proposed for complete alteration.

- Primary potential indirect wetland impacts are expected through groundwater drawdown and surface flow reduction. These areas will be quantified and included in the Wetland Monitoring Plan.

- Site Infrastructure has been micro-sited to avoid wetland habitats wherever possible.

- A Wetland Alteration Permit will be required for the Project, and a Preliminary Wetland Compensation Plan will be included in the EARD.

- The project team is actively working to identify and design wetland restoration projects.

- A detailed Wetland Monitoring Plan (including partially altered and potentially indirectly impacted wetlands) will be prepared and submitted for approval prior to construction.

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FISH AND FISH HABITAT

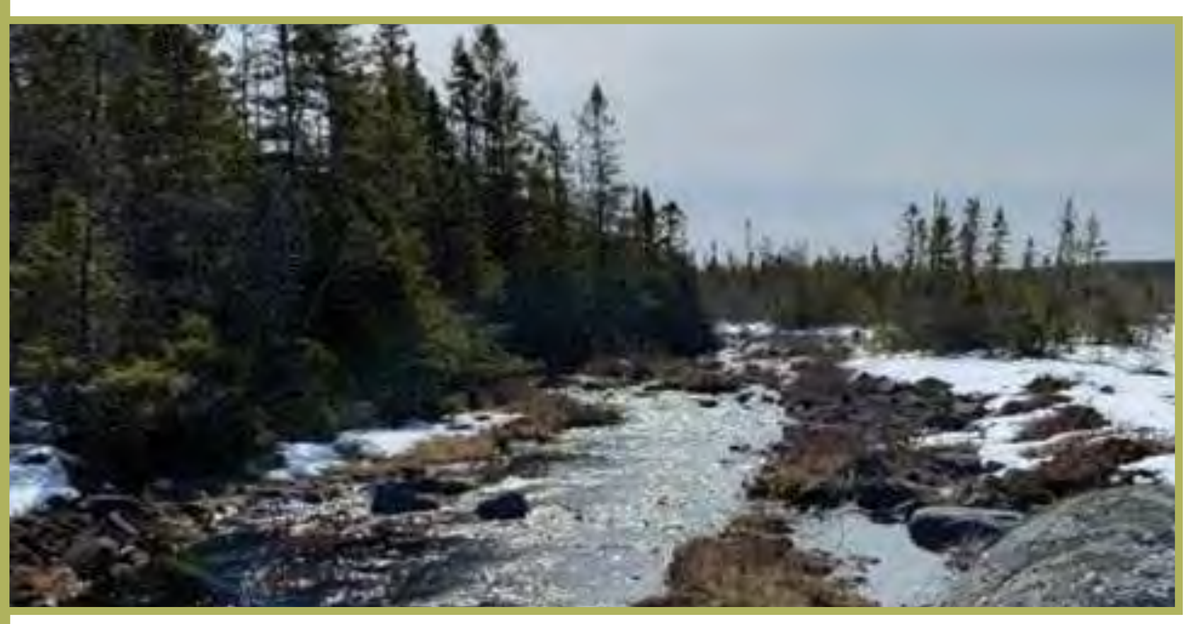
- The Project Team evaluated fish and fish habitat for the Project within the framework offered by the Fisheries Act (1985).

- Field assessments in 2020 and 2021 included:
  - habitat surveys
  - electrofishing and supporting fish collection
  - eDNA surveys
  - water quality surveys
  - benthic invertebrate communities

- Fish habitat quality was described and determined to be suitable for various life history stages of the fish species present in the Project Area. Spawning habitat suitable for salmonids was scarce.

- In some watercourses, low pH levels, elevated summer temperatures, and low DO concentrations limit fish habitat quality.

- 66 watercourses were delineated within the Project Area and detailed habitat evaluations were completed on any system with expected direct or indirect impacts.



- Through all fish sampling efforts, a total of 1,817 individual fishes of 6 species were identified.

- Species include (in order of abundance):
  1. Yellow Perch (Primarily in Gold Brook Lake)
  2. American Eel
  3. Brook Trout
  4. Golden Shiner
  5. Banded Killifish
  6. Blacknose Shiner

Overall, diversity and abundance were low, and consistent with expectations based on fish habitat quality within the Project Area. Development of the pits and associated mine infrastructure will impact several tributaries to Gold Brook Lake and Gold Brook, both directly and indirectly. Indirect effects assessment to determine impacts to Gold Brook and Gold Brook Lake are ongoing.

- A fish habitat offsetting plan is being developed to facilitate this diversion and compensate for loss of fish habitat. The Project Team is actively working to identify and design fish restoration projects and working collaboratively with Indigenous groups and communities with this goal in mind.

- Site Infrastructure has been micro-sited for fish habitat avoidance wherever possible.

- A Fisheries Authorization will be required for the Project, and a Preliminary Offsetting Plan for fish habitat compensation/restoration included in the EARD.

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TERRESTRIAL ENVIRONMENT

- Habitat and Flora (vascular and non-vascular plants and lichens) surveys were completed in 2017 - 2021 within the Goldboro Project Area and adjacent lands.

- Habitat (vegetation communities) was surveyed to determine habitat types throughout the Project Area.

- Within the Project Area, historical mining and disturbances from timber harvesting has occurred.

- The Project Area is within the Eastern Interior and Eastern Shore Ecodistrict and consists of coastal and near-coastal habitat types, predominately consisting for softwood tree species such as black spruce, red spruce, balsam fir and with scattered hardwood species such as red maple and white birch.

- Nine natural vegetation community groups and 21 vegetation types were observed within the Project Area.

- Vascular, non-vascular plant and lichen surveys were completed through all represented habitat types (upland and wetland habitat).

- These surveys focussed on rare plants and lichens, as per Provincial guidance.

- A total of 203 flora species were observed and include 113 vascular plants, 40 bryophytes and 30 lichen species.

- A Species at Risk (SAR) is a species legally protected under the Species at Risk Act (SARA) and/or the provincial Nova Scotia Endangered Species Act (NSESA) while a Species of Conservation Interest (SOCI) is one which is listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or species classified as S1 to S3S4 by the Atlantic Canada Conservation Data Centre (ACCDC).

- Five rare vascular plants and seven rare lichens were identified. Two Species at Risk (SAR) lichens; blue felt lichen and frosted glass whiskers were observed. No SAR vascular or non-vascular plants were identified during the field surveys.

- Direct loss is expected as a result of Project development for:

  - Vascular plants (SOCI)
    - Nova Scotia Agalinis
    - Southern Twayblade
    - Wiegand's Sedge
    - Northern Comandra

  - Lichens SAR/SOCI
    - Blue Felt Lichen (SAR)
    - Shingle Lichen (SOCI)
    - Appressed Jellyskin Lichen (SOCI)
    - Corrugated Shingles Lichen (SOCI)

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BIRDS

- Migratory birds and SAR are protected under federal legislation by the Migratory Birds Convention Act (MBCA), Migratory Bird Regulations and SARA. The Nova Scotia Wildlife Act protects all birds within the province by stating that, except with a permit issued by the minister, no person shall destroy, take, possess, buy or sell any egg of a bird or turtle or disturb the nest of a bird or turtle; or use a snare, net or trap to take any bird.

- Avian baseline surveys completed include nocturnal owl (2017 and 2021), spring migration (2019 and 2021), Breeding Bird (2017, 2019 and 2021), Common Nighthawk (2017 and 2021), fall migration (2019 and 2021), and incidental winter surveys (2021). Incidental observations of birds were recorded by MEL ecologists during all baseline biophysical surveys, particularly for SAR and SOCI birds.

- MEL avian specialists focused on confirming observed breeding status of birds, using guidance provided by the Maritime Breeding Bird Atlas. Breeding evidence was categorized as possible, probable or confirmed, according to specific behaviors.

- Through all seasonal surveys, a total of 3,747 individuals were observed, representing 91 species.

- Abundance and diversity of avian species observed was moderate to high based on observer experience in the geographic area. The common species assemblage of forest birds was observed, along with a cohort of species more typically found in intact or interior forest (such as Cape May Warbler, Canada Jay, Blackpoll Warbler).

- 4 Species at Risk (SAR) and 24 Species of Conservation Interest (SOCI) bird species were observed in the Project Area.
  - The SAR bird species include:
  - Canada Warbler
  - Olive-Sided Flycatcher
  - Evening Grosbeak
  - Wood Thrush

- Project activities are likely to result in localized avoidance of the Project Area by some bird species. This potential avoidance would be due to changes in ambient noise levels, light levels, direct and indirect habitat loss and increased fragmentation.

- Habitat loss is expected for breeding birds (SAR and SOCI).

- Birds are expected to occupy adjacent areas once the Project has been developed. Adjacent areas are largely undeveloped and provide suitable habitat for bird species.

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FAUNA

- The legislation outlining management of terrestrial fauna includes: the Nova Scotia Wildlife Act and its regulations protect wild species diversity and abundance; the Canada Wildlife Act; Species at Risk Act and Nova Scotia Endangered Species Act provide protection to terrestrial fauna.

- Data collection on various fauna species occurred through targeted field surveys and incidental observations. Targeted surveys were completed for bats, mainland moose, and snapping turtles.

- Incidental observations were recorded for all other fauna species including other mammals, reptiles and amphibians, and invertebrates (including freshwater molluscs, lepidopterans, and odonates) during other surveys completed to support the EARD.

- The following mammal species were confirmed to use the Project Area:
  - Mainland Moose (ACCDC: S1; NSESA: E)
  - American Black Bear
  - American Red Squirrel
  - Beaver
  - Bobcat
  - Coyote
  - North American Porcupine
  - North American River Otter
  - Red Fox
  - Snowshoe Hare
  - White-tailed Deer
  - Vole species

- The Goldboro Project Area was evaluated for bat hibernacula potential through both desktop and field evaluations. No evidence of bat usage or suitable hibernacula habitat were observed.

- A common assemblage of herpetofauna was observed using the Project Area. Species observed include:
  - Common Gartersnake
  - Green Frog
  - Spring Peeper

- Aside from observations of Mainland Moose, no priority wildlife species were observed.

- While not observed, habitat for Snapping Turtles (SAR) was observed within the Goldboro Project Area.

- No evidence of Wood Turtle (SAR) usage was identified during desktop or field evaluations.

- Project activities are likely to result in localized avoidance of the Project Area by some species. This potential avoidance would be due to changes in ambient noise levels, light levels, direct and indirect habitat loss and increased fragmentation.

- Mobile species are expected to occupy adjacent areas once the Project has been developed. Adjacent areas are largely undeveloped and provide suitable habitat for wildlife species.

Anaconda Mining

MI'KMAQ RIGHTS, ENGAGEMENT & IMPACTS

Anaconda Mining acknowledges the asserted Aboriginal and Treaty Rights of Mi'kmaq of Nova Scotia.

The Company recognizes Mi'kmaq cultural responsibilities to respect and protect the lands, waters, animals, habitat, and natural resources.

As Rights Holders, Mi'kmaq are committed to protect and enhance the resource-based economy which is essential to maintain their way of life, culture, and the well-being of future generations.

Anaconda initiated Early Engagement with Kwilmu'kw Maw-klusuaqn Negotiation Office (KMK), the Assembly of Nova Scotia Chiefs and representatives of Paqtnkek Mi'kmaw Nation in 2017.

On June 2, 2019, the Company and the Assembly of Nova Scotia Mi'kmaw Chiefs signed a Memorandum of Understanding (MOU) that outlines a process that the parties may use to develop a Mutual Benefits Agreement (MBA) that reflects a desire to build a mutually beneficial relationship with respect to the Project. This process is ongoing.

Anaconda maintains its commitment to work collaboratively with Mi'kmaq of Nova Scotia regarding environmental and cultural priorities, as well as social and economic opportunities throughout the life of the Project.

Information shared through Mi'kmaq Engagement, as well as completion of a Mi'kmaq Ecological Knowledge Study (MEKS) by Membertou Geomatics (2017), has been reflected in the development of the Project. Anaconda has engaged Membertou Geomatics to provide an updated MEKS that will reflect any new information or considerations related to the current project impact area.

Some of the priorities brought forward during Mi'kmaq Engagement include enhanced eel studies, reducing impact on streams and fish habitat, additional measures for water quality treatment and monitoring, mitigating impact on Crown Land, enhanced tailings management infrastructure, and proactive sharing of information relevant to Mi'kmaq Rights.

Anaconda has committed to pursue opportunities to incorporate Mi'kmaq traditional knowledge and two-eyed seeing in environmental management and monitoring activities.

Anaconda will implement (Mi'kmaq developed) cultural awareness training as a requirement for every person employed at the Goldboro Gold Project.

Anaconda Mining

ARCHAEOLOGY
MI'KMAW & ANCESTRAL RESOURCES

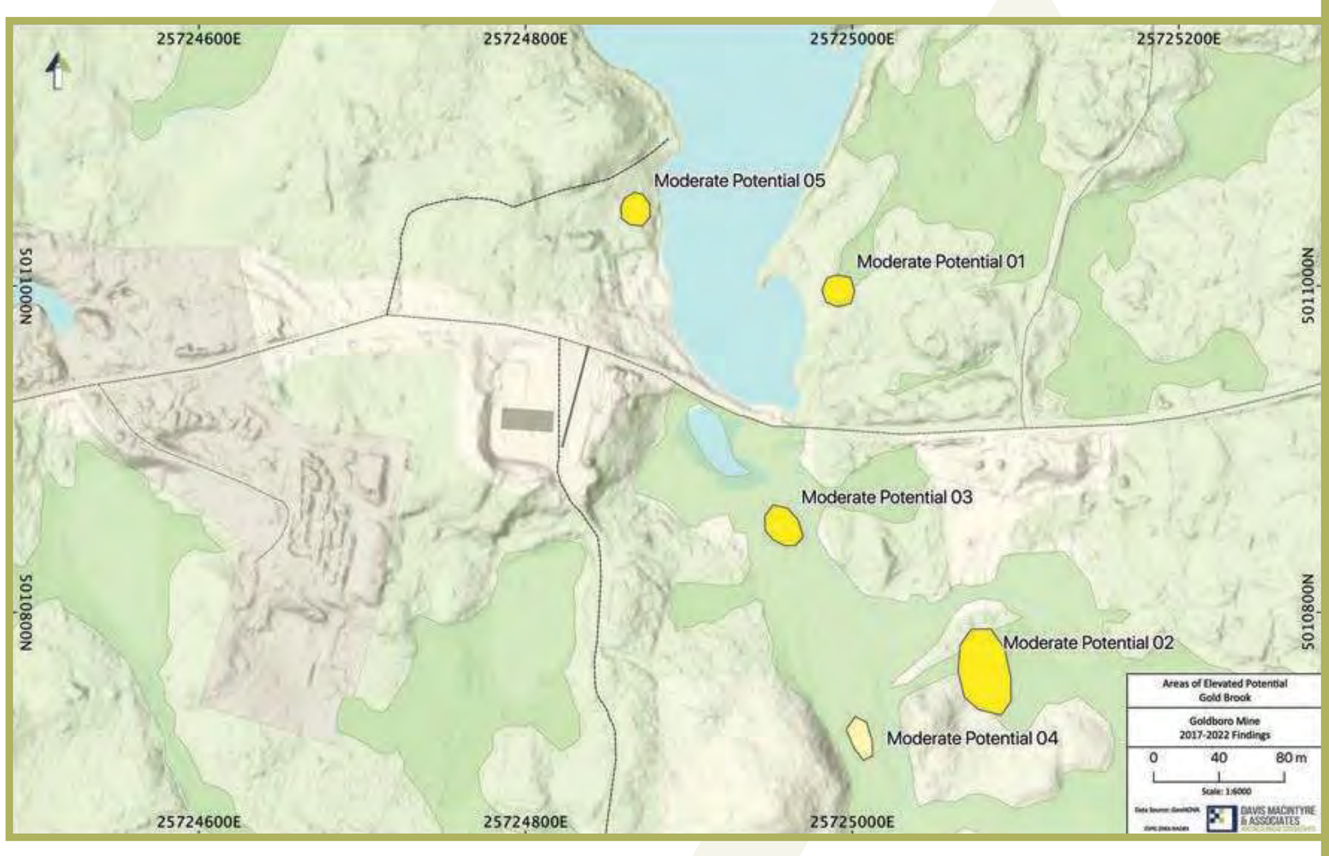
History

Spatially and geographically, Mi'kmaq land use throughout Mi'kma'ki is not considered in the same sense that European occupation is recorded. Colonialism has had a significant impact on Mi'kmaw ways of life. Prior to European contact, the Mi'kmaq and their ancestors had a very dynamic relationship with the land which was reflected in their language, legends, songs, dances and oral tradition. The landscape was viewed as "sentient, ever-changing, and in a continual process of becoming". Therefore, the euro-centric view of the land as discrete and definitive land parcels does not reflect the Mi'kmaw world view and references to site-specific pre-contact land use from the first-hand perspective of the Mi'kmaq (through oral tradition) are difficult to ascertain. However, historic references by Europeans do exist and Mi'kmaw land use and occupation is reflected in the archaeological record.

Nova Scotia has been home to the Mi'kmaq and their ancestors for at least 11,500 years. A legacy of experience built over millennia shaped cultural beliefs and practices, creating an intimate relationship between populations and the land itself.

Findings

- A total of 16 areas of moderate potential and 2 areas of low-moderate potential for Mi'kmaw and ancestral archaeological resources were identified through a series of archaeological surveys.
- The 7 related to Ocean Lake will not be investigated further, following the decision to confine the project footprint to a single watershed area.
- Of the remaining 9, it is expected that only 4 are likely to be impacted by the project.
- Moderate potential and low-moderate potential, means that based upon predictive modelling, there is a chance that these locations were utilized by Mi'kmaq or their ancestors for encampment or other activities. While artefacts and/or evidence has not been identified, the possibility of activity can't be ruled out, so investigation/testing is warranted.
- The 4 areas of elevated archaeological potential that will likely be impacted shall be investigated through archaeological shovel testing (with Mi'kmaq participation).
- Archaeological work/testing work will be completed before final engineering/infrastructure design and before any ground is disturbed.



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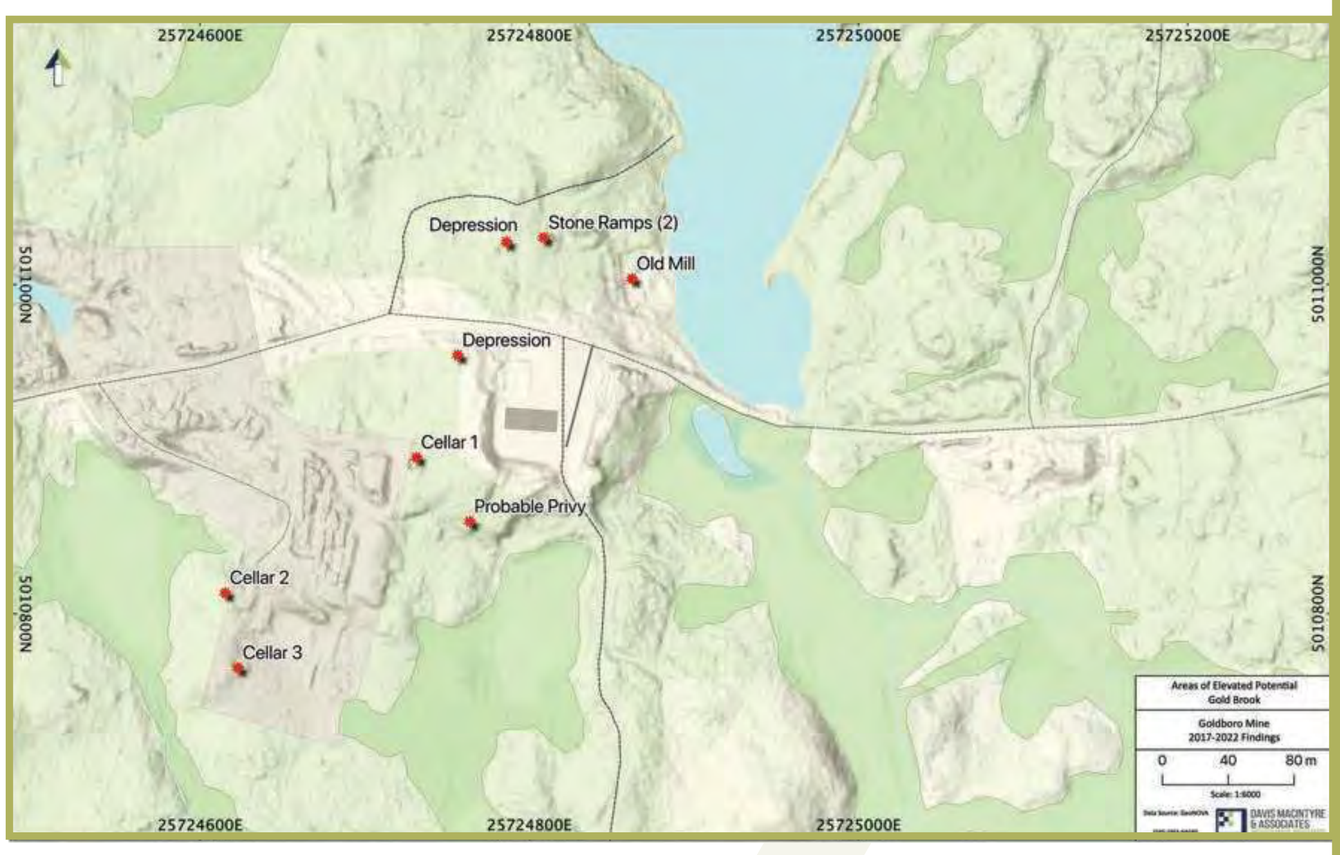
ARCHAEOLOGY
HISTORIC MINING DISTRICT

History

In 1892, Howard Richardson was the first to record the occurrence of gold in the slate belt found within the study area. Later that year, Richardson would develop this belt with the Richardson Mining Company. The East Goldbrook mine, located on the eastern side of Gold Brook Lake, opened with the sinking of its first shaft in 1907. Gold mining at the southern end of Gold Brook Lake appears to have continued sporadically into the 1930s. The Proposed Goldboro Mine Project Area includes a registered archaeological site, BhDj-2, related to historic mining activity which includes cellars and a mill site.

Findings

- A total of 10 known/suspected historic archaeological features have been identified.
- 2 distinct historic cellars are within the proposed impact zone and will be investigated through formal archaeological excavations.
- 2 additional suspected cellars shall be shovel tested and, if necessary, more thoroughly excavated.
- The historic stamp mill, where ore was processed to extract gold historically, shall be surface-recorded and investigated with a mechanical excavator under the supervision of an archaeologist.
- 5 more minor features (2 surface depressions, 2 stone ramps, and a suspected historic privy) will also be investigated with mechanical assistance.
- Archaeological work/testing work will be completed before final engineering/infrastructure design and before and ground is disturbed.



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EMPLOYMENT & TRAINING

Anaconda Mining has a strong commitment to employee education, training, and mentoring. In addition to mandated training from regulatory bodies, Anaconda provides specialty in-house training as well as funding for employee education initiatives and professional certification. The Company has formal and informal mentoring programs and makes a point of hiring people who have a goal of personal and professional advancement.

Anaconda has a clear vision: to be the place where a diverse mix of talented people want to come, to stay, and do their best work.

Anaconda seeks to hire people who have connections to the communities and provinces where we operate. We know from experience that this approach is better for creating sustainable social and economic benefits.

Up to 538 full-time direct jobs could be created during the two-year construction phase, of which 325 of those jobs are expected to be directly on-site at the Project, along with a further 213 full time spin-off jobs each year over this period.

Once operational, the Goldboro Gold Project is estimated to provide direct annual employment for approximately 215 full-time positions at the Project site and 517 spin-off jobs, in the Eastern Region of Nova Scotia where the current unemployment level of 14.2% exceeds the provincial average.

Over the life cycle of the Project, including construction, operations and reclamation, the Goldboro Gold Project has **the potential to create 735 new jobs a year** in Nova Scotia for 15 years.

Employment opportunities for the Goldboro Gold Project will be posted on our website at **anacondamining.com/anx/careers.**

As the permitting process progresses, more information about training and employment opportunities will be made available.

For employment consideration, email resumes and cover letters to
careers@anacondamining.com
Only those selected for an interview will be contacted.

Anaconda Mining

SOCIO-ECONOMIC IMPACT FOR NOVA SCOTIA

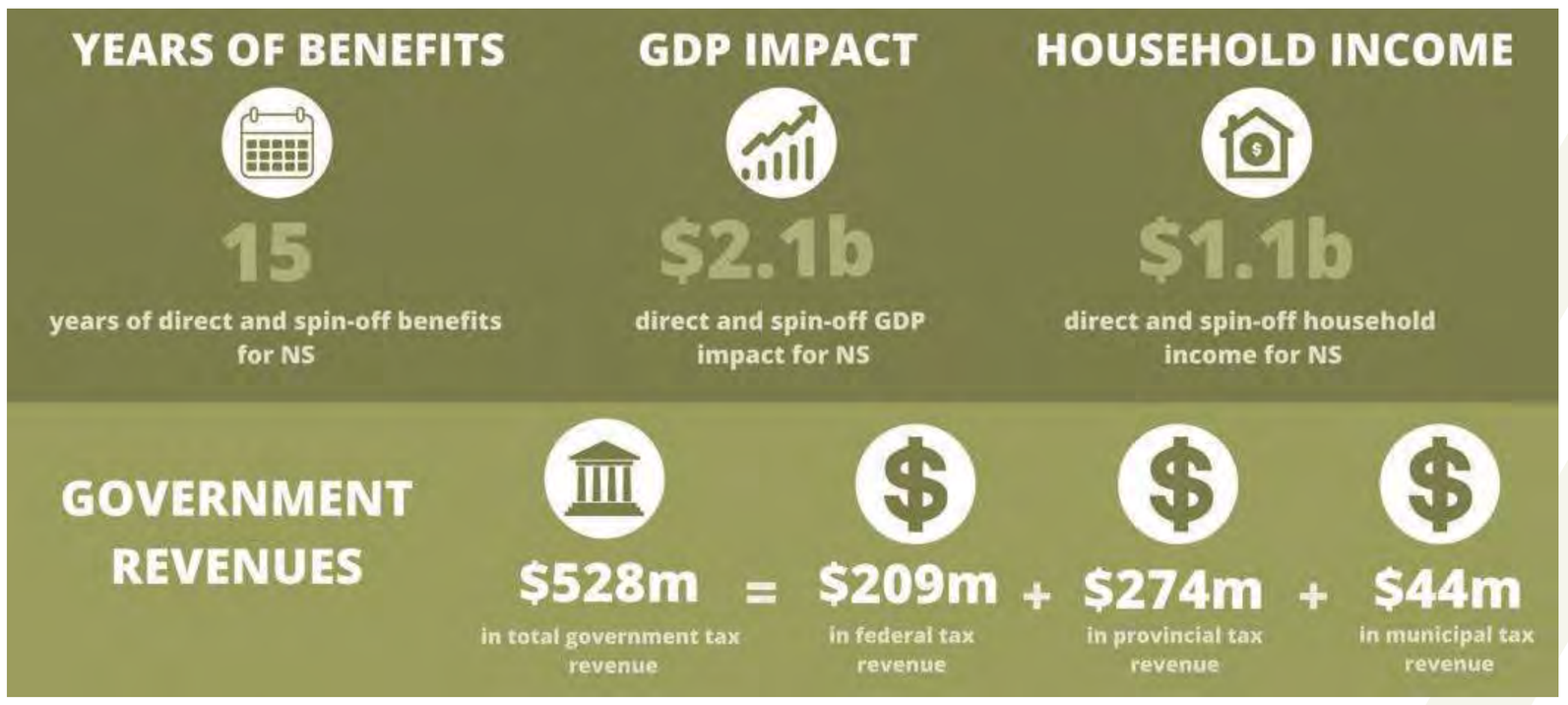
The Goldboro Gold Project is currently the largest private sector undeveloped project in the Province of Nova Scotia and would be comparable to other planned projects including the Halifax Infirmary Expansion and the Sydney Container Terminal.

To independently demonstrate the social and economic impacts of the Goldboro Gold Project throughout its approximately 15 years of construction and operations activity, Anaconda engaged Group ATN to complete a socio-economic impact analysis of the potential benefits accruing to the Province of Nova Scotia, and the potential benefits to the Mi'kmaq of Nova Scotia. The full Socio-Economic Impact Report is available at anacondamining.com.

Over approximately 15 years, Anaconda anticipates spending up to $1.7 billion on goods and services, the majority of which is expected to be in Nova Scotia, resulting in a potential provincial GDP impact of $2.1 billion.

Household income in Nova Scotia may potentially increase by up to $1.1 billion from the development of the Project.

Based on the current plan outlined in the Feasibility Study, the Project is estimated to generate $528 million in income and mining taxes at the federal, provincial and municipal level from direct and spin-off economic activity.



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COMMUNITY ENGAGEMENT & BENEFITS AGREEMENT

Anaconda Mining began Community Engagement in 2017, including the establishment of a Community Liaison Committee. Information shared over the past 5 years has been used to inform the development of the proposed Project. The Company is committed to continuing Community Engagement throughout the life of the Project.

The Community Benefits Agreement with the Municipality of the District of Guysborough outlines Anaconda's commitments to bring sustainable social and economic benefits to the Municipality of the District of Guysborough including:

- Implement targeted measures for local recruitment and employment at both the construction and operational stages of the Project.
- Collaborate with the Guysborough Career Resource Centre to assess local labour market training and employment opportunities.
- Encourage contractors, suppliers, and service providers to maximize opportunities to hire locally and support business' activities in the Municipality of the District of Guysborough.
- Engage local businesses and suppliers to identify procurement and service opportunities with the Project.
- Provide financial incentives for Anaconda employees to purchase or build homes within the Municipality ($5,000 per employee).
- Establish five bursaries for local high school students. This year there will be $5,000 allocated for the bursaries. This will increase to $10,000 in 2025 or when commercial gold production begins. Details to be announced in March 2022.
- Hire co-op work term students and apprenticeship placements.
- Contribute annual grants for community groups, organizations, and community projects within the Municipality. The value of grants will be $15,000 per year until commercial production of gold when it will increase to $100,000 per year for the life of the project.
- Establish a local Project Information Office within the Municipality in 2022 with a further commitment to maintain a local Operational Office within the Municipality for the life of the Project.
- Facilitate ongoing dialogue between the Municipality and the Company including quarterly updates to the Municipality as they relate to the Agreement, the implementation of the benefits outlined in the Agreement, and general updates concerning the Project.

Anaconda Mining

Appendix D.1

Air Emissions Assessment

Air Emissions Assessment

Goldboro Gold Project

Anaconda Mining Inc.

May 20, 2022

The Power of Commitment

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Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	00	Punith Nallathamby	Matt Griffin		Matt Griffin		May 4, 2022
S4	01	Punith Nallathamby	Matt Griffin		Matt Griffin		May 20, 2022

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1. Introduction

GHD Limited (GHD) was retained by Anaconda Mining Inc. (Anaconda) to conduct air emissions estimates and dispersion modelling for the Goldboro Gold Project (the Project) located in Goldboro, Guysborough County, Nova Scotia (NS). The Project is located approximately 175 kilometres (km) northeast of Halifax, 60 km southeast of Antigonish, and 1.6 km northeast of the community of Goldboro on the eastern shore of Isaacs Harbour, in Guysborough County, NS, Canada.

Anaconda proposes to develop the Project as a 4,000-tonne per day (tpd) mine and processing facility. The mine plan includes two open pits (East Pit and West Pit), an ore processing facility, a tailings management facility (TMF), three waste rock storage areas (WRSAs), till and organic stockpiles, support buildings, and associated infrastructure. The anticipated mine life for extraction of ore is approximately 11 years.

For the purposes of this assessment, a Project Area (PA) was defined as the footprint of Project related infrastructure plus a buffer of 100 – 200 m. Air quality was assessed at the Proposed Property Boundary for the Project. Land required for Project development is comprised of both private and Crown properties. Private property transactions and Crown Land Lease Applications are on-going. The Proposed Property Boundary, East Pit, West Pit, and haul roads are presented in Figure 1.

The scope of the Project includes activities associated with construction, operation, and closure. Project construction activities will include clearing and grubbing the till and organic stockpiles, WRSAs, pit, plant, and TMF areas, and construction of the initial lift of the TMF, mill area, secondary access roads, construction laydowns, Run-of-Mine (ROM) pad, surface water management and other infrastructure. The operation phase will include conventional ore extraction methods (drilling, blasting, loading, and hauling), ore processing, and waste management. ROM ore will go directly to the crusher while stockpiled high-grade and low-grade ore will be progressively processed throughout the mine life. Non-ore bearing waste rock, not used for construction or backfill, will be stockpiled at its final disposal point, managed and reclaimed in place. The closure phase will include earthworks and demolition required to return the Project Area to a safe, stable, and vegetated state, and all monitoring and treatment, where required.

This report summarizes the methodology used to estimate the air emissions and develop the dispersion models that were used to assess the impact of air emissions from the Project. Air emissions compounds evaluated included total suspended particulates (TSP), particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and carbon monoxide (CO). The sources of emissions included mining and process related activities within the PA, as well as vehicular emissions involved with transportation of material.

2. Air Emission Estimates

Particulate emission rates from the Project related sources were calculated using the United States Environmental Protection Agency (US EPA) AP-42 (5th Edition) emission factors, namely for open pit mining activities and resuspended road dust (US EPA, 2020). Haul road vehicle tailpipe emissions along with non-road vehicular tailpipe emissions were estimated using the NONROAD model integrated within MOVES3. The operations phase of the Project is anticipated to be of longer duration than the construction phase, and the number of vehicles, extraction rates, and material processing rates will be higher during operations than during construction. It is therefore expected that the operations phase represents the worst case, and air emission estimates and dispersion modelling were only completed for the operations phase.

2.1 Sources of Particulates

The possible sources of particulate emissions in the PA include the following:

– Haul roads
– Mining activities at the open pits:
  - East Pit
  - West Pit
– Mill area operations
– WRSAs and till stockpiles:
  - Northeast (NE) WRSA, receiving waste rock from the East Pit
  - Adjoining Northeast (NE-A) till stockpile, receiving till from the West Pit
  - Southeast (SE) WRSA, receiving waste rock from the East Pit and the West Pit
  - Northwest (NW) WRSA, receiving waste rock from the West Pit
  - Southwest (SW) till stockpile, receiving till from the West Pit
– The TMF embankment

2.1.1 Haul Roads

There is a network of haul roads within the PA that connect the various aspects of the Project. The haul roads are used for the transportation of waste to the WRSAs, till stockpiles, and organic material stockpiles from the East and West Pits, for the transportation of Run-of-Mine (ROM) material to the Mill Area from the East and West Pits, and for the transportation of waste rock and tailings to the TMF. The haul roads are split into the following routes, to account for the individual vehicle traffic in each route:

– East Pit to Mill Area: haul trucks carrying ROM material to the Mill Area
– East Pit to SE WRSA: haul trucks carrying waste rock and till to SE WRSA
– East Pit to NE WRSA: haul trucks carrying waste rock and till to NE WRSA
– East Pit to TMF: haul trucks carrying waste rock to TMF
– West Pit to Mill: haul trucks carrying ROM material to the Mill Area
– West Pit to SE WRSA: haul trucks carrying waste rock and overburden to SE WRSA
– West Pit to NW WRSA: haul trucks carrying waste rock and till to NW WRSA
– West Pit to TMF: haul trucks carrying waste rock to TMF
– West Pit to SW till stockpile: haul trucks carrying till to SW till stockpile
– West Pit to NE-A till stockpile: haul trucks carrying till to NE-A till stockpile
– West Pit to Backfill: haul truck carrying waste rock to backfill the East Pit.

The Life of Mine (LOM) projection schedule predicts the probable amount of waste rock, till, and ROM material mined annually over a span of 12 years (including 1.5 to 2 years of construction). According to the LOM projection schedule, in Year 5 of operations the East Pit and the West Pit together will produce the maximum material mined of 18,923,997 tonnes in a given year. The number of round trips required to carry these materials was estimated based on the load carrying capacity (38 tonne, and 86 tonne) of the planned haul trucks. Estimating the haul truck traffic using Year 5 of the LOM gives a realistic maximum number of trips that will occur amongst the various truck routes; this was used to estimate TSP and PM_{10} road dust emissions. The peak traffic (out of the entire LOM) for each route was used to estimate emission rates to provide a conservative approach to predicting $PM_{2.5}$ road dust emissions. The number of trips per hour used to estimate road dust emission rates for TSP, PM_{10}, and $PM_{2.5}$ are summarized in Table 1C.

Haul road emissions calculations assume that the roads are unpaved, and a Fugitive Dust Management Plan will be implemented. Anaconda plans to have dust control measures in place so as to achieve a 95% level of dust mitigation. The roads are constructed using clean waste rock and therefore only road dust emissions were calculated and assessed. Emissions calculations for haul road particulates are provided in Table 1A-1C, including all of the assumptions and constants, based on the AP-42 methodology for the 95% road dust mitigation scenario. The 95% level of control used in the assessment for dust on the internal haul route is an outcome of the modelling, not an input assumption requiring justification. It represents the level of control found to be needed to achieve acceptable results at the nearest receptors. Published studies such as the handbook "Dust Control at Hazardous Waste Sites" by Keith D. Rosbury, PEI Associates, Inc., and Golden, CO 80401 (EPA/540/2-85/003, 1985) show that it is achievable. Rosbury summarized results from various studies showing that levels of control as high as 98% were attained in some cases. Rosbury went on to prescribe a watering rate that would achieve near 100% control (approximately 1.7 L/m²/h). The US EPA (AP-42, Chapter 13.2.2) showed that by maintaining a road surface moisture level of 5 times that of the ambient soil, a 95% level of control could be achieved. It is clear therefore that the 95% level of control is attainable through sufficient watering. This finding of the studies is consistent with GHD's experience in observing the effect of intensive watering programs.

The NONROAD model integrated within MOVES3 can estimate the particulate matter emissions from nonroad motor vehicles (exhaust particulates), however these represent less than 1% of the particulates emitted from the road surfaces and so were considered insignificant and therefore not modelled.

2.1.2 Open Pits

The major sources of dust generation at the East and West Pits include resuspension of road dust, transfer/loading operations, and surface processing through heavy machinery. There are a few non-road vehicles such as excavators, loaders, dozers, etc., used in the pits. The list of non-road vehicles for East Pit and West Pit is summarized under Table 2 and Table 3 respectively. The NONROAD model integrated within the MOVES3 emission modelling system was used to generate emission factors for the off-road equipment used in these pits. MOVES3 is maintained by the US EPA and is geared towards the US States and Counties. Aroostook and Washington counties from the State of Maine were used as a representative of the PA. The MOVES3 model was simulated for one year (2020), and the maximum emission factor representative of each off-road vehicle was used to estimate emissions.

The road dust and the truck loading are expected to dominate the particulate generation during the operations phase. It is projected that the maximum material that can be mined annually from the East pit is 8,500,000 tonnes (Year 6), at any given year of the LOM; similarly from the West Pit, the maximum material that can be mined annually is 17,899,620 tonnes (Year 8). These maximum production capacities were used to conservatively estimate the particulate matter generated from loading activities.

2.1.3 Mill Area

The mill area is to receive the ROM material from both the East Pit and West Pit. There is a ROM material stockpile with transfer operations (ROMTRANS) adjacent to the mill area where the ROM material from the East and West Pits will be unloaded from the haul trucks. The material is stored temporarily before being transferred to the crushers. Particulate generating processes related to the mill area consist of transfer conveyors, material handling, loading and unloading operations at the ROMTRANS, and primary, secondary and tertiary ROM crushing. AP-42 standard calculations and assumptions, including controls where applicable, were used to generate these values and are provided in the Table 4. Mine tailings generated will be stored in the TMF under wet cover and are not anticipated to result in airborne emissions.

2.1.4 WRSAs and Till Stockpiles

Three WRSAs and two till stockpiles will be constructed throughout the PA. For the purposes of this assessment, these stockpiles were assigned the following names:

– NW WRSA

– NE WRSA
– NE-A till stockpile
– SW till stockpile
– SE WRSA

2.2 Sources of Gaseous Compounds

Tailpipe emissions from haul trucks along the haul roads and off-road vehicles at the East and West Pits include NO_x, SO_2 and CO. These emissions were calculated using the NONROAD model integrated within MOVES3 (which provides emission factors in a "grams/hp-hr" format). The tailpipe emissions estimates based on operational time are provided in Table 5A-5B.

3. Background Air Quality Data

3.1 Regional Background

Background air quality concentrations were added to the modelled concentrations for the Project to obtain an estimate of the air quality conditions when the proposed operations commence. There are currently no permanent air monitoring stations within the vicinity of the Project.

The most recent three years (2017 through 2019) for which all ambient air quality data are currently available were obtained from the Environment and Natural Resources Canada National Pollutant Surveillance network (NAPS). The nearest representative stations which report substances of interest for this assessment are:

– Halifax, NS (station ID 030118) – NO_2, SO_2, CO
– Lake Major-Halifax, NS (station ID 030120) – $PM_{2.5}$, NO_2, SO_2
– Port Hawkesbury, NS (station ID 030201) – $PM_{2.5}$, NO_2, SO_2
– Sydney, NS (station ID 030310) – $PM_{2.5}$, NO_2, SO_2, CO
– Aylesford Mountain, NS (station ID 030701) – $PM_{2.5}$, NO_2
– Pictou, NS (station ID 030901) – $PM_{2.5}$, NO_2, SO_2

Baseline ambient air sampling was conducted for TSP and PM_{10} at three locations in Goldboro from July 17 through July 19, 2018. The average values (shown in Table 6) from this baseline monitoring were used to represent the background concentration of TSP and PM_{10} for this assessment.

The background air concentrations from the NAPS stations are provided in Table 6, which shows the 30th, 50th, 70th, and 90th percentile values for ½-hour, 1-hour and 24-hour CO, 1-hour and 24-hour NO_2, 1-hour and 24-hour SO_2, and 24-hour $PM_{2.5}$ for the 2017 through 2019 period.

This air assessment was completed using the maximum 90th percentile measured concentration as "background" for all compounds reported by the NAPS stations listed above. This is a conservative approach but excludes extreme high values that are very rarely measured (the "maximum" values). Annual values for $PM_{2.5}$ are represented by the "Average" values for 24-hour $PM_{2.5}$ concentrations.

3.2 Project Monitoring

The National Pollutant Release Inventory (NPRI) is a federally administrated program that collects data on annual emissions of substances released to the air, water and land, as well as transfers of substances for disposal or recycling. NPRI reporting is a requirement of subsection 46(1) of the CEPA. Anaconda is aware of the legislation and will comply with reporting requirements, as applicable. Monitoring of particulate emissions will be conducted as

required by NSECC. Dust monitoring will take place at drier times to gauge the effectiveness of dust suppression mitigation.

Prior to construction beginning, dustfall samples will be taken according to the ASTM Standard Test Method for Collection and Measurement of Dustfall to establish a baseline for dust quantities in the area (ASTM 2017). The samples will be collected to the north, south, east, and west of the Project. Dust sample collection will continue on a quarterly basis to capture seasonal changes in weather and environmental conditions, or as a new construction activity commences. Dust sample analysis will be completed by a third-party laboratory.

The maximum permissible concentrations of common industrial contaminants as described in the NS *Environment Act* will be referred to and it will be ensured that the Project is not in violation of any of these limits. Ongoing air quality monitoring will occur over the life of the Project with comparison made to baseline air quality conditions.

4. Air Quality Criteria

Air quality is provincially regulated via the NS *Air Quality Regulations*. Criteria for all parameters listed in the NS *Air Quality Regulations* were applied in this assessment. If there were no NS criteria for compounds of interest, then Canada wide standards were assumed to apply.

PM_{10} is not regulated in either NS or by Federal Legislation. Ontario has an Interim Ambient Air Quality Criteria (AAQC) for PM_{10} of 50 µg/m^3 for the 24-hour averaging period, but this value is not used to assess compliance for single facilities or operations and is generally applied at the regional level. PM_{10} concentrations are therefore provided for informational purposes only; PM_{10} will be compared to this interim standard for context, but is not considered a regulated compound in NS.

Table 7 provides a summary of the compounds of concern for this assessment, the identified air quality criteria and averaging periods, and the data source. The assessment criteria selected for this assessment are provided in the final column of Table 7.

5. Air Dispersion Modelling

Dispersion modelling was performed using the US EPA multi source dispersion model AERMOD, following a modified methodology as described in the Air Dispersion Modelling Guideline for Ontario and in Ontario Regulation 419/05 (O. Reg. 419/05) (MOE, 2017).

Currently there isn't any guidance on the use of air dispersion models in NS, therefore the Ontario O. Reg. 419/05 requirements were used as a framework for this assessment. The air dispersion model and methodology used in this assessment are currently accepted in Ontario, and the AERMOD model is accepted in multiple provinces and territories, as well as in the United States. AERMOD is an advanced steady state plume model that has the ability to incorporate building cavity downwash, actual source parameters, emission rates, terrain and historical meteorological information to predict ground level concentrations (GLCs) at specified locations and has been peer reviewed and compared both to other models and monitoring data.

5.1 Dispersion Modelling Executables

The following dispersion and pre-processor models were used in this assessment:

– AERMOD digital terrain pre-processor (AERMAP), version 18081
– American Meteorological Society/Environmental Protection Agency Regulatory Improvement Committee (AERMIC) air dispersion model (AERMOD), version 19191

– Building Profile Input Program (BPIP), version 04274
– AERMET meteorological preprocess (AERMET), version 19191

5.2 Meteorological Data

Several meteorological stations were reviewed to obtain data required for the air emission estimates and dispersion modelling completed for the Project. Port Hawkesbury (ECCC Station #8204495), approximately 54 km northeast of the PA, was selected as the most appropriate surface dataset for this assessment as it was the closest station to the Project which records cloud cover, a necessary component in calculating plume dispersal. Five years (2014-2018) of unprocessed hourly meteorological data was obtained from the Port Hawkesbury station.

Upper air data (radiosonde, Sable Island) was sourced from National Oceanic and Atmospheric Administration (NOAA). The historical meteorological data, upper air data, coupled with the Earth Observation for Sustainable Developments of Forests (EOSD) land use characteristics was processed using AERMET version 19191. The hourly data generated included many factors which affect the dispersion of air compounds including wind speed, wind direction, temperature, ceiling height, and atmospheric stability.

5.3 Averaging Periods

Air compounds were modelled with appropriate averaging periods based on their respective air quality criteria. The averaging periods of interest for each compound are provided in Table 7. Maximum predicted GLCs presented for the various averaging periods are as follows:

– 1-hour GLCs based on 99.9th percentile
– 8-hour GLCs based on Maximum
– 24-hour GLCs based on 99.9th percentile
– Annual GLCs are the max GLC of all years

Meteorological anomalies have not been removed for this assessment. AERMOD does not have the capability to report ½-hour GLCs, hence ½-hour GLCs were extrapolated from 1-hour GLCs using a factor of 1.2, as suggested in the Air Dispersion Modelling Guideline for Ontario (Version 3.0).

5.4 Digital Elevation Model Data

Digital elevation model (DEM) data was obtained from Canadian Digital Elevation Data (CDED) through the WebGIS feature of AERMOD View of Lakes Environmental Software. The DEM data was used to include the effects of terrain in the modelling. To better simulate the East and West Pits, the block model of the pits was overlaid onto the DEM and fused with it using ArcGIS. By doing so, the usage of the open pit algorithm of AERMOD was avoided.

The DEM data integrated with the open pits block model was then preprocessed with AERMAP version 18081 for use with AERMOD.

5.5 Source Input Parameters

5.5.1 Haul Roads

The entire haul road which comprises the various routes mentioned under Section 2.1.1 is approximately 16.7 km in length. Since the various routes overlap one another, the various routes are divided up into fourteen road segments. This division of road segments eases the modelling run time. The haul roads are typically double laned and have a width of 16.5 m; except within the pits where the haul road width is 25 m, and the road leading to the TMF where the width is 11 m. The line volume feature of AERMOD was used to simulate these haul roads.

5.5.2 East Pit and West Pit

Several operations are proposed at the base of the East and West Pits, such as blasting, material handling, transfer operations, movement of off-road vehicles and mining equipment. These operations tend to generate re-suspended dust and tailpipe emissions that are not at a fixed location but constantly moving around. In the air dispersion model AERMOD, a volume source depicting the base of the East and West Pits has been used to represent all of these activities.

5.5.3 Process Operations

There are two main sources of particulate emissions at the mill area: one occurs at the ROMTRANS and the other occurs at the crushers. Each of these sources have been modelled as volume sources.

5.6 Deposition

Deposition was modelled for TSP, PM_{10}, and $PM_{2.5}$. For consistency, plume depletion was permitted for all three size fractions (including TSP, PM_{10} and $PM_{2.5}$), in order to ensure that predicted concentrations were consistent with each other. Plume depletion calculates the settling of particles from emitted plumes as a result of their mass and aerodynamic properties and can provide the predicted deposition (in grams per square metre, g/m^2) that may be used further to estimate health risks based on biological intake (i.e., ingestion). Deposition was not modelled for the purposes of air quality assessment.

5.7 Receptors

Receptor grids were set up around the Proposed Property Boundary with the following grid spacing:

– 20 m spacing within 200 m of the edge of a bounding box that encompassed all onsite facility sources
– 50 m spacing from 200 to 500 m
– 100 m spacing from 500 to 1,000 m
– 200 m spacing from 1,000 to 2,000 m
– 500 m spacing from 2,000 to 5,000 m

A property line ground level receptor grid with 10 m spacing was used to evaluate the maximum property boundary concentration. No receptors were placed inside the Proposed Property Boundary.

Modelling was also completed for selected sensitive receptors that have the potential to be impacted by air emissions. The sensitive receptors that were considered are as follows:

– Sensitive Receptor 1 (SR1) – 99 Goldbrook Road
– Sensitive Receptor 2 (SR2) – 59 Goldbrook Road
– Sensitive Receptor 3 (SR3) – 31 Church Lane NE
– Sensitive Receptor 4 (SR4) – 13022 NS-316
– Sensitive Receptor 5 (SR5) – 13132 NS-316
– Sensitive Receptor 6 (SR6) – 13356 NS-316
– Sensitive Receptor 7 (SR7) – 13617 NS-316
– Sensitive Receptor 8 (SR8) – 12608 NS-316
– Sensitive Receptor 9 (SR9) – 45.227043 Latitude, -61.542652 Longitude (by Amos Gillies Rd)
– Sensitive Receptor 10 (SR10) – 538 Amos Gillies Rd

6. Results

Table 7 summarizes the particulate and gaseous emissions modeling results due to the Project activities with mitigation measures. Modelling results for all particulate size fractions and gaseous pollutants identified were predicted to meet the chosen assessment criteria for all applicable averaging periods, from operations alone and when added to background concentrations. The modelled results coupled with the background concentrations were also well within the assessment criteria at the above-mentioned sensitive receptors.

7. Conclusions

Modelling of Project-related sources showed maximum predicted concentrations at Proposed Property Boundary to be well below applicable air quality criteria. The haul roads within the PA are the source primarily responsible for the maximum predicted concentrations of particulate matter at both the gridded receptors and the sensitive (residential) receptors identified for this assessment. Emissions of particulate from the haul road, including background concentrations, do not exceed the particulate air quality criteria for the 95% dust mitigation scenario. Details on proposed dust mitigation will be provided in a detailed Fugitive Dust Mitigation Plan.

Emissions of gaseous species from the haul trucks as well as mining equipment are predicted to be well below the assessment criteria.

Should you have any questions on the above, please do not hesitate to contact us.

Sincerely,

GHD

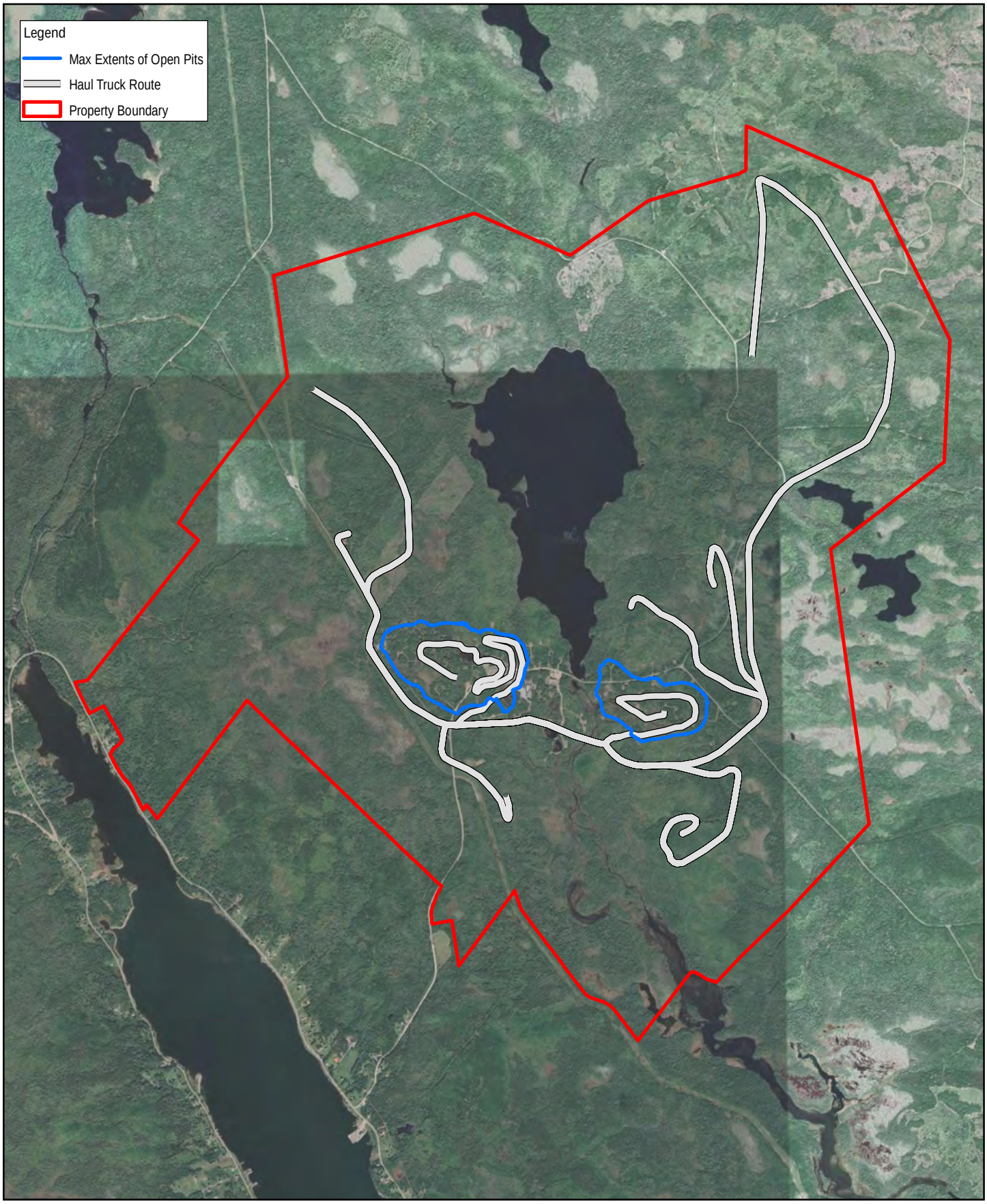
Matthew Griffin, P.Eng. (ON)

8. References

ASTM International (ASTM). 2017. Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter).

Ontario Ministry of Environment and Climate Change (MOE). 2017. Guidance for Demonstrating Compliance with the Air Dispersion Modelling Requirements set out in Ontario Regulation 419/05 Air Pollution – Local Air Quality made under the Environmental Protection Act.

United States Environmental Protection Agency (US EPA). 2020. AP 42, Fifth Edition, Volume I.



Paper Size ANSI A

0 180 360 540 720

Metres

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983 CSRS
Grid: NAD 1983 CSRS UTM Zone 20N

N

GHD

ANACONDA MINING INC.
GOLDBORO GOLD PROJECT
AIR EMISSIONS ASSESSMENT TECHNICAL REPORT

TRUCK ROUTES

Project No. 11222385
Revision No. -
Date Mar 10, 2022

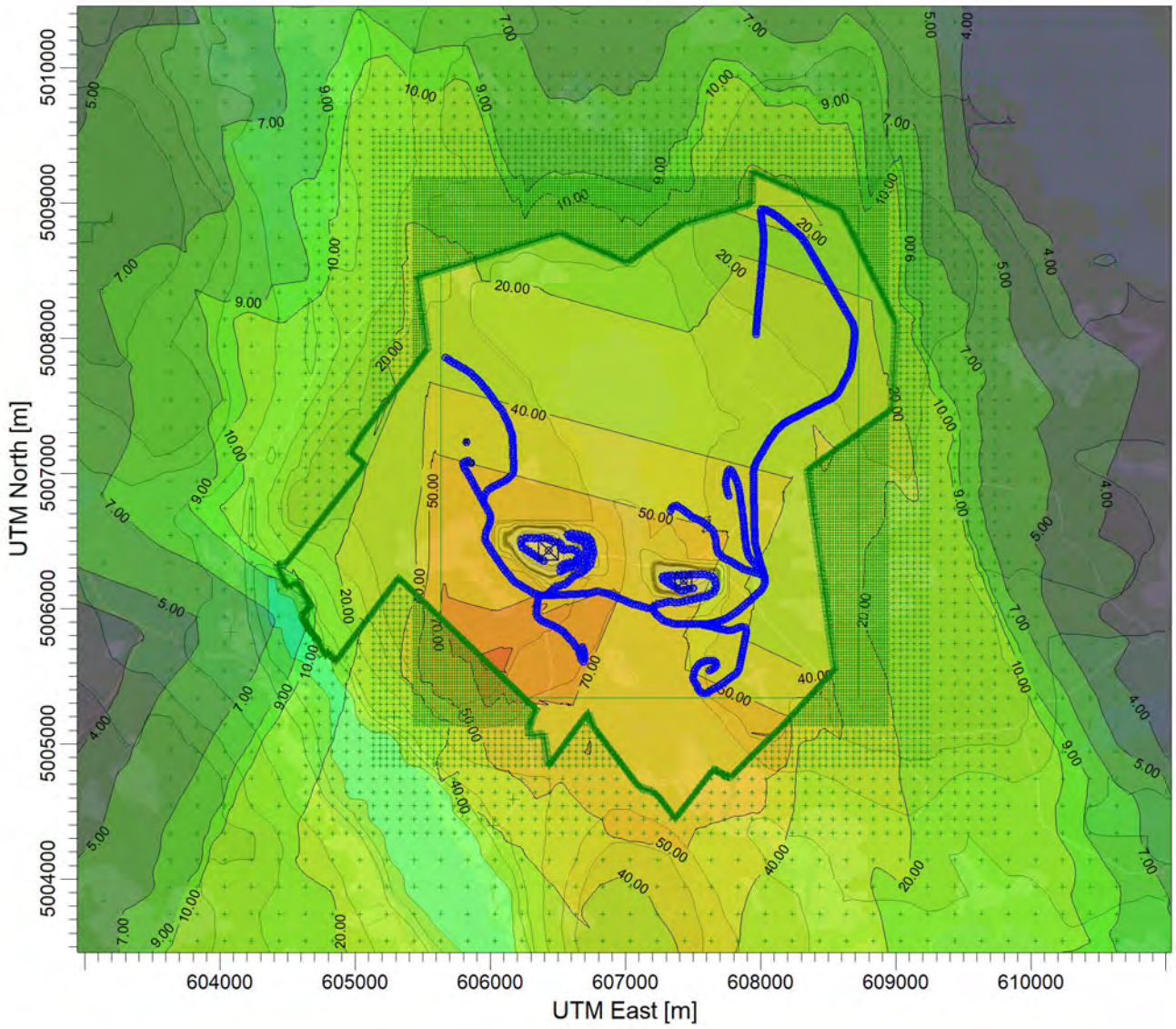
FIGURE 1

Q:\GIS\PROJECTS\11222000s\11222385\Layouts\202203_PRES001\11222385_202203_PRES001_GIS001.mxd
Print date: 10 Mar 2022 - 14:05

Data source: Google Earth Imagery, Date: 09/14/2015.

PROJECT TITLE:

TSP, 95% CE, YR5 - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

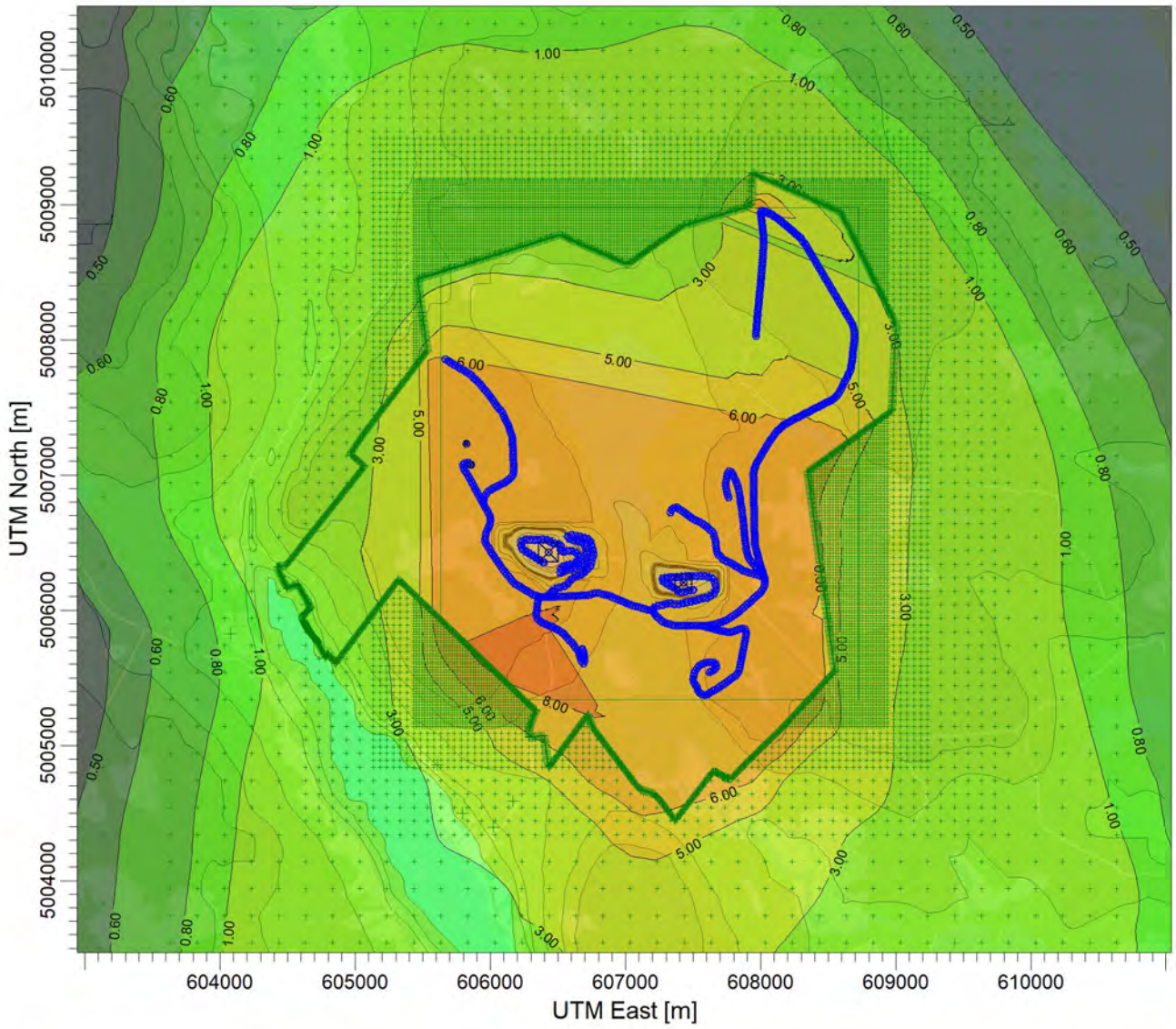
Max: 95.16 [ug/m^3] at (605983.30, 5005594.34)

0.95 1.00 2.00 4.00 5.00 7.00 9.00 10.00 20.00 40.00 50.00 70.00 90.00 95.16

COMMENTS: Background Concn: 7.2 ug/m^3 Criteria: 120 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 2**
	OUTPUT TYPE: **Concentration**	SCALE: 1:50,910 0 2 km	
	MAX: **95.16 ug/m^3**	DATE: **3/28/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

TSP, 95% CE, YR5 - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

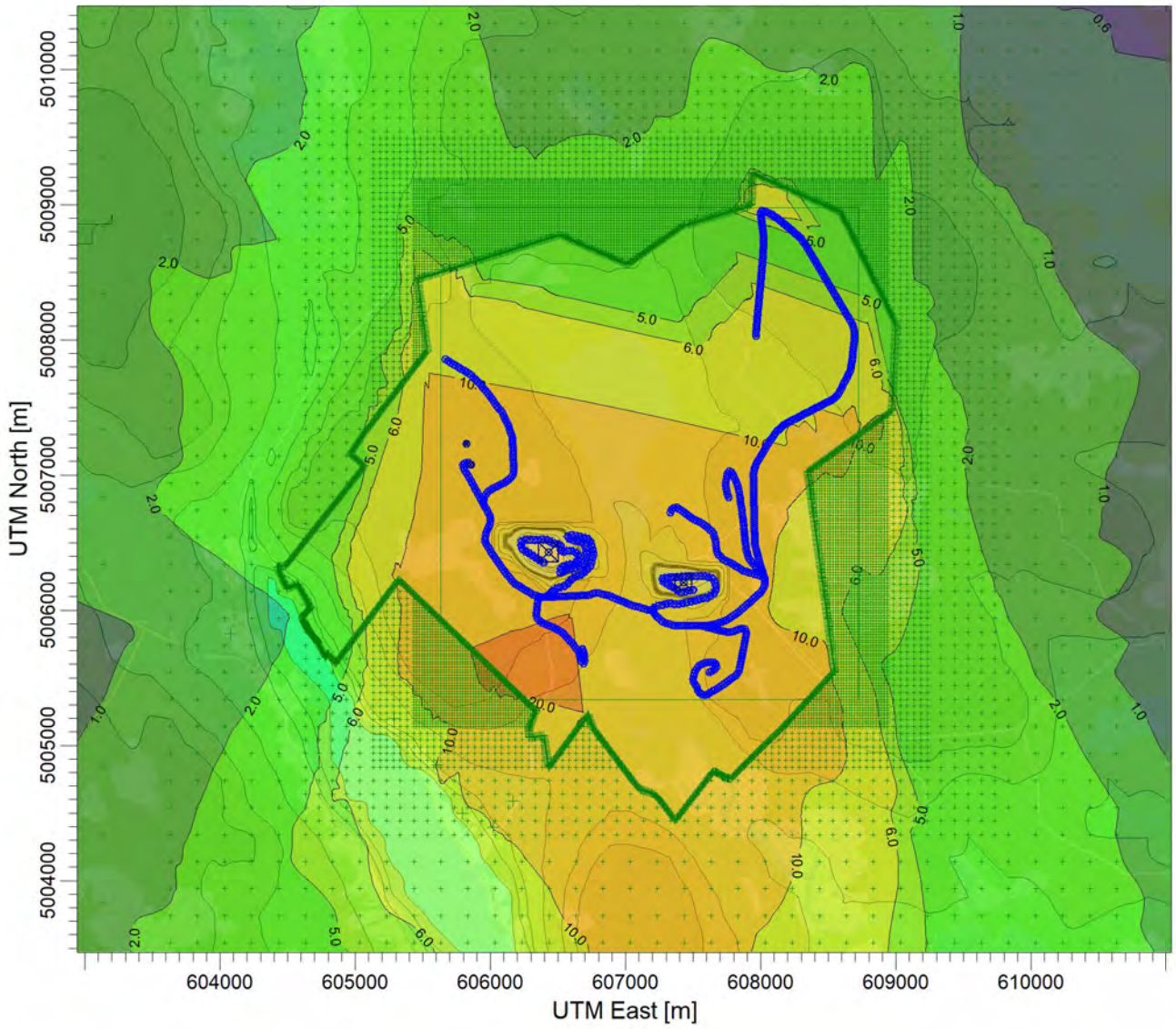
Max: 8.38 [ug/m^3] at (605935.14, 5005640.40)

0.08 0.10 0.30 0.50 0.60 0.80 1.00 3.00 5.00 6.00 8.00 8.38

COMMENTS: Criteria: 60 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 3**
	OUTPUT TYPE: **Concentration**	SCALE: 1:50,910 0 2 km	
	MAX: **8.38 ug/m^3**	DATE: **4/7/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

PM10, 95% CE - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

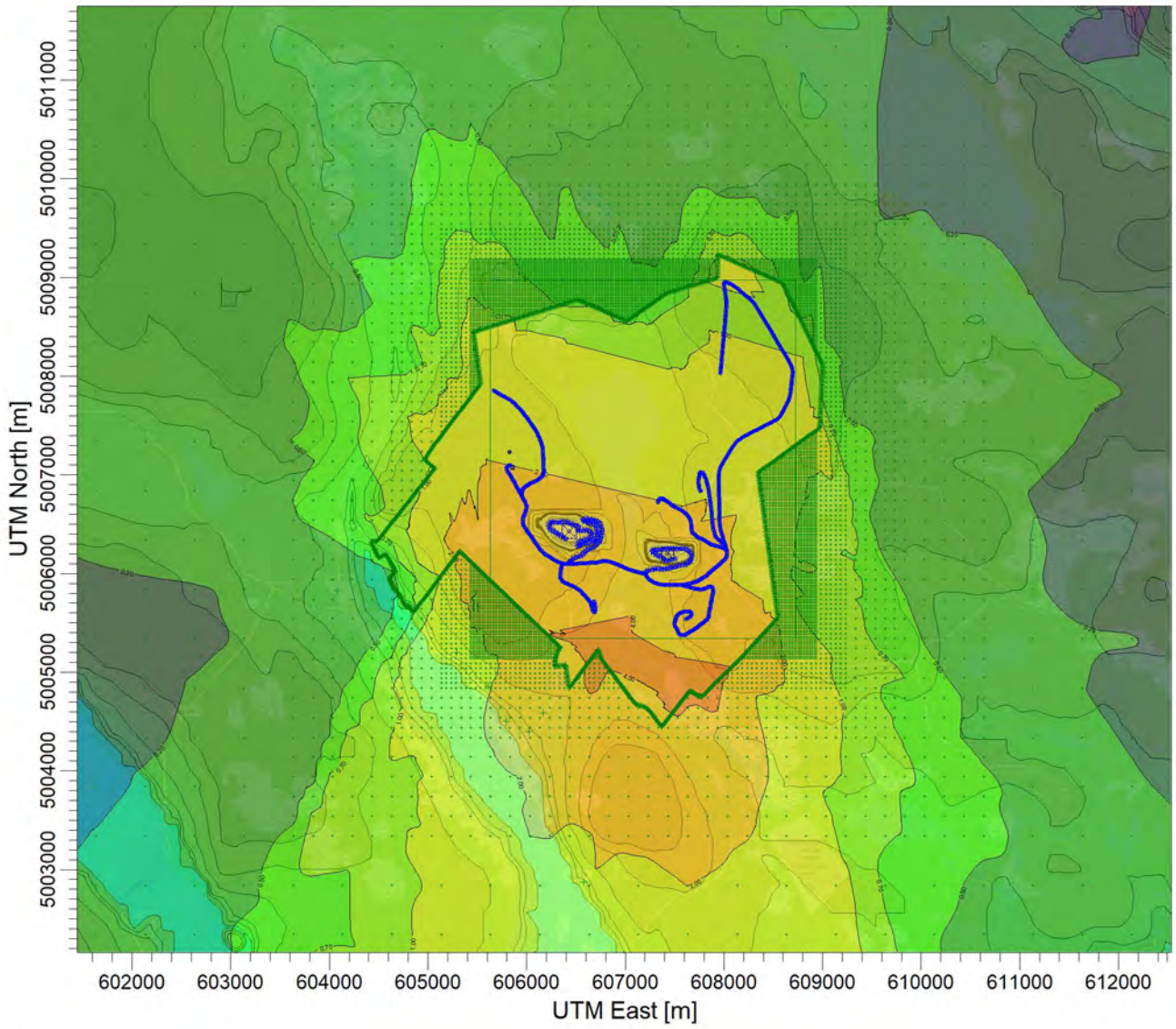
Max: 25.0 [ug/m^3] at (606038.35, 5005541.71)

0.2 0.5 0.6 1.0 2.0 5.0 6.0 10.0 20.0 25.0

COMMENTS: Background Concn: 9.6 ug/m^3 Criteria: 50 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 4**
	OUTPUT TYPE: **Concentration**	SCALE: 1:50,910 0 2 km	
	MAX: **25.0 ug/m^3**	DATE: **3/30/2022**	PROJECT NO.: **11222385**

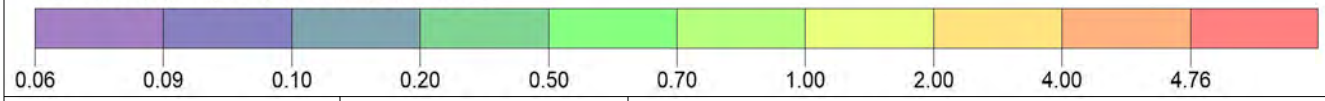
PROJECT TITLE:

PM2.5, 95% CE - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

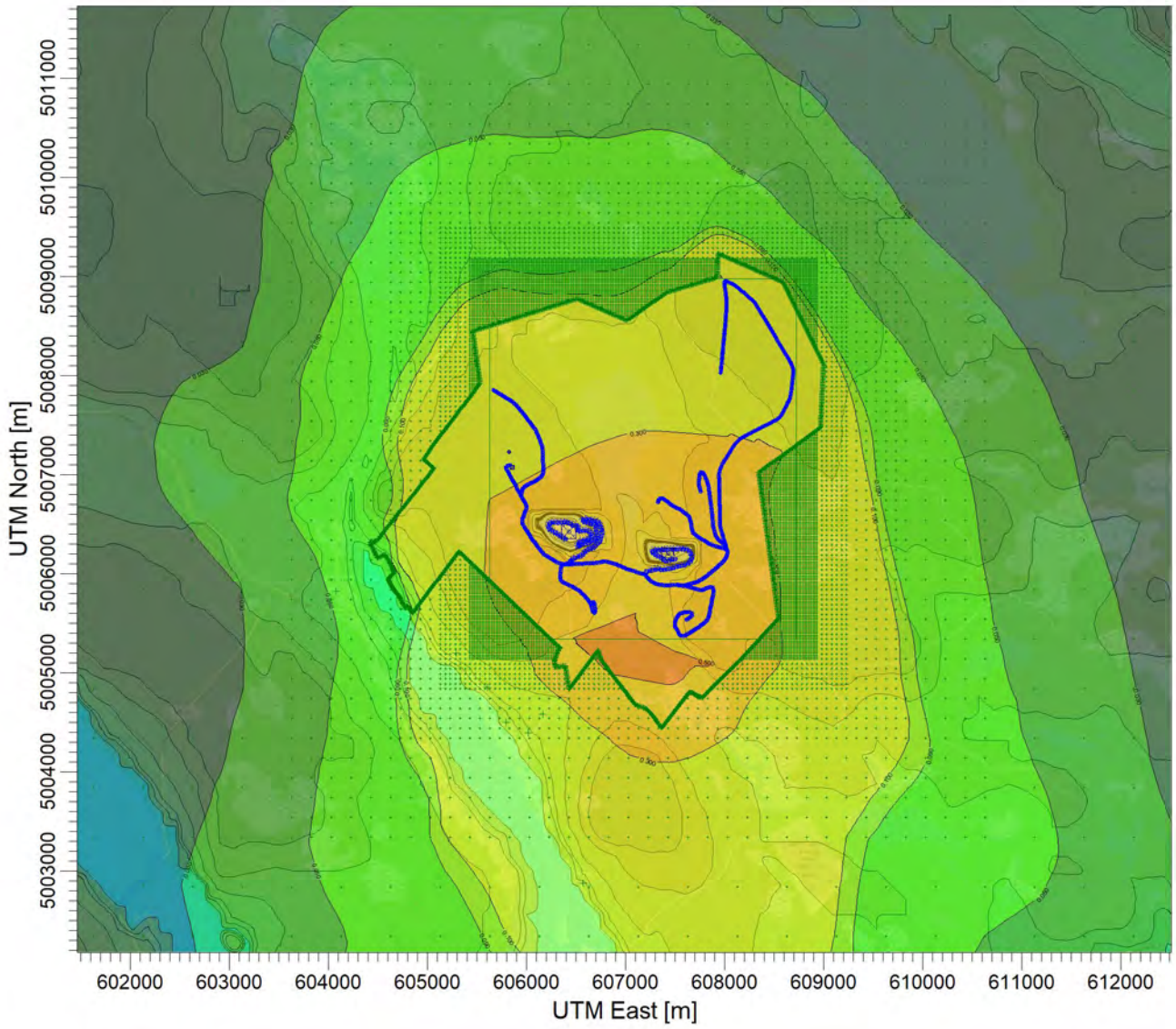
Max: 4.76 [ug/m^3] at (607852.88, 5004829.94)



COMMENTS: Background Concn: 9 ug/m^3 Criteria: 27 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 5**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,766 0 2 km	
	MAX: **4.76 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

PM2.5, 95% CE - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

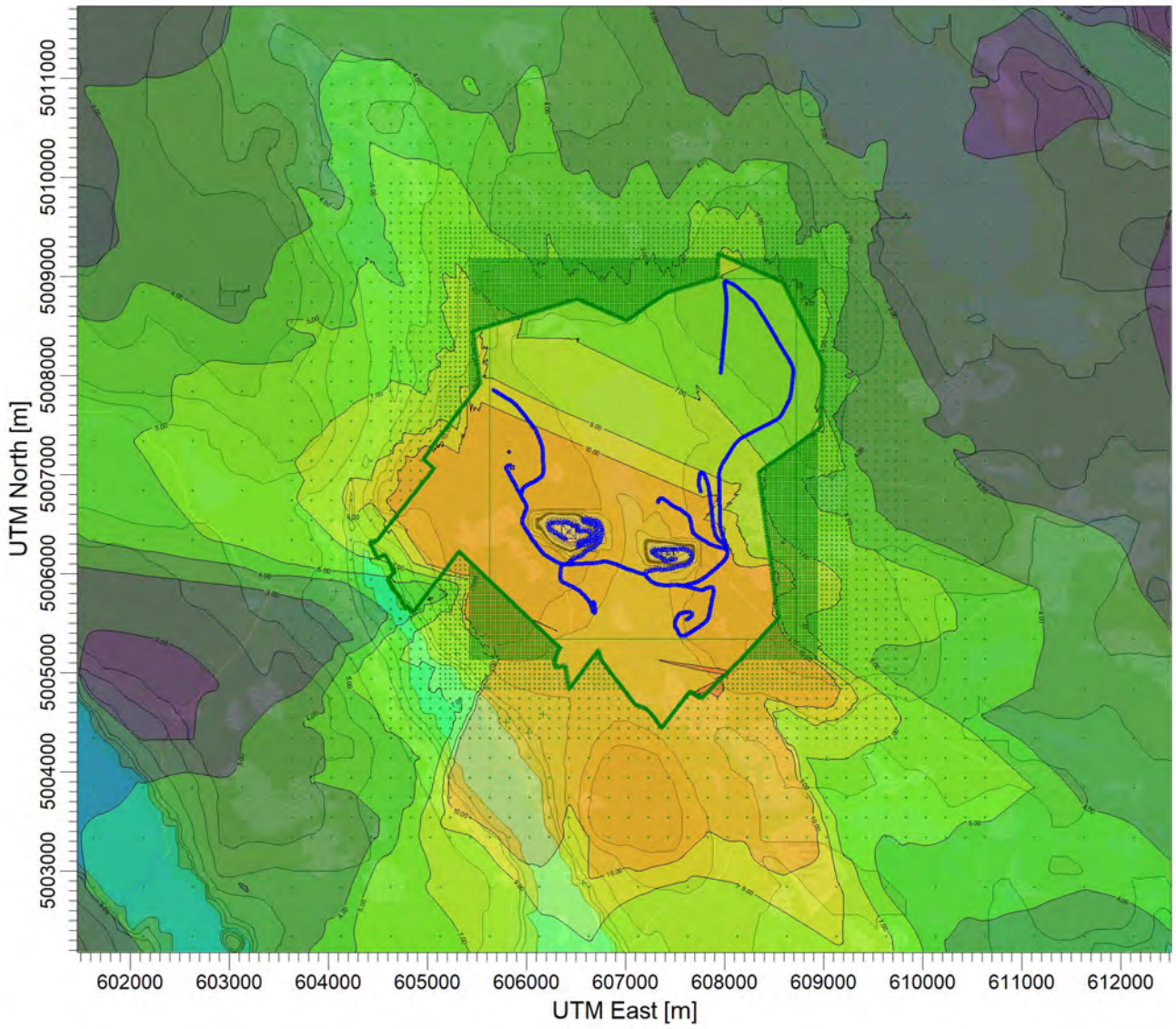
Max: 0.551 [ug/m^3] at (606724.29, 5005230.68)

0.006 0.009 0.010 0.030 0.050 0.090 0.100 0.300 0.500 0.551

COMMENTS: Background Concn: 5.7 ug/m^3 Criteria: 8.8 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 6**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,473 0 2 km	
	MAX: **0.551 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

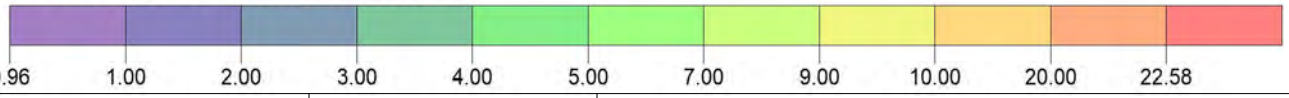
PROJECT TITLE:

NOx - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 9TH HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

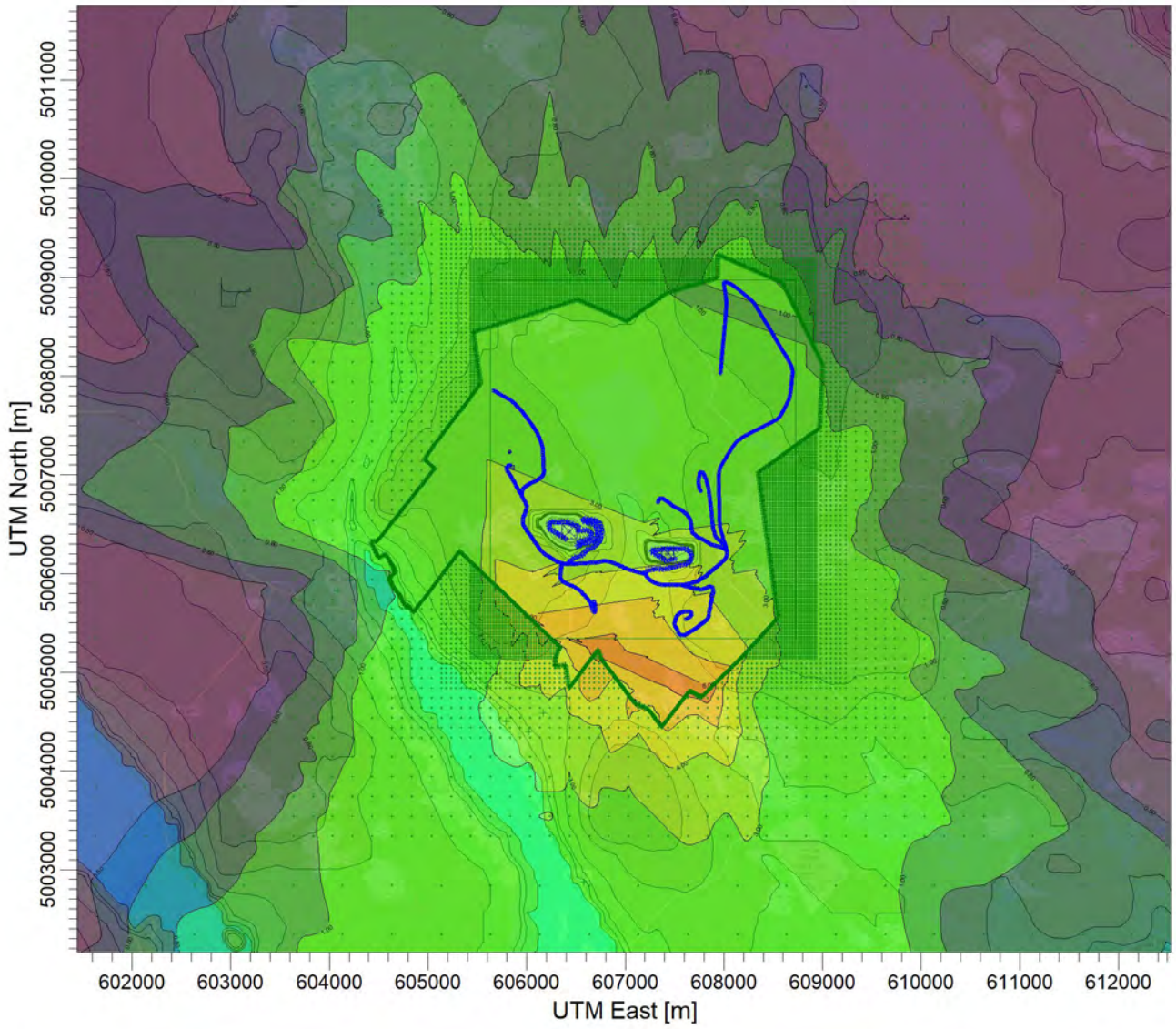
Max: 22.58 [ug/m^3] at (607914.78, 5004894.44)



COMMENTS: Background Concn: 41.4 ug/m^3 Criteria: 400 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 7**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,473 0 2 km	
	MAX: **22.58 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

NOx - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

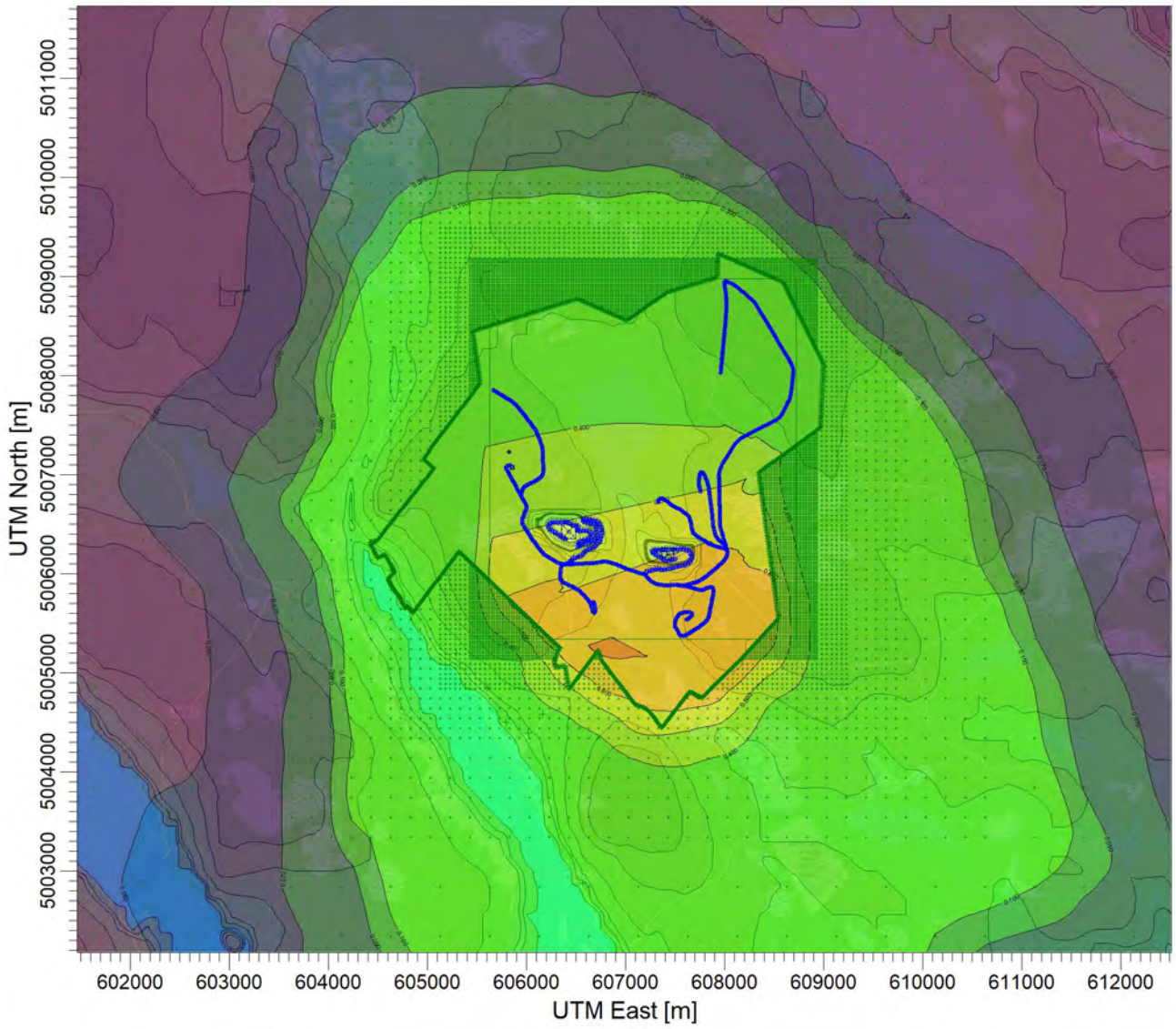
Max: 6.61 [ug/m^3] at (607852.88, 5004829.94)

0.13 0.50 0.60 0.80 1.00 3.00 4.00 5.00 6.00 6.61

COMMENTS: Background Concn: 17 ug/m^3 Criteria: 200 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 8**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,766 0 2 km	
	MAX: **6.61 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

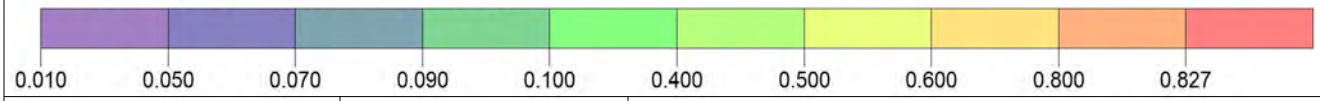
PROJECT TITLE:

NOx - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

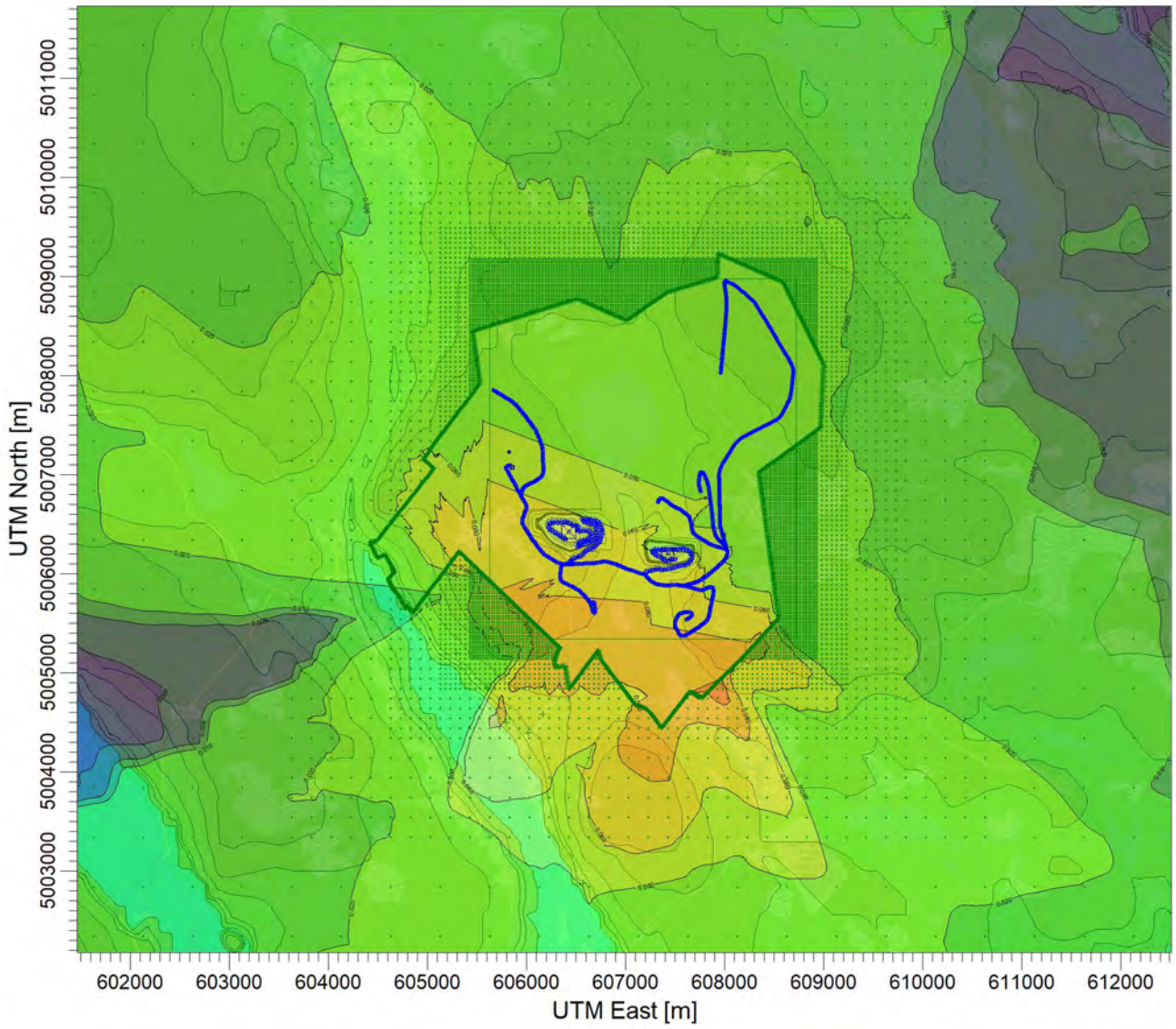
Max: 0.827 [ug/m^3] at (606724.29, 5005230.68)



COMMENTS: Background Concn: Not Available Criteria: 100 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 9**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,473 0 2 km	
	MAX: **0.827 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

SO2 - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 9TH HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

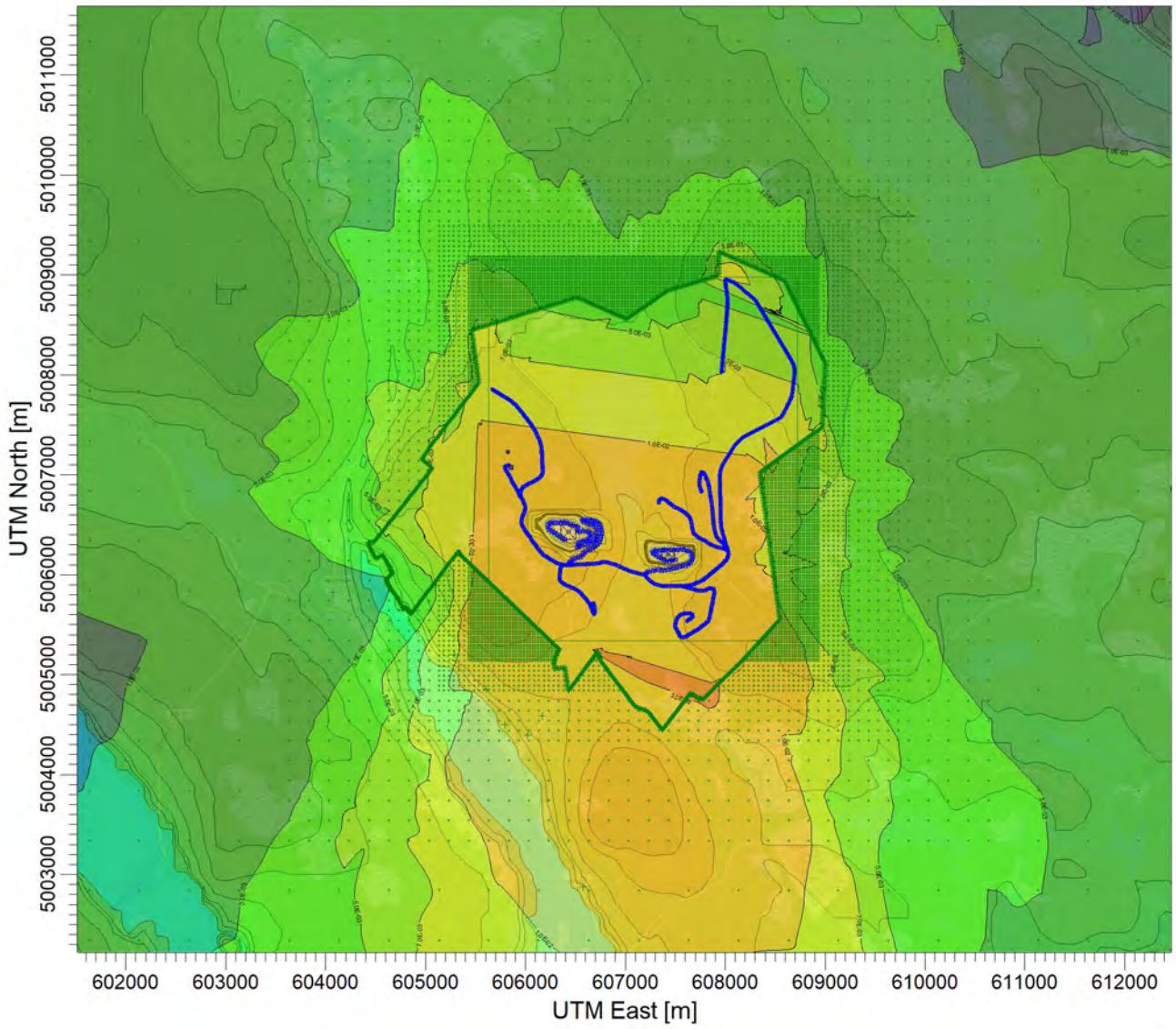
Max: 0.120 [ug/m^3] at (607914.78, 5004894.44)

0.004 0.005 0.007 0.009 0.010 0.020 0.050 0.060 0.080 0.100 0.120

COMMENTS: Background Concn: Not Available Criteria: 900 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 10**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,473 0 2 km	
	MAX: **0.120 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

SO2 - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 2ND HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

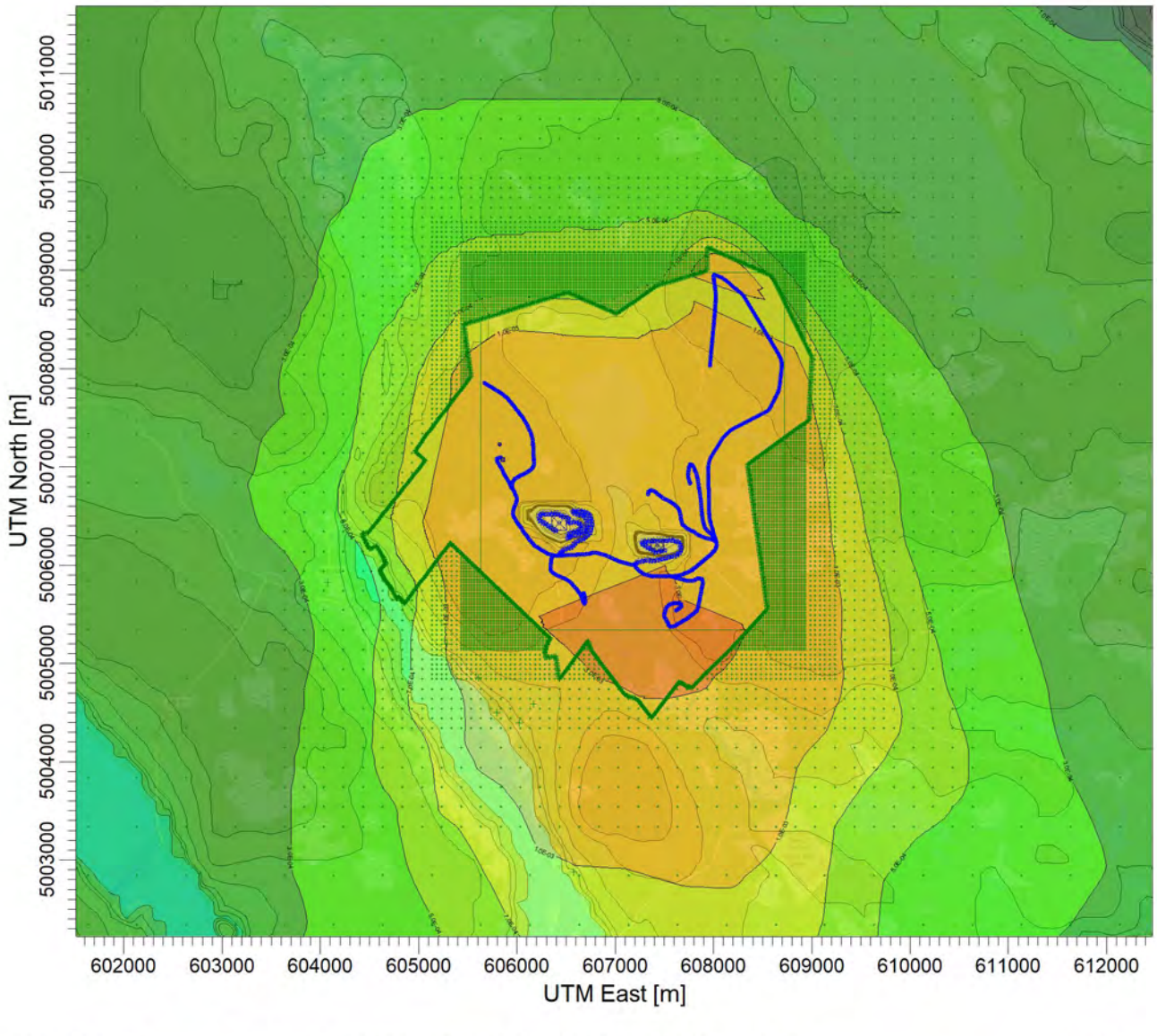
Max: 3.4E-02 [ug/m^3] at (607852.88, 5004829.94)

4.0E-04 5.0E-04 7.0E-04 1.0E-03 3.0E-03 5.0E-03 7.0E-03 1.0E-02 3.0E-02 3.4E-02

COMMENTS: Background Concn: 5.2 ug/m^3 Criteria: 300 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 11**
	OUTPUT TYPE: **Concentration**	SCALE: 1:68,888 0 2 km	
	MAX: **3.4E-02 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

SO2 - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

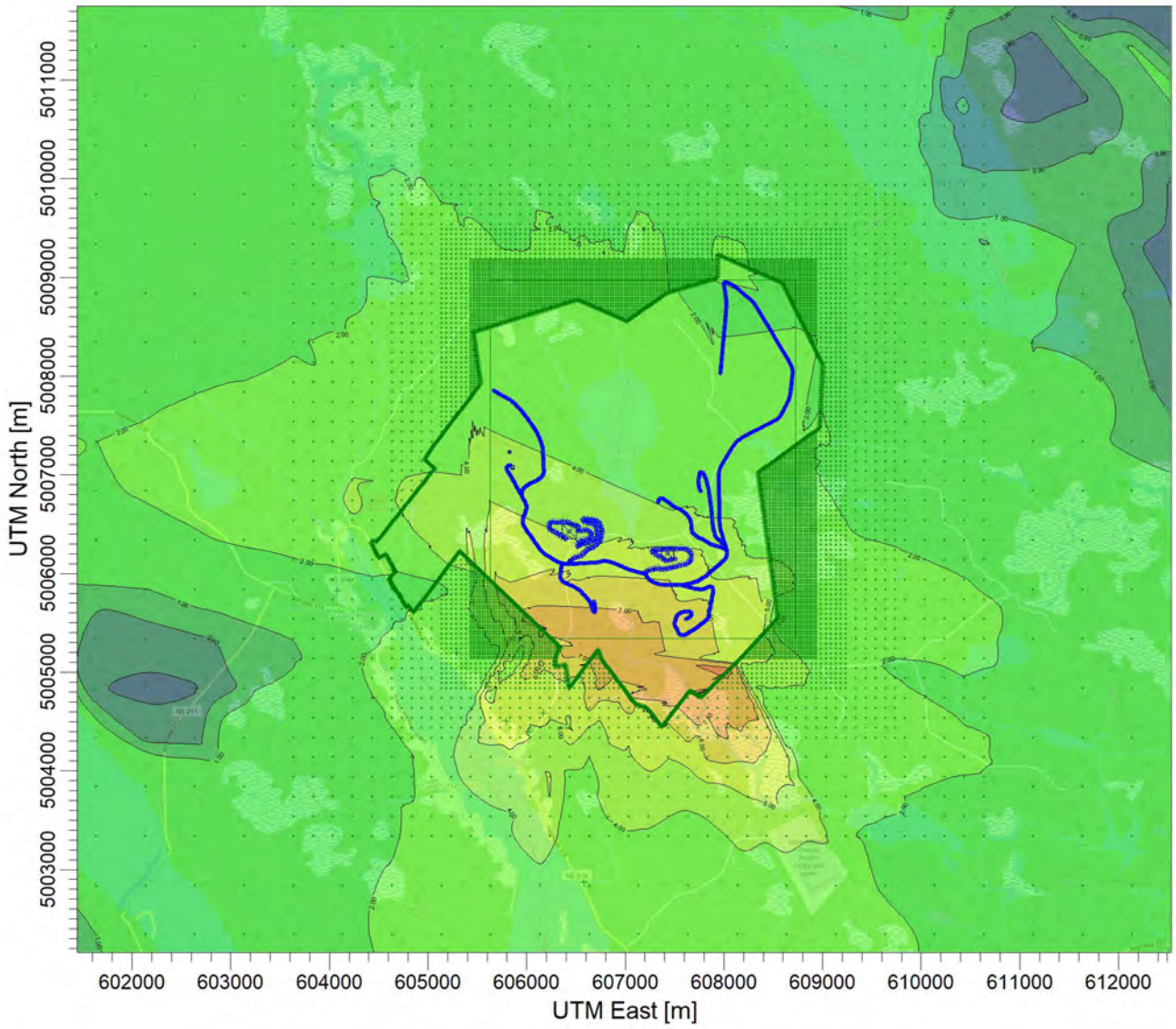
Max: 3.8E-03 [ug/m^3] at (606724.29, 5005230.68)

4.0E-05 5.0E-05 7.0E-05 1.0E-04 3.0E-04 5.0E-04 7.0E-04 1.0E-03 3.0E-03 3.8E-03

COMMENTS: Background Concn: Not Available Criteria: 60 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 12**
	OUTPUT TYPE: **Concentration**	SCALE: 1:68,888 0 2 km	
	MAX: **3.8E-03 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

CO - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 9TH HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

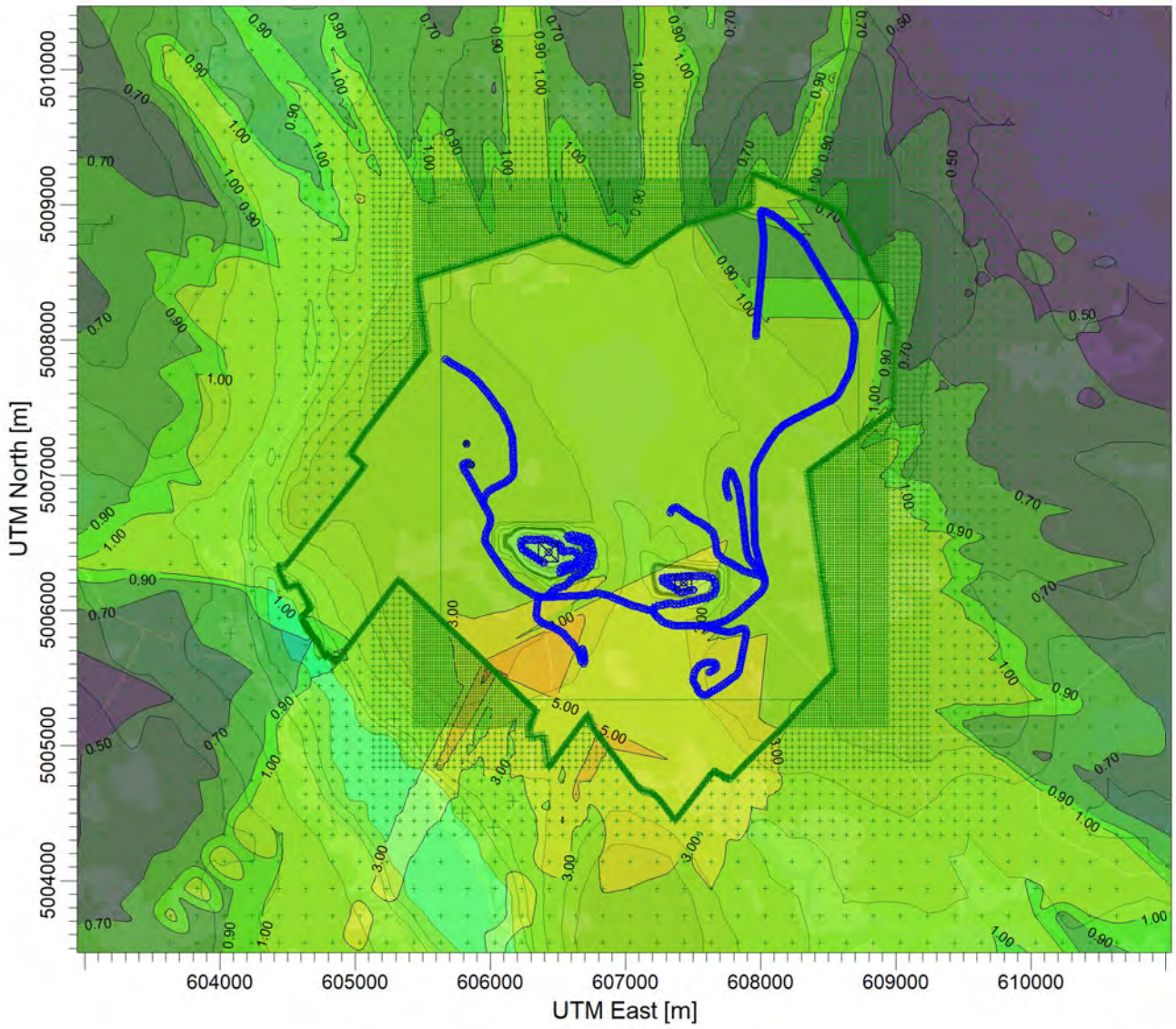
Max: 9.61 [ug/m^3] at (608015.02, 5004991.47)

0.42 0.50 0.60 0.80 0.90 1.00 2.00 4.00 5.00 6.00 7.00 9.00 9.61

COMMENTS: Background Concn: 687 ug/m^3 Criteria: 34600 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 13**
	OUTPUT TYPE: **Concentration**	SCALE: 1:69,766 0 2 km	
	MAX: **9.61 ug/m^3**	DATE: **3/21/2022**	PROJECT NO.: **11222385**

PROJECT TITLE:

CO - Mar 09, 2022
Anaconda Mining Inc. Goldboro Gold Project, NS



PLOT FILE OF HIGH 1ST HIGH 8-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 7.63 [ug/m^3] at (605997.07, 5005581.18)

0.15 0.30 0.50 0.70 0.90 1.00 3.00 5.00 7.00 7.63

COMMENTS: Background Concn: 251.9 ug/m^3 Criteria: 12700 ug/m^3	SOURCES: **19**	COMPANY NAME: **GHD**	
	RECEPTORS: **13728**	MODELER: **Punith Dev Nallathamby**	**Figure 14**
	OUTPUT TYPE: **Concentration**	SCALE: 1:50,910 0 2 km	
	MAX: **7.63 ug/m^3**	DATE: **4/7/2022**	PROJECT NO.: **11222385**

Table 1A

Estimated Particulate Emission Factors - Haul Route between Pits and Processing Facility

Variable or Constant	$PM_{2.5}$	PM_{10}	TSP
k	0.15	1.5	4.9
a	0.9	0.9	0.7
b	0.45	0.45	0.45
S (Surface material silt content)[1]	3.9	3.9	3.9
Conversion from lb/VMT to g/VKT	281.9	281.9	281.9

Formula (AP-42 13.2.2 (1a)):
EF(g/VKT) = 281.9 (g/VKT / lb/VMT) * k * (S/12)^a * (W/3)^b

		Emission Factors		
Truck Routes	**W - Mean Vehicle Weight of Haul Truck (ton)**	**TSP (g/VKT)**	**PM_{10} (g/VKT)**	**$PM_{2.5}$ (g/VKT)**
East Pit				
East Pit->Mill	60	2.41E+03	5.90E+02	5.90E+01
East Pit->SE Waste Rock Area	129	3.41E+03	8.35E+02	8.35E+01
East Pit->NE Waste Rock Area	123	3.34E+03	8.18E+02	8.18E+01
East Pit->TMF	128	3.41E+03	8.33E+02	8.33E+01
West Pit				
West Pit->Mill	60	2.41E+03	5.90E+02	5.90E+01
West Pit->SE Waste Rock Area	129	3.41E+03	8.35E+02	8.35E+01
West Pit->NW Waste Rock Area	129	3.41E+03	8.35E+02	8.35E+01
West Pit->TMF	128	3.40E+03	8.31E+02	8.31E+01
West Pit->SW Waste Rock Area	99	3.03E+03	7.42E+02	7.42E+01
West Pit->NE-A Waste Rock Area	91	2.93E+03	7.15E+02	7.15E+01
West Pit->Backfill	129	3.41E+03	8.35E+02	8.35E+01

Variable	Value	Comments
Peak Annual Material Mined (tonne)		
Waste rock and overburnden from East Pit	7,325,876	From year 6 of the Life of Mine.
Potential Mill Feed from East Pit	1,174,124	From year 6 of the Life of Mine.
Waste rock and overburnden from West Pit	16,483,813	From year 8 of the Life of Mine.
Potential Mill Feed from West Pit	1,415,807	From year 8 of the Life of Mine.

Notes:

(1) Unpaved Road Surface Material Silt Content representative of the State of Maine (USA), as provided in AP 42 Section 13.2.2 Unpaved Roads - Related Informatio
'https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-section-1322-unpaved-roads-related-information-(
(2) Tailpipe particulate emissions have not been included as they are insignificant when compared to road dust emissions
(3) The fully loaded Haul Truck (Komatsu HM400-5) weighs 80.47 ton, and weighs 38.59 ton when empty.
(4) The fully loaded Haul Truck (Komatsu HD785-8) weighs 176.15 ton, and weighs about 81.35 ton when empty.
(5) The Mean Vehicle Weight was estimated using a weighted average of the truck traffic for each route.

Table 1B

Truck Routes and Corresponding Road Segments Used

Truck Route	Road Segments Used														
	1	2	3	4A	4B	5	6	7	8	9	10	11	12	13	14
East Pit															
East Pit->Mill	Y		Y		Y	Y	Y								
East Pit->SE Waste Rock Area	Y									Y	Y				
East Pit->NE Waste Rock Area	Y									Y		Y	Y		
East Pit->TMF	Y									Y		Y			Y
West Pit															
West Pit->Mill		Y		Y		Y	Y								
West Pit->SE Waste Rock Area		Y	Y							Y	Y				
West Pit->NW Waste Rock Area		Y		Y		Y		Y							
West Pit->TMF		Y	Y							Y		Y			Y
West Pit->SW Waste Rock Area		Y		Y					Y						
West Pit->NE-A Waste Rock Area		Y	Y							Y		Y		Y	
West Pit->Backfill	Y	Y	Y												

Road Segments Lengths (km)														
1	2	3	4A	4B	5	6	7	8	9	10	11	12	13	14
1.28	2.21	0.76	0.10	0.09	0.89	0.39	1.39	0.80	0.37	1.52	0.67	1.07	0.96	4.27

Truck Route	Road Segments Lengths (km)														Truck Route Length (km)
	1	2	3	4A	4B	5	6	7	8	9	10	11	12	13	14	
East Pit																
East Pit->Mill	1.28		0.76		0.09	0.89	0.39									3.42
East Pit->SE Waste Rock Area	1.28									0.37	1.52					3.17
East Pit->NE Waste Rock Area	1.28									0.37		0.67	1.07			3.39
East Pit->TMF	1.28									0.37		0.67			4.27	6.59
West Pit																
West Pit->Mill		2.21		0.10		0.89	0.39									3.59
West Pit->SE Waste Rock Area		2.21	0.76							0.37	1.52					4.86
West Pit->NW Waste Rock Area		2.21		0.10		0.89		1.39								4.60
West Pit->TMF		2.21	0.76							0.37		0.67			4.27	8.28
West Pit->SW Waste Rock Area		2.21		0.10					0.80							3.10
West Pit->NE-A Waste Rock Area		2.21	0.76							0.37		0.67		0.96		4.98
West Pit->Backfill	1.28	2.21	0.76													4.26

Road Segments Width (m)														
1	2	3	4A	4B	5	6	7	8	9	10	11	12	13	14
25	25	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	11

Notes:

(1) The road network in the site area has been divided into small road segments, to facilitate faster AERMOD run time.
(2) The various truck routes, use only certain road segments, and are identified in the table above.

Table 1C

Estimated Particulate Emission Rates - Haul Route between Pits and Processing Facility – 95% Road Dust Mitigation

ER(g/s) = EF(g/VKT) * # of trips * Distance (km) * Dust Control % / (3600 s/hr)
% Dust Control measures 95% Appropriate dust mitigation plans are planned to be used.

		Truck Route TSP Emission Rate (g/s)															TSP Emission Rate
Truck Route	**# of Trips**	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**by Truck Route (g/s)**
East Pit																	
East Pit->Mill	4	1.72E-01		1.02E-01		1.21E-02	1.20E-01	5.22E-02									4.58E-01
East Pit->SE Waste Rock Area	6	3.64E-01									1.05E-01	4.31E-01					9.01E-01
East Pit->NE Waste Rock Area	12	7.14E-01									2.06E-01		3.72E-01	5.98E-01			1.89E+00
East Pit->TMF	6	3.63E-01									1.05E-01		1.89E-01			1.21E+00	1.87E+00
West Pit																	
West Pit->Mill	6		4.45E-01		1.92E-02		1.80E-01	7.82E-02									7.22E-01
West Pit->SE Waste Rock Area	0																0.00E+00
West Pit->NW Waste Rock Area	22		2.31E+00		9.94E-02		9.33E-01		1.45E+00								4.79E+00
West Pit->TMF	4		4.18E-01	1.44E-01							6.98E-02		1.26E-01			8.06E-01	1.56E+00
West Pit->SW Waste Rock Area	0																0.00E+00
West Pit->NE-A Waste Rock Area	0																0.00E+00
West Pit->Backfill	0																0.00E+00
TSP ER by Segment (g/s)		1.61E+00	3.17E+00	2.46E-01	1.19E-01	1.21E-02	1.23E+00	1.30E-01	1.45E+00	0.00E+00	4.86E-01	4.31E-01	6.88E-01	5.98E-01	0.00E+00	2.02E+00	

		Truck Route PM_{10} Emission Rate (g/s)															PM_{10} Emission Rate
Truck Route	**# of Trips**	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**by Truck Route (g/s)**
East Pit																	
East Pit->Mill	4	4.20E-02		2.50E-02		2.96E-03	2.93E-02	1.28E-02									1.12E-01
East Pit->SE Waste Rock Area	6	8.90E-02									2.57E-02	1.05E-01					2.20E-01
East Pit->NE Waste Rock Area	12	1.74E-01									5.04E-02		9.10E-02	1.46E-01			4.62E-01
East Pit->TMF	6	8.88E-02									2.57E-02		4.63E-02			2.96E-01	4.57E-01
West Pit																	
West Pit->Mill	6		1.09E-01		4.69E-03		4.40E-02	1.91E-02									1.77E-01
West Pit->SE Waste Rock Area	0																0.00E+00
West Pit->NW Waste Rock Area	22		5.64E-01		2.43E-02		2.28E-01		3.55E-01								1.17E+00
West Pit->TMF	4		1.02E-01	3.52E-02							1.71E-02		3.08E-02			1.97E-01	3.82E-01
West Pit->SW Waste Rock Area	0																0.00E+00
West Pit->NE-A Waste Rock Area	0																0.00E+00
West Pit->Backfill	0																0.00E+00
PM_{10} ER by Segment (g/s)		3.94E-01	7.75E-01	6.02E-02	2.90E-02	2.96E-03	3.01E-01	3.19E-02	3.55E-01	0.00E+00	1.19E-01	1.05E-01	1.68E-01	1.46E-01	0.00E+00	4.93E-01	

		Truck Route $PM_{2.5}$ Emission Rate (g/s)															$PM_{2.5}$ Emission Rate
Truck Route	**# of Trips**	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**by Truck Route (g/s)**
East Pit																	
East Pit->Mill	8	8.39E-03		5.00E-03		5.91E-04	5.86E-03	2.55E-03									2.24E-02
East Pit->SE Waste Rock Area	16	2.37E-02									6.86E-03	2.81E-02					5.87E-02
East Pit->NE Waste Rock Area	16	2.33E-02									6.72E-03		1.21E-02	1.95E-02			6.16E-02
East Pit->TMF	8	1.18E-02									3.42E-03		6.18E-03			3.95E-02	6.09E-02
West Pit																	
West Pit->Mill	12		2.18E-02		9.37E-04		8.79E-03	3.83E-03									3.53E-02
West Pit->SE Waste Rock Area	12		3.08E-02	1.06E-02							5.14E-03	2.11E-02					6.76E-02
West Pit->NW Waste Rock Area	22		5.64E-02		2.43E-03		2.28E-02		3.55E-02								1.17E-01
West Pit->TMF	10		2.56E-02	8.81E-03							4.27E-03		7.71E-03			4.93E-02	9.56E-02
West Pit->SW Waste Rock Area	6		1.37E-02		5.89E-04					4.91E-03							1.92E-02
West Pit->NE-A Waste Rock Area	8		1.76E-02	6.07E-03							2.94E-03		5.31E-03		7.65E-03		3.96E-02
West Pit->Backfill	24	3.56E-02	6.16E-02	2.12E-02													1.18E-01
$PM_{2.5}$ ER by Segment (g/s)		1.03E-01	2.27E-01	5.17E-02	3.96E-03	5.91E-04	3.75E-02	6.38E-03	3.55E-02	4.91E-03	2.93E-02	4.92E-02	3.13E-02	1.95E-02	7.65E-03	8.88E-02	

Notes:

(1) Estimating the Haul Truck traffic using Year 5 of the LOM gives a realistic maximum number of trips that occur amongst the various truck routes; this was used to estimate TSP and PM10 road dust emissions
(2) The peak traffic (out of the entire LOM) for each route was used to estimate PM2.5 road dust emissions to get a conservative estimate.

Table 2

Estimated Particulate and Gaseous Emissions from Material Handling - East Pit

Summary for Pit Emissions	Emission Rate (g/s) Using AP-42 and MOVES3 NONROAD Model					
	TSP	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO
Truck Loading	4.89E-02	2.44E-02	1.22E-02	-	-	-
Excavators	-	3.49E-03	3.39E-03	4.50E-02	1.38E-04	1.69E-02
Loaders	-	1.59E-02	1.54E-02	2.05E-01	2.14E-04	9.92E-02
Drills	-	9.79E-03	9.49E-03	1.44E-01	8.68E-05	4.43E-02
Dozers	-	3.26E-03	3.16E-03	4.26E-02	1.10E-04	1.61E-02
Grader	-	1.73E-03	1.68E-03	2.27E-02	6.08E-05	8.55E-03
Trucks	-	4.46E-03	4.32E-03	6.22E-02	3.55E-04	1.97E-02
Skid Steer	-	8.96E-03	8.69E-03	6.59E-02	3.83E-05	4.83E-02
Snow Plow	-	1.06E-02	1.03E-02	1.47E-01	1.09E-04	7.23E-02
Crane	-	2.02E-03	1.95E-03	3.59E-02	5.99E-05	1.01E-02
Handler	-	9.26E-03	8.98E-03	6.31E-02	3.30E-05	6.30E-02
Fork lift	-	3.06E-03	2.97E-03	2.58E-02	2.31E-05	1.98E-02
TOTAL	**4.89E-02**	**9.70E-02**	**8.26E-02**	**8.60E-01**	**1.23E-03**	**4.18E-01**

Open Pit - Truck Loading

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg)	Emission Rate (g/s)
Truck Loading	1,759		TSP	1.00E-04 (1)	4.89E-02
			PM_{10}	5.00E-05	2.44E-02
			$PM_{2.5}$	2.50E-05 (2)	1.22E-02

Peak Annual Material Mined (tonne)		Comments
Waste rock and overburnden from East Pit	7,325,876	From year 6 of the Life of Mine.
Potential Mill Feed from East Pit	1,174,124	From year 6 of the Life of Mine.

Off-Road Vehicular Tail Pipe Emission Rate in g/hp-hr

Source	Number of Vehicles	Engine Power (hp)	PM_{10} (g/hp-hr)	$PM_{2.5}$ (g/hp-hr)	NO_x (g/hp-hr)	SO_2 (g/hp-hr)	CO (g/hp-hr)
Excavators	2	273	3.73E-02	3.62E-02	4.82E-01	1.48E-03	1.81E-01
Loaders	2	373	1.24E-01	1.21E-01	1.61E+00	1.68E-03	7.76E-01
Drills	2	148	1.93E-01	1.87E-01	2.84E+00	1.71E-03	8.75E-01
Dozers	2	215	4.42E-02	4.29E-02	5.79E-01	1.50E-03	2.18E-01
Grader	1	238	4.25E-02	4.13E-02	5.58E-01	1.49E-03	2.10E-01
Trucks	6	240	1.81E-02	1.75E-02	2.52E-01	1.44E-03	8.01E-02
Skid Steer	1	110	4.76E-01	4.61E-01	3.50E+00	2.03E-03	2.56E+00
Snow Plow	1	373	1.67E-01	1.62E-01	2.30E+00	1.71E-03	1.13E+00
Crane	1	225	5.23E-02	5.07E-02	9.33E-01	1.55E-03	2.61E-01
Handler	1	85	6.36E-01	6.17E-01	4.33E+00	2.27E-03	4.33E+00
Fork lift	1	75	2.38E-01	2.31E-01	2.01E+00	1.80E-03	1.54E+00

Notes:

(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM_{10} only, the TSP emission factors was assumed to be the PM_{10} emission factor multiplied by 2.

(2) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM_{10} only, the $PM_{2.5}$ emission factors was assumed to be the PM_{10} emission factor divided by 2.

(3) The NONROAD model integrated in MOVES3 was used to estimate vehicular tailpipe emissions in g/hp-hr.

(4) As per the Technical Report and Prelimnary Economic Assessment (Aug 5, 2021); the Haul Trucks are expected to run for 5,401 hours in a year.

(5) As per the Technical Report and Prelimnary Economic Assessment (Aug 5, 2021); the other loading and mining equipment are expected to run for 4,832 hours in a year.

(6) The NO_2/NO_x ratio ranges from 0.48 to 0.74 as per Technical support document (TSD) for NO2-related AERMOD modifications (EPA- 454/B-15-004, December, 2015); here we conservatively assume all NO_x is NO_2.

Table 3

Estimated Particulate and Gaseous Emissions from Material Handling - West Pit

Summary for Pit Emissions	Emission Rate (g/s) Using AP-42 and MOVES3 NONROAD Model					
	TSP	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO
Truck Loading	1.03E-01	5.14E-02	2.57E-02	-	-	-
Excavators	-	3.49E-03	3.39E-03	4.50E-02	1.38E-04	1.69E-02
Loaders	-	1.59E-02	1.54E-02	2.05E-01	2.14E-04	9.92E-02
Drills	-	9.79E-03	9.49E-03	1.44E-01	8.68E-05	4.43E-02
Dozers	-	3.26E-03	3.16E-03	4.26E-02	1.10E-04	1.61E-02
Grader	-	1.73E-03	1.68E-03	2.27E-02	6.08E-05	8.55E-03
Trucks	-	4.46E-03	4.32E-03	6.22E-02	3.55E-04	1.97E-02
Skid Steer	-	8.96E-03	8.69E-03	6.59E-02	3.83E-05	4.83E-02
Snow Plow	-	1.06E-02	1.03E-02	1.47E-01	1.09E-04	7.23E-02
Crane	-	2.02E-03	1.95E-03	3.59E-02	5.99E-05	1.01E-02
Handler	-	9.26E-03	8.98E-03	6.31E-02	3.30E-05	6.30E-02
Fork lift	-	3.06E-03	2.97E-03	2.58E-02	2.31E-05	1.98E-02
TOTAL	**1.03E-01**	**1.24E-01**	**9.61E-02**	**8.60E-01**	**1.23E-03**	**4.18E-01**

Open Pit - Truck Loading

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg)	Emission Rate (g/s)
Truck Loading	3,704		TSP	1.00E-04 (1)	1.03E-01
			PM10	5.00E-05	5.14E-02
			PM2.5	2.50E-05 (2)	2.57E-02

Peak Annual Material Mined (tonne)		Comments
Waste rock and overburnden from West Pit	16,483,813	From year 8 of the Life of Mine.
Potential Mill Feed from West Pit	1,415,807	From year 8 of the Life of Mine.

Off-Road Vehicular Tail Pipe Emission Rate in g/hp-hr

Source	Number of Vehicles	Engine Power (hp)	PM_{10} (g/hp-hr)	$PM_{2.5}$ (g/hp-hr)	NO_x (g/hp-hr)	SO_2 (g/hp-hr)	CO (g/hp-hr)
Excavators	2	273	3.73E-02	3.62E-02	4.82E-01	1.48E-03	1.81E-01
Loaders	2	373	1.24E-01	1.21E-01	1.61E+00	1.68E-03	7.76E-01
Drills	2	148	1.93E-01	1.87E-01	2.84E+00	1.71E-03	8.75E-01
Dozers	2	215	4.42E-02	4.29E-02	5.79E-01	1.50E-03	2.18E-01
Grader	1	238	4.25E-02	4.13E-02	5.58E-01	1.49E-03	2.10E-01
Trucks	6	240	1.81E-02	1.75E-02	2.52E-01	1.44E-03	8.01E-02
Skid Steer	1	110	4.76E-01	4.61E-01	3.50E+00	2.03E-03	2.56E+00
Snow Plow	1	373	1.67E-01	1.62E-01	2.30E+00	1.71E-03	1.13E+00
Crane	1	225	5.23E-02	5.07E-02	9.33E-01	1.55E-03	2.61E-01
Handler	1	85	6.36E-01	6.17E-01	4.33E+00	2.27E-03	4.33E+00
Fork lift	1	75	2.38E-01	2.31E-01	2.01E+00	1.80E-03	1.54E+00

Notes:

(1) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM_{10} only, the TSP emission factors was assumed to be the PM_{10} emission factor multiplied by 2.

(2) Emission factors are from USEPA AP-42, Section 11.19.2 Crusher Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for truck unloading of fragmented stone. As the emission factors are given for PM_{10} only, the $PM_{2.5}$ emission factors was assumed to be the PM_{10} emission factor divided by 2.

(3) The NONROAD model integrated in MOVES3 was used to estimate vehicular tailpipe emissions in g/hp-hr.

(4) As per the Technical Report and Prelimnary Economic Assessment (Aug 5, 2021); the Haul Trucks are expected to run for 5,401 hours in a year.

(5) As per the Technical Report and Prelimnary Economic Assessment (Aug 5, 2021); the other loading and mining equipment are expected to run for 4,832 hours in a year.

(6) The NO_2/NO_x ratio ranges from 0.48 to 0.74 as per Technical support document (TSD) for NO2-related AERMOD modifications (EPA- 454/B-15-004, December, 2015); here we conservatively assume all NO_x is NO_2.

Table 4

Estimated Particulate Emissions from Material Handling - Processing Facility

Summary	AP-42 Emission Rate (g/s)		
	TSP	PM_{10}	$PM_{2.5}$
Crusher	1.30E-01	5.86E-02	1.09E-02
ROMTRANS	1.17E-01	4.40E-02	2.20E-02

Crushers

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg) (1)	Emission Rate (g/s)
Primary Crusher	260.4	Controlled	TSP	0.0006	4.34E-02
			PM_{10}	0.00027	1.95E-02
			$PM_{2.5}$	5.00E-05	3.62E-03
Secondary Crusher	260.4	Controlled	TSP	0.0006	4.34E-02
			PM_{10}	0.00027	1.95E-02
			$PM_{2.5}$	5.00E-05	3.62E-03
Tertiary Crusher	260.4	Controlled	TSP	0.0006	4.34E-02
			PM_{10}	0.00027	1.95E-02
			$PM_{2.5}$	5.00E-05	3.62E-03

Note:
(1) Emission factors for Tertiary Crushing have been used due to a lack of Primary Crushing and Secondary Crushing emission factors. This is a conservative assumption.

ROMTRANS (Transfer operations around Raw Material Storage Pile)

Source ID	Max. Production Rate (tonnes/hour)	Controlled or Uncontrolled?	Species	USEPA AP-42 Emission Factor (kg/Mg)	Emission Rate (g/s)
Handling, Transfering and Conveying	260.4	Uncontrolled	TSP	1.50E-03	1.09E-01
			PM_{10}	5.50E-04	3.98E-02
			$PM_{2.5}$	2.75E-04 (1)	1.99E-02
Unloading from ROM Stockpiles	260.4	Uncontrolled	TSP	1.60E-05 (2)	1.16E-03
			PM_{10}	8.00E-06	5.79E-04
			$PM_{2.5}$	4.00E-06 (3)	2.89E-04
Loading ROM Stockpiles	260.4	Uncontrolled	TSP	1.00E-04 (4)	7.23E-03
			PM_{10}	5.00E-05	3.62E-03
			$PM_{2.5}$	2.50E-05 (5)	1.81E-03

Notes:

(1) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Conveyor Transfer Point. As there is no $PM_{2.5}$ emission factor, emission factors were assumed to be the PM_{10} emission factor divided by 2.
(2) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Unloading Fragmented Stone. As the emission factors are given for PM_{10} only, the TSP emission factors were assumed to be the PM_{10} emission factor times 2.
(3) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Unloading Fragmented Stone. As the emission factors are given for PM_{10} only, the $PM_{2.5}$ emission factors were assumed to be the PM_{10} emission factor divided by 2.
(4) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Loading Conveyor, crushed stone. As the emission factors are given for PM_{10} only, the TSP emission factors were assumed to be the PM_{10} emission factor times 2.
(5) Emission factors are from USEPA AP-42, Section 11.19.1 Crushed Stone Processing and Pulverized Mineral Processing, Table 11.19.2-1 for Truck Loading Conveyor crushed stone. As the emission factors are given for PM_{10} only, the $PM_{2.5}$ emission factors were assumed to be the PM_{10} emission factor divided by 2.
(6) The daily throughput for the processing facility is 4,000 ton/day; with the process facility operating time being 22 hour/day, and the crusher operating time being 15 hour/day.

Table 5A

Estimated Tailpipe Emission Rates - Haul Routes between Pits and Processing Facility

Off-Road Vehicular Tail Pipe Emission Rate in g/hp-hr

Source	Total Number of Vehicles	Engine Power (hp)	NO_x (g/hp-hr)	SO_2 (g/hp-hr)	CO (g/hp-hr)
Haul Truck 90T	14	1200	2.52E-01	1.44E-03	8.01E-02
Haul Truck 40T	5	473	4.76E-01	1.48E-03	2.01E-01

	Number of Trucks at a given time		Emission Rate (g/s) Using MOVES3 NONROAD Model		
Truck Routes	Haul Truck 90T	Haul Truck 40T	NO_x	SO_2	CO
East Pit					
East Pit->Mill		2	7.71E-02	2.40E-04	3.26E-02
East Pit->SE Waste Rock Area	2		1.04E-01	5.91E-04	3.29E-02
East Pit->NE Waste Rock Area	2		1.04E-01	5.91E-04	3.29E-02
East Pit->TMF	1		5.18E-02	2.96E-04	1.65E-02
West Pit					
West Pit->Mill		2	7.71E-02	2.40E-04	3.26E-02
West Pit->SE Waste Rock Area	1		5.18E-02	2.96E-04	1.65E-02
West Pit->NW Waste Rock Area	3		1.56E-01	8.87E-04	4.94E-02
West Pit->TMF	2		1.04E-01	5.91E-04	3.29E-02
West Pit->SW Waste Rock Area	1		5.18E-02	2.96E-04	1.65E-02
West Pit->NE-A Waste Rock Area		1	3.85E-02	1.20E-04	1.63E-02
West Pit->Backfill	2		1.04E-01	5.91E-04	3.29E-02

Notes:

(1) The NONROAD model integrated in MOVES3 was used to estimate vehicular tailpipe emissions in g/hp-hr.
(2) At peak production hour, all 19 Haul Truck are expected to be operating simultaneously.
(3) Annually the valuable production time of the Haul trucks are expected to be 5401 hours.
(4) The NO_2/NO_x ratio ranges from 0.48 to 0.74 as per Technical support document (TSD) for NO2-related AERMOD modifications (EPA- 454/B-15-004, December, 2015). Here we conservatively assume all NO_x is NO_2.

Table 5B

Estimated Tailpipe Emission Rates - By Road Segment for Truck Routes

ER per Road Segment (g/s) = Truck Route ER (g/s) * Length of Segment (km) / Total Length of Truck Route (km)

	Truck Route NO_x Emission Rate (g/s)															NO_x Emission Rate
Truck Route	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**by Truck Route (g/s)**
East Pit																
East Pit->Mill	2.89E-02		1.72E-02		2.03E-03	2.02E-02	8.78E-03									7.71E-02
East Pit->SE Waste Rock Area	4.19E-02									1.21E-02	4.97E-02					1.04E-01
East Pit->NE Waste Rock Area	3.92E-02									1.13E-02		2.04E-02	3.28E-02			1.04E-01
East Pit->TMF	1.01E-02									2.91E-03		5.25E-03			3.36E-02	5.18E-02
West Pit																
West Pit->Mill		4.75E-02		2.05E-03		1.92E-02	8.35E-03									7.71E-02
West Pit->SE Waste Rock Area		2.36E-02	8.14E-03							3.94E-03	1.62E-02					5.18E-02
West Pit->NW Waste Rock Area		7.49E-02		3.22E-03		3.03E-02		4.71E-02								1.56E-01
West Pit->TMF		2.77E-02	9.55E-03							4.63E-03		8.36E-03			5.34E-02	1.04E-01
West Pit->SW Waste Rock Area		3.70E-02		1.59E-03					1.33E-02							5.18E-02
West Pit->NE-A Waste Rock Area		1.71E-02	5.91E-03							2.86E-03		5.17E-03		7.45E-03		3.85E-02
West Pit->Backfill	3.12E-02	5.39E-02	1.86E-02													1.04E-01
NO_x ER by Segment (g/s)	1.51E-01	2.82E-01	5.94E-02	6.86E-03	2.03E-03	6.96E-02	1.71E-02	4.71E-02	1.33E-02	3.78E-02	6.58E-02	3.92E-02	3.28E-02	7.45E-03	8.70E-02	

	Truck Route SO_2 Emission Rate (g/s)															SO_2 Emission Rate
Truck Route	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**by Truck Route (g/s)**
East Pit																
East Pit->Mill	8.99E-05		5.36E-05		6.33E-06	6.28E-05	2.73E-05									2.40E-04
East Pit->SE Waste Rock Area	2.39E-04									6.90E-05	2.83E-04					5.91E-04
East Pit->NE Waste Rock Area	2.23E-04									6.45E-05		1.16E-04	1.87E-04			5.91E-04
East Pit->TMF	5.75E-05									1.66E-05		3.00E-05			1.92E-04	2.96E-04
West Pit																
West Pit->Mill		1.48E-04		6.37E-06		5.97E-05	2.60E-05									2.40E-04
West Pit->SE Waste Rock Area		1.35E-04	4.64E-05							2.25E-05	9.22E-05					2.96E-04
West Pit->NW Waste Rock Area		4.27E-04		1.84E-05		1.73E-04		2.69E-04								8.87E-04
West Pit->TMF		1.58E-04	5.45E-05							2.64E-05		4.77E-05			3.05E-04	5.91E-04
West Pit->SW Waste Rock Area		2.11E-04		9.08E-06					7.58E-05							2.96E-04
West Pit->NE-A Waste Rock Area		5.33E-05	1.84E-05							8.91E-06		1.61E-05		2.32E-05		1.20E-04
West Pit->Backfill	1.78E-04	3.07E-04	1.06E-04													5.91E-04
SO_2 ER by Segment (g/s)	7.87E-04	1.44E-03	2.79E-04	3.38E-05	6.33E-06	2.95E-04	5.33E-05	2.69E-04	7.58E-05	2.08E-04	3.75E-04	2.10E-04	1.87E-04	2.32E-05	4.96E-04	

	Truck Route CO Emission Rate (g/s)															CO Emission Rate by
Truck Route	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**Truck Route (g/s)**
East Pit																
East Pit->Mill	1.22E-02		7.27E-03		8.60E-04	8.53E-03	3.71E-03									3.26E-02
East Pit->SE Waste Rock Area	1.33E-02									3.84E-03	1.58E-02					3.29E-02
East Pit->NE Waste Rock Area	1.24E-02									3.59E-03		6.48E-03	1.04E-02			3.29E-02
East Pit->TMF	3.20E-03									9.24E-04		1.67E-03			1.07E-02	1.65E-02
West Pit																
West Pit->Mill		2.01E-02		8.64E-04		8.11E-03	3.53E-03									3.26E-02
West Pit->SE Waste Rock Area		7.49E-03	2.58E-03							1.25E-03	5.13E-03					1.65E-02
West Pit->NW Waste Rock Area		2.38E-02		1.02E-03		9.61E-03		1.50E-02								4.94E-02
West Pit->TMF		8.79E-03	3.03E-03							1.47E-03		2.65E-03			1.70E-02	3.29E-02
West Pit->SW Waste Rock Area		1.17E-02		5.05E-04					4.22E-03							1.65E-02
West Pit->NE-A Waste Rock Area		7.24E-03	2.50E-03							1.21E-03		2.19E-03		3.15E-03		1.63E-02
West Pit->Backfill	9.90E-03	1.71E-02	5.90E-03													3.29E-02
CO ER by Segment (g/s)	5.10E-02	9.62E-02	2.13E-02	2.39E-03	8.60E-04	2.62E-02	7.24E-03	1.50E-02	4.22E-03	1.23E-02	2.09E-02	1.30E-02	1.04E-02	3.15E-03	2.76E-02	

Table 6

Background Ambient Air Monitoring Data (NAPS) 2017 - 2019

	Concentration (µg/m^3)					
	30th %ile	50th %ile	70th %ile	90th %ile	Average	Maximum
24-hour TSP						
Goldboro Village	—	—	—	—	**7.2**	8.1
24-hour PM10						
Goldboro Village	—	—	—	—	**9.6**	11.5
24-hour PM2.5						
Halifax (030118)	—	—	—	—	—	—
Lake Major - Halifax (030120)	4.0	5.0	6.0	7.0	5.0	19.0
Port Hawkesbury (030201)	4.0	5.0	6.0	8.0	6.0	22.0
Sydney (030310)	5.0	6.0	7.0	9.0	6.0	20.0
Aylesford Mountain (030701)	6.0	7.0	8.0	**10.0**	**7.0**	18.0
Pictou (030901)	4.0	5.0	6.0	9.0	5.0	17.0
1-hour NO2						
Halifax (030118)	6.6	10.7	16.2	**27.3**	13.2	94.9
Lake Major - Halifax (030120)	3.6	5.5	7.7	13.9	6.8	48.3
Port Hawkesbury (030201)	1.3	2.3	4.1	12.2	5.1	111.1
Sydney (030310)	2.1	3.4	5.3	11.3	5.1	76.5
Aylesford Mountain (030701)	—	—	—	0.6	—	10.5
Pictou (030901)	0.8	1.3	2.3	5.5	2.3	38.4
24-hour NO2						
Halifax (030118)	9.6	12.4	16.0	**21.4**	13.3	41.5
Lake Major - Halifax (030120)	4.7	6.4	8.3	11.8	6.8	22.4
Port Hawkesbury (030201)	2.3	3.4	5.3	12.0	5.3	49.3
Sydney (030310)	3.0	3.9	5.6	10.0	5.1	51.1
Aylesford Mountain (030701)	—	—	—	0.6	—	1.7
Pictou (030901)	1.3	2.1	2.8	4.3	2.3	13.2
1-hour SO2						
Halifax (030118)	0.5	1.0	2.1	**3.7**	1.0	16.0
Lake Major - Halifax (030120)	0.3	0.5	0.8	3.1	1.0	32.0
Port Hawkesbury (030201)	0.5	0.8	1.3	3.1	2.1	160.6
Sydney (030310)	0.5	0.8	1.0	1.8	1.3	223.0
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	0.3	0.5	0.8	2.4	1.3	111.6
24-hour SO2						
Halifax (030118)	0.5	1.3	2.1	2.9	1.0	5.5
Lake Major - Halifax (030120)	0.5	0.8	1.3	2.9	1.0	8.9
Port Hawkesbury (030201)	0.8	1.0	1.6	**4.5**	2.1	44.5
Sydney (030310)	0.5	0.8	1.0	2.4	1.3	36.2
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	0.3	0.5	1.0	2.9	1.3	32.0
1/2-hour CO						
Halifax (030118)	139.03	166.83	180.73	264.15	—	1404.16
Lake Major - Halifax (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Sydney (030310)	208.54	222.44	250.25	**319.76**	236.34	1626.60
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
1-hour CO						
Halifax (030118)	114.5	137.4	148.85	217.55	—	1156.45
Lake Major - Halifax (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Sydney (030310)	171.75	183.2	206.1	**263.35**	194.65	1339.65
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—
8-hour CO						
Halifax (030118)	125.95	137.4	148.85	206.1	137.4	595.4
Lake Major - Halifax (030120)	—	—	—	—	—	—
Port Hawkesbury (030201)	—	—	—	—	—	—
Sydney (030310)	171.75	194.65	206.1	**251.9**	194.65	938.9
Aylesford Mountain (030701)	—	—	—	—	—	—
Pictou (030901)	—	—	—	—	—	—

Note:

(1)Values in BOLD are the identified concentrations used to define "background" for this assessment.

Table 7

Ambient Air Quality Criteria and Modelled Results

Substance	Averaging Period	Nova Scotia[1] (µg/m^3)	Ontario[2] (µg/m^3)	CAAQS[3] (µg/m^3)	Selected for this Assessment (µg/m^3)	Background Concn	Modelled GLC (µg/m^3)	Total GLC[5] (µg/m^3)	% of Criteria	Compliance (Yes/No)
TSP	24-hour	120	120	—	120	7.2	95.162	102.362	85%	Yes
	Annual (1)	70	60	—	60		9.401	9.401	16%	Yes
PM_{10}	24-hour	—	50	—	50	9.6	24.983	34.583	69%	Yes
$PM_{2.5}$	24-hour (3)	—	—	28	27	10.0	4.757	14.757	55%	Yes
	24-hour (2020) (3)	—	—	27						
	Annual (4)	—	—	10	8.8	7.0	0.551	7.551	86%	Yes
	Annual (2020) (4)	—	—	8.8						
NO_2	1-hour	400	400	—	400	21.4	22.585	44.017	11%	Yes
	1-hour (2020) (5)	—	—	112.9						
	1-hour (2025) (5)	—	—	79						
	24-hour	—	200	—	200	21.4	6.609	28.041	14%	Yes
	Annual	100	—	—	100		0.918	0.918	1%	Yes
	Annual (2020)	—	—	32						
	Annual (2025)	—	—	22.6						
SO_2	1-hour	900	690	—	900	3.7	0.120	3.788	0.421%	Yes
	1-hour (2020) (6)	—	—	183.2						
	1-hour (2023)	—	100	—						
	1-hour (2025) (6)	—	—	170.1						
	24-hour	300	275	—	300	4.5	0.034	4.488	1%	Yes
	24-hour (2023)	—	—	—						
	Annual	60	—	—	60		0.004	0.004	0.007%	Yes
	Annual (2020)	—	—	13.1						
	Annual (2023)	—	10	—						
	Annual (2025)	—	—	10.5						
CO	1/2 hour	—	6000	—	6000	319.8	11.530	331.288	6%	Yes
CO	1-hour	34600	—	—	34600	263.4	9.608	272.958	1%	Yes
CO	8-hour	12700	—	—	12700	251.9	7.629	259.529	2%	Yes

Notes:

(1) https://novascotia.ca/just/regulations/regs/envairqt.htm Accessed September, 2021.
(2) MECP (Ontario), 2018
(3) https://ccme.ca/en/air-quality-report#slide-7 Accessed September, 2020.
(4) Ontario's 2018 ACB List Dustfall criteria in terms of g/m^2
(5) Total GLC is the summation of Modelled GLC with Background Concentration.


GHD

Appendix D.2

Greenhouse Gas Assessment

Greenhouse Gas Assessment

Goldboro Gold Project

Anaconda Mining

May 20, 2022

The Power of Commitment

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1. Introduction

GHD Limited (GHD) was retained by Anaconda Mining Inc. (Anaconda) to conduct a Greenhouse Gas (GHG) Assessment for the Goldboro Gold Project (the Project) located in Goldboro, Guysborough County, Nova Scotia (NS). The Project is located approximately 175 kilometres (km) northeast of Halifax, 60 km southeast of Antigonish, and 1.6 km northeast of the community of Goldboro on the eastern shore of Isaacs Harbour, in Guysborough County, NS, Canada.

Anaconda proposes to develop the Project as a 4,000-tonne per day (tpd) mine and processing facility. The mine plan includes two open pits (East Pit and West Pit), an ore processing facility, a tailings management facility (TMF), three waste rock storage areas (WRSAs), till and organic stockpiles, support buildings, and associated infrastructure. The anticipated mine life for extraction of ore is approximately 11 years.

The scope of the Project includes activities associated with construction, operations, and closure. Project construction activities will include clearing and grubbing the till and organic stockpiles, WRSAs, pit, plant, and TMF areas, and construction of the initial lift of the TMF, mill area, secondary access roads, construction laydowns, Run-of-Mine (ROM) pad, surface water management and other infrastructure. The operations phase will include conventional ore extraction methods (drilling, blasting, loading, and hauling), ore processing, and waste management. Blasting is planned to occur approximately twice per week during the construction and operations phases of the Project. ROM ore will go directly to the crusher while stockpiled high-grade and low-grade ore will be progressively processed throughout the mine life. Non-ore bearing waste rock, not used for construction or backfill, will be stockpiled at its final disposal point, managed and reclaimed in place. The closure phase will include earthworks and demolition required to return the Project Area to a safe, stable, and vegetated state, and all monitoring and treatment, if required.

2. Provincial and Federal Greenhouse Gas Overview

The National Pollutant Release Inventory (NPRI) is Canada's legislated and publicly accessible inventory of pollutant releases to air, water, and land. The NPRI is managed by Environment and Climate Change Canada (ECCC) and currently tracks over 200 substances and groups of substances. Under the authority of the *Canadian Environmental Protection Act* (CEPA), owners or operators of facilities that meet the NPRI reporting requirements published in the Canada Gazette, Part 1 are required to report to NPRI.

Accurate tracking of GHG emissions is an important part of assessing Canada's overall environmental performance. In March 2004, the Government of Canada announced the introduction of the Greenhouse Gas Emissions Reporting Program. All facilities that emit the equivalent of 50 kilotonnes or more of GHGs in carbon dioxide equivalent units (CO_2e) per year are required to submit a report. Facilities with emissions falling below the reporting threshold of 50 kilotonnes per year can voluntarily report their GHG emissions. Facilities in NS reported a GHG emissions total of 12,650 kilotonnes of CO_2e in 2020.

In 2009, the Province of Nova Scotia released the GHG Emissions Regulations, made under Section 112 of the Environment Act, establishing GHG emission caps on the electricity sector. These regulations apply to any electricity generating facility located in the province of NS that emits greater than 10 kilotonnes of CO_2e greenhouse gases in a calendar year. The facility owner must submit an annual report no later than March 31 of the following year.

The Project is located in a relatively undeveloped rural region of Guysborough County, NS with infrequent industrial operations that would contribute to GHG emissions. The nearest facility reporting to the NPRI is the Point Tupper

Generating Station, approximately 48 km northeast of the PA. Existing GHG emissions would be generated primarily through recreational vehicle usage, local traffic, and forestry operations.

3. GHG Assessment Methodology

Sources of GHG emissions were considered for each phase of the Project (construction, operations, and closure). The primary sources of emissions from each phase of the Project are stationary and mobile fuel combustion sources. These fuel combustion GHG-specific emissions include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). During the construction and operations phases of the Project, GHG emissions that would be generated from explosives used in rock blasting were also considered. Emulsion explosives will be used for rock blasting. Under ideal conditions, the sole GHG emission from this explosive is CO_2, though small amounts of CH_4 and N_2O may also form as a result of the combustion. For the purposes of these emission estimates, it has been assumed that only CO_2 emissions will occur.

Other key assumptions used as part of the GHG emission estimates include:

– Sources of stationary and mobile combustion are operational 24 hours per day during the operations phase of the Project. It is estimated there will be only 52% of valuable production time (i.e., 4,563 hours in a year) after taking into consideration 85% of mechanical availability, 1521 hours of operational delays, 15 days of weather delays in a year, and an 82% efficiency factor.
– The primary source of GHG emissions is from combustion of diesel and propane. Estimates for fuel use have been made for the construction, operations, and closure phases. Diesel is primarily used as fuel for the haul trucks and mining equipment. Propane is used as heating fuel for the buildings, in the process plant for the operation of the furnace, kiln in the gold room, and carbon elution areas.
– For the purpose of GHG estimation, peak weekly fuel consumption 190,000 litres (L) of diesel, 81,830 L of propane is used for the maximum production year (YR5 of Life of Mine), and proportionally distributed for the remaining years in the operations phase.
– The emulsion used during the operations phase was estimated to be approximately 2,176 tonnes/year during peak mining activity based on prior mining experience at similar sites.
– Exact details pertaining to equipment that will be used for construction and closure phases was not available at the time of this GHG report preparation. Based on prior experience at similar sites, the construction phase GHG emissions were estimated to be 15% of the GHG emitted during the peak year of operations; similarly the closure phase GHG emissions were estimated to be 39% of the GHG emitted during the peak year of operations.

4. Results

The projected GHG emission estimates for the life of the Project, based on the available information, are summarized in Tables 1 through 4. Emissions estimates can be further refined as the Project progresses by incorporating known rather than projected data.

NS reported 12,650 kilotonnes of CO2e of GHG emissions in 2020. Based on the GHG assessment conducted for the Project, the peak annual emission is estimated to be 33.08 kilotonnes of CO2e, approximately 0.26% of the reported 2020 GHG total for NS. The average annual emissions over the life of the Project are estimated to be 18.98 kilotonnes of CO2e - approximately 0.15% of the reported 2020 GHG total for NS.

5. Conclusion and Mitigation Measures

This GHG assessment demonstrates that the Project will not be a significant contributor to GHG emissions in NS. Anaconda will implement mitigation measures to minimize GHG emissions associated with the Project, including reducing engine idling where possible, and the use of more fuel-efficient vehicles and equipment. Equipment, vehicles, and haul trucks will be maintained in good working order. Haul roads and infrastructure will be designed to reduce haul distances where possible. These mitigation measures are anticipated to continue throughout the life of the Project.

Table 1

Summary of Green House Gas Emissions

		Explosive Emissions (tonnes)				Stationary Combustion Emissions (tonnes)				Transportation Emissions (tonnes)				Total Emissions (tonnes)			
	Year	CO2	CH4	N20	Total CO2e Emissions (tonnes)	CO2	CH4	N20	Total CO2e Emissions (tonnes)	CO2	CH4	N20	Total CO2e Emissions (tonnes)	CO2	CH4	N20	Total CO2e Emissions (tonnes)
Site Preparation	YR-2	0.00	0.00	0.00	0.00	2683.93	0.04	0.19	2742.01	2013.11	0.05	0.17	2065.94	4697.04	0.10	0.36	4807.96
Operations	YR-1	84.28	0.00	0.00	84.28	1099.95	0.02	0.08	1123.75	5427.82	0.15	0.47	5570.28	6612.06	0.17	0.54	6778.32
	YR1	246.67	0.00	0.00	246.67	3219.24	0.05	0.23	3288.90	15885.65	0.43	1.36	16302.58	19351.56	0.48	1.59	19838.15
	YR2	314.56	0.00	0.00	314.56	4105.16	0.07	0.29	4193.99	20257.33	0.55	1.74	20789.00	24677.04	0.62	2.03	25297.55
	YR3	255.46	0.00	0.00	255.46	3333.96	0.05	0.24	3406.11	16451.77	0.45	1.41	16883.56	20041.19	0.50	1.65	20545.13
	YR4	340.83	0.00	0.00	340.83	4448.04	0.07	0.32	4544.29	21949.29	0.60	1.88	22525.37	26738.16	0.67	2.20	27410.49
	YR5	411.31	0.00	0.00	411.31	5367.87	0.09	0.38	5484.02	26488.28	0.72	2.27	27183.49	32267.46	0.81	2.66	33078.82
	YR6	230.26	0.00	0.00	230.26	3004.98	0.05	0.21	3070.00	14828.37	0.40	1.27	15217.55	18063.60	0.45	1.49	18517.81
	YR7	271.82	0.00	0.00	271.82	3547.47	0.06	0.25	3624.23	17505.34	0.48	1.50	17964.78	21324.63	0.53	1.75	21860.84
	YR8	392.27	0.00	0.00	392.27	5119.35	0.08	0.36	5230.13	25261.97	0.69	2.17	25924.99	30773.60	0.77	2.53	31547.40
	YR9	300.58	0.00	0.00	300.58	3922.69	0.06	0.28	4007.58	19356.91	0.53	1.66	19864.95	23580.18	0.59	1.94	24173.10
	YR10	192.13	0.00	0.00	192.13	2507.35	0.04	0.18	2561.61	12372.77	0.34	1.06	12697.51	15072.25	0.38	1.24	15451.24
	YR11	45.89	0.00	0.00	45.89	598.93	0.01	0.04	611.89	2955.47	0.08	0.25	3033.04	3600.29	0.09	0.30	3690.82
Decommissioning	YR12	0.00	0.00	0.00	0.00	2683.93	0.04	0.19	2742.01	9800.66	0.27	0.84	10057.89	12484.60	0.31	1.03	12799.90

	CO2	CH4	N20	Total CO2e Emissions (tonnes)
Site Preparation	4697.04	0.10	0.36	4807.96
Operations	242102.01	6.05	19.92	248189.66
Decommissioning	12484.60	0.31	1.03	12799.90

Overall Project CO2e (ktonnes)		% of 2020 NS emissions
Total	265.80	2.10
Peak Operational	33.08	0.26
Annual Average	18.99	0.15

Note:

[1] The total GHG emissions from Nova Scotia were identified to be 12,649,890 tonnes CO2e during 2020, as per the “Summary of 2020 Greenhouse Gas Emissions Reported under the Quantification, Reporting and Verification of Greenhouse Gas Emissions Regulations” by Department of Environment and Climate Change in January 2022.

Table 2

Greenhouse Gas Emissions from Explosive Detonations

			Emission Factors (tonnes/tonne of ANFO) [1]			Emissions (tonnes) [2]			
	Year	Explosive Usage (tonne)	CO2	CH4	N20	CO2	CH4	N20	Total CO2e Emissions (tonnes) [3]
Site Preparation	YR-2	0	0.189	NA	NA	0.00	0.00	0.00	0.00
Operations	YR-1	446	0.189	NA	NA	84.28	0.00	0.00	84.28
	YR1	1305	0.189	NA	NA	246.67	0.00	0.00	246.67
	YR2	1664	0.189	NA	NA	314.56	0.00	0.00	314.56
	YR3	1352	0.189	NA	NA	255.46	0.00	0.00	255.46
	YR4	1803	0.189	NA	NA	340.83	0.00	0.00	340.83
	YR5	2176	0.189	NA	NA	411.31	0.00	0.00	411.31
	YR6	1218	0.189	NA	NA	230.26	0.00	0.00	230.26
	YR7	1438	0.189	NA	NA	271.82	0.00	0.00	271.82
	YR8	2076	0.189	NA	NA	392.27	0.00	0.00	392.27
	YR9	1590	0.189	NA	NA	300.58	0.00	0.00	300.58
	YR10	1017	0.189	NA	NA	192.13	0.00	0.00	192.13
	YR11	243	0.189	NA	NA	45.89	0.00	0.00	45.89
Decommissioning	YR12	0	0.189	NA	NA	0.00	0.00	0.00	0.00
								Total CO_2e	3086.07	tonnes

Notes:

[1] Emission Factors based on The Mining Association of Canada's published document entitled “Energy and GHG Emissions Management Guidance” (2009)

[2] Emissions based on Equation 2-2 and Equation 2-13 of "CANADA'S GREENHOUSE GAS QUANTIFICATION REQUIREMENTS – GREENHOUSE GAS REPORTING DECEMBER 2021"

[3] Global Warming Potentials (GWP) based on Environment and Climate Change Canada.

Table 3

Greenhouse Gas Emissions from Stationary Fuel Combustion Sources

			Propane Emission Factors (kg/kl) [1]			Emissions (tonnes) [2]				
	Year	Fuel Consumption (kl)	CO2	CH4	N20	CO2	CH4	N20	Total CO2e Emissions (tonnes) [3]	
Site Preparation	YR-2	1771.57	1515	0.024	0.108	2683.93	0.04	0.19	2742.01	
Operations	YR-1	726.04	1515	0.024	0.108	1099.95	0.02	0.08	1123.75	
	YR1	2124.91	1515	0.024	0.108	3219.24	0.05	0.23	3288.90	
	YR2	2709.68	1515	0.024	0.108	4105.16	0.07	0.29	4193.99	
	YR3	2200.63	1515	0.024	0.108	3333.96	0.05	0.24	3406.11	
	YR4	2936.00	1515	0.024	0.108	4448.04	0.07	0.32	4544.29	
	YR5	3543.15	1515	0.024	0.108	5367.87	0.09	0.38	5484.02	
	YR6	1983.48	1515	0.024	0.108	3004.98	0.05	0.21	3070.00	
	YR7	2341.56	1515	0.024	0.108	3547.47	0.06	0.25	3624.23	
	YR8	3379.11	1515	0.024	0.108	5119.35	0.08	0.36	5230.13	
	YR9	2589.23	1515	0.024	0.108	3922.69	0.06	0.28	4007.58	
	YR10	1655.02	1515	0.024	0.108	2507.35	0.04	0.18	2561.61	
	YR11	395.33	1515	0.024	0.108	598.93	0.01	0.04	611.89	
Decommissioning	YR12	1771.57	1515	0.024	0.108	2683.93	0.04	0.19	2742.01	
								Total CO_2e	46630.53	tonnes

Notes:

[1] Emission Factors based on Table 2-1 and Table 2-5 of "CANADA'S GREENHOUSE GAS QUANTIFICATION REQUIREMENTS – GREENHOUSE GAS REPORTING PROGRAM DECEMBER 2021"

[2] Emissions based on Equation 2-2 and Equation 2-13 of "CANADA'S GREENHOUSE GAS QUANTIFICATION REQUIREMENTS – GREENHOUSE GAS REPORTING PROGRAM DECEMBER 2021"

[3] Global Warming Potentials (GWP) based on Environment and Climate Change Canada.

Table 4

Greenhouse Gas Emissions from Mobile Fuel Combustion Sources

			Diesel Emission Factors (kg/kl) [1]			Emissions (tonnes) [2]			
	Year	Fuel Consumption (kl)	CO2	CH4	N20	CO2	CH4	N20	Total CO2e Emissions (tonnes) [3]
Site Preparation	YR-2	750.88	2681	0.073	0.23	2013.11	0.05	0.17	2065.94
Operations	YR-1	2024.55	2681	0.073	0.23	5427.82	0.15	0.47	5570.28
	YR1	5925.27	2681	0.073	0.23	15885.65	0.43	1.36	16302.58
	YR2	7555.88	2681	0.073	0.23	20257.33	0.55	1.74	20789.00
	YR3	6136.43	2681	0.073	0.23	16451.77	0.45	1.41	16883.56
	YR4	8186.98	2681	0.073	0.23	21949.29	0.60	1.88	22525.37
	YR5	9880.00	2681	0.073	0.23	26488.28	0.72	2.27	27183.49
	YR6	5530.91	2681	0.073	0.23	14828.37	0.40	1.27	15217.55
	YR7	6529.41	2681	0.073	0.23	17505.34	0.48	1.50	17964.78
	YR8	9422.59	2681	0.073	0.23	25261.97	0.69	2.17	25924.99
	YR9	7220.04	2681	0.073	0.23	19356.91	0.53	1.66	19864.95
	YR10	4614.98	2681	0.073	0.23	12372.77	0.34	1.06	12697.51
	YR11	1102.38	2681	0.073	0.23	2955.47	0.08	0.25	3033.04
Decommissioning	YR12	3655.60	2681	0.073	0.23	9800.66	0.27	0.84	10057.89
								Total CO_2e	216080.92 tonnes

Notes:

[1] Emission Factors based on Table 2-2 and Table 2-6 of "CANADA'S GREENHOUSE GAS QUANTIFICATION REQUIREMENTS – GREENHOUSE GAS REPORTING PROGRAM DECEMBER 2021"

[2] Emissions based on Equation 2-2 and Equation 2-13 of "CANADA'S GREENHOUSE GAS QUANTIFICATION REQUIREMENTS – GREENHOUSE GAS REPORTING PROGRAM DECEMBER 2021"

[3] Global Warming Potentials (GWP) based on Environment and Climate Change Canada.

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The Power of Commitment

Appendix D.3

Fugitive Dust Best Management Practices Plan

Best Management Practices Plan for Control of Fugitive Dust Emissions

Goldboro Gold Project

Anaconda Mining Inc.

May 24, 2022

→ The Power of Commitment

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Appendices

1. Introduction

GHD Limited (GHD) was retained by Anaconda Mining Inc. (Anaconda) to develop a Best Management Practices Plan for Control of Fugitive Dust Emissions (Dust BMPP) for the Goldboro Gold Project (the Project) located in Goldboro, Guysborough County, Nova Scotia (NS). The Project is located approximately 175 kilometres (km) northeast of Halifax, 60 km southeast of Antigonish, and 1.6 km northeast of the community of Goldboro on the eastern shore of Isaacs Harbour, in Guysborough County, NS, Canada. For the purposes of this assessment, a Project Area (PA) was defined as the footprint of Project related infrastructure plus a buffer of 100 – 200 m.

The purpose of this Dust BMPP is to provide details about the best management practices that will be in place to control potential fugitive dust emissions, as well as planned strategies for dealing with potential fugitive dust issues, based on the dust conditions observed.

This Dust BMPP include the following information:

– Description of the Project activities;
– Identification of the main sources of fugitive dust emissions within the PA;
– Potential causes for high dust emissions resulting from these sources;
– Preventative and control measures to minimize the likelihood of high dust emissions and opacity issues from the sources of fugitive dust emissions;
– Inspection and maintenance procedures and monitoring initiatives to ensure effective implementation of the preventative and control measures;
– Training requirements of Anaconda personnel and contractors; and,
– Opportunities for continuous improvement of the Dust BMPP.

The general purpose of the Dust BMPP is to identify potential sources and, where necessary, plan for and implement mitigation measures to reduce fugitive dust emissions associated with mining and related activity during each phase of the Project. Minimizing fugitive dust emissions at the source will have a combined benefit of protecting the health and safety of workers in the PA as well as protecting the environment and minimizing long-term impacts associated with the Project.

Fugitive dust typically refers to small particles that are moved into the atmosphere from non-ducted, open sources known as non-point sources. Non-point fugitive dust sources may originate from both stationary and mobile sources, including such things as open fields, open burning, agricultural activity, construction sites, logging road traffic, vehicle traffic on paved and unpaved public roads, aggregate pits and storage piles, as well as open pit mines. By contrast, point sources are typically ducted stationary sources, such as stacks or vents at industrial or commercial facilities.

Potential Project-related sources of fugitive dust will include: drilling and blasting within the open pits (East and West Pits), haul truck operations, crushing and grinding within the mill area, vehicle traffic along Goldbrook Road and the road network within the PA, road grading, wind erosion of waste rock storage areas (WRSAs), till and organic material stockpiles, run-of-mine (ROM) stockpiles, and the tailings management facility (TMF). Fugitive dust emission sources within the mill area include mineral material transfer systems associated with the primary crusher and the crushed ore stockpile.

Studies undertaken at other mining operations have indicated that, in the absence of mitigation measures, dust entrainment by the wheels and the wake created by moving haul trucks generate almost 97% of suspended particulate emissions associated with mining activity, although most of this dust settles out rapidly and decreases to insignificant levels within the mine property boundaries.

In terms of geologic origin, potential fugitive dust will originate predominantly from a combination of relatively inert naturally occurring matter including background soils such as dirt, clay, silt and sand, ore-grade materials or host rock materials.

The extent of fugitive dust emissions depends on several factors, the most important being particle size, wind speed, moisture content and dust density. Maximum fugitive dust generation will take place during windy weather where small and light particles are present in dry, active surface material. As a result, dust plumes tend to be most noticeable from potential sources when wind speeds are high and/or when vehicles are moving. The potential drift distance of fugitive dust particles is governed by the initial injection height of the particle, the terminal settling velocity of the particle, and the degree of atmospheric turbulence.

This Dust BMPP is a "living document" and will be further developed by Anaconda into a more detailed plan prior to commencement of the construction phase of the Project.

Upon commencement of the Project, Anaconda shall immediately implement the Dust BMPP for the control and mitigation of potential fugitive dust emissions resulting from the Project. This Dust BMPP will be followed throughout the lifespan of the Project and be revised based on "as-constructed" conditions or to circumvent dust issues.

2. Responsibilities

Anaconda will be responsible for ensuring that overall performance objectives and protection measures are achieved under the Dust BMPP. All employees, contractors, and contractor employees are responsible for complying with the intent of the Dust BMPP.

As identified in the introduction, there will be a variety of non-point sources with potential for fugitive dust emissions spread throughout the PA which will have potential to generate such emissions depending upon a variety of weather and other conditions which will change on a daily and seasonal basis.

As a result, individual operating departments will have overall responsibility, as delegated through their reporting structure, for monitoring and implementing appropriate levels of mitigation for the control of fugitive dust generation within their operational areas. Fugitive dust emissions will be visually monitored on a regular basis by operating personnel and mitigation measures implemented as conditions warrant.

The following identifies the responsibilities held by each of the employment levels as they pertain to this Dust BMPP.

Anaconda Management

The Anaconda Management Representatives, or designates, are responsible for:

– Reviewing the effectiveness of the current dust control measures on an on-going basis;
– Ensuring the required resources are in place to execute the Dust BMPP;
– Scheduling and coordinating the implementation of fugitive dust control measures, as required;
– Maintaining documentation of schedules and daily logs;
– Ensuring the training of all applicable personnel and contractors on the plan and best management practices for the prevention of fugitive dust emissions; and,
– Completing Fugitive Dust Checklists, as necessary.

Applicable Personnel

All Personnel/Contractors who could be engaged in the associated work outlined in this Dust BMPP are responsible for:

– Reviewing the effectiveness of the current dust control measures on an on-going basis; and,
– Following the best available practices for dust control that are currently in place.

3. Process Description

Anaconda proposes to develop the Project as a 4,000-tonne per day (tpd) mine and processing facility. The mine plan includes two open pits (East Pit and West Pit), an ore processing facility (the mill area), a TMF, three waste rock storage areas (WRSAs), till and organic material stockpiles, support buildings, and associated infrastructure. The anticipated mine life for extraction of ore is approximately 11 years.

The scope of the Project includes activities associated with construction, operation, and closure. Project construction activities will include clearing and grubbing the overburden and organic stockpiles, WRSAs, pit, plant, and TMF areas, and construction of the initial lift of the TMF, plant site, secondary access roads, construction laydowns, ROM pad, surface water management and other site infrastructure. The operation phase will include conventional ore extraction methods (drilling, blasting, loading, and hauling), ore processing, and waste management. ROM material will go directly to the crusher while stockpiled high-grade and low-grade ore will be progressively processed throughout the mine life. Non-ore bearing waste rock, not used for construction or backfill, will be stockpiled at its final disposal point, managed and reclaimed in place. The closure phase will include earthworks and demolition required to return the Project Area to a safe, stable, and vegetated state, and all monitoring and treatment, if required.

Table 1 below presents general information about the Facility relevant to this Dust BMPP.

Table 1 Facility Description

Facility:	Goldboro Gold Project
Location:	1.6 km northeast of the community of Goldboro, NS
Main activities/equipment used:	Mining and ore processing
Project Area size:	1,055 hectares (ha)
Production:	Up to 4,000 tpd
Nearest sensitive receptors:	Residences on Goldbrook Road, approximately 1.5 km from East and West Pits

The general mine arrangement is presented in Figure 1 following the text.

4. Fugitive Dust BMPP Methodology

This fugitive Dust BMPP has been developed by following the Plan Do Check and Act (PDCA) cycle according to ISO guideline as follows:

– **PLAN** - identifies and characterizes the emission sources and Best Management Practices at the Site
– **DO** - documents the schedule for implementation of the proposed improvements
– **CHECK** - describes the monitoring procedures and a recordkeeping system
– **ACT** – describes, when necessary, the BMPP review and update procedures in order to promote its continuous improvement

5. Identification and Classification of Fugitive Dust Emission Sources

Fugitive dust emissions occur due to mechanical disturbances of granular materials exposed to the air. Dust generated from these open sources is termed "fugitive" because it is not discharged to the atmosphere in a confined flow stream, such as in an exhaust pipe or stack.

The mechanical disturbance may be equipment movement, the wind, or both. Therefore, some fugitive dust emissions occur and/or are intensified by equipment use, while others, i.e., wind erosion emissions, are independent of equipment use.

The main factors affecting the amount of fugitive dust emitted from a source include characteristics of the granular material being disturbed (i.e., particulate size distribution, density, and moisture) and intensity and frequency of the mechanical disturbance (i.e., wind conditions and/or equipment use conditions). Precipitation and evaporation conditions can affect the moisture of the granular material being disturbed and, therefore, have an indirect effect on the amount of fugitive dust emitted.

Once dust is emitted, its travelling distance from the source is affected by various parameters. Namely climatic conditions; specifically, wind speed, wind direction, precipitation, and particle size distribution. Higher wind speeds increase the distance travelled while precipitation can accelerate its deposition. Finer particulates can travel longer before settling and therefore are of more concern.

The potential sources of fugitive dust emissions that have been identified for the Project include the following:

– Clearing, grubbing, and stripping;
– Till and organic material stockpiles;
– East Pit and West Pit operations;
– Mobile equipment sources;
– Mill area operations;
– WRSAs;
– Material loading/unloading; and,
– TMF embankment.

5.1 Clearing, Grubbing, and Stripping

As vegetation is cleared for construction areas or earthworks projects are undertaken, soil materials have the potential to become airborne. The natural moisture content of in-place native materials will mitigate against significant dust generation (wetlands comprise 27% of land cover within the PA). Project personnel and supervisors will visually monitor activity and implement mitigation measures as necessary which may include the following:

– Complete clearing, grubbing and stripping activities on an area-by-area basis in as efficient a manner as practical such that work is completed on fresh materials and soil is not allowed to dry out unnecessarily;
– Install windbreaks around identified problem areas, where practical, to limit the dust emissions from equipment and stockpiles, and other activities likely to generate dust; and,
– Reclaim and re-vegetate decommissioned areas as soon as is practical.

5.2 Till and Organic Material Stockpiles

Till and organic material stripped from construction areas will be stockpiled for future use in reclamation as required under the Project’s Conceptual Reclamation and Closure Plan. The natural moisture content of native soils will

mitigate against any such dust generation in the short term until these materials dry out, at which point they will become more susceptible to wind erosion. Project personnel and supervisors will visually monitor till and organic material stockpiles and undertake mitigation measures as necessary which may include the following:

– Vegetate till and organic material stockpiles as soon as practical to minimize both wind and water erosion;
– Fencing or other windbreaks may be considered around stockpiles to reduce wind velocities; and,
– Reclaim and re-vegetate decommissioned areas as soon as is practical.

5.3 Open Pit Operations

Open pit operations have the potential to create fugitive dust emissions though drilling and blasting, materials handling and the transportation of ROM material and waste rock by a variety of heavy equipment and vehicles. The coarse nature and the natural moisture content of the materials, as well as depth of the East and West Pits will minimize the potential for effects from fugitive dust emissions beyond the pit limits. The greatest potential for impacts associated with fugitive dust beyond the pit boundaries exists where activity is undertaken near or outside of the pit rim.

Project Supervisors will visually monitor pit activity and implement mitigation measures as necessary, when possible, which may include the following:

– Use of dust curtains and water lubrication of blast hole drilling equipment;
– Use of delay blasting techniques, where practical;
– Ensuring roads are regularly maintained and kept in good repair;
– Application of water or dust suppressants to roadways to minimize dust from ROM material and waste rock haulage and grading, when ambient air temperatures permit;
– Use of appropriately sized large haul trucks for ROM material and waste transport to minimize the number of trips required between the source and destination; and,
– Ensuring vehicles will be driven at designated speeds.

5.4 Mobile Equipment Sources

Mobile equipment sources consist of the various vehicles used within the PA. These include haul trucks, dozers, front-end loaders, graders, and light vehicles. On a worst-case hour, approximately 19 trucks are expected to be moving within the PA. Therefore, traffic is expected to be a source of fugitive dust emissions. Within the PA there will be unpaved roads. One mitigation may be that prior to exiting the PA, heavy vehicles pass over a grizzly screen system or wheel washing station where dirt on the tires will be knocked off to minimize dirt track-out.

Unpaved Roads/Areas

Unpaved roads have a much greater potential to release fugitive dust emissions than paved roads. These gravel roads release dust emissions as the accumulation of dust on the road surface is disturbed by vehicular traffic. Dust generation will typically become greater as road base material ages, is pulverized by traffic, and dries out during periods of warmer weather. Vehicle speed, vehicle weight, moisture content, and silt content are all critical factors in the amount of fugitive dust emitted from the roads. Should a significant amount of dust be generated on the roads, water suppressant will be applied to reduce fugitive dust release. Manufactured dust suppressants are effective dust suppressants because they attract and retain moisture either from rainfall or directly from the atmosphere. This moisture keeps dust fines wetted and prevents them from becoming airborne. These products can only draw moisture from the atmosphere if the relative humidity is above 40%. Fortunately, the relative humidity in Canada is invariably above 40%, and usually lies in the range of 60% to 90% all year round. A water truck will be used to apply water (with or without suppressant) to the road surface on an as needed basis and based on weather conditions.

Project Supervisors will visually monitor road activity and implement mitigation measures as necessary which may include the following:

– Ensuring roads are regularly maintained and kept in good repair;

– Wet suppression controls on unpaved surfaces (watering during dry seasons and possible application of chemical dust suppressant);
– Speed reduction to keep dust levels at minimum;
– Use of appropriately sized haul trucks for ROM material and waste transport to minimize the number of trips required between the source and destination;
– Optimize the infrastructure layout to minimize the distance travelled, thereby reducing vehicle emissions and dust generation, where practical; and,
– Reclaim and re-vegetate decommissioned roads as soon as practical.

5.5 Mill Area Operations

Processing operations will occur at the mill area and will include screening or crushing operations which are expected to be potential sources of fugitive dust emissions. The crusher may be equipped with a spray bar to minimize the potential for fugitive dust emissions from the crushing operations. ROM material will be hauled from the East and West Pits and stored temporarily in the ROM stockpile in the mill area. ROM material will be transferred to the crushers and the crushed ore will be fed onto a transfer conveyor system which transports the crushed ore to a crushed ore stockpile. Typically, dust is expected to be generated during the transfer and crushing operations. The crusher operators will visually monitor crusher operations for fugitive dust generation. Potential mitigation measures may include:

– A water spray system to wet ROM material prior to or concurrent with discharge into the feed bin, where practical under permitting weather conditions;
– A dust suppression/collection system within the crushing facility to control fugitive dust that will be generated during crushing, material loading, and related operations;
– Overland conveyors may be covered/semi enclosed to prevent dust generation;
– Discharge from crushers onto conveyors or into other equipment may be enclosed as far as is practicable; and,
– Drop/discharge heights at material transfer points will be minimized where practical.

Crushed ore is discharged from the conveyor onto the top of an outdoor, uncovered crushed ore stockpile to be located near the mill area. Dust emission levels from an open surface conical stockpile due to wind erosion will depend on factors such as age of the material on the pile, moisture content of the crushed ore at the surface of the pile, particle size and density, precipitation, wind speed, and time of the year.

The majority of the outer surface of the stockpile will be composed of coarser material due to gravity separation and will therefore be resistant to the effects of wind erosion. As a result, fugitive dust emissions from the coarse ore stockpile will primarily be associated with wind erosion at the ore drop from the conveyor to the top of the pile. The mill area personnel will visually monitor the coarse ore storage pile for fugitive dust generation. Potential mitigation measures may include, when practical:

– Minimize the drop/discharge height from the overland conveyor onto the coarse ore stockpile;
– Installation of a shroud around the drop point; and,
– A water spray system to wet crushed ore prior to or concurrent with discharge from the conveyor onto the coarse ore pile, weather conditions permitting.

5.6 Waste Rock Storage Areas

Fugitive dust emissions from WRSAs have the potential to result from various activities associated with the materials handling and storage process such as equipment traffic in storage area, materials handling (unloading, dozing, grading), wind erosion of exposed surfaces, proportion of waste rock fines, and material moisture content.

Generally, the natural moisture content of the materials will minimize dust generation during the initial handling stages and the coarse nature of the materials will minimize the potential for effects associated with fugitive dust emissions

from the storage areas over the longer term. Project personnel and supervisors will visually monitor WRSAs and undertake mitigation measures as necessary which may include the following:

– Vehicle traffic within the storage areas will be limited to specific roadways to minimize the effects of pulverization of coarser surface materials;
– Storage areas will be revegetated as soon as practical once complete;
– Installation of windbreaks around identified problem areas, where practical, to limit the dust emissions from equipment and stockpiles, and other activities likely to generate dust; and,
– Reclaim and re-vegetate decommissioned areas as soon as practical.

5.7 Material Loading and Unloading

Material loading and unloading will occur at various stages of the Project. Each loading and unloading event represents a potential source of fugitive dust emissions.

Material loading occurs any time a piece of equipment (e.g., a front end loader) is being used to pick up material. To minimize potential emissions, material loading should be carefully completed at a reduced speed to limit disturbance.

Material unloading occurs any time material is dropped from one height to another. Examples of this would include material being dropped into a dump truck and material being dropped from a conveyance system to a stockpile. To minimize potential emissions, the drop distance of materials should be minimized.

5.8 Tailings Management Facility

The TMF is an engineered structure designed for impoundment of tailings slurry, to act as a recycled water reclaim pond, and to store tailings solids over the long term. The tailings solids are ground up rock of ore grade material with the consistency of fine sand and silt like particles from which the mineralized component has been largely removed. Following placement, tailings will become inundated with ongoing thickened tailings slurry deposition and water. This will maintain the tailings below a water cover and in a saturated state. As a result, tailings will not be susceptible to wind erosion and generation of fugitive dust. Project personnel and supervisors will visually monitor the TMF on a regular basis and undertake mitigation measures as necessary which may include the following:

– The TMF will be regularly monitored for tailings beach saturation and dust emissions. Tailings spigots will be rotated as required to maintain beach saturation; additional spigots or dust suppression may be required;
– The closure cover over the tailings material will consist of a combination of a geosynthetic reinforcement layer, non-potentially acid generating (NPAG) waste rock (nominal 2 to 3 m thick), till (0.45 m thick), and topsoil (0.15 m thick); and,
– Vegetate closure cover to prevent erosion and dust generation.

6. Control Measures

Control measures to reduce fugitive dust emissions should take into account the source of the dust emissions, the dispersion conditions, and the location of sensitive areas in order to avoid relevant impacts of dust emissions on receptors.

Control measures are implemented to reduce the generation and/or dispersion of fugitive dust emissions. These control measures can be classified as follows:

– **Preventative Procedure**: Measures pertaining to the design and installation of structures and the operating procedures which are implemented on a regular basis in order to prevent the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.

– **Reactive Control Measures**: Measures which are implemented in the event of unexpected circumstances which can lead to the generation of dust and/or the dispersion of dust emitted reaching sensitive areas.

Table 2 presents a list of preventative procedures and control measures that may be used to mitigate fugitive dust emissions that are associated with the Project activities.

Table 2 Description of Preventative Procedures and Control Measures that may be used for Potential Fugitive Dust Emissions

Preventative Procedure/Control Measure	Description	Frequency
Applying water suppressant (with or without chemical additives)	Water suppressant sprayed on the roads. Applying water to road surfaces reduces the potential for dust to be picked up by winds.	Water will be applied to the roads on a daily basis based on a number of conditions, including climatic conditions (e.g., windy dry day vs. a precipitation day), season, etc.
Spray bar	The crushing equipment equipped with spray bars. Applying water suppressant to the crushed material reduces the potential for dust to be picked up by winds.	The watering rate will be set, as needed, to suppress visible dust based on climatic conditions (e.g., windy dry day vs. a precipitation day).
Grizzly screen system with Wheel washing station	Use of a wheel washing station with grizzly screen system at the PA exit to help minimize dirt track-out.	All heavy vehicles will need to pass over grizzly screen prior to leaving the PA. The wheel washing station can also be setup, which will be operated during conducive seasons such as Spring, Summer, and Fall.
Optimized truck routes	Optimize truck routes for each transport activity occurring within the PA to minimize the distances travelled. Optimized truck routes provide the most appropriate traffic flow for the activities occurring within the PA. This is an effective best management practice as it reduces the amount of dust kick up by minimizing trip distance.	The truck route optimization will be subject to change as the Project develops.
Speed limits	Speed limit will need to be set throughout the PA to minimize emissions of fugitive dust from vehicular traffic.	A speed limit will be required for all vehicles travelling within the PA depending on weight and purpose.
Maintaining the stockpile sizes, appropriate drop heights, and material type	Materials are dropped onto the stockpiles by loader, stacker, or truck. Efforts will be made to minimize the drop height wherever possible.	Stockpile size, location, material type, and material drop heights to be monitored and maintained daily.
Berms	Berms will be constructed around the perimeter of the East and West Pits	Berms will be constructed prior to the operations phase of the Project. Maintenance of the berms and pit slopes will be carried out throughout the life of the pit.
Vegetation	Prior to each phase of excavation, Anaconda will ensure the designated vegetation will be in place. This vegetation will help prevent fugitive dust from escaping the PA.	Vegetation will be planted as per the reclamation and closure plan.

The highest risk source of fugitive dust emissions is considered to be vehicle traffic on unpaved roadways. Therefore, applying water suppressant (with or without chemical additives) to the roads is considered to be the highest priority with respect to fugitive dust mitigation.

The images below demonstrate the water suppressant and grizzly screen mitigation methods that may be deployed in the PA.

Figure 1 Water Truck* (left) and Grizzly Screen (right)

* *Image taken from Figure 12 or the Technical Bulletin "Management Approaches for Industrial Fugitive Dust Sources" dated February, 2017.*

7. Meteorological Data

As the Project will process aggregate material in an outdoor environment, there is the potential for wind to pick up and transport fine dust particles. Therefore, it is important to have an understanding of the local meteorological conditions and how they might affect fugitive dust emissions.

Five years (2014-2018) of unprocessed hourly meteorological data for the Project Facility was obtained from Historical Data of Environment Climate Change Canada for the Port Hawkesbury station. Port Hawkesbury, which is approximately 54 km away from the PA, was selected since it recorded cloud cover, which is a necessary component in calculating a range of variable for plume dispersal. The hourly data generated included many factors which affect the dispersion of air compounds including wind speed, wind direction, temperature, ceiling height, and atmospheric stability. The data was 94.23% complete with a calm wind frequency of 2.66%.

The data was converted into a wind rose plot (WRPLOT) supported file format (USEPA SAMSON format). Wind roses and wind speed frequencies were then generated using WRPLOT to assess the local wind speeds and wind directions. The wind rose plot is presented on Figure 2 and the wind class frequency distribution is presented on Figure 3. The wind rose plot demonstrates that the predominant wind directions are blowing towards the southeast and that approximately 65 percent of the winds have a speed of 5.7 metres per second (m/s) or less.

8. Inspection, Maintenance, and Documentation

The presence of dust will be visually monitored continuously by site staff, and control measures will be implemented on an as-needed basis. In addition, daily inspections of processing equipment (including crushers, conveyors, etc.) will be conducted by the equipment operators to verify equipment is operating as intended. The housekeeping practices will be reviewed as part of these daily inspections, and further practices required, if any, will be identified at that time. As part of the daily process inspections, the weather conditions will be reviewed and the temperature and windspeed will be documented in the daily logs. If the temperature is greater than 20 degrees Celsius (°C) and wind speeds are in excess of 5 m/s process inspections will occur twice per day.

On a bi-weekly basis, Project personnel will conduct a full walkthrough of the PA, including pertinent perimeter inspections to identify any potential areas of concern related to the generation of fugitive dust. The Project personnel should also make note of visible activities being conducted outside the perimeter of the PA. Should any off-site operation cause concern for adverse dust impacts near the PA, more regular inspections and maintenance procedures may need to be implemented. Additionally, all applicable Project personnel will be directed to be cognizant of any potential fugitive dust emissions from Project activities and will be instructed to communicate potential issues to Anaconda management immediately upon detection.

The bi-weekly inspection will include special attention to the following areas:

– Unpaved roads/areas;
– Outdoor stockpiles (wind erosion and drop operations);
– Material loading/unloading areas; and,
– Berms.

Daily observations will be logged and filed as per standard procedures. Bi-weekly fugitive dust checks will be completed in a similar fashion to the example checklist provided in Appendix A. Based upon the findings, equipment maintenance will be completed and housekeeping practices will be reviewed and modified, as appropriate.

The documentation requirements for this fugitive dust BMPP includes Anaconda recording, in a log book, each time a specific preventative and control measure described in the Dust BMPP is implemented. Anaconda shall record, at a minimum:

– The date when each dust control measure is installed, including a description of the control measure;
– The date when each new preventative measure or operating procedure to minimize emissions is implemented, including a description of the preventative measure or operating procedure; and,
– The date, time of commencement, and time of completion of each periodic activity conducted to minimize emissions, including a description of the preventative measure/procedure and the name of the individual performing the periodic activity.

9. Training

As part of maintaining best management practices for controlling and preventing fugitive dust emissions, an initial and on-going training program will be provided for all applicable staff. Personnel will be employed throughout the life of the Project to supervise, direct, monitor, and implement the management actions required by the Dust BMPP. Personnel requiring specific training will be identified by Anaconda and will receive such training prior to assuming any related responsibility. All employees will be made aware of the general issues and concerns surrounding dust generation as part of their routine health and safety induction and training. Specific training requirements for each operational post

will be maintained and a record kept of the training received by each person. Training and instruction for staff with duties related to activities that may cause fugitive dust will involve:

– Problem recognition: this training will focus on the potential sources of fugitive dust, how to recognize them, and the nature of appropriate follow-up procedures;
– Personal safety practice: these training courses will instruct employees on correct behaviors to avoid exposure to and the effects of fugitive dust; and,
– Job-specific task training would instruct personnel how to implement fugitive dust management practice while performing their specific job functions.

Anaconda will ensure that all new hires including Anaconda personnel and contractors that will be engaged in the associated work listed in this Dust BMPP will be familiar with this Dust BMPP.

10. Dust BMPP Review and Continuous Improvement

Inspections and monitoring procedures will assist Anaconda personnel with the maintenance of an effective Dust BMPP. The Dust BMPP should be monitored and updated, as follows:

– If there are significant changes in the fugitive dust emissions sources (e.g., "as-constructed" Project infrastructure, etc.);
– If there are verified complaints associated with fugitive dust emissions from the Project; and,
– When there are visible dust emissions occurring more frequently and/or at a higher rate (excluding seasonal conditions).

Review of the Dust BMPP is intended to evaluate the effectiveness of the dust control practices and focus on the identification of improvement opportunities that can reduce the risk of complaints related to fugitive dust emissions. A review of the Dust BMPP will ensure it is remaining effective in controlling fugitive dust emissions.

As part of implementing a successful fugitive Dust BMPP, it is important to be aware of areas where fugitive dust emissions can be reduced further. The Project will endeavour to improve its capacity for controlling fugitive dust emissions by identifying areas for potential future improvements and implementing additional practices as appropriate.

11. References

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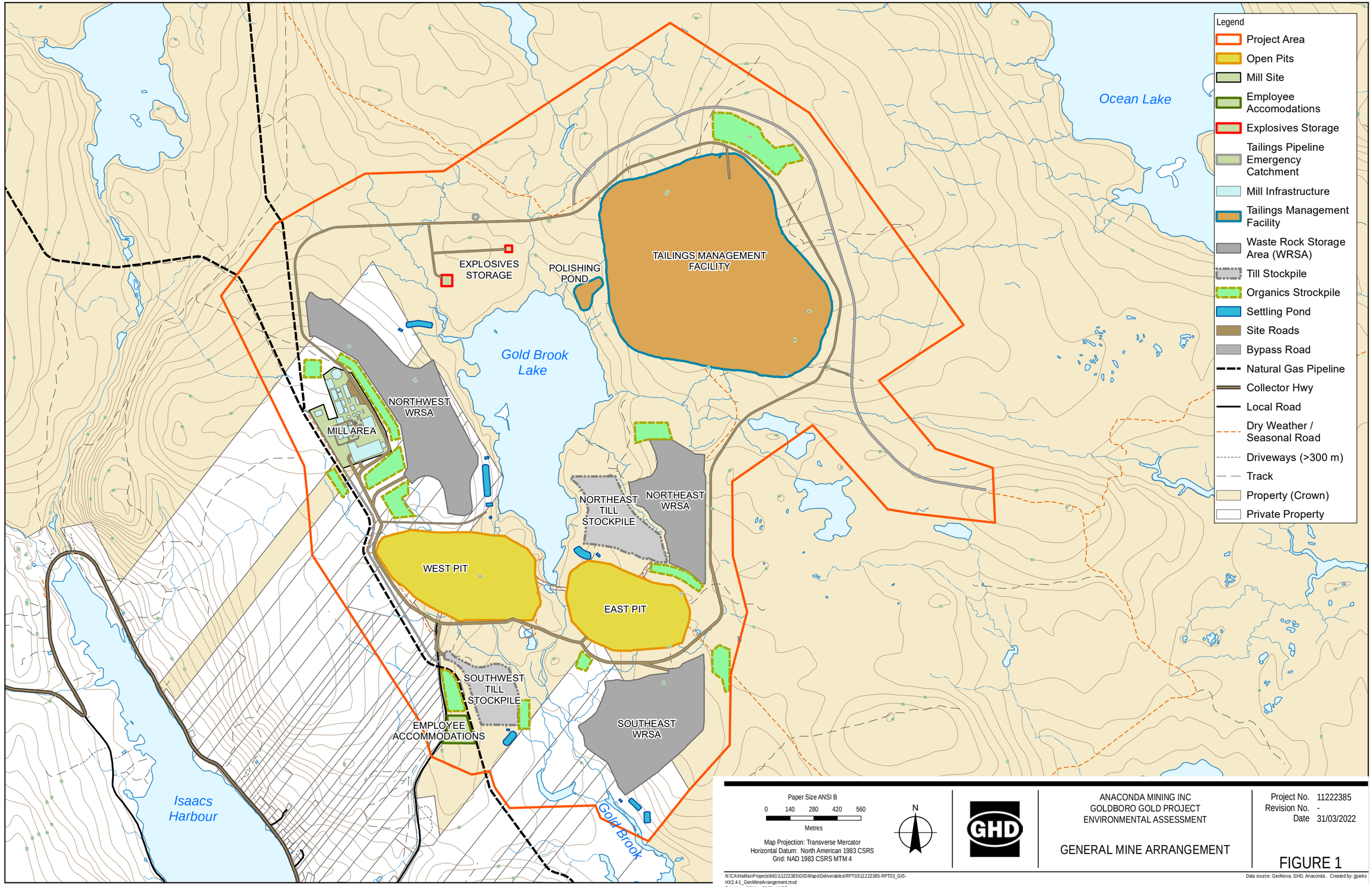

Paper Size ANSI B

0 140 280 420 560

Metres

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983 CSRS
Grid: NAD 1983 CSRS MTM 4

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GHD

ANACONDA MINING INC
GOLDBORO GOLD PROJECT
ENVIRONMENTAL ASSESSMENT

GENERAL MINE ARRANGEMENT

Project No. 11222385
Revision No. -
Date 31/03/2022

FIGURE 1

N:\CA\Halifax\Projects\661\11222385\GIS\Maps\Deliverables\RPT03\11222385-RPT03_GIS-HX2.4-1_GenMineArrangement.mxd
Print date: 02 May 2022 - 14:57

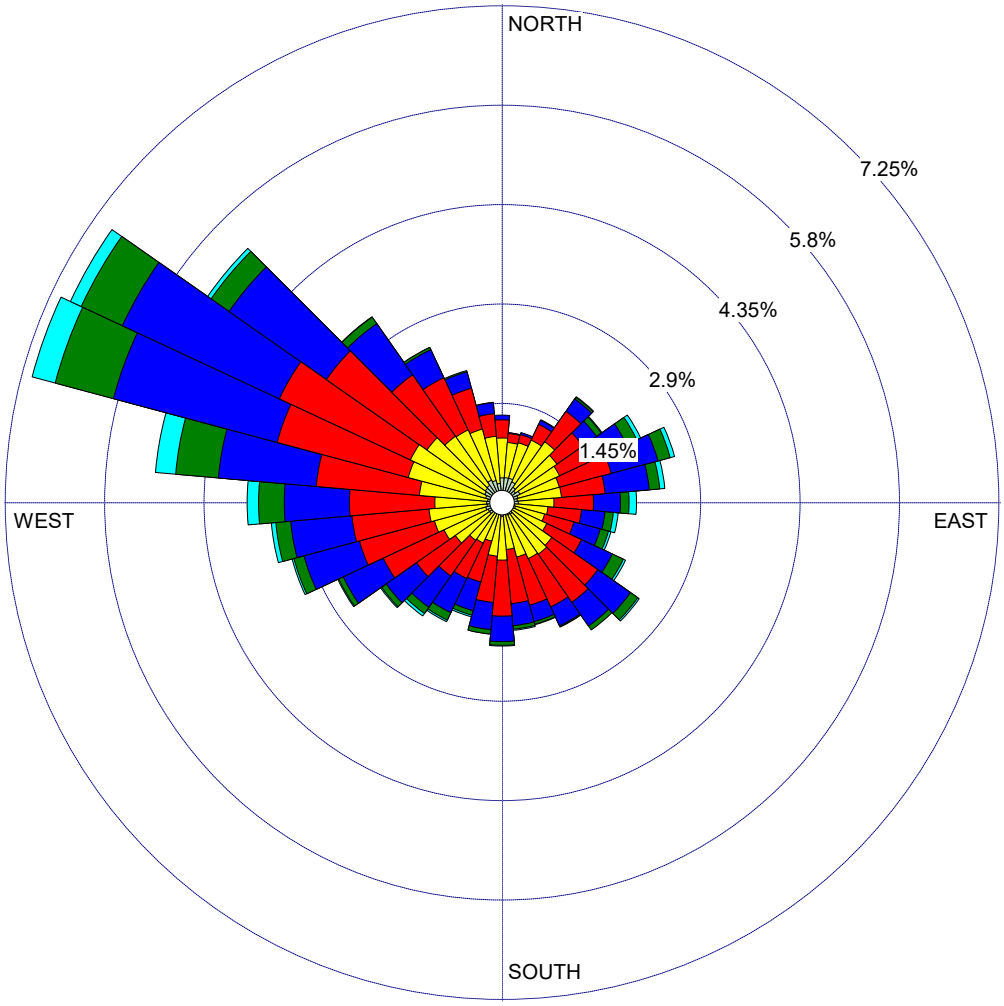
Data source: GeoNova, GHD, Anaconda . Created by: jjparks

WIND ROSE PLOT:

1222385 - Anaconda Mining Inc. Goldboro Gold Project, NS
Station Name: Port Hawkesbury

DISPLAY:

Wind Speed
Direction (blowing from)



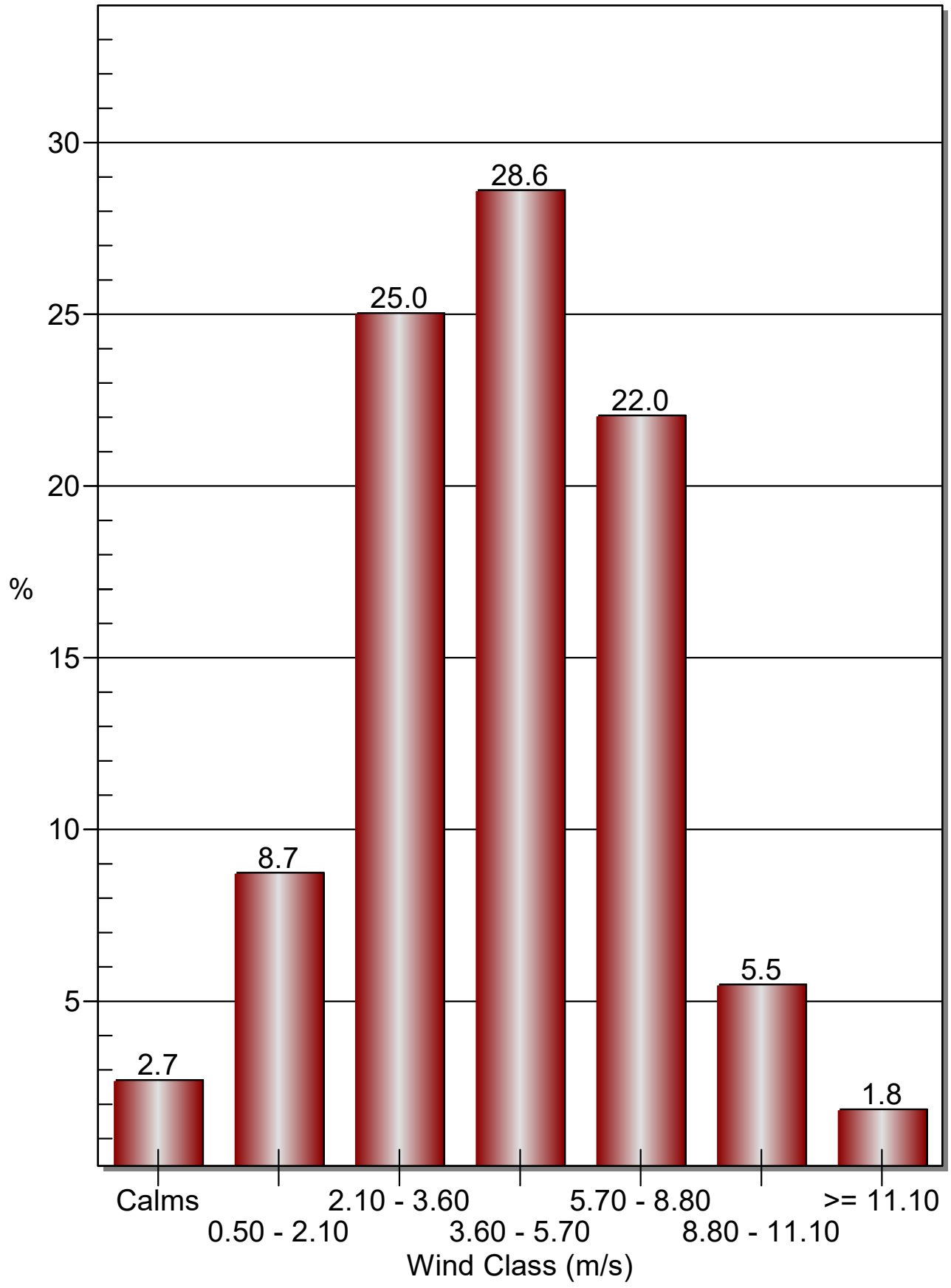
WIND SPEED
(m/s)

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 2.66%

COMMENTS:	DATA PERIOD: **Start Date: 1/1/2014 - 00:00** **End Date: 12/31/2018 - 23:59**	COMPANY NAME: **GHD**	
		MODELER:	FIGURE 2
	CALM WINDS: **2.66%**	TOTAL COUNT: **41294 hrs.**	
	AVG. WIND SPEED: **4.48 m/s**	DATE: **4/4/2022**	PROJECT NO.: **1222385**

Figure 3: Wind Class Frequency Distribution



Appendix A

Fugitive Dust Checklist

Fugitive Dust BMPP Inspection Checklist
Goldboro Gold Project

Completed by: _____

Date: _____

Weather Conditions: **Precipitation?** **Yes** ☐ **No** ☐ **Rain** ☐ **Snow** ☐ **Temperature:** _____ °C **Wind Speed:** **Calm** ☐ **Moderate** ☐ **High** ☐ **Wind Direction (blowing from):** _____

SOURCE	INSPECTION POINTS	Yes	No	NOTES
Paved Roads	Are dust emissions observed to be under control?	☐	☐	
	Are vehicles obeying the posted speed limit?	☐	☐	
	Is washing/sweeping required?	☐	☐	
Unpaved Roads	Are dust emissions observed to be under control?	☐	☐	
	Is water spraying required?	☐	☐	
	Are vehicles obeying the posted speed limit?	☐	☐	
Stockpiles	Are dust emissions observed to be under control?	☐	☐	
	Is water spraying required?	☐	☐	
Transfer Locations	Are dust emissions observed to be under control?	☐	☐	
	Are drivers required to unload at lower height	☐	☐	
Berms	Are dust emissions observed to be under control?	☐	☐	
	Are berms in good condition	☐	☐	

Additional Comments / Corrective Action:


GHD

Appendix D.4

Light Impact Assessment

Light Impact Assessment

Goldboro Gold Project

Anaconda Mining Inc.

20 May 2022

The Power of Commitment

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Document status

Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S3	00	Punith Nallathamby	Matt Griffin		Matt Griffin		May 4, 2022
S4	01	Punith Nallathamby	Matt Griffin		Matt Griffin		May 20, 2022

Contents

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1. Introduction

GHD Limited (GHD) has undertaken an analysis of the proposed lighting installations for the Anaconda Mining Inc. (Anaconda) Goldboro Gold Project (the Project) located in Goldboro, Guysborough County, Nova Scotia (NS). The Project is located approximately 175 kilometres (km) northeast of Halifax, 60 km southeast of Antigonish, and 1.6 km northeast of the community of Goldboro on the eastern shore of Isaacs Harbour, in Guysborough County, NS, Canada.

Anaconda proposes to develop the Project as a 4,000-tonne per day (tpd) mine and processing facility. The mine plan includes two open pits (East Pit and West Pit), an ore processing facility, a tailings management facility (TMF), three waste rock storage areas (WRSAs), overburden and organic stockpiles, support buildings, and associated infrastructure. The anticipated mine life for extraction of ore is approximately 11 years.

For the purposes of this assessment, a Project Area (PA) was defined as the footprint of Project related infrastructure plus a buffer of 100 – 200 m. Light levels were also assessed at the Proposed Property Boundary for the Project. Land required for Project development is comprised of both private and Crown properties. Private property transactions and Crown Land Lease Applications are on-going.

The scope of the Project includes activities associated with construction, operation, and closure. Project construction activities will include clearing and grubbing the overburden and organic stockpiles, WRSAs, pit, plant, and TMF areas, and construction of the initial lift of the TMF, plant site, secondary access roads, construction laydowns, Run-of-Mine (ROM) pad, surface water management and other site infrastructure. The operation phase will include conventional ore extraction methods (drilling, blasting, loading, and hauling), ore processing, and waste management. ROM ore will go directly to the crusher while stockpiled high-grade and low-grade ore will be progressively processed throughout the mine life. Non-ore bearing waste rock, not used for construction or backfill, will be stockpiled at its final disposal point, managed and reclaimed in place. The closure phase will include earthworks and demolition required to return the Project Area to a safe, stable, and vegetated state, and all monitoring and treatment, if required.

The impacts of the proposed lighting installations in the PA on nearby sensitive receptors were quantified and compared with the guidelines published by The Institution of Lighting Engineers (ILE) in the document entitled "Guidance Notes for the Reduction of Obtrusive Light".

2. Definitions

Light trespass is defined as the spilling of light beyond the boundary of the property or area being lit and is primarily a concern at night. Excess obtrusive light can be a nuisance to others, wastes electricity, and indirectly results in unnecessary emissions of greenhouse gases. Light trespass, or light pollution, can also negatively impact the surrounding ecosystem by disrupting the habits of native species. As such, it is important to understand the potential light impacts from this development, and to endeavour to minimize them.

Luminous flux is the quantity of the energy of the light emitted per second in all directions. The unit of luminous flux is lumen (lm).

Illuminance refers to the amount of light that covers a surface. If Φ is the luminous flux and S is the area of the given surface then the illuminance E is determined by $E = \Phi/S$. Illumination is quantified in terms of lux. One lux is the illuminance of a 1 square metres (m^2) surface uniformly lit by 1 lm of luminous flux.

A residence that may experience an objectionable encroachment of light beyond the Proposed Property Boundary is referred to as a *residential receptor* or *sensitive receptor.* This undesirable light spill may include the entry of unwanted light through windows, or direct line of sight to bright light sources.

3. Baseline Conditions

The Project is located in a historical mining area surrounded by forest, waterbodies, watercourses and wetlands. The nearest permanent residential receptors to the Project are houses along Goldbrook Road approximately 1.3 km from the nearest primary Project lighting source.

The ILE has developed an Environmental Zone classification system whereby the existing ambient light levels at a site are used to determine the recommended maximum amount of light trespass to nearby receptors. The classification for rural areas, small villages, or relatively dark urban locations is "E2 Low district brightness areas". Based upon this classification, the light trespass limit at an off-site receptor after curfew (typically considered to be 11 p.m.) is 1 lux, which is the accepted equivalent to moonlight. The after curfew (post-curfew) limit was used to assess the impact of lighting from the Project as mining operations under full-scale operation are scheduled to be 24 hours per day.

4. Method of Assessment

Anaconda provided GHD with a list of equipment that are expected to be sources of light during operations. From known information about the power output of the installations and typical efficiencies, the luminous flux of each light source was calculated:

$$Luminous\ Flux\ (lm) = Power\ Output\ (watts) \times Efficiency\ \left(\frac{lumens}{watt}\right)$$

The power output of the proposed lighting was known from manufacturer information, and the efficiency was based on typical industry published values, as presented in the following table.

Type of Light	Typical Efficiency (lumens/watt)
LED	58 – 113
Compact Fluorescent	70
Linear Fluorescent	108
Incandescent	15
Halogen	20
High Pressure Sodium	100

Sample Calculation:

There are four loaders to be operated around the East Pit and West Pit areas, each with six mounted halogen lights having a power output of 65 watts each and with average efficiencies of 20 lumens/watt. The luminous flux of the trucks can be calculated as follows:

$$Power\ Output = 4\ loaders\ \times 6\frac{Lights}{Loader} \times 65\frac{W}{Light} = 1560\ W$$

$$Luminous\ Flux = 1560\ W\ \times 20\frac{lumens}{W} = 31{,}200\ lumens$$

After determining luminous flux estimates for each light source, the impacts of the incident light at the identified sensitive receptors can be determined. There are four main areas across the PA where lighting is to be located:

1. East Pit and West Pit
2. Operational Facilities (Mill Area)
3. WRSAs
4. Haul Roads

As a simplistic approach, the closest distance from any of the primary light sources to the sensitive receptor was used to determine the impact at the sensitive receptor. This means that it has been conservatively assumed that all equipment and lights are located at the operating location that is closest to the sensitive receptor. In actual operation, the majority of the equipment and lights will be at greater distances than what is provided in Table 1. The illuminance level at a receptor is equal to the combined total from each light source. It has been assumed that 50 percent of the incident light will not reach the receptor due to the tree cover surrounding the PA. The following equation was used to estimate the illuminance contribution from each light source:

$$E = \frac{\phi}{d^2} \times 50\%$$

Where:

E = illuminance (lux)

ϕ = luminous flux (lm)

d = distance to the receptor (m)

Sample Calculation:

The luminous flux from the four loaders at the East Pit and West Pit is an estimated 31,200 lm. The distance to the Receptor 1 from the location of any primary lighting sources is approximately 1,903 m. The illuminance contribution from the loaders to Receptor 1 can be estimated as follows:

$$Illuminance = \frac{31{,}200\ lumens}{(1{,}903\ m)^2} \times 50\% = 4.31 \times 10^{-3}\ lux$$

This method was used to determine the estimated illuminance at each receptor from each of the light sources. The sum of all contributions for each receptor represents the total estimated level of light that will be present at the receptor.

Table 1 provides a summary of the light sources in the PA and the expected impacts from each source on the receptors. The combined effects of all the applicable sources during pre-curfew as well as post-curfew at each receptor were summed and compared to the illuminance limits recommended by the ILE, as shown in Table 2.

For the purposes of this assessment, "pre-curfew" was assumed to be before 11 PM and included road activity as well as Project activities. "Post-curfew" was between 11 PM and 7 AM and included overnight activities in the PA including road activity. The summary of results from the Light Impact Assessment is provided in the results section below and in Table 2.

5. Results and Discussion

The calculated light levels at the identified sensitive receptors are below the limits recommended by the ILE guidelines during both pre- and post-curfew conditions, as shown in Table 2.

The predicted illuminance levels represent the worst-case operating conditions of the Project. The assessment considers when all of the mobile equipment and fixed equipment at the mine would be in use at the same time and at

the location closest to the receptors while illuminating towards receptors. The areas surrounding the PA are wooded with varying topography and inhibit the spread of light. It was assumed for screening purposes that 50 percent of the light will not reach the receptors due to directionality and line of sight obstructions. In reality, the amount of light blocked by the surrounding woodland and topographic changes will likely be much greater than this (>90 percent), especially during seasons when trees are in full bloom.

The results presented on Table 2 show that the ILE Guidance Light Limits (pre-curfew and post-curfew) are met at all receptors.

Effects of light on fauna are not well understood and are generally described qualitatively. Some insects are attracted by nighttime lighting. Bats may follow these insects into human-occupied areas in order to hunt. Nighttime lights can adversely affect birds which fly at night and can increase the incidence of bird impacts on buildings (especially highly reflective buildings or glass buildings where interior lighting may confuse birds). Nocturnal animals may be adversely affected by excessive light in the nighttime hours.

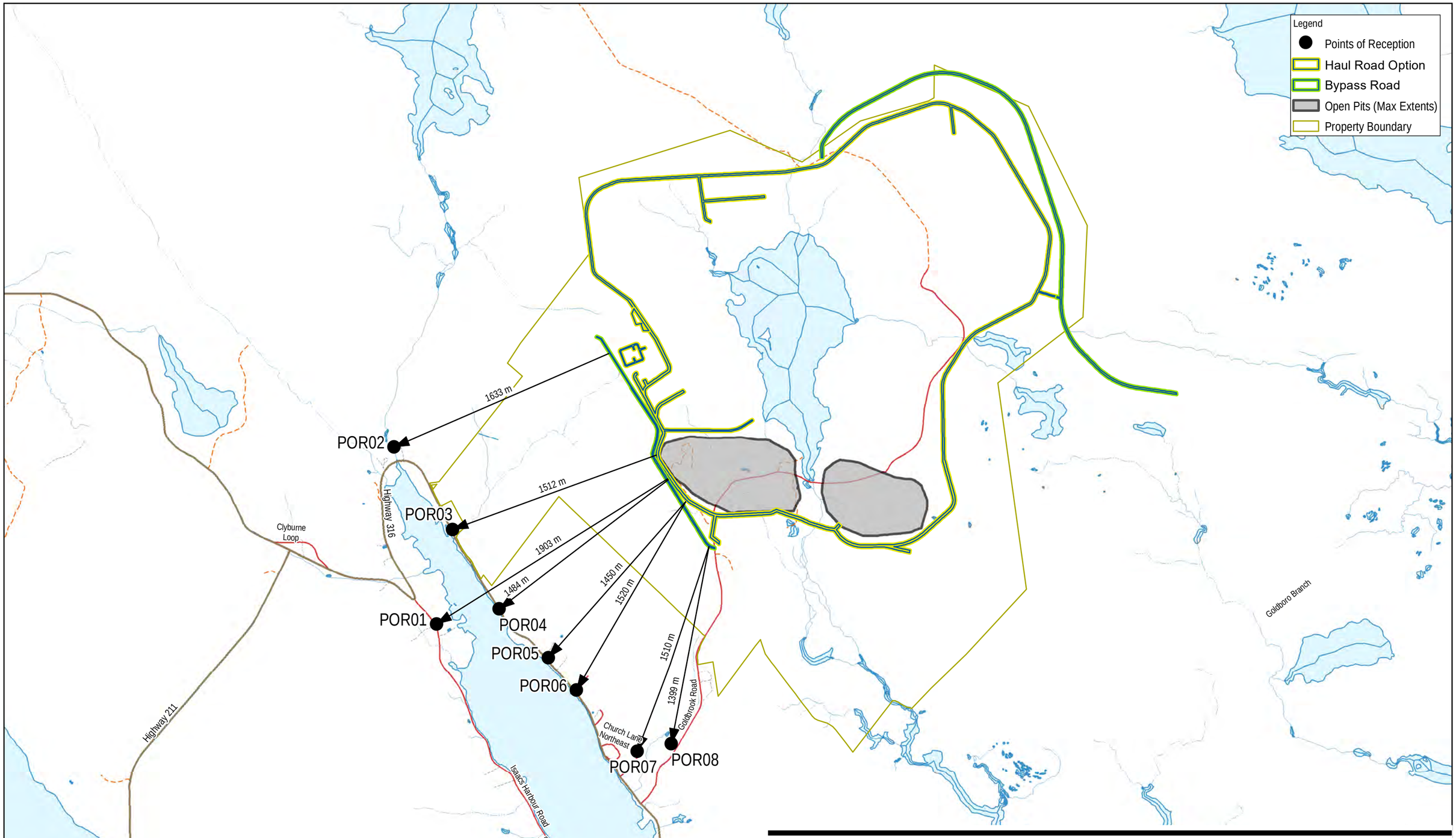
Nocturnal animals may be affected by nighttime light and change their movement patterns or activities as a result. Deer and moose prefer dawn and dusk hours, both of which may be affected by project lighting. Deer and moose prefer to avoid people, if possible, and may modify their behaviour/distribution due to the presence of the mine site, regardless of lighting.

6. Best Management Practices

Best management practices can minimize the light pollution incurred during the daily operation of a facility. Anaconda has indicated that all of the floodlights in the PA will employ a "full horizontal cut off". A full horizontal cut off allows no direct light emissions above a horizontal plane through the luminaire's lowest light emitting part. This practice has been shown to significantly reduce light trespass in other applications. Where possible, all lighting fixtures will be facing towards the working area, to limit obtrusive light "spill" to nearby receptors. Also, Anaconda has indicated that lighting not being utilized will be turned off when practical.

The majority of the light fixtures to be used in the PA will utilize LED Light. This is one of the more energy efficient types of light, yielding significantly more lumens per watt than traditional halogen and incandescent bulbs, in addition to having a longer lifespan. Where possible, Anaconda will choose energy efficient options for light replacements or additions.

Routine monitoring of the light levels during the construction and operations phases using a light meter will provide an opportunity to compare actual light levels with theoretical values. More refined light level measurements could assist in further quantifying the effects of light sources on the sensitive receptors.



Paper Size ANSI B

0 170 340 510 680

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 20N

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GHD

ANACONDA MINING INC.
GOLDBORO GOLD PROJECT
LIGHT IMPACT STUDY

SITE AND POINT OF RECEPTION LOCATION PLAN

Project No. 11222385
Revision No. -
Date Apr 28, 2022

FIGURE 1

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Print date: 28 Apr 2022 - 15:08

Data source: .

Table 1

Light Source Summary Tables
Goldboro Gold Project
Anaconda Mining Inc.
Eastern Goldfields District, Goldboro, Nova Scotia

4.31E-03 'ercentage of incident lumens assumed to reach the receptor considering directionality and line of site obstructions: **50%**

							Receptor #1 (R1)- Isaacs Harbour Road Residence		Receptor # 2 (R2)- Residence on unknown road, ~100 meters north of Marine Drive		Receptor # 3 (R3)- Residence on Marine Drive		Receptor # 4 (R4) - Residence on Marine Drive		Receptor # 5 (R5) - Residence ~100 meters northeast of Marine Drive		Receptor # 6 (R6) - Residence ~135 meters northeast of Marine Drive		Receptor # 7 (R7) - Residence located ~ 185 meters northeast of Marine Drive		Receptor # 8 (R8) - Residence on unknown road, ~500 meters northeast of Marine Drive	
Area	**Source**		**Power**	**Qty**	**Total Power**	**Luminous Flux (1)**	**Approx. Distance**	**Illuminance (2)**	**Approx. Distance**	**Illuminance (2)**	**Approx. Distance**	**Illuminance (2)**	**Approx. Distance**	**Illuminance (2)**	**Approx. Distance**	**Illuminance (2)**	**Approx. Distance**	**Illuminance**	**Approx. Distance**	**Illuminance**	**pprox. Distanc**	**Illuminance**
			(watts)		**(watts)**	**(lumens)**	**(m)**	**(lux)**	**(m)**	**(lux)**	**(m)**	**(lux)**	**(m)**	**(lux)**	**(m)**	**(lux)**	**(m)**	**(lux)**	**(m)**	**(lux)**	**(m)**	**(lux)**
Open Pit																						
	Mobile Equipment (3)																					
	Trucks (various)	6 mounted halogen lights	390	15	5,850	117,000	1,903	1.62E-02	1,633	2.19E-02	1,512	2.56E-02	1,484	2.66E-02	1,450	2.78E-02	1,520	2.53E-02	1,510	2.57E-02	1,399	2.99E-02
	Excavators	6 mounted halogen lights	390	6	2,340	46,800	1,903	6.46E-03	1,633	8.77E-03	1,512	1.02E-02	1,484	1.06E-02	1,450	1.11E-02	1,520	1.01E-02	1,510	1.03E-02	1,399	1.20E-02
	Loaders	6 mounted halogen lights	390	4	1,560	31,200	1,903	4.31E-03	1,633	5.85E-03	1,512	6.82E-03	1,484	7.08E-03	1,450	7.42E-03	1,520	6.75E-03	1,510	6.84E-03	1,399	7.97E-03
	Drills	6 mounted halogen lights	390	7	2,730	54,600	1,903	7.54E-03	1,633	1.02E-02	1,512	1.19E-02	1,484	1.24E-02	1,450	1.30E-02	1,520	1.18E-02	1,510	1.20E-02	1,399	1.39E-02
	Dozers	6 mounted halogen lights	390	5	1,950	39,000	1,903	5.38E-03	1,633	7.31E-03	1,512	8.53E-03	1,484	8.85E-03	1,450	9.27E-03	1,520	8.44E-03	1,510	8.55E-03	1,399	9.96E-03
	Grader	6 mounted halogen lights	390	1	390	7,800	1,903	1.08E-03	1,633	1.46E-03	1,512	1.71E-03	1,484	1.77E-03	1,450	1.85E-03	1,520	1.69E-03	1,510	1.71E-03	1,399	1.99E-03
	Mobile Floodlight Tower (4)	2 metal halide lights	4,200	2	8,400	924,000	1,903	1.28E-01	1,633	1.73E-01	1,512	2.02E-01	1,484	2.10E-01	1,450	2.20E-01	1,520	2.00E-01	1,510	2.03E-01	1,399	2.36E-01
Operational Facilities																						
	Mobile Floodlight Tower (4)	4 metal halide lights	4,200	2	8,400	924,000	1,903	1.28E-01	1,633	1.73E-01	1,512	2.02E-01	1,484	2.10E-01	1,450	2.20E-01	1,520	2.00E-01	1,510	2.03E-01	1,399	2.36E-01
	Crusher (Mobile Equipment)	6 mounted halogen lights	390	1	390	7,800	1,903	1.08E-03	1,633	1.46E-03	1,512	1.71E-03	1,484	1.77E-03	1,450	1.85E-03	1,520	1.69E-03	1,510	1.71E-03	1,399	1.99E-03
	Pole Mounted Lights (5)	LED roadway lights	75	28	2,100	241,500	1,903	3.33E-02	1,633	4.53E-02	1,512	5.28E-02	1,484	5.48E-02	1,450	5.74E-02	1,520	5.23E-02	1,510	5.30E-02	1,399	6.17E-02
Waste Rock Storage																						
	Mobile Floodlight Tower (4)	4 metal halide lights	4,200	2	8,400	924,000	1,903	1.28E-01	1,633	1.73E-01	1,512	2.02E-01	1,484	2.10E-01	1,450	2.20E-01	1,520	2.00E-01	1,510	2.03E-01	1,399	2.36E-01

POST-CURFEW	**Total, R1:**	4.58E-01	**Total, R2:**	6.22E-01	**Total, R3:**	7.26E-01	**Total, R4:**	7.53E-01	**Total, R5:**	7.89E-01	**Total, R6:**	7.18E-01	**Total, R7:**	7.28E-01	**Total, R8:**	8.48E-01
PRE-CURFEW	**Total, R1:**	4.58E-01	**Total, R2:**	6.22E-01	**Total, R3:**	7.26E-01	**Total, R4:**	7.53E-01	**Total, R5:**	7.89E-01	**Total, R6:**	7.18E-01	**Total, R7:**	7.28E-01	**Total, R8:**	8.48E-01

Unless specified, the average Lumens /Watt used were as follows:

LED lights typically are 58-113 lumens/ per watt.
Compact Flourescent lights are typically 70 lumens/watt.
Linear Flourescent lights are typically 108 lumens/watt.
Incandescent lights are typically 15 lumens/watt.
Halogen lights are typically 20 lumens/watt.
High Pressure Sodium lights are typically 108 lumens/watt.

Source: United States Department of Energy, Solid-State Lighting LED Basics https://energy.gov/eere/ssl/led-basics

Illuminance = Luminous Flux/square of distance travelled; therefore 1 Lux = 1 lumen/m2.

Mobile equipment with headlights was assumed to be stationary for simplicity. It was assumed that each piece of equipment has 6

The Generac Magnum MLT3060M floodlight towers are expected to be used on Site. Manufacturer's specification were used to determine a luminous flux of 462,000 lumens. See Appendix A for Mobile Floodlight Tower specifications.

Illuminance for Pole Mounted Lights based on a 75 W LED light, with a luminous flux of 8625 lumens, typical for site lighting applications. See Appendix A for LED lighting specifications.

Table 2

Comparison of Light Levels at Receptors with Published Guidelines
Goldboro Gold Project
Anaconda Mining Inc.
Goldboro, Nova Scotia

Receptor	Description	Illuminance (lux)		ILE Guidance Limit (1)		Percentage of Criteria (3)	
		Pre-Curfew (2)	Post-Curfew	Pre-Curfew (2) (lux)	Post-Curfew (2) (lux)	Pre-Curfew (%)	Post-Curfew (%)
R1	Isaacs Harbour Road	4.58E-01	4.58E-01	5	1	9.16%	45.81%
R2	Residence on unknown road, ~100 meters north of Marine Drive	6.22E-01	6.22E-01	5	1	12.44%	62.21%
R3	Residence on Marine Drive	7.26E-01	7.26E-01	5	1	14.51%	72.56%
R4	Residence on Marine Drive	7.53E-01	7.53E-01	5	1	15.07%	75.33%
R5	Residence ~100 meters northeast of Marine Drive	7.89E-01	7.89E-01	5	1	15.78%	78.90%
R6	Residence ~135 meters northeast of Marine Drive	7.18E-01	7.18E-01	5	1	14.36%	71.80%
R7	Residence located ~ 185 meters northeast of Marine Drive	7.28E-01	7.28E-01	5	1	14.55%	72.75%
R8	Residence on Goldbrook Road, ~500 meters northeast of Marine Drive	8.48E-01	8.48E-01	5	1	16.95%	84.76%

Assumptions:

(1) Based on an assumed classification of the area as Environmental Zone E2- Low district brightness areas.
Source: Guidance Notes for the Reduction of Obstrusive Light, The Institute of Lighting Engineers (2011).

(2) Curfew = the time after which stricter requirements for the control of obtrusive light will apply. If not defined by the local planning authority, the ILE suggests 11:00 p.m.
Source: Guidance Notes for the Reduction of Obstrusive Light, "Table 1-Obtrusive Light Limitations for Exterior Lighting Installations", The Institute of Lighting Engineers (2011).

(3) Based on conservative assumption of 50% reduced light due to directionality and line of site obstructions.


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