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# Beharra.

# The Midwest's leading high grade silica sand project.

ASX: PEC

Corporate Presentation, NWR Resources Series Virtual Conference  
Mining's Top Microcaps and Midcaps, Tuesday 26th October 2021



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# Competent Persons Statement

The information in this report that relates to the March 2020 Exploration information for the Beharra Project is based on information compiled and fairly represented by Mr Colin Ross Hastings, who is a Member of the Australasian Institute of Mining and Metallurgy and consultant to Perpetual Resources Limited. Mr Hastings is also a shareholder of Perpetual Resources Limited. Mr Hastings has sufficient experience relevant to the style of mineralisation and type of deposit under consideration, and to the activity which he has undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Mr Hastings consents to the inclusion in this report of the matters based on this information in the form and context in which it appears.

The information in this report that relates to the Exploration information for the Beharra Project from September 2020 onwards is based on information compiled and fairly represented by Mr John Doepel, who is a Member of the Australasian Institute of Mining and Metallurgy and consultant to Perpetual Resources Limited. Mr Doepel has sufficient experience relevant to the style of mineralisation and type of deposit under consideration, and to the activity which he has undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Mr Doepel consents to the inclusion in this report of the matters based on this information 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 Elizabeth Haren, a Competent Person who is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy and a Member of the Australian Institute of Geoscientists. Elizabeth Haren is employed as an associate Principal Geologist by Snowden Mining Consultants Pty Ltd, who was engaged by Perpetual Resources Limited. Elizabeth Haren 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 Resources and Ore Reserves”. Elizabeth Haren consents to the inclusion in the report of the matters based on her information in the form and context in which it appears.

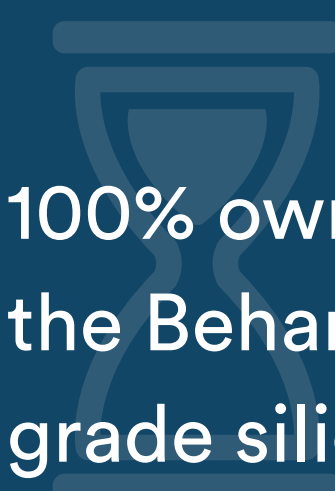
The information in this report that relates to Mineral Resources is based on information compiled by Dr Andrew Scogings, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy, a Member of the Australian Institute of Geoscientists and is a Registered Professional Geologist in Industrial Minerals. Andrew Scogings is employed as an associate Executive Consultant Geologist by Snowden Mining Consultants Pty Ltd. Dr Scogings 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 Resources and Ore Reserves”. Dr Scogings consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to the Beharra Ore Reserve is based on information reviewed or work undertaken by Mr Frank Blanchfield (FAusIMM). Mr Blanchfield is an employee of Snowden and has relied on Perpetual for marketing, environmental, permitting, and financial modelling and any costs not relating to mining and metallurgy. The mine design and mining costs and economic viability of the project were assessed and completed by Snowden under his direction. Mr Blanchfield has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the preparation of mining studies to qualify as a Competent Person as defined by the JORC Code 2012. Mr Blanchfield consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The scientific and technical information in this report that relates to process metallurgy is based on information reviewed and work completed by Arno Kruger (MAusIMM), who is a metallurgical consultant and employee of IHC Robbins. The metallurgical factors including process flowsheet design and costs and assumptions for the bulk aircore sample that relate to Mineral Resources have been reviewed and accepted by Mr Kruger. Mr Kruger has sufficient experience that is relevant to the type of processing under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the JORC Code 2012. Mr Kruger consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.



# Perpetual Resources: Investment Highlights



100% owner of the Beharra high grade silica sand project



Highly supportive commodity market backdrop provides strong tailwinds



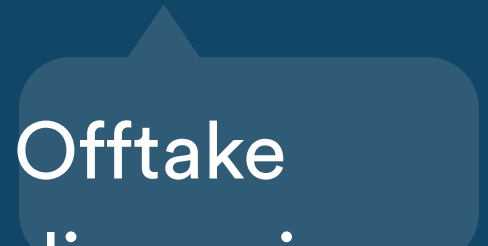
Led by an experienced Board and team of Executives



PFS demonstrates a long-life project with compelling economics



Existing road network linked to deep water port



Offtake discussions well advanced



Simple metallurgy and flow sheet



Regulatory and environmental approvals progressing well

Beharra PFS Outcomes	Base case
Post-Tax NPV (ungeared)	\$231m
Post-Tax IRR (ungeared)	55%
Production	1.5mt/yr
Initial Capex	A\$39m
Revenue (/tonne)^	A\$67 FOB
Opex (/tonne)^	A\$43 FOB
Yr 2 EBITDA~	A\$37m

Note: For further information and full detail on all assumptions, please refer to ASX announcement titled, "Maiden Ore Reserve and Outstanding Beharra PFS Result Update" dated 17th March 2021.

^In nominal terms  
~First year of full production



# Corporate Snapshot

ASX Code	PEC
Share Price (as at 22 October 2021)	\$0.11
Ordinary Shares	492.2m
Options (5m at 4.5¢, 5m at 13¢, 10m at 16¢)	20m
Market Cap.	\$54m
Cash	\$3m
Debt	Nil
Enterprise Value	\$51m
Performance Shares	15.4m

Shareholders (Top 20 represent 63% of Register)

Delphi & Deutsche Balaton	12%
Julian Babarczy	6%
Robert Benussi	6%
Tolga Kumova	6%



**Julian Babarczy**  
Executive Chairman



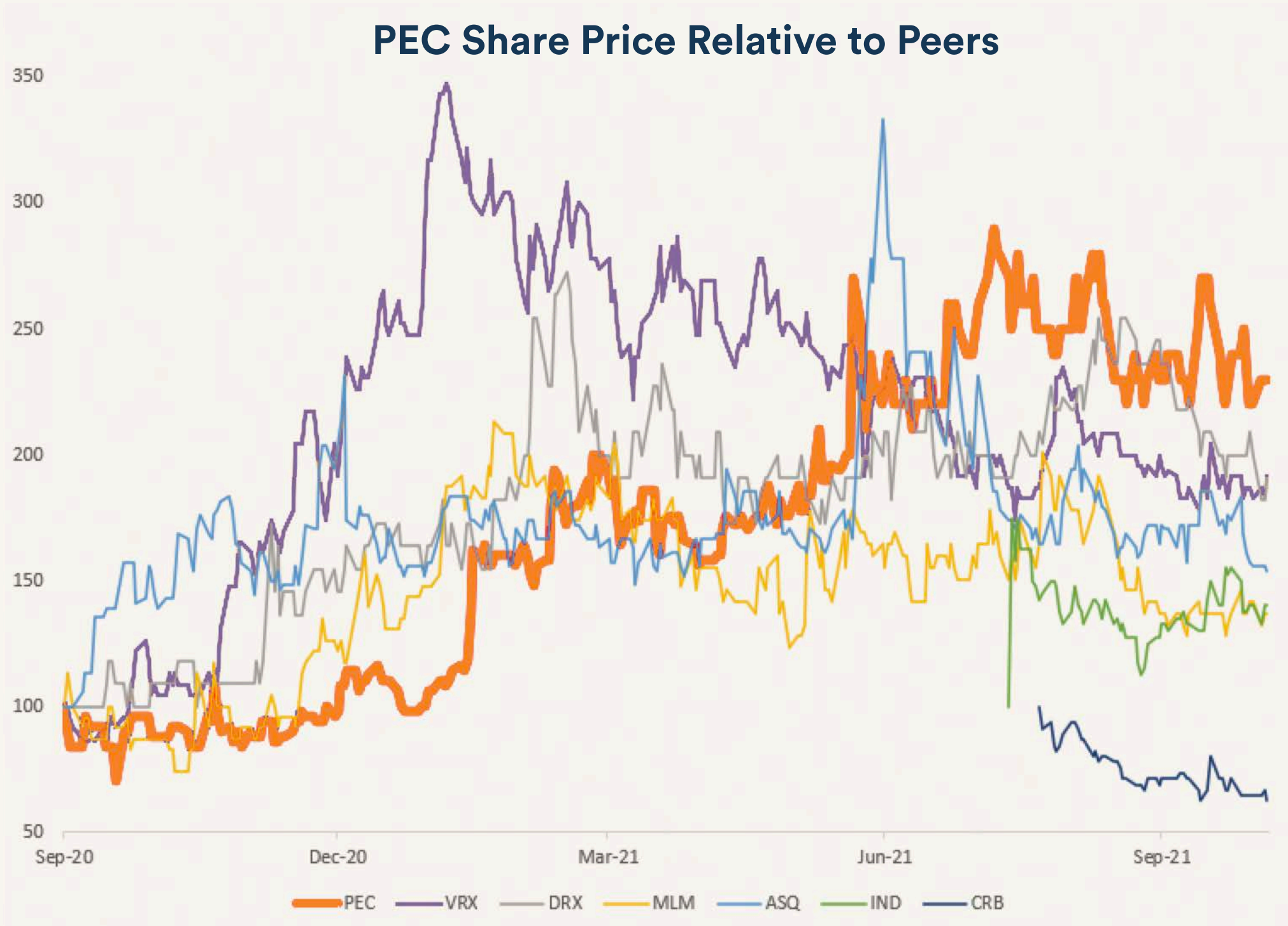
**Robert Benussi**  
Managing Director



**Brett Grosvenor**  
Non-Executive Director



**George Karafotias**  
Non-Executive Director





# Project Portfolio

Four discrete Project Hubs – all located proximal to established infrastructure.

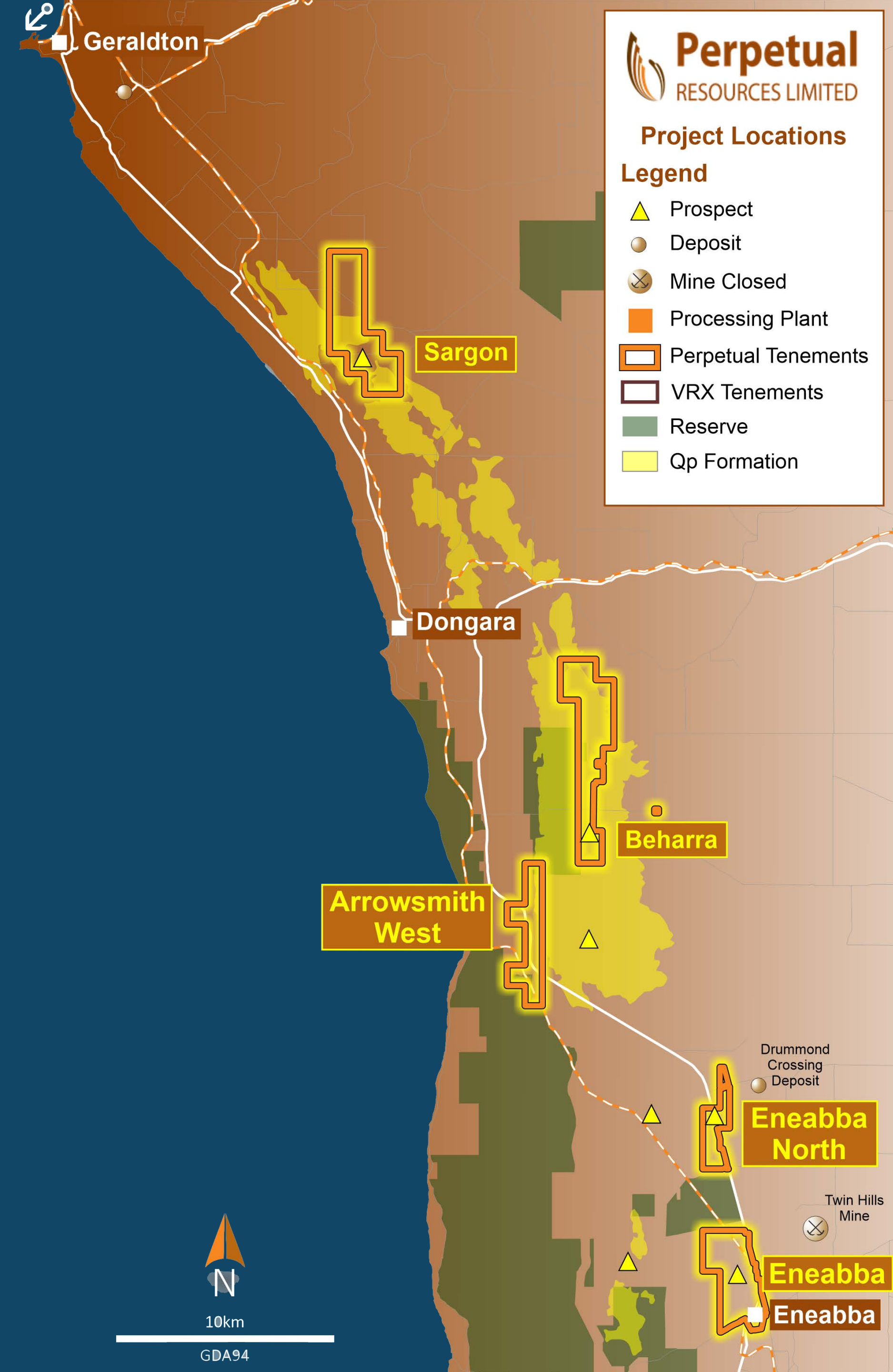
## Beharra<sup>1</sup> – the focus

- Pre-feasibility study completed with compelling economics
  - Post tax NPV (ungeared): \$231m
  - Post tax IRR (ungeared): 55%
  - Initial Capex: \$39m
- Mining License application granted
- White sand only optimisation efforts showing strong potential
- DSO Scoping study underway
- Strong interest from potential customers

## Exploration

- Reconnaissance activity underway across all exploration areas
- Aircore drilling planned across all exploration areas in coming quarters

<sup>1</sup> Note: For further information and full detail on all assumptions, please refer to ASX announcement titled, "Maiden Ore Reserve and Outstanding Beharra PFS Result Update" dated 17th March 2021.





**“We give such little thought to it...  
But sand and gravel build the  
foundations of our economies.”**

United Nations Report on Sand and Sustainability, 2019



# Sand Facts

“For construction alone, the world consumes roughly 40 to 50 billion tonnes of sand on an annual basis. That’s enough to build a wall of 27 meters high by 27 meters wide that wraps around the planet every year”

“The global rate of sand use — which has tripled over the past two decades partially as a result of surging urbanization — far exceeds the natural rate at which sand is being replenished by the weathering of rocks by wind and water”

“We just think that sand is everywhere. We never thought we would run out of sand, but it is starting in some places”

“Sand is the world’s most consumed raw material after water and an essential ingredient to our everyday lives”

“Sand is perceived as cheap, available and infinite and that is partly because the environmental and social costs are pretty much not priced in”



# What is Silica Sand Used For?

## Glass

- Architectural
- PV solar cell glass covers
- Smartphones
- Tablets
- Automotive
- Fiberglass
- Container Packaging

## Building products

- Quartz surfaces
- Roofing shingles

## Foundry sands

- Automotive & Manufacturing

## Fillers & Extenders

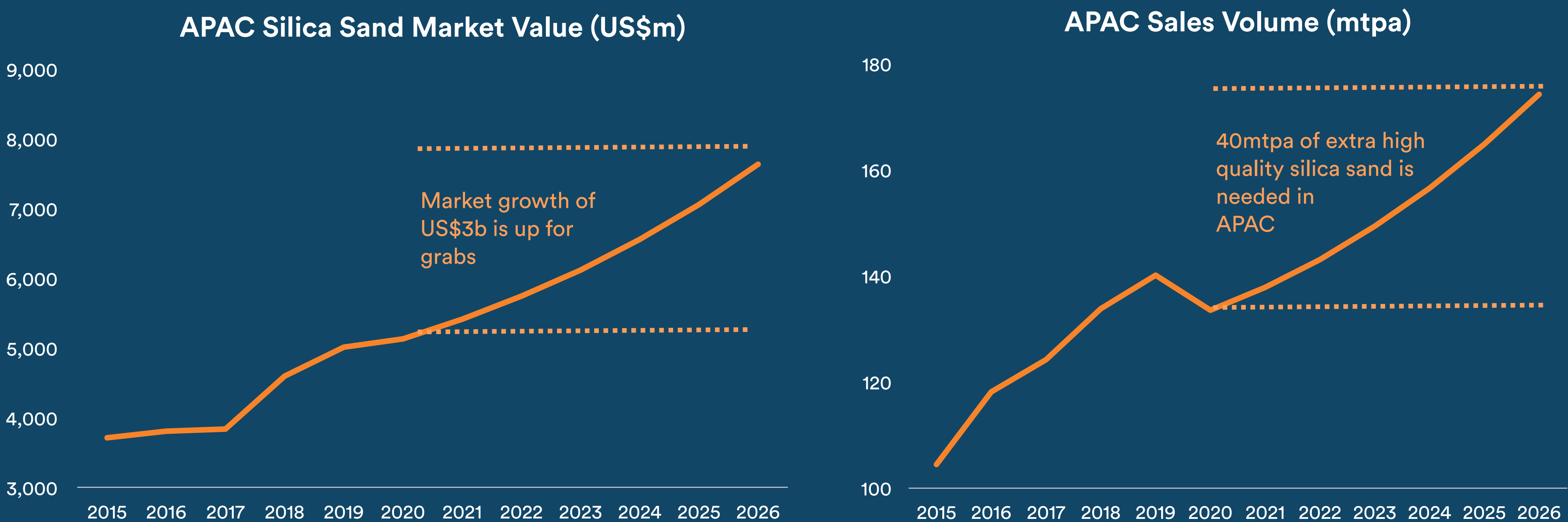
## Chemicals

## Construction Sands





# Asia Pacific: The Fastest Growing Silica Sand Market in the World



Source: IMARC Group, Report Title: "Asia Pacific Silica Sand Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2021-2026", Report Date: February 2021

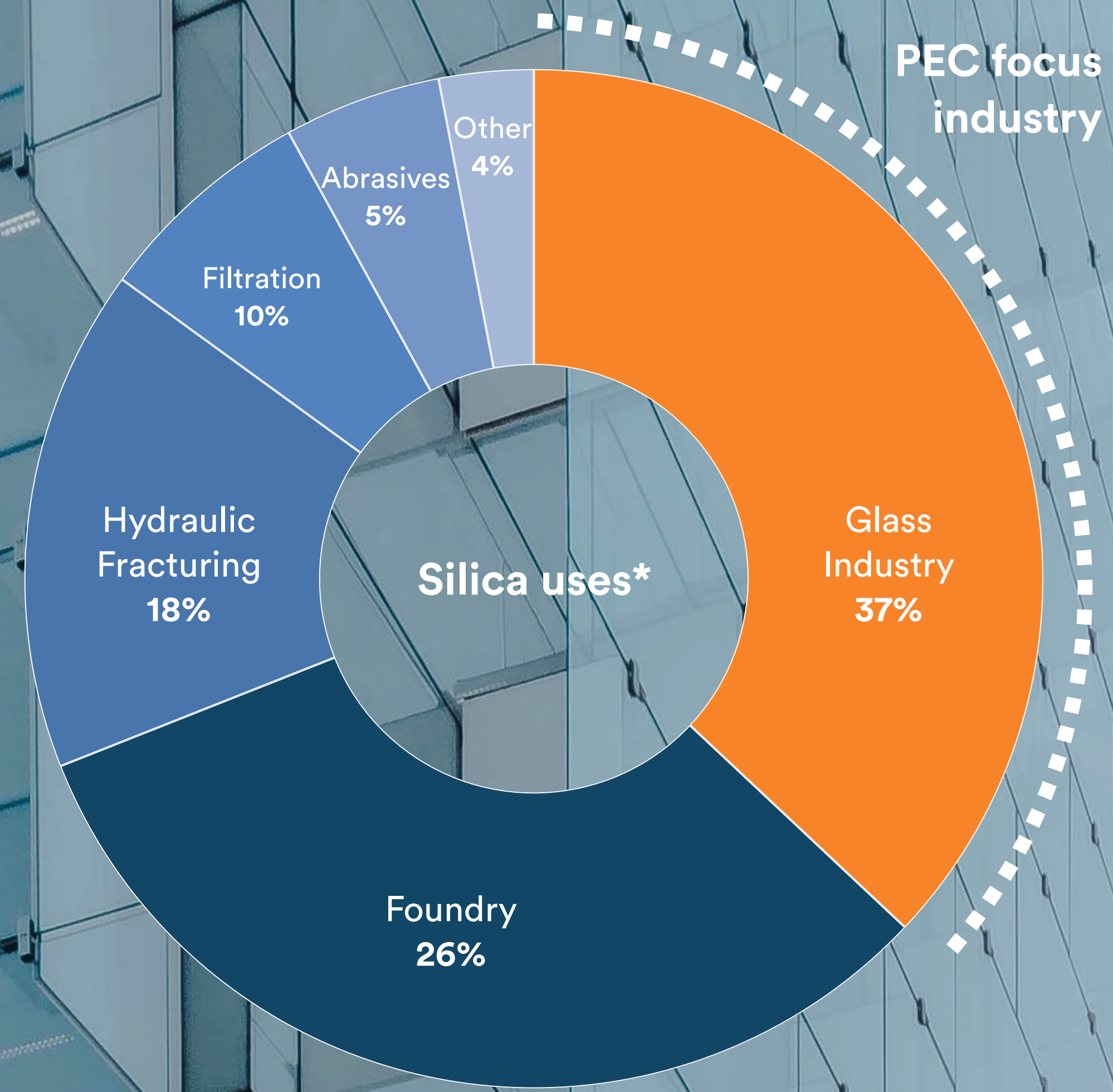


# Relative Size of End Markets

- The Asian glass industry is the largest and highest growth for high grade silica sand
- The PV solar panel glass cover industry is experiencing exponential growth
- These markets are Perpetual’s focus
- Initial beneficiation test work has confirmed Beharra silica sand exceeds the minimum specification for high end glass, major float and container glass applications
- Particle size distribution analysis also demonstrates that Beharra sands may also service Asia’s foundry sand markets

Glass Application Type*	Minimum Specifications	
	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>
Float (Plate)	99.5%	200-400ppm
Container	99.5%	300-500ppm
Cover (Solar Panels)	99.95%	<100ppm
Smart (Ultra Clear)	99.97%	<100ppm
Specialist (Thin Screen)	99.97%	<100ppm

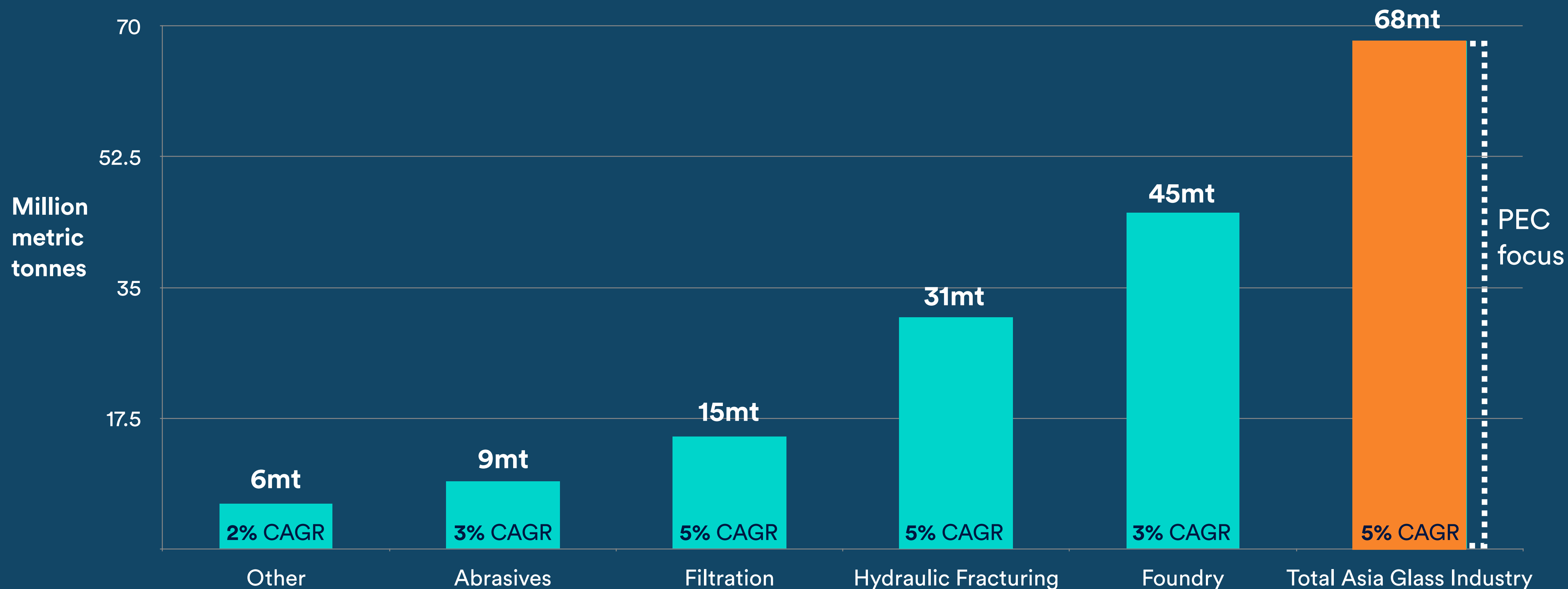
\*Source: Stratum Resources



Source: IMARC Group, Report Title: “Asia Pacific Silica Sand Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2021-2026”, Report Date: February 2021



# Perpetual's Target Markets are the Biggest and Fastest Growing in Asia



Source: IMARC Group, Report Title: "Asia Pacific Silica Sand Market: Industry Trends, Share, Size, Growth, Opportunity and Forecast 2021-2026", Report Date: February 2021

1. Bar height represents size of market in Asia Pacific region

2. CAGR represents the period of 2020-2026



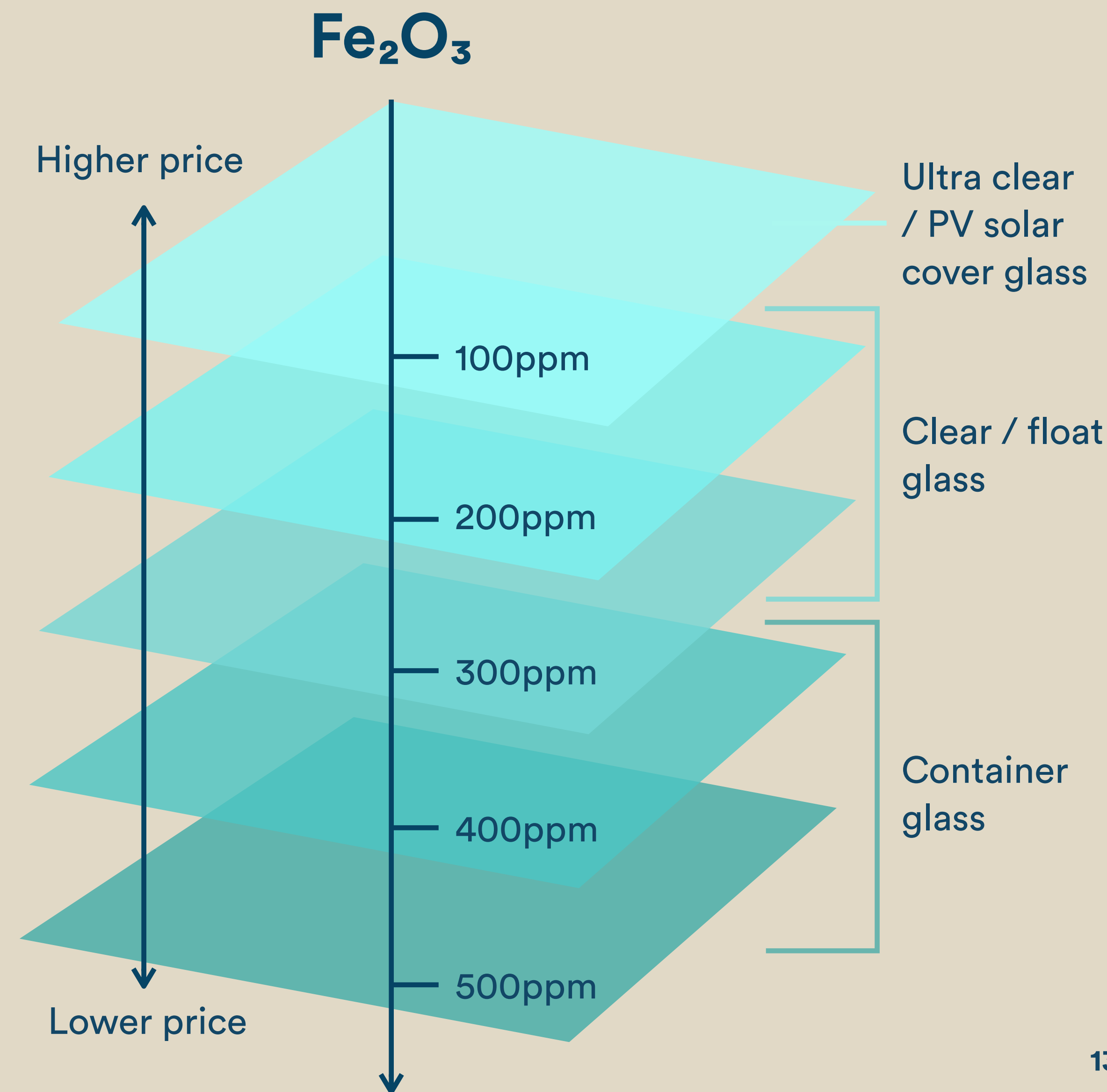
# How Silica Sand is Priced

Silica sand is like iron ore, where various specifications are priced with reference to a key attribute (in this case, silicon dioxide) with price adjustments related to impurity content.

- 1 To service glass markets, silica sand must have a minimum  $\text{SiO}_2$  content of 99.5%

## THEN

- 2 Buyers look next to the impurity profile to determine end use and the price they are willing to pay
  - $\text{Fe}_2\text{O}_3$  is the main impurity of focus (see diagram)
  - $\text{Al}_2\text{O}_3$  is the next key impurity of concern (although <2000ppm is generally acceptable)
  - Other impurities such as  $\text{TiO}_2$ ,  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Na}_2\text{O}$ ,  $\text{K}_2\text{O}$  are also important but generally manageable





# Beharra: High Grade Silica Sands

## LOCATION

Approximately 100km south of Geraldton, comprising a north-south striking exploration licence covering an area of about 49 km<sup>2</sup>

## SCALE

The project lies within the northern part of the Perth Basin and contains a 13km strike length of high grade silica sand

## RESERVE/RESOURCE

- Maiden Mineral Reserve Estimate of 48mt of 99.6% SiO<sub>2</sub>, 276ppm Fe<sub>2</sub>O<sub>3</sub><sup>1</sup>
- Mineral Resource Estimate of 139mt at 98.6% SiO<sub>2</sub><sup>2</sup>
- Beharra tenement <40% explored – significant upside remains
- >90% of resource identified as higher purity white sands
- Direct shipping potential exists

## PROCESSING

- Detailed metallurgical test work conducted by Perpetual confirmed a simple gravity and magnetic separation flow sheet to produce a concentrate that resulted in upgrading the SiO<sub>2</sub> to 99.6% and reduced Fe<sub>2</sub>O<sub>3</sub> content to 276ppm (1,950ppm in situ)<sup>3</sup>
- White sand only development scenario could significantly enhance economics - results pending

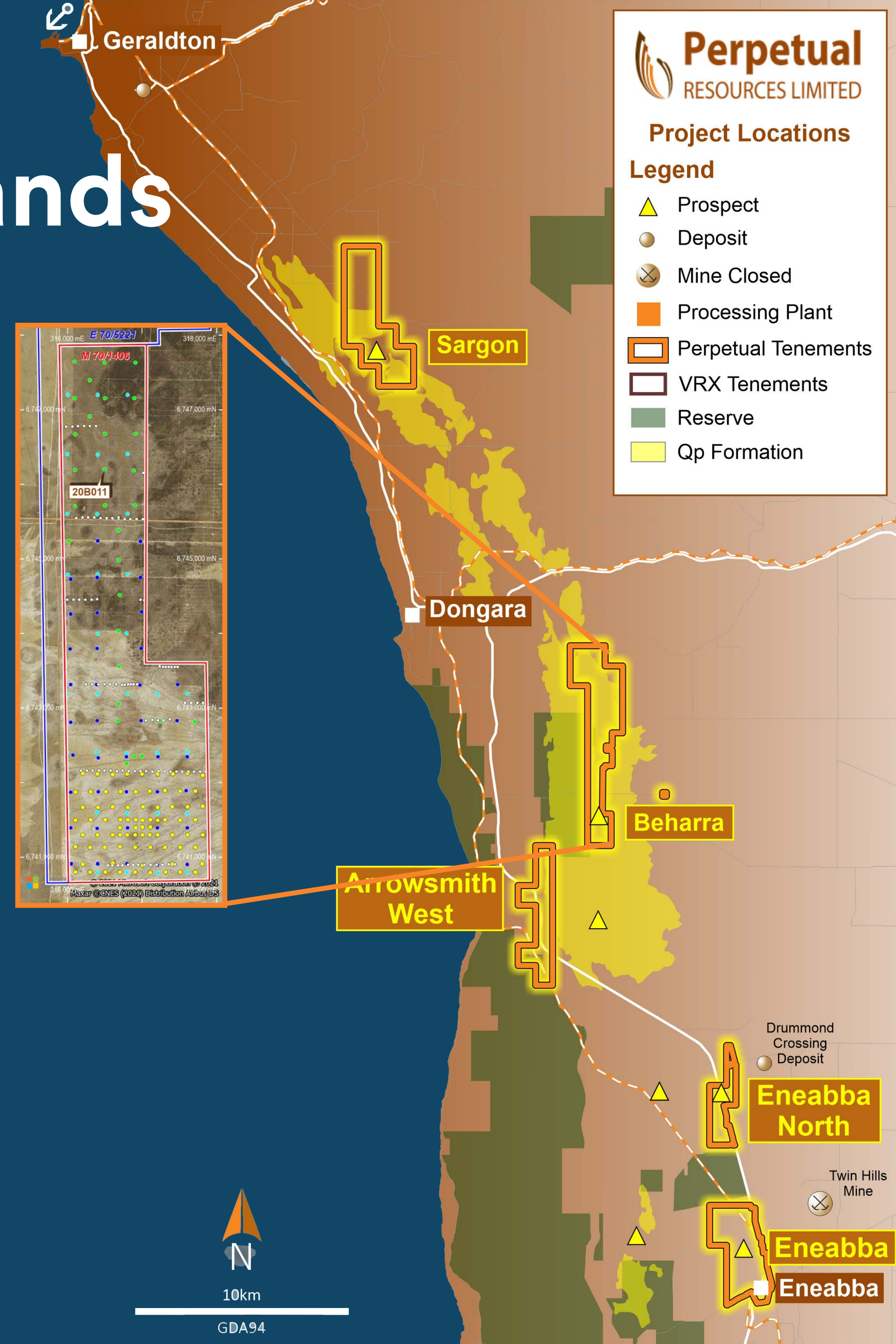
## PRODUCT

Extensive metallurgical testing has confirmed suitability for the major high growth glass markets in Asia, including the high growth PV solar cell glass cover industry

<sup>1</sup> Please refer to ASX announcement titled, "Maiden Ore Reserve and Outstanding Beharra PFS Result Update" dated 17th March 2021.

<sup>2</sup> Please refer to ASX announcement titled, "Upgraded Mineral Resource Estimate - Beharra", dated 9th March 2021.

<sup>3</sup> Please refer to ASX announcement titled, "Exceptional Metallurgical Test Results - Beharra", dated 29th January 2021.





# Project Economics

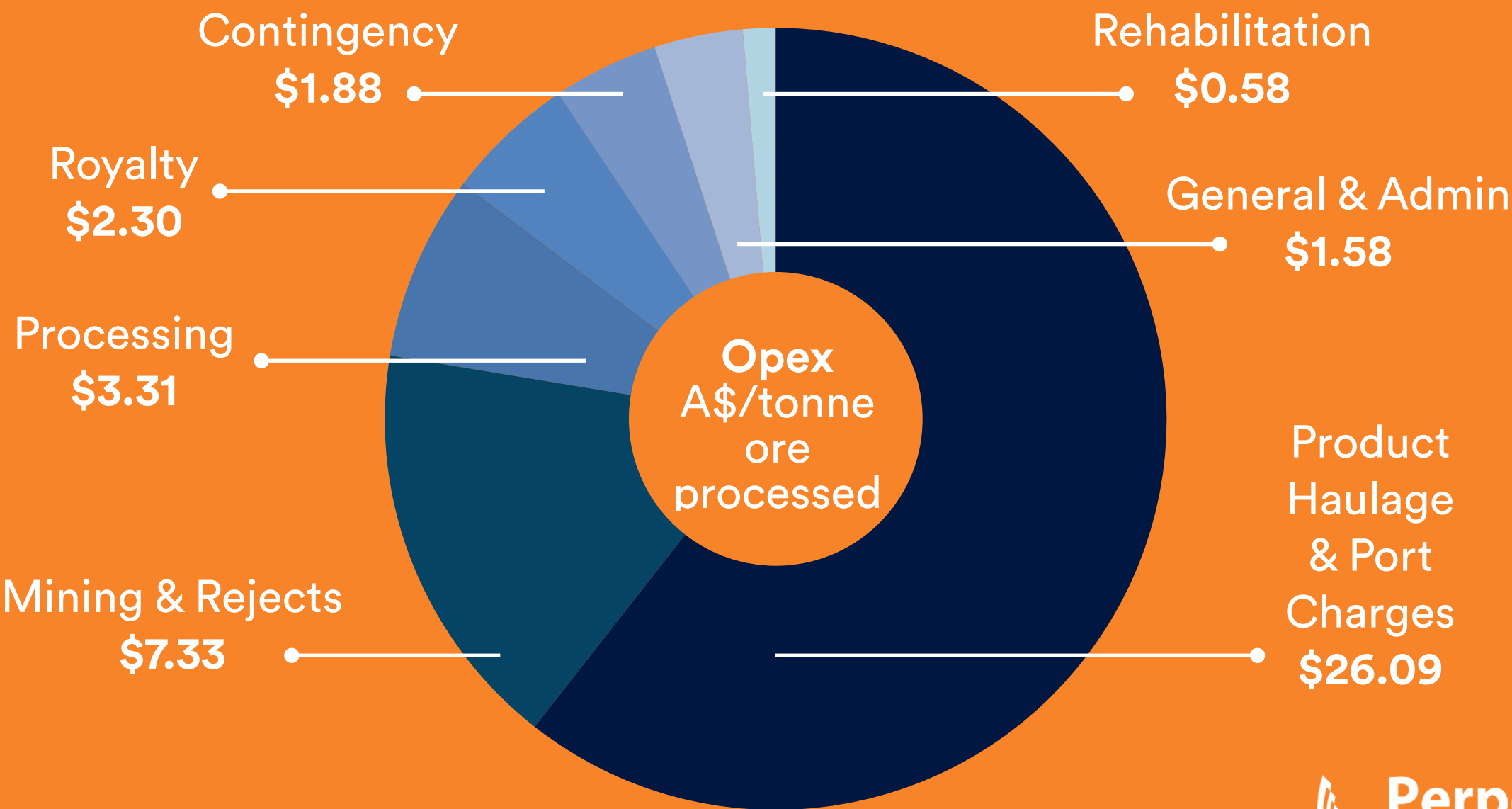
Perpetual’s strategy is to operate with maximum flexibility, aiming to be able to respond to the expected positive changes in market demand. As a result, a flexible cost base is assumed, with potential to reduce opex over time through strategic reinvestment of cashflows into core plant and equipment and/or additional logistics infrastructure.

Beharra PFS Outcomes	Base case
Post-Tax NPV (ungeared)	\$231m
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Production	1.5mt/yr
Initial Capex	\$39m
Revenue (/tonne)#^	A\$67 FOB
Opex (/tonne)^	A\$43 FOB
Yr 2 EBITDA~	A\$37m

#Refer to slide 14 for further information  
^In nominal terms  
~First year of full production

Capital Expenditure	Cost (A\$)
Wet Processing Plant	\$19.1m
On Site Infrastructure	\$3.5M
Off-Site Infrastructure (Bore field, site access roads)	\$9.3m
Indirect Costs (PCM Fees)	\$2.3m
Other	\$1.3m
Contingency	\$3.5m
TOTAL	A\$39m

Note: For further information please refer to ASX announcement titled, “Maiden Ore Reserve and Outstanding Beharra PFS Result Update”, dated 17th March 2021.





# What Makes Beharra Special

## 90% white sand

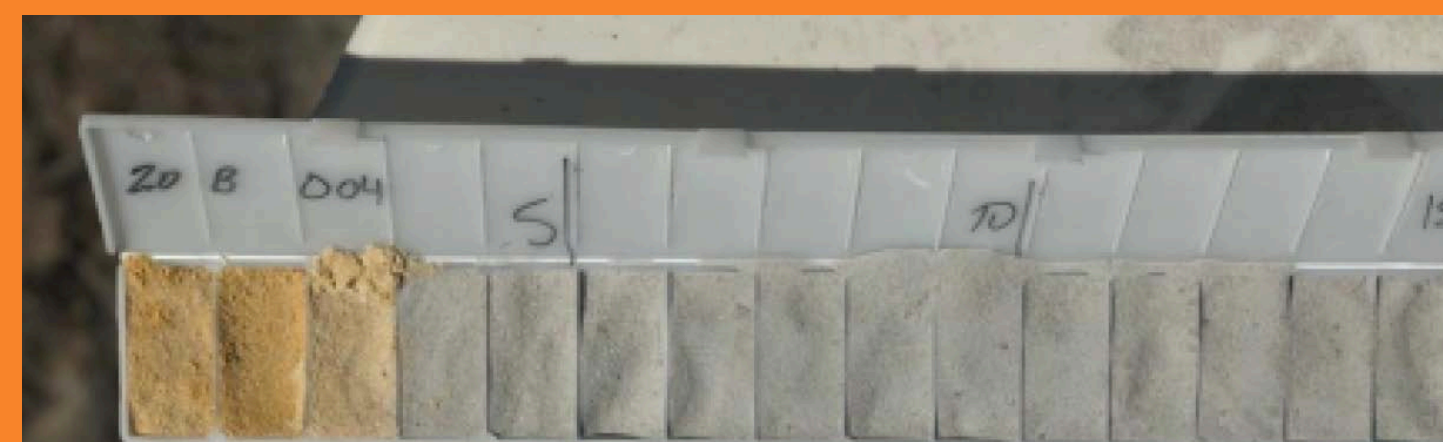
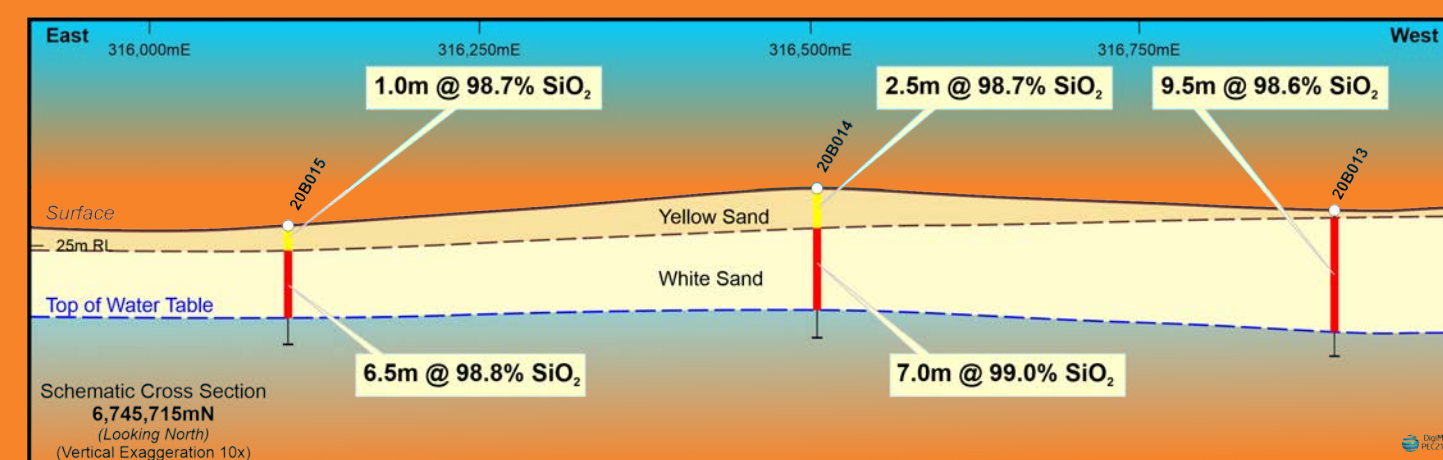
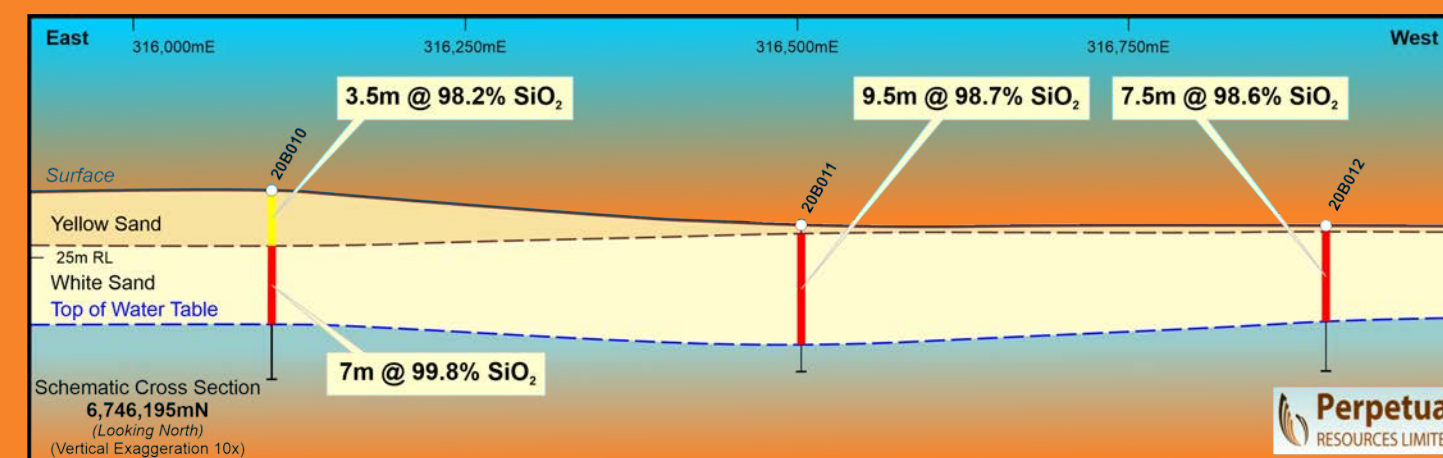
- White sand has less impurities, the key to achieving a high value product
- Higher impurities require more processing, which adds to capital and operating costs
- Yellow sand is only useful for lower value construction sand applications



Beharra White Sand compared to Beharra Yellow Sand

## Simple geology

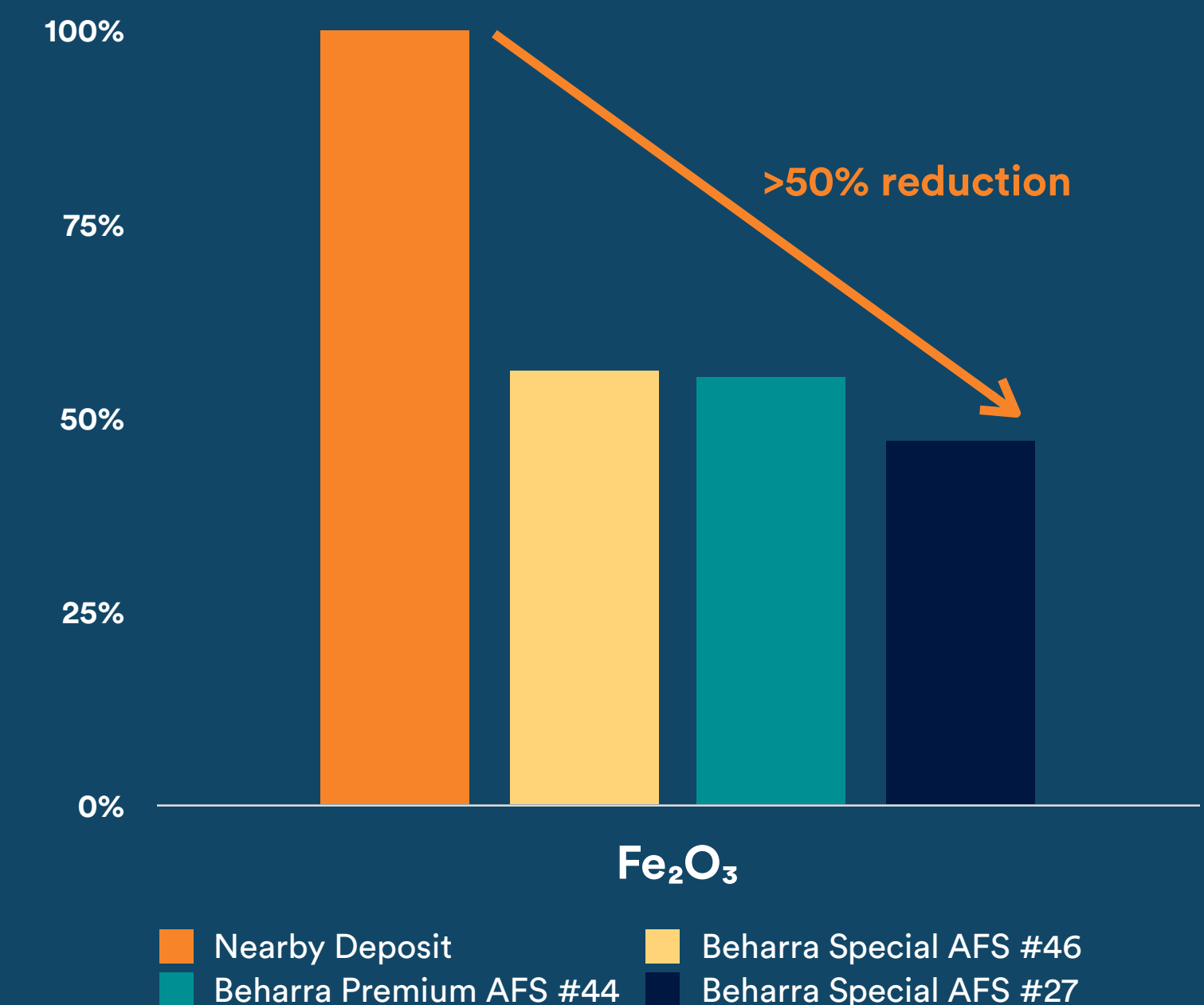
- Clearly defined horizons of white and yellow sand
- Selective mining expected to be straightforward



>12m Intersection of White Sand separated into 1m intervals from September 2020, Beharra Drill Program

## Superior metallurgy\*

- Lowest known impurity profile in the Midwest
- Potential for premium product pricing

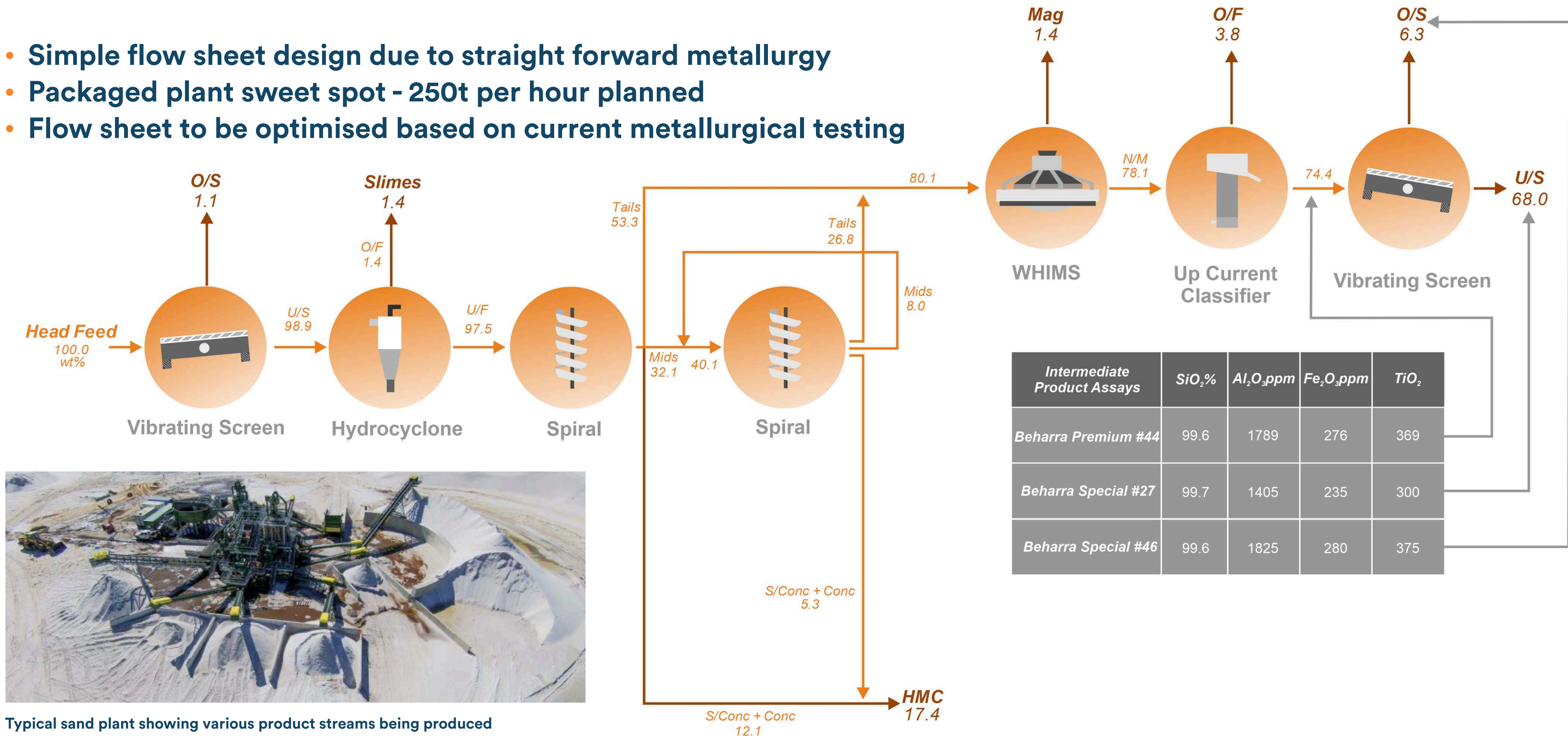


\*Source: PEC test results (see ASX Announcement dated 29th January 2021) and VRX Silica's Arrowsmith North technical Sheet (see <https://vrxsilica.com.au/assets/Arrowsmith-NF500.pdf>)



# PFS Production Process

- Simple flow sheet design due to straight forward metallurgy
- Packaged plant sweet spot - 250t per hour planned
- Flow sheet to be optimised based on current metallurgical testing



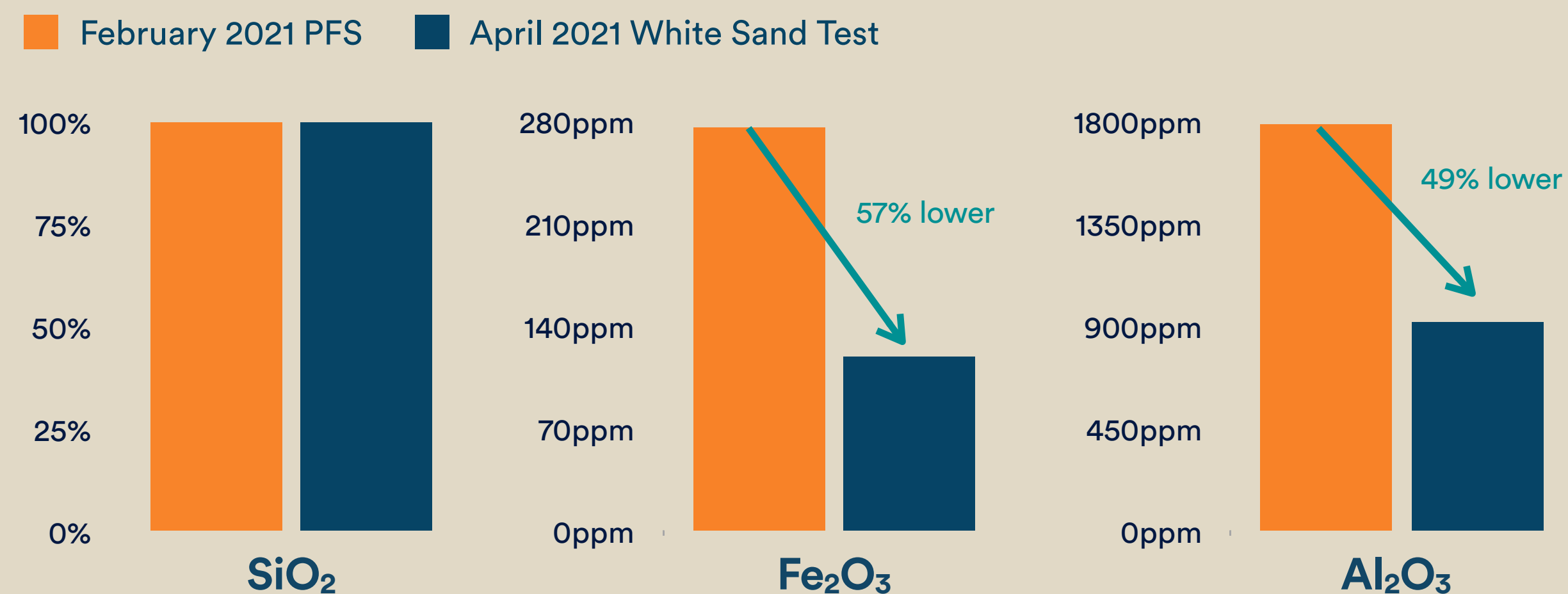
Typical sand plant showing various product streams being produced

Note: For further information please refer to ASX announcement titled, “Exceptional Metallurgical Test Results - Beharra”, dated 29th January 2021.

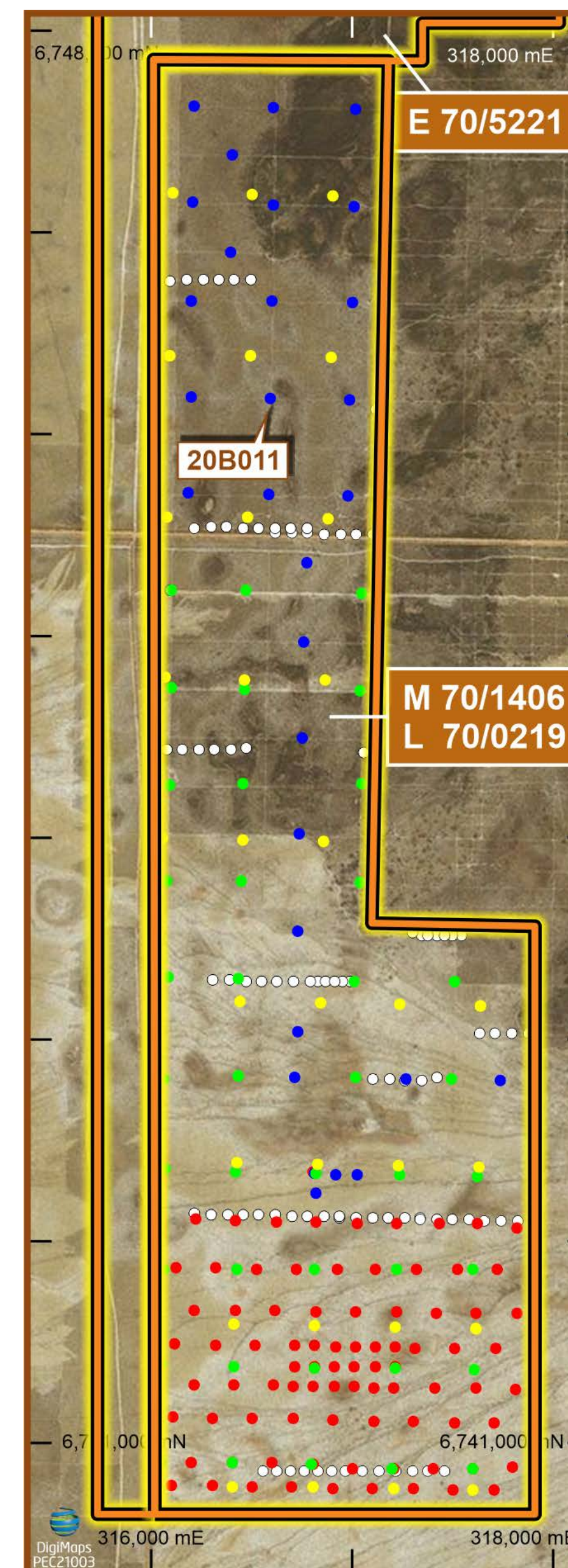


# White Sand Potential

- White sand only processing seen as a potentially significant project optimisation scenario
- A single 300kg sample of white only sand was tested by IHC Robbins in April 2021, showing significant reductions in the key impurity  $\text{Fe}_2\text{O}_3$



- Follow up testing saw completion at an 86-hole air-core program targeting 10 years of mine life
- Definitive white sand only bulk metallurgical test work due for completion in October 2021



## Legend

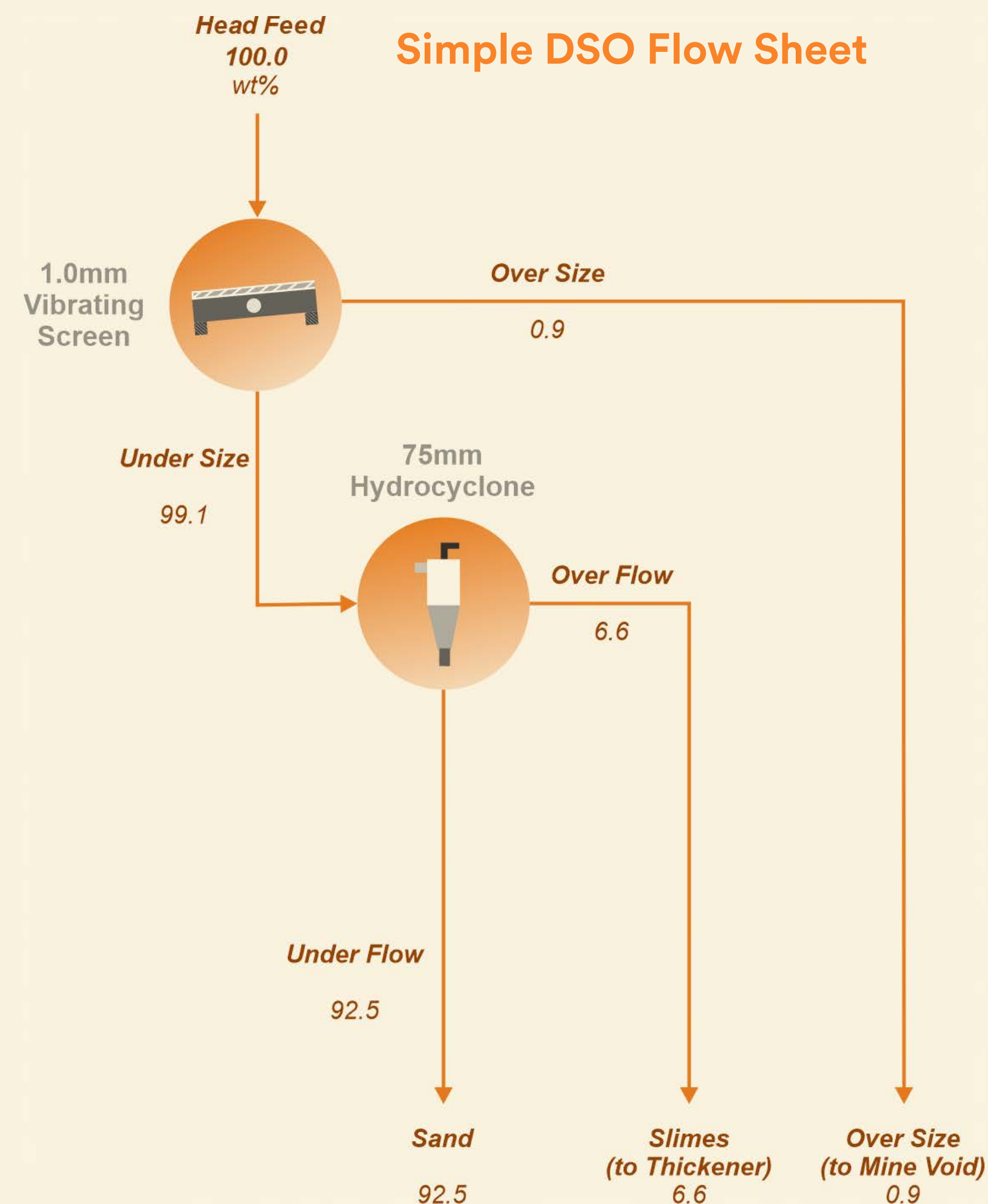
- Historic Air Core
- Hand Auger Feb 2019
- Phase 1 Air Core March 2020
- Phase 2 Air Core Sept 2020
- Phase 3 Air Core June 2021



# DSO White Sand Potential

- PEC received unsolicited approach from previously announced offtake party for sales of Direct-Shipping-Ore (DSO) white sand from Beharra.
- Offtake party undertook metallurgical testwork and achieved a further material reduction in  $\text{Fe}_2\text{O}_3$  from Beharra samples.
- Additional sand samples have now been shipped to the offtake party for further definitive testing to define a DSO product specification and associated downstream market.
- PEC has commenced a DSO Scoping Study for a potential DSO operation to create an ultra-low capital development pathway for Beharra, targeting delivery by year end 2021.
- Negotiations and discussions will commence shortly for a potential DSO product to explore innovative commercial profit-sharing models with the interested offtake party.

*Note: For further information on the Beharra DSO Scoping Study, please refer to ASX announcement dated 14th September 2021*

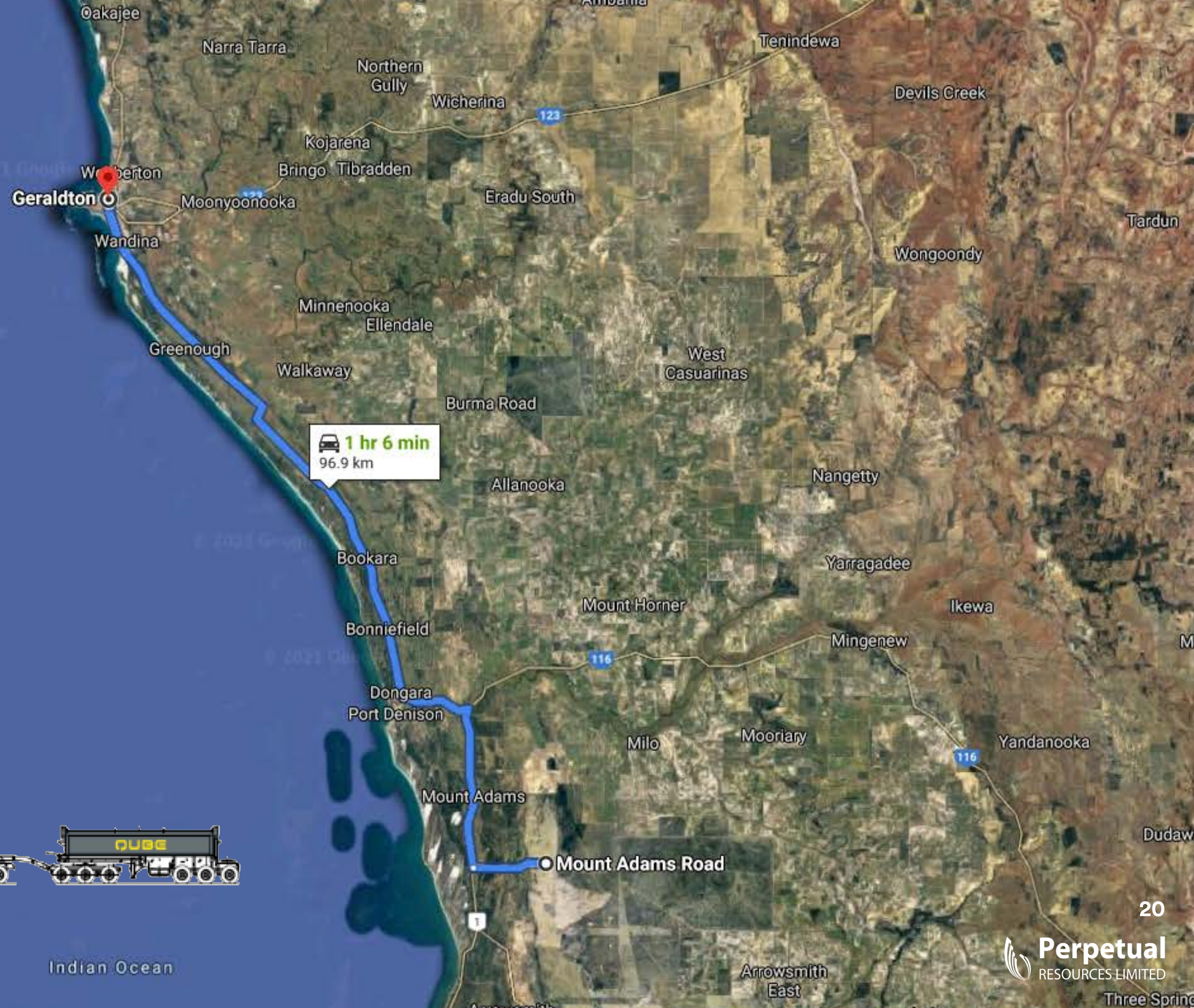




# Tier 1 Infrastructure Regional

Beharra is one hour by high quality road to Geraldton Port, underpinning the economic viability of Beharra.

RAV7.3 – PBS Super Triple





# Strong Stakeholder and Approval Progress

Perpetual is earning its “social licence” to operate at Beharra

## COMMUNITY

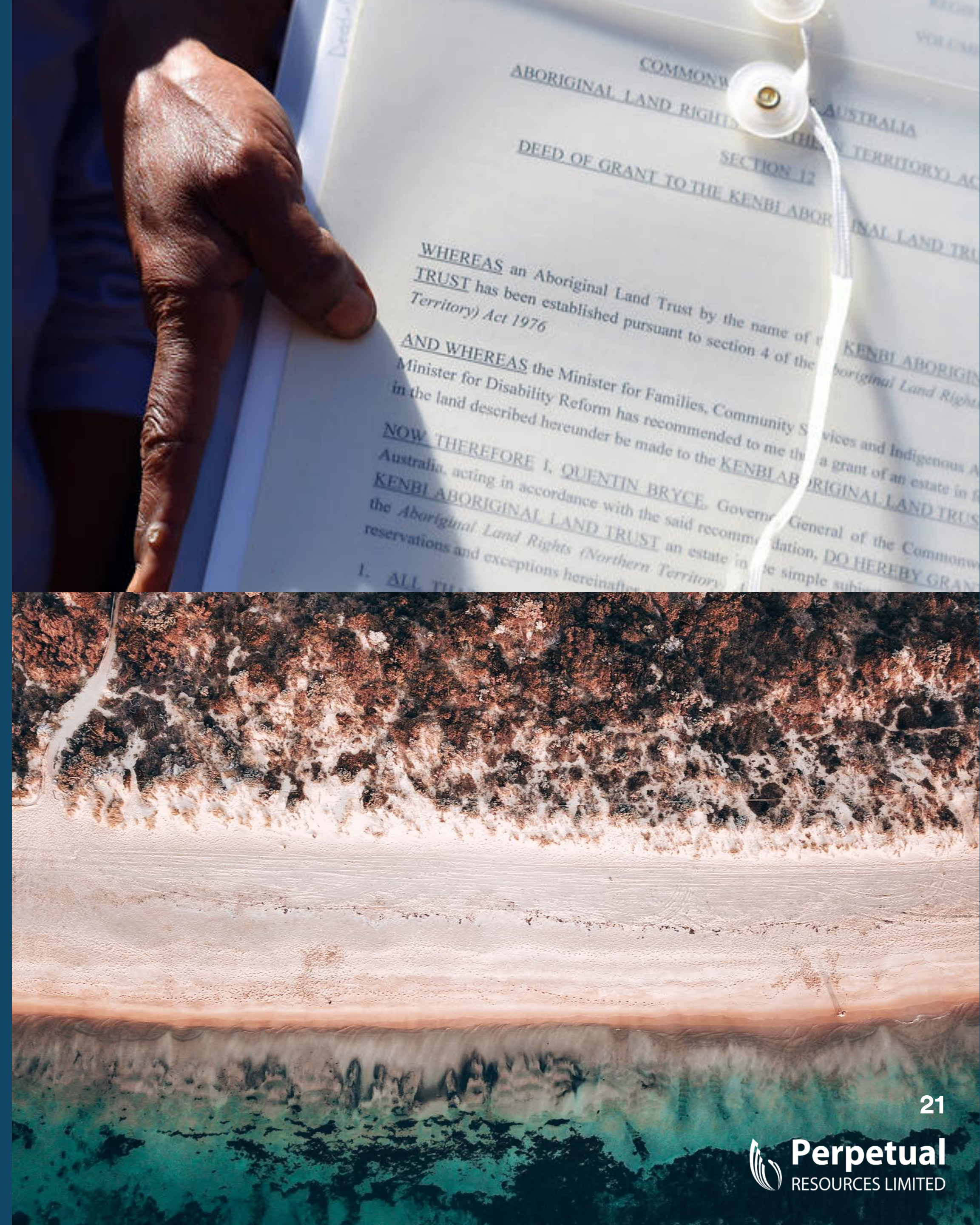
- Strong working relationships with Traditional Owner groups
- All key Native Title Agreements in place
- Landmark collaboration with YSRC secures water licence
- Local engagement well progressed

## ENVIRONMENT

- Level 2 Environmental Studies underway
- Environmental approval process progressing well (please see Appendix for further detail)

## TENURE

- Mining License granted in June 2021
- Main Roads and Shire engagement well progressed
- Port discussions to commence





# Beharra Market Entry Strategy

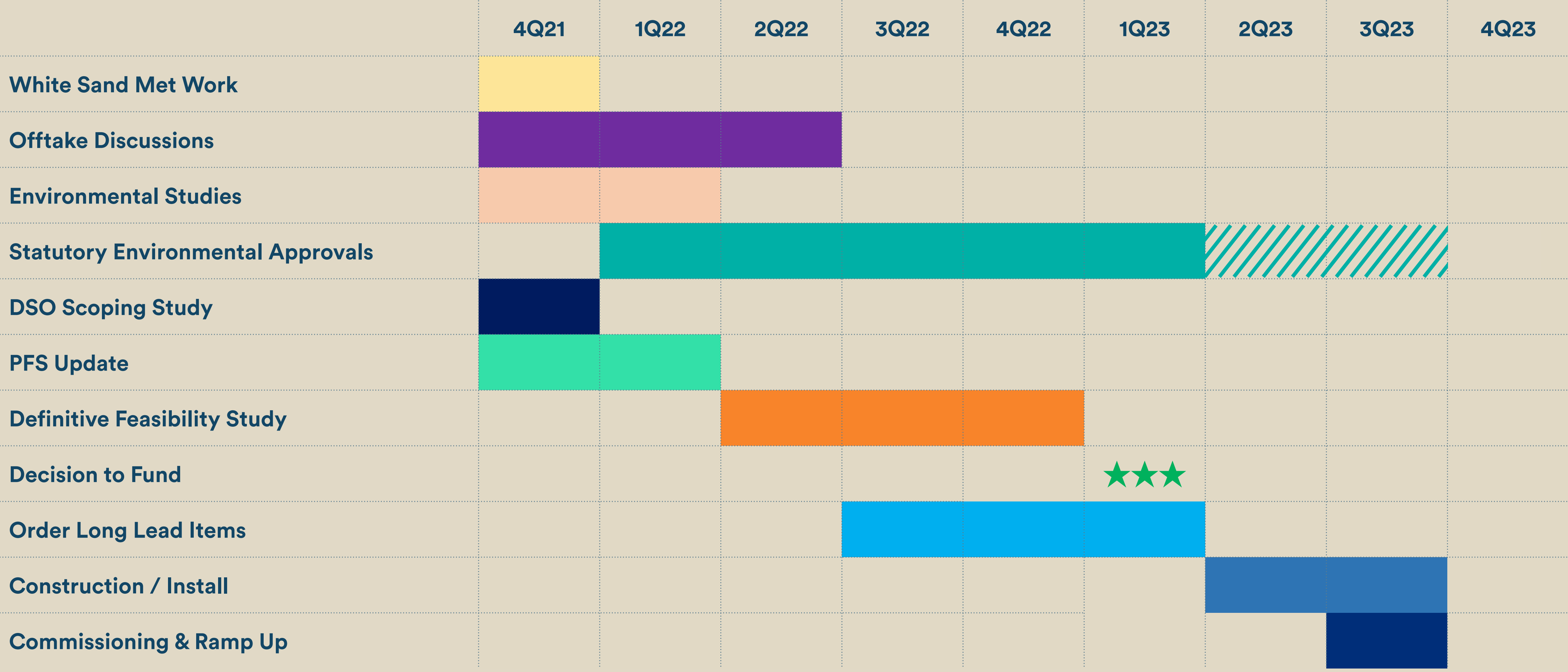
- Perpetual has secured multiple MOU's for offtake
  - Yaoguo Solar Science & Technology Co - **250K tonnes p.a.**
  - Guangdong Qingyuan New Material Technology Co - **400K tonnes p.a.**
  - C&D Logistics Group Co - **600K tonnes p.a.**
- Perpetual has had overwhelming interest and is in discussions with multiple other parties regarding offtake
- Beharra product has been tested by potential customers with very positive feedback
- Receipt of white sand metallurgical test results in October 2021 is eagerly awaited by all potential customers
- Final product samples will be shipped to potential customers in October 2021
- Aim is to convert MOU's into offtake contracts in coming quarters
- Potential DSO production scenario being studied

*Note: Please refer ASX announcements dated 26th October 2020, 10 May 2021 and 17 May 2021.*





# Beharra Development Timeline





# Conclusion

## The Mid West Region's lowest impurity silica sand project

- The Mid-West Region's pre-eminent silica sand resource and project
- Ideally located proximal to tier 1 infrastructure
- Compelling project economics confirming a long life, low capital and high margin operation
- Significant scope for project expansion
- Project optimisation being aggressively pursued

## Strong project economics

- 1.5mtpa silica sand sales generates an NPV of \$231m and a compelling IRR of 55%
- Project economics are resilient to key sensitivities
- Project upside exists though optimization of revenue per tonne
- Annual EBITDA of A\$37m in first year of full operation (Year 2)

## Located on doorstep to APAC, the world's fastest growing market

- Minimal road upgrades to ensure sealed road transport from site to port
- Deep water port with direct access to major high value APAC markets

## Strong study team and consultants

- Expert multi-disciplinary team providing experienced advice on project development and study options
- Decades of experience in developing sand-related projects throughout Australia
- Deep sand processing knowledge and expertise

## Experienced Board and Leadership Team

- Highly credentialled Board of Directors with significant project execution and operations experience, as well as deep project and company funding experience
- Management team with significant project execution expertise
- Growing owners' team with select additions expected to further strengthen capabilities

## Rapidly advancing project

- Maiden Mineral Resource Estimate delivered mid 2020
- PFS delivered in 1Q 2021
- Maiden Mineral Reserve Estimate delivered 1Q 2021
- White sand development scenario being aggressively pursued
- DSO production scenario studies commenced
- Targeting rapid production start in line with strong market demand





**Julian Babarczy**  
Executive Chairman

**Robert Benussi**  
Managing Director

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