EXECUTIVE SUMMARY

DIATREME RESOURCES
GALALAR SILICA SAND PROJECT
INITIAL ADVICE STATEMENT

PROJECT NUMBER 559C
JUNE 2020

PREPARED BY: ENVIRONMENT NORTH
BIOTROPICA AUSTRALIA
& BMT



1 INTRODUCTION

The Galalar Silica Sand Project (GSSP) (formerly called the Cape Bedford Project) will be an open cut mining operation designed to extract and process silica sand into a product suitable for manufacturing high quality glass products including solar panels. It will involve dry-mining silica sand above the water table, on-site processing involving washing and gravity separation, stockpiling processed product, and export via ship to overseas markets.

Diatreme Resources Limited (Diatreme) as Proponent has entered into a number of arrangements with the Hopevale Congress Aboriginal Corporation ('Hopevale Congress' or 'Congress') Registered Native Title Body Corporate (RNTBC). Hopevale Congress is the representative body of all native title holders of the land on which the mine will be built and the owner of the Aboriginal freehold land.

The proposed mine is located near Cape Bedford some 20 km east of Hope Vale. The proponent has current awarded Exploration Permit [for] Minerals (EPM), tenement areas EPM 17795 and EPM 27265, and has current lodged applications noted as EPMA 27430 and EPMA 27212 covering an extensive dune field near Cape Bedford east of Hope Vale known to contain silica sand and mineral sands.

The current resource is approximately 47.5 million tonnes (Mt) and at the proposed rate of extraction (average of 0.95 Mt per annum will last in excess of 20 years. However, a conservative initial mine life of 15 years has been assumed. A heavy mineral by-product will be produced by the processing plant and stockpiled until there is a sufficient quantity for a heavy mineral shipment. Most of the products will be eventually exported.

Associated infrastructure at the site will include a workshop and office, a stockpile site, a mobile processing plant, slurry holding and treatment ponds, roads etc. There will be no camp at the mine – workers are expected to commute from Hope Vale, Cooktown, or elsewhere in the local area.

As explained in **Section 5**, the project consists of a mine and associated infrastructure and a number of export options. The mine details and operations and coastal shipping are common to all export options.

It is proposed that all options will be assessed as part of an Environmental Impact Statement (EIS) process and the superior option will be selected and if possible, improved.

2 PROPONENT

2.1 GENERAL DETAILS

The Proponent is Diatreme Resources Limited ABN 33 061 267 061. Some details are:

<u>Contact person:</u>

- Mr Neil McIntyre
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  Diatreme Resources Limited

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  QLD 4151

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  COORPAROO
  QLD 4151

2.2 CORPORATE/JOINT-VENTURE ARRANGEMENTS

Hopevale Congress Aboriginal Corporation is the representative body of all native title holders encompassing an area of some 1100 sq km (Lot 35 SP232620) and includes all of EPM 17795. Native title was determined in 1997 and the former Deed of Grant in Trust was converted to Aboriginal Freehold land under the *Aboriginal Land Act 1991* (Qld) in December 2011.

Congress represents the interests of 13 clans. Its foremost priority is to:

> … maintain the rights of the Traditional Owners as the custodians of their own country and to improve access and work collaboratively with Traditional Owners so they can get back on country to build their capacity in land management, business development and achieve their clans' aspirations.

Of relevance to the GSSP, Congress:

- holds both native title and Aboriginal Freehold over all of EPM 17795
- has signed a Compensation and Conduct Agreement and Cultural Heritage Agreement with Diatreme
- will receive royalties from the GSSP
- Traditional owner groups through Hopevale Congress have a 12.5% project equity in the GSSP and hence will receive an income stream
- via a suitable Congress nominee – a 100% indigenous owned company – will be involved in contracting opportunities from construction to mining
- will assist with recruitment of local indigenous workers from the Hope Vale area.

3 APPROVALS PROCESS

3.1 OVERVIEW

Diatreme has recently commenced a process to obtain all necessary approvals for the GSSP via a Voluntary EIS under the *Environmental Protection Act 1994*, Chapter 3, part 1.

Resource activities such as mining silica sand may only be carried out by a person holding, or operating under, an environmental authority (EA) issued under the *Environmental Protection Act 1994* (Qld) (EP Act) and a resource tenement granted under the *Mineral Resources Act 1989* (Qld) (MR Act).

The EIS will inform a decision on the EA and the resource tenement, as well as a number of 'downstream' approvals which are also required to be obtained once the EIS is approved. These will be identified in the EIS.

3.2 ENVIRONMENTAL IMPACT STATEMENT

The purpose and scope of the EIS is to:

- assess the potential adverse and beneficial environmental, economic and social impacts of the project
- assess management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project
- consider feasible alternative ways to carry out the project
- provide information to the public about the project
- help the administering authority decide an EA application for which the EIS is required
- give information to other Commonwealth and state authorities to help them make informed decisions

- allow the Queensland Government to meet its obligations for a single environmental assessment process under a bilateral agreement with the Australian Government for matters regulated under the *Environment Protection and Biodiversity Conservation Act 1999* (in this case the bilateral is expected to be relevant as outlined in **Section 3.5**).

3.3 ENVIRONMENTAL AUTHORITY AND MINING LEASE

The EA application under the *Environmental Protection Act 1994* can only be made once a mining lease (ML) has been or will be issued. An application for a ML under the MR Act was submitted by Diatreme on 19 December 2019. It is proposed that the EIS and ML processes will proceed in parallel.

3.4 'DOWNSTREAM' APPROVALS

'Downstream' approvals will include a range of development permits and other authorities under Queensland State legislation, generally relating to activities associated with the project that occur off or outside the mining lease. It is planned that the EIS will provide all necessary supporting information so that these applications can be made immediately following a decision on the EIS.

3.5 USE OF THE EPBC ACT BILATERAL

The bilateral agreement between the Commonwealth of Australia and the State of Queensland relating to environmental assessment allows the Commonwealth Minister for the Environment to rely on specified environmental impact assessment processes of the State of Queensland in assessing actions under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The objectives of the bilateral agreement are to:

- provide for the protection of the environment, and ensure high environmental standards
- promote the conservation and ecologically sustainable use of natural resources
- ensure an efficient, timely and effective process for environmental assessment and approval of actions
- minimise duplication in environmental assessments.

On 5 June 2020 the Minister decided that the proposed action ('to construct and operate the Galalar Silica Sand Mine with two alternatives for an associated barge loading facility, 20 km north of Cooktown' [see EPBC Act referral 2020/8626]) is a controlled action. The relevant controlling provisions are:

- World Heritage properties (sections 12 & 15A)
- National Heritage places (sections 15B & 15C)
- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)
- Commonwealth marine areas (sections 23 & 24A)
- Great Barrier Reef Marine Park (sections 24B & 24C).

The Minster also decided that the project will be assessed under a bilateral agreement with the Queensland Government (see **Section 4.4**). This decision constitutes a deemed application for a marine park permit under the *Great Barrier Reef Marine Park Act 1975* (Cwlth). This process will proceed in parallel with the EPBC Act and EP Act assessment and has already commenced.

4 CONSULTATION PROCESS

4.1 OVERVIEW

The EIS process consists of a series of steps (see **Figure 4-1**). Noting that as the EPBC Act bilateral is to be used as above, the decision by the Commonwealth Minister for the Environment regarding the controlling provisions of the EPBC Act is required before the Terms of Reference (ToR) for the EIS can be finalised.

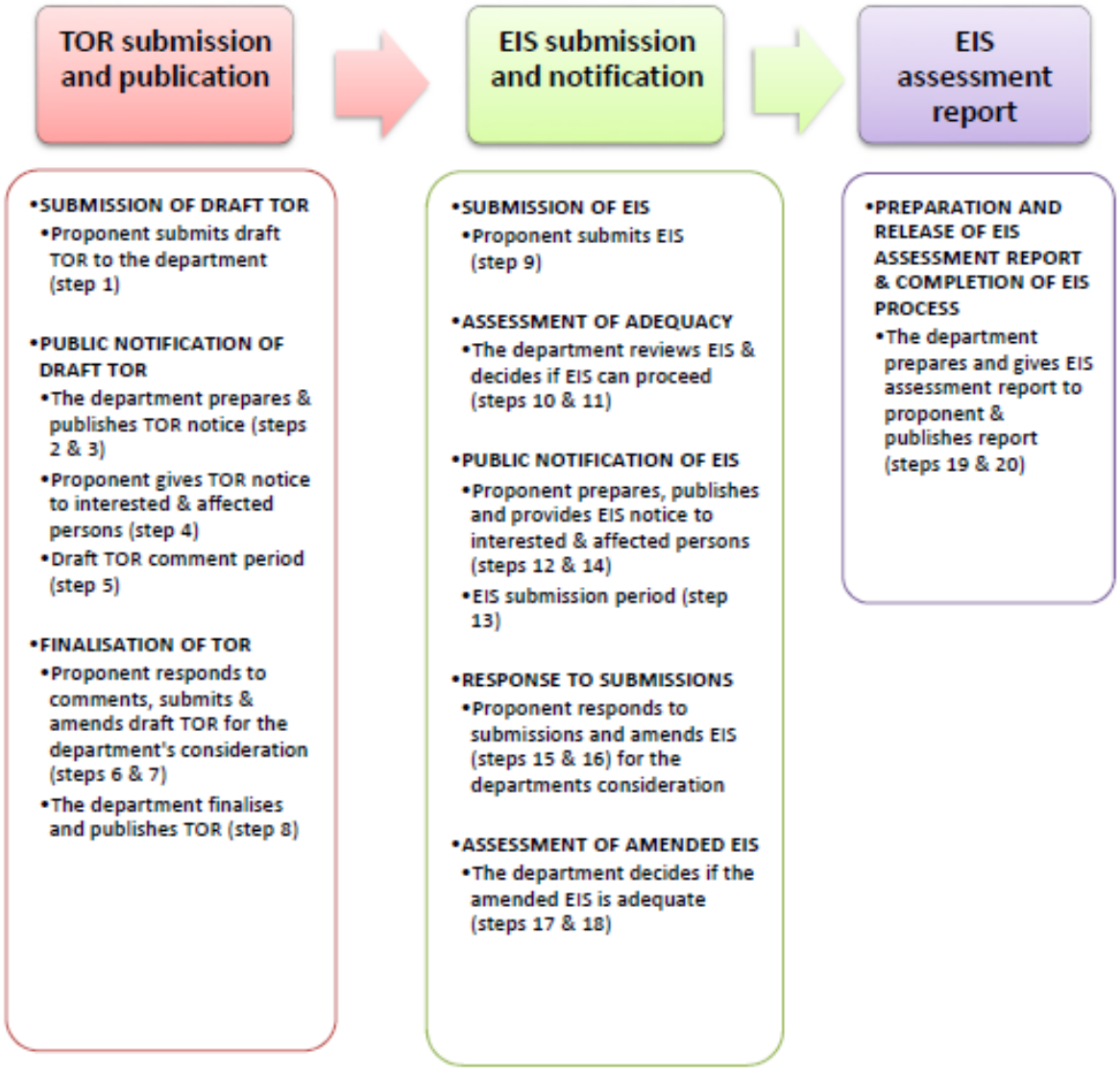

Figure 4-1 The EIS process under Chapter 3 of the EP Act.

4.2 TERMS OF REFERENCE

The first formal opportunity for public input is on the ToR under which the draft EIS is to be prepared. The Initial Advice Statement (IAS) of which this document is the Executive Summary is publicly available, along with draft ToR prepared by the proponent based on generic ToR provided by the Department of Environment and Science (DES) and for the Social Impact Assessment (SIA), the Office of the Coordinator-General (OCG).

Associated with the decision under the EPBC Act, guidelines were issued for inclusion in the ToR. An EIS subject to the bilateral agreement must include a stand-alone assessment report for the MNES included in the controlling provisions. This usually takes the form of a dedicated chapter in the EIS

As per **Figure 4-1** above, the public will have an opportunity to comment on the draft EIS when it has been deemed to be adequate by DES and OCG. Notices will be issued at the appropriate time.

4.3 DRAFT EIS

As per **Figure 4-1** above, the public may comment on the draft EIS when it has been deemed to be adequate by DES and OCG. Notices will be issued at the appropriate time.

4.4 OTHER CONSULTATION

Chapter 6 of the generic ToR requires the development of a consultation program that is consistent with and complements the statutory notification requirements.

Once this program has been developed, Diatreme will commence consultation with all stakeholders. This will also include specific contact associated with research on a range of technical studies.

5 PROJECT DESCRIPTON

5.1 OVERVIEW

For the purposes of the voluntary EIS, the project consists of the Mining Area at Cape Bedford and export options based on two alternative barge loading locations. These have been selected from a large number of options as documented in the IAS. In broad terms:

- The **Mining Area** contains the silica resource and infrastructure required to process it for export..
- **Nob Point Loading:** Barge loading from Nob Point following road transport 3.6 km from the mine, and barging to one of the following transhipment locations:
  - offshore from Nob Point opposite the barge loading area
  - the Port of Cape Flattery.
- **Cooktown Loading:** Barge loading from Marton (Cooktown) following road transport 63 km from the mine and barging via the Endeavour River to a transhipment anchorage in or adjacent to the Port of Cooktown.

5.2 EXPORT OPTIONS

Export options are summarised in **Table 5-1** below and shown on **Figure 5-1**.

Table 5-1 Export Options

EXPORT OPTION	BARGE LOADING LOCATION	BARGING	TRANSHIPPING
Nob Point Loading			
Nob Point Export Option	Nob Point (three loading sub-options are being considered)	Barge to anchorage immediately offshore of Nob Point (Nob Point Transhipment Anchorage)	Nob Point Transhipment Anchorage
Cape Flattery Export Option		Barge to anchorage in Port of Cape Flattery (Cape Flattery Transhipment Anchorage)	Cape Flattery Transhipment Anchorage in Port of Cape Flattery (in GBRMP exclusion area)
Cooktown Loading			
Cooktown (Trucking) Export Option	Cooktown (Marton)	Barge down Endeavour River to anchorage in or adjacent to Port of Cooktown (Cooktown Transhipment Anchorage)	Cooktown Transhipment Anchorage in or adjacent to the Port of Cooktown

Sub-options being considered are:

- **Nob Point Loading.** The loading sub-options differ in the details of the on-shore and tidal/intertidal infrastructure:
  - Sub-option 1 (Nob Point 1) involves: (a) a conventional barge ramp featuring concrete slab-on-ground construction, or (b) an elevated piled ramp (if required for environmental reasons)
  - Sub-option 2 (Nob Point 2) involves a land-based crane for loading the barge directly from the land.
  - Both sub-options would require mooring piles for stabilising the barge during loading.
- **Transfer Mode Options**. Options for transferring (to barge and transhipping) are being considered as follows (not all modes are being considered for all export options):
  - Bulk (uncontained product)
  - Skips (8 cubic metre covered skips that will be re-used after emptying product into the export ship)
  - Bags (1 cubic metre bags that will be opened in China).
- **Transhipment anchorages options** at the Cooktown Transhipment anchorage include:
  - Inner – situated within the Port of Cooktown and in the Yellow (Conservation Park) GBRMP zone
  - Outer – situated just outside the Port of Cooktown and in the Blue (General Use) GBRMP zone where there is deeper water more suited to the draft of the export vessel.

It is proposed that all of the above options (and associated sub-options) will be assessed in the EIS and that the EIS process will allow the superior option to be selected and if possible, improved.

The project has a nominal 15-year mine life, producing 750,000 tonnes per annum based on a 79% recovery rate (i.e. 950,000 t/a mined). Note that export from the Cooktown (Inner) transhipment anchorage will be restricted to 300,000 t/a due to draft limitations.

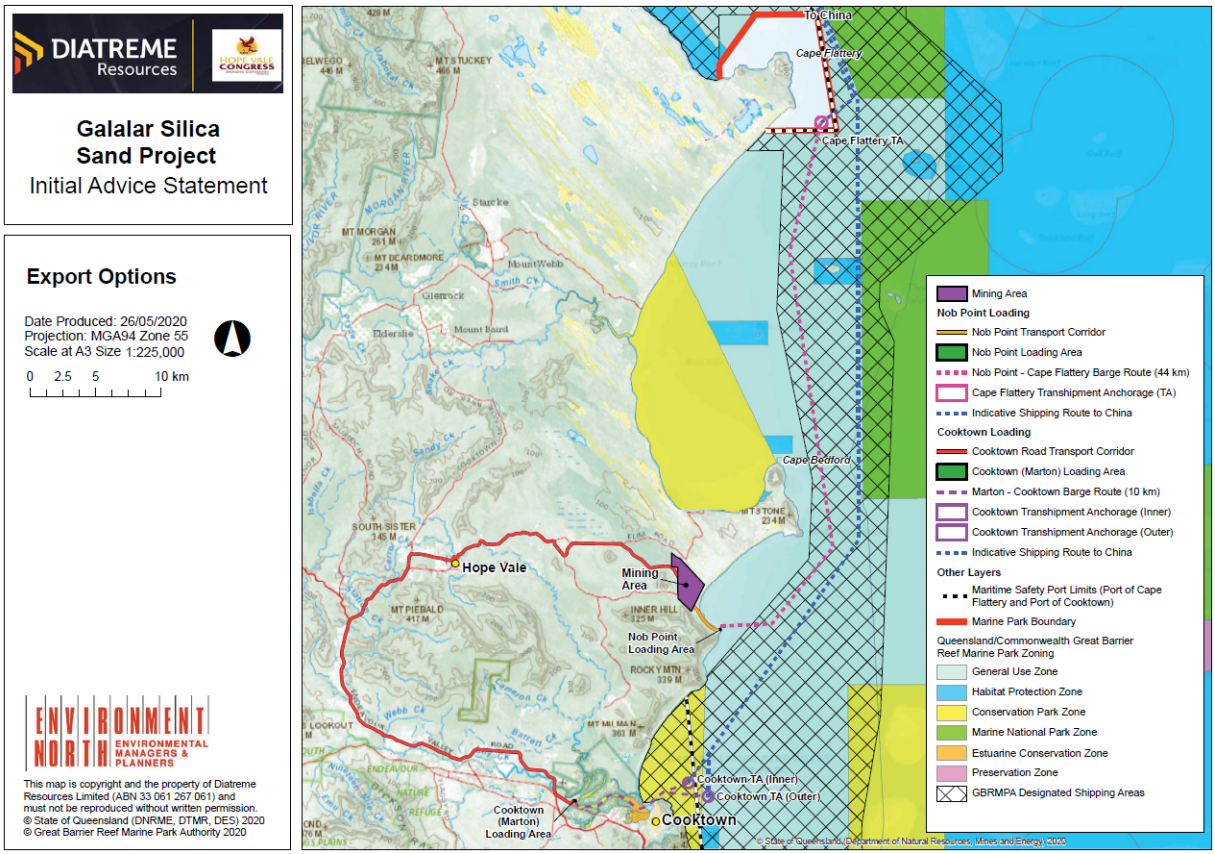

Figure 5-1 Export Options.

5.3 MINE AND PROCESSING

Figure 5-2 below shows the concept layout of the mining area which includes the proposed mine and all associated infrastructure, all within the proposed ML as per the MLA. This figure shows the proposed mine (green polygons) which will be developed over 15 years. Also included will be ancillary infrastructure including power generation, laydown areas & storage, general infrastructure (office, workshops etc.), parking, internal roads, and water and sewerage infrastructure.

The average depth of the sand to be mined is approximately 15 m. Disturbance varies from year to year from 3.2 ha to 13.5 ha per annum and averaging just under 6 ha per annum. Due to the lag between mining and rehabilitation it is possible that up to 16 ha may be exposed at any one time.

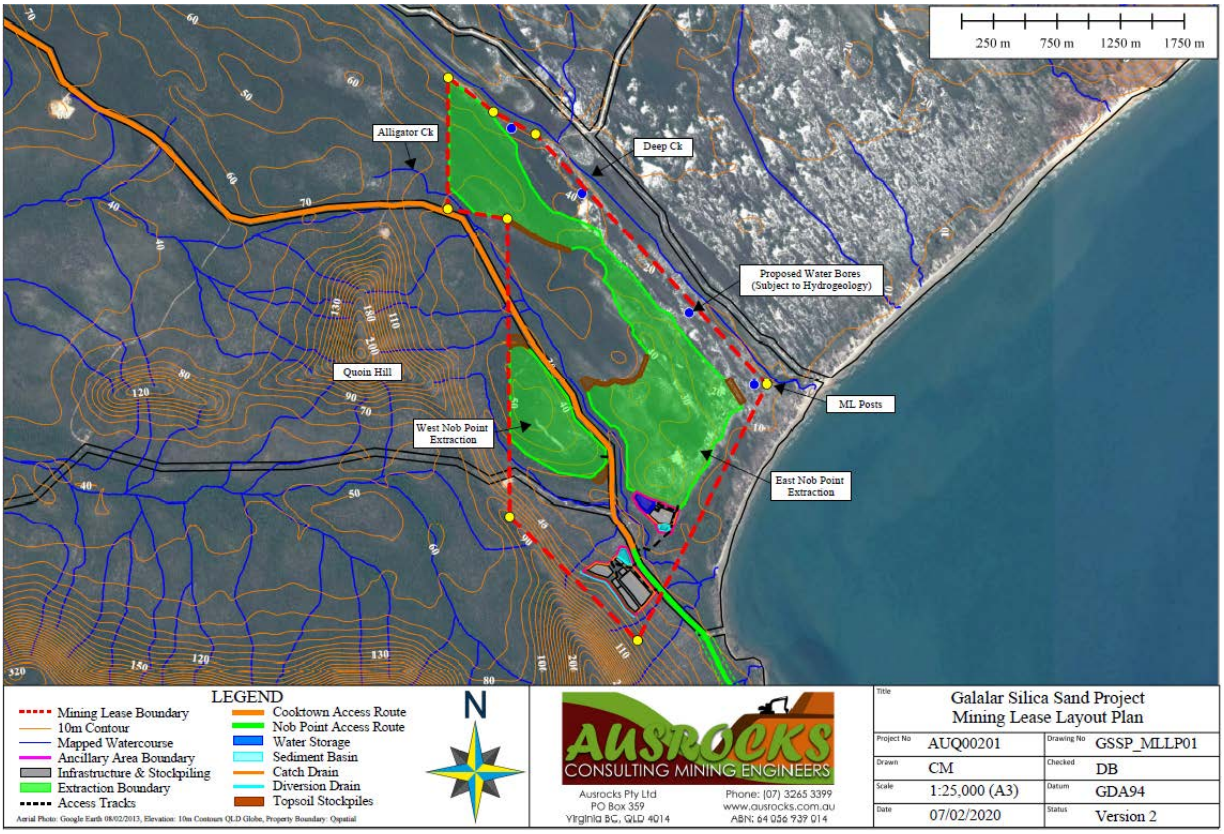

Figure 5-2 Layout of ML.

The exposed silica ore will be excavated using a front end loader and loaded directly into a hopper-feeder unit at a rate of 138 tonnes per hour (tph) for 19.2 hours per day and 360 days per year. The average daily operating hours allows for maintenance and operational downtime, and the days per year includes an allowance of five public holidays that would not be worked. The hopper-feeder unit will screen out oversize rubbish and pump the sand to a mobile wet spiral plant in slurry form at a controlled feed rate of 138 tph.

5.4 TRANSPORT AND EXPORT OF PRODUCT

5.4.1 Nob Point Loading

For Nob Point loading, trucks will carry the processed product along a short (3.6 km) new haul road to a new barge loading area to be constructed at Nob Point. From here it will be barged to a *Handysize* vessel anchored offshore or optionally, in the Port of Cape Flattery, which will then then sail to China. See **Photo 5-1** for a typical *Handysize* vessel.

	**Photo 5-1** Typical *Handysize* (35,000 t) ship.

5.4.2 Cooktown Loading

For Cooktown loading, the silica product will be loaded onto double road trains at the mine site for transport by road to the Cooktown Loading Area at Marton, Cooktown.

Each road train will carry 50 tonnes of product. The trucks will transport the product approximately 63 km to the Cooktown Loading Area travelling on a short site access road, Hope Vale Shire roads, Cook Shire roads, and the Endeavour Valley Road which is a State Controlled Road (SCR).

It is expected that 2100 t (42 double road trains) of product will be transported from the mine to Cooktown daily for 360 days of the year. The round-trip time for a truck will be approximately 2.5 hours, allowing each truck to complete five loads per day. One average there will be 3.5 trucks per hour in each direction.

At Marton product will be loaded onto barges that will travel down the Endeavour River to an anchorage site just inside or just outside the Port of Cooktown (two options are being considered). Silica sand will then be loaded onto a waiting 35,000 t *Handysize* class ship which will then sail to China.

5.5 STAFFING AND ACCOMMODATION

5.5.1 Staffing

Table 5-2 below sets out an estimate of staffing for the mine and the two export options during the construction and operational phase.

STAGE	MINE SITE	NOB POINT LOADING	COOKTOWN LOADING
Construction			
	25	Road transport – 5 Barge loading – 10	Road transport– 5 Barge loading – 10
Total	***25***	***15***	***15***
Operation			
	Mine Manager Office Administrator Logistics Administrator Production Superintendent 2 x Laboratory Technicians 4 x Shift Supervisors 4 x Machine Operators 12 x Process Operators 1 x Night Watchman if necessary.	Road transport (drivers) – 9* Loading / transhipping – 9*	Road transport (drivers) – 9 Loading / transhipping – 25
Total	***27***	***18****	***34***

* estimate only

Based on these figures, total numbers are:

- Construction (both loading options): 40 people over less than one year
- Operation:
  - Nob Point loading: 27 + 18 = 45 people, OR
  - Cooktown loading: 27 + 34 = 61 people.

In addition, there will be short term contractors and others not based at the mine site (e.g. electrical and mechanical contractors who will supply maintenance services).

The market for low iron silica is expected to continue growing and additional employees will be required to increase the production rate in line with market demand.

5.5.2 Accommodation

The GSSP will not be a FIFO (fly-in fly-out) operation. The project will not require a site camp and employees and contractors are expected to be accommodated in the Hope Vale and Cooktown areas where there are adequate facilities for the workforce.

A bus will be used during construction to reduce the number of vehicles travelling on the road from Hope Vale to the construction site. Private and company vehicles will be used for transport during operations.

On-site accommodation will be limited to a night watchman.

6 VALUES, IMPACTS AMD MITIGATION

Table 6-1 below provides a summary of key values, significant impacts, and proposed management in terms of the 'matters' set out in the generic ToR. The ToR include consideration of 'critical matters'. This is defined as a matter that has one or more of the following characteristics:

- It has a high or medium probability of causing serious or material environmental harm, or a high probability of causing an environmental nuisance.
- It is considered important by the administering authority, and/or there is a public perception that an activity has the potential to cause serious or material environmental harm or an environmental nuisance, or the activity has been the subject of extensive media coverage.
- It is relevant to a controlling provision under the EPBC Act.
- It raises obligations under any other legislation applicable for the proposed project (e.g. *Water Act 2000*).

Based on a comprehensive review of values and likely impacts in the IAS, it is concluded that the following should be considered to be Critical Matters:

- water resources (groundwater and surface water)
- flora and fauna (biodiversity)
- coastal environment
- social
- economic
- transport
- prescribed Matters of National Environmental Significance.

Regarding management, as part of the EIS process, each technical study to be undertaken to address the ToR will identify values and threats to these values and will investigate measure that are needed to protect the values from the threats. These actions will be collected together into a set of formal environmental management strategies and converted at a later date (i.e. post-approval) to a number of management plans for progressing this work. Proposed management plans are outlined in **Table 6-1** below.

Table 6-1 Summary of values, impacts, and mitigation

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Climate	The mine site is located within a temperate climate zone with essentially no dry season and a warm summer and cool winter. Recent annual rainfall data shows a relatively low to moderate level of annual variability ranging from a minimum of 668 mm (2002) to a maximum of 3208 mm (1973). The average annual pan evaporation is approximately 1991 mm. Higher evaporation rates occur in the warmer months between September and December and exceed rainfall in dry years.	Climate is unlikely to have a significant impact on the project, other than the risk of tropical cyclones (the region experiences on average 0.5 tropical cyclones per annum). Heavy wet season rainfall increases the risk of soil erosion but this is a standard design and construction management issue. The variability of rainfall needs to be taken into account in the design of the water extraction strategy.	Cyclone Preparation and Mitigation Plan (see **Hazards and Safety**). Construction EMP for Terrestrial Works (including an Erosion and Sedimentation Control Plan).
Land	The mine area comprises a network of sand dunes and wetlands with the natural ground elevation varying by around 50 m between the highest and lowest points (located west of the proposed workings and along the route of Deep Creek, respectively). Gradients along the elevated areas are relatively steep, reducing to flatter gradients along the wetland areas. Hillslope-scale ground slopes range from 10% to a maximum of around 150%.	The main impacts on land are likely to be associated with erosion and sedimentation. See **Water**.	See **Water**.

(Continued over)

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Water			
Water Quality (C)	Testing of surface water and groundwater has yet to be undertaken. However, knowledge obtained from similar environments (e.g. Cape Flattery) suggests that baseline groundwater and surface water quality will be very high.	A comprehensive surface water and groundwater investigation will be undertaken to develop a quantitative hydrogeological model which will be used to predict impacts. This model will include both quantity and quality components. Initial indications from the conceptual hydrogeological model are that the sands are very permeable, meaning that careful management will be required to preserve groundwater quality.	Management will be required of all potential sources of contamination, namely processing, stormwater runoff, and sewage treatment. Operational EMP for Terrestrial Works.
Water Resources (C)	Deep Creek (to the north of the ML) and Alligator Creek (between the mine and the mine infrastructure area) are minor perennial streams. Deep Creek appears to be fed largely by groundwater while Alligator Creek has a more substantial surface catchment with small tributaries. The dune sands and alluvium are expected to behave as an unconfined aquifer, while the deeper bedrock will likely behave as a confined leaky aquitard. There is likely to be a substantial groundwater resource and a small bore is proposed for site and process water.	The surface water and groundwater investigation will also be used to predict impacts on surface and groundwater resources. Initial indications from the conceptual hydrogeological model are that impacts from the mining will be minimal on surface water, groundwater, surface wetlands, and groundwater dependent ecosystems. Saltwater intrusion is also unlikely but will be fully assessed.	Proposed mitigation includes a re-use and recycling strategy, possibly with groundwater recharge to ensure sustainable yield from the bore and maintain groundwater levels within the range of natural variability. Groundwater monitoring bores will remain in place throughout construction and operation to monitor potential impacts. Operational EMP for Terrestrial Works.
Flooding	Owing to the highly effective drainage capacity of the sandy soils, flooding in the ML is expected to be minimal. While the Cooktown Loading Area is subject to Endeavour River flooding, elevated water levels are expected to be dominated by storm tide. See **Hazards and Safety**.	Flooding is not expected to be an issue and the works will not increase afflux levels or create unacceptable flow conditions on any adjacent properties. The mine and Nob Point land infrastructure are situated above the design storm tide level.	Design and siting measures to avoid or minimise impacts

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
		The Cooktown Loading Area and associated laydown areas and infrastructure will be sited and designed to withstand impacts from coastal and flooding hazards.	
Flora and fauna			
Biodiversity (C)	Several rounds of dry season and wet season surveys have been undertaken to identify vegetation communities present as well as recorded and likely flora and fauna species. In terms of communities, the key value is the littoral rainforest (LRF) found on the mine site in two locations. This is a threatened ecological community (TEC) listed under the EPBC Act (see **NMES**). Several listed (state and/or Commonwealth) flora and fauna species were recorded on the various sites and migratory species may use adjacent habitats or overfly the sites.	See **MNES**. The larger of the mapped areas of LRF will be avoided and suitably buffered to ensure that no significant impact occurs. The small (2.6 ha) outlier will have to be cleared to accommodate the mining operation. Habitat of all listed threated (terrestrial) species has been avoided and buffered in the mine design. Impacts of clearing at the Cooktown Loading Area are expected to be minimal.	Construction EMP for Terrestrial Works (including an Erosion and Sedimentation Control Plan).
Biosecurity	Pest flora: The majority of the mine and Nob Point area contains a pristine, weed-free environment, although three exotic species were recorded along the adjacent beach / strand community. The majority of the Cooktown Loading Area represents a weed-free environment. In total, 11 exotic species were recorded mostly on the forest / road boundary.	No significant impact expected. Two species are listed as a Category 3 Restricted Matter under the Biosecurity Act and hence require management. No significant impact expected (no listed species at the Cooktown Loading Area).	Pest flora management will be required during construction and operation. Construction EMP for Terrestrial Works. Operational EMP for Terrestrial Works

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Biosecurity (cont.)	Pest fauna: Feral pigs were recorded within the riparian rainforest at the mine and there is evidence of both cattle and wild horses throughout the area and throughout the Cape Bedford environment. No pest species were recorded within the Cooktown Loading Area, although, due to the proximity to developed (rural-residential) areas, the more common suite of pest fauna (e.g. cane toad, Indian mynah, and feral cat) are potentially present within or adjacent to the site.	No significant impact expected.	Pest fauna management will be required during construction and operation. Construction EMP for Terrestrial Works. Operational EMP for Terrestrial Works.
Coastal Environment (C) (see also **Hazards and Safety)**	The coastal environment is characterised by: • a small number of mangroves adjacent to the mine and the Cooktown Loading Area • presence of a yellow "Conservation park' marine park zone along the Endeavour River relevant to the Cooktown Loading Area • subtidal seagrass beds and scattered coral stretching from opposite the mine to Nob Point (in the vicinity of the proposed Nob Point infrastructure) • bare seabed devoid of coral or seagrass at the transhipment anchorages (at both Nob Point and Cooktown). Various marine megafauna were observed or are expected to occur on offshore areas.	Likely impacts on the coastal environment are: • no impacts on mangroves adjacent to the mine but minor clearing will be required at the Cooktown Loading Area • minor loss of seagrass and corals at Nob Point • potential impacts from works and barge operations in the Endeavour River (in terms of the management intent for the State Marine Park) • little to no impacts at the transhipment anchorages (Nob Point and Cooktown). Marine megafauna are not likely to be affected by the works or operations and mitigation can be developed to minimise any harmful interaction.	Siting and design measures of the various loading areas to further avoid or minimise impacts to marine flora and fauna values Construction EMP for Marine Works (address seasonal timing of work to avoid important lifecycle periods, reduce impacts from marine piling and similar issues). Operational EMP for Marine Works (including a Vessel Mooring and Barge Operation EMP and Marine Megafauna Management Plan).

(Continued over)

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Air	The various project areas are remote and, due to the absence of nearby industrial development, are likely to have excellent air quality. There are no sensitive receptors in close proximity to the mine or Nob Point. Sensitive receptors along the road corridor to Cooktown have not yet been evaluated, but would include a number of residences in the Hope Vale and Marton areas, as well as rural properties along the route.	Review of air quality for the much larger Cape Flattery silica mine suggests that operational air quality is not likely to be an issue. During the EIS assessment will be made of air emissions arising from all sources, especially road transport (Cooktown loading). A comprehensive air emissions inventory will also be undertaken, including greenhouse gasses (GHG).	Construction EMP for Terrestrial Works. Operational EMP for Terrestrial Works GHG strategy.
Noise and Vibration	Sensitive receptors as above.	Potential emission sources that could impact on sensitive receptors are: • establishment and operation of the mine and ancillary infrastructure • upgrading, use, and maintenance of the Road Transport Corridor (Cooktown loading) • establishment and operation of the Cooktown Loading Are). Of these, it is expected that the only potentially significant emissions could arise from the use of the Road Transport Corridor. During the EIS assessment will be made of noise emissions arising from road transport (Cooktown loading).	Construction EMP for Terrestrial Works. Operational EMP for Terrestrial Works.

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MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Waste Management	Waste management is an issue that will be addressed in the EIS after all process and allied waste streams have been identified.	Only small quantities of solid waste will be generated. Solid waste will be sorted into recyclable and general waste, stored locally, and regularly returned to Hope Vale for handling via the municipal disposal system. A small commercial sewerage package plant will be installed adjacent to the Workshop for handling Workshop and Office sewage. Discharge from this plant will be licensed. Gaseous waste will be limited to diesel exhaust gas from earthmoving equipment, trucks, vehicles and tugs / barges / ships. Chemicals used will be limited to diesel fuel and small quantities of laboratory chemicals. there are not expected to be any significant risks. There will be no dispersal of hazardous or toxic substances in the environment. Accidental loss of silica product during loading and unloading operations is expected to be minimal and is considered to be unlikely to result in any impacts on the seabed but will be considered nonetheless as part of the EIS.	Construction EMP for Terrestrial Works. Operational EMP for Terrestrial Works.

(Continued over)

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Hazards and Safety	The EIS will address likely risk and hazards, such as: • natural hazards e.g. cyclones (including storm tide), flood, fire, earthquake • geo-environmental hazards (e.g. unexploded ordnances, contaminated land, acid sulphate soils) • biological and animal hazards e.g. crocodiles, biting insects • hazardous goods storage and movement • construction risks • operational risks • occupational risk (working over water, moving vehicles, security incidents, health and safety risk) • other (pandemic, counter-terrorism, security incidents).	Hazards that could be of some significance to the project are expected to be limited to cyclones and associated storm tide. Design solutions exist to reduce risk and these will be incorporated into the project.	Design and siting solutions to reduce risks from hazards Cyclone Preparation and Mitigation Plan.
Cultural Heritage Indigenous cultural heritage	Indigenous cultural heritage surveys undertaken for the exploration phase reveal that the landscape is relatively dynamic and it is likely that, through time, dunes have been blown to the northwest by the prevailing south-east winds. This may have alternately exposed and covered Aboriginal cultural heritage sites. Deep Creek (Thalgaar) bisects the western side of the cultural heritage project area. This corridor forms a swamp within the northern part of the ML draining to the sea to the south.	Impacts on indigenous cultural heritage are not expected to be significant and there are robust processes in place to manage on-site activities. The cultural heritage work undertaken for the exploration campaigns will to be expanded and updated for the development phase in the EIS. At that time impacts will be identified and mitigations strategies developed.	Construction EMP for Terrestrial Works.

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Non-indigenous cultural heritage	The Planning Scheme for the HVASC shows that there are no mapped non-indigenous cultural heritage sites in the vicinity of the project area.	Impacts non-indigenous cultural heritage are not expected to be significant (to be confirmed by the EIS).	Construction EMP for Terrestrial Works.
Social (C)	At the heart of the Hope Vale community are the descendants of the original Aboriginal language group of people, the Guugu Yimithirr. The community's involvement with the project is through Hopevale Congress of Clans, representing the traditional owners of the area in which the mining lease and the proposed Nob Point barge loading site is located. Cooktown is named after Lt James Cook who repaired his ship on the banks of the Endeavour River in 1770 after it was damaged off Cape Tribulation during his voyage of discovery up the east coast of Australia. The town throughout its history has been the administrative centre for Cook Shire covering most of the central and northern peninsula area with a substantial amount of its population of the area living in Aboriginal communities or in the general community.	Most social impacts are expected to be beneficial, given the strong involvement of Congress and the substantial employment and income inputs to the community. A Social Impact Assessment (SIA) will be undertaken during the EIS as required by the Strong and Sustainable Resource Communities Act 2017 (Qld) (SSRC Act). The intent of this Act is to ensure that 'residents of communities near large resource projects benefit from the construction and operation of the projects'. The SIA will also consider potential impacts on marine users in the Cooktown export option in terms of both the Cooktown Loading Area works and barging operations (see **Transport** below). The project is not FIFO and no on-site accommodation will be supplied.	A Social Impact Management Plan (SIMP) is required to be developed as a condition of approval under the SSRC Act.

(Continued over)

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Economic (C)	Hope Vale has a very high unemployment rate (39% cf state average of 8%) whereas Cooktown has a low unemployment rate (4% cf state average of 8%). Median weekly incomes at both centres are well below state levels. However, the low level of incomes is offset by low costs of housing.	In terms of Gross Regional Product: • Construction Phase: Addition to Gross Regional Product including 'flow-on' about $19 m or 0.12% and total workforce including 'flow-on' of about 110 positions over a full year (about 0.09% of regional workforce). • Operational Phase: Impact on Gross Regional Product including 'flow-on', Cooktown Loading $36.5 m (0.2%), Nob Point Loading $20.4 m (0.13%), and total employment including 'flow-on' Cooktown Loading 130 positions (0.11%) and Nob Point Loading 90 (0.08%). In addition, there will be a very substantial gross operating surplus that will flow into the economy through annual expenditure of royalties to the Queensland Government $0.675 m, Hope Vale community $0.8 m and company tax to the Commonwealth and profits distributed to shareholders including 12.5% to Hope Vale community. Indications are that overall benefit to the community will be to raise disposable incomes by at least 25 - 30% for the Base Case and 45 - 50% for the Nob Point Export Option.	SIMP

(Continued over)

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Transport (C) Nob Point Export Option Cooktown Export Option		No significant transport impacts are expected. Coastal shipping is under the control of the Australian Maritime Safety Authority. Wear and tear on the road network. Traffic and loss of amenity for residents adjacent to the road transport corridor (basically Hope Vale to Marton). Possible barging conflicts with other users of the Endeavour River will be assessed and linked to the SIA. Coastal shipping is under the control of the Australian Maritime Safety Authority.	Operational EMP for Terrestrial Works. Operational EMP for Terrestrial Works.
Matters of National Environmental Significance World Heritage properties (C)	All project elements are adjacent to the Great Barrier Reef World Heritage Area (GBRWHA) and Great Barrier Reef Marine Park (GBRMP). The GBRWHA has recognised Outstanding Universal Value (OUV).	Self-assessment concludes that there will be some localised impacts (particularly for the Nob Point option for marine habitat and visual amenity) that will need to be further minimised or reduced as far as practicable through siting, design and management planning measures. Following application of these measures, these impacts are unlikely to represent significant impacts that affect the OUV of the GBRWHA. However, the loss of visual amenity (OUV) arising from the mine and the Nob Point infrastructure could meet the significant impact test.	Visual impacts will be reduced by careful attention to residual landform and sequential rehabilitation of the mine site. Construction & Operational Environmental Management Plan – Mine and Terrestrial Areas (including an Erosion and Sedimentation Control Plan). Construction & Operational Environmental Management Plan – Foreshore and Marine Areas (address seasonal timing of work to avoid important lifecycle periods, reduce impacts from marine piling and similar issues).

MATTER (CRITCAL)	KEY VALUES	LIKELY IMPACTS	PROPOSED MITIGATION
Listed threatened species and communities and migratory species (C)	<u>Species</u> Three terrestrial flora species and three listed and migratory fauna species were recorded within the Project Areas while two listed and migratory fauna species were recorded within the littoral zones outside of the Project Areas. Various marine listed and migratory fauna species are likely to occur in the marine areas off the mine and in both transhipment anchorages.	Habitat of all listed threated (terrestrial) species has been avoided and buffered in the mine design.	Management of clearing operations to avoid buffered habitats. Construction & Operational Environmental Management Plan – Mine and Terrestrial Areas. Construction & Operational Environmental Management Plan – Foreshore and Marine Areas (address seasonal timing of work to avoid important lifecycle periods, reduce impacts from marine piling and similar issues). Maritime Safety Plans (including a Vessel Mooring and Barge Operation EMP and Marine Megafauna Management Plan).
	<u>Communities</u> Littoral Rainforest (LRF) (a TEC) was located in the mining area.	The larger of the mapped LRF areas will be avoided and suitably buffered to ensure that no significant impact occurs. The small (2.6 ha) LRF outlier cannot be practically avoided. Self-assessment concludes that the loss of the 2.6 ha LRF patch will constitute a significant impact.	Rehabilitation strategy in accordance with the mandated progressive rehabilitation and closure plan (PRC plan). Construction & Operational Environmental Management Plan – Mine and Terrestrial Areas.
Commonwealth Marine Area (CMA) (C)	Coastal shipping and barging for the Cape Flattery transhipping option will take place in the CMA.	Coastal shipping has the potential to involve impacts due to marine incidents (e.g. collision and grounding). Coastal shipping is under the control of the Australian Maritime Safety Authority and will be regulated accordingly.	Maritime Safety Plans (including a Vessel Mooring and Barge Operation EMP and Marine Megafauna Management Plan). As required by the Australian Maritime Safety Authority.