



## **Fungoni Definitive Feasibility Study delivers outstanding financial returns**

*Fungoni high grades and low costs underpinning a fast payback and an IRR of 56%*

### **HIGHLIGHTS**

- Positive DFS on Strandline's 100%-owned Fungoni heavy mineral sands project in Tanzania completed
- Low development capital cost of US\$30 million, including mine infrastructure, port facilities, working capital, land access, pre-production mining, owners costs and project contingencies of 10%
- Maiden ore reserve of 12.3 Mt @ 3.9% Total Heavy Mineral (THM)<sup>1</sup>
- 2.7 year payback period from start of construction
- Outstanding Internal Rate of Return (IRR) of 56% and revenue-to-operating cost ratio of 2.7 (first quartile)
- Project Pre-Tax NPV of US\$42.9 million (A\$57.2 million at USD:AUD 0.75, 10% discount rate)
- Life of Mine (LOM) Revenue of US\$168 million (A\$224 million) and LOM EBITDA of US\$98 million
- Environmental Certificate granted and Mining Licence Application submitted
- Nominal 12 month design, construction and commissioning period
- Opportunities to grow reserves and mine life, further increasing financial returns
- Fungoni will use modular relocatable infrastructure with state-of-the-art processing technology which can be re-used at Strandline's other mineral sands assets in Tanzania
- Fungoni paves the way for multiple project development options across Strandline's strategic portfolio of mineral sands assets

### **Next Steps**

- Advance project execution planning activities and negotiate major contracts
- Secure Fungoni Mining Licence and land access approvals
- Finalise project funding arrangements and advance stakeholder engagement

Strandline Managing Director Luke Graham said: "This DFS confirms that Fungoni is an outstanding Project which will generate strong financial returns for Strandline shareholders and deliver significant socio economic benefits for the people of Tanzania.

"The Project has an exceptional high unit-value heavy mineral assemblage, is simple to mine, recovers +93% of the valuable mineral in the ground and produces a highly marketable product suite."

"The path to profitable production is short, based on proven low-cost execution strategies, the payback period and rates of return are very attractive, and there is potential to grow mine life and re-use the infrastructure on future Strandline projects."

"The Fungoni Project is the first in the Company's pipeline of quality mineral sands assets in Tanzania, paving the way for its multiple future development options - refer recent ASX announcements relating to Tanga, Bagamoyo and Rio Tinto JV Projects."

<sup>1</sup> This announcement supersedes the ASX announcement dated 5 October 2017 incorporating changes to Ore Reserve classification.

## Summary of Key DFS Findings

Strandline Resources (**Strandline** or the **Company**) is pleased to announce the findings of the Definitive Feasibility Study (**DFS**) on its Fungoni Heavy Mineral Sands (**HMS**) Project. The study confirms the Project will deliver strong financial returns, has a high unit value product suite, is capital-efficient, and demonstrates the strategic potential of the Company's portfolio of mineral sands assets in Tanzania.

The DFS was completed by a range of independent and highly reputable consultant/contractor firms with experience in mineral sands and Africa project development, including:

- GR Engineering Services (**GRES**) - Process and non-process infrastructure design, DFS compilation, and development of overall capital and operating cost estimates
- IHC Robbins (**IHC**) - Geology and Mineral Resource Estimation
- AMC Consultants (**AMC**) - Mine study and Ore Reserve development
- Knight Piésold (**KP**) - Hydrology, hydrogeology, tailings storage facility design and geotechnics
- TZ Minerals International (**TZMI**) – Product marketing study and commodity price forecast
- Allied Mineral Laboratories (**AML**) - Bulk metallurgical testwork and analysis
- Environmental Resource Consultants (**ERC**) – Land access compensation and resettlement planning
- Kiv Five Consultants (**Kiv Five**) - Environmental Impact Assessment and environmental management plan

The DFS represents a significant milestone in Strandline's strategy to become a low-cost, high-margin mineral sands producer of relevance to key customers around the world. The DFS defines a realistic and proven project delivery plan and rapid pathway to commercial production; confirming the ability to complete construction and commissioning in a nominal 12 month period.

The Project is based on mining ore at 2Mt/a, processing onsite using multiple stages of beneficiation and mineral separation equipment to produce saleable, low impurity, premium quality industrial mineral products. A Mineral Resource Estimate of 22Mt @ 2.8% total heavy mineral (**THM**), classified 41% Measured and 59% Indicated, provides the geological foundation for the Project, with an initial Ore Reserve inventory of 12.3Mt @ 3.9% THM.

The high-grade orebody is exposed at surface with the mineralisation showing strong geological continuity along strike and at depth. The mining study confirms conventional mining of the higher grade optimised domains from surface and averaging 12 metres thick, with a maximum thickness of 22 metres. There is real potential to extend the Fungoni Project LOM by further optimising the mine pits as product pricing improves thus expanding mineral resource that can be mined profitably.

The Company has undertaken engineering trade-off evaluations during the DFS to optimise the processing route, product marketability, minimise execution risk whilst ensuring a practical and responsible project solution is achieved at the lowest cost base.

Advanced beneficiation and separation of minerals will take place in Tanzania with high local content maximising value generation and capital inflows to Tanzania. The DFS confirms a very favourable product suite and high mineral recoveries:

**Table 1 Fungoni Life of Mine Product Recoveries and Tonnages**

Product	Pit-t-Product Recovery (%)	LOM Saleable tonnes (kt)
Ilmenite	94.5	197.1
Rutile	70.7	15.6
Zircon *	94.8	82.5
Monazite *	97.3	7.1
<b>Total</b>		<b>302.3</b>

Note\* Zircon and monazite minerals are combined in a zircon-monazite rich product

The Project is favourably located ~25km from the Dar es Salaam port in a growing commercial/industrial district and will benefit from the close proximity to existing infrastructure, including an established road network and services industry.

## Key Financial Results and Assumptions

Project economics are based on known current ore reserves for an initial 6.2 year LOM. The key financial results and underlying assumptions used are outlined in the following tables:

**Table 2 – DFS Financial Results**

Description	Result
NPV (10% DR, Real, Pre Tax, no debt)	\$42.9M
IRR	56.2%
Payback Period of Initial Capital	2.72 years
LOM Revenue	\$168.1M
LOM EBITDA	\$97.8M
LOM OPEX C1 Costs inc transport	\$63.1M
LOM All-in Sustaining Costs (AISC)	\$71.2M
Revenue to C1 Cost Ratio	2.7
Annual Average Operating Margin	\$348/t
LOM Free Cash Flow (FCF)	\$71.5M

**Table 3 – DFS Key Assumptions**

Description	Result
Annual Production Rate (Steady State)	2.0Mt
LOM Production	12.3Mt
Mine Life (Initial)	6.2 Years
Exchange Rate (A\$/US\$)	0.75
Discount Rate	10%
Capital Expenditure (Pre-production)	US\$30.0M
Product Price Zircon (FOB) Average LOM	US\$1,134/t
Product Price Rutile (FOB) Average LOM	US\$1072/t
Product Price Ilmenite (FOB) Average LOM	US\$232/t
Product Price Monazite (FOB) Average LOM	US\$1722/t

The NPV has been calculated using project related costs only and does not consider Strandline's corporate costs. The assets relating to the Fungoni Project are held in Strandline's 100%-owned subsidiary Jacana Resources (Tanzania) Limited (**Jacana**).

The Project is relatively sensitive to movements in commodity prices, particularly zircon, as 55% of revenue is expected to be generated from contained zircon sales. Other areas of sensitivity are operating cost, capital cost, ore grade and HM recovery to product.

Importantly, mineral sands supply/demand fundamentals have tightened during 2017 and commodity prices have started to trend upwards from a low base during 2013 to 2016.

### Operations Overview:

Generally, the Fungoni operations will comprise of:

- A conventional open pit dry mining operation where free-dig unconsolidated sand is mined using an excavator and hauled by truck up to 750 metres to a Mobile Feed Unit (**MFU**). The MFU prepares the ore ready for processing and the ore is pumped in a slurry form to the processing plant facilities. The MFU is moved twice during the LOM as the mine plan advances from the south to north through the deposit.
- Multiple stages of advanced process beneficiation and mineral separation are performed on site using modern technology to produce three saleable high-quality industrial mineral products including a combined zircon and monazite product, rutile product (+95% TiO<sub>2</sub>) and ilmenite product (+58% TiO<sub>2</sub>).
- The process and non-process infrastructure related to the Project is based on a modular relocatable design concept which facilitates simple construction and de-commissioning ready for relocation and use in the next project, and also serves to de-risk in-country implementation and construction;
- The process facilities include a Wet Concentrator Plant (**WCP**) and Mineral Separation Plant (**MSP**). The non-process infrastructure comprises product storage facilities, water treatment plant, ablution facilities, power plant, tailings storage facilities, water services, security facilities, site roads, laboratory, weighbridge, workshop, buildings and offices.
- Water for operations will be supplied by a combination of sources including in-pit water, tailings and slimes dams supernatant storage and raw water top from a local bore field (at a peak of 76L/s in the dry season). Power will be supplied on site via a diesel-fired power plant at an average consumed load of 1.3MW.
- The sand tailings and slimes will be stored temporarily in dams and progressively returned to the mining void for rehabilitation. The rehabilitation process is efficient and proven and once complete, the land will be returned to the original landholder in its pre-mining state ready for future development or farming.
- Products will be transported by truck in container and bulk form to the Dar es Salaam port approximately 25km away via the existing road network on a "just-in-time" basis ready for ship loading and distribution to the global market.



Figure 1: Preliminary 3D image of Fungoni Project (Feasibility level design)

### Capital and Operating Expenditure:

Capital and operating cost estimates used in the DFS are supported by first principle estimates and quotations from suppliers and contractors, providing a high degree of confidence in the financial projections, with an overall accuracy level of  $\pm 10\text{-}15\%$  as appropriate for a DFS of this nature.

The low pre-production capital requirement of US\$30 million reflects the modest scale of the Project and simple mine site infrastructure design required to efficiently extract the valuable mineral products. The construction phase is based on an EPC contract approach (typically based on fixed price, fixed schedule with performance guarantees) for the design, procurement, construction, commissioning and performance testing of the process plant. Strandline's project team will oversee the EPC contract and directly manage the auxiliary packages relating to the less complex work scopes such as bulk earthworks, roads, buildings, offices, fuel facility, power plant, storage shed, etc.

The operating philosophy is based on industry proven operations and maintenance strategies. The Project benefits from a simple and very cost-effective mining method (dry mining) suitable for local earthworks contractors; an efficient processing solution using gravity and electrostatic separation (limited consumables and no toxic material management concerns); a low-cost operating environment and a short mine-to-ship logistics route.

The base date for the DFS capital and operating cost estimates is September quarter 2017. The implementation plan assumes a 12 month design and construction phase commencing as soon funding and final approvals are in place, and assumes a 3 month ramp-up period to achieve steady state nameplate production performance.

Table 4 DFS Project Development Capital

Capital Cost Item	Amount (US\$)
Site establishment, bulk earthworks & roads	\$0.71M
Process Infrastructure	\$14.84M
Non-Process Infrastructure – Mine	\$4.57M
Non-Process Infrastructure - Port	\$0.47M
Pre-production Mine Development	\$0.42M
Owners Costs inc land access, insurance, project team/expenses	\$4.03M
Working Capital, Spares & First Fills	\$2.19M
Contingency (10%)	\$2.72M
<b>Project Development Capital Total</b>	<b>\$29.95M</b>

Table 5 DFS Operating Expenditure

Operating Cost Item	LOM (US\$/Saleable t)
Mining inc Tailings and MFU	\$80.10/t
Processing inc WCP, MSP, Laboratory, Power, etc	\$65.53/t
Administration	\$28.03/t
Transportation (to ship)	\$34.99/t
<b>C1 Cost</b>	<b>\$208.65/t</b>
Royalty	\$23.92/t
Sustaining Capital	\$3.14/t
<b>All in Sustaining Cost</b>	<b>\$235.71/t</b>
<b>Product Basket Price (saleable)</b>	<b>\$556.28/t</b>
<b>Operating C1 Cost Margin</b>	<b>\$347.63/t</b>
<b>All-in Sustaining Cost Margin</b>	<b>\$320.58/t</b>

Other capital items include sustaining capital of US\$0.92M and deferred capital relating to MFU moves and mine closure rehabilitation of US\$0.44M. A residual value of US\$5M for the relocatable infrastructure (mainly the MFU, WCP and MSP modules) has been allowed for at the end of the mine life in the financial model.

## Product and Market Overview:

Extensive metallurgical testwork has been carried out since 2014 on representative samples taken from the Fungoni orebody, with the latest DFS programme being conducted at TZMI's Allied Mineral Laboratories and Nagrom Laboratories in Western Australia.

Testwork undertaken on a representative LOM bulk sample contributed in the selection of the preferred process equipment, flowsheet and performance parameters. Variability and characterisation testwork was also performed with a low grade and high grade bulk sample to stress test the flowsheet under extreme grade cases. The testwork produced products for marketing and determining product specification. Trade-off studies were performed during the DFS to determine an optimum process circuit and product suite.

A product market study, conducted by independent titanium and zircon minerals experts TZMI using metallurgical results and market intelligence, identified that the Project produces a very marketable suite of products with low impurity levels and favourable grain size. This includes a chloride grade ilmenite product, a rutile product and a combined zircon-monazite product, where the zircon mineral was determined to be premium grade quality. Product samples have also been market tested by major end-consumers around the world and offtake/sales agreements are under advanced evaluation.

Pricing assumptions for ilmenite, rutile and zircon were obtained from TZMI's independent assessment of the Fungoni suite of products and applied forecast pricing for the LOM. The zircon price was then adjusted to take into account downstream handling costs. Monazite spot pricing has been assumed from Strandline's own market intelligence plus a 20% discount allowance for downstream handling costs and contingency. Product pricing as it applies to the Fungoni products is effective September 2017. There is assumed to be a modest (1 month) delay between product shipping and receipt of revenue from sales, which is achievable through a letter of credit or similar arrangement.

The graphs below show the estimated product quantities and revenue split per saleable mineral produced by the Project. The average LOM price for contained mineral is US\$1,134/t for zircon, US\$1,722/t for monazite, US\$1,072/t for rutile, US\$232/t for ilmenite and US\$317/t leucoxene. The leucoxene mineral, nominally 70–80% TiO<sub>2</sub> grade, reports to the ilmenite and rutile products at a 90:10 split respectively. The revenue for the Project is US\$168.1 million with a product basket price of US\$556.3/t of contained saleable mineral, with potential strong revenue upside in an improving market environment.

The financial analysis demonstrates an exceptional RC ratio (Revenue to C1 Opex) of 2.7, placing Fungoni in the first quartile of mineral sands Projects globally.

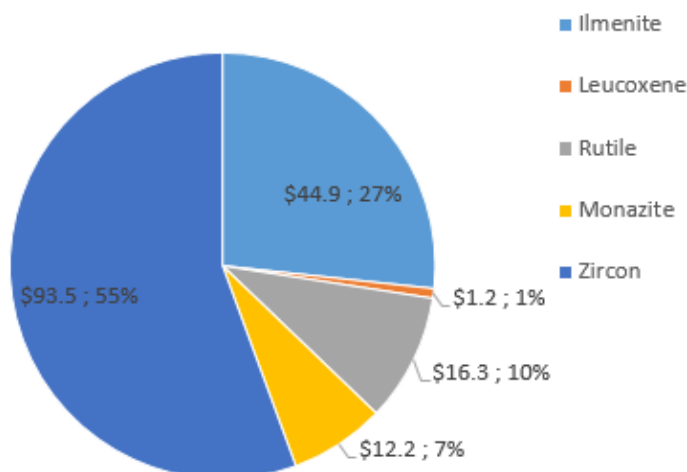


Figure 2: Revenue Split (US\$M, %) Per Saleable Mineral

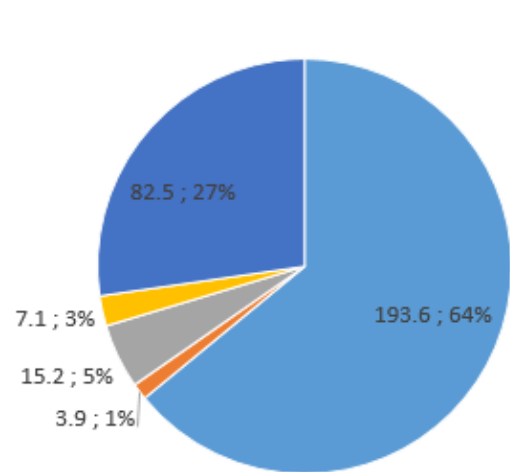


Figure 3: Quantity Split (kt, %) Per Saleable Mineral

The global heavy mineral sands market is a mature industry and product demand is leveraged heavily to urbanisation and global growth (global GDP and consumer spending). New capital projects containing high specification products, such as Fungoni's product mix, are required to meet future demand.

The largest potential end use for the Fungoni products are in direct production of white pigment and welding electrodes (ilmenite and rutile respectively) and ceramics or refractories for zircon. Potential end uses for the

monazite mineral are magnet manufacturing applications, production of high definition televisions screens, and catalytic converters.

### **Mineral Sands Commodity Market Continues to Improve:**

Mineral sands supply and demand fundamentals have tightened in recent times and prices have started to increase from the low base experienced during 2013 to 2016. This recovery has been led by the titanium minerals and now zircon, as evidenced by Iluka Resources' (ASX: ILU) recent announcement (see Iluka's ASX release dated 12 September 2017) referring to a zircon reference price increase of US\$130/t to US\$1230/t, effective from 01 October 2017 for a six-month period.

The Fungoni Project is positioned well to benefit from an improving mineral sands commodity outlook and in particular, the emerging zircon structural supply gap forecasted for the market from 2018.

### **Environment and Social Impact:**

The Company has undertaken extensive environmental and social impact assessments in accordance with Tanzanian regulatory requirements and in consideration of the Equator Principles. This includes significant community consultation, land access compensation and resettlement planning for project affected people.

Tanzania's environmental regulator, the National Environmental Management Council (NEMC) sets the guidelines and requirements of the Environmental Impact Assessment (EIA). The EIA for the Fungoni Project was approved by the Ministry of State, Vice President's Office – Union and Environment and the EIA Certificate was received in July 2017.

The DFS demonstrates low impact shallow mining, progressive back-fill and rehabilitation to the pre-mining state, and the philosophy to return the rehabilitated land back to the original landholder as soon as practical after mining. This method of land access and rehabilitation is well proven in the mineral sands sector whereby the Company effectively rents/leases the land for the period of disturbance.

### **Fungoni Provides Important Benefits to the People of Tanzania:**

The Company's strategy is to develop and operate a series of low cost, high margin expandable mining assets in a responsible and sustainable manner. Development of the Fungoni Project will forge a new industry for Tanzania, being the first major commercial mineral sands mine in that country, and lead the way for future developments there by Strandline.

The Project is planned to provide important benefits to the people of Tanzania:

- Fungoni will generate a host of key social benefits including significant job creation, training and job diversity, transferable skills development as well as community engagement programmes;
- Fungoni will provide capital flows into Tanzania and will provide an additional element in the country's growing level of foreign investment;
- Advanced beneficiation of minerals will take place in Tanzania utilising high local content maximising value generation and creating real socio economic benefit;
- Fungoni is based on 'low impact' mining philosophy with progressive backfill and rehabilitation of the mined area; returning the land to pre-mining state ready for future development or farming; and
- Fungoni will pave the way for future mineral sands developments within Tanzania, including the Company's larger scale Tanga Project (at Tajiri) in northern Tanzania.

The DFS demonstrates that Fungoni will create in the order of 100 locally-sourced direct skilled jobs through the operational phases. The Company expects a significantly larger number of indirect employment opportunities (typically in the order of 3 to 5 times) will also be supported by the Project.

The involvement of local businesses and contractors in the Project will be supported through a procurement and logistics policy consistent with the Government's objectives. The Company's community engagement and sustainability initiatives will foster collaboration and partnerships. Furthermore, the Project will provide capital flows into Tanzania and would provide an additional element in the country's growing level of foreign investment.

## Forward Plan:

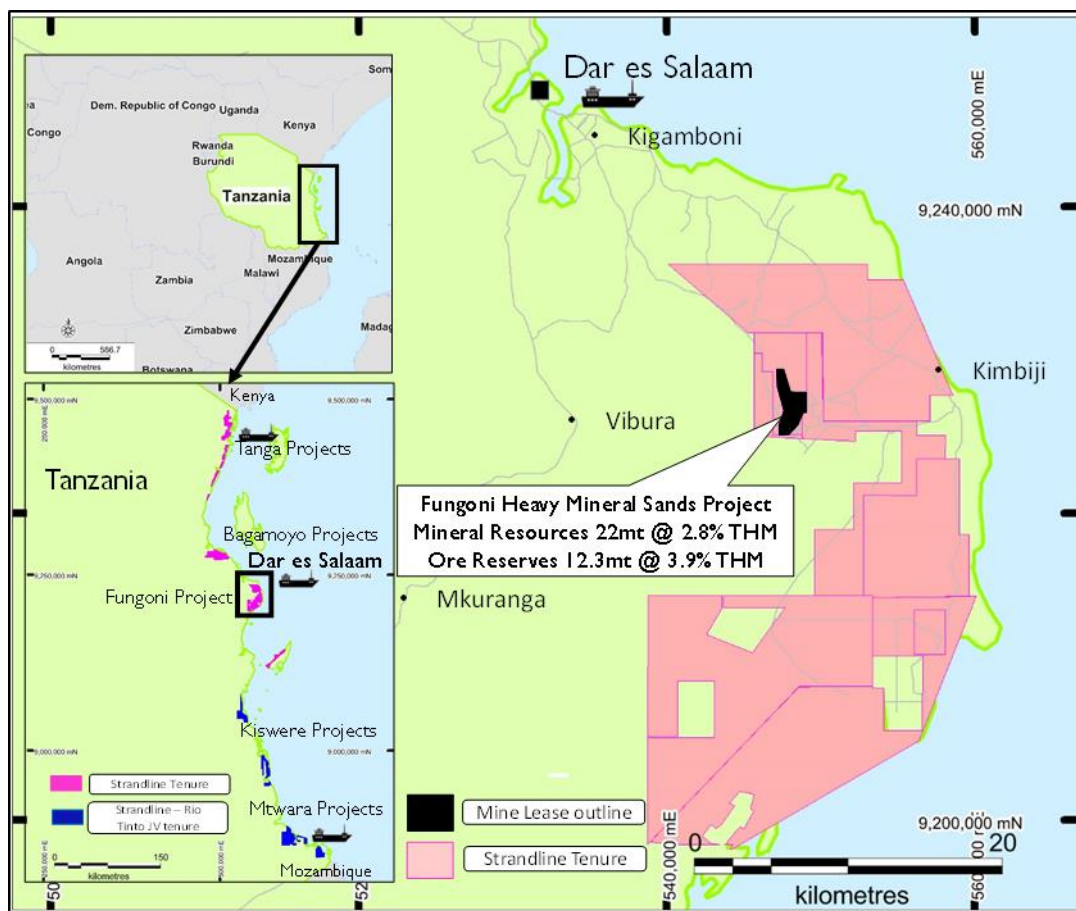
With project feasibility activities now complete, Strandline seeks to broaden its customer base and general awareness of the Project prior to mine establishment and progress negotiation of major construction contracts.

The Fungoni Project plays a key role in Strandline's strong investment proposition:

- Strong financial metrics, with low development capital and first quartile Revenue to C1-Opex metrics;
- Exceptional high unit value assemblage and high mineral recoveries producing an attractive product suite;
- Technical and commercial robustness as demonstrated by highly reputable and independent consultant partners; based on proven delivery strategies and applying industry experience in mineral sands;
- Near term production scenario targeting a rising mineral sands market and emerging supply gap whereby new capital projects are required to meet demand;
- The Fungoni Project is the first development in the Company's pipeline of quality mineral sands assets in Tanzania and Australia, paving the way for multiple development options and growth horizons over time;
- The Fungoni Project offers strategic relevance and is located in the leading and growing mineral sands jurisdiction of south-east Africa; and
- Favourable long term mineral sands commodity market driven by urbanisation, global growth and an extensive array of 'everyday' applications, including ceramics, paint, technology, refractories and chemicals.

Key milestones to achieve a decision to mine are to secure the Mining Licence approval from the Ministry of Energy and Minerals Tanzania and finalise land access agreements. Strandline has commenced its project financing activities to ensure sufficient funding through to receipt of first revenue.

Refer to Annexure 1 for more detail relating to the Fungoni Project DFS.



**Figure 4: The Fungoni Project is favourably located close to Dar es Salaam Port Infrastructure and supporting industries**

## ANNEXURE 1 - FUNGONI DFS DETAIL

### Project Description:

Jacana Minerals (Tanzania) Limited (**Jacana**), a Tanzanian 100% owned subsidiary of ASX listed Strandline Resources Limited (**Strandline** or the **Company**), is an exploration and mining company focused on the development of heavy mineral sands projects in Tanzania. Strandline also owns other mining assets in other countries.

The Company has invested in extensive exploration, engineering and community engagement activity in recent years with the aim to develop a succession of mineral sands projects in Tanzania with varying timelines, production scales and product outputs. The most advanced of these is the Fungoni Project (the **Project**), very favourably located close to infrastructure and industry support services, some 25km southeast of Dar es Salaam.

The Company appointed a selection of independent consultants and contractors to complete a robust DFS for the Fungoni Project. The technical and commercial results from the DFS demonstrate a fundamentally strong project for the Company to develop. The DFS follows a scoping level study completed in March 2016 by TZ International Minerals (**TZMI**). The scope of the DFS includes the following main areas:

- Metallurgical testwork, characterisation and process flowsheet development;
- Mining plan, design and Ore Reserve estimation;
- Geological evaluation and Mineral Resource estimation;
- Hydrology, hydrogeology, and geotechnical analysis;
- Process and non-process infrastructure engineering design relating to mine and port;
- Bulk earthworks, drainage and tailing storage facility design;
- Product evaluation and marketing study;
- Logistics relating to project implementation and operations;
- Environmental baseline study, environmental impact assessment and land access resettlement planning;
- Execution planning including implementation schedule;
- Operations and maintenance philosophy;
- Risk and opportunity assessment;
- Capital and operating cost estimates  $\pm 10-15\%$ ;
- Financial modelling and analysis; and
- DFS report compilation

The project is based on mining ore at nominally 2 Mt/a, processing on site through multiple stages of advanced beneficiation and separation equipment to produce three (3) main industrial mineral products; rutile, ilmenite and a combined zircon-monazite product.

A 22Mt @ 2.8% heavy mineral JORC classified Mineral Resource estimate provides the geological foundation for the project with initial Ore Reserves of 12.3Mt @ 3.9% heavy mineral grade. The average heavy mineral assemblage relating to the reserves is ilmenite (42.3%), leucoxene (1.2%), rutile (4.4%), zircon (18.2%) and monazite (1.5%). The initial life of mine is estimated at 6.2 years. The Company has undertaken engineering trade-off studies to optimise the product suite, marketability, and value generation whilst ensuring a practical mining solution is achieved.

The saleable products, totalling approximately 302,000 tonnes produced over the life of mine, will be exported in containers and as bulk cargo through the port of Dar es Salaam to the global mineral sands market. The mineral sands market is a mature industry and product supply-demand is leveraged heavily to urbanisation and global growth (global GDP and consumer spending). New capital projects are required to meet future demand.

The Fungoni Project products have been evaluated by a range of end-customers and independent specialist laboratories, confirming favourable high specification saleable characteristics, containing low impurities and contaminants across all products. The largest potential end use for the Fungoni industrial minerals are in the direct production of white pigment and welding electrodes (ilmenite and rutile respectively) and ceramics or refractories (zircon).



The Project site comprises of a mine, ore preparation, process beneficiation plant, mineral separation plant, product storage area, laboratory, dams and associated infrastructure facilities such as power station, water treatment plant, buildings, workshop, training facility etc. Where appropriate the facilities will be a modular relocatable design to facilitate easy construction and decommissioning at the end of the mine life. The Fungoni facilities are expected to be re-used at the Company's other mineral sands assets in the future.

The mining plan is open pit and the operation is benign in nature (with no toxic concerns), using conventional dry mining techniques and an average pit depth of 12 metres. The non-valuable sand and clay (approximately 97% of the ore body) is progressively returned to the pit void throughout the mine life following mineral extraction. This enables progressive rehabilitation of the land as the mine plan moves forward. The rehabilitation process is efficient and once complete, the land will be in a condition equivalent to its pre-mining state suitable for future development or farming.

The Company has undertaken extensive environmental and social impact assessments (EIA) during the DFS period, including land access compensation and resettlement planning, and has received its Environmental Certificate from the Ministry of State, Vice President's Office – Union and Environment in July 2017.

The Fungoni Project is planned to provide important benefits to the people of the Kigamboni District and Tanzania generally. The key social benefits will be job creation, training and job diversity, transferrable skill development, with estimates in the order of 100 direct employees and a significantly greater number of indirect employment opportunities being supported by the project. The involvement of local businesses and contractors in the project will be supported through a procurement and logistics policy consistent with the Government's objectives.

The Company's community engagement and sustainability initiatives will foster collaboration, partnership and share in the benefits the operation creates. Furthermore, the Project will provide capital flows into Tanzania and will be an additional element in the country's growing level of foreign investment.

#### **Project Development Timetable and Execution Plan:**

A detailed project execution plan, based on proven project delivery strategies, has been developed for the various phases of project development including engineering, procurement, construction, commissioning, performance testing and operations ramp-up.

Once project funding, project approvals (including achieving the mining license from the Ministry of Energy and Minerals) and land access agreements are secured, the procurement and construction phase will commence. The project owners team (**Owner**) will be assembled to oversee and manage the various contract packages associated with the Project execution phase including, but not limited to:

- Front end engineering design and long lead procurement packages such as spirals, screens, scrubber and power plant;
- Engineering, procurement and construction (**EPC**) contract for the more complex infrastructure packages (such as process plant) executed under a fixed price EPC Contractor arrangement;
- Supply and installation contract packages for the auxiliary infrastructure items (less complex scope) managed directly by the Owner, including miscellaneous fabrication and site works packages;
- Site establishment and bulk earthworks package managed directly by the Owner;
- Mine pre-strip and contract mining activities managed directly by the Owner;
- Transport and logistics managed by the EPC Contractor; and
- Environmental and social monitoring managed by the Owner.

Following a Decision to Mine the project schedule from commencement of the project through to completion (first production) is expected to be 52 weeks as shown in Table 6 below:

**Table 6 - Timeframe of Key Development Activities**

Project Activity	Estimated Timeframe
Project Approvals and Project Funding	Commenced
Preparation for Major Contracts inc EPC & Bulk Earthworks	Commenced
Final Investment Decision / Decision to Mine	Week 0
Front End Engineering Design and Long Lead Procurement	Week 1 - 6
Site Mobilisation, Establishment & Bulk Earthworks	Week 4 - 14
Infrastructure Construction	Week 10 - 46
Mine Pre-strip and Feed Stockpile Development	Week 30 - 42
Commissioning	Week 48 - 54
First Production	Week 52
Production Ramp-up Phase (3 month allowance to full production steady state)	Week 52 to 64

**Geology, Resources and Reserves:**

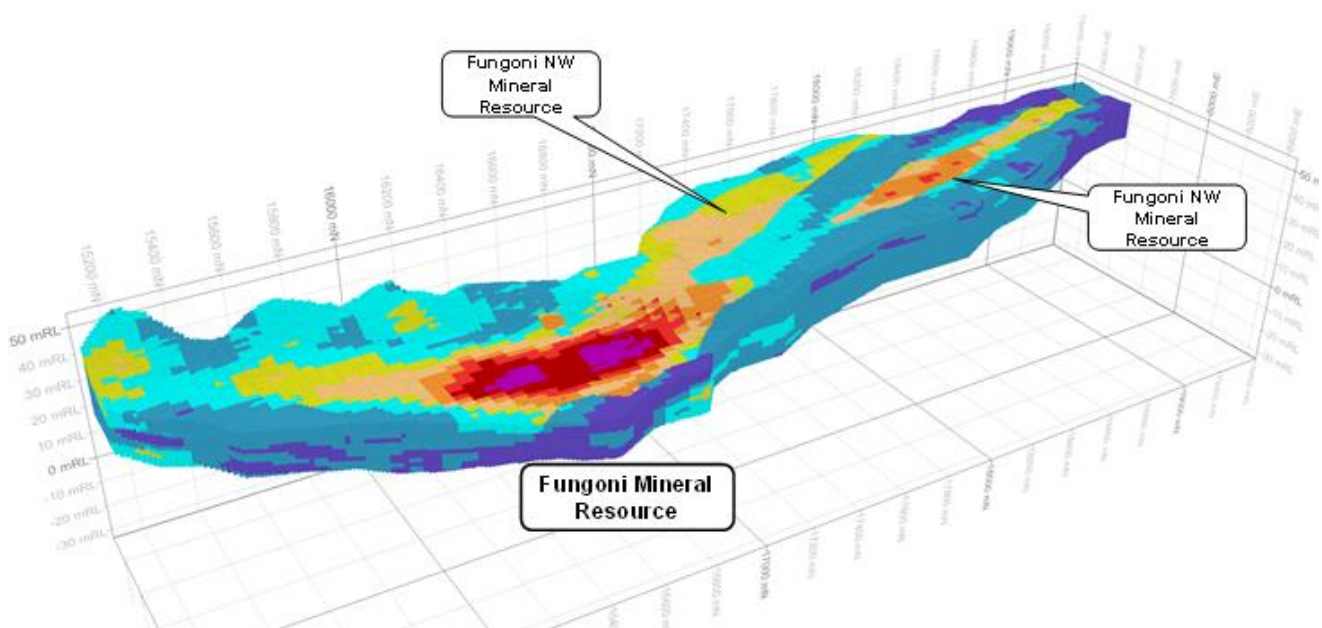
Jacana has been exploring the Fungoni Project area since 2012 with the completion of three aircore drill programmes to generate the current Mineral Resource estimate of 22Mt @ 2.8% Total Heavy Mineral. Table 7 below displays the Mineral Resources estimated for the Fungoni Project main orebody area.

Refer ASX announcement 02 May 2017 for full details of the Fungoni Mineral Resource Estimate.

**Table 7 - Mineral Resource Statement for Fungoni Project at May 2017**

MINERAL RESOURCE SUMMARY FOR FUNGONI PROJECT										
Summary of Mineral Resources <sup>(1)</sup>					VHM assemblage <sup>(2)</sup>					
Deposit	Mineral Resource Category	Tonnage	In situ THM	THM	Ilmenite	Rutile	Zircon	Leucoxene	Slimes	Oversize
		(Mt)	(Mt)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
FUNGONI	Measured	8.77	0.37	4.26	43.3	4.3	18.3	1.0	18.5	6.8
FUNGONI	Indicated	12.97	0.24	1.84	36.7	4.3	14.6	1.4	24.4	7.3
	Total <sup>(3)</sup>	21.74	0.61	2.82	40.7	4.3	16.9	1.2	22.0	7.0
<sup>(1)</sup> Mineral Resources reported at a cut-off grade of 1.0% THM										
<sup>(2)</sup> Valuable Mineral assemblage is reported as a percentage of in situ THM content										
<sup>(3)</sup> Appropriate rounding applied										
<sup>(4)</sup> Refer to Appendix 3 for detailed breakdown by zone of Trash and VHM										

The overall Fungoni Mineral Resource is exposed at surface (out cropping in most places) with the mineralised ore body showing strong geological continuity along strike and at depth. The higher grade upper domains of the resource are defined by more dominant minerals such as zircon, ilmenite and rutile, in addition to kyanite/sillimanite, and typically more sandy soils with lower slimes content.



**Figure 5: Image of Fungoni resource block model**

Mineral Resources were converted to Ore Reserves in accordance with the JORC Code 2012 Edition<sup>2</sup>, based on the pit designs, recognising the level of confidence in the Mineral Resource estimation, and reflecting modifying factors.

Refer ASX announcement 6 October 2017 for full details of the Fungoni Ore Reserve statement.

**Table 8 Ore Reserve Statement for Fungoni Project at October 2017**

ORE RESERVES SUMMARY FOR FUNGONI PROJECT						
Deposit	Reserve Category	Ore	Slimes		Heavy Mineral	
		(Mt)	(Mt)	(%)	(kt)	(%)
<b>FUNGONI</b>	Proved	6.9	1.2	18	341	4.9
<b>FUNGONI</b>	Probable	5.4	1.0	19	138	2.6
	<b>Total</b>	<b>12.3</b>	<b>2.3</b>	<b>19</b>	<b>480</b>	<b>3.9</b>

\*Note totals may deviate from the arithmetic sum due to rounding.

### Metallurgy and Processing:

Metallurgical testwork has been conducted on the Fungoni orebody since 2014 on representative samples. The latest round of definitive-level testwork forming part of the DFS was conducted at AML and Nagrom laboratories in Western Australia using bulk samples collected from drilling samples across the Fungoni deposit. The test work included the following key activities:

- Comparison and selection of the process flowsheet options evaluated for the MFU, WCP and MSP;
- Subjecting two variability samples (high grade and low grade) through the selected flowsheet to stress test the flowsheet performance and product outputs;
- Development of product marketing samples and specifications; and
- Dynamic thickening test work to size the thickener and flocculant consumption rate.

Flowsheet trade-off studies were performed during the testwork programme to determine the optimum process circuit and product suite for the DFS base case design.

The Fungoni Project comprises three (3) on site processing facilities, including stages of advanced beneficiation. These include:

- Mobile Feed Unit (**MFU**);
- Wet Concentration Plant (**WCP**); and
- Mineral Separation Plant (**MSP**).

The processing plants for the Fungoni Project are designed to process ore to recover three separate products, ilmenite, rutile and a combined zircon-monazite product, whilst rejecting waste products to either the mining void or slimes storage facility.

Ore will be blended from a ROM pad and fed into the MFU for scrubbing and coarse screening (25mm) in a trommel. The minus 25mm sand/clay mixture will then be transferred to the WCP for further screening and desliming. The WCP will then concentrate the valuable heavy minerals and reject most of the non-valuable, lighter gangue minerals utilising gravity separation equipment and screens. The Heavy Mineral Concentrate (**HMC**) will contain typically 94% HM.

The rich HMC will then be processed in the MSP. The MSP will separate the heavy mineral into the valuable products ilmenite, rutile, and zircon-monazite. This will be accomplished by a combination of electrostatic separation and magnetic fractionation.

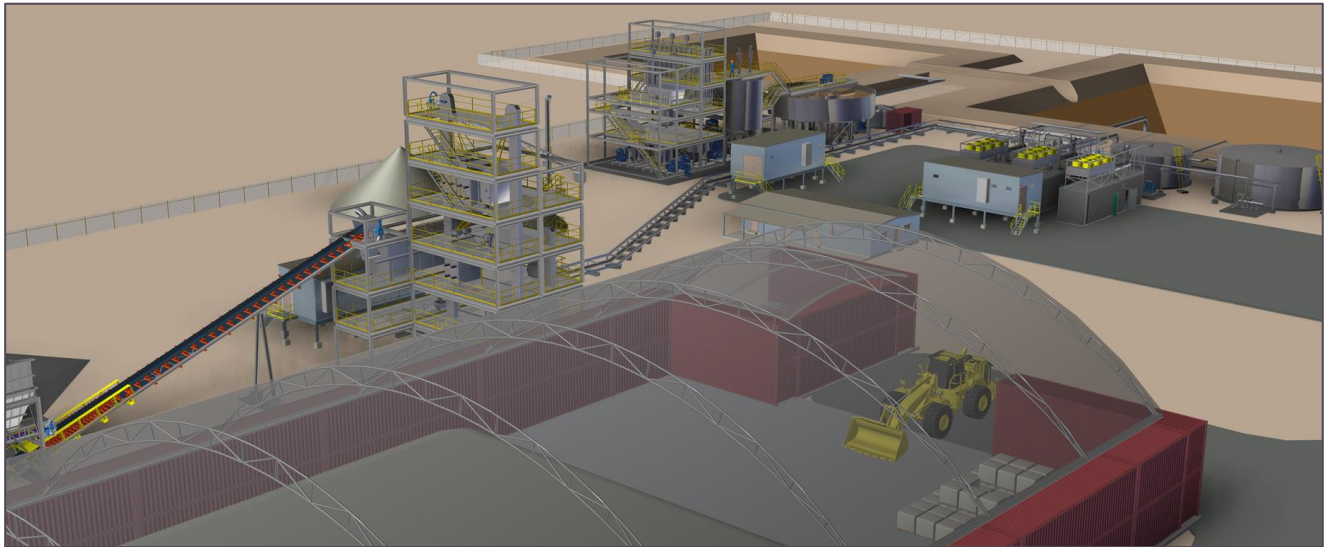
The process design has been proven through bulk testwork to achieve high mineral recoveries across all valuable mineral species, maximising the value extracted from the orebody. The following table provides a summary of the design performance expected:

<sup>2</sup> Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, The JORC Code 2012 Edition. Effective 20 December 2012 and mandatory from 1 December 2013. Prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australasian Institute of Geoscientists and Minerals Council of Australia (JORC).

**Table 9 - Fungoni Design Parameters**

Design Parameter	Units	Value
WCP feed rate - design	t/h	253
Spiral circuit feed rate - design	t/h	203
MSP feed rate – design	t/h	10
Titanium stream feed rate design	t/h	5
Zircon stream feed rate design	t/h	5
Zircon recovery (as a zircon-monzate containing product)	%	94.8
Ilmenite recovery (final product)	%	94.5
Rutile recovery (final product)	%	70.7

The products will be stockpiled in bulk (ilmenite and zircon) or bagged (rutile) on site in a dedicated storage shed until sufficient quantities are produced for shipment.


**Figure 6: Screen Snap of 3D Design Model of Fungoni Project Site Facilities**

### Mining:

The mining and related earthmoving activities will be delivered under a contract mining arrangement. The mining contractor will be responsible for delivering and feeding ore to the MFU as per the mine plan and also performing the necessary reclaiming of tailing an in-pit slimes dams, relocation of slimes from the surface dams, haul road maintenance, bench and drainage maintenance, in pit dewatering and re-contouring of the pit area.

The contract will be let under a schedule of rates basis incorporating nominal day works provisions. Strandline will be responsible for statutory duties, technical services, geology and mine planning costs, potable water, power and communication systems.

Initially, the mineralised topsoil and vegetation will be removed by clear and grub activities. A number of large shallow open pits which will be dry mined by an excavator and truck fleet. Run-of-Mine ore is hauled up to 750 metres to mobile feed units (MFU) located close to the pit exit. The MFU prepares the ore ready for processing and the ore is pumped in a slurry form to the processing plant facilities. The MFU is relocated twice during the LOM (in year 4 and 5) as the mine plan advances generally from the south to north through the deposit. The mine pit depth averages approximately 12 metres from surface, with a maximum depth of 22 metres.

Knight Piésold Pty Limited (**KP**) performed the geotechnical investigations and interpretations relating to the DFS. Ground condition typically comprises very loose and loose sand, with variable silt content to 5 metres depth. Pit slopes at a vertical to horizontal ratio of 1:3 (1V:3H), with a 2-m wide bench every 4 m of vertical height were used in pit optimization and pit design.

Grade control of the ore has been defined through the mine optimisation and planning process, to achieve the target feed head grade to the plant. Grade control actions include:

- Pre-mining grade control drilling;
- Geological team working ahead of the mining face with laboratory analysis onsite; and
- Front end loader material selection at feed point to the MFU.



## Infrastructure Requirements:

The non-process infrastructure requirements relating to the Fungoni Project have been designed to include the main items listed below. As per the process infrastructure, the non-process infrastructure design has been based on a modular relocatable design concept where practical (e.g. skid mounted or containerised equipment) which facilitates simple construction and decommissioning ready for relocation and use in the next project.

- Mine Access Road:
  - A 750 metre, 6 metre wide gravel access road (c/w a 250 mm sub-base and overlain by 100 mm wearing course) linking the facilities to the public road entrance.
- Bulk Earthworks and Drainage Management;
  - The process plant will be established on a single level pad, founded in cut material, with excess of cut material being used for development of the tailings dam starter embankment.
  - HDPE lined settling pond and process water pond will be constructed and plant site drainage will gravitate to diversion channels located across site.
- Power Supply:
  - Diesel-fired power plant (generators) strategically located near to the main load points and suitable for a maximum demand of 1.6 MW and average consumed power of 1.3 MW.
  - Cost of power is forecast to be 22 US cents/kWh.
  - Power at 415Vac distributed throughout the site to the various transportable air-conditioned substations and distribution points.
- Water Supply:
  - Process water for the main process will be from a combination of water sources, including in-pit tailings supernatant water storage, slimes dam supernatant water storage, storm water and pit dewatering inflows, and raw water top-up from the bore field;
  - A bore field located on site will be constructed, sourcing water from the large Kimbiji aquifer and capable of supplying the maximum required 76L/s.
- Tailing Storage Facility:
  - The Slimes TSF has been designed in accordance with the respective ANCOLD and ICOLD guidelines. Furthermore the design addresses the following:
    - Permanent and secure containment of all solid waste materials;
    - Maximisation of residue densities using sub-aerial deposition;
    - Removal and reuse of free water;
    - Control of seepage;
    - Containment and control of design storm events;
    - Ease of operation; and
    - Rapid and effective rehabilitation.
- Mine Facilities and Buildings:
  - Comprises the contractor's compound and hardstand area. The buildings, workshop, wash down facility and associated mining equipment will be supplied by the Mining Contractor;
- Product Storage Shed:
  - A large storage shed will be constructed to house the product prior to export. The shed will be divided in to sections to ensure non-contamination between product types.
  - Capacity of 18,000t is provided in the design. A laydown area will also be constructed adjacent to the storage shed.
- Water Treatment Plant (WTP) for potable water:
  - A 35m<sup>3</sup> per day containerised WTP will be installed at the processing plant and fed from the raw water tank.

- Potable water will be reticulated around the site to offices, ablutions and building facilities as required.
- Waste Water Treatment Plant (WWTP):
  - Domestic waste water will be generated from the administration areas and distributed to a dedicated WWTP and the effluent will be treated to meet the stringent discharge and reuse standards specified within the Environmental License for discharge to receiving waters.
- Fuel Storage and Dispensary:
  - Fuel storage using a single 100m<sup>3</sup> fuel tank will be located in a secured and bunded area adjacent to the power station.
  - Diesel fuel will be delivered to site by road using road tankers.
- Communications:
  - Communications between site, Dar es Salaam and overseas will be established using a standard VSAT system.
- Weighbridge:
  - A weighbridge is installed on site for product logistics and inventory management. It has a design capacity of 120T, calibrated to 90T and verified for trade use.
- Laboratory:
  - Sample assaying and assemblage assessment will be performed onsite in a certified laboratory containing international standard laboratory equipment and managed by qualified laboratory technicians.
- Office and Security Facilities:
  - Administration buildings include reception area, office rooms, training area, meeting rooms, amenities, data rooms and storage areas.
  - Security gate house will receive visitors to the mine site.
  - First aid clinic/medical centre will include a waiting room, paramedic station, observation/recovery rooms and wash room facilities and adjacent parking area for emergency vehicles.
- Mobile ship loader (for port):
  - A transportable self-powered ship loader comprising a receival hopper suitable for rear tip trucks, a conveying system and an extendable chute that positions over the ship's hatch for discharge.
  - The ship loader design is compact, safe, minimises spillage and is capable of loading in excess of 300 tonne per hour. The ship loader and associated equipment will be stored at a location near to the port and assembled on the berth 'just in time' ready for each campaign loading operation to commence.

#### **Product Handling and Logistics:**

Once sufficient product is available, shipments will be arranged for the various products; zircon and rutile products will be exported via containers (containing 24 tonnes per container) and shipments are expected every 4 to 6 weeks (nominally 2,000 to 3,000 tonnes per shipment). Ilmenite product in bulk form will be exported once a quarter (8,000-12,000 tonnes per shipment). Trucks, supplied by a local logistics contractor, will be used to transport the containers and bulk cargo to Dar es Salaam port ~25kms from site, on an efficient 'just in time' basis. The port of Dar es Salaam is managed by the Tanzanian Port Authority and has a total quay length of 2,000 metres, with seven (7) deep water berths.

The rutile bags will be stuffed, sealed and bonded in containers on site and transported via flatbed truck to the Dar es Salaam port. The zircon product will be loaded into lined containers, sealed, bonded and weighed via the site weighbridge prior to departing to the port (berth-side) ready for shipment.

The ilmenite product will be loaded in bulk onto rear-tipper trucks (nominally 30t capacity) via a front end loader. The ilmenite trucks will be weighed via the site weighbridge prior to departing to the port for direct bulk loading to ship via a Company supplied mobile ship loader.

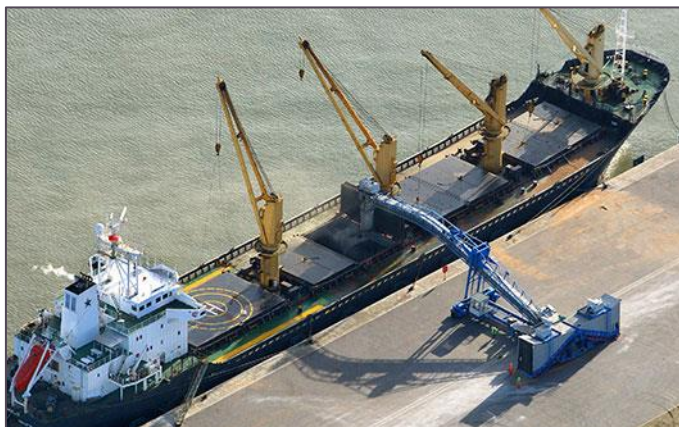


Figure 10: Example Mobile Ship loader Unit



Figure 11: Dar es Salaam Port Container Loading Area

**Product Market Overview:**

The global heavy mineral sands market is a mature industry and product supply/demand is leveraged heavily to urbanisation and global growth (global GDP and consumer spending). Mineral sands products have extensive array of applications and many used in everyday life, including ceramics, paint, technology, chemicals, refractories, and the construction industry.

The term ‘mineral sands’ refers to concentrations of minerals commonly found throughout the world in beach sand deposits and are classified as Industrial Minerals. More specifically the term refers to those minerals in potentially commercial concentrations at Fungoni, including ilmenite, rutile, leucoxene, zircon and monazite.

New capital projects containing premium-grade high specification products such as Fungoni, are required to meet forecast future demand. This forecast supply increase is influenced by closure of some existing mines and an overall decline in grades and maturing ore bodies.

A product market study, conducted by independent experts TZMI using metallurgical results and market intelligence, identified that the Fungoni Project can efficiently produce an attractive suite of products including a combined zircon-monazite product, ilmenite product, and a rutile product. All products are considered highly marketable with low impurities, low contaminants, favourable grain size, and the major product produced zircon, is considered of premium grade quality. Product samples have also been market tested by major end-consumers around the world and offtake/sales agreements are under advanced evaluation.

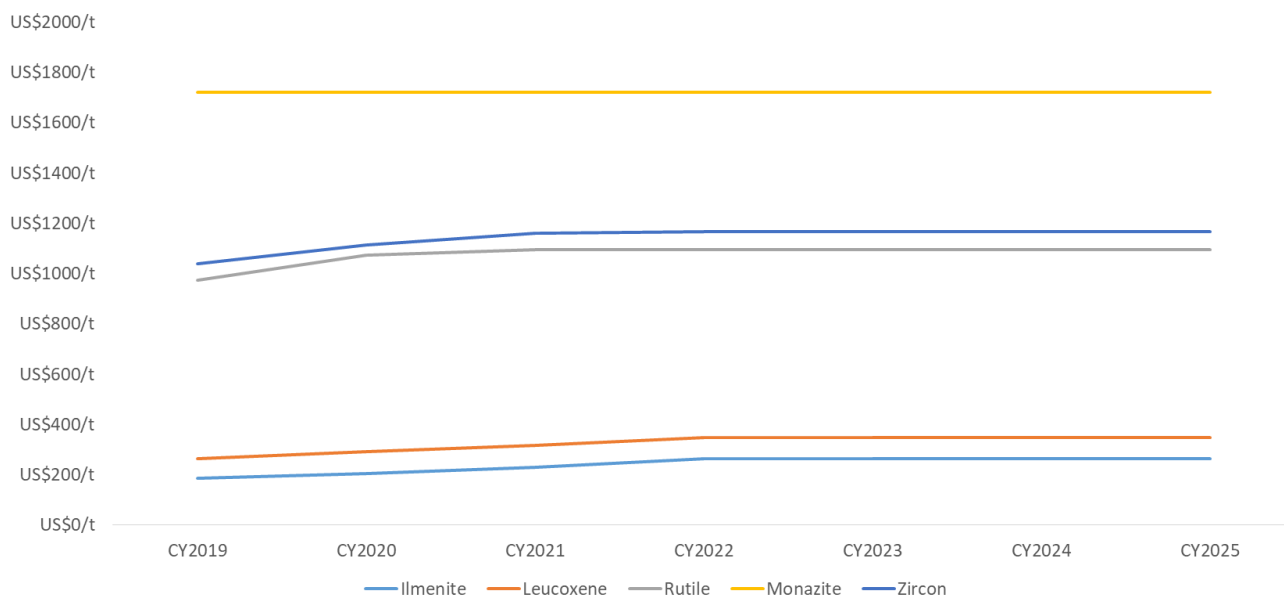


Figure 12 Fungoni DFS Product Pricing Assumptions (US\$) – Free on Board



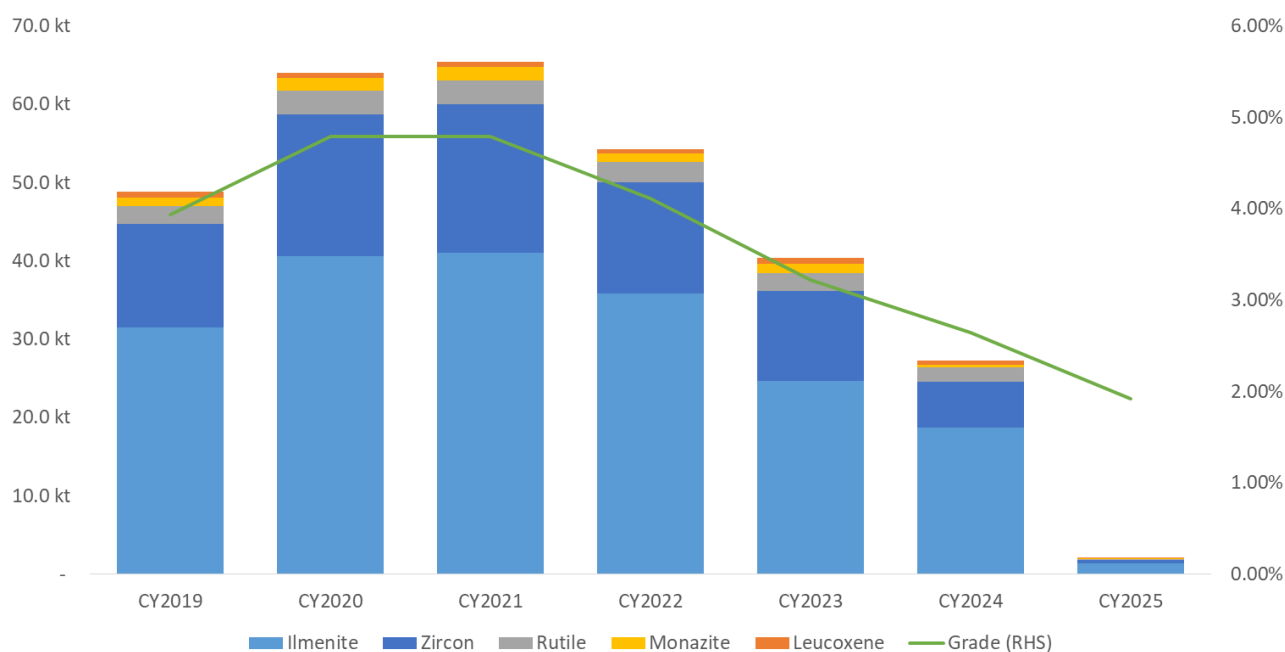
The mineral sands industry in general is orientated primarily towards the supply of ilmenite and rutile to produce titanium dioxide white pigments and titanium metal. The global pigment market accounts for approximately 90% of all feedstock demand, and is therefore the dominant driver of product offtake.

For zircon, ceramic applications are the dominant end-use application, accounting for approximately over 50% of global zircon demand. Monazite is a phosphate mineral containing rare earth oxides with growing everyday uses such as in magnet manufacturing applications, production of high definition television screens, and catalytic converters.

Through a market testing exercise the Company has selected a preferred product suite that enhances marketability and value generation whilst ensuring a practical mining and processing solution is achieved.

Approximately 302,000 tonnes of contained saleable mineral is produced over the life of mine with average annual production of saleable mineral 50,000 tonnes per annum - refer Figure 13 below.

Mineral sands commodity prices have started to trend upwards from a low base experienced during 2013 to 2016 period. This recovery has been led by the titanium minerals in the first instance and now zircon demand is increasing, with prices continuing to rise as evidenced by Iluka Resources' (ASX: ILU) announcing on 12 September 2017 a zircon reference price increase of US\$130/t to US\$1230/t, effective 01 October 2017 for a six-month period.



**Figure 13: Fungoni Saleable Mineral Annual Production Profile**

The Fungoni Project has a very high composition of zircon mineral by world standards and provides a major source of the Project's revenue (in the order of 55%). In ceramics, China is the biggest influencing factor importing around a third of world supply. Product sample evaluation by several major offtake customers based in China confirms that the Chinese market value's Fungoni's proposed zircon and monazite products highly.

**Capital and Operating Expenditure:**

Capital and operating cost estimates for the DFS are presented in US dollars (US\$) and have a estimate base date of September quarter 2017. The estimated costs have been sourced in a number of standard ways, including first principles, supplier quotes, vendor information, benchmarking and contractor commitments, providing a high degree of confidence in the financial projections, with an overall accuracy level of ±10-15% as appropriate for a DFS of this nature.

The low pre-production capital requirement of US\$29.95 million reflects the modest scale of the Project and simple mine site infrastructure design required to efficiently extract the valuable mineral products. The capital estimate covers the full design, construction and commissioning of the MFU, WCP, MSP, thickener and supporting project infrastructure including, but not limited to, site establishment, security, bulk earthworks, roads, dams, power plant, bore field, water treatment plant, storage facilities, ablutions, laboratory, workshop,

mobile ship loader, buildings and offices. Allowances have also been made for equipment spares, first fills, land access and resettlement, working capital, owner's project team, pre-strip and pre-production mining works and an overall project contingency of 10%.

The construction phase is based on an EPC Contract approach (typically engaged under fixed price, fixed schedule with performance guarantees) for the design, procurement, construction, commissioning and performance testing of the process plant. Strandline's project team (Owners team) will oversee the EPC contract and directly manage the auxiliary packages relating to the less complex work scopes such as bulk earthworks, roads, buildings, offices, fuel facility, laboratory etc.

The operating philosophy is based on industry proven operations and maintenance strategies. The Project benefits from a simple and cost-effective mining method (conventional dry mining) suitable for local earthworks contractors, an efficient processing solution using gravity and electrostatic separation (limited consumables and no toxic material management concerns), a low-cost operating environment (e.g. labour and materials cost), and a short mine-to-ship logistics route. The average annual LOM operating costs (C1) is US\$10.2 million and includes mining, processing, general administration and transportation (to ship).

**Table 10 – DFS Project Development Capital**

Capital Cost Item	Amount US\$
Site establishment, bulk earthworks & roads	\$0.71M
Process Infrastructure	\$14.84M
<i>MFU</i>	\$2.52M
<i>WCP</i>	\$5.57M
<i>MSP</i>	\$3.88M
<i>Auxiliary Process Infrastructure</i>	\$2.88M
Non-Process Infrastructure – Mine	\$4.57M
<i>Tailings Storage Facility</i>	\$0.65M
<i>Buildings and Offices</i>	\$1.85M
<i>Power Plant</i>	\$1.30M
<i>Product Storage Facility</i>	\$0.77M
Non-Process Infrastructure - Port	\$0.47M
Pre-production Mine Development	\$0.42M
Owners Costs inc land access, insurance, project team/expenses	\$4.03M
Working Capital, Spares & First Fills	\$2.19M
Contingency (10%)	\$2.72M
<b>Project Development Capital Total</b>	<b>\$29.95M</b>

**Table 11 - DFS Operating Expenditure**

Operating Cost Item	LOM (US\$/Saleable t)
Mining inc Tailings and MFU activity	\$80.10/t
Processing inc WCP, MSP, Laboratory, Power, etc	\$65.53/t
Administration and general	\$28.03/t
Transportation (to ship)	\$34.99/t
<b>C1 Cost</b>	<b>\$208.65/t</b>
Royalty	\$23.92/t
Sustaining Capital	\$3.14/t
<b>All in Sustaining Cost</b>	<b>\$235.71/t</b>
<b>Product Basket Price</b>	<b>\$556.28/t</b>
<b>Operating C1 Cost Margin</b>	<b>\$347.63/t</b>
<b>All-in Sustaining Cost Margin</b>	<b>\$320.58/t</b>

Other capital items include sustaining capital of US\$0.92M and deferred capital relating to MFU moves and mine closure rehabilitation of US\$0.44M. A residual value of US\$5M for the relocatable infrastructure (mainly the MFU, WCP and MSP modules) has been allowed for at the end of the mine life in the financial model.

### Financial Analysis

Project economics are based on known current ore reserves for an initial 6.2 year LOM. A discounted cash flow (DCF) analysis has been undertaken on the Fungoni Project incorporating the estimated capital and operating expenditures and revenue assumptions based on the latest TZMI advice on forecast product prices (September 2017).

The valuation date used in the financial model is 01 January 2018, the date mine development is expected to commence. The NPV has been calculated using project related costs only and does not consider Strandline's corporate costs. The assets relating to the Fungoni Project are held in Strandline's 100%-owned subsidiary Jacana Resources (Tanzania) Limited (**Jacana**).

The key financial results and underlying assumptions used are outlined in the following table:

**Table 12 – DFS Financial Results**

Description	Result US\$
NPV (10% DR, Real, Pre Tax, no debt)	\$42.9M
IRR	56.2%
Payback Period of Initial Capital	2.72 years
LOM Revenue	\$168.1M
LOM EBITDA	\$97.8M
LOM OPEX C1 Costs inc transport	\$63.1M
LOM All-in Sustaining Costs (AISC)	\$71.2M
Revenue to C1 Cost Ratio	2.7
Annual Average Operating Margin	\$348/t
LOM Free Cash Flow	\$71.5M

**Table 13 – DFS Key Assumptions**

Description	Result
Annual Production Rate (Steady State)	2.0Mt
LOM Production	12.3Mt
Mine Life (Initial)	6.2 Years
Exchange Rate (AUD/USD)	0.75
Discount Rate	10%
Capital Expenditure (Pre-production)	US\$30.0M
Product Price Zircon (FOB) Average LOM	US\$1,134/t
Product Price Rutile (FOB) Average LOM	US\$1,072/t
Product Price Ilmenite (FOB) Average LOM	US\$232/t
Product Price Monazite (FOB) Average LOM	US\$1,722/t

The Project is subject to the laws of Tanzania and the following royalty and tax assumptions have been made:

- Corporate tax rate of 30% on taxable profit;
- Capital expenditure is depreciable (written off) for tax purposes at 20% per annum on a straight-line basis over five years;
- Royalty paid to the Tanzanian Government of 3% of the Project revenue (for industrial minerals);
- An export clearance and inspection fee of 1% of Project revenue paid to the Government and a service levy of 0.3% of Project revenue paid to the local Government (District);
- Value added tax (VAT) of 18% where applied to capital and operating cost items will be recoverable upon commencement of production revenue; and
- Any Government invoked free-carried interest in the Project, will be treated as a post-tax dividend to the Government payable once all capital costs have been recovered, and debt and interest charges paid.

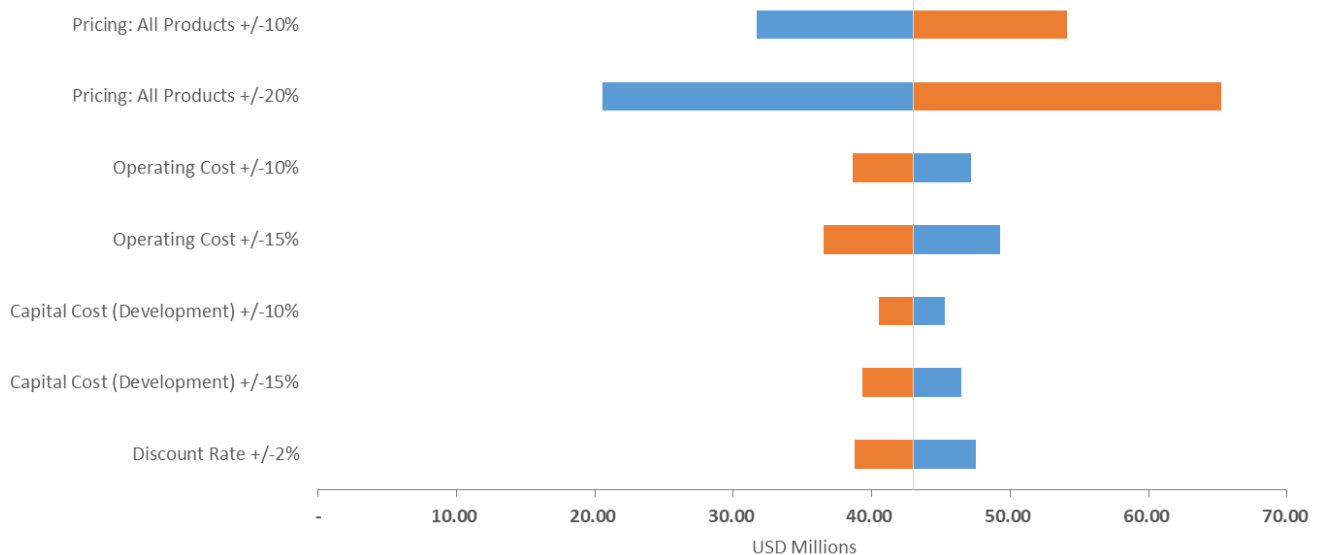
The quarterly revenue and cost breakdown is shown below.



**Figure 14: Quarterly Revenue and Cost Breakdown (US\$)**

The Project is most sensitive to movements in commodity prices, particularly zircon, as 55% of revenue is expected to be generated from contained zircon. An overall 10% increase or decrease in commodity prices adjusts the NPV<sup>10</sup> from US\$42.9M to US\$54.1M and US\$31.7M respectively.

Other areas of sensitivity are operating cost, capital cost and HM recovery to product. A 10% increase or decrease in operating cost adjusts the NPV<sup>10</sup> to US\$47.2M and US\$ 38.7M respectively.



**Figure 15: Pre-Tax' Sensitivity Analysis**

### **Health Safety Environment, Permitting and Community:**

Environmental and social impact assessments have been undertaken within the Fungoni Project area since 2016, in accordance with Tanzanian regulatory requirements and consistent with the Equator Principles. This involved extensive community consultation, baseline surveys of assets and project affected people and land access compensation and resettlement planning.

Tanzania's environmental regulator, the National Environmental Management Council (NEMC) sets the guidelines and requirements of the Environmental Impact Assessment (EIA). The EIA for the Fungoni Project was approved by the Ministry of State, Vice President's Office – Union and Environment and the EIA Certificate was received in July 2017.

The following Tanzanian policies were taken into consideration during the impact assessment process and development of the preliminary environmental management plan (EMP) to ensure minimal environmental and social impact through project implementation:

- National Environmental Policy 1997;
- Mineral Policy 2009;
- The National Land Policy 1996;
- The National Forest Policy 1996;
- National Water Policy (NAWAPO) 2002;
- Sustainable Industrial Development Policy 1996;
- National Human Settlements Development Policy 2000;
- National Gender Policy 1999;
- National Employment Policy 1997;
- The National Health Policy 1990;
- Energy Policy 2003; and
- International Policies, including the World Bank's mandatory provisions in the Environmental Assessment (EA) guidelines in the form of Operational Policies (OP).

The key social features of the Project area were identified as follows:

- Majority of the residents are from the Sukuma and Nyamwezi tribes who migrated to the area for farming and grazing reasons;

- Major economic activities among the communities surrounding the project site include farming (watermelon, cashew nuts, vegetables and cassava), employment in the construction industry and livestock grazing;
- The mine lease area includes some unusable swamp area;
- The project will affect a number of families with properties such as land and residential dwellings; and
- There are no grave sites or heritage areas identified within the proposed mine lease area.

The DFS demonstrates relatively low impact open-cut mining (no toxic elements of concern), progressive back-fill of the mine void and full rehabilitation to the pre-mining state. The Company is employing a strategy whereby the rehabilitated land is returned to the original land holder as soon as practical after mining. This method of land access is well proven in the mineral sands sector whereby the Miner effectively leases the land for the period of disturbance (the land access agreement is commonly referred to as a Compensation and Mining Rights Agreement between the landholder and the mining company). The compensation, land access and resettlement costs are included in the DFS capital and operating cost estimates.

The key stages of rehabilitation are described below:

1. **Planning:** Rehabilitation management plans are developed to guide progressive rehabilitation during the mining operations and mine closure. Prepared prior to commencement of mining, they encompass extensive assessments to determine the characteristics of flora, fauna, pasture, soil, ground and surface waters and landscape features. Rehabilitation objectives are determined in consultations with landholders and regulatory authorities, involving Jacana's environmental specialists and external professionals. Plans are developed for reconstruction of soil profiles. Landform shapes and re-establishment of the agreed vegetation;
2. **Pre-mining:** The mining sequence includes continuous mining and rehabilitation activities. Before mining commences vegetation is removed from the area to be mined and those areas sanctioned for mining and processing infrastructure (the: "disturbance area"). Seed collection activities may be undertaken prior to ground clearing and used later for re-establishment of native vegetation. Topsoil is stripped to remove the organic rich material and stockpiled for later use.
3. **Mining advancement:** As the open mined area advances, the mining pit (void) is backfilled with oversize material and sand and clay extracted during the separation and concentration process at site. This is then covered with stockpiled soils to re-create the planned soil profile and final land form. Once the desired landform is achieved, the area may be ripped. Ripping loosens the soil and encourages the spread of plant roots required for healthy vegetation and decreases wind and water erosion. Vegetation cover is re-established depending on the final land use requirement.
4. **Monitoring:** Rehabilitation areas are monitored for up to two years after mining has ceased. Soil and plant tissue samples are analyzed for major and trace nutrients enabling the Company to monitor and adjust (if required) fertilizer application to restore agricultural land.

A compensation and resettlement action plan (RAP) has been developed to outline the procedures that the Company will follow to mitigate adverse effects, compensate loses, and provide development benefits to persons and communities affected by the Project. The RAP process has considered the following essential components:

- identification of project impacts and affected populations;
- a framework for land access and compensation;
- a description of resettlement assistance and restoration of livelihood activities;
- a detailed implementation budget and programme;
- a description of organizational responsibilities;
- a framework for public consultation, participation, and development planning;
- a description of provisions for redress of grievances; and
- a framework for monitoring, evaluation, and reporting.

Stakeholders were identified at national, regional, district, ward and village levels including government bodies. Community and stakeholder consultation and engagement activities have commenced and will continue throughout the life of the Project. Land access for construction activities will only occur once land access agreements are in place and resettlement has occurred.

The Company's commitment is to develop and operate its mining assets in a responsible and sustainable manner and share in the benefits generated through its operations. Development of the Fungoni Project will forge a new industry for Tanzania, being the first major commercial mineral sands mine in Tanzania, and pave the way for future developments in Tanzania.

The Project is planned to provide important benefits to the people of Tanzania. The key social benefits will be job creation, training and job diversity, transferable skills development and community engagement programmes. The DFS demonstrates that Fungoni will create in the order of 100 locally-sourced direct skilled jobs through the operational phases. The Company expects a significantly larger number of indirect employment opportunities (typically in the order of 3 to 5 times) will also be supported by the project.

The involvement of local businesses and contractors in the Project will be supported through a procurement and logistics policy consistent with the Government's objectives. The Company's community engagement and sustainability initiatives will foster collaboration and partnerships. Furthermore, the Project will provide capital flows into Tanzania and would provide an additional element in the country's growing level of foreign investment.

### **Project Opportunity and Risk:**

As an integral part of the DFS key project risks were assessed to better understand the material risks and opportunities associated with the development strategy and implementation activities. This process is critical to inform the on-going risk management activity and support decision making.

The assessment indicates that while the Project has sound fundamental characteristics across all aspects, there remain several material risks that relate specifically to Tanzania around the areas of sovereign risk, processing complexity, and controlling operating costs and efficiencies. The assessment also confirms the rigour of the management activities undertaken prior to and during the review.

The key risks include:

- Delays in securing project capital funding, land access or final project approvals;
- An increase in working capital or pre-production expenditure resulting in top-up funding being required;
- Negative movements in commodity prices;
- Failure to secure offtake/sales agreements across the product suite;
- Performance of implementation partners across key performance indicators of quality, schedule, cost and safety; and
- Process performance relating to plant throughput, recovery, grade and specification.

Treatment strategies and controls were identified and considered reasonable and effective to reduce the residual risks to an acceptable level suitable for project development. These strategies and controls have been incorporated into the final implementation and management plans for the Project.

Potential opportunities to further enhance the Project were also identified and these will be subject to review as the Project develops and throughout the operations phase.

The key opportunities include:

- Further optimising the mine pits as product pricing improves thus expanding mineral resource that can be mined profitably;
- Asset recycling; use the Fungoni modular relocatable processing plant and related infrastructure to support development of Strandline's other mineral sands assets in the future;
- Positive movement in commodity prices above forecast;
- Modular design concept provides design flexibility to allow the plant to be efficiently reconfigured to adapt to market drivers further maximising ROI;

- Improved process performance including recoveries, throughput and specification;
- Alternative lower cost equipment suppliers including refurbished second-hand plant; and
- Capital reduction initiatives, including transferring capital items into operating cost items, such as build-own-operate power plant and MFU.

### Synopsis:

The main conclusions of the DFS are as follows:

- The DFS has been compiled by a range of independent and experienced consultants and contractors and the Project is at an advanced stage of development ready for execution;
- Ore will be excavated and hauled to the MFU where it will be screened, slurried and pumped to the WCP at a nominal rate of 253 tph for the 6.2 year LOM;
- The WCP will separate the coarse material and clays using screens and cyclones and then use spirals and classifier technology to separate the heavy mineral from the sand;
- The HM concentrate (grade 94%) will be processed in the MSP, using electrostatic separation, gravity and magnetic fractionation to separate rutile, ilmenite, and zircon-monzonite into saleable products;
- The coarse (sand-sized) tailings will be used to construct the walls of the TSF as required and fine (clay-sized) tailings will be deposited within the tailings facility in such a way as to facilitate solar drying and water recovery;
- The products will be stored onsite in readiness for shipping and then trucked in container form (for zircon and rutile) and bulk form (for ilmenite), 25kms to the Dar es Salaam port on a 'just in time' shipping basis without the need for product staging at the port;
- The water supply will be from a bore field located on the mine lease with ongoing recycle and dewatering to provide the main operational needs once established;
- Power for the operation will be supplied by diesel generators strategically located near the main loads;
- Environment approvals have been received and, at the time of publishing the DFS, the mining license application was under review by the Ministry of Energy and Minerals;
- Land access for construction will be obtained after compensation and land access agreements with land holders have been finalised;
- The Project provides significant benefits to the people of Tanzania including key social benefits of job creation, training and job diversity and community engagement programmes, and paves the way for future mineral sands development in country;
- The financial analysis indicates that the total expenditure is expected to be US\$29.95M on start-up, with a further US\$0.92M of deferred capital and mine closure cost of US\$0.44M during future years.;
- Average annual LOM operating cost (C1 cash costs) over the LOM is US\$63.1M with an All-in Sustaining Cost of US\$71.2M;
- The Project has a pre-tax NPV<sup>10</sup> of US\$42.9M and an IRR% of 56.2, and payback period of 2 years and 9 months from commencement of construction. The revenue to C1 operating cost ratio is compelling (first quartile of mineral sands projects) at 2.7; and
- The Project production will start nominally 52 weeks after project development commence.

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## ABOUT STRANDLINE

Strandline Resources Limited (ASX: STA) is a Tanzanian-focused mineral sands developer positioned within the world's major zircon and titanium producing corridor in South East Africa. Strandline has a dominant mineral sands position with a series of 100% owned projects spread along 350km of the Tanzanian coastline.

Strandline's strategy is to develop and operate quality, low cost, expandable mining assets with market differentiation. Leveraging off the exploration success in recent years, the Company's focus is to continue its aggressive exploration and development strategy to progress economically attractive projects based on high unit value titanium and zircon products.

## Forward Looking Statements

This report contains certain forward looking statements. Forward looking statements are only predictions and are subject to risks, uncertainties and assumptions which are outside of the control of Strandline. These risks, uncertainties and assumptions include commodity prices, currency fluctuations, economic and financial market conditions, environmental risks and legislative, fiscal or regulatory developments, political risks, project delay, approvals and cost estimates. Actual values, results or events may be materially different to those contained in this announcement. Given these uncertainties, readers are cautioned not to place reliance on forward looking statements. Any forward looking statements in this announcement reflect the views of Strandline only at the date of this announcement. Subject to any continuing obligations under applicable laws and ASX Listing Rules, Strandline does not undertake any obligation to update or revise any information or any of the forward looking statements in this announcement to reflect changes in events, conditions or circumstances on which any forward looking statements is based.