

Ventnor Resources Limited (ASX: VRX) (**Ventnor** or the **Company**) provides the following summary of activities conducted during the December 2017 quarter.

## Exploration

On 12 October, Ventnor announced a new silica sand project at Arrowsmith, 270km north of Perth, WA.

Ventnor advised the market that Arrowsmith has the potential for significant silica sand resources which could address what is a dwindling sand supply in the Asia-Pacific region which is used in glass manufacturing, concrete construction and as a tech metal.

Supply deficits are due to Asian regional governments acknowledging sand as a strategic resource. Prior mining activities such as river dredging have caused environmental damage. Coastal developments are increasing, reducing access to resources, as is social pressure on often illegal sand mining operations.

Asian demand is increasing for energy-saving double glazing and for applications within the expanding automobile industry in China and India.

Demand is increasing for high purity silica sand in the production of Photo Voltaic panels and Silicon-Metal composite material for high capacity Lithium-ion rechargeable batteries.

Demand for sand in current burgeoning infrastructure-construction programs utilising concrete in Asia - particularly China, India and Vietnam - has put pressure on suppliers and consequently, on prices.

Preliminary reconnaissance work on the Arrowsmith Project indicates substantial potential for sand resources suitable for both glass making and construction.

Arrowsmith is traversed by the Eneabba-Geraldton rail line, which provides direct access to the ship-loading facilities at the Geraldton Port facilitating a unique logistics solution.

EL applications predominantly cover Vacant Crown Land, are extensively covered by cleared tracks from historic oil exploration seismic surveys, and easily accessed by the adjacent Brand Highway.

The area potentially has low environmental impact mining propositions; rehabilitation techniques are well established in the industry.

Preliminary assays and testwork indicate that processing to upgrade the silica to glass-making quality will have a low capital intensity, low technical risk and requiring no chemicals.

## SILICA SAND

### MARKET DYNAMICS

1. Globally, silica sand is a strong growth mineral due to the demand by the construction sector, wherein its use in the manufacture of flat glass for windows is constant. Greater growth is being felt in the Asian market, particularly China where there is a massive glass manufacturing expansion.
2. There's increased demand for specialised plate glass required in double glazing created by Asian/Pacific governments in efforts to reduce energy demands.
3. Developing Asian markets have increasing demand for glass in their developing automobile industry.
4. New markets address increasing demand for silica sand as a "tech metal" for use in production of Photo Voltaic panels and Silicon-Metal composite material for high capacity Lithium-ion rechargeable batteries.
5. Rationalisation of major producers of silica sand has resulted in a relatively small number of sand-producing corporations.
6. The market for silica sand in the Asia/Pacific region is forecast to advance 6.1% per year to 138 million metric tons in 2018.
7. Silica sand demand by region is shown in table below:

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%

### SILICA SAND USES

#### *Introduction*

Quartz is the most common silica crystal and the second most common mineral on the earth's surface. It is found in almost every type of rock: igneous, metamorphic, and sedimentary. While quartz deposits are abundant, and quartz is present in some form in nearly all mining operations, high purity and commercially viable deposits occur less frequently. Silica sand deposits are most commonly surface-mined in open pit operations, but dredging and underground mining methods are also employed.

Silica sand has supported human progress throughout history, being a key raw material in the industrial development of the world, especially in the glass, metal casting, and ceramics industries. Silica contributes to today's information technology revolution, being used in computer components, providing raw materials for silicon chips and as quartz for PV panels.

### ***Glassmaking***

Silica sand is the primary component of all types of standard and specialty glass. It provides the essential  $\text{SiO}_2$  component of glass formulation; its chemical purity is the primary determinant of colour, clarity and strength in glass. Industrial sand is used to produce flat glass for building and automotive use, container glass for foods and beverages, and tableware.

### ***Metal Casting***

Industrial sand is an essential part of both the ferrous and non-ferrous foundry industries. Metal parts ranging from engine blocks to sink faucets are cast in a sand-and-clay mould to produce their external shape, using a resin-bonded core to create the desired internal shape. Silica's high fusion point ( $1,760^\circ\text{C}$ ) and low rate of thermal expansion produce stable cores and moulds compatible with all pouring temperatures.

### ***Metallurgical Uses***

In metal production, silica sand operates as a flux to lower the melting point and viscosity of slag to make it more reactive and efficient. Lump silica is used either alone or in conjunction with lime to achieve the desired base/acid ratio required for final purification of metals.

### ***Chemical Production***

Silicon-based chemicals are found in thousands of everyday applications ranging from food processing to soap and dye production. These chemicals are used in products such as household and industrial cleaners, in the manufacture of fibre optics, and to remove impurities from cooking oil and brewed beverages.

### ***Paint and Coatings***

Paint formulators select micron-sized industrial sands to improve the appearance and durability of architectural and industrial paints and coatings. High purity silica produces critical performance properties such as brightness reflectance and colour consistency.

### ***Ceramics***

Ground silica is an essential component of the glaze and body formulations of all types of ceramic products, including tableware, sanitary ware and floor and wall tile. In the ceramic body, silica is the skeletal structure onto which clays and flux components attach. Silica products are also used as the primary aggregate to provide high-temperature resistance to acidic attack in industrial furnaces.

### ***Filtration and Water Production***

Industrial sand is used to filter water to become drinkable. Uniform grain shapes and grain size distributions produce efficient filtration bed operations for the removal of contaminants from wastewater to provide potable water. As silica is chemically inert, it will not degrade or react when it comes in contact with acids, contaminants, volatile organics, or solvents.

### ***Oil and Gas Recovery***

Known commonly as proppant, or "frac sand," industrial sand is pumped down holes in deep well applications to prop open rock fissures to increase the flow rate of natural gas or oil. In this specialised application, round whole-grain sand is used to maximise permeability and to prevent formation cuttings from entering the well bore.

## **CONSTRUCTION SAND**

Construction sand is the primary structural component in a wide variety of building and construction products. Whole-grain silica is used in flooring compounds, mortars, specialty cements, stucco, roofing shingles, skid-resistant surfaces, and asphalt mixtures to provide packing density and flexural strength without adversely affecting the chemical properties of the binding system. Ground silica performs as a functional extender to add durability, anti-corrosion and weathering properties in epoxy-based compounds, sealants and caulks.

## **ASIAN MARKETS**

### **SINGAPORE**

Singapore building construction uses one million tonnes of concrete a month, which includes 300,000 tonnes of construction sand. Current sources are Malaysia, Cambodia, Myanmar and occasionally Philippines. Other regional sources have placed restrictions on or have totally banned exports of their local sand. Sources are generally dredged from rivers with consequential unacceptable environmental impacts. The Singapore Building and Construction Authority (BCA) has placed a requirement that 5% of construction sand be imported from “non-traditional” sources which includes Australia. Singapore is concerned that current sources may become unreliable or intermittent and is actively encouraging a greater spread of sources. Importers are concerned that the BCA will raise that requirement to 10% from non-traditional sources, as originally intended. If Singapore continues at its current rate of growth, this could be a significant market for Australian suppliers.

### **INDIA**

The building expansion program underway has put incredible pressure on sand suppliers for concrete, so much so that illegal dredging of rivers has resulted in recent public scrutiny of the environmental long-term impacts. This is also potentially a significant market for construction sand.

### **VIETNAM**

Vietnam has gone from an exporter of industrial sand, to an importer, with increased use in concrete with a significant building boom underway.

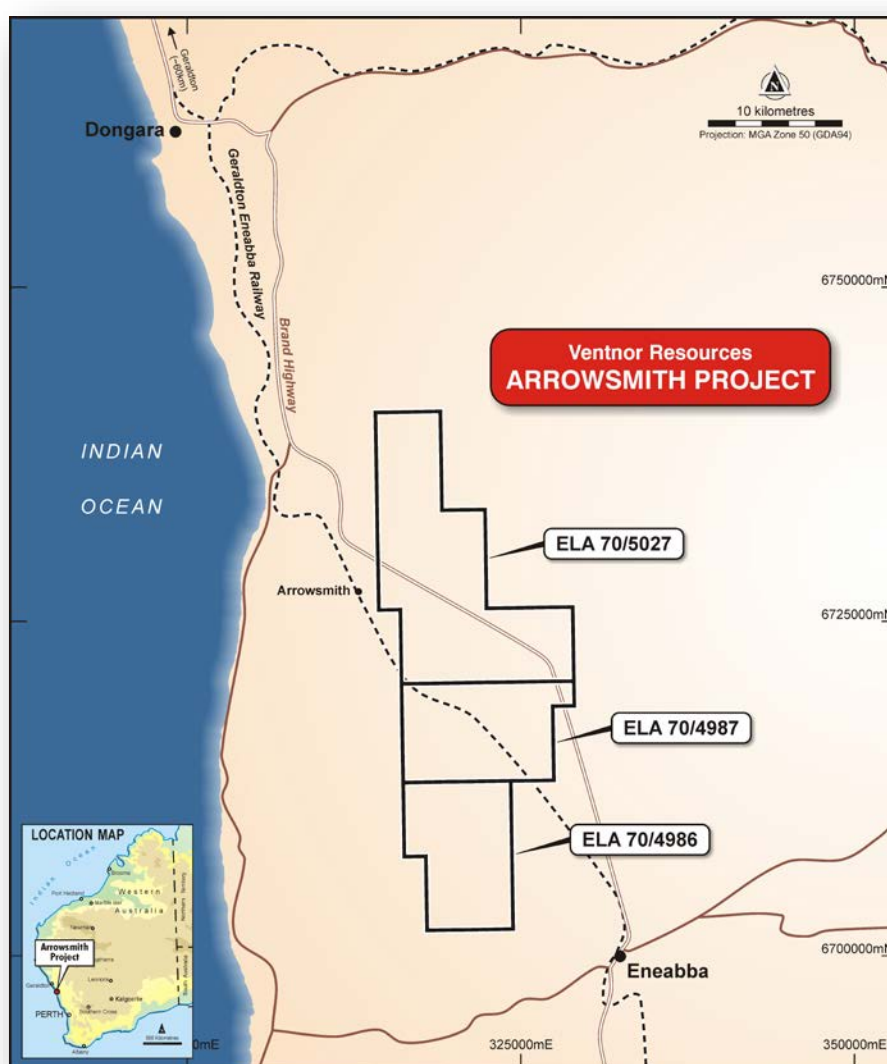
**Ventnor management believes that the Arrowsmith Project has the potential for significant silica sand resources to supply increasing markets in the Asia-Pacific region for both glass making and construction and increasingly the Tech metal market.**

## Arrowsmith Project Details

Ventnor Resources has applied for three exploration licenses north of Eneabba, Western Australia, to explore for construction sand and high-quality silica sand. The details of these tenements, known collectively as the Arrowsmith Project, are shown below in Table 1, with the location in Figure 1.

Tenement	Holders	Application Date	Expected Grant Date	Area (Km <sup>2</sup> )
ELA70/4986	Ventnor Mining Pty Ltd	25/05/2017	Early Q1 2018	93
ELA70/4987	Ventnor Mining Pty Ltd	25/05/2017	Early Q1 2018	86
ELA70/5027	Ventnor Mining Pty Ltd	29/08/2017	Late Q1 2018	179

**Table 1 – Arrowsmith Tenement Details**



**Figure 1 – Arrowsmith Project Location**



The targeted silica sand deposits are the aeolian sand dunes that overlie the Pleistocene limestones and paleo-coastline which host the Eneabba heavy mineral deposits.

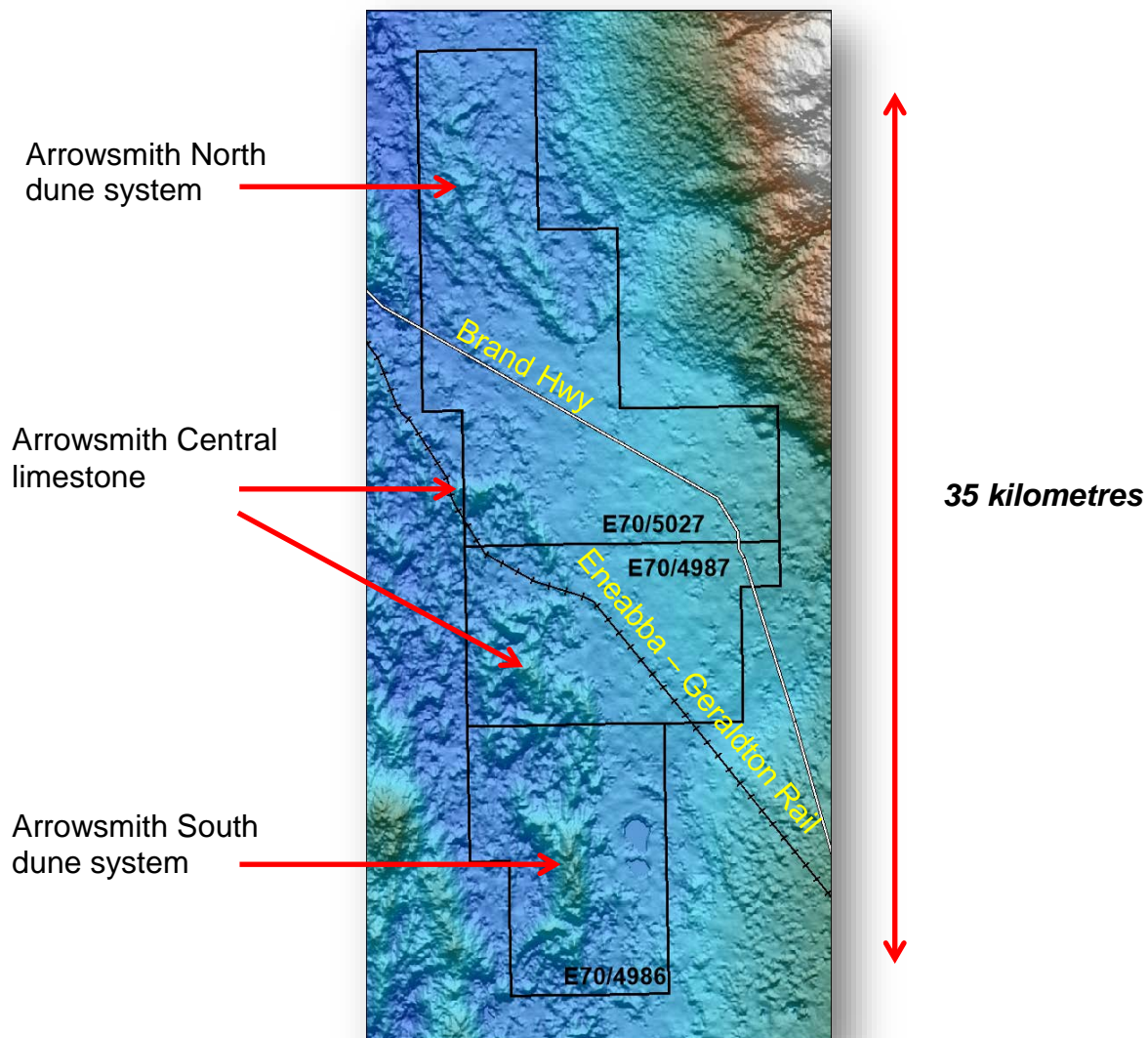
The Exploration Targets for the Arrowsmith Project are:

Arrowsmith North – 100 Million to 140 Million tonnes high-quality silica sand;

Arrowsmith South – 40 Million to 80 Million tonnes high-quality silica sand.

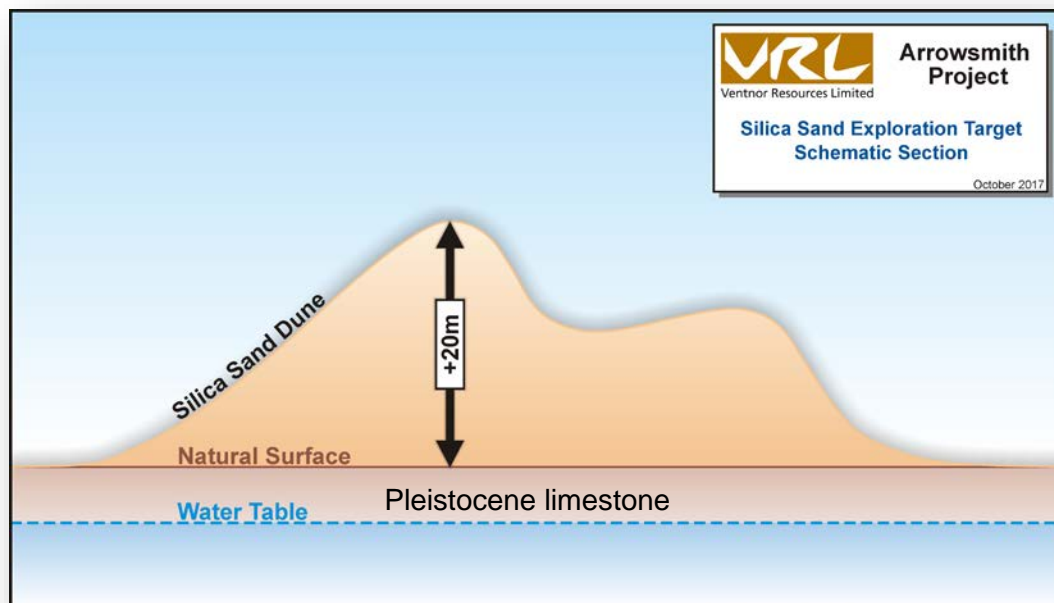
**The potential quality and grade of these Exploration Targets are conceptual in nature. There has been insufficient exploration to estimate a Mineral Resource; it is uncertain if further exploration will result in the estimation of a Mineral Resource.**

The image (Figure 2) below is a topographic map of the area generated by Shuttle Radar Topography Mission data (SRTM). This map was used to identify potential dune structures as topographic highs, which have been followed by ground field investigation and sampling using a hand-held auger.



**Figure 2 Arrowsmith Project SRTM topography**

The image (Figure 3) below is a schematic section showing the silica sand dune that is targeted for exploration. The targeted dune is the area above the surrounding natural surface and well above the standing water table.



**Figure 3 Schematic section of Silica Sand Dune Exploration Target**

Three areas were investigated: Arrowsmith North for construction sand which may also be upgraded to glass quality; Arrowsmith Central, which is prospective for sand and also limestone; and Arrowsmith South, prospective for high quality silica sand.

Initial samples were taken by hand auger and selected from below the humus layer, typically the first 30cm. Samples were sent to Intertek Laboratory in Perth for silica sand analysis via a Four-Acid digest and ICP finish. The table below shows the major constituents of the sand, with full analytical results available in the Appendix.

MGA_East Zone50	MGA_North Zone50	Location	SiO2 %	Al2O3 ppm	Fe2O3 %	K2O ppm	TiO2 ppm	LOI-1000C %
317330	6729258	Arrowsmith North	<b>98.40</b>	6,979	0.19	1,885	1,621	0.33
317160	6730256	Arrowsmith North	<b>97.80</b>	10,547	0.36	993	1,155	0.53
316989	6731249	Arrowsmith North	<b>98.00</b>	9,448	0.30	800	1,243	0.48
316818	6732242	Arrowsmith North	<b>96.80</b>	15,988	0.55	1,629	1,636	0.69
316642	6733263	Arrowsmith North	<b>97.30</b>	12,801	0.48	983	1,397	0.63
316319	6735123	Arrowsmith North	<b>97.90</b>	9,826	0.36	881	1,513	0.52
316115	6736295	Arrowsmith North	<b>98.40</b>	7,389	0.26	588	1,102	0.40
316109	6737182	Arrowsmith North	<b>98.20</b>	8,611	0.29	891	1,320	0.40
316584	6737185	Arrowsmith North	<b>96.10</b>	7,538	0.19	3,997	1,264	1.13
316974	6737193	Arrowsmith North	<b>99.10</b>	3,733	0.10	891	874	0.23
317964	6737207	Arrowsmith North	<b>99.00</b>	3,684	0.14	411	1,277	0.31
321170	6731628	Arrowsmith North	<b>99.30</b>	2,653	0.12	213	1,044	0.21
319751	6731161	Arrowsmith North	<b>98.50</b>	6,527	0.24	269	1,092	0.40
318790	6721353	Arrowsmith Central	<b>95.00</b>	25,477	0.58	5,847	1,737	0.98
318383	6721357	Arrowsmith Central	<b>94.90</b>	25,529	0.59	6,663	2,376	0.92
317956	6722076	Arrowsmith Central	<b>95.70</b>	21,472	0.44	7,531	2,079	0.66
316750	6722030	Arrowsmith Central	<b>95.50</b>	21,314	0.42	7,649	1,988	0.83
315686	6725167	Arrowsmith Central	<b>97.30</b>	13,323	0.26	2,121	1,360	0.63
323890	6718805	Arrowsmith Central	<b>99.30</b>	2,898	0.09	677	1,246	0.15
322516	6718792	Arrowsmith Central	<b>98.30</b>	7,907	0.17	2,326	1,268	0.28
321399	6712070	Arrowsmith South	<b>94.90</b>	26,338	0.55	7,923	1,880	0.83
321141	6711127	Arrowsmith South	<b>96.10</b>	18,871	0.43	5,220	1,688	0.82
321295	6710201	Arrowsmith South	<b>97.70</b>	10,848	0.12	5,318	1,611	0.30
321715	6707710	Arrowsmith South	<b>98.30</b>	8,371	0.08	4,554	1,562	0.18
322815	6705357	Arrowsmith South	<b>97.40</b>	11,735	0.34	2,464	2,693	0.52
323118	6704616	Arrowsmith South	<b>97.10</b>	13,528	0.40	2,521	3,146	0.49
323047	6702748	Arrowsmith South	<b>96.60</b>	17,069	0.31	2,934	3,257	0.69
318284	6705732	Arrowsmith South	<b>93.30</b>	35,969	0.61	10,230	2,329	1.04
319519	6705047	Arrowsmith South	<b>95.90</b>	20,165	0.40	7,256	1,784	0.61
318284	6705732	Arrowsmith South	<b>97.60</b>	11,079	0.16	6,018	2,241	0.21
319519	6705047	Arrowsmith South	<b>98.30</b>	6,955	0.14	2,338	2,313	0.39

High grade silica sand is sand which has purity greater than 99.5% SiO<sub>2</sub>. It typically will require processing to remove the various deleterious minerals to achieve the highest possible silica grade. Auger samples were composited into two samples representing "Cream" and "Yellow" sand and supplied to Nagrom Laboratory in Perth to determine the Size by Analysis.

This technique analyses the elemental chemistry of a suite of particle sizes to determine where the deleterious minerals report to; below is a summary of the results. The results indicate that +90% of the dune sand is sized between +0.212mm and -1mm, preferentially retains the silica sand grains while eliminating many of the impurities.

Preliminary indications are encouraging in that the dune sand located on the Arrowsmith tenements can be upgraded by conventional techniques, to provide a high-grade purity of 99.5% SiO<sub>2</sub> with only nominal amounts of benign deleterious minerals.

For personal use only



**Size by Analysis**

SAMPLE	Mass	SiO <sub>2</sub>	LOI <sub>1000</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CeO <sub>2</sub>
	%	%	%	%	%	%	ppm

**Arrowsmith North Cream Sand**

Assay Head	98.757	0.22	0.145	0.334	0.104	3.0
------------	--------	------	-------	-------	-------	-----

**Arrowsmith North Cream Sand Size by Analysis**

Size (mm)

+1	0.16%	96.054	0.57	2.761	0.335	0.043	<1
+0.5	41.86%	99.319	0.06	0.348	0.181	0.041	<1
+0.355	24.88%	98.918	0.01	0.625	0.220	0.048	<1
+0.212	26.20%	99.047	0.06	0.486	0.272	0.060	<1
+0.106	5.36%	96.879	0.02	1.717	0.566	0.527	3
+0.075	0.43%	91.143	0.16	3.829	1.481	2.057	65
+0.045	0.45%	90.356	0.31	4.127	2.102	1.225	58
+0.038	0.10%	89.604	0.68	4.198	2.557	1.015	50
-0.038	0.55%	81.893	5.03	3.484	5.676	1.303	68
<b>+0.212 - 1mm</b>	<b>92.94%</b>	<b>99.135</b>	<b>0.05</b>	<b>0.461</b>	<b>0.217</b>	<b>0.048</b>	<b>&lt;1</b>

**Arrowsmith North Yellow Sand**

Assay Head	97.780	0.44	0.328	0.870	0.134	8.0
------------	--------	------	-------	-------	-------	-----

**Arrowsmith North Yellow Sand Size by Analysis**

Size (mm)

+1	0.67%	96.971	0.09	2.459	0.479	0.063	4
+0.5	60.51%	98.995	0.11	0.425	0.369	0.050	2
+0.355	20.62%	98.709	0.10	0.519	0.404	0.064	2
+0.212	10.98%	98.378	0.09	0.758	0.526	0.087	2
+0.106	3.57%	95.624	0.19	1.511	1.225	0.774	12
+0.075	0.78%	88.111	0.10	4.241	3.257	1.957	96
+0.045	0.34%	89.209	0.57	3.408	3.031	1.341	103
+0.038	0.29%	89.694	0.60	3.088	3.303	1.014	67
-0.038	2.23%	58.879	9.97	7.225	20.339	1.575	197
<b>+0.212 - 1mm</b>	<b>92.11%</b>	<b>98.857</b>	<b>0.11</b>	<b>0.486</b>	<b>0.396</b>	<b>0.058</b>	<b>2</b>

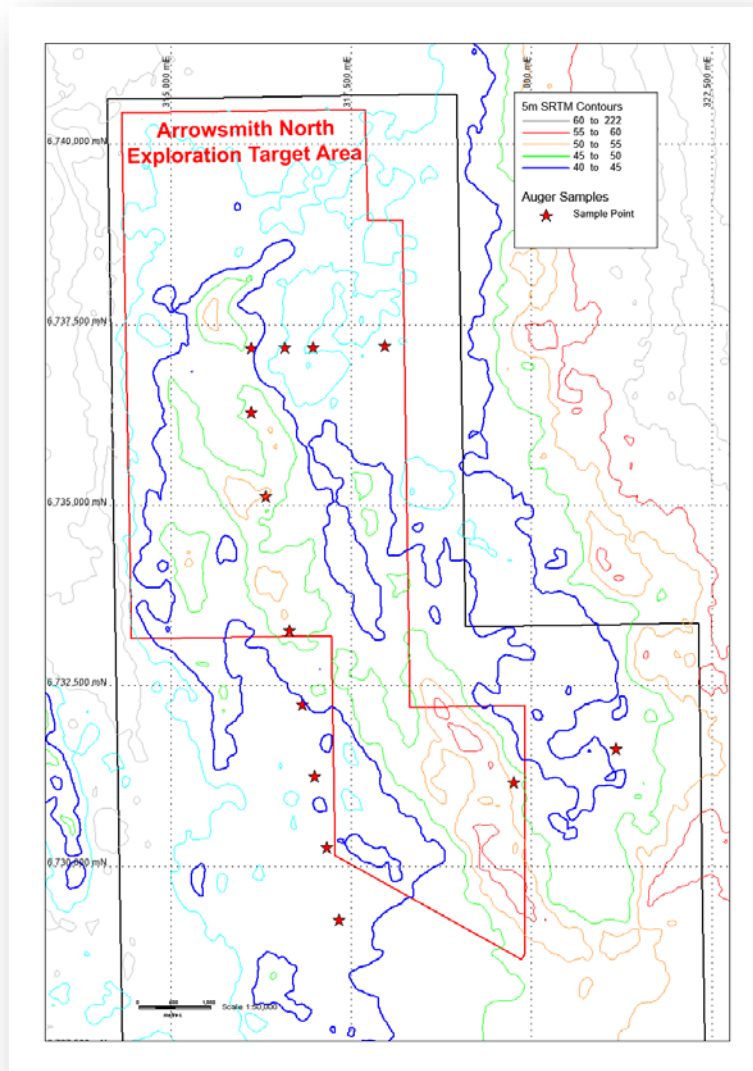
**Size by Analysis for composited auger samples**

For personal use only

## EXPLORATION TARGETS

Exploration Targets for potential high-grade silica sand have been generated for two areas within the Arrowsmith Project: Arrowsmith North and Arrowsmith South, see below:

### **Arrowsmith North**

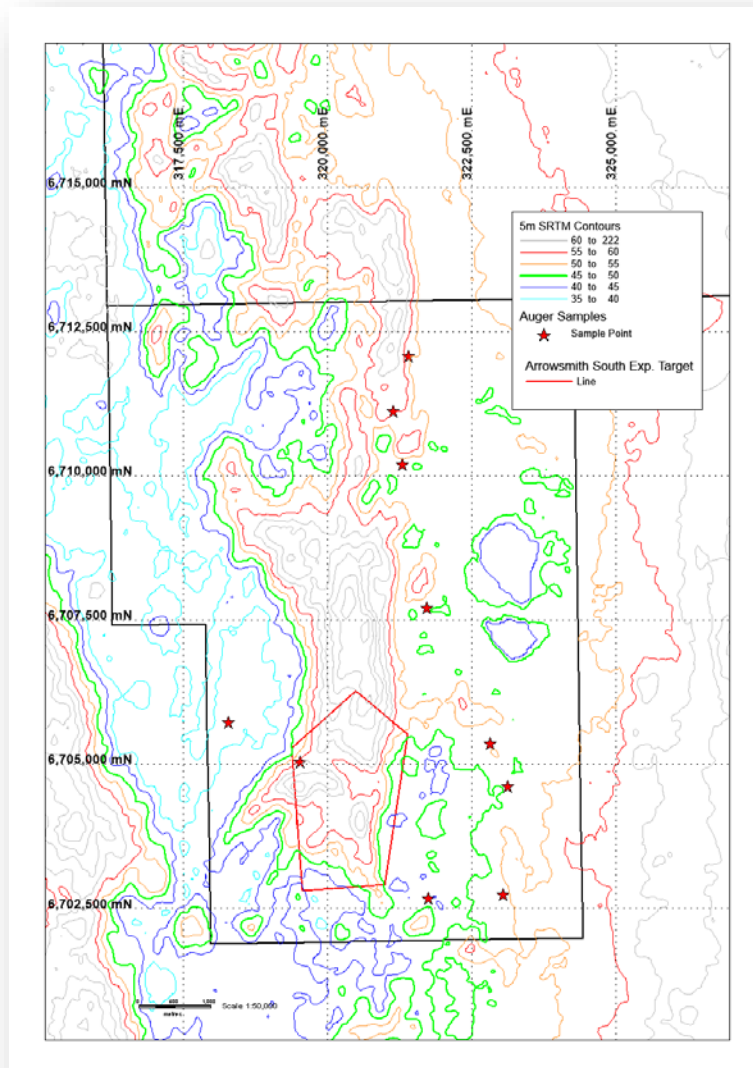


### **Arrowsmith North Exploration Target**

The Arrowsmith North Exploration Target area focuses on a prominent broad dune structure, (see above), and avoids existing infrastructure and potential conservation areas. The potential volume is estimated from the 40mRL (surrounding RL) to the top of the dune and assumes that between 70% and 100% of the dune is silica sand suitable for processing. The estimate uses an *in-situ* bulk density of 1.5t/m<sup>3</sup> to calculate the tonnage. The area has the potential to be a significant tonnage of construction sand adjacent to the Eneabba-Geraldton rail line with direct access to the Geraldton Port. The target grade of +95% SiO<sub>2</sub> is considered conservative as all samples, except two, taken from the area exceed this value; processing is expected to increase this grade.

## Arrowsmith South

The Arrowsmith South Exploration Target focuses on the southern end of a topographical high that is noted as containing an intercalation of limestone and dune sands (see below), and avoids existing infrastructure and potential conservation areas. The potential volume is estimated from the 45mRL to the top of the dune and assumes that between 50% and 100% of the dune is silica sand for processing. The estimate uses an *in-situ* bulk density of 1.5t/m<sup>3</sup> to calculate the tonnage. The target grade of +95% SiO<sub>2</sub> is considered conservative as assays from all samples taken from the area exceed this value; processing is expected to increase this grade.



## Arrowsmith South Exploration Target

The initial metallurgical testwork indicates that the *in-situ* sand can be beneficiated to produce a high SiO<sub>2</sub> silica sand product, suitable for commercial sale.

## Future Work

Mineralogical analysis is currently underway to determine the deleterious minerals that remain in the +0.212mm and -1mm size fraction. Dependent on this determination, testwork will determine the best methodology to remove these minerals from the silica sand grains.

A deeper hand-auger program will be undertaken in the next few months to better determine the variability of the sand quality through the dune system.

An aircore drilling program is proposed to determine the extent of the dune system and the variability of the grade, to be undertaken early 2018 when granting of the tenements is anticipated.

Bulk samples will be collected to undertake further metallurgical testwork and determine the most suitable processing circuit.

## Corporate

### Demerger of Delgare Pty Ltd

During the quarter Ventnor held its Annual General Meeting on 30 November 2017 at which shareholders approved the demerger of Delgare Pty Ltd with an In-Specie distribution of Delgare shares to Ventnor shareholders as at the nominated Record Date.

Delgare Pty Ltd was a wholly owned subsidiary of Ventnor which held the Thaduna/Green Dragon Copper Project (TGD) in the Murchison district of Western Australia. The Project is located 40km east of DeGrussa and represents the largest copper resource in the Doolgunna-Bryah Basin Region outside of Sandfire's DeGrussa Doolgunna Project.

Following the successful exploration of TGD by Ventnor and the identification of a 142,000 tonne in situ copper resources there were a series of dealings with Sandfire Resources NL on the project. These were fully covered in the Notice of Meeting document and will not be repeated as the outcome is that the sole asset of Delgare is a royalty on copper production from the Project (**Royalty**) which can be summarised as:

"The consideration for the purchase comprised the issue of Sandfire shares to Delgare or its nominee to a value of \$1,700,000, a deferred cash payment of \$950,000 if Sandfire proceeds with a decision to mine from the Project (**DTM Payment**) and a royalty on copper production from the Project (**Royalty**). The initial share consideration has been paid and the DTM Payment and Royalty remains. A short summary of the terms and conditions of the Royalty follows.

### *Initial and Ongoing Royalty*

For each calendar quarter or part thereof in which copper (**Product**) is extracted from the Project and sold, removed or otherwise disposed of, Delgare (or its nominee) shall receive a 2% net smelter royalty (**NSR**) payable up to the first 90,000 tonnes of Product and an ongoing NSR of 1% on all further Product. Of the NSR, 0.2% and 0.1% respectively is payable to LinQ Corporate Pty Ltd until the aggregate payments to LinQ equal \$1.6 million (after which time Delgare will receive the entirety of the NSR).

The obligation to pay the Royalty continues, with respect to the Project, for the full term of the underlying tenements, including any successor tenements and throughout the period that the Product can lawfully be extracted and recovered, unless the agreement is previously determined in accordance with its terms."

The Demerger and the In-Specie distribution of Delgare shares was completed by 12 December 2017 with new Delgare holding statements dispatched on that date.

### Non-Renounceable Rights Issue of Shares

On 28 November 2017 Ventnor announced a 1 for 8 non-renounceable rights issue of approximately 27,924,449 fully paid ordinary shares to eligible shareholders to raise approximately \$977,356 (before costs) at 3.5 cents per share (**Rights Issue**).

The offer, which was not underwritten, represented a discount of approximately 21% from the 10-trading day VWAP of the Company's shares on the ASX and included a top-up facility under which eligible shareholders could apply for additional shares.

The Record Date for the offer was 1 December 2017 and the Closing Date was 15 December 2017. All Entitlement Shares were issued on 22 December with the issue of Shortfall Shares completed by 5 January 2018, subsequent to the quarter.

### Events Subsequent to the Quarter

The issue of all Shortfall Shares under the Non-Renounceable Rights Issue was completed by 5 January 2018.

### Competent Person's Statement

*The information in this release that relates to Exploration Results is based on, and fairly represents, information compiled by Mr David Reid who is a Member of the Australian Institute of Geoscientists (MAIG). Mr Reid is a contractor to Ventnor Resources Limited. Mr Reid has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity 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." Mr Reid consents to the inclusion in this report of the matters based on information provided by him and in the form and context in which it appears.*



## 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 (%)
ELA70/4986	Application	100	-	-	100
ELA70/4987	Application	100	-	-	100
ELA70/4993	Application	100	100	-	-
ELA70/5027	Application	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
P52/1243	Granted	100	100	-	-
P52/1244	Granted	100	100	-	-
P52/1281	Granted	100	100	-	-
P52/1282	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
ELA38/3294	Application	-	-	100	100