December 2019 Quarterly Update

The following is a summary of the activities conducted by VRX Silica Ltd (**VRX Silica** or **Company**) (ASX: VRX) during the quarter ending 31 December 2019.

Muchea Silica Sand Project

Muchea BFS and Maiden Ore Reserve

On 18 October 2019 VRX Silica Limited announced details of its Bankable Feasibility Study (**BFS**) and maiden *Probable Ore Reserve* at its Muchea Silica Sand Project (**Muchea**), located 50km north of Perth, WA.

This was the third BFS for the Company's three advanced silica sand projects announced during 2019.

Highlights:

- *Muchea has outstanding financial metrics and is capable of producing very high-grade silica sand products*
- *Ungeared NPV_{10} of $338 million based on 25 years of a potential mine life of +100 years. Other key BFS outcomes:*
- *Total Probable Ore Reserve of 18.7 Mt @ 99.9% SiO_2 with 14.6 Mt @ 99.9% SiO_2 in the Mining Lease application area*
- *Studies identify three high-grade high-value silica sand products in high demand in international markets*

Exploration and Project Development

Muchea BFS and Maiden Ore Reserve

The Muchea Silica Sand Project (**Muchea**) is located 50km north of Perth (see Figure 1).

The Probable Ore Reserve for Muchea totals **18.7 Mt @ 99.9% SiO_2** as reported in accordance with the JORC Code, with **14.6Mt @ 99.9% SiO_2** contained within the area of the Company's Mining Lease application (M70/1390) for Muchea.

This Reserve estimate is only a small portion of the silica sand Inferred Resource Estimate for the project but produces a very high- grade product which is in high demand in specialist Asian markets.

Muchea is a world class high-grade silica sand project which can support a substantial export industry for WA providing benefits to the State and the Muchea-Gingin district.

Muchea will produce alternative high-grade products to Arrowsmith and will add to our available catalogue of products from our silica sand projects. The Company has already had significant interest in the Muchea product which will command higher prices than products from the Company's Arrowsmith North and Central silica sand projects.

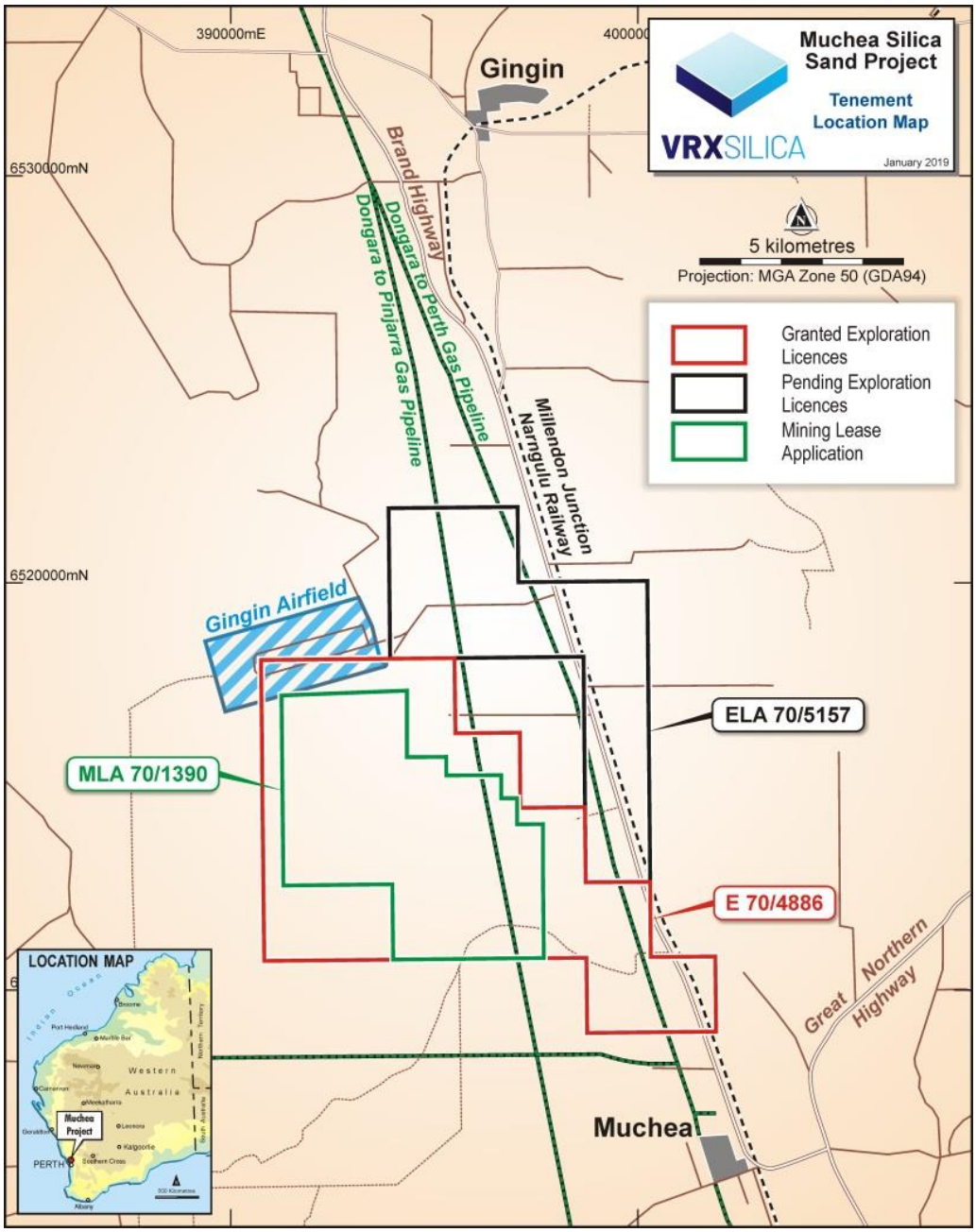


Figure 1: Muchea Project Location

Financial model

Based on the capital and operating cost estimates a financial model was developed for the purpose of evaluating the economics of the Project.

Key economic assumptions for the model are set out above and in detail in the BFS. The BFS contains further details, including a life of mine production profile and sensitivity analysis for the model.

Key outcomes from the BFS and summary financial model outputs are set out below, with the first column showing outputs from the aggregated Probable Ore Reserve and the Inferred Mineral Resource, and the second column showing outputs from the Probable Ore Reserve only.

Mining from the area of the Probable Ore Reserve only supports a 9-10 year mine life. The Company intends to mine solely from the Probable Ore Reserve during that period. The financial model shows that Muchea is a viable project with the Probable Ore Reserve only, and the Inferred Mineral Resource is not the determining factor for its viability. Key outcomes from the BFS and summary financial model outputs are set out below.

	Muchea (Inc. Inferred)	Muchea (Reserve Only)
Post Tax, ungeared NPV_{10}	$337,900,000	$180,500,000
Post Tax, ungeared NPV_{20}	$146,400,000	$104,600,000
Post Tax, ungeared IRR	96%	96%
Payback period (yrs) (post tax) (ramp up rate)	2.3	2.3
Exchange Rate US$/A$	$0.70	$0.70
Life of Mine (yrs) (Scope of BFS Study)	25	15
Total Sales (initial 25 years) no escalation	$3,345,000,000	$1,011,000,000
EBIT	$1,540,000,000	$447,000,000
Cashflow after finance and tax	$1,123,000,000	$321,000,000
Shares on Issue	404,318,617	404,318,617
EPS after tax (per year)	$0.11	$0.09
Capex (2 mtpa)	$32,820,000	$32,820,000
Capex contingency (inc)	20%	20%
Life of Mine C1 costs, FOB Kwinana (inc royalties)	$32.74	$33.84
Tonnes Processed (initial 25 years) (Mt)	54	16
Production Target (Mt) (BFS Study)	(25 years) 48.3	(9-10 years) 14.6
Probable Ore Reserves @ 99.9% SiO_2 (Mt)	18.7	18.7
Ore Reserve life (yrs)	9-10	9-10
JORC Resources (million tonnes)	208	208

Notes:

1. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised.
2. The Probable Ore Reserve and the Inferred Mineral Resource underpinning the above production targets have been prepared by a Competent Person in accordance with the requirements of the JORC Code.
3. The material assumptions for the BFS are set out below. All such material assumptions continue to apply and have not materially changed from the date of release of the BFS.
4. All figures are presented in Australian dollars, unadjusted for inflation.

Key points and assumptions

The BFS is based on only 25 years production from a potentially long-term +100 year mine life.

The maiden Probable Ore Reserve of **14.6 Mt @ 99.9% SiO_2** contained within the area of the Company's Mining Lease application and will support a 9-10 year project. This is estimated from the Indicated Mineral Resource only and constitutes approximately 39% of the estimated total production target (in terms of processed tonnes of silica sand) over the 25 year mine life. The Company intends to mine solely from Probable Ore Reserves during the initial 9-10 years of the project.

The balance is from the Inferred Mineral Resource of **61.4 Mt @ 99.6% SiO_2** in the proposed mining area which the Company intends to mine from year 10 onwards. The Company has undertaken sufficient drilling to assume geological and metallurgical continuity of the sand deposit. There is negligible difference between the modelled sand in each category. In order to upgrade the Inferred Mineral Resource, the Company anticipates that an additional 2,000m of aircore drilling will be required. The cost for drilling, assaying and associated studies is estimated (at current rates) to be in the region of $200,000 and will need to be undertaken within the first 9-10 years of mining operations. Given the simple nature of the silica sand deposit at the project and the associated geological and metallurgical confidence, the Company expects that this additional drilling will be sufficient to realise the production target. Notwithstanding this, there is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised.

The Company has been in discussions with both the Department of Premier and Cabinet and the Department of Jobs, Tourism, Science and Industry to identify options for the Company to gain access to ground within File Notation Area 12671 (**FNA**), which is for the proposed "Perth and Peel Green Growth Plan for 3.5 million". Whilst that ground sits outside the proposed development area for the project and the FNA does not affect the modelled 25 years of production at Muchea detailed in the BFS, the Company is seeking access to this ground to extend the project's mine life to well beyond 25 years, and potentially over 100 years. Further details of the FNA are set out in the BFS.

The Company has met with various local Members of State and Federal Parliament with great support for the project. The project will be a potentially new long-term industry for Western Australia with substantial economic benefits, including long-term employment and royalties with a significant economic contribution to the Muchea-Gingin district.

The Company has engaged with the Department of Water and Environmental Regulation following preliminary environmental studies to identify key issues pertaining to the project environmental approvals for mining particularly the vegetation for potential foraging by Carnaby's cockatoos.

VRX Silica has developed a mining and rehabilitation methodology specific to the environment at Muchea which will enable a successful restoration of mined areas.

A key challenge for industrial minerals projects is meeting market specifications. The silica sand market has specifications for parameters such as purity (e.g. SiO_2 content) in addition to tight specifications for trace elements such as Fe, Ti, Al and Cr in the glass industry.

The Company is confident that it can meet specifications for the ultra-clear glass market from Muchea.

Key economic assumptions for the Muchea BFS are as follows:

Currency	Australian dollars Sales contracts in Asia for silica sand are invariably based $US and a A$0.70 exchange rate has been applied
Project life	25 years Total Probable Ore Reserve alone supports a 9-10 year project. Mining will occur solely from the Probable Ore Reserve during the first 9-10 years. There is a reasonable expectation that with further close spaced drilling the existing Inferred Mineral Resource would convert to Indicated Mineral Resource and subsequently Probable Ore Reserve. This will increase the mine life to well in excess of this time period, however the model is conservatively restricted to 25 years
Depreciation	15% rate on capital
Corporate tax rate	27% on taxable profit
Production	Steady state of production from Probable Ore Reserves over life of mine, with the first 2 years at 1 million tonnes per year and thereafter at 2 million tonnes per year The Company has currently expressions of interest and letters of intent to purchase 3.5 million tonnes per year of Muchea products and expects further interest once these products are made available to the market
Shares on Issue	404,318,617
NPV estimation discount rates	Standard financial modelling conducted at both 10% and 20% discount rates. The 20% rate is generally above standard reporting rates but demonstrates that the Project is still financially robust at this higher rate
Capital cost	Based on estimates ±15% from engineering companies with extensive experience in sand separation
Operating costs	A$32.74 C1 costs, including royalties Based on first principles and current rates for equipment
Sales revenue	US$38-55 (A$54-79) per dry metric tonne dependent on product type, product quality, contract terms and sales quantity Revenue is constant based on current prices and ignores any projected growth in prices
Maximum debt	A$30 million
Borrowing rates	12%
Accounts receivable	30 days
Accounts payable	30 days
Plant maintenance	5% of capital cost per year
Environmental bond	A$500,000 May be substituted by the WA Department of Mines, Industry Regulation and Safety's "Mining Rehabilitation Fund"
Capex contingency	20%
Recoveries	Muchea F80C (80ppm Fe_2O_3) 20% Muchea F80 (80ppm Fe_2O_3) 48% Muchea F150 (150ppm Fe_2O_3) 20% Recoveries are based on CDE testwork at ±5%

Probable Ore Reserve

The Probable Ore Reserve for Muchea totals **18.7 Mt @ 99.9% SiO_2** as reported in accordance with the JORC Code with **14.6Mt @ 99.6% SiO_2** contained within the area of the Company's Mining Lease application (MLA70/1390).

VRX Silica has previously announced[1] an upgraded MRE for Muchea of an **Indicated Mineral Resource** of **29 Mt @ 99.6% SiO_2** in addition to an **Inferred Mineral Resource** of **179 Mt @ 99.6% SiO_2** for a **Total MRE** of **208 Mt @ 99.6% SiO_2,** see Table 1.

Classification	Million Tonnes	SiO_2%	Al_2O_3%	Fe_2O_3%	TiO_2%	LOI%
Indicated	29	99.6	0.09	0.03	0.07	0.22
Inferred	179	99.6	0.05	0.02	0.1	0.23
Indicated + Inferred	208	99.6	0.06	0.02	0.1	0.23
*Note: Interpreted silica sand mineralisation is domained above a basal surface wireframe. The upper (overburden) layer within 0.5 m of surface is depleted from the modelled silica sand unit, being reserved for rehabilitation purposes. All classified silica sand blocks in the model are reported. Differences may occur due to rounding.						

Table 1: Muchea Silica Sand Mineral Resource Estimate as at September 2019

VRX Silica has now completed necessary work to convert the Indicated Mineral Resource to Probable Ore Reserves.

Table 2 details the Probable Ore Reserve that will be produced from the mining of the Indicated Mineral Resource and processing in a purpose built, wet sand processing plant. The plant will produce three saleable products for different markets with a **total Probable Ore Reserve of 18.7 Million tonnes**, with **14.6Mt @ 99.6% SiO_2** contained within the Mining Lease application (M70/1390) area.

Ore Reserve			Global	Within M70/1390					
Classification	Product	Recovery	Million Tonnes	Million Tonnes	SiO_2 %	Al_2O_3 %	Fe_2O_3 %	TiO_2 %	LOI %
Probable	Muchea-F80	48%	10.2	8.0	+99.	0.02	0.008	0.03	0.1
	Muchea-	20%	4.25	3.3	+99.	0.02	0.008	0.03	0.1
	Muchea-	20%	4.25	3.3	99.8	0.07	0.015	0.03	0.1
		Total Reserve	**18.7**	**14.6**					

Particle Size	Sieve Opening (µm Retained)							
Product	850	600	425	300	212	150	106	75
Muchea-F80		0.5%	49%	50%	0.5%			
Muchea-F80C	9.0%	90.0%	1.0%					
Muchea-F150				0.5%	88%	11%	0.5%	

Table 2: Muchea Silica Sand Probable Ore Reserve as at October 2019

[1]ASX announcement of 17 June 2019, "Muchea Mineral Resource Estimate Upgrade".

Metallurgical Factors

CSA Global reviewed the metallurgical testwork to comply with Clause 49 of the JORC Code[2]. CSA Global has concluded that the available process testwork indicates likely product qualities for glass and ceramics is considered appropriate for eventual economic extraction from Muchea. In addition, potentially favourable logistics and project location support the classification of the Muchea deposit (in accordance with Clause 49) as an industrial mineral with an Inferred/Indicated Mineral Resource.

The extensive metallurgical testwork which has been completed by CDE Global at their facility in Cookstown, Northern Ireland, and Nagrom in Kelmscott, Perth, allowed for the creation of a catalogue of silica sand products that could be produced from Muchea[3] (see Table 3).

These products become the recovered products which make up the Ore Reserve (see Table 2).

Chemical Composition

Product	SiO_2 %	Al_2O_3 %	Fe_2O_3 %	TiO_2 %	CaO %	MgO %	K_2O %
Muchea-F80	+99.9	0.02	0.008	0.030	0.005	0.001	0.004
Muchea-F80C	+99.9	0.02	0.005	0.030	0.005	0.001	0.004
Muchea-F150	99.8	0.07	0.015	0.035	0.020	0.001	0.004

Particle Size	Sieve micron and % retained on sieve								
Product	850	600	425	300	212	150	106	75	53
Muchea-F80		0.5%	49%	50%	0.5%				
Muchea-F80C	9.0%	90.0%	1.0%						
Muchea-F150				0.5%	88%	11%	0.5%		

Table 3: Muchea saleable products from catalogue

The mass balance of the particle sizes was analysed allowing for the recoveries of these products in a wet processing plant to be estimated.[4] The recovery of each product is shown in Table 4.

Product	Industry	Recovery
Muchea-F80	Glassmaking	48%
Muchea-F80C	LCD	20%
Muchea-F150	Glassmaking	20%
	Total Recovery	**88%**

Table 4: Muchea Product Recovery

[2] Reviewed as part of the metallurgical testwork for the Muchea maiden MRE, see ASX announcement of 20 November 2018, "Muchea Silica Sand Project Maiden Resource".
[3] ASX announcement of 26 February 2019, "Testwork Update and Product Catalogues".
[4] ASX announcement of 3 May 2019, "High Recovery from Silica Sand Process Plant Design".

Material Modifying Factors – Environmental Studies

Development location:

- Mining is 100% on Unallocated Crown Land
- East of the Yeal Nature Reserve and State Forest
- West of Freehold land
- South of Gingin Airfield
- Approximately 25 km inland of the coast
- West of Chandala Brook (Registered Aboriginal Heritage Site)
- Outside of World Heritage Areas, National Heritage Places, Ramsar Wetlands, Conservation Reserves or Commonwealth Marine Reserves

The Probable Ore Reserve is located within an area of deep Bassendean sands, leached of nutrients. The vegetation type is Banksia Woodlands. The topography is low to medium dunes.

Material Modifying Factors – Mining Factors

The mining method chosen for Muchea is a rubber wheeled front-end loader, feeding into a 3mm trommel screen to remove oversize particles and organics. Undersize sand is slurried and pumped to a sand processing plant located proximal to the Moora-Kwinana railway line. After processing, the silica sand is then loaded into railway trucks for bulk export from the Kwinana Bulk Terminal.

Mining of the in-situ sand will extract to the extent and base of the Indicated Resource/Probable Ore Reserve leaving a slightly undulating surface. Appropriate buffer zones are left from the adjacent stakeholders such as freehold land and the Dongara-Pinjarra gas pipeline. The pre- and post-mining topography is shown in Figures 2 and 3. 100% of the material in the mining area is considered to be sand that can be beneficiated to a saleable silica sand project. The top 500mm has been excluded from the MRE as it will be reserved for rehabilitation purposes. As there is no waste material, the recovery factor is considered to be 100% and ore loss therefore is considered to be 0%.

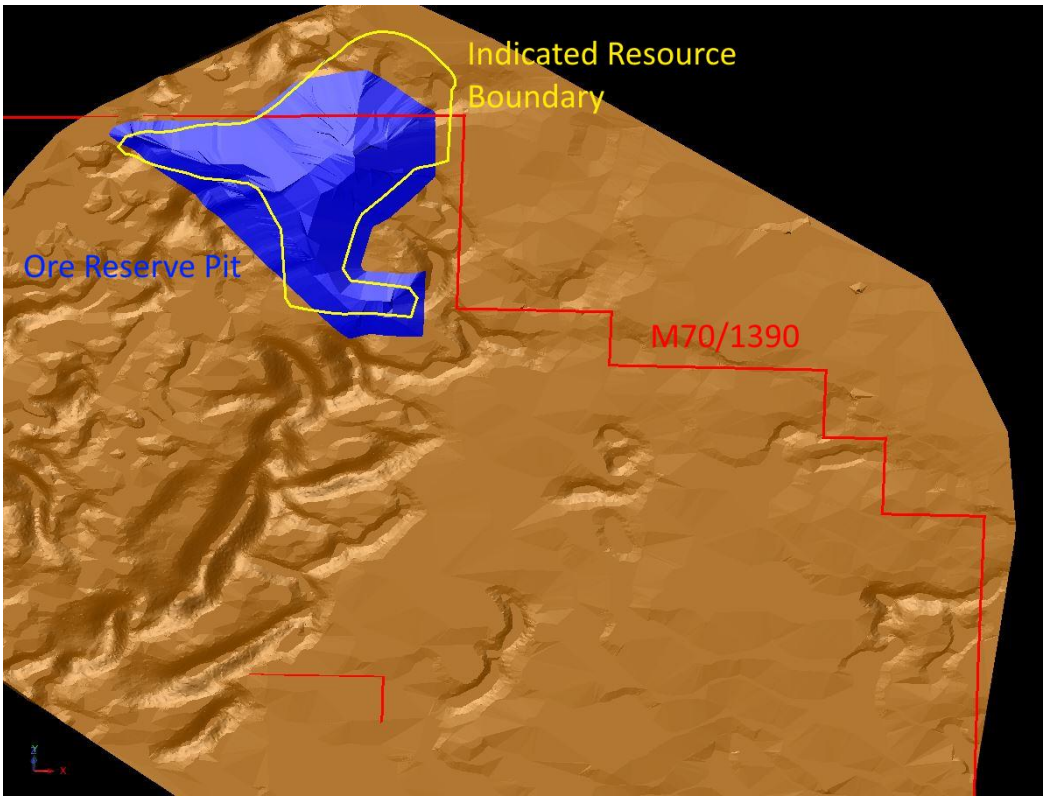


Figure 2: Muchea Pre-Mining Topography (10:1 vertical exaggeration)

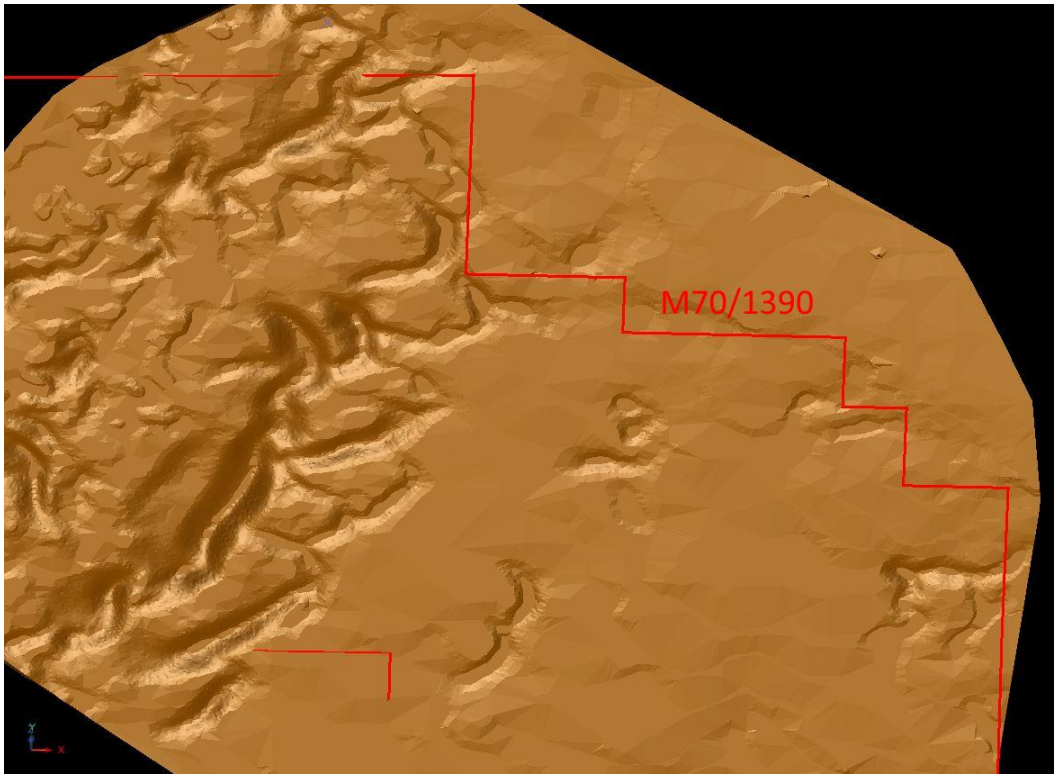


Figure 3: Muchea Post-Mining Topography (10:1 vertical exaggeration)

Material Modifying Factors – Environmental Studies

Development location:

- Mining is 100% on Unallocated Crown Land
- East of the Yeal Nature Reserve and State Forest
- West of Freehold land
- South of Gingin Airfield
- Approximately 25 km inland of the coast
- West of Chandala Brook (Registered Aboriginal Heritage Site)
- Outside of World Heritage Areas, National Heritage Places, Ramsar Wetlands, Conservation Reserves or Commonwealth Marine Reserves

The Probable Ore Reserve is located within an area of deep Bassendean sands, leached of nutrients. The vegetation type is Banksia Woodlands. The topography is low to medium dunes.

Mine Plan

The production target for Muchea incorporates the maiden Probable Ore Reserve of 14.6 Mt @ 99.9% SiO_2 that sits within the Mining Lease application area (see above under "Probable Ore Reserve") as well as a portion of the Inferred Mineral Resource.

The Inferred Mineral Resource available to mine within the Mine Plan Pit is 61.4 Mt @ 99.6% SiO_2.

In designing the Mine Plan Pit, the Company has examined the restrictions and constraints on mining activities in the context of surrounding areas and the interests of stakeholders, and planned accordingly. To that end, the Mine Plan Pit ensures:

- mining will not occur any closer than 100m to the Dongara to Pinjarra gas pipeline;
- mining will not occur any closer than 200m to the boundary of any freehold land and will be at least 600m from the nearest house; and
- the Mining Lease area does not intersect with the Gingin Airfield ground and mining will not occur any no closer than 250m to the boundary of the Gingin Airfield. In addition, mining will not occur under the flight lines to and from the airfield.

These buffer zones are at least equal to, or are in excess of, industry practice and legislative requirements (if any). In addition, the western boundary of the Mine Plan Pit is contiguous with the FNA (see above under "Key points and assumptions") and does not intersect with any proposed conservation area under the Green Growth Plan.

The Mine Plan Pit therefore is not impacted by any known exclusion areas.

The maiden Probable Ore Reserve is estimated from the Indicated Mineral Resource only. This constitutes approximately 30% of the estimated total production target (in terms of processed tonnes of silica sand) over the 25 year mine life for the project BFS estimates. It provides sufficient tonnage for the first 9-10 years of mining operations. The Company intends to mine solely from the Probable Ore Reserve during that period. Key assumptions underpinning the financial model for the Project are set out below, including timing for project start-up and ramp-up to full capacity. The financial model (see below and in the BFS) shows that Muchea is a viable project with the Probable Ore Reserve only, and the Inferred Mineral Resource is not the determining factor for its viability.

The ore which forms the Inferred Mineral Resource is contiguous with the Indicated Mineral Resource and has been categorised as lower confidence due to wider spaced drilling. (Drilling of the Indicated Mineral Resource is typically 50m spaced along existing tracks, whereas the Inferred Mineral Resource is drilled on a 400m spacing along existing tracks.)

The Company has undertaken sufficient drilling to assume geological and metallurgical continuity of the sand deposit. There is negligible difference between the modelled sand in each category and it is believed an additional 1,500m of drilling would be required to upgrade the inferred resource category. The cost for drilling, assaying and associated studies is estimated (at current rates) to be in the region of $250,000 and will need to be undertaken within the first 9 years of mining operations.

Given the simple nature of the silica sand deposit at the Project and the associated geological and metallurgical confidence, the Company expects that this additional drilling will be sufficient to realise the production target.

Notwithstanding the above, there is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated Mineral Resources or that the production target itself will be realised.

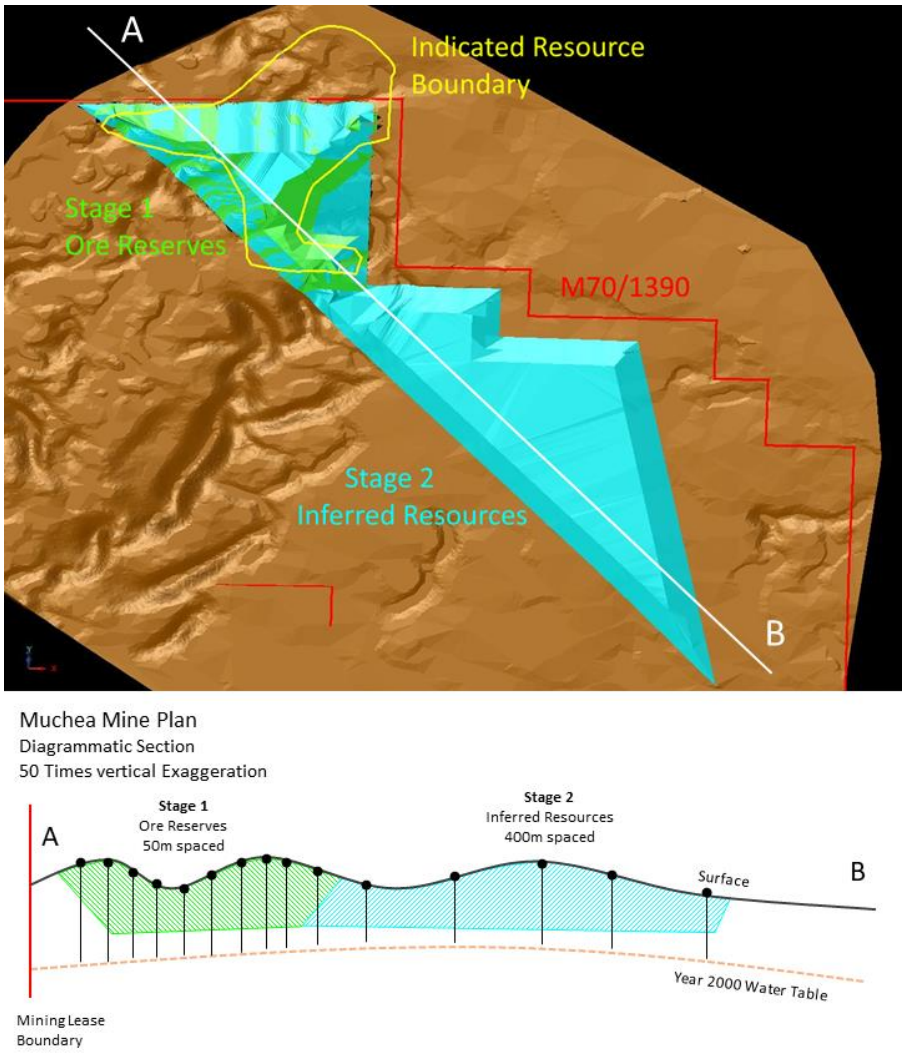


Figure 4: Muchea Post-Mining of Ore Reserves and Inferred Resources

Topography (5:1 vertical exaggeration)
Probable Ore Reserve within green boundaries and Inferred Mineral Resource within blue boundaries.

Assessment Process:

- Pre-referral submission to Department of the Environment and Energy (DotEE)
- Final referral submission to DotEE
- Submission of Section 38 referral to the State Environmental Protection Authority (EPA)
- Seek an Accredited *Environment Protection and Biodiversity Conservation* Act 1999 (Cth) Assessment under the State *Environmental Protection Act* 1986 (WA) via an Environmental Review Document with public comment
- Undertake any further studies required
- Submission of Environmental Review Document

Mitigation Strategies

- Proposed action lies within a large development envelope, allowing for the flexibility to target areas of lower significance to Matters of National Environmental Significance (MNES)
- Disturbance will be kept to a minimum, up to 35 ha per year and 14 ha at any one time
- Progressive rehabilitation using topsoil re-location to ensure topsoil and plants are translocated intact to previously mined areas
- Conduct further surveys to identify MNES
- Use findings to steer the project and avoid MNES where possible

There are no mine tailings storage requirements, there are no waste dumps and processing requires no chemicals.

Material Modifying Factors – Infrastructure

The project is located on vacant, unallocated crown land which is east of the Yeal Nature Reserve and State Forest, west of Freehold land and south of the Gingin Airfield. The southern boundary is the limit of tenure. The Brand Highway is proximal to the area and access is via the sealed Timaru Road from Brand Highway. The rail line to the Kwinana Bulk Terminal runs east of the Brand Highway and will be used to transport the processed silica sand to the Kwinana Bulk Terminal for bulk export.

The project will require its own water infrastructure and power is reticulated from alongside Brand Highway. As there will be no accommodation at the mine site labour will be sourced from the nearest towns, Gingin and Muchea (approximately 12km and 14 km, respectively, from the mine site).

Costs

Operating costs

Operating costs were determined from first principles and are estimated to include all costs to mine, process, transport and load product on to ships.

Royalties

The prevailing rate of royalty due to the State is used in VRX's economic assessments. The State Royalty rate is A$1.17 per dry metric tonne and reviewed every 5 years with the next review due in 2020.

A 1% net production royalty from the project will be payable to Australia Silica Pty Ltd.

There are no other royalties payable, though a royalty is in the process of being negotiated with Native Title claimants and has been included in the project metrics.

Revenue

Product Quality

Multiple products will be differentiated during processing subject to required particle size distribution by screening. Recovery of products has been independently assessed by CDE Global, a world leading silica sand testing laboratory.

Commodity Prices

Commodity prices for silica sand products have been determined by independent industry source Stratum Resources. The industry standard is that sales contracts are in US dollars. The exchange rate to convert to Australian dollars will be the prevailing rate at the time of payment.

Subject to final quality produced, the prices for the commodity will range from US$38 to US$55 per dry metric tonne FOB. There will be no other treatment, smelting or refining charges and no shipping cost estimates with all contracts to be based on FOB rates.

Revenue will be based on a negotiated per shipment basis per dry metric tonne FOB with payment by demand on an accredited bank letter of credit.

Market Assessment

The Company has commissioned an independent assessment of the current market prices for proposed products by industry leader Stratum Resources. The assessment includes projections for future demand and supply of silica sand and concludes that there is a future tightening of supply of suitable glassmaking silica sand with a commensurate increase in price.

Sales volumes have been estimated as a result of received letters of intent and expressions of interest to purchase products.

Economic Factors

The Company's economic analysis has calculated at a 10% discounted ungeared post tax net present value (**NPV_{10}**). A 20% discounted NPV has also been calculated to demonstrate the strength of the economic analysis.

The assessment has not considered any escalated future product prices nor any inflation to operating costs. The analysis has used a US$/A$ exchange rate of US$0.70/A$1.00.

The analysis is based on a 25 year production profile with the Probable Ore Reserve supporting a 9-10 year project. Mining will occur solely from the Probable Ore Reserve during that period. There is a reasonable expectation that with further close spaced drilling the existing Inferred Resources would convert to Indicated Resources and Probable Reserves well in excess of this time period, however the model is conservatively restricted to 25 years. See above for further information.

Capital requirements are based on independent estimates.

The analysis is most sensitive to the exchange rate and sales prices. The analysis indicates the financials of the project are very robust and there is a high confidence that a viable long-term mining operation can be justified.

Due to the higher-grade products the average sales price of Muchea silica sand products is higher than those from the Arrowsmith silica sand projects.

Social Factors

The Company lodged an application for a Mining Lease (M70/1390) on 17 January 2019. The application lies within the Whadjuk native title claim boundaries (WAD242/11), which is part of the South West Native Title Settlement. The Whadjuk people are represented by the South West Aboriginal Land and Sea Council Aboriginal Corporation. The Company is currently in negotiations with the claimant group with respect to this mining lease application including the Miscellaneous Licences applications required to access the project area, and the Company expects that an agreement will be reached between the parties allowing for the Mining Lease to be granted.

The project is wholly on unallocated crown land with little negative impact on local communities.

Project Funding

The financial model summarised in the BFS sets out the project metrics and provides a basis for the potential capital structure of the Company for the development of the project. Total capital expenditure at Muchea (for a 2 million tonnes per annum processing plant) is estimated at approximately A$33 million (the BFS details capital cost estimates).

The Company anticipates that the source of funding for the capital investment at Muchea will be any one, or a combination of, equity, debt and pre-paid offtake from the project. Whilst no final decision has been made in that regard, the financial model assumes a maximum A$30 million in debt.

The Company has received a number of enquiries and expressions of interest from debt financiers for the project. As noted above, the financial model provides for debt capacity and is designed to meet the expectations of any providers of potential debt funding for their due diligence and other internal requirements.

In addition, VRX Silica has also received enquiries and expressions of interest from organisations across Asia for silica sand products from the project and holds signed letters of intent for substantial tonnages. A number of these organisations have expressed interest in becoming a funding partner of the Company for development of a mine by way of pre-paid offtake arrangements or commercial debt funding.

The balance of the Company's capital requirements will be funded from equity capital.

Whilst the envisaged project development requires a low capital intensity relative to a greenfields hard rock mining project, and any one of, or a combination of equity, debt and pre-paid offtake is planned, VRX Silica has not as yet secured the required capital. The positive financial metrics of the BFS and feedback from potential funding partners provides encouragement as to the likelihood of meeting optimum project and corporate capital requirements.

Muchea, Arrowsmith North and Arrowsmith Central Project Metrics

Key BFS outcomes for Muchea, Arrowsmith North and Arrowsmith Central, and in aggregate, are set out below.

	Arrowsmith North	Arrowsmith Central	Muchea	**Total**
Post Tax, ungeared NPV_{10}	$242.3m	$147.6m	$337.9m	**$727.8m**
Post Tax, ungeared NPV_{20}	$99.8m	$56.1m	$146.4m	**$302.3m**
Post Tax, ungeared IRR	79%	60%	96%	**83%**
Payback period (yrs) (post tax) (ramp up rate)	2.4	2.8	2.3	**2.4**
Exchange Rate US$/A$	$0.70	$0.70	$0.70	**$0.70**
Life of Mine (yrs) (Scope of BFS Study)	25	25	25	**25**
Total Sales (initial 25 years) no escalation	$2,773m	$2,167m	$3,345m	**$8,285m**
EBIT	$1,144m	$737m	$1,540m	**$3,421m**
Cashflow after finance and tax	$835m	$539m	$1,123m	**$2,497m**
Shares on Issue	404,318,617			
EPS after tax (per year)	$0.08	$0.05	$0.11	**$0.25**
Capex (2 mtpa)	$28.3m	$25.9m	$32.8m	**$87m**
Capex contingency (inc)	20%	20%	20%	**20%**
Life of Mine C1 costs, FOB Kwinana (inc royalties)	$30.18	$27.67	$32.74	**$30.24**
Tonnes Processed (initial 25 years) (Mt)	53	51	54	**158**
Production Target (Mt) (BFS Study) (initial 25 Years)	47.7	39.6	48.3	**136**
Probable Ore Reserves (Mt)	204	18.9	18.7	**242**
Ore Reserve life (yrs)	102	10	9-10	

Notes:

1. A proportion of the production target for each of Arrowsmith Central and Muchea is based on Inferred Mineral Resource. There is a low level of geological confidence associated with inferred mineral resources and there is no certainty that further exploration work will result in the determination of indicated mineral resources or that the production target itself will be realised.
2. The Ore Reserves and, in the case of Arrowsmith Central and Muchea, the Inferred Mineral Resource underpinning the above production targets have been prepared by a Competent Person in accordance with the requirements of the JORC Code.
3. The material assumptions are set out in the BFS for each project. All such material assumptions continue to apply and have not materially changed from the date if release of the BFSs.
4. All figures are presented in Australian dollars, unadjusted for inflation

Warrawanda Project

Assays conducted on cores from the diamond drilling program undertaken in the previous quarter have indicated that the quartz outcrops are not an economic grade and have insufficient tonnages to warrant further exploration.

The tenement holding is under review.

Capital Raising

During the quarter 6 million 2.8c options were exercised and on 4 November 2019 VRX Silica announced it had successfully completed a bookbuild to raise $4 million (before costs) through a placement of securities to a range of sophisticated and institutional investors, including existing shareholders and new investors.

The placement funds were raised to accelerate the advancement of the Company's Arrowsmith North, Arrowsmith Central and Muchea silica sand projects, including for permitting and approvals, long lead capital items, detailed engineering work, hydro and resource drilling, and for working capital purposes.

The placement was made under the Company's placement capacity under Listing Rule 7.1 and resulted in the issue of 34,782,610 new fully paid ordinary shares at an issue price of 11.5 cents each. Participants in the placement will also be issued with one free-attaching option for every two shares subscribed for in the placement exercisable at 18 cents and expiring 18 months from their date of issue to be quoted on ASX subject to meeting ASX listing rule requirements.

Hartleys Limited (AFSL No 230052) acted as lead manager to the placement.

Events Subsequent to the Quarter

On 29 January 2020 the Company held a general meeting of shareholders seeking Listing Rule 7.4 ratification of the issue of the placement shares referred to above and Listing Rule 7.1 approval for the issue of the free-attaching options and options to the lead manager. All resolutions were passed following the conduct of a poll.

The options are expected to be issued on 31 January 2020 and quoted on ASX on or about 3 February 2020.

Competent Persons' Statements

The information in this report that relates to Arrowsmith North, Arrowsmith Central and Muchea Exploration Results and Muchea Aircore Drilling Area Mineral Resources are based on data collected and complied under the supervision of Mr David Reid, who is a full-time employee of VRX Silica. 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 (JORC Code). 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 Arrowsmith North, Arrowsmith Central and Muchea Auger area 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 information in this report that relates to Arrowsmith North, Arrowsmith Central and Muchea Probable Ore Reserves is based on data collected and compiled under the supervision of Mr David Reid, who is a full-time employee of VRX Silica. 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 (JORC Code). Mr Reid consents to the inclusion of the data in the form and context in which it appears.

Authority for Release

This announcement has been authorised for release to ASX by Bruce Maluish, VRX Silica Limited Managing Director.

Interests in Mining Tenements

Western Australia

Arrowsmith Project – Silica

Tenement	Status	Interest at beginning of quarter	Interests relinquished, reduced or lapsed	Interests acquired or increased	Interest at end of quarter
E70/4986	Granted	100%	-	-	100%
E70/4987	Granted	100%	-	-	100%
E70/5027	Granted	100%	-	-	100%
E70/5109	Granted	100%	-	-	100%
E70/5197	Granted	100%	-	-	100%
MLA/1389	Application	-	-	-	-
MLA/1392	Application	-	-	-	-
L70/198	Granted	-	-	100%	100%
L70/199	Granted	-	-	100%	100%
L70/202	Application	-	-	-	-
L70/203	Application	-	-	-	-
L70/208	Application	-	-	-	-

Muchea Project – Silica

Tenement	Status	Interest at beginning of quarter	Interests relinquished, reduced or lapsed	Interests acquired or increased	Interest at end of quarter
E70/4886	Granted	100%	-	-	100%
ELA70/5157	Application	-	-	-	-
MLA/1390	Application	-	-	-	-
L70/200	Application	-	-	-	-
L70/204	Application	-	-	-	-
L70/205	Application	-	-	-	-
L70/206	Application	-	-	-	-

Boyatup Project – Silica

Tenement	Status	Interest at beginning of quarter	Interests relinquished, reduced or lapsed	Interests acquired or increased	Interest at end of quarter
E69/3560	Granted	100%	-	-	100%
E69/3668	Granted	100%	-	-	100%

Warrawanda Project - Nickel

Tenement	Status	Interest at beginning of quarter	Interests relinquished, reduced or lapsed	Interests acquired or increased	Interest at end of quarter
E52/2372	Granted	100%	-	-	100%
E52/3447	Granted	100%	-	-	100%

Biranup Project – Base Metals/Gold

Tenement	Status	Interest at beginning of quarter	Interests relinquished, reduced or lapsed	Interests acquired or increased	Interest at end of quarter
E39/1828	Granted	100%	-	-	100%
E38/3191	Granted	100%	-	-	100%
E39/2000	Granted	100%	-	-	100%
E39/2001	Granted	100%	-	-	100%
E39/2003	Granted	100%	-	-	100%
E38/3294	Granted	100%	-	-	100%