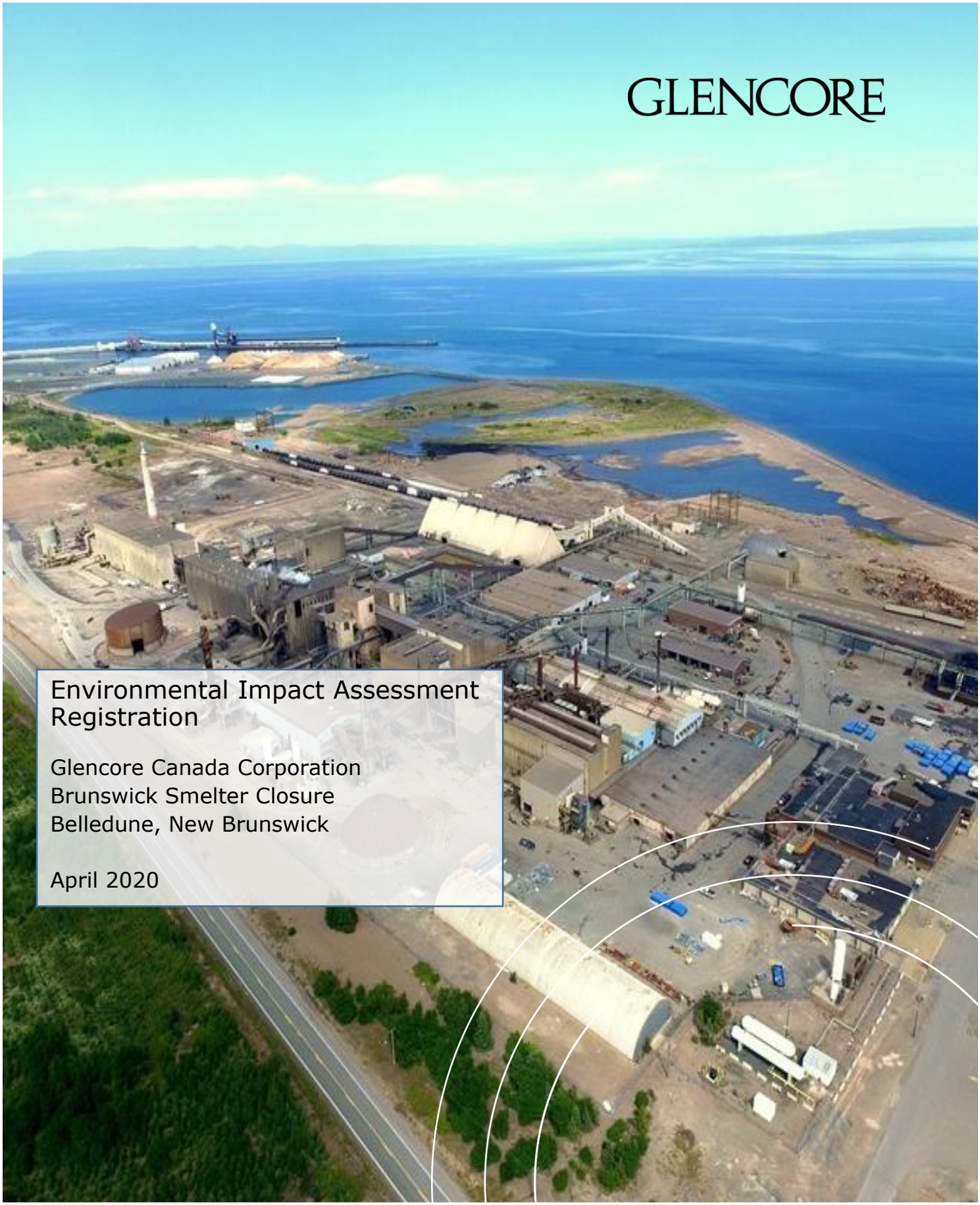


Environmental Impact Assessment Registration

Glencore Canada Corporation
Brunswick Smelter Closure
Belledune, New Brunswick

April 2020

Brunswick Smelter Closure
EIA Registration

TABLE OF CONTENT:

APPENDICES:

1.0 THE PROPONENT

(a) NAME OF PROPONENT: Glencore Canada Corporation

(b) ADDRESS OF PROPONENT:

Brunswick Smelter
692 Main Street
Belledune, NB
E8G 2M1

(c) PRINCIPLE PROPONENT CONTACT:

Rick Schwenger
Reclamation Manager
692 Main Street
Belledune, NB
E8G 2M1

Nat Bepperling
Site Manager
692 Main Street
Belledune, NB
E8G 2M1

(d) PRINCIPLE CONTACT PERSON FOR PURPOSES OF ENVIRONMENTAL IMPACT ASSESSMENT:

Kelly Longval
Project Manager
692 Main Street
Belledune, NB
E8G 2M1

(e) PROPERTY OWNERSHIP:

Infrastructure Ownership:
The Brunswick Smelter and its associated infrastructure is owned by Glencore Canada Corporation (Glencore). Glencore also owns the slag pile located south of the Smelter Area (also referred to as the New Slag Pile), the Jacquet River Pumphouse and associated freshwater pipeline and reservoir, which are part of the Closure Plan.

Land Ownership:
The project will take place on land fully owned by Glencore, with the following two exceptions:

(1) Demolition of the conveyors and transfer stations on Terminal 1 belonging to the Port of Belledune;
(2) Soil reclamation, if any, required in the cemetery owned by the Roman Catholic Bishop of Bathurst.

Additional details are available in section 2(d) of this application and in Section 5.2 Land Ownership of the GHD Closure Plan - Prefeasibility Study 2019 Update (File No.11198639), referred to as the "GHD Closure Plan", available in Appendix A of this application.

2.0 THE UNDERTAKING

(a) NAME OF THE UNDERTAKING: Brunswick Smelter Closure Project

(b) PROJECT OVERVIEW:

The Brunswick Smelter is a primary lead/silver smelter located at 692 Main Street in Belledune, NB (Figure 1 of the GHD Closure) and is owned by Glencore. The facility was originally commissioned in 1966 by East Coast Smelting. The Brunswick Smelter was originally designed as a lead-zinc smelter to produce metallic lead and zinc from concentrates produced locally at the Brunswick Mine Site located 35 kilometers south of Bathurst. The facility also formerly included a fertilizer plant (which closed in 1995). The fertilizer plant initially produced a monoamonium phosphate product and later di-ammonium phosphate product, using by-products from the smelting process.

In March 2013, the Brunswick Mine Site officially ceased operation, resulting in the elimination of the main feedstock for the Brunswick Smelter. The Facility remained operational until December 2019 by importing a variety of feedstocks, continuing to operate as a primary lead smelter with a reported production capacity of 120,000 tonnes per year.

The Brunswick Smelter facility includes the Smelter Area, Material Handling West Area (MHW), and the Fertilizer Plant located north of Highway 134 in Belledune, NB (collectively referred to as the "Site" or "Facility"). A Site Location Map, Property Plan and Overall Site Plan are provided on Figures 1, 2 and 3, respectively of the GHD Closure Plan. The locations of various Site features are shown on Figure 4 of the same report.

The Material Handling West Area is also known as the Bulk Handling Facility or Belledune Handling Operations (BHO) and these terms may be used interchangeably throughout the application and supporting documents.

In addition to the above mentioned Glencore owned properties directly north of Highway 134 (Smelter Area, MHW Area and Fertilizer Plant), Glencore properties also include an existing slag pile (also referred to as the New Slag Pile) and surrounding land located south of Highway 134 and the conveyors that extend from the MHW Area to the Port.

The decommissioning of the Jacquet River Pumphouse (located off-Site approximately 14 km to the west) and associated reservoir and freshwater pipeline (owned by Glencore) is not included in the current closure plan. Jacquet River Pumphouse supplies freshwater to other commercial/industrial operations in the area as well as several residential properties.

PROJECT AREA

(b.1) The Smelter Area:

SMELTER AREA

The Smelter Area (which is the largest portion of the Site including:

- SRF Building
- Lead Refinery
- Furnace Building
- Metal Storage Building
- Dross Building
- Silver Refinery
- Sinter Plant
- Crusher Building
- Proportioning Plant
- SRF, Secondary Lead, and Sinter Storage Domes
- Smelter Conveyor System and Transfer Houses
- Back 50, Back 40 and process sludge areas
- Acid Plant and associated tanks/pipelines
- Acid Stack
- RMS Building
- Car Unloading Building
- Thaw Shed
- Quonset Storage Dome
- Charge Preparation Building
- WESP
- Belledune Point
- RPW System including building, clarifier, ponds and pool
- WWTP and associated infrastructure (see Section b.2)
- New Slag Pile (see Section b.3)

- Sinter and Furnace Baghouses and stacks

Smelter Area Decommissioning to begin upon ceasing Smelter operations – Jan 2020 (excludes the WWTP and associated infrastructure, some of the rail lines, New Slag Pile and the track scale).

- 12 months duration during which time Glencore employees with the support of local contractors will be responsible for:
    - bulk solid waste and miscellaneous containerized materials will be inventoried as part of the chemical sweep.
    - Concentrates and reagents will be redistributed to other Glencore Facilities.
    - Containerized materials shall be accumulated and temporarily stored at a central collection point. Once the sweep is complete, a commercial waste disposal firm will be retained for the proper packaging, transportation, and disposal of the chemical wastes in accordance with provincial regulations.
    - To the extent possible emptying and disposal of liquids from pipelines, reservoirs and process piping will be completed. Any remaining liquids will be identified and removal/disposal will be included in the scope of work of the demolition contractor;
    - To the extent possible residues such as sludge and dust accumulation will be removed from buildings. Any remaining residue will be identified and removal/disposal will be included in the scope of work of the demolition contractor;
    - Once bulk solids and containerized materials are removed, initial industrial cleaning of the Site shall take place using a combination of low/high pressure wash and vacuum trucks.
    - Testing of Glencore owned transformers for PCBs.

Smelter Area Demolition to begin upon receipt of receipt of Certificate of Determination or Completion of EIA process:

- 12-18 months duration during which time contractors, under the supervision of Glencore employees, will be responsible for most activities on site including but not limited to:
    - Disconnecting of electrical services to the Smelter Area including any pad or pole-mounted transformers prior to decommissioning activities;
    - Inventorying and removal of hazardous and regulated wastes;
    - Final chemical sweep and disposal of any remaining containerized material following requirements for the proper packaging, transportation, and disposal of the chemical wastes in accordance with provincial regulations
    - Final industrial cleaning will include low volume, high-pressure water blasting, steam cleaning, washing with detergent or degreasing soap, and other means and methods. Wastewater will be contained and collected.
    - Asbestos abatement including the removal of friable ACM such as insulation for mechanical equipment, drywall compound, piping and pipe fittings and removal of non-friable ACM such as transite wall panels and floor tiles.
    - Infrastructure demolition including structures, tanks, conveyors, equipment, ducting, piping.
    - Removal of any obsolete rail track and ties;
    - Slabs-on-grade and below grade foundations are to remain in place.
    - The underground services with pipes greater than 0.5 m in diameter (generally including the saltwater intake, effluent piping, storm sewer, and some sanitary sewer infrastructure) at the Site will be excavated and crushed (for concrete

materials) or removed (for steel materials) in order to prevent future ground subsidence causing damage to the protective Site cover following Site closure.

- The underground services with pipes less than 0.5 m in diameter (generally including sanitary sewer, process water and fire suppression infrastructure) at the Site will generally remain in place with service connections to the buildings being abandoned and capped in place.
- The Car Unloading Building in the Smelter has a hopper basement and associated conveyor tunnels that require backfilling. Following removal of the buildings and associated infrastructure, the below-ground portions will be backfilled with imported borrow material form the on-Site borrow pit source. The concrete foundations will be left in place and covered with fill material as part of the final Site grading. The conveyor tunnels will be excavated, crushed and filled with backfill to prevent risk of future subsidence.
- The above ground RPW Pond will be removed during the decommissioning work.
- All petroleum tanks will be cleaned by a licensed petroleum contractor and transported off-Site for disposal (or re-certification and re-use).
- Metal impacted demolition debris including wood, non-asbestos containing material insulation, roofing materials, non-recyclable concrete and concrete blocks will be transported to and disposed of at Brunswick Mine's No. 12 Open Pit upon approval from NBDELG.
- Non-friable ACM, such as roofing materials and transite wall panels will also be placed in a segregated lined roll-off container for disposal at Brunswick Mine's No. 12 Open Pit upon approval from NBDELG.
- A variety of ferrous and non-ferrous metals will be segregated and processed for recycling.
- The removal, collection, and proper handling of each of the universal waste materials will be a specific decommissioning activity, and will be conducted in accordance with provincial and federal regulations. Recycling options exist for the majority of these materials.
- The friable ACM insulating material on vessels, tanks, piping, and other equipment, as well as containment materials and disposable personal protective equipment, will be double-bagged and placed in lined roll-off containers for disposal at a licensed off-Site facility authorized to accept friable ACM waste.
- Solid wastes will be characterized for disposal in accordance with provincial and federal regulations with the following exceptions:
    - sludge from the CRP and the cleaning of ditches as well as copper speiss which will be disposed of in the Brunswick Mine's tailings basin upon approval from NBDELG.
    - Ceramic and plastic saddles, refractory bricks and creosote/pressure treated timber products (rail ties) will be disposed of at Brunswick Mine's No. 12 Open Pit upon approval from NBDELG.
- Following PCB testing, any transformer oils, bushings or carcasses that contain PCB will be transported for off-site disposal at a licensed handling facility.
- Wastewater generated by cleaning activities will be directed to the CRP via the existing drainage network or collected and transported to the CRP via vacuum truck, for processing at the WWTP prior to discharging to Chaleur Bay. Cleaning wastewater will be segregated, collected and disposed off-Site if certain contaminants are anticipated (i.e., washwater containing acids, petroleum impacted washwater, or if any PCB-contaminated surfaces should be identified).

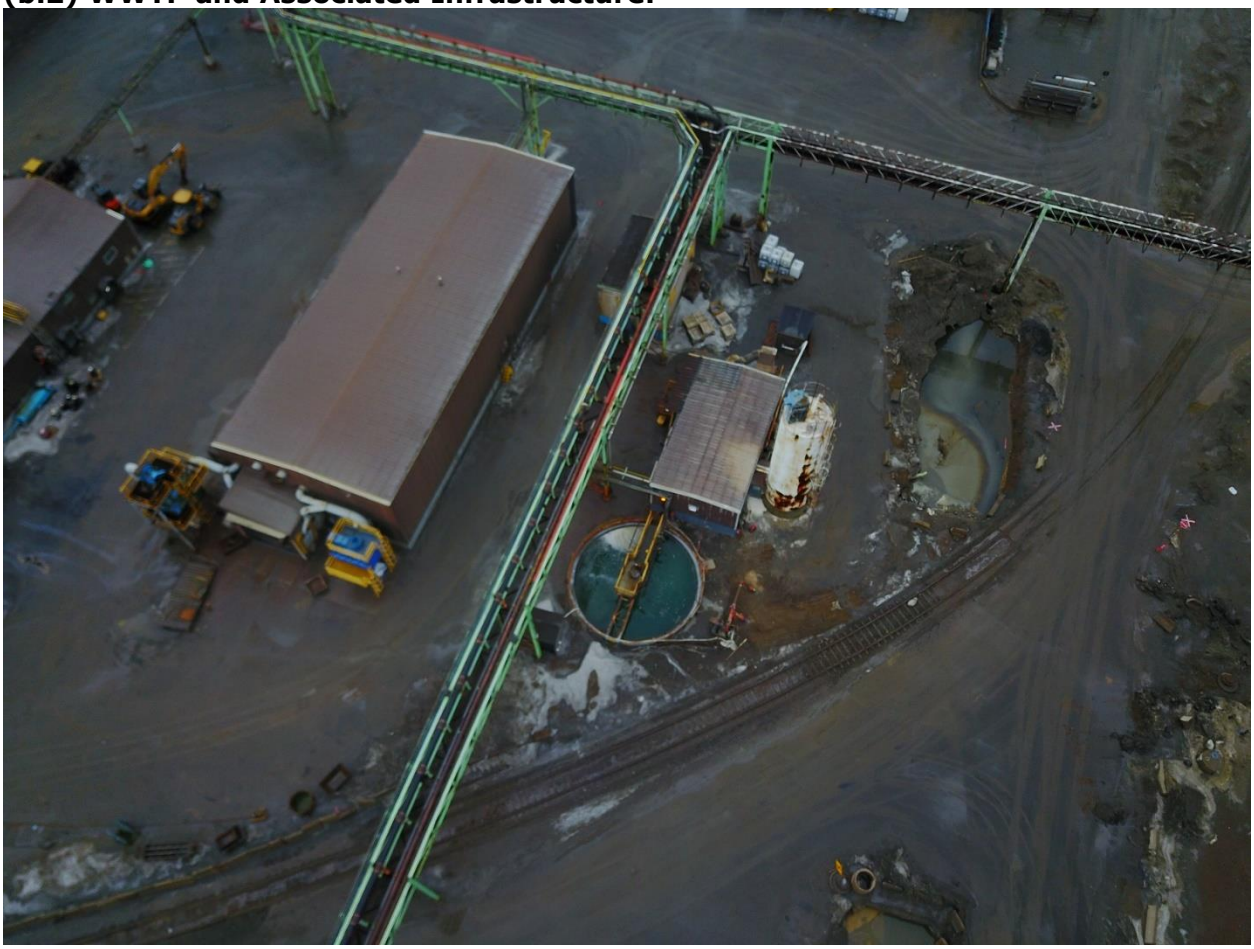
The Smelter Area management of soil and water contamination will begin upon completion of demolition activities.

- Duration varies depending on the option selected. The work is also divided into two categories, WWTP operation to be carried out by Glencore employees until applicable discharge limits have been met and earthwork related to treatment options aiming at reducing the duration of WWTP operations. For the duration of earthworks, the contractors, under the supervision of Glencore employees, would be responsible for most activities.
- Anticipated impacts are generally related to metals in soil at the Site that have the potential to leach to surface water or groundwater. Typical metals associated with the Site include arsenic, cadmium, copper, lead, thallium, and zinc.
- Surface water and shallow groundwater associated with Site will need to be managed for a period of time following closure of the Facility. A trade-off study is planned for the summer of 2020 to review potential options. The best option will be selected based on cost, effectiveness, residual liability. There are currently three options being considered for the trade-off study and they are as follows:
    - Option A assumes that water treatment at the Site, potentially including active pumping, would be required for 10 years post closure through the operation of the existing WWTP;
    - Option B includes a passive wetland system or passive media filter with polishing wetland system.
    - Option C includes complete excavation and disposal of contaminated soils. Removed soils would be disposed of at the Brunswick Mine No. 12 Open Pit upon approval from NBDELG.
- Regardless of the selected option to treat surface water and shallow ground water, the following earthworks will be required:
    - Grade site to match existing access roads.
    - Convey stormwater run-off via a network of existing and new ditches.
    - Develop borrow pit at former air-strip on Glencore property south of Highway 134.
    - Placement of a protective site cover over the areas with metal concentrations exceeding SSTLs. Cover to include a layer of granular material covered by a layer of organic topsoil. Exact thicknesses to be determined during detail design.
    - Permanent fencing will be installed to limit access to the site.
    - Perimeter access will remain.

Belledune Point and the old slag pile area have been previously referred to as a Low Exposure Land Use area (SNC, 2009). The old slag pile area located on Belledune Point was rehabilitated to become a Saltwater Lagoon as outlined in the Belledune Point Rehabilitation Plan (Brunswick Smelter, 2013). The rehabilitation plan was developed in collaboration with several federal/provincial agencies including the NBDELG, DFO, Canadian Wildlife Service and Department of Energy and Mines. In addition, the Belledune Point rehabilitation work was completed in accordance with the Approval to Construct I-7784 issued by the NBDELG.

The old concrete foundation present in the Saltwater Lagoon area will be abandoned in place to avoid destruction of ecological habitat. Portions of Belledune Point will need to be covered (but not the lagoon areas)

(b.2) WWTP and Associated Infrastructure:



WWTP, CLARIFIER AND BRICK SHOP

The Waste Water Treatment Plant (WWTP) associated infrastructure includes:

- Clarifier;
- Piping and pipe support trestle;
- Cooling Recycle Pond (CRP);
- CRP Pump House;
- Polishing Pond;
- Geo-tube dewatering pads;
- Former Brick Shop to be used as a storage building for the WWTP.

CRP PUMPHOUSE, CRP POND AND POLISHING POND

The WWTP, CRP Pump house along with associated ponds and infrastructure will remain operational throughout the decommissioning and demolition of both the Smelter and MHW areas to treat wastewater generated from the closure activities. The brick shop building will also remain and be used as a storage building for WWTP.

Prior to the start of demolition work, two (2) new electrical feeds will be required from the residential line. One will provide power to the WWTP and associated infrastructure and the other will provide power to the track scale.

Additionally, the fresh water line feeding the WWTP will need to be re-routed as it currently passes through many of the process building which are part of the site demolition.

The intent is operate and maintain the WWTP and only proceed with the demolition of these buildings once the following conditions are met:

- Smelter area demolition and cover complete;
- BHO area demolition and cover complete;
- Applicable discharge limits are being met without the operation of the WWTP by the selected water remediation resulting from the trade-off study.

Once the conditions listed above are met, WWTP will be decommissioned and demolished as follows:

- 2 months duration during which time contractors, under the supervision of Glencore employees, will be responsible for most activities on site, including but not limited to:

- A chemical sweep will be executed and all containerized materials shall be centralized for pick-up by a commercial waste disposal firm, retained for packaging, transportation, and disposal of the chemical wastes in accordance with provincial regulations.
- To the extent possible emptying and disposal of liquids from pipelines, reservoirs and process piping will be completed. Any remaining liquids will be identified and removal/disposal will be included in the scope of work of the demolition contractor;
- Disconnecting of electrical services to the WWTP and associated infrastructure including any pad or pole-mounted transformers prior to decommissioning activities;
- Inventorying and removal of hazardous and regulated wastes;
- Industrial cleaning will include low volume, high-pressure water blasting, steam cleaning, washing with detergent or degreasing soap, and other means and methods, as required. Wastewater will be contained and collected.
- Asbestos abatement including the removal of friable ACM such as insulation for mechanical equipment, drywall compound, piping and pipe fittings and removal of non-friable ACM such as transite wall panels and floor tiles.
- Infrastructure demolition including structures, tanks, conveyors, equipment, ducting, piping.
- Removal of any remaining obsolete rail track and ties;
- Slabs-on-grade and below grade foundations are to remain in place.
- The underground services with pipes greater than 0.5 m in diameter (generally including the saltwater intake, effluent piping, storm sewer, and some sanitary sewer infrastructure) at the Site will be excavated and crushed (for concrete materials) or removed (for steel materials) in order to prevent future ground subsidence causing damage to the protective Site cover following Site closure.
- The underground services with pipes less than 0.5 m in diameter (generally including sanitary sewer, process water and fire suppression infrastructure) at the Site will generally remain in place with service connections to the buildings being abandoned and capped in place.
- An estimate of less than 0.1 m3 of residual gypsum in the former gypsum piping being stockpiled in the Smelter Area had Naturally Occurring Radioactive Materials (NORM) concentrations exceeding applicable Canadian NORM guidelines for Unconditional Derived Release Limits of Diffuse NORM Sources and will require cleaning or disposal at an approved facility. The gypsum is accumulated in the annular space between the inner plastic sleeve and the outer wood sheath of the piping.
- All petroleum tanks will be cleaned by a licensed petroleum contractor and transported off-Site for disposal (or re-certification and re-use).
- Metal impacted demolition debris including wood, non-asbestos containing material insulation, roofing materials, non-recyclable concrete and concrete blocks will be transported to and disposed of at Brunswick Mine's No. 12 Open Pit upon approval from NBDELG.
- A variety of ferrous and non-ferrous metals will be segregated and processed for recycling.
- The removal, collection, and proper handling of each of the universal waste materials will be a specific decommissioning activity, and will be conducted in accordance with provincial and federal regulations. Recycling options exist for the majority of these materials.
- The friable ACM insulating material on vessels, tanks, piping, and other equipment, as well as containment materials and disposable personal protective equipment,

will be double-bagged and placed in lined roll-off containers for disposal at a licensed off-Site facility authorized to accept friable ACM waste.

- Solid wastes will be characterized for disposal in accordance with provincial and federal regulations with the following exceptions:
- Sludge from the CRP will be disposed of in the Brunswick Mine's tailings basin upon approval from NBDELG.
- Surface water and shallow ground water remediation will be extended, if required to the WWTP plant area.
- Grade WWTP area to match existing access roads.
- Stormwater run-off ditches will be finalized.
- The protected site cover will be extended to the WWTP area.
- The borrow pit, if still active will be closed.
- Perimeter access will remain.

(b.3) New Slag Pile:

NEW SLAG PILE

Between 1967 and the early 1980s, slag associated with the Facility was pumped as slurry and stockpiled in a saltwater wetland on Belledune Point. It was estimated that one million tonnes of slag were stored on Belledune point. In 1980 due to the limited storage capacity at Belledune Point and as part of an overall site water management program it Glencore decided to develop a new Slag Management area south of the Smelter and the Belledune Point Slag Pile was closed, capped and vegetated.

In 2011, a trade-off study completed for the Old Slag Pile in Belledune Point determined that removal of the Old Slag Pile eliminated the environmental risks and further financial liabilities. Between the fall of 2011 and the fall of 2012, Brunswick Smelter began trucking slag from the Old Slag Pile and placed the material in an isolate area within the New Slag Management Area. In total 526,000 m3 of slag was moved to the New Slag Management Area and represents approximately 1,052,000 tonnes of material.

The New Slag Pile (also referred to as the New Slag Management Area) was constructed in 1980 is located approximately one kilometer to the south of the Smelter site. All run-off from the new slag pile is contained in a pond that is sampled prior to discharge. There is the

provision to direct the water to the CRP and WWTP if the water does not meet specified discharge limits in the Certificate of Approval, however, this has never been a requirement.

The New Slag Pile is the highest land feature on the Glencore property. The elevation at the base of the New Slag Pile (near a Regulated Wetland) is approximately 25 metres above sea level (masl) and slopes northward to Highway 134 (with an elevation of 10 to 12 masl).

The current approved operational limit for the New Slag Pile is 35 Ha. The slag storage area is currently approximately 21 hectares. Slag is generated at the blast furnace and is a stable crystalline material due to its rapid quenching; slag has been stored on-Site since commencement of smelter operations. Slag is an inert and stable black granulated silicate containing up to 10 % zinc and 1 % lead.

The Slag Retention Pond directly north of the New Slag Pile was created during construction of the New Slag Pile. It is where runoff from the Slag Storage Pile is collected. The Slag Pond is discharged to the Baie des Chaleurs via the West Ditch. The pond is currently classified as a regulated wetland by the NBDELG and subject to the WAWA Regulation of the Clean Water Act for activities within 30 metres of its boundary. The existing retention pond will remain in-place along with the earthen dam structure and incorporated into the New Slag Pile closure plan.

The conceptual capping plan involves grading the slopes, covering the top of the pile with granular borrow material, organic cover and hydro-seeding. Since the nature of the slag material make the slopes unstable, it is recommended the slopes are stabilized by adding rock fill. The cover thickness and rock fill requirements on side slopes will require validation as part of detailed engineering.

The conceptual New Slag Pile cell closure plan also includes maintaining the existing dam and associated retention pond as well as the construction of an access road around the base of the pile. The retention pond is currently mapped as a provincially regulated wetland by the NBDELG and receives storm water run-off from the slag pile.

There has, however, been some third party interest in the slag pile. Capping will only be undertaken once these interests have been fully investigated and if none are deemed suitable from a technical, liability or economic stand point.

(b.4) Material Handling West Area:

MATERIAL HANDLING AREA

The Materials Handling West Area includes:

- Battery Recycling Plant
- Battery Storage Building
- DAP Storage Building
- Acid Pumphouse
- Acid Building
- Process Acid Tanks
- MHW Conveyor System and Transfer Houses (including those on Port of Belledune's Terminal 1)
- Concentrate Storage Silos
- Bulk Acid Tanks (#1 and #3)
- Railcar and Truck Unloading Building
- Concentrate Storage Domes
- Di-Ammonium Phosphate Plant (DAP)
- Phosphoric Acid Plant (PAP)

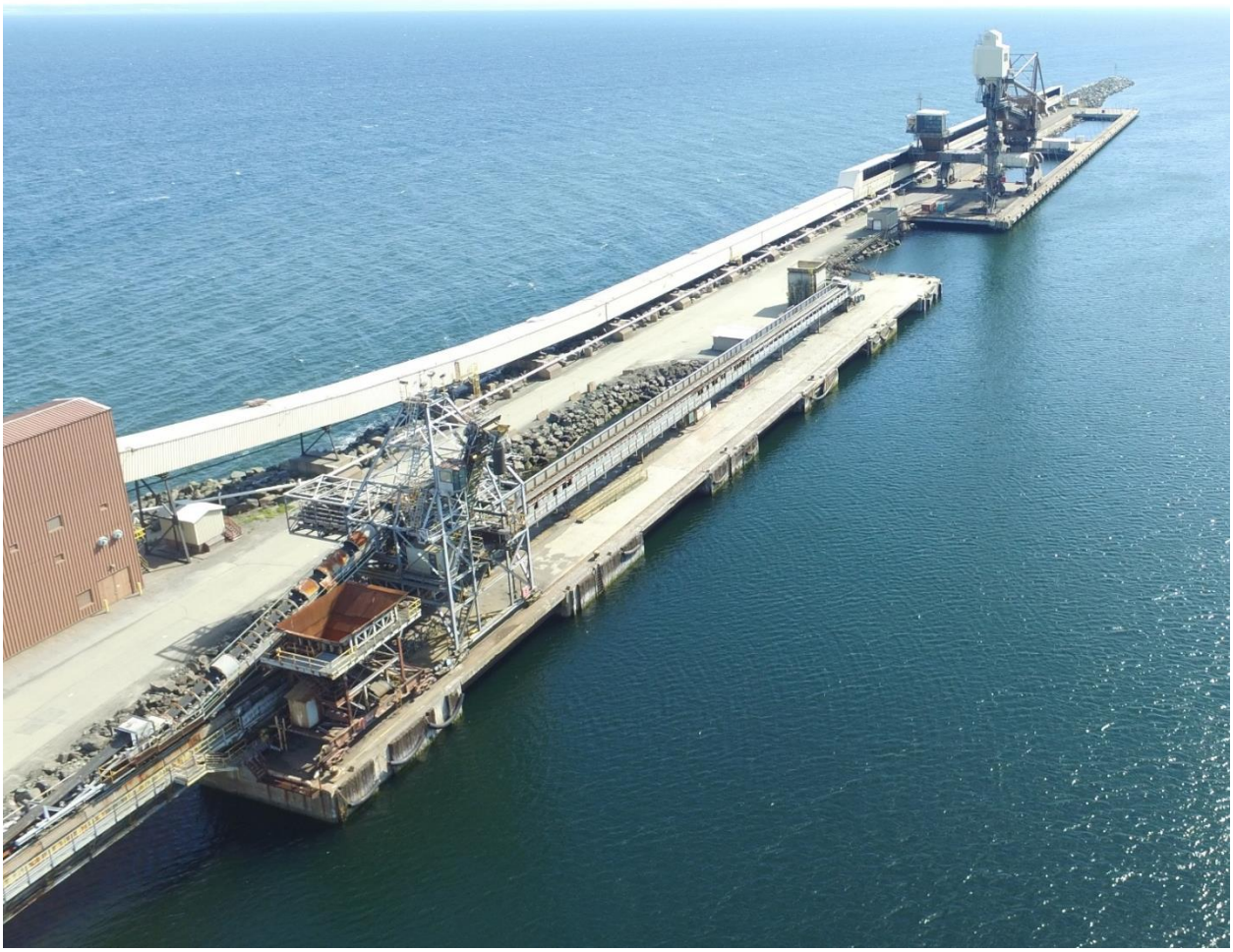
The MHW Area moves incoming imported metal containing feed materials through the Port, toward interim storage and delivery to the Smelter. The MHW Area also housed several ancillary operations, most notably lead acid battery recycling/recovery and Fertilizer Plant.

The Fertilizer Plant area (located within the MHW Area) which includes two inactive buildings, the Di-Ammonium Phosphate Plant and Phosphoric Acid Plant (DAP and PAP buildings).

FERTILIZER PLANT AT MATERIAL HANDLING AREA

The Material Handling West Area decommissioning will begin when trans-loading of Trevali's Caribou Mine concentrate is finished. Demolition will include all infrastructure on the Material Handling site including any infrastructure on the Port of Belledune's Terminal 1. The only exceptions would be infrastructure of interest to third parties.

- 8 months duration during which time contractors, under the supervision of Glencore employees, will be responsible for most activities on site including but not limited to:
    - Bulk solid waste and miscellaneous containerized materials will be inventoried as part of the chemical sweep.
    - Containerized materials shall be accumulated and temporarily stored at a central collection point. Once the sweep is complete, a commercial waste disposal firm will be retained for the proper packaging, transportation, and disposal of the chemical wastes in accordance with provincial regulations.
    - To the extent possible emptying and disposal of liquids from pipelines, reservoirs and process piping will be completed. Any remaining liquids will be identified and removal/disposal will be included in the scope of work of the demolition contractor;



PORT OF BELLEDUNE TERMINAL 1

- To the extent possible residues such as sludge and dust accumulation will be removed from buildings. Any remaining residue will be identified and removal/disposal will be included in the scope of work of the demolition contractor;
- Testing of Glencore owned transformers for PCBs.
- Disconnecting of electrical services to the MHW Area including any pad or pole-mounted transformers prior to decommissioning activities;
- Inventorying and removal of hazardous and regulated wastes;
- Industrial cleaning will include low volume, high-pressure water blasting, steam cleaning, washing with detergent or degreasing soap, and other means and methods. Wastewater will be contained and collected.
- Asbestos abatement including the removal of friable ACM such as insulation for mechanical equipment, drywall compound, piping and pipe fittings and removal of non-friable ACM such as transite wall panels and floor tiles.
- Infrastructure demolition including structures, tanks, conveyors, equipment, ducting, piping.
- Removal of any obsolete rail track and ties;
- Slabs-on-grade and below grade foundations are to remain in place.

- The underground services with pipes greater than 0.5 m in diameter (generally including the saltwater intake, effluent piping, storm sewer, and some sanitary sewer infrastructure) at the Site will be excavated and crushed (for concrete materials) or removed (for steel materials) in order to prevent future ground subsidence causing damage to the protective Site cover following Site closure.
- The underground services with pipes less than 0.5 m in diameter (generally including sanitary sewer, process water and fire suppression infrastructure) at the Site will generally remain in place with service connections to the buildings being abandoned and capped in place.
- The MHW Stormwater Storage Pond will not require backfilling as the Stormwater Pond will be maintained post-closure (including the potential installation of an impermeable liner)
- Railcar/Truck Unloading Building located in the MHW Area has a hopper basement and associated conveyor tunnels that require backfilling. Following removal of the buildings and associated infrastructure, the below-ground portions will be backfilled with imported borrow material form the on-Site borrow pit source. The concrete foundations will be left in place and covered with fill material as part of the final Site grading. The conveyor tunnels will be excavated, crushed and filled with backfill to prevent risk of future subsidence.
- All petroleum tanks will be cleaned by a licensed petroleum contractor and transported off-Site for disposal (or re-certification and re-use).
- The Concentrate Storage Holding Pond will be decommissioned by removing the liner and inlet structures and backfilling with imported on-Site borrow.
- The Stormwater Pond will be maintained post-closure including the potential installation of an impermeable liner (to be determined at detailed design).
- Metal impacted demolition debris including wood, non-asbestos containing material insulation, roofing materials, non-recyclable concrete and concrete blocks will be transported to and disposed of at Brunswick Mine's No. 12 Open Pit upon approval from NBDELG.
- Approximately 6 m3 of residual bulk product remaining in the PAP building had concentrations of diffuse NORM exceeding applicable Canadian NORM guidelines and will require removal and disposal at an approved facility.
- Approximately 145 m3 of materials and equipment located in the Scrap Yard were identified to have NORM measurements above the NORM Management (Dose Management) Threshold and will likely require management off-Site disposal.
- Filter pans located on the 4th floor of the historical PAP building were not accessible for NORM testing. The filter pans located in the scrap yard contained NORM readings above applicable Canadian NORM guidelines and, therefore, the filter pans on 4th floor of the PAP building will require testing during demolition and will also likely contain residual NORM levels above applicable guidelines. In the case of confirmation, the filter pans will require management off-Site disposal.
- Non-friable ACM, such as roofing materials and transite wall panels will also be placed in a segregated lined roll-off container for disposal at Brunswick Mine's No. 12 Open Pit upon approval from NBDELG.
- A variety of ferrous and non-ferrous metals will be segregated and processed for recycling.
- The removal, collection, and proper handling of each of the universal waste materials will be a specific decommissioning activity, and will be conducted in accordance with provincial and federal regulations. Recycling options exist for the majority of these materials.

  - The friable ACM insulating material on vessels, tanks, piping, and other equipment, as well as containment materials and disposable personal protective equipment, will be double-bagged and placed in lined roll-off containers for disposal at a licensed off-Site facility authorized to accept friable ACM waste.
  - Solid wastes will be characterized for disposal in accordance with provincial and federal regulations.
  - Following PCB testing, any transformer oils, bushings or carcasses that contain PCB will be transported for off-site disposal at a licensed handling facility.
  - Wastewater generated by cleaning activities will be directed to the CRP via the existing drainage network or collected and transported to the CRP via vacuum truck, for processing at the WWTP prior to discharging to Chaleur Bay. Cleaning wastewater will be segregated, collected and disposed off-Site if certain contaminants are anticipated (i.e., washwater containing acids, petroleum impacted washwater, or if any PCB-contaminated surfaces should be identified).

The Material Handling West Area management of soil and water contamination will begin upon completion of demolition activities.

- Duration varies depending on the option selected. The work earthworks contractors, under the supervision of Glencore employees, would be responsible for most activities.
- Anticipated impacts are generally related to metals in soil at the Site that have the potential to leach to surface water or groundwater. Typical metals associated with the Site include arsenic, cadmium, copper, lead, thallium, and zinc.
- Surface water and shallow groundwater associated with Site will need to be managed for a period of time following closure of the Facility. A trade-off study is planned for the summer of 2020 to review potential options. The best option will be selected based on cost, effectiveness, residual liability. There are currently three options being considered for the trade-off study and they are as follows:
  - Option A assumes that water treatment at the Site, potentially including active pumping, would be required for 10 years post closure through the operation of the existing WWTP;
  - Option B includes a passive wetland system or passive media filter with polishing wetland system.
  - Option C includes complete excavation and disposal of contaminated soils. Removed soils would be disposed of at the Brunswick Mine No. 12 Open Pit upon approval from NBDELG.
- Regardless of the selected option to treat surface water and shallow ground water, the following earthworks will be required:
  - Grade site to match existing access roads.
  - Convey stormwater run-off via a network of existing and new ditches.
  - Develop borrow pit at former air-strip on Glencore property south of Highway 134.
  - Placement of a protective site cover over the areas with metal concentrations exceeding SSTLs. Cover to include a layer of granular material covered by a layer of organic topsoil. Exact thicknesses to be determined during detail design.
  - Permanent fencing will be installed to limit access to the site.
  - Perimeter access will remain.

(b.5) Jacquet River Pump House, Fresh Water Pipeline and associated Reservoir:

JACQUET RIVER PUMP HOUSE

The freshwater line between the Jacquet River Pumphouse and the Site will remain in place for as long as the WWTP is operational or until it is replaced by an alternate water supply.

The closure plan assumes that the Jacquet River Pumphouse, Freshwater Pipeline and associated reservoir could be sold or turned over to a third party such as the Port or NB Power. The Freshwater Pipeline and associated infrastructure supply freshwater to multiple third parties including a residential area (Townsite), small industrial park, NB Power and the Port. One or all of these entities would likely take ownership of the infrastructure in order to maintain their supply of freshwater.

FRESH WATER RESERVOIR

(b.6) Water Management during Closure Activities:

As part of the decommissioning of the Smelter, various equipment, bulk storage and process tanks, piping, ducts, pits, floor trenches, sumps, and surfaces will be purged, rinsed, and cleaned prior to demolition. This cleaning will remove accumulated solid residue and oils or other liquids that may be released during demolition activities. Techniques for cleaning will include low volume, high-pressure water blasting, bulk dust removal using fire hosing, steam cleaning, washing with detergent or degreasing soap, and other methods (as required). Wastewater will be contained and collected for treatment at the CRP and WWTP. Cleaning wastewater will be segregated if certain contaminants are anticipated (i.e., NORM impacted washwater, petroleum impacted washwater, or if any PCB-contaminated surfaces should be identified).

Cleaning would typically be completed in two stages. Initial cleaning would consist of cleaning that may occur while the facility is energized, such as cleaning of tanks, pipes, ducts, and equipment. Final cleaning would consist of cleaning that requires the area to be de-energized prior to cleaning such as washing of the interior building walls. During final cleaning, temporary power would be required for lighting and washing equipment operations.

In addition to water generated by the cleaning works, surface water run-off generated by rain on lands not yet covered and groundwater collected with the groundwater interceptor trench will require treatment through the CRP and WWTP during the decommissioning works. Therefore, cleaning activities will need to be restricted during the spring freshet as the CRP and WWTP is nearing capacity related to surface water run-off during this time of year. The existing stormwater collection system will be maintained throughout the remainder of the decommissioning and demolition activities to collect and treat surface water run-off across the uncovered Site, as well as from run-off in areas of stockpiled materials that are potentially impacted with metals. The demolition contractor(s) decommissioning and demolition plan must include consideration for stockpile locations to ensure any run-off from these areas is collected and directed to the WWTP for treatment.

Upon completion of the demolition activities and in conjunction with final Site grading, the existing stormwater catchbasins and piping will be decommissioned. First, the stormwater system will be flushed using high-pressure wash and vacuum trucks, with the washwater being treated through the CRP and WWTP. Once the stormwater system is clean, the stormwater piping will be capped at each building foundation and catchbasin to prevent future subsidence, and the catchbasins will be backfilled. The stormwater system decommissioning and construction of the final Site cover should be completed from west to east to allow continued water treatment from uncovered areas of the Site.

It is noted that depending on the extent of residues built up in the stormwater system, flushing may not adequately clean the stormwater system and excavation and disposal of some stormwater piping may be required. A pilot test is recommended as part of the detailed designs to determine an appropriate stormwater system decommissioning methodology.

(b.7) Water Management after Closure:

The Site will be graded to convey storm water by overland flow and ditching to one of three outfalls to the Chaleur Bay. Sediment and erosion controls will be constructed and maintained until planted vegetation is established to minimize sediment laden run-off into the ditches and receiving waters.

As metal impacted soil is to be covered and remain on-Site, there is the potential surface water run-off generated post-closure will not be suitable for direct discharge into Chaleur Bay. A trade-off study will be executed in the spring of 2020 to evaluate three potential options for post-closure surface water management.

Option A assumes that water treatment at the Site, potentially including active pumping, would be required until applicable discharge limits are being met without the operation of the WWTP. The estimated duration would be 10 years after the end of closure activities.

Option B includes construction of several passive engineered wetlands to treat surface water run-off prior to discharging to Chaleur Bay.

The two treatment options carried forward in the qualitative conceptual option analysis and include:

1. Passive Wetland System; and
2. Passive Media Filter with Polishing Wetland System.

Passive treatment has the benefit of minimizing long-term operation and maintenance costs including energy consumption. The hydrology and existing grades at the Site appear to be supportive for passive treatment, with the current topography conducive to the installation of surface flow constructed wetlands. In addition, the existing network of drainage or diversion ditches, the location of the existing MHW Area holding pond and Smelter Area CRP, as well as the proposed excavation activities within the Borrow Area are all supportive for integration of passive treatment systems at the Site. The caveat is invert elevation of the existing drainage ditches, specifically the MHW Area holding pond outlet, which may necessitate alterations to the conceptual design of the inlet structures proposed for the wetlands.

Passive Wetland System:

Wetland systems rely on natural sources of energy to lower aquatic contaminant loads and concentrations through physical, chemical, and biological assimilative processes. The primary mechanism of metals removal in the proposed passive wetland systems is adsorption by the wetland root system.

Surface flow constructed wetland systems are typically shallow basins, densely vegetated by a variety of rooted emergent plant species. Substrates are comprised of flooded organic or mineral soils; the emergent plants take up nutrients in stormwater flows and provide a substrate for the growth of microbial, algal, and invertebrate populations that assimilate constituents in the stormwater through uptake, transformation, and sedimentation processes.

Surface water (and potentially groundwater) will be conveyed to the wetland system by open channel drainage ditch (or by pipe), and will enter the wetland through an inlet structure, with the structure invert (i.e., rock structure or pipe) set at the maximum design level (i.e.,

high water level) of the system. The inlet structure will be located to create the longest flowpath possible between the inlet and outlet control structures to minimize short circuiting; design elevations will be confirmed during the detailed design phase and following completion of an elevation survey.

While sizing and configuration of the proposed wetland systems is somewhat dictated by the designated space available at the Site (i.e., the CRP footprint for Wetland 1, or the existing soil containment berm for Wetland 2), the Length:Width aspect ratios are within the recommended 3:1 to 5:1 range to minimize short-circuiting.

Conceptually, for construction of the wetland, approximately 0.3 to 0.6 m of organic soil will be placed over the base of the wetland to facilitate plant growth and help maintain moisture during dry seasons. Baffles will be constructed within the passive wetland system to lengthen the flow path and extend the retention time of the water within the wetland. The base and sides of the wetland will be seeded with vegetative species selected based on the results of the treatability study. Native wetland plant species will be utilized in accordance with NBDELG requirements. Treated water will be discharged via a rock outlet structure and/or pipe to the existing surface water drainage ditch downstream of the wetland. Typically, the elevation of the effluent structure will be established to retain approximately 0.6 m to 1 m of water within the passive wetland system at all times. In addition, deeper areas in the central portion of the wetlands may be constructed based on elevation requirements and to ensure adequate water retention times are maintained. An overflow weir will also be established to prevent flooding of the wetland. Design elevations will be confirmed during the detailed design phase following a Site survey.

Passive Media Filter with Polishing Wetland:

The second treatment option carried forward in the qualitative option analysis is a passive media filter with polishing wetland technology. Essentially, it utilizes the same wetland system identified above, but has the added feature of a passive media filter for pre-treatment.

Using the passive media filter with polishing wetland technology, collected surface water and groundwater from the Smelter Area (and Back 40/50) would be conveyed through the reactive media system containing zero-valent iron (ZVI). ZVI is typically used as a filter medium to remove heavy metal contaminants in groundwater, and therefore is well-suited for application at the Site for removal of [arsenic, cadmium, copper, lead, thallium and zinc]. ZVI has a high removal capacity, primarily through means of sorption or co-precipitation. The main mechanism for metals removal using ZVI is sorption onto the iron oxide surface. Alternatively, ZVI reduces the metal, which can subsequently be removed from solution by co-precipitation. Through this sorptive process, leachate passing through the filter media exhibits significantly reduced concentrations of metals prior to entering the polishing wetland. Once all the available sorption sites in the ZVI media are full, its treatment capacity is exhausted and the media must be replaced.

The filter media would be containerized in a sealed below-grade chamber creating an anaerobic condition. The subsurface chamber would permit the inflow of potentially impacted surface water, and allow effluent discharge to the wetland by gravity. Sizing of the chamber will be finalized as part of a treatability study along with anticipated media change-out rates.

Assuming the media supplied at 50 percent ZVI would be mixed with well graded sand at a ratio of 1:4 (media : sand) to help prevent metal clogging in the filter bed, minimally a custom

pre-cast concrete chamber or cast in-place concrete structure (or series of chambers) with a combined capacity of 100 cubic meters would be required. Treated effluent from the filter would be conveyed to the wetland via below grade pipes. Within the wetland, further metal removal would be achieved through adsorption in the wetland root system. The polishing wetland construction for this system would be consistent with the conceptual passive wetland system previously described.

As with most leachate treatment systems, a treatability study would need to be completed to confirm the suitability of the treatment technology for the specific leachate and to adequately size the system components.

Additionally, a feasibility study would be required to determine influent flow rates, flow velocities and hydraulic retention times within the cells (to verify required sizing of piping, valves, chambers, and the wetland itself), inlet/outlet invert elevations (including Site survey), treatment cell sizing, and reporting.

Option C includes complete excavation, loading, transportation and disposal of the metal impacted soil at the Brunswick Mine Site No. 12 Open Pit assuming approval from NBDELG.

The area of metal impacted soil at the Site requiring cover was estimated at approximately 921,675 m2.

In general, the majority of the samples with elevated metal concentrations were in the top 0.3 metres (1 ft) of the soil profile. However, within both the Smelter Area and the MHW Area there are multiple sample locations that had elevated metal concentrations extending >0.6m depth (for example the Back 40 and Process Sludge Storage Areas and the Acid Tank Area in the MHW). It was assumed the entire metal impacted area would require excavation to 0.3 metres (1 ft) depth and 25% of the area would require excavation to 0.9 metres depth (3 ft). Further testing would be required to determine the exact surface area and volumes to be excavated.

(b.8) Management of Contaminated Soils:

The specific objectives for management of contaminated soils at the Site include the following:

- Ensuring that the Site is closed in a manner that is protective of human and ecological health and in compliance with NBDELG regulatory requirements; and
- Minimizing long-term maintenance requirements.

Petroleum Hydrocarbon Impacted Soil:

Past test locations identified various locations within the Smelter Area with elevated mTPH concentrations (ranging from 3,400 to 11,000 mg/kg) in soil. Concentrations of mTPH in groundwater exceeding the Tier I RBSL of 20 mg/L were previously detected in several test locations within the Smelter Area but free phase petroleum product was not observed in the 53 monitoring wells sampled at the Site in 2019. In addition, mTPH was <20 mg/L in monitoring wells sampled as part of the 2019 HGS and DGA program including locations that historically contained hydrocarbon concentrations exceeding the applicable guidelines (i.e., MW-1 and located near the former No. 2 bulk fuel oil AST north of Lead Refinery).

The estimated volume of hydrocarbon (product) impacted groundwater is 500,000 litres as diesel impacted groundwater was reportedly observed in a 2019 trench excavation west of the Sinter Building. However it is noted that the volume of impacted materials may have been reduced given the reduction in use of petroleum hydrocarbons in the Smelter operations (i.e., conversion to a propane fuel source).

Hydrocarbon impacted soil and groundwater is likely present in certain areas on-Site and further assessment of these areas will only be possible after the Facility is closed due to the potential for buried utilities and existing building infrastructure near storage tanks.

The following are areas of potential concern for petroleum hydrocarbon impacted soil:

- The soil around and under existing and former petroleum storage tanks and the underground fuel pipeline (see Table 2 and Section 3.2); and
- Former storage of CN Moncton petroleum contaminated soil.

In addition, there could be unknown decommissioned USTs left in place at the Site which could also represent a potential concern. Further testing, after Site closure, will be undertaken to provide an accurate estimate of hydrocarbon impacted soil/groundwater remaining at the Site.

The strategy for on-Site management and remediation of mTPH impacted soil and groundwater includes the use of selected, remaining concrete building floor slab(s), with any floor drains sealed, to be used as bio-treatment pads for the impacted soil. Soil will be excavated from the various locations transported to the bio-treatment pads to a thickness of 0.6 to <1 m. Soil nutrients consisting of nitrogen and phosphorous nutrients (fertilizer) will be blended into the soil. The soil will be mechanically turned / tilled the following year and then tested for mTPH to document quality against applicable Tier I RBSLs and/or Tier II SSTLs. After the treated soil is confirmed to meet the screening level it will be covered in place with 0.15 m of organic soil and seeded.

This option is considered to be feasible given:

- The available on-Site areas (including concrete floor slabs) for the spreading of the soil in thin layers (0.6 m to <1 m);
- That time is not a constraint for bioremediation processed (2 summer seasons could be required);
- Remediation does not require an aggressive treatment process; and
- Since the treated soil can remain in place on-Site.

Metal Impacted Soil – Site:

Based on the data collected from the Site in 2019 as well as historical investigation, the general environmental mitigations proposed for metal impacted soil is the application of a protective soil cover.

Metal concentrations in soil samples collected from Belledune Point were generally below risk-based SSTLs or CCME SQGs for an industrial land use, excluding arsenic and lead. As such, the area of Belledune Point identified to contain concentrations of metals exceeding screening levels was also included in the area of the Site requiring soil cover. This is considered to be conservative assumption as further risk assessment may demonstrate that remedial action is not required.

Similarly, the MHW Area and a small isolated area between the MHW Area and the Smelter area were also identified as requiring cover for the protection of human health. However, an alternative option would be the excavation of surficial soil in the MHW Area for disposal at the Smelter Area. This option may reduce or eliminate the requirement for soil cover in this area of the Site.

The protective cover would be designed to be structurally stable and require little to no maintenance, not be susceptible to erosion by wind or water, and have the ability to sustain vegetation growth. The cover would not prevent infiltration of water or groundwater movements. Upon completion of final grading activities, the graded areas would be covered with granular material and top dressed with organic topsoil and hydroseeded.

The cover thickness will be developed during the detailed design phase and may vary depending on elevation requirements, concentrations of contaminants in soil and future land uses for specific areas of the Site.

This remedial approach has previously been accepted by the NBDELG for the protection of human health to mitigate risks to human health through direct contact/ingestion of surface soil.

In addition, an alternative option for management of metal impacted soil in the Smelter Area and MHW Area is excavation and off-Site disposal of the impacted soil.

Metal Impacted Ballast – Rail Spur Line:

The portion of the rail spur line extending 2.3 km from the CN main line to Shannon Drive is assumed to remain. It is noted that there is also a short rail line extending off of the Glencore spur line property into the NB Power property. SNB shows this spur line property as being owned by Glencore and Glencore is responsible for maintenance of the spur line. However, the decommissioning and demolition of the spur line may require agreement from CN and NB Power. Prior to decommissioning and demolition, the potential transference of ownership of

the rail spur line property and infrastructure to a third party (i.e., the Port) will ne investigated.

Ore concentrate was previously observed along portions of the rail spur line related to the transport of ore concentrate prior to March 2013 (when the Brunswick Mine Site ceased operations). The proposed remedial approach for ore concentrate impacted ballast on the spur line assumes the use of specialized rail equipment (LORAM Rail Vacuum) and rail engineering contractor. The remedial work would include the excavation of the ballast rock to a depth of 0.3 m within the gauge of rail (1.4 m) by 2.3 km in length and assumes the transport of 3,000 tonnes metal impacted ballast material to the Brunswick Mine Site open pit for disposal. The excavated ballast rock would be replaced for continued safe operation of the spur line.

It is noted that this work would require long lead time for securing / scheduling rail contractors and involve advance communications with CN and NB Power with respect to connected rail lines on these properties.

NORM Impacted Soil:

As part of the NORM and Hazardous Materials Survey program completed in 2019 by GHD, a total of 19 soil samples were collected from various areas of the Fertilizer Plant, including the Scrap Yard. The soil samples collected from the Site in 2019 had NORM concentrations below applicable guidelines for Unconditional Derived Release Limits of Diffuse NORM Sources. These results confirmed the findings of the 2019 non-intrusive survey as well as soil samples collected in 2008 and indicate that remediation of soils specific to NORM are likely not required as part of future Site closure activities. However, it is noted that soil samples were not collected from areas directly beneath equipment or piping with elevated NORM concentrations and these areas will require additional assessment at the time of facility closure.

It is also noted that groundwater samples collected from the Fertilizer Plant area did not contain detectable concentrations of NORM indicating groundwater in the area has not been impacted with NORM and does not require additional evaluation or remediation as part of future Site closure activities.

PCB Impacted Soil:

As part of historical investigations as well as the investigations completed by GHD in 2019, soil samples were collected in the vicinity of on-Site substations and former PCB Storage Building. Results of the soil sampling program did not identify detectable concentrations of PCBs in on-Site soil. Similarly, concrete samples collected from the two transformer pads in the Fertilizer Plant area in 2019 did not contain detectable concentrations of PCBs and do not require specific handling or disposal requirements as part of future Site closure activities.

Although soil on-Site does not appear to be impacted with PCBs, only limited testing of potential PCB source areas has been conducted to date. Various sources of PCBs have been used at the Site in the past and potential PCB impacted soil could be found in the vicinity of current or former electrical substations in the course of demolition work. Additional testing may be required to confirm concentrations in these areas at the time of Site closure. If any minor quantities of local impacted soils with PCBs are found at the Site, they would be stored in drums and transported off-Site for disposal at a licensed facility.

(b.9) Reports provided for reference:

Closure Plan – Prefeasibility Study 2019 Update – Available in Appendix A-1

In 2019, GHD Limited (GHD) was retained by Glencore to provide engineering and project management services in the review of the 2008/2009 Closure Plan Prefeasibility Study (PFS) and prepare an updated closure plan based on current conditions at the Brunswick Smelter.

The 2019 Closure Plan Update focused mainly on infrastructure located on the Glencore owned properties directly north of Highway 134 (Smelter Area, MHW Area and Fertilizer Plant) but also includes the existing slag pile (also referred to as the New Slag Pile) located south of Highway 134 and the conveyors that extend from the MHW Area to the Port of Belledune. The Jacquet River Pumphouse (located off-Site approximately 14 km to the west) and associated reservoir and freshwater pipeline (all owned by Glencore), are also discussed as part of the 2019 Closure Plan Update.

The overall objective of the study was to determine the necessary decommissioning activities to close the Brunswick Smelter in a manner that is environmentally and economically sound, in compliance with applicable provincial and federal regulations and standards, and maximizes the potential end use value of the Site.

The study covers such topics as:

- Smelter background, including site history and an overview of the current facilities;
- General regional settings, climate and hydrology;
- Legal considerations including water rights, land ownership, easements, third party agreements and access road development;
- Infrastructure ownership;
- Government and community relations including current Approvals to Operate, applicable Acts, Regulations and Guidelines, Indigenous/Aboriginal Considerations, NB Heritage and Archeological Sites;
- Human resource requirements before, during and after executing closure works;
- Occupational Health, Hygiene and Safety including safety risk identification, safety management, security and access;
- Environmental baselines for soil, groundwater, sediment, surface water, hazardous materials, decommissioning cleaning waste, painted surfaces, PCB-containing equipment and NORM impacted materials;
- High level summary of other previously completed environmental investigations;
- Specific environmental considerations relating to effluent water, air emissions, Belledune Point and regulated wetlands;
- Description of environmental guidelines that may apply to the Closure Project for transformer oil as well as soil, groundwater, sediment and surface water contaminants;
- Proposed environmental mitigation measures for residue piles, building materials, surface water, metal impacted groundwater and petroleum hydrocarbon impacted soils and groundwater;
- Requirements to develop and environmental management plan to effectively mitigate potential environmental impacts associated with the closure activities;
- Demolition and management of demolition materials and wastes including classification, description, and quantities, decommissioning cleaning requirements, requirements for below grade voids, NORM trade-off study and detailed decommissioning plan;

- Water management plan including a review of previous water management studies, water management during closure activities and after closure;
- Contaminated soils management plan including petroleum hydrocarbon impacted soil, metal impacted soil, metal impacted ballast, NORM impacted soil and PCB impacted soil;
- Project execution plan;
- Site long-term operation plan;
- Risk assessment and management;
- Proposed future studies.

Hydrogeological Study and Data Gap Assessment – Available in Appendix A-2

GHD was retained by Glencore to conduct a Hydrogeological Study (HGS) and Data Gap Assessment (DGA), of the Brunswick Smelter facility.

GHD completed the HGS and DGA work between August 27 and October 31, 2019. A HGS and DGA was completed at the Site as part of the "Closure Plan - Prefeasibility Study 2019 Update". The HGS and DGA consisted of the following:

- Review of the previous environmental reports that have been completed for the Site;
- Completion of the existing monitoring well survey (a total of 69 existing monitoring wells were located on-Site, repairs made as required, and their geodetic locations were confirmed);
- Drilling and installation of 20 monitoring wells to further evaluate the geological stratigraphy and assess soil and groundwater quality conditions and drilling of 27 soil probes to further evaluate the geological stratigraphy and assess soil quality conditions;
- Collection of representative soil, groundwater, surface water, sediment and slag samples for laboratory analyses;
- Determine the area of metal impacted soil and dissolved metal plume as well as the migration potential to down gradient ecological receptors;
- Establish the groundwater flow pattern affecting the plume, including preferential pathways such as buried utilities, high permeability layers, vertical and horizontal gradients;
- Assess current soil and groundwater conditions in other areas of the Site (Bulk Handling West Area, Fertilizer Plant and New Slag Pile) to assess potential data gaps and add to the current Site environmental database. Samples to be analyzed for petroleum hydrocarbons, PAHs, PCBs and/or metals);
- Identify applicable guidelines based on those used in standard industry practice in Atlantic Canada, which are most appropriate for the current and intended future land use of the Site; and
- Evaluate conceptual remedial options.

The main results of the HGS and DGA are summarized as follows:

- The estimated aerial extent of metals impacted soil at the Site in excess of the lead SSTLs for protection of human health based on industrial land use (i.e. the metal with the largest footprint) is 92 ha ±20% including: 71.5 ha in the Smelter Area and 20.5 ha in the combined Material Handling West Area and the Fertilizer Plant. The volume of material required to cover the areas of metal impacted soils above industrial land use SSTLs assuming a 0.6 m thick cover to eliminate the human health exposure

pathway would be 550,000 m3. This volume of cover material includes the terrestrial areas Belledune Point.

- Metal concentrations typically decreased significantly in subsurface soil compared to surface soil. Similar to concentrations of metals in soil, concentrations of leachable metals in soil also decreased with depth below surface grade.
- As the Site is considered non-potable, human exposure pathways to metals in groundwater (i.e., ingestion) is generally considered to be incomplete. The screening of metals in groundwater was based on groundwater discharging from the Site to marine surface water body (Chaleur Bay) and protection of marine ecological receptors. Concentrations of metals in groundwater samples collected directly adjacent to the Chaleur Bay shoreline in 2019 were generally below applicable screening guidelines for the protection of marine aquatic life.
- Concentrations of metals in groundwater directly adjacent to the Salt Water Lagoon exceed applicable screening guidelines for protection of marine aquatic life. However, concentrations of metals in groundwater were observed to significantly decrease (orders of magnitude) as groundwater flows from the Smelter Area towards Belledune Point.
- Free phase petroleum product was not observed in the 53 monitoring wells sampled at the Site (18 of the monitoring wells were dry). Concentrations of petroleum hydrocarbons (BTEX/mTPH) in groundwater samples from selected test locations were within the RBCA Tier I RBSLs for an industrial site with non-potable water use and coarse grained soil. The area and volume of hydrocarbon impacted soil and groundwater will need to be assumed in the 2019 Closure Plan – Prefeasibility Study 2019 since delineation was not possible due to operating Site infrastructure. However, groundwater samples were collected as part of the HGS and DGA for monitor wells located near certain hydrocarbon source areas which will reduce some of the uncertainty in the volume estimates.
- Concentrations of PAHs and PCBs in both soil and groundwater samples collected as part of the HGS and DGA study were either not detected or well below screening criteria and therefore are not considered to be COCs that will require significant management effort in the Closure Plan - Prefeasibility Study 2019 Update.
- Black slag, as well as brown/black silt and sand, was observed at the base of the Saltwater Lagoon; the Saltwater Lagoon is located within the Belledune Point and was re-created by the removal of 526,000 m3 of slag from the "old" slag pile to the New Slag Pile in 2011-2012. Concentrations of arsenic, cadmium, copper and lead and zinc exceeded the CCME ISQGs and the PELs in the nine sediment samples collected during the 2019 program.
- Surface water samples collected from the Saltwater Lagoon had concentrations of arsenic, cadmium and/or mercury exceeding the CCME WQGs for the Protection of Marine Aquatic Life, long term screening levels and/or the NSE PSS. Concentrations of other metals such as copper, lead, thallium and zinc also exceeded the NSE PSS. The Saltwater Lagoon likely receives shallow groundwater from a portion of the Smelter site including the Back 40 and Back 50 areas and is also influenced by tides in Chaleur Bay.
- Slag samples from the New Slag Pile contained elevated metals with the following average concentrations: arsenic 1,900 mg/kg; cadmium 21 mg/kg; copper 3,800 mg/kg; lead 26,000 mg/kg; thallium 1.8 mg/kg and zinc 110,000 mg/kg (mercury was not detected in the samples). Lead exceeded the CEPA leachate screening level (5,000 µg/L) with a concentration of 100,000 µg/L. Cadmium and arsenic did not exceed the CEPA leachate screening levels. Dissolved lead in groundwater down gradient of the New Slag Pile was only 0.79 µg/L and 2.61 µg/L, respectively.

NORM and Hazardous Materials Survey Report – Available in Appendix A-3

GHD was retained by Glencore to conduct a Naturally Occurring Radioactive Materials (NORM) survey for the Fertilizer Plant area of the Brunswick Smelter facility, specifically the Diammonium Phosphate Plant and the Phosphoric Acid Plant buildings (DAP and PAP buildings).

GHD completed the NORM and Hazardous Materials Survey work between September 16 and 19, 2019. The work was completed at the Site as part of the "Closure Plan – Prefeasibility Study 2019 Update" and consisted of the following:

- The review the previous environmental reports that have been completed specifically for the DAP and PAP buildings;
- The identification of applicable guidelines based on those used in standard industry practice in Atlantic Canada, which are most appropriate for the current and intended future land use of the Site;
- The completion of a non-intrusive NORM screening survey of the DAP and PAP buildings and surrounding soil areas to validate previous findings and identify areas of the buildings (and surrounding soil) that potentially contain NORM levels above applicable guidelines.
- Based on the findings of the non-intrusive survey, the collection of representative building material samples, surface soil samples, feedstock samples (remaining in equipment vessels) and groundwater samples for quantitative laboratory analysis of gamma spectrometry as well as other parameters.
- Determining if groundwater surrounding the Fertilizer Plant area has NORM concentrations above applicable guidelines and establish the groundwater flow pattern affecting the plume, including preferential pathways such as buried utilities as well as potential receptors;
- The completion of a hazardous materials inventory of the DAP and PAP buildings including the collection of bulk samples for laboratory analysis.
- Determine the quantity of residual product remaining in tanks/vessels/piping of the DAP and PAP buildings as well as the type of product.

The results of the NORM and Hazardous Materials Survey are summarized as follows:

- Although the non-intrusive NORM screening survey did not identify elevated gamma readings in the PAP building, residual bulk product samples collected from the PAP building had concentrations of diffuse NORM exceeding applicable Canadian NORM guidelines. As such, this residual bulk product remaining in the PAP building would require removal and disposal at an approved facility as part of future building decommissioning activities. Approximately 6 m3 of residual bulk product is estimated that will require removal and disposal as NORM.
- The non-intrusive NORM screening survey conducted on the Gypsum Line piping being stored in the Smelter Area identified NORM measurements consistent with background conditions. However, a bulk sample of residual gypsum accumulated in the annular space between the plastic inner sleeve and the outer wood sheath had NORM concentrations exceeding applicable Canadian NORM guidelines for Unconditional Derived Release Limits of Diffuse NORM Sources. As such, the former gypsum piping being stockpiled in the Smelter Area will likely require cleaning or disposal at an approved facility as part of future Site closure activities. There is approximately 225 metres of 0.6 metre diameter piping currently being stored at the Site that has the

potential to be impacted with NORM (approximately 63 m3). The volume of residual gypsum accumulated in the annular space between the inner plastic sleeve and the outer wood sheath is estimated to be <0.1 m3.

- The majority of materials and equipment found within the Scrap Yard were identified to have NORM measurements above the NORM Management (Dose Management) Threshold and will likely require management (cleaning and recycling or off-Site disposal, whichever is most cost-effective) as part of future Site closure activities. Approximately 145 m3 of NORM impacted materials and equipment is located in the Scrap Yard.
- GHD was unable to perform NORM screening surveys on the filter pans located on the 4th floor of the historical PAP building due to inaccessibility during the 2019 Site visit. The filter pans located in the Scrap Yard contained NORM readings above applicable Canadian NORM guidelines and, therefore, it is assumed that the filter pans on 4th floor of the PAP building also contain residual NORM levels above applicable guidelines.

Marine Ecological Risk Assessment – Available in Appendix C-1 & C-2

In 2015, Glencore commissioned Intrinsik Environmental Sciences Inc. to conduct an ecological risk assessment (ERA) of the marine areas, and species foraging in those areas, near the smelter. Intrinsik conducted this study with Minnow Environmental Inc., who specializes in aquatic surveys, and had conducted monitoring associated with the facility for many years.

The primary releases of interest from the smelter relate to current lead smelter treated effluent discharge, former fertilizer plant gypsum-based effluent discharge, atmospheric discharges, and possible contributions related to erosion of the former slag disposal area on Belledune Point. The main receptor groups of interest include aquatic species (marine phytoplankton and pelagic invertebrates, benthic invertebrates, and marine fish species) as well as avian species living at or near the facility and foraging in the marine environment and the associated shoreline

For assessment purposes, samples were grouped into 3 areas. Area 1 includes samples from Stations 1 to 7 (on Belledune Point; SBS 1 – SBS-7; Figure 2-3); Area 2 includes samples from Stations 8 to 14 (SBS8 – SBS14; Figure 2-3); and Area 3 includes samples from Stations 15 to 21 (SBS 15 – SBS 21; Figure 2-3).

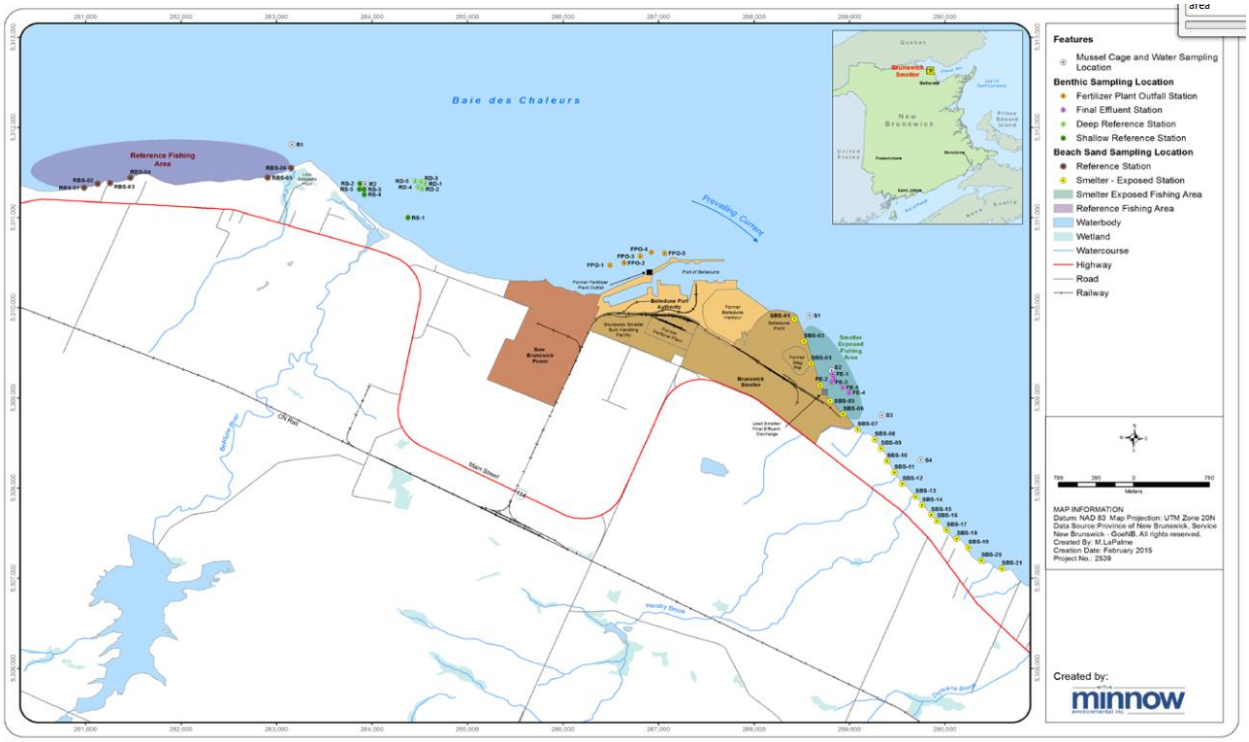


FIGURE 2-3 OF THE MARINE ECOLOGICAL RISK ASSESSMENT

STUDY AREA SAMPLING STATIONS AND ZONES INCLUDED IN THE 2014 FIELD PROGRAM

Based on the data and assessments conducted, the following conclusions were drawn:

Marine Phytoplankton and Pelagic Invertebrates:

- Risks are considered to be negligible to low, based on comparison of measured water quality metals concentrations to marine water quality guidelines and reference, as well as to other toxicology data and information.

- The exposure data are limited in terms of number of samples, and hence there is uncertainty in this conclusion. This uncertainty is reduced by knowledge that the area adjacent to the smelter is a highly dispersive environment, and while releases from the facility are measureable in the environment, exposure levels for transient mobile species are expected to be low, and hence would not be anticipated to result in population- or community-level effects.

Marine Benthic Community:

- Risks are considered to be low for benthos near the former fertilizer outfall location, and in an area distant to the final effluent discharge point, and are considered moderate for the final effluent discharge area, based on the existing chemistry data, and benthic density, diversity and richness data. Evenness and diversity of the benthic community at the final effluent area suggested ecologically meaningful differences from reference. There was also reduced diversity in this area, relative to reference, albeit, to a lesser degree than that reported for evenness and diversity. In the current survey, increased

sediment metals concentrations, lower benthic invertebrate density and differences in community structure relative to surveys conducted in 2008 and 2004, were noted, which were not linked to effluent discharge, but rather, appear to be related to either erosion of the former slag disposal area at Belledune Point, or a recently completed harbor dredging project.

Marine Shellfish:

- Risks are considered to be low, based on the available data and studies conducted. Survival was not considered to be influenced in the study area, relative to reference. Growth was actually greater in the study area mussels at several sites, than in reference areas, but condition was slightly lower. These results were attributed to higher allocation of energy use to growth in the smelter-exposed mussels compared to reference. While tissue metals were significantly higher in the exposure group for arsenic, cadmium, copper, lead, selenium, silver, strontium and zinc, the results of the survival, growth and condition endpoints indicate no adverse smelter-related effects toblue mussels.

- Uncertainties in the assessment include a lack of assessment of the reproductive endpoint, since the study was initiated outside of the season of reproductive tissue development (and hence reproduction endpoint could not be evaluated). Nonetheless, numerous juvenile blue mussels were found adhering to the cages of the deployed mussels. While a quantitative assessment of reproductive endpoints was not undertaken, qualitative observations suggest presence of juveniles in all cage areas with lower numbers being observed at the smelter-exposed station located furthest from the smelter (Station S4).

Marine Fish:

- Risks are considered to be low, based on assessment of water quality, survival, growth/condition, reproduction and tissue residue data. No critical effect sizes were exceeded for any endpoint with the exception of egg size. Smaller egg size in smelter-exposed fish was hypothesized to reflect natural variability in spawning timing between the exposure and reference fish populations.

- Male outcomes are uncertain due to limited sample size, but are not indicative of adverse effects, based on the existing dataset.

Avian Species Nesting and Foraging in the Area:

- Common tern nest on the smelter property annually, and forage in both the near shore and far shore areas adjacent to the smelter. Based on the weight of evidence, risk potential to the common tern colony is considered low. Modelled exposures suggest low risk potential to the common tern colony, with only iron having 95th percentile HQs> 1. Clutch counts from 2010 suggest the colony is within the range of clutch counts in other areas of New Brunswick. Fish tissue concentrations of mercury and selenium are well below thresholds associated with adverse effects in piscivores, and measured residues in eggs, kidney and liver are below toxicity thresholds (where they are available), with the exception of lead in a number of kidney and liver samples. While exceedance of toxicity thresholds for lead in some samples suggests a high potential for adverse effects in those individuals, a limited number of dead chicks were found following extensive daily surveys of the colony in 2014, and many of the metals residues within tissues were below toxicity thresholds suggestive of clinical or severe effect levels. Weighing the available

information, some individuals within the colony have a high potential for adverse effects from exposures to lead, but there appears to be a low probability of effects on the colony as a whole, based on the numbers of chick tissue samples exceeding toxicity thresholds, relative to the number of eggs reported in previous colony counts. The colony has returned to nest at the smelter year after year, and anecdotal observations suggest it is increasing in size. There is uncertainty in this conclusion related to specific clutch size for 2014, and exposures to chicks which were not sampled.

- Black-crowned night heron forage on and near the smelter property (Belledune Point), but nesting pairs have not been observed in previous surveys conducted. Risk potential for this species is considered to be negligible to low, based on low probability of Hazard Quotients exceeding 1, with the exception of iron, lead, and to a lesser extent, strontium and thallium. Lead and zinc concentrations in beach sand along Belledune Point are elevated relative to concentrations of sediments considered to be protective of waterfowl in other areas, but beach sand metal concentrations are not elevated in Areas 2 or 3, down the shore. The dominant exposure pathway is diet, but considering that there would be a limited number of individuals present in this area, and hence, population level effects are considered unlikely near the Brunswick Smelter. Lead would be considered the COC with greatest risk potential, based on the available data.

- Sandpiper forage along the shore of the beach on the smelter property, and four nesting pairs were reported on Belledune Point in surveys conducted in 2009. This survey was updated in 2015, and a total of 6 nesting pairs were confirmed in Area 1 and 2, with 4 possible additional nesting pairs identified. Risk potential for this species is considered to range from low to moderate, depending upon proximity to the smelter. On Belledune Point, risks are considered to range from low to moderate based on the high probability of multiple Hazard Quotients exceeding 1 (aluminum, copper, iron, lead, selenium, thallium and zinc). Lead had the most elevated HQ in this area, and represents the substance of greatest concern. The HQs are likely biased high, due to assumptions that metals in dietary items are 100% bioavailable, and the TRV used is based on lead acetate, which is more bioavailable than the form present in the Belledune area (which would be a lead sulphate). Belledune Point is the area with highest exposure potential, due to the presence of slag along the beach/shoreline, and concentrations of lead and zinc in this area were also found to exceed concentrations reported as being protective of waterfowl in other published literature. Areas further down the shoreline to the east of the facility represent a low risk potential. The risk potential for the shoreline overall was considered to be low as diet was found to be the most important exposure pathway in all areas considered (and bioacccessibility in diet was assumed to be 100%). However, adverse effects in some individuals could be occurring on Belledune Point but are considered less likely in Areas 2 and 3. Depending on exposures and population size an effect on the local population could be possible, but is unlikely.

Ecological Risk Assessment of Off-Site Terrestrial and Freshwater Aquatic Areas – Available in Appendix C-3

In 2008, Glencore commissioned Intrinsik Environmental Sciences Inc. to conduct an ecological risk assessment (ERA) of off-site terrestrial and freshwater aquatic areas near the smelter. The study was conducted over 5 years, and involved a team of consultants who conducted field sampling, biological surveys, and risk assessment to evaluate potential risks in the environment associated with releases from the smelter.

In this ERA, the key smelter-related sources of chemicals of potential concern were:

- atmospheric deposition of smelter air emissions; and
- fugitive dust emissions from the slag pile.

Conclusions were:

- Risks to vegetation are considered to be low, with the exception of near-field areas immediately South – South-West of the facility, where they are considered moderate. The effects on vegetation South and South-West of the facility are likely related to a number of factors, including site disturbance, soil contamination, possible SO2 in the near-field, salt spray, nutrient deficiency, amongst others.

- Risks to soil invertebrates and soil micro-organisms are considered to be low. Based on the results of the assessment, some individual level effects could be occurring in some species, but community level effects within the vicinity of the Belledune smelter as a result of smelter operations are considered unlikely.

- Risks to avian species (herbivorous, carnivorous or insectivorous) are considered to be low. Based on the results of the assessment, some individual level effects could be occurring in some species, but population level effects within the vicinity of the Belledune smelter as a result of smelter operations are considered unlikely.

- Risks to herbivorous and carnivorous mammalian species are considered to be negligible, whereas risks to insectivorous small mammals are considered to be low. Based on the results of the assessment, some individual level effects could be occurring in some species, but population level effects within the vicinity of the Belledune smelter as a result of smelter operations are considered unlikely.
- Risks to freshwater aquatic life in Hendry Brook are considered to be negligible to low, whereas risks to freshwater aquatic life in Unnamed Brook area considered to be low for freshwater pelagic species and moderate for benthos, largely due to the influence of the slag storage area in a portion of that brook.

- Based on the available information, risks to sensitive species known to be present on the site (which are limited in number) are likely low (possible effects on some individuals expected, but effects are not considered adverse or measureable). There is considerable uncertainty in this conclusion, but the limited number of sensitive species, and limited size of areas with significant contamination suggests that this is likely a reasonable conclusion.

(c) PURPOSE/RATIONALE/NEED FOR THE UNDERTAKING:

The operation of the Brunswick Smelter was not economically sustainable after the closure of Brunswick Mine.

(d) PROJECT LOCATION:

Generally, the project will take place between Latitudes 47◦54’28.60” Longitude 65◦51’32.48” and Latitudes 47◦53’2.26” Longitude 65◦49’40.22”.

The Project includes 36 parcels of Glencore owned land (identified by SNB) encompassing a total area of approximately 604 hectares with the property identification numbers listed in

Table 5.1 and shown on Figure 2 of the GHD Closure Plan. Glencore also owns additional properties outside of the study area shown on Figure 2.

20252680	20780508	20443172	20443214	20441283	20443099
20252318	20443149	20832481	20443115	20443164	20443073
20801619	20443255	20443057	20443222	20443263	20251963
20278339	20445789	20443198	20443230	20443180	20603197
20755302	20443156	20443206	20443123	20443107	20445714
20444840	20442992	20443081	20443248	20277968	20655122

Study Area Property Identification Numbers

Adjacent and nearby third party industrial properties are owned by Irving Oil, NB Power, New Brunswick Department of Transportation, the Port of Belledune and Caribou Mining. Two adjacent properties are also owned by the Roman Catholic Bishop of Bathurst (including the cemetery near the MHW Area).

Glencore also owns the Jacquet River Pumphouse property (PID # 50078294) and the Freshwater Reservoir property (PID# 50078260) located approximately 14 km to the southwest of the Site. The Freshwater Supply Line crosses several third-party properties (underground) with right-of-way easement and/or agreements obtained in the mid-1960s (according to SNB files).

Included in the 2019 Closure Plan area are the Glencore properties located south of the Smelter Area. These properties encompass the New Slag Pile and the former airstrip property that are owned by Glencore. The access road to the slag pile crosses several of these Glencore owned properties but a portion of the slag pile access road is on an existing road named the Belledune Road, (PID #00000003) with no access owner listed on SNB. Glencore may inquire about securing this portion of the NBDTI property to remove a potential access route to the Site.

Information obtained from SNB does not identify Glencore as being the lessee of any specific waterlots. However, SNB does identify Glencore as a lessee of parcel PID #20780508 located on the wharf owned by the Port. This property consists of a portion of the access road and docking area that contains a conveyor system. Glencore also currently leases Terminal 1 from the Port for import and export of materials including mineral concentrates.

Easements:
There are no known easements associated with the Site infrastructure excluding the easement and/or agreements associated with the Freshwater Supply Line.

Third Party Agreements:
The Jacquet River Pumphouse and property located approximately 14 km southwest of the Site is owned by Glencore. The steel freshwater supply pipeline crosses several third party properties (primarily underground) with right-of-way easement and/or agreements developed in the mid-1960s (according to SNB files). In addition to supplying the Brunswick Smelter with freshwater, the Jacquet River Pumphouse, Freshwater Reservoir and Freshwater Supply Line also supply several third-party organizations, including the Belledune Industrial Park, approximately 30 residences located on Chaleur Drive, the Port of Belledune and it is also used by NB Power as a back-up water supply for the Belledune Thermal Generating Station. The Freshwater Supply Infrastructure, which shall remain in place and operational for the

foreseeable future. The potential transference of ownership of the Jacquet River Pumphouse and infrastructure to a third party will only be evaluated once fresh water is no longer required to supply the Waste Water Treatment Plant (WWTP).
SNB files indicated that a multi-party access agreement was signed in 2002 to develop a new Port access road from Highway 134 (Main Street) to the Port terminal. The new access road was reportedly required due to increasing vehicular traffic accessing the Port. The access agreements were established between the Port and the Village of Belledune, the Roman Catholic Bishop of Bathurst and Glencore in relation to the new access road. The access agreement specific to the Site acknowledges that Glencore has an existing haul road crossing, an existing utility road crossing, a sulfuric acid line, a rail crossing, a freshwater line, a salt water line, an overhead electrical line and underground electrical cables (collectively the easements) which cross the Port access road. The access agreement indicates the Port is to assume liability and responsibility for the maintenance and use of this new access road.

There are no known easements between NB Power and Glencore regarding the four electrical substations at the Site. However, as previously indicated, information provided by Glencore indicates that Glencore is responsible for decommissioning and demolition of electrical substation buildings, building contents, substation yard fencing and equipment foundations. NB Power owns, and is responsible for the decommissioning and removal of, the transformers and other equipment within the substation yards.

A rail spur line extends northward along the western Site boundary (from the CN main line) and into the Smelter facility to the Car Unloading Building (Figures 2 and 3 of the GHD Closure Plan). SNB shows this spur line property as being owned by Glencore and information provided by Glencore indicates that Glencore is responsible for maintenance of the spur line. However, the decommissioning and demolition of spur line may require agreement from CN. The potential transference of ownership of the rail spur line property and infrastructure to a third party (i.e., the Port) will not be evaluated until the MHW activities have ceased.

Access Road Development:
Access roads to the Site off of Highway 134 (owned by NBDTI) and the Port access road will be maintained. It is not anticipated that any additional access points will be required at the time of Site closure.

(e) SITING CONSIDERATIONS:

Not applicable.

(f) PHYSICAL COMPONENTS AND DIMENSIONS OF THE PROJECT:

Figures 1 through 5D of the GHD Closure Plan are site plans as detailed below:

- Figure 1 shows the general site location.
- Figure 2 is the Property Plan including Parcel Identification Numbers.
- Figure 3 is an aerial photograph showing the Overall Site Plan including photo reference, scale and operating site boundaries.
- Figure 4 through 5D identify site features and can be used in conjunction with Table 1 Inventory of Infrastructure and Section 3.2 Overview of Current facilities of the GHD Closure Plan for dimensions and descriptions of the site facilities and infrastructure.

Most of the roughly 604 hectares of Glencore owned land is concentrated in an area roughly 3.5 km by 2.5 km. Exceptions to this would be the Glencore owned land at Jacquet River

Pumphouse property (PID # 50078294) and the Freshwater Reservoir property (PID# 50078260).

Based on Google Earth Pro, the developed area of the site is roughly 1.5 square kilometers.

(g-h) OPERATION, MAINTENANCE & CONSTRUCTION DETAILS:

Upon EIA registration and until receipt of a Certificate of Determination:

The following Glencore Planning and Management activities are intended to proceed while awaiting a Certificate of Determination:

- Asset Management Planning;
- Raw material inventory management and removal including processed raw materials, reagents and imported ore which will be shipped to customers via truck, rail or vessel by the Belledune Handling Operations or disposed of at out-of-province certified disposal facilities in accordance with applicable federal and provincial regulations;
- Disposal of hazardous waste, process sludge, and process tank inventory;
- Initial Cleaning Activities for Smelter including using high pressure wash and vacuum truck service providers to prepare infrastructure for the hand-over to the demolition contractor;
- Isolating WWTP infrastructure from the remaining Smelter plant infrastructure.

Raw material, hazardous waste and process sludge disposal will follow the waste generator permitting process.

Isolating the WWTP infrastructure from the remaining Smelter plant infrastructure will include completing the design, procurement and construction of alternate, on site, fresh water line connection to the existing freshwater supply, new independent communication infrastructure and new electrical distribution system from NB Power residential line.

- Alternate fresh water line construction summer/fall 2020;
- New electrical distribution system construction summer/fall 2020;
- New communication infrastructure construction summer/fall 2020.

Additionally, leased nitrogen and oxygen tanks will be demobilized.

Estimated hours of construction will be 7 am to 7 pm, Monday to Friday. A maximum of 40 employees/contractors are expected on site at any particular time during this period.

Construction equipment will include vacuum truck, pressure-washing equipment, excavators, front-end loaders, bulldozers, backhoes, tandem trucks.

Waste transportation would include a combination of lined containers, regular, tarped, lined and watertight tractor-trailers, dust such as bag house dust and hot gas precipitator dust would be loaded in lined bags (super sacks).

In addition to closure related activities, handling and shipment of Trevali's Caribou Mine concentrate will continue.

Upon receipt of Certificate of Determination:

Decommissioning and Demolition Activities:
Upon receipt of a Certificate of Determination, the intent is to proceed with the Smelter area decommissioning and demolition upon selection of a demolition contractor. Exclusions to this demolition contract would include the WWTP, the CRP Pump house and all associated infrastructure, along with the track scale.

The total estimated duration of demolition work is 12-18 months. Estimated hours of work will be 7 am to 7 pm. Since demolition contractors mostly mobilize from out-of-province, the work schedule is likely 7 days a week with a work rotation to be determined by the demolition contractor. A maximum of 60 employees/contractors are expected on site at any particular time during this period.

The Material Handling West area decommissioning and demolition including the Fertilizer Plant and track scale on the Smelter site will begin once there is no longer a commercial requirement to handle and ship Trevali's Caribou Mine concentrate. The intent is to proceed with the demolition of all MHW site infrastructure, including the Fertilizer Plant, by a demolition contractor with the only exceptions being based on commercial interest from a third party.

The total estimated duration of demolition work is 8 months. Estimated hours of work will be 7 am to 7 pm. Since demolition contractors mostly mobilize from out-of-province, the work schedule is likely 7 days a week with a work rotation to be determined by the demolition contractor. A maximum of 60 employees/contractors are expected on site at any particular time during this period.

Finally, the WWTP, CRP Pump house along with associated ponds and infrastructure will remain operational throughout the decommissioning and demolition of both the Smelter and MHW areas to treat wastewater generated from the closure activities. The brick shop building will also remain and be used as a storage building for WWTP. The intent is to proceed with the demolition of these buildings once applicable discharge limits have been met by the soil remediation method, selected based on the results of the trade-off study.

The total estimated duration of demolition work is 2 months. Estimated hours of work will be 7 am to 7 pm. Since demolition contractors mostly mobilize from out-of-province, the work schedule is likely 7 days a week with a work rotation to be determined by the demolition contractor. The maximum of 30 employees/contractors are expected on site at any particular time during this period.

Specific activities that will take place during the decommissioning and demolition activities will include, but not be limited to:

- Installation of Temporary Facilities and Controls
- Deactivation and De-energizing of Equipment
- Chemical Sweep & Universal Waste Removal
- Asbestos Abatement
- Final Building Cleaning, Draining of Equipment Oils & Cleaning of Process Equipment
- Naturally Occurring Radioactive Materials (NORM) Removals
- Interior Demolition & Strip out of Buildings
- Building Superstructure Demolition
- Demolition of Above Grade Foundations & Supports
- Demolition of Material Transfer Infrastructure
- Demolition of Bulk Storage Tanks & Piping Systems

Decommissioning and demolition will be completed using a combination of full to mid-sized excavators with attachments such as shears, pulverisers, hydraulic hammers, grapples, buckets, and magnets for demolition, excavation and material handling operations, as well as specialized high-reach demolition equipment and a mobile crusher plant. Other equipment may include front-end loaders, skid-steer loaders, mini-excavators, forklifts, telescopic handlers and scissor-lifts.

Material disposal activities:

Material disposal activities will include:

- Transportation and Off-site Disposal of Regulated Wastes at an out-of-province certified disposal facilities in accordance with applicable federal and provincial regulations.
- Disposal of Demolition Debris including non-recyclable, non-hazardous and metal-impacted demolition debris (concrete, wood, drywall, etc) as well as non-friable asbestos cladding at Brunswick Mine Pit.
- Processing and Transportation to off-Site material recycling facility of Recyclable Materials.

Waste and construction debris off-site transportation would include a combination of lined containers, regular, tarped, lined and watertight tractor trailers, dust such as bag house dust and hot gas precipitator dust would be loaded in lined bags (super sacks).

Civil Infrastructure and Environmental Mitigation Activities:

Once demolition is completed, the civil infrastructure and environmental mitigation work related to remediation of contaminated water and soil will begin. The total duration will depend on the results of a planned trade-off study to evaluate potential future environmental liabilities associated with covering the metal impacted soil compared to excavation and off-Site disposal.

Specific Activities will include:

- Rail Line Removal;
- Construction of Wetland or excavation of contaminated soils and transportation to the Brunswick Mine Site open pit for disposal;
- Borrow pit development/closure;
- Site cover & drainage improvements;
- New Slag Pile cover;
- On-site remediation of hydrocarbon impacted soil/groundwater at the Smelter Site;
- Remediation of ore concentrate impacted ballast on the rail spur line at Material Handling West. The ballast rock will be excavated and material transported to the Brunswick Mine Site open pit for disposal. The excavated ballast rock would be replaced for continued safe operation of the spur line;
- Monitoring wetland treatment efficiency, if applicable.

Glencore will complete a trade-off study to evaluate potential future environmental liabilities associated with covering the metal impacted soil compared to excavation and off-Site disposal.

The total estimated duration of demolition work is 8 months. The estimated hours of work will be 7 am to 7 pm. Since demolition contractors mostly mobilize from out-of-province, the work schedule is likely 7 days a week with a work rotation to be determined by the demolition contractor. A maximum of 60 employees/contractors are expected on site at any particular time during this period.

A preliminary construction schedule is attached in Appendix B for this application document.

Potential sources of pollutants from construction activities will include noise and fugitive dust emissions from demolition activities, leaks and spills from refueling of mobile equipment, leaks and spills from defective equipment, leaks or spills of residual products or chemicals stored on-site or contained within process equipment, storage tanks, or piping.

Environmental mitigation associated with closure activities will be addressed as detailed in section 10.9 Environmental Management of Construction/Demoltion and Section 14.6 Environmental (of the Project Execution Plan) of the GHD Closure Plan.

Access roads to the Site off of Highway 134 (owned by NBDTI) and the Port access road will be maintained. It is not anticipated that any additional access points will be required at the time of Site closure.

Glencore will maintain 24 hr security until the site is handed over to the demolition contractor, at which point, the contractor will be responsible for 24 hr security.

All waste will be addressed in accordance to Section 11 Demolition and Management of Demolition Material and Wastes of the GHD Closure Plan.

A borrow investigation program conducted by SNC as part of the 2008/2009 Closure Plan PFS has revealed the presence nearby of at least 460,000 m3 of a well graduated sand and gravel with less than 10% silt and a natural water content close to the optimum within the on-Site borrow pit. Should the option of covering the metal impacted soil be selected, it is not anticipated that significant importation of granular materials from off-Site sources will be required for the Smelter Site cover. However, the 2008/2009 Closure Plan PFS borrow investigation program identified only 120,000 m3 of organic soil within the on-Site borrow pit. Therefore, an additional 20,000 m3 organic topsoil may be required to be imported for off-Site sources. Should the option to excavate all metal impacted soils for off-site disposal be selected, an additional source of borrow material would be required to be identified.

Based on the assessment of forest technicians, cutting of any merchantable wood in the borrow areas will be contracted to third-parties. Mobile equipment such as dozers will be used to push the grubbing to the outer perimeters of the area. Any organic soil will be stockpiled for use as cover on the Smelter site. The borrow area excavation will be re-contoured and covered with the grubbing in accordance with applicable regulations set forth by the Province of New Brunswick.

Section 4 Regional Settings of the GHD Closure Plan details regional settings of the project including sensitive areas such as wetland, watercourses, wildlife habitat, Environmentally Significant Areas. Sections 10.5 & 10.6 of the same report provide details of planned construction activities near these sensitive areas.

Any valuable assets currently on site will be offered within Glencore for use at its other operating units within Canada and abroad.

(i) FUTURE MODIFICATIONS, EXTENSIONS, OR ABANDONEMENT:

N/A

(j) PROJECT-RELATED DOCUMENTS

The Certificate of Approval to Operate (I-9010), valid through to August 22, 2020, requires that Glencore completes test monitoring of wastewater and effluent including the analysis of pH, iron, copper, lead, zinc, cadmium, and arsenic from the smelter effluent treatment plant, polishing pond, cooling water discharge, slag pond, east and west diversion ditches, and groundwater monitoring wells in accordance with the Approval to Operate. Glencore provides a Monthly Environmental Report to the NBDELG pertaining to the effluent water quality testing and monitoring, a summary of any significant events such as discharges which exceed the limits with mitigation taken, a summary of the total water intake from the Jacquet River in accordance with the approval to operate.

Glencore currently has an Approval to Operate (I-9101), valid through to November 14, 2020, from NBDELG for the purpose of operating the Brunswick Smelter and MHW Area. The NBDELG issued this Air Quality Permit pursuant to the Air Quality Regulations 97-133 under the Clean Air Act. This Approval to Operate contains conditions on operating, emissions limits, stack testing requirements, ash disposal requirements, record keeping and reporting requirements, in accordance with the Approval to Operate and as detailed in this section.

Supporting Environmental Risk Assessment reports are available in Appendix C.

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

Section 3 Background and Section 4 Regional Settings of the GHD Closure Plan provide details relating to the description of the existing environment.

Glencore's environmental monitoring program for its Brunswick Smelter site was designed to assess the presence of chemicals of concern from smelting operations in different compartments of the local environment, to provide information on contaminant levels in important food organisms and to assess the health of local benthic communities.

During operations, the program consisted of monitoring six separate environmental compartments; air, water, soil, sediment, plants, and animals (Table 5.1). Air was monitored throughout the year for particulate concentrations and the metal concentrations associated with these particulates. This provided an ability to track the concentrations of these materials emitted by the Smelter and their temporal and spatial variability. Similarly, surface waters were monitored bi-weekly when water flow was present, to assess spatial patterns and temporal trends in metal concentrations. Ground water was monitored less frequently (twice a year) to track the potential for dispersion of contaminants in this water. The concentration of metals in plants and animals that were important food sources for humans were tracked once per year to ensure that no significant contamination occured, and if it were to, to provide the necessary knowledge to make a management decision. Similarly, the concentration of metals in forage was monitored to ensure that no transfer of contaminants occured. The physical properties of soil and sediment and their metal concentrations were monitored to provide a consistent knowledge of metal levels in these compartments and to support the assessment of metal levels in plants and benthic macro invertebrates, respectively.

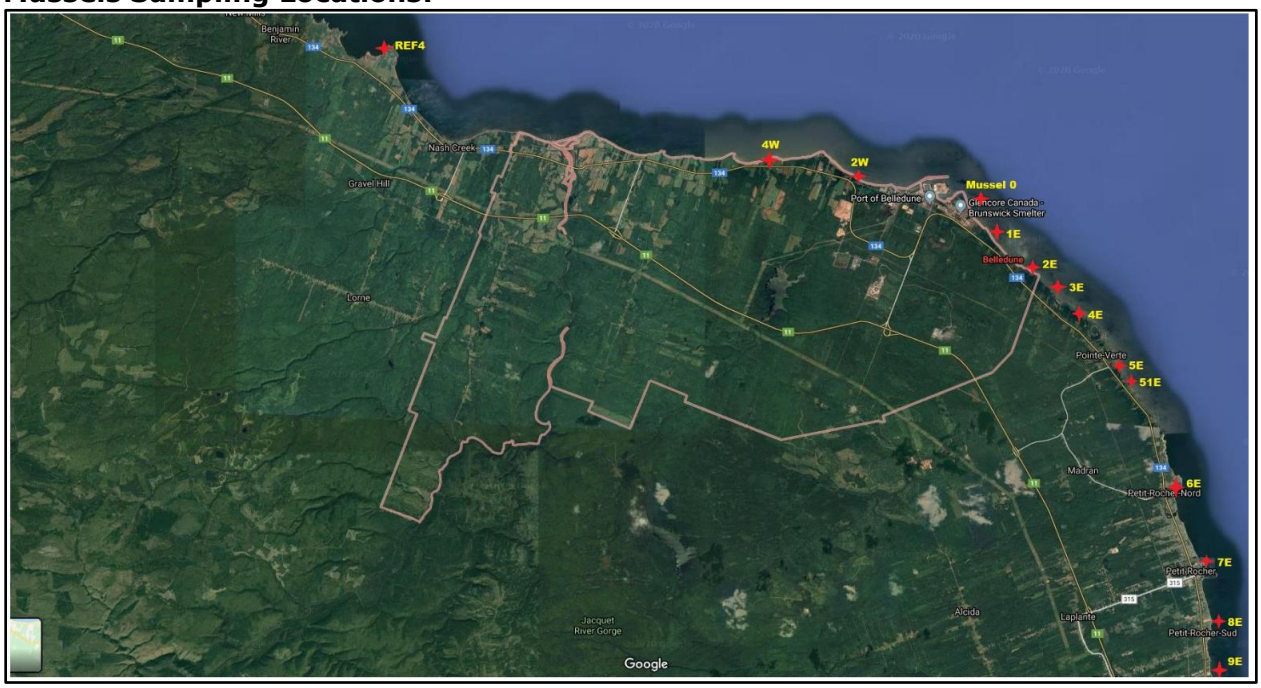
Compartment	Title	Frequency	Sites	Replicates	Analyses
Ambient Air	particulates	Every 6th day	5		Particulates, As, Cd, Pb, Tl, Zn, SO_4
Water	Surface water	Various Twice a week	8(Bi weekly) 3 (weekly) 3 (daily) 4 (24hcomp)		pH, As, Cd, Cu, Fe, Pb, Tl, Zn
		Once a month	Grab Final EFF Grab Bulk Eff		Nitrate Total Suspended solid Nitrogen Phosphorus Mercury Ammoniac Fluoride BOD
		Once a month	Grab Final Eff		Sulfate
		Once a month	Grab Bulk Eff Salt Eff weekly composite Salt Inf weekly composite Final Eff weekly composite		ICP-Metal
		4 Time a year	Final Eff		Toxicity Test

					Sulfide
	Ground water	Twice a year	53 This #changes most years due to heavy equipment damage to wells		pH, As, Cd, Pb, Tl, Zn
Compartment	**Title**	**Frequency**	**Sites**	**Replicates**	**Analyses**
Animal Tissue	Native mussels	Once a year (summer)	7 every 3 years starting in 2015	10% outside lab	Cd, Pb, Hg, Tl, Zn
	Benthic macro invertebrates	Every 10th year (mid-summer)	25	1	Taxonomy, abundance, diversity
Supportive Soil and Sediment	Sediment	Every 10th year (mid-summer)	25 stations	1 for each analysis	Grain size, TOC, As, Cd, Pb, Tl, Zn
	Soil	Once a year (beginning of the summer)	4(Forage Soil) 0 (garden) Subject to change	Outside lab	pH, As, Cd, Pb, Tl, Zn

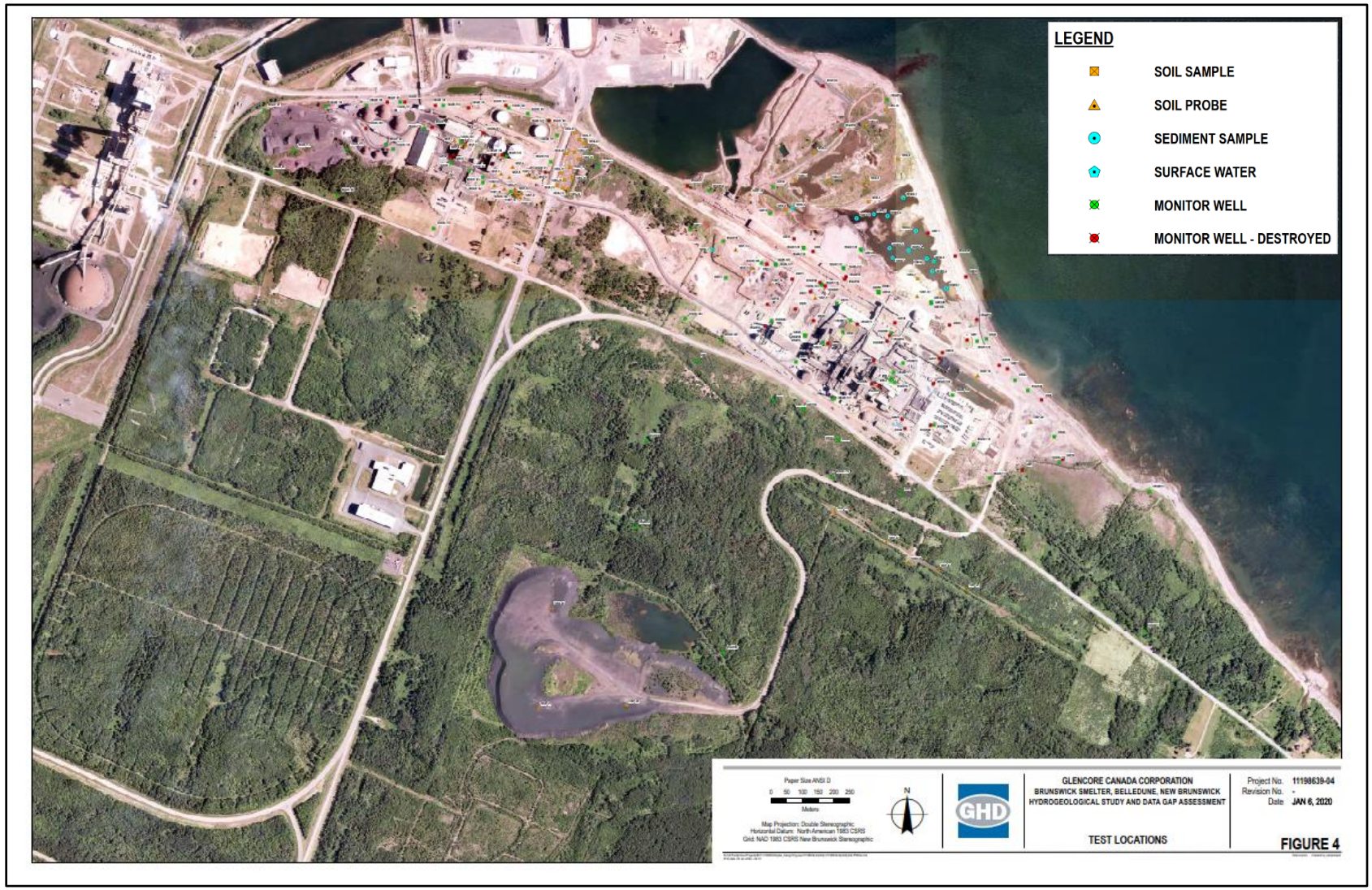
Water Sampling Locations:

Ambient Air Sampling Locations:

Mussels Sampling Locations:



Hydrogeological Study and Data Gap Assessment - Ground Monitoring Wells and Other Test Locations



All other information regarding surface water and ground water monitoring are available in the Hydrogeological Study and Data Gap Assessment (Included as Appendix B of the GHD Closure Plan).

Upon termination of Smelter operations, written confirmation was received from NBDELG that activities related to SO2 monitoring, stack testing and ambient air sampling could cease.

Glencore is currently in the process re-applying for the Certificate of Approval to Operate (I-9010) under the Water Quality Regulation - Clean Environment Act and Approval to Operate (I-9101) under the Air Quality Regulation - Clean Air Act. All future sampling requirements will be determined as part of the application and renewal process.

Section 11 Demolition and Management of Demolition Material and Wastes Settings of the GHD Closure Plan provides details of hazardous materials as well as the planned disposal facilities.

4.0 SUMMARY OF ENVIRONMENTAL IMPACTS

Environmental impacts from the operations and expected impacts from the closure activities of the Brunswick Smelter are well documented in Section 10 Environment of the GHD Closure Plan.

Appendix D contains details of beneficial environmental impacts of the Brunswick Smelter Closure.

5.0 SUMMARY OF PROPOSED MITIGATION

Environmental impact mitigation plans from the former operations and planned closure activities are detailed in sections 10.8 Environmental Mitigation Measures and 10.9 Environmental Management of Construction/Demolition of the GHD Closure Plan.

Glencore is currently in the process of preparing its Project Execution Plan, which will provide details of the roles and responsibilities of the project team including those related to site supervision and waste management.

6.0 PUBLIC AND FIRST NATIONS INVOLVEMENT

Communication with all stakeholders including community and First Nations will take place in the form of public meetings and open houses with planning of these activities to begin in February 2020 under the guidance of Glencore Canada Corporations' Director of Governmental Relations and & Corporate Affairs.

Section 7.2 Indigenous/Aboriginal Considerations of the GHD Closure Plan details project considerations with regards to local First Nations communities.

7.0 APPROVAL OF THE PROJECT

Section 7.1 Federal, Provincial and Local Government of the GHD Closure Plan details the current Certificates of Approval to Operate, Applicable Acts, Regulations, and Guidelines including a list of potentially required permits, licenses, approvals and authorizations that may be required as part of the decommissioning project.

Additional permits, licenses, approvals and authorizations may be required for disposal of waste at Glencore's Brunswick Mine.

8.0 FUNDING

Glencore has not applied for any grants or loans for capital funds from any government agency.

9.0 SIGNATURES

April 8, 2020

Date

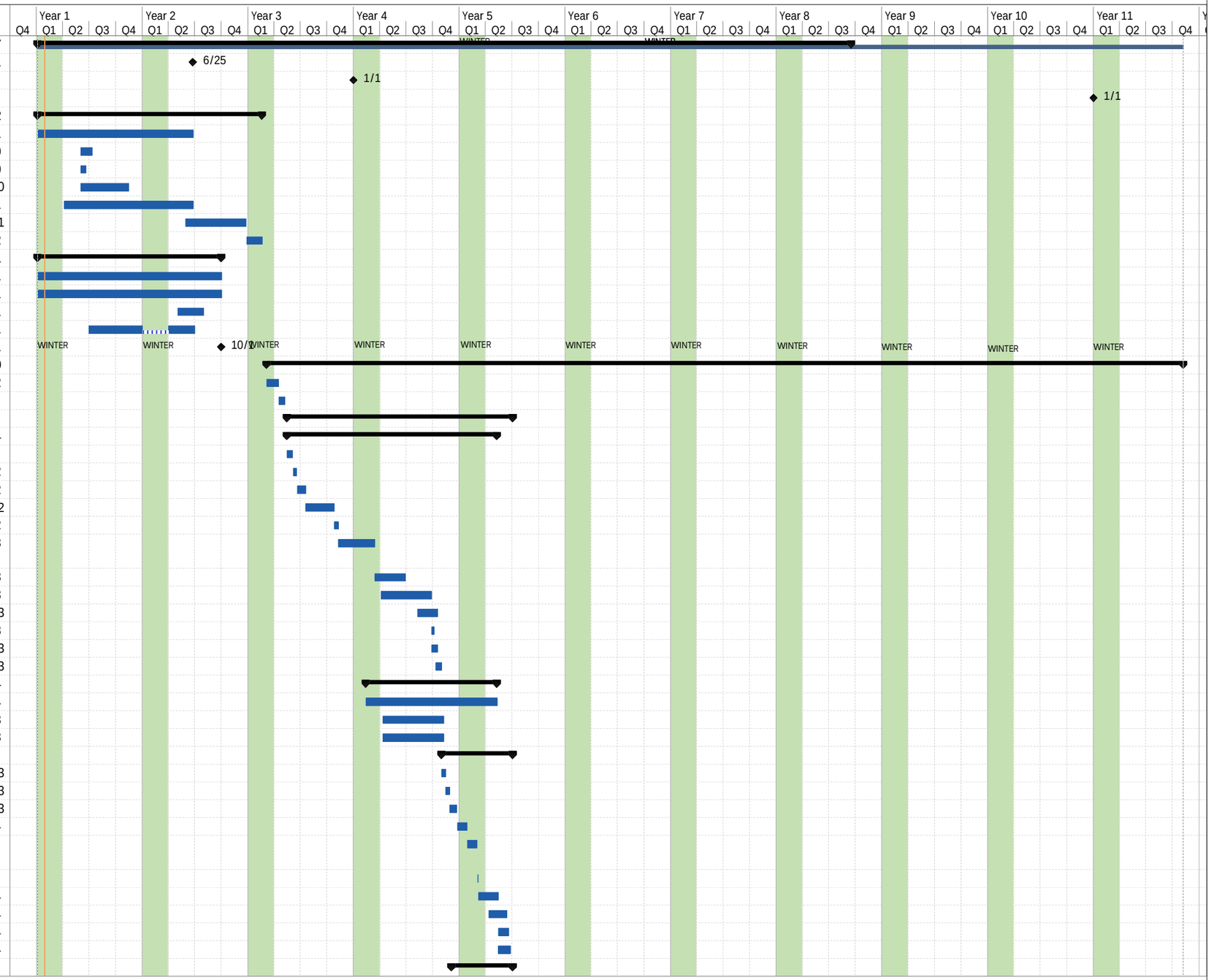
Signature of Main Proponent Contact

APPENDIX A
GHD Closure Plan - Prefeasibility Study 2019 Update (File No.11198639)

APPENDIX B
Preliminary Construction Schedule

Brunswick Smelter Closure Schedule

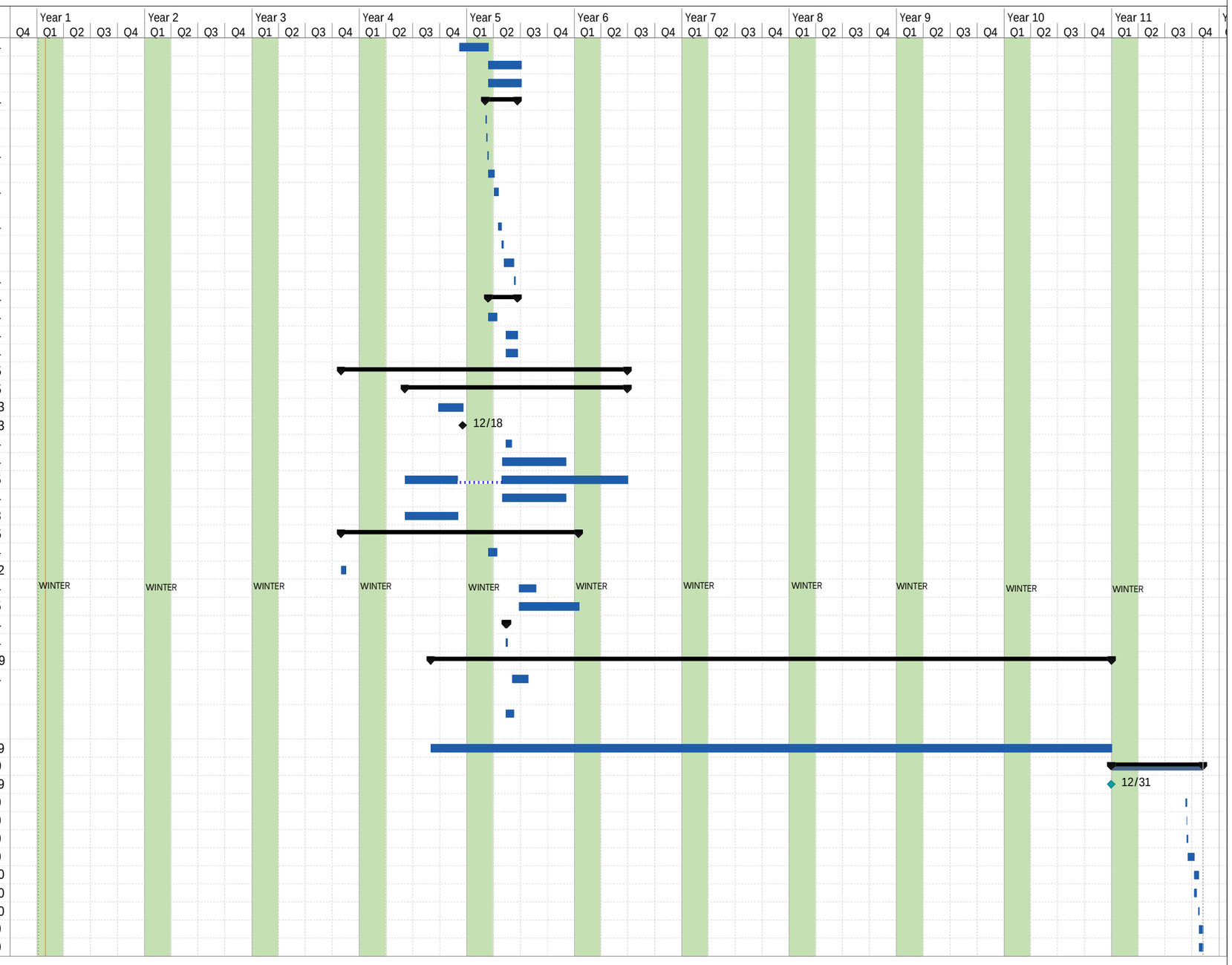
ID	Task Name	Start	Finish
1	Glencore Smelter Decommissioning	1/6/2020	9/16/2027
2	Assumption on timing of Minister's Determination	6/25/2021	6/25/2021
3	Assumption on End of Trevali Contract	1/1/2023	1/1/2023
4	Assupmtion on achieving sustained discharge limits w/o WWTP	1/1/2030	1/1/2030
5	Pre-Decommissioning Engineering	1/6/2020	2/18/2022
6	Stakeholder Consultation and Agreement	1/6/2020	6/25/2021
7	Environmental Sampling	6/1/2020	7/10/2020
8	Topographic Survey	6/1/2020	6/19/2020
9	Hazardous Materials Update & Additional Basic Engineering Studies	6/1/2020	11/13/2020
10	EIA Preparation, Registration and Approvals	4/6/2020	6/25/2021
11	Detailed Design and Tendering	5/31/2021	12/24/2021
12	Contractor Selection and Award	12/27/2021	2/18/2022
13	Glencore Planning and Management Activities	1/6/2020	10/1/2021
14	Asset Management Planning	1/6/2020	10/1/2021
15	Raw Material Inventory Management & Removals	1/6/2020	10/1/2021
16	Relocation of Valuable Equipment to Other Glencore Facilities	5/3/2021	7/30/2021
17	Initial Cleaning Activities for Smelter & Material Handling West	6/30/2020	6/30/2021
18	Cesation of Site Activities by Glencore Personnel	10/1/2021	10/1/2021
19	Decommissioning & Demolition Activities	3/7/2022	11/7/2030
20	Project Start-up and Mobilization & Contractor Submittals	3/7/2022	4/15/2022
21	Pre-Decommissioning Inspections/Inventories	4/18/2022	5/6/2022
22	Building Infrastructure	5/16/2022	7/3/2024
23	Smelter Area	5/16/2022	5/10/2024
24	Installation of Temporary Facilities and Controls	5/16/2022	6/3/2022
25	Deactivation and De-energizing of Equipment	6/6/2022	6/17/2022
26	Chemical Sweep & Universal Waste Removal	6/20/2022	7/19/2022
27	Asbestos Abatement	7/20/2022	10/25/2022
28	Deactivation and De-energizing of Buildings	10/26/2022	11/8/2022
29	Final Building Cleaning, Draining of Equipment Oils & Cleaning of Process Equipment	11/9/2022	3/14/2023
30	Interior Demolition & Stripout of Buildings	3/15/2023	6/27/2023
31	Building Superstructure Demolition	4/5/2023	9/26/2023
32	Demolition of Above Grade Foundations & Supports	8/9/2023	10/17/2023
33	Demolition of Material Transfer Infrastructure	9/27/2023	10/6/2023
34	Demolition of Bulk Storage Tanks & Piping Systems	9/27/2023	10/17/2023
35	Acid Stack Demolition	10/11/2023	10/31/2023
36	Material Disposal	2/13/2023	5/10/2024
37	Transportation and Off-site Disposal of Regulated Wastes	2/13/2023	5/10/2024
38	Disposal of Demolition Debris at Brunswick Mine Pit	4/12/2023	11/7/2023
39	Processing and Transportation of Recyclable Materials	4/12/2023	11/7/2023
40	Material Handling West Facilities	11/1/2023	7/3/2024
41	Installation of Temporary Facilities and Controls	11/1/2023	11/14/2023
42	Deactivation and De-energizing of Equipment	11/15/2023	11/28/2023
43	Chemical Sweep & Universal Waste Removal	11/29/2023	12/22/2023
44	Asbestos Abatement	12/25/2023	1/26/2024
45	Final Building Cleaning, Draining of Equipment Oils & Cleaning of Process Equipment	1/29/2024	3/1/2024
46	Interior Demolition & Stripout of Buildings	3/4/2024	3/5/2024
47	Building Superstructure Demolition	3/7/2024	5/15/2024
48	Demolition of Above Grade Foundations & Supports	4/11/2024	6/12/2024
49	Demolition of Material Transfer Infrastructure	5/16/2024	6/19/2024
50	Demolition of Acid Storage Tanks & Piping Systems	5/16/2024	6/26/2024
51	Material Disposal	12/6/2023	7/3/2024



Task Milestone Summary

Brunswick Smelter Closure Schedule

ID	Task Name	Start	Finish
52	Transportation and Off-site Disposal of Regulated Wastes	12/6/2023	3/12/2024
53	Disposal of Demolition Debris at Brunswick Mine Pit	3/14/2024	7/3/2024
54	Processing and Transportation of Recyclable Materials	3/14/2024	7/3/2024
55	Fertilizer Plant (DAP/PAP)	3/4/2024	6/21/2024
56	Installation of Temporary Facilities and Controls	3/4/2024	3/6/2024
57	Deactivation and De-energizing of Equipment	3/7/2024	3/8/2024
58	Chemical Sweep & Universal Waste Removal	3/11/2024	3/13/2024
59	Asbestos Abatement	3/14/2024	4/3/2024
60	Final Building Cleaning, Draining of Equipment Oils & Cleaning of Process Equipment	4/4/2024	4/16/2024
61	NORM Removals	4/17/2024	4/26/2024
62	Interior Demolition & Stripout of Buildings	4/29/2024	5/3/2024
63	Building Superstructure Demolition	5/6/2024	6/7/2024
64	Demolition of Above Grade Foundations & Supports	6/10/2024	6/13/2024
65	Material Disposal	3/14/2024	6/21/2024
66	Transportation and Off-site Disposal of Regulated Wastes	3/14/2024	4/10/2024
67	Disposal of Demolition Debris at Brunswick Mine Pit	5/13/2024	6/21/2024
68	Processing and Transportation of Recyclable Materials	5/13/2024	6/21/2024
69	Civil Infrastructure	10/31/2022	6/30/2025
70	Smelter Area	6/5/2023	6/30/2025
71	Site Services Decommissioning	9/26/2023	12/18/2023
72	Freshwater Infrastructure Decommissioning	12/18/2023	12/18/2023
73	Rail Line Removal	5/13/2024	5/31/2024
74	Wetland Construction	5/1/2024	12/2/2024
75	Borrow Pit Development/Closure	6/5/2023	6/30/2025
76	Site Cover & Drainage Improvements	5/1/2024	12/2/2024
77	New Slag Pile Cover	6/5/2023	12/1/2023
78	Material Handling West Facilities	10/31/2022	1/15/2025
79	Site Services Decommissioning	3/14/2024	4/10/2024
80	Rail Line Removal	10/31/2022	11/15/2022
81	Wetland Construction	6/27/2024	8/21/2024
82	Site Cover & Drainage Improvements	6/27/2024	1/15/2025
83	Fertilizer Plant (DAP/PAP)	5/13/2024	5/17/2024
84	Site Services Decommissioning	5/13/2024	5/17/2024
85	Remediation of Environmental Impacts	9/1/2023	12/31/2029
86	Hydrocarbon Impacted Soil/Groundwater Remediation - Smelter Area	6/3/2024	7/26/2024
87	Ore Concentrate Impacted Ballast on Rail Spur Line - Material Handling West	5/13/2024	6/7/2024
88	Monitoring Wetland Treatment Efficiency	9/1/2023	12/31/2029
89	WWTP Closure	12/31/2029	11/7/2030
90	Cease Wastewater Treatment Activities	12/31/2029	12/31/2029
91	Installation of Temporary Facilities and Controls	9/9/2030	9/11/2030
92	Deactivation and De-energizing of Equipment	9/12/2030	9/12/2030
93	Chemical Sweep & Universal Waste Removal	9/13/2030	9/16/2030
94	Decommissioning Cleaning	9/17/2030	10/7/2030
95	Building and Concrete Structures Demolition	10/8/2030	10/21/2030
96	Demolish Polishing Pond	10/8/2030	10/14/2030
97	Above Grade Foundations Demolition	10/22/2030	10/24/2030
98	Backfill, Regrade and Cover WWTP and Polishing Pond	10/25/2030	11/7/2030
99	Re-configure Wetland Outlet and Drainage Ditching	10/25/2030	11/7/2030



Task Milestone Summary

APPENDIX C
Environmental Risk Assessment Reports

APPENDIX D
Beneficial Environmental Impacts of Brunswick Smelter Closure

BRUNSWICK SMELTER

Glencore Canada Corporation

INFORMATION MEMORANDUM: February 3, 2020

FROM : Michel Cotton

TO : Kelly Longval

SUBJECT : Beneficial environmental impacts of Brunswick smelter closure

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Executive summary

Below is a list of expected environmental benefits from the closure of the Brunswick Lead smelter. The approach is to assume that all known & measured impacts from recent years are eliminated.

1 – Ground & particulate emissions.

Reduction (elimination) of particulate heavy metal emissions:

	Quantity (Metric tonnes / year)
Total Particulate	48
Lead	11.1
Zinc	1.5
Cadmium	1.5
Arsenic	6.6

(Based on 2018 Annual environment effects monitoring report to NBDOE)

2 – Sea water.

- Reduction (elimination) of heavy metal emissions to sea water (Cd, As, Tl).
- Elimination of heat input in the Bay-des-Chaleurs by elimination of process cooling requirement.
- Reduction of Cargo ships traffic in the Bay (by 15-20 vessels/year; *ref. 2017-18*)
- Reduction of risk of accidental release of heavy-metal bearing concentrate in the Port area from a reduction in product handling.

3 – Fresh water.

- Reduction of fresh water extraction from Jacquet River for smelter usage
- Approx. reduction of 1,500,000 m^3/year (*ref. 2018 water balance*).

4 – Energy & Greenhouse gas emissions.

- Elimination of 229,000 mt/year of CO_2e direct (scope 1) emissions from the process.
- Elimination of 33,600 mt/year of CO_2e indirect emissions from the reduction in electricity consumption. *(Based on 2018 data).*

5 – Atmospheric pollutants emissions.

- Elimination of SO_2 emissions: 9,443 metric tonnes/year.
  (Based on 2018 Annual environment effects monitoring report to NBDOE)

6 – Road & rail traffic.

- Elimination of approx. 1,100 tractor trailer loads of product shipped via road.
- Elimination of approx. 650 railcars of product shipped via rail.
  (Based on 2017 Smelter production & shipping destinations)