



Ventnor Resources Limited

WA Silica Sand Projects

November 2018

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Competent Person

The information in this Report that relates to Muchea Exploration Results is based on data collected under the supervision of Mr David Reid, in his capacity as Exploration Manager. Mr Reid, BSc (Geology), is a registered member of the Australian Institute of Geoscientists and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and the activity being undertaken to qualify as a Competent Person under the 2012 edition of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Mr Reid consents to the inclusion of the data in the form and context in which it appears.

The information in this report that relates to Mineral Resources is based on information compiled by Mr Grant Louw who is a full-time employee of CSA Global, under the direction and supervision of Dr Andrew Scogings, who is an Associate of CSA Global. Dr Scogings is a Member of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. He is a Registered Professional Geologist in Industrial Minerals. Dr Scogings has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code). Dr Scogings consents to the disclosure of information in this report in the form and context in which it appears.

The world is facing a global sand crisis



News ▾ Middle East Documentaries ▾ Shows ▾ Investigations

FEATURE / BUSINESS & ECONOMY

Running out of sand: in numbers

We illustrate the depletion of one the world's most sought-after commodities of the 21st century: sand.

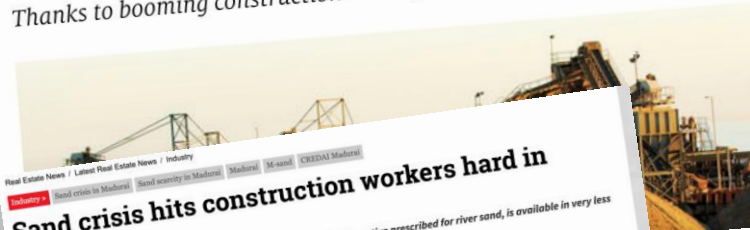
Demand for sand leads to global ecological crisis

by Alexandra Popescu on 8 February 2018

A shore thing

An improbable global shortage: sand

Thanks to booming construction activity in Asia, sand is in high demand



Real Estate News / Latest Real Estate News / Industry

Sand crisis hits construction workers hard in Madurai

What has made things worse is that M-sand (manufactured sand), the alternative prescribed for river sand, is available in very less quantity and its quality is also far from desirable.

TNN | January 23, 2018, 12:00 IST

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The world is facing a global sand crisis

September 8, 2017 6:22am AEST

Sand for use in hydraulic fracturing operations at a processing plant in Chippewa Falls, Wisconsin in 2011. AP Photo/Steve Karnowski, Author provided

When people picture sand spread across idyllic beaches and endless deserts, they understandably think of it as an infinite resource. But as we discuss in a [just-published perspective](#) in the journal Science, over-exploitation of global supplies of sand is damaging the environment, endangering communities, causing shortages and promoting violent conflict.

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TOPIC BELT AND ROAD INITIATIVE

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THE WORLD IS RUNNING OUT OF A RESOURCE, AND IT'S NOT OIL

A looming shortage of sand – a crucial resource once thought endless – could sink infrastructure projects, including those in China's Belt and Road Initiative

Global Shortage of Key Resource Could Doom Key Asian Infrastructure Projects

ENVIRONMENT 03:40 07.01.2018 (updated 07:18 07.01.2018) [Get short URL](#)

6 11 0

In the city of Kampot in southern Cambodia, the extraction of sand from an estuary on the Praek Tuek Chhu river is increasing and sand extraction is so common in Asia currently that the continent may deplete all of its sand in the not-too-distant future.

Philippines Indonesia

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SPECIAL COVERAGE

Sand mining: Growing pains of cross-border trade

Unchecked sand mining, with

Silica Sand Use

Construction Sand

Concrete

Glassmaking

Float, Containers, Architectural, Thin Film

Metal Casting/Foundry

Automobile parts

Oil/Gas Well Stimulation

Frac sand/proppant

Metallurgical

Ferrous and Non-ferrous Alloys

Paint and Coatings

Brightness and durability

Chemical Production

Sodium silicate, Silicon gels

Ceramics and Refractories

High temp resistance

Filtration

Water production

Recreational

Inert growing media, Golf bunkers

Silica Sand Markets



Priority for Marketing



Construction sand



Silica sand for glassmaking



Foundry sand



Frac sand proppant

Market Outlook



Estimated demand for silica sand for glassmaking by region:

Region	% of Global demand
Asia Pacific	47%
North America	20%
Western Europe	16%
Eastern Europe	8%
Africa/Middle East	5%
Central and South America	4%

Source: Freedonia



Market Outlook



Asian glass making production increasing 5-6% per year

Use	Spec	Market in Asia
Float (Plate) Glass	99.5% SiO ₂	60-65 Mt
Container Glass	99.5% SiO ₂	70-75 Mt
Cover Glass (Solar Panels)	99.95% SiO ₂ Low Fe	5-6 Mt
Smart Glass (Ultra Clear)	99.97% SiO ₂ Low Fe	1-2 Mt
Specialist Glass (Thin Screen)	99.97% SiO ₂	500-600 Kt

Source: Stratum Resources



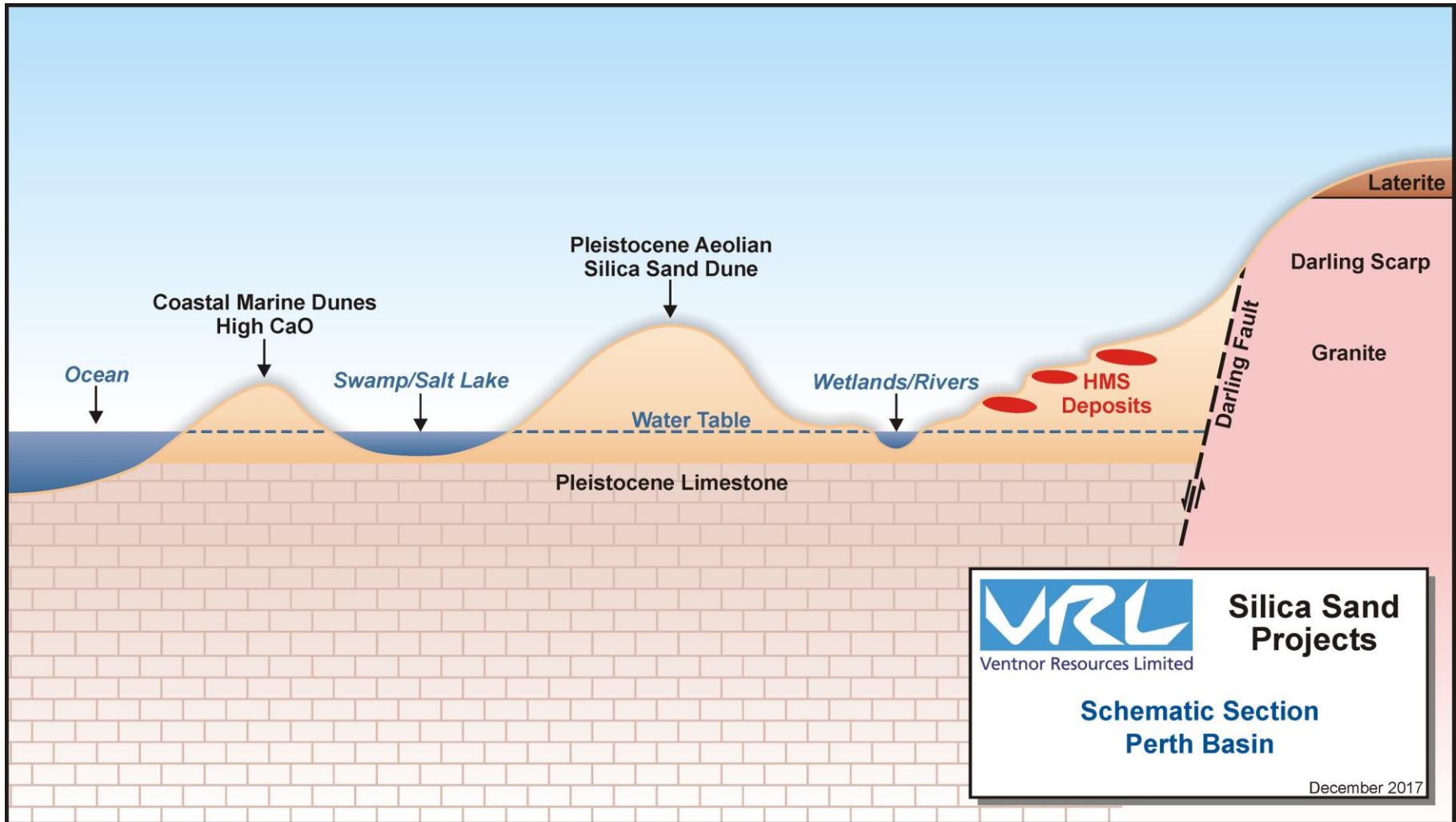
Ventnor's silica sand strategy

Identify and delineate large scale silica sand resources close to infrastructure

Develop plans for the mining and export of high quality silica sand

Explore opportunities for further processing to value-add

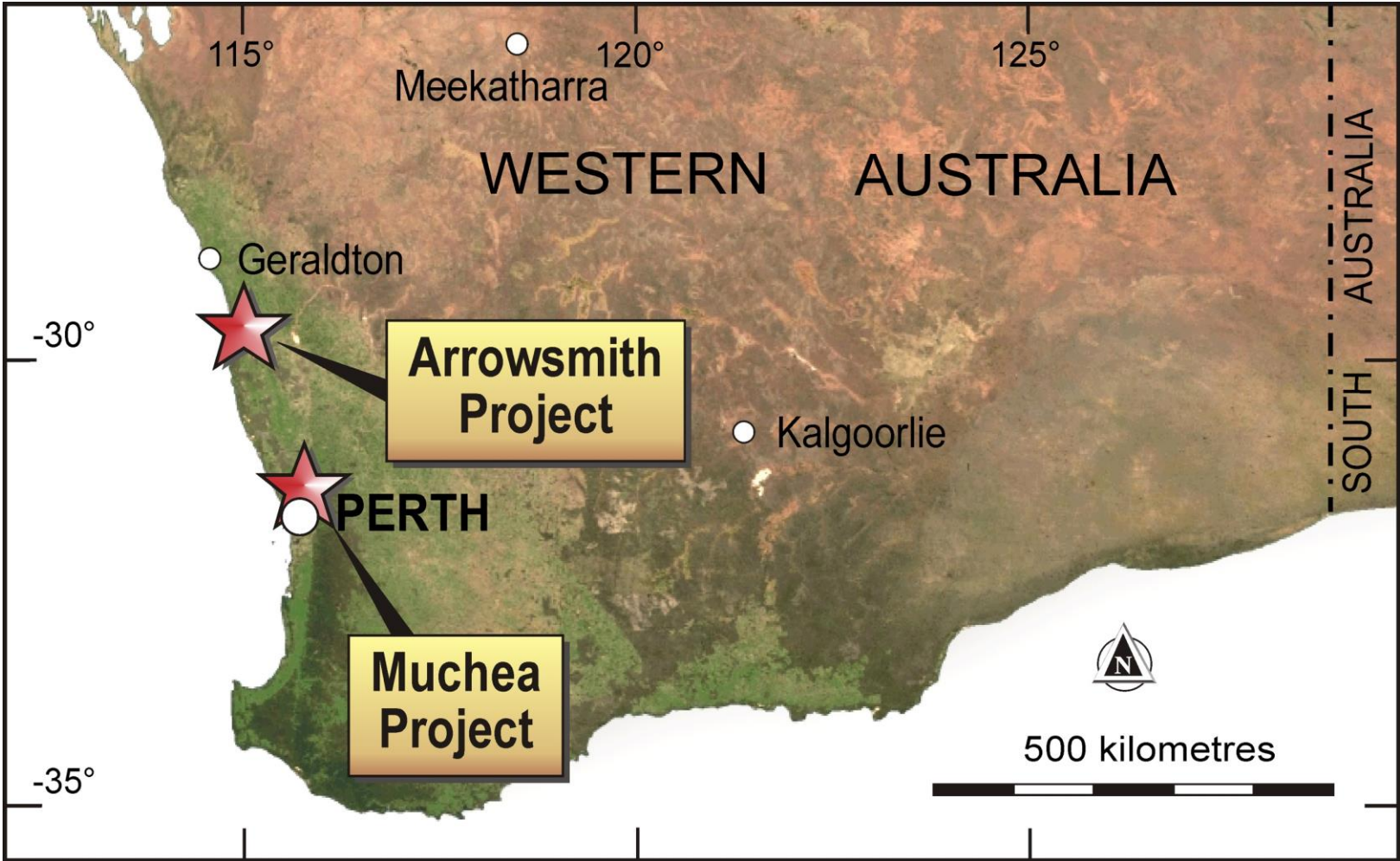
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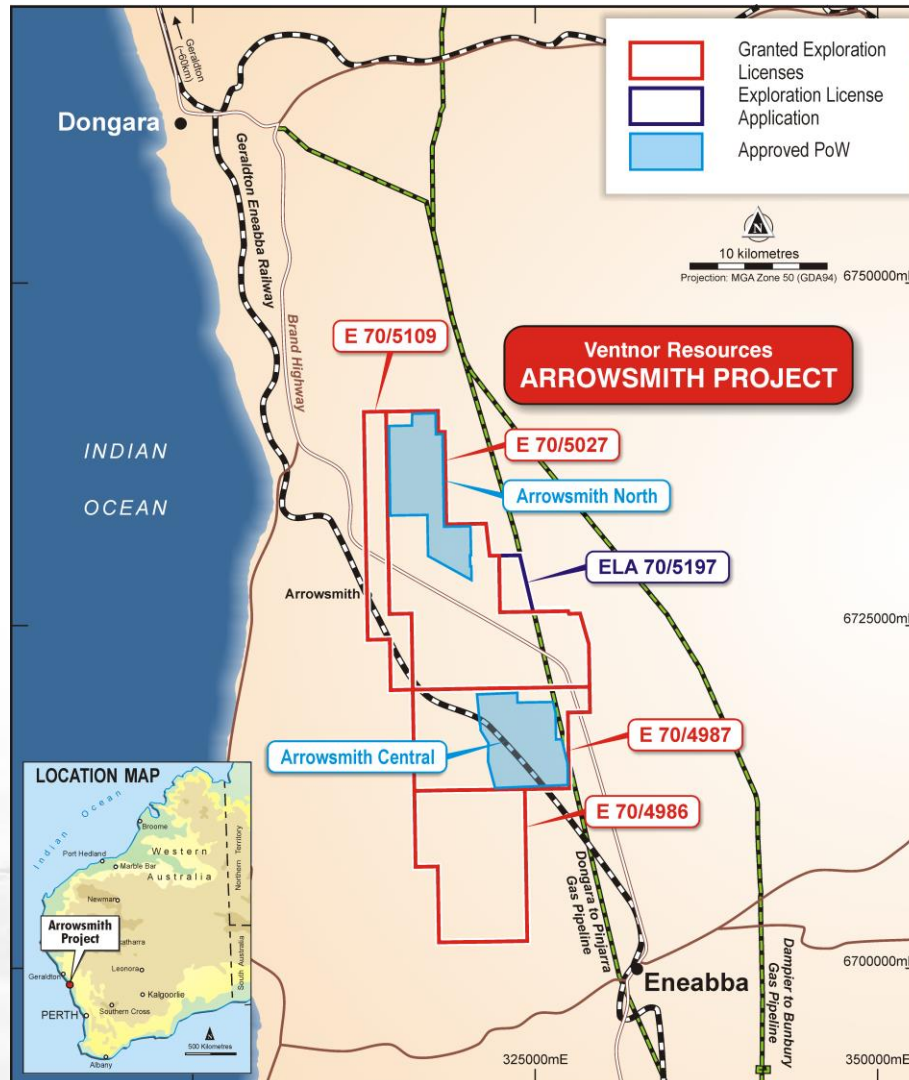


Ventnor Resources Limited

WA Silica Sand Projects



Arrowsmith



- 270km nth of Perth
- South of Dongara with rail connections to Geraldton Port
- Very large-scale potential
- Preliminary testwork confirms glass-making quality
(+99.5% SiO₂)
- Low capital intensity and low environmental impact mining propositions

Arrowsmith



Arrowsmith North Inferred Resource



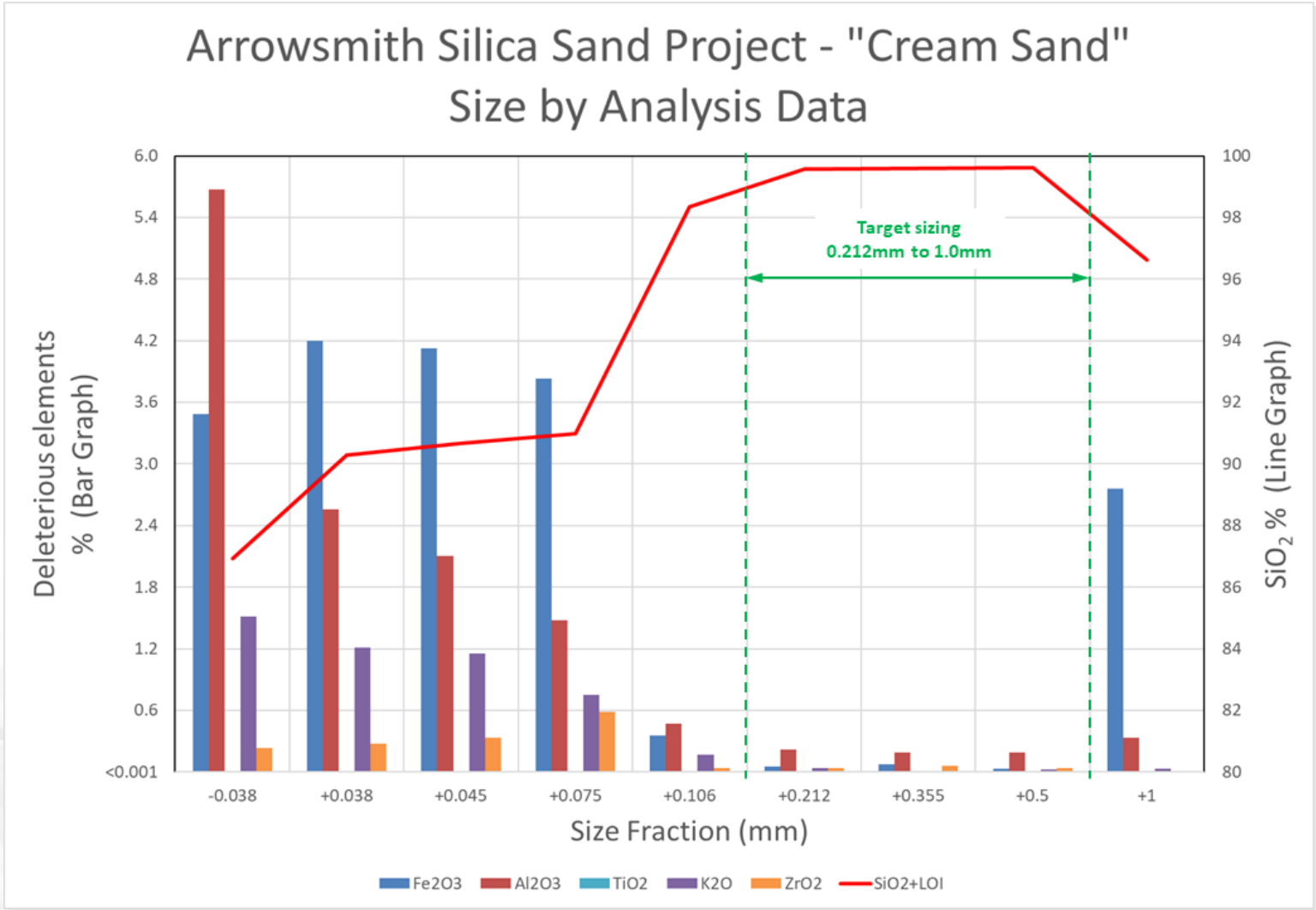
193.6 million tonnes @ 98% SiO₂*

Classification	Domain	Million Tonnes	SiO ₂ %	Al ₂ O ₃ %	Fe ₂ O ₃ %	TiO ₂ %	LOI%
Inferred	Yellow Sand	149.4	97.7	1.1	0.4	0.2	0.5
	White Sand	44.2	99.1	0.3	0.1	0.2	0.2
	All Sand	193.6	98	0.9	0.3	0.2	0.4

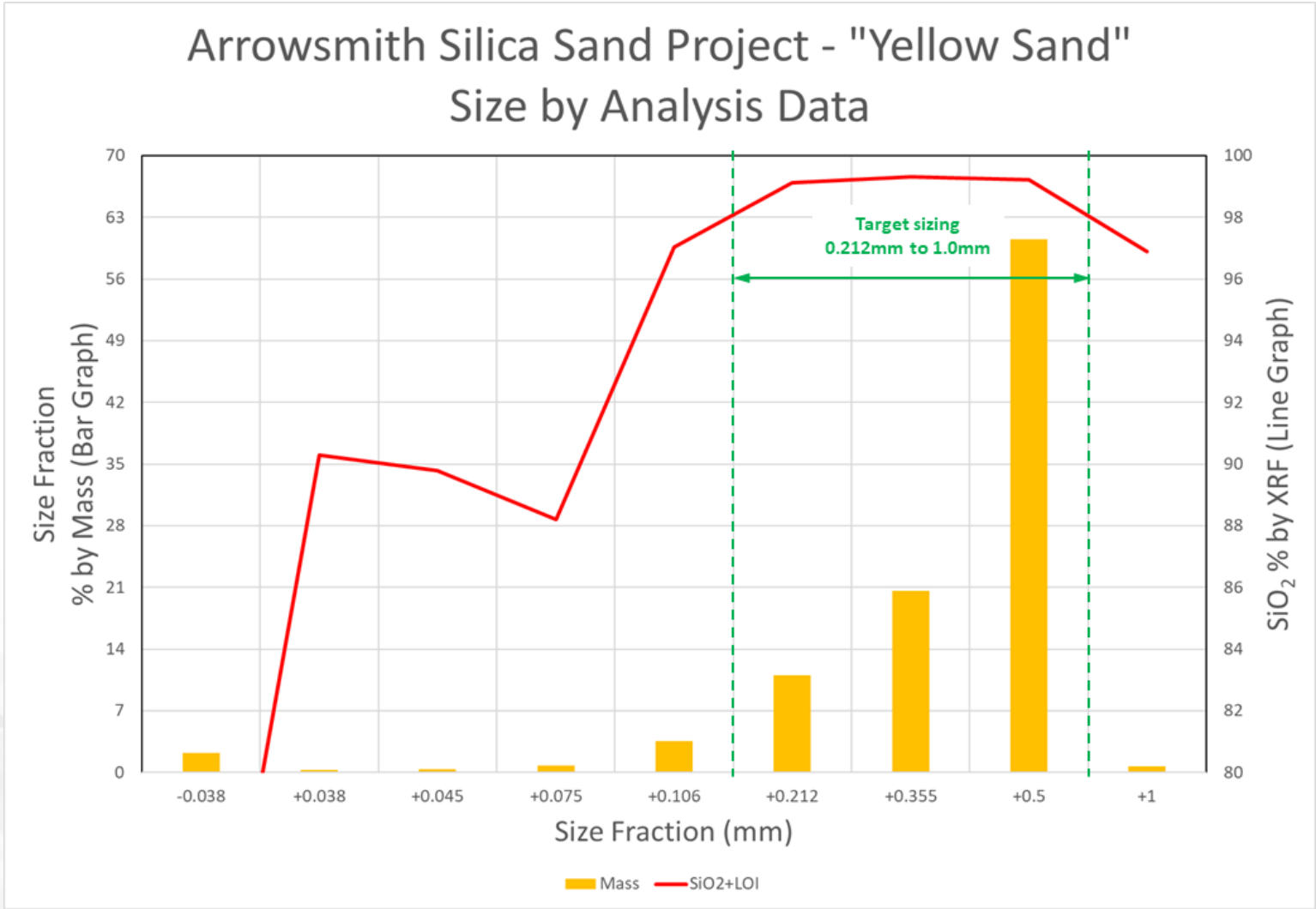
**Note: Interpreted mineralisation is domained into different sand types based on drill logging data and publicly available soil mapping information, above a basal surface wireframe defined based on the current drill sampling depths. Depletion zones include the upper 0.5 m for rehabilitation purposes, and minor swamp zones in the east and south of the modelled area. Differences may occur due to rounding.*

** Details of Arrowsmith North Resource Estimate are contained in the ASX announcement of 2 October 2018*

Arrowsmith North Upgrade



Arrowsmith North Upgrade





Rail Access to Geraldton



Geraldton Port

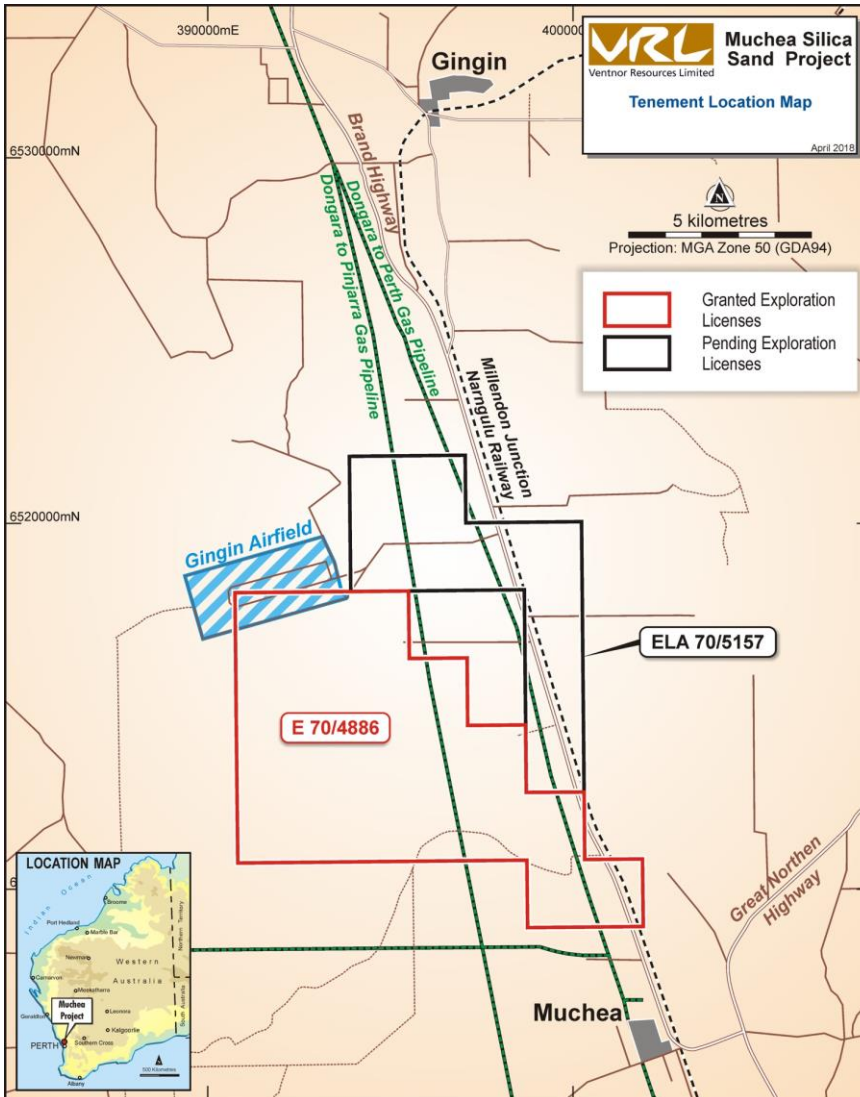


Muchea



- Significant high grade Silica Sand deposit
 - 50 km nth of Perth
 - 14 km nth of Muchea
- Transport logistics - rail products to Kwinana Port for export
- Adjacent to Brand Highway
- Granted tenure 100% VRX

Muchea



- Due diligence drilling indicated high-grade SiO₂ (+99.6% Avg)
- Preliminary testwork indicates processing can upgrade sand to specialised glass quality
- Current logistics under-utilised with significant interest from operators

Muchea Indicated/Inferred Resource



191Mt @ 99.6% SiO₂

Classification	Million Tonnes	SiO₂%	Al₂O₃%	Fe₂O₃%	LOI%	TiO₂%
Indicated	19	99.7	0.03	0.03	0.2	0.08
Inferred	172	99.6	0.04	0.02	0.2	0.08
Indicated + Inferred	191	99.6	0.04	0.02	0.2	0.08

**Note: Interpreted mineralisation is domained into different sand types based on drill logging data and publicly available soil mapping information, above a basal surface wireframe defined based on the current drill sampling depths. Depletion zones include the upper 0.5 m for rehabilitation purposes, and minor swamp zones in the east and south of the modelled area. Differences may occur due to rounding.*

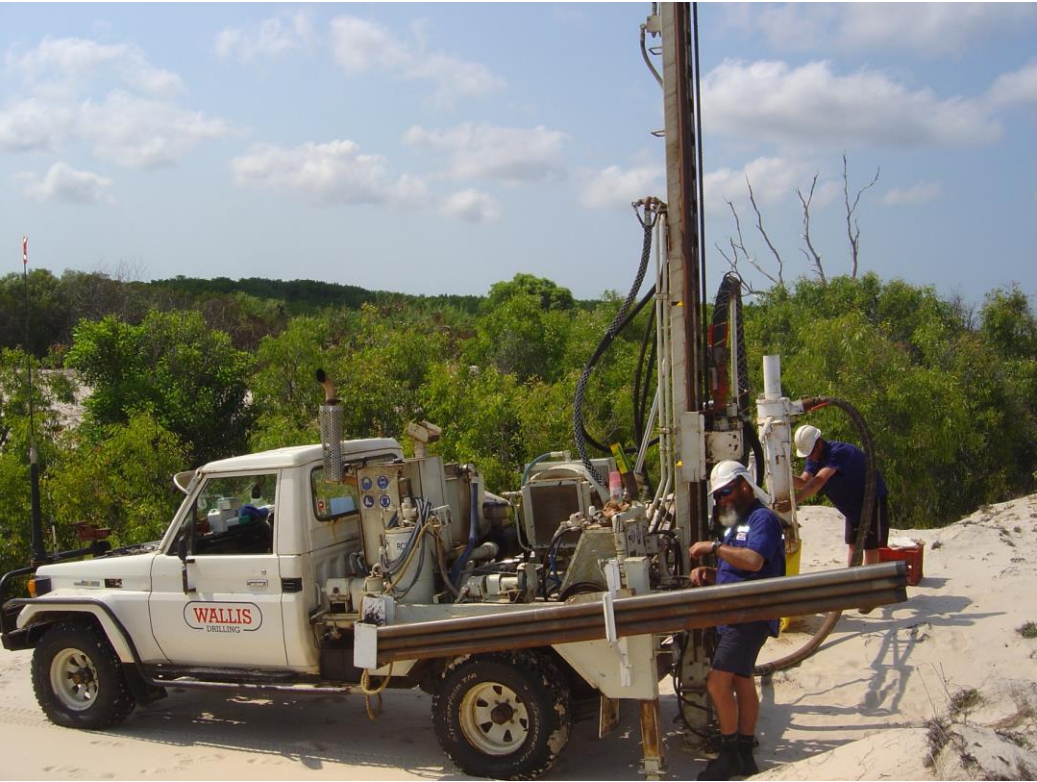
** Details of Muchea Resource Estimate are contained in the ASX announcement of 20 November 2018*

Muchea



- Muchea is potentially a world class high-grade silica sand deposit
- With an unusually high grade feed stock simple processing can provide almost any required grade product

Proposed Exploration Program



Drilling using 4WD-mounted AC rig and hand held auger

Exploration Program

- Exploration to date has allowed and estimate for an Inferred Resources at Arrowsmith North and an Indicated/Inferred Resource at Muchea
- All exploration above the water table
- Very low cost shallow drilling (10-15m) in free running sand
- Sand 2-3% moisture (no dust...)
- ISBD determination completed
- Significant testwork programs either completed or underway
- *Mining will require no dewatering*



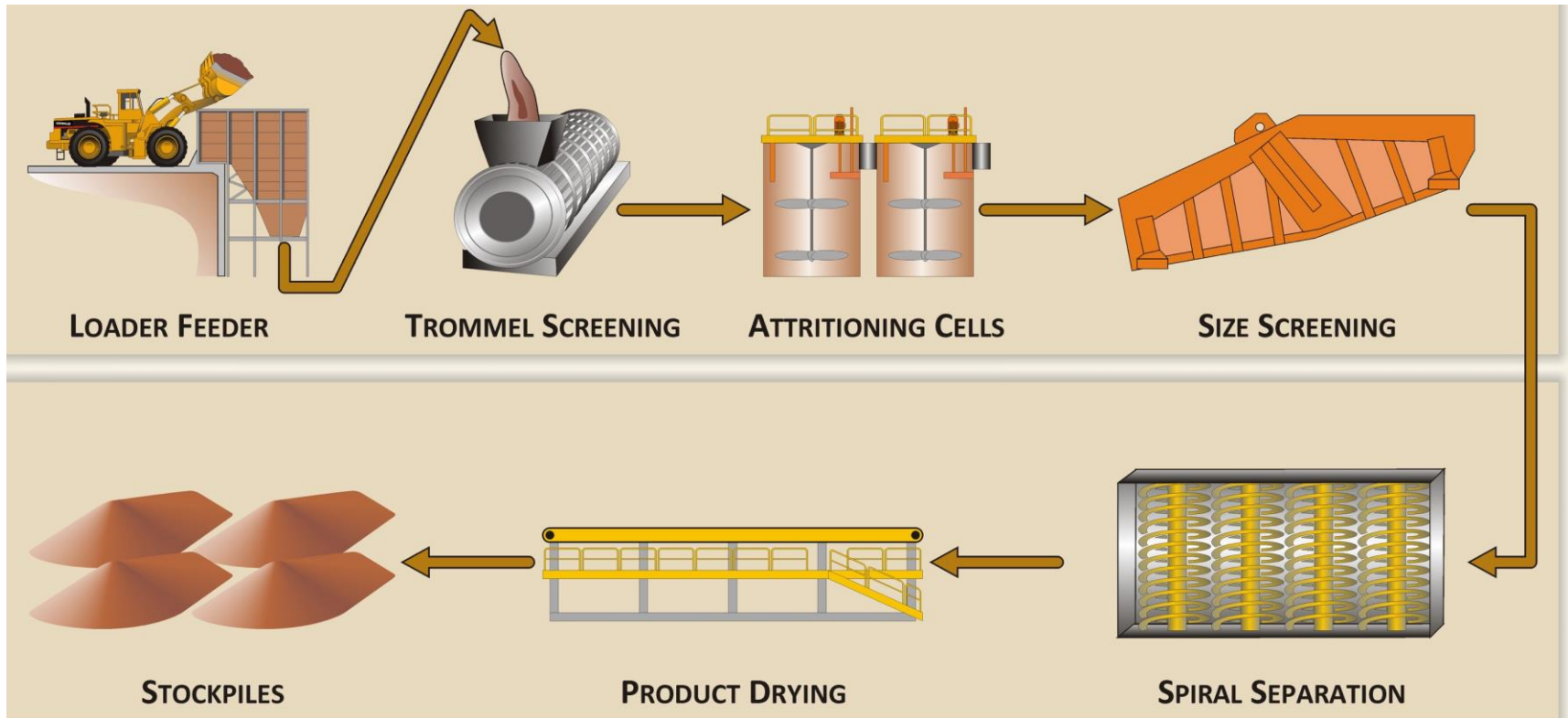
Development Program

- Closer spaced drilling for an Indicated Resource at Arrowsmith North and an expanded Indicated Resource at Muchea is planned for January 2019
- Third iteration bulk testwork underway will determine potential products and required processing equipment
- Wet processing by conventional plant (no chemicals)
- Preliminary engineering underway $\pm 15\%$ capital cost estimate
- *Testwork will also produce final quality samples to send to potential importers in Japan, China, India, Vietnam, Thailand, Taiwan and Korea*
- Finalise logistics chain for access to rail and port facilities to export sand from Arrowsmith through Geraldton and from Muchea through Kwinana
- Environmental studies completed to support Mining Proposals
- **Feasibility study** components to be completed by end of 2018

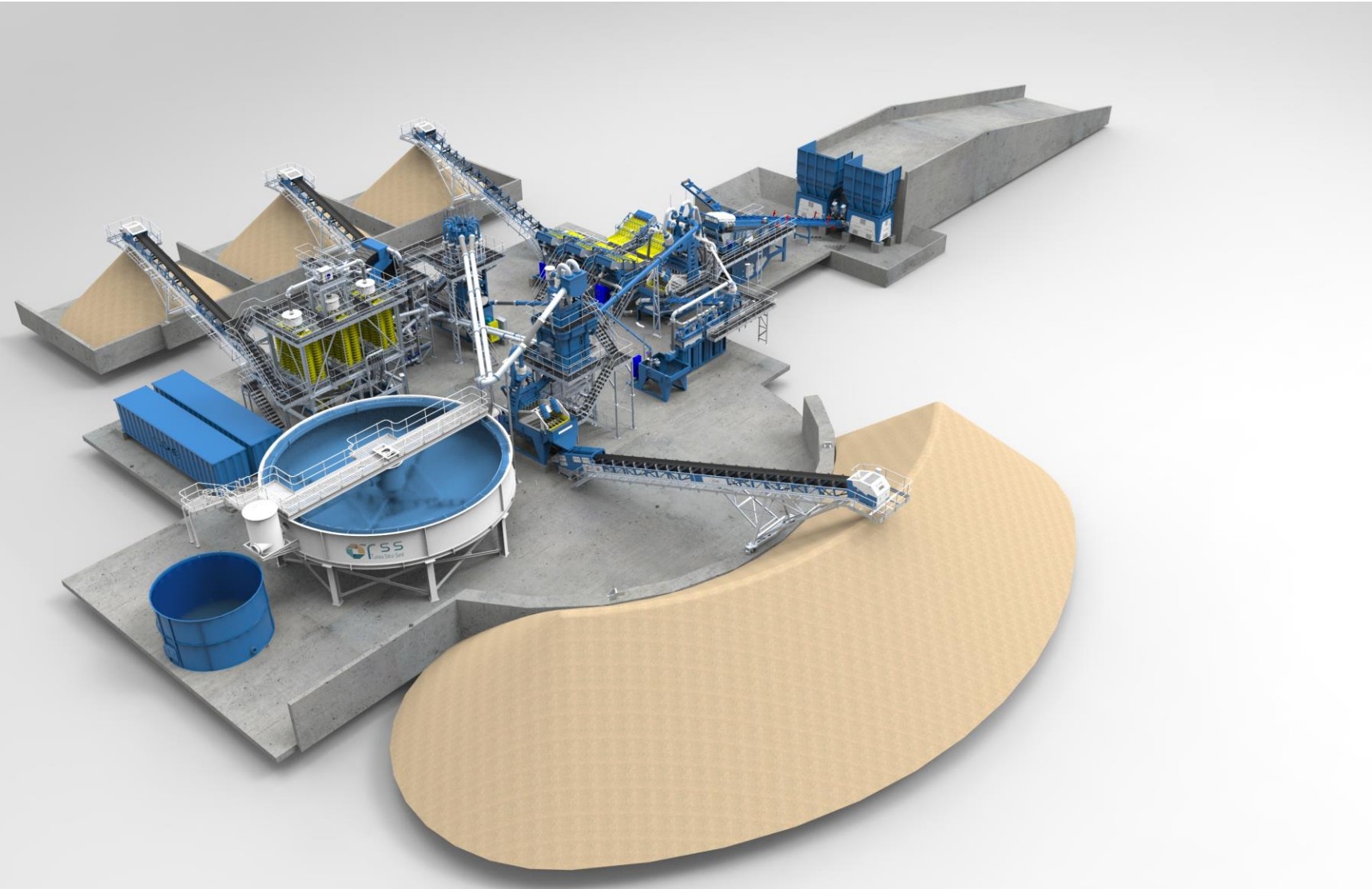


Processing

Established processing techniques
(no chemicals, no dust)



Processing



Corporate & Capital Summary

Share Code (ASX)	VRX Shares
Shares on Issue	364.7 m
Options issued	52.0 m
ASX 52 week high/low	\$0.19/\$0.036
Cash	\$1.6 m
Debt	Nil
Market Capitalisation	\$62 m

Directors

Paul Boyatzis

Non-Executive Chairman

Bruce Maluish

Managing Director

Peter Pawlowitsch

Non-Executive Director



Investment Considerations

**EMERGING
AUSTRALIAN
STRATEGIC
SILICA SAND
PRODUCER**

**OUTSTANDING
PROJECT
ECONOMICS
AND
LOGISTICS**

**IDEALLY
PLACED TO
CAPITALISE ON
ROBUST
MARKET
OUTLOOK AND
DEMAND**

**POTENTIAL
LARGE SAND
RESOURCES
AND
PRODUCTION**

**RAPID
PATHWAY TO
FINANCING
AND
PRODUCTION**

**OTHER
PROSPECTS
UNDER
INVESTIGATION**