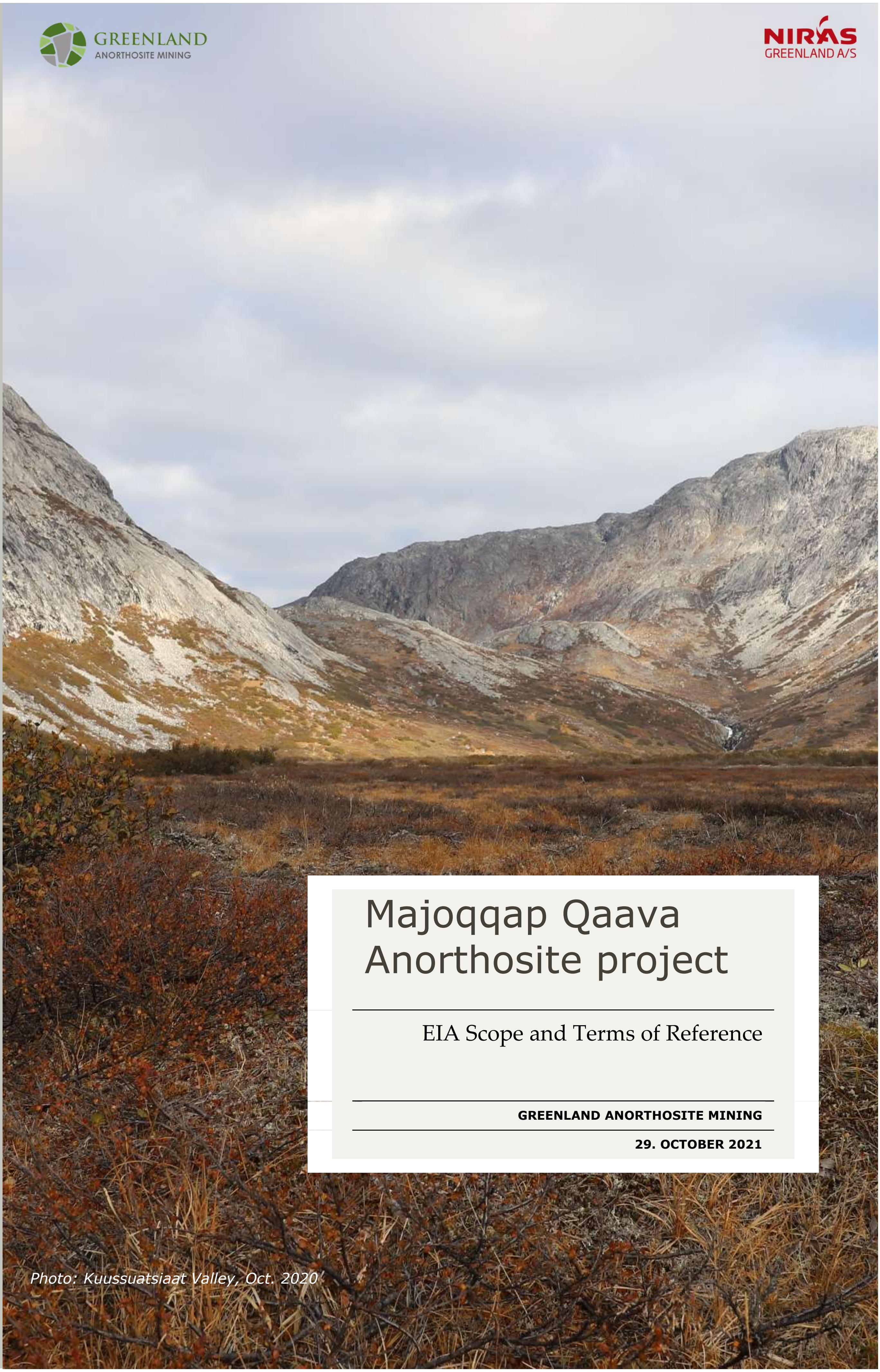
GREENLAND ANORTHOSITE MINING

NIRAS GREENLAND A/S



Majoqqap Qaava Anorthosite project

EIA Scope and Terms of Reference

GREENLAND ANORTHOSITE MINING

29. OCTOBER 2021

Photo: Kuussuatsiaat Valley, Oct. 2020

Content

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Abbreviations

The following abbreviations are found in this document:

ARDML Acid Rock Drainage Metal Leaching

ANFO ANFO (or AN/FO) for ammonium nitrate/fuel oil is a widely used bulk industrial explosive.

Anorthosite Anorthosite is a white-grey phaneritic, intrusive igneous rock characterized by its composition: mostly plagioclase feldspar (90–100 %), with a minimal mafic component. Pyroxene, ilmenite, magnetite, and olivine are the mafic minerals most commonly present.

BWI Bond Ball Mill Work Index.

Bytownite Bytownite is a calcium rich feldspar mineral. Mineralogically, Bytownite is a member of the plagioclase solid solution series of feldspar minerals with composition between anorthite and labradorite. It is usually defined as having between 70 and 90 % An (formula ($Ca_{0.7-0.9}$,$Na_{0.3-0.1}$)[Al(Al,Si)Si_2O_8]) (source. Wikipedia).

Ceramic A ceramic is any of the various hard, brittle, heat-resistant and corrosion-resistant materials made by shaping and then firing a non-metallic mineral, such as clay, at a high temperature. Common examples are earthenware, porcelain, and brick.

CIM CIM is a standard definition for calculating mineral resources and reserves used in Canada. Mineral Resources and Mineral Reserves in Mining Studies are incorporated under the "National Instrument NI 43-101" Rules. CIM definitions and standards are described at www.cim.org.

DWT Dead weight tonnage.

E-glass Glass fibre is formed when thin strands of silica-based or other formulation glass are extruded into many fibres with small diameters suitable for textile processing. The technique of heating and drawing glass into fine fibres has been known for millennia; however, the use of these fibres for textile applications is more recent.

The most common types of glass fibre used in fiberglass is E-glass glass ("E" because of initial electrical application), which is alumino-borosilicate glass with less than 1 % alkali oxides, mainly used for glass-reinforced plastics.

EPCM Engineering, Procurement and Construction Management - a professional engineering services contract for the construction of manufacturing plants or heavy engineering facilities across many industries.

Feldspar Feldspars ($KAlSi_3O_8$ – $NaAlSi_3O_8$ – $CaAl_2Si_2O_8$) are a group of rock-forming minerals that make up about 41 % of the Earth's continental crust by weight. A rock formed almost entirely of calcic plagioclase feldspar is known as anorthosite.

Filler Filler materials are particles added to resin or binders (paints, plastics, composites, concrete) that can improve specific physical properties such as hardness, brightness, durability etc., make the product cheaper, or a mixture of both.

GAM Greenland Anorthosite Mining ApS.

Hp Horsepower

HPGR High-Pressure Grinding Roller. HPGR´s are used for size reduction or rocks and ores. They compress the feed material between two rotating rollers, one of which is in a fixed position and another roller that is floating. The two rotating rollers generate such a high pressure that it grinds the feed material to the desired smaller grain size.

k tpa Kilo Tonnes per Annum.

Km/km^2 Kilometre/sq. kilometre

kW Kilo watt

LCM Loose Cubic Meter.

LoM Life of Mine.

LOA Length over all

ltr. Litres

ltr./s Litres per seconds

MAQ Majoqqap Qaava Anorthosite.

m ASL Metres above sea level.

MWh Mega Watt Hours

mm, cm, µm millimetre, centimetre, micrometre.

MMA Mine Maintenance Area.

MLSA Mineral Licence and Safety Authority

mt Million tonnes.

MRA Mineral Resources Authority

N.A. Not applicable, not available

NI 43-101 National Instrument 43-101 (the "NI 43-101" or the "NI") is a national instrument for the Standards of Disclosure for Mineral Projects within Canada that is also widely used in other jurisdictions. The Instrument is a codified set of rules and guidelines for reporting and displaying information related to mineral properties owned by, or explored by, companies which report these results on stock exchanges within Canada.

NOx Is a generic term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide (NO) and nitrogen dioxide (NO_2).

NSI Navigational Safety Investigation

Optical Sorting Optical sorting (sometimes called digital sorting) is the automated process of sorting solid products using cameras and/or lasers. Depending on the types of sensors used and the software-driven intelligence of the image processing system, optical sorters can recognize objects' colour, size, shape, structural properties and chemical composition and remove defective products and foreign material from the production line, or separate products of different grade or types of materials.

PEA Preliminary Economic Assessment. A PEA is a study prepared in accordance with NI 43-101 that tries to answer the question, "how can a deposit best be exploited to maximize its economic returns?" Unlike more advanced studies, a PEA can use inferred resources for its operational and financial modelling so long as one has a reasonable expectation the outcome will be a profitable mine. A PEA is normally followed by a Pre-Feasibility Study (PFS) and, if financing with debt, a Feasibility or Bankable Feasibility Study (FS/BFS). A PEA rarely forms the basis for a production decision because of the higher degree of unknown risks and costs and timelines.

PSI Pounds per Square Inch

RER Rare Earth Roll

RoM Run-of-Mine.

SOx Is a generic term for the sulphur oxides that are most relevant for air pollution, mostly sulphur dioxide (SO_2).

SRK SRK Consulting, Cardiff, Wales.

Stone wool Stone wool is an insulation material of inorganic origin intended for thermal and acoustic insulation, as well as for fire prevention in civil engineering, industry and the shipbuilding industry.

TML Transportable Moisture Limit

TOR Terms of Reference

TSF Tailings Storage Facility.

t/xx Tonnes per day/week/year

WAI Wardell Armstrong International laboratory, Cornwall, UK.

XRT X-Ray Transmission that measures atomic density in rocks.

1 Introduction

Greenland Anorthosite Mining ApS [GAM] is a Greenlandic mineral exploration company focused on developing the Majoqqap Qaava anorthosite Project into a mine operation. The Majoqqap Qaava anorthosite project is located on the southwest coast of Greenland in the Kuussuatsiaat Valley in the inner part of Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden), 40 km northeast of Qeqertarsuatsiaat (Fiskenæsset) (population: 169) within the 100 % exclusive exploration license Majoqqap Qaava MEL 2019-162. The license covers 34 sq. km and is located at approximately latitude 63°13’N and longitude 50°12’W. There is no existing infrastructure at the Project site. Transport to and from Qeqertarsuatsiaat (Fiskenæsset) is possible either by boat or helicopter. Greenland’s capital, Nuuk, is located c. 130 km to the north-northwest of the project area and has well-developed infrastructure with modern harbour facilities and a population exceeding 18,000 people.

Anorthosite is a massive white rock primarily comprised of the chemical components aluminium, silicon, and calcium. The deposit at Majoqqap Qaava is unique in its size and purity of these components, but equally importantly due to its unusually low content of the so-called alkali metals - sodium and potassium - being the key for many industrial applications. This inherent feature is particularly important for E-glass fibre production (for use in the wind turbine industry, automobiles, boats, aircrafts etc.). Following simple and cheap processing, anorthosite may also be used as a vital component in the production of stone wool, which is used in the insulation industry, filler and coatings for the paint industry, aluminium metal and many other industrial applications.

1.1 Project location

Majoqqap Qaava is situated in west Greenland at an approximate latitude of 63°13’N and longitude 50°12’W. The licence shown in Figure 1 and Figure 2, covers an area of 34 km^2 and is located approximately 130 km south-southeast of Greenland’s capital, Nuuk, and 40 km east-northeast of the small settlement of Qeqertarsuatsiaat (Fiskenæsset). The project is located at the base of the Kuussuatsiaat Valley, in the innermost part of the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden).

GAM has concentrated exploration on a 5.5 km^2 area, targeting an anorthosite rock unit which forms part of an intrusion known as the Fiskenæsset Gabbro-Anorthosite Complex.

The topography in the wider Qeqertarsuatsiaat (Fiskenæsset) region varies from gentle low-lying relief (0-500 m) with moderate vegetation along the coastal stretches to areas with higher relief (up to 1,500 m) in the inland areas in vicinity of the inland ice. The exposure of bedrock is generally good, especially inland where vegetation is sparse, but significant parts of the coastal areas may be covered by overburden and vegetation. The region is intersected by several large deep-water fjord systems, which are generally ice-free all year round. The area of exploration rises from sea-level to elevations of c. 1,000 m near the Majoqqap Qaava summit. A large system of lakes follows the flat lying southwest-trending Kuussuatsiaat valley for more than 10 km terminating at the north coast of Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden).

Figure 1. License map showing MEL 2019-162 and neighbouring claims.

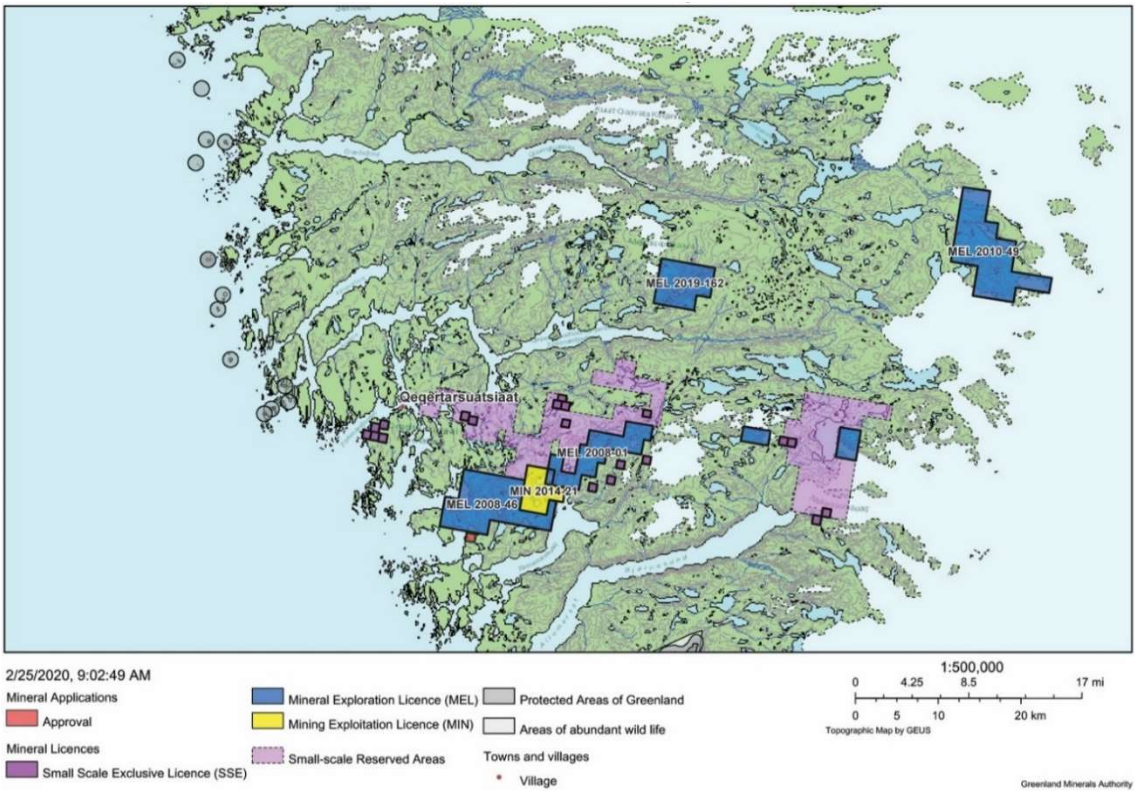
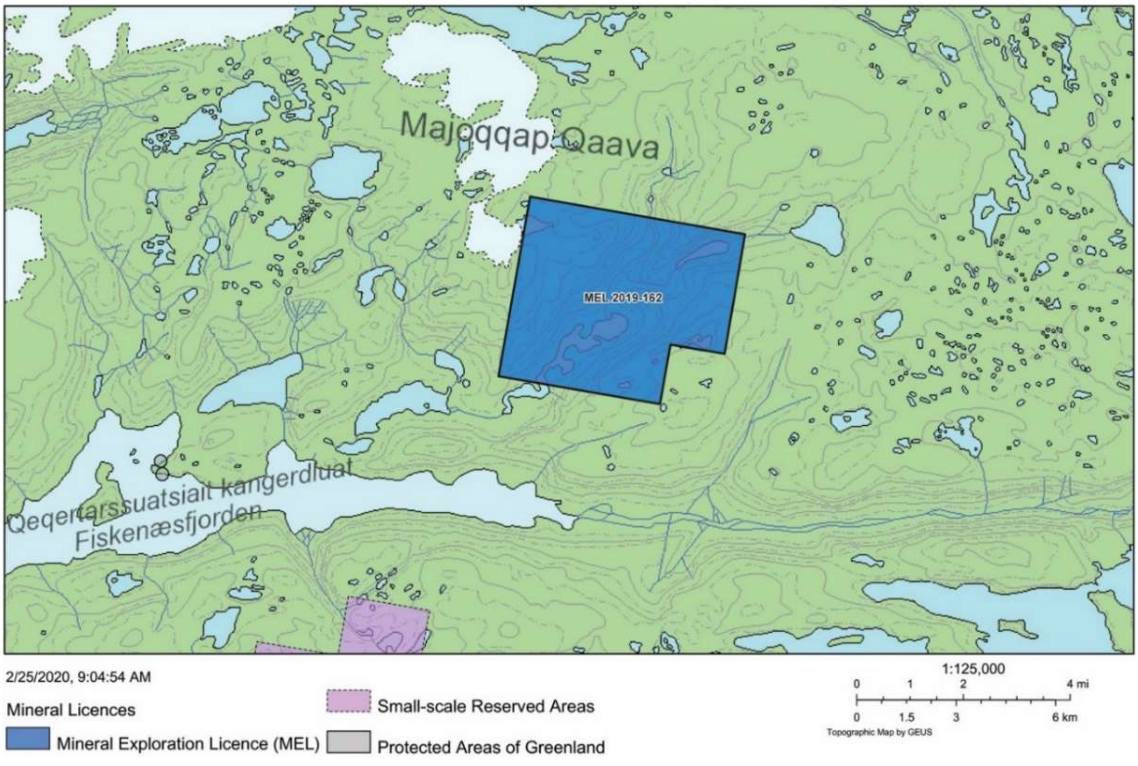


Figure 2. License map showing MEL 2019-162.

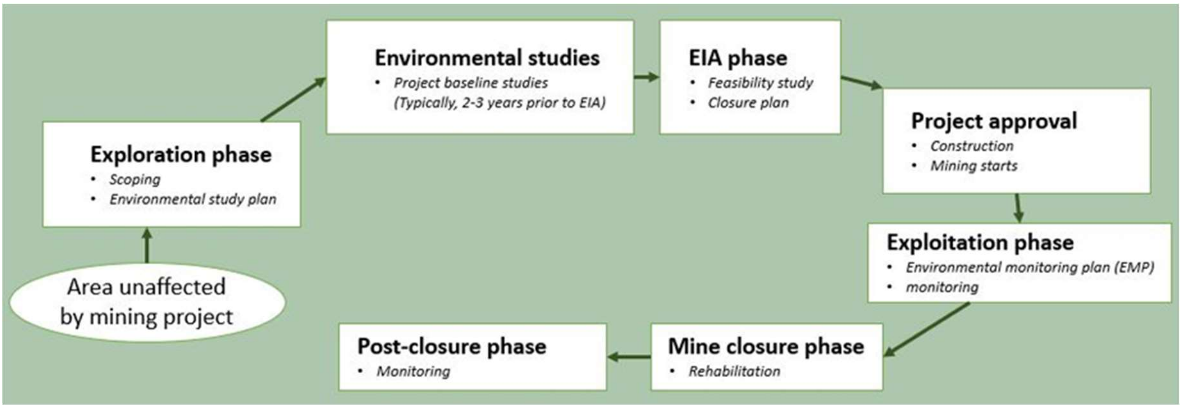


1.2 Legislation and permitting process

To acquire an exploitation license in Greenland, the Greenland Authorities require submission and approval of an Environmental Impact Assessment [EIA], Social Impact Assessment [SIA] and an Impact Benefit Agreement [IBA] for the project.

The present document contains the scoping and Terms of Reference [ToR] for the EIA for GAM's Majoqqap Qaava anorthosite project. The EIA must be prepared in accordance with guidelines published by the Greenland Mineral Resources Authority (Mineral Resources Authority, 2015). A schematic presentation is shown in, Figure 3.

Figure 3. Schematic outline of the EIA legislation processes for mining in Greenland.



1.3 Environmental impact assessment process [EIA]

This section will outline the proposed actions and studies to be undertaken in order to provide a thorough and conclusive EIA. This includes a description of proposed field studies, pinpointing of environmental aspects which require special attention, an overall proposal of the EIA table of content and a draft of the project closure and post-closure obligations.

The document represents the first step in the preparation of the EIA, which involves presentation of a project scoping and a Terms of Reference [ToR] for approval by the Mineral Resources Authority [MRA].

Scoping is the initial phase of the EIA process. The scoping phase contains a brief description of the proposed project including the location and a description of project activities. Information is also provided about the climate, flora and fauna. The scoping also describes and discusses the potential environmental impacts to be foreseen. Finally, knowledge gaps are identified and the range and extent of additional studies to be conducted is determined. Based on the Scoping, the Terms of Reference [ToR] for the EIA is formulated.

After a public pre-consultation period of 35 days, a White Paper will be prepared containing all comments and questions received, along with answers from the mining company and the Greenland Authorities. The ToR will be adjusted accordingly to the white paper and submitted to the MRA. After ratification of the final ToR by MRA the EIA process continues with preparation of a project EIA report.

2 Project description

The following paragraphs will outline the proposed project. This will include an overall description of the proposed project, relevant project aspects and project alternatives.

2.1 The Company

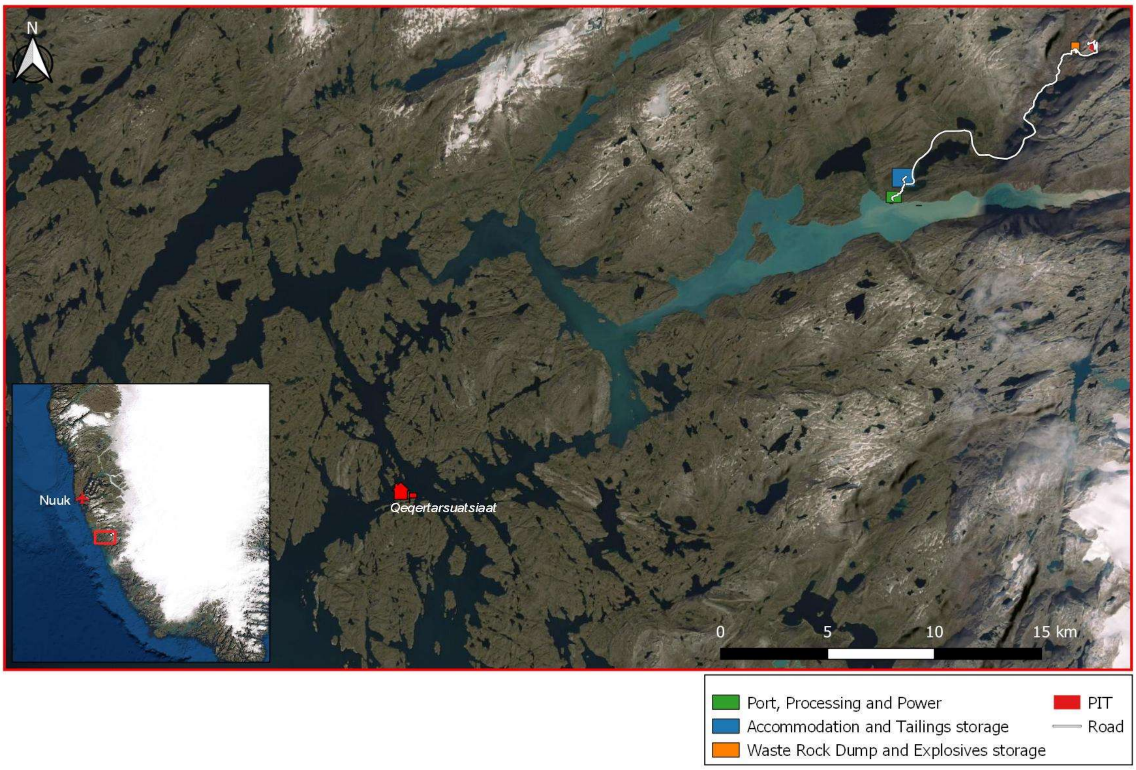
Greenland Anorthosite Mining ApS [GAM] is a Greenlandic mineral exploration company focused on developing the Majoqqap Qaava anorthosite Project into a mine operation. The project is located on the southwest coast of Greenland in the vicinity of Qeqertarsuatsiaat (Fiskenæsset) and is contained within the 100 % exclusive exploration license Majoqqap Qaava MEL 2019-162. GAM is planning to establish a mining and processing operation at the Majoqqap Qaava project. The principal product to be produced is raw anorthosite, which is almost entirely (>95 %) composed of the feldspar mineral Bytownite.

2.2 Location

Majoqqap Qaava is located in west Greenland at an approximate latitude of 63°13'N and longitude 50°12'W. The licence covers an area of 34 km^2 and is located approximately 130 km south-southeast of Greenland's capital, Nuuk, and 40 km east-northeast of the small settlement of Qeqertarsuatsiaat (Fiskenæsset). The project lies at the base of the Kuussuatsiaat Valley, in the innermost part of the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden) – Figure 4.

The area of exploration rises from sea-level to elevations of c. 1,000 m near the Majoqqap Qaava summit. The anorthosite deposit is located at 300-400 m above sea level. A large system of lakes follows the flat lying southwest-trending Kuussuatsiaat valley for more than 10 km terminating at the north coast of the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden).

Figure 4: Project location and layout



2.3 Project overview

The overall project timeline is shown in Figure 5. The construction phase is expected to start after the mining permit has been granted ultimo 2022/2023 and the total mining phase, also known as Life of mine [LoM], is expected to run for 30 years.

Current project progression is presented in Figure 6.

Figure 5: Overall project timespan

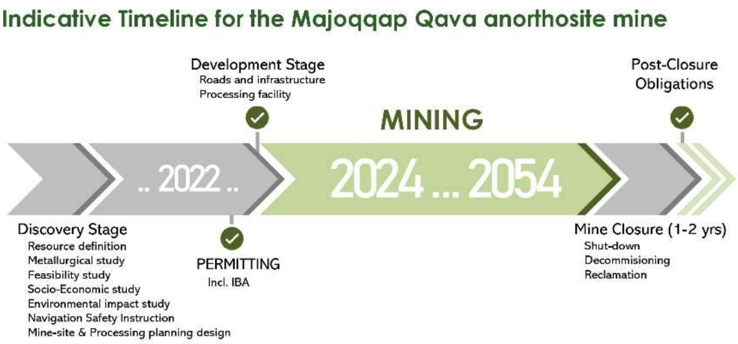
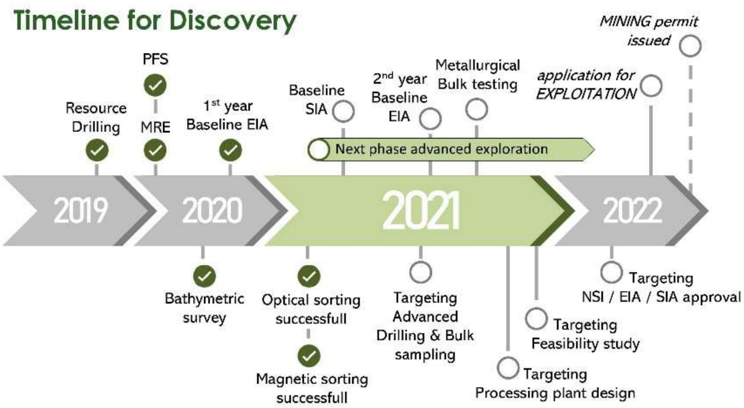


Figure 6: Overview of current project status



The mining method for the Project will be open pit mining which includes drilling, blasting, loading, hauling, waste dumping (if necessary), ore stockpiling and rehandling. Ore material will be drilled and blasted at the pit-site using ANFO (ammonium nitrate and diesel). There is minimal need for stripping of overburden or waste rock.

The project description includes two production scenario extremes defined by GAM, which covers a minimum production set-up (Scenario A) and a maximum production set-up (Scenario B). A schematic flow-chart of the ore processing related to both scenarios are found in Appendix 4. The overall difference between Scenario A and Scenario B is the degree of product beneficiation done at the Greenlandic site; for Scenario A, the project process plant will produce one product for export (a crushed and sorted material fraction of c. 0.5 mm) whereas Scenario B will include a processing plant capable of delivering products in 4 size fractions of +60 mm, 0.8 mm, 0.2mm and 45µm.

GAM will establish a mine that is both feasible and sustainable thereby minimizing the impact on the local environment while still being logistically optimal. Several key parameters dictate, which production scenario that ultimately will be chosen for the mine. These include:

- The access to sustainable energy sources (wind, water, solar) in Europe as an alternative to diesel fuel in Greenland, which leads to higher CO_2 emissions;
- The price of energy;
- Logistics and handling of product. Milling to <45 µm in Greenland will most likely require shipping the material in smaller cement-type ships and will involve more complicated (and expensive) handling and reloading of the product compared to coarser material;
- An increased number of ships will be required if milling to <45 µm is carried out in Greenland;
- A larger (and more expensive) infrastructural footprint is required for scenario B compared to scenario A.

The following sections provide a description of major project components and activities. The physical components of the Project include the following: mine, port, access road, processing facility, storage facilities, accommodation camp, and a tailings disposal area.

2.4 Mining operation

2.4.1 Mineral resource estimate

GAM is planning to establish a mining and processing operation at Majoqqap Qaava. The mine will be an open pit mine. The principal product that will be produced is raw anorthosite, which is almost entirely (>95 %) composed of the feldspar mineral Bytownite (app. end-member composition $CaAl_2Si_2O_8$). Based on 1,509 m of diamond drilling in 2019 by GAM, an inferred Mineral Resource of 21.8 Mt according to CIM definitions has been calculated by SRK Consulting, Wales, Table 1. The resource consists of anorthosite material containing some 0.5 % K_2O and 1.8 % Na_2O, for a combined Alkali content of 2.3 %. Of the 21.8 Mt, a minimum of 7.14 Mt of anorthosite material with 1.95 % alkali metals is expected.

Table 1. Mineral Resource Statement for the Majoqqap Qaava Anorthosite Project, effective 25 March 2020.

Classification	Density	Tonnage [Mt]	Alkali [%]	K_2O [%]	Na_2O [%]	Al_2O_3 [%]	CaO [%]	Fe_2O_3 [%]	SiO_2 [%]	TiO_2 [%]
Inferred	2.8	21.8	2.3	0.5	1.8	30.2	15.0	1.2	49.3	0.03
Total	2.8	21.8	2.3	0.5	1.8	30.2	15.0	1.2	49.3	0.03

A follow-up phase of drilling is planned for 2021 to both expand and infill the current resource base. This will have the potential to delineate a further 20-40 Mt of anorthosite with an average alkali content of between 2.0 % and 2.5 % and increase a sufficient part of the resource to indicated category. The mid-term exploration target is only a small portion of the anorthosite that could be present in total in the licence area.

Following ramp up, the project is planned to involve annual mining of between 460,000-940,000 tonnes of raw anorthosite and shipping of approximately 290,000-800,000 tonnes of product material to Europe and North America.

Figure 7: A concept of the open pit mining method

2.4.2 Open pit design

The mine pit is located on the southeast side of a ridge (Figure 7). The pit design assumes that a temporary ramp will be established on the Eastern face of the mining location making use of a similar Cut-and-Fill methodology required to establish the haul route from the pit to port. The anticipated pit design and mine production does not produce significant waste material. However, in theory waste material may be produced if anorthosite material which has not been explored to a level of detail which would allow it to be considered as a Mineral Resource is mined. Waste material would consist of coarse blasted blocks of anorthosite. A potentially suitable area to store such waste rock material, is located 3.5 km to the west of where the pit is situated along the proposed haul road.

The mine pit location on the southeast side of said ridge enables that ex-pit runoff should be easily diverted away with small bunds around the pit rim. A river and lake system run approximately parallel to the ridge, draining south along the ESE (and lowest) side of the pit.

2.4.3 Mining equipment

Machinery needed to run the proposed mining operation will include standard and well-known mining equipment i.e. excavators, front-end loaders, drilling equipment, a fleet of tipper trucks for hauling ore etc. A full list of expected mining equipment is presented in Appendix 3.

2.4.4 Mining and ore beneficiation

The mining and ore processing operation will run for est. 9 months (270 days) of the year, i.e. excluding the coldest winter months, where the plant will run on a reduced maintenance level.

The estimated resource haul and shipping tonnage for scenario A (min) and scenario B (max) are:

A. RoM is estimated to 460k tpa with a total production to market of ~290k tpa

B. RoM is estimated to 940k tpa with a total production to market of ~800k tpa

A process design has been prepared, which is based on being able to achieve the requirements for the processed product types. The flow diagram is different depending on whether you look at scenario A or B. Scenario A involves a relatively simple crushing and separation process for E-glass / ceramic / filler materials, where the final grinding to <45 µm takes place outside Greenland. Scenario B involves a more complex crushing and separation process, which also includes the production of materials for the rock wool industry in several fraction sizes, and where grinding of products to <45 µm takes place on-site in Greenland – Appendix 4.

2.4.5 Processing plant

The process facility will consist of a 125x50 meter process facility building containing a series of ore feeders, ore crushers and separator units and the project powerplant. The crusher and separation setup will depend on the product scenario (A or B). Both processing schedules are presented in detail in Appendix 4.

The processing facility is designed at a semi-continuous, partially closed circuit. The individual process components will be shielded from the outside according to manufacturer's recommendations. To further reduce dust and noise nuisance and to minimize ore condensation issues, the primary crushing stage is expected to be containerized, or installed in a separate secluded section of the Factory Hall.

2.5 Infrastructure

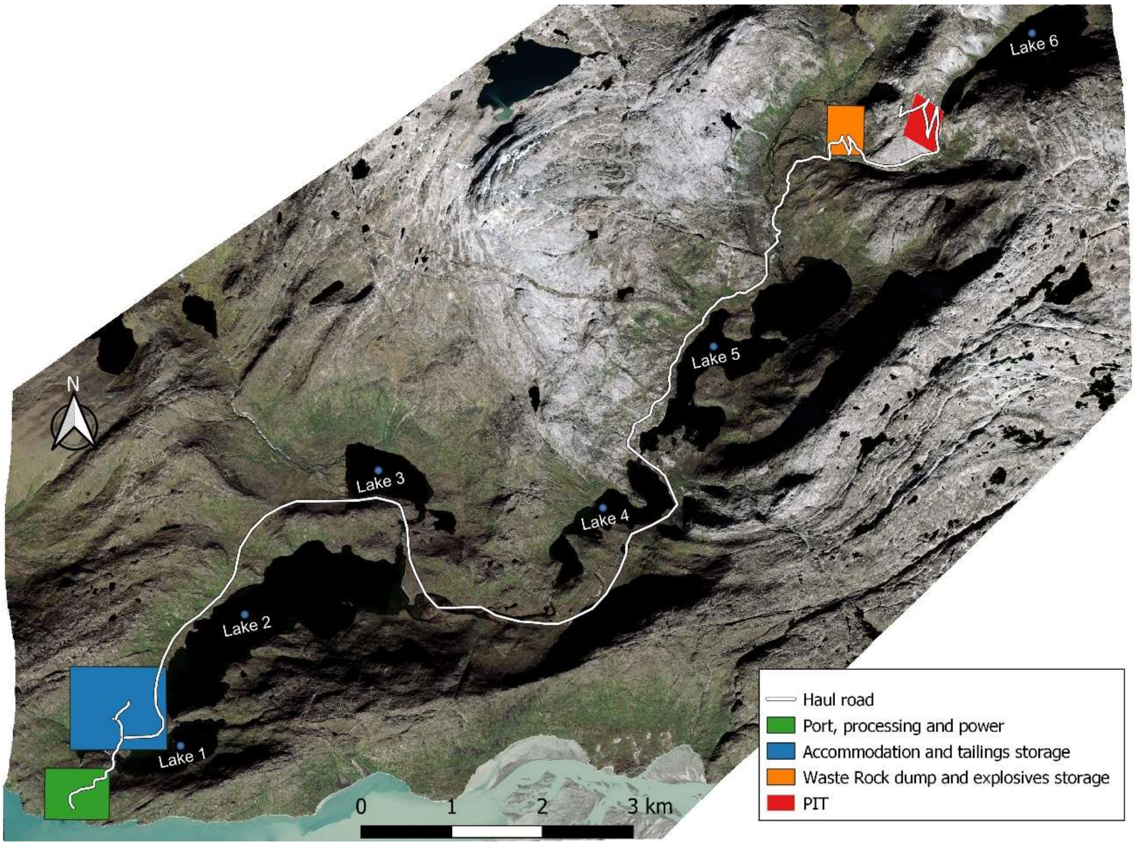
2.5.1 Haul & tailings route

The main haul road will run from the shoreline up through the valley to the pit site, and connect the port-, processing- and accommodation areas including the RoM pad to the mining area - Figure 8. The construction concept is for a single lane road with regular bypassing shoulders to allow returning (empty) trucks to give way to down coming ore-hauling trucks. The haul route is designed to follow the contour path in the most optimal and cost-efficient way by minimizing the requirement for blasting and build-up where possible.

Terrain in connection with the road trace and the associated facilities and gravel pits will be affected to a greater or lesser extent. As the nature of the terrain is not yet known in detail, it is possible that some of the filling masses can be picked up / extracted in central gravel pits found in and along the trace. The road must pass several large and small rivers / streams, which must be passed by laying underflows / passages (steel pipes).

During the operation phase the road will be continuously maintained with materials from the gravel pits used in the initial the road construction. If available, environmentally inert rejects from the production of anorthosite will be used as an alternative. The haul road is only used to a lesser extent during the winter months. To avoid slippery winter conditions the road will be prepared with gravel/sand-topping as required.

Figure 8: Map of the project area, general project layout and the proposed haul road.



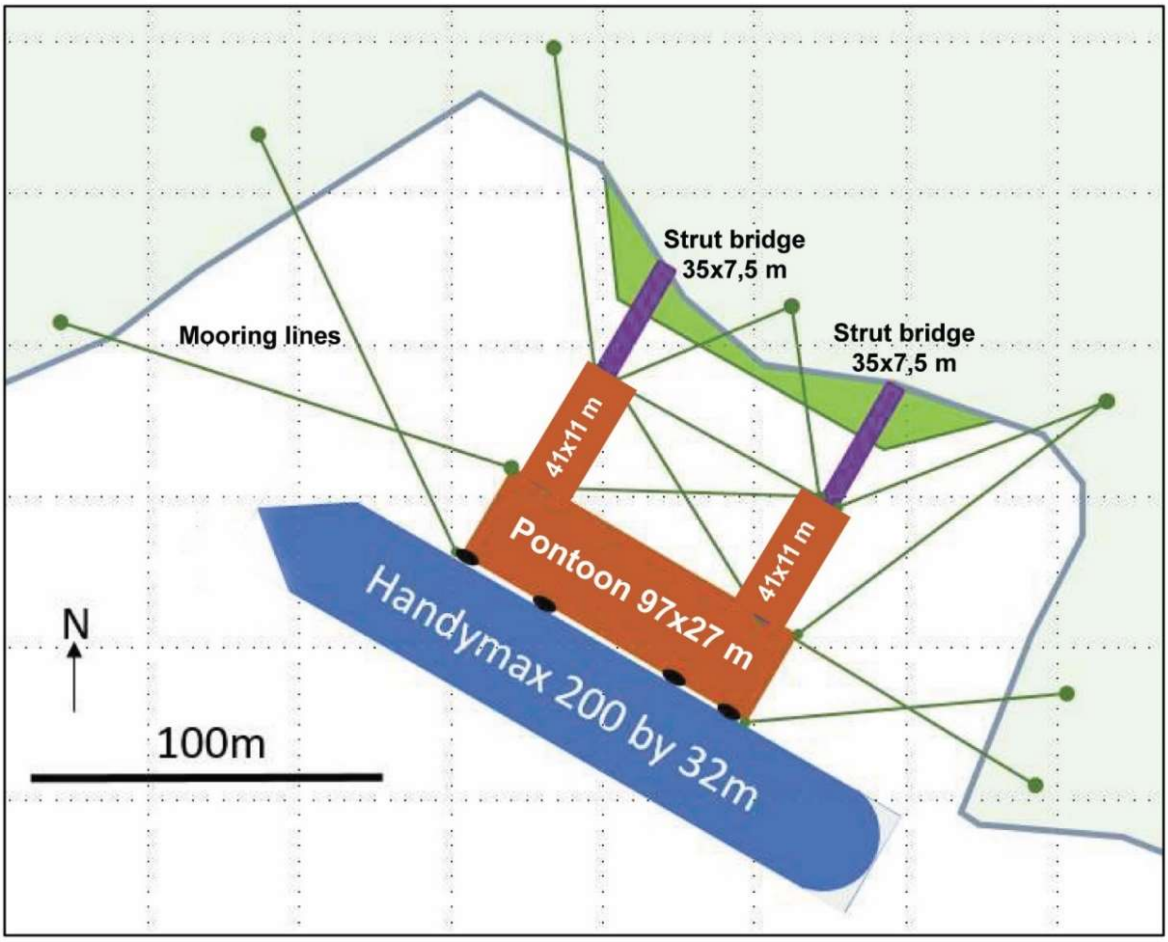
2.5.2 Port facility and jetty

The project anticipates vessels up to 45,000 DWT Handymax Dry Bulk Carrier (length over all [LOA] 180 m, beam 28.5 m, draught 10.5 m) to moor at the port site. In order to provide operational flexibility, the berth design should allow for a slightly wider (but reasonable) spectrum of vessel sizes. For this berth, an upper design vessel size with dimensions approximate to a Supramax are proposed (e.g. LOA 199 m, beam 32 m, draught 12.2 m) which would enable shipments of 52,000 DWT. At the smaller end, the anticipated vessel will be 15,000 DWT, but for flexibility the smallest design vessel should be taken as 10,000 DWT (LOA:122 m beam:19.0 m, draught 7.8 m).

The port facility will be laid out with the cargo storage behind the berth, as close as practical while allowing a free circulation of necessary traffic with a heavy-duty road linking to the berth. Depending on whether product scenario A or B is chosen, the product storage will be in three separate formats, outside open storage (B), inside covered storage (A+B) and silos (B). Fixed and mobile conveyor units will be positioned to transfer the cargo from storage to the mobile ship loader at the berth. The loader can be equipped with a suitable dust suppression spout and deflection plates to minimize dust and enable even distribution of material in the ship's hold. Office buildings and workshops etc. will be positioned out of the way of operational areas.

The mine camp will also have a dedicated oil and fuel spill truck to collect and absorb eventual fuel spill from the surface and GAM will generally follow best practices and the company's internal health and safety procedures to avoid accidental fuel spills and to isolate the impact of such a spill.

Figure 9: Tentative design of permanent floating berth below rock outcrop.



2.5.3 Fuel consumption and fuel storage

Diesel fuel is required for mining and other mobile equipment, heating and hot water, and the power plant. The estimated yearly fuel consumption for scenario A (min scenario) is 2.9 mio. litres of diesel and for the more complex scenario B (max scenario) estimated 8.7 mio. litres of diesel.

Fuel will be delivered to the project via coastal tanker vessels, in the order of 300 m^3 per delivery. Fuel is pumped directly into the storage tanks using fuel-lines from the coastal tanker. A permanent fuel line from the storage tanks to the wharf may be installed. To receive, store and dispense the fuel, five 100 m^3 self-bunded containerised fuel storage units will be provided (four at the general port storage area and one at the MMA) as well as appropriate unloading and dispensing pipework and pumps. The tanks will be located in containment areas with berms; secondary containment will protect against leaks and spills. The tank area and adjacent fuelling surface will be gravelled with an underlying impermeable membrane. A mobile fuel tanker is included for distribution around the site (i.e., not for refuelling of mining vehicles) and to the bunded containerised fuel storage unit at the MMA.

2.5.4 Power plant and consumption

In order to power the processing plant, ancillary equipment and the camp, an off-grid solution is required, consisting of a diesel power plant and may if possibly and economic feasible be combined with alternatives such as solar, wind or hydropower options. The diesel power plant will generate power at an appropriate medium voltage, which will be distributed around the site to the main consumers including a ring main at the processing plant.

A power plant of 50x25m is expected as a stand-alone unit for noise reduction. Alternatively, this will be incorporated with the dedicated Processing plant.

Table 2. Displays requirements to the power plant based on scenario A and B respectively.

Description	Installed Load [KW]		Average Demand [KW]		Operating Hours [per year]	Yearly Consumption [MWh]	
	A	B	A	B	A-B	A	B
Accommodation Camp	47	67	33	47	6,540	213	305
General Infrastructure	100		70		6,540	458	
Processing Plant	1,200	5,500	832	3,818	5,400	4,493	20,617
Stockyards	200		140		6,540	916	
Port Facility	50		35		6,540	229	
Total	1,597	5,917	1,118	4,142		6,308	22,525

A minor, mobile generator unit (expected 25-50 kW) is planned to meet requirements at the quarry site.

2.5.5 Explosive Storage

The project is expecting to operate an ANFO mixing unit for the production of explosives. ANFO is to be augured into boreholes by a dedicated truck that mixes the components immediately before the product is dispensed. The explosive storage will be located at an appropriate distance from the quarry site and other infrastructure (minimum 1 km).

The explosive storage will be formed of approved and bunded containers for the various components according to the Norwegian Directorate for Civil Protection [DSB] and complies with Det Norske Veritas' understanding of §7-4 DSB922, including guidance to this instruction and is approved for use in Greenland. GAM will also comply with the current rules for the establishment and storage of explosives and flammable materials in the project establishment. The explosives storage facility will be fenced and locked up for security. The mine will have storage facilities for two months of explosives.

2.6 Mine camp

The mine camp will include maintenance and administration areas, recreational facilities and accommodation.

2.6.1 Maintenance and administration

The maintenance and administration area will consist of a maintenance- and office facilities for the proposed operation. This will include two office buildings, a 300 m^2 change house building for personal equipment care, a 450 m^2 integrated workshop and warehouse building for maintenance, repair and storage of spares, a 450 m^2 vehicle workshop, a separate 250 m^2 warehouse for general storage and a packaged, containerised laboratory facility. A medical and emergency response facilities will be provided at the accommodation camp and office complex where there will be a medical station with a trained HSE responsible or nurse.

2.6.2 Accommodation and waste

Based on the initial analysis by GAM, the accommodation camp will include the following for ca. 60 (scenario A) to 85-90 (scenario B) people;

- Accommodation units.

- Central facilities building with TV and recreation rooms, a kitchen and canteen.
- Connection to electrical supply, potable water and sewer systems.

The accommodation units will be prefabricated construction. The total capacity of the camp is based on the 2 x 12-hour shifts, requiring four banks of each shift personnel with two shift banks housed on site at any one time. A 20 % contingency is allowed for in case of extended stays / shift misalignment.

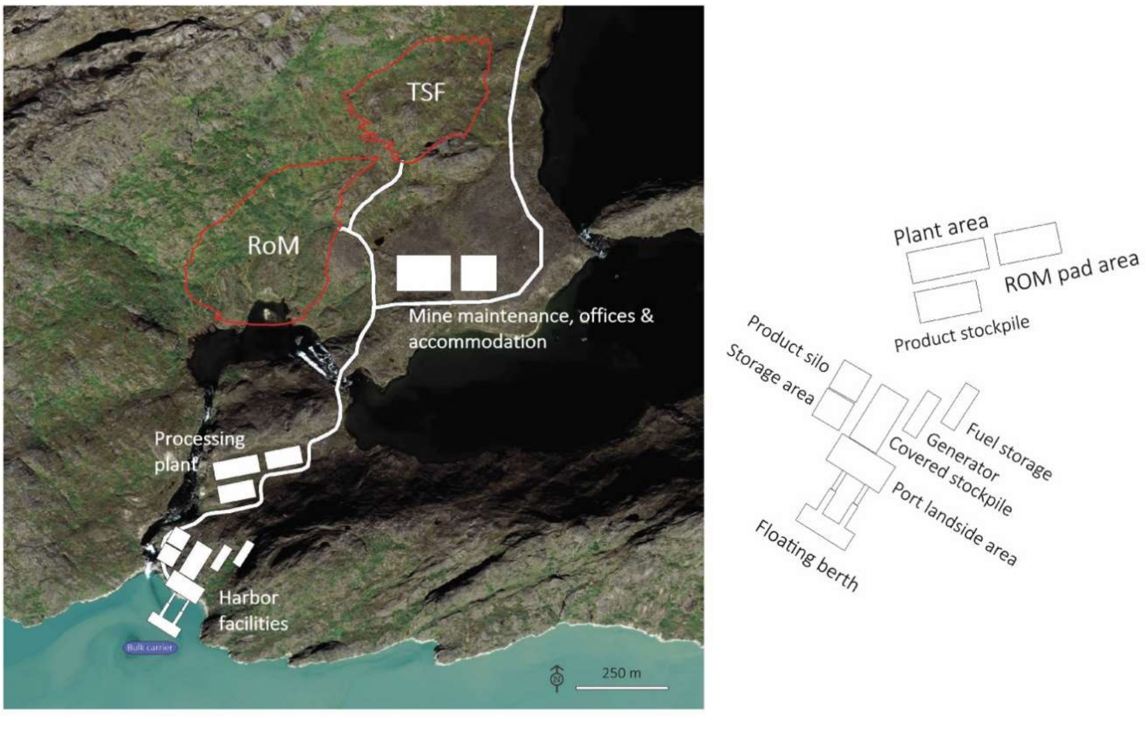
Sewage will be handled by an electrically heat traced sewage pipe system. The sewage system will consist of a passive gravity sewer system, connecting all buildings producing black wastewater in the camp area. Sewage effluent will be discharged to the recipient fjord through an underwater outlet. The outlet will be protected against ice scouring etc. by an appropriate stone and concrete structure and located deep enough to secure optimal mixing and dispersion to the recipient.

A separate maintenance building will contain a sewage well allowing for mechanical disposal of black wastewater from the pit-site. Sewage from the Pit-site accommodation will be collected in a sewage tank, from where it can be pumped to a dedicated trailer-mounted sewage container. This will be hauled to the campsite on regular intervals and pumped into the sewage system through the maintenance building sewer well. The company is in the process of evaluating mechanical/chemical water treatment facilities suitable for the climatic conditions in the region.

The maintenance building will contain a dedicated wash- and locker room. If the disposal of sewage water following the national standards and practices should result in unexpected or unacceptable environmental issues, mitigation measures will be implemented.

A diesel-fired incinerator will be used to incinerate general and organic waste collected from the site. Recyclable and controlled wastes will be collected in a dedicated storage area which will be fenced and will frequently be removed from site to a licenced contractor's facility.

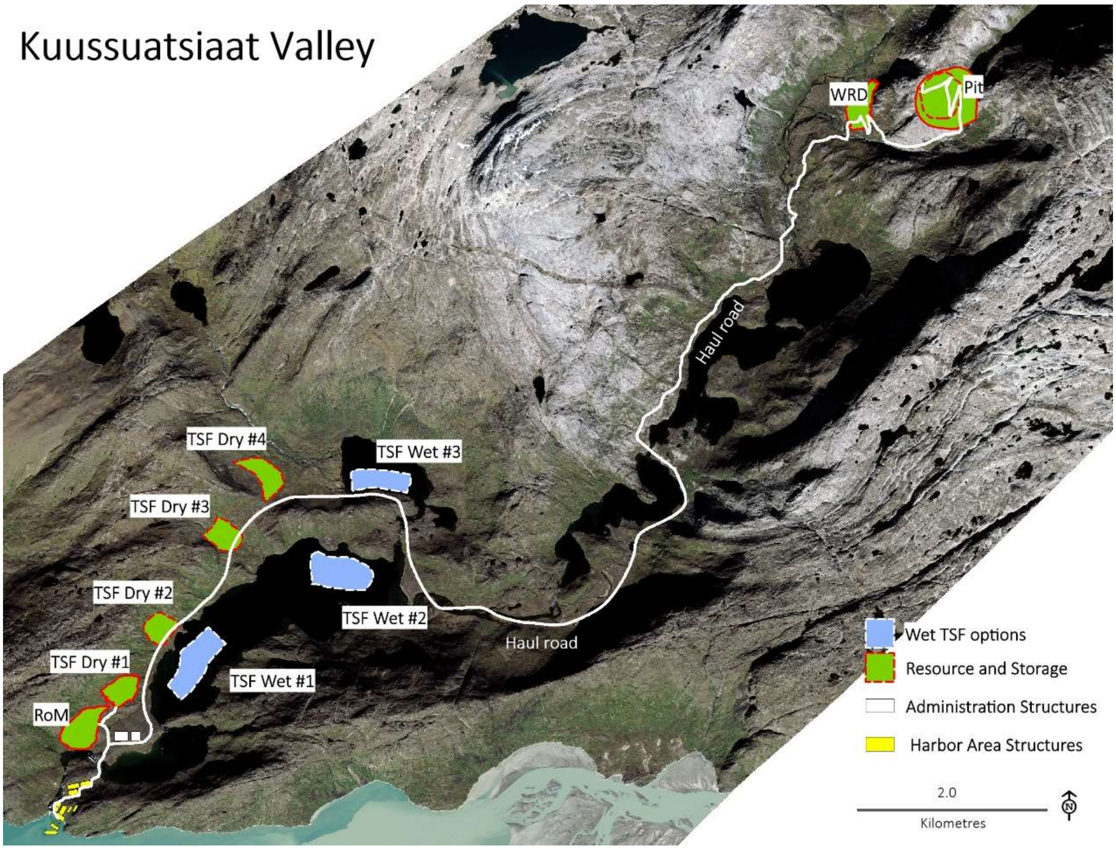
Figure 10: Schematic display of the proposed mine camp, process and harbour.



2.7 Tailings, storage and stockpiles

Extraction, hauling and processing ore requires ore handling sites, RoM storage areas and a long-term strategy for tailings storage.

Figure 11: Map of dedicated project tailings, storage and stockpiling areas



2.7.1 Depots and stockpiles

The proposed operation includes the following depots and stockpiles related to mine operation for Scenario A+B:

- A Waste Rock Depot [WRD] close to the pit-site, for deposition of overburden and minor stockpiling for haulable ore;
- A Run of Mine [RoM] depot in vicinity of the process plant and port site for stockpiling ore prior to processing;
- Product stockpiling & materials handling for processing and shipping - This includes a covered warehouse storage for magnetic separation material ("E-glass" product);

Scenario B will additionally require:

- an outside stockyard for stone wool coarse product (>60 to <120 mm)
- a covered Warehouse for stone wool fines product (<0.8 mm and <0.2 mm)
- a silo storage for magnetic separation material ("E-glass" product <45 μm).

2.7.2 Tailings storage

The main considerations for selection of a suitable site for tailings storage are:

- Haulage distance (from processing plant) – to minimise associated costs;
- Slope inclination – for construction suitability;
- Flood-risk areas for a 1 in 10-year storm event and a 1 in 100-year storm event – preferably avoiding both to minimise non-contact water management costs;
- Areas with a large upstream catchment area – avoiding, to minimise non-contact water management costs;
- Planned roads – proximity to planned roads to minimise cost of additional road construction.

The TSF will be designed according to the following factors: required storage capacity for the project duration (up to 5,100 k tons, Table 8); anticipated geotechnical and geochemical tailings characteristics; ground conditions; climatic conditions and potential flood events; operational factors including noise and dust; and concepts for facility closure. The estimated tailings amounts are listed in Table 8.

Tailings materials consist of two main types of material: Coarse 20-120 mm pegmatite material and fine (<500 to +75 µm) magnetic waste. In scenario A, some fines < 75 µm may also be discarded to the extent that these cannot be mixed with other product types. At this stage it is assumed that the material to be deposited presents no material Acid Rock Drainage Metal Leaching [ARDML] risk and contain no hazardous elements, however this will be qualified by GAM as part of ongoing studies with relevant material. Based on the preliminary test work conducted to date the chemical composition of the magnetic tailings is assumed to be broadly equivalent to the anorthosite reported in the Mineral Resource, with slightly elevated iron content (< 4 % Fe_2O_3).

Several possible tailings storage areas have been located north and northeast of the main maintenance area *(*Figure 11*).* Preferred locations include a land-based storage in close vicinity of the mining camp (TSF Dry #1), and a lake-based storage northeast of the camp (TSF Wet #1) (lake 2 – see Figure 8). The key advantage of both locations is proximity to the processing plant and thereby short haulage distances. Alternative locations are placed further away from the camp and include three land-based storages along the haul road to the north (TSF Dry #2-4) and two lake-based locations further northeast in lake 2 and 3 (TSF Wet #2 and #3).

Evaluation and selection of a tailings storage solution will be fully described in the project EIA.

2.7.2.1 *Basis of land-based tailings storage design*

Site TSF Dry #1 is located on a slope of suitable gradient (less than 18 degrees) and avoids the zone at risk of flooding in a 1 in 100-year storm flooding event.

The area designated for maintenance and the mine camp is near and in front of the toe of this site, at a lower elevation. Storage of tailings in this site therefore poses a potential risk to infrastructure and occupants which needs to be suitably addressed and mitigated in the design and future studies. The type of facility chosen for tailings storage is a tailings 'stack' due to the low water content and granular nature of the waste output from the processing plant. Transport of tailings is assumed to be by haul truck from the process plant to the facility. At the facility, the tailings will be dumped, spread (by dozer) and compacted, according to the design.

2.7.2.2 *Basis of lake-based tailings pond design*

Possible sites for wet storage of tailings exist in the large lake east of the accommodation area (*lake 2)* and potentially *lake 3* (see Figure 8*)*. Based on observations made by NIRAS in September 2020, it was documented that several areas with more than 60 m of water depth occur in lake 2. As the lake is >2 km long, the volume is therefore more than sufficient to store tailings from the mine project through LoM (Life of Mine). The lake is probably geologically underlain by basement gneisses. Suitability of Lake 3 will be evaluated during the 2021 field campaigns.

The advantages of using the lake includes the following;

- There will be no dispersion of dust and fine material from the tailings storage on surface;
- Two additional lakes further downstream from the tailings storage lake will act as effective catchments basins for suspended fine material, thereby minimizing dispersion of these elements to the fjord;
- Besides monitoring, the lake tailings storage will not require any additional work when the mine closes as the material effectively will settle over time at the bottom of the lake;
- Visual impact will be lesser compared to a land-based storage.

Tailings from the processing facility will be driven to the lake pond by trucks on their way to the mine. A suitable haul ramp would have to be constructed next to the lake, from where trucks could safely dump the tailings into a pipe system at adequate depth below the thermocline and from where tailings could be also remobilized to the extent necessary.

The tailings will be deposited beneath a thermocline if one is established during the summer. Otherwise, +10 metres of water column above the tailings will be maintained throughout the life of the project. The final determination of the minimum water depth will be determined based on best environmental practices after several years of observing the physical nature of the tailings in the Lake. A more detailed survey of the lakes suitability to be used as a tailings pond will be evaluated during the next phases of the EIA.

2.8 Shipping

Two shipping routes are possible, a northern and a southern. The northern route goes by the Aniggoq - Sarfat Aariaat fjord areas before entering Qeqertarsuatsiaat Kangerdluat and the port area, whereas the southern route goes directly through Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden) passing Qeqertarsuatsiaat (Fiskenæsset village) on the way. The southern route on the other hand has one narrow passage (90-100 m wide) with sections of shallow water (14-15 m) that only will allow ships with drafts of 12 metres or less to pass safely. Apart from the narrow passage both routes show sufficient sounded water depths of minimum 18-20 m at all locations and in most places much deeper. Whereas the northern route requires tugboat assistance in order to safely navigate the sharp turns near Sarfat Aariaat (Figure 12), the southern route does not require tug board assistance.

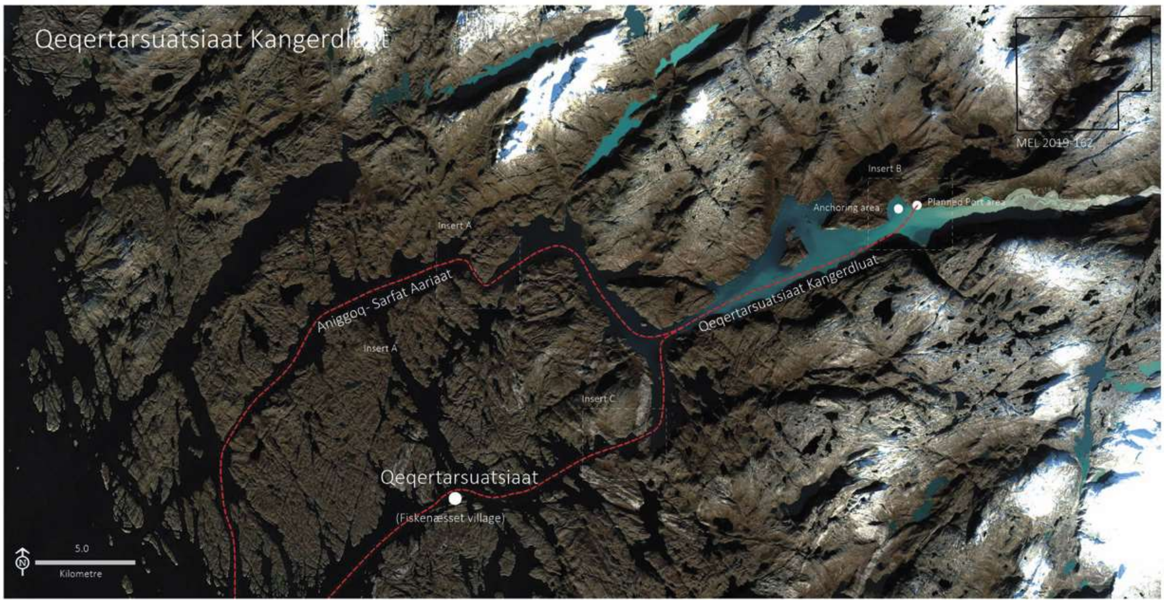
Shipping activity depends on the final production scenario (A and B described earlier and shown in appendix 4). Based on these production setups, scenario A will require an estimated 7-10 shipments per year and scenario B an estimated 25-35 shipments per year, using Handymax bulk carriers loading 40,000-50,000 DWT.

GAM will analyse the preferred route further once additional information regarding shipping conditions, bulk ship types etc. have been obtained.

Within the port area, water depths increase rapidly directly from the rocky shore making it possible for large bulk carriers of 150 to 200 m length (Handysize) to moor along the berth.

Based on Sentinel 2 L1C satellite images from 2016 to 2020, an ice-reconnaissance of the Aniggoq - Sarfat Aariaat - Qeqertarsuatsiaat Kangerdluat access routes have been conducted by GAM. The study reached the conclusions that ice-formation occurs all years in the shallow sand delta area in the innermost part of the Qeqertarsuatsiaat Kangerdluat east of the shipping route to Majoqqap Qaava. The first ice forms in late January to mid-February. The Fjord system is ice-free and fully navigable again in early to mid-May at the latest.

Figure 12: Overview map of the two optional navigational routes from the Davis Strait into the mine camp area by either a northern or southern route



Project scope

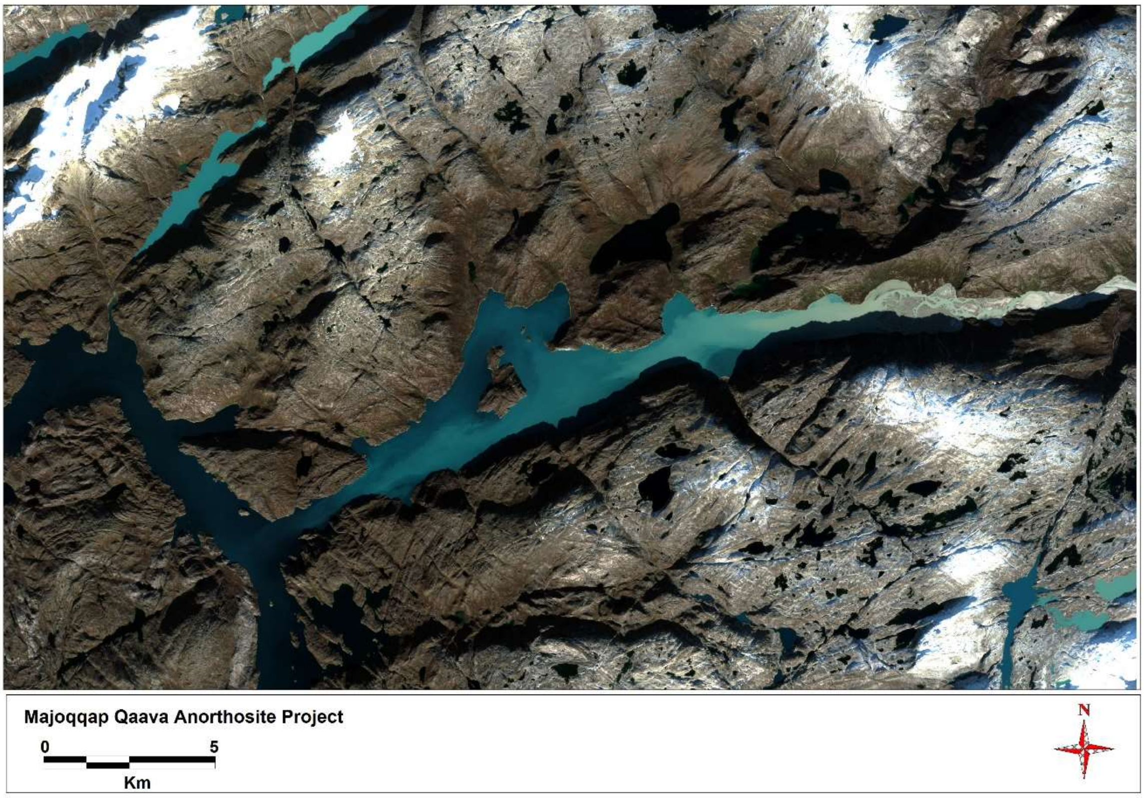
3 Scope

Scoping is the initial phase of the EIA process. In the Scoping Phase, key issues to be investigated and assessed during the subsequent phases of the process are identified, and the range and extent of the studies to be conducted is determined. Field samples collected in 2020 is expected to cover the first year of baseline, and in 2021 the collection of the 2. year baseline will be conducted. A stakeholder meeting will be held at Qeqertarsuatsiaat. These studies, interviews and meetings will be used to decide the future collection of data, disseminate information on the GAM-project, gather feedback from various stakeholders, and as certain whether additional information is needed to evaluate baseline conditions and potential impacts within the project area. The key objectives for the Scoping Phase will be to:

- Continue to identify key issues of the GAM project and the EIA process.
- Identify areas of likely impact and environmental issues that may require further investigation in an EIA.
- Determine the need for specialist baseline and impact assessment studies in response to initial stakeholder input.
- Share the results of the baseline studies conducted so far.

3.1 Study area

Figure 13. Overview of Majoqqap Qaava anorthosite Project area.



3.2 Climate

The project area is located on the Greenlandic Southwest coast on 63°N. The climate in this region is considered low arctic and partly affected by permafrost. Temperatures in the region averages 0.7 °C over the course of a year with the coldest month being January/February and the warmest months July/August.

Table 3. Temperatures for the region as a calculated average between weather stations in Nuuk and Paamiut, respectively north- and south of the project location.

Month	Jan	Feb.	Mar	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Max. (°C)	-3.8	-3.6	-3.4	0.2	4.1	7.4	9.9	9.3	6.5	2.5	-0.2	-2.6
Min. (°C)	-10.1	-10.3	-10.0	-5.7	-1.2	1.3	3.5	3.4	1.4	-2.5	-5.9	-8.8
Avg. (°C)	-6.9	-6.9	-6.7	-2.8	1.5	4.3	6.7	6.4	3.9	0.0	-3.0	-5.7

The SW coast of Greenland is highly affected by weather systems building up over the Davis straight, and forced north or south along the Greenlandic coast by the counteracting pressure systems building over the Greenlandic ice cap. This causes high levels of precipitation and potentially strong winds along the coastline. The project area is somewhat protected against these weather regimes, due to the location in the innermost part of the c. 50 km long Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden). The company is in the process of acquiring 1-2 years of detailed hydrological and meteorological data from the project site.

The collected hydraulic data and meteorological data will be used in different hydrological scenario calculations including extreme events. The hydrology model will be calibrated using flowrate measurements at bottleneck locations in the freshwater system (Q/h profiling) along with continues water pressure logging at key points, which monitors water retainment at these sites. The model-calculated runoff and water levels will focus on selected locations along the river system, as well as mapping flood events estimating maximum water levels in the valley during major precipitation or drought events.

3.3 Protected areas

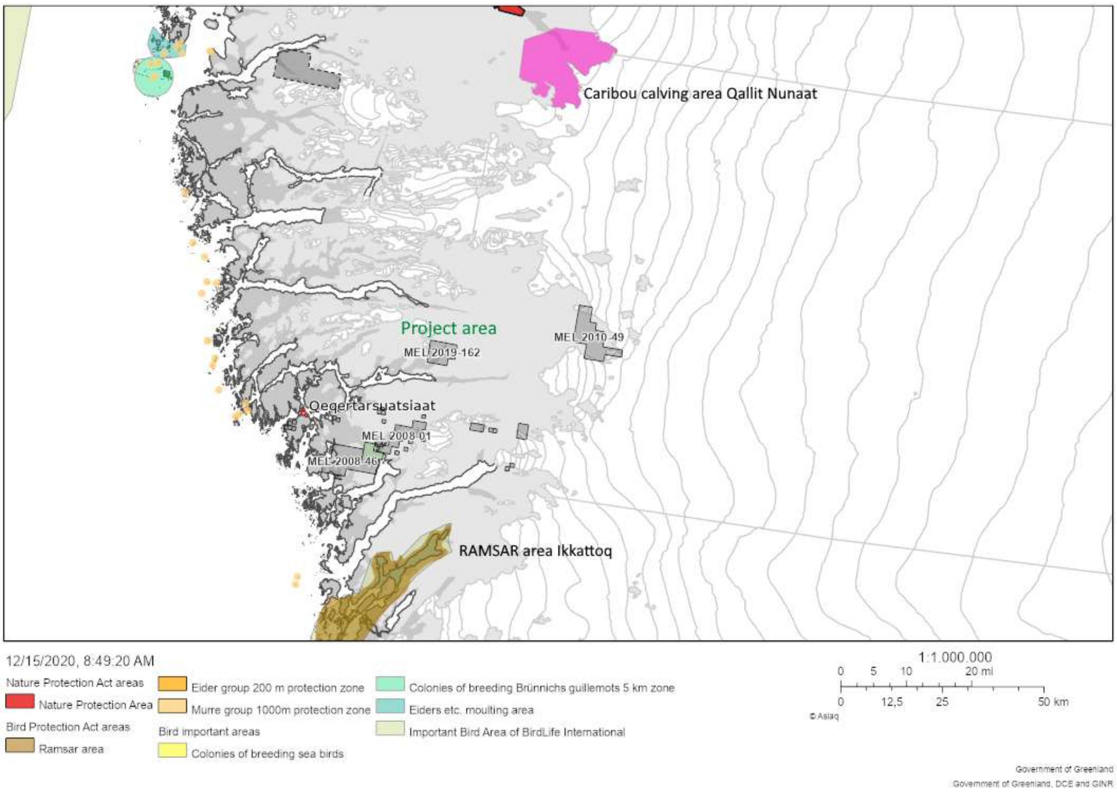
There are no protected areas within the valley which constitutes the main project area. The nearest regulated area is at an inlet located approx. 5 kilometres west of the proposed berth. This inlet holds two bird colonies, an eider colony[1] and a minor vertical cliff reported to sustain various breeding sea birds[2].

The closest RAMSAR area is *Ikkattoq*, located approx. 45 kilometres (straight line) to the SW. This is considered to remain unaffected by the project, Figure 14.

The closest mapped caribou calving area is *Qallit Nunaat*, located some 65 kilometres NE (straight line) of the license area. This is considered to remain unaffected by the project.

[1] Colony id 1590
[2] Colony id 510

Figure 14: Map showing protected areas near the project area.



3.4 Local use of the project area

The project area is located in the vicinity of the village Qeqertarsuatsiaat (Fiskenæsset). The local inhabitants from Qeqertarsuatsiaat (Fiskenæsset)travel widely to fish and hunt, which are two of the main occupations in the village. The project area itself and areas in close proximity are known to provide hunting grounds for Caribou and arctic Hare. Several freshwater systems in and around the project area are known to hold healthy populations of arctic charr.

Main marine resources utilized by the locals in the surrounding fjord system are fisheries for cod and capelin, the latter being seasonal dependent and coastal fishing for migrating arctic charr.

In the project EIA, the consequences of the proposed project on local use of the project area and neighbouring areas, will rely heavily on interviews and conclusions from the simultaneous Social Impact Assessment [SIA].

3.5 Environment

3.5.1 Terrestrial

The terrestrial environment includes vegetation, birds and mammals, and will be discussed in the following section.

3.5.1.1 *Vegetation*

Arctic vegetation is divided into a number of plant communities according to species composition, life strategies, degree of vegetation cover and relationship to physical parameters, such as soil texture and water content, snow cover and slope and aspect of the terrain.

The vegetation in the project area contains all vegetation types; Dwarf-shrub, heath, Fens (mires), herb-fields, Snow beds etc.). The large variation in physical conditions results in a diverse flora with elements mainly from the low arctic flora. Although there are no regular forests in the Project area, certain areas in the region support areas of dense shrub and bushes of grey leaf willow (*Salix glauca)* and green alder (*Alnus crispa)* in tundra heaths. A detailed list of vegetation species on the site is not currently available. The EIA's environmental baseline will include a comprehensive description of the vegetative community at the Project site.

Figure 15. Alder, birch and willow trees in a heath area in the project area.

3.5.1.2 *Wildlife*

Several sources of information on terrestrial wildlife in and around the Project site are available. GINR conducted general wildlife surveys by helicopter across southwestern Greenland in March 2005, 2006 and 2012, and included five study regions: Naternaq, North, Central, South, and Paamiut. The Project is located within the southern survey region. In general, these surveys indicated that the terrestrial ecosystem of western Greenland has poor mammalian diversity. Wildlife species observed within the southern Region included caribou/reindeer (*Rangifer tarandus spp*.), arctic fox (*Alopex lagopus*) and arctic hare (*Lepus arcticus*). Additionally, terrestrial avian species reside in western Greenland year-round, including Common raven (*Corvus Corax*), Rock ptarmigan (*Lagopus mutus*) and the white-tailed eagle (*Haliaeetus albicilla*). A list of species that is expected to be found in the project area and their conservation status can be found in Appendix 6.

Birds

The White-tailed eagle (*Haliaeetus albicilla*) eagle is Greenland's largest breeding bird and is listed as vulnerable in the Greenlandic Red List. The diet is primarily fish such as cod and charr, but also other birds such as eider. The white-tailed eagle is present in the inner part of the Kuussuatsiaat Valley and an adult bird was observed several times in 2020. It remains however unclear whether the white-tailed eagle nests in the valley or forage only. The caribou hunting season may attract eagles scavenges on caribou remains. Adult white-tailed eagles typically stay in the territory during winter, while younger birds migrate to the southern parts of Greenland (GINR, 2013). The white-tailed eagle is listed as "vulnerable" on the Greenland Red List of threatened species, (Boertmann & Bay, 2018). Effort will be made to localize nests of white-tailed eagle in the Kuussuatsiaat Valley. Especially an area between lake 2 and lake 5 (Figure 8 pp. 15) is of special interests, Figure 17 pp. 30.

The **Rock Ptarmigan** is a common breeder throughout Greenland, where three subspecies occur: rupestris (south), saturatus (northwest) and captus (north and northeast), the two latter being endemic (Boertmann 1994). The northernmost populations are migratory, presumably wintering in southern Greenland. They depart the north in late Sep – Oct and return from Feb onwards, males before females.

Gyr falcons (*Falco rusticolus*) are widely distributed as breeding birds in Greenland most numerous in West Greenland. The nest is typically located at the upper part of nesting cliffs both at the coast and inland. The food consists mainly of bird species that breed in the lower regions of the cliffs. Southern breeders are stationary while birds from the northern regions tend to migrate south before winter. Gyr Falcons are sensitive to disturbances near the nest at the start of the breeding season from end March to end July. Prolonged disturbances may cause the birds to leave the nest. In the project area no obvious gyr falcon breeding sites have been found. However, due to the status of nearly threatened on the Greenlandic red list, this species will have attention in the field studies and the EIA.

Other Birds include, but are not limited to, the Snow bunting (*Plectrophenax nivalis*), Lapland bunting (*Calcarius lapponicus*), Northern wheatear *(Oenanthe oenanthe*), common redpoll (*Acanthis flammea)*, common raven (*Corvus corax*). These birds are common and widespread throughout south and west Greenland and common breeders at low to medium altitude in Qeqertarsuatsiaat area. None of the species are present on the Greenlandic Red List, thus not subject to any threats, Appendix 6.

Arctic hare

Arctic hare is most likely present in the Kuussuatsiaat Valley, despite no observations of this species has been made in the caribou survey in 2006 or during the field work in the area in 2020, (Cuyler et al., 2009) and (Pers. obs.). Human activities are not expected to impact neither the local stock nor the arctic hare's abundance in general.

Arctic fox

Arctic fox is most likely present in the Kuussuatsiaat Valley, despite no observations of this species has been made in the caribou survey in 2006 or during the field work in the area in 2020, (Cuyler et al., 2009) and (Pers. obs.). The Arctic fox has a great ability to adapt to changes in the environment including human activities. Thus, the Arctic fox is frequently observed around settlements in Greenland. The proposed mine activities are unlikely to have any significant impact on this species.

Caribou

The Qeqertarsuatsiaat caribou population inhabit an area between Sermilik fjord and Frederikshåb Isblink and include the project area, Figure 16. This population has fluctuated greatly from a pre-calving population estimate of approx. 181 caribou in 1993 to a pre-calving population estimates of ca. 5,372 and 5,224 caribou in 2001 and 2006, respectively. The increase in pre-calving caribou 2001 and 2006 may partly be driven by a change in observation method, going from fix-winged to helicopter (low altitude and speed). The latest estimate was made in 2012 and resulted in a status-que with estimate of 4,800 individual, (Cuyler etal., 2016). During this survey 2 pre-calving individuals were registered in the project area (Cuyler etal., 2016). In September-October 2020, 23 caribou were observed in the Majoqqap Qaava project area. The observations were primarily made in the inner most parts of the Kuussuatsiaat Valley, Figure 17.

Figure 16. Caribou areas and breeding areas.

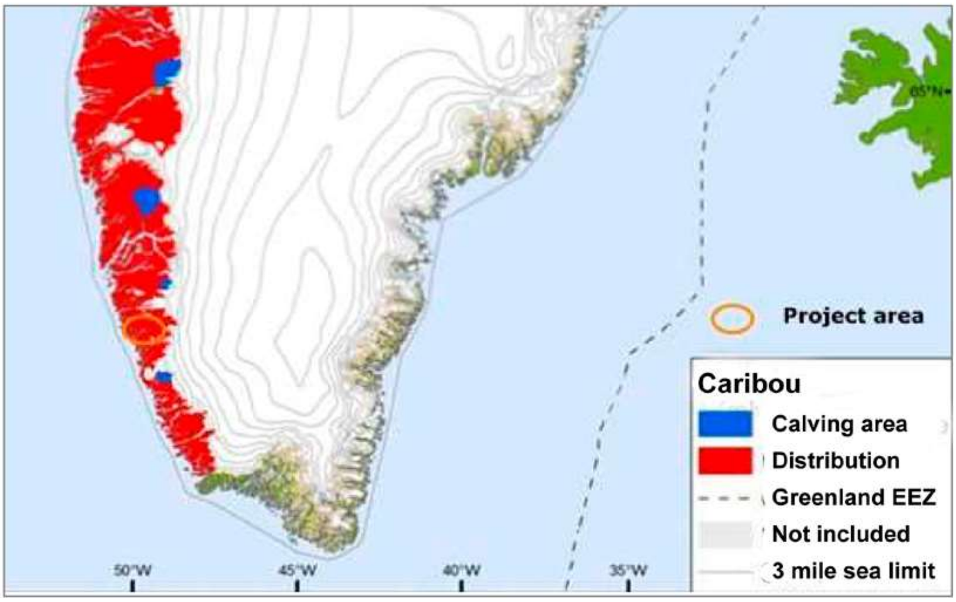
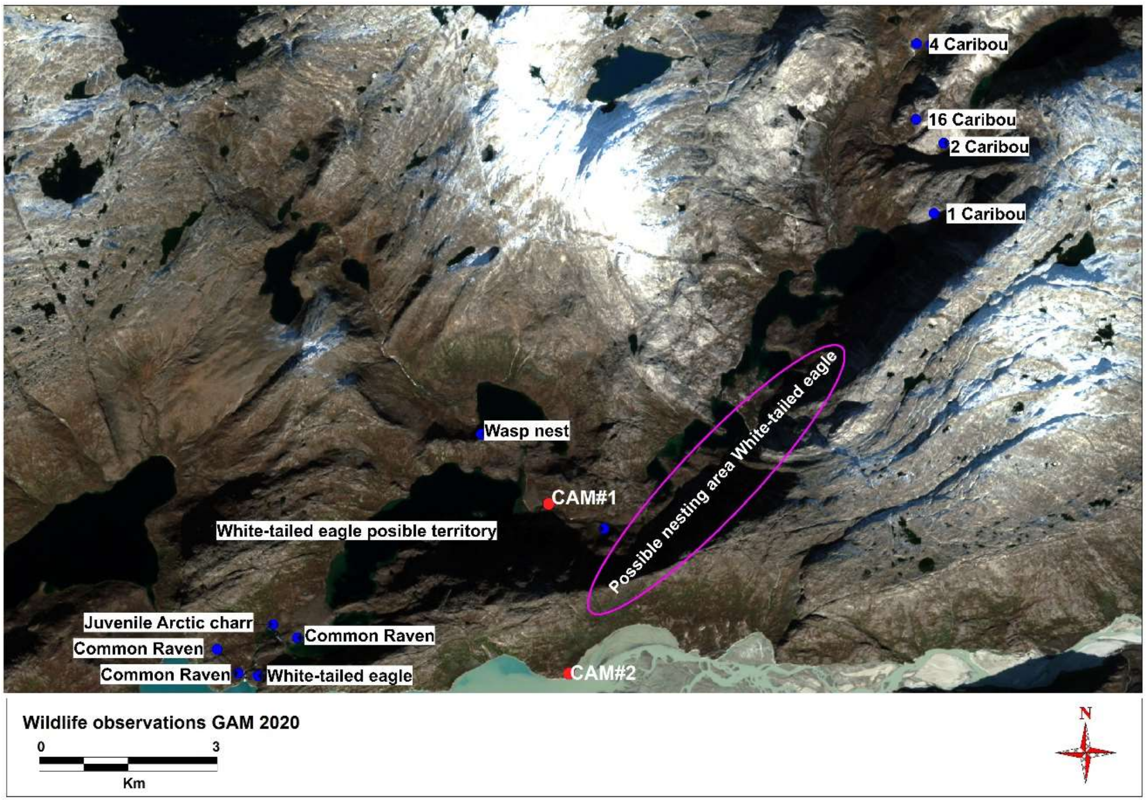


Figure 17. Caribou and wildlife observations in 2020.



3.5.2 Freshwater

Water quality

The MRA has published water standards that are to be applied to mining projects in Greenland. These standards are essentially baseline or background standards but are intended to be converted to effluent standards by the application of appropriate factors, to account for dilution in receiving water bodies and/or concentration in discharges (Mineral Resources Authority, 2015).

Greenland Anorthosite Mining has sampled and analysed water from eight stations in the project area and at one reference station in autumn 2020. The samples have been analysed to determine the total metal concentration of 12 constituents, including arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, zinc, Total-P (phosphorus) and Total-N (nitrogen). The results showed an elevated background level of Total-P and Total-N at some stations. Both Total-P and Total-N concentrations exceeded this BMP guideline levels at all stations except the stations; F1, F6 and F7, Table 4. At station F7, copper concentrations slightly higher than the BMP guidelines was found.

Additional water quality monitoring will be necessary to confirm whether the elevated concentrations are chronic at the Project site, and whether Project-specific water quality standards will be appropriate in this case.

Table 4. Result of the filtered freshwater analyses from the River in the project area.

Station	Arsenic (As)	Cadmium (Cd)	Chrome (Cr (III))	Copper (Cu)	Iron (Fe-tot)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)	Total-P	Total-N
D.L. (µg/l)	***0.02***	***0.003***	***1***	***0.03***	***1***	***0.03***	***0.001***	***0.03***	***0.3***	***10***	**50**
F1	<d.l.	0.009	<d.l.	0.87	<d.l.	<d.l.	0.001	0.21	3.8	17	290
F2	<d.l.	<d.l.	<d.l.	0.13	7	<d.l.	<d.l.	0.17	1.8	15	300
F3	<d.l.	<d.l.	<d.l.	0.11	<d.l.	<d.l.	<d.l.	0.09	1.2	32	190
F4	<d.l.	0.009	<d.l.	0.59	<d.l.	<d.l.	0.007	1.86	1.7	26	150
F5	0.05	0.006	<d.l.	0.49	<d.l.	<d.l.	0.002	0.15	2.4	24	190
F6	<d.l.	0.013	<d.l.	0.59	<d.l.	0.03	0.002	0.38	4.0	16	230
F7	<d.l.	0.023	<d.l.	3.51	1	0.04	<d.l.	0.47	6.8	16	170
F8	<d.l.	<d.l.	<d.l.	0.11	<d.l.	<d.l.	<d.l.	0.22	1.6	23	150
F9-ref	<d.l.	0.012	<d.l.	0.53	6	<d.l.	<d.l.	0.34	3.5	27	650
BMP*	4.0	0.100	3.0	2.0	300	1.0	0.05	5.0	10	20	300

* BMP water quality guidelines for freshwater.

Invertebrates

Freshwater forms the habitat for many insect larvae. The most diverse and dominant order are diptera, flies and mosquitoes, that summerize more than 50 % of the insect species found in Greenland (pers. obs.). The two dominating families are Simuliidae ssp. (blackflies) and Chironomidae ssp. (mosquito), and especially in fish free streams and lakes, tadpole schrimps (*Lepidurus arcticus*) and fairy schrimp (*Branchinecta paludosa*) may be found.

The ecological role of macro-invertebrates is important, as they are the major factor in canalizing energy up the food web, by eating the benthic and planktonic algae and serving as a food item for other insects, fish, birds etc.

Fish (Arctic charr)
Arctic charr (*Salvelinus alpinus*) is found throughout Greenland and is the only freshwater species that occurs in north and northeast Greenland. Arctic charr may occur in two forms. The anadrome form spawns and lives its first years in freshwater, and later spends the summer at sea, returning to freshwater in the winter. The resident form is present in lakes throughout its life. The key factor for the occurrence of resident Arctic charr, is therefore the presence of lakes and rivers where they can spend winter. The water depth of these lakes or rivers must be sufficient to secure that all water does not freeze up. For anadrome Arctic charr, the water level should be high enough and with no obstructions to allow passage when the fish migrate back from the sea to the river system during August/September. The most significant impact to Arctic charr is the release of pollutants and fine sediments to rivers or lakes and the obstruction of streams connecting the sea and freshwater spawning grounds. Arctic charr is found in the lakes in the project area. Thus, identifying spawning grounds for this species will be in focus in the second year of baseline survey in 2021. The Qeqertarsuatsiaat area holds numerous rivers known as good fishing locations, and the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjord) is a commonly used by local hunters and fishermen for catching arctic charr with gillnets, Figure 19 (Nielsen et al, 2000).

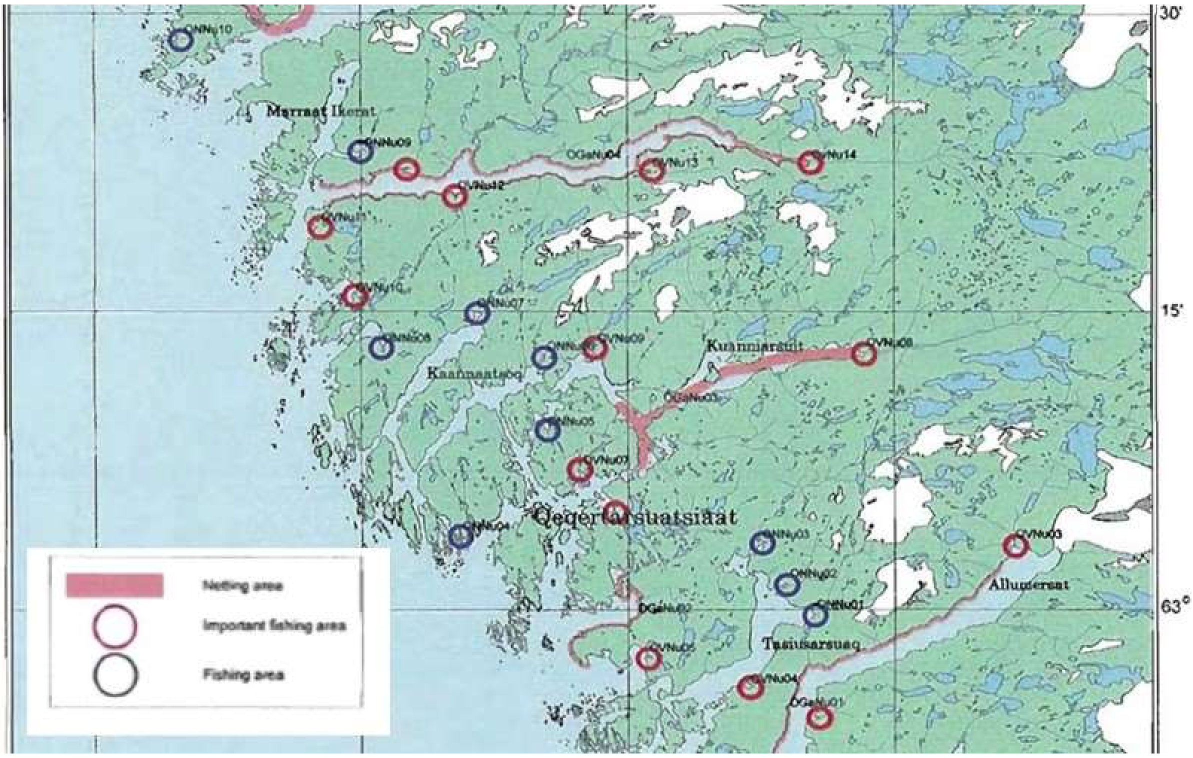
Figure 18. Waterfall at the outlet into the fiord (left) and at the entrance to lake 1 (right).

Scope: The freshwater system in Majoqqap Qaava anorthosite Project area contains a large freshwater system with five lakes connected through a main river. At present only screening data on arctic charr is available from the Majoqqap Qaava anorthosite Project area. During the screening one large specimen of arctic charr (+40 cm) together with 12 small individuals (<15 cm), was caught in a gillnet in Lake 1. Some of the small individuals were mature, despite their size and part of a resident lake stock. The large specimen (a male) is most likely a part of an anadromous migration stock. Thus, these data revealed that arctic charr does pass both the waterfall at the outlet into the fiord and waterfall at the entrance to Lake 1, Figure 18.

Birds
A great number of birds are associated with freshwater as well as the marine environment. Various species of geese use lakes for resting, whereas other species utilize lakes and rivers for foraging, especially on artic charr or vegetation. The two Greenlandic species of phalaropes are found in small lakes during the breeding season. Of the birds associated to freshwater, the Great Northern Diver and is included in the Greenland Red List of threatened species as nearly threatened, (Boertmann & Bay, 2018). Harlequin duck was listed on the former red list but was excluded from the recent update. In 2003 1 male and 5 female Harlequin Ducks were registered on a river in the Qeqertarsuatsiaat fiord. However, the exact location remained unknown, (Boertmann., 2003). Because the habitat of Harlequin Duck is abundant in the project area special attention were made to spot this species, during the field work in autumn 2020. However, no Harlequin duck was observed during the 2020 field work.

The **Great Northern Diver** (*Gavia immer*) is widely distributed in Greenland. Its northern boundary on the west coast is Upernavik and on the East coast up to Danmark's Fjord (Boertmann D. , 2007). It breeds in Greenland, where it is normally found in larger lakes holding stocks of Arctic charr. It leaves Greenland in wintertime and are expected to winter along the east coast of North America (Boertmann D. , 2007). The Great Northern Diver has been registered offshore Qeqertarsuatsiaat in mainly in 1993, (Boertmann & Mosbech, 2001). Thus, it is most possible that this species inhabits the lakes in the project area, as the observed birds was autumn birds registered offshore. Furthermore, the number of Great Northern Diver in the Qeqertarsuatsiaat inland lakes during summer, is expected to be higher, than the few offshore registrations give reason to believe. A list of species that is expected to be found in the project area and their conservation status can be found in Appendix 6.

Figure 19. Important areas for fishing Arctic charr at Qeqertarsuatsiaat.



3.5.3 Marine environment

The coastline of the inner Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjord) is characterized by an undulating shoreline with relatively steep slopes. The coastal area in vicinity of the project is diverse and includes rocky shores made up from bedrock or sedimentary rocks, but also areas of soft silty sediments are widespread. This leads to the presence of several marine habitats in the vicinity of the project area. Sheltered coastlines will normally support a high biodiversity, but the marine environment in Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjord) is highly influenced by glacial silt in the water.

The mining activity at Majoqqap Qaava is expected have little impact on the marine environment, as the pit area is located some 15 kilometres inland. The process facility will be located in the lower part of Kuussuatsiaat Valley and the tailings will be deposited on land or in lake 2, according to the mining plan layout. Thus, expected impact from the mining activities is mainly introduced through increased levels of nutrients and suspended sediments.

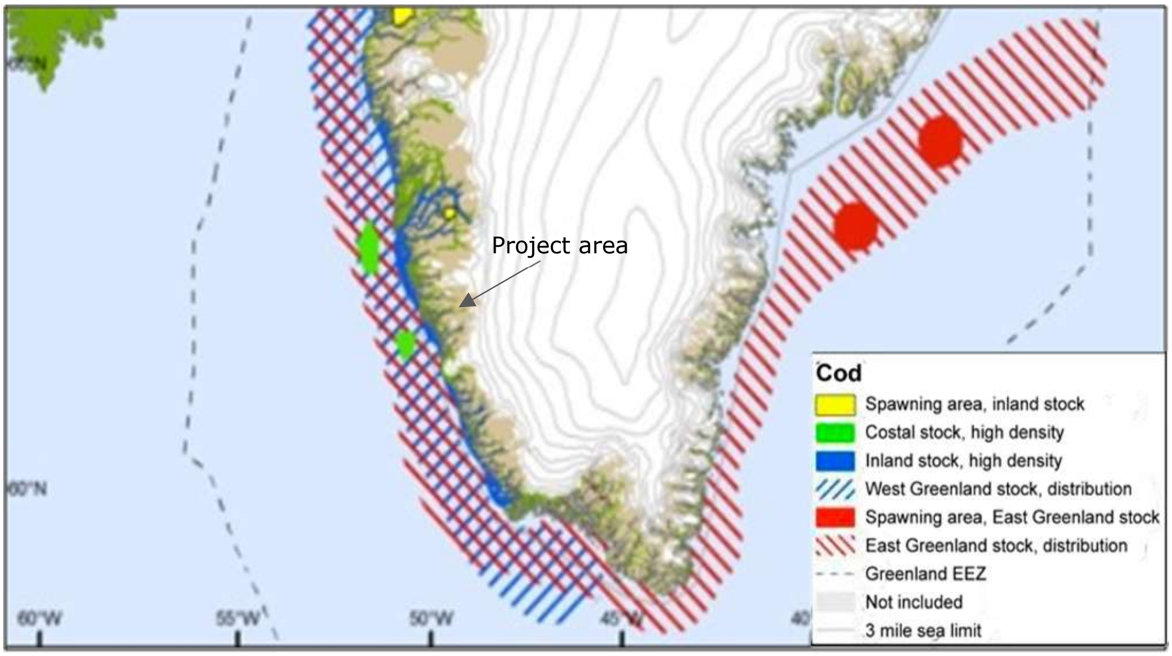
Macro-invertebrates
Little is known of the invertebrate community in the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden). Overall, two habitat types exist in the fiord, hard-bottom with epifauna and soft-bottom inhabited by infauna species. The most abundant macro-invertebrate on the hard-bottom substrate in the upper littoral zone in the fjord is common mussel (*Mytilus edulis*), but also large densities of barnacles and periwinkle have been observed (during skin-diving). Infauna organisms include both dwelling mussel and bristle worms identified with drop-down camera. However, detailed species identification was not possible.

The invertebrates that inhabit the fiord are adapted to high levels of suspended sediment in the water column and sedimentation of silt on the seabed. The mining activities is expected to increase both the level of suspended sediment and sedimentation. However, the contribution from the mining activities is permille of the natural glacial deposition in the fiord.

Macroalgae
The species richness with respect to seaweed in Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden) is low and dominated by species adapted to high amounts of suspended sediment and high sedimentation rates. Thus, the combination of high turbidity and the steep slopes in the fjord, diminishes the area where light penetrates all the way to the seabed, resulting in a narrow band of vegetation mainly in the littoral zone and the upper part of the sub-littoral zone (Pedersen, 2011). The most abundant seaweed species in the fjord is expected to be the multiannual bladderwrack (*F. vesiculosus*) and rockweed (*F. distichus*).

The mining activities are expected to increase the level of suspended sediment locally. However, the increase will be in the order of permille, compared to the natural levels generated by the glacier.

Figure 20. Important area for fishing cod at Qeqertarsuatsiaat, (Christensen et. al., 2016).



Fish
The most abundant coastal fish species in the fjords are expected to be the Atlantic cod (*Gadus morhua*) and short-spined sculpins (*Myoxocephalus scorpius*). Both species were all caught around the proposed marine port site in Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden) during 2020 field studies. Cod is estimated to occur in high abundance in the Qeqertarsuatsiaat fiord system, Figure 20. Furthermore,

Capelin (*Mallotus villosus*) may also occur in specific parts of Qeqertarsuatsiaat Fiord system, Figure 21. Lumpsucker is an important species in the commercial fisheries, however the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden) seems less important than the coastline around the settlement of Qeqertarsuatsiaat and further offshore, Figure 22.

Figure 21. Important area for fishing and spawning of Capelin at Qeqertarsuatsiaat, (Christensen et. al., 2016).

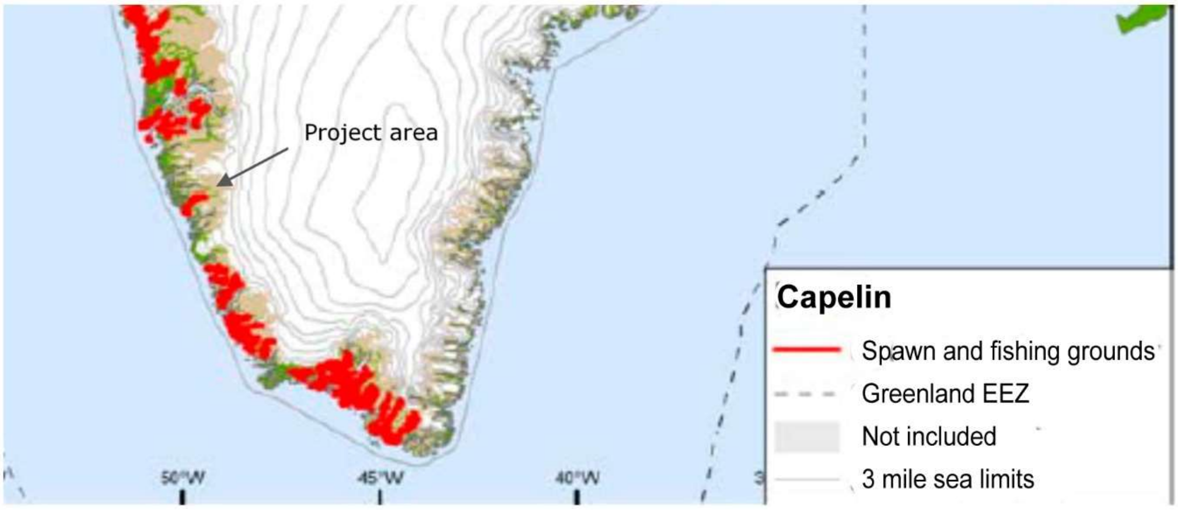
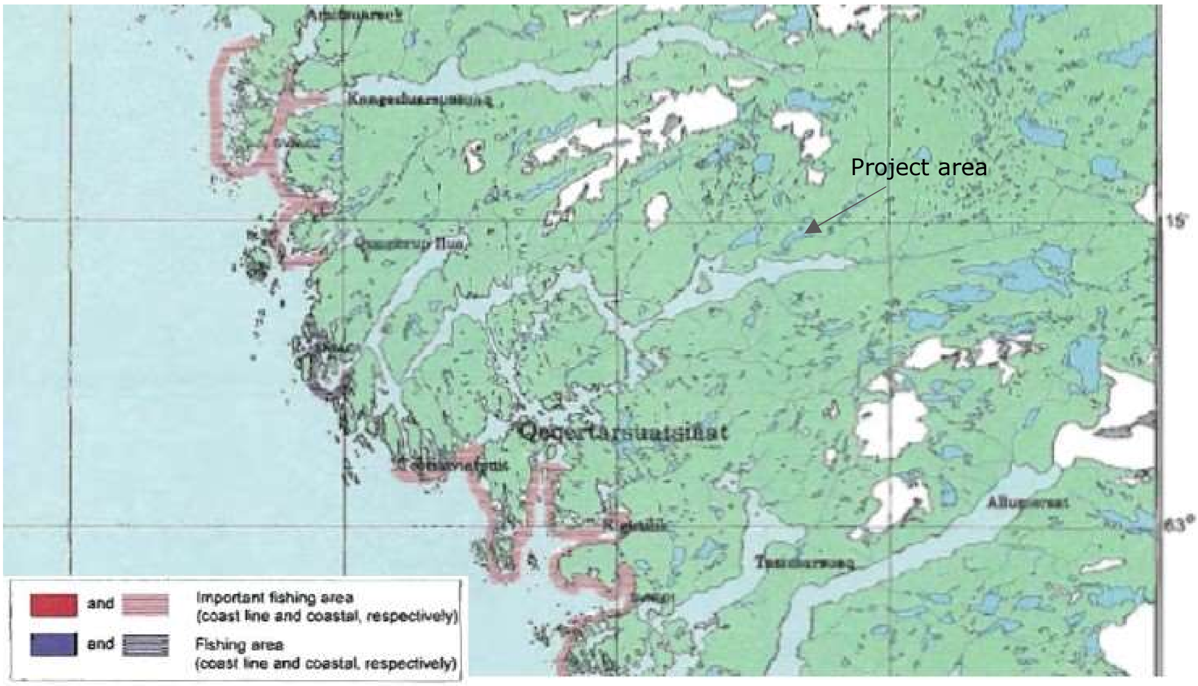


Figure 22. Important area for fishing lumpsucker at Qeqertarsuatsiaat, (Nielsen et al, 2000).

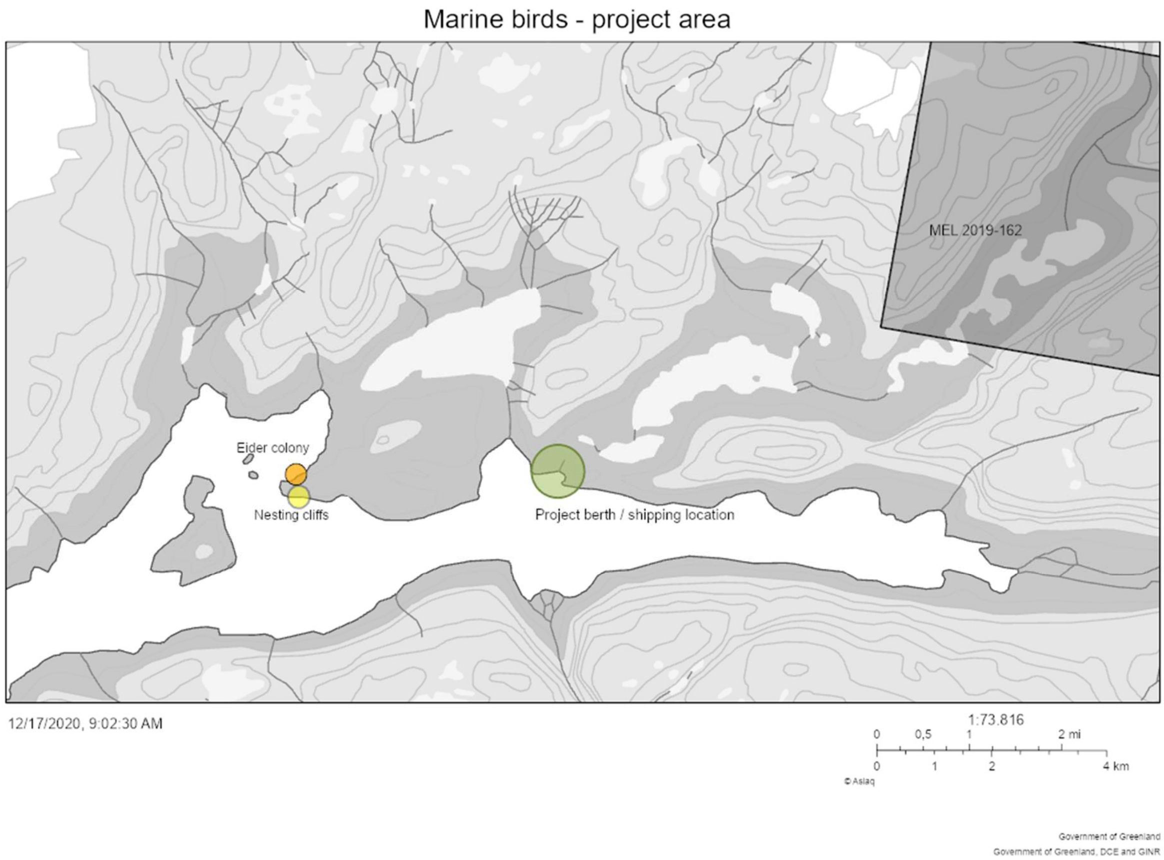


Birds

The project area is located at the very base of the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden). Project activity can be divided into activity in close proximity of the actual land-based operation and activities related to shipment of ore.

Regarding potential effects on sea birds close to the land-based operation, two sites require attention. These are the two mapped seabird colonies located roughly 5 kilometres west of the future project berth area, described as an eider colony (*S. mollissima)* and as a nesting cliff for various seabirds, possible including the thick-billed murre who appears on the Greenlandic red list as vulnerable, Figure 23. In addition to birds at the nesting cliffs, black guillemot (*Cepphus grille*) is expected to be found in the intertidal zone and long-tailed duck (*Clangula hyemalis*) that is listed as vulnerable on the global red list but not included in the Greenlandic red list, may seasonally be found in the open parts of the fiord. A list of species that may be found in the project area and their conservation status can be found in Appendix 6.

Figure 23 Mapped bird locations closest to the project shipping area

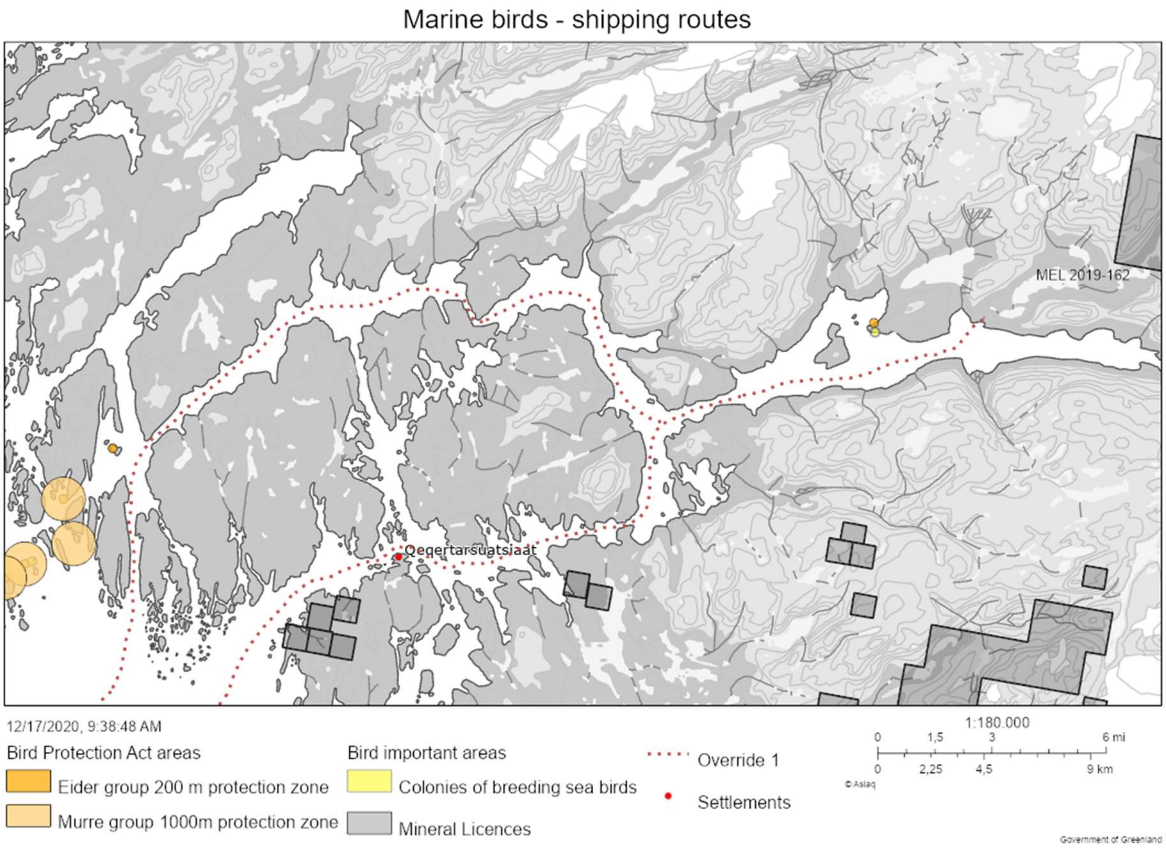


No bird colonies have been identified along the conceptual shipping routes within the fjord-system. However, when reaching the group of islands bordering the open waters of the Davis straight, several sea bird colonies are identified, Figure 24. These colonies are described as murre colonies (probably a mix of Alcidae species such as common murre (*Uria aalge*), thick-billed murre (*U. lomvia*) and black guillemot (*Cepphus grylle)*), eider colonies (*S. mollissima*) and colonies of breeding seabirds (expected to consist of various species of gulls e.g. Glaucous Gull (*Larus hyperboreus) ,* Great Black-backed Gull (*L. marinus*) and Iceland Gull (*L. glaucoides)* along with other species such as skuas (*Stercorarius s.p.)* and others).

The shipping route consists of two alternatives where the choice between either the north- or south route will depend on weather, tide and other factors. Following the southern route, no known bird sites are expected to be impacted. Utilizing the northern route, carriers will approach, but still be too distant to disturb, the described sea bird sites at the island groups near open waters. Thus, both the southern and the northern routes will comply to all regulations regarding distance to the mentioned colonies.

Sea birds does also rest and forage within the fjord-system, but transiting ships will usually only cause short duration disturbances, where birds will withdraw from the shipping lane, only to return shortly after the vessels have passed.

Figure 24: Identified bird colonies along the conceptual shipping routes.



Marine mammals

Few marine mammals are expected in the inner part of the Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjord). The high content of post-glacial elements (suspended solids) in the water column will probably discourage a range of marine mammels from fouraging near the project site.

The harbour seal (Phoca vitulina) is at present a protected species in Greenland and appears on the Greenlandic Red list as critically endangered. The harbour seal is distributed along the sections of the Greenlandic coast with sub-arctic marine environments (south of 75°N on the west coast) (Rosing-Asvid, 2010). Compared to the other Greenlandic seal species, only the harbour seal is dependant on access (in limited periods) to haul-out locations for reproduction and moulting. The stock in West Greenland declined rapidly after the 1950s. On the west coast, harbour seals congregated at several breeding and moulting localities until the 1960s. Most of these localities were abandoned by the early 1990s and harbour seals are now rarely seen in West Greenland (Teilmann, 1994).

Because of the endangered status of this species in the Greenlandic Red List, and the fact that the innner part of Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjord) is a possible haul-out location, a wild-camera setup surveying the sandy intertidal flats was deployed in autumn 2020.

Ringed seals (Phoca hispida), Harp Seals (Pagophilus groenlandicus) and Hooded Seals (Cystophora cristata) might appear in the outer Qeqertarsuatsiaat fiord system. None of these are endangered.

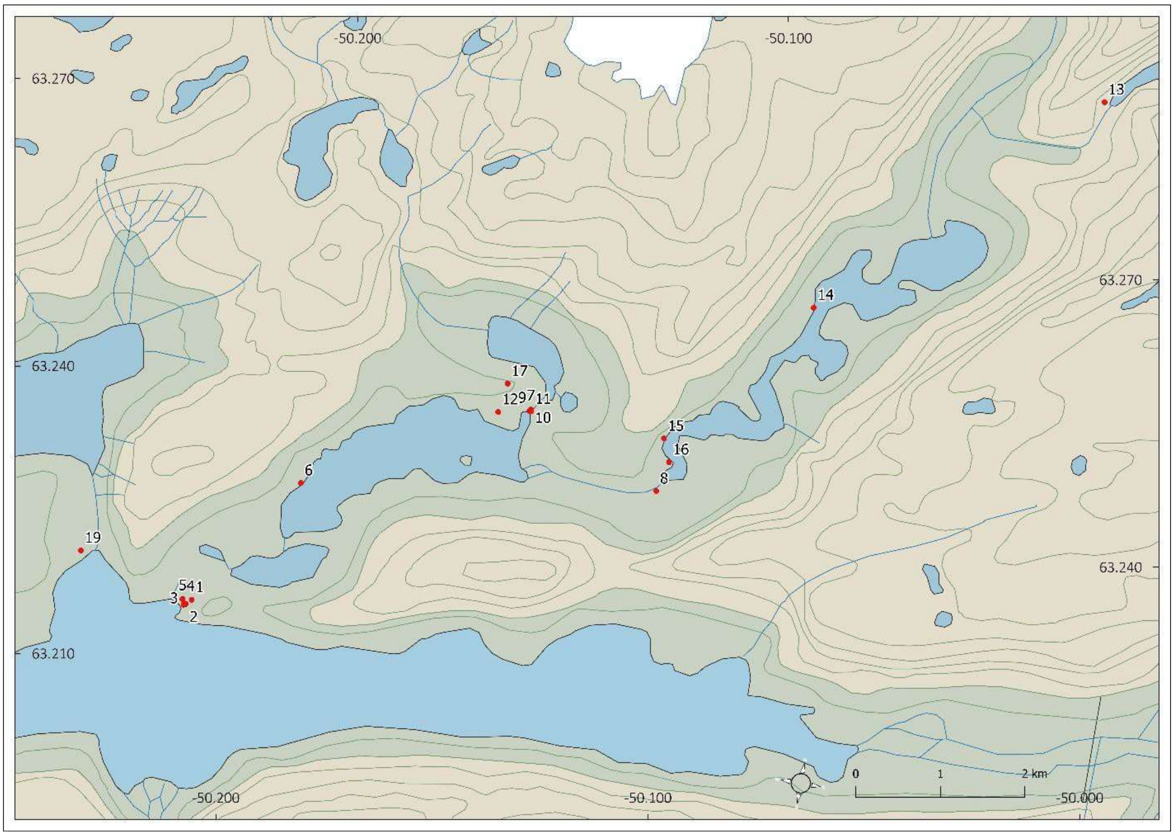
In september 2018 a possible Northern Bottlenose Whale (*Hyperoodon ampullatus*) whale was captured in a photo in the central part of Qeqertarsuatsiaat fiord, Figure 25. Other more common whale species such as the Harbour porpoise (Phocoena phocoena), Minke whale (Balaenoptera acutorostrata) and Humpback whale (Megaptera novaeangliae) might also appear in Qeqertarsuatsiaat fiord, although no references has been found.

Figure 25: A possible Northern Bottlenose Whale resting in central part of Qeqertarsuatsiaat fiord.

3.6 Archaeology

Greenland National Museum & Archives (NKA) has carried out an archaeological survey (7-11 September 2020) of the planned harbour area and road transect leading to the anorthosite mining area. The survey identified and documented 18 minor features within the project area, representing caribou hunting activities and movement in the landscape, Figure 26. There are no conflicts between the heritage sites and the construction work currently planned by Greenland Anorthosite Mining. A list of the 18 documented features is shown in Appendix 5.

Figure 26: Map showing the archaeological finding in the area during field work September 2020.



3.7 Summary of scope

Table 5 sets out a scoping summary table, which identifies all potential impacts and whether these impacts have been scoped in for further consideration in the EIA. The table includes impacts foreseen in all the project aspects but not divided into the phase's construction, operation and decommission. Thus, some of the impacts listed in the table may occur in more than one project phase. The table also includes a brief description of the assessment that will be conducted for each of the potential impacts that have been scoped in for analysis.

The scoping analysis has been carried out based on the existing understanding of Project activities and potential interactions with the baseline environment. If new information arises over the course of the EIA that affects these conclusions, this will be taken into consideration for a possible amendment to the scope of the EIA.

Table 5. EIA Scoping Summary Table.

Aspect	Impact	Source of Impact	Scoped In/ Out	Reasoning	If In, How Assessed?	Cumulative / Transboundary Impacts Considered?
Physical Resources						
Landscape	Change in landforms and cover type	Development of mine and associated infrastructure within Project boundary	In	The Project will disturb land within footprint of buildings, excavations, and roads. Native vegetation will be impacted by construction of these components. Permanent changes in topography will occur in at least some of these areas.	Impacts will be assessed against baseline conditions as documented in terrestrial vegetation survey	N/A
Geology	Alteration of streambed and/or channel alignment on inland streams, or shoreline of fjords	Road crossings, TSF discharge, and marine terminal	In	Constriction of stream channel at road crossing and/or discharges from the TSF have the potential to alter the velocity and/or volume of downstream flows. Construction of marine terminal has potential to alter currents in immediate vicinity, although this is mostly considered a short-term impact.	Impacts will be assessed against baseline conditions as documented in visual habitat survey components of the aquatic and marine field studies	N/A
Freshwater quality	Short-term changes in water quality due to disturbance of streambeds and surrounding terrestrial habitat during road construction; potential downstream impacts from discharges from TSF rock and other sources	Runoff from disturbed land, sanitary and grey water discharges, TSF discharges	In	The Project will have the potential to affect water quality in freshwater streams in and downstream of the Project area.	Impacts will be assessed against baseline water quality samples and populations estimates of arctic charr	N/A

Aspect	Impact	Source of Impact	Scoped In/ Out	Reasoning	If In, How Assessed?	Cumulative / Transboundary Impacts Considered?
Seawater quality	Short-term changes in water quality due to disturbance of fjord during construction of the marine port; potential impacts from discharges from TSF	Runoff from disturbed land, sanitary and grey water discharges, TSF discharges, ballast and other discharges from ships at marine port	In	The Project will have the potential to introduce additional discharges to the streams onsite and the fjord at the marine port.	Impacts will be assessed against baseline water quality samples taken during the aquatic and marine field studies	N/A
Air quality and project Carbon footprint	Emissions from internal combustion exhausts on mobile and stationary units and dust caused by construction activities, mining activities and closure activities.	Short-term localized air quality degradation from construction and mining equipment. Longer-term impacts from mining equipment and generator emissions. Dust dispersion from project operations	In	The Project will cause localized degradation of air quality and be a CO_2 source for the life of the Project due to exhaust emissions. Mining operations including constructions, blasting and hauling ore, processing and shipping will cause dust dispersion.	Meteorological data from the site will be used in a site-specific analysis, which will assess potential local issues caused by emissions. The overall project carbon footprint will be estimated for all project phases and an assessment of dust dispersion during project phases will be presented and supported by adequate dust dispersion modelling.	No - emissions and dust may disperse a short distance from the site but are not expected to cross geopolitical boundaries. Emissions are currently very low across southwest Greenland, so cumulative impacts are expected to be insignificant.
Noise and vibrations	Noise from domestic activity, noise from operating machinery and noise from blasting	Domestic activities in camp, generators, machinery operating in work areas, motor vehicles on roadways, and mechanized activities at the marine port. Short-term noise from blasting.	In	Non-natural sound levels at the Project site are currently very low-the Project will introduce several new sources of anthropogenic noise to the area. Mining demands blasting occasionally.	Predictive noise modelling and comparison of results to relevant international guidance thresholds.	No - noise from the Project is not expected to be audible across geopolitical boundaries. Anthropogenic noise levels are currently very low across southwest Greenland, so cumulative impacts are expected to be insignificant.

Aspect	Impact	Source of Impact	Scoped In/ Out	Reasoning	If In, How Assessed?	Cumulative / Transboundary Impacts Considered?
Light	Light emissions from camp, work areas, and marine port	Disturbance of wildlife species' diel activity patterns	In	Non-natural light is virtually non-existent in the Project area. The Project will introduce non-natural light to the Project site.	Qualitative literature-based assessment of light impacts	N/A
Heat	None	N/A	Out	Project will not emit heat or radiation to the environment.	N/A	N/A
Radiation	None	N/A	Out		N/A	N/A
Environmental Resources						
Vegetation	Change in vegetative cover and/or diversity	Development of mine and associated infrastructure within Project boundary	In	The Project will disturb land within footprint of buildings, excavations, and roads. Native vegetation will be impacted by construction of these components.	Impacts will be assessed against baseline conditions as documented in terrestrial vegetation survey. The long-term impact will be assessed from knowledge in literature	N/A
Wildlife habitat	Change in diversity and/or structure of vegetative community, or change in habitat conditions both terrestrial and aquatic	Any of the physical or biological impacts listed in this table could potentially be a source of impacts on wildlife habitat	In	The Project will disturb land, cause changes in vegetation, and potentially impact water quality and/or air quality.	Impacts will be assessed against baseline conditions as documented in various biological surveys being undertaken	No - this Project has the potential to affect migratory species, but not to the extent that changes in cumulative impacts would be significant or that effects would be noticeable across geopolitical boundaries.
Effects on possible carbon sinks	None	N/A	Out	Project will have the potential to affect vegetation, but not to the extent that the carbon assimilative capacity would be compromised.	N/A	N/A

Aspect	Impact	Source of Impact	Scoped In/ Out	Reasoning	If In, How Assessed?	Cumulative / Transboundary Impacts Considered?
Disturbance of wildlife	Change in diversity and/or structure of vegetative community or change in aquatic habitat conditions.	Physical changes to the landscape (earthmoving, changes in air or water quality) or sensory cues (light, sound, etc.)	In	Changes in vegetation, water quality, air quality, noise (including under water noise), light, shipping, etc. all have the potential to alter wildlife behaviours.	Where possible, potential sources of disturbance will be quantified and assessed against baseline conditions and relevant international guidance thresholds. In other cases, predicted impacts will compared to baseline conditions as documented in the biological field studies, and verified through consultation with local experts	No - this Project has the potential to affect migratory species, but not to the extent that changes in cumulative impacts would be significant or that effects would be noticeable across geopolitical boundaries.
Loss of biodiversity/ change in ecosystems	Change in diversity of vegetative, terrestrial wildlife, and/or marine and aquatic communities	Loss or reduction of species' populations, changes in distribution of species	In	The Project would have the potential to affect the population or distribution of certain species on a local scale	The terrestrial, aquatic, and marine biological surveys will identify species that may be particularly susceptible to impacts on their populations and/or distributions.	N/A
Introduction of non-native species	Release of exotic species into the environment at the Project site	Ballast water from vessels.	In	Foreign species can represent threats to native species	Qualitative assessment of the risk posed by potential introductions, both in terms of the exotic species most likely to be encountered and the susceptibility of the ecosystem to effects from their potential introduction to the Project area.	Yes - Introduction of non-native species often occurs across geo-political boundaries. Only transboundary impacts of importation (i.e. impacts on ecology at the site) will be considered; potential impacts of exportation of species is beyond the scope of this ESIA.
Land Use and Access to Local Resources						
Cultural heritage/ Archaeology	Project construction and operation could	Physical disturbance of land from port, road, camp, and mine construction	In	The Project site lies within an area of known historical/cultural importance and so has the potential to affect archaeological resources in or near the	Field survey has been conducted by the NKA	Yes

Aspect	Impact	Source of Impact	Scoped In/ Out	Reasoning	If In, How Assessed?	Cumulative / Transboundary Impacts Considered?
	affect archaeological resources	and ongoing mine operation		footprint of Project activities/facilities		
Land uses and access	The presence of the Project could preclude use of the Project area for other non-compatible uses	Potential exclusion of hunters and fishermen from traditional hunting and fishing areas	In	Hunting and fishing are popular culture activities and require open access to remote areas. The presence of the Project could potentially impede movement/access of hunters and fishermen through the area. Alternatively, the road could help the hunters inland faster and herby increase the hunting radius.	The access requirements of local hunters and fishermen will be determined through interviews with local residents and potential impacts on their activities will be assessed on the basis of planned Project activities in areas identified by local residents and the potential impacts of the Project on quarry species.	N/A
Increased demand on existing resources	Consumption of resources that are in limited supply in the local communities	Degradation of water quality, occupation of the landscape	In	Local communities are dependent on specific natural resources, and the Project may compete with the communities for those resources.	Resource specific assessments (air, water, land, biological resources, etc.) will assess the impact of the Project on each resource category.	N/A
Effects of building infrastructure on access	Additional access could lead to additional resource use and potential environmental degradation	Increase extractive activities in the Project area or nearby areas	In	Existing infrastructure lowers the cost associated with accessing nearby resources. Infrastructure for this Project (particularly the roads and port) could attract additional extractive interests to the area.	The ESIA will consider how the Project is to be closed/decommissioned in order to predict the extent to which its facilities would attract additional development or activity to the area.	N/A
Cumulative impacts	Incremental contribution to degradation of specific resources of concern	Degradation of water and/or air quality, ecological impacts	In	For resources that extend beyond a specific Project's footprint, cumulative impacts are important factors in the overall condition of the resource.	Qualitative assessment of Project's incremental impact on the environment based on knowledge of other projects in the area with similar impacts	N/A

Terms of Reference [ToR]

4 Terms of Reference [ToR]

4.1 Baseline work

Before a company can begin the construction phase of a project, an adequate amount of baseline data must be collected. This data will function as a reference to the monitoring programs enforced on the project owner during the project operations phase. The governmental guidelines (Mineral Resources Authority, 2015) define a minimum of 2-3 years of required baseline surveying.

The environmental baseline work related to the GAM anorthosite project includes the following sample setup. Sampling stretches for two seasons (2020 and 2021).

Table 6: List of project environmental baseline sample types

Environment	Sample type	Sample relevance
Terrestrial	Botanical survey	Description of botanical composition and screening for red list vascular plants
Terrestrial	Meteorological data	Collection of wind, temperature and precipitation data for modelling purposes
Terrestrial	Wildlife cameras	Seasonal photos of certain project locations to verify seasonal changes
Terrestrial	Bird observations	Continuing observations of birds in the project area. Especially to identity nesting areas
Terrestrial	Lichen sampling	Collection of Lichens on selected sites to attain background values as reference to future monitoring
Terrestrial	Dust dispersion	Dust sampling using accredited dust-fall bottles, deployed at infrastructure and process key locations.
Freshwater	Water chemistry	Water analysis to document trace metals background values
Freshwater	In-situ conditions	pH, temp, turbidity/TSS, conductivity, dissolved O_2
Freshwater	Turbidity	Water analysis to document suspended solids concentrations
Freshwater	Arctic Charr	Sampling of juvenile arctic charr and screening of waterways to identify potential charr spawning sites
Freshwater	Waterflow	Waterflow- and water level measurements
Freshwater	Invertebrates	Screening of invertebrate society
Freshwater	Lake topography	Bathymetric surveying of potential tailings lake (lake 1, 2 and 3)
Marine	Biota	Sampling of mussels, fish, seaweed and sediments to establish trace metal baseline levels
Marine	Documentation of seabed	Photos of the current state of near project seabed.
Marine	Bird observations	Screening of identified and relevant bird nesting sites and general marine birdlife observations
Marine	Marine mammals	Continuing screening during fieldwork for marine mammal presence near the project site and transit routes

Baseline sampling was initiated in October 2020 and will be completed during 2021. The collection of meteorological data will continue in 2022 and onwards. Sampling is only possible during the ice-free period from mid-June to mid-October. Baseline sampling plan is displayed in Table 7.

The sampling protocol including equipment, elements and analysis are attached as Appendix 2

Table 7: Baseline sampling plan

	2020												2021											
Planned environmental baseline sampling plan	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Water samples creek (analyses of metals, chl.a. TSS)										X								X	A	X	A			
Water Chemestry Creek (pH, temp. Conductivity etc.)										X								X	A	X	A			
Sediment Creeks																		X						
Lake water samples (analyses of metals, chl.a. TSS)																		X		X				
Lake Chemstry (pH, temp. Turbidity, conductivity)																		X		X				
Lake bathymetry																		X						
Sediment Lakes																		X		X				
Botanical survey																				X				
Lichen sampling										X								X						
Arctic char obs. and sampling										X										X				
Marine sampling (fish, mussels, seaweed, sediment)										X								X						
Weather data (wind, temp, humidity etc.)										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hydrological data (pressure data loggers)										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hydrological measurements (flowrates)										X								X		X				
Notes	*A = Automated sampling																							
	(hatched) **ice covered / no sampling**																							

4.2 Key environmental aspects

Although the project is a straightforward blast, haul and ship operation, some elements in the project workflow does pose varying levels of disturbances to the surrounding environment. The project scoping phase identified the following subjects to be of special significance (for a full list of the proposed EIA content, please visit Appendix 1.

4.2.1 Dust dispersal

Blasting, truck hauling of ore and loading ore onto bulk carriers are all activities that will cause dust. The different activities will cause varying degrees of dust dispersal and have varying effects on the surrounding environment. Effects will typically include dust layering on vegetation, reducing plant growth and negatively affecting insects and wildlife dependent on the affected vegetation. Also, dust can be washed into the freshwater systems, increasing turbidity and mineral- and trace metal values, potentially affecting freshwater invertebrate and fish populations.

Blasting will occur both in the project construction phase and in the project mining phase. During construction, blasting will be necessary when land developing the campsite and processing plant areas, for levelling out road transects and for preparing the planned stockpile areas. The actual explosion is detonated underneath blasting mats, which reduce the spread of rocks, debris and dust substantially. However, the following handling of the blast rock and development of the area using excavators, front-loaders and haul trucks, can cause substantial dust dispersal.

Once the infrastructure has been established, the actual mining operation will commence. This involves regular blasting in the pit-area and substantial activity of heavy machinery at the pit-site. Here, blasted ore will be loaded onto haul trucks that will transport the ore to the processing plant at the base of the valley. Transportation of between 1,700-3,500 tons of ore per day (scenario A and B respectively) will require approximately 50-100 truck hauls pr day, via the c. 17 km haul road and will potentially cause substantial dust to be spread.

At the camp- and process site ore will be deposited in storage stockpiles. Crushing the crude ore, processing and handling and depositing the refined ore is potentially a major source of dust spread in the area. Finally, the ore is loaded onto bulk carrier vessels at the project berth, which can cause varying dust dispersal and potential spill of ore into the fjord.

In order to assess the effects of dust spread, a dust spread analysis will be presented using local meteorological data. The analysis (CALPUFF or what is deemed adequate) will combine wind speed and wind direction data from weather stations located at the campsite area and the pit-site with atmosphere met-data and local topography. This will help identify specific areas that could possibly be exposed to heavy dust fall, and enable GAM to prepare mitigating measures, should it occur.

The proposed environmental monitoring program will include specific monitoring tasks to supervise dust spread development.

4.2.2 Tailings storage

When producing and concentrating an ore resource, rock material without the required chemical specifications or lacking the wanted properties is categorized as waste material or tailings. During the lifetime of a mine, tailings build-up can be substantial why a secure and long-lasting solution to tailings storage is vital.

In addition, a similar plan is needed for the very limited amount of ore overburden, which is categorized as soil or rock covering the orebody.

Handling tailings during a mining operation is regarded as an environmental key aspect. Depending on the ore resource, tailings can potentially pose a serious risk to the surrounding environment. The fact that a passive orebody is mobilized, oxidized and moisturized through the various mining processes can potentially changes the chemical properties of the rock material. An unintended spread to the environment in that case could be highly problematic.

The Greenland Anorthosite Mining project involves extraction and processing of Anorthosite. Overall, the resource is considered predominantly chemically inert with very low levels to no sulphur or heavy metal components. Further analysis of the resource is ongoing, including environmentally important tailings leaching tests. At present, the orebody and tailings are regarded as constituting a minor environmental risk.

The proposed project includes two production scenarios (A and B). The scenarios define different mining regimes and hence differences in resulting tailings amounts.

Table 8: Estimated tailings storage requirements

	Ore sorting (k tpa.)	Mag. Separation and fines (k tpa.)	Total (k tpa.)	Total LoM 30 yrs. (kt)
Scenario A	30-35	70-135	100 - 170	3,000 – 5,100
Scenario B	60-70	70	130 - 140	3,900 – 4,200

Throughout the life of the mine operation, substantial amounts of tailings are to be deposited. The project has defined several potential tailings storage options, Figure 11.

Dry tailings depot.

The company has defined a suitable location for dry storage of tailings on land. The deposit will be located north of the process- and camp area, on higher ground with a <18 degrees slope gradient. The tailings will be deposited using haul trucks and the deposit will gradually be dozed and compacted to increase deposit stability. The structural strength of a land based tailings depot will be assessed by combining knowledge of the topography, geology and tailings composition combined with hydrological modelling – info on the latter is described in 4.2.4.1.

Similar assessments will be conducted, should the project chose one of the other land-based alternatives instead (Figure 11)

Wet tailings depot.
Another option is to deposit tailings in a lake. During preliminary project studies, two suitable lakes have been identified within the project area (Lake 2 and lake 3). For underwater deposition to be an environmentally viable solution, certain criteria must be met:

- The deposition depth must be adequate for a stabile thermocline to be able to form above the depot. A thermocline acts as a physical density barrier, which will reduce spread of the finer tailings fraction to the environment downstream of the depot.
- It would be preferable to store tailings in a deep part enclosed by lower shelfs of the lake. This would also reduce distribution of tailings particles downstream since retention times are expected to be longer in these deeper waterbodies.

To fully assess potential impacts of an underwater deposit in the mentioned lakes, more studies of the actual physical and chemical properties of the lake and its surroundings are necessary. This work is in progress – see Table 7.

4.2.3 Local wildlife

One main impact from the proposed mining activities is the disturbance of wildlife. The project will result in continuous activity throughout the valley, from the port- and camp area along the haul road to the pit area. This activity will affect local wildlife to some extent.

The valley is evaluated as a location with relevance to the Qeqertarsuatsiaat caribou population. The caribou in this region primarily move to northern locations during the calving period, but the valleys in- and around the GAM licence area does provide a large grassing and foraging area to caribou during the summer period.

The license area is not included as a specific *area of biological interest* (DCE, 2016)*,* but the area does support the local wildlife with grasslands, water etc. just as large parts of the coastal areas of SW Greenland. The caribou populations were critically small during the 1990s due to hunting and extremely hard winters, which resulted in a complete hunting ban for a period. Since then, the populations have grown in numbers to an extent where hunting times in recent years have been extended to keep the populations regulated. Very high caribou population densities can result in caribou food shortage, resulting in weaker individuals more susceptible to parasites and diseases and with lesser value as a hunting resource.

The EIA will assess project effects on local caribou populations, including hunting and the indirect inclusion of grassing areas. The EIA will also provide assessments of project effects on other known wildlife in the area, specifically focusing on red list species.

4.2.4 Freshwater

The project license area is constituted by a valley with a substantial freshwater system. The EIA will assess potential effects on local freshwater biota as well as project effects on waterflow and water dynamics.

Field studies in 2020 concluded that arctic charr does migrate past a large waterfall in the lower part of the freshwater system. Further studies on the arctic charr population and distribution upstream will be assessed as a part of the EIA. Also, a screening of the general freshwater macroinvertebrate society will be assessed in order to evaluate the freshwater systems sensitivity to disturbances, such as increased turbidity and changes to water chemistry.

4.2.4.1 *Hydrology*

Freshwater hydrology is of great importance to the proposed mining operation. In order to run a consistent and effective operation, infrastructure has to be maintained and kept operational. The freshwater systems related to the proposed project pose a risk to the project infrastructure. Heavy rainfall events or abrupt melting and resulting runoff could cause flooding of roads and potentially affect stockpile depots, tailings depots and fuel- and explosive storage facilities. The EIA will modulate waterflow and water distribution during a 50- and 100-year flooding event using a MIKE hydrological model, potentially supplemented by a SHE surface run-off model and/or a SCALGO analysis. This data will be utilized during the project construction phase and it will form the basis of a risk analysis of potential pollution events (fuel leaks, tailings dispersion etc.) and define appropriate mitigation measures and project environmental emergency procedures.

4.2.5 Marine life

The Qeqertarsuatsiaat Kangerdluat (Fiskenæsfjorden) is a large fjord system with multiple minor straights and fjord arms. The project area is located at the very base of the fjord system, in a fjord arm heavily affected by silty glacial runoff. The fjord system is not categorized as an important fishing area as such, although local fishermen does rely on inshore cod fishing (*G. morhua)* and seasonal fishing for charr (*S. alpinus)*, salmon (*S. salar)*, lumpsuckers (*C. lumpus*) and capelin (*M. villosus*). The fjord system supports several species of marine mammals such as seals and to some extent whales. There are few recordings of the actual importance of the fjord system to marine mammals but field studies and interviews with local hunters and fishermen will provide data for this to be assessed in the EIA.

In terms of oil spill, the inner part of the fjord is categorized as highly sensitive whereas the shipping route outwards toward Qeqertarsuatsiaat is moderately sensitive. Some of the outer parts of the fjord system along the proposed shipping routes, past Qeqertarsuatsiaat, are categorized as extremely sensitive to oil spill due to the numerous near shore seabird nesting sites (Mosbech, 2000). The EIA will contain updated and project specific navigational safety instructions supported by fully certified updated navigational charts of the shipping lanes and project berth waters. Risk assessments of shipping activities will be conducted, and quality assured by skippers with lifelong experience in navigating in Greenlandic waters.

4.3 Project-Specific EIA Studies

Table 9 describes the specific desktop and field studies that will be undertaken as part of the Project EIA. This list is dynamic and will likely change based on information gathered during the various phases of the EIA process.

Table 9: List of Studies to be conducted for the EIA.

Number	Study	Approach	Schedule
1	Caribou distribution and migration.	Utilize existing data from GINR.	QA/QC of existing data completed spring 2021.

Number	Study	Approach	Schedule
2	Location of calving grounds or other important caribou areas between Sermilik fjord and Frederikshåb Isblink	Utilize aerial transect survey data collected by GINR.	QA/QC of existing data completed summer 2021. Data review and summary to be completed spring 2021.
3	Arctic charr and general aquatic ecology study	Habitat assessment in creeks in the study area, particularly those used as migratory habitat for migratory charr.	Site-specific studies in several streams in and downstream of the pit site in late September 2020 and August 2021.
4	Marine resources/ aquatic biodiversity*	Site-specific marine biota and habitat survey in the vicinity of the port site.	August-September 2020/2021 in conjunction with charr study.
5	Consultation with fishermen*	Consult with local fishermen in Qeqertarsuatsiaat to determine seasonality, habitat requirements, and distribution of important species.	Spring/summer 2021.
6	Meteorological conditions study	Describe existing air quality and local meteorological conditions in the airshed using GAM met-station data.	2020-2021 (ongoing) Data collection at GAM´s two existing meteorological stations at the Project site.
7	Surface water, groundwater, and hydrographic analysis*	Characterization of surface water and groundwater resources. Water quality data in the affected creeks (including dissolved oxygen, temperature, conductivity, and turbidity). Groundwater analysis to include: • Water table elevation • Transmissivity • Groundwater quality	Data collection ongoing 2020-21.
8	Vegetation mapping and rare flora study*	General vegetation mapping followed by site-specific surveys conducted during appropriate season.	August 2021.
9	Noise study	Utilize existing noise data.	Data review and summary to be completed summer 2021.
10	Dust study	Deployment of dust-fall traps	June – August 2021

Number	Study	Approach	Schedule
11	Rock leaching and geo-kinetic/toxicity tests	Static, Kinetic and leaching analysis for project ore samples performed at an accredited lab	Initiated after the 2021 drilling campaign.
12	Dredging, navigation, and shipping*	Surveys and desktop studies to assess: • volume of sediment to be moved (if any); • sediment characteristics; • bathymetry; • salinity, temperature and tidal patterns; • biological receptors; and • characteristics of ballast. Modelling will include dredge plume distribution and transport and fate of accidental spill.	Summer 2021.
13	Freshwater and marine birds	Red-throated diver, great northern diver, white tailed eagle and other raptors, harlequin ducks.	Spring/summer 2021.
14	Marine mammals	Desktop study and wild-camera photo analysis to identify species of concern including harbour seal.	Spring/summer 2021.
15	Archaeology Studies*	Greenland National Museum and Archives (GNMA) will prepare a desktop review of the Project Area, followed by fieldwork.	Desktop study April 2021, fieldwork Summer 2020.

*indicates studies that are currently planned to have a fieldwork component.

4.4 Impact assessment method

The Impact Assessment Phase assesses the significance of the potential impacts identified during scoping, including cumulative effects, against the baseline conditions and identifies mitigation and management measures that could minimize negative impacts and/or enhance benefits.

Information on potential impacts, including potential cumulative effects generated from the activities required to construct and operate the Project will be obtained from various sources, including consultation with GAM and local sources discussions with the MLSA and other Greenland authorities. The following sections define the methodology that will be used to identify and assess the potential impacts of the Project.

Impact assessment takes place as follows:

- Identify sources of impacts and the impacts themselves that are generated by any aspect of the Project
- Rate impacts compared to baseline conditions before any mitigation (for negative impacts) or enhancement (for positive impacts) is implemented
- Suggest mitigation and enhancement measures to address the impact; and
- Rate impacts after mitigation to produce a "residual" impact rating.

It is standard practice in ESIA processes to "rate" potential impacts:

- To provide a basis for prioritization of impacts to be dealt with
- To provide a method of assessing the effectiveness of proposed mitigation measures
- To provide a scale which shows the level of impact both before and after a proposed mitigation measure has been applied

A consistent system for rating impacts will be used in order to apply analytical rigor to the assessment and rating process. Specifically, an impact rating is the product of two elements: (1) the magnitude of the potential impact or enhancement and (2) the likelihood of the impact or enhancement occurring.

The magnitude of each impact or enhancement will be rated using the criteria identified in Table 10 and Table 11. Colours are used to assist the reader in reviewing the relative magnitude of the impacts.

Table 10: Magnitude Criteria (Negative Environmental Impacts).

Low	Affects environmental conditions, species, and habitats over a short period of time, is localized and reversible.
Medium	Affects environmental conditions, species and habitats in the short to medium term. Ecosystems integrity will not be adversely affected in the long term, but the effect is likely to be significant in the short or medium term to some species or receptors. The area/region may be able to recover through natural regeneration and restoration.
High	Affects environmental conditions, species and habitats for the long term, may substantially alter the local and regional ecosystem and natural resources, and may affect sustainability. Regeneration to its former state would not occur without intervention. Affects environmental conditions or media over the long term, has local and regional affects and/or is irreversible.

Table 11. Magnitude Criteria (Positive Environmental Effects).

	Duration	***Extent***	***Degree of Change***	***Focus/ Sensitivity***
High level of enhancement	Benefits will be sustained over the long term.	Benefits will extend beyond local environment (i.e., linkage of fragmented habitat, e.g., regional corridor)	Direct benefits to species or resources will provide significant opportunities for sustainability.	Benefits will pertain to species, habitats and natural resources that are degraded, or are sensitive, rare, or in need of protection.
Medium level of enhancement	Benefits will be measurable in the short term and possibly longer.	Benefits to many species, habitats and natural resources in the local environment and beyond.	Moderate benefits to species, habitat, and natural resources that may provide some opportunities for sustainability.	Benefits will pertain to species, habitats and natural resources that have some level of degradation, sensitivity, or rarity.
Low level of enhancement	Benefits will be short term.	Benefits to a few species, associated habitat, and resources in the local environment only.	Minor benefits to species, habitat, and natural resources that may provide minor opportunities for sustainability.	Benefits will pertain to species, habitats and natural resources that are not sensitive or rare.

The likelihood of the event occurring is assessed as follows:

- Low likelihood – rare (e.g., few or no occurrences in Project-related biofuel industry)
- Medium likelihood – uncommon (e.g., documented occurrences in Project-related biofuel industry)
- High likelihood – common (e.g., occurs within the biofuel industry)

The overall rating of the impacts will be determined by using the following matrix (Table 12). It should be noted that the matrices included in this and the previous section act as a guide and there may be situations where their rigid application is inappropriate and where stakeholder perceptions and feedback have a significant role to play. For specific impacts where this is the case, the rating will be clearly explained in the evaluation of the impact.

Table 12. Impact Rating Matrix.

Magnitude	***Likelihood***		
	Low	***Medium***	***High***
High level of enhancement	Moderate	Major	Major
Medium level of enhancement	Minor	Moderate	Major
Low level of enhancement	Insignificant	Minor	Moderate
Low severity	Insignificant	Minor	Moderate
Medium severity	Minor	Moderate	Major
High severity	Moderate	Major	Major

4.5 Reporting and Disclosure Phase

The MRA's recommendations for contents of the EIA are outlined in Table 13, along with a brief summary of the contents. The EIA report must be written in English and Greenlandic and the Executive Summary must also be prepared in Danish.

A required component of the EIA is an Environmental Management Plan (EMP). The EMP is an adaptive management system that should be designed to assure that the mitigation measures recommended in the EIA are effectively implemented during the life of the Project and continually refined and modified as necessary based on actual field conditions and circumstances which may not have been anticipated at the time of EIA preparation. The EMP includes a Monitoring Plan that will define the long-term monitoring actions to be undertaken by GAM in compliance with BMP requirements.

The EMP typically has the following components:

- An organizational hierarchy which assures day to day oversight and implementation of the EMP with the identification of a senior corporate official who has ultimate responsibility for the implementation of the system
- A clear statement of goals and a schedule of actions to be implemented including the specific impact mitigation measures identified in the EIA
- Clear responsibilities for implementation of each mitigation measure with a clear chain of command for oversight
- A budget for implementation including a budget for likely contingencies and a mechanism for budget replenishment in the event of unexpected events or circumstances (e.g., force majeure events)
- A contracting management system to assure that all contractors and subcontractors are informed and aware of the EMP and a contracting mechanism which will incentivize contractors and their subcontractors to comply with the EMP or alternatively penalize them for failure to comply with the EMP
- An ongoing monitoring and reporting program, with specified reporting intervals, for the life of the Project including real time management oversight and auditing (ideally by a third party) to ascertain that the impacts are occurring as predicted and the mitigation measures are effective. The EMP also includes a mechanism to continually revise and implement necessary corrective actions to assure that impacts are avoided where possible and when not avoidable are mitigated effectively

Table 13. EIA Contents as Recommended in the BMP EIA Guidelines.

Requirement	Description
Summary	A non-technical summary of the EIA document, prepared in Greenlandic, Danish, and English
Introduction	Description of the mine project and objectives
Description of the Environment	A comprehensive environmental baseline that describes the pre-project condition of the environment that would be affected by the project

Requirement	Description
Description of the Project	Description of all phases of the mine project from exploration to closure, including decommissioning and rehabilitation. This section includes illustrations, diagrams, maps, and plans as necessary to illustrate the major planned project infrastructure.
Environmental Impacts and Mitigations	Description of the anticipated impacts of the Project on the affected environment. This section includes an assessment of impacts from all alternatives and all phases included in the project description. Impacts are to be quantified when possible, and Issues where information is lacking, incomplete or uncertain should be identified. Impacts in each of the following three categories should be assessed: • **Physical impacts** (e.g.; erosion, hydrological **changes**, dust emissions, as well as emissions of noise, vibration, light, heat, and radiation • **Ecological and chemical impacts** (e.g.; **pollution**, impacts on vegetation, wildlife, habitats, biodiversity, and general ecology, and introduction of exotic species) • **Land use impacts** (e.g.; limitations on other non-project related land use, increased demand on resources, effects on infrastructural development on access and land use, and cumulative impacts)
Environmental Management Plan	Plan to reduce the impacts described in the EIA, including an assessment of the anticipated effectiveness of these measures.
Environmental Monitoring Plan	Program for tracking the impacts identified in the EIA as they occur and comparing the predictions of the EIA to actual conditions during the different stages of the Project.
Public consultation	Description of the procedures used to conduct the public consultation phase of the project and the results of the consultations.
Conclusions	Conclusions of the EIA regarding the preferred options, important potential environmental effects, mitigation, decommissioning and remediation, uncertainties and public concerns.
References, authors, and glossary	Explains the terms used, sources of information included in the EIA, and a list of abbreviations

4.6 Stakeholder Consultation

Stakeholder consultation is a key aspect of the EIA process. The consultation process gives stakeholders an opportunity to learn about the Project, raise concerns, understand the potential impacts, and comment on the Project as well as on the reports that are produced during each phase of the EIA. It will also ensure that affected communities have an opportunity to understand and comment on the elements of the Project that will affect them.

Planning for consultation will be structured within a Stakeholder Engagement Plan (SEP) prior to consultation activities. This plan will be updated throughout the consultation process. The SEP identifies and maps Project stakeholders, ensuring that they are engaged as appropriate; it defines how engagement will be undertaken with specific stakeholder groups, the information that will be provided and sought, and sets out the processes and mechanisms by which stakeholder feedback is captured and integrated into Project planning and design.

Stakeholder engagement for the EIA will be carried out in three phases:

- **Project engagement:** Provide affected stakeholders with information about the Project and potential issues, elicit stakeholder feedback to inform the impact assessment and management planning
- **Disclosure engagement:** Disclose the results of the environmental impact assessment studies and Project management plan to affected stakeholders, seek feedback on the draft reports for incorporation into final versions
- **Implementation engagement:** Disclose results of the environmental monitoring program and solicit input from stakeholders on impacts and efficacy of the environmental management/mitigation program

Where consultation is carried out by or on behalf of the EIA, these activities will be captured in the SEP. This will ensure that a consistent approach to engagement is maintained throughout the studies.

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6 Appendices

Appendix 1. EIA Table of Content (proposal)

1 Non-Technical Summary
1.1 English
1.2 Greenlandic
1.3 Danish
2 Introduction
3 Regulatory Framework
4 Description of the Majoqqap Qaava Project
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4.2 The mineral resource
4.3 Mining Operations
4.4 Infrastructure
4.5 Infrastructure and Camp complex
4.6 Personnel
4.7 Alternatives Considered
4.8 Closure Plan
5 Environmental Baseline (Description of the area)
5.1 Physical Environment
5.2 Terrestrial Environment
5.3 Limnetic (Open Water) Environment
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5.5 Areas of Interests/Conflicts
5.6 Sensitive Areas and Protected Areas
5.7 Traffic
5.8 Methods Used for Environmental Impact Assessment
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7 Environmental Impact and Mitigations
7.1 Mine Site
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7.3 Tailings Disposal
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7.5 Dust
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7.7 Impact from Waste and Wastewater
7.8 Oil and Chemical Spill risk assessment
7.9 Impact on Ecological Environment
7.10 Invertebrates
7.11 Freshwater Fish
7.12 Marine Ecology
7.13 Introduction of invasive non-indigenous species with ballast water
7.14 Cultural Heritage and Human Activities
7.15 Cumulative effects
8 Environmental Management Plan
9 Environmental Monitoring Program
9.1 Marine Monitoring Program
9.2 Fresh Water Monitoring Program
9.3 Terrestrial Monitoring Program
10 Closure Activities
10.1 Close Down and Decommissioning of the Mine
11 Public Consultation
12 Conclusions
13 References, authors
14 Appendices

Appendix 2. Data collection tasks and methods

Sampling protocol

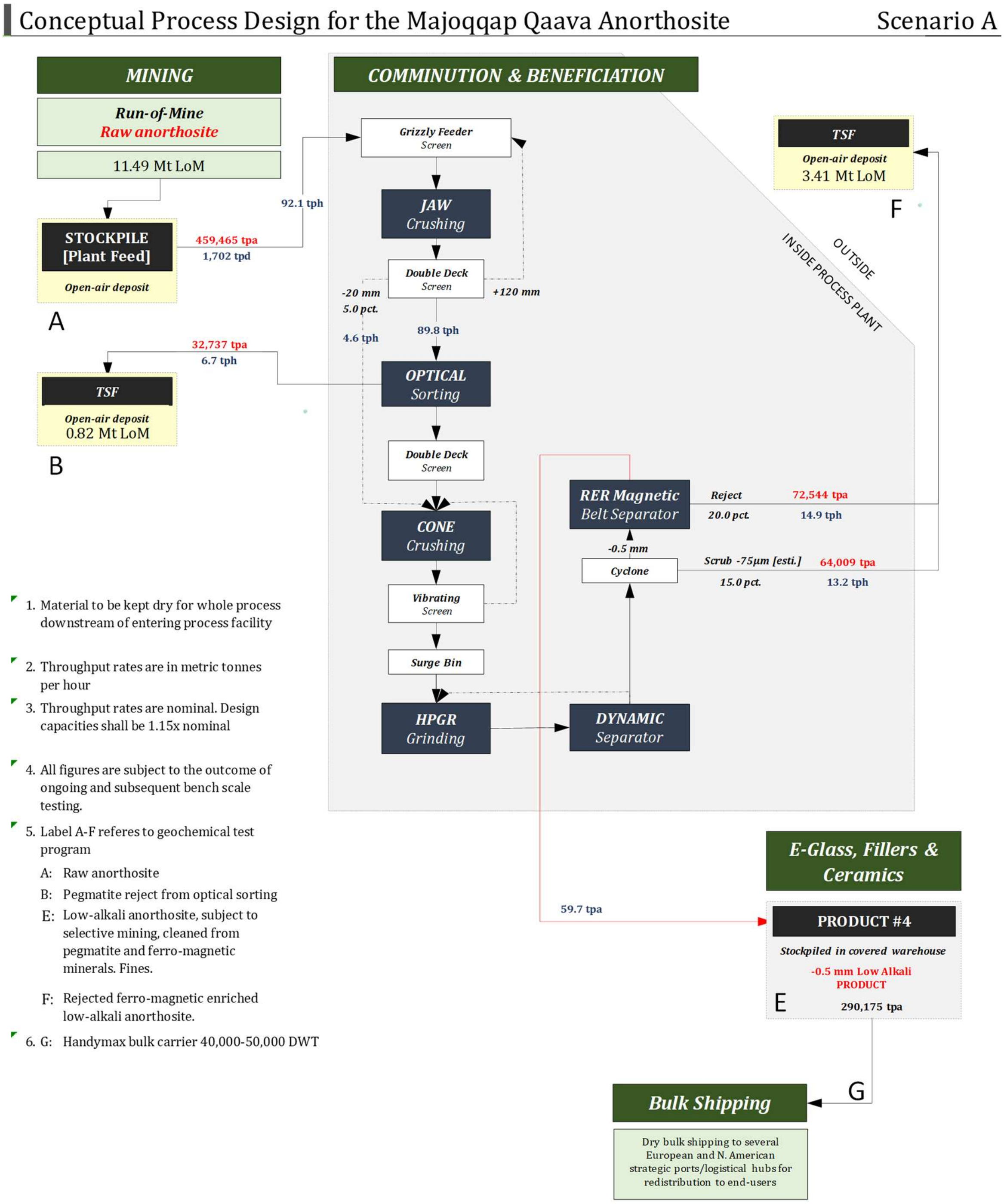
Subject	Equipment	Type	Parameter	Analysis/method
Meteorology	Onset - HOBO U30 sample station	Data	Continues	Software modelling
Meteorology	Wind Speed and Direction Set Smart Sensor - S-WSET-B	Data	Continues	Software modelling
Meteorology	Temp/RH Sensor (12-bit) w/2m cable S-THB-M002	Data	Continues	Software modelling
Meteorology	Onset Solar Radiation Shield RS3-B	Data	Continues	Software modelling
Meteorology	Pluvio2 All-weather precipitation gauge without moving parts according to WMO guide line No. 8	Data	Continues	Software modelling
Dust	Standardized dust-fall bottles deployed according to method	sample	dust mg/cm²	NS4852:2010
Freshwater	Water stream - Manual- and autosampling (ISCO 3700)	Water	Metals*	M-0140 RefM018/ICP-MS
Freshwater	Water stream - Manual- and autosampling (ISCO 3700)	Water	Total N	M-0023 DS/EN ISO11905
Freshwater	Water stream - Manual- and autosampling (ISCO 3700)	Water	Total P	M-0020 DS 292
Freshwater	Water stream - Manual- and autosampling (ISCO 3700)	Water	Suspended solids	Weight (mg/l)
Freshwater	Water Stream - Velocity / Discharge volume	Data	m^3/s	StreamPro ADCP/OTT current meter
Freshwater	Water lakes - Manual Ruttner Water Sampler	Water	Metals*	M-0140 RefM018/ICP-MS
Freshwater	Water lakes - Manual Ruttner Water Sampler	Water	Total N	M-0023 DS/EN ISO11905
Freshwater	Water lakes - Manual Ruttner Water Sampler	Water	Total P	M-0020 DS 292
Freshwater	Water lakes - Manual Ruttner Water Sampler	Water	Chl.a	Chl a conc. sample (µg/l)
Freshwater	Water lakes - Manual Ruttner Water Sampler	Water	Suspended solids	Weight (mg/l)
Freshwater	Lakes - bathymetry	Data	Depth (m)	Echo sounding
Freshwater	Manual in situ, lakes and streams	Data	Temp, pH, cond., dissolved 0_2.	YSI model Professional Plus with a Lutron YK-22DOA O_2 sensor
Freshwater	Manual, lakes and streams	Sediment	Metals*	DS/EN 15934|DS 259:2003, DS/EN ISO|17294m:2016 ICP-MS
Freshwater	Invertebrate screening	Biological	Indexing	In-situ screening
Freshwater	Arctic Charr (S. alpinus)	Biological	Metals* and distribution	Reflab M053 and in-situ screening
Terrestrial	Lichens (F. nivalis)	Biological	Metals*	DS 259:2003; DS 204 mod.; DS/EN ISO 17294m:2016
Marine	M. scorpius	Biological	Metals*	Reflab M053
Marine	M. edulis	Biological	Metals*	Reflab M053
Marine	F. vesiculosus	Biological	Metals*	Reflab M053
Marine	sediment	sediment	Metals*	Reflab M053

* Basic elements being As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Zn according to standing guidelines (Mineral Resources Authority, 2015)
Broad multi-element analyses will also be conducted on key samples

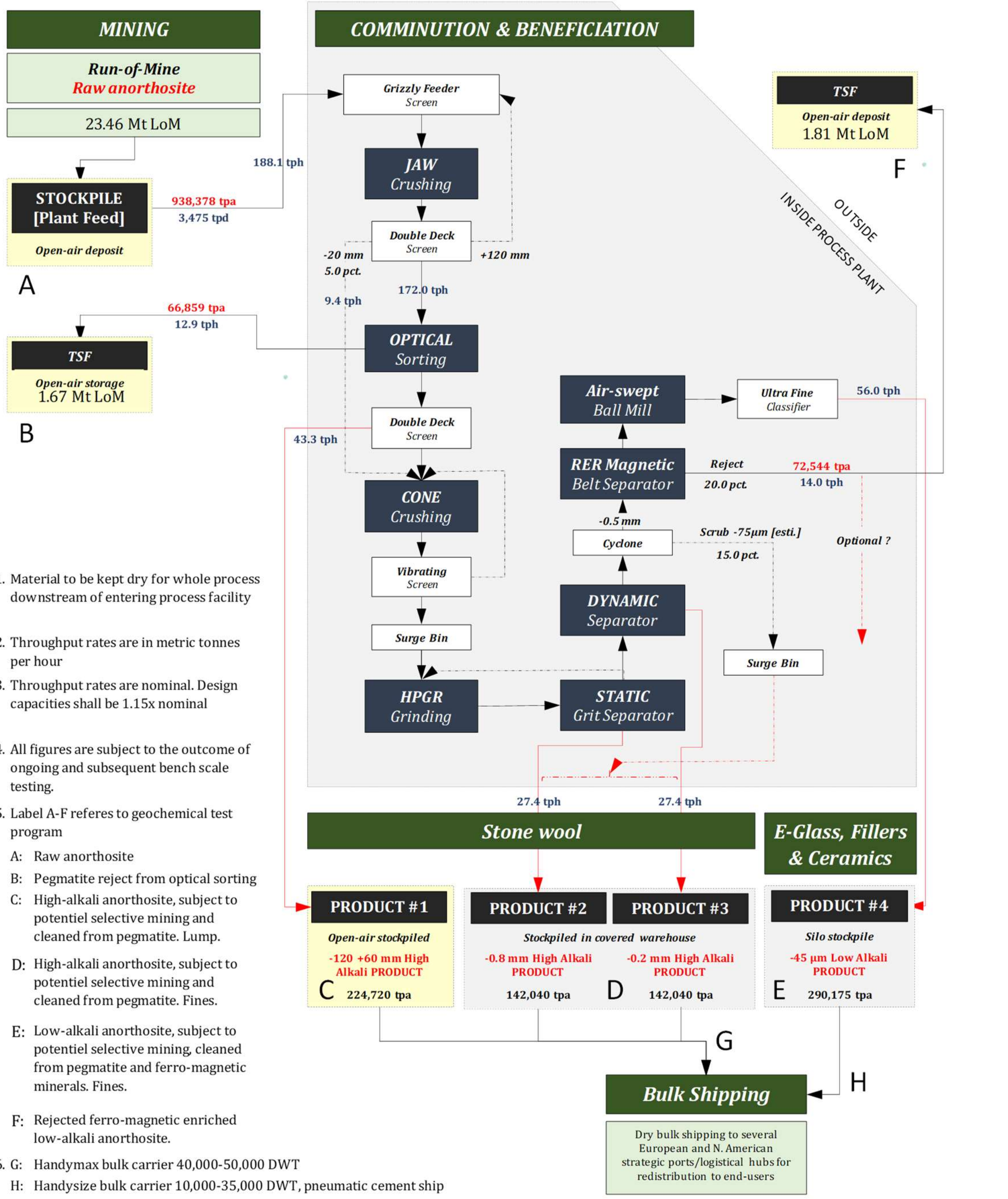
Appendix 3. Mining equipment

Equipment	Description	Scenario A	Scenario B
Excavator	Hydraulic shovel. Back-hoe 5.2 to 6.3 m^3 bucket capacity.	1	1
Front End Loader	FEL with 4.7t 13 m^3 bucket capacity	1	1
Off highway tipper truck	18-44t Tipper truck (haul truck)	5-6	8-10
Primary Drill	Percussion Crawler. 11.4-14.0 cm hole, 3.7 m rods.	1	1
Secondary Drill	Percussion Crawler. 11.4-14.0 cm hole, 3.7 m rods.	1	1
Primary Track Dozer	60 Kilowatt Bulldozers. 2.4 m blade width	2	2
Stemming Loader	4.2 m^3 bucket	1	1
Primary Motor Grader	105 Kw grader w. ripper/scarifier, 3.7 m blade width.	2	2
Rock breaker	104 kg m - 1,000 blows per minute - 3.6-8.2 mt.	1	1
Water Truck	18,000 ltr.	1	1
Fuel / Lube Truck	Mobile field fuel/lube truck. 1,800 gvw service trucks	2	2
Transporter	Fixed load capacity - 150 tonnes. 275 kg/min bulk trucks	1	1
Low Bed	Truck flatbed 8.8 – 11.8 tonnes	1	1
Forklift		1	1
Lighting Plant	Trailer mounted telescoping light towers. 7.8 kilowatt	3	4
Pumps	3.7 kilowatt	2	2
Light Vehicle		2	3
Mini van		2	2

Appendix 4. Schematic flow-chart of the ore processing related to both A and B scenarios



Conceptual Process Design for the Majoqqap Qaava Anorthosite — Scenario B



1. Material to be kept dry for whole process downstream of entering process facility
2. Throughput rates are in metric tonnes per hour
3. Throughput rates are nominal. Design capacities shall be 1.15x nominal
4. All figures are subject to the outcome of ongoing and subsequent bench scale testing.
5. Label A-F referes to geochemical test program
   - A: Raw anorthosite
   - B: Pegmatite reject from optical sorting
   - C: High-alkali anorthosite, subject to potentiel selective mining and cleaned from pegmatite. Lump.
   - D: High-alkali anorthosite, subject to potentiel selective mining and cleaned from pegmatite. Fines.
   - E: Low-alkali anorthosite, subject to potentiel selective mining, cleaned from pegmatite and ferro-magnetic minerals. Fines.
   - F: Rejected ferro-magnetic enriched low-alkali anorthosite.
6. G: Handymax bulk carrier 40,000-50,000 DWT
   H: Handysize bulk carrier 10,000-35,000 DWT, pneumatic cement ship

Appendix 5. List of archaeological features registered in the area during survey in 2020

Item #	Type	Position N	Position W	Description (in Danish)
1	A cairn	**63,21890**	**-50,21457**	Enkelt hovedstore sten oven på en kampesten
2	A cairn	**63,21835**	**-50,21577**	Varde opsat m. 3 hovedstore sten og 2 fladesten
3	Meat storage (open)	**63,21823**	**-50,21624**	Lille åben kød depot ved opgangstedet
4	Meat storage (open)	**63,21881**	**-50,21670**	Stor åben kød depot – 290cm x 270cm
5	Meat storage (open)	**63,21876**	**-50,21671**	Stor åben kød depot – 280cm x 300cm
6	A cairn	**63,23310**	**-50,19407**	Enkelt hovedstore varde placeret ved en recent teltring (no.7)
7	Tent ring (recent)	**63,24500**	**-50,14375**	Recent teltring – 200cm x 210cm – diverse glasskår lå spredt i nærområdet
8	Hunters bed under boulder - with marking cairn	**63,24490**	**-50,14389**	Enkelt hovedstore sten på en kampesten
9	A cairn	**63,24483**	**-50,14403**	Enkelt hovedstore sten på en kampesten
10	A cairn	**63,24482**	**-50,14358**	Enkelt hovedstore sten på en kampesten
11	A cairn	**63,24414**	**-50,15123**	Enkelt stor sten på en kampesten
12	A cairn	**63,23310**	**-50,19407**	Enkelt hovedstore sten placeret ved elv overgangen
13	A cairn	**63,23878**	**-50,11137**	Hovedstore sten på en kampesten. Varden var den eneste fund i pit området.
14	Shooting hideout	**63,26081**	**-50,08228**	3 hovedstore sten på række oven på en kampesten, skydeskjul (Tvivlsom)
15	Hunters bed in “cave”	**63,24607**	**-50,09968**	Jagtseng plads til 2-3pers. Fjeldudhæng (grotte) højde: 190cm bredde: 200cm længde: 700cm Grotten har en stenmur mod syd. Rester af brænde af kvist findes ved den vestlige ende.
16	Fireplace (recent)	**63,24351**	**-50,10343**	Nyere ildsted ved store sten, i læ mod nordvinden
17	Hunters bed at boulder	**63,24445**	**-50,13865**	
18	A cairn	**63,22623**	**-50,19638**	Single rock on boulder.

Appendix 6. List of bird species that are expected to occur in the project area and their conservation status

Species	Greenlandic red list	Global red list
Red-throated diver	LC	LC
Great northern diver	NT	LC
Canada goose	LC	LC
Mallard	LC	LC
Long-tailed duck	LC	VU
Harlequin duck	LC	LC
Red-breasted merganser	LC	LC
White-tailed eagle	VU	LC
Gyr falcon	NT	LC
Peregrine falcon	LC	LC
Rock ptarmigan	LC	LC
Great ringed plover	LC	LC
Purple sandpiper	LC	LC
Red-necked phalarope	LC	LC
Raven	LC	LC
Northern wheatear	LC	LC
Common redpoll	LC	LC
Lapland longspur	LC	LC
Snow bunting	LC	LC
Marine birds		
Common eider	LC	NT
Arctic skua	LC	LC
Lesser black-backed gull	LC	LC
Iceland gull	LC	LC
Glaucous gull	LC	LC
Great black-backed gull	LC	LC
Arctic tern	NT	LC
Thick-billed murre	VU	LC
Razorbill	LC	NT
Black guillemot	LC	LC

*LC: Least concern; NT: Near threatened; VU: Vulnerable