ASX ANNOUNCEMENT

14 June 2023

Positive Scoping Study for Northern Silica Project strengthens development plans

- **Scoping Study for Northern Silica Project (NSP) shows potential for valuable long life mining operation, of significant scale and in close proximity to existing marine infrastructure**
- **Study indicates potential Target production rate of 5 Mtpa could be sustained for 25 years**
- **Metallurgy tests indicate a high purity "low iron" silica product, likely to be highly suitable for solar panel manufacturers sheet glass requirements**
- **Indicated & Inferred Mineral Resources currently total 235 Mt, with further expansion drilling planned for 2023**
- **Tripartite Deed of Access signed to facilitate port precinct environmental studies and to advance Part Facility User agreement investigations**
- **Diatreme to immediately progress full Feasibility Study for NSP and advance regulatory approval process; NSP confirmed as an important development priority with EPBC referral and EIS studies underway.**

Emerging silica sands developer and explorer, Diatreme Resources Limited (ASX:DRX) has completed a Scoping Study for its emerging Northern Silica Project (NSP), with the study highlighting the Far North Queensland project's potential to become a leading supplier of low cost, premium quality "low iron" silica sand product for fast growing photovoltaic (PV) glass markets.

The Scoping Study has boosted confidence in the project, with Diatreme now planning to advance to a full Feasibility Study involving all necessary technical studies, environmental impact assessments, permits and approvals required to move to a final investment decision.

The NSP has undergone continued expansion, with additional drilling planned in 2023 anticipated to further increase its high-grade silica sand resource. In March, Diatreme announced an 89% increase in its Mineral Resource estimate to 235 million tonnes (Mt), up from 124.1 Mt previously (refer ASX release 13 March 2023). The Scoping Study's Production Target uses 151Mt, or 64% of the total Mineral Resources for the 25 year production scenario, which is the basis of the financial analysis in this study . Importantly, the proposed NSP mining area is located in sand dunes adjacent to dunes where Cape Flattery Silica Mines has been mining and processing silica sand and exporting high quality silica sand products for decades.

IMPORTANT CAUTIONARY STATEMENT

The Scoping Study referred to in this ASX announcement has been undertaken to evaluate the potential development of Diatreme's Northern Silica Project (NSP) near Cape Flattery in North Queensland. The NSP is located approximately 14 kilometres west of the Queensland State owned port of Cape Flattery. Diatreme Resources Limited currently holds 90.01% of the joint venture company Cape Silica Holdings Pty Ltd (CSHPL) and is the operator of the NSP. Sibelco Silica Pty Ltd (Sibelco) is a 9.99% joint venture partner in CSHPL. The financial analysis for the study has been prepared based on a single entity 100% basis and is a preliminary economic study of the potential viability of the NSP. It is based on low accuracy (+/-35%) technical and economic assessments that are not sufficient to support estimation of Ore Reserves. The next development phase NSP Feasibility Study will produce sufficiently accurate costs and revenue information to complete an estimate of Ore Reserves which is expected to provide assurance of an economic development case.

The Production Target scheduled for extraction in this Scoping Study has been based on Mineral Resources of which approximately 68% are classified as Indicated Resources and 32% are classified as Inferred Resources. Indicated Resources account for the first 18 years of the 25 year financial evaluation period. There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty of the quantity of this material that future work will convert to Indicated Mineral Resources and whether the Production Target will be realised.

The NSP is part of the same sand dune field that has been mined for more than 40 years by Cape Flattery Silica Mines and is currently exporting approximately 3Mtpa. Diatreme considers the NSP to be a low-risk project using mining, processing and logistics methods proven to be successful for decades providing confidence of a high conversion rate of Mineral Resources to Ore Reserves. Diatreme financial analysis indicates that the NSP is financially viable regardless of the conversion rate of Inferred Resources to Indicated Resources or to Production Target.

Diatreme believes that it has a reasonable basis for providing these forward looking statements and the forecast financial information based on material assumptions outlined in this release. One of the key assumptions is that the funding for the Project will be available when required. Diatreme considers all the material assumptions to be based on reasonable grounds, although there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study funding in the order of approximately $356 million will be required to establish the initial base case production rate followed by an additional capital requirement of approximately $179 million 2 years later to fund the expanded production case. There is no certainty that the Company will be able to raise the funding when required. It is also possible that funding may only be available on terms that may be dilutive to, or otherwise affect the value of Diatreme's shares. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

STUDY HIGHLIGHTS

- The NSP has been evaluated over a 25-year mine life, based on a high purity silica sand production target of 121Mt from the current 235Mt of Mineral Resources.
- The estimated yield to product from run of mine dune sand is approximately 80%, indicating 151Mt of sand would be mined to produce 121Mt of product. This yield is based on previous bulk sample test work for Diatreme's Galalar Silica Sand Project and recent metallurgical test work on composite samples from the NSP Mineral Resource area.
- Composite sample processing test work showed NSP sand and Galalar sand are metallurgically very similar. The sample products achieve the quality standards required for raw materials used in the manufacture of "low iron" sheet glass, a key component of solar panel manufacturing.
- Product value has been estimated in the range of $77 to $88 (A$) per tonne FOB. The base case assumption in the financial analysis is $81 FOB. Long term average shipping rates including an international marketing cost have been used to discount the current average high purity silica price at Chinese ports to obtain the estimated FOB price at Cape Flattery. The long-term shipping and marketing rate is estimated to be approximately $24 (A$).
- Average life of mine unit FOB cost for the operation is estimated to be approximately $27.40 per tonne of product loaded onto a receiving vessel at Cape Flattery Port. The FOB cost includes royalties and distribution of capital costs for the life of the mine.
- The base case analysis uses an initial project capital estimate of approximately $356 million ($A, including contingencies of $46.4 million) to establish an operation capable of exporting 3 Mt per year. An additional capital requirement of approximately $179 million (including contingencies of $23.4m) is included two years later to increase the production rate to 5 Mt per year.
- Key modelling parameters ($A) and results of the Scoping Study financial analysis based on modelled variables with an estimated accuracy of +/-35% are:
  - **NPV (pre-tax)** **$1,410 million**
  - **NPV (post-tax)** **$830 million**
  - **IRR (pre-tax)** **33%**
  - **IRR (post-tax)** **32%**
  - **Payback period** **6 years**
  - **Discount rate** **10%**
  - **Exchange rate** **AUD = 0.73 USD**
- Project NPV is most sensitive to variations in revenue. A revenue decrease of 10% reduces NPV by 27%, while a 10% revenue rise increases NPV by 27%.
- Diatreme is focused on minimising revenue risk through high quality engineering design, construction and operation to ensure the main drivers of revenue, production rate and product quality can be sustained over the life of the operation.

Diatreme's CEO Neil McIntyre commented:

"This Scoping Study demonstrates the extraordinary potential of our Northern Silica Project to become a long-term producer of high purity "low iron" silica products, contributing extremely valuable new jobs and investment for the Hope Vale/Cooktown region, focusing on local communities.

"Standouts include the project's large and expanding resource base, strong underpinning economics, pathway to growing export markets and ability to meet the requirements of solar panel sheet glass manufacturers, a market under pressure for new sources of supply. For example, solar investment is expected to exceed oil investment for the first time ever in 2023, with total clean energy investment expected to exceed US$1.7 trillion, according to the International Energy Agency.

"For Diatreme shareholders, the Scoping Study results show the potential returns achievable from this project and we look forward to advancing a full Feasibility Study to cement these indicative numbers, while also further optimising the project's development.

"With the NSP's permitting and studies pathway now advancing, including access to the Port precinct to undertake relevant studies,the NSP Project becomes Diatreme's most immediate silica Project development priority, we look forward to further de-risking the project and ensuring its delivery in the quickest possible timeframe for the benefit of all stakeholders."

LOCATION AND TENURE

The NSP is located approximately 35 km north of Hope Vale township and 14 km west of Cape Flattery Port. Current access to site for exploration is via both sealed and unsealed roads and tracks, however road access will be upgraded progressively during exploration and a major upgrade is included in the project capital to minimise disruptions that occur during the wet season.

Diatreme has applied to Ports Norths for partial use of the wharf at Cape Flattery for ship loading. Studies and negotiations are progressing towards using the wharf for ship mooring and transhipping. The Scoping Study is based on the use of barges to transport the product a distance less than 1km from a proposed barge loading facility within the port limits to a ship moored at the wharf.

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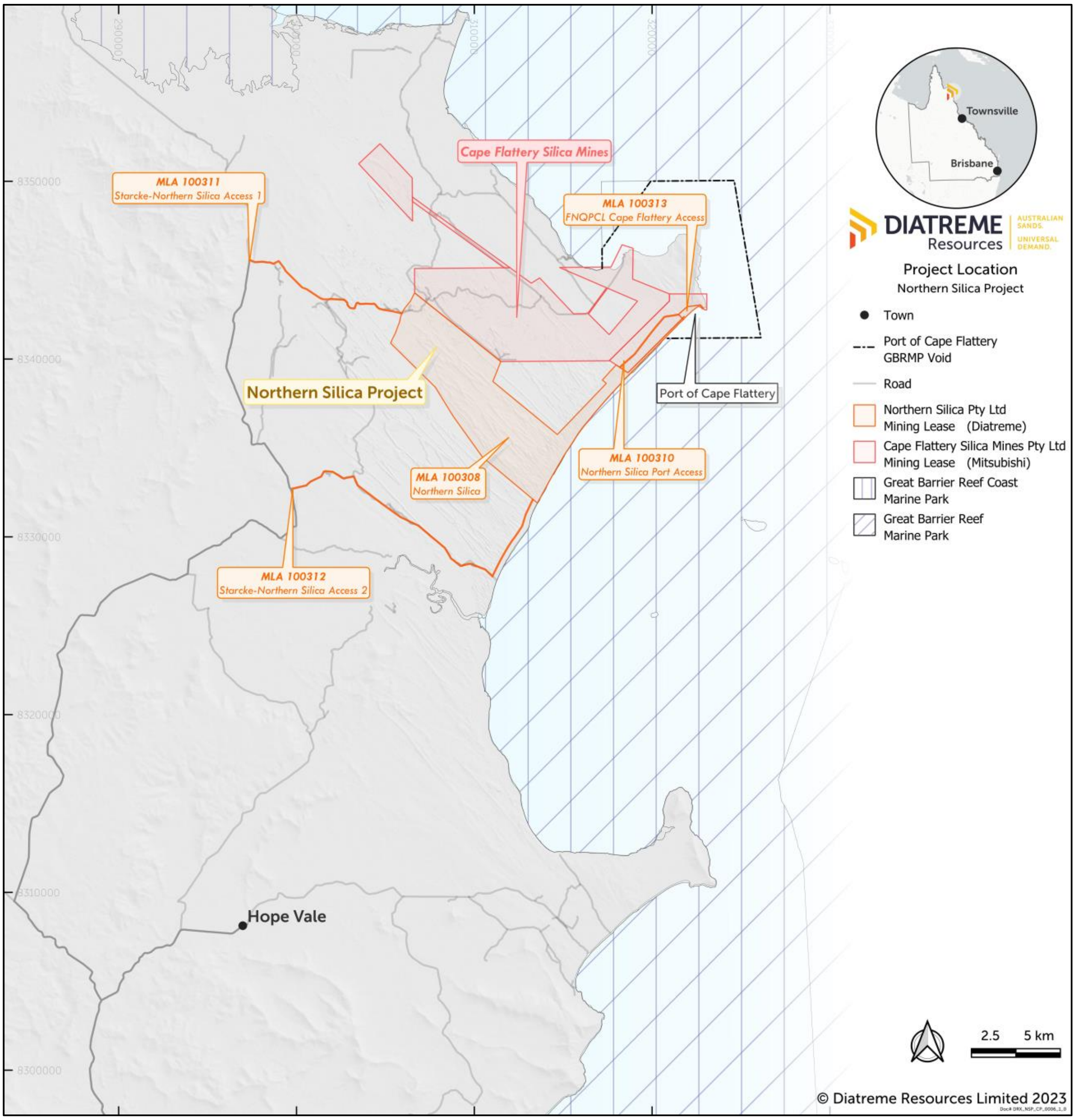


Figure 1: Northern Silica Project Location Map

All exploration work is currently being undertaken on Diatreme's EPM area. Mining Lease Applications have been lodged for the mining area, site access route and product transport route.

EXPORT OPTIONALITY AND USE OF CAPE FLATTERY PORT - BACKGROUND

In developing the export methodology within the Scoping Study for the use of Cape Flattery strategic port land and marine infrastructure, Diatreme has used an underpinning commercial rationale and development strategy, which is self-reliance and independence from the incumbent port operator Cape Flattery Silica Mines (CFSM - wholly owned by Mitsubishi) and assumes no access to their export outloading stream.

In the case of the Cape Flattery Port whilst being ultimately "owned" by the Qld Government and administered by its designated port authority, Far North Queensland Ports Corporation (Ports North), not untypical of some regional bulk ports the "bareback" wharf infrastructure (deck and below) is owned by Ports North. The outloading infrastructure (conveyors, ship loader and associated chattels - above deck) are owned by CFSM.

The encompassing sublease arrangements between Ports North and CFSM consider third party access to both above and below deck infrastructure. There are certain flexibilities for Ports North to grant access to below deck infrastructure and to allow development of new port facilities, however, the right to utilise above deck infrastructure on the existing wharf is at CFSM's discretion.

Diatreme, Ports North and CFSM have recently executed a tripartite "Deed of Access" which allows Diatreme, its employees and contractors to access Ports north leasehold and freehold land parcels to undertake environmental monitoring and surveys. Additionally, the deed also provides for access to existing port infrastructure to support Part Facility user agreement investigations regarding the Northern Silica Project under agreed conditions.

LOADING OUTSTREAM STRATEGY

To enable the preparation of a scoping study without non government approval contingencies for full facilities use Diatreme has designed a port access strategy that will provide certainty to facilitate its exports.

Through negotiation of a "Partial User" agreement with the Ports North the NSP project will look to create and construct its own loading option within the port precinct by construction of an independent outloading stream, transship its product to a moored vessel located at the existing wharf and then load by use of geared vessels from barge to ocean going vessels (55,000 tonne OGV's) for product export.

Further details around this optionality are contained in the attached summary Scoping Study.

Moving forward, Diatreme remains cautiously optimistic that a sensible negotiated outcome allowing open access to all port infrastructure can be facilitated, however given the importance of this investment regionally and indeed nationally, will continue to pursue its independent marine infrastructure approach ensuring its silica project development will be able to be advanced in a pragmatic, economic and timely fashion whilst maintaining appropriate open dialogue with all key stakeholders.

KEY STUDY INPUTS, ASSUMPTIONS AND OUTCOMES

Key inputs and outcomes of the Scoping Study are as follows:

- JORC compliant Mineral Resource estimate (Indicated and Inferred)
- Mining methodology selected and outlined
- Preliminary process test work completed
- Conceptual process plant design to meet required production targets with expansion potential
- Non-process infrastructure to support the project including:
  - On-site camp facilities
  - Materials handling and stockpiling infrastructure
  - On-site power generation utilising 54% renewable energy
  - Transhipping and ship loading infrastructure
- Financial model indicating strong project economics.

The NSP Scoping Study benefitted from the advanced studies conducted for the Company's adjacent Galalar Silica Sand Project (GSSP). Many of the inputs used in the study are based on assumptions, data and lessons learned from the GSSP, accompanied by specialist inputs.

In November 2021, Diatreme completed a Pre-Feasibility Study on the Galalar Silica Sand Project (GSSP), located 30km south of the NSP. The projects are located in similar geological environments and the Mineral Resources for both projects have similar metallurgical properties.

The process technology and mining methods used in the Scoping Study are considered to be industry standard and are currently being successfully used in other similar operations. These known technologies and methods have been scaled to suit the NSP and confirmed by specific site testwork.

A linear stacker reclaimer system has been selected for the NSP product stockpile to meet the project's production profile and shipping requirements.

The NSP's transhipping system uses a barge loading facility and transhipping operation travelling less than 1km to a vessel berthed at the Cape Flattery Port (existing berthing pocket), with the operation undertaken within the Cape Flattery Port's limits.

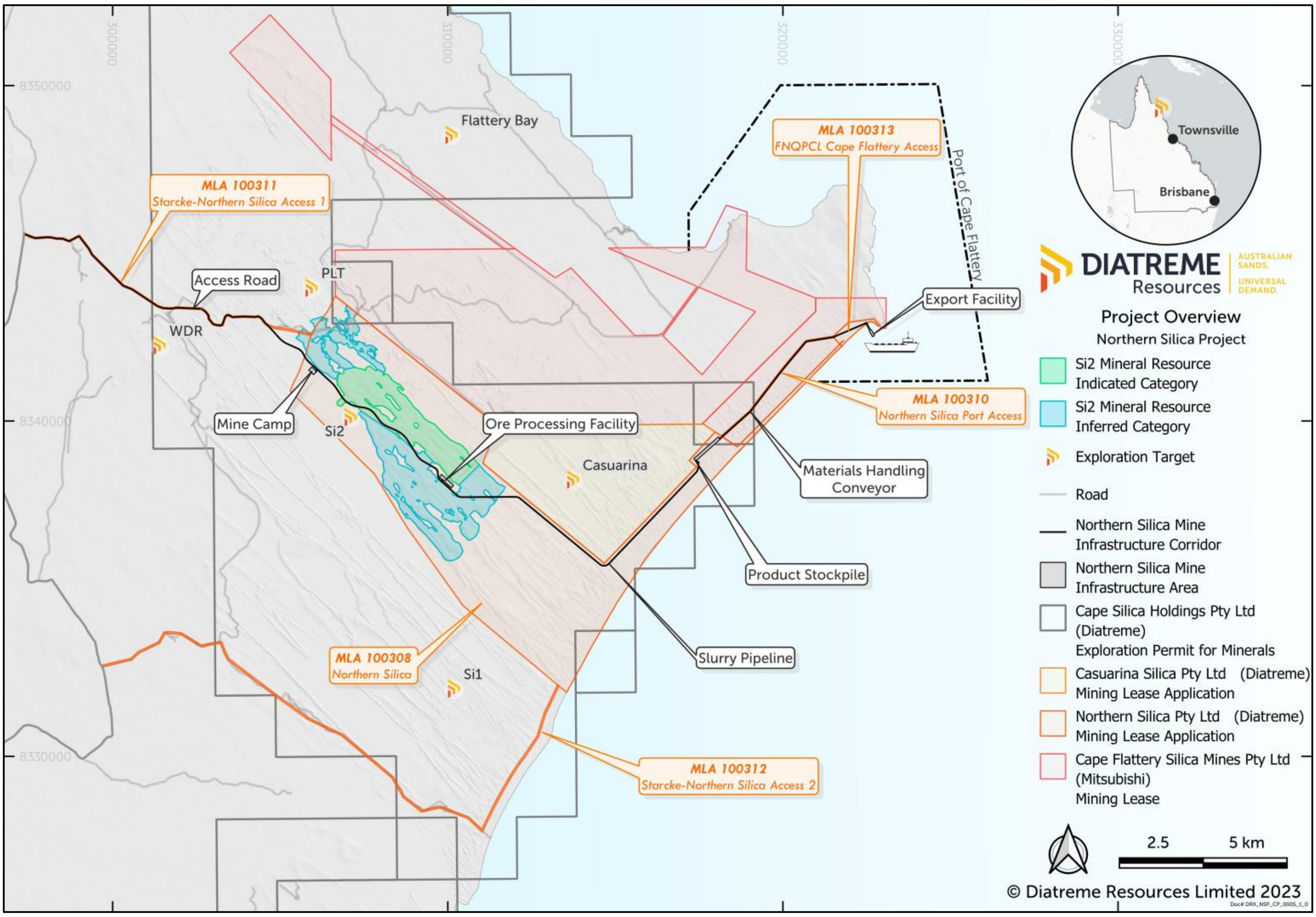


Figure 2: Northern Silica Project Infrastructure Layout

The project capital cost includes significant components required for infrastructure. The map (Figure 2) shows the infrastructure components and their location relative to the Mineral Resource and includes the relevant external connecting infrastructure and tenement application areas.

The following set of tables presents the assumptions used in the financial model and the outcomes from the model. Model inputs have a typical accuracy of +/- 35% and any values generated by the model should be treated as mid-point values with a possible spread of values due to the accuracy of the inputs. A sensitivity analysis is provided as a chart which demonstrates the range of possible outcomes for a range of variable inputs.

The total capital cost estimates for the initial and upgraded project production scenarios are presented below. A contingency allowance of 15% has been added to the estimated cost of the known components at the time of the estimate. The estimated costs presented here are approximate and rounded to AUD millions.

Capital Cost Estimate by Stage

DESCRIPTION	3 Mtpa ($M) Initial Capital	Year 2 Expansion to 5Mtpa	5 Mtpa Total Project
Capital Estimate (without contingency)	**$ 309.2**	**$ 155.8**	**$ 465**
Contingency (15%)	$ 46.4	$ 23.4	$ 69.8
Total	**$ 355.6**	**$ 179.2**	**$ 534.8**

Tax and Royalty Assumptions

Item	Assumption
Australian Corporate Tax	30%
GST	The financial model assumes the Project is GST neutral No GST has been assumed for initial working capital build up
Queensland State Royalty	A$0.90/wmt Silica Sand sold (Mineral Resource Regulation 2013)
Traditional Owner Royalty	2.0% of Project Revenue (FOB basis) - Estimate

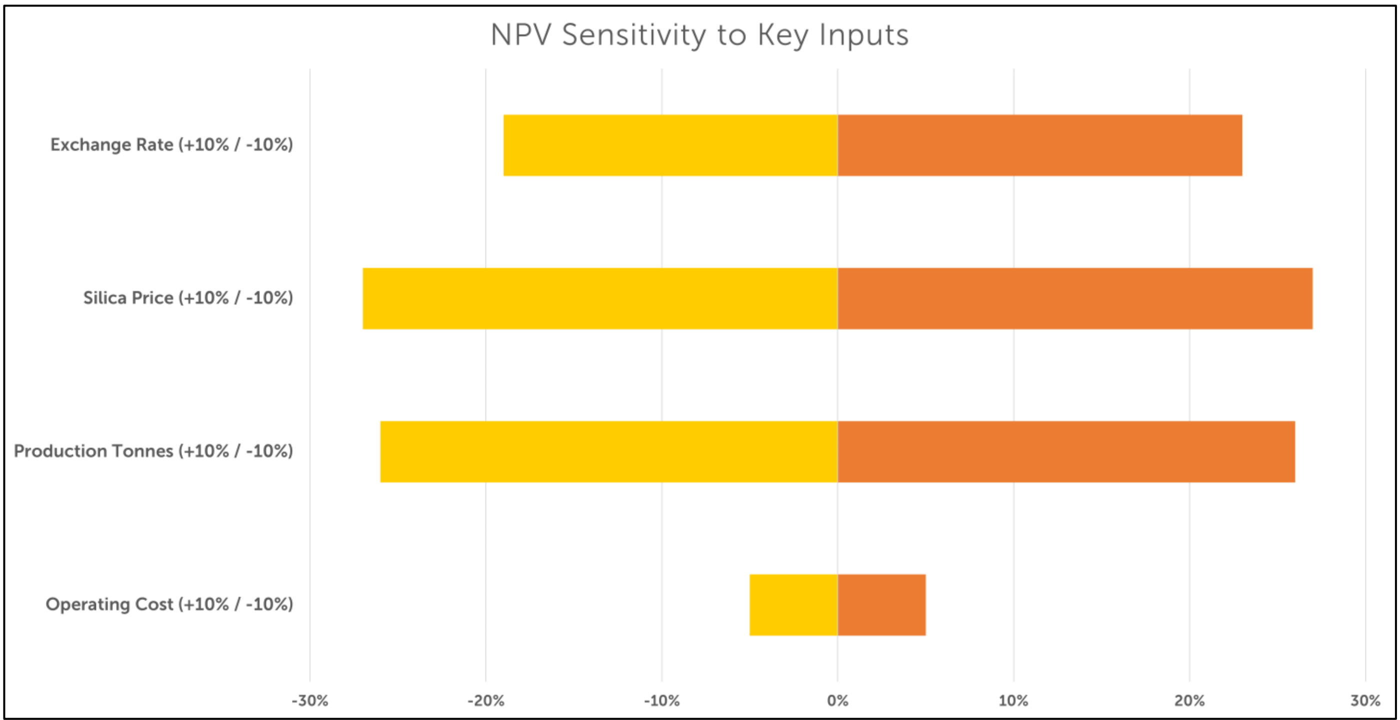
Financial Evaluation Results

Item	Unit	Quantity
NPV (pre-tax)	A$M	1,410
IRR (pre-tax)	%	33
NPV (post-tax)	A$M	829
IRR (post-tax)	%	32
WACC	%	10
Payback Years	Years	6
Mine Life	years	25
LOM Net Revenue	A$M	9,783
LOM Opex	A$M	2,298
LOM Sustaining Capex	A$M	180
Total Capex	A$M	535
Sales Price (FOB)	A$/t	81
Shipping and Marketing	A$/t	24
FOB Cost (C1 Costs)	A$/t	27.40

Exchange Rate Assumptions

Exchange Rate	Assumption
AUD:USD	0.73
RMB:USD	6.45
RMB:AUD	4.64

Sensitivity Analysis Graph

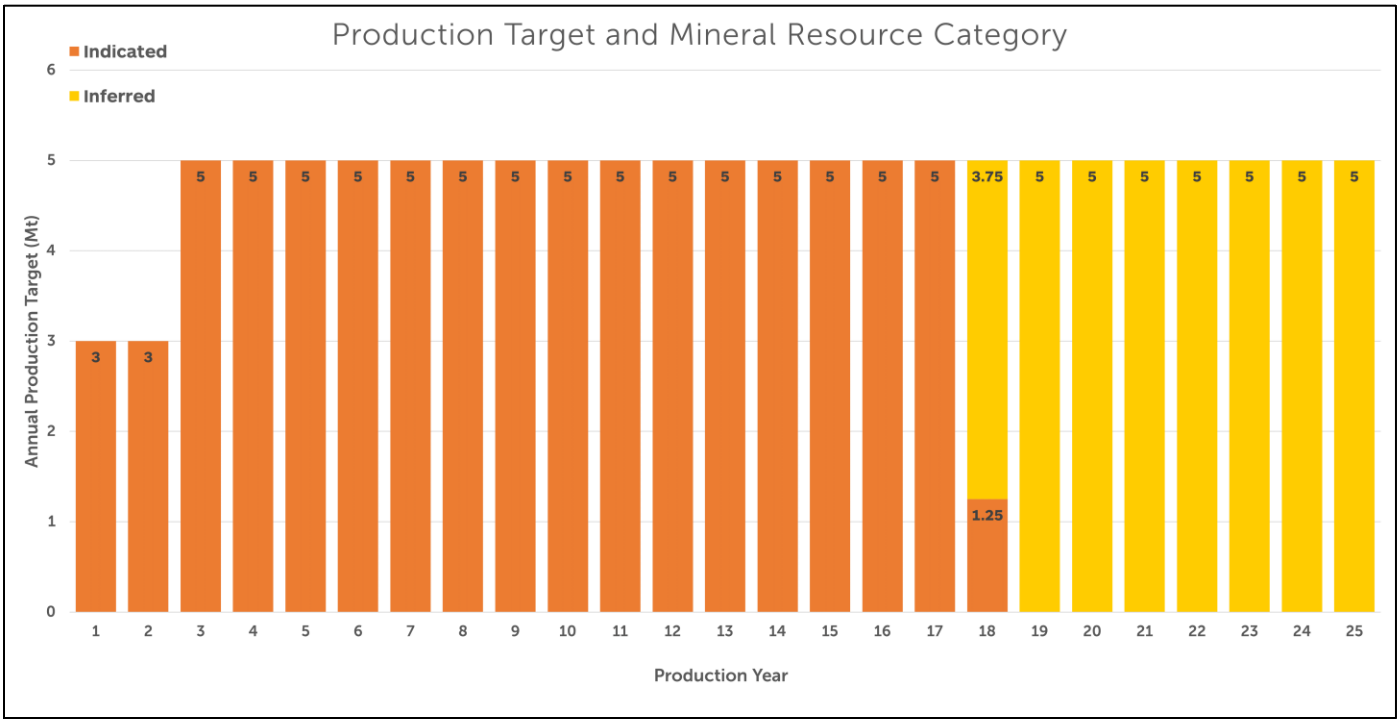


Sensitivity Analysis Results

Item	NPV Min (A$M)	NPV Max (A$M)	Min (%)	Max (%)
Exchange Rate (+10%/-10%)	$ 674	$ 1,020	-19%	23%
Silica Price (+10%/-10%)	$ 609	$ 1,051	-27%	27%
Production Tonnes (+10%/-10%)	$ 611	$ 1,048	-26%	26%
Operating Cost (+10%/-10%)	$ 787	$ 872	-5%	5%

PRODUCTION TARGET

The Production Target is based on 68% Indicated Resources and 32% Inferred Resources. The study period is for a mine life estimated to be 25 years using an initial production rate of 3Mt per year for two years, followed by 5Mt per year for 23 years. These production rates require annual mining of 3.75Mt for two years, increasing to 6.25Mt for the following 23 years. The following chart illustrates the production schedule and the categories of Mineral Resources that form the basis for the Production Target.



CAPITAL COST

The capital cost estimate was based on conceptual engineering assessments for process and non-process infrastructure by external consultants and included use of relevant information from the GSPP. The capital cost estimate was completed to an accuracy of +/-35%. All capital components for the initial 3 Mt per year production rate and the additional capital for the upgrade to 5 Mt per year are presented in the chart below.

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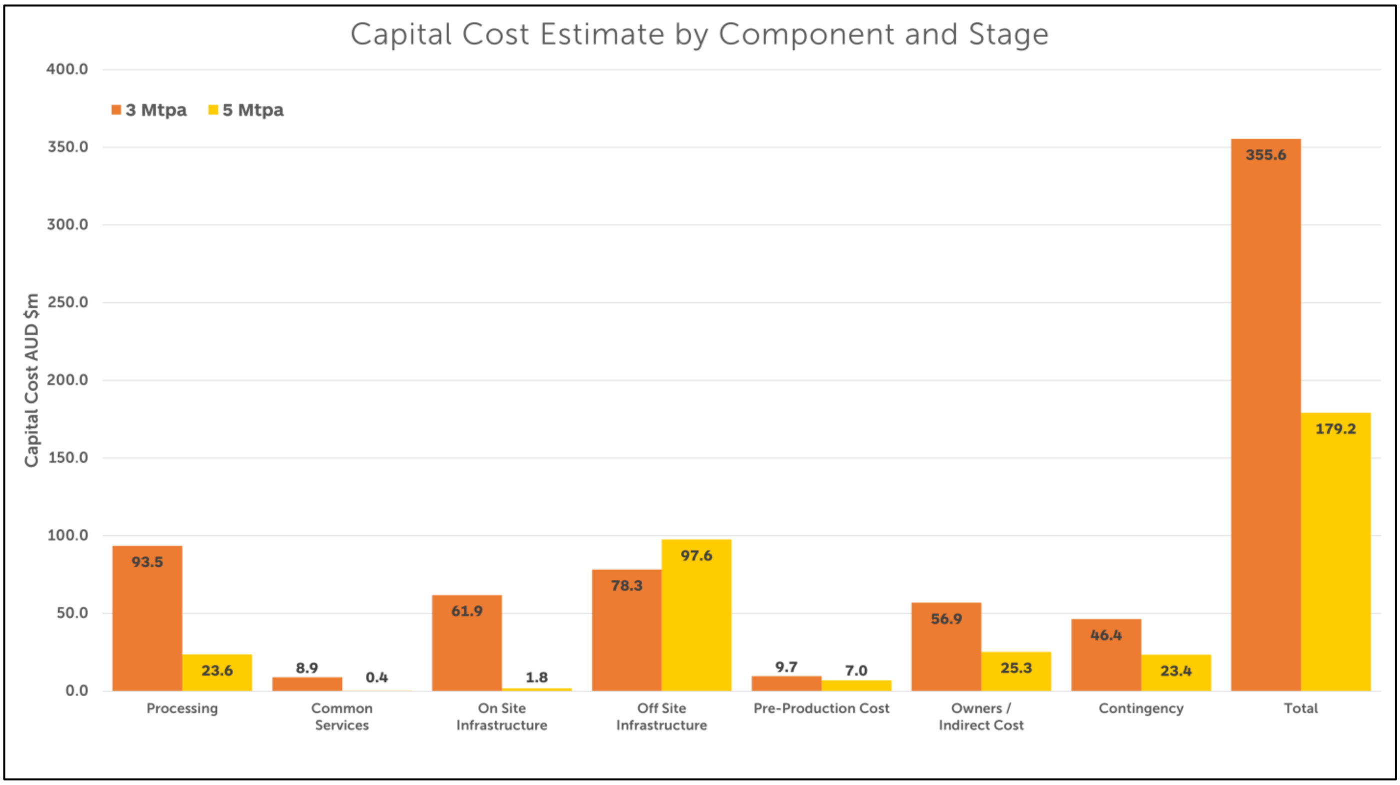
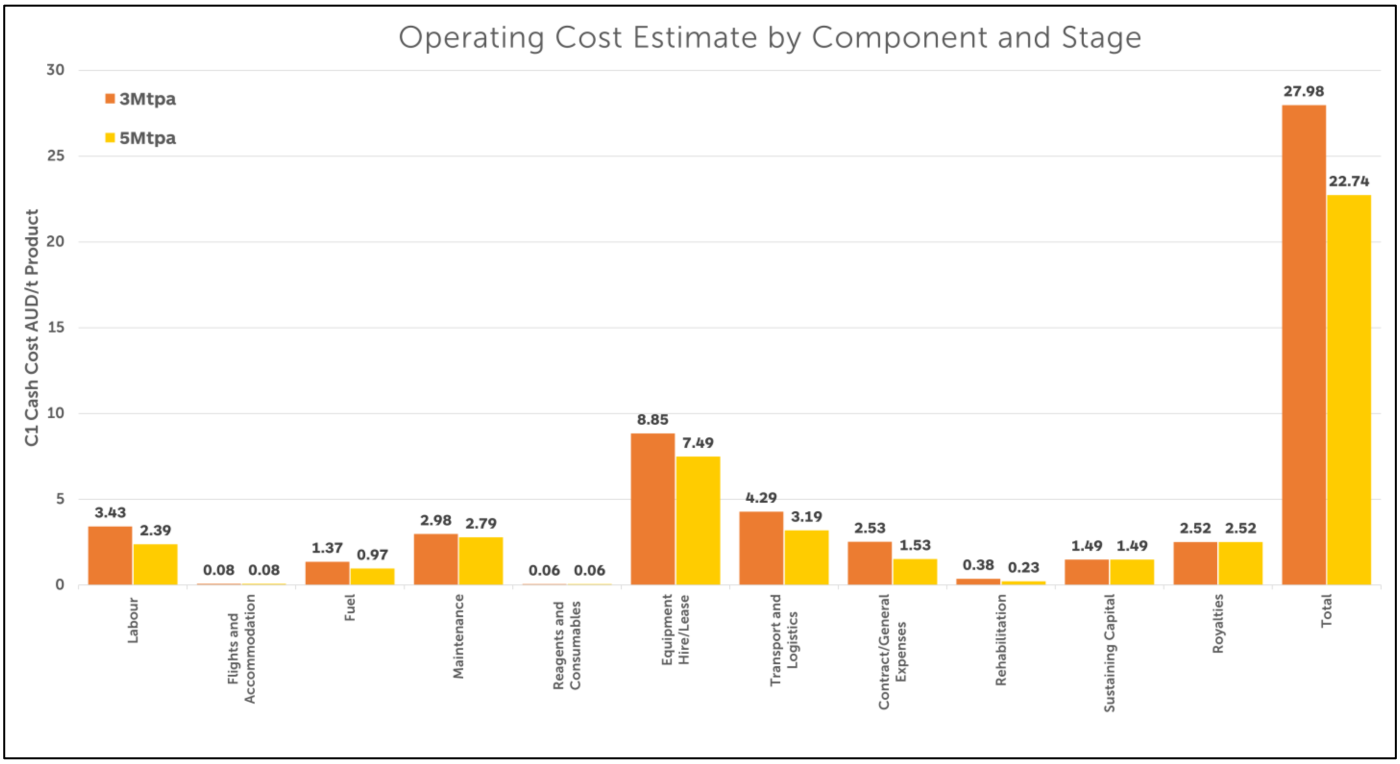


OPERATING COST

An operating cost estimate was prepared using benchmark data, previous PFS quality data generated for the GSSP, and specialist consultant input to meet and exceed the accepted quality standard for scoping studies. The operating cost estimate was completed to an accuracy of +/-35%.

All unit operating cost components for the initial 3 Mt per year production rate and the final 5 Mt per year production rate are presented in the chart that follows. The chart shows the approximate magnitude of the operating cost reductions when the production rate increases to 5 Mtpa. The average life of mine FOB cost is $27.40/t per tonne of product loaded onto a ship after inclusion of royalties and life of mine capital distribution.



PRICE ASSUMTPTION FOR USE IN PROJECT ECONOMIC MODEL

Diatreme market engagement indicates price variability between 500-600 RMB for PV grade silica product delivered major China ports inclusive of delivery costs to Port , subject to some price variability on actual receiving Port , ancillary local on costs and application of China VAT costs if deemed applicable.

This analysis, appropriate to scoping study use assumes pricing at the mid-range between the low and mid-case equivalent which equates to a **net received price of A$81 per tonne (FOB equivalent).**

For current Scoping Study purposes, the financial analysis model is based on net proceeds at the domestic loading point (Cape Flattery Port) FOB A$81 per tonne for net sales revenue with no escalation during life of mine.

Diatreme also notes:

- For the purposes of this financial analysis, Diatreme has netted shipping and related costs to arrive at an FOB (freight on board) equivalent revenue.
- Ancillary other marketing costs included in opex.
- Pricing appears under further upward pressure due to supply constraints.
- There is no established reference point for silica product pricing generally, so all price discovery is around engagement with end users and by nature is subject to final negotiations between the parties.
- All market engagement is at non-binding level only – Diatreme will progress these to more binding arrangements appropriately relative to the project’s advancement.

- Assumes 100% of product into China for purposes of the modelling – some variations in shipping costs to Japan and other Asian markets.
- Markets for PV grade product are smaller into Japan/Korea/Taiwan markets but there is appetite for product.
- Market risk diversification program into non-Chinese markets underway targeting other Asian and engagement with non-Asian markets.

FUNDING

The Scoping Study indicates the potential for a long-life project with strong economic outcomes. Diatreme anticipates the assembly of a structured project finance package to be readily available from traditional banking sources around the time of the Final Investment Decision (FID).

Diatreme is supported by its major cornerstone investors who have ensured the Company and the NSP received appropriate funding during the exploration and pre-development stages. These investors have shown interest in assisting with, and potentially participating in the ongoing project development costs, including participating in the funding for the capital required for project construction. The extent of the involvement of these shareholders in any future funding arrangements is subject to standard commercial evaluations as the project progresses and the success in achieving the permits and approvals required for the project to be implemented.

Leading global materials solutions leader Sibelco is a major shareholder in Diatreme and is a joint venture partner in the NSP. Sibelco's involvement is backed by a $35 million investment being made with an initial investment of $11 million and a second tranche of $24 million due for drawdown in December 2024.

The funds received from these investment tranches will be utilised by Diatreme and the joint venture to:

- Advance the development of the silica projects, maintain tenements, and meet ongoing obligations for exploration, permitting, economic studies and the approval and permitting processes.
- Maintain ongoing community obligations related to these activities.

RISK NOTE FUNDING

Regardless of the current intent of the Joint Venture partner and the apparent strength of the project fundamentals in the Scoping Study, there is no certainty that Diatreme will be able to secure the total funding required to implement the project when the full Feasibility Study is completed. Typical project development financing involves a combination of debt and equity. Funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's shares.

NEXT STEPS

Immediate priorities for the NSP include the following:

- Advancement of EIS preparation for public comment and determining final terms of reference.
- Concurrently undertaking EIS planning and relevant studies (water, flora, fauna, social impact etc).
- Advancing further project definitive studies and project enhancement analysis.
- Advancing various discussions with potential product offtakers.

CONCLUSION

The Scoping Study's strong results have led the Company to progress immediately to a full Feasibility Study suitable for a final investment decision. The NSP project has now become a key immediate development priority for the Company, with the NSP likely to become one of the world's major long term silica projects supplying high purity "low iron" glass sand to world markets for use in solar panel manufacturing.

The location of this project adjacent to a current large scale, long term silica mine reduces many of the risks associated with a greenfield mining project. In addition, Diatreme's joint venture with Sibelco offers a high degree of comfort around many other risk factors including funding, technology and market access.

Diatreme is expecting further upgrades to the NSP's Mineral Resources during 2023 and planning for bulk samples has commenced to deliver data for final process design and product quality specification. Sufficient samples will be produced from this testwork to provide potential customers with product samples representative of early production from the operation.

This announcement is authorised for release by the Board.

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About Diatreme Resources

Diatreme Resources (ASX:DRX) is an emerging Australian producer of mineral and silica sands based in Brisbane. Our key projects comprise the Northern Silica Project & Galalar Silica Sand Project in Far North Queensland, located next to the world's biggest silica sand mine at Cape Flattery.

In Western Australia's Eucla Basin, Diatreme's 'shovel-ready' Cyclone Zircon Project is considered one of a handful of major zircon-rich discoveries of the past decade.

Diatreme has an experienced Board and management, with expertise across all stages of project exploration, mine development and project financing together with strong community engagement skills.

Diatreme's silica sand resources will contribute to global decarbonisation by providing the necessary high-grade silica for use in the solar PV industry. The Company has a strong focus on ESG, working closely with its local communities and all other key stakeholders to ensure the long-term sustainability of our operations, including health, safety and environmental stewardship.

For more information, please visit www.diatreme.com.au

ASX releases referenced for this release:

- Permitting pathway advances for Northern Silica Project – 19 May 2023
- Quarterly Activities Report – 28 April 2023
- Major silica resource expansion from 124Mt to 235Mt – 13 March 2023
- Northern Silica Project potential resource expansion – 11 January 2023
- Sibelco completes 1st tranche investment in Cape Silica JV – 2 December 2022
- MOU Signed with Ports North on Northern Silica Project – 18 August 2022
- Mining Lease Applications Lodged for Northern Silica Project – 5 July 2022
- Galalar Maiden Ore Reserve, PFS delivers substantial boost to new silica sand mine – 9 November 2021

Diatreme confirms that it is not aware of any new information or data that materially affects the information included in the original releases and that all material assumptions and technical parameters underpinning the estimates in the original releases continue to apply and have not materially changed. Diatreme confirms that the form and context in which the competent person's findings are presented have not been materially modified from the original releases.

COMPETENT PERSONS STATEMENT

Exploration Targets & Exploration Results Statements

The information in this report that relates to Exploration Targets & Exploration Results is based on information compiled by Mr Frazer Watson, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy, and the Australian Institute of Geoscientists. Mr Watson is a full-time employee of Diatreme Resources Limited. Mr Watson has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resource and Ore Reserves'. Mr Watson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Where reference is made to previous releases of Exploration Results in this announcement, the Company confirms that it is not aware of any new information or data that materially affects the information included in those announcements and all material assumptions and technical parameters underpinning the exploration results included in this announcement continue to apply and have not materially changed.

The information in this report that relates to previous Exploration Results was prepared and first disclosed under the JORC Code 2012 and has been properly and extensively cross-referenced in the text to the date of the original announcement to the ASX.

Resource Statements

The information in this report that relates to Mineral Resources at the Si2 Resource is based on information, geostatistical analysis and modelling carried out by Mr Chris Ainslie, Project Engineer – Mining & Quarrying. Mr Ainslie is an employee of Ausrocks Pty Ltd and a Member of the Australasian Institute of Mining & Metallurgy and a Member of the Australian Institute of Geoscientists. Mr Ainslie worked under the supervision of Mr Carl Morandy, Mining Engineer who is Managing Director of Ausrocks Pty Ltd and a Member of the Australasian Institute of Mining & Metallurgy and Mr Brice Mutton, Senior Geologist who is an Associate of Ausrocks Pty Ltd and is a Fellow of the Australasian Institute of Mining & Metallurgy and a Fellow of the Australian Institute of Geoscientists. Ausrocks Pty Ltd have been engaged by Cape Silica Holdings Pty Ltd (CSHPL) to prepare this independent report and there is no conflict of interest between the parties. Mr Mutton has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity for which he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code). Mr Mutton consents to the inclusion in the report on the matters based on their information in the form and context in which it appears.

Where reference is made to previous releases of Mineral Resources in this announcement, the Company confirms that it is not aware of any new information or data that materially affects the information included in those announcements and all material assumptions and technical parameters underpinning the resource estimates included in this announcement continue to apply and have not materially changed.

The information in this report that relates to previous Mineral Resources was prepared and first disclosed under the JORC Code 2012 and has been properly and extensively cross-referenced in the text to the date of the original announcement to the ASX.

Scoping Study Summary

The information in this Scoping Study release is based on information compiled by Mr Phil McMurtrie, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Mr McMurtrie is a mining engineer and director of Tisana Pty Ltd (consulting to Diatreme Resources Limited). Tisana Pty Ltd has been engaged by Diatreme Resources Limited to prepare this scoping study summary. Mr McMurtrie has sufficient experience in the study, development, and operation of mineral and silica sand projects and consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

FORWARD LOOKING STATEMENTS

This document may contain forward looking statements. Forward looking statements are often, but not always, identified by the use of words such as "seek", "indicate", "target", "anticipate", "forecast", "believe", "plan", "estimate", "expect" and "intend" and statements that an event or result "may", "will", "should", "could" or "might" occur or be achieved and other similar expressions. Indications of, and interpretations on, future expected exploration results or technical outcomes, production, earnings, financial position, and performance are also forward-looking statements.

The forward-looking statements in this presentation are based on current interpretations, expectations, estimates, assumptions, forecasts and projections about Diatreme, Diatreme's projects and assets and the industry in which it operates as well as other factors that management believes to be relevant and reasonable in the circumstances at the date that such statements are made.

The forward-looking statements are subject to technical, business, economic, competitive, political and social uncertainties and contingencies and may involve known and unknown risks and uncertainties. The forward-looking statements may prove to be incorrect.

DISCLAIMER

Diatreme and its related bodies corporate, any of their directors, officers, employees, agents or contractors do not make any representation or warranty (either express of implied) as to the accuracy, correctness, completeness, adequacy, reliability or likelihood of fulfilment of any forward-looking statement, or any events or results expressed or implied in any forward-looking statement, except to the extent required by law.

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Other than as requested by law and the ASX listing Rules, Diatreme disclaims any duty to update forward-looking statements to reflect new developments.

REASONABLE BASIS FOR FORWARD LOOKING STATEMENTS

No Ore Reserve has been declared. The ASX release has been prepared in compliance with the JORC Code (2012) and the ASX Listing Rules. All material assumptions on which the Scoping Study Production Target and projected financial information are based have been included in this release and disclosed in the body of the announcement, and associated graphs and figures.

DIATREME
Resources

AUSTRALIAN SANDS. UNIVERSAL DEMAND.

NORTHERN SILICA SAND PROJECT

SCOPING STUDY SUMMARY– June 2023

Table of Contents

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DIATREME Resources

Table of Figures

List of Tables

EXECUTIVE SUMMARY

A. INTRODUCTION

A scoping level study has been completed for Diatreme Resources' Northern Silica Project (NSP) in Cape Flattery, Far North Queensland. The Scoping Study highlights the viability of the project to produce and export a "low iron" high purity silica product, also known as "PV Grade Silica", identified as a critical mineral by the Queensland Government. The project includes extraction, processing, transportation and supporting infrastructure.

Capital and operating costs have been costed for the two progressive production scenarios, 3 million tonnes per annum (Mtpa) and 5 Mtpa, reflecting the project's planned phased implementation.

An economic evaluation has been conducted on the base case scenario of the project, resulting in a robust development case and attractive economics.

The project is based on a largely "standalone" development option with planned port infrastructure (logistics wharf and wharf extension) developed within the Port of Cape Flattery limits. The development would substantively increase the export capacity of PV grade critical mineral silica sand from the existing port precinct, providing important economic opportunities regionally. The project will also provide important jobs and business development opportunities directly to local communities.

B. PROJECT DESCRIPTION

The project will be a greenfield open cut mining operation with an onsite processing facility that will produce and export saleable silica sand product. The project considers an initial target production of 3 Mtpa of silica sand for a 25 year mine life, with a production expansion to 5 Mtpa of silica sand after two years of operation.

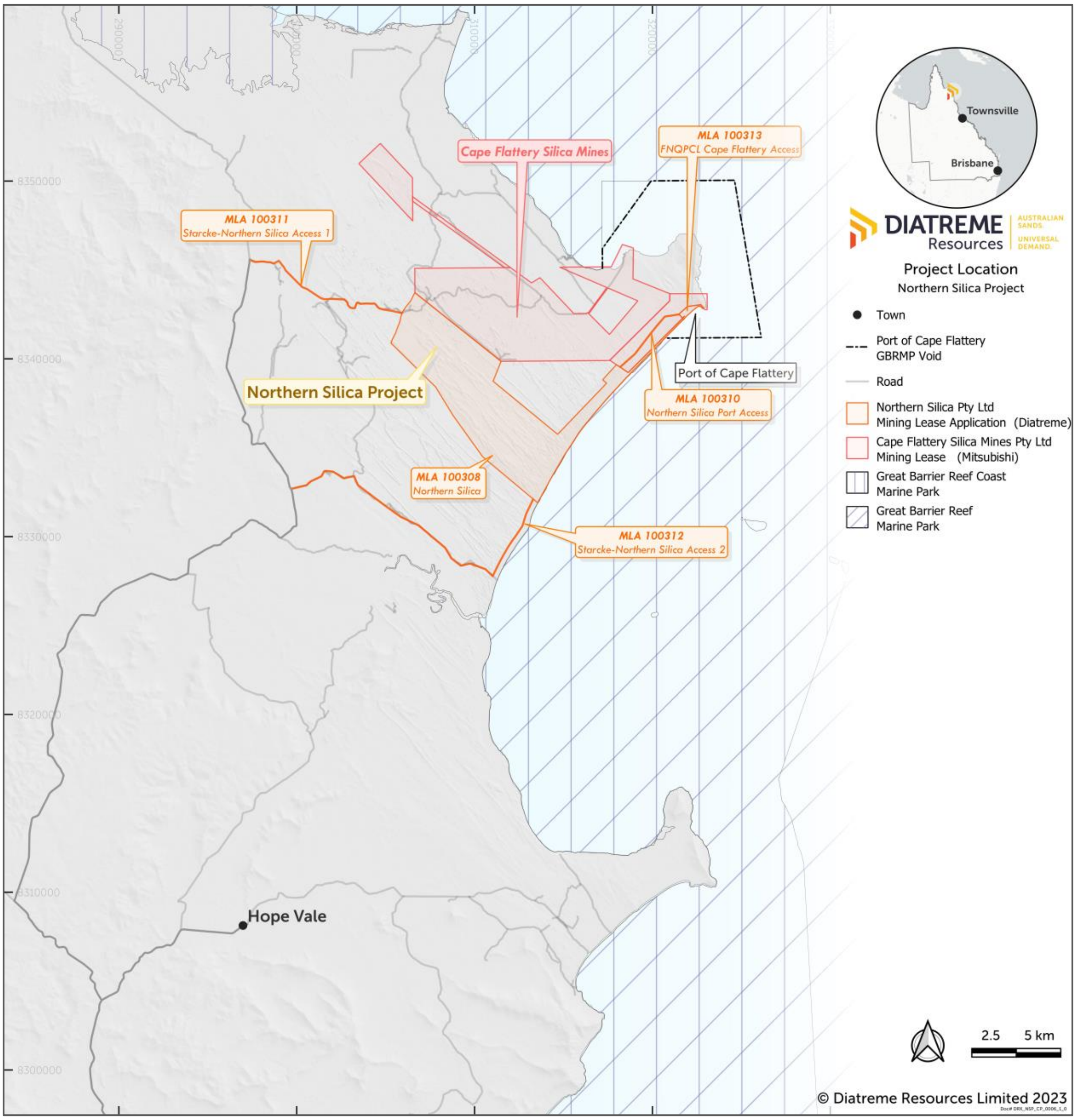
The project will consist of the following components:

- Camp and Admin infrastructure area (described as Camp location)
- Mine extraction areas and associated mine infrastructure area (jointly described as the Processing and Infrastructure Area)
- Stockpile area
- Site access road from Mount Webb – Wakooka Rd – this includes the Designated Mine Access between the western limit of the ML and the intersection with the gazetted Mount Webb - Wakooka Road and other roads west to Hope Vale
- Port infrastructure at Port of Cape Flattery for transhipment operations during the early years followed by a direct loadout facility.

C. LOCATION, OWNERSHIP AND TENURE

The NSP is located in the Hope Vale Aboriginal Shire in the vicinity of Cape Flattery, Far North Queensland. The project area encompasses the area around the silica sand mining operation of Cape Flattery Silica Mines which adjoins the Cape Flattery Port. (Refer Figure below)

Figure 0-1 - Project Location



The NSP comprises MLA100308, MLA 100310, MLA 100313, MLA 100311 and MLA 100312, the details of which are shown in the following tables. The project covers 529 sq km, comprising 49 sq km (4890 ha) of mining lease with the remainder being exploration tenement.

Table 0-1 - Tenement Schedules

Lease	Purpose	Ownership
MLA 100308 Northern Silica	Mining, Processing, with Infrastructure supporting both Northern Silica and Casuarina Silica leases.	100%
MLA 100310 Northern Silica Port Access	Access to port across Mitsubishi granted ML.	100%
MLA 100313 FNQPCL Cape Flattery Access	Lease over the Ports North Freehold Leases.	100%
MLA 100311 Starcke-Northern Silica Access 1	Shortest possible access form Starke Road to Northern Silica Project and camp.	100%
MLA 100312 Starke-Northern Silica Access 2	Backup access to NSP and Casuarina Silica.	100%

D. INVENTORY AND MINING

Regional exploration commenced In March 2019. Results have confirmed the existence of high purity silica sand in most target areas, with favourable SiO_2 percentages.

A JORC (2012) resource estimate for the project has been prepared by an independent third party Ausrocks, with a resource estimate table provided below.

Table 0-2 - Si2 Resource – Upgraded Mineral Resource Estimate – February 2023

JORC Resource Category	Silica Sand (Mt)	SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	Al_2O_3 (%)	LOI (%)	Total (%)	Silica Sand (Mm^3)	Density (t/m^3)	Cut-off Grade SiO_2 (%)
Indicated	103	99.31	0.10	0.14	0.09	0.13	99.83	65.0	1.6	98.5
Inferred	132	99.27	0.11	0.15	0.12	0.17	99.90	82.0	1.6	98.5
Total	235	99.29	0.11	0.15	0.11	0.15	99.87	147.0	1.6	98.5

A fleet of 988 Wheel Loaders will serve as the primary production unit for loading directly from the mine face to the feed unit. The loading process will be carried out from floor level. The extraction procedure will involve varying the loading zone across a face width, ensuring that the extraction area does not form a convex shape.

The mining face height is generally less than 12m, which is considered low risk at angles below 40 degrees. However, for mining operations where the operating face height exceeds 12m, appropriate face slope stability procedures will be implemented to mitigate the risk of collapse. The height will be monitored during the ongoing operation and optimised where necessary for ongoing safe operations.

E. METALLURGICAL TESTWORK

The metallurgy program for the NSP Scoping Study has been limited to metallurgical characterisation of four composite samples from exploration drilling. The drill samples were composited from different geological zones of the area drilled for the Si2 mineral resource evaluation as part of the Scoping Study.

The Scoping Study characterisation testwork demonstrated that Sample 1, Sample 3 and Sample 4 all achieved the target Fe2O3 grade of 120ppm without magnetic separation and the average grade of the samples is likely to achieve the target product grade using commercial scale equipment. Three samples achieved 110ppm or lower after magnetic separation.

Table 0-3 - Metallurgical Characterisation Summary

	Fraction	% wt to feed	SiO_2 %	Al_2O_3 ppm	Fe_2O_3 ppm	TiO_2 ppm
Sample 1	-710+106µm	96.4	99.5	1020	1220	1960
	gravity float (-2.7sg)	95.9	99.9	330	110	150
	attritioned product (+106µm)	95.6	99.9	310	100	140
	non-magnetic product	94.8	99.9	310	100	140
Sample 3	-710+106µm	95.2	99.5	880	1020	1600
	gravity float (-2.7sg)	94.8	99.9	350	130	170
	attritioned product (+106µm)	94.2	99.9	320	110	150
	non-magnetic product	93.3	99.9	310	100	150
Sample 4	-710+106µm	97.7	99.7	700	570	870
	gravity float (-2.7sg)	97.5	99.9	260	140	150
	attritioned product (+106µm)	96.9	99.9	260	120	150
	non-magnetic product	95.9	99.9	250	110	150
Sample 5	-710+106µm	97.5	99.6	800	860	1250
	gravity float (-2.7sg)	97.2	99.9	340	230	180
	attritioned product (+106µm)	96.3	99.9	310	200	160
	non-magnetic product	90.6	99.9	310	190	160

F. MINERALS PROCESSING

For minerals processing, CDE were tasked with the development and design of the process plant. CDE previously completed this work for the Galalar Silica Sand Project (GSSP) which was completed in 2021. This information was used as the basis for the NSP's plant design.

The NSP's proposed mine infrastructure and plant incorporates all necessary fixed and mobile infrastructure necessary to operate the mine. These are greenfield sites with no existing infrastructure. All necessary plant and infrastructure will be mobilised to the site during the construction phase.

The mineral processing is divided into four units:

- Mobile Mining Unit (MMU)
- Fixed Silica Processing Plant (SPP)
- Fixed Dewatering Plant and
- Field Mobile Reject Sand Stacking Unit (Tailings Unit)

The 3 Mtpa plant essentially consists of two parallel trains of equipment desliming, sizing and removing high density contaminants with a common tailings treatment system. The 5 Mtpa plant is a single processing train with identical equipment and processes to one of the 3 Mtpa trains and a separate tailings treatment system.

Figure 0-2 - Proposed NSP 3 Mtpa Processing Plant Layout

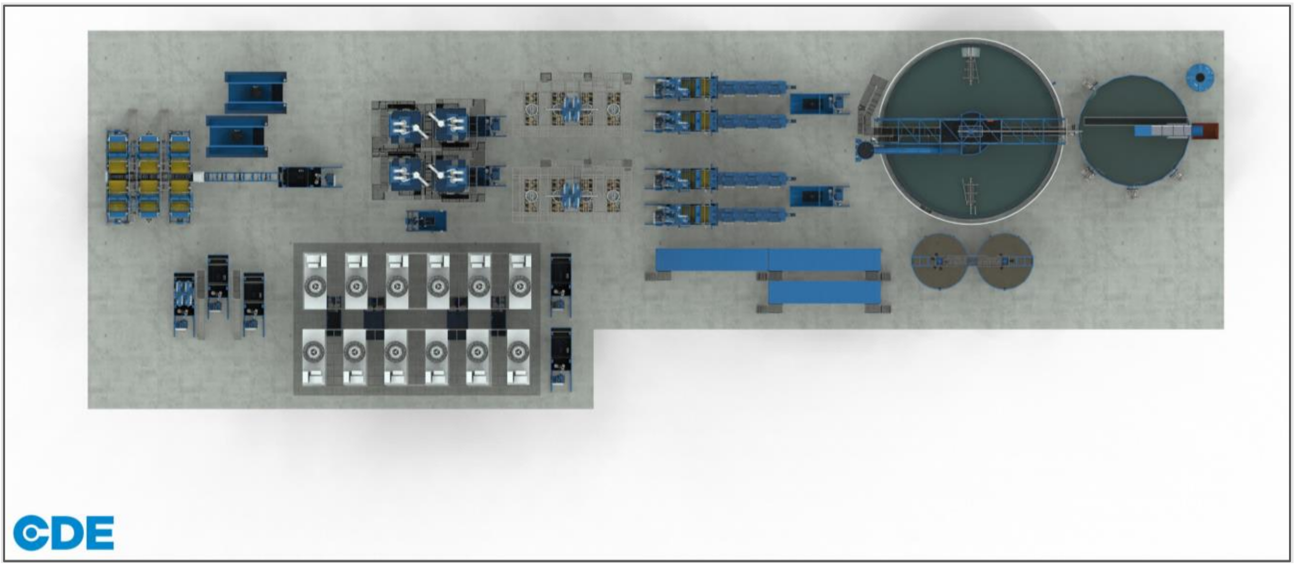
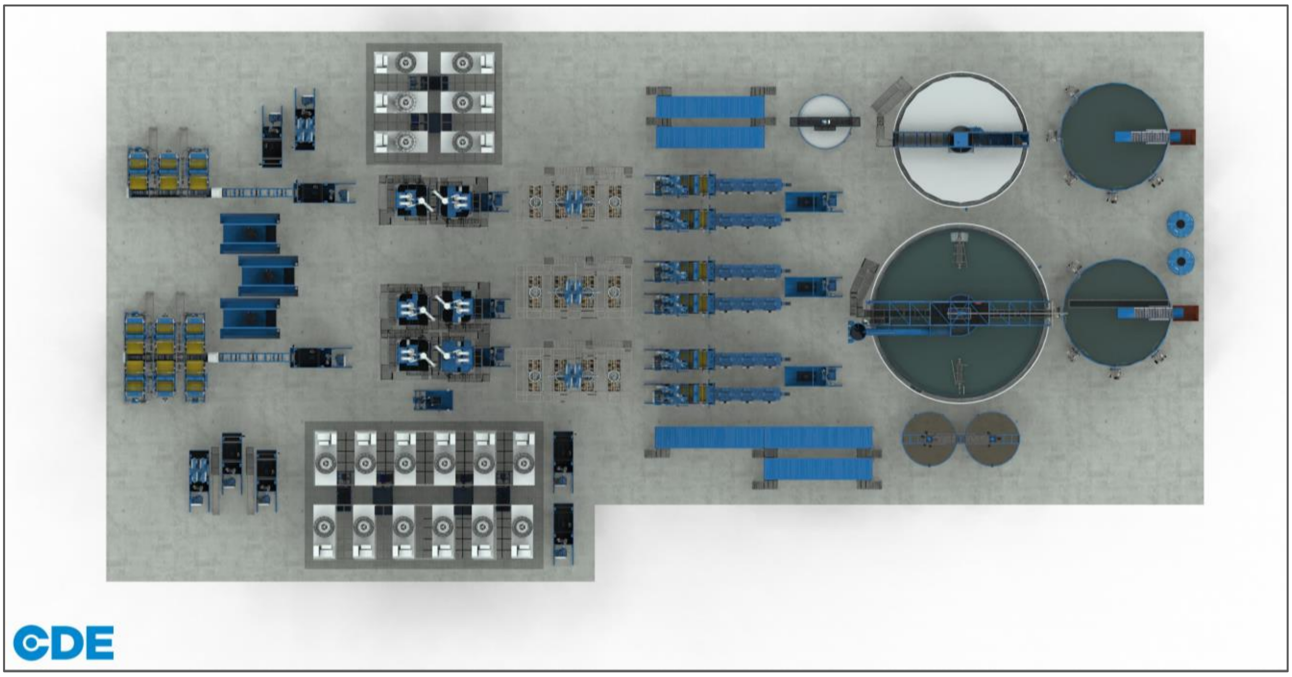


Figure 0-3 - Proposed NSP 5 Mtpa Processing Plant Layout



G. INFRASTRUCTURE AND LOGISTICS

Infrastructure engineering was completed by independent engineering firm Wave International (Wave). Wave also completed work on Diatreme's GSSP PFS and utilised previous learnings as a basis of design and to complement the NSP Scoping Study.

The proposed infrastructure design by Wave includes: all infrastructure post processing and relevant support infrastructure for mine and plant operations, which include but were not limited to site access roads, product stockpile, and port infrastructure.

The project requires a number of roads for access to site as well as interconnecting key infrastructure components. Four key roads were identified as shown below.

Table 0-4 - Site Access Roads

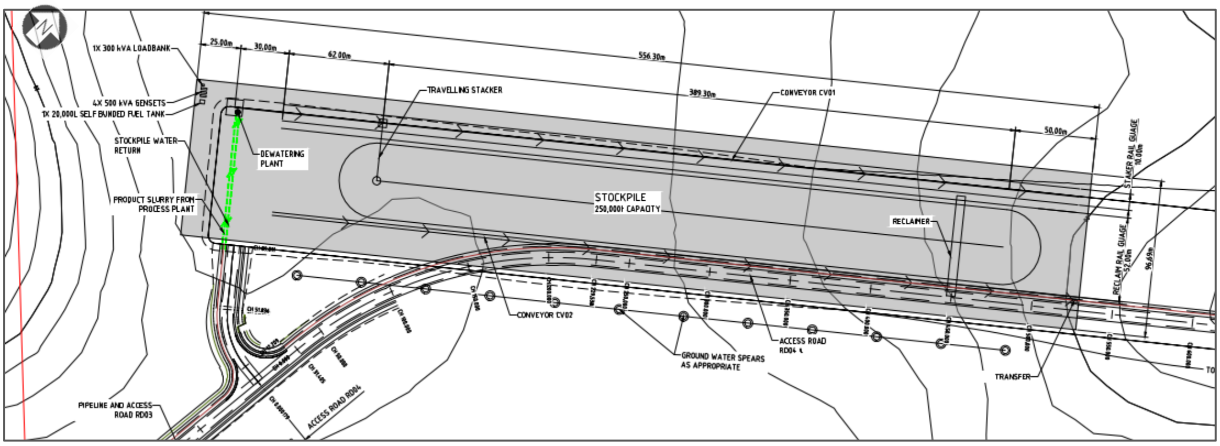
Road	Description
Site Access Road A (RD01)	10.8 km road providing access from Wakooka Road to the accommodation village.
Mine Access Road (RD02)	5.2 km road joining the site access road, connecting the accommodation village to the process plant and MIA.
Pipeline Access Road (RD03)	10 km road running parallel to the pipeline from the process infrastructure area to the stockpile area.
Conveyor Access Road (RD04)	5.7 km road running parallel to the conveyor from the stockpile area to the marine infrastructure facility.

Product from the minerals processing plant will be piped to the stockpile area. The stockpile area is situated at the discharge point of the product pipeline and intake feed of the overland conveyor system. The stockpile area consists of the dewatering plant, stacker and reclaimer and associated materials handling conveyors.

The dewatering plant will dewater the product and sends it to the stacker. Then as the stockpile propagates and grows it will further dewater naturally with reclaimed water sent back to the processing plant.

Once an ocean-going vessel (OGV) is ready to load, the materials handling system consisting of a reclaimer and conveyors will transport the product to the port facility.

Figure 0-4 - Stockpile General Arrangement



The port infrastructure area facilitates product movement from Diatreme's lease via material handling equipment to the marine loadout.

The port facility will be developed in two phases as follows (Figure 0-5):

- Phase 1 – Production of 3,000,000t per annum. Transhipping via 8,500t barge to 55,000t vessel moored within the Port of Cape Flattery.
- Phase 2 - Production of 5,000,000t per annum. Direct loading from jetty to a 55,000t vessel docked at a wharf.

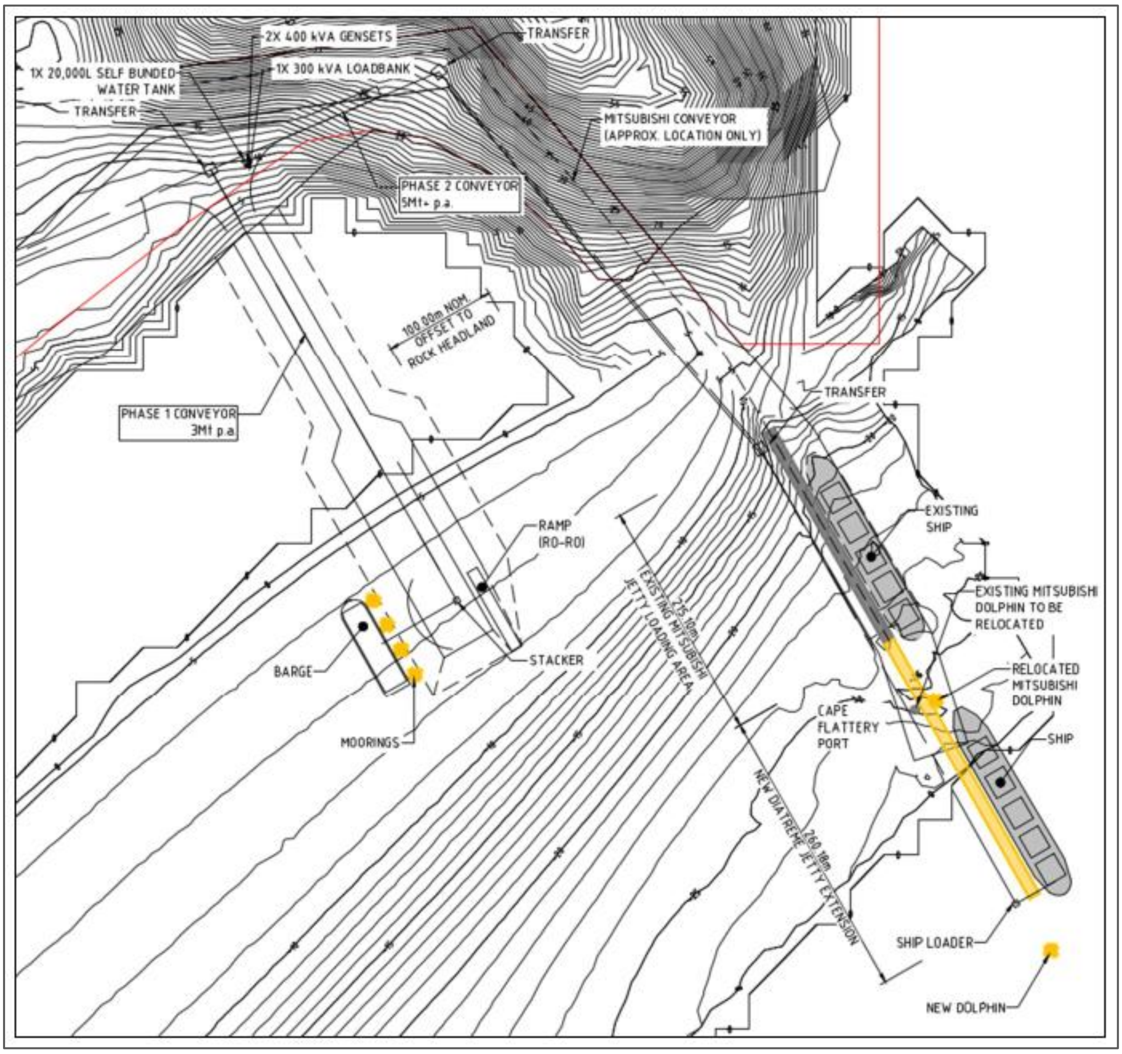
The initial (3 Mtpa) operational concept is to transfer the product via a rock wharf mounted conveyor system out-loading to barges. The product will then be transhipped to bulk carriers anchored at the existing wharf. A concrete roll on - roll off (RORO) logistics access has been incorporated into the rock wharf structure, allowing for additional port logistics access for mining operations.

The phase 2 (5 Mtpa) conceptual design will tie into the existing PN jetty arrangement using a jetty extension and ship loading facility. The conceptual design allows for bulk carriers with 55,000t capacity, to moor directly to the jetty, adjacent to the ship loader.

This will be achieved by tying into the existing Ports North jetty arrangement, extending Diatreme's conveyor system and extending the wharf. The wharf will be constructed using piled foundations with an elevated steel truss superstructure, supporting the conveyor system feeding to the ship loader.

Diatreme is already engaged with Ports North and has formed a technical committee to assess port engineering options to accommodate the product from the NSP. This process includes evaluation of funding options, ownership of construction, future maintenance and operation.

Figure 0-5 - Port General Arrangement Concept



H. CAPITAL COST ESTIMATE

A capital cost estimate (CAPEX) was prepared based on engineering development for process and non-process infrastructure by external consultants and historical information from the GSSP.

The capital cost estimate includes all direct (process and non-process infrastructure) costs, indirect (owners and other) costs, contingency and other allowances. The table below provide a summary of the capital cost estimate for the project. Note that all costs provided in this section are in $AUD.

The estimate is presented to show the initial cost of the 3 Mtpa high grade silica plant with transhipping operation, the cost to expand to a 5 Mtpa operation (inclusive of port cost by Diatreme) and the final cost of the 5 Mtpa operation.

The capital cost estimate is considered qualitatively to have an accuracy of nominally +35% / -35%

Table 0-5 - Capital cost estimate summary by WBS

WBS	WBS L1 CODE and DESCRIPTION	3 Mtpa	5 Mtpa Expansion	5 Mtpa
1000	Mining	$ -	$ -	$ -
2000	Processing	$ 93,500,000	$ 23,600,000	$ 117,100,000
5000	Common Services	$ 8,900,000	$ 400,000	$ 9,300,000
6000	On Site Infrastructure	$ 61,900,000	$ 1,800,000	$ 63,700,000
7000	Off Site Infrastructure	$ 78,300,000	$ 97,600,000	$ 175,900,000
8000	Pre-Production Cost	$ 9,700,000	$ 7,000,000	$ 16,700,000
9000	Owners / Indirect Cost	$ 56,900,000	$ 25,300,000	$ 82,200,000
	Subtotal	**$ 309,200,000**	**$ 155,800,000**	**$ 465,000,000**
	Contingency	$ 46,400,000	$ 23,400,000	$ 69,800,000
	Total	**$ 355,600,000**	**$ 179,200,000**	**$ 534,800,000**

I. OPERATING COST ESTIMATE

An operating cost estimate (OPEX) was prepared, underpinned by historical benchmark data, consultant input, and capital estimates for the project. The tables below summarise the Scoping Study level operating cost for the production of high-grade silica at 3 and 5 Mtpa respectively.

Table 0-6 - Operating Cost Estimate Summary (3 Mtpa)

OPERATING COST SUMMARY 3 Mtpa			
Item	**AUD/y**	**AUD/t Prod**	**AUD/t Ore**
Labour	$ 10,300,000	$ 3.43	$ 2.74
Flights and Accommodation	$ 400,000	$ 0.08	$ 0.07
Fuel	$ 4,100,000	$ 1.37	$ 1.10
Maintenance	$ 8,900,000	$ 2.98	$ 2.38
Reagents and Consumables	$ 200,000	$ 0.06	$ 0.05
Equipment Hire/Lease	$ 26,500,000	$ 8.85	$ 7.08
Transport and Logistics	$ 12,900,000	$ 4.29	$ 3.43
Contract/General Expenses	$ 7,600,000	$ 2.53	$ 2.02
Sustaining Capital	$ 7,400,000	$ 1.49	$ 1.19
Total	$ 78,300,000	$ 25.07	$ 20.06

Table 0-7 - Operating Cost Estimate Summary (5 Mtpa)

OPERATING COST SUMMARY 5 Mtpa			
Item	AUD/y	AUD/t Prod	AUD/t Ore
Labour	$ 12,000,000	$ 2.39	$ 1.91
Flights and Accommodation	$ 400,000	$ 0.08	$ 0.07
Fuel	$ 4,900,000	$ 0.97	$ 0.78
Maintenance	$ 14,000,000	$ 2.79	$ 2.23
Reagents and Consumables	$ 300,000	$ 0.06	$ 0.05
Equipment Hire/Lease	$ 37,500,000	$ 7.49	$ 5.99
Transport and Logistics	$ 16,000,000	$ 3.19	$ 2.56
Contract/General Expenses	$ 7,700,000	$ 1.53	$ 1.22
Sustaining Capital	$ 7,400,000	$ 1.49	$ 1.19
Total	**$ 100,200,000**	**$ 19.99**	**$ 15.99**

J. ECONOMIC ANALYSIS

Based on the capital and operating cost estimates prepared, a financial model has been developed to evaluate the project economics. The base case was evaluated and is summarised in the following table. The economics of this Scoping Study are considered substantive enough to continue investment in further project development and more definitive feasibility studies.

Table 0-8 - Summary of Financial Return of NSP

Economic Metric		Amount
NPV (pre-tax)	A$m	1,410
IRR (pre-tax)	%	33%
NPV (post-tax)	A$m	830
IRR (post-tax)	%	32%
WACC	%	10%
Payback Years	years	6
Mine Life	years	25
LOM Net Revenue	A$m	9,783
LOM Opex	A$m	2,298
LOM Sustaining Capex	A$m	180
Initial Capex	A$m	535
Sales Price (FOB)	A$/t	81
Shipping and Marketing	A$/t	24
FOB Cost	A$/t	27.40

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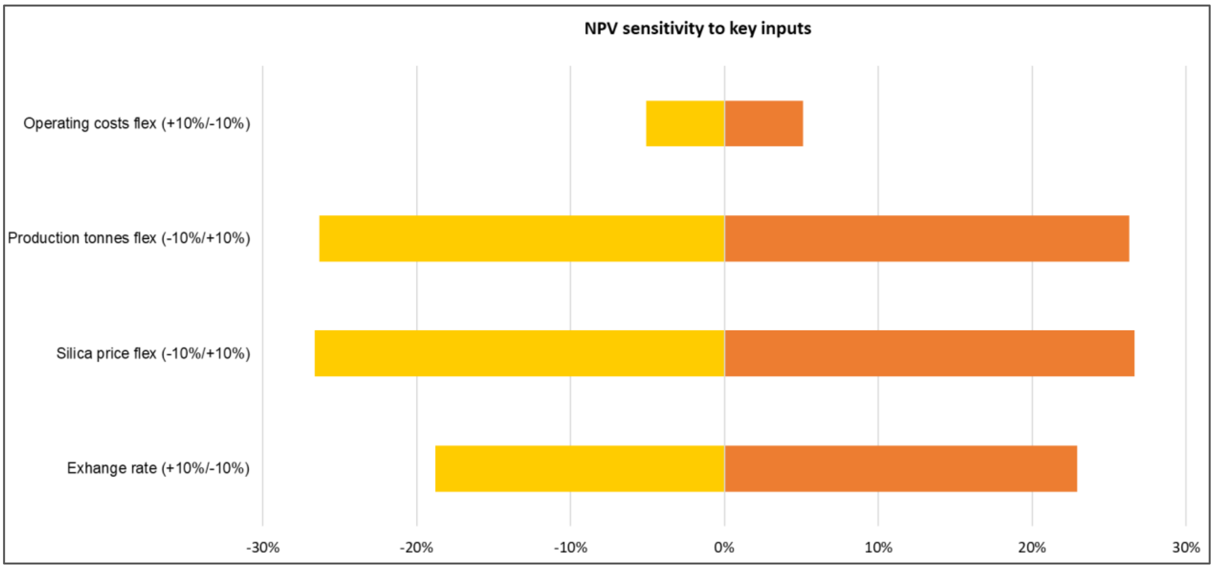
Figure 0-6 - NPV Sensitivities



K. FORWARD WORK

The future work plan highlights key activities required prior to or during the next phase of project development. These items have been considered based on the project implementation timeline and identified risks and opportunities.

The following key forward work items have been identified during the Scoping Study as:

1. Ongoing engagement with port stakeholders
2. Commencement of Pre-Feasibility Study followed by Definitive Feasibility Study
3. Ongoing engagement and consultation with local communities and local stakeholders
4. Completion of further exploration and resource updates – Infill drilling and resource expansion
5. Progression of metallurgical testwork programs
6. Commencement of geotechnical and hydrogeological studies
7. Establishment and commencement background environmental monitoring
8. Impact assessments as part of the EIS process – Air and Noise, Aquatic Ecology, Coastal Environment, Cultural Heritage, Groundwater, Landscape and Visual, Social, Soils and Geology, Surface Water and Flooding, Terrestrial Ecology and Transport.
9. Negotiate Mining Project Agreement (MPA) with underlying landowners and Cultural Heritage Management Agreement with native title holders.
10. Public notification of various project development documents such as the Terms of Reference and EIS.

1 INTRODUCTION

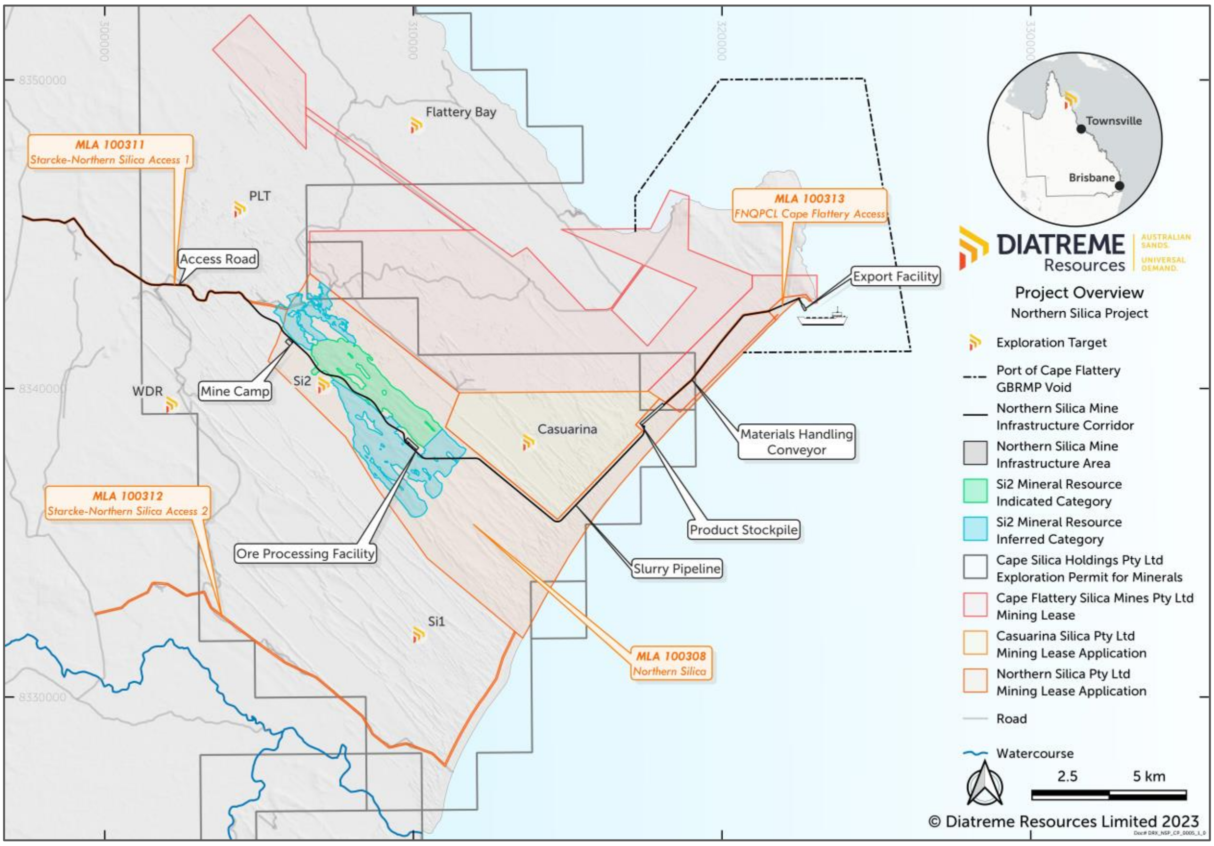
1.1 PROJECT DETAILS

The NSP will include an open cut mining operation and an onsite processing facility that will produce saleable silica sand product. The Scoping Study considers initial target production of 3 Mtpa of silica sand for a 25 year mine life. The Company is progressing its permits and approvals on the basis that the project will expand to the production of 5 Mtpa of silica sand during that period.

The project will consist of the following components:

- Camp and Admin infrastructure area (described as Camp location)
- The mine extraction areas and associated mine infrastructure area (jointly described as the Processing and Infrastructure Area)
- Stockpile area
- Site access road from Mount Webb – Wakooka Rd – this includes the designated mine access between the western limit of the ML and the intersection with the gazetted Mount Webb - Wakooka Road and other roads west to Hope Vale
- Port infrastructure at Port of Cape Flattery for transhipment operations during the early years followed by direct loadout facility.

Figure 1-1 - Project Details



2 SCOPE AND METHODOLOGY

2.1 OBJECTIVES

The scope of this study is to complete an initial evaluation of the feasibility of the Northern Silica Project. The study is intended to be a Scoping Study as defined by AusIMM, comprising of the following elements:

- Resource summary (Indicated and Inferred)
- Class 5 capital cost estimate (underpinned by appropriate engineering).
- Class 5 operating cost estimate (underpinned by appropriate engineering).
- Economic evaluation based on the above items.

The specific scope completed as part of this Scoping Study is as follows:

- To review and update relevant previous work completed on the project from GSSP.
- To incorporate, where relevant, additional data from ongoing Diatreme's metallurgical testwork programs.
- To utilise the process flowsheet developed during the GSSP for the process plant.
- To develop the integration of renewable energy supply into the project.
- To complete an options study on key items: contracting methodology, product specification, stockpile location, site access and port facilities.
- To develop conceptual layouts for the process infrastructure.
- To develop conceptual layouts for the non-process infrastructure.
- To develop a capital cost estimate for the project.
- To develop an operating cost estimate for the project.
- To develop a financial model for the project and evaluate project economics.

The Scoping Study is undertaken to a level of accuracy and using methods in accordance with the guidelines provided in publications by the Australasian Institute of Mining and Metallurgy (AusIMM).

3 LOCATIONS, OWNERSHIP AND TENURE

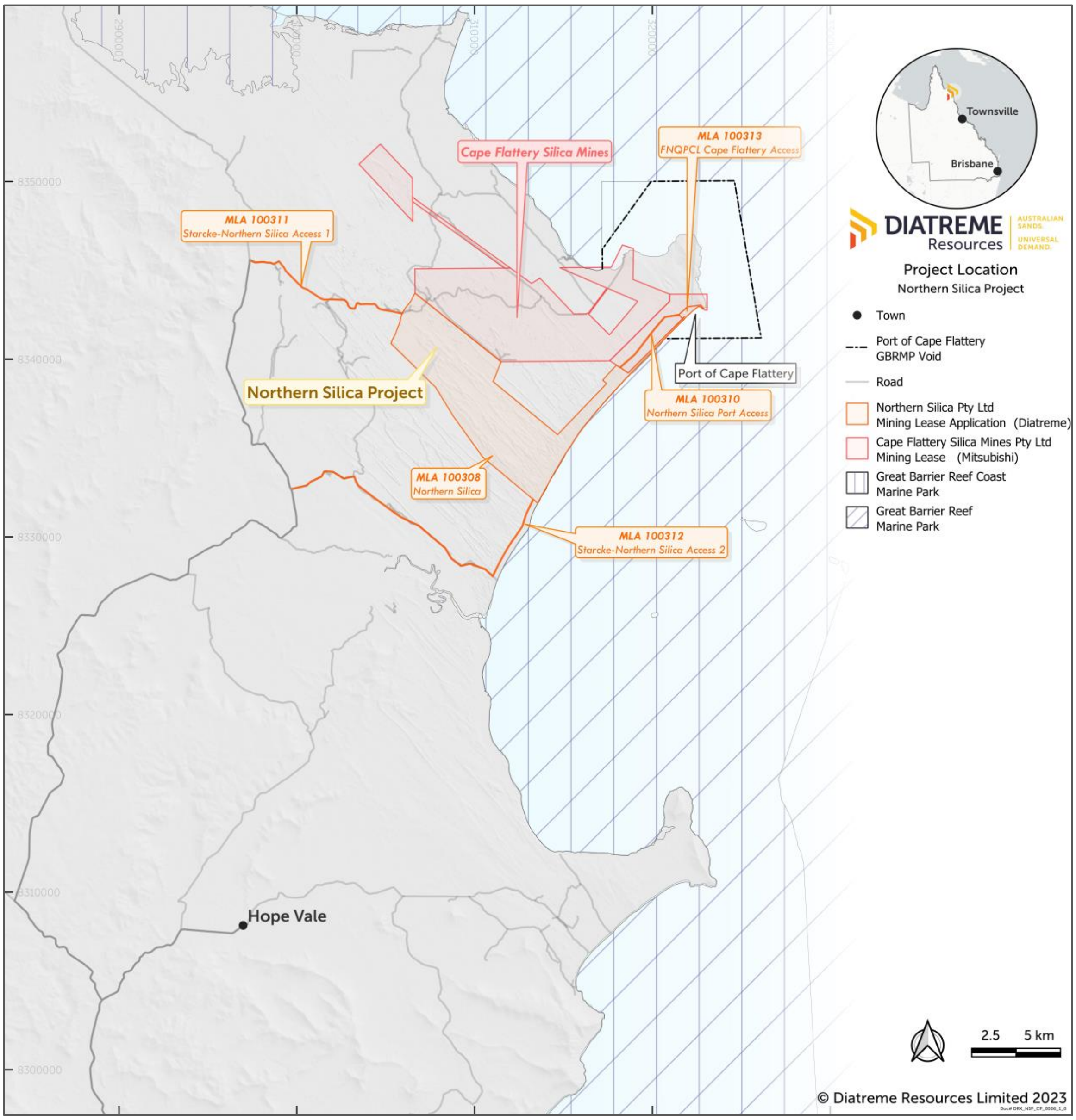
3.1 LOCATION

The Northern Silica Project is located in the Hope Vale Aboriginal Shire in the vicinity of Cape Flattery, Far North Queensland. The project area encompasses the area around the silica sand mining operation of Cape Flattery Silica Mines which adjoins the Cape Flattery Port.

Cape Flattery is a regional area serviced by the local communities of Hope Vale and Cooktown and the major regional city of Cairns. Road access to the project site from Cooktown and Hope Vale is via the Cooktown McIvor River Road. Air access is only by helicopter from Cooktown or Cairns and marine access is from Cooktown and Cairns ports.

Figure 3-1 shows the project location and surrounding area details, including key features relevant to the NSP.

Figure 3-1 - Project Location



The following image is a photo captured of the project area including the port facilities.

Figure 3-2 - Cape Flattery Port with NSP in Background

(Source: Diatreme Resources)

3.2 CLIMATE

Cape Flattery's climate is described as tropical savanna with warm temperatures throughout the year during both the wet and dry seasons. Mean maximum daily temperatures range from 26.6°C in July to 32.6°C in December. The wet season is from December to March.

Cape Flattery has average rainfall of 1366mm per annum with 73% occurring during the wet season. The area is subject to monsoonal influences from the Coral Sea with the wettest month being March, which accounts for 26% of the rainfall. The area is subject to average wind gust of 22.3 km/h with maximum wind gusts reaching 167 km/h in March.

3.3 STAKEHOLDERS

3.3.1 WALMBAAR ABORIGINAL CORPORATION

Walmbaar Aboriginal Corporation is the registered native title body corporate holding native title rights over an area of some 158 sq km, being the vast majority of MLA 100308. Native title was determined in 1997. Walmbaar holds the native title rights and interests for members of the Dingaal clan group. In addition, it jointly holds the interests over Country shared by Dingaal and Nguurrumungu together with Hopevale Congress. Of relevance to NSP:

- Walmbaar hold native title rights over most of MLA 100308
- Walmbaar is negotiating a Cultural Heritage Management Agreement with Diatreme
- Walmbaar will receive negotiated benefits from the NSP

3.3.2 HOPEVALE CONGRESS ABORIGNAL CORPORATION

Hopevale Congress Aboriginal Corporation is a representative body of native title holders encompassing an area of some 1100 sq km (Lot 35 SP232620) and includes parts of MLA 100308. Native title was determined in 1997. Within MLA 100308, Congress holds native title rights and interests for Nguurruumungu, and jointly with Walmbaar the interests over shared Dingaal and Nguurruumungu Country. With EPM 17795, Congress represents the native title interests of Dharppa, Thanil, Gulaal, Nguurruumungu and Dingaal/Nguurruumungu (jointly) clan areas.

In December 2011, the former Deed of Grant in Trust in the Hope Vale area was converted to Aboriginal Freehold land under the Aboriginal Land Act 1991 (Qld) and transferred to Hopevale Congress to hold in trust for the people particularly concerned with the land. Congress is the trustee of the land on which the NSP is proposed.

Of relevance to the NSP:

- Congress holds native title over most of EPM 17795 and Aboriginal Freehold over all of EPM 17795
- Congress has signed a Compensation and Conduct Agreement and Cultural Heritage Management Agreement with Diatreme
- Congress will receive royalties from the NSP as landowner
- Congress will receive negotiated benefits from the NSP

3.3.3 PORTS NORTH, CAPE FLATTERY SILICA MINES AND METALLICA MINERALS LIMITED

Diatreme is in consultation with other stakeholders in the immediate region including, Ports North as the owner of the Cape Flattery Port, Cape Flattery Silica Mines (CFSM) which is also the operator of the port, and Metallica Minerals Limited which is developing a silica sand project to the north and east of CFSM.

In August 2022, Diatreme and Ports North entered into a Memorandum of Understanding (MOU) to advance discussions on the use of the Cape Flattery Port for ship loading operations for the project.

3.4 PERMITTING

The Northern Silica Project comprises MLA 100308, MLA 100310, MLA 100313, MLA 100311 and MLA 100312, the details of which are shown in the following tables. The project covers 529 sq km, comprising 49 sq km (4890 ha) of mining lease with the remainder being exploration tenement.

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MLA 100311 Starcke-Northern Silica Access 1	Shortest possible access form Starke road to Northern Silica Project and camp.	100%
MLA 100312 Starke-Northern Silica Access 2	Backup access to NSP and Casuarina Silica.	100%

3.5 OTHER PERMITS

Diatreme also holds additional tenements as shown in Table 3-2.

MLA 100309 "Casuarina Silica" will be developed for future inclusion in the NSP, but for the purpose of the Scoping Study will be excluded. MLA 100235 "Galalar" and MLA 100285 "Nob Point Barge Ramp" are part of Diatreme's GSSP, currently at DFS stage.

Table 3-2 - Other Diatreme Tenements

Lease	Purpose	Ownership
EPM 27265 Gubbins	Exploration tenement contiguous with EPM 17795	100%
EPM 27430 McIvor	Exploration tenement contiguous with EPM 17795	100%
MLA 100309 Casuarina Silica	Separated Lease with infrastructure areas noted	100%
MLA 100235 Galalar	Mining Lease Application located within same exploration tenements	100%

4 INVENTORY AND MINING

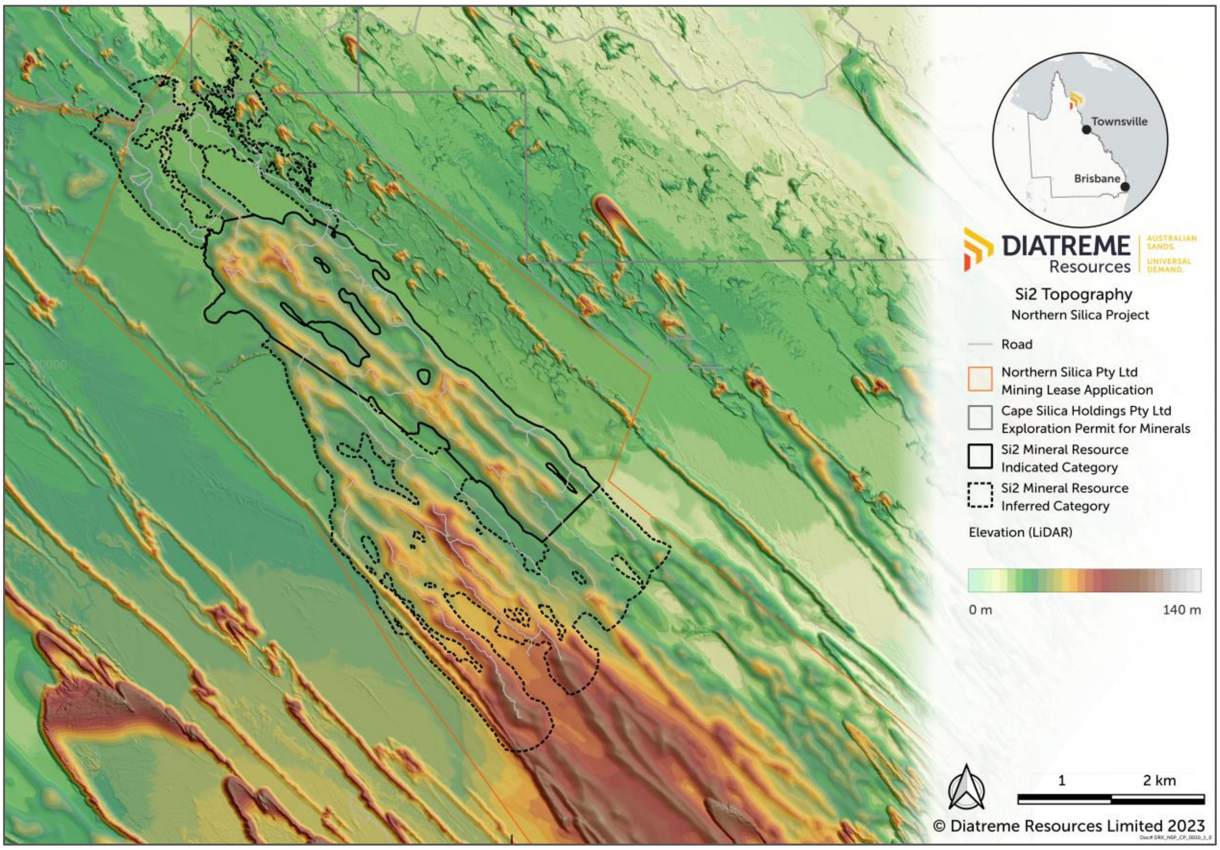
4.1 MINERAL RESOURCE

Ausrocks Pty Ltd (Ausrocks) was commissioned by Diatreme to complete a Mineral Resource Estimate on the Northern Silica Project (NSP) - Si2 Resource (Project) based on three exploration drill programs and a detailed topographic survey (LiDAR). Ausrocks is a Brisbane-based resources consultancy with expertise in industrial minerals and quarrying.

Diatreme has carried out three exploration programs on the Si2 Resource. Ausrocks reviewed all mineral samples and metallurgical testwork data to ensure only valid and relevant data was used for the resource estimate. A total of 188 drill holes were used to define the Upgraded Mineral Resource Estimate. SiO_2 % ranged from 95.28%-100.00% (excluding the B1 floor units at the bottom of the hole which is inherently contaminated with clays/indurated material).

The drill spacing along the dune traverse ranged from confirmatory level spacing (150m-250m) to a scout level spacing (250m-400m) ending in water table or B1/basement. The level of accuracy with the surface data (LiDAR), drill spacing and interpreted geological continuity allowed two resource categories to be defined (Indicated and Inferred Mineral Resource).

Figure 4-1 - Topography



Micromine 2023 was used to complete the Mineral Resource Estimate in accordance with the JORC Code (2012). A block model was generated to model the overall deposit shape and volume. The block model was defined by the top of the resource (0.3m below the surface topography to exclude the topsoil layer), the base of the resource (base of the drill holes) and the interpreted geological boundaries. Parent blocks were sized at 50mE x 50mN x 2mRL. Sub-blocks were sized at 5mE x 5mN x 1mRL.

The block model was subject to statistical and geostatistical analysis, and the Ordinary Kriging (OK) method was used to populate the blocks. The Inverse Distance Weighting (IDW) method was used to check the model and yielded comparable results. In addition to modelling SiO_2 data in the block model, Fe_2O_3, TiO_2, Al_2O_3 and LOI were also block modelled with other assayed elements not modelled due to low values at or near the detectable limits.

The extent and variability of the Upgraded Mineral Resource Estimate is expressed in terms of the full Resource Area:

- Max Length (along strike): 8km
- Max Width: 2.4km
- Mineral Resource Area: Approximately 1,275ha
- Resource Thickness: Averages 11.7m (ranging up 54.7m)
- Top of Resource: 21.5mRL to 108mRL (the top of the resource corresponds to the topography)
- Bottom of Resource: 18mRL to 75mRL (the base of the resource corresponds to water table / basement)

A silica (SiO_2 %) grade cut-off was used to define the in-situ resource to achieve a marketable high purity silica sand. Geological logging and returned assay grades and intersections showed an obvious grade demarcation of ore versus waste at 98.5% SiO_2. This was further supported by statistical analysis and representation. Lengthy continuous vertical intervals of >98.5% SiO_2 were the norm, and these intervals were used for the modelling and Mineral Resource Estimate. The clear in-situ grade demarcation of >98.5% SiO_2 persisted throughout the exploration program and across the whole of the Resource Area.

A material density of 1.6 t/m^3 was used for the Mineral Resource Estimate. A material density of 1.6t/m^3 falls within the range of typical silica sand deposits. No bulk density measurements have been undertaken on site. The resource is currently reported as in-situ tonnage with a moisture content of 2.5%.

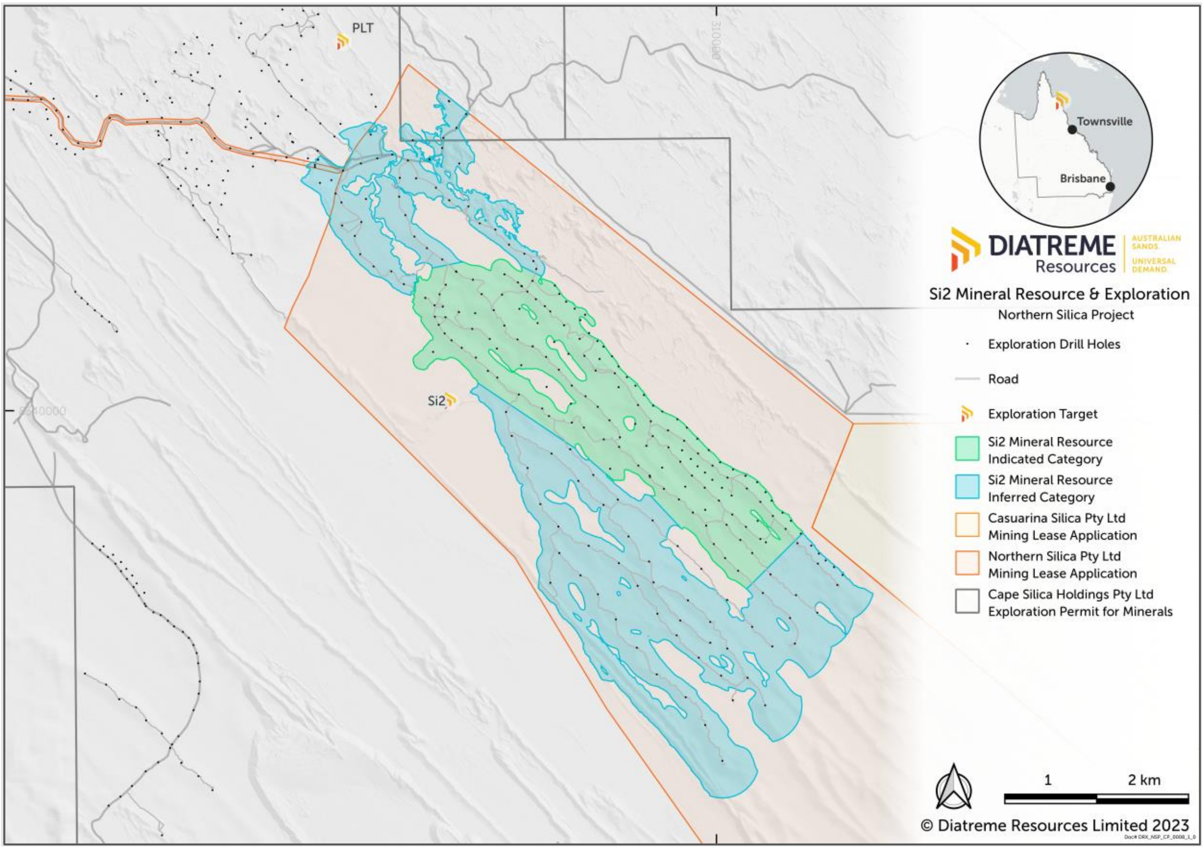
A topsoil thickness of 0.3m has been assumed based on visual assessment and drillhole intercepts. Topsoil thickness may vary across the Si2 Resource based on the vegetation density. LiDAR was acquired along with high resolution aerial photography for resource estimation. A detailed digital terrain model was generated for planning both exploration through to mine and infrastructure planning.

Table 4-1 shows a summary of the Mineral Resource Estimate. Figure 4-2 shows the Indicated and Inferred resource boundary and drill hole locations.

Table 4-1 - Si2 Resource – Upgraded Mineral Resource Estimate – February 2023

JORC Resource Category	Silica Sand (Mt)	SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	Al_2O_3 (%)	LOI (%)	Total (%)	Silica Sand (Mm^3)	Density (t/m^3)	Cut-off Grade SiO_2 (%)
Indicated	103	99.31	0.10	0.14	0.09	0.13	99.83	65.0	1.6	98.5
Inferred	132	99.27	0.11	0.15	0.12	0.17	99.90	82.0	1.6	98.5
Total	235	99.29	0.11	0.15	0.11	0.15	99.87	147.0	1.6	98.5

Figure 4-2 - Mineral Resource



DIATREME Resources

Figure 4-3 - Cross Section (West to East) through the Si2 Resource Block Model

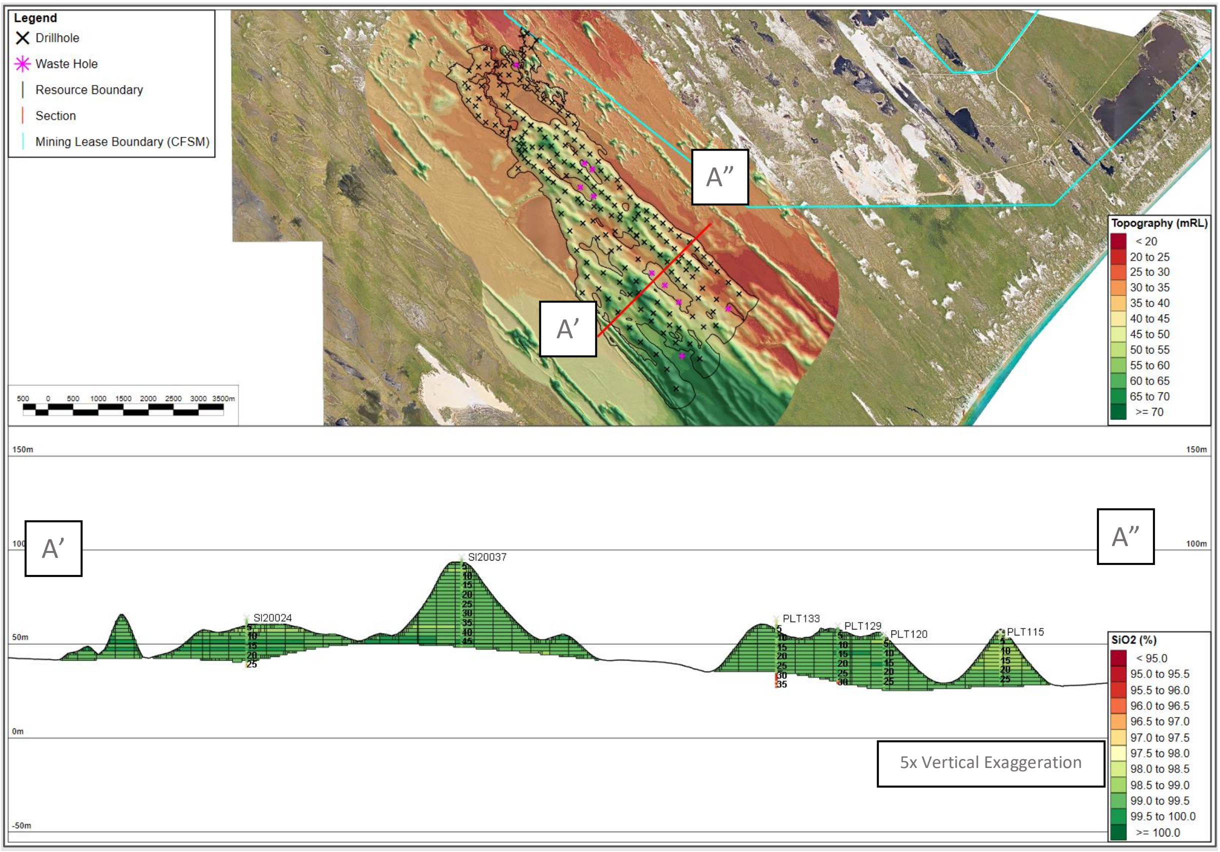
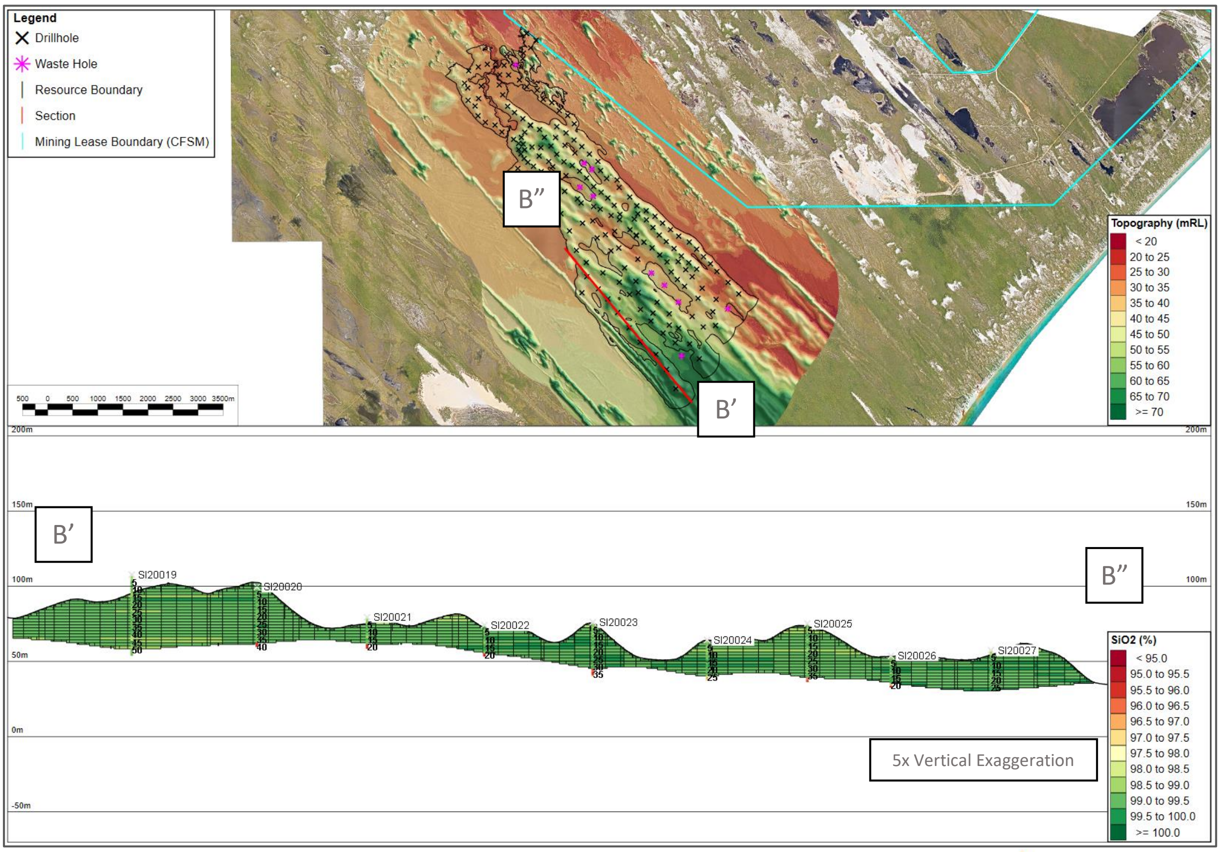


Figure 4-4 - Long Section (South to North) through the Si2 Resource Block Model



4.2 PRODUCTION TARGET

This study used a low iron silica production target of 3 Mtpa for the first two years then 5 Mtpa tonnes from year three onwards for export over a study period of 25 years. The annual production rate is 3-5M tonnes, which requires an annual mining rate of 3.75-6.25M tonnes, allowing for the low iron silica recovery factor of 80% estimated by Diatreme using MT's laboratory characterisation of three composite samples from the resource.

The total production target requires 151.25M tonnes to be mined from the 235M tonne Mineral Resource estimate. The Indicated resource for the Si2 Resource project is 103M tonnes, which accounts for 68% of the total low iron silica production target for the 25-year project evaluation.

4.3 PROPOSED PRODUCTION SCHEDULE

The production schedule is based on 68% Indicated Resources and 32% Inferred Resources. The production target has been modelled over a study period of 25 years with an annual production rate of 3M tonnes for the first two years then 5M tonnes from year three, which requires an annual mining rate of 3.75m tonnes for the first two years then 6.25m tonnes from year three. The schedule for production and the Mineral Resource category on which the production is based is presented in Table 4-2 below.

Table 4-2 - Production Schedule

Production Year	Mined Tonnes	Tonnes Produced	JORC Mineral Resource Category
1	3,750,000	3,000,000	Indicated
2	3,750,000	3,000,000	Indicated
3	6,250,000	5,000,000	Indicated
4	6,250,000	5,000,000	Indicated
5	6,250,000	5,000,000	Indicated
6	6,250,000	5,000,000	Indicated
7	6,250,000	5,000,000	Indicated
8	6,250,000	5,000,000	Indicated
9	6,250,000	5,000,000	Indicated
10	6,250,000	5,000,000	Indicated
11	6,250,000	5,000,000	Indicated
12	6,250,000	5,000,000	Indicated
13	6,250,000	5,000,000	Indicated
14	6,250,000	5,000,000	Indicated
15	6,250,000	5,000,000	Indicated
16	6,250,000	5,000,000	Indicated
17	6,250,000	5,000,000	Indicated
18	6,250,000	5,000,000	Indicated / Inferred
19	6,250,000	5,000,000	Inferred
20	6,250,000	5,000,000	Inferred
21	6,250,000	5,000,000	Inferred
22	6,250,000	5,000,000	Inferred
23	6,250,000	5,000,000	Inferred
24	6,250,000	5,000,000	Inferred
25	6,250,000	5,000,000	Inferred
25-Year Total	**151,250,000**	**121,000,000**	**68% Indicated** **32% Inferred**

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4.4 EQUIPMENT SELECTION

The primary mining equipment for the operation has been chosen as a fleet of 988K Wheel Loaders. While these machines are effective, hybrid models such as the 988XE are now available in the market. To ensure that the operation remains efficient and environmentally friendly, ongoing investigations will be conducted to determine the suitability of hybrid machines for the operation.

An overview of the equipment necessary for the mining operations is presented in Table 4-3.

Table 4-3 - Equipment Selection

Qty	Plant	Purpose/Description
5	988K Wheel Loaders	Primary mining (up to x3 for years 1-2, up to x5 for year 3 on)
1	D10T Dozer	Primary clearing, bulk push rehabilitation works
1	D7T Dozer	Topsoil management, minor works and land shaping
1	14H Grader	Road management
2	966M Wheel Loader	Plant area general use, rehabilitation management
1	226D3 (2T) Skid Steer Loader	Minor plant use including conveyor clean-up
1	CB34B (5T) Double Drum Roller	Maintenance of accessways
1	428 (8T) Backhoe	Drain cleaning, minor maintenance & general purpose
1	15kL Mobile Fuel & Service Truck	Refuelling & minor servicing of machinery
1	25kL ADT Water Truck	Haul road and rehabilitation watering, geotechnical control
1	15t Flat Bed Truck	Site deliveries
1	MHT-X 790 Manitou	General purpose
1	340 AJ Elevated Work Platform	34 ft Boom for maintenance and repairs
12	Mobile LED Lighting Towers	Night operations
10	Light Vehicles	Site access
1	24-Seater Bus	Personnel transport

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4.5 MINING OPERATIONS

The mining operation and processing plant will operate as a continuous process for 24 hours per day and 360 days per year. The shift roster will be a four-crew system and the crews will rotate on a schedule to be finalised following detailed discussions with local employees. A site camp will be located centrally near an interdune low which will provide services and facilities for site staff during their work roster. Personnel will transit via vehicle to Hope Vale or Cooktown at the commencement and completion of each work roster.

The mining operation will commence with the removal of large vegetation on the mining areas ahead of the planned mining operation using a bulldozer. Where possible, vegetation will be pushed or transported off mining areas and stockpiled for future use in rehabilitated areas.

Excavation of the silica ore will be carried out using front-end loaders and loaded directly into a hopper-feeder unit, with a processing rate of 500 tonnes per hour for 7,500 hours per year (equivalent to 20.8 hours per day and 360 days per year) for years one and two. In year three and onwards, a second hopper-feeder unit will accommodate an increased production rate of 834 tonnes per hour for 7,500 hours per year (equivalent to 20.8 hours per day and 360 days per year).

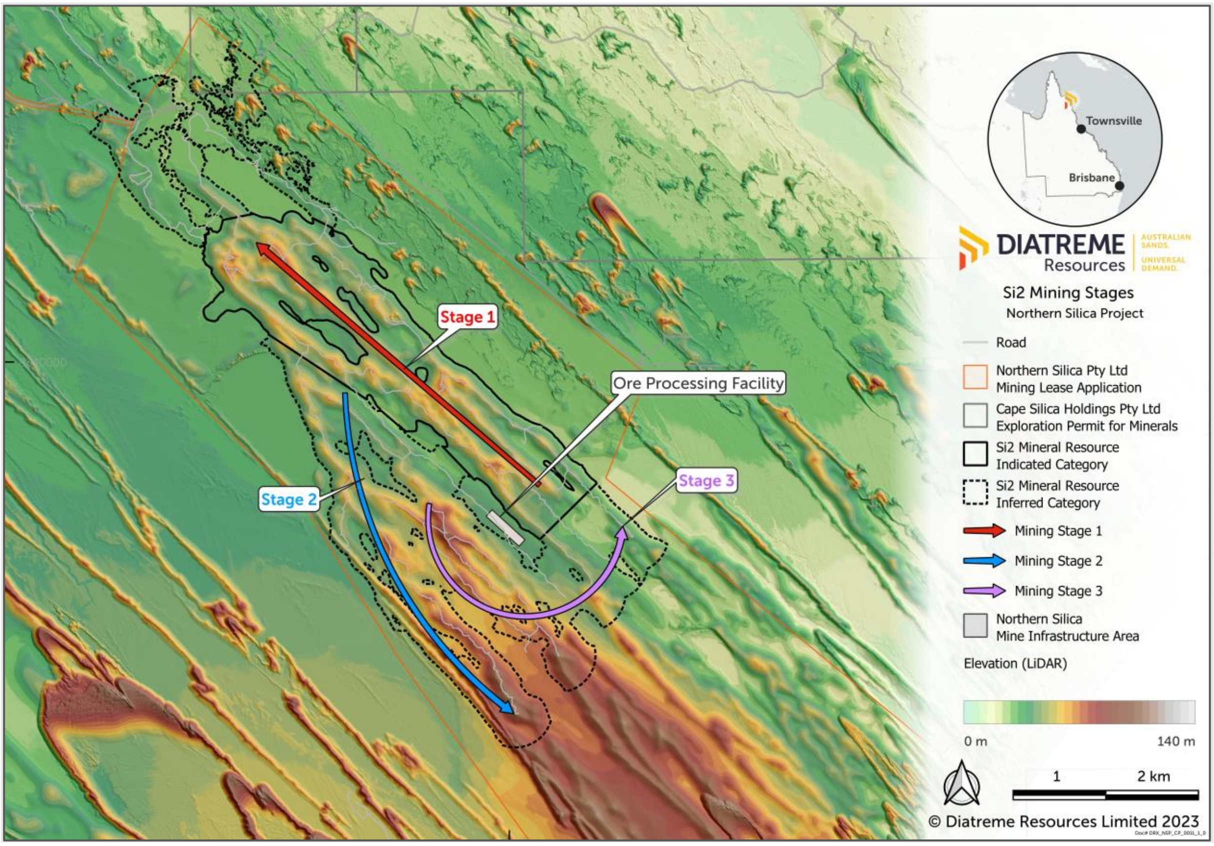
A fleet of 988 Wheel Loaders will serve as the primary production unit for loading directly from the mine face to the feed unit. The loading process will be carried out from floor level. The face will typically stand up to approximately 40 degrees but gradually settle to the angle of repose at around 35 degrees. The extraction procedure will involve varying the loading zone across a face width of up to 250m, ensuring that the extraction area does not form a convex shape. Loading from a wide zone facilitates material blending, and a consistent feed rate can be achieved by alternating short and long tramming hauls to the feed unit. If material becomes hung up due to indurated sand layers or other causes, the face will be manually slumped using either a water truck with a cannon spray or a dozer in extreme circumstances.

A mobile mining unit (MMU) will be used to screen out oversize particles and vegetation matter, and then pump the sand in slurry form at a controlled feed rate to a wet spiral plant. Each MMU includes the following components:

- Coarse screening with a dry grizzly featuring a 100mm aperture, followed by a 4mm web vibrating screen above the sump.
- Hopper and feed conveyor for transporting the material.
- Water supply pipeline for wet screening.
- Wet trommel screening with a 4mm aperture for further processing.
- Constant density sump to ensure consistent slurry density.
- Slurry pump and pipeline for transporting the processed sand to the wet spiral plant.
- Power supply generator for operating the MMU.

An indicative mining direction for the first 26 years of operation, along with the location of the processing plant, is detailed in Figure 4-5. This directional plan serves as a rough guide to the intended sequence of mining activities and offers insight into the projected timeline for the operation.

Figure 4-5 - Indicative Mining Direction



5 METALLURGICAL TESTWORK

5.1 METALLURGICAL TESTWORK

5.1.1 BACKGROUND

Previous metallurgical testwork on samples from the GSSP developed a laboratory scale procedure for simulating the process plant flowsheet. This characterisation procedure was used during the GSSP studies to test ore samples and assess the ability of the process to produce high purity silica product from variable ore samples. Although the laboratory characterisation procedure produces a product which is slightly better quality than would be produced by a commercial scale processing plant, it provides a reliable indication of the potential product quality that could be produced based on a representative sample for a particular area of the mineral resource.

5.1.2 HISTORICAL TESTWORK

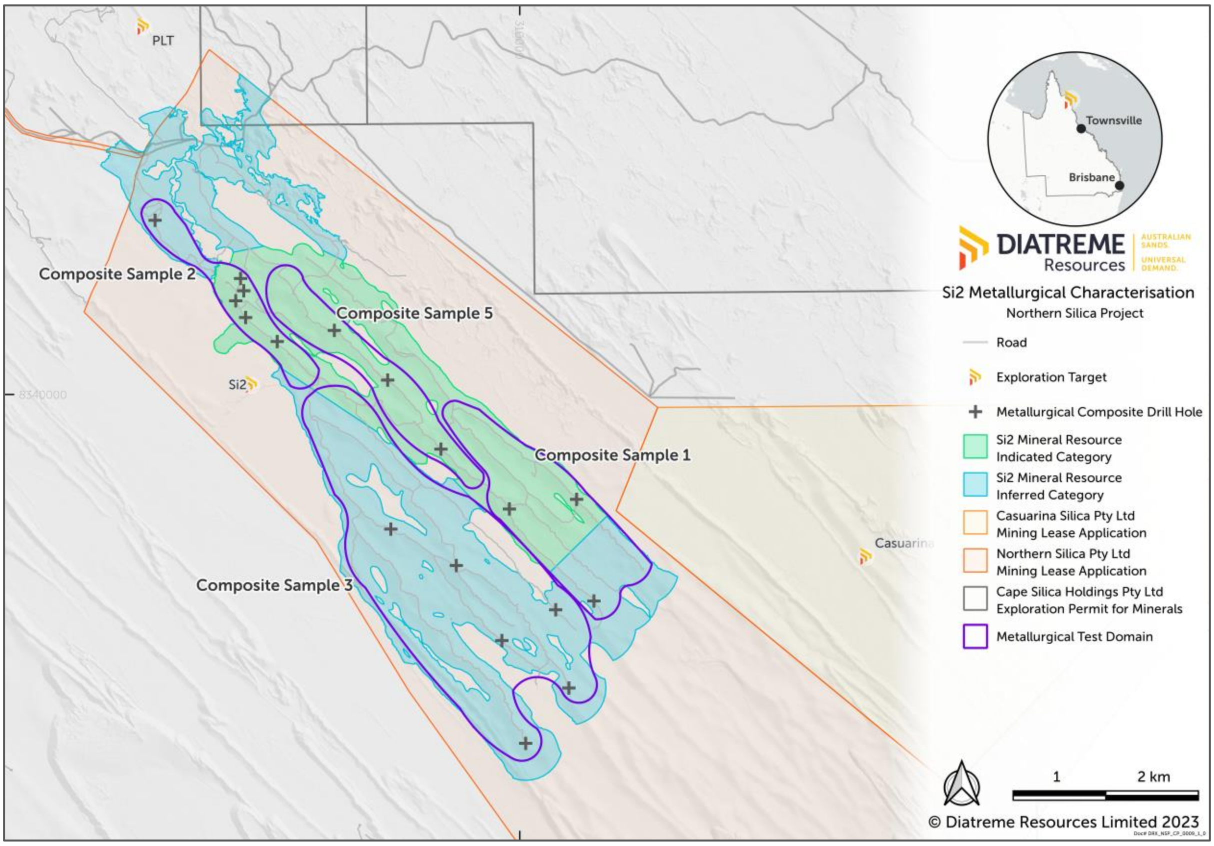
Composite samples from Galalar were processed using the characterisation procedure and the results were compared with bulk sample testwork. The results demonstrated that the method was useful for estimating potential silica product quality from a commercial scale processing plant. Analysis of historical testwork has determined that the key identifier of successful processing to high purity product is the Fe_2O_3 assay. A product assay of 110ppm (0.011%) or lower from the characterisation procedure is a good indicator that the commercial scale process will achieve the high purity silica standard for SiO_2 and all contaminants.

5.2 SCOPING STUDY - TESTWORK PROGRAM

5.2.1 METALLURGICAL CHARACTERISATION

The metallurgy program for the NSP's Scoping Study has been limited to metallurgical characterisation of four composite samples from exploration drilling. The drill samples were composited from different geological zones of the area drilled for the Si2 mineral resource evaluation as part of the Scoping Study. The areas covered by the four composite samples are shown in Figure 5-1.

Figure 5-1 - Locations of Four Composite Samples



The significant processes in the metallurgical characterisation procedure are:

- Screening to remove coarse (+710 µm) and fine particles (-106 µm)
- Gravity separation using bromoform heavy liquid
- High energy attritioning using high slurry density
- Screening to remove fine particles (-106 µm)
- Dry magnetic separation to remove high iron particles and produce product samples

This characterisation procedure produces a product sample that is higher quality than is achievable in a commercial scale processing plant. When this procedure was used for the Galalar bulk sample, the product was approximately 5-10 ppm lower in Fe_2O_3 than could be achieved using commercial scale equipment.

The target iron content for the high purity silica sand product is 120ppm (0.012%) Fe_2O_3 and results from the testwork on 4 composite samples indicates this is likely to be achieved without magnetic separation. Magnetic separation will not be included in the process for the standard 120ppm Fe_2O_3 product. It is an option for achieving ~100ppm Fe_2O_3 product if there is market demand at a price that justifies the additional processing.

5.2.2 SUMMARY & CONCLUSIONS

The Scoping Study characterisation testwork demonstrated that Sample 1, Sample 3 and Sample 4 all achieved The target Fe_2O_3 grade of 120ppm is without magnetic separation and the average grade of the samples is likely to achieve the target product grade using commercial scale equipment. These three samples achieved 110ppm or lower after magnetic separation.

The objective of the bulk sample testwork for the feasibility study will be to achieve 120ppm Fe_2O_3 using commercial scale equipment without magnetic separation, allowing a reduction in complexity of the NSP flowsheet and associated reduction in capital and operating costs of the processing plant relative to Galalar.

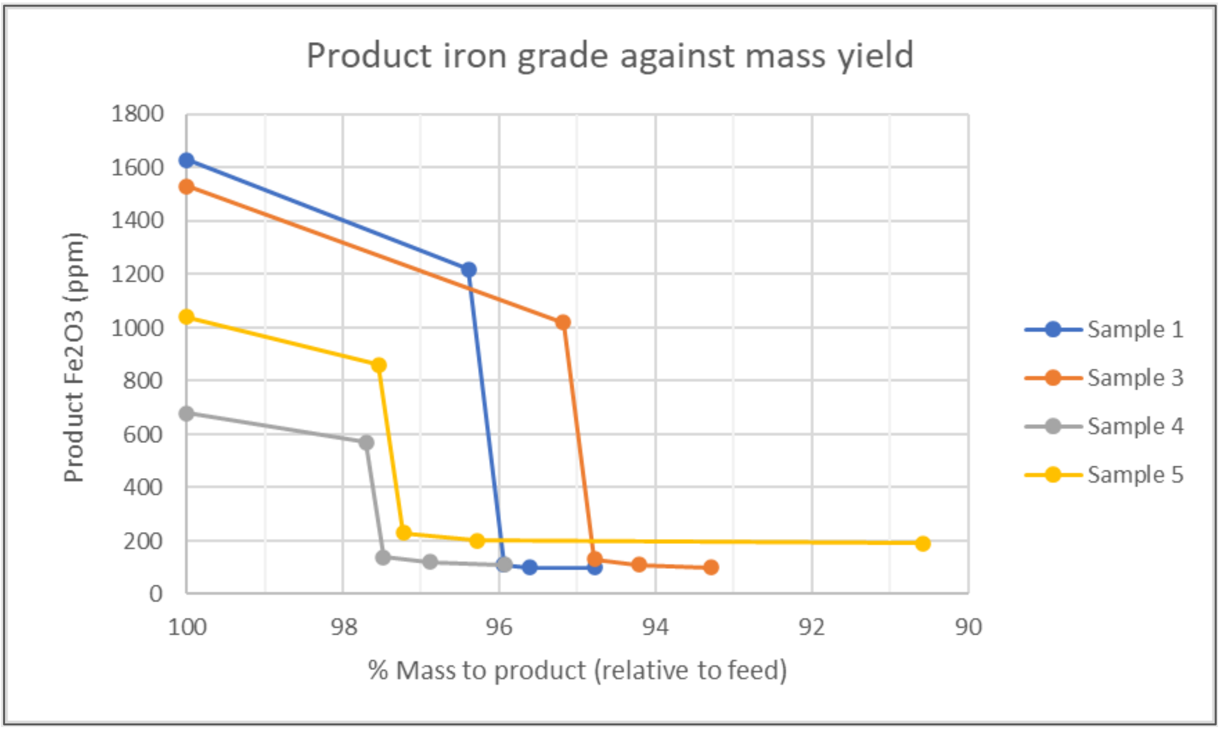
A summary of the mass distribution and chemical assays for each stage of separation simulating the standard silica sand processes is shown in Table 5-1 and in Figure 5-2.

For each sample the "non-magnetic product" is the final silica product. The yield to product from the original composite samples vary from 90.6% for Sample 5 to 95.9% for Sample 4. The target yield for the feasibility study bulk sample testwork will be 80% for a silica sand product with 120ppm Fe2O3.

Table 5-1 - Metallurgical Characterisation Summary

	Fraction	% wt to feed	SiO_2 %	Al_2O_3 ppm	Fe_2O_3 ppm	TiO_2 ppm
Sample 1	-710+106µm	96.4	99.5	1020	1220	1960
	gravity float (-2.7sg)	95.9	99.9	330	110	150
	attritioned product (+106µm)	95.6	99.9	310	100	140
	non-magnetic product	94.8	99.9	310	100	140
Sample 3	-710+106µm	95.2	99.5	880	1020	1600
	gravity float (-2.7sg)	94.8	99.9	350	130	170
	attritioned product (+106µm)	94.2	99.9	320	110	150
	non-magnetic product	93.3	99.9	310	100	150
Sample 4	-710+106µm	97.7	99.7	700	570	870
	gravity float (-2.7sg)	97.5	99.9	260	140	150
	attritioned product (+106µm)	96.9	99.9	260	120	150
	non-magnetic product	95.9	99.9	250	110	150
Sample 5	-710+106µm	97.5	99.6	800	860	1250
	gravity float (-2.7sg)	97.2	99.9	340	230	180
	attritioned product (+106µm)	96.3	99.9	310	200	160
	non-magnetic product	90.6	99.9	310	190	160

Figure 5-2 - Product Fe2O3 Grade vs Mass Yields



Additional investigation of the final products was necessary to determine the reason for the lower product quality from Sample 5.

The averages of the potential product grades from the characterisation results for the three samples from the ore zone are presented in Table 5-2.

Table 5-2 - Characterisation Testwork - Average Product Quality

Characterisation Process	SiO_2 (%)	Fe_2O_3 (ppm)	Al_2O_3 (ppm)	TiO_2 (ppm)
Excluding magnetic separation	99.9	110	297	147
Including magnetic separation	99.9	103	290	147

The quality of the final product from a commercial plant processing ore from this area of the NSP is likely to have similar grades for SiO_2 and TiO_2 while the grades for Fe_2O_3 and Al_2O_3 will be approximately 5-10% higher than those shown in Table 5-2. Using these results, this study has been based on marketing a final product that will be produced without magnetic separation.

Future bulk sample testwork should also test the decision to exclude magnetic separation. At this stage the additional costs of magnetic separation are not justified due to uncertainty of the value differential of the products.

6 MINERALS PROCESSING

6.1 FLOWSHEET DESIGN CONSIDERATIONS AND DEVELOPMENT OPTIONS

For minerals processing, CDE were tasked with the development and design of the process plant. CDE previously completed this work for the GSSP, which was completed in 2021, with this information used as the basis for the NSP's plant design.

Table 6-1 - Plant Operational Summary, Yield & Product Information

Parameter:	Units:	3 Mtpa Plant:	5 Mtpa Plant:
Operational Summary			
Plant Feed Rate	dtpa	3,750,000	6,255,000
Overall process recovery	%	80	80
Operating hours per year	Hr	7,500	7,500
Product per year	dtpa	3,000,000	4,995,000

6.2 FUTURE EXPANSION

The plant has been designed to produce 3 Mtpa high purity silica sand in the initial stage of operation. Two parallel process trains will be operated with a common tailings thickening and process water system.

Consideration has been given in the layout for the expansion of production to 5 Mtpa in the future. An additional processing train with dedicated tailings thickening and process water system will be added to achieve the desired output with minimal operational disruption and downtime.

6.3 PROCESS DESCRIPTION

6.3.1 GENERAL

The proposed mine infrastructure and plant for the NSP incorporates all necessary fixed and mobile infrastructure necessary to operate the mine. These are greenfield sites with no existing infrastructure. All necessary plant and infrastructure will be mobilised to the site during the construction phase.

The site layout is divided into four units:

- Mobile Mining Unit (MMU)
- Fixed Silica Processing Plant (SPP)
- Fixed Dewatering Plant and
- Field Mobile Reject Sand Stacking Unit (Tailings Unit)

The 3 Mtpa plant essentially consists of two parallel trains of equipment desliming, sizing and removing high density and paramagnetic contaminants with a common tailings treatment system. The 5 Mtpa plant is a single processing train with identical equipment and processes to one of the 3 Mtpa trains and a separate tailings treatment system. The following text describes how the 3 Mtpa train works and equipment interacts. The 5 Mtpa is not described but operates in an identical fashion.

6.4 MOBILE MINING UNIT (MMU)

The mining area is approximately 20-30 ha per year, located within the dune system. The scale of the mining activity involves the use of multiple MMU units that would each pump slurry to the SPP for processing. Multiple small units are easier and quicker to relocate with less production downtime.

Each MMU will include:

- Hopper-feeder unit with 100mm grizzly
- Vibrating screener unit with 4mm aperture screen
- Slurry sump and pump
- Water supply pipeline from SPP
- Slurry pipeline to SPP

6.5 SILICA PROCESSING PLANT (SPP)

The sand that is pre-screened will be sent to the fixed Silica Processing Plant (Figure 6-1 and Figure 6-2). Here the sand will be sized and upgraded to produce a high-purity silica sand. The processing area will be located close to the initial mining area and the pumping distance from the MMU will be short. As the mining face progresses the MMU will be located up to 5km from the plant.

The unit processes involved at the SPP are:

- Feed receival and top size control
- Gravity beneficiation
- Attritioning
- Classification
- Reject sand removal
- Water services

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Figure 6-1 - Proposed NSP 3 Mtpa Processing Plant Layout

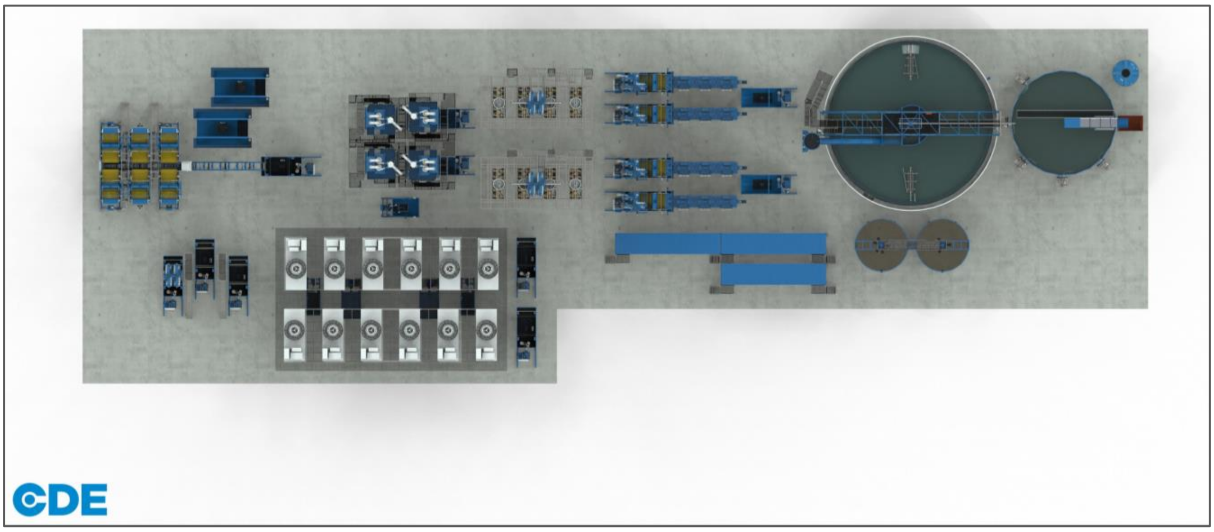
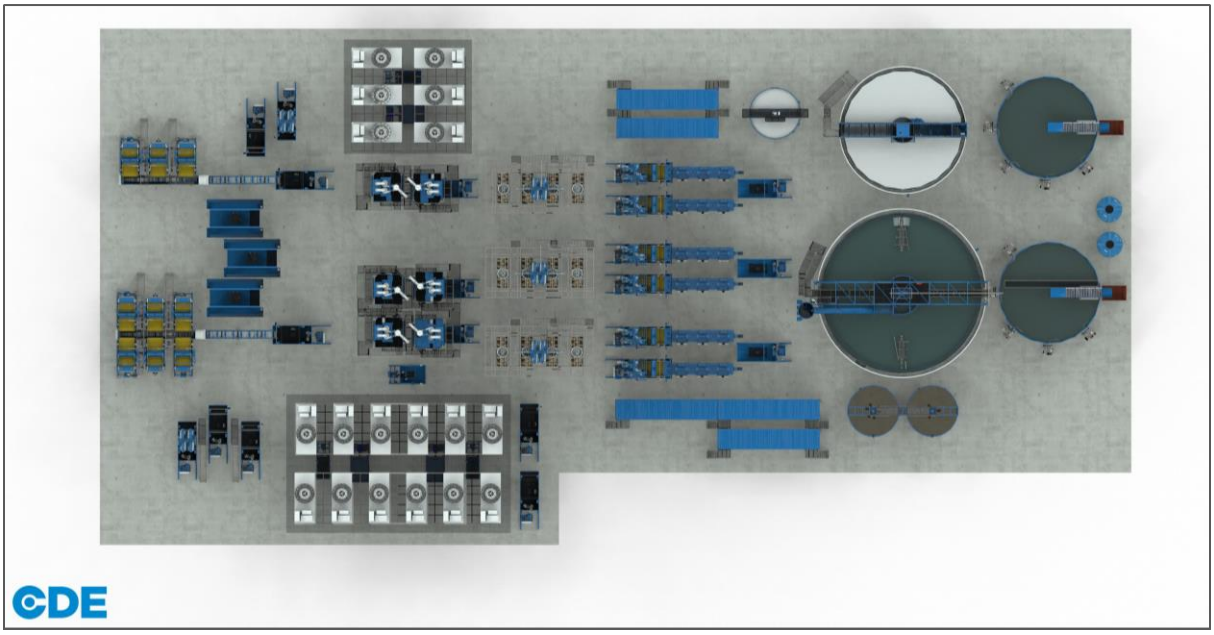


Figure 6-2 - Proposed NSP 5 Mtpa Processing Plant Layout



6.6 PRODUCT DEWATERING AND STOCKPILING

After processing, the product silica sand will be transferred as a slurry mixture to the stockpile area via a 10km transfer pipeline. The slurry will be dewatered at the stockpile area via the CDE dewatering plant.

Dewatered process water will then be pumped back to the process plant via the water return pipeline for reuse. The slurry pipeline has a capacity for 5 Mtpa with the slurry mixture containing 45% water by weight.

The product stockpile area will receive the final silica product as a slurry conveyed from the SPP. The pumping distance is approximately 10 kilometre through a high-density polyethylene pipe.

High purity silica sand from the processing plant is received directly to the sump of the final product. Slurry will be pumped from the sump to the 500mm diameter thickening cyclones which discharge directly to the dewatering screens.

Cyclone overflow is directed to a collection tank cyclone overflow where recovered water is pumped back to the processing plant. Dewatered product sand is discharged to the Transfer Conveyor, which feeds a second transfer conveyor which in turn feeds the final product stacker. Transfer Conveyor is fitted with a cross-belt sampler for product sampling and a belt weigher for production rate and totals monitoring.

Raw water is used as a final rinse of the sand via spray bars on the dewatering screens, sourced from the raw water tank.

The base of the stockpile is deep sand which will allow water to drain from the product into the underlying sand and eventually back to the water table. The moisture content of the product is expected to reduce to 3% during periods of low rainfall and may be up to 5% or higher during the wet season.

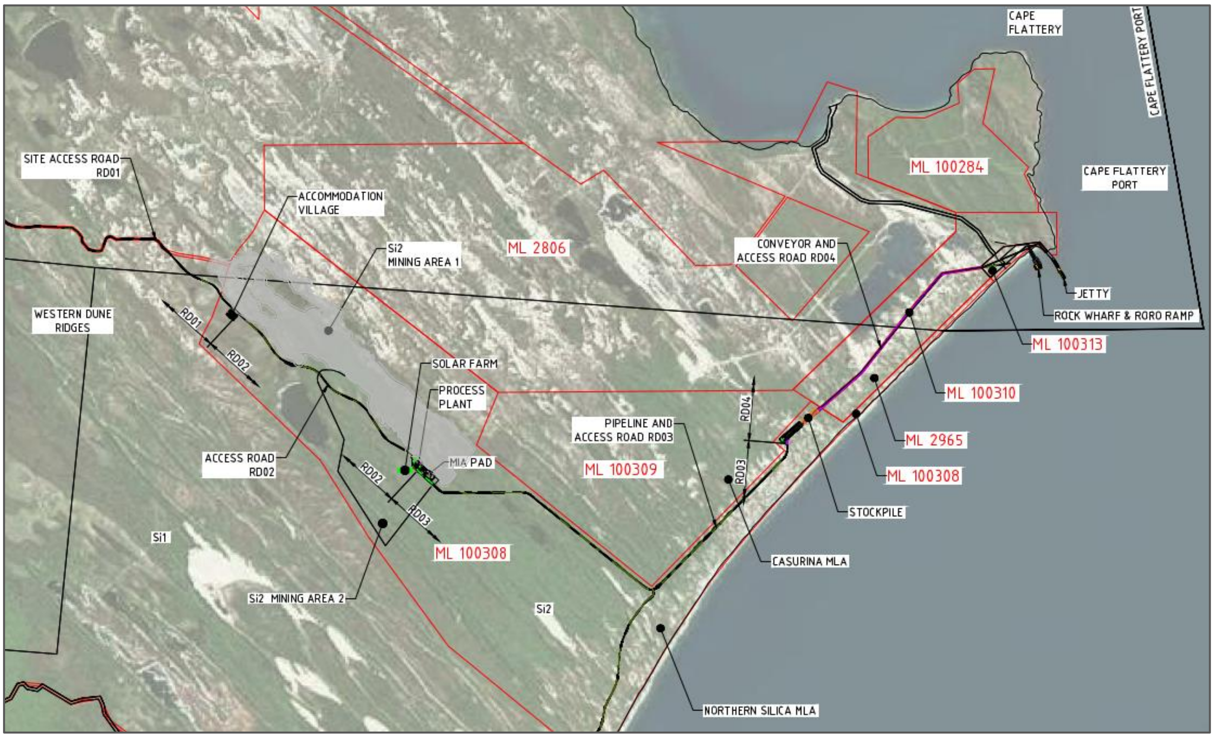
The product stockpile area will be used for the life of mine.

7 INFRASTRUCTURE AND LOGISTICS

7.1 SITE LAYOUT

The mine site layout has been developed within mine leases MLA 100308 and 100310. Figure 7-1 illustrates the location of the key infrastructure components: Accommodation Village, process plant area, stockpile area, and port infrastructure. Materials handling infrastructure will facilitate product movement from the mining area to an out-loading facility at the Cape Flattery Port area, controlled by Ports North.

Figure 7-1 - Site Layout



7.2 SITE ACCESS

The proposed development is remote and the associated inaccessibility of some public roads during the wet season may impact on project operations. Diatreme has considered a range of options to guarantee the continuity of operations. One access road (Site Access Road A (RD01)) is proposed which will allow general services, personnel transport, links to land based emergency services and access for general traffic.

Road access will be from the Mount Webb Wakooka Road (also known as the Starcke Wakooka Track) to the west. Where possible, the roads have been aligned with existing tracks, avoiding creeks and wetlands.

Various other site access roads have been accommodated accordingly. These consist of Mine Access Road (RD02), Pipeline Access Road (RD03), and Conveyor Access Road (RD04).

RD02, RD03 & RD04 will form the all-weather access road from the port infrastructure area to the camp.

7.3 STOCKPILE AREA

The stockpile area is situated at the discharge point of the product pipeline and intake feed of the overland conveyor system. The stockpile area consists of the dewatering plant (see processing), stacker and reclaimer and associated materials handling conveyors.

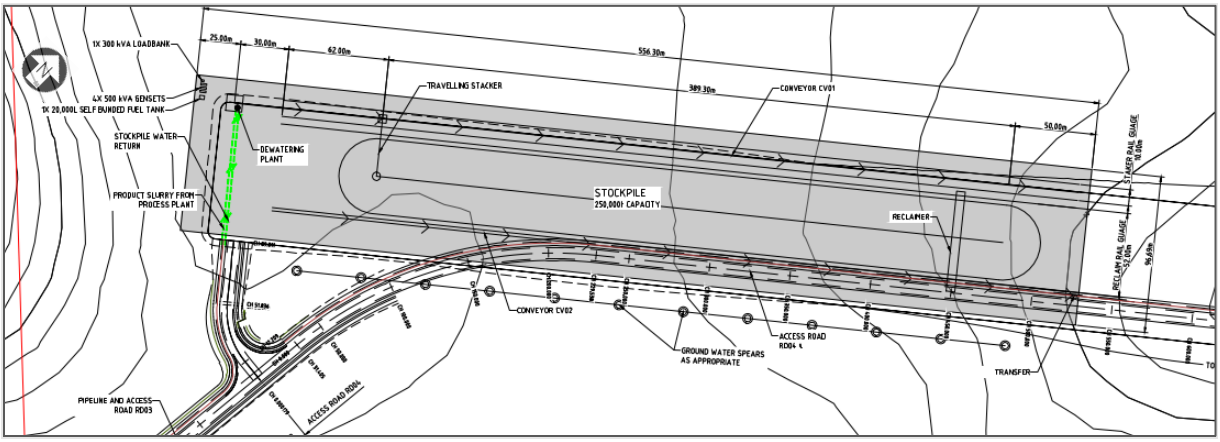
The stockpile hardstand dimensions are approximately 5.4 hectares. A stockpile capacity of 250,000t or approximately one month of production at 3 Mtpa has been allowed for.

Based on production rates, operational down-time and ship loading rates and the following material handling rates were determined:

- Stacking – 1,000 tph
- Reclaiming – 1,200 to 1,500 tph

The linear configuration of the stockpile allows for rail mounted material handling plant to operate simultaneously, is illustrated in Figure 7-2 below.

Figure 7-2 - Stockpile General Arrangement



7.4 PORT INFRASTRUCTURE

7.4.1 SUMMARY

The port infrastructure area facilitates product movement from Diatreme's lease via material handling equipment to the marine loadout.

The following section covers infrastructure components within the Ports North Cape Flattery Port lease:

- General Arrangement
- Wharf
- Jetty
- Marine Loadout
- Logistics Access

The port facility will be developed in two phases as follows:

- Phase 1 – Production of 3,000,000t per annum. Transhipping via 8,500t barge to 55,000t vessel moored within the Port of Cape Flattery.
- Phase 2 – Production of 5,000,000t per annum. Direct loading from jetty to a 55,000t vessel docked at a wharf.

Diatreme is already engaged with Ports North and has formed a technical committee to assess port engineering options to accommodate the NSP product. This process includes evaluation of funding options, ownership of construction, future maintenance and operation. It is expected that the quantum of capital required will attract NAIF and other funding, augmenting the main Diatreme funding.

7.4.2 PORT CAPACITY BASIS OF DESIGN

As part of the project concept, it was envisaged that during the first two years of operations (Phase 1) that up to 3 Mtpa will be transhipped to OGV via a logistics wharf. The two years of transhipping will allow for implementation of Diatreme's own ship loading infrastructure. Once complete, Phase 2 will allow for annual throughput of 3 to 5 Mtpa via the new infrastructure, leaving the logistics wharf for other duties.

It is not Diatreme's intention to tranship to an OGV from an offshore anchorage, instead preferring to moor the OGV at the existing Ports North wharf. This utilises the potential availability of the wharf infrastructure while reducing initial capex outlay.

7.4.3 GENERAL ARRANGEMENT

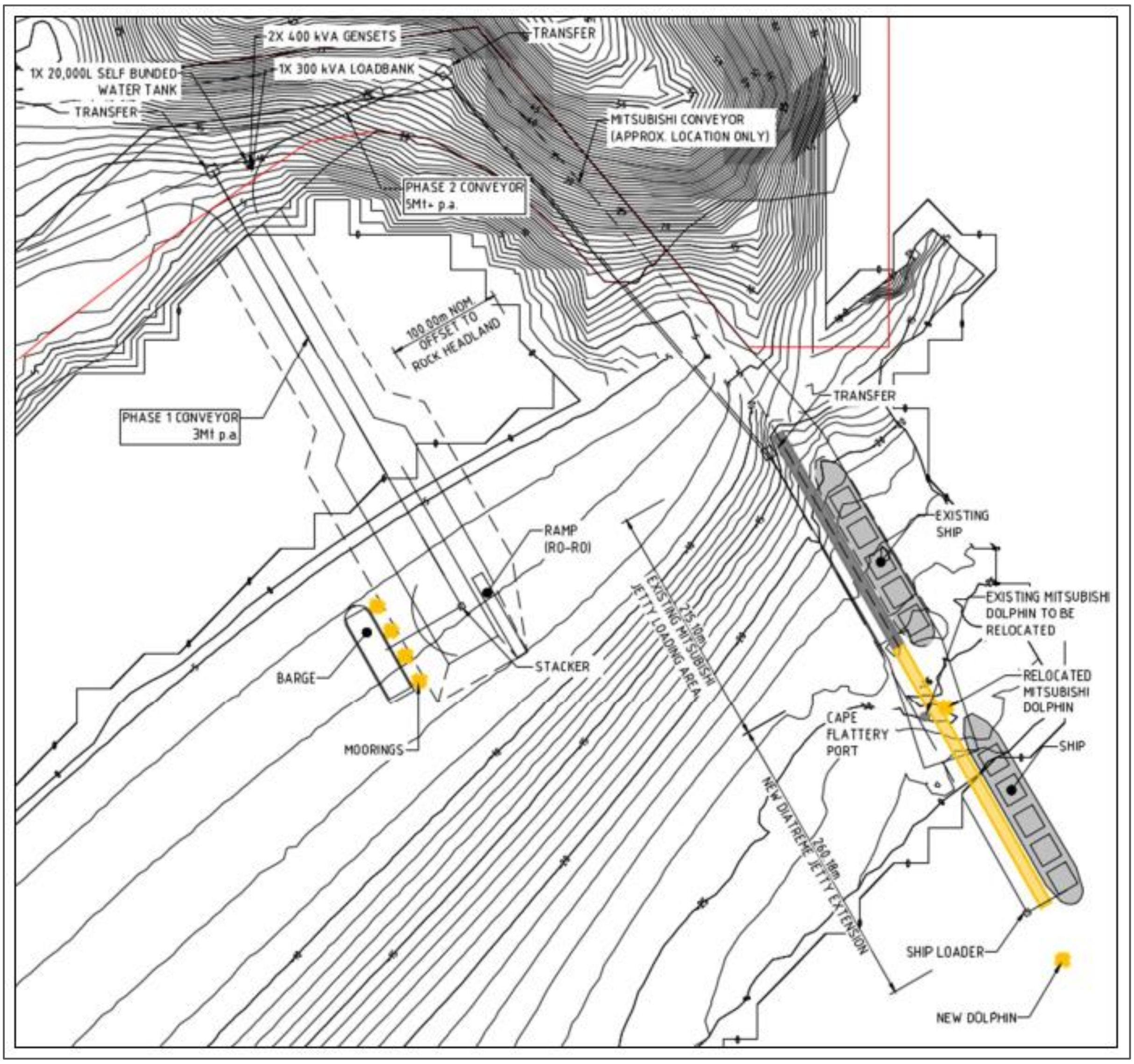
The port infrastructure conceptual design (Figure 7-3) accommodates phase 1 (3 Mtpa) and phase 2 (5 Mtpa) production.

The initial (3 Mtpa) operational concept is to transfer the product via a rock wharf mounted conveyor system out-loading to barges. The product will then be transhipped to bulk carriers anchored at the existing wharf.

A concrete roll on–roll off (RORO) logistics access has been incorporated in the rock wharf structure allowing for additional port logistics access for mining operations.

The phase 2 (5 Mtpa) conceptual design will tie into the existing CFSM jetty arrangement using a jetty extension and ship loading facility.

Figure 7-3 – Port General Arrangement Concept



7.4.4 ROCK WHARF

The rock wharf will be constructed from crushed rock materials in combination with geogrid and geofabrics. A primary and secondary rock armouring layer will provide protection.

The maximum width of the structure will be approximately 35m to allow for the conveyor system, barge loader and access/maintenance corridors. To reach depths navigable for a 8500t capacity barge, the rock wharf will extend to an approximate length of 450m. Moorings, navigational lights and beacons are to be installed for safe navigation of the wharf infrastructure.

A concreted access ramp will be constructed as part of the rock wharf, allowing roll-on roll-off (RORO) vessels to load and unload LV/MV's directly to the port area. This will provide supplementary logistics access from the port area and offer alternative access to the mine site. Large components of machinery, processing and bulk materials handling equipment required for construction may also be via barge offloading to the rock wharf. Mobile cranage equipment will be located on the NSP lease and utilised for barge load outs where required.

Tugs engaged by Diatreme would locate in the port areas located to the north of CFSM when not in use.

7.4.5 JETTY EXTENSION

The 5 Mtpa conceptual design allows for bulk carriers with 55,000t capacity, to moor directly to the jetty, adjacent to the ship loader. This will be achieved by tying into the existing Ports North jetty arrangement, extending Diatreme's conveyor system and extending the jetty a further 260m. The jetty will be constructed using piled foundations with an elevated steel truss superstructure, supporting the conveyor system feeding to the ship loader.

7.4.6 MARINE LOADOUT – BARGE LOADING

The conceptual design for the initial (3 Mtpa) production will use a radial telescopic barge loader installed on the rock wharf.

The overland conveyor system feeds directly into the barge loader hopper, pivoting at a fixed position. The telescopic truss mounted conveyor runs on a radial rail, supported by pile foundations. The telescopic boom and radial motion allow for the product to be distributed across the barge's stockpile area.

7.5 SITE INFRASTRUCTURE

This section of the report describes the on-lease non-process infrastructure including:

- Accommodation Village
- Mine Industrial Area
- Water Services
- Electrical Services

An infrastructure area will be located within the Mining Lease and is planned to cover an area of approximately 10ha. The infrastructure area is planned to contain the following:

- Parking
- Mine offices
- Mine workshop
- Sewage treatment plant
- Laydown & storage area
- Topsoil storage
- Erosion & sediment control structures

The mine office will consist of a transportable office module containing several offices, a meeting room, ablutions, lunchroom, first aid and other facilities as required. The mine workshop will consist of a storage shed with bunded fuel and oil storage and facilities for general mechanical work.

Major rebuilds and repairs will be undertaken off site by contractors at an authorised repair workshop which will require transport of the plant.

A commercial sewage treatment plant will treat wastewater generated by the facilities. Erosion and sediment controls will be implemented at the infrastructure area and will include a diversion for clean water, topsoil stockpiles on the upslope of the development and catch drains to direct stormwater to the sediment basin located at the base of the catchment.

Diatreme is undertaking power optimisation studies for the NSP's proposed Cape Flattery Port expansion. There are several locations for power delivery, which would require standalone solar/wind and backup diesel generation. Given the proposed mining footprints, the areas required for solar installations are easily accommodated. This approach mitigates the high costs for reticulating power over large distances and minimises the operation's carbon footprint, in alignment with Diatreme's ESG principles.

Similarly, rising diesel costs add substantive operating costs/risk. The advantage of Diatreme's infrastructure configurations is minimal power draw at each separated installation.

Solar powered water bores will operate with dedicated backup generators and feed service lines to mine, infrastructure and port. The system will be automated, requiring minimal maintenance. Major pump rebuilds and replacement will be completed at vendor facilities in Cairns and Townsville. It is expected that 80-85% of water abstracted will be returned to dunes and will be confirmed through comprehensive groundwater studies.

8 ENVIRONMENTAL, SOCIAL, COMMUNITY AND PERMITTING

8.1 SUMMARY

The NSP will require a series of environmental approvals in parallel with MLAs. Principal amongst these is an Environmental Authority (EA) for a resource environmentally relevant activity (ERA), issued under the *Environmental Protection Act 1994* (Qld) (EP Act). To the extent that the project poses a risk of significant impact to matters of national environmental significance (MNES), a Controlled Activity Approval will also be required under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

As an Environmental Impact Statement (EIS) is likely to be triggered for the project, Diatreme is seeking for the project to be assessed via a 'Coordinated Project' process under the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act). This provides an EIS pathway that can support both an EA and a Controlled Activity Approval, while also facilitating/resolving associated permitting requirements that otherwise sit outside the assessment pathways for these approvals (i.e. infrastructure access, maritime infrastructure arrangements, water allocations).

As part of the EIS, a series of long-term data collection and/or modelling exercises will be required, with particular focus on ground and surface waters, terrestrial and aquatic ecology, marine and coastal environment, soils, and cultural heritage. The EIS process also triggers the need for specific management plans or analyses, including:

- A Social Impact Assessment (SIA) and Social Impact Management Plan (SIMP) in accordance with the *Strong and Sustainable Resource Communities Act 2017* (Qld) (SSRC Act)
- A Cultural Heritage Management Plan (CHMP) under the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act) or equivalent provisions within a native title agreement prepared in accordance with the *Native Title Act 1993* (Cth)
- A strategic allocation of water (for use in processing) from the McIver Catchment under the *Water Act 2000* (Qld)
- A Progressive Rehabilitation and Closure Plan (PRCP) developed at the time of approval in accordance with the EP Act.[1]

The EIS will progress in parallel with Right to Negotiate (RTN) processes under the *Native Title Act 1993* (Cth) with the relevant Native Title Body Corporate and Clan Groups as part of a broader mining project agreement.[2]

[1] Note this will be a draft document for the EIS, with a final PRCP to be developed as part of the EA.
[2] Equivalent processes also occur under the State *Native Title Act 1993* (Qld).

9 INDUSTRY OVERVIEW

9.1 SUMMARY

Diatreme's NSP is capable of producing a premium grade "low iron" silica product (also known as PV grade) suitable for use as direct feed product by glass manufacturers for ultimate end use in the sheet or covering glass used on solar panels.

The characteristics needed in this silica product include low iron (ideally sub or no more than 100ppm, but manufacturers are currently using in the 100-120ppm range), correct particle size range and low levels of other key contaminants. With approx. 80% of the world's solar panels manufactured in China, the largest market demand is in the supply to Chinese manufacturers, who have supply issues from domestic supply sources and are increasingly looking to offshore suppliers of this premium silica product.

Following extensive market investigations (from specialist minerals marketing firm Wogen Ltd) and engagement with various offtakers and suppliers, and through Diatreme's joint venture partner Sibelco, Diatreme has gained an understanding of current market prices of this "low iron" silica product into China. The indicative price range for product currently into China is in a range of RMB 500-600 CIFFO per tonne delivered to a major port (Quindao).

9.1.1 PRICE ASSUMTPTION FOR USE IN PROJECT ECONOMIC MODEL

Conservatively, Diatreme assumes pricing at the mid-range between the low and mid-case equivalent equates to a **net received price of A$81 per tonne (FOB equivalent).**

For current Scoping Study purposes, the financial analysis model is based on net proceeds at the domestic loading point (Cape Flattery Port) of FOB AUD$81 per tonne for net sales revenue.

Diatreme also notes:

- For the purposes of this financial analysis, Diatreme has netted shipping and related costs to arrive at an FOB (freight on board) equivalent revenue.
- Ancillary other marketing costs are included in opex.
- Pricing appears under further upward pressure due to supply constraints.
- There is no established reference point for silica product pricing generally, so all price discovery is around engagement with end users and by nature is subject to final negotiations between the parties.
- All market engagement is at non-binding level only – Diatreme will progress these to more binding arrangements appropriately relative to the project's advancement.
- Assumes 100% of product into China for purposes of the modelling – some variations in shipping costs to Japan and other Asian markets.
- Markets for PV grade product are smaller into Japan/Korea/Taiwan markets but there is appetite for the product.
- Market risk diversification program into non-Chinese markets is underway and it is likely for 30-40% of total exported product to go to non-Chinese markets.

10 CAPITAL COST ESTIMATE

10.1 SUMMARY

A capital cost estimate (CAPEX) was prepared based on engineering development for process and non-process infrastructure by external consultants and historical information from the GSSP.

The capital cost estimate includes all direct (process and non-process infrastructure) costs, indirect (owners and other) costs, contingency and other allowances. The tables below provide a summary of the capital cost estimate for the project. Note that all costs provided in this section are in $AUD.

The following principal data sources, deliver up to date costings for the development and have been provided by a number of the consultants listed for involvement in the project evaluation and development:

- Processing (CDE, Wave International and owners' data)
- Common Services (Engenuity, Wave International and owners' data)
- On Site Infrastructure (Wave International and owners' data)
- Off Site Infrastructure (Wave International and owners' data)
- Pre-Production Cost (owners data)
- Owners/Indirects (owners' data)

The estimate is presented to show the initial cost of the 3 Mtpa high grade silica plant with transhipping operation, the cost to expand to 5 Mtpa operation (inclusive of port cost by Diatreme) and the final cost of the 5 Mtpa operation.

Table 10-1 - Capital Cost Estimate Summary by WBS

WBS	WBS L1 CODE and DESCRIPTION	3 Mtpa	5 Mtpa Expansion	5 Mtpa
1000	Mining	$ -	$ -	$ -
2000	Processing	$ 93,500,000	$ 23,600,000	$ 117,100,000
5000	Common Services	$ 8,900,000	$ 400,000	$ 9,300,000
6000	On Site Infrastructure	$ 61,900,000	$ 1,800,000	$ 63,700,000
7000	Off Site Infrastructure	$ 78,300,000	$ 97,600,000	$ 175,900,000
8000	Pre-Production Cost	$ 9,700,000	$ 7,000,000	$ 16,700,000
9000	Owners / Indirect Cost	$ 56,900,000	$ 25,300,000	$ 82,200,000
	Subtotal	**$ 309,200,000**	**$ 155,800,000**	**$ 465,000,000**
	Contingency	$ 46,400,000	$ 23,400,000	$ 69,800,000
	Total	**$ 355,600,000**	**$ 179,200,000**	**$ 534,800,000**

10.2 BASIS OF ESTIMATE

10.2.1 GENERAL

The general estimating philosophy that was used to determine the direct field cost and the indirect cost were a combination of Stochastic (factoring) and Analogy (like for like) and Deterministic (measurement) estimating techniques.

The estimate was based upon Scoping Study level pricing provided by the external consultants contracted as well as historical pricing data and factors which were obtained during the GSSP Prefeasibility Study.

A Scoping Study estimate such as this, where factors are used to determine capital cost based on the mechanical equipment value, is very dependent on the accuracy of the priced mechanical equipment list (both in terms of price and content). All attempts have been made to include sufficient equipment in the list as expected by the layout and similar, operating plants, noting the early stage of the study and limited engineering progress to date.

The following is a summary of basis of estimate utilised in the Scoping Study:

1. Mining:
    a. Preliminary capital cost estimate, factored from GSSP for mining capital costs.
    b. Factored estimate for any capitalised equipment.
2. Process Infrastructure:
    a. Factored equipment list, and modular supply quotes.
    b. Bulk factored estimate, factored from GSSP for construction and bulks.
    c. Factored indirect cost estimate, based on SS implementation schedule.
3. Non process infrastructure:
    a. Budget supply quote and factored direct cost estimate, factored from GSSP for construction and bulks.
    b. Factored indirect cost estimate, based on SS implementation schedule.
4. Project level indirect costs:
    a. Factored estimate for project indirect costs (EPCM, etc) based on schedule and direct cost estimates.
    b. Factored estimate for owner's costs.
5. Contingency:
    a. Direct cost estimate of each line item.

10.2.2 ESTIMATE STRUCTURE

A Work Breakdown Structure (WBS) has been developed for the project and will be used both in this Scoping Study and future studies to provide a coding structure to define the project scope, cost and schedule. The capital cost estimate is structured using the WBS, with individual cost line items in the estimate entered at level 3 of the WBS.

Within the work breakdown structure, each cost line item is further structured into categories of direct / indirect, discipline and supply / installation such that the resulting estimate can be analysed.

10.2.3 FOREIGN EXCHANGE

The estimate has been prepared in Australian Dollars. The following exchange rates have used where foreign currency inputs have been received. The exchange rate is based on long term forecast provided by Diatreme's consultant.

Table 10-2 – Foreign Exchange Rates

CURRENCY	AUD$ EXCHANGE RATE
US Dollars	$0.73
GB Pound	$0.57

10.2.4 ESTIMATE CONSTRAINTS, ASSUMPTIONS AND EXCLUSIONS

The list below reflects the currently identified constraints and exclusions that are pertinent to this Capex estimate.

Estimate view:

- Force majeure issues;
- Future scope changes;
- Flooding delay costs or resulting construction labour stand down costs;
- Foreign exchange cover;
- Standing costs;
- Access to the plant is from Hope Vale via the upgraded road;
- There is no allowance for a new airstrip;
- The facility to be specified and constructed to suit a 25 year life-of-mine;
- No allowance is made for escalation.

The estimate includes costs which have been rolled up into other WBS area. It should be noted where some areas have zero cost, the costs have been included as part of a package.

11 OPERATING COST ESTIMATE

11.1 SUMMARY

An operating cost estimate (OPEX) was prepared, underpinned by historical benchmark data, consultant input, and capital estimates for the project. The tables below summarise the Scoping Study level operating costs for the production of high grade silica at 3 and 5 Mtpa.

The operating cost template is structured around the following cost centres:

- Labour
- Flights and Accommodation
- Fuel
- Maintenance
- Reagents and Consumables
- Equipment Hire/Lease
- Transport and logistics
- Contract/General Expenses (including owner's costs)
- Sustaining Capital

Table 11-1 - Operating Cost Estimate Summary (3 Mtpa)

OPERATING COST SUMMARY 3 Mtpa			
Item	**AUD/y**	**AUD/t Prod**	**AUD/t Ore**
Labour	$ 10,300,000	$ 3.43	$ 2.74
Flights and Accommodation	$ 400,000	$ 0.08	$ 0.07
Fuel	$ 4,100,000	$ 1.37	$ 1.10
Maintenance	$ 8,900,000	$ 2.98	$ 2.38
Reagents and Consumables	$ 200,000	$ 0.06	$ 0.05
Equipment Hire/Lease	$ 26,500,000	$ 8.85	$ 7.08
Transport and Logistics	$ 12,900,000	$ 4.29	$ 3.43
Contract/General Expenses	$ 7,600,000	$ 2.53	$ 2.02
Sustaining Capital	$ 7,400,000	$ 1.49	$ 1.19
Total	**$ 78,300,000**	**$ 25.07**	**$ 20.06**

Table 11-2 - Operating Cost Estimate Summary (5 Mtpa)

OPERATING COST SUMMARY 5 Mtpa			
Item	**AUD/y**	**AUD/t Prod**	**AUD/t Ore**
Labour	$ 12,000,000	$ 2.39	$ 1.91
Flights and Accommodation	$ 400,000	$ 0.08	$ 0.07
Fuel	$ 4,900,000	$ 0.97	$ 0.78
Maintenance	$ 14,000,000	$ 2.79	$ 2.23
Reagents and Consumables	$ 300,000	$ 0.06	$ 0.05
Equipment Hire/Lease	$ 37,500,000	$ 7.49	$ 5.99
Transport and Logistics	$ 16,000,000	$ 3.19	$ 2.56
Contract/General Expenses	$ 7,700,000	$ 1.53	$ 1.22
Sustaining Capital	$ 7,400,000	$ 1.49	$ 1.19
Total	**$ 100,200,000**	**$ 19.99**	**$ 15.99**

The operating cost at 3 Mtpa represents the operating cost for the first two years of operation for the project. Once the next phase upgrades are completed to allow for 5 Mtpa operation it is expected that the operating cost will reduce and be representative of the life of mine operating cost.

12 ECONOMIC ANALYSIS

12.1 SUMMARY

This section analyses the financials outcomes of the NSP's Scoping Study. The financial evaluation in this chapter considers 100% of the project's output and associated revenue and costs.

Only one operating scenario was considered for the financial model which has been described in the previous chapters. The financial model takes into account both phases of the project.

The financial model uses a discounted cashflow methodology to assess the financial viability of the project. Using an 8% real discount rate, the financial model indicates that the NSP delivers a strong financial return for the case considered as shown in the table below:

Table 12-1 - Summary of Financial Return of NSP

Economic Metric		Amount
NPV (pre-tax)	A$m	1,410
IRR (pre-tax)	%	33%
NPV (post-tax)	A$m	830
IRR (post-tax)	%	32%
WACC	%	10%
Payback Years	years	6
Mine Life	years	25
LOM Net Revenue	A$m	9,783
LOM Opex	A$m	2,298
LOM Sustaining Capex	A$m	180
Initial Capex	A$m	535
Sales Price (FOB)	A$/t	81
Shipping and Marketing	A$/t	24
FOB Cost	A$/t	27.40

The base case generates an after tax NPV of A$830m with a payback period of six years.

12.2 BASIS OF ESTIMATE

The financial evaluation of the project has made several assumptions:

- All physical tonnages are assumed to be dry;
- Inflation or escalation is not considered, and future cash flow have been discounted using a real discount rate to generate the Net Present Value calculations;
- Working capital is considered in the following:
  - Initial Product stockpiles reflected in mining and processing ramp up factors;
  - Seasonality reflected in lower availability during the year
  - Sales receipts with a Provisional Payment and Final Payment (see 12.2.1 below); and

Given the factors above, once in operation the working capital requirements of the project are expected to be relatively stable.

The financial model was constructed on a yearly basis. The financial model commences on the Final Investment Decision (FID) date.

12.2.1 SILICA SAND PRICING ASSUMPTIONS

The product market and price forecasts used in the financial evaluation are outlined in detail in Chapter 9 and is based on a photovoltaic grade silica sand with an iron (Fe) content of 110 – 120ppm. Forward looking prices are based on the product being delivered to China on CIFFO terms and quoted in RMB/t. FOB terms are calculated using assumed shipping and insurance costs.

Shipping and insurance cost inputs are in AUD and are based on a five-year forward looking estimate. It is acknowledged for this Scoping Study, global shipping rates are currently at high prices, and it has been assumed that such prices are unsustainable and potentially lower in the future.

In the financial model the payment terms for the silica sand product assumes an 100% provisional payment upon loading of the export vessel, then the balance of the final payment is an adjustment for quality variations one month later.

A marketing fee of 0.5% of FOB revenue is assumed based on discussion with potential marketing and offtake firms.

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12.2.2 MACROECONOMIC ASSUMPTIONS

The project's economics are presented based on a 2023 benchmark price and cost basis. All amounts (unless otherwise stated) are presented in Australian dollars (AUD). Where prices have been presented in US Dollars (USD) or Chinese Renminbi (RMB) they have been converted at a flat exchange rate over the life of the project.

Table 12-2 - Summary of Macroeconomic Assumptions

Currency Conversion	Assumption
AUD:USD	0.73
RMB:USD	6.45
RMB:AUD	4.64

12.2.3 TAXATION AND ROYALTIES

The fiscal regime applied to the NSP in the financial evaluation is detailed in the following table.

Table 12-3 - Summary of Tax and Royalty Assumptions

Fiscal	Assumption
Australian Corporate Tax	30%
GST	The financial model assumes the Project is GST neutral on a period by period basis No GST has been assumed for initial working capital build up
Queensland State Royalty	A$0.90/wmt Silica Sand sold (Mineral Resource Regulation 2013)
Traditional Owner Royalty	2.0% of Project Revenue (FOB basis) [need agreement definition]

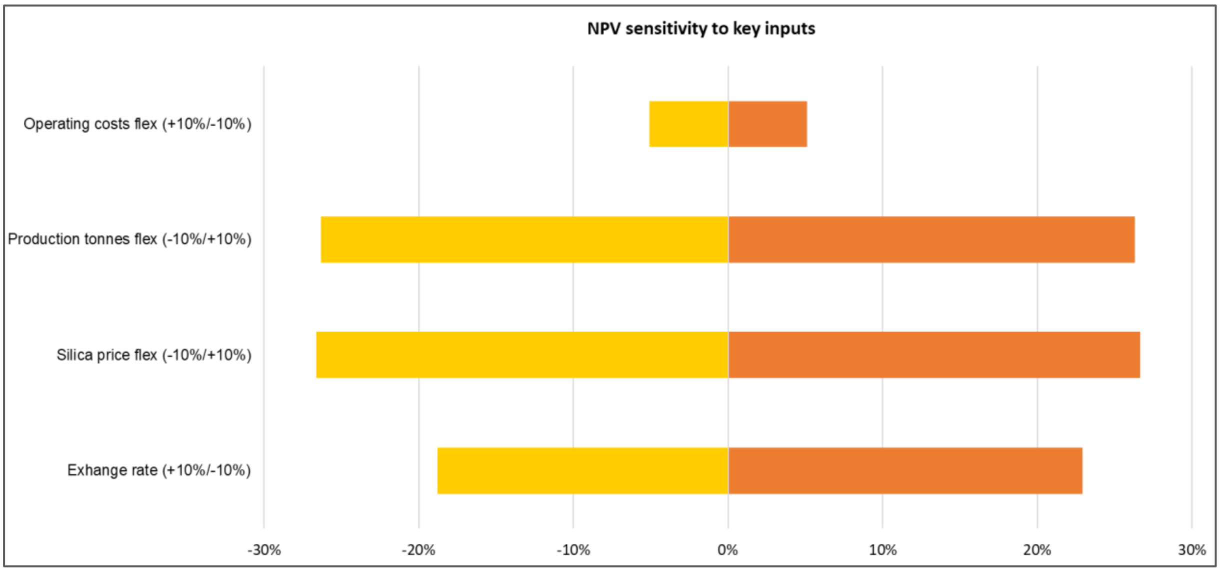
12.3 SENSITIVITY ANALYSIS

The following table and graph provide the sensitivity data for the project base case. It shows the project is most sensitive to the production tonnes, silica price and exchange.

Table 12-4 - Sensitivity Analysis Summary

Sensitivity Variable	NPV Min (A$m)	NPV Max (A$m)	Min (%)	Max (%)
Exchange Rate (+10%/-10%)	$ 674	$ 1,020	-19%	23%
Silica Price Flex (+10%/-10%)	$ 609	$ 1,051	-27%	27%
Production Tonnes (+10%/-10%)	$ 611	$ 1,048	-26%	26%
Operating Cost Flex (+10%/-10%)	$ 787	$ 872	-5%	5%

Figure 12-1 - Sensitivity Plot



13 FORWARD WORK

13.1 SUMMARY

The future work plan highlights key activities required prior to or during the next phase of studies. These items have been considered based on the project implementation timeline and identified risks and opportunities.

The following key forward work items have been identified during the Scoping Study as:

- Ongoing engagement with port stakeholders
- Commencement of Pre-Feasibility Study followed by Definitive Feasibility Study
- Ongoing engagement and consultation with local communities and local stakeholders
- Completion of further exploration and resource updates – Infill drilling and resource expansion
- Progression of metallurgical testwork programs
- Commencement of geotechnical and hydrogeological studies
- Establishment and commencement background environmental monitoring
- Impact assessments as part of the EIS process – Air and Noise, Aquatic Ecology, Coastal Environment, Cultural Heritage, Groundwater, Landscape and Visual, Social, Soils and Geology, Surface Water and Flooding, Terrestrial Ecology and Transport.
- Negotiate Mining Project Agreement (MPA) with underlying landowners and Cultural Heritage Management Agreement with native title holders.
- Public notification of various project development documents such as Terms of Reference and EIS.

13.2 EXPLORATION AND RESOURCE DEVELOPMENT

Prior to moving to the next phase of feasibility studies of the NSP, further drilling is required to enable the upgrade of the resource to meet the PFS or DFS requirements. This should be conducted as soon as practicable due to wet weather seasons affecting the timing and progress of the drill program. The culmination of the drill program will:

- Further confirm and expand the current geological model
- Increase drilling density expand the indicated resource
- Enhance definition of the higher-grade zones to sequence the mine
- Move Inferred Resource into Indicated and Measured Resource, to enable classification as Probable and Proved Ore Reserves

13.3 METALLURGICAL TESTWORK

Based on the testwork completed during the Scoping Study, Diatreme plans to undertake further testwork to confirm process parameters and plant design. The following table outlines the testwork going forward.

Table 13-1 - Metallurgical Testwork Program

Testing	Justification	Priority and Comment
PSD	PSD on bulk sample of actual ore to be feed into process plant	Recommend to ensure product will achieve customer sizing specification
Spirals	Bulk sample spirals testing to determine separation performance for removal of heavy minerals.	Recommended to ensure selection of suitable spiral model and quantity. Assess and determine whether inclusion of mids circuit is required in lieu of WHIMS. Confirmatory work on yield.
WHIMS	Bulk sample WHIMS testing to determine magnetic separation performance	Recommended to determine whether a lower iron product can be economically produced using WHIMS.
Attrition	Bulk sample attritioner testing to determine operating parameters	Recommended to ensure correct attritioner size, performance, attritioning duration and slurry density.
Variability (Process variability)	Characterisation processing of composite samples from geological zones across the entire resource to test variability samples through the process.	Recommend to determine whether the process will produce a consistent product from ore with different characteristics.
Vendor Testwork	Processing of bulk sample through the flowsheet with vendor equipment to confirm performance.	Recommend to confirm the flowsheet through commercial scale equipment. This includes rheology testwork.

Bulk sample testwork will involve processing a one tonne bulk sample from the initial mining area through a pilot scale process circuit using commercial scale equipment. This testwork will confirm the product specifications and the process design for the feasibility study. The size of this sample will allow production of marketing samples for potential customers.

An assessment of the variability of the ore body will be completed using the results of the characterisation of the composite samples from exploration drilling. The variability samples will be characterised in parallel with a sub-sample from the bulk sample to identify potential processing variability within the orebody.

13.4 POWER SUPPLY ENGINEERING

Based on power supply engineering completed during the Scoping Study, power engineering should be progressed to optimise the following:

- Wind generator selection
- BESS type (VRFB, LiOH etc)
- Power curtailment

Power supply engineering will need to take place after confirmation of required installed power for the project.

13.5 PORT ENGINEERING

Further to stakeholder negotiations, investigation around engineering of the port facilities should be progressed including:

- Further met-ocean studies (part of environmental monitoring program)
- Offshore geotechnical studies.

13.6 WATER SUPPLY

Environmental work has identified production bores for water supply. Further work in the PFS is required to confirm the supply availability and water quality.

13.7 GEOTECHNICAL & HYDROGEOLOGY INVESTIGATION

To provide the necessary information for engineering purposes, geotechnical activities are required in various areas including the process plant/camp, roads, stockpile, materials handling equipment, port facilities, and site-wide bulk earthworks. Hydrogeological modelling is required for water supply design and information on depth to water table including seasonal variations in the water table. These aspects of hydrogeology are important to consider in the geotechnical assessment for foundation design and drainage management.

Geotechnical works will include:

11. Borehole drilling and test pitting at the process plant/camp, to determine the geotechnical parameters required for structural analysis and footing design.
12. Borehole drill and test pitting at the stockpile and sediment basins to better understand the ground conditions (geotechnical and hydrogeological)
13. Borehole drill and test pitting along the materials handling road to determine the geotechnical parameters required for structural analysis and footing design

13.8 ENVIRONMENTAL MONITORING

Environmental monitoring will be a continuous aspect of the NSP. It encompasses the collection of groundwater, surface water, and stygofauna samples, along with the gathering of met-ocean and water quality data. Seasonal surveys and cultural heritage and SIA surveys are also included. Additionally, access tracks must be established to enable the team to reach environmental monitoring sites and install monitoring equipment. These activities fall under the umbrella of the NSP's environmental initiatives.

Basis and Assumptions for Production Target Estimation

The NSP project evaluation is based on a Production Target that is derived from a Mineral Resource estimate. The current category of the Mineral Resource estimate will not support estimation of an Ore Reserve. This commentary has been prepared for compliance with the JORC Code (2012) and the ASX Listing Rules. All material assumptions on which the Scoping Study production target and projected financial information are based have been included in the Scoping Study or disclosed in the table below. The table provides commentary on preparation of the Scoping Study Production Target in the format of the JORC Code (2012) Table 1, Section 4.

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* • *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	• The Scoping Study does not include an estimate of Ore Reserves. • The Mineral Resource Estimate used as a basis for the Scoping Study Production Target was announced to the ASX on 13 March 2023 "Major silica resource expansion from 124Mt to 235Mt". • 64% of the combined Indicated and Inferred Mineral Resources were used for the Production Target. • The Production Target composition is 68% Indicated Resources and 32% Inferred Resources. • Factors affecting the use of Mineral Resources include ecological constraints, groundwater table, processability, and proximity to tenement boundaries, roads and watercourses.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Persons for the NSP Exploration Results and Mineral Resources have completed site visits and provided all information necessary for the Scoping Study. • Site visits confirmed the topography, vegetation, groundwater and other mining and logistics assumptions. • Competent Persons statements are included in the ASX announcement for the NSP Scoping Study.
Study status	• *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.* • *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.*	• The Scoping Study does not include an estimate of Ore Reserves.

Criteria	JORC Code explanation	Commentary
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	• A silica grade cut-off of 98.5% SiO_2 was used for the Mineral Resource Estimate. The conversion to Production Target also considered the level of other compounds in the resource that may impact product quality. • The cut-off grade is based on experience with Diatreme's GSSP which is a similar type of mineral deposit. The mining and processing cost structure at the GSSP was the basis for the NSP evaluation. • Estimates of logistics costs for the NSP were used.
Mining factors or assumptions	• *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.* • *The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.* • *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* • *The mining dilution factors used.* • *The mining recovery factors used.* • *Any minimum mining widths used.* • *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* • *The infrastructure requirements of the selected mining methods.*	• The sand dunes are suitable for open-cut mining. The Mineral Resource is continuous from the topsoil cover to the water table. This method is utilized for similar mining operations nearby. The method selected includes wheel loader excavation and then slurry pumping to the processing plant. • Geotechnical parameters are selected based on experience in similar mining environments. The angle of repose is assumed to be 35 deg based on other similar operations. • Benches are not required due to the shallow open pit design and the low angle of repose. • Grade control at a 50x50m grid has been assumed pre-mining. • Mine design was limited to the practical sequence of mining the sand dunes with no overburden. • The area of Indicated Resources is planned for mining before Inferred Resources. • A mining dilution factor has not been used. This assumes that removal of topsoil is well managed resulting in minimal dilution. The deposit does not exhibit a typical overburden or host rock, with most surrounding material being silica sand that is not mined for practical reasons. • Full mining recovery is assumed due to the mine design and excavation method where recovery is well managed through survey. • No minimum mining width is used due to the flexibility in the mining method. • All mining areas are sufficiently wide for the proposed mining method. • The Production Target composition is 68% Indicated Resources and 32% Inferred Resources. • The first 17 years of the project evaluation is based on Indicated Mineral Resources. Indicated Mineral Resources alone are sufficient to provide a strong financial result for the project. • Exclusion of Inferred Mineral Resources does not have a material impact on the outcomes of the Scoping Study.

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		• All mining equipment is mobile and the flexibility of the method allows plant to move frequently and minimise tramming distance for the wheel loader. The processing plant location will be fixed for the period covered by the scoping study. •
Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.* • *Whether the metallurgical process is well-tested technology or novel in nature.* • *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* • *Any assumptions or allowances made for deleterious elements.* • *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.* • *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?*	• CDE was engaged for the conceptual process plant design and cost estimation. The proposed metallurgical process is well developed in the silica sand industry and uses standard processing equipment that is currently used at mines with similar operating parameters. • The plant includes a dry mining unit that pumps slurry to the process plant. • Processing includes screening, gravity separation, attritioning, classification and dewatering before product stockpiling. • Composite samples from four areas of the Mineral Resource have been processed by Mineral Technologies through laboratory scale equipment to provide small product samples. The product sample were assayed by ALS and the results used for mine planning and process design. • Laboratory tests indicated recovery rates exceeding 90%. The yield to product has been conservatively estimated at 80% for the Scoping Study to allow for reduced yield from commercial scale equipment
Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.*	• Studies for an EIS and consultation with Qld State and Commonwealth agencies have commenced. • The operation has low environmental risk due to the low risk nature of silica sand and any chemicals used on site. • Reject sand from the process has similar characteristics to the in-situ sand and will be used as the base for rehabilitation. • A similar scale silica sand mine has been operating in adjoining dunes for decades with acceptable environmental impacts.

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Infrastructure	• *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.*	• Mining Lease applications have been lodged for all areas of land required for the project. The • Majority of the land under application is on existing Diatreme EPM and connects with public road access to the west and the Cape Flattery Port to the east. • An application for a transport corridor crosses an existing mining tenement held by another party and approval of this will be processed in accordance with the relevant legislation. • Labour, accommodation and other services have been assessed and are available locally, sufficient community engagement has been completed to support this process
Costs	• *The derivation of, or assumptions made, regarding projected capital costs in the study.* • *The methodology used to estimate operating costs.* • *Allowances made for the content of deleterious elements.* • *The source of exchange rates used in the study.* • *Derivation of transportation charges.* • *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* • *The allowances made for royalties payable, both Government and private.*	• Capital and operating cost items have been estimated using a mixture of fee proposals from suppliers, benchmarking similar operations and industry knowledge. • Cost Estimates are +/- 35% in line with AusIMM Scoping Study quality standards. • Provision has been made for escalation of future operating and capital costs in line with reasonable market expectations. • Previous cost estimation for the GSSP PFS has provided most information of a standard suitable for the Scoping Study. • Details of government ($0.90/t) and other royalties (2%) are provided in the Scoping Study summary.
Revenue factors	• *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.* • *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*	• High purity silica sand product pricing is quality dependent. The NSP product is expected to be suitable for use in PV cover glass manufacture. The price used in the study is based on market assessment, discussion with potential offtake partners and comparable industry data. • The price been estimated FOB ($81/t) and includes estimated barge loading and transhipping costs at the Cape Flattery port.

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Market assessment	• *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.* • *A customer and competitor analysis along with the identification of likely market windows for the product.* • *Price and volume forecasts and the basis for these forecasts.* *For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.*	• A marketing study previously completed for the GSSP product and discussions with potential customers indicates there is strong growth in the market for PV cover glass for use in solar panels. • New high purity silica projects are being developed but not at a rate that could cause oversupply. • Reputable market bodies have indicated the demand for silica sand is increasing and that the sand produced at the NSP will be readily accepted by the market. • Proposed long term production of 5Mt/a is approximately 5% of the global market for glass quality silica sand. • Silica sand specifications for PV glass have been received from manufacturers and samples of NSP quality product have been tested by potential customers with satisfactory results.
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	• Diatreme is in discussions with landholders which are expected to lead to a Mining Agreement after more detailed project information is finalised. • Currently maintaining tenements, and meeting ongoing obligations for exploration, permitting, economic studies and the approval and permitting processes. • Continued maintenance of ongoing community obligations related to these activities. • Advancing the EIS preparation for public comment and determining final terms of reference. • Undertaking EIS planning and relevant studies (water, flora, fauna, social impact). • Diatreme is planning to progress these agreements to completion during the Feasibility Study.
Other	• *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* • *Any identified material naturally occurring risks.* • *The status of material legal agreements and marketing arrangements.* • *The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be*	• An Ore Reserve estimate has not been produced. • No material naturally occurring risks currently identified. Risk management will be an ongoing process during the Feasibility Study. • Diatreme has MOU's with potential customers for GSSP product. The NSP product is similar quality and these MOUs are expected to be maintained for this product. • Mining Lease applications for the NSP have been submitted. • An application for a transport corridor crosses an existing mining tenement held by another party and approval of this will be processed in accordance with the relevant legislation. • An application for a partial user agreement has been lodged with Ports North, the Qld State Government authority responsible for the Cape Flattery Port.

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	received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.	
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.* • *Whether the result appropriately reflects the Competent Person's view of the deposit.* • *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).*	• An Ore Reserve estimate has not been produced.
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• An Ore Reserve estimate has not been produced.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.*	• An Ore Reserve estimate has not been produced. • Details of the development of the Production Target from Indicated and Inferred Mineral Resources have been provided previously in this table. • Inputs to the economic analysis are Scoping Study standard and are approximately +/- 35%. This accuracy level is based on a large proportion of the cost inputs being available from the GSSP PFS. • The Cautionary Statements in the ASX announcement to which this table is attached provide information on the accuracy of the results of the economic analysis for the NSP Scoping Study.

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	• *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	

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