



## MAIDEN ORE RESERVE FOR TORMIN INLAND STRAND

- Ore Reserve of 21.8 million tonnes at 31% THM<sup>1</sup> containing 6.7 million tonnes heavy mineral
- Ore Reserve located adjacent to existing processing infrastructure
- Staged development targeting an initial 1.2Mtpa Inland Strand operation on Existing Mining Rights followed by expansion to 2.4Mtpa on grant of additional mining rights
- Inland Strand operations planned to recommence in the September quarter 2022

Mineral Commodities Ltd (ASX: MRC or “the Company”) and its empowerment partner, Blue Bantry Investments 255 (Pty) Ltd, are pleased to announce a Maiden JORC Ore Reserve for the Western Strandline of the Tormin Mineral Sands Operation in South Africa. The Western Strandline Ore Reserve is located within Prospecting Right 10262PR (WC 30/5/1/1/2/10262PR) and includes the inland portions of the 162 & 163 Expanded Mining Right (“EMR”) of the Company’s 50% owned South African subsidiary, Mineral Sands Resources (Pty) Ltd (“MSR”).

The Tormin Inland Strands deposits comprises the Western and Eastern Strandlines which run directly behind the existing beach mining areas and adjacent to the current processing infrastructure at Tormin (Figure 1).

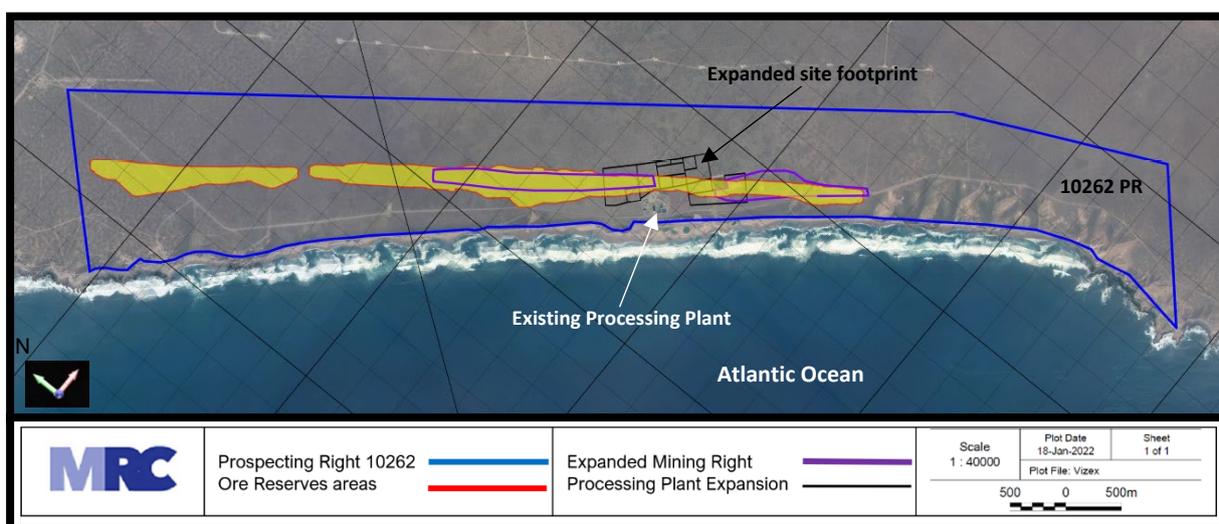


Figure 1 - Tormin Mineral Sands Operation Western Strandline Ore Reserve

<sup>1</sup> Total Heavy Minerals (“THM”) includes all minerals that report as a sink during heavy liquid separation at a specific gravity (“SG”) of 2.96 (“TBE”) after desliming, within the 45 microns to 1mm size fraction as a percentage of the total material.

The Maiden Ore Reserve is a sub-set of the Western Strandline Mineral Resource estimate of **193 million tonnes at 9.5% Total Heavy Minerals (“THM”)<sup>2</sup>** as announced in December 2021. Specifically, it is based on the 74 million tonnes of measured, indicated and stockpiled resources. The Company is planning a phase-3 drilling program designed to infill the inferred resource of the Western and Eastern Strandline and will target delineating a JORC Code (2012) compliant updated Mineral Resource and Ore Reserve.

The Maiden Ore Reserve estimate is based on a Pre-Feasibility Study (“PFS”), using modifying factors applied on measured and indicated Mineral Resources. The Ore Reserve is classified as Proven and Probable in accordance with the JORC Code 2012 and requirements of the ASX Listing Rule 5.9. The orebody contains a high grade heavy mineral assemblage and will produce profitable mineral sands products. The Maiden Ore Reserve is estimated at **21.8 Mt of ore with an average THM grade of 31% resulting in 6.7Mt of in-situ Heavy Minerals** in Proven and Probable categories (Table 1). It encompasses approximately 8km in total length across 153 hectares adjacent to the existing plant.

Table 1 - Maiden Ore Reserve estimate for the Western Strandline

Reserve		Reserve Tonnes	In situ HM	THM	Zircon	Garnet	Ilmenite	Rutile	Magnetite	Slime	Oversize
Category		(Mt)	(Mt)	(%)	(%HM)	(%HM)	(%HM)	(%HM)	(%HM)	(%)	(%)
Within EMR	Proven	7.5	2.6	34.3	1.9	13.6	9.1	1.0	0.6	9.4	2.8
	Probable										
Stockpiles	Proven	0.4	0.1	33.6	4.1	17.9	26.9	1.7	0.8	14.8	4.3
Outside EMR	Proven	8	2.3	31.8	1.7	12.2	8.2	1.0	0.4	8.9	2.6
	Probable	5.9	1.7	28.9	0.9	14.7	2.9	0.7	0.7	5.1	2.3
Proven		15.9	5.0	33.0	1.8	12.9	8.6	1.0	0.5	9.1	2.7
Probable		5.9	1.7	28.9	0.9	14.7	2.9	0.7	0.7	5.1	2.3
<b>Total</b>		<b>21.8</b>	<b>6.7</b>	<b>31.0</b>	<b>1.6</b>	<b>13.1</b>	<b>7.0</b>	<b>0.9</b>	<b>0.6</b>	<b>8.0</b>	<b>2.6</b>

- Ore Reserves are a sub-set of Mineral Resources.
- Mineral assemblage reported as in situ percentage of THM content.
- The economic cut-off is defined as positive cash flow per tonne.
- Tonnes and grades numbers may not compute due to rounding.

The Inland Strand Project is based on a staged development approach. Stage 1 involves a 1.2Mtpa mining and processing operation within the already granted Expanded Mining Right (162 & 163 EMR) and Stockpiled ore – where 7.9Mt of Ore Reserves are available. Mining operations are then planned to extend into the new Mining Right application areas (located wholly within 10262PR and the Company-owned farm Geelwal Karoo 262), with the 13.9 Mtpa of Ore Reserves in this area underpinning a doubling of Inland Strand production to a 2.4Mtpa operation in Stage 2. Regulatory approvals will be required to extend mining activities outside the existing granted EMR and preparations for applications are at an advance stage. The Maiden Ore Reserve is expected to support mining operations for more than 10 years.

Managing Director Jacob Deysel commented: “*This represents an important milestone that underpins our growth strategy for Tormin. Growing the Inland Strand resource and now maiden ore reserve allows us to take a critical look at our expansion strategy for the Inland Strand operations. A phased development program from the Inland Strand and Beach deposits*

<sup>2</sup> Refer ASX announcement entitled ‘Significant Increase in Tormin Inland Strand’s Mineral Resources’, dated 7 December 2021.

*in a short period will significantly improve flexibility, optionality and revenue capacity from Tormin.”*

### Material Assumptions and outcome of the Pre-Feasibility Study

The Company has significant experience in the heavy mineral sands industry having operated the Tormin Mineral Sands Mine since 2014, mining and processing more than 15Mt of ore in its approximately 2.6Mtpa plant to produce non-magnetic (zircon and rutile), garnet and ilmenite concentrates for export.

Following the grant of the Section 102 Expanded Mining Right from the South African Department of Mineral Resources and Energy (“DMRE”) in June 2020, the Company engaged Minsol Engineering to undertake a Pre-Feasibility Study (“PFS”). The staged development program in the PFS uses existing processing equipment where possible, complemented with the installation and commissioning of additional equipment to process the Inland Strand ore. The implementation strategy will reduce pre-development capital, support the replenishment of the Tormin current beaches, as well as expansion of Inland Strand processing on receipt of additional mining rights, to increase revenues. The development stages are:

- Stage 1: 1.2Mtpa Inland Strand operation during 2022-2024 on the current EMR Ore Reserves.
- Stage 2: Expansion to 2.4Mtpa targeting late 2024 following receipt of additional mining rights.

The Ore Reserve within the granted EMR supports up to 6.5 years of Stage 1 operations, de-risking the timing of the grant of additional mining rights required for Stage 2.

The PFS, used for the economics in the Ore Reserve Estimate, indicates that the project is technically low risk, delivering a low capital cost solution with attractive financial outcomes which easily surpasses MRC’s internally generated minimum investment criteria (Table 5). Stage 1 is funded from a combination of cash flows generated from the Company’s current business operations and funding facilities in place in South Africa.

### Criteria Used for Classification

Inland Strand Mineral Resources were released on 7 December 2021 in accordance with the JORC Code 2012 and independently peer-reviewed by Wardell Armstrong International (Table 2).

**Table 2 - Mineral Resources for the Western Strandline Deposit (2% THM cut-off grade)**

Category	Tonnes (Mt)	THM (%)	In Situ THM (Mt)	Zircon (% HM)	Garnet (% HM)	Ilmenite (% HM)	Rutile (% HM)	Anatase (% HM)	Magnetite (% HM)	Slimes (%)
Measured	32.7	19.21	6.2	1.82	12.49	7.91	1.09	0.21	0.52	10.39
Indicated	39.7	9.48	3.7	1.05	14.77	3.80	0.84	0.21	0.74	5.07
Inferred	119.2	6.93	8.2	2.60	10.68	18.04	1.44	0.29	0.43	9.59
Stockpile	1.6	12.84	0.2	4.21	18.85	25.78	1.95	0.39	0.78	15.77
<b>Total</b>	<b>193.2</b>	<b>9.58</b>	<b>18.5</b>	<b>2.16</b>	<b>11.89</b>	<b>13.46</b>	<b>1.26</b>	<b>0.25</b>	<b>0.51</b>	<b>8.85</b>

- Mineral assemblage reported as in situ percentage of THM content.
- Tonnes and grades numbers may not compute due to rounding.

Measured and Indicated Mineral Resources were used to form the basis of the Ore Reserve Estimate in accordance with the JORC Code (2012). Micromine and MineShed software were used for pit optimisation and mine planning. All the Mineral Resources intersected by the open pit mine design and classified as Measured Resources were classed as Proved Ore Reserve, and the Indicated portion of the Mineral Resources classed as Probable Ore Reserve after considering mining, metallurgical, social, environmental, and financial aspects of the project from the PFS. There are no Inferred Resources included in the Ore Reserve statement.

### **Mining method and mining assumptions**

The thickness and continuous nature of the mineralisation at the Western Strandline supports conventional open-pit mining with excavators and dump trucks. The Company believes there are no mining factors that affect the assumption that the deposit has reasonable prospects for economic mining.

Pit shells were developed with the Micromine optimisation tool using the variable cashflow cut-off grade estimated in the block model. The optimisation shells selected comprised open pits, initially targeting the higher value areas earlier in the mining plan. The stage 1 pits are optimised on the Measured and Indicated material in the south and north pits within the Expanded Mining Rights area (Figure 2).

Firstly, topsoil is removed using a dozer. The topsoil stockpiles will not exceed two metres in height and will be seeded with a cover crop to stabilise them and to avoid airborne dust and material loss given mineralisation occurs near the surface. Excavators and trucks will be used for initial overburden stripping to open mining zones and in areas where voids for tailings storage need to be established in advance. Once suitable tailings areas are available, overburden stripping to expose the ore will primarily use a D9 dozer or equivalent, with the overburden pushed directly into the previous mining areas.

Ore hauled from the mining pit will be direct tipped into the drive-over Mobile Feed Unit (MFU) feed bin where possible or stockpiled for subsequent processing. A front end loader will feed stockpiled ore to the MFU. Oversize material will be removed from the ore feed by a scrubber trommel at the MFU and loaded into dump trucks by front end loader and either hauled back into the pit as backfill or used for haul road construction.

Stage 1 operations will commence at 135tph Rougher Head Feed in the September quarter of 2022 to process approximately 1.2Mtpa during the first 30 months (Year 1 –Year 3) until December 2024. During this period, the strip ratio is approximately 1:1 (Waste: Ore), and the overburden stripping volume peaks at 125,000 m<sup>3</sup> per month. Then, subject to the grant of additional mining rights, duplication of mining and processing circuits in Year 3 of Stage 1 will commence to increase production capacity to 2.4Mtpa by late 2024 (Stage 2). The Ore Reserves and mine planning in this scenario underpin more than 10 years of Inland Strand mining operations.

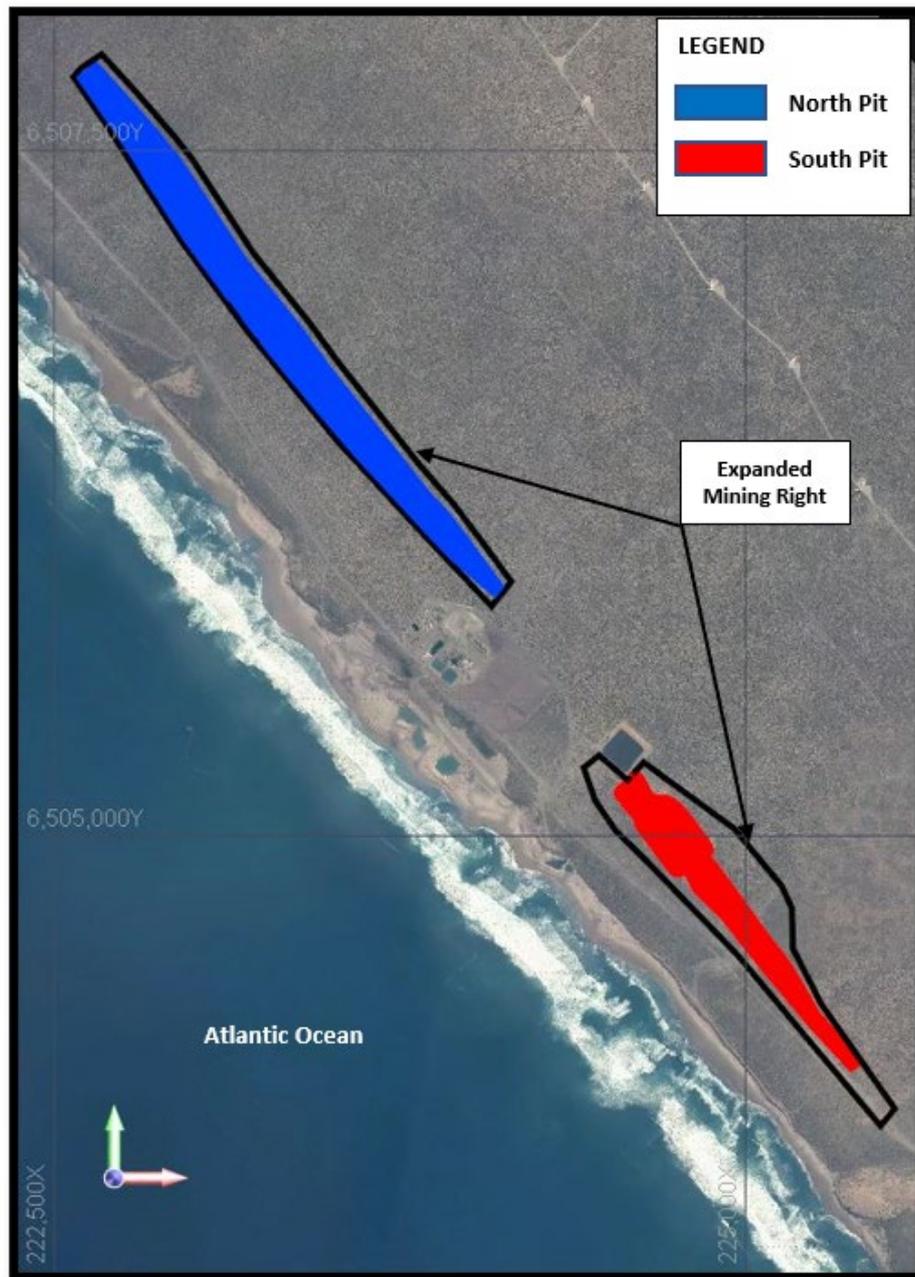


Figure 2 – Scheduled pit outlines at the Western Strandline within the Mining Right

The mining schedule is based on Measured and Indicated Mineral Resources with detailed mine designs and mining fleet requirements determined by qualified engineers and mining contractors. The results from geotechnical and hydrogeological studies carried out at the Tormin Inland Strand (including drilling, logging, in-pit slope stability analysis, in situ permeability testing and laboratory test works, also 2D resistivity survey and water boreholes monitoring) have been included in the Western Strandline mine design.

The rehabilitation management plan and standard operating procedures have been prepared and will be implemented as required. Backfilled tailings will be profiled to mimic original topography prior to the replacement of topsoil for rehabilitation and reseeded.

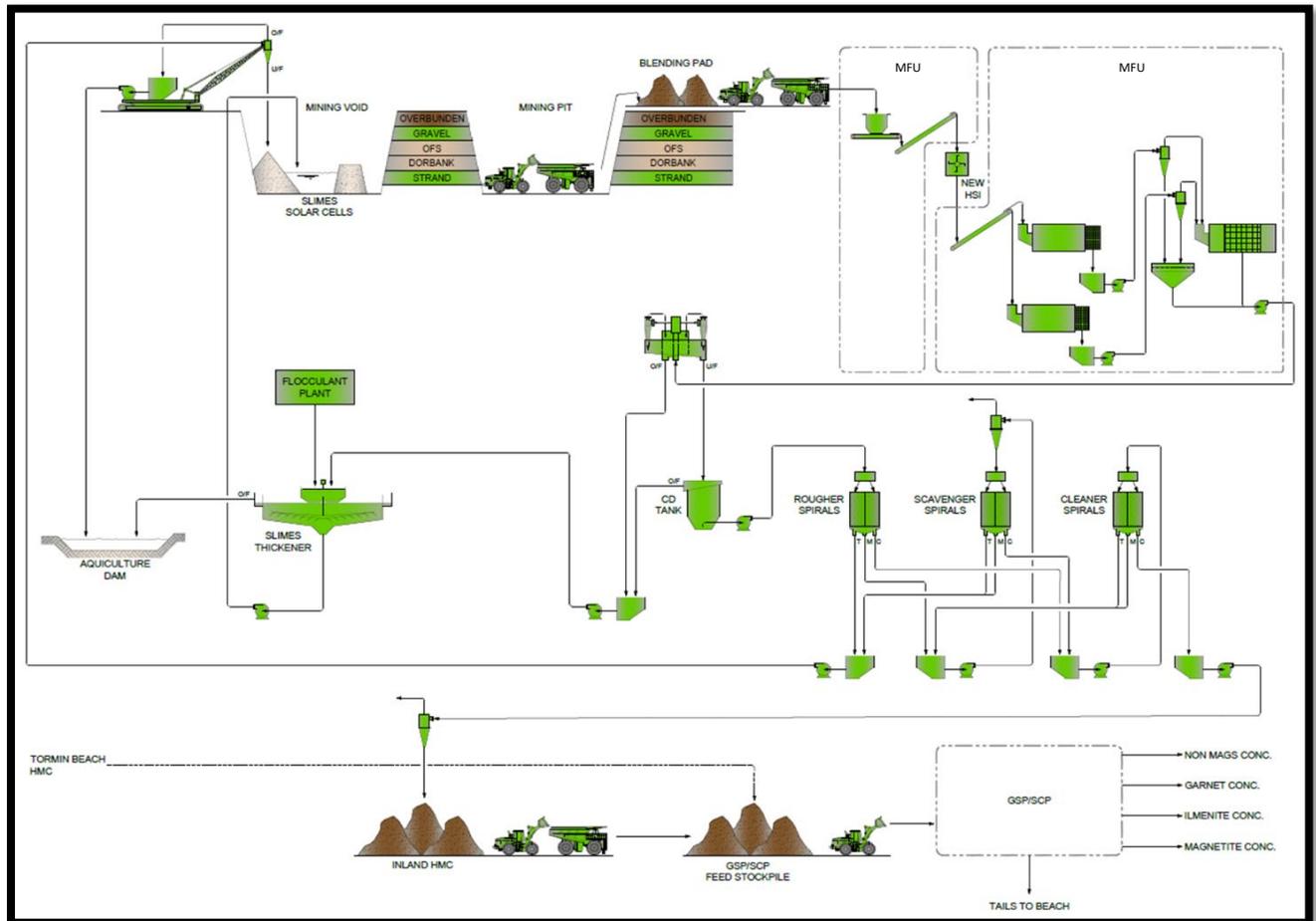
**Processing method and processing assumptions**

The processing plant has been designed by experienced mineral sands engineers, Minsol Engineering, based on metallurgical factors derived from laboratory testwork programs by Nagrom, Haver & Boecker, and Delchem as well as onsite production scale processing trials, with design recoveries provided in Table 3.

**Table 3 – Design mineral recoveries for the Western Strandline**

Heavy Minerals	Units	ROM Feed (inc. Slimes)	HMC	Mineral Recovery to HMC
Zircon	%	0.50	2.53	92
Rutile	%	0.25	1.13	82
Ilmenite	%	2.83	14.35	92
Garnet	%	4.27	21.18	90
Magnetite	%	0.16	0.81	92

The PFS is presented at the appropriate level of design required to support the recovery, throughput, and production estimates. The processing flowsheet is representative of the deposit in terms of material type, grades, and spatial distribution (Figure 3).



**Figure 3 – Schematic of Inland Strand mining and mineral processing**

Liberated ore from the MFU will be deslimed and processed via conventional, primary, gravity concentration plants to recover valuable heavy minerals as a Heavy Mineral Concentrate (HMC). The Company's existing Primary Beach Concentrator-Tertiary Separation Plants (PBC-TSP) will be used as the primary concentrators. Strandline HMC will be stockpiled at the primary concentrator and then hauled to the Company's existing Garnet Stripping Plant-Secondary Concentrator Plant (GSP-SCP) to produce ilmenite, garnet and non-magnetics concentrates for sale. Slimes will be pumped to a slime thickener situated at the Aquaculture Dam for water recovery before co-disposal into the mining void with coarse gravity tailings.

Much of the processing plant and infrastructure is already owned by MRC, with some modifications or upgrades required for completion. This includes the MFU, PBD-TSPs and the GSP-SCP. The completion of the feed preparation and tailings systems are the key outstanding items. This reduces the pre-development capital expenditure and schedule required to bring Stage 1 Inland Strand operations back online.

Thickened slimes will be pumped to the mining void to form a low permeability layer. Sand tails from the primary concentrate will be pumped to dewatering cyclones to remove excess water, with the cyclone underflow at ~65% solids. Clean seawater will be decanted from the settled solids and recycled to the process plant for re-use. The infrastructure requirements, including tailings and slimes management, have been designed and defined by specialist engineers and appropriate industry consultants. The detailed designs discussed above have been used as the basis for capital and operating cost estimates derived from first principles estimates, benchmark data, scaling of comparable design components, and vendor quotes.

The Company continues to evaluate options for further improvements in the tailings system, including dewatering screens for the sand fraction and centrifuging of the thickened slimes.

### **Basis of the cut-off grade**

The Mineral Resource is reported to a 2% THM cut-off grade in accordance with JORC Code 2012. The Ore Reserve is based on a value model that assigns mining and processing recoveries, costs, and revenue to the geological model. This value model follows the entire mining process from soil stripping to final rehabilitation. An economic optimisation is applied to determine blocks with positive cash flow per tonne, which are designated ore, and negative blocks are designated waste.

### **Estimation methodology**

The updated Mineral Resource for the Western Strandline released in December 2021<sup>3</sup> has been classified into Measured, Indicated, and Inferred categories. The Mineral Resource estimation involved the use of drillhole and geology/topography to construct three-dimensional wireframes to define mineralised domains using Micromine software. Domains were snapped to the nearest true intersection from sampling. Data was extrapolated between data points and approximately half of the drill spacing beyond. Ordinary kriging was used as the primary estimator for the THM and Valuable Heavy Minerals values. A block size of 50x12.5x1m reflects

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<sup>3</sup> Refer ASX announcement entitled 'Significant Increase in Tormin Inland Strand's Mineral Resources', dated 7 December 2021.

the geometry of the mineralised domains and drillhole spacing. Then a measured Bulk Density for each lithology layer was applied to the model. Areas with drilling spaced at 125x25m were generally classified as Measured Resources and 250x20m were generally classified as Indicated Resources. Drilling up to 500x100m has been generally classified as Inferred Resources.

The Micromine block model was sub-blocked to 4x4x1m to aid the selection of blocks within this perimeter for the Ore Reserve estimation. Micromine optimisation tools and MineShed software were used for pit optimisation and mine planning. A practical mining void shape with consideration of geotechnical parameters for floor and pit slopes, processing recoveries, and economics was developed for the selected pit shells, and a new block model generated with ore and waste flagged accordingly. This block model was divided into 100m panels, with the mining blocks and ore and waste tonnes and grade reported for each panel – for importing into scheduling (Figure 2). No minimum mining widths were used as the geometry of the deposit is tabular. Mining recovery of 95% was assumed as all material within the mineralised mining horizon was considered as ore and mining boundary losses are minimal.

### Material modifying factors

Modifying factors for the Ore Reserve have been contributed by various expert sources. Each of the individuals listed in Table 4 has consented to the application of their study for the Ore Reserve estimation. The work undertaken by experienced specialists supports the related modifying factors applied to the Ore Reserve estimate. MRC has relied on the detailed work completed by all partners. Some of the modifying factors, such as operating cost estimates, have been derived from a combination of budget quotations, estimates, built-up rates, and data sourced from Tormin mine site.

**Table 4 – List of Experts for the Western Strandline Ore Reserve**

Modifying Factors	Responsible Person/s	Company
Financial Analysis	Adam Bick	Mineral Commodities
Environmental and rehabilitation	Scott Masson Sue Reuther Megan Smith Mark Graham	SRK Consulting Enviroworks GroundTruth
Pre-feasibility study	Robert Simmons Brad Patrick	Minsol Engineering
Geology and Mineral Resource	Bahman Rashidi	Mineral Commodities
Mining and Ore Reserve	Milenko Jankovic	Mineral Commodities
Hydrogeological studies	Preanna Naicker Adriaan du Toit	GEOSS AEMCO
Geotechnical Assessments	Johan Hanekom Kevin Le Bron	Middindi Consulting MLB Consulting
Tailing deposition planning and water management	Jeff Berndt Cobus Robertson	J B Mining Services Obsideo Consulting
Metallurgy	CJ Liebenberg Robert Simmons	Mineral Sands Resources Minsol Engineering
Process plant and infrastructure	Rhys Callaghan Cobus Robertson	Minsol Engineering Obsideo Consulting

The Expanded Mining Right (162 & 163 EMR) was granted on 30 June 2020 and all regulatory approvals have been awarded. An environmental impact assessment (EIA) has been completed by SRK Consulting as an independent environmental consultant and environmental approvals have been granted. The current Ore Reserves sit within the Company-owned 1,741 hectares farm Geelwal Karoo 262 which covers the entire Prospecting Right 10262. The Company intends to apply for an additional Mining Right (MR) over the balance of Prospecting Right 10262, outside of the Expanded Mining Right area. There is a reasonable expectation that the new MR will be issued within the timeframe required for the proposed expansion to 2.4Mtpa by 2024 (Stage 2).

Mineral sands mining and processing operations at Tormin have been ongoing since 2014 and the local community is generally familiar with heavy mineral sands operations and product transport. There are also other resource extraction operations within the district and the Company has been operating successfully in the region for more than 8 years to date. MSR's strong investment in the social and economic upliftment of Historically Disadvantaged South Africans ("HDSA") and the ongoing support of its Black Economic Empowerment ("BEE") partners in the Tormin Mineral Sands Operation will continue to grow under the proposed mine expansion.

Most of the infrastructure requirements for the Project already exists at the Tormin site. MSR is investigating connecting to the Eskom national electricity grid to provide power and replace the current gensets as a cost-effective power supply option for the expansion plant via supply of up to 10MVA from the adjacent wind energy facility. In this event, a 22kV underground powerline of approximately 4km will be installed from the Sere wind farm substation to a new MSR substation.

Marketing arrangements are commercially sensitive, but price assumptions are based on fixed price and volume contracted sales agreements and commercial negotiations. The PFS sale price assumptions:

- Garnet concentrate – US\$112 per tonne.
- Ilmenite concentrate – US\$130 per tonne.
- Magnetite concentrate – US\$125 per tonne.
- Non-magnetic concentrate – US\$870 per tonne.

Generally, the bulk mineral concentrates (ilmenite and garnet concentrates) are trucked to the port of Saldanha for export, while the non-magnetic and magnetite (bagged) concentrates are trucked to the port of Cape Town, where they are containerised and exported.

The PFS was completed by Minsol Engineering and generated into a financial model. The capex is presented with an order of accuracy of  $\pm 20\%$ , developed on the Association for the Advancement of Cost Engineering ("AACE") guidelines for cost estimation. The PFS has met AACE requirements for a PFS, with several activities completed to Feasibility standard including, but not limited to, process selection, flowsheet development, engineering specifications, and equipment pricing. Furthermore, the database used to supplement the development of the cost estimate includes both current pricing from similar projects in South Africa and historical cost data from several projects completed at Tormin, including expansion projects in 2014-16 that draw many similarities with the current project.

The capital cost estimate for the 1.2Mtpa base case mobile and remote Inland Strand Primary Concentrator is approximately US\$3M to produce 320ktpa of Heavy Mineral Concentrate (“HMC”). The operation of 1.2Mtpa has been considered as a base case (“Stage 1”) and the Company is planning an increase of operation to 2.4Mtpa by late 2024 (“Stage 2”) with additional capital cost of approximately US\$1.8M. The project implementation duration for the base case is estimated to be 16 weeks and 26-28 weeks for the expansion to 2.4Mtpa. The implementation schedule is based on design development, vendor quoted manufacturing periods, local contractor installation timeframes, and commissioning requirements. The key financial metrics from the PFS are outlined in table 5.

**Table 5 – PFS Capital cost and Processing cost assumption for the Western Strandline**

Real 2021 Prices (US\$)	Stage 1 FY2022 – 2024	Stage 2 FY2025 – 2032	LOM
Operation	1.2Mtpa	2.4Mtpa	
Production	320ktpa HMC	630ktpa HMC	
Pre-tax project NPV <sub>7</sub>			US\$ 63.1M
Post-tax project NPV <sub>7</sub>			US\$ 42.8M
Capital cost	US\$ 3.0M	US\$ 1.8M	US\$ 4.8M
Revenue	US\$ 73.5M	US\$ 321.4M	US\$ 394.9M
EBITDA	US\$ 11.4M	US\$ 96.1M	US\$ 107.5M

• Numbers have been rounded.

Refer to the JORC Table 1- section 4 for the Ore Reserve statement explanatory note.

## Project Progress

Mining commenced in the Western Strandline in September 2020<sup>4</sup> with 1.7Mt of material mined out from the Southern pit including approximately 450Kt of high grade ore which has been stockpiled and ready for processing (Figure 4).



**Figure 4 – Mining carried out in the Southern Pit of Western Strandline**

The Company has purchased a front-end ore processing plant for mobilisation to Tormin Site in March 2021. The Mobile Feed Unit (MFU) plant includes feed hoppers, scrubbing plants, conveying equipment, and associated electric MCC equipment. This initiative has not only reduced up front capital but will reduce the project delivery timeline.

<sup>4</sup> Refer ASX announcement entitled ‘[Commencement of Mining at Tormin Western Strandline](#)’ dated 11 September 2020.

Since the commencement of Project implementation, all detailed engineering has been completed and significant earthworks and civils carried out. The 225t mobile MFU and primary crushing circuit and tailing pumping upgrades are underway. An 18-metre thickener has been installed and installation of the flocculant plant is ongoing (Figure 5), together with optimisation of the tailings system. The Company aims to commence processing by the September quarter 2022.



Figure 5 - Flocculant plant area (right) and thickener installation site (left)

**ENDS**

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**About Mineral Commodities Ltd:**

Mineral Commodities Ltd (ASX: MRC) is a global mining and development company with a primary focus on the development of high-grade mineral deposits within the mineral sands and battery minerals sectors.

The Company is a leading producer of zircon, rutile, garnet, and ilmenite concentrates through its Tormin Mineral Sands Operation, located on the Western Cape of South Africa.

In October 2019, the Company completed the acquisition of Skaland Graphite AS, the owner of one of the world's highest-grade operating flake graphite mine and one of the only producers in Europe.

The planned development of the Munglinup Graphite Project, located in Western Australia, builds on the Skaland acquisition and is a further step toward an integrated, downstream value-adding strategy which aims to capitalise on the fast-growing demand for sustainably manufactured lithium-ion batteries.

### **Cautionary Statement**

This report may contain forward-looking statements. Any forward-looking statements reflect management's current beliefs based on information currently available to management and are based on what management believes to be reasonable assumptions. It should be noted that several factors could cause actual results or expectations to differ materially from the results expressed or implied in the forward-looking statements.

These forward-looking statements are not a guarantee of future performance and involve unknown risks and uncertainties, many of which are beyond MRC's control, which may cause actual results and developments to differ materially from those expressed or implied. These risks include but are not limited to, political and economic conditions, stock market fluctuations, commodity demand and price movements, regulatory risks, operational risks, reliance on key personnel, Ore Reserve and Mineral Resource estimates, foreign currency fluctuations, exploration risks, mining development, construction, and commissioning risk.

The Ore Reserve discussed herein is based on PFS, and it has been undertaken to determine the feasibility to mine and process heavy mineral ore from a production plant constructed at Tormin. MRC considers all the material assumptions to be based on reasonable grounds. The production targets underpinning financial forecasts included in the PFS consist of only Measured and Indicated Resources that used for the Ore Reserve over the mine life. No exploration target material has been included in the economic valuation or production target.

Entire Ore Reserves areas are in the Company-owned farm Geelwal Karoo 262 and Prospecting Right 10262. The Company is currently undergoing an application for a new Mining Right (MR), outside of the Expanded Mining Right (162 & 163 EM). Subject to approvals, the new Mining Right is expected within the timeframe required for the proposed expansion stage 2 mining operation.

Forward-looking statements in this report apply only at the date of issue. Subject to any continuing obligations under applicable law or regulations, MRC does not undertake to publicly update or revise any of the forward-looking statements in this report or to advise of any change in events, conditions, or circumstances on which any such statement is based. Readers are cautioned not to place undue reliance on any forward-looking statements contained in this report.

## Competent Persons Statement

The information in this Announcement related to Mineral Resources is based on information compiled and approved for release by Mr Bahman Rashidi, who is a member of the Australian Institute of Mining and Metallurgy (“AusIMM”) and the Australian Institute of Geoscientists (“AIG”). Mr Rashidi is the Group Exploration Manager and a full-time employee of the Company. Mr Rashidi is also a shareholder of Mineral Commodities Ltd. He has sufficient experience which is relevant to the style of mineralisation and types of deposit under consideration and to the activity, he is undertaking to qualify as a Competent Person in accordance with the JORC Code (2012). The information from Mr Rashidi was prepared under the JORC Code (2012). Mr Rashidi consents to the inclusion in this ASX release in the form and context in which it appears.

The information in this Announcement related to Ore Reserve is based on information compiled and has been approved for release by Mr Milenko Jankovic, who is a member of the Australian Institute of Mining and Metallurgy (“AusIMM”). Mr Jankovic is the Group Mining/Planning Engineer and a full-time employee of the Company and has over 30 years of mining experience in a variety of mineral deposits and styles. Mr Jankovic has sufficient experience which is relevant to the style of mineralisation and types of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person in accordance with the JORC Code (2012). The information from Mr Jankovic was prepared under the JORC Code (2012). Mr Jankovic consents to inclusion in the report of the matters based on this information in the form and context in which it appears.

**Appendix 1**  
**JORC TABLE 1**  
**Section 1 Sampling Techniques and Data**  
(Criteria in this section apply to all succeeding sections)

Criteria	JORC Code Explanation	Commentary
<ul style="list-style-type: none"> <li><b>Sampling techniques</b></li> </ul>	<ul style="list-style-type: none"> <li>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1m samples from which 3kg was pulverised to produce a 30g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</li> </ul>	<ul style="list-style-type: none"> <li>The current resource database consists of 507 aircore holes and 2 sonic holes, representing 13,251m of vertical drilling, and their analytical data.</li> <li>Sample taken from surface to bedrock.</li> <li>Mineralogical studies and grade testwork undertaken according to mine control standards within Tormin mine site laboratory.</li> <li>Sampled exclusively by vertical holes.</li> <li>One-metre air core drill samples from a cyclone were collected in 20-25kg plastic bags.</li> <li>Each bag was riffle split into two pre-numbered calico bags of ~5kg each and the remainder of the samples collected in a large plastic bag.</li> <li>5kg samples were submitted directly to the Tormin mine laboratory to be analysed for oversize, slimes, and heavy minerals.</li> <li>The laboratory sample was dried, de-slimes (removal of -45 micron fraction) and screen (+2mm oversize).</li> <li>200g of sample split to use for heavy liquid separation using TBE with density range between 2.92 and 2.96g/ml to define THM content.</li> </ul>
<ul style="list-style-type: none"> <li><b>Drilling techniques</b></li> </ul>	<ul style="list-style-type: none"> <li>Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</li> </ul>	<ul style="list-style-type: none"> <li>Air core drilling was used. Air core drilling is considered a standard industry drilling method for HMS mineralisation.</li> <li>78mm and 85mm drill bits and rods were used.</li> <li>Two sonic holes by wide barrel (137mm) drilled.</li> <li>All holes were drilled vertically.</li> </ul>
<ul style="list-style-type: none"> <li><b>Drill sample recovery</b></li> </ul>	<ul style="list-style-type: none"> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</li> </ul>	<ul style="list-style-type: none"> <li>Metric samples from aircore drill were taken and riffled down to a representative sample for heavy liquid separation and XRD.</li> <li>No sample loss or cavitation were experienced. Dry samples may lose some of their slimes fraction due to blowing out of sampling equipment, however HM are not affected.</li> <li>Sample recovery was very good.</li> <li>The aircore and sonic drilling provide high quality samples from the face of the drill hole.</li> </ul>
<ul style="list-style-type: none"> <li><b>Logging</b></li> </ul>	<ul style="list-style-type: none"> <li>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<ul style="list-style-type: none"> <li>Each hole was logged by a geologist on pre-printed log sheets.</li> <li>Geological and lithological observations per depth were recorded together with field sections and hand drawn down-the-hole logs.</li> <li>Special attention was given to heavy minerals intersected as a guide to potential marine strandlines and marine diamond deposits.</li> <li>Percentage HMS was recorded from visual observations as well as the magnetic content of each metre by handheld pen magnet.</li> <li>Marine gravels and contact with basement bedrock recorded as maximum depth of mineralisation.</li> <li>Each 1m sample was washed and sieved to obtain a representative sample stored in numbered chip trays.</li> </ul>
<ul style="list-style-type: none"> <li><b>Sub-sampling techniques and sample preparation</b></li> </ul>	<ul style="list-style-type: none"> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality, and appropriateness of the sample preparation technique.</li> <li>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul style="list-style-type: none"> <li>Sampling over 1m down the hole intervals as determined by 1m marks on the rig mast.</li> <li>Drill samples were riffle split into approximately 3kg samples to be assayed.</li> <li>All samples were dry.</li> <li>Technicians undertaking the splitting were supervised by minesite geologists to ensure sampling quality.</li> <li>The sample sizes were considered suitable, based on industry practices of mineral sand exploration.</li> <li>Field duplicate samples were riffled for the Tormin mine laboratory and external QA/QC checks for every 25th sample</li> <li>Lab duplicate samples were split for the Tormin mine laboratory and for external QA/QC checks.</li> </ul>
<ul style="list-style-type: none"> <li><b>Quality of assay data and laboratory tests</b></li> </ul>	<ul style="list-style-type: none"> <li>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</li> </ul>	<ul style="list-style-type: none"> <li>All sample analyses were undertaken by the Tormin mine laboratory.</li> <li>The mine owns and operates a state of the art heavy liquid separation (HLS) lab using TBE with density range between 2.92 and 2.96g/ml with Panalytical XRD machines (the Rietveld method after HLS in an automated mode setup). All grades reported are from XRD results on heavy liquid sink.</li> </ul>

Criteria	JORC Code Explanation	Commentary
	<ul style="list-style-type: none"> <li>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</li> </ul>	<ul style="list-style-type: none"> <li>Industrial laboratory XRF machines (Panalytical Epsilon 3 ED) are used by Tormin mine as a grade verification check on the XRD zircon content.</li> <li>The Tormin mine laboratory completes its own internal QA/QC using Certified Reference Material ("CRM") at the rate of approximately 1 in 50 and sending every 25th sample to the external labs.</li> <li>271 field duplicates plus 80 blank samples, and 56 CRMs were included into the sample stream and submitted to the lab.</li> <li>The CRMs, blank and duplicate sample results are within accepted limits.</li> <li>External sampling checks for XRD have been done by XRD Analytical and Consulting (398 samples) and UIS Analytical Services (20 samples) and for XRF in Mintek and UIS Analytical Services (10 samples each), accredited laboratories in Pretoria and Johannesburg. Also, 10 samples have been assayed in Mintek and UIS Analytical Services by ICP-MS for trace elements and REEs.</li> <li>The adopted QA/QC protocols are appropriate for the Mineral Resource and public reporting and QA/QC system returning acceptable results.</li> <li>QEMSCAN testwork on 18 composite samples by SGS, ALS and SJT MetMin was used for verification of the mineral assemblage and the component mineralogy as well as grain size distribution and HMS particle size.</li> <li>Additionally, optical microscopy grain counting was used to confirm heavy mineral assemblage on 4 composite samples.</li> <li>No geophysical tools or handheld instruments were utilised in the sample analysis.</li> </ul>
<ul style="list-style-type: none"> <li><b>Verification of sampling and assaying</b></li> </ul>	<ul style="list-style-type: none"> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	<ul style="list-style-type: none"> <li>All sampling was undertaken by mine site personnel overseen by a qualified and experienced mine geologist and independent consultants.</li> <li>All sample preparation was carried out by qualified staff, supervised by chemists and the laboratory manager.</li> <li>The lab results and logging have been reviewed by external consultants to MSR as well as internally by MRC's exploration manager.</li> <li>10 twinned holes drilled in different fence lines.</li> <li>48 holes (1,192m) from historical drilling were verified and included into the resource model.</li> <li>The drillhole logs have been converted to electronically stored formats and stored in a database provided by Maxgeo (DataShed). This database is hosted on an offsite server supplied by Maxgeo and managed by their trained database staff.</li> <li>No adjustments to assay data results were made outside the standard XRD and XRF calibration software being used.</li> </ul>
<ul style="list-style-type: none"> <li><b>Location of data points</b></li> </ul>	<ul style="list-style-type: none"> <li>Accuracy and quality of surveys used to locate drillholes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	<ul style="list-style-type: none"> <li>Hole collars were surveyed by DGPS accurate to within centimetres by mine surveyors.</li> <li>Down hole surveys for shallow vertical air core holes are not required.</li> <li>WGS 84 datum and UTM/ zone 34S coordinate system is used.</li> </ul>
<ul style="list-style-type: none"> <li><b>Data spacing and distribution</b></li> </ul>	<ul style="list-style-type: none"> <li>Data spacing for reporting of exploration results.</li> <li>Whether the data spacing and distribution are sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul style="list-style-type: none"> <li>Systematic grade spacing used in the drilling program was 250m x 20m containing 30 fence lines.</li> <li>Each drillhole is spaced 20m apart along each drill line perpendicular to the strandline inferred strike.</li> <li>The above-mentioned drill fence line is 250m apart along the strandline strike.</li> <li>infill fence lines with 500m x 25m and 250m x 25m grade were drilled between the primary lines.</li> <li>16 holes from historical drilling were verified and included in the resource model.</li> <li>10 twinned holes were drilled in different fence lines.</li> </ul>
<ul style="list-style-type: none"> <li><b>Orientation of data in relation to geological structure</b></li> </ul>	<ul style="list-style-type: none"> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</li> </ul>	<ul style="list-style-type: none"> <li>Vertical drilling to intersect sub-horizontal strata.</li> <li>Orientation of the drillholes will not result in sampling bias.</li> </ul>
<ul style="list-style-type: none"> <li><b>Sample security</b></li> </ul>	<ul style="list-style-type: none"> <li>The measures taken to ensure sample security.</li> </ul>	<ul style="list-style-type: none"> <li>Sampling was carried out using pre-printed calico bags to prevent mislabelling.</li> </ul>

Criteria	JORC Code Explanation	Commentary
		<ul style="list-style-type: none"> <li>All sample bag numbers were logged against the drillhole by the site geologist.</li> <li>Three samples per metre drilled were produced. The reject was stored securely in a bag farm for reference, one for external QA/QC use and one was sent directly to the mine lab at the end of each day's drilling in a secure area.</li> <li>The Tormin mine laboratory inspected the submitted samples and did not report any missing, nor any error of the samples against the sample lists.</li> <li>Where external laboratories were used, their chain of custody controls for shipping and sample submission were used.</li> </ul>
<ul style="list-style-type: none"> <li><b>Audits or reviews</b></li> </ul>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of sampling techniques and data.</li> </ul>	<ul style="list-style-type: none"> <li>The lab results and logging have been reviewed by external consultants to MSR and internally as part of normal validation processes by MRC.</li> </ul>

**Section 2 Reporting of Exploration Results**  
(Criteria listed in the preceding section also apply to this section)

Criteria	Explanation	Commentary
<ul style="list-style-type: none"> <li><b>Mineral tenement and land tenure status</b></li> </ul>	<ul style="list-style-type: none"> <li>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</li> <li>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</li> </ul>	<ul style="list-style-type: none"> <li>The area has a granted prospecting right (WC 30/5/1/1/2/10262 PR) in the name of Mineral Sands Resources (Pty) Ltd, a subsidiary of ASX listed Mineral Commodities Ltd (ASX: MRC).</li> <li>This Prospecting Right (Inland Strand) incorporates an area approximately 12km in length covering 1,741 hectares of coastal area adjacent to the existing beach mining operations on the Company-owned farm Geelwal Karoo 262.</li> <li>162 and 163 Expanded Mining Right (WC 30/5/1/2/2/10108 MR) encompassing the Northern Beaches and Inland Strandline expansion project was approved by the Department of Mineral Resources - South Africa on 30 June 2020.</li> <li>MSR has been operating successfully in the region for more than 8 years to date.</li> </ul>
<ul style="list-style-type: none"> <li><b>Exploration done by other parties</b></li> </ul>	<ul style="list-style-type: none"> <li>Acknowledgment and appraisal of exploration by other parties.</li> </ul>	<ul style="list-style-type: none"> <li>The general area has been investigated and mined for heavy mineral deposits as far back as the 1930s (Haughton, 1931). Subsequent geological surveys and exploration programs investigated the distribution, mineralogy, and economic potential of the heavy mineral sands along the coastline of Geelwal Karoo (Toerien &amp; Groeneveld 1957, Abele 1989, Swart 1990, Barnes 1998) and Trans Hex 1989-1991).</li> <li>De Beers drilled 9 fence lines across the property and bulk sampled the area in the 1960s.</li> <li>During 1999, Trans Hex conducted additional onshore drilling of strandlines and identified the inland raised beach deposits containing heavy minerals. Trans Hex subsequently bulk sampled the material by digging several trenches in 1999-2000.</li> <li>Geelwal Karoo Diamante conducted small diameter forum drilling to a depth of 40m between 2000 and 2002, with a total of 42 drillholes.</li> <li>Extensive work, including mining of the inshore strandlines along the coast, was undertaken by Namakwa Diamond Company in 2003-2005. This work also identified the presence of the Inland Strand.</li> </ul>
<ul style="list-style-type: none"> <li><b>Geology</b></li> </ul>	<ul style="list-style-type: none"> <li>Deposit type, geological setting and style of mineralisation.</li> </ul>	<ul style="list-style-type: none"> <li>The western coastal plain of South Africa contains a significant resource of detrital heavy minerals by world standards.</li> <li>The heavy mineral sand deposits occur in a current active beach environment (eg Tormin mine) as well as in older palaeo-beach raised strandlines found inland (inland strandlines) eg Tronox Namakwa Sands.</li> <li>Apart from the mid-Jurassic, Cretaceous and Tertiary (Paleogene) sediments along the coast, numerous small fossiliferous, marine, and terrestrial deposits of Neogene age outcrop along the coastal zone.</li> <li>The onshore mineral sands are marine palaeo-terraces "Inland Strands", aeolian sands and fluvial sediments. These targets were formed during Miocene, Pliocene, and Quaternary/Pleistocene coastal transgression (sea move inland) and regression cycles.</li> <li>The lithological units of the Western Strandline can be described as below: <ul style="list-style-type: none"> <li>a. Aeolian sand – non mineralised</li> <li>b. Red Aeolin sand – mineralised</li> <li>c. Silcrete Duricrust/ dorbank</li> <li>d. Orange Feldspathic Sand – non mineralised</li> <li>e. Orange Feldspathic Sand – mineralised</li> </ul> </li> </ul>

Criteria	Explanation	Commentary
		<ul style="list-style-type: none"> <li>f. Dorbank – mineralised</li> <li>g. Strandline – mineralised</li> <li>h. Base pebble beds – mineralised</li> <li>i. Schist basement</li> </ul> <ul style="list-style-type: none"> <li>• For purposes of estimation, the lithology has been grouped into the following: <ul style="list-style-type: none"> <li>A: Red Aeolian sand</li> <li>B: Silcrete Duricrust/dorbank</li> <li>C: Orange Feldspathic Sand</li> <li>D: Main Strandline Mineralisation (including the thin mineralised dorbank)</li> <li>E: Secondary perched strandline mineralisation</li> <li>F: Gravel</li> <li>G: Schist basement</li> </ul> </li> <li>• The orebody hosts mineralisation in all geological units/layers except for the schist basement.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Drill hole Information</b></li> </ul>	<ul style="list-style-type: none"> <li>• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: <ul style="list-style-type: none"> <li>• Easting and northing of the drill hole collar</li> <li>• elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> <li>• dip and azimuth of the hole</li> <li>• down hole length and interception depth</li> <li>• hole length.</li> </ul> </li> <li>• If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>• The minimum hole length is 5m, maximum 60m and average depth of drilling is 24metres.</li> <li>• East collar ranges – 220,261mE to 227,375mE.</li> <li>• North collar ranges – 6,500,851mN to 6,510,977mN.</li> <li>• Height collar ranges- 34.25m to 95.84m.</li> <li>• Azimuth ranges/dip ranges – vertical drilling.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Data aggregation methods</b></li> </ul>	<ul style="list-style-type: none"> <li>• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>• Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</li> <li>• The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	<ul style="list-style-type: none"> <li>• Not relevant.</li> <li>• No grade cutting of HM values were undertaken.</li> <li>• No metal equivalents were used for reporting of Mineral Resources.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Relationship between mineralisation widths and intercept lengths</b></li> </ul>	<ul style="list-style-type: none"> <li>• These relationships are particularly important in the reporting of Exploration Results.</li> <li>• If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>• If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</li> </ul>	<ul style="list-style-type: none"> <li>• Not relevant.</li> <li>• The strandline mineralisation is sub-horizontal in nature and the air core drilling intercepts are vertical.</li> <li>• Thickness of intercept reported is therefore true thickness of the mineralisation.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Diagrams</b></li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</li> </ul>	<ul style="list-style-type: none"> <li>• Maps, sections and plan views are provided in the main body of the report.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Balanced reporting</b></li> </ul>	<ul style="list-style-type: none"> <li>• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</li> </ul>	<ul style="list-style-type: none"> <li>• Statistics of drillhole grades used during the Mineral Resource Estimate are contained in the main body of the report.</li> <li>• This report provides the total information available to date and is considered to represent a balanced report.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Other substantive exploration data</b></li> </ul>	<ul style="list-style-type: none"> <li>• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</li> </ul>	<ul style="list-style-type: none"> <li>• Historical drill data is not reported as it is classified as historical foreign estimates that are non-JORC compliant.</li> <li>• Aeromagnetic geophysical data has been used for drilling target delineations.</li> <li>• Only 48 holes (1,192m) from historical drilling were verified and included into the resource model. This is an increase from the previous model, as new drilling has confirmed logging and assays from more of the historical dataset.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Further work</b></li> </ul>	<ul style="list-style-type: none"> <li>• The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>• Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	<ul style="list-style-type: none"> <li>• Further drilling is planned to produce more Measured/Indicated resources over the western Strandline.</li> </ul>

**Section 3 Estimation and Reporting of Mineral Resources**  
(Criteria listed in Section 1, and where relevant in Section 2, also apply to this section)

Criteria	JORC Code explanation	Commentary
<b>Database integrity</b>	<ul style="list-style-type: none"> <li>Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> <li>Data validation procedures used.</li> </ul>	<ul style="list-style-type: none"> <li>The data was plotted and plots were as expected with no mis-plots or extraneous data found. Maximum and minimum values and average values were all within the norm. Duplicate values were confirmed as such. The coordinates were confirmed as being WGS84 UTM zone 34S.</li> <li>Data is stored in an offsite database hosted by Maxgeo.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>The Competent Person is currently a full-time employee of Mineral Commodities Ltd.</li> <li>No site visits were undertaken for this resource estimate due to COVID-19 travel ban, although the Competent Person did visit the project previously and is familiar with the site and resource conditions.</li> </ul>
<b>Geological interpretation</b>	<ul style="list-style-type: none"> <li>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</li> <li>Nature of the data used and of any assumptions made.</li> <li>The effect, if any, of alternative interpretations on Mineral Resource estimation.</li> <li>The use of geology in guiding and controlling Mineral Resource estimation.</li> <li>The factors affecting continuity both of grade and geology.</li> </ul>	<ul style="list-style-type: none"> <li>The deposit is a classic inland strandline mineral sands deposit with no doubt as to its genesis.</li> <li>The grain size characteristics are interpreted to support an offshore depositional setting, closer to the shoreline position.</li> <li>Samples were collected for resource estimation purposes.</li> <li>The geology/topography of the deposit has been used to constrain the resource envelope. The data was partitioned into areas (subsets) based on geology/topography. The base of the deposit is defined by the underlying bedrock, the landward side by barren land and sand dunes.</li> </ul>
<b>Dimensions</b>	<ul style="list-style-type: none"> <li>The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.</li> </ul>	<ul style="list-style-type: none"> <li>The total deposit, inside MSR controlled Prospecting Rights, has a strike length of approximately 12,125m and an average width (including low grade halo) of 380m. High grade strandline core of the deposit averages approximately 200m width, along the entire strike length. It is developed from surface to a maximum depth of 49m and the average resource thickness is approximately 21m (including low grade halo). The deposit occurs from the surface down.</li> </ul>
<b>Estimation and modelling techniques</b>	<ul style="list-style-type: none"> <li>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen, include a description of computer software and parameters used.</li> <li>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</li> <li>The assumptions made regarding recovery of by-products.</li> <li>Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).</li> <li>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</li> <li>Any assumptions behind modelling of selective mining units.</li> <li>Any assumptions about correlation between variables.</li> <li>Description of how the geological interpretation was used to control the resource estimates.</li> <li>Discussion of basis for using or not using grade cutting or capping.</li> <li>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</li> </ul>	<ul style="list-style-type: none"> <li>Micromine software was used to domain and estimate each of the valuable heavy minerals. Domains were snapped to the nearest true intersection from sampling.</li> <li>Assays were all generally 1.0m, with some assayed field composited to 4m in length, and so the entire data set was composited down to 1m.</li> <li>Outlier values were cut based on local analysis for each lithology. Only THM percentage was required to be top cut for the low grade Dorbank and RAS lithologies (cut to 30% and 15% respectively), and the only constituent mineral requiring top cut was Garnet within the RAS (cut to 10%)</li> <li>Data was extrapolated between data points and approximately half of the drill spacing beyond. Data points are nominally 125m x 25m to 250m x 25m. There are generally between 2-15 drill holes per line (average 7 holes).</li> <li>Ordinary kriging was used as the primary estimator. Each variable was estimated separately, using variograms created for each lithology.</li> <li>An anisotropic search was used, with the variable ratios of direction of greatest continuity: Across the continuity: depth. (STRAND 1:0.4:0.04, LGSANDS 4:0.4:0.08) A maximum search distance of 500m was used for the STRAND unit, and 750m for LGSAND units. Octant searching was used, with maximum points per sector of between 5 and 12. Minimum points to estimate a block were 5. These neighbourhood parameters were all confirmed using QKNA.</li> <li>This is a resource estimate and mining parameters are not used beyond normal global parameters of grades, dimensions, and accessibility.</li> <li>The THM standard deviation in the block model is as follows: <ul style="list-style-type: none"> <li>10.55 with a coefficient of variation of 1.09</li> </ul> </li> <li>These values are acceptable as they indicate the modelling algorithm produces realistic values within the range of the dataset. In addition, an in-depth validation process was used to test the robustness of the modelled data, including visual checks, check estimates (NN), swath plots and detailed statistical comparisons.</li> <li>Maiden Mineral Resources have been previously estimated for the Western Strandline in August 2020.</li> </ul>
<b>Moisture</b>	<ul style="list-style-type: none"> <li>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</li> </ul>	<ul style="list-style-type: none"> <li>The resource tonnages are estimated on a dry basis.</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>The basis of the adopted cut-off grade(s) or quality parameters applied.</li> </ul>	<ul style="list-style-type: none"> <li>Final report was based on a 2% THM cut-off grade for blocks as this is the current minimum grade where there is a reasonable expectation for eventual extraction.</li> <li>2% cut off grade was based on grade-tonnage curves with respect to THM and VHM assemblage. Also taken into account was current and anticipated plant performance, and other similarly sized deposits in the region.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.</li> </ul>	<ul style="list-style-type: none"> <li>The resource is considered as dry mining feed and mineralisation can be any depth or width. Dry mining techniques are preferred in situations involving high grades.</li> <li>Mining is through conventional open pit methods.</li> <li>The thickness and continuous nature of the mineralisation, supports a non-selective bulk mining method.</li> <li>The Company believes there are no mining factors which affect the assumption that the deposit has reasonable prospects for economic mining.</li> </ul>
<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li>The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.</li> </ul>	<ul style="list-style-type: none"> <li>The metallurgical recovery is similar to other mineral sand operations.</li> <li>Metallurgical parameters have been taken from the metallurgical tests, and metallurgical testwork results support the recovery. The VHM mineral assemblage, low slimes and oversize are fit for an economic extraction.</li> <li>As the mine is an ongoing profitable concern, there are no doubts about the metallurgical suitability of the mined material.</li> <li>The most recent studies are: <ul style="list-style-type: none"> <li>2020 Tormin Expansion projects-implementation strategy by MinSol Engineering</li> <li>2021 Pre-feasibility study report for Inland Strandline expansion by MinSol Engineering</li> </ul> </li> <li>To date, the Company considers there are no metallurgical factors which are likely to significantly affect the assumption that the deposit has reasonable prospects.</li> </ul>
<b>Environmental factors or assumptions</b>	<ul style="list-style-type: none"> <li>Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfield project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered, this should be reported with an explanation of the environmental assumptions made.</li> </ul>	<ul style="list-style-type: none"> <li>There are no environmental factors likely to affect the assumption that the deposit has reasonable prospects for economic extraction.</li> <li>The local vegetation environment generally consists of strandveld plant communities. Topsoil stripped from the mining operations will be stockpiled for later use during rehabilitation. Slimes content is moderate (&lt;10%) and tailings generated in the processing plant will be pumped back into the open pits as part of the rehabilitation strategy. Any excess water will be recovered and recycled to the process.</li> <li>Tailings generated in the processing plant will be pumped back into the open pits as part of the rehabilitation strategy. Any excess water will be recovered and recycled to the process.</li> <li>There are no significant pollutants introduced with the tailings and the material is inert, however further studies for tailing and slime waste classification are ongoing.</li> </ul>
<b>Bulk density</b>	<ul style="list-style-type: none"> <li>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.</li> <li>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.</li> <li>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</li> </ul>	<ul style="list-style-type: none"> <li>The bulk density is based on a calculation of the specific gravity of the silica and heavy mineral content fractions of each sample. It is therefore not fixed and fluctuates between 1.68 and 2.1 as per the formula: <math>SG=1.68+(0.0095 \times THM)</math>.</li> </ul> <p>The use of a bulk density algorithm is a standard industry practice for the estimation of mineral sands resource.</p>
<b>Classification</b>	<ul style="list-style-type: none"> <li>The basis for the classification of the Mineral Resources into varying confidence categories.</li> <li>Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</li> <li>Whether the result appropriately reflects the Competent Person's view of the deposit.</li> </ul>	<ul style="list-style-type: none"> <li>The Mineral Resources have been classified as Measured, Indicated, and Inferred Categories, in accordance with the 2012 Australasian Code for Reporting of Mineral Resources and Ore Reserves ("JORC Code (2012)").</li> <li>A range of criteria has been considered in determining this classification including: <ul style="list-style-type: none"> <li>Geological continuity</li> <li>Drillhole spacing: <ul style="list-style-type: none"> <li>Areas with aircore drilling spaced at 125x25m have been generally classified Measured</li> <li>Areas with aircore drilling spaced at 250x20m have been generally classified Indicated.</li> <li>Areas outside this has been classified as Inferred, as broadly spaced scoping drilling in the south, coupled with other widely spaced historic data, gives some confidence in the continuity of mineralisation up to 100m from the main high grade strandline core, providing the search criteria are met.</li> </ul> </li> </ul> </li> </ul>

Criteria	JORC Code explanation	Commentary
		<ul style="list-style-type: none"> <li>The results of the validation of the block model show acceptable correlation of the input data to the estimated grades.</li> <li>The author is confident that all relevant factors have been considered and the results reflect his views.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li>The results of any audits or reviews of Mineral Resource estimates.</li> </ul>	<ul style="list-style-type: none"> <li>The Mineral Resource has been reviewed internally as part of normal validation processes by MRC.</li> <li>Wardell Armstrong International (“WAI”) conducted a review of the Mineral Resource Estimate and no material issues were identified. Mr Ché Osmond (CGeol) and Richard Ellis (CGeol) (WAI) undertook an audit of the Mineral Resource estimate as an independent technical review.</li> </ul>
<b>Discussion of relative accuracy/confidence</b>	<ul style="list-style-type: none"> <li>Where appropriate, a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</li> <li>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</li> </ul>	<ul style="list-style-type: none"> <li>An in-depth geostatistical study has been completed on this resource, which has allowed for robust estimation and high levels of confidence in the resource.</li> <li>No production has occurred from the deposit. Since September 2020 when mining commenced in the Western Strandline, a total of 1.6Mt has been mined from the South pit, with all material being stockpiled and not processed. This material was depleted from the updated mineral resource and reported as a stockpile.</li> </ul>

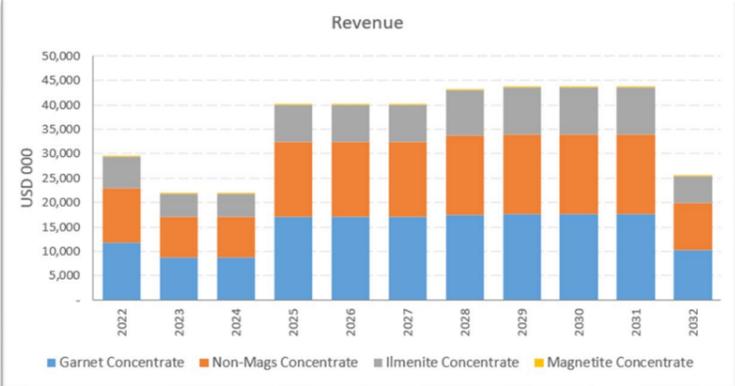
#### Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section)

Criteria	JORC Code Explanation	Commentary
<b>Mineral Resource estimate for conversion to Ore Reserves</b>	<ul style="list-style-type: none"> <li>Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.</li> <li>Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.</li> </ul>	<ul style="list-style-type: none"> <li>This Ore Reserve is based on the Measured and Indicated portion of the updated Mineral Resource at Tormin Western Strandline released on 7 December 2021.</li> <li>The Mineral Resource model is a 3D block model reported at 2%THM cut-off grade.</li> <li>Mineral Resources are reported inclusive of Ore Reserves.</li> </ul>
<b>Site visits</b>	<ul style="list-style-type: none"> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	<ul style="list-style-type: none"> <li>No site visits were undertaken for this Ore Reserves estimate due to COVID-19 travel ban.</li> </ul>
<b>Study status</b>	<ul style="list-style-type: none"> <li>The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.</li> <li>The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.</li> </ul>	<ul style="list-style-type: none"> <li>This study is assessed as being at a Pre-Feasibility Study level to support the Ore Reserve.</li> <li>The Pre-Feasibility Study evaluated geology and resource, mining, metallurgy, process plant and tailings, infrastructure and logistics, environment, human resources, marketing, implementation plan and schedule, capital and operating costs, financial assessment and other activities/issues that could impact the proposed operation as contained in the PFS report.</li> <li>Modifying factors accurate to the study level have been applied. The resulting mine plan is technically achievable and economically viable.</li> </ul>
<b>Cut-off parameters</b>	<ul style="list-style-type: none"> <li>The basis of the cut-off grade(s) or quality parameters applied.</li> </ul>	<ul style="list-style-type: none"> <li>A value model was developed that assigns mining and processing recoveries, costs, and revenue to the geological model. This value model follows the entire mining process from topsoil stripping to final rehabilitation.</li> <li>A cost/value model was formulated in Micromine optimisation software from a simplified cash flow script to generate at a block level all of the required attributes to calculate the cash flow grades for the proposed processing permutation for subsequent use in pit optimisation and strategic mine schedule optimisation.</li> <li>The basis for the application of the THM/VHM cut-off grade is a simplified variable cash flow per tonne. This approach provides the most mathematically efficient inputs to solve the objective function as used consistently in the optimisation models developed, which is to maximise the real, pre-tax NPV.</li> <li>Blocks where the cash flow per tonne is positive are designated ore and negative blocks are designated waste.</li> </ul>
<b>Mining factors or assumptions</b>	<ul style="list-style-type: none"> <li>The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).</li> <li>The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.</li> <li>The assumptions made regarding geotechnical parameters (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.</li> </ul>	<ul style="list-style-type: none"> <li>The pit shells were developed in Micromine optimisation tool using the variable cashflow cut-off grade estimated in the block model. The optimisation shells selected comprised 3 open pits, which initially target the higher value areas earlier in the mining plan. The stage pits are optimised on the Measured and Indicated material from the south pit and north pits.</li> <li>Mine scheduling has been done by using MineSched software.</li> </ul>

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	<ul style="list-style-type: none"> <li>The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).</li> <li>The mining dilution factors used.</li> <li>The mining recovery factors used.</li> <li>Any minimum mining widths used.</li> <li>The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.</li> <li>The infrastructure requirements of the selected mining methods.</li> </ul>	<ul style="list-style-type: none"> <li>Mining dilution was assumed 5% as all material within the mineralisation horizon is treated as ore due to the selective nature of mining.</li> <li>All the selected pit shells had detailed pit designs created which aligned with the shells.</li> <li>Inferred Mineral Resources were considered as waste.</li> <li>The deposits will be mined in multiple stages in a conventional open pit operation and will utilise conventional load-haul mining methods. Each panel will be mined using 70 tonne class excavators and 60 tonne class rigid frame trucks.</li> <li>A minimum mining width for pits of 50m is based on the use of CAT 773 E class trucks.</li> <li>Geotechnical assessment and recommendations provided by Middindi Consulting and MLB Consulting. Pit slopes assumed as 45 and 75 degrees depends on material types.</li> <li>Hydrogeological studies have been carried out by the Australian Environmental &amp; Mining Co (AEMCO) and Geohydrological impact assessment completed by Geohydrological and Spatial Solutions International (GEOSS).</li> <li>Ore to be excavated from open pits with an average depth of 15m and maximum depth of 30m. Ore is hauled to a Mobile Feed Unit (MFU) for transport to ore processing plant.</li> <li>Haul road widths designed to 20m for dual lane traffic and 11.5m for single lane, based on the use of CAT 773 E class rigid frame trucks, with all ramp gradients to be limited to 1:10 (10%).</li> <li>The high-grade nature of the deposit results in pit optimisation shell sizes increasing incrementally with revenue factor.</li> <li>Access to the area is straightforward and roads are available within Tormin mining area.</li> <li>The topography is smooth (about 3 degrees), and it is anticipated that no significant issues associated with mining are likely.</li> <li>Infrastructure requirements for the selected mining method are minimal. Annual material movement is planned to be limited to 2.5 Mt per annum for the first three years of operation (stage1) and maximum of 5Mt per annum after expansion (stage 2).</li> </ul> <div data-bbox="1184 1495 1944 1976" style="text-align: center;"> <p><b>Waste : Ore</b></p> <table border="1"> <caption>Approximate data from Waste : Ore chart</caption> <thead> <tr> <th>Year</th> <th>Inland Strand - Western Strandline S102 (Tonnes)</th> <th>Inland Strand - Western Strandline Outside S102 (Tonnes)</th> <th>Waste (Tonnes)</th> <th>Average HM grade</th> </tr> </thead> <tbody> <tr><td>2022</td><td>1,000,000</td><td>500,000</td><td>1,000,000</td><td>4.5</td></tr> <tr><td>2023</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.5</td></tr> <tr><td>2024</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.5</td></tr> <tr><td>2025</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>1.5</td></tr> <tr><td>2026</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>1.5</td></tr> <tr><td>2027</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>1.5</td></tr> <tr><td>2028</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.0</td></tr> <tr><td>2029</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.5</td></tr> <tr><td>2030</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.5</td></tr> <tr><td>2031</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.5</td></tr> <tr><td>2032</td><td>1,200,000</td><td>600,000</td><td>1,000,000</td><td>4.5</td></tr> </tbody> </table> </div> <ul style="list-style-type: none"> <li>The LOM average strip ratio is approximately 1.5:1 (Waste: Ore).</li> <li>Based on the block model, the total mined mine waste volumes are expected to be approximately 22.2 million cubic metres over ~10.5-years life of mine. This equates to 38 million tonnes of loose material at an average in-situ bulk density of 1.72.</li> </ul>	Year	Inland Strand - Western Strandline S102 (Tonnes)	Inland Strand - Western Strandline Outside S102 (Tonnes)	Waste (Tonnes)	Average HM grade	2022	1,000,000	500,000	1,000,000	4.5	2023	1,200,000	600,000	1,000,000	4.5	2024	1,200,000	600,000	1,000,000	4.5	2025	1,200,000	600,000	1,000,000	1.5	2026	1,200,000	600,000	1,000,000	1.5	2027	1,200,000	600,000	1,000,000	1.5	2028	1,200,000	600,000	1,000,000	4.0	2029	1,200,000	600,000	1,000,000	4.5	2030	1,200,000	600,000	1,000,000	4.5	2031	1,200,000	600,000	1,000,000	4.5	2032	1,200,000	600,000	1,000,000	4.5
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<b>Metallurgical factors or assumptions</b>	<ul style="list-style-type: none"> <li>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.</li> <li>Whether the metallurgical process is well-tested technology or novel in nature.</li> <li>The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.</li> <li>Any assumptions or allowances made for deleterious elements.</li> <li>The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.</li> <li>For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications?</li> </ul>	<ul style="list-style-type: none"> <li>The metallurgical process proposed comprises conventional gravity separation of heavy minerals using spirals. The metallurgical recovery is similar to other mineral sand operations.</li> <li>Metallurgical parameters have been taken from the metallurgical tests by Nagrom, Haver &amp; Boecker and Delchem, and metallurgical testworks results support the recovery. The VHM mineral assemblage, low slimes and oversize are fit for an economic extraction.</li> <li>Key design criteria are below:</li> </ul> <table border="1" data-bbox="1268 2466 1829 2769"> <thead> <tr> <th>Description</th> <th>ROM Grade (inc. Slimes) (%)</th> <th>HMC Grade (%)</th> <th>Recovery to HMC (%)</th> </tr> </thead> <tbody> <tr> <td>Zircon</td> <td>0.50</td> <td>2.53</td> <td>92</td> </tr> <tr> <td>Rutile</td> <td>0.25</td> <td>1.13</td> <td>82</td> </tr> <tr> <td>Ilmenite</td> <td>2.83</td> <td>14.35</td> <td>92</td> </tr> <tr> <td>Garnet</td> <td>4.27</td> <td>21.18</td> <td>90</td> </tr> <tr> <td>Magnetite</td> <td>0.16</td> <td>0.81</td> <td>92</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>The Ore Reserve estimation has been based on the recoveries and processes outlined from metallurgical testwork.</li> </ul>	Description	ROM Grade (inc. Slimes) (%)	HMC Grade (%)	Recovery to HMC (%)	Zircon	0.50	2.53	92	Rutile	0.25	1.13	82	Ilmenite	2.83	14.35	92	Garnet	4.27	21.18	90	Magnetite	0.16	0.81	92																																				
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<b>Environmental</b>	<ul style="list-style-type: none"> <li>The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.</li> </ul>	<ul style="list-style-type: none"> <li>48kt of ore have been processed in the MSR's Tormin processing plant in March quarter 2021 and its recovery parameters are used for optimisation</li> <li>Significant environmental assessment work has been undertaken. The deposit lies entirely within prospecting right (WC 30/5/1/1/2/10262 PR) and 36% of the Ore Reserve is within the 162 &amp; 163 Expanded Mining Right.</li> <li>Environmental impact assessment has been completed by SRK Consulting as an independent environmental consultant and environmental approvals have been granted for the 162 &amp; 163 EMR.</li> <li>Ecology, fauna, and flora studies were undertaken as part of the baseline assessment report to grant Integrated Environmental Authorisation (IEA) by the Ministry of Forestry, Fisheries and Environment.</li> <li>MSR implements dust suppression measures to reduce dust emissions from haul roads. A watercart continuously applies seawater to all internal and external haul roads as required, including the DR2225 public gravel road to Koekenaap. MSR will continue to implement dust suppression measures on haul roads.</li> <li>MSR has engaged GroundTruth to undertake a Biodiversity Management Plan (BMP).</li> <li>Environmental studies to support additional mining rights on prospecting right (WC 30/5/1/1/2/10262 PR) outside the 162 &amp; 163 Expanded Mining Right are in progress.</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.</li> </ul>	<ul style="list-style-type: none"> <li>Access to Tormin Mine is from Koekenaap via Robeiland and De Punt, or from Koekenaap via Kommandokraal and Schaapvlei. The gravel road extending the length of Farm Geelwal Karoo 262 is maintained by MSR and provides access to the processing plant.</li> <li>The Company owned Geelwal Karoo Farm 262.</li> <li>Diesel powered generator sets (gensets) are currently used at Tormin Mine to provide power to the Mine. Power is generated by 3 x 1250kVA gensets plus 1 standby unit with an installed power capacity of 3.75MVA. The gensets are containerised and located adjacent to the SCP and GSP.</li> <li>MSR has made an application to Eskom to provide power from the national grid to replace the current gensets and, more importantly, provide a cost-effective power supply option for the expansion plant and MSP. The future 10MVA power requirement is to utilise the adjacent wind energy facility. In this event, a 22kV underground powerline of approximately 4km will be installed from the Sere wind farm substation to a new MSR substation. CVG Consulting Engineers has been engaged for detail engineering work for this project.</li> <li>Obsideo Consulting has designed the tailing and water management plan to suit the expansion plant requirement.</li> <li>MSR utilises water from two sources, namely seawater for processing activities from the seawater intake located on the coast and fresh water for domestic purposes, the latter transported by truck to site from Lutzville. The current daily seawater intake rate is approximately 7.2 ml/d. Seawater is pumped from the seawater intake station located on the beach via a booster pump station to the aquaculture dam. Make-up water is pumped from the aquaculture dam to the process water dam which is located at the GSP/SCP. Process water from the SCP and GSP is discharged into the secondary process water dam for settling. The water is then recirculated back to the main process water storage dam for further use in processing. Excess process water is returned to the beach with the tailings as a slurry.</li> <li>The average tailings production is approximately 80% of ROM. Total anticipated tailings from inland mining, including slimes, will be approximately 0.7Mtpa for stage 1. Tailings will have a (seawater) moisture content of ~ 65% with the aim of extracting 100 % of free flowing (decant) water after settlement.</li> <li>Tailings will be pumped as a slurry from the processing plant and backfilled in the mine void. Tailings, including thickened slimes, from the processing plant will be pumped separately to the mining void for co-disposal. The tailings and thickened slimes will be allowed to settle in the containment cells. Clean water will be decanted from the containment cells and recycled to the processing plant for reuse in processing. Davies Lynn &amp; Partners has been engaged for technical studies of the tailings system.</li> <li>3D- Dig software used for tailing deposition planning and simulate Co-disposal into backfill and its long-term impact</li> <li>Backfilled tailings will be covered with returned (dry) overburden.</li> <li>Rehabilitation management plan and standard operation procedure has been prepared by Enviroworks.</li> <li>Rehabilitation will be undertaken as soon as the mining path allows. Backfilled tailings and returned overburden will be profiled to mimic</li> </ul>

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<b>Costs</b>	<ul style="list-style-type: none"> <li>The derivation of, or assumptions made, regarding projected capital costs in the study.</li> <li>The methodology used to estimate operating costs.</li> <li>Allowances made for the content of deleterious elements.</li> <li>The source of exchange rates used in the study.</li> <li>Derivation of transportation charges.</li> <li>The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.</li> <li>The allowances made for royalties payable, both Government and private.</li> </ul>	<p>original topography as closely as possible before topsoil is replaced for rehabilitation and reseeded, where required.</p> <ul style="list-style-type: none"> <li>MinSol Engineering and Obsideo Consulting have prepared a preliminary capital cost estimate for the Western Strandline Project based on Association for the Advancement of Cost Engineering cost estimation guidelines.</li> <li>The Project includes engineering, design, procurement, and construction of a 1.2Mtpa (base case, stage1) wet processing facility, using conventional crushing, scrubbing and gravity separation technology. Much of the processing plant and infrastructure required for the processing operation is already owned by MRC, with only minor modifications or upgrades required.</li> <li>The expansion stage has been considered for a 2.4Mtpa mining operation (stage2).</li> <li>The capital estimate for the process plant, infrastructure, associated equipment and project management costs is considered accurate to <math>\pm 20\%</math>.</li> <li>The total Project contingency is 15%. This contingency value is added to the direct and indirect cost components of the capital cost estimate. The purpose of the contingency is to make specific provision for unknowns within the Project scope to reduce the risk of cost over-runs. Contingencies do not include allowances for scope changes, escalations, or exchange rate fluctuations.</li> <li>The operating cost estimate for the Project includes all costs associated with processing, infrastructure, and site-based general and administration costs and has been prepared to an accuracy of <math>\pm 20\%</math>.</li> <li>Industry standards, quotations from vendors or information from the operating cost database and information from the process design criteria underlie the basis of the estimate.</li> <li>The operating costs have been compiled by MinSol Engineering from a variety of sources and additional consultants including: <ul style="list-style-type: none"> <li>Budget quotations received from suppliers</li> <li>Operating cost database</li> <li>Wages and salaries, general and administration costs</li> <li>Estimates based on industry standards from similar operations</li> <li>First principal estimates based on typical operating data</li> <li>The mining operating cost estimates have been prepared by MRC, with inputs from the mining contractor.</li> </ul> </li> <li>Royalties have been calculated at 5% of sales revenue payable to the government of South Africa.</li> <li>All amounts have been modelled in US dollars with foreign estimated inflows/outflows converted to US dollars at an average exchange rate forecast for the relevant transaction year. The forecast exchange rate of USD/ZAR 14.5 and USD/AUD 1.3 used reflects long term exchange forecasts with an accuracy of <math>\pm 10\%</math>.</li> </ul>																																			
<b>Revenue factors</b>	<ul style="list-style-type: none"> <li>The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns, etc.</li> <li>The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.</li> </ul>	<ul style="list-style-type: none"> <li>Revenue from the Project is derived from the sale of heavy mineral concentrates.</li> <li>The price assumptions are based on contracted sales agreements.</li> <li>Transport and treatment charges as well as other administration charges incurred on site are all based upon actual costs being incurred mining at Tormin site.</li> <li>Revenue estimates are based on independent market pricing and life-of-mine concentrate production of 320Ktpa at stage 1 and 630ktpa at stage 2.</li> </ul>  <table border="1"> <caption>Revenue (USD 000)</caption> <thead> <tr> <th>Year</th> <th>Garnet Concentrate</th> <th>Non-Mags Concentrate</th> <th>Ilmenite Concentrate</th> <th>Magnetite Concentrate</th> </tr> </thead> <tbody> <tr> <td>2021</td> <td>12,000</td> <td>10,000</td> <td>5,000</td> <td>3,000</td> </tr> <tr> <td>2022</td> <td>10,000</td> <td>8,000</td> <td>4,000</td> <td>2,000</td> </tr> <tr> <td>2023</td> <td>11,000</td> <td>9,000</td> <td>4,000</td> <td>2,000</td> </tr> <tr> <td>2024</td> <td>13,000</td> <td>11,000</td> <td>5,000</td> <td>3,000</td> </tr> <tr> <td>2025</td> <td>15,000</td> <td>14,000</td> <td>6,000</td> <td>4,000</td> </tr> <tr> <td>2026</td> <td>16,000</td> <td>15,000</td> <td>6,000</td> <td>4,000</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Forecast prices for heavy mineral products (2021-2026) were incorporated into the model.</li> <li>Revenue estimates are base case only.</li> </ul>	Year	Garnet Concentrate	Non-Mags Concentrate	Ilmenite Concentrate	Magnetite Concentrate	2021	12,000	10,000	5,000	3,000	2022	10,000	8,000	4,000	2,000	2023	11,000	9,000	4,000	2,000	2024	13,000	11,000	5,000	3,000	2025	15,000	14,000	6,000	4,000	2026	16,000	15,000	6,000	4,000
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<b>Market assessment</b>	<ul style="list-style-type: none"> <li>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.</li> </ul>	<ul style="list-style-type: none"> <li>The conditions of the global economy are key drivers for the mineral sand industry and its products. There is a clear correlation between economic welfare and consumption of titanium, garnet, and zircon feedstock. Demand for mineral sands products has historically been</li> </ul>																																			

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	<ul style="list-style-type: none"> <li>A customer and competitor analysis along with the identification of likely market windows for the product.</li> <li>Price and volume forecasts and the basis for these forecasts.</li> <li>For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</li> </ul>	<p>closely linked to growth in global GDP, which has grown at close to 3% per annum.</p> <ul style="list-style-type: none"> <li>Global demand for titanium feedstock is dominated by the TiO<sub>2</sub> pigment end use. By 2025, TZMI estimates that global demand for titanium feedstock will reach 8.7 million tonnes titanium dioxide (TiO<sub>2</sub>), which corresponds to a compound annual growth rate of 2.6%.</li> <li>Ilmenite and Zircon pricing has seen a significant uplift in the last 12 to 18 months. Zircon and Ilmenite prices continue to rise in 2022.</li> <li>Zircon concentrate for the month of October 2021 recorded a weighted average price of US\$650 per tonne CIF. China remains the largest importer of zircon concentrate, accounting for 99% of global demand.</li> <li>The price range of industrial garnet is based on the application, quality, quantity purchased, source and type. There are no terminal markets for garnet and no reliable published prices for products. Products are sold through negotiations between buyer and seller. US\$112 per tonne has been considered for garnet concentrate.</li> <li>MRC supplies circa 25% of the world's demand for garnet sands and is one of the top ten independent zircon and titanium feedstock suppliers.</li> <li>MRC has offtake agreements in place for garnet and existing customers for ilmenite and zircon products from its Tormin mineral sands mine. Product samples produced from the Project PFS test work indicate the product quality will meet customer requirements and have been assessed as such by potential customers.</li> <li>Price assumptions are cross referenced against TZMI assumptions over the coming years.</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.</li> <li>NPV ranges and sensitivity to variations in the significant assumptions and inputs.</li> </ul>	<ul style="list-style-type: none"> <li>The Project PFS NPV of US\$63 million is reported on a pre-tax, pre-debt, real basis using a 7% discount rate.</li> <li>A discount rate of 7% (real) was applied reflecting the weighted average cost of capital expected from debt funding the project.</li> <li>Economic analysis was carried out using established site costs for mining, geology, processing, and administration.</li> <li>Sensitivities of the NPV to changes in key assumptions have been analysed. These were run on the following key model assumptions: heavy minerals recovery, exchange rate, discount rate, operating costs, and capital costs. In each case, the sensitivities run was regarded as a possible downside scenario and a possible upside scenario based on the historic experience of mining projects.</li> <li>Sensitivity of concentrate sale price was not assessed due to the long term off take agreement in place between MSR and its partners.</li> <li>All cashflows have been prepared in real terms, assuming 2021 dollars, with no inflation of heavy minerals concentrate prices.</li> <li>The positive NPV confirms the economic extraction of the Ore Reserve.</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>The status of agreements with key stakeholders and matters leading to social licence to operate.</li> </ul>	<ul style="list-style-type: none"> <li>MSR has been operating at Tormin since 2014. The local community is generally familiar with the characteristics of mining, processing and product transport at Tormin, and there are other resource extraction operations within the district. Stakeholder consultation conducted to date has identified that the majority of the community is supportive of the Project.</li> <li>MSR is the most important workplace in the area, and it is an important part of the local economy of the district.</li> <li>Expansion of processing plant securing long term employment that contributes to the local and regional economies. Approximately 80 additional employment opportunities will be created by the mine expansion.</li> <li>Important social programs will be continued and extended as a result of the expansion. MSR's strong investment in the social and economic upliftment of Historically Disadvantaged South Africans ("HDSA") and the ongoing support of its Black Economic Empowerment ("BEE") partners in the Tormin Mineral Sands Operation will continue to grow under the proposed mine expansion.</li> <li>The Company has submitted and received approval for its future 2019 – 2023 Social Labour Plan from the DMRE, which underpins the Company's future commitment to local enterprise development, education, and infrastructure projects and initiatives. The total committed expenditure over five years is ZAR36.8 million.</li> </ul>
<b>Other</b>	<ul style="list-style-type: none"> <li>To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:</li> <li>Any identified material naturally occurring risks.</li> <li>The status of material legal agreements and marketing arrangements.</li> <li>The status of governmental agreements and approvals critical to the viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable</li> </ul>	<ul style="list-style-type: none"> <li>MSR has been operating successfully in the region for more than 8 years to date.</li> <li>Prospecting right (PR) 10262 was granted in January 2020 and there is a Mining Right (162&amp;163EMR) in place, granted on 30 June 2020 which covers a significant part of the Ore Reserve. All mineral permits associated with the Ore Reserves Estimate are in good standing.</li> </ul>

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	<p><i>grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.</i></p>	<ul style="list-style-type: none"> <li>The company is currently undergoing an application for the new Mining Right (MR) over the 10262 Prospecting Right outside of the current Mining Right (EMR).</li> <li>There is a reasonable expectation that the new MR will be issued well within the timeframe required for the proposed increase of production capacity by 2024 (stage 2).</li> <li>Other than the satisfactory completing of a new MR, there are no other known unresolved matters that are dependent on a third party that may materially impact the future exploitation of the reserve.</li> </ul>
<b>Classification</b>	<ul style="list-style-type: none"> <li><i>The basis for the classification of the Ore Reserves into varying confidence categories.</i></li> <li><i>Whether the result appropriately reflects the Competent Person's view of the deposit.</i></li> <li><i>The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).</i></li> </ul>	<ul style="list-style-type: none"> <li>The Mineral Resource classifies all mineralisation at Western Strandline as Measured, Indicated, and Inferred and 100% of the maiden Ore Reserve has been derived from Measured and Indicated Mineral Resources.</li> <li>The Ore Reserve includes Proven and Probable classifications. Probable reserves account for 27% of the total Ore Reserves and 0% of the Ore Reserves within the granted EMR, which supplies Stage 1 of the project.</li> <li>The classification reflects the Competent Person's view of the deposit.</li> <li>Pit optimisations and the proposed mining schedule are cognisant of the Mineral Resource classification.</li> </ul>
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of Ore Reserve estimates.</i></li> </ul>	<ul style="list-style-type: none"> <li>The Ore Reserve methodology and estimates has been reviewed internally as part of normal validation processes by MRC.</li> <li>Capital and operating costs has been reviewed by MRC prior to report by MinSol Engineering.</li> </ul>
<b>Discussion of relative accuracy/confidence</b>	<ul style="list-style-type: none"> <li><i>Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.</i></li> <li><i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> <li><i>Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</i></li> <li><i>It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>	<ul style="list-style-type: none"> <li>This is considered to be a maiden Ore Reserve Estimate under the guidelines of the JORC Code (2012) since this is the first reserve estimate completed in this project.</li> <li>The Ore Reserve has been peer reviewed internally and the Competent Person is confident that it is an accurate estimate of the maiden Ore Reserve.</li> <li>Mining and processing methods selected are typical for mineral sands and have been demonstrated in various other mineral sand operations. They are considered a low risk of impacting the Ore Reserves.</li> <li>To date, approximately 450Kt of ore has been mined from the Southern pit and stockpiled. The stockpiled ore indicated an excellent reconciliation with the Mineral Resource and Ore Reserve.</li> <li>There is a degree of uncertainty regarding geotechnical characterisation. The geotechnical pit slope assumptions are based on depth of pits to 30m. Further geotechnical work is recommended.</li> <li>The PFS provides a higher degree of confidence in the modifying factors than usual. Over eight years' profitable mining at Tormin gives confidence that the operation costs and product price expectations are realistic.</li> <li>All costs used in the optimisation and Ore Reserve process are supported by an extended operational history and actual results from MSR operation.</li> </ul>