1 Non-technical Summary

This is the non-technical summary of the Social Impact Assessment (SIA) for the Ilmenite Project near Moriusaq, North-West Greenland.

The aim of the Ilmenite Project is to extract ilmenite from onshore beaches of 'black sand' deposit on the South coast of Steensby Land peninsula in Northern Greenland. Ilmenite is a titanium-iron oxide mineral ($FeTiO_3$) that is mined and processed for its titanium. Titanium dioxide (TiO_2) is an important commodity used as pigments in paint, plastics, enamels, paper and cosmetics and in the making of different metal alloys.

The project is owned by Dundas Titanium A/S, a company registered in Greenland. Dundas Titanium A/S owns 100 % of the current exploration license (number 2015/08) and has been responsible for all the exploration work at the site carried out over the last three years. Dundas Titanium is 100 % owned by Bluejay Mining plc.

A separate Environmental Impact Assessment (EIA) has been developed for the project.

The non-technical summary describes the project, the SIA methodology and process and the result of the impact analysis.

1.1 Overview of social impacts for Greenland

The project will have four overall positive impacts on the Greenlandic society:

- It will **create job opportunities** for Greenlanders, with up to 270 employees during the construction phase and approximately 175 employees in the operation phase.
- It will give **training and skill upgrading opportunities to Greenlandic workers and students** and give opportunities to build experience in the mining sector.
- It will **create opportunities for Greenlandic companies** to provide goods and services to the project.
- It will **generate a public revenue** through the payment of royalties, corporate taxes and income taxes. The gross public revenue is expected to accumulate to at least DKK 592 million during a ten-year operation period.

The SIA process has, however, also identified some negative social impacts from the project. These include:

- The project will lead to **restricted access to the license area.** Parts of the area is currently being used for limited recreational activities and overnight stays during travel in the area.
- The project will impact the **level of pressure on public services** such as transport, telecommunication, police and health services.
- There are **risks of accidents** and risks of negative impacts on employees related to working on a mining project.

The negative social impacts from the project are relatively small, and can to a large extend be mitigated. The mining and processing of ilmenite are simple processes, and many positions at the project can therefore be given to people with no formal education.

The closest town to the project is Qaanaaq. Qaanaaq has one of the highest unemployment rates in Greenland and a relatively large share of the population has limited education. The project can potentially have a positive impact on employment opportunities and therefore as a result upgrade skills at a local level.

1.2 Overview of the project

The Ilmenite Project is a mining project, with an expected extraction of 440,000 tonnes of ilmenite annually.

Ilmenite is found in the 'black sand' deposit that covers the license area. The black sand is located at the surface, and there is therefore no underground mining involved in extracting the sand.

The license area covers an area which is approximately 30 km long and 2 km wide. The area is located in the Municipality of Avannaata, around 80 km South of Qaanaaq. The abandoned former settlement Moriusaq is located within the license area, as illustrated in Figure 1.1 and Figure 1.2. In the current mining scenario, the total area that is expected to be mined is 8.5 km^2. The area to be mined only includes onshore mining in the area north of Iterlak.

The mining and beneficiation process will consist of four overall processes:

1. **Mining:** The black sand will be mined by automated mining machines (so-called 'continuous surface miners') that 'harvest' the black sand through cuts by rotating cutter-heads. No drilling or blasting will be needed.
2. **Wet gravity processing at the wet plant:** At the wet plant the sand will be separated into two fractions through a two-step gravity separation, one fraction with 'heavy minerals' (app. 10 % of the mined volume) and one fraction with 'light minerals' (app. 90 % of the mined volume). The gravity separation is a simple washing process in which the black sand is basically washed in gravity separators. The water used for the washing will be normal seawater. No chemicals, crushing or liberation of the minerals are needed in the process. The 'light minerals' will be transported back to the earlier mine cuttings where it will be backfilled. The 'heavy mineral concentrate' (consisting of approximately 88 % ilmenite) will be transported to the dry plant.
3. **Dry magnetic processing at the dry plant:** The 'heavy mineral' fraction material from the wet plant will be dried and all moisture will be removed. When the material is completely dry, it will be sent through a magnetic seperation by different magnets in the dry plant. The heavy minerals will be refined into a clean 'premium ilmenite product', a 'standard ilmenite product' and a fraction that is rejected (consisting of magnetite, amphiboles and pyroxene).
4. **Shipping and storage:** The ilmenite products will be stored in a large storage facility at the mining site. During the ice-free shipping window (June-October) the material will be shipped by bulk-carriers to an international, all year round open water storage location or directly to customers.

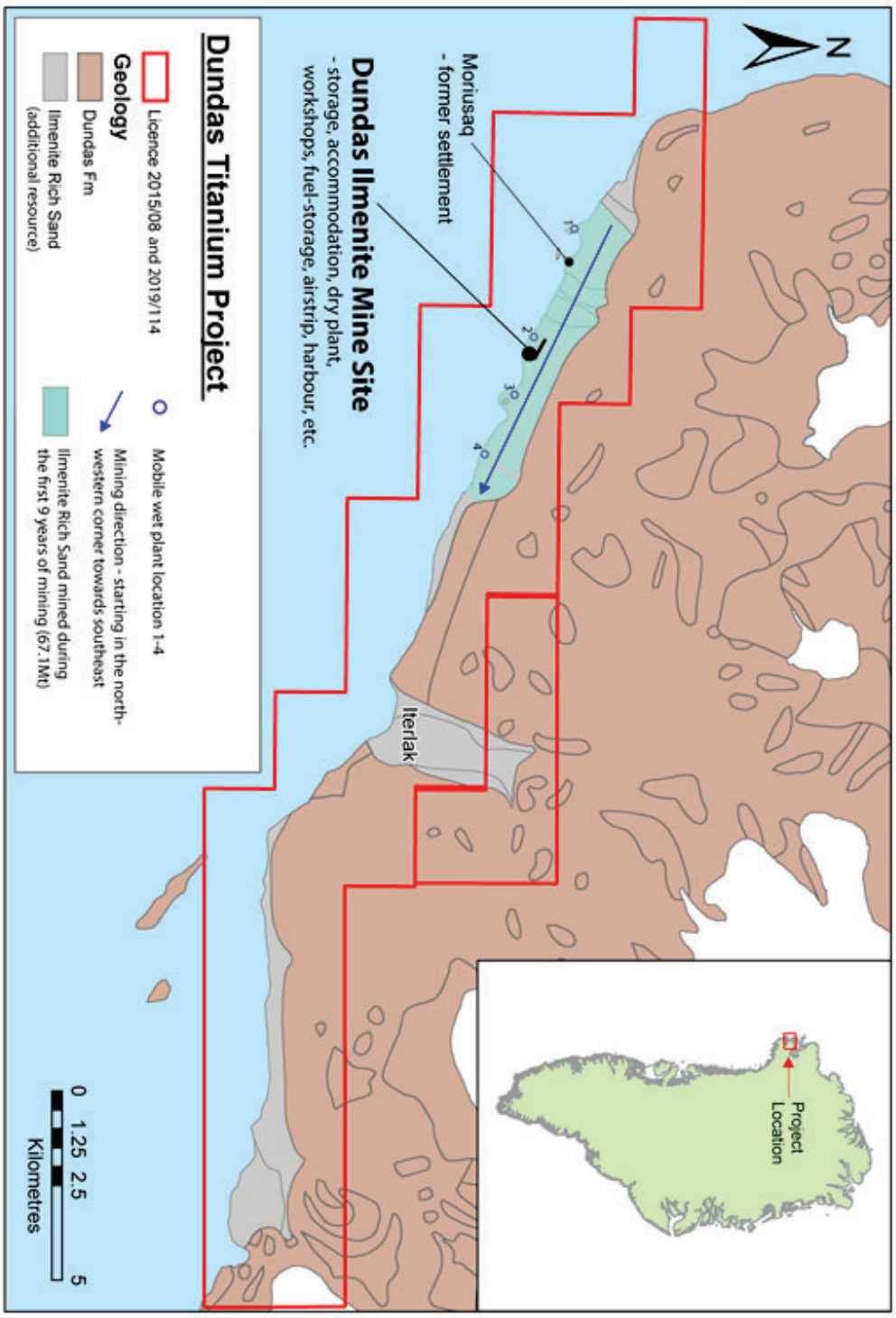

Figure 1.1: Extent of the exploration license hold by Dundas Titanium A/S. Only the onshore raised beaches from the north-western corner, west of Moriusaq (top-right corner of the onshore license area) to the Iterlak river delta are considered in the current mining scenario. The red outline shows the extent of the Bluejay exploration licenses.

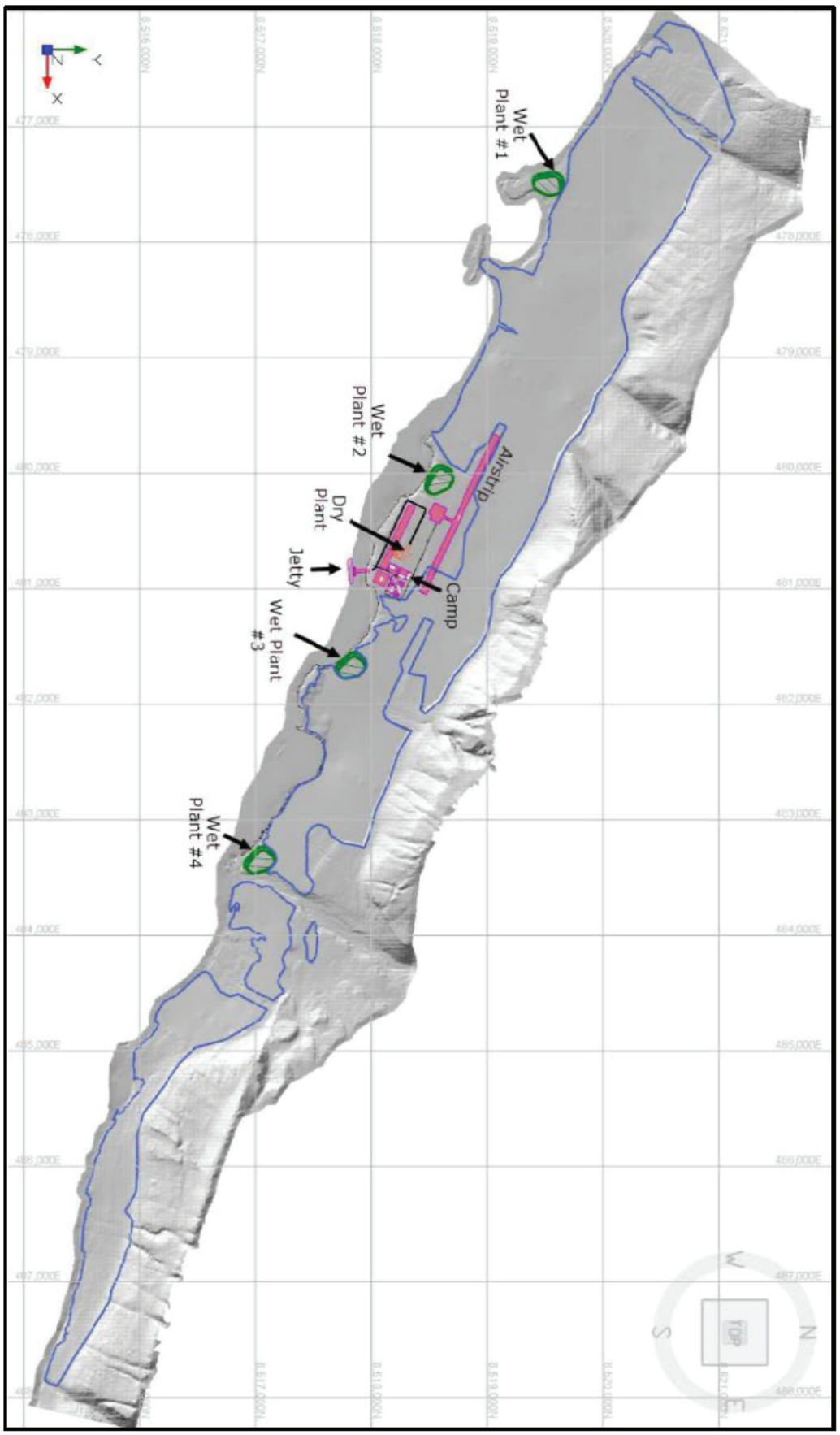

Figure 1.2: Map of planned infrastructure at Ilmenite Project. The blue line indicates areas that will be mined during the current planned mine-life. Mining will be initiated in the north-western (top right) corner of the area and will progress towards South. The green areas indicate the locations of the wet plant during the life of the mine. Purple areas outline other infrastructure at the mine-site (airstrip, camp/accommodation, dry plant, jetty/port/shipping facilities)

The wet plant will move three times during the mine life. The locations of the wet plants are based on the orebody and grade distribution and a target maximum haulage distance of 1 km. The wet plant moves are as follows:

Wet Plant Location #1: Year 1 to Year 4 Q1;Wet Plant Location #2: Year 4 Q1 to Year 6 Q4;Wet Plant Location #3: Year 6 Q4 to Year 8 Q3; Wet Plant Location #4: Year 8 Q3 onwards.

The project is expected to employ up to 270 employees (peak period) during construction and around 175 employees when in production. Approximately 120 people will be at the site at any time during production due to rotations with six weeks on-site and three weeks home.

On average it is expected that the share of unskilled workers will be approximately 50 % of the total work force during operation. Skilled workers will fill approximately 40 % of the positions, while academics will constitute the last 10 %.

The mining site is expected to be in operation all year around. It is planned that employees will work in rotations of six weeks on-site, and three weeks off site. Employees will be transported directly to the site by chartered flights from a central hub in Greenland.

Besides the continuous surface miners, the wet plant, the dry plant and the concentrate storage, the following infrastructure will be built on-site: A small port, a ship-loading facility, an airstrip, power and water supply, accommodation, office, medical and safety facilities and workshop facilities.

The black sand located under the abandoned settlement Moriusaq will be mined, which means that the buildings will be removed. The cemetery area will not be mined.

Because of safety aspects (e.g. heavy machinery operations), access to the mine area and mine site will be restricted and monitored. Dundas Titanium A/S is considering allowing people to travel through the area to stay in a guest house/room at the site, either in the accommodation camp, or in one or two renovated houses from Moriusaq.

Dundas Titanium A/S will establish a grievance mechanism, ensuring that the local population can always contact the company and that these inquiries are handled and responded to.

Key figures of the project are shown in Table 1.1 and Table 1.2 at the next page

Table 1.1: Key figures for the Ilmenite Project

Project element	Details	Description
Products	Ilmenite product	440,000 tonnes per annum
Mining rate		7.4 million tonnes per year
Plant feed rate		965 tons per hour (average over life of mine)
Mine method		Open pit
Construction phase		2 years
Operating phase		10 years
Decommissioning/closing		1 year
Plant operation calendar		12 months - 24/7 operation (average of 7906 hours per calendar year)
Supporting infrastructure	Diesel power plant	59 mega watts
Size of Project elements	Total footprint (at 10 yrs.)	8.5 km^2
Size of Project elements	Mine pits	8 km^2
Water use	Fresh water requirements	1,046 m^3/h sea water
Excess water	Discharge of excess water to the sea	913 m^3/h
Waste volume	Material returned to mine void	6.6 million tonnes per year
Product Transport	Handy-Max vessel 40,000 DWT	11 ships per year
Employee Transport	Airstrip	Airport at the mine site
Employees	Construction	Up to 270
Employees	Operation	175

Table 1.2: Key financial figures for the Ilmenite Project. Based Pre-Feasibility Study, June 2019

Element	Details	Description
CapEx	The estimated capital expenditure (CapEx) inclusive of mining, processing, storage of dried finished product and a near shore direct ship loading facility	245 US$M
OpEx	Based on total 440,000 tonnes ilmenite per annum and an estimated operating cost of 112.81$ per tonne	496 US$M in 10 years operation phase
Payback Period	Based on a 32.8% internal rate of return (IRR) on base case and 34% IRR on upside case, post tax	3 years

1.2.1 The Ilmenite Project – a possible Large-Scale Project

This aim of the Large Scale Project Act is according to Section 1 to promote investments in Greenland, and to prevent and restrict unintended negative impacts in terms of macroeconomics and the competitiveness of the business community, including disproportionate increases in general levels of wages and costs as a result of the possible construction activities in e.g. the mineral resource industry in Greenland. The Large Scale Project Act therefore only applies to the construction phase of mining projects, which fulfil the requirements listed below and as they are stipulated in Section 6 of the Large-Scale Project Act:

a. The project's capital costs exceed DKK 1 billion

b. One of the following two conditions:

- The project's need for labour for performance of construction activities exceeds the qualified, not otherwise employed and available workforce in Greenland,
  or
- The project's requirements for technical and financial capacity exceeds the capacity of Greenlandic enterprises in a technical or financial sense.

As it is shown in Table 1.2 the project's capital cost is estimated to be around 1,7 billion DKK (245 US$M) and is therefore above the threshold of 1 billion DKK stipulated in Section 6 (1), no. 1 of the Large-Scale Project Act. The Project therefore fulfils this criterion for being considered as a large scale project.

Secondly, as shown in the employment section of the SIA report (see Section 5.2), it is foreseen that Greenland will lack several skilled and qualified construction workers in the coming years due to general construction activities including the new airports in Nuuk, Ilulissat and Qaqortoq. The report demonstrates that the project's need for labour for performance of the project's construction activities exceeds the qualified, not otherwise employed and available workforce in Greenland. Hence, the Project is during its construction phase assessed to fulfil the requirements of Section 6(1), no. 2 of the Large Scale Project Act.

Thirdly, Section 5.4 of the SIA Report also demonstrates that the project's technical and financial capacity exceed the capacity of Greenlandic enterprises in a technical or financial sense.

To sum up the Project can therefore be considered a large-scale construction project pursuant to Section 6 of the Large-Scale Project Act.

1.3 SIA methodology and process

The purpose of a Social Impact Assessment (SIA) is to identify potential socio-economic impacts from a project, both positive and negative.

The Social Impact Assessment and related engagement process for the Ilmenite Project has been developed in accordance with the '*Guidelines on the process and preparation of the SIA report for mineral projects 2016*' developed by the Government of Greenland.

The SIA has been developed by NIRAS Greenland A/S. NIRAS Greenland is an independent consultant to Dundas Titanium A/S.

The SIA process consists of five overall steps:

1. **Scoping phase and development of Terms of Reference:** The aim of the scoping phase and the terms of reference is to identify the social areas that can be affected by the project. The scoping phase resulted in the document 'Terms of Reference' (ToR), which was published for public consultation. Following the public consultation, the ToR was updated and approved by the authorities. This SIA is built on the ToR.
2. **Development of socio-economic baseline:** The socio-economic baseline describes key figures of the community that can be impacted by the project.

The baseline is used in the analysis of potential impacts, and can also be used for monitoring of the project.

3. **Stakeholder consultation:** A key part of the SIA process is to inform and engage stakeholders in the project.
4. **Analysis of social impacts and identification of mitigation measures:** Based on the project description, the socio-economic baseline and the stakeholder consultation, the severity and likelihood of the impacts are analysed. Furthermore, mitigation measures that can minimise negative impacts and maximise positive impacts are identified and described. The results of the assessment are shown in this SIA report.
5. **Development of benefit and impact plan:** The benefit and impact plan provides input to the IBA negotiation to take place between the government, the municipality and the mining company.

For each potential impact it is assessed which geographic area the project could impact:

- Local impact: Impacts that might be seen in Qaanaaq, Siorapaluk, Qeqartat and Savissivik
- Regional impact: Impacts that might be seen in the Municipality of Avannaata
- National impact: Impacts that might be seen in Greenland

For the above mentioned local towns and villages it is assessed whether they will be particularly affected by the activities of the Ilmenite Project.

Furthermore, it has been assessed whether the identified impacts occur in the project's construction phase, during operation or in the closure phase.

All potential impacts are assessed to be either negative or positive, and the severity risk/change of the impact is qualified based on the likelihood of the impact to happen (improbable, possible or probable) and the severity of the impact if it occurs (insignificant, minor, moderate or significant), as illustrated in Table 1.3.

Table 1.3: Impact assessment codes

		Severity of impact							
		Negative				**Positive**			
Likenlihood of impact		**Significant** *High impact with large influence*	**Moderate** *Effects are felt and influence som stakeholders*	**Minor** *Effects are observed*	**Insignifi-cant** *Little to no effect if impact occurs*	**Insignifi-cant** *Little to no effect if impact occurs*	**Minor** *Effects are observed*	**Moderate** *Effects are felt and influence som stakeholders*	**Significant** *High impact with large influence*
	Improbable *Impact is unlikely to occur*								
	Possible *Impact will likely occur*	High impact	Medium impact	Low impact	Insignificant impact	Insignificant impact	Low impact	Medium impact	High impact
	Probable *Impact is expected to occur*								

1.4 Assessment of social impacts

As part of the SIA process, a list of issues have been analysed with focus on how the project can potentially impact these issues.

The issues are divided in five categories:

- Employment (section 1.4.1)
- Education and training (section 1.4.2)
- Greenlandic enterprises (section 1.4.3)
- Public revenue (section 1.4.4)
- Other socio-economic and sustainability matters (section 1.4.5)

An overview of the results of the impact assessment is shown in Table 1.4. A brief description of each impact is given in the following sections. For the potential negative impacts, mitigation measures that can minimise these impacts have been identified. Similarly, for positive impacts, measures have been identified that can maximise these impacts. Proposed mitigation measures are listed in section 1.5.

Table 1.4: Overview of impact assessment

Issue	Impact in construction phase	Impact in operation phase	Impact in closure phase
Employment			
Potential impact 1: Direct engagement of Greenlandic workers	**Positive – medium impact** Likelihood: Possible Severity: Moderate	**Positive – medium impact** Likelihood: Possible Severity: Moderate	**Negative – medium impact** Likelihood: Possible Severity: Moderate
Potential impact 2: Creation of indirect and induced job opportunities	**Positive – medium impact** Likelihood: Possible Severity: Moderate	**Positive – medium impact** Likelihood: Possible Severity: Moderate	**Negative – medium impact** Likelihood: Possible Severity: Moderate
Potential impact 3: Cumulative impacts related to job market	**Negative – low impact** Likelihood: Possible Severity: Minor	**Negative – low impact** Likelihood: Possible Severity: Minor	**Not relevant**
Potential impact 4: Occupational health and safety on-site	**Negative – medium impact** Likelihood: Unlikely Severity: Significant	**Negative – medium impact** Likelihood: Unlikely Severity: Significant	**Negative – medium impact** Likelihood: Unlikely Severity: Significant
Potential impact 5: Labour conditions and health of employees	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor
Education and training			
Potential impact 6: Development of competencies	**Positive – low impact** Likelihood: Possible Severity: Minor	**Positive – high impact** Likelihood: Likely Severity: Moderate	**Positive – insignificant impact** Likelihood: Unlikely Severity: Minor

Greenlandic enterprises			
Potential impact 7: Business opportunities for Greenlandic businesses	**Positive - medium impact** Likelihood: Possible Severity: Moderate	**Positive - medium impact** Likelihood: possible Severity: Moderate	**Negative – medium impact** Likelihood: Possible Severity: Moderate
Public revenue			
Potential impact 8: Royalties and taxes	**Positive - medium impact** Likelihood: Likely Severity: Minor	**Positive – high impact** Likelihood: Likely Severity: Moderate	**Positive – low impact** Likelihood: Likely Severity: Insignificant
Other socio economic and sustainability matters			
Potential impact 9: Pressure on public sector, infrastructure and services	**Negative– low impact** Likelihood: Possible Severity: Minor	**Negative – low impact** Likelihood: Possible Severity: Minor	**Not relevant**
Potential impact 10: Public health	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Not relevant**
Potential impact 11: Cumulative impacts (not related to job market)	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Not relevant**
Potential impact 12: Recreational / local use of project area and cultural heritage	**Negative – medium impact** Likelihood: Likely Severity: Minor	**Negative – medium impact** Likelihood: Likely Severity: Minor	**Not relevant**
Potential impact 13: Resettlement/livelihood compensation	**Not relevant**	**Not relevant**	**Not relevant**
Potential impact 14: Vulnerable groups	**Negative– insignificant impact** Likelihood: Unlikely Severity: Minor	**Negative – insignificant impact** Likelihood: Unlikely Severity: Minor	**Not relevant**

1.4.1 Employment

The project will create a number of new employment opportunities in the Municipality of Avannaata. The positions can potentially be filled by local employees, or international employees, if the Greenlandic workforce is unavailable.

During the construction phase up to 270 persons will be working at the project. Some of these will be working for contractors hired to construct the plant and accommodation on-site, and will therefore not be hired directly by Dundas Titanium A/S.

During the operation phase there will be approximately 175 people employed on the project, where 2/3 will be on-site at any time. Approximately 50 % of the positions can be filled by people with no formal education.

Potential impact 1: Direct engagement of Greenlandic workers
The impact of the direct employment during the construction phase and operation phase is assessed to be positive. The project will create up to 270 positions during the two-year construction phase, and approximately 175 positions in the operation phase. The more Greenlandic workers that are employed, the larger the positive impact.

Employees will be transported to the mining site from a central hub in Greenland, and the effects on employment will therefore not only be seen in Qaanaaq and the settlements. However, it will be beneficial to both the local society and the company if there is a specific focus on attracting workers from the local area.

When the mine closes, it is a potential negative impact if employees have no alternative place of employment. This risk must be assessed by the company and authorities in cooperation, once it is known when the project will close down. However, as many employees will have gained experience and skills in the mining sector, a sector that is expected to grow during the coming decades, it is expected that most employees will be able to find new employment when the mine eventually closes down.

Potential impact 2: Creation of indirect and induced job opportunities
The mining project can generate both indirect and induced jobs in Greenland:

- **Indirect jobs**: Jobs that are created as suppliers to the mine hire workers to meet the increased demand of their products and services
- **Induced jobs**: Jobs that occur due to an increased economic activity, as the increased income of workers directly and indirectly employed by Dundas Titanium A/S are used to purchase services and products in other sectors

During both the construction and operation phase it is expected that Greenlandic contractors and other companies can provide services to the project. During construction, contractors might for instance be hired for construction of infrastructure on-site and for assembly of the camp. Here, Greenlandic companies can compete with international contractors.

During operation small or medium scale companies, as well as Greenlandic transportation companies, may provide their services to the project. A very conservative estimate is that the project will create 35 indirect and induced jobs in the operation phase.

Potential impact 3: Cumulative impacts related to the job market
As the project will be among the largest employers in Greenland, it will compete with other mining projects and other sectors to attract Greenlandic workers. The development in other sectors can therefore impact the number of Greenlandic employees who can be attracted to work on the project.

In Greenland there is a lack of skilled workers and workers with experience from the mining sector, and the project will therefore compete with other projects to attract employees.

The project will compete with both other mining projects and other sectors for local employees, mainly in two areas of expertise:

- Skilled mineworkers who can be employed at other mining or exploration projects
- Unskilled and skilled workers who can work at the mine, but could also fill jobs in other sectors.

When demand for employees exceed supply, this will benefit employees, who will have more employment opportunities and as a result they can be offered higher salaries or better work conditions.

Shortage of labor may force owners of construction and mining projects to delay their projects if there is no workforce available. This puts pressure on the labor market, in a situation where the number of construction projects in Greenland is increasing.

The unemployment in the Thule area is however higher than in most of Greenland, and the project will create job possibilities in an area with only few job opportunities.

Potential impact 4: Occupational health and safety on site
There is a potential risk of accidents during the construction, operation and closing of the mine, mainly related to the operation of heavy machinery. The company will continuously work to minimise risks of accidents. However, in the unlikely event that a serious accident occurs this will have significant negative impact.

The long distance to large scale health facilities also make up a risk, in case of large accidents involving numerous employees.

The project therefore has a negative impact on the risk of occupational health and safety compared to a no-production alternative. The impact is negative in all phases of the mine life.

Potential impact 5: Labour conditions and health of employees
There is a risk of negative impacts on employees general health. Based on the isolation and location of the project there is a risk of contagious diseases spreading among employees. Furthermore, there is a risk of mental illnesses related to the lack of daylight and harsh weather conditions. However, if preventive health screenings prior to employment are established, combined with health and life style campaigns amongst workers, the risk is assessed to be insignificant.

The project is located in a very remote part of Greenland, and employees will not be able to leave the site during the six weeks on-site.

There is a risk of cultural differences between employees, as they are expected to come from different parts of Greenland and the world. This can lead to social conflicts. It is therefore important that there is a focus on intercultural understanding among the management on-site. Similarly, a zero tolerance to discrimination must be established.

It has been raised as a concern that the sand at the site could potentially be polluted, due to its proximity to the Thule Air Base and the crash site from the B-52 flight crash in 1968 (for more information see appendix 3: Social Baseline). This concern has been assessed in a number of studies, and there has not been

identified any risks in the Moriusaq area. A new study was carried out in relation to the Ilmenite project by the Technical University of Denmark in 2019[1] and the study finds no indication that there is a health risk related to working on the project.

1.4.2 Education and training

Greenlandic employees at the project will obtain new competencies and skills that can be used in other positions when the project is closed, or as a stepping stone to higher positions at the ilmenite mine or in other organisations or companies. The competencies will be obtained through both formal training and by gaining practical experience with mining and processing.

Potential impact 6: Development of competencies
To obtain the largest possible Greenlandic workforce, expected mismatches between the competencies of potential workers and the required skills at the project must be minimized. This will happen through training on-site and/or training of employees at for instance the Greenland School of Minerals & Petroleum or relevant courses in or outside Greenland.

The impact of training and education on employees is positive. The extent of the impact is dependent on the number of employees completing internal and external training programmes in relation to their work on the project, and the number of internships offered by the company.

1.4.3 Greenlandic enterprises

Potential impact 7: Business Opportunities for Greenlandic businesses
The project will contract companies to do work that they cannot do internally at a competitive price, or that they do not have the skills to do. A company can for instance choose to outsource shipping, transport of employees, engineering, construction, supply of food, catering, cleaning, provision of fuel, electricity work and many other goods and services.

At this stage, it is not decided which goods and services that will be part of the project organisation, and which goods and services that will be contracted to external suppliers.

Procurement and contract packages for infrastructure components, equipment, goods and services will be issued to Greenlandic bidders. Pre-qualified international bidders may be used in cases where Greenlandic enterprises are not technically or commercially competitive or during construction if a large-scale project licence is applied for and obtained.[2]

Greenlandic companies can potentially provide services within air transport, shipping, construction work, supply of arctic diesel, normal site and maintenance work, supply of traditional food and goods, catering, cleaning, administrative and other support services etc.

[1] Roos, Per (2019). Assessment of risk from plutonium isotopes in connection with the proposed onshore mining activities at Moriusaq, Thule, Northwest Greenland.
[2] In accordance with Government of Greenland (2009): Section 18 (2) of the Mineral Resources Act.

It is assessed that Greenlandic companies can support the project, and the impact is therefore positive. The extent is dependent on how many services the mining company outsources.

1.4.4 Public revenue

If the project materialises, it is expected to create a positive public gross revenue. Public revenue will be achieved through income taxes, corporate taxes and royalties.

Potential impact 8: Royalties and taxes
The impact of royalties and taxes on public revenue is expected to be positive.

During the operation phase, the project will generate income taxes and royalties. If the project is generating profits for Dundas Titanium A/S it will furthermore generate corporate taxes. In the pre-feasibility study (PFS) the tax and royalty payments have been calculated in different mining scenarios. With ten years of production, and the costs and income as assumed in the PFS, the total corporate tax and royalty payment is calculated to be a sum of DKK 346.6 million. If the lifetime of the project is extended, this figure will increase.

Income tax generation is dependent on the salaries of employees, and the nationality of employees. Based on the expected positions and salaries, the annual income tax generation from employees directly employed by the project will be between DKK 24.6 and 26.6 million.

During the phases of construction and closure employees will also pay income taxes.

1.4.5 Other socio-economic and sustainability matters

In addition to creating new job opportunities and generating public revenue, the project can also have an impact on other social issues in the local society.

Potential impact 9: Pressure on public sector, infrastructure and services
The project is located in a remote part of Greenland, where infrastructure and public services are limited. The project will impact the public services: Police will be responsible if something happens on site, telecommunication services in the area will have to be improved to service the project, and the Greenlandic health sector can be put under extra pressure. The overall assessment is that the project will lead to increased pressure on public services.

The project is not expected to have negative impacts at a local level, and it can potentially lead to positive indirect impacts to the population in Qaanaaq and the settlements, if for instance telecommunication services are improved.

Several stakeholders have pointed out that it would have a direct positive impact on Qaanaaq if the project used the airport in Qaanaaq as an entry point, instead of building its own airstrip. This is however not possible for the project. However, Dundas Titanium A/S is evaluating the possibilities of making a stop in Qaanaaq when en route for the mining site to pick-up/drop local employees

Potential impact 10: Public health
There are no people living near the project, and no communities will be impacted by potential health effects from the project, such as dust, noise or pollution.

With many employees, potentially from different countries and cultures, living full time at the mine site for several weeks, the largest risk for impacts of the public health derives from infections received at the mine site and brought back to the home communities.

Potential impact 11: Cumulative impacts (not related to job market)
Climate change is affecting the traditional livelihood in the Thule area, where weather and ice conditions are changing. This means that the timing of migrating animals are changing. Consequently, the best areas to go hunting are slowly changing. For instance, walrus hunting near Siorapaluk is no longer as good as it used to be. The Moriusaq area has only been used very little for hunting and fishing during the past years, but in a no-project scenario, Moriusaq could potentially change status, so it would be used for fishing or hunting again.

The project will lead to increased maritime traffic in the area. However, the change is relatively small. The local chairman of KNAPK (the Association of Fishers and Hunters in Greenland) does not expect that the project will impact the animals in the area, as these are already used to the noise from the Thule Air Base.

It must be noted that environmental impacts are not assessed in the SIA.

Due to the limited size of the project, the project is not assessed to have any major impact on the possibilities for living a traditional life for the population in Qaanaaq or the settlements, with regard to fishing and hunting.

Potential impact 12: Recreational/local use of project area and cultural heritage
The project area is located between Qaanaaq (80 km north) and Savissivik (120 km south). There is only very limited activity in the area.

When the project materialises, and the closed and abandoned settlement Moriusaq is removed, the mining company will provide opportunities to stay overnight at the project's facilities or in renovated moved houses from Moriusaq, or in new houses, and it will be possible to visit the Moriusaq cemetery. There will, however, be limited access to the parts of the license area where the company is working, and people who wish to dock within the license area will have to contact the mining company.

The Greenland National museum has identified nine sites falling under the provisions of the Heritage Act at the license area of the Ilmenite Project. These sites will either not be mined or they will be subject to a complete archaeological investigation by the museum.

Potential impact 13: Resettlement/livelihood compensation
No people live in the license area, and no hunters or fishermen make their livelihood - or significant parts of their livelihood - from hunting or fishing in the project area.

Consequently, nobody will be resettled due to the project and nobody will receive livelihood compensation.

Potential impact 14: Vulnerable groups
Vulnerability is often linked to factors such as poor health, abuse, lack of education and unemployment.

As the project is not located in an inhabited area, it will not directly influence a local population. Due to this, the project will not directly impact any vulnerable groups.

Indirect negative impacts can occur with regard to children in vulnerable families, if the most functional adult in the household is employed on the project, and is therefore not present in the household during the time she/he is working on the project.

Similarly, it has been indicated that the project can have indirect negative impacts on vulnerable people in small, local communities, if the project succeeds in hiring several employees from the relatively small communities.

1.5 Overview of proposed measures (mitigation or enhancement)

Mitigation measures have been identified throughout the SIA process. Mitigation measures are measures that can enhance positive impacts of the project or measures that can minimise negative impacts.

Mitigation measures can be initiated by the company or the authorities.

Table 1.5: Overview of proposed mitigation measures

Issue	Proposed mitigation measures
Employment	
Potential impact 1: Direct engagement of Greenlandic workers	• Focus should be on creating an attractive work place for recruitment and retention of local workforce. This includes that Dundas Titanium A/S must address cultural, gender, competences and geographical issues and incorporate findings into planning of the project (rotation scheme, transport arrangements and working conditions at camp). • The project should put emphasis on creating and maintaining Greenlandic culture at the site, including managers who speak Greenlandic and provision of local food at the site. • There should be adequate access to internet and phone connections for employees to be able to keep in touch with their families. • It is suggested that local workers can be offered shorter term positions. For instance, the local unemployment is higher in the autumn, when there are no fishing and hunting activities, and thus this time of year would be a good opportunity for a short-term position. • To target the search for local applicants, it is necessary to ensure strong cooperation between public jobcentres (Majoriaq), educational institutions, job consultants in the towns and settlements and the mining company, to target the search for applicants. • Detailed job description and requirements for all categories of job during operation phase should be made publicly available to community, municipality, unions and technical schools. Job descriptions and qualification requirements are to be developed and distributed to all relevant stakeholders. • In order to progressively replace foreign labourers with local labourers, it is necessary to do an active on-site training of local employees, so that they can advance to higher level positions. • Stakeholders are advising that the company starts to work on engaging Greenlandic employees as early as possible, preferably during the exploration and construction phases. • It is suggested that the mining company makes visual advertisements (for instance short videos) describing what it is like to work at the mine. Potential employees can then watch the video on the company homepage, in order to get an insight into the daily tasks of, for instance, a shift operator. This will give a much better impression of the work compared to a written job advertisement.
Potential impact 2: Creation of indirect and induced job opportunities	• The creation of indirect jobs in Greenland is dependent on how much of the supplies to the mine that are supplied locally. A focus on hiring Greenlandic contractors and buying products produced in Greenland (when possible) will lead to a relatively higher indirect job creation. • When possible, procurement and contract packages for goods and services should be prepared in a way that makes it possible for Greenlandic companies to bid on the contract, to see if they can provide a competitive bid. • When possible and competitive, activities related to transportation of goods and staff should be outsourced to local companies.

	• Close dialogue to local transportation providers should be established to discuss local opportunities and challenges (Air Greenland and Royal Arctic Line). • Close dialogue with Tele-POST to clarify and establish the necessary communication services for the project. • When outsourcing services (potentially carpentry, engineering, electricity work, IT services, cleaning, catering, laundry and similar), Greenlandic companies should be invited to bid on the contract. • When outsourcing larger service contracts, it can be set as a requirement that some goods/services are purchased in Greenland. • Local hunters could provide local meat to the camp. • A forum can be established with the local business council, regional and/or national authorities and GE (Greenland Business Association) to discuss potential tender processes, with the purpose of ensuring that also Greenlandic companies are targeted.
Potential impact 3: Cumulative impacts related to job market	• There should be a focus on employing people who are currently outside the labour market. This should happen in a cooperation between authorities, educational institutions and the company. • There should be a focus on providing targeted training to potential unskilled employees, so they can fill the open positions and obtain documented qualifications for work on other future mining projects.
Potential impact 4: Occupational health and safety on site	• Occupational Health Risk Assessments must be carried out and updated continuously. The assessment must be used to develop, implement and monitor a health and safety management plan that all staff at the site must adhere to. • Training programmes for all staff on H&S and emergency response at the mine site, training programmes must be carried out in Greenlandic, English and potentially other languages for people not fluent in one of the two languages. • Establishment of a health and safety committee with joint participation of management and workers, where workers help to monitor and advise on H&S programs at the mine site. • Pre-notification of operations and traffic of vessels to relevant authorities. • Contractual requirements on H&S to contractors regarding safety measures, response time, etc., in order to minimise risk of accidents, appropriate and timely response in case of accidents, emergency evacuation etc. • Procedures for on-site handling of accidents, and clear procedures for emergency evacuations must be agreed with relevant authorities.
Potential impact 5: Labour conditions and health of employees	• An organised health screening process prior to employment. The health screening can also screen for contagious diseases that could spread to other employees at the mine. • Dust and noise control on machinery, e.g. water sprays and noise inhibitors. • Provision of personal dust protective equipment and noise protective equipment (e.g. dust masks, ear defenders, helmet). • Monitoring of potential plutonium pollution or pollution from the Thule Air Base. • Introductory sessions for all workers should include a section on intercultural understanding. • International workers should be given an overview on Greenlandic culture as part of their introduction programme.

	• It should be ensured that the camp accommodates the cultural needs of the different nationalities living at the camp. • Established anti-bullying and anti-harassment policies in place, and procedures if employees are bullied or harassed.
Potential impact 6: Development of competencies	• A Training Needs Assessment can be undertaken in cooperation with local authorities to ensure that the training opportunities provided benefit both Dundas Titanium A/S and the local business life, also for service-related and managerial positions. • Pre-employment and on-the-job training programmes for the operation phase must be developed as early as possible, and preferably during the construction phase. • Pre-employment and on-the-job training programmes should be developed in cooperation with local authorities, educational institutions and labour market organisations. • A continuous dialogue with educational institutions (especially the mining school) on how internships and training programs can be carried out in cooperation with the institutions must be initiated. It is suggested that a quarterly meeting between the mining school and the project is planned throughout the project's construction phase, to ensure that the school is aware of the future demand for skills. • There must be a focus on continuously upgrading of employees at all levels, in order to retain and develop employees. • The company must offer apprenticeships within different fields of work, e.g. processing, management etc.
Education and training	
Potential impact 6: Development of competencies	• A Training Needs Assessment can be undertaken in cooperation with local authorities to ensure that the training opportunities provided benefit both Dundas Titanium A/S and the local business life, also for service-related and managerial positions. • Pre-employment and on-the-job training programmes for the operation phase must be developed as early as possible, and preferably during the construction phase. • Pre-employment and on-the-job training programmes should be developed in cooperation with local authorities, educational institutions and labour market organisations • A continuous dialogue with educational institutions (especially the mining school) on how internships and training programs can be carried out in cooperation with the institutions must be initiated. It is suggested that a quarterly meeting between the mining school and the project is planned throughout the project's construction phase, to ensure that the school is aware of the future demand for skills. • There must be a focus on continuously upgrading of employees at all levels, in order to retain and develop employees. • The company must offer apprenticeships within different fields of work, e.g. processing, management etc.
Greenlandic enterprises	
Potential impact 7: Business opportunities for Greenlandic businesses	• When possible, procurement and contract packages for goods and services should be prepared and issued to the pre-qualified and approved bidders in Greenland as well as overseas. • Activities related to the transportation of goods and staff can be outsourced. Where possible and competitive, local businesses can provide these services (Air Greenland and Royal Arctic Line).

	• Servicing of the camp will be tendered. Such services include catering services, cleaning, laundry and similar tasks. There will be a number of local services provided for the mine such as carpenters, engineers, electricians and IT services. • Close dialogue with local transportation providers will be established to discuss local opportunities and challenges (Air Greenland, Royal Arctic Line). • Close dialogue with local fuel providers (as Polaroil) will be established to discuss local opportunities and challenges. Special attention will be given to the type of fuel and opportunities of transport of fuel to the location. • Close dialogue with KNAPK in order to organise provision of local food to the camp. • Establishment of a forum with business council. This forum will be used before and during the tender process to provide information and clarification of the tenders.
Public revenue	
Potential impact 8: Royalties and taxes	No mitigation measures are listed for this impact.
Other socio economic and sustainability matters	
Potential impact 9: Pressure on public sector, infrastructure and services	• Dialogue between Dundas Titanium A/S and the relevant authorities is necessary to clarify the procedure for establishing an airstrip on site and the routes that can be used to access the airstrip. • A Health and Safety Management Plan must be developed in close cooperation with the authorities, including a procedure for use of external public health care services. • Establish contact with local health service and authorities and prepare contingency plans in cooperation. • Develop a plan and an approach in collaboration with the Police covering aspects of customs and the role of the Police on site.
Potential impact 10: Public health	No mitigation measures are listed for this impact.
Potential impact 11: Cumulative impacts (not related to job market)	No mitigation measures are listed for this impact.
Potential impact 12: Recreational/local use of project area and cultural heritage	• People travelling in the area should be able to dock their boats, and have the opportunity to stay in the area for rest. • If possible, it would be a benefit for locals if they could buy fuel and basic goods at the site. • It should be easy to find a phone number for the person at the camp, whom locals should contact when they are in the area.
Potential impact 13: Resettlement/livelihood compensation	No mitigation measures are listed for this impact.

Potential impact 14: Vulnerable groups	• The project, in corporation with the authorities, should have focus on identifying and assisting people with little or no formal skills to realise the opportunities for working at the project, and assist in the application and potential training. • Job adds should be made easily accessible for people with little education and who are not currently working. For instance, it is suggested that job ads are printed and made available at Majoriaq in Qaanaaq and service houses in the settlements. It is also suggested that the mining company make a small video in plain language explaining how it is to work at the mine. In this way people with limited knowledge of the mining sector can get an understanding of what the job includes. • The project should not offer salaries that are much higher than what skilled workers can earn in the local communities.