SOVEREIGN METALS LIMITED

ASX ANNOUNCEMENT I 28 September 2023

KASIYA PRE-FEASIBILITY STUDY RESULTS

PFS CONFIRMS KASIYA AS A MAJOR CRITICAL MINERALS PROJECT DELIVERING INDUSTRY-LEADING ECONOMIC RETURNS AND SUSTAINABILITY METRICS

ECONOMIC HIGHLIGHTS

US$1,605M	**28%**	**US$415M**
After Tax NPV_8	After Tax IRR	Ave. Annual EBITDA
US$16Bn	**US$404/t**	**US$597M**
Total Revenue (initial modelled 25 years LOM)	Operating Cost (FOB Nacala per tonne of product)	Capex to 1st Production

PFS HIGHLIGHTS

- **"Market Leader" Position in Two Critical Minerals:**
  - Positioned to become the **world's largest rutile producer** at 222kt per annum for an initial 25 year life-of-mine (**LOM**)
  - Potentially **one of the world's largest natural graphite producers** outside of China at 244kt per annum
  - Natural rutile facing **significant global supply deficit** forecast to widen further considerably in the next 5 years[1]
  - Natural graphite market moving into deficit as **demand rapidly grows** in the lithium-ion battery and electric vehicle (**EV**) sectors
  - Initial Probable Ore Reserves declared of 538Mt, representing conversion of **only 30% of the total Mineral Resource**
  - **Substantial production rate and mine life upside exists** as the PFS modelling was limited to only 25 years
- **Highly Compelling Cost Profile:**
  - Cash operating costs of **US$404/t of product** will position Kasiya as the **lowest cost producer of rutile and graphite globally**
  - Increased capital to first production from the Expanded Scoping Study, is primarily due to bringing forward capital items previously planned for Stage 2 including a rail spur, full-scale water dam, integrated power and optimised graphite production, as well as generally enhanced engineering and global cost inflation

- **Industry-Redefining Environmental and Social Advantages:**
    - **Extremely low CO_2-footprint operation** incorporating climate-smart attributes including hydro-mining with renewables power solution
    - CO_2 emissions expected to be **lowest in class** versus existing and planned operations and versus alternative synthetic products
    - **Low-impact operation** with mineralisation at surface, zero-strip ratio, low reagent usage, simple process flowsheet and progressive land rehabilitation

- **Strong Support from the Government of Malawi:**
    - Government of Malawi has applauded the timely investment by Rio Tinto and marked it as a milestone towards realising the country's aspirations of growing the mining sector as a priority industry
    - PFS demonstrates Kasiya's potential to provide significant socio-economic benefits for Malawi including fiscal returns, job creation, skills transfer and sustainable community development initiatives
    - With mining being one of the key pillars for growth under Malawi's economic development strategy (Agriculture, Tourism, Mining - ATM Policy) and the potential for Kasiya to be a project of national significance, the Government has constituted an Inter-ministerial Project Development Committee to work alongside the Company to assist in the permitting processes

- **Optimisation with Strategic Investor Rio Tinto to Commence:**
    - Advancing into an optimisation phase prior to moving to the Definitive Feasibility Study (**DFS**) with support from the Company's strategic investor, Rio Tinto
    - Formal establishment of the Technical Committee with Rio Tinto

Managing Director, Dr Julian Stephens commented: *"The release of the Kasiya PFS marks another important step towards unlocking a major source of two critical minerals required to decarbonise global supply chains and to achieve Net-Zero.*

The Project benefits from existing high-quality infrastructure and inherent ESG advantages. Natural rutile has a far lower carbon footprint compared to other titanium feedstocks used in the pigment industry, and natural graphite is a key component in lithium-ion batteries – crucial to de-carbonising the global economy.

The high-quality of work completed and the results of the PFS demonstrates that Kasiya is a globally significant project that has the potential to deliver a valuable long-term source of low-CO_2 products and generate substantial economic returns with a forecast average EBITDA of US$415 Million per annum for the initial 25 years modelled. The Project is well positioned to be a large scale, multi-generational asset with significant opportunity for further upside as only 30% of the current mineral resource (MRE) is utilised in the PFS model.

Kasiya's compelling economics demonstrate the potential for industry-leading returns, even against the backdrop of global cost inflation.

The Company is looking forward to conducting an optimisation review in collaboration with new strategic investor, Rio Tinto and progressing to the Definitive Feasibility Study."

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Source:
1. TZ Minerals International Pty Ltd (TZMI)

KASIYA PFS OUTCOMES

Sovereign Metals Limited (**the Company** or **Sovereign**) is pleased to announce the results of the Pre-Feasibility Study (**PFS** or **Study**) for the Company's Kasiya Rutile-Graphite Project (**Kasiya** or **the Project**) in Malawi.

The PFS confirmed Kasiya as potentially a major critical minerals project with an extremely low CO_2-footprint delivering major volumes of natural rutile and graphite while generating significant economic returns.

The PFS is an Association for the Advancement of Cost Engineering International (**AACEI**) Class 3 estimate with an accuracy of -20% and +25%.

Table 1: Key Outcomes

Outcome	Unit	Kasiya
NPV_8 (real post-tax)	US$	US$1,605M
NPV_{10} (real post-tax)	US$	US$1,205M
IRR (post-tax)	%	28%
Capital Costs to First Production (Stage 1)	US$	US$597M
Expansion Capital (Stage 2)	US$	US$287M
Plant relocation	US$	US$366M
Operating Costs	US$/t mined	US$8.74
Operating Costs	US$/t product	US$404
Revenue to Cost Ratio	X	2.8
NPV_8 / Capital Costs to First Production	X	2.7
Throughput (Average LOM)	Mtpa	21.5
Modelled Life	years	25
Annual Production (Average LOM) – rutile	ktpa	222
Annual Production (Average LOM) – graphite	ktpa	244
Total Revenue (LOM)	US$	US$16,121M
Annual Revenue (Average LOM)	US$	US$645M
Annual EBITDA (Average LOM)	US$/year	US$415M
Payback – from start of production	years	4.3 years

LARGE-SCALE, LONG-LIFE AND HIGH-MARGIN OPERATION

Kasiya, located in central Malawi, is the **largest natural rutile deposit and second largest flake graphite deposit in the world**. Sovereign is aiming to develop a **low-CO_2 and sustainable operation** to supply highly sought-after natural rutile and graphite to global markets.

Kasiya has a geological benefit with both natural graphite and rutile hosted in soft, friable saprolite material at surface that can be mined, beneficiated, and purified with a considerably lower carbon footprint than hard-rock operations or synthetic graphite and synthetic rutile production.

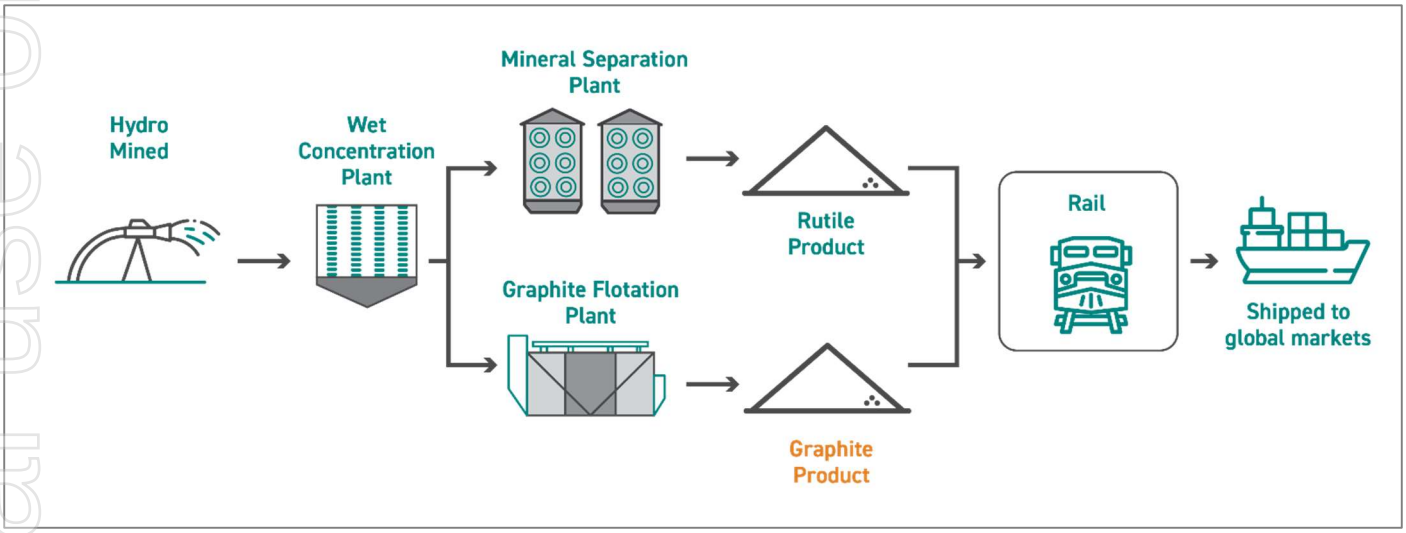

Figure 1: High-level schematic of the planned Kasiya Rutile-Graphite Project

The proposed large-scale operation will process 24 million tonnes of ore per annum to produce approximately 245kt of natural rutile and 288kt of natural graphite per annum once at steady state.

The rutile-graphite rich mineralisation will be extracted from surface utilising cost-effective hydro-mining to depths averaging 15m. Ore is transported as slurry via a pumping network to a Wet Concentration Plant (**WCP**) where a low-energy requirement, chemical-free process produces a Heavy Mineral Concentrate (**HMC**). The HMC is transferred to the dry Mineral Separation Plant (**MSP**) where premium quality rutile (+95% TiO_2) is produced via electrostatic and magnetic separation.

Graphite rich concentrate is collected from the gravity spirals and processed in a separate graphite flotation plant, producing a high purity, high crystallinity and high value coarse-flake graphite product.

The Project has excellent surrounding infrastructure including sealed roads, a high-quality rail line connecting to the deep-water port of Nacala on the Indian Ocean and hydro-sourced grid power. For the duration of the operation, rutile and graphite products will be railed directly from a purpose-built rail dry port at the mine site eastward via the Nacala Logistics Corridor (**NLC**) to the port of Nacala.

Based on the build-out strategy, the operation will commence in the southern section of the Ore Reserve with a 12Mtpa throughput plant which will be expanded from Year 6 to increase the throughput to 24Mtpa. As the southern mineralisation is exhausted, a new plant will be constructed in the north and the second stage WCP moved in order to continue to support 24Mtpa throughput.

CRITICAL RAW MATERIALS

Both rutile and graphite are critical to the world economy as well as crucial to decarbonisation solutions required to meet "Net-Zero" and other targets set by policymakers. Titanium and natural graphite have been classified as critical raw materials by the US and EU due to a combination of their scarceness and China-controlled supply chains.

Current sources of natural rutile are in decline as several operations' reserves are depleting concurrently with declining ore grades. These include Sierra Rutile's (SRL) Mine Area 1 in Sierra Leone and Base Resources' Kwale operations in Kenya.

Global rutile supply is projected to decline sharply beyond 2023, following the scheduled closures of Base Resource's Kwale and SRL operations unless mine life extension is approved (Source: TZ Minerals International Pty Ltd (TZMI). There are limited new deposits forecast to come online, and hence supply of natural rutile is likely to remain in structural deficit for the long term, even with Kasiya at full production.

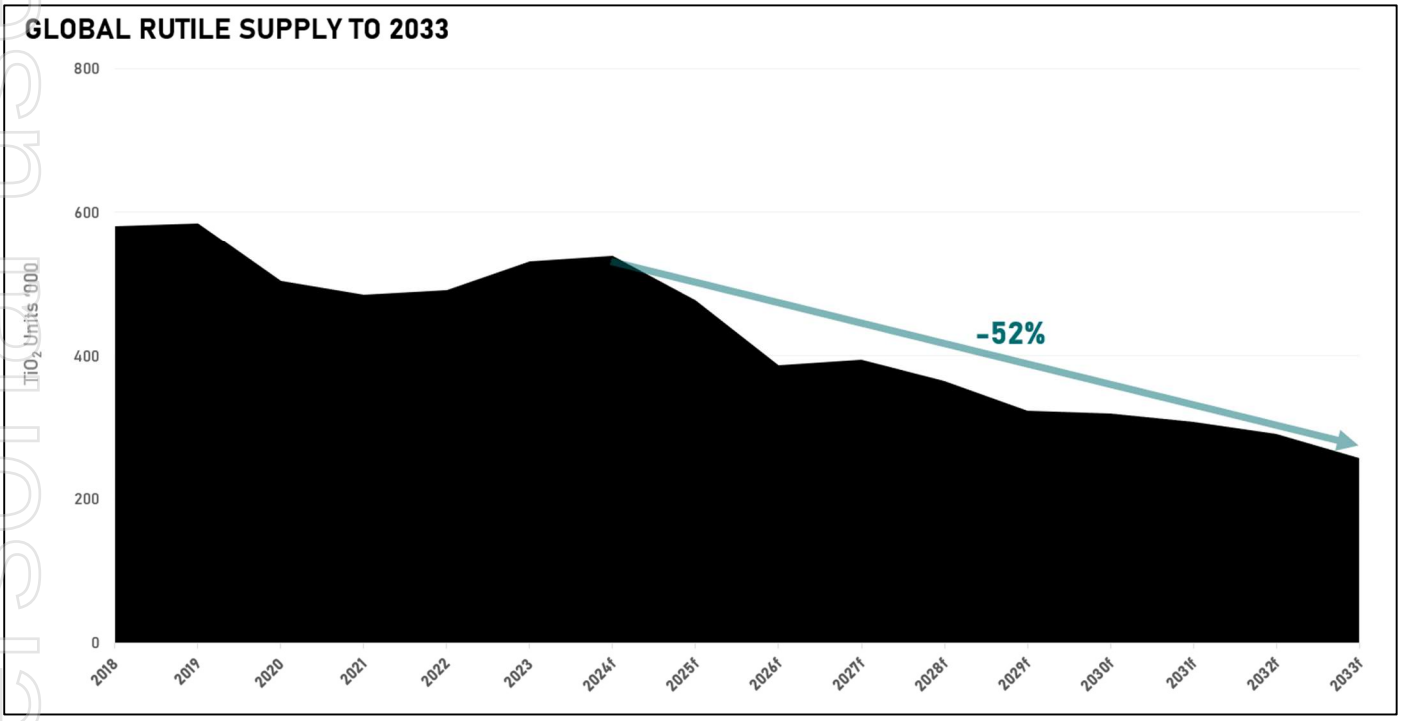

Figure 2: Previous and forecast global natural rutile supply 2018-2033
**Supply profile only reflects existing operations*
(source: TZMI)

Demand for high quality flake graphite and natural rutile is growing due to global decarbonisation requirements and current and future predicted supply deficits. Per Benchmark Mineral Intelligence, the demand for anodes grew by 46% in 2022 compared to only 14% growth in natural flake graphite supply.

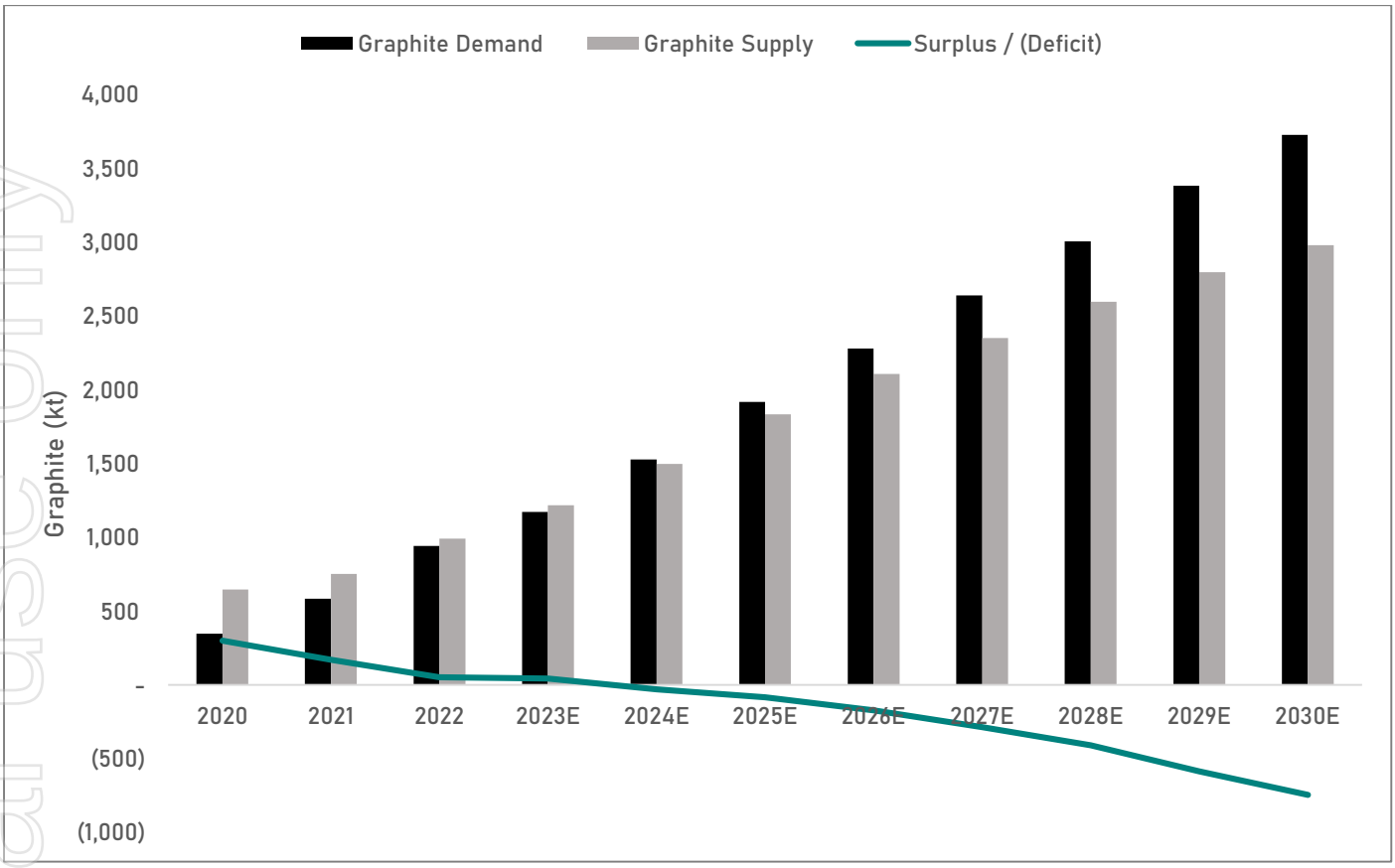

Figure 3: Graphite demand / supply showing market deficit beginning 2024E
Source: Macquarie Research (March 2023)

LOW-COST OPERATION

Kasiya's low operating costs are achieved through deposit size and grade, zero strip ratio from surface, location and excellent existing operational infrastructure. Kasiya is strategically located in close proximity to Malawi's capital city Lilongwe, providing access to a skilled workforce and industrial services.

Products will be exported to global markets via the deep water port of Nacala along the existing Nacala Logistics Rail Corridor (**NLC**). This existing infrastructure provides significant capital cost savings for Kasiya compared to many other undeveloped minerals projects.

Kasiya has an average life-of-mine FOB (Nacala) operating cost of US$404 per tonne of product produced (rutile plus graphite).

One of the highest Revenue : Cost of Sales Ratios in the Mineral Sands Industry

The revenue-to-cash cost ratio of 2.8x positions Kasiya in the first quartile compared to other undeveloped mineral sands operations. The production of high value natural rutile and graphite delivers strong cashflows with a cash margin of over 64% for the life of the operation.

The Study has applied conservative pricing assumptions for both products which still results in a strong position on the revenue to cost ratio metric. This supports the robustness of the Kasiya operation and its strong profitability during different pricing environments and the revenue stability of two different products with different demand drivers.

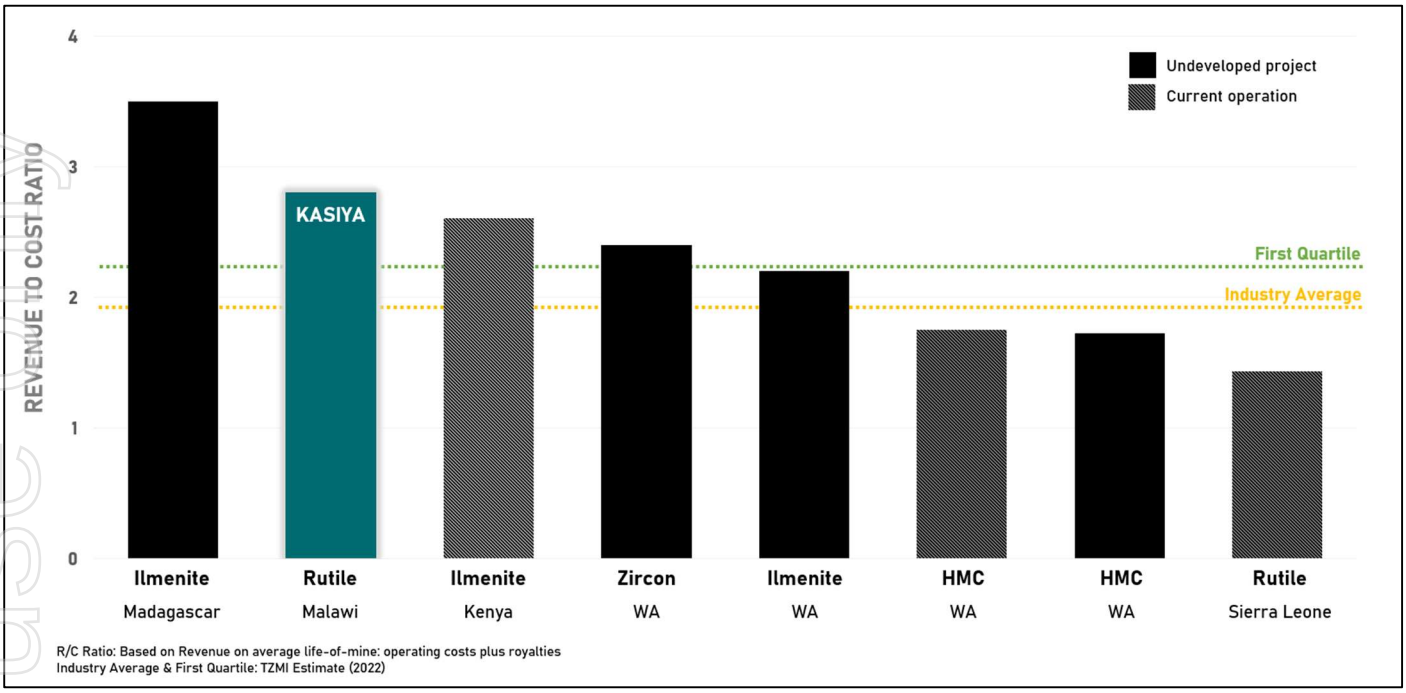

Figure 4: Revenue to cost ratio of Kasiya and other selected mineral sands projects
(Sources: see Appendix 2)

Lowest Cost Flake Graphite Project in the World

Graphite is produced at Kasiya via obtaining a graphite rich concentrate from the gravity spirals as part of the rutile processing. The graphite rich concentrate is then processed in a separate standard graphite flotation plant, producing a high purity, high crystallinity and high value coarse-flake graphite product.

On an incremental cost basis reflecting graphite production as a co-product to primary rutile production, the operating cost is US$182 per tonne of graphite produced (FOB Nacala).

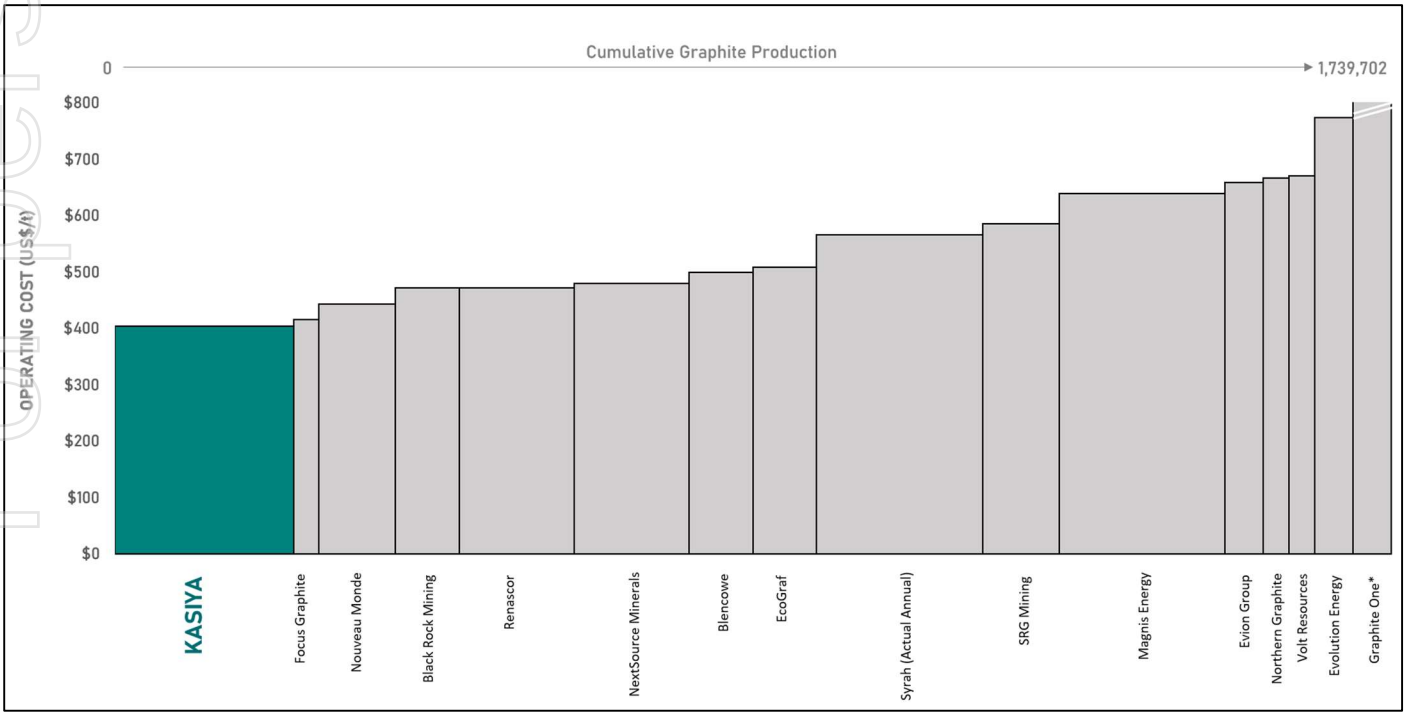

Figure 5: Actual and forecast graphite production (non-Chinese)
(Sources: See Appendix 3; All costs presented as FOB and exclusive of royalties)

LOW CO_2 ADVANTAGE

Kasiya has the potential to provide two products that both have very favourable low carbon in-use advantages. Benchmark Life Cycle Assessment (**LCA**) studies for natural rutile and natural graphite produced from Kasiya* have the potential for a substantially reduced carbon footprint compared to other titanium feedstocks and natural graphite products in the market.

Natural rutile (~95% TiO_2) is the cleanest, purest natural mineral form of TiO_2 with the other major source being ilmenite (~50% TiO_2). The genuine scarcity of natural rutile prompted the titanium industry to develop upgraded titanium feedstock products from ilmenite that can be used as substitutes for natural rutile (i.e. synthetic rutile and titania slag).

Two energy and carbon intensive processes are used by major market participants to produce the upgraded synthetic rutile and titania slag. Both methods use ilmenite (~$FeTiO_3$) as the raw feedstock and are essentially processes for the removal of iron oxide. The downstream pigment production process relies heavily on the use of these upgraded titanium feedstocks, each having an associated substantial environmental impact.

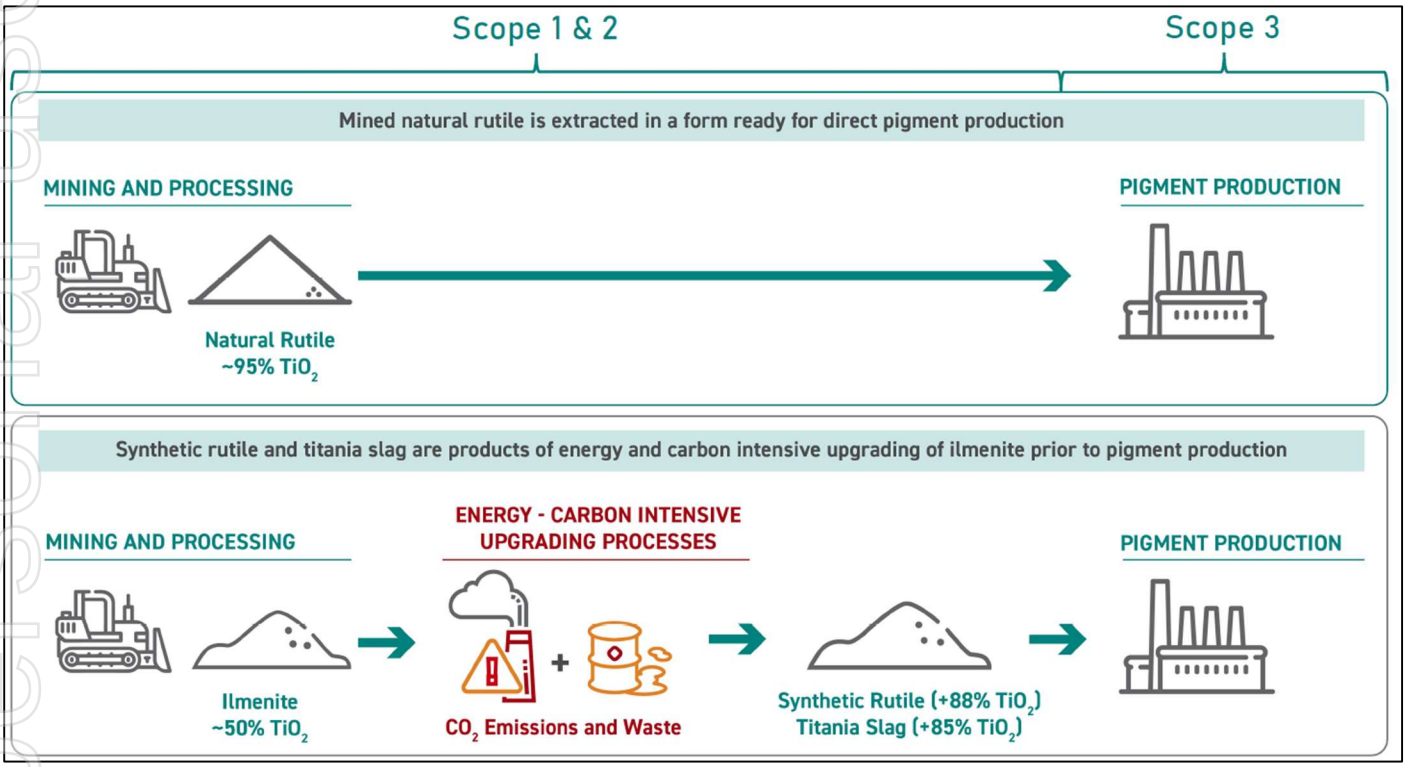

Figure 6: Natural rutile versus synthetic rutile and titania slag flowchart

Natural rutile produced at Kasiya has a fraction of the GWP of the alternative feedstocks. The Global Warming Potential (GWP) for natural rutile concentrate from Kasiya (0.1 t CO_2e per tonne) is significantly lower than producing titania slag in South Africa (2.0 t CO_2e per tonne) and producing synthetic rutile via the Becher process in Australia (3.3 t CO_2e per tonne).

The Scope 1 and 2 emissions comparing the carbon footprint of these three production routes are shown in Figure 6. The higher GWP for synthetic rutile is mainly due to the use of coal and other reagents for the upgrading of lower grade ilmenite to the final synthetic rutile feedstock product.

* LCA conducted on inputs from the Expanded Scoping Study released July 2022.

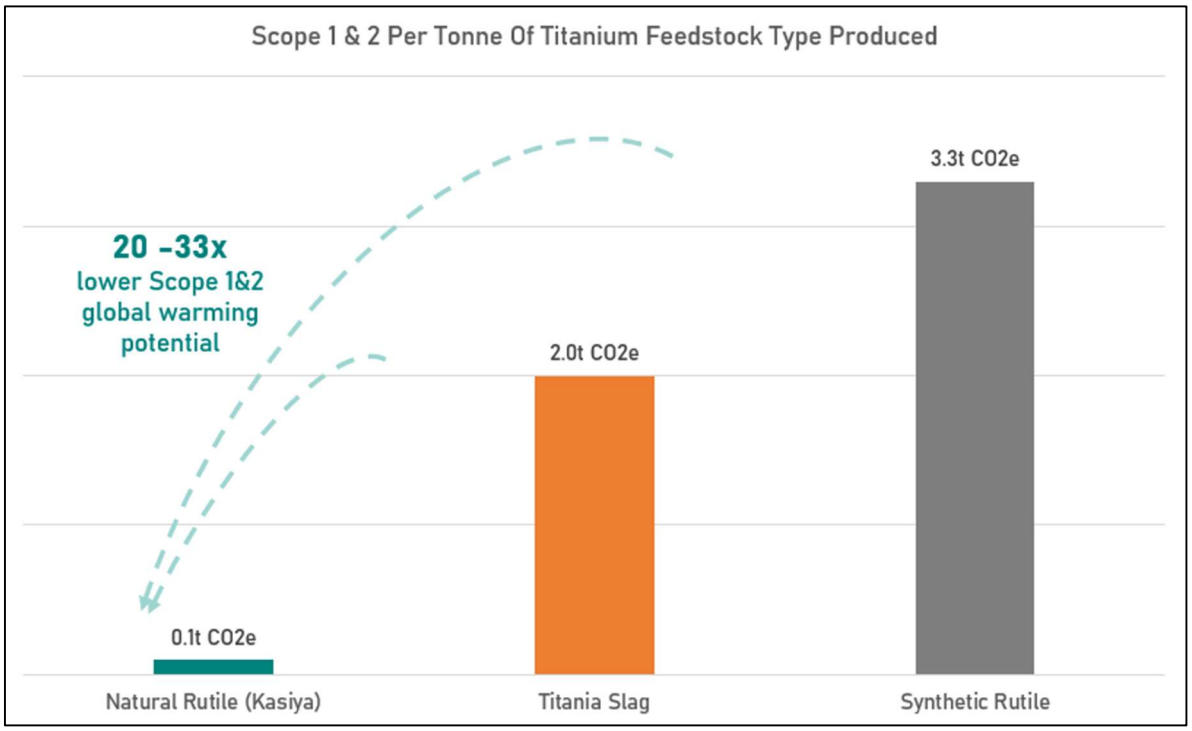

Figure 7: GWP impact of natural rutile production from Kasiya as a titanium feedstock vs. alternatives
(Source: Minviro)

Kasiya has the lowest GWP compared with currently known and planned future natural graphite projects:

- Up to 60% lower than currently reported GWP of graphite producers and developers, including suppliers to Tesla Inc.
- 3x less polluting than proposed Tanzanian natural graphite production from hard rock sources
- 6x less polluting than current Chinese natural graphite production which accounts for up to 80% of current global graphite supply

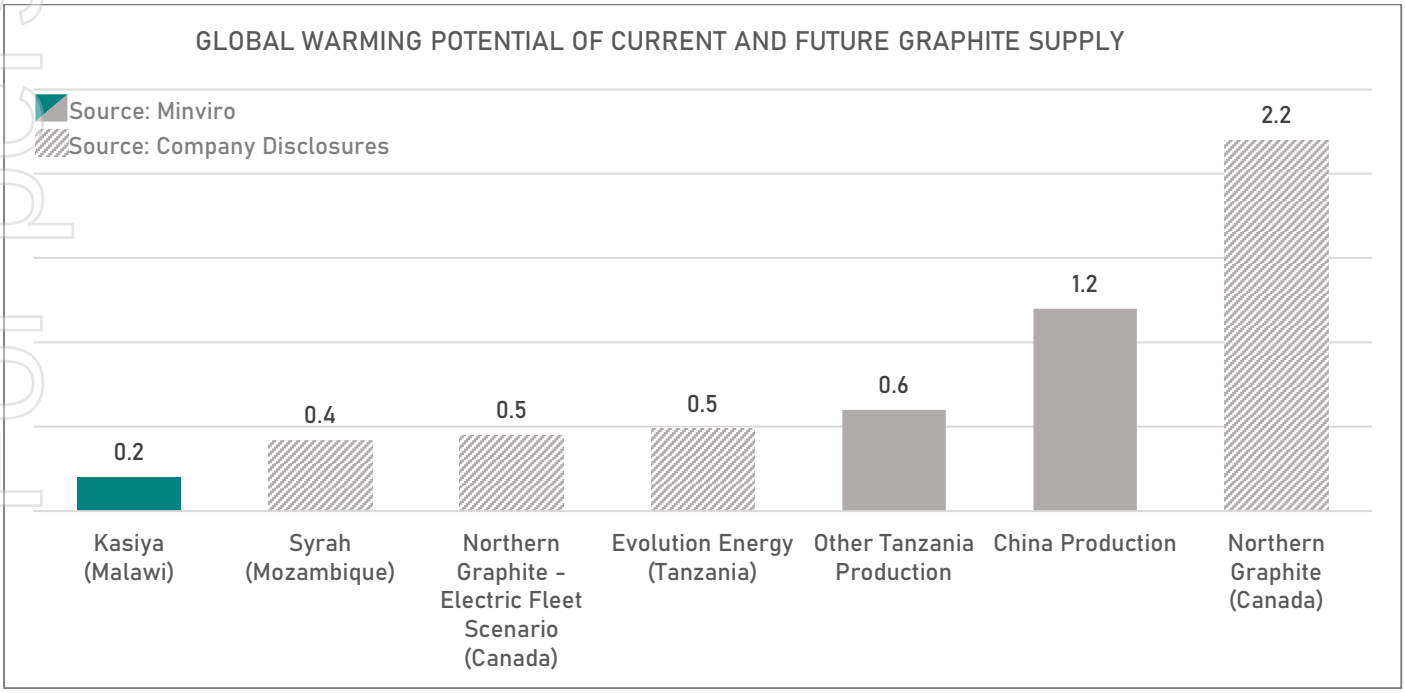

Figure 8: Global Warming Potential per tonne of graphite product (CO_2e/t)
(Sources: see Appendix 6)
(Note: All figures are cradle-to-gate except for Syrah Resources which includes transportation to the port of Nacala; transportation of Kasiya's graphite to the port of Nacala would add an estimated incremental $0.04CO_2e$ to its GWP)

Industry's interaction with supply chain participants indicates the progression towards higher proportions of natural graphite used in battery anodes will be supported by its lower cost and superior environmental credentials. The environmental footprint of EVs will become an increasingly important market consideration as EV penetration accelerates, noting that synthetic graphite has a carbon footprint orders of magnitude higher than flake graphite because it is made from needle coke produced from oil and coal refining via energy intensive processes.

Leading EV producer Tesla Inc.'s (**Tesla**) "Master Plan 3" outlines its proposed path to reach a sustainable global energy economy through end-use electrification and sustainable electricity generation and storage. In the plan, Tesla suggests that the world would need to produce 10.5Mt of graphite per year and estimates US$104 Billion of new graphite mining investment is required to achieve its target (source: Tesla Master Plan 3 (April 2023)).

STRONG GOVERNMENT SUPPORT

The Malawian government identifies mining as one of the sectors that could potentially generate economic growth for the country. The country has several significant mineral resources that could be sustainably mined to contribute to Malawi's economic goals.

Kasiya has the potential to deliver significant social and economic benefits for Malawi including fiscal returns, job creation, skills transfer and sustainable community development initiatives.

The Government of Malawi strongly supports Sovereign and its development of the Kasiya project. Malawi's Minister of Mines and Minerals, The Honourable Monica Chang'anamuno, recently publicly applauded the timely investment by Rio Tinto and marked it as a milestone towards realising the country's aspirations of growing the mining industry as promoted in the Malawi Vision 2063, which isolates mining as a priority industry.

With mining being one of the key pillars for growth under Malawi's economic development strategy (Agriculture, Tourism, Mining - ATM Policy) and the potential for Kasiya to be a project of national significance, the Government has constituted an Inter-ministerial Project Development Committee to work alongside the Company to assist in the permitting processes.

INVESTMENT BY RIO TINTO

In July 2023, Rio Tinto made an investment in Sovereign resulting in an initial 15% shareholding and options expiring within 12 months of initial investment to increase their position to 19.99%. Under the Investment Agreement, Rio Tinto will provide assistance and advice on technical and marketing aspects of Kasiya including with respect to Sovereign's graphite co-product, with a primary focus on spherical purified graphite for the lithium-ion battery anode market.

The Company is planning to commence optimisation phase prior to advancing to the DFS. Sovereign is soon to establish a Technical Committee and commence the working relationship with Rio Tinto after the publication of this Study.

SOVEREIGN METALS LIMITED

KASIYA RUTILE-GRAPHITE PROJECT
PRE-FEASIBILITY STUDY

TECHNICAL SUMMARY

The PFS has confirmed Kasiya as a major critical minerals project with an extremely low CO_2-footprint delivering substantial volumes of natural rutile and graphite to market while generating significant economic returns.

The proposed large-scale operation will commence with 12Mt per annum throughput (Stage 1) and expand to 24Mt per annum throughput (Stage 2). At full-scale Kasiya is poised to produce approximately 245kt of natural rutile and 288kt of natural graphite per annum.

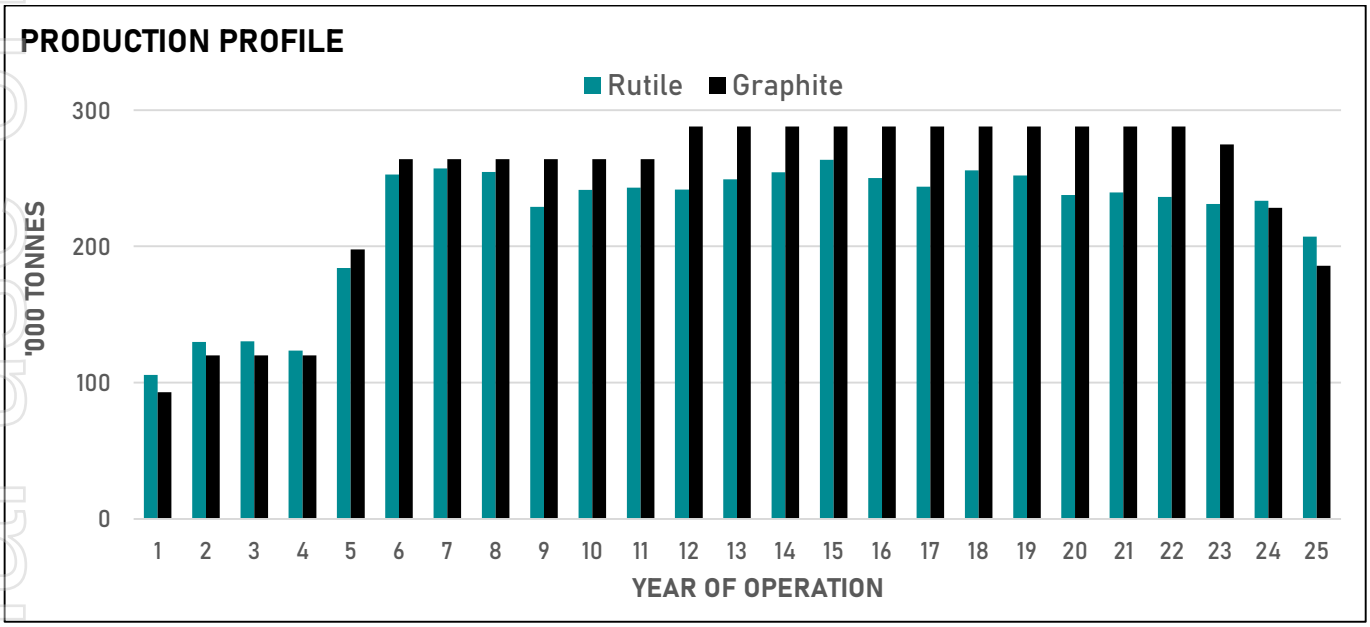

Figure 9: Rutile and graphite production profile modelled in the PFS

The Project uses a pumping and piping network system to transport ore, concentrate, water and tailings across the operation. Sovereign used the services of Paterson and Cooke for the PFS, global leaders in this field with over 30 years of experience designing slurry pipeline systems.

The rutile-graphite rich mineralisation will be extracted from surface by cost-effective hydro-mining to pit depths averaging 15m. Ore is slurried and transported via the pipe network to a conventional Wet Concentration Plant (**WCP**) where gravity separation - a low-energy and chemical-free process - produces a Heavy Mineral Concentrate (**HMC**). The HMC is transferred to the dry Mineral Separation Plant (**MSP**) where premium quality rutile (+95% TiO_2) is produced via electrostatic and magnetic separation.

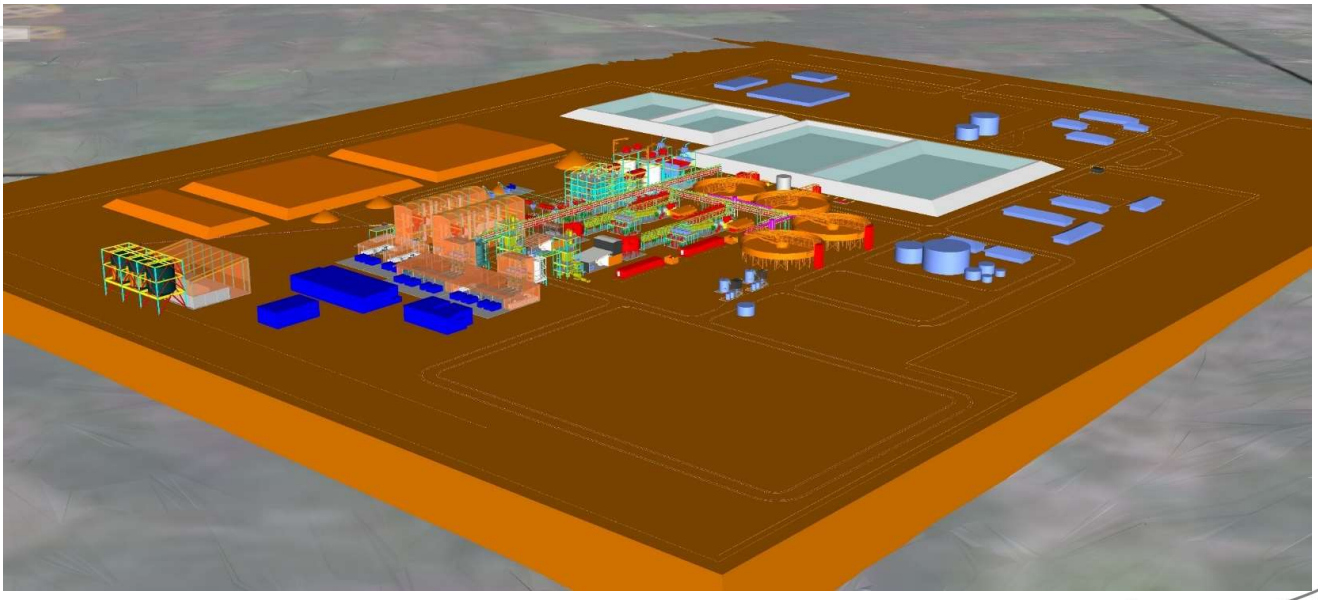

Figure 10: 3D Model of the 24Mtpa plant site

Graphite rich concentrate is collected from the WCP and processed in a separate graphite flotation plant, producing a high purity, high crystallinity and high value coarse-flake graphite product.

The mining plan for Kasiya has been designed to minimise social and environmental impact. The operation will systematically extract and process ore then progressively rehabilitate the pits in order to minimise the overall disturbance of land resources, as well as reducing the overall mining footprint over the LOM.

Figure 11: Example of overland pipes the concept planned for Kasiya
(Source: Paterson & Cooke)

STUDY PARTNERS

The PFS used information and assumptions provided by a range of independent, internationally recognised industry leading specialists and consultants, including the following who have carried out key components of the Study;

DRA **Lead study manager**	Nyeleti Engineered to Excel; AGE **Hydrology/Hydrogeology**
PLACER CONSULTING PL **Mineral Resource Estimate (MRE)**	DHAMANA consulting; HEARTHSTONE SOCIAL CONSULTING **Environment and Social**
orelogy™ an idoba company **Ore Reserve, Mine scheduling and pit optimisation**	Agreenco **Rehabilitation**
FRASER ALEXANDER **Mining method and tailings management**	JCMPOWER **Power**
Paterson & Cooke **Overland pumping**	TZMI **Marketing – rutile**
epoch resources **Tailing storage and disposal**	Fastmarkets **Marketing – graphite**
AML **Metallurgy – rutile**	thelo DB Railways for Africa; NACALA LOGISTICS; GRINDROD **Logistics**
ALS; SGS **Metallurgy – graphite**	MINVIRO **Life Cycle Assessments**

GEOLOGY

The Kasiya Rutile-Graphite deposit is in an area northwest of Malawi's capital of Lilongwe called the Lilongwe Plain. The topography is flat to gently undulating and the underlying geology is dominated by paragneiss with pelitic, psammitic and calcareous units.

A particular paragneiss unit rich in rutile and graphite is the primary source of both minerals. The high-grade rutile deposit at Kasiya is best described as a residual placer. It is formed by weathering of the primary paragneiss host rock and concentration in place of the heavy minerals such as rutile, as opposed to the high-energy transport and concentration of heavy minerals in a traditional placer.

Rutile mineralisation lies in laterally extensive, near surface, flat "blanket" style bodies in areas where the weathering profile is preserved and not significantly eroded. Kasiya shows widespread, high-grade mineralisation commonly grading 1.2% to 2.0% rutile in the top 3-5m from surface. Moderate grade mineralisation generally grading 0.5% to 1.2% rutile commonly extends from 5m to the base of the soft saprolite unit to generally 20-25m depth where it terminates on the hard saprock basement.

Graphite generally occurs in broad association with rutile. However, it is depleted in the top 3-5m and therefore can often show an inverse grade relationship with rutile in the near-surface zones. At depths generally greater than 5m a more consistent rutile-graphite grade relationship exists.

MINERAL RESOURCE & ORE RESERVE

Kasiya is the largest rutile deposit in the world with more than double the contained rutile of its nearest rutile peer, Sierra Rutile (Figure 12). Additionally, the graphite MRE at Kasiya places it as the second largest flake graphite deposit in the world (Figure 13).

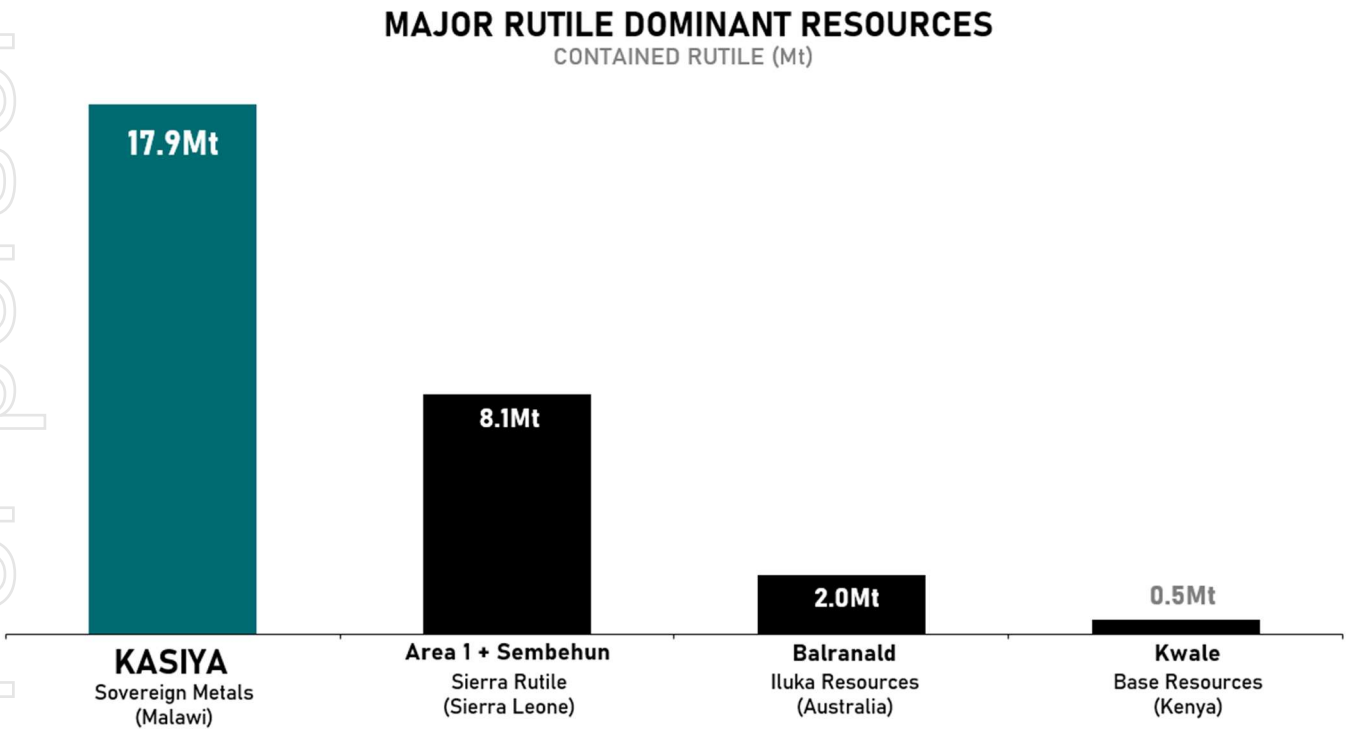

Figure 12: Major rutile dominant resources by contained rutile
(Tonnages inclusive of Ore Reserves)
(Sources: refer to Appendix 4)

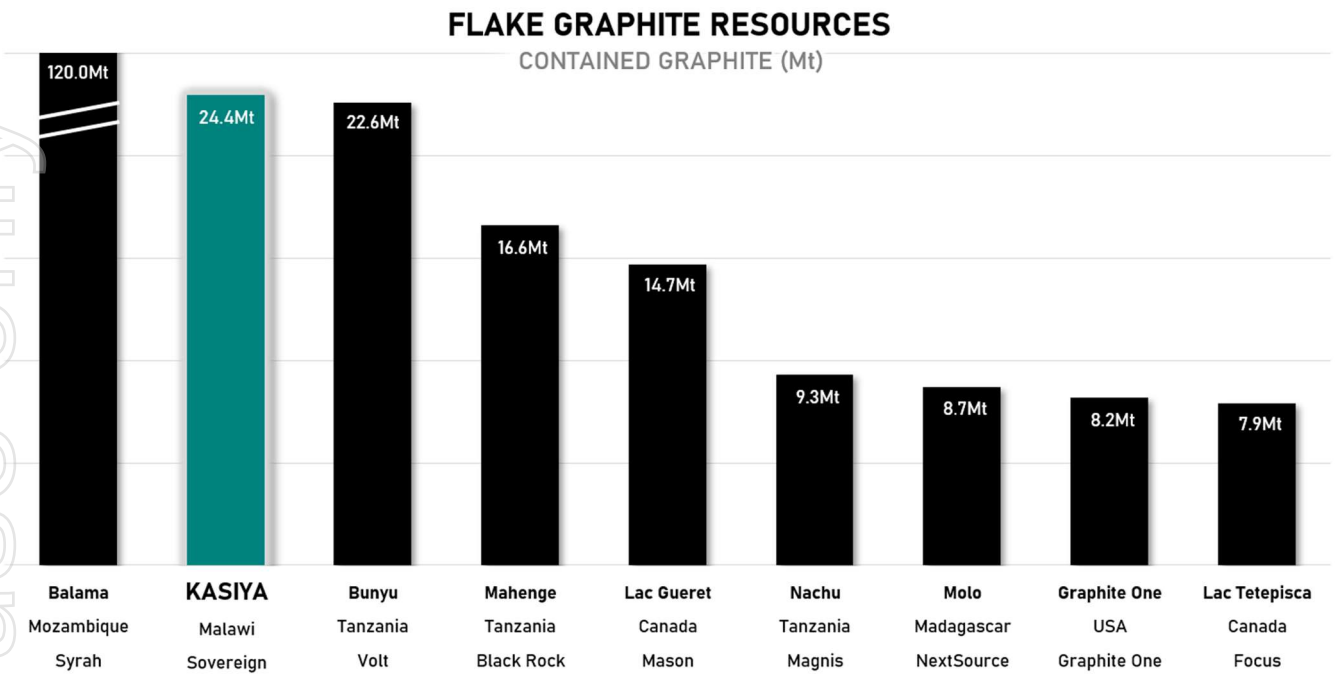

Figure 13: Major listed global flake graphite resources by contained flake graphite
(Tonnages inclusive of Ore Reserves)
(Sources: refer to Appendix 5)

The Kasiya Mineral Resource Estimate (**MRE**) has been prepared by independent consultants, Placer Consulting Pty Ltd (**Placer**), and is reported in accordance with the JORC Code 2012 (Table 2).

Table 2: Kasiya Mineral Resource Estimate at 0.7% Rutile Cut-off (inclusive of Ore Reserves)

Mineral Resource Category	Material Tonnes (millions)	Rutile (%)	Rutile Tonnes (millions)	Graphite (TGC%)	Graphite Tonnes (millions)	RutEq. Grade* (%)
Indicated	1,200	1.0%	12.2	1.5%	18.0	1.9%
Inferred	609	0.9%	5.7	1.1%	6.5	1.6%
Total	**1,809**	**1.0%**	**17.9**	**1.4%**	**24.4**	**1.8%**

* RutEq. Formula: Rutile Grade x Recovery (100%) x Rutile Price (US$1,484/t) + Graphite Grade x Recovery (67.5%) x Graphite Price (US$1,290/t) / Rutile Price (US$1,484/t). All assumptions are taken from this Study ** Any minor summation inconsistencies are due to rounding

The MRE has defined very broad and contiguous zones of high-grade rutile and graphite which occur across a very large area of over 201km^2.

Sovereign's 2022 drill program at Kasiya used push tube (**PT**) core holes to in-fill and convert Inferred mineralisation into the Indicated category. The consistency and robustness of the geology allowed for an efficient conversion of this previously Inferred material on a near-identical one-for-one basis to the Indicated category.

Further advancement of the MRE in 2023 was the application of air-core (**AC**) drilling to define the depth of mineralisation in several selected higher-grade areas. As expected, this drilling shows that high-grade rutile and graphite mineralisation extends to the base of the soft saprolite unit terminating on the saprock basement averaging about 22m depth. This AC drilling targeted early-scheduled mining pits mainly in the southern areas of the MRE footprint.

The higher-grade graphite zones identified at depth in the AC drilling are generally associated with higher grade rutile at surface. Some of these zones have graphite grades at depths >6m in the 4% to 8% TGC range and represent significant contained coarse flake graphite tonnages.

Based on the Modifying factors outlined in the PFS, a maiden Ore Reserve of 538Mt has been declared as summarised in Table 3below.

Table 3: Ore Reserve for the Kasiya Deposit as of September 2023

Classification	Tonnes (Mt)	Rutile Grade (%)	Contained Rutile (Mt)	Graphite Grade (TGC) (%)	Contained Graphite (Mt)	RutEq. Grade* (%)
Proved	-	-	-	-	-	-
Probable	538	1.03%	5.5	1.66%	8.9	2.00%
Total	**538**	**1.03%**	**5.5**	**1.66%**	**8.9**	**2.00%**

* RutEq. Formula: Rutile Grade x Recovery (100%) x Rutile Price (US$1,484/t) + Graphite Grade x Recovery (67.5%) x Graphite Price (US$1,290/t) / Rutile Price (US$1,484/t). All assumptions are taken from this Study ** Any minor summation inconsistencies are due to rounding

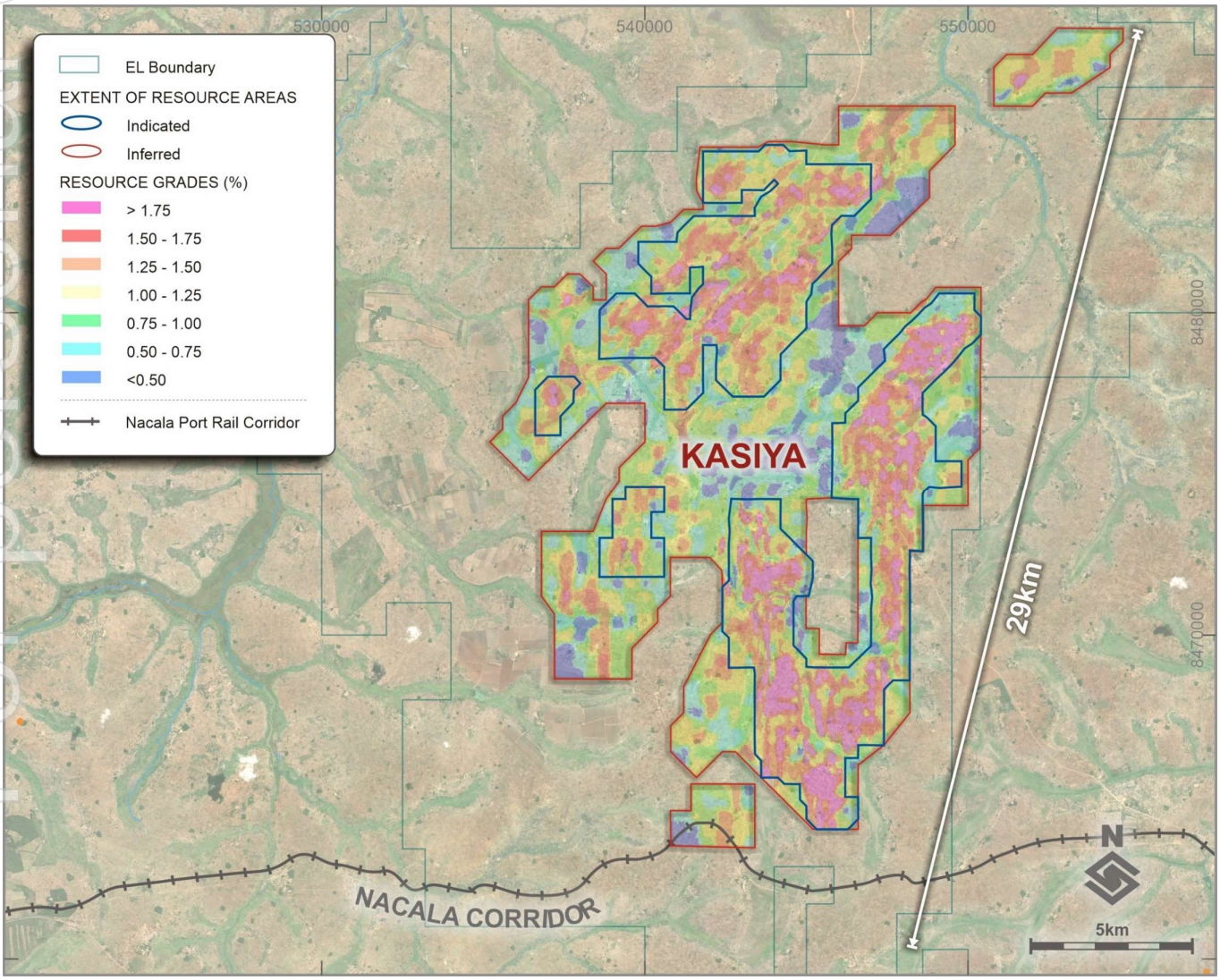

Figure 14: Kasiya MRE showing rutile grades in the uppermost part of the block model and Indicated and Inferred areas

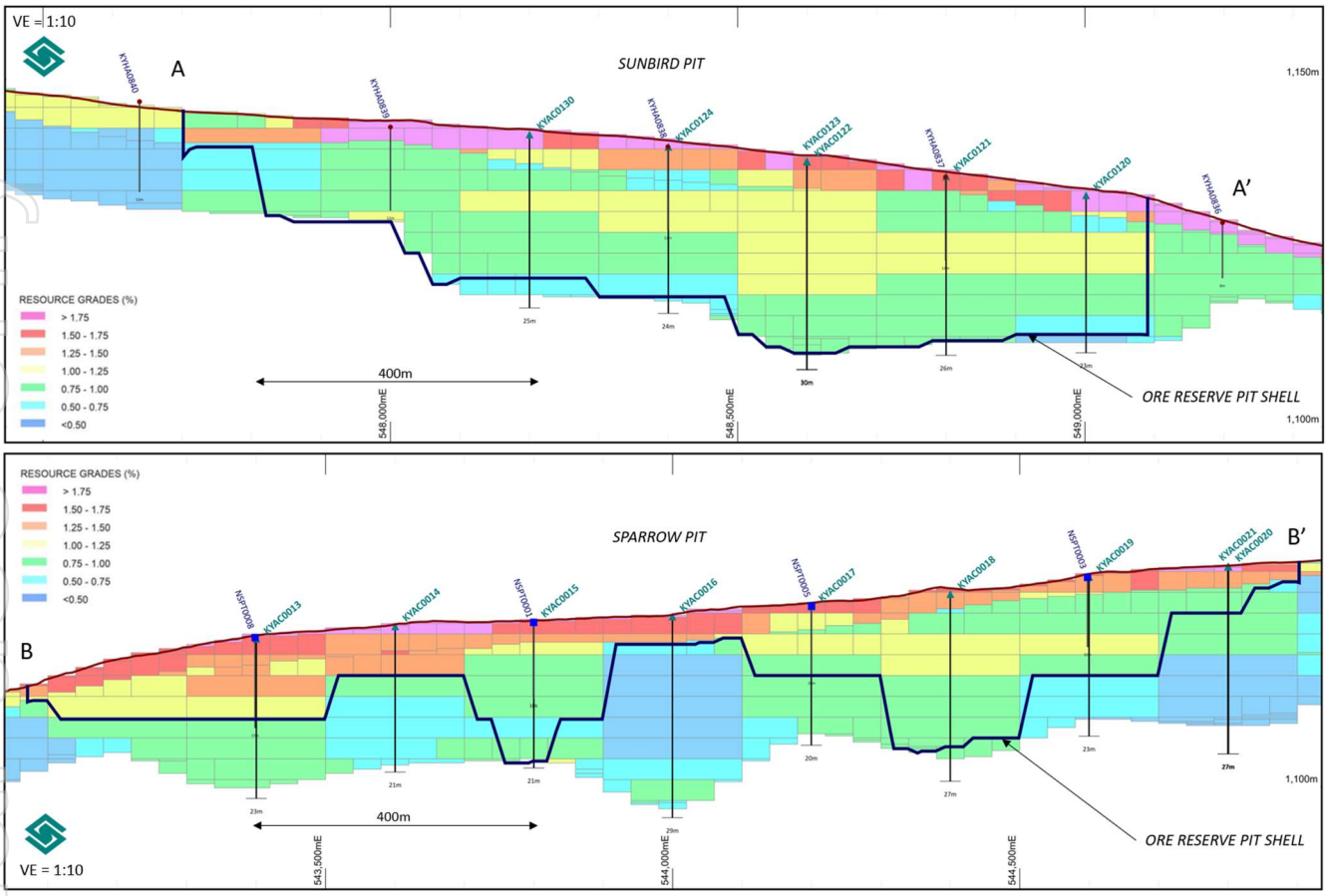

Figure 15: A-A' & B-B' cross-sections from new mineralised zones in the east and southern parts of the MRE block model showing colouring by rutile grade (see Figure 17 for legend & Figure 21 for cross-section locations)

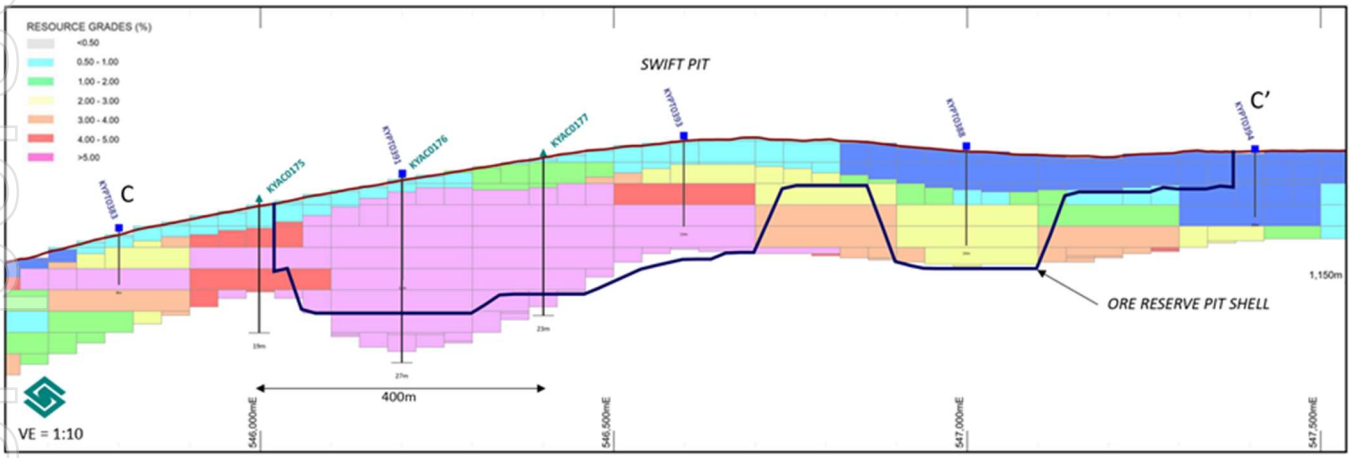

Figure 16: C-C' cross-section from the southern part of the MRE block model in a higher-grade graphite zone showing colouring by graphite grade (TGC) (see Figure 17 for legend & Figure 21 for cross-section locations)

MINING

Selection of Mining method

Mining options were evaluated in detail during the PFS to determine the best suited mining method for the operation. The criteria for selection were based not only on capital and operating cost, but ESG considerations and infrastructure requirements. Sovereign performed testwork on ROM material and conducted an independent assessment and trade-off analysis for several common mining methods. The outcomes of this work performed resulted in hydro mining being determined as the optimal method for mining soft, friable pedolith and saprolite of the Kasiya rutile-graphite deposit.

The preference for hydro mining at Kasiya is due to the consistent particle size distribution through the Ore Reserve, favourable operating and capital costs, low carbon footprint and air pollution (low dust and no diesel emissions) as well as the support infrastructure and water availability in the project area.

The Company engaged Fraser Alexander, a highly experienced mining contractor and consultancy specialising in hydro-mining to provide engineering and cost inputs for hydro-mining in the PFS.

The Project will utilise hydro mining as the primary mining methodology for extraction of the Ore Reserve. Hydro mining uses high-pressure jets of water to dislodge loose, friable material types such as the pedolith and saprolite at Kasiya. The resulting slurry is then transported to the processing facility via a network of pipelines/pumps designed by Paterson and Cooke.

Figure 17: Semi-autonomous track mounted hydro-mining mining unit, top-down mining method
(Source: Fraser Alexander)

Dry methods are required to push approximately 11% of the Ore Reserve material prior to hydro-mining. These are the "basins" of the hydro mining areas which need selective "floor clean-up" dozer pushing.

Hydro mining is a proven technology and has been successfully applied on heavy mineral sand operations in Africa including at Base Resources' Kwale project in Kenya and Tronox's Fairbreeze and Hillendale projects in South Africa.

The pedolith and saprolite-hosted mineralisation at Kasiya is largely homogenous and has relatively consistent physical properties throughout the MRE and contained Ore Reserve. The material competence is described as loose and friable, soft and well weathered with no cemented particles or dense clay layers. The particle size distribution (**PSD**) is favourable for hydro-mining due to its high content of -45µm fines. The material is conducive to hydro-mining as the fines effectively increase the viscosity of the slurry created, which enhances the slurry's ability to carry sand and heavy mineral particles.

Design

Hydro-mining is defined as the excavation of material from its in-situ state using pressurised water. A stream of high-pressure water is directed at the ore with the purpose of mechanically breaking and softening the material so that it can be carried away by the created gravitational slurry flow. The application or effectiveness of the method is a function of a variety of factors ranging from the diameter, velocity and flow volume of the water stream to the location, hardness, particle size and moisture content of the material to be mined.

At full production the hydro-mining system consists of pumps and piping for twelve modular movable hydro-mining units (HMUs), on a six duty and six standby basis. A modular HMU consists of four high-pressure (HP) water pumps on skids with piping feeding two e-ROMUs (electrically driven remotely operated monitor units), on a one duty and one standby basis. Slurry created flows gravitationally in an open launder through a 30mm mechanical boom screen into a sump where a vertical spindle pump mounted on a barge feeds in-pit slurry booster pumps on skids. HDPE (high-density polyethylene) piping feeds one ex-pit moveable vibrating screen with 2mm aperture.

Figure 18: Semi-automated, track mounted, top-down hydro-mining in operation
(Source: Paragon)

The oversize is backfilled in the pit void and the slurry transfer pumps and piping system feed the screen undersize (i.e., plant feed) WCP.

Hydro-mining for the PFS is based on the top-down methodology. The top-down operational method has advantages in terms of safety, achieving and maintaining design slurry densities, achieving and maintaining design production rates and ease of planning and control.

For mine planning, mine scheduling and sequencing purposes a 100m x 100m grid is used as a base with 200m x 1,000m blocks allocated per HMU. For most areas between 5-15m ultimate pit depth, mining starts at the lowest basin level, with the mining progression moving upstream for slurry gravitational launder flow and seepage and stormwater to freely drain downstream away from the mining face.

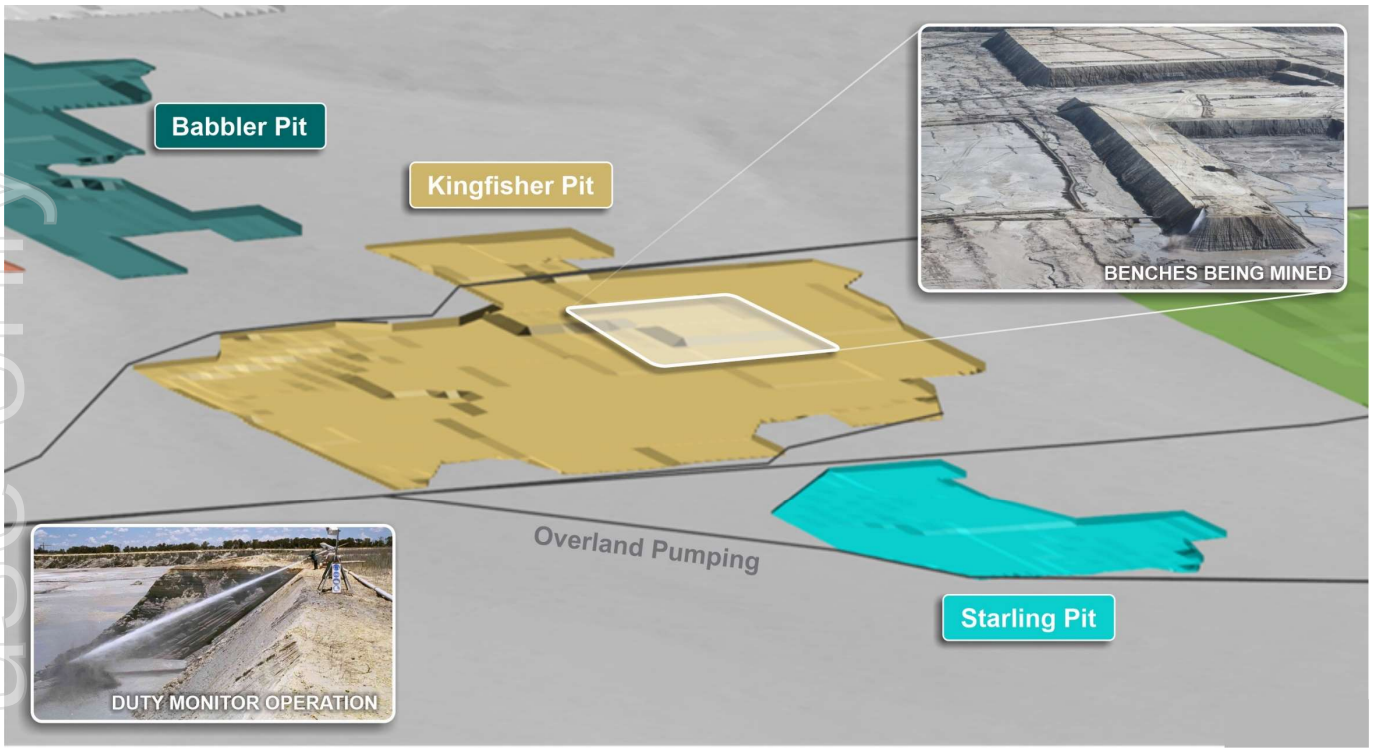

Figure 19 Hydro-mining concept and layout for Kasiya

Mine Scheduling

Based on the mining inventory a schedule by area was developed based on the following criteria:

- Production to start in the southern domain.
- Mining of up to 4 Pits simultaneously utilising the flexibility of hydro mining.
- Ramp up in Year 1 of production to a plant throughput a 12 Mtpa. A subsequent ramp-up to 24 Mtpa in Year 5 to Year 7, maintaining 24 Mtpa throughput for the remaining 25 year operation

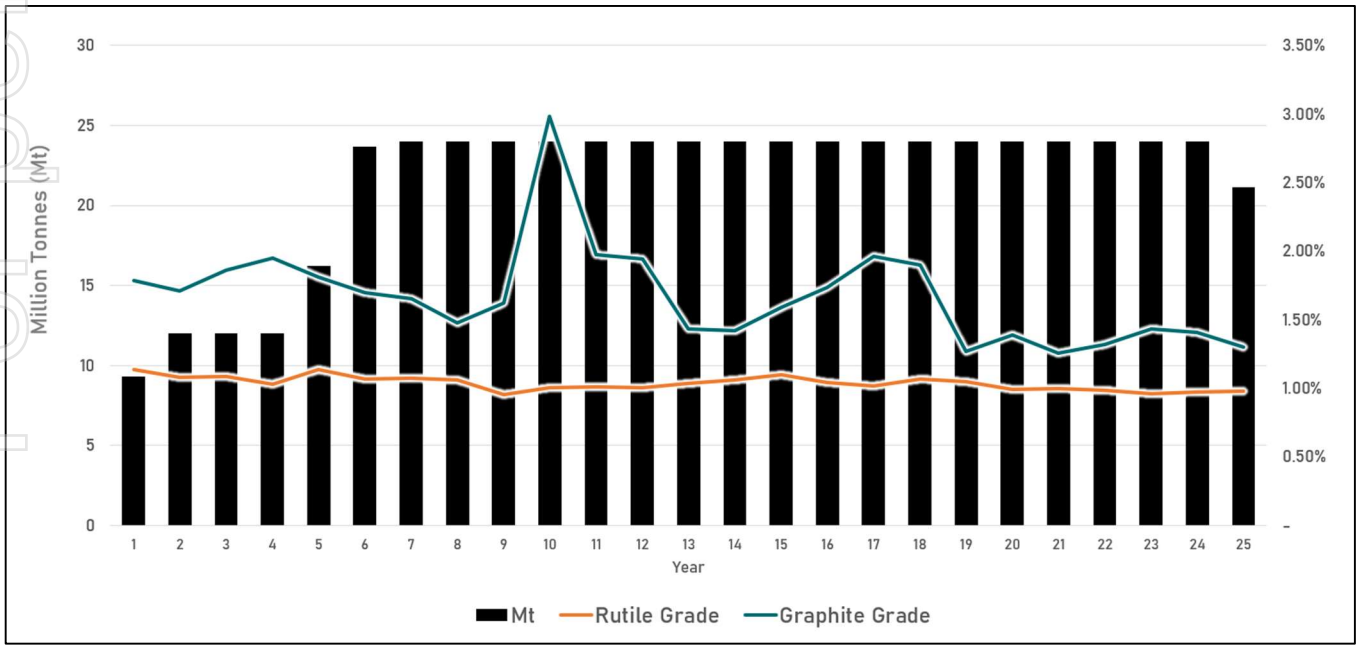

Figure 20: Throughput tonnage and grade profiles as modelled in the Kasiya PFS

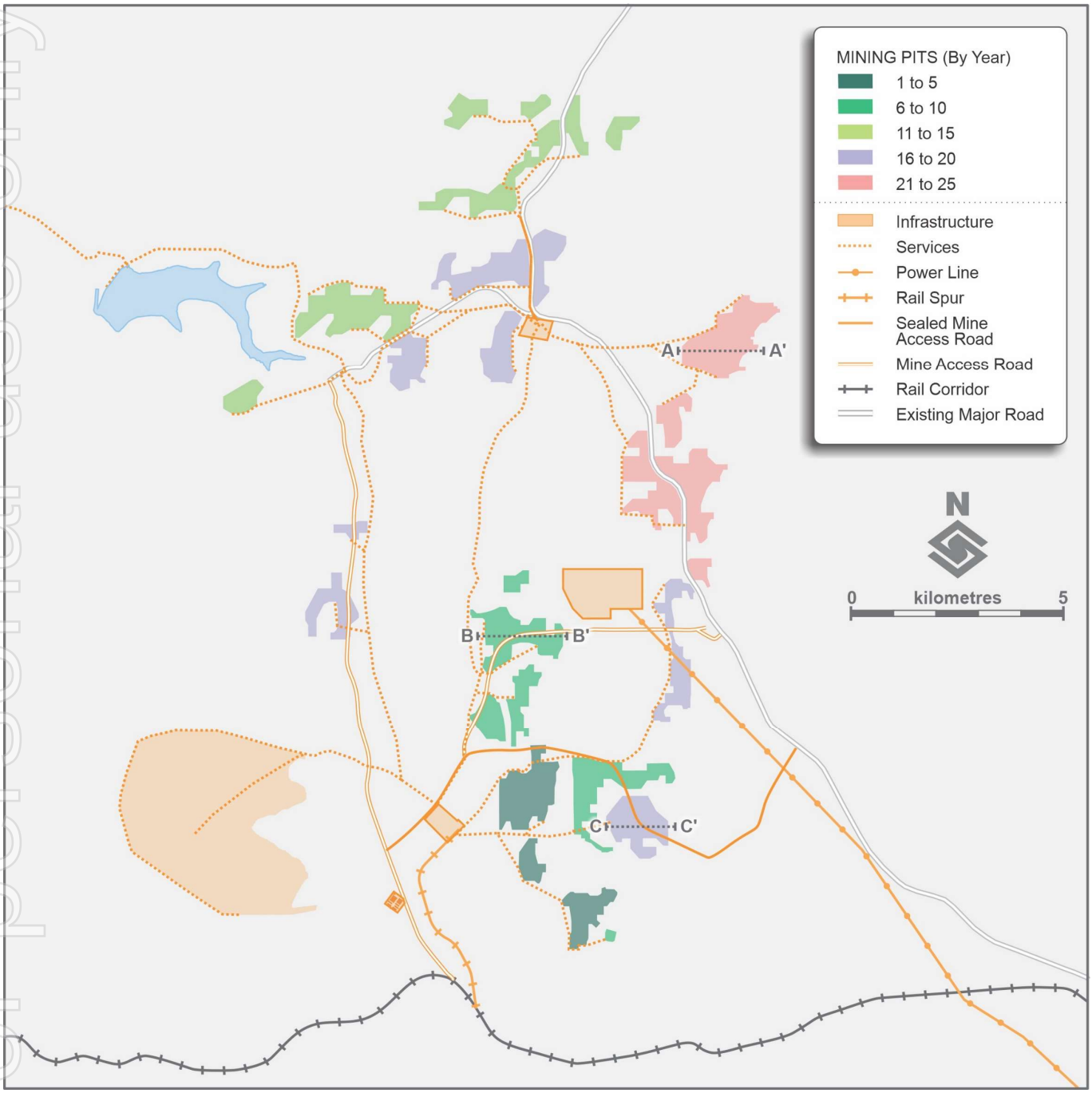

Figure 21. Kasiya PFS pit and planned infrastructure layout

METALLURGY & PROCESS DESIGN

Sovereign has conducted extensive metallurgical test-work to support the process design and flowsheet development for Kasiya. Rutile metallurgical test work was performed at the globally recognised minerals sands laboratory, Allied Minerals Laboratories (**AML**) in Perth. Graphite test-work was completed at ALS laboratories in Perth with supervision from the principal metallurgist at Metpro (Canada).

Test work programs have been designed to produce premium specification rutile and highly crystalline, high purity flake graphite products. To date, all test work has been very successful and has resulted in conventional flowsheets proving highly effective for producing premium quality rutile and graphite products (Figure 22).

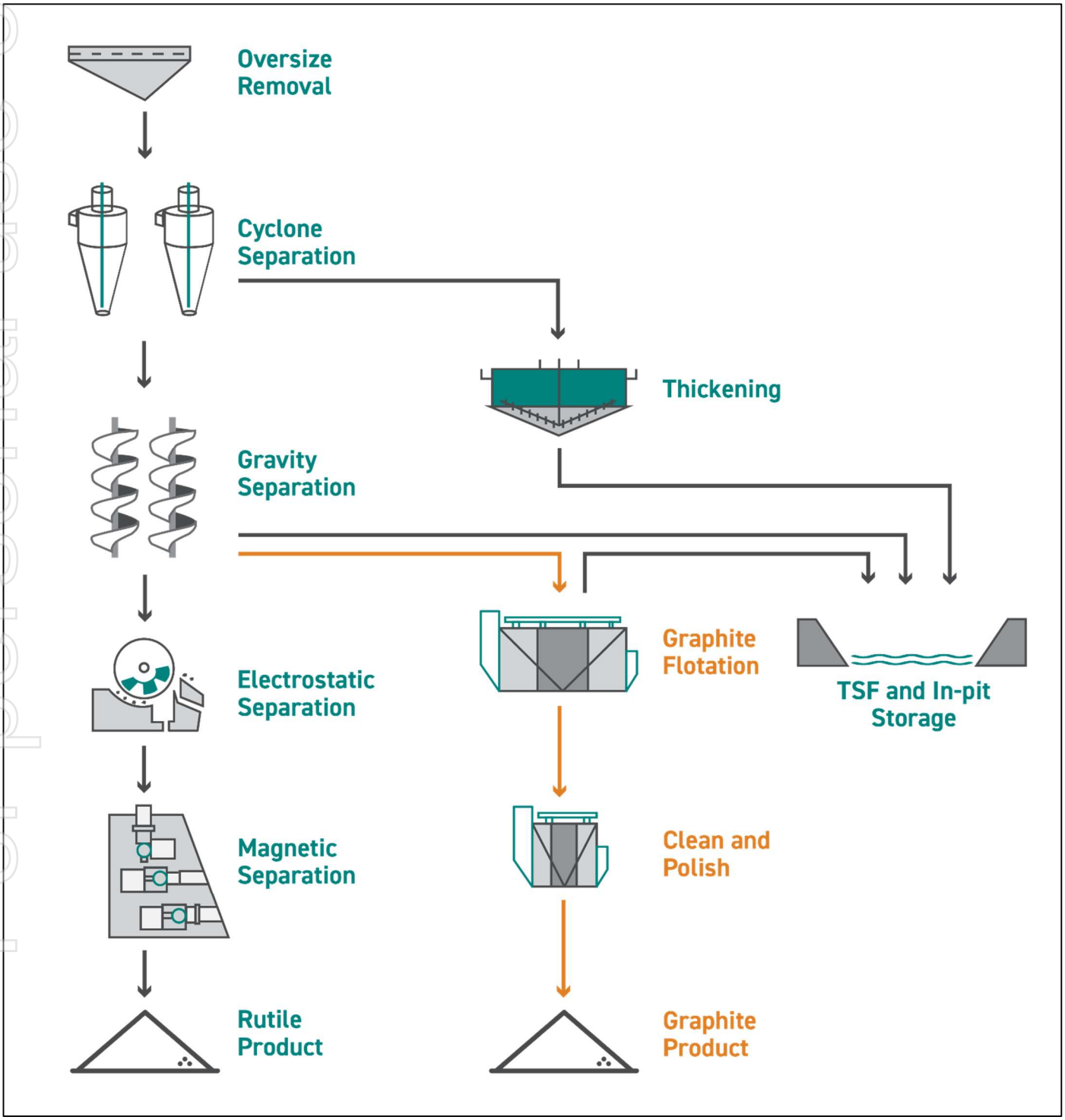

Figure 22: High-level process flowsheet for rutile and graphite production at Kasiya

The plant will recover rutile and graphite via the process route presented in Figure 22. The process is separated into four distinct processing areas listed below. The wet plant receives material pumped from the mining pit which has been pre-screened at 2mm to remove oversize.

The process flowsheet developed is described as follows;

Wet Plant:

- Receives <2mm material from the pits.
- Removes fine particles (nominally <45 µm) using cyclones and up-current classifiers (UCC).
- Recovers a heavy mineral concentrate (HMC) via coarse and fine spiral circuits.
- Produces separate coarse and fine gravity tailings streams enriched in graphite
- Produces a coarse tailings (nominally <2 mm and >45 µm) low in rutile and graphite.

Mineral Separation Plant (MSP):

- Electrostatic separation to separate the HMC into conductive rutile and ilmenite and a non-conductive concentrate.
- Magnetic separation to separate the conductive non-magnetic rutile and magnetic ilmenite concentrates.
- Bagging of rutile products for sale.
- Stockpiling of MSP tails.

Graphite Plant:

- Recovery of graphite from combined gravity separation tailings by froth flotation, inclusive of polishing and stirred media mills.
- Graphite concentrate thickening, filtration, drying, screening and bagging for sale.

Tailings Functions:

- Thickening of fine tailings in a high-compression thickener.
- Fine tailings will be pumped to the TSF
- Sand tailings will be pumped to the TSF to be used for TSF wall building, via stacking cyclones. Stacking cyclone overflow will report to the TSF impoundment.
- Fine and coarse tailings will be co-deposited in mined out pits. Fine and coarse streams will be pumped separately from the WCP to the pits where they will be combined with flocculent and deposited.

Product Recoveries

Rutile

The recovery to saleable premium rutile product is determined by dividing the percentage weight of the product at requisite product specification by the percentage weight rutile contained in the feed. The feed assay is determined by the Sovereign Lilongwe Laboratory Method (**SLLM**) - the same assay method used to populate the drill-hole database and inform the MRE and Ore Reserve.

In bulk metallurgical testwork, recovery to product is increased over and above the SLLM grade due to inclusion of slightly magnetic high TiO_2 mineral species not able to be measured by the SLLM. The non-magnetic fraction produced in metallurgical bulk sample processing routinely assays in the order of 97%-98% TiO_2, well above the 95% TiO_2 necessary for market, allowing inclusion of some of the additional slightly magnetic high TiO_2 components and explaining why recovery to product in bulk testwork is routinely greater than 100% of the SLLM grade. The product recovery relationship to SLLM assays is robust and repeatable over six separate bulk samples processed at AML. For the purposes of the PFS, a conservative 100% recovery to product is used.

Graphite

The total metallurgical recovery for graphite used in the PFS is 67.5%. This is generally lower than traditional graphite projects because the ore is processed through deslime and gravity stages prior to entering the graphite flotation plant. Losses of finer graphite occur in both of these pre-flotation stages.

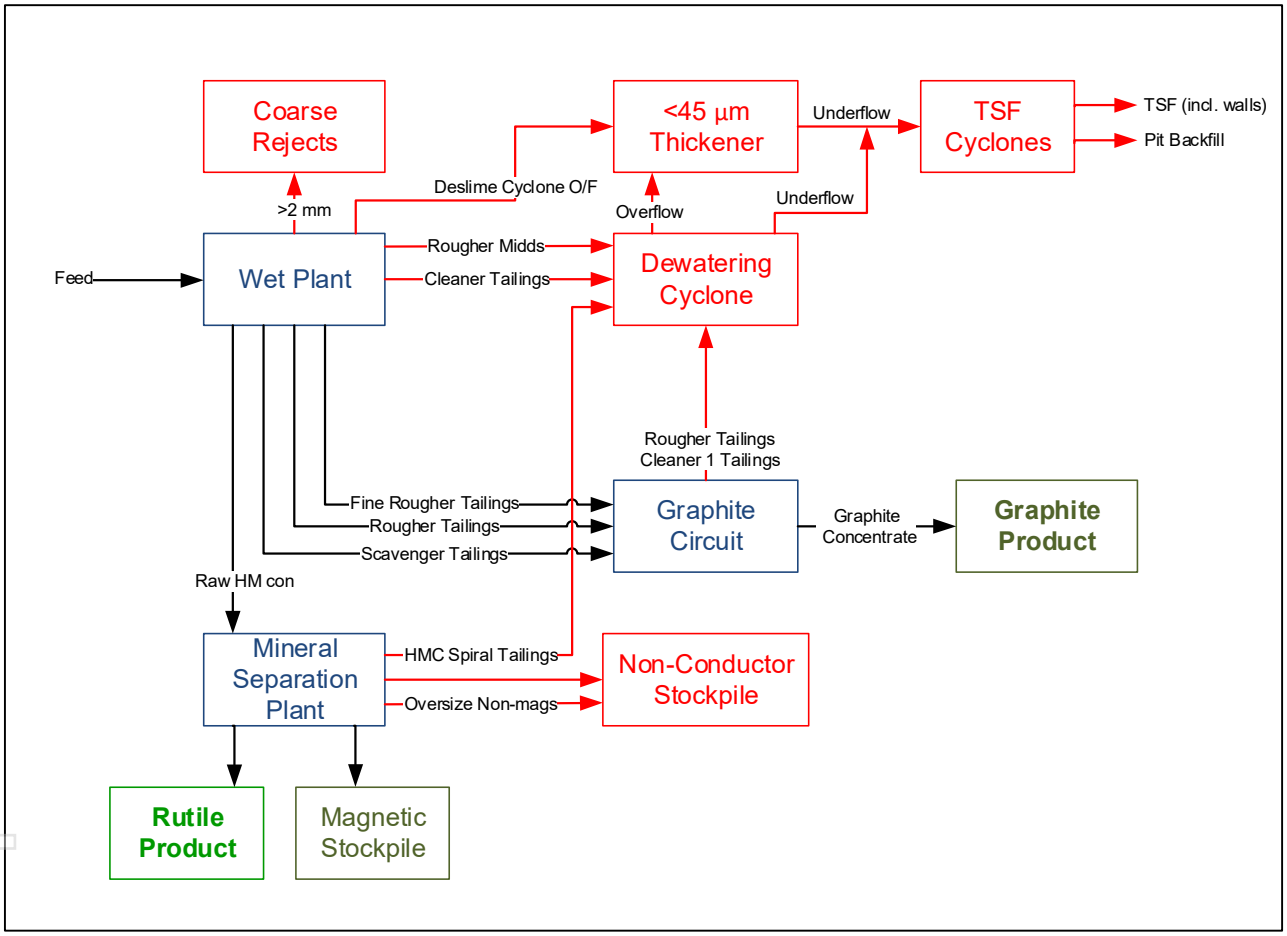

Figure 23: Simplified process block flow diagram

PREMIUM PRODUCT SPECIFICATIONS

Kasiya has been able to prove it is able to produce world-class product specification, with the rutile product reported at ~96% TiO_2 with low impurities and high metallurgical recoveries (Table 4).

The rutile and graphite mineralisation at Kasiya is amenable to processing via conventional flowsheets using "off the shelf" processing equipment. Overall, the superior metallurgical performance at Kasiya is interpreted to be due to;

- Coarse, highly crystalline rutile grains that are naturally well-liberated and largely free of inclusions or attachments (Figure 25)
- Low chemical impurities in the rutile crystal lattices
- Simple HMC mineralogy with very little difficult to separate or near-density gangue minerals present
- Coarse, highly crystalline graphite being well liberated and pre-concentrating easily in the spiral gravity separation process

Rutile Product

The premium chemical parameters and particle sizing (d_{50} 126µm, 8.6% <75µm) of the rutile produced means the product is suitable for all major end-use markets including TiO_2 pigment feedstock, titanium metal and the welding sector.

Table 4: Rutile Specifications

Constituent		Kasiya (Sovereign Metals)	Peer Comparisons	
			Sierra Rutile (Sierra Rutile Limited)	Kwale (Base Resources)
TiO_2	%	95.7	96.3	96.2
ZrO_2+HfO_2	%	0.18	0.78	0.72
SiO_2	%	0.70	0.62	0.94
Fe_2O_3	%	0.98	0.38	1.25
Al_2O_3	%	0.44	0.31	0.23
Cr_2O_3	%	0.10	0.19	0.17
V_2O_5	%	0.58	0.58	0.52
Nb_2O_5	%	0.37	0.15	-
P_2O_5	%	0.018	0.01	0.00
MnO	%	0.007	0.01	0.03
MgO	%	0.001	0.01	0.10
CaO	%	0.011	0.01	0.04
S	%	0.005	<0.01	-
U+Th	ppm	30	26	53

Selected rutile product specification derived from bulk test-work on Kingfisher pit sample representing the first 3 years of mining which in general is also broadly representative of the overall Kasiya Ore Reserve. "Base Resources" is Base Resources Limited. "b/d" is below the analytical level of detection; "-" is not disclosed. Sources: Sierra Rutile and Kwale data from BGR Assessment Manual titled "Heavy Minerals of Economic Importance" 2010.

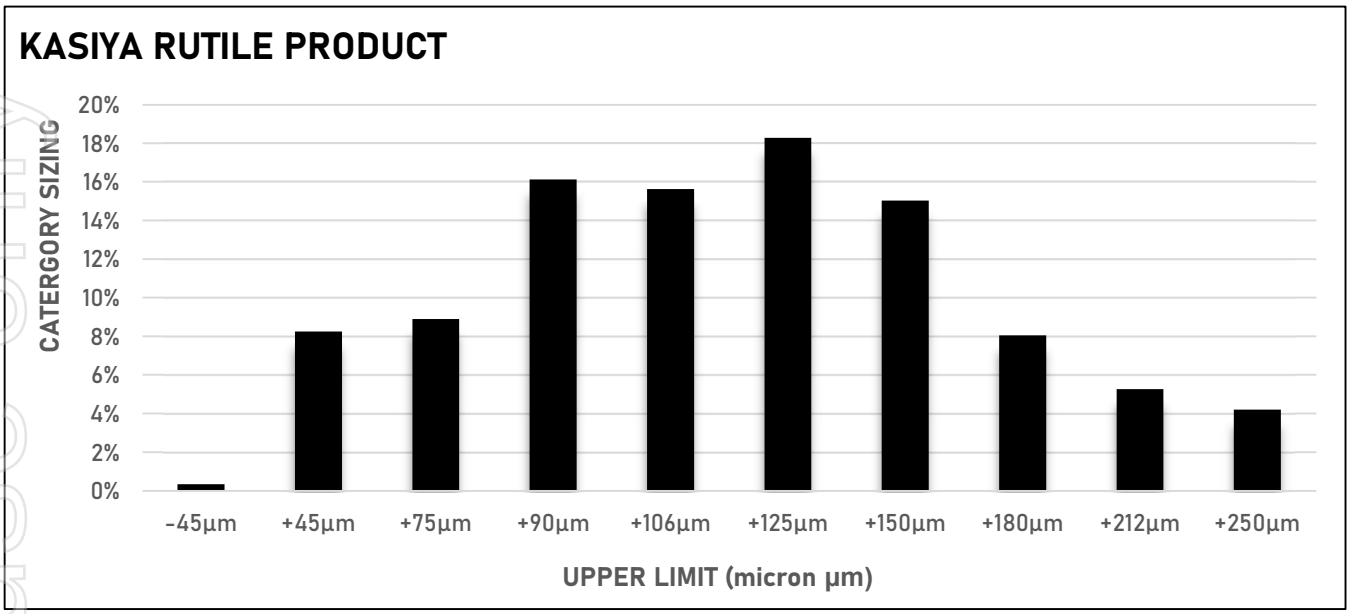

Figure 24: Particle size distribution of Kasiya rutile product

Sovereign has already shared samples of rutile product from Kasiya with major end-users globally, all of which have confirmed its premium chemical and physical specifications will be suitable for use in their titanium metal, welding products and pigment processes.

This has resulted in the Company entering initially non-binding Memorandums of Understanding (**MoU**) with three major partners in the natural rutile sector: Mitsui, Chemours and Hascor.

Figure 25: Photomicrograph of high purity rutile product

Graphite Product

The specifications for the graphite product produced during the test work are also considered to be premium with the product naturally grading over 96% C^t with more than 57% in the large to super-jumbo fractions (+180µm). The grade and size distribution are shown in Table 5 below.

Table 5: Graphite Specifications

Particle Size		Carbon	Weight Distribution	Flake Category
Tyler Mesh	Micron (µ)	(C^t %)	(% w/w)	
+32	+500	97.1	5.6	Super Jumbo
-32 +48	-500 +300	96.4	24.2	Jumbo
-48 +80	-300 +180	96.7	27.1	Large
-80 +100	-180 +150	97.1	11.6	Medium
-100 +150	-150 +106	96.9	12.3	Small/Medium
-150 +200	-106 +75	98.2	7.7	Small
-200	-75	94.1	11.7	Amorphous
Total		96.5	100	

Selected graphite specification from bulk sample test-work from Kingfisher pit representing the first 3 years of mining which in general is also broadly representative of the +200 mesh products in the overall Kasiya Ore Reserve.

TAILINGS DISPOSAL AND MANAGEMENT

Kasiya has been designed to minimise social and environmental impact. The operation will systematically extract and process ore then progressively backfill and rehabilitate the pits. The objective of the Project is to minimise the overall disturbance of land resources, as well as keeping the active overall mining footprint as small as reasonably possible.

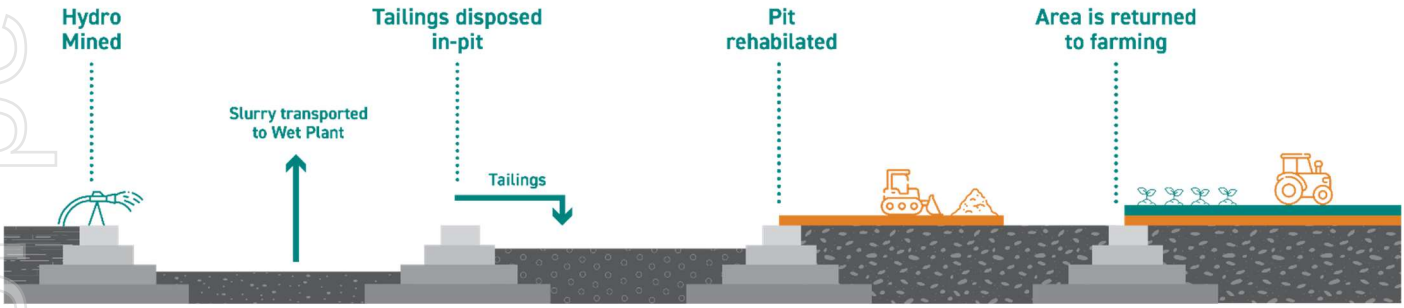

Figure 26: Mining and in-pit disposal schematic

Sovereign appointed Epoch Resources (**Epoch**) to complete an assessment on the tailings management and storage for the Project. The Study considered the following legislation, regulations and standards during the assessment process:

- International Financial Corporation Guidelines
- Canadian Dam Association Guidelines
- Global Industry Standard on Tailings Management (**GISTM**)

The process included an assessment of various potential locations which were analysed against social, environmental and cultural factors as well as infrastructure and economics.

Tailings Strategy

Tailing disposal will be a combination of in-pit disposal within the void created by mining, and ex-pit disposal in a standalone Tailing Storage Facility (**TSF**).

Sovereign has completed various test work programs at Paterson & Cooke's laboratory under the supervision of BLD Engineering to understand the behaviour and characteristics of the material. Test work demonstrated that a conservative pit void co-disposal ratio of 75%:25% sand to fines for the first 7 years of operations and a ratio of 65%:35% sand to fines for years 8 onwards should be achievable.

The process design includes high compression thickening and positive displacement pumps to maximise slurry density that can be pumped. Paterson and Cooke designed the pumping and pipeline requirements based on the above testwork programs to manage the various materials streams to the relevant facilities across the operation.

In-pit deposition

The in-pit deposition design is to be implemented in such a way that it does not interfere with mining operations. This involved several considerations regarding the degree and rate at which the pits should be filled.

Tailings deposited into the pits as backfill is effective at filling them to 95% capacity and achieving a near-original ground level.

The in-pit deposition design shall be implemented to ensure optimal rehabilitation and consolidation of the backfill material prior to rehabilitation activities. A 2m agricultural zone will be placed atop the backfill material to facilitate successful rehabilitation (Figure 27).

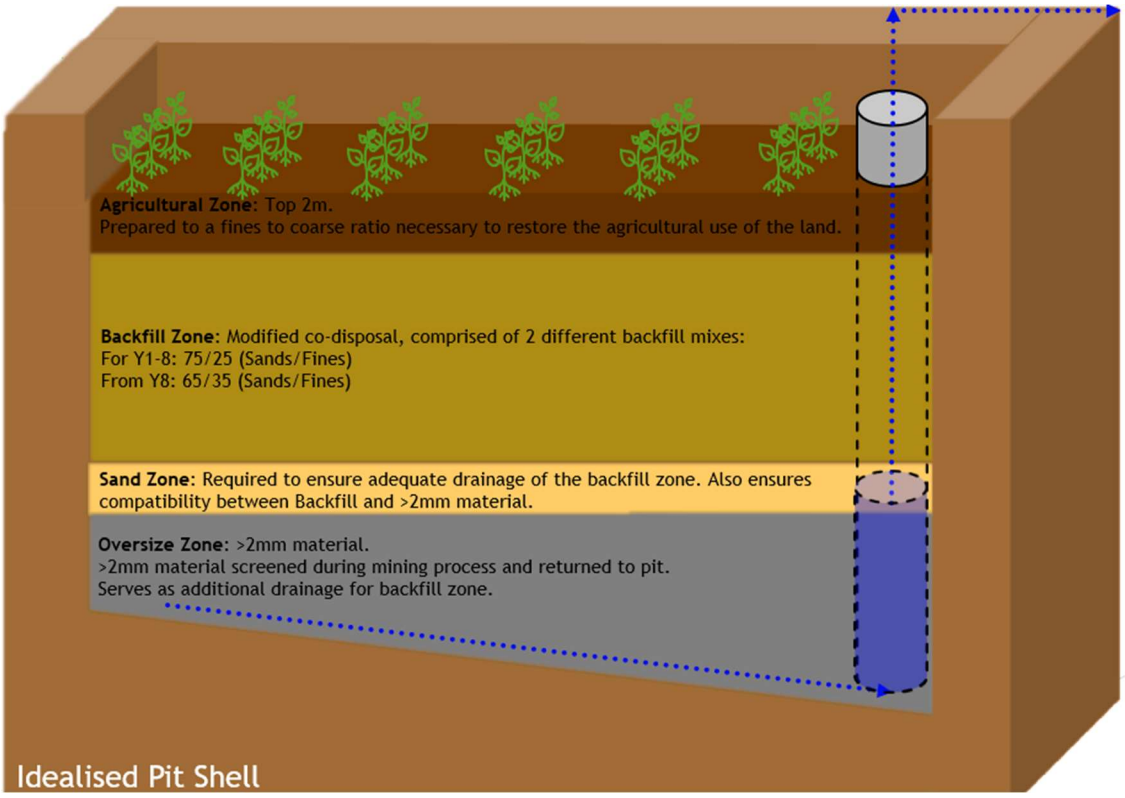

Figure 27: Cross-section of in-pit disposal layers

Tailings Storage Facility (TSF)

The physical characteristics of the extracted material means the volume of tailings produced exceeds the volume of space available for in-pit disposal. As such, a TSF is required to store the excess tailings that cannot be disposed of in the pit voids.

The TSF sizing criteria was determined to be 150Mt based on a volume of 187.5Mm^3 at a dry density of 0.8t/m^3. The design approach adopted for the TSF is a traditional valley dam consisting of a series of downstream lifts of cycloned sand material above an engineered starter wall.

The TSF site selection process followed the Global Industry Standards on Tailings Management (**GISTM**) as a guideline to define the criteria considered. Environmental and social sensitivity maps provided by Dhamana Consulting were used to inform the selection.

The site ranking assessment was completed with the site selected being located in close proximity to the planned southern plant site (Stage 1 and 2).

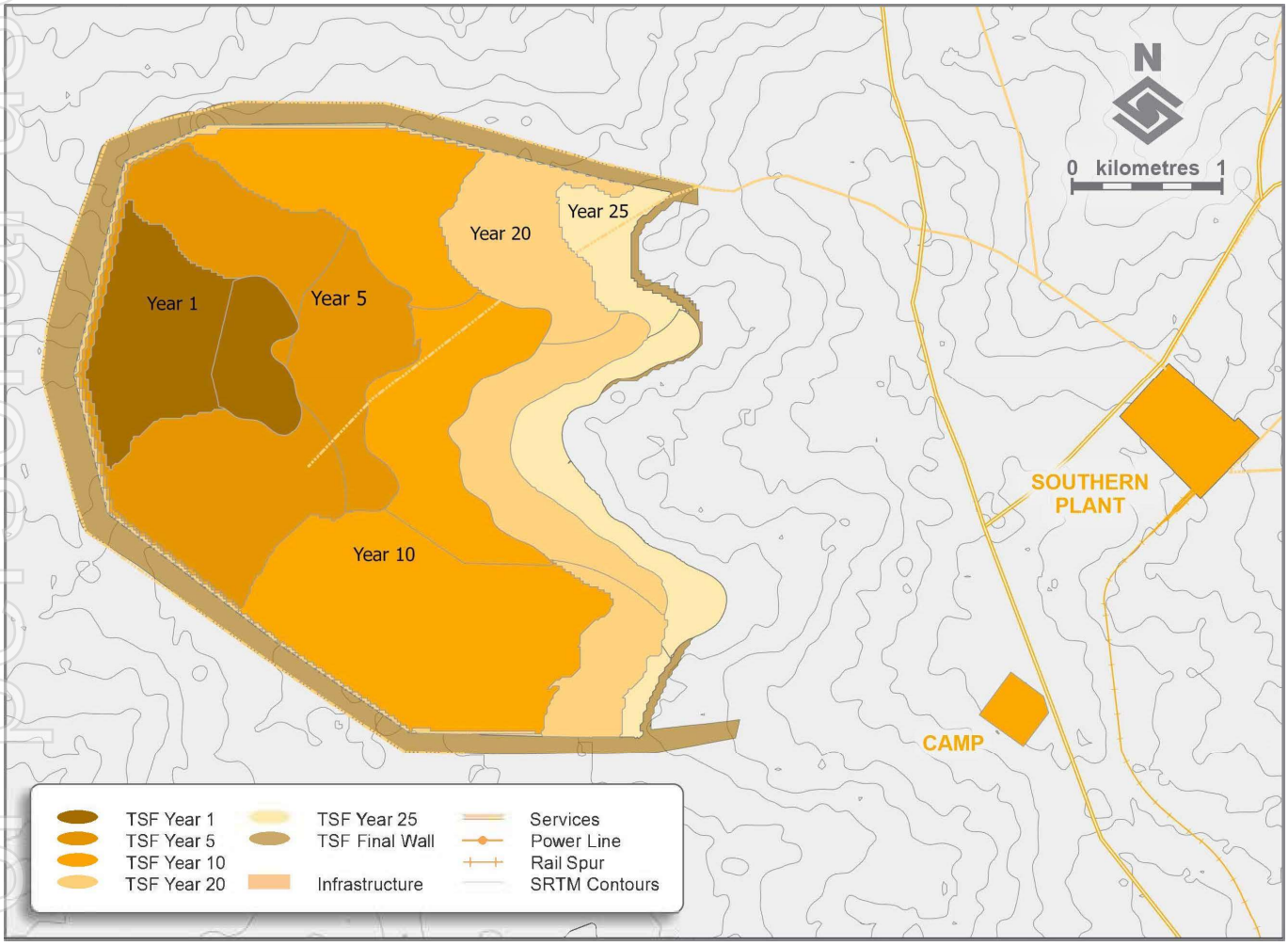

Figure 28: TSF showing the deposition footprint over the life of mine

REHABILITATION

Sovereign is committed to the economic and efficient treatment, disposal and rehabilitation of its waste material ensuring that it leaves a safe, stable and productive landform that blends in with its surrounding landscape.

Land to be disturbed by mining is almost exclusively used for agriculture with mainly subsistence farming and some larger scale commercial farms. Rehabilitation is designed to return land to the original agricultural use, and potentially increase land utilisation by introducing modernised farming techniques post rehabilitation.

Rehabilitation of the mining pits can begin once backfilling, desaturation, and re-shaping of the material has been completed over each pit or otherwise disturbed land area.

The rehabilitation approach comprises an upper 2m of pit backfill at a mixture of 70% sand and 30% fines that is considered the rehabilitation layer. It will be void of vegetation that may compete with the rehabilitation crops, such as weeds or grasses or creepers.

A 100mm layer of topsoil for enabling efficient and effective crop establishment will then be spread. Significant topsoil stores to facilitate this layer will be available from the different infrastructure footprints including the TSF and raw water dam facilities.

The addition of a topsoil layer with available macro nutrients and a relatively high organic carbon content will reduce the requirement of fertilisers and biomass as a carbon source. This can be expected to reduce the rehabilitation timeline, approach and input material requirements, thus reducing rehabilitation cost.

Several generations of cash crop establishment, monitoring, soil profiling and analysis will then take place, until proof of land use and crop yield potential has been reached. At this stage the ground handover can commence. The rehabilitation scenario selected reflects a long-term, low-risk approach to rehabilitation.

Figure 29. Example of a vetiver cover crop at a TSF rehabilitation site in southern Africa

INFRASTRUCTURE

The Project's central location and close proximity to Lilongwe, Malawi's capital, boasts enviable access to services and infrastructure. Further, a significant investment into infrastructure that would support a multi-generational operation that can be used well beyond the modelled life of 25 years is planned.

WATER

The Project is considered to have good water availability. Malawi features a humid sub-tropical climate, with generally dry and mild winters and the majority of rainfall occurring during the summer months of December to March. Temperatures are moderated by elevation and average 20.3°C with annual precipitation averaging 784mm. Average monthly rainfall peaks in January at 225mm with the minimum rainfall of near zero being encountered in June to September.

Process water to sustain the operation will be supplied from a purpose-built raw water dam. The dam will be built in a low-lying contour northwest of the processing plant. The greater project area features a catchment from which a reliable supply of raw water can be sourced. A raw water dam that guarantees a secure and consistent water supply for the project's operations will be constructed. The dam will capture and store run-off during the wet season, storing sufficient water to sustain the operation for the duration of the dry season.

A comprehensive analysis of the catchment's water resource characteristics, along with the proposed dam's location, required yield, embankment design, space requirements, and design flood parameters was covered by Australian Groundwater & Environmental Consultants (**AGE**) in their study and dam design.

Based on detailed water balance modelling of the mine workings, the expected mine water requirements for the operation were 8.2Mm^3 per year for 12Mtpa and 16.3Mm^3 to support 24Mtpa throughput. The selected dam size was based on water requirements to sustain 24Mpta throughput.

Sovereign also plans to install a diversion pump and pipeline to extract water when required from the Bua River.

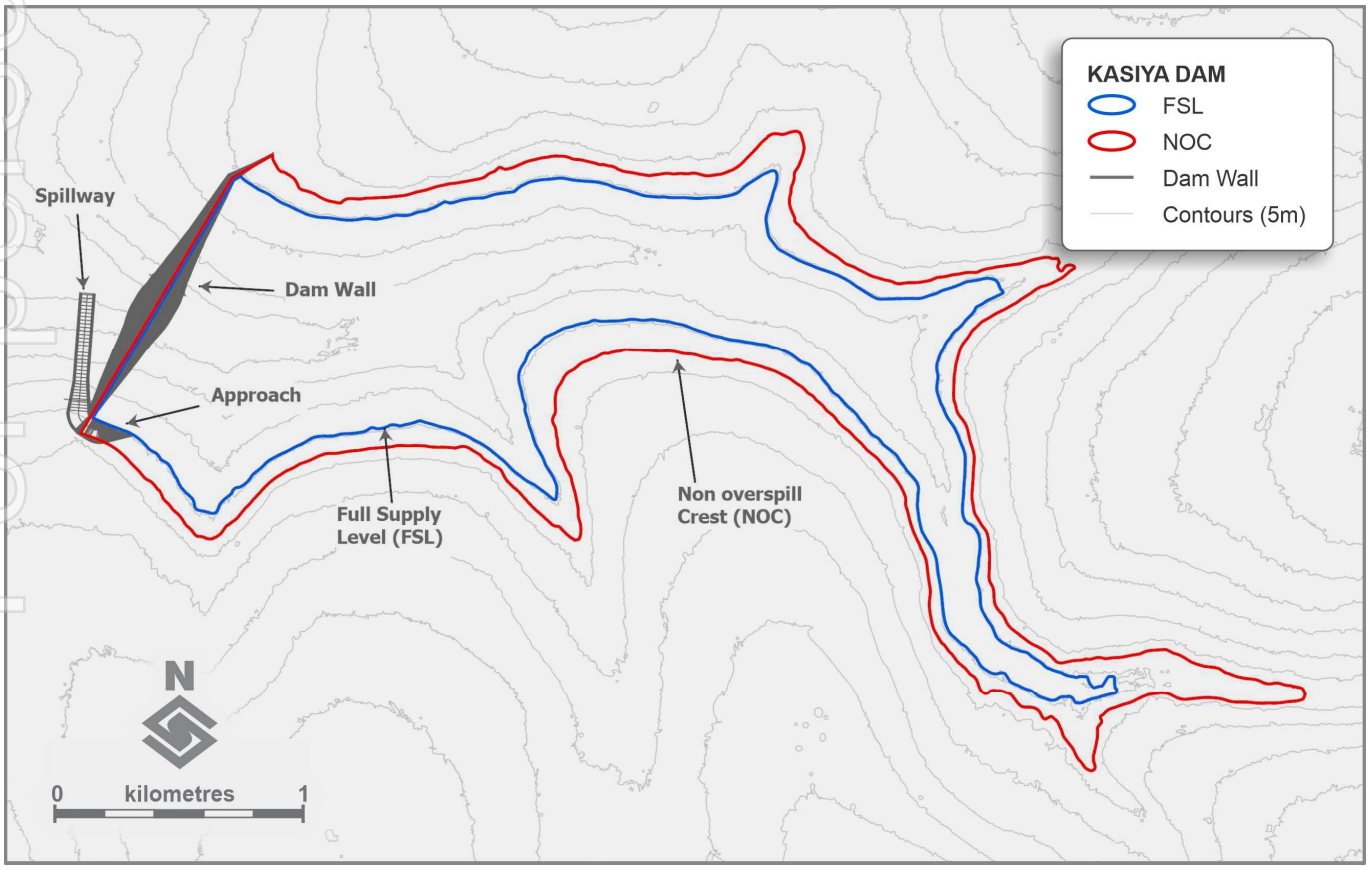

Figure 30: Kasiya raw water dam conceptual lay-out

POWER

Sovereign's objective is to develop a sustainable, low carbon and reliable power solution for Kasiya. Access to hydro-generated grid power and favourable conditions for a solar power system allows for a hybrid, low-carbon solution. JCM Power (**JCM**) were appointed to design an IPP solution for Kasiya.

JCM is a Canada-headquartered IPP which develops, constructs, owns and operates renewable energy and storage projects in emerging markets across the globe. JCM is funded by reputable development finance institutes including FMO, IFU, STOA, FinDev Canada and Swedfund.

JCM recently successfully commissioned the 60MW Salima Solar project and the 20MW Golomoti Solar PV and Energy Storage project, both in Malawi. JCM was involved in the development, management, engineering, procurement, and construction of these projects.

Figure 31: 60MW Salima Solar Power Plant in Malawi recently constructed and commissioned by JCM (source: JCM)

JCM have designed a grid connected hybrid solution (solar PV, battery energy storage system (**BESS**) and diesel backup). The system is designed to provide a 100% reliable power supply for the duration of the Project's life. At full production (24Mtpa throughput) the Project requires 56MW. JCM provided a power tariff of 15.4 cent per kWh for the life of mine.

To connect the power system to the hydro-sourced grid network, a 132kV overhead transmission line is required to be installed and connected to the Nkhoma substation located 82km from Kasiya. Nkhoma is considered most suitable in terms of reliable power supply, technical design, and environmental and social impact.

JCM conducted an assessment of the sizing of different components to understand the various trade-offs between over-sizing PV, adding energy storage, recovering grid connection costs, and supplementing generation with diesel. This resulted in the power mix shown in Figure 32 below.

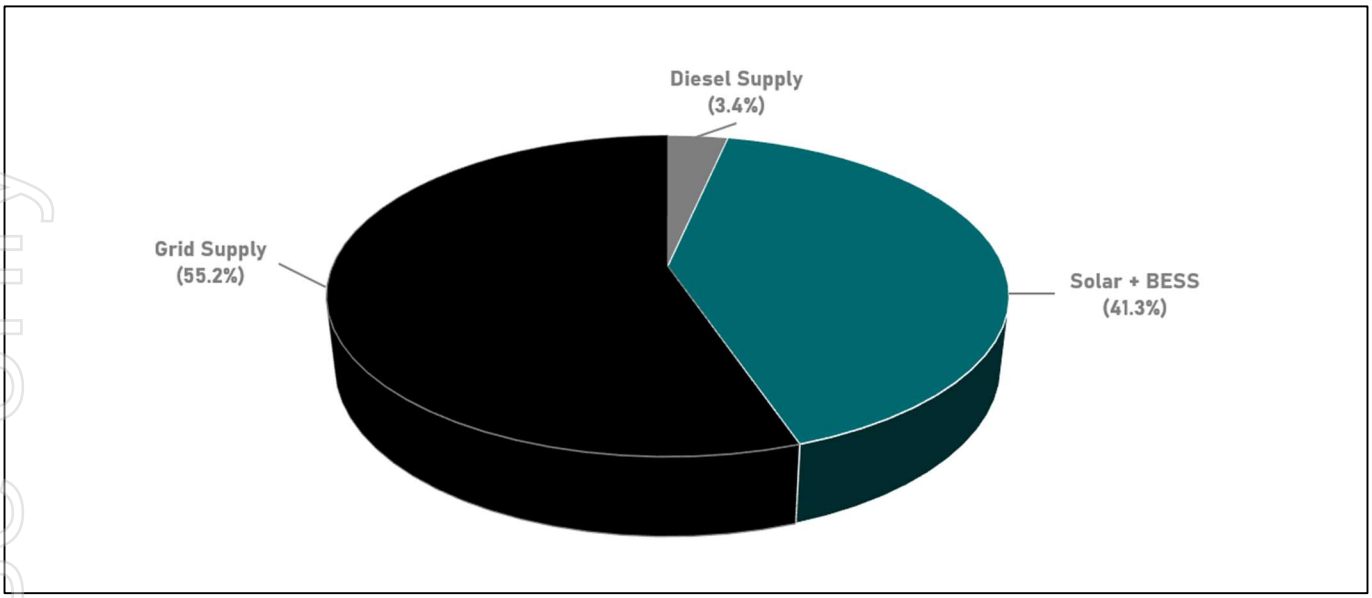

Figure 32: Planned Kasiya energy mix

The Malawi grid reliability is expected to improve in the coming years considering that the country's first HV transmission interconnector to Mozambique is scheduled to be commissioned by end of 2023 (more likely at some stage in 2024). JCM has informed Sovereign 50MW has already been signed with Mozambique with plans to increase it to 120MW.

This improved reliability will especially benefit large customers connected at transmission level, such as Sovereign, which is intended to be connected to ESCOM's 400kV Nkhoma substation. Improvements in grid reliability and capacity will reduce the requirement for diesel back-up.

Figure 33: Nkhoma substation equipped for connection to the Kasiya operation

SITE LAYOUT

The Project layout was determined through the evaluation of technical, environmental and social factors. The layout was developed around the mining schedule, TSF and the water storage dam, as these were the leading factors in deciding the location of the other various elements.

Following the TSF and raw water storage dam location determinations, the processing plants, overland pipelines and rail spur were then determined. Remaining items such as the camp site were placed to best fit into that starting configuration. The major design objectives influencing the site location and arrangement were minimising environmental and social impact and keeping facilities as central and convenient to the mine pits as possible.

For the operational phase, topography and drainage, including 50-year flood lines, were considered. Rainwater management during construction and operations was an important consideration in the selection of sites and layouts.

Wherever possible, existing communities are avoided. However, due to the extent of the mining operations, TSF and water storage dam some communities could not be easily avoided and in this case some relocation and livelihood restoration programs will be required.

HUMAN RESOURCES

The proximity to Lilongwe gives the Project a number of benefits, including access to a large pool of professionals and skilled tradespeople. Malawian national employees will be employed predominantly from the Kasiya area and the capital city of Lilongwe.

During construction, Kasiya will employ a planned 995 total workforce with the majority to be employed in the plant operations.

During steady state operations, Kasiya will employ a workforce of nearly 1,100 with the majority to be employed in the plant operations. Expatriates make up approximately 5% of the planned workforce. Similar projects in Africa typically witness a flow on effect for employment in local communities. For every person employed directly in the project a significant multiplier of people will be employed in indirect jobs supporting the project.

Sovereign has structured training and skills transfer programs covering on-the-job training for full-time employees, as well as programs for local graduates and interns. The programs focus on building skills capacity in the surrounding community.

The Company currently has 80 full time employees and is an equal opportunity employer with a gender diverse workforce. Currently, 30% of Sovereign's professional Malawian staff and at least 50% of our regular interns are female.

Figure 34: Sovereign's female team members at the Company's laboratory facility in Lilongwe, Malawi

TRANSPORT AND LOGISTICS

Existing rail infrastructure

The Kasiya Project directly benefits from the exceptional existing infrastructure in central Malawi. The Nacala Rail Corridor (**NLC**) which runs through the Kasiya project area offers the preferred logistics route to the deep-water Indian Ocean port of Nacala for export of mineral products to global markets.

Figure 35: The Kasiya Project area showing rail and port infrastructure for export of product to global markets

This established and operation-ready logistics infrastructure will provide significant capital and operating cost savings to the Kasiya Project. To access the NLC, Sovereign plans to construct its exclusive 6km rail spur to connect directly with the plant. This will significantly reduce environmental impact and carbon footprint of the project, significantly reduce road traffic and increases efficiencies for handling inbound and outbound freight compared to any road alternative.

Figure 36: Nacala Logistics' train transporting coal on the NLC

Sovereign appointed independent African logistic consultants Thelo DB and Grindrod to assess the options for exporting Kasiya's natural rutile and graphite products to global markets for the PFS. Thelo and Grindrod confirmed that the preferred logistics routes to global markets are via the NLC rail and the deep-water port of Nacala.

The cost for transporting from Kasiya, storing, customs and port fees for both natural rutile and graphite products was estimated to be US$98 per tonne.

Port infrastructure and handling

Products are transported from Kasiya to Nacala Port where they are stored at a 'back of port' facility.

The products are then prepared for shipment and transported to the side of port for ship loading.

Sovereign engaged Grindrod Logistics an experienced freight handler and current operator at the Nacala Port to provide a solution for the PFS.

Figure 37: Grindrod's back of port facility at Nacala Port

ENVIRONMENTAL & SOCIAL IMPACT

Environmental and Social Setting

Site surveys by specialist environmental and social consultants were conducted in August 2021, May 2022 and will re-commence in October 2023 focussing on the following aspects:

- Terrestrial fauna and flora
- Aquatic fauna and flora
- Soil and land capability and land utilisation
- Water resources, including potential surface water and groundwater impact, and the availability of raw water supply for the project
- Communities and potential resettlement

The ESIA for the Project will be undertaken in compliance with relevant Malawian legislation, regulations and standards, in particular, the Environmental Management Act (No. 19 of 2017) and Guidelines of Environmental Impact Assessment (DEA, 1997).

Environmental, Social and Governance

The Project aims to meet the requirements of international guidelines and standards, including the IFC Performance Standards on Environmental and Social Sustainability (IFC, 2012), the World Bank Group Environmental, Health and Safety Guidelines (WBG, 2007) and the Equator Principles (Equator Principles Association, 2020).

Decarbonising the global economy and realising the UN Sustainable Development Goals (**SDGs**) requires a sustained demand for metals and minerals over the coming decades. Accordingly, the Company intends to adopt the **ICMM** principles for future studies and development phases of the Kasiya project. The ICMM Principles align with the United Nations Sustainable Development goals and define good practice environmental, social and governance requirements for the mining and metals industry. The Company also intends to adhere to the Task Force on Climate-Related Financial Disclosures (**TCFD**).

The Kasiya project will be designed considering both the Equator Principles and Scope 1, 2 and 3 emissions under the Green House Gas protocol so that the design meets high standards for ESG from the outset. Access to power from the dominantly hydro-electric and solar Malawi power grid, plus a purpose-built Kasiya solar Independent Power Producer (**IPP**) system, will ensure low carbon power supply for the project. The use of rail rather than road transport for rutile and graphite product transport will further assist with a low carbon footprint.

The Study contemplates that the operation will use a closed circuit zero discharge process water circuit and a tailings storage facility designed to store benign tailings during operations which will be rehabilitated progressively.

Social Responsibility

Sovereign believes in establishing strong and mutually beneficial relationships with all relevant stakeholders – especially with communities around its proposed operations and the Government of Malawi.

The Company is committed to reducing the land acquisition and resettlement requirements for the Kasiya Project consistent with our environmental and social standards. The PFS has optimised the mining pit design and infrastructure design and locations. This has resulted in a substantive reduction in the expected resettlement in the planned mining pit areas compared to the ESS.

A total of 2,409ha is required for permanent mine infrastructure whilst a total of 2,774ha is required for the mining pits. Pits will be rehabilitated progressively and returned to the community with an average of 7 years turn-around from start of mining to complete rehabilitation.

Sovereign has adopted a Social Responsibility Framework (SRF) which functions as the social safeguard under which the Company will develop the Project – from early planning, into construction, through operations and finally in mine closure and land rehabilitation. The framework is comprised of twelve Investment Areas to be developed and managed under the Project Environmental and Social Management System (ESMS).

Figure 38: The Project Social Responsibility Framework Investment Areas

Sovereign plans to further develop the key requirements provided in the SRF, through the forthcoming DFS and the ESIA. Briefly, the way forward will include the following major activities:

1. Assessment of social impacts through the ESIA and associated specialist studies, which is expected to be developed over the remainder of 2023 and into 2024.

2. Development of the RPF and formal ratification of the resettlement approach with the Government of Malawi and local authorities.

3. Accelerate formal talks with the Government of Malawi and establish technical committees or working groups to address major technical areas (i.e. resettlement, settlement planning, community development agreements)

4. Open engagement with local authorities and affected communities through a concerted public relations program, as well as through the formal stakeholder engagement process required under the ESIA.

5. Build the Project ESMS, and progressively build up in-house resources and personnel to support the accelerated planning of social programmes and activities. The nature of the resourcing will be customised to the needs and scheduling of the Project as it matures.

6. Prepare the various Social Management Plans that are required as part of the statutory approvals under the Mines and Minerals Act, as well as part of the ESIA approval process.

RUTILE MARKET

Natural rutile is the purest, highest-grade natural form of TiO_2 and is the preferred technical feedstock in manufacturing titanium pigment and producing titanium metal.

The global titanium feedstock market is currently over 8.2Mt of TiO_2 with the majority of this consumed by the pigment industry. Natural rutile's high purity classifies it as a high-grade titanium feedstock. The high-grade titanium feedstock market consumes approximately 3.7Mt of contained TiO_2 with strong demand driven from the pigment, welding and Ti metal industries.

Natural rutile is a genuinely scarce commodity with no other large rutile dominant deposits having been discovered in the last half century.

Global rutile supply is projected to sharply decline beyond 2024, following the scheduled closures of Base Resource's Kwale and Sierra Rutile's Area 1 mines (TZMI). There are very limited new deposits forecast to come online resulting in the supply of natural rutile being likely to remain in structural deficit for the long term, even with Kasiya at full production.

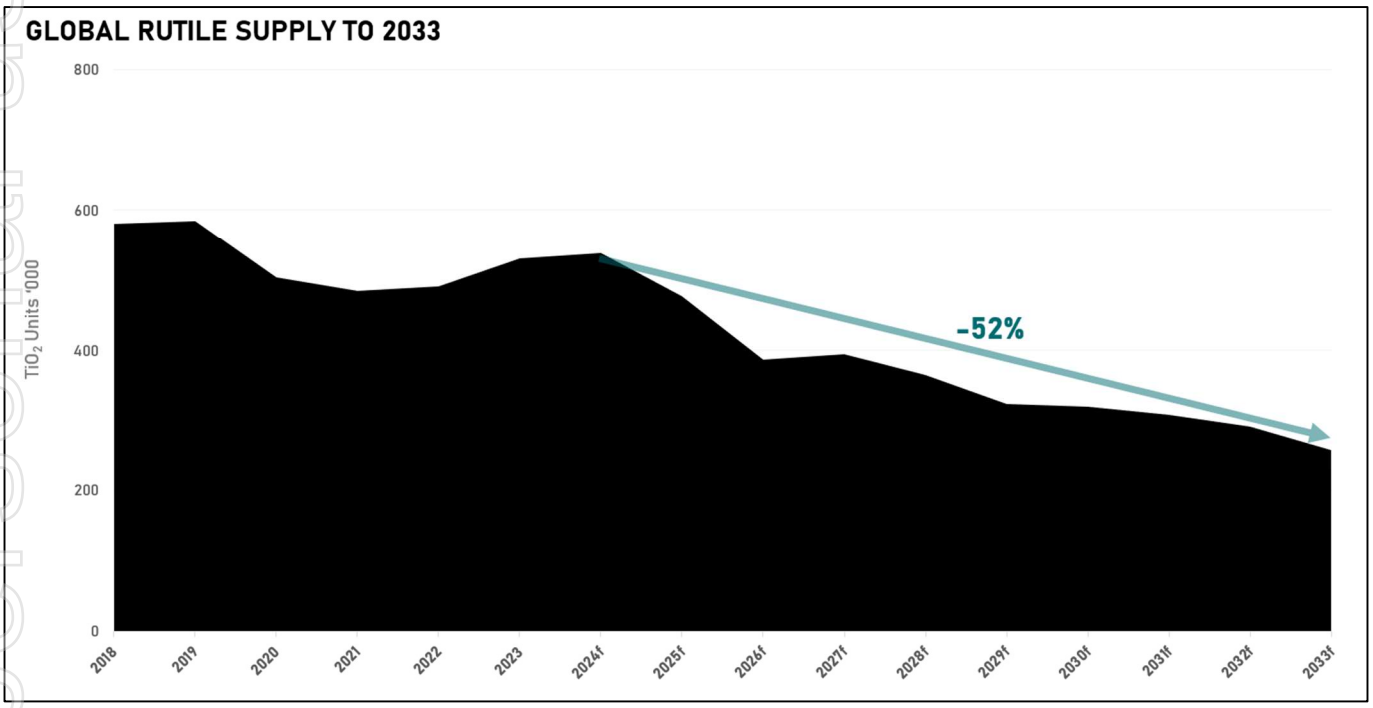

Figure 39: Previous and forecast global natural rutile supply 2018-2033
**Supply profile only reflects existing operations*
(source: TZMI)

The rutile market fundamentals continue to be robust with current and forecast pricing remaining very strong. According to TZMI, demand for natural rutile is projected to change over the short-term from being primarily driven by pigment to one that is dominated by the welding end-use.

The natural rutile market can be divided is two discrete sectors;

- Bulk rutile mostly sold on contract to chloride pigment and titanium sponge (metal) producers
- Bagged rutile sold to welding and other industrial sectors

Bagged rutile sales into the welding and other sectors achieve better pricing outcomes, often with 25%+ premiums to bulk rutile pricing.

The rutile pricing scheme applied for the PFS was;

- For 12Mtpa (or ~127ktpa rutile production) 63.5ktpa of rutile will be sold into the bagged welding market.
- For 24Mtpa (or 235ktpa rutile production) 70.5ktpa will be sold into the bagged welding market.
- For both stages, the remainder will be sold into the titanium metal and pigment markets.

The rutile price adopted in the PFS's financial model is based on TZMI's real 2023 price forecast and apportioned to volumes sold into the two defined markets (bagged welding at 25% premium to the bulk pigment market). The LOM average price applied was US$1,484 per tonne FOB Nacala.

Titanium market consultants TZMI commented that in general bulk rutile sales in H1 2023 were priced at US$1,400-1,700 per tonne FOB. Currently, producers including Iluka Resources have reported even higher rutile sales prices of US$1,871 per tonne in the last quarter (Quarter ended 30 June 2023).

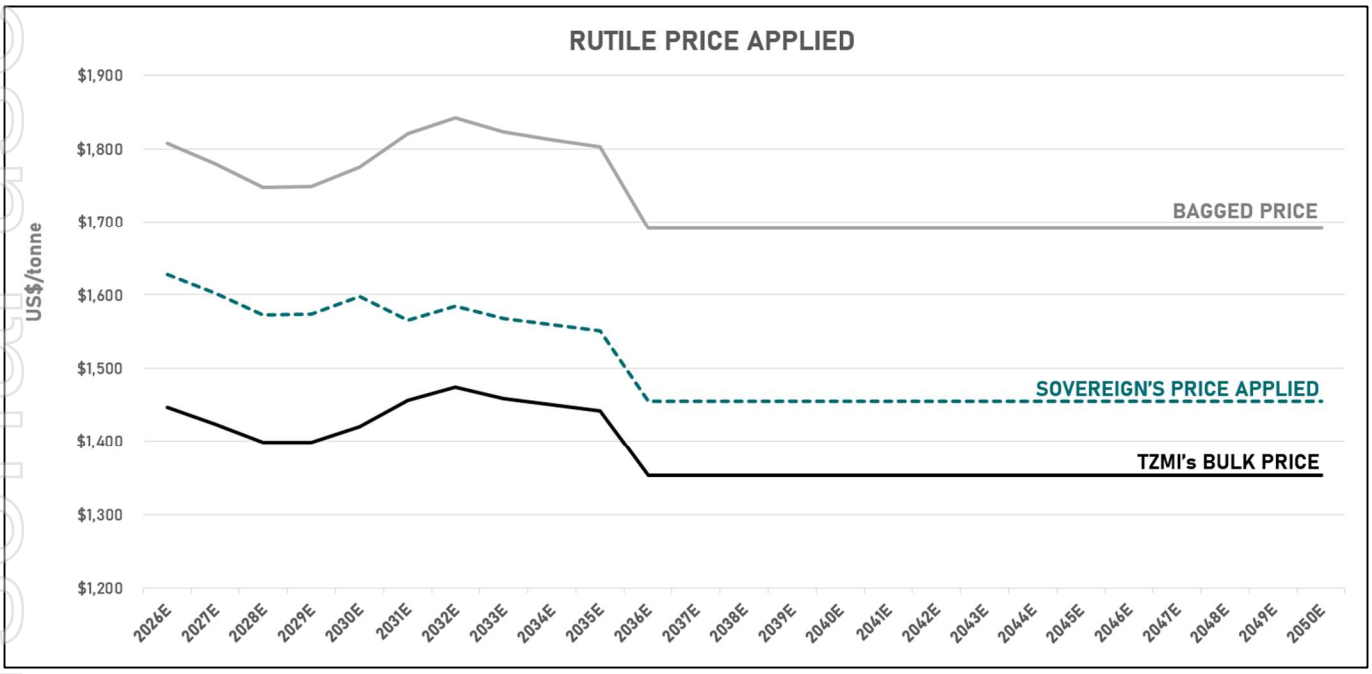

Figure 40: Rutile Price Forecast (TZMI)

Marketing Strategy

The Company engaged market leading TZMI to provide a bespoke marketing report to support the PFS. TZMI is a global, independent consulting and publishing company which specialises in technical, strategic and commercial analyses of the opaque (non-terminal market) mineral, chemical and metal sectors.

TZMI's assessment has confirmed that, based upon their high-level view on global demand and supply forecasts for natural rutile, and with reference to the specific attributes of Kasiya, there is a reasonable expectation that the product will be able to be sold into existing and future rutile markets.

In July 2023, Rio Tinto made an investment in Sovereign resulting in an initial 15% shareholding and options expiring within 12 months of initial investment to increase their position to 19.99%. Under the Investment Agreement, Rio Tinto will provide assistance and advice on technical and marketing aspects of Kasiya. Also, included under the Investment Agreement, Rio Tinto has the option to become the operator of Kasiya on commercial arm's-length terms.

In the event, Rio Tinto elect to be the operator of the Project and for so long as Rio Tinto remain the operator, Rio Tinto shall have exclusive marketing rights to market 40% of the annual production of all products from the Project as identified in the DFS on arm's-length terms.

Rio Tinto's option over operatorship and 40% marketing rights lapse if not exercised by the earlier of (i) 90 days after the Company announces its DFS results or 180 days after the announcement of the DFS if Rio Tinto's advises it needs additional time to consider the exercise of the Rio Tinto's Option or (ii) Rio Tinto ceasing to hold voting power in the Company of at least 10%.

Prior to entering into its transaction with Rio Tinto, the Company has been able to enter into the following Memorandums of Understanding (**MoU**) (non-binding) for annual rutile sales:

Mitsui & Co	Global trading and investment company	30,000 tonnes
Chemours	One of the world's largest producers of high-quality titanium dioxide	20,000 tonnes
Hascor	Global processor and distributor of rutile for the welding industry	25,000 tonnes

Based on product quality assessments performed by offtakers and customers, Kasiya's natural rutile has premium chemical parameters and is suitable for all major end-use markets including welding, pigment feedstock and titanium metal.

GRAPHITE MARKET

Flake graphite has been identified as a critical and strategic material due to its essential applications in the aerospace and energy sectors, and due to its role as the primary anode component in lithium-ion batteries.

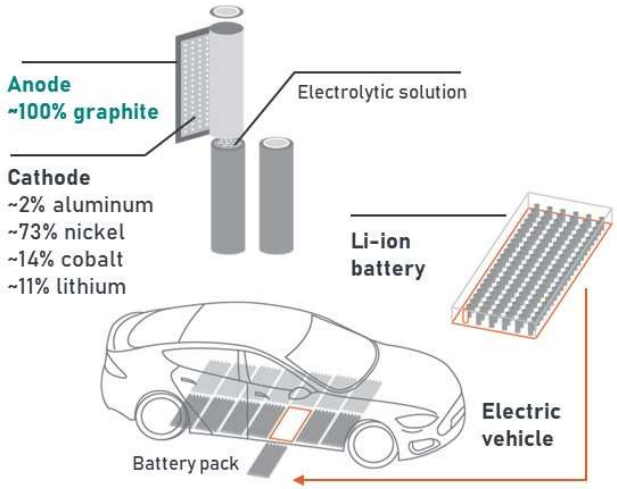

Figure 41: As the anode material, graphite can account for up to 50% of the composition of a lithium-ion battery used in an EV

The transportation and automotive sectors continue to go through a period of profound transformation. Electrification is now occurring rapidly in almost all segments of road transport, from passenger cars to commercial vehicles, buses and two- and three-wheelers.

Per Bloomberg, EV sales have already risen almost 230% from 3.2 million sales in 2020 to 10.5 million in 2022. By 2026, this figure is expected to be 26.6 million – an increase of over 700% in a six-year period (source: Bloomberg Electric Vehicle Outlook 2023).

The lithium-ion battery sector is the main emerging market for flake graphite (Figure 42). Greater capacity batteries, such as those required for EVs, are expected to drive significant demand for graphite over the coming years. It is forecast the battery sector will become the largest graphite market segment by 2028. Per Benchmark Mineral Intelligence, the demand for anodes grew by 46% in 2022 compared to only 14% growth in natural flake graphite supply.

Looking further ahead, per Tesla Inc.'s (**Tesla**) Master Plan 3 which details a pathway to global battery deployment, the biggest mining and refining investments required by Tesla's plan are for lithium and graphite. The Tesla Master Plan 3 highlights US$104 billion of new investment in graphite mining would be required to reach the goal of 10.5Mt of the graphite per year (source: Tesla Master Plan 3 (April 2023))

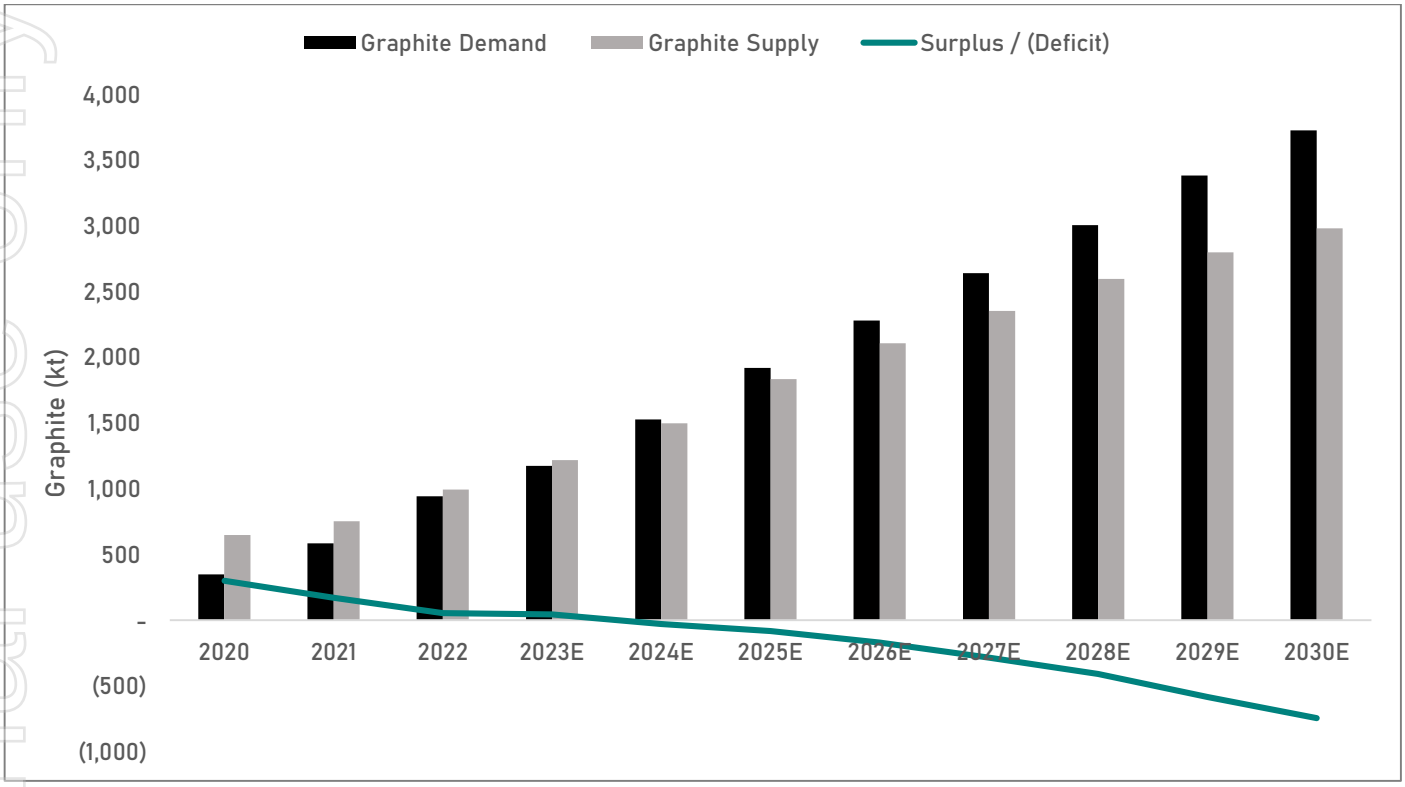

Figure 42: Graphite demand / supply showing market deficit beginning 2024E
Source: Macquarie Research (March 2023)

Currently, China is the world's largest supplier of natural flake graphite. In 2020, leading data provider and market intelligence publisher Benchmark Mineral Intelligence reported that China produced 86% of all lithium-ion battery anodes from natural and synthetic graphite and 100% of all the world's natural graphite anodes.

Industry's interaction with supply chain participants indicates the progression towards higher proportions of natural graphite used in battery anodes will be supported by its lower cost and superior environmental credentials. Environmental footprint of EVs will become increasingly important as EV penetration of the overall automobile market accelerates.

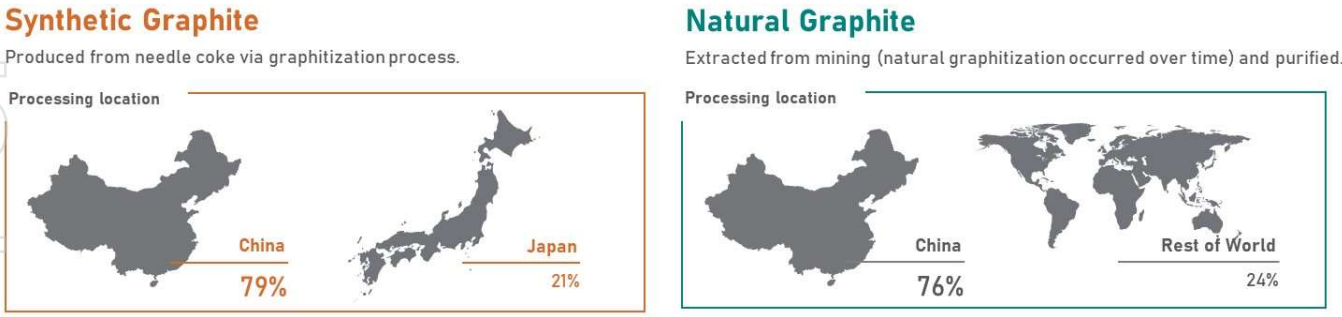

Figure 43: Synthetic and natural graphite production
(Sources: Morgan Stanley Equity Research "Better Anode, Safer Batteries", June 2019; Deutsche Rohstoffagentur "Supply and Demand of Natural Graphite", July 2020)

According to Benchmark (2021), the natural and synthetic graphite industries have little crossover in market share and end-uses with the exception of lithium-ion battery production where they are both used as anode material.

Marketing Strategy

Sovereign has built a strong understanding of the graphite market and developed a number of well-established relationships with potential offtakers.

A major component to graphite sales agreements is customer qualification, and this is a key reason for initiating the graphite bulk sample program and scaling up in-country facilities in order to continuously produce bulk sample over the coming quarters. The graphite produced from this program will be shared with prospective end-users and is an important next step for Sovereign to qualify the Kasiya graphite product.

Sovereign's recent initial graphite characterisation testwork conducted by an independent German industrial minerals specialist demonstrated excellent crystallinity and purity - two key attributes of natural graphite used for anode feedstock in lithium-ion battery anodes.

Crystallinity is an indicator of electrical conductivity which affects battery performance. This parameter is critical to the usability in the lithium-ion battery sector as the higher the crystallinity i.e. the more "perfect" the flakes/crystals, the better the electrical conductivity and battery performance.

The testwork shows that Kasiya graphite is classed as near perfect, fully ordered graphite, confirming it should possess the best electrical conductivity attributes.

Purity denotes the product's total carbon content and residual key impurities including sulphur and iron which are important in anodes. Purification is achieved via either leaching or heat treatment.

Testwork achieved >99.95% purity which is above the benchmark required for graphite in lithium-ion batteries. The results also demonstrated very low sulphur content in this material due to the graphite being hosted in soft saprolite - a key differential from graphite purified from hard-rock deposits.

As noted in the rutile marketing section, Rio Tinto recently made an investment in Sovereign resulting in an initial 15% shareholding and options to increase their position to 19.99%. Under the Investment Agreement, Rio Tinto has the option to become the operator of Kasiya on commercial arm's-length terms.

In the event, Rio Tinto elect to be the operator of the Project and for so long as Rio Tinto remain the operator, Rio Tinto shall have exclusive marketing rights to market 40% of the annual production of all products from the Project as identified in the DFS on arm's-length terms.

Rio Tinto's option over operatorship and 40% marketing rights lapse if not exercised by the earlier of (i) 90 days after the Company announces its DFS results or 180 days after the announcement of the DFS if Rio Tinto's advises it needs additional time to consider the exercise of the Rio Tinto's Option or (ii) Rio Tinto ceasing to hold voting power in the Company of at least 10%.

Sovereign and Rio Tinto will work together to qualify Kasiya's graphite product with a particular focus on supplying the spherical purified graphite segment of the lithium-ion battery anode market. Rio Tinto has set up a battery materials business in 2021, including its recently announced plans to set up a battery testing plant in Melbourne, Australia.

Sovereign engaged Fastmarkets, a specialist international publisher and information provider for the global steel, non-ferrous and industrial minerals markets, to assess the marketability of Sovereign's graphite product.

Fastmarket's assessment has confirmed that, based upon their high-level view on global demand and supply forecasts for natural flake graphite, and with reference to the specific attributes of Sovereign's graphite, there is a reasonable expectation that the product will be able to be sold into existing and future graphite markets. Given the extremely low-cost profile and high-quality product, it is expected that output from Kasiya will be able to fill new demand or displace existing lower quality / higher cost supply.

Price Forecast

The Company has taken a deliberately conservative view on graphite pricing. The basket price used for the Study was based on current pricing sourced from independent consultant, Fastmarkets, and verified against published off-take agreement information in the market. The prices reported are in line with reported prices being received by other graphite producers with prices discounted by Sovereign to incorporate market establishment and agent fees.

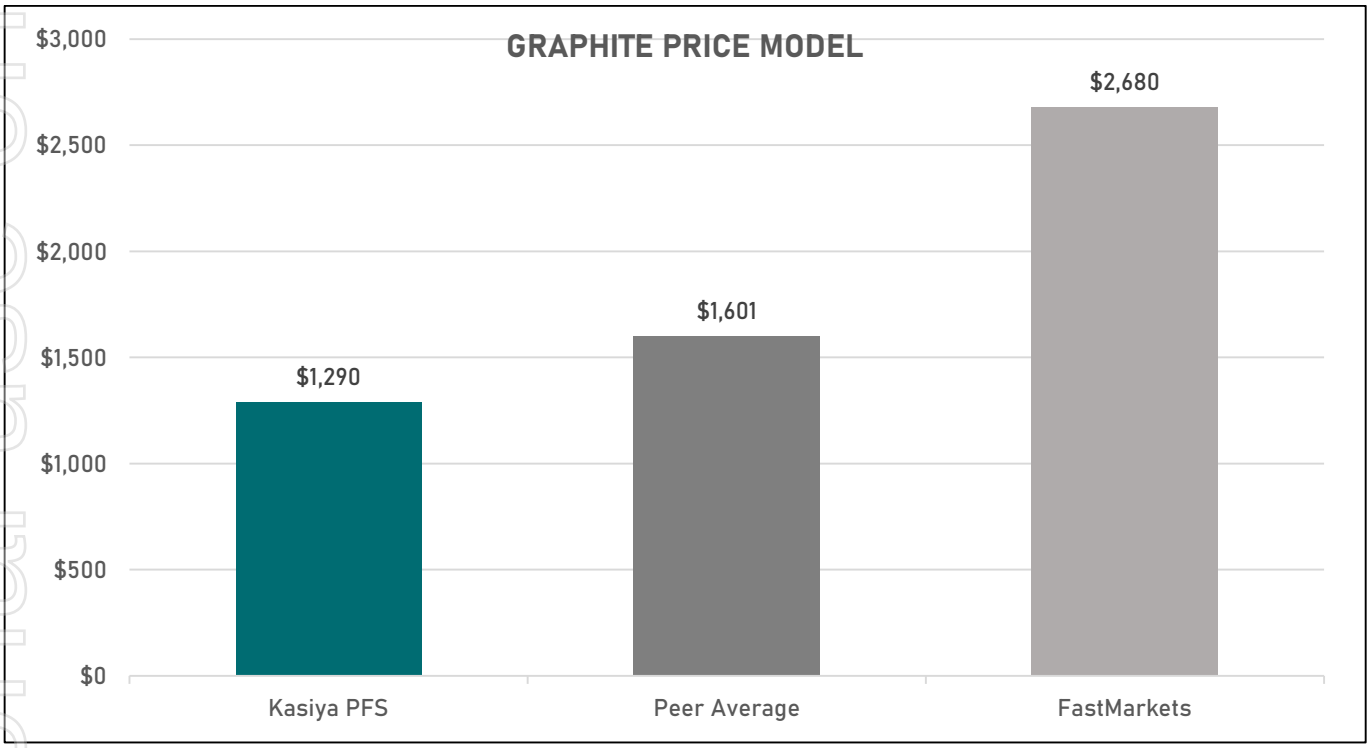

Figure 44: Kasiya PFS Graphite basket price versus Peer Average and Fastmarkets forecast long term prices
Source: Refer to Appendix 7

Based on other guidance and other companies' reported basket prices the equivalent basket price for Kasiya is over US$2,000. However, Sovereign has adopted a conservative average basket price of US$1,290 across the LOM of the operation, below the forecast provided by Fastmarkets.

Table 6: Graphite Price Assumption

Flake Category	Micron (µm)	Distribution (% w/w)	Forecast Price US$/t	Contribution US$/t
Super Jumbo	+500	5.5	$2,513	$138
Jumbo	-500 +300	23.9	$2,047	$490
Large	-300 +180	26.8	$1,396	$374
Medium	-180 +150	11.6	$931	$108
Fine	-150	32.2	$558	$180
Total		**100**	**-**	**$1,290**

Totals that do not sum exactly are due to rounding

COST ESTIMATIONS

Kasiya's cost profile matches the long-life, large scale operation with significant investment in key infrastructure to support a potential multi-generational project or increased scale. The Project has low estimated operating costs through its size, grade, location and existing infrastructure.

The Project leverages off excellent existing infrastructure including hydro-power and an extensive sealed road network. Kasiya is strategically located in close proximity to the capital city of Lilongwe, providing access to a skilled workforce and industrial services.

The existing quality logistics route to the Indian Ocean deep water ports of Nacala and Beira for the export of products to global markets provides significant capital cost savings compared to many other undeveloped projects.

The high-grade mineralisation occurring from surface results in no waste stripping and the amenability to hydro-mining means the mining cost component is relatively low.

Capital Costs

Capital estimates for the process plant have been prepared by DRA Global Ltd, together with input from the various PFS consultants. A large portion of the cost estimates were derived from supplier quotations, historical data, benchmarks and other independent sources. The capital cost estimate has an accuracy of -20% and +25% and compiles with a Class 3 Estimate as defined by the Association for the Advancement of Cost Engineering International (**AACEI**). A summary of the capital cost breakdown is presented in Table 7 below.

Table 7: Capital Costs

	Stage 1 12Mtpa Operation US$m	Stage 2 Expansion to 24Mt US$m	Plant Relocation US$m
Direct			
Mining	$13.2	$45.4	$63.4
Process Plant - Rutile	$59.2	$59.2	$39.6
Process Plant - Graphite	$44.0	$51.9	$50.3
Tailings	$55.0	$39.4	$50.7
Infrastructure	$219.2	$8.9	$37.1
Total Direct	**$390.6**	**$204.7**	**$241.1**
Indirect			
EPCM	$38.7	$19.4	$25.5
Construction, Start-up & RAP	$80.1	$14.7	$38.3
Total Indirect	**$118.8**	**$34.1**	**$63.8**
Contingency	*$87.8*	*$47.8*	*$60.8*
Total Pre-Production	**$597.2**	**$286.6**	**$365.7**

The Stage 1 capital cost estimate to first production is the capital required to build and commission a 12Mtpa operation. This includes the significant investment into infrastructure that supports the expansion and the operations growth in the future stages. Stage 2 is the capital required to expand the operation to nameplate throughput of 24Mtpa. The third major capital estimate is the capital required to construct a new plant and plant relocation to the northern portion of the Ore Reserve in Year 12 of operations.

For all estimates an average contingency of 17% has been applied.

Increased capital to first production is mainly due to bringing forward capital previously planned for Stage 2, including a rail spur, full-scale raw water dam and integrated power, as well as generally enhanced engineering plus global cost inflation.

Direct

Mining is estimated on a contractor basis for the LOM. The capital costs estimated for mining in Table 7 above are the costs to establish the Company's own infrastructure.

The Process Plant estimates for the three Stages are based on the flowsheets and mass balances established during test work programs and outlined in the Metallurgy and Process section above.

Infrastructure costs cover the operational infrastructure to support the Project. For Stage 1, these include installation of a power line to connect to the hydropower sourced grid, access road, water storage dam, supporting pumping and pipeline infrastructure, the construction costs for the initial TSF and the mobile fleet to service the operation. For both Stages 2 and the plant relocation these components are significantly reduced due to the upfront investment in Stage 1.

Indirect

EPCM is an applied factor to the estimated plant and infrastructure direct costs. These costs include provisions for expatriate flight and travel costs during the construction period.

Estimations for the construction costs (outside EPCM), owner's and start-up costs have been included for each Stage. These costs include owner's teams and establishment expenses.

Operating Costs

The operating costs for the production of rutile and graphite at Kasiya over the LOM is presented in Table 8 below.

Table 8: Operating Estimate (LOM)

Description	US$/t Mined Tonne	US$/t Product
Mining	$2.09	$96
Processing – Rutile	$1.90	$88
Processing – Graphite	$0.95	$44
Tailings & Rehabilitation	$1.25	$58
General & Administration	$0.42	$20
Total Mine Gate	**$6.62**	**$306**
Logistics	$2.12	$98
Total Operating Costs	**$8.74**	**$404**

Mining costs have been estimated by Fraser Alexander, a regional leader in hydro-mining and materials handling. Mining costs have been built up from first principles based on equipment, vendor, and contractor quotations, local unit cost rates, and benchmarked costs. It has been assumed mining will be on an all-in contractor basis for the life of mine.

Processing costs include all the processing and tailings management operating costs for each of the three Stages. All consumables and reagents (including flocculant) are included in these costs. Labor costs have been developed based on a first-principles build-up of staffing requirements with labor rates from benchmarks for Malawi and expatriates from South Africa and other countries. Staffing costs for each domain have been allocated accordingly. Logistics costs were estimated by independent consultancy, Thelo DB with input from Nacala Logistics and Grindrod. It is estimated the operation will require US$470m of sustaining capital over the life of mine.

FINANCIAL & ECONOMIC ANALYSIS

Modelling Assumptions

A detailed project economic model was prepared by the Company as part of the Study. The economics include the following key assumptions

- Capital and operating costs are in accordance with the technical study outcomes
- Construction is 30-months for Stage 1 and 24-months for Stages 2 and the plant relocation
- Ramp-up is based on a 9-month time frame to nameplate production for each plant
- Financial modelling has been completed on an annual basis
- Pricing information is as detailed in this announcement
- Corporate tax rate of 30%
- Rent Resource Tax (**RRT**) of 15% after-profit
- 5% royalty
- A 0.45% royalty for the community development fund.
- 2% vendor gross profit royalty

Table 9: Key PFS Outcomes

Outcome	Unit	Kasiya
NPV_8 (real post-tax)	US$	$1,605m
NPV_{10} (real post-tax)	US$	$1,205m
IRR (post-tax)	%	28%
NPV_8 (real pre-tax)	US$	$2,419m
NPV_{10} (real pre-tax)	US$	$1,818m
IRR (pre-tax)	%	32%
Total Revenue	US$	$16,121m
EBITDA (Average LoM)	US$/y	$415m
Payback – from start of production	years	4.3 years

Sensitivity Analysis

The Study has been designed to a PFS level with capital and operating cost accuracy of - 20% and +25%. Key inputs into the Study have been tested by capital cost, operating costs and price sensitivities.

Table 10: Post-Tax NPV Sensitivity against other discount rates

NPV – Post tax (US$m)			
6%	8%	10%	12%
$2,150m	$1,605m	$1,206m	$907m

Table 11: Pre-Tax NPV Sensitivity against other discount rates

NPV – Pre tax (US$m)			
6%	8%	10%	12%
$3,252m	$2,419m	$1,818m	$1,375m

Table 12: Post Tax NPV Sensitivity against Key Inputs (US$m)

	Unfavourable change				Favourable change		
	-30%	-20%	-10%	Base	+10%	+20%	+30%
Product Prices	$636	$965	$1,286	$1,605	$1,923	$2,239	$2,555
Rutile Price	$1,103	$1,271	$1,439	$1,605	$1,771	$1,938	$2,103
Graphite Price	$1,149	$1,301	$1,454	$1,605	$1,757	$1,908	$2,059
Operating Cost	$1,310	$1,407	$1,507	$1,605	$1,703	$1,801	$1,899
Capital Cost	$1,452	$1,503	$1,555	$1,605	$1,655	$1,705	$1,754

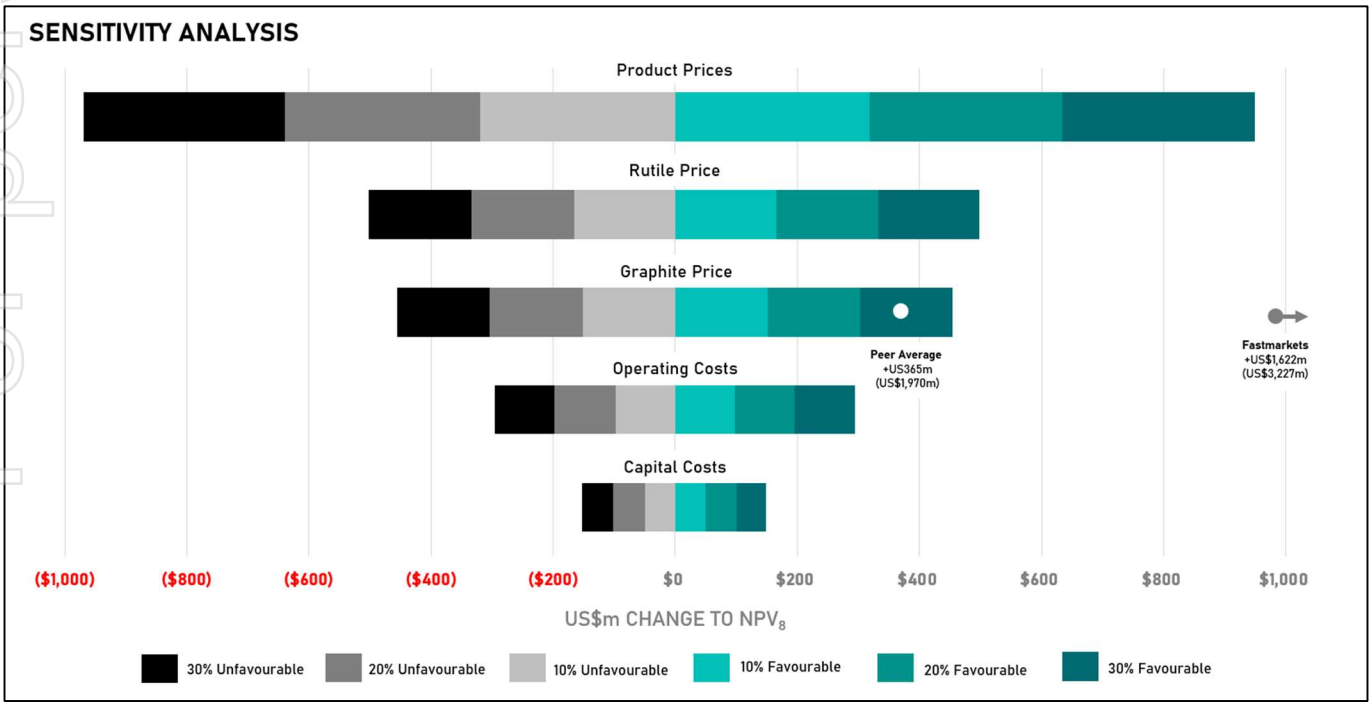

Figure 45: NPV_8 sensitivity analysis of key inputs

MINE CLOSURE PLAN

Project closure is planned to be undertaken in three phases:

- Progressive rehabilitation of mined out open pits during the operational phase;
- Decommissioning of infrastructure at completion of production phase;
- Final rehabilitation and revegetation; and
- Post-closure monitoring and maintenance works.

Open Pits

All structures, pipelines and fencing will be dismantled and removed from the area once backfill and pit profiling has been completed. Rehabilitation of each pit will be completed sequentially over a 4 to 5-year period during and post the operational phase. Once the agricultural land capability is achieved through the rehabilitation process the area may be returned to the previous owners for further cultivation, considering adequate land management practices are in place. Post closure monitoring and maintenance will include monitoring of rehabilitated areas and agricultural practices.

Tailings Storage Facility

All structures, pipelines and fencing will be dismantled and removed from the area. The TSF embankments will be reprofiled to create a safe and stable landform. The drainage plan for the TSF top surface will consist of a gravity discharge configuration or a retention strategy. The landform will be contoured and spread with topsoil and revegetated. The downstream slope is designed to a 1V:4H for the onset with closure revegetation in mind. Appropriate surface drainage will be re-established around the TSF to prevent scouring of the embankments and toe of the TSF.

Processing Plant

Power and water supply infrastructure to the site will be disconnected and made safe. All buildings, structures and the processing plant will be dismantled and removed from the area including all consumables, wastes and hazardous materials. Any contaminated sites will be assessed and remediated during operations. Equipment and supporting structures that have been dismantled will be salvaged and sold as second-hand equipment or scrap metal where possible. Portable office buildings will be considered for donation to local communities for use as community infrastructure. Concrete slabs will be either be ripped up and material disposed of in the open pits or TSF, or alternatively broken up and buried under an appropriate layer of cover material that can sustain vegetation. Hydrocarbon-contaminated soils, if any, will be treated on site through bioremediation. Cleared areas will be re-contoured, topsoiled and revegetated.

Water Management Infrastructure

The closure plan for the water management infrastructure involves removing all above and below ground assets and infrastructure (such as pipelines and pumps) where required, managing surface water drainage, contour ripping, spreading available soil and applying seed. Impacted soils will be remediated and the landfill will be covered in accordance with relevant licence conditions and legislated standards.

If required by the Malawi Government, the water storage dam embankment will be breached at the lowest point to prevent further water retention. The areas will be contoured and flow in the stream reinstated. Alternatively, the water storage dam can be transferred to the Malawi Government.

Site Maintenance and Monitoring

On completion of the final closure measures, a monitoring and maintenance program will be implemented to ensure that the closure measures are robust, have been performed adequately and that no further liabilities arise. It is assumed that a minimum monitoring period of 5 to 10 years will be required post closure.

PERMITTING

Sovereign holds a number of Exploration Licences (**ELs**) granted validly under the Mines and Mineral Act. as summarised in Table 13:

Table 13: Tenure

Licence	Holding Entity	Interest	Type	Licence Renewal Date	Expiry Term Date[1]	Licence Area (km²)	Status
EL0609	MML	100%	Exploration	25/09/2024	25/09/2028	440.5	Granted
EL0582	SSL	100%	Exploration	15/09/2023[2]	15/09/2027	285.0	Granted
EL0492	SSL	100%	Exploration	29/01/2025	29/01/2025	935.4	Granted
EL0528	SSL	100%	Exploration	27/11/2023	27/11/2025	16.2	Granted
EL0545	SSL	100%	Exploration	12/05/2024	12/05/2026	53.2	Granted
EL0561	SSL	100%	Exploration	15/09/2023[2]	15/09/2027	124.0	Granted
EL0657	SSL	100%	Exploration	3/10/2025	3/10/2029	2.3	Granted

Notes:

SSL: Sovereign Services Limited & MML: McCourt Mining Limited

[1] An EL covering a preliminary period in accordance with the Malawi Mines and Minerals Act (No 8. Of 2019) (**Mines Act**) is granted for a period not exceeding three (3) years. Thereafter two successive periods of renewal may be granted, but each must not exceed two (2) years. This means that an EL has a potential life span of seven (7) years. ELs that have come to the end of their term can be converted by the EL holder into a retention licence (**RL**) for a term of up to 5 years subject to meeting certain criteria.

[2] The Company submitted an extension application for EL0582 and EL0561 prior to the renewal date in accordance with the Mines Act.

Subject to further positive technical studies, Sovereign proposes to apply for a ML to secure mineral deposits for mining at Kasiya. Under the Mines Act there are certain requirements, milestones and approvals required in order to submit a ML application. At this point of Kasiya's development, the Company notes no known or material issues in this respect.

Under the Mines Act, The Government of Malawi shall have the right, but not the obligation, to acquire, directly or through a Government nominee, without cost, a free equity ownership interest of up to ten percent (10%) in any mining project that will be subject to a large-scale mining licence (>5Mt mined per annum or >US$250m Capex).

As previously noted by the Company, the Government of Malawi has proposed a new Mines and Minerals Bill (2023) (**New Bill**) which has been passed by the Malawian Parliament and now awaits Malawian Presidential Assent and publication in the Malawi Gazette before coming into force. If approved, the New Bill will replace the current Mines Act. The New Bill introduces amendments to improve transparency and governance of the mining industry in Malawi. Sovereign notes the following updates in the New Bill which may affect the Company in the future: (i) ELs may be granted for an initial period of 5 years with the ability to extend by 3 years on two occasions (total 11 years); (ii) the Malawian Government maintains a right to free equity ownership (as discussed above) for large-scale mining licences but the New Bill proposes to remove the free government equity ownership with the right to be a negotiation matter; and (iii) A new Mining and Regulatory Authority will be responsible for implementing the objectives of the New Bill.

In a Press Release issued on 20 July 2023, the Government of Malawi has publicly applauded the timely investment by Rio Tinto and marked it as a milestone towards realising the country's aspirations of growing the mining industry as promoted in the Malawi Vision 2063, which identifies mining as a priority industry.

The Government's statement confirms its commitment to ensuring the growth of the mining sector through deliberate initiatives aiming at establishing a conducive investment environment in the sector.

SOVEREIGN METALS LIMITED

DISCLOSURES, DISCLAIMERS, MODIFYING FACTORS & SOURCES

DISCLOSURES & DISCLAIMERS

Competent Person Statements

The information in this announcement that relates to Production Targets and Ore Reserves is based on and fairly represents information provided by Mr Ross Cheyne, a Competent Person, who is a Fellow Member of The Australasian Institute of Mining and Metallurgy. Mr Cheyne is employed by Orelogy Consulting Pty Ltd, an independent consulting company. Mr Cheyne has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Cheyne consents to the inclusion in the Announcement of the matters based on his information in the form and context in which it appears.

The information in this announcement that relates to Processing, Infrastructure and Capital and Operating Costs is based on and fairly represents information compiled or reviewed by Mr Tomasz Tomicki, a Competent Person, who is a Fellow Member of The Australasian Institute of Mining and Metallurgy. Mr Tomicki is employed by DRA Pacific Pty Ltd, an independent consulting company. Mr Tomicki has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activities undertaken. Mr Tomicki, consents to the inclusion in the Announcement of the matters based on his information in the form and context in which it appears.

The information in this announcement that relates to Metallurgy - rutile is based on and fairly represents information compiled or reviewed by Mr Tomasz Tomicki, a Competent Person, who is a Fellow Member of The Australasian Institute of Mining and Metallurgy. Mr Tomicki is employed by DRA Pacific Pty Ltd, an independent consulting company. Mr Tomicki has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activities undertaken. Mr Tomicki, consents to the inclusion in the Announcement of the matters based on his information in the form and context in which it appears.

The information in this announcement that relates to Metallurgy - graphite is based on and fairly represents information compiled or reviewed by Mr John Fleay, a Competent Person, who is a Fellow Member of The Australasian Institute of Mining and Metallurgy. Mr Fleay is employed by DRA Pacific Pty Ltd, an independent consulting company. Mr Fleay has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activities undertaken. Mr Fleay, consents to the inclusion in the Announcement of the matters based on his information in the form and context in which it appears.

The information in this announcement that relates to the Mineral Resource Estimate is extracted from the announcement entitled 'Kasiya Indicated Resource Increased by over 80%' dated 5 April 2023 and is based on, and fairly represents information compiled by Mr Richard Stockwell, a Competent Person, who is a fellow of the Australian Institute of Geoscientists (AIG). Mr Stockwell is a principal of Placer Consulting Pty Ltd, an independent consulting company. The original announcement is available to view on www.sovereignmetals.com.au. Sovereign confirms that a) it is not aware of any new information or data that materially affects the information included in the original announcement; b) all material assumptions included in the original announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this announcement have not been materially changed from the original announcement.

Forward Looking Statement

This release may include forward-looking statements, which may be identified by words such as "expects", "anticipates", "believes", "projects", "plans", and similar expressions. These forward-looking statements are based on Sovereign's expectations and beliefs concerning future events. Forward looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Sovereign, which could cause actual results to differ materially from such statements. There can be no assurance that forward-looking statements will prove to be correct. Sovereign makes no undertaking to subsequently update or revise the forward-looking statements made in this release, to reflect the circumstances or events after the date of that release.

This ASX Announcement has been approved and authorised for release by the Board of Directors.

SUMMARY OF MATERIAL ASSUMPTIONS

Material assumptions used in the estimation of the production target and associated financial information are set out in the following table.

Table 14: Assumptions

Assumption	Input
Maximum accuracy variation - Capital costs	-20%/+25%
Maximum accuracy variation - Operating costs	-20%/+25%
Minimum LoM	25 years
Annual average throughput (tonnes) – Stage 1	12,000,000
Annual average throughput (tonnes) – Stage 2	24,000,000
Annual throughput (tonnes) – LoM average	21,600,000
Head grade – rutile	1.03%
Recovery – rutile	100%
Product grade (TiO_2) - rutile	96%
Head grade – graphite	1.66%
Recovery – graphite	67.5%
Product grade (TGC) - graphite	96%
Annual production (average LoM) – rutile (tonnes)	222,000
Annual production (average LoM) – graphite (tonnes)	244,000
USD:AUD	0.67
USD:MWK	0.0010
USD:ZAR	0.0549
Sales Price – rutile (average LoM)	US$1,484/t
Sales Price – graphite (average LoM)	US$1,290/t
Government Royalty	5% of gross revenue
Vendor Royalty	2% of gross profit
Community Development Fund	0.45% of gross revenue
Stage 1 Capital	US$572m
Stage 2 Capital (expansion to 24Mtpa)	US$287m
Plant Relocation	US$366m
Sustaining Capital	US$470m
Operating Costs including royalties (LoM) – FOB Nacala	US$404/t
Corporate Tax Rate	30%
Rent Resource Tax (RRT)	15% after-profits
Discount Rate	8%

ORE RESERVE STATEMENT

Orelogy Consulting Pty Ltd (**Orelogy**) was responsible for the mine planning component of the PFS for Kasiya. As such Orelogy have developed an Ore Reserve estimate for Kasiya in accordance with the guidelines of the JORC Code 2012.

The Kasiya MRE released by Sovereign in on 5 April 2023 was used as the basis for the PFS Ore Reserve estimate. Mineral Resources were converted to Ore Reserves in line with the material classifications which reflect the level of confidence within the resource estimate. The Ore Reserve reflects that portion of the Mineral Resource which can be economically extracted by open pits utilising a combination of hydro mining and bulldozer methodologies. The Ore Reserve considers the modifying factors and other parameters detailed in the relevant sections of the PFS report, including but not limited to the mining, metallurgical, social, environmental, approvals, tenure, statutory and financial aspects of the project.

In line with the JORC 2012 guidelines, the Kasiya Probable Ore Reserve is based on Indicated classified Mineral Resources. There is no Measured classified Mineral Resource at Kasiya and consequently no Proved Ore Reserve.

The reported MRE is inclusive of the Ore Reserve.

The Ore Reserve includes an allowance for mining dilution and ore loss on the basis that all material within the shell is classified and extracted as ore.

The open pit geometries developed for the purposes of mine planning, and which define the subsequent Ore Reserve, are based on Whittle pit shells edited to comply with practical mining requirements and identified exclusion zones.

The information that relates to Ore Reserves was compiled by Mr Ross Cheyne of Orelogy who takes overall responsibility for the Ore Reserve as Competent Person (see Competent Persons Statement above). Mr Cheyne is a Fellow of The Australasian Institute of Mining and Metallurgy and has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as Competent Person in terms of the JORC (2012 Edition).

A site visit was undertaken by Mr Ryan Locke in, a Principal Consultant with Orelogy, as a nominated representative of the Competent Person.

The Ore Reserve estimate is summarised in Table 15 below, along with the associated cut-off grade used to define the shell.

Table 15: Ore Reserve for the Kasiya Deposit as of September 2023

Classification	Tonnes (Mt)	Rutile Grade (%)	Contained Rutile (Mt)	Graphite Grade (TGC) (%)	Contained Graphite (Mt)
Proved	-	-	-	-	-
Probable	538	1.03%	5.5	1.66%	8.9
Total	**538**	**1.03%**	**5.5**	**1.66%**	**8.9**

Pit Optimisation

An open pit optimisation utilising Whittle™ software was carried out on the Kasiya deposit using Indicated Mineral Resources only (in line with the JORC 2012 guidelines). The latest parameters available were used to determine the economic extent of the open pit excavation. The process plant production parameters were supplied by Sovereign with an initial rate of 12Mtpa and a ramp up in production from years 5 - 7 to annual rate of 24Mtpa.

The intention to hydro-mine the majority of the defined Ore Reserve means that there is no ability to selectively mine and all material will be extracted and sent as plant feed. Therefore, all material within the "shell" will be extracted and fed to the plant as ore and any interstitial waste and/or sub-economic grade material will be likewise treated as diluent material. However, due to the relatively homogenous and continuous nature the orebody, the quantities of this material will be relatively small and therefore a simple 5% dilution was applied within the Whittle™ tool.

For the production schedule on which the Ore Reserve is based all material within the shell was treated as "ore" to ensure the appropriate dilution was captured.

Mineable Pit Geometries

Based on the cut-off grades applied the mining areas was further interrogated to determine the potential recoverable mining inventory. The interrogation process applied the following constraints to determine the bulk mining boundaries:

- A minimum depth of 5m for the hydro mining method.
- Removal of any small, isolated pits.
- Pit extents limited to mineable areas and to remain outside of identified exclusion areas wherever reasonably possible. Sovereign identified all local village areas and areas of cultural or environmental significance within the potential mining envelope that should not be disturbed during the mining phase of the Project.

MODIFYING FACTORS

The Modifying Factors included in the JORC Code (2012) have been assessed as part of the Pre-Feasibility Study, including mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and government factors. The Company has received advice from appropriate experts when assessing each Modifying Factor.

A summary assessment of each relevant Modifying Factor is provided below.

***Mining** – refer to section entitled 'Mining' in the Announcement.*

The Company engaged independent consultants, Orelogy and Fraser Alexander to carry out the pit optimisations, mine design, scheduling, mining cost estimation and Ore Reserves for the Study. The proposed mining method is hydro mining with minor bulldozer assistance. This is considered appropriate for this style of shallow, soft and friable saprolite-hosted rutile and graphite mineralisation. This methodology is used across numerous mineral sands operations, particularly in Africa, and is well suited for this style of mineralisation.

***Metallurgy and Processing** – refer to section entitled 'Metallurgy and Process Design' in the Announcement.*

Rutile

The Company completed bulk rutile testwork programs at the globally recognised AML in Perth, Australia. The latest program was supervised by Sovereign's Head of Development, Paul Marcos. Mr Marcos is a metallurgist and process engineer and a mineral sands industry veteran. Bulk test-work programs have confirmed premium grade rutile can be produced via a simple and conventional process flow sheet.

Processing engineering was completed by DRA Global who developed the process plant design and associated cost estimate for the Study. An average product grade of 96% TiO_2 and 100% recovery to product factor has been applied.

Graphite

The Company has conducted graphite testwork across ALS Laboratory in Perth and SGS Lakefield in Canada. Veteran graphite metallurgist Oliver Peters, MSc, P.Eng., MBA (Consulting Metallurgist for SGS and Principal Metallurgist of Metpro Management Inc.) was engaged to supervise and consult on the testwork programs. Mr Peters has over 25 years' experience in metallurgy on graphite and other commodities. He has operated numerous graphite pilot plants and commissioned a number of full-scale processing facilities.

DRA's Senior Engineer, Stewart Calder and Manager Metallurgy, John Fleay supervised and advised on sample selection, testwork scope and results from the latest testwork programs. Both consultants are considered to have the appropriate capabilities and similarities with the material and the early stage of the project.

Processing engineering was completed by DRA Global who developed the process plant design and associated cost estimates for the PFS. Overall average graphite recovery applied in the model was 67.5%. Gravity recovery ranges between 73.6% to 86.2%, averaging 77.9% and flotation plant recovery ranges between 89.2% and 96.1%, averaging 91.4%. Total Graphite (TGC) recovery average is 72.5%. Overall concentrate grades average 96% C(t) with over 57% of the graphite flake product being larger than 180µm.

Rutile & Graphite

It is acknowledged that laboratory scale test-work will not always represent actual results achieved from a production plant in terms of grade, chemistry, sizing and recovery. Further test-work will be required to gain additional confidence on specifications and recoveries that will be achieved at full-scale production.

Overall, the process flow-sheet is conventional for both rutile and graphite with no novel features or equipment incorporated.

***Infrastructure** – refer to sections entitled 'Infrastructure', and 'Transport and Logistics' in the Announcement.*

Kasiya is located approximately 40km northwest of Lilongwe, Malawi's capital, and boasts excellent access to services and infrastructure. The proximity to Lilongwe gives the project a number of benefits, including access to a large pool of professionals and skilled tradespeople, as well as industrial services.

The Company appointed JCM to design a preliminary IPP solution for Kasiya. JCM is a Canada-headquartered IPP which develops, constructs, owns and operates renewable energy and storage projects in emerging markets across the globe. JCM provided an estimated, levelized cost of energy (**LOCE**) on a Power Purchase Agreement (**PPA**).

Logistics cost estimates, including rail and port infrastructure and handling, were provided by Thelo DB, Nacala Logistics and Grindrod based on market data, suppliers' quotations, industry databases, industry contacts and consultants' existing knowledge of southern African transport infrastructure and freight markets. All consultants are independent with substantial experience in the management of transport logistics studies in southern Africa.

***Marketing** – refer to sections entitled 'Marketing Strategy' in the Announcement.*

Rutile

The Company engaged market leading TZMI to provide a bespoke marketing report to support the Study. TZMI is a global, independent consulting and publishing company specialising in technical, strategic and commercial analyses of the opaque (non-terminal market) mineral, chemical and metal sectors.

TZMI's assessment has confirmed that, based upon their high-level view on global demand and supply forecasts for natural rutile, and with reference to the specific attributes of Kasiya, there is a reasonable expectation that the product will be able to be sold into existing and future rutile markets.

Given the premium specifications of Kasiya's natural rutile, the product should be suitable for all major natural end-use markets including TiO_2 pigment feedstock, titanium metal and welding sectors.

In July 2023, Rio Tinto made an investment in Sovereign resulting in an initial 15% shareholding and options expiring within 12 months of initial investment to increase their position to 19.99%. Under the Investment Agreement, Rio Tinto will provide assistance and advice on technical and marketing aspects of Kasiya. Also, included under the Investment Agreement, Rio Tinto has the option to become the operator of Kasiya on commercial arm's-length terms.

In the event, Rio Tinto elect to be the operator of the Project and for so long as Rio Tinto remain the operator, Rio Tinto shall have exclusive marketing rights to market 40% of the annual production of all products from the Project as identified in the DFS on arm's-length terms.

Rio Tinto's option over operatorship and 40% marketing rights lapse if not exercised by the earlier of (i) 90 days after the Company announces its DFS results or 180 days after the announcement of the DFS if Rio Tinto's advises it needs additional time to consider the exercise of the Rio Tinto's Option or (ii) Rio Tinto ceasing to hold voting power in the Company of at least 10%.

Graphite

The Company engaged Fastmarkets, a specialist international publisher and information provider for the global steel, non-ferrous and industrial minerals markets, to prepare a marketing report for graphite.

Fastmarkets' assessment has confirmed that based upon their high-level view on global demand and supply forecasts for natural flake graphite, and with reference to the specific attributes of Sovereign's projects, there is a reasonable expectation that the product from Sovereign's projects will be able to be sold into existing and future graphite markets. Given the extremely low-cost profile and high-quality product, it is expected that output from Kasiya will be able to fill new demand or substitute existing lower quality / higher cost supply.

Project considerations taken by Fastmarkets in forming an opinion about the marketability of product include:

- Low capital costs (incremental)
- Low operating costs
- High quality concentrate specifications

Industry participants confirm that the highest value graphite concentrates remain the large, jumbo and super-jumbo flake fractions, primarily used in industrial applications such as refractories, foundries and expandable products. These sectors currently make up the significant majority of total global natural flake graphite market by value.

Fastmarkets have formed their opinion based solely upon project information provided by Sovereign Metals to Fastmarkets and have not conducted any independent analysis or due diligence on the information provided.

As noted above, Rio Tinto recently made an investment in Sovereign. The Company and Rio Tinto will work together to qualify Kasiya's graphite product with a particular focus on supplying the spherical purified graphite segment of the lithium-ion battery anode market. Rio Tinto has set up a battery materials business in 2021, including its recently announced plans to set up a battery testing plant in Melbourne, Australia.

***Economic** – also refer to sections entitled 'Cost Estimations' and 'Financial & Economic Analysis' in the Announcement.*

Capital estimates for the procress plant have been prepared by DRA global, together with input from the Company and other contributing consultants using combinations of cost estimates from suppliers, historical data, benchmarks and other independent sources. The accuracy of the initial capital cost estimate for the Project is ±20%.

Capital costs include the cost of all services, direct costs, contractor indirects, EPCM expenses, non-process infrastructure, sustaining capital and other facilities used for the mine. Capital costs make provision for mitigation expenses and mine closure and environmental costs.

Working capital requirements (including contingency) for plant commissioning and full ramp-up have been included in the headline capital estimate reported under construction, owner's and start-up costs.

Mining costs have been estimated by Fraser Alexander, a regional leader in hydro-mining and materials handling. Mining costs have been built up from first principles based on equipment, vendor, and contractor quotations, local unit cost rates, and benchmarked costs.

Labor costs have been developed based on a first-principles build-up of staffing requirements with labour rates benchmarked in Malawi and expatriate rates benchmarked for professionals from South Africa and other jurisdictions.

A Government royalty of 5% (applied to revenue) and a vendor profit share of 2% (applied to gross profit) has been included in all project economics. A 0.45% royalty (applied to revenue) has been applied for the community development fund.

Rehabilitation and mine closure costs are included within the reported operating cost and sustaining capital figures.

A detailed financial model and discounted cash flow (**DCF**) analysis has been prepared by the Company in order to demonstrate the economic viability of the Project. The financial model and DCF were modelled with conservative inputs to provide management with a baseline valuation of the Project.

The DCF analysis demonstrated compelling economics of the prospective Project, with an NPV (ungeared, after-tax, at an 8% discount rate) of US$1,605 million, and an (ungeared) IRR of 28%.

Sensitivity analysis was performed on all key assumptions used. The robust project economics insulate the Kasiya Project from variation in market pricing, capital expense, or operating expenses. With a rutile and graphite concentrate price 30% lower than the PFS prices the Project still displays a positive NPV (ungeared, after-tax, 8% discount rate) of US$636 million and IRR of 17%.

Payback period for the Project is 4.3 years from the start of production. The payback period is based on free-cash flow, after taxes.

Sovereign estimates the total capital cost to construct the mine to be US$597m (which includes a contingency of 17% of direct and indirect costs).

Key parameters are disclosed in the body of the announcement, and include:

- Life of Mine: 25 years
- Discount rate: 8%
- Tax rate: 30%
- Resource Rent Tax (RRT) of 15% after tax profit
- Royalty rate: 5% royalty (Government), 2% of gross profit (Original Project Vendor) and 0.45% Community Development Fund.
- Pricing: Rutile average price of US$1,484 per tonne and Graphite average basket price of US$1,290 per tonne

The financial model has been prepared internally by the Company using inputs from the various expert consultants and has been reviewed by BDO Australia – Perth, an independent leading accountancy, tax and advisory services firm to validate the functionality and accuracy of the model.

The Company engaged the services of advisory firm, Argonaut PCF Limited (**Argonaut**), with regards to project economics. Argonaut is a financial advisory firm which specialises in multiple sectors, including metals and oil & gas. Argonaut is well regarded as a specialist capital markets service provider and has raised project development funding for companies across a range of commodities including the industrial and speciality minerals sector. Following the assessment of a number of key criteria, Argonaut has confirmed that, on the basis that a DFS arrives at a result that is not materially negatively different than the PFS as noted above, all in-country government and regulatory approvals are received, commercial offtake agreements are in place for the majority of rutile and graphite production for at least the first five years of mine life, and that there has not been any material adverse change in financial condition, results of operations, business or prospects of the Company/or political and business environment in Malawi and/or financial or capital markets in general, Sovereign should be able to raise sufficient funding to develop the Project.

In July 2023, Rio Tinto made an investment in Sovereign resulting in an initial 15% shareholding and options expiring within 12 months of initial investment to increase their position to 19.99%. Under the Investment Agreement, is has been agreed with Rio Tinto that if Sovereign is raising debt finance for the development of the Project, Sovereign and Rio Tinto will negotiate, in good faith, financing arrangements in order to put in place an acceptable mine construction funding package.

Since initial exploration of the Kasiya Project in November 2019, the Company has completed extensive drilling, sampling, metallurgical test-work, geological modelling and defined an Indicated and Inferred Mineral Resource Estimate. Over this period, with these key milestones being attained and the Project de-risked, the Company's market capitalisation has increased from approximately A$18m to over A$236m. As the Project continues to achieve key milestones, which can also be significant de-risking events, the Company's share price could be anticipated to increase.

The Company is debt free and is in a strong financial position, with approximately A$45m cash on hand (31 August 2023). The current financial position means the Company is soundly funded to continue into a DFS phase to further develop the Project.

In July and August 2023, Rio Tinto invested $40.6m to become a strategic investor of the Company. The investment proceeds will be used to advance Kasiya and represents a significant step towards unlocking the Project for a major new supply of low-CO_2-footprint natural rutile and flake graphite. Under the Investment Agreement, Rio Tinto will provide assistance and advice on technical and marketing aspects of Kasiya including with respect to Sovereign's graphite co-product, with a primary focus on spherical purified graphite for the lithium-ion battery anode market.

The Company's shares are listed on the ASX and AIM which are premier markets for growth companies and provides increased access to capital from institutional and retailed investors in Australia and the UK.

Sovereign has an experienced and high-quality Board and management team comprising highly respected resource executives with extensive technical, financial, commercial and capital markets experience. The directors have previously raised more than A$2bn from capital markets for a number of exploration and development companies.

As a result, the Board has a high level of confidence that the Project will be able to secure funding in due course, having particular regard to:

1. Required capital expenditure;
2. Sovereign's strategic partner relationship with Rio Tinto;
3. Sovereign's market capitalisation;
4. Recent funding activities by directors in respect of other resource projects;
5. Recently completed funding arrangements for similar or larger scale development projects;
6. The range of potential funding options available;
7. The favourable key metrics generated by the Kasiya Project;
8. Ongoing discussions for potential offtake agreements; and
9. Investor interest to date.

Environmental, Social, Legal and Governmental *– refer to section entitled 'Environmental & Social Impact' in the Announcement.*

Sovereign is committed to conduct its activities in full compliance to the requirements of national regulations, its obligations under international conventions and treaties and giving due consideration to international best practices and policies. The Company has appointed an experienced environmental consultant to manage the ESIA process, and environmental and social baseline studies have commenced with appropriately qualified independent experts. The Company has also completed a high-level risk assessment to identify major environmental and social risks which could affect the development of the Project, along with mitigating strategies to allow identified risks to be addressed early in the project design phase.

The Company has embarked on several community engagement exercises in the area and there is a general positive acceptance of the Project. Social responsibility/RAP costs totalling US$92m have been included in this Study, as well as a 0.45% revenue royalty for the community development fund.

Based on the current assessments and commenced ESIA, the Company believes there are no environmental issues currently identified that cannot be appropriately mitigated in accordance with standard practices adopted for the development of mining projects.

Subject to further positive technical studies, Sovereign intends to apply for a ML to secure mineral deposits for mining. Under the Mines Act there are certain requirements, milestones and approvals required prior to submission of a ML application. At this point of Kasiya's development, the Company notes no known issues or impediments obtaining a ML under normal course of business.

Under the current Mines Act, The Government of Malawi shall have the right, but not the obligation, to acquire, directly or through a Government nominee, without cost, a free equity ownership interest of up to ten percent (**10%**) in any mining project that will be subject to a large-scale mining licence (>5Mt mined per annum or >US$250m Capex).

As previously noted by the Company, the Government of Malawi has proposed a new Mines and Minerals Bill (2023) (**New Bill**) which has been passed by the Malawian Parliament and received Presidential Assent, though awaits publication in the Malawi Gazette before coming into force. If approved, the New Bill will replace the current Mines Act. The New Bill introduces amendments to improve transparency and governance of the mining industry in Malawi. Sovereign notes the following updates in the New Bill which may affect the Company in the future: (i) ELs may be granted for an initial period of 5 years with the ability to extend by 3 years on two occasions (total 11 years); (ii) the Malawian Government maintains a right to free equity ownership (as discussed above) for large-scale mining licences but the New Bill proposes to remove the free government equity ownership percentage with the right to be a negotiation matter; and (iii) A new Mining and Regulatory Authority will be responsible for implementing the objectives of the New Bill.

In a Press Release issued on 20 July 2023, the Government of Malawi has publicly applauded the timely investment by Rio Tinto and marked it as a milestone towards realising the country's aspirations of growing the mining industry as promoted in the Malawi Vision 2063, which identifies mining as a priority industry.

The Government's statement confirms its commitment to ensuring the growth of the mining sector through deliberate initiatives aiming at establishing a conducive investment environment in the sector.

APPENDIX 1 – JORC CODE, 2012 EDITION – TABLE 1

SECTION 1 - SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code explanation	Commentary
Sampling Techniques	*Nature and quality of sampling (e.g. 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.*	Hand Auger (**HA**) samples are composited based on regolith boundaries and sample chemistry generated by hand-held XRF (**pXRF**). Each 1m of sample is dried and riffle-split to generate a total sample weight of 3kg for analysis, generally at 2 - 5m intervals. This primary sample is then split again to create a 3kg composite to provide a 1.5kg sample for both rutile and graphite analyses. Infill Push-Tube (**PT**) core drilling is sampled routinely at 2m intervals by compositing dried and riffle-split half core. A consistent, 1.5kg sample is generated for both the rutile and graphite determination. Air-Core (**AC**) samples are composited based on expertly logged regolith boundaries. Each 1m of sample is dried and riffle-split to generate a total sample weight of 3kg for analysis, generally at 2m intervals. This primary sample is then split again to provide a 1.5kg sample for both rutile and graphite analyses.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Drilling and sampling activities are supervised by a suitably qualified company geologist who is present at all times. All drill samples are geologically logged by the geologist at the drill site/core yard. Each sample is sun dried and homogenised. Sub-samples are carefully riffle split to ensure representivity. The 1.5kg composite samples are then processed. An equivalent mass is taken from each sample to make up the composite. A calibration schedule is in place for laboratory scales, sieves and field XRF equipment. Placer Consulting Pty Ltd (**Placer**) Resource Geologists have reviewed Standard Operating Procedures (**SOPs**) for the collection and processing of drill samples and found them to be fit for purpose and support the resource classifications as applied to the Mineral Resource Estimate (**MRE**). The primary composite sample is considered representative for this style of rutile mineralisation.
	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 (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g 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 (e.g. submarine nodules) may warrant disclosure of detailed information.	Logged mineralogy percentages, lithology/regolith information and TiO_2% obtained from pXRF are used to assist in determining compositing intervals. Care is taken to ensure that only samples with similar geological characteristics are composited together.
Drilling Techniques	*Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. 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).*	A total of 1,357 HA holes for 12,643m have been drilled to date at the Kasiya Rutile Deposit to obtain samples for quantitative determination of recoverable rutile and Total Graphitic Carbon (**TGC**). A PT infill drilling programme, designed to support this resource estimate upgrade, was completed. An additional 234 core holes for 2,368.5m were included in the updated MRE. The total PT holes contributing to the updated MRE are 488 for 4,669m. A total of 182 AC holes for 4,404m were completed in six locations across the Kasiya deposit deemed likely to fall into mining pit areas. The results are included in this updated MRE. Placer has reviewed SOPs for HA, PT and AC drilling and found them to be fit for purpose and support the resource classifications as applied to the MRE. Sample handling and preparation techniques are consistent for PT and coring samples. Two similar designs of HA drilling equipment are employed. HA drilling with 75mm diameter enclosed spiral bits (**SOS**) with 1m long steel rods and with 62mm diameter open spiral bits (**SP**) with 1m long steel rods. Drilling is oriented vertically by eye. Each 1m of drill sample is collected into separate sample bags and set aside. The auger bits and flights are cleaned between each metre of sampling to avoid contamination. Core-drilling is undertaken using a drop hammer, Dando Terrier MK1. The drilling generated 1m runs of 83mm PQ core in the first 2m and then transitioned to 72mm core for the remainder of the hole. Core drilling is oriented vertically by spirit level. AC drilling was completed by Thompson Drilling utilising a Smith Capital 10R3H compact track-mounted drill. The drilling is vertical and generates 1m samples with care taken in the top metres to ensure good recoveries of the high-grade

Criteria	JORC Code explanation	Commentary
		surface material. Each 1m sample bag is immediately transported back to Sovereign's field laydown yard where they await processing.
Drill Sample Recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	Samples are assessed visually for recoveries. The configuration of drilling and nature of materials encountered results in negligible sample loss or contamination. HA and PT drilling is ceased when recoveries become poor once the water table has been reached. Water table and recovery information is included in lithological logs. Core drilling samples are actively assessed by the driller and geologist onsite for recoveries and contamination. AC drilling recovery in the top few metres are moderate to good. Extra care is taken to ensure sample is recovered best as possible in these metres. Recoveries are recorded on the rig at the time of drilling by the geologist. Drilling is ceased when recoveries become poor or once Saprock or refusal has been reached.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	The Company's trained geologists supervise drilling on a 1 team 1 geologist basis and are responsible for monitoring all aspects of the drilling and sampling process. For PT drilling, core is extruded into core trays; slough is actively removed by the driller at the drilling rig and core recovery and quality is recorded by the geologist. AC samples are recovered in large plastic bags. The bags are clearly labelled and delivered back to sovereign's laydown yard at the end of shift for processing.
	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.	No relationship is believed to exist between grade and sample recovery. The high percentage of silt and absence of hydraulic inflow from groundwater at this deposit results in a sample size that is well within the expected size range. No bias related to preferential loss or gain of different materials is observed.
Logging	*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.*	Geologically, data is collected in detail, sufficient to aid in Mineral Resource estimation. All individual 1m HA intervals are geologically logged, recording relevant data to a set log-chief template using company codes. A small representative sample is collected for each 1m interval and placed in appropriately labelled chip trays for future reference. All individual 1m PT core intervals are geologically logged, recording relevant data to a set log-chief template using company codes. Half core remains in the trays and is securely stored in the company warehouse. All individual AC 1-metre intervals are geologically logged, recording relevant features. data to a set log-chief template using company codes. A small representative sample is collected for each 1-metre interval and placed in appropriately labelled chip trays for future reference.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	All logging includes lithological features and estimates of basic mineralogy. Logging is generally qualitative. The PT core is photographed dry, after logging and sampling is completed.
	The total length and percentage of the relevant intersection logged	100% of samples are geologically logged.
Sub-sampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	Due to the soft nature of the material, core samples are carefully cut in half by hand tools.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	HA, PT and AC hole samples are dried, riffle split and composited. Samples are collected and homogenised prior to splitting to ensure sample representivity. ~1.5kg composite samples are processed. An equivalent mass is taken from each primary sample to make up the composite. The primary composite sample is considered representative for this style of mineralisation and is consistent with industry standard practice.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Techniques for sample preparation are detailed on SOP documents verified by Placer Resource Geologists. Sample preparation is recorded on a standard flow sheet and detailed QA/QC is undertaken on all samples. Sample preparation techniques and QA/QC protocols are appropriate for mineral determination and support the resource classifications as stated.

Criteria	JORC Code explanation	Commentary
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	The sampling equipment is cleaned after each sub-sample is taken. Field duplicate, laboratory replicate and standard sample geostatistical analysis is employed to manage sample precision and analysis accuracy.
	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.	Sample size analysis is completed to verify sampling accuracy. Field duplicates are collected for precision analysis of riffle splitting. SOPs consider sample representivity. Results indicate a sufficient level of precision for the resource classification.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The sample size is considered appropriate for the material sampled.
Quality of assay data and laboratory tests	*The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	<u>Rutile</u> The Malawi onsite laboratory sample preparation methods are considered quantitative to the point where a heavy mineral concentrate (**HMC**) is generated. Final results generated are for recovered rutile i.e, the % mass of the sample that is rutile that can be recovered to the non-magnetic component of a HMC. Heavy liquid separation (**HLS**) of the HM is no longer required and a HM result is not reported in the updated MRE. The HMC prepared via wet-table, gravity separation at the Lilongwe Laboratory provides an ideal sample for subsequent magnetic separation and XRF. All 8,855 samples (not incl. QA) included in the MRE update received the following workflow undertaken on-site in Malawi; • Dry sample in oven for 1 hour at 105℃ • Soak in water and lightly agitate • Wet screen at 5mm, 600µm and 45µm to remove oversize and slimes material • Dry +45µm -600mm (sand fraction) in oven for 1 hour at 105℃ 7,904 of the 8,855 samples received the following workflow undertaken on-site in Malawi • Pass +45µm -600mm (sand fraction) across wet table to generate a HMC. • Dry HMC in oven for 30 minutes at 105℃ Bag HMC fraction and send to Perth, Australia for quantitative chemical and mineralogical determination. 951 of the 8,855 samples received the following workflow undertaken at Perth based Laboratories (superseded). • Split ~150g of sand fraction for HLS using Tetrabromoethane (**TBE**, SG 2.96g/cc) as the liquid heavy media to generate HMC. Work undertaken at Diamantina Laboratories. 4,738 of the 8,855 samples received magnetic separation undertaken at Allied Mineral Laboratories in Perth, Western Australia. • Magnetic separation of the HMC by Carpco magnet @ 16,800G (2.9Amps) into a magnetic (**M**) and non-magnetic (**NM**) fraction. 4,117 of the 8,855 samples received magnetic separation undertaken on-site in Malawi. • Magnetic separation of the HMC by Mineral Technologies Reading Pilot IRM (Induced Roll Magnetic) @ 16,800G (2.9Amps) into a magnetic (**M**) and non-magnetic (**NM**) fraction. All 8,855 routine samples received the following chemical analysis in Perth, Western Australia. • The routine NM fractions are sent to ALS Metallurgy Perth for quantitative XRF analysis. Samples receive XRF_MS and are analysed for: TiO_2, Al_2O_3, CaO, Cr_2O_3, Fe_2O_3, K_2O, MgO, MnO, SiO_2, V_2O_5, ZrO_2, HfO_2. <u>Graphite</u> 8,078 graphite samples are processed at Intertek-Genalysis Johannesburg and Perth via method C72/CSA. A portion of each test sample is dissolved in dilute hydrochloric acid to liberate carbonate carbon. The solution is filtered using a filter paper and the collected residue is the dried to 425°C in a muffle oven to drive off organic carbon. The dried sample is then combusted in a Carbon/ Sulphur analyser to yield total graphitic or TGC.

Criteria	JORC Code explanation	Commentary
		An Eltra CS-800 induction furnace infra-red CS analyser is then used to determine the remaining carbon which is reported as TGC as a percentage.
	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.	Acceptable levels of accuracy and precision have been established. No pXRF methods are used for quantitative determination.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicate, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Sovereign uses internal and externally sourced wet screening reference material inserted into samples batches at a rate of 1 in 20. The externally sourced, certified standard reference material for HM and Slimes assessment is provided by Placer Consulting. An external laboratory raw sample duplicate is sent to laboratories in Perth, Australia as an external check of the full workflow. These duplicates are produced at a rate of 1 in 20. Accuracy monitoring is achieved through submission of certified reference materials (**CRM's**). ALS and Intertek both use internal CRMs and duplicates on XRF analyses. Sovereign also inserts CRMs into the sample batches at a rate of 1 in 20. Three Rutile CRMs are used by Sovereign and range from 35% - 95% TiO_2. Three Graphite CRMs are used by Sovereign and range from 3% – 25% TGC. Analysis of sample duplicates is undertaken by standard geostatistical methodologies (Scatter, Pair Difference and QQ Plots) to test for bias and to ensure that sample splitting is representative. Standards determine assay accuracy performance, monitored on control charts, where failure (beyond 3SD from the mean) may trigger re-assay of the affected batch. Examination of the QA/QC sample data indicates satisfactory performance of field sampling protocols and assay laboratories providing acceptable levels of precision and accuracy. Acceptable levels of accuracy and precision are displayed in geostatistical analyses to support the resource classifications as applied to the estimate.
Verification of sampling & assaying	*The verification of significant intersections by either independent or alternative company personnel.*	Results are reviewed in cross-section using Datamine Studio RM software and any spurious results are investigated. The deposit type and consistency of mineralisation leaves little room for unexplained variance. Extreme high grades are not encountered.
	The use of twinned holes.	Twinned holes are drilled across a geographically dispersed area to determine short-range geological and assay field variability for the resource estimation. Twin drilling is applied at a rate of 1 in 20 routine holes. Twin paired data in all drill methods represent ~4% of the database included in the updated MRE. Substantial comparative data between different drilling types and test pit results are also available but not referenced in the MRE.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All data are collected electronically using coded templates and logging software. This data is then imported to a cloud hosted Database and validated automatically and manually. A transition to electronic field and laboratory data capture has been achieved.
	Discuss any adjustment to assay data.	Assay data adjustments are made to convert laboratory collected weights to assay field percentages and to account for moisture. QEMSCAN of the NM fraction shows dominantly clean and liberated rutile grains and confirms rutile is the only titanium species in the NM fraction. Recovered rutile is defined and reported here as: TiO_2 recovered in the +45 to -600um range to the NM concentrate fraction as a % of the total primary, dry, raw sample mass divided by 95% (to represent an approximation of final product specifications). i.e recoverable rutile within the whole sample.
Location of data points	*Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	A Trimble R2 Differential GPS is used to pick up the collars. Daily capture at a registered reference marker ensures equipment remains in calibration. No downhole surveying of any holes is completed. Given the vertical nature and shallow depths of the holes, drill hole deviation is not considered to significantly affect the downhole location of samples.
	Specification of the grid system used.	WGS84 UTM Zone 36 South.
	Quality and adequacy of topographic control.	The digital terrane model (**DTM**) was generated by wireframing a 20m-by-20m lidar drone survey point array, commissioned by SVM in March 2022. Major cultural features were removed from the survey points file prior to generating the topographical wireframe for resource model construction. The ultra-high

Criteria	JORC Code explanation	Commentary
		resolution 3D drone aerial survey was executed utilising a RTK GPS equipped Zenith aircraft with accuracy of <10cm ground sampling distance (GSD). Post-processing includes the removal of cultural features that do not reflect material movements (pits, mounds, etc) The DTM is suitable for the classification of the resources as stated.
Data spacing & distribution	*Data spacing for reporting of Exploration Results.*	The HA collars are spaced at nominally 400m along the 400m spaced drill-lines with the PT holes similarly spaced at an offset, infill grid. The resultant 200m-by-200m drill spacing (to the strike orientation of the deposit) is deemed to adequately define the mineralisation in the MRE. The AC collars are spaced on a 200m x 200m grid which is deemed to adequately define the mineralisation. The PT twin and density sample holes are selectively placed throughout the deposit to ensure a broad geographical and lithological spread for the analysis.
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	The drill spacing and distribution is considered to be sufficient to establish a degree of geological and grade continuity appropriate for the Mineral Resource estimation. Kriging neighbourhood analysis completed using Supervisor software informs the optimal drill and sample spacing for the MRE. Based on these results and the experience of the Competent Person, the data spacing and distribution is considered adequate for the definition of mineralisation and adequate for Mineral Resource Estimation.
	Whether sample compositing has been applied.	Individual 1m auger intervals have been composited, based on lithology, at 2 – 5m sample intervals for the 1,357 HA holes. 488 PT core holes have been sampled at a regular 2m interval to provide greater control on mineralisation for the Indicated Resource. Individual 1m intervals have been composited, based on lithology, at a max 2m sample interval for the 182 AC holes. The DH Compositing tool was utilised in Supervisor software to define the optimal sample compositing length. A 2m interval is applied to the MRE.
Orientation of data in relation to geological structure	*Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known considering the deposit type*	Sample orientation is vertical and approximately perpendicular to the orientation of the mineralisation, which results in true thickness estimates, limited by the sampling interval as applied. Drilling and sampling are carried out on a regular square grid. There is no apparent bias arising from the orientation of the drill holes with respect to the orientation of the deposit.
	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.	There is no apparent bias arising from the orientation of the drill holes with respect to the orientation of the deposit.
Sample security	*The measures taken to ensure sample security*	Samples are stored in secure storage from the time of drilling, through gathering, compositing and analysis. The samples are sealed as soon as site preparation is complete. A reputable international transport company with shipment tracking enables a chain of custody to be maintained while the samples move from Malawi to Australia. Samples are again securely stored once they arrive and are processed at Australian laboratories. A reputable domestic courier company manages the movement of samples within Perth, Australia. At each point of the sample workflow the samples are inspected by a company representative to monitor sample condition. Each laboratory confirms the integrity of the samples upon receipt.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data*	The CP Richard Stockwell has reviewed and advised on all stages of data collection, sample processing, QA protocol and Mineral Resource Estimation. Methods employed are considered industry best-practice. Perth Laboratory visits have been completed by Mr Stockwell. Field and in-country lab visits have been completed by Mr Stockwell in May 2022. A high standard of operation, procedure and personnel was observed and reported. Sovereign Metals Managing Director Julian Stephens and Exploration Manager Samuel Moyle have been onsite in Malawi numerous times since the discovery of the Kasiya Deposit.

SECTION 2 - REPORTING OF EXPLORATION RESULTS

Criteria	Explanation	Commentary
Mineral tenement & land tenure status	*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 environment settings.*	The Company owns 100% of the following Exploration Licences (**ELs**) and Licence Applications (**APLs**) under the Mines and Minerals Act 2019, held in the Company's wholly-owned, Malawi-registered subsidiaries: EL0561, EL0492, EL0609, EL0582, EL0545, EL0528, EL0657 and APL0404. A 5% royalty is payable to the government upon mining and a 2% of net profit royalty is payable to the original project vendor. No significant native vegetation or reserves exist in the area. The region is intensively cultivated for agricultural crops.
	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.	The tenements are in good standing and no known impediments to exploration or mining exist.
Exploration done by other parties	*Acknowledgement and appraisal of exploration by other parties.*	Sovereign Metals Ltd is a first-mover in the discovery and definition of residual rutile and graphite resources in Malawi. No other parties are, or have been, involved in exploration.
Geology	*Deposit type, geological setting and style of mineralisation*	The rutile deposit type is considered a residual placer formed by the intense weathering of rutile-rich basement paragneisses and variable enrichment by elluvial processes. Rutile occurs in a mostly topographically flat area west of Malawi's capital, known as the Lilongwe Plain, where a deep tropical weathering profile is preserved. A typical profile from top to base is generally soil ("SOIL" 0-1m) ferruginous pedolith ("FERP", 1-4m), mottled zone ("MOTT", 4-7m), pallid saprolite ("PSAP", 7-9m), saprolite ("SAPL", 9-25m), saprock ("SAPR", 25-35m) and fresh rock ("FRESH" >35m). The low-grade graphite mineralisation occurs as multiple bands of graphite gneisses, hosted within a broader Proterozoic paragneiss package. In the Kasiya areas specifically, the preserved weathering profile hosts significant vertical thicknesses, from near surface, of graphite mineralisation.
Drill hole information	*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: easting and northings of the drill hole collar; elevation or RL (Reduced Level-elevation above sea level in metres of the drill hole collar); dip and azimuth of the hole; down hole length and interception depth; and hole length*	All intercepts relating to the Kasiya Deposit have been included in public releases during each phase of exploration and in this report. Releases included all collar and composite data and these can be viewed on the Company website. There are no further drill hole results that are considered material to the understanding of the exploration results. Identification of the broad zone of mineralisation is made via multiple intersections of drill holes and to list them all would not give the reader any further clarification of the distribution of mineralisation throughout the deposit.
	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	No information has been excluded.
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high-grades) and cut-off grades are usually Material and should be stated.*	All results reported are of a length-weighted average of in-situ grades. The resource is reported at a range of bottom cut-off grades in recognition that optimisation and financial assessment is outstanding. A nominal bottom cut of 0.7% rutile is offered, based on preliminary assessment of resource product value and anticipated cost of operations.
	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.	No data aggregation was required.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	**Rutile Equivalent (RutEq)** *Formula*: ((Rutile Grade x Recovery (100%) x Rutile Price (US$1,484/t) + Graphite Grade x Recovery (67.5%) x Graphite Price (US$1,290/t)) / Rutile Price (US$1,484/t)). ***Commodity Prices:*** • Rutile price: US$1,484/t • Graphite price: US$1,290/t ***Metallurgical Recovery to Product:*** • Rutile Recovery: 100% • Graphite Recovery: 67.5%

Criteria	Explanation	Commentary
		All assumptions taken from this Study and with discussion and Modifying Factors included in this document.
Relationship between mineralisation widths & intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.*	The mineralisation has been released by weathering of the underlying, layered gneissic bedrock that broadly trends NE-SW at Kasiya North and N-S at Kasiya South. It lies in a laterally extensive superficial blanket with high-grade zones reflecting the broad bedrock strike orientation of ~045° in the North of Kasiya and 360° in the South of Kasiya.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	The mineralisation is laterally extensive where the entire weathering profile is preserved and not significantly eroded. Minor removal of the mineralised profile has occurred in alluvial channels. These areas are adequately defined by the drilling pattern and topographical control for the resource estimate.
	If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known'.	Downhole widths approximate true widths limited to the sample intervals applied. Mineralisation remains open at depth and in areas coincident with high-rutile grade lithologies in basement rocks, is increasing with depth. Graphite results are approximate true width as defined by the sample interval and typically increase with depth.
Diagrams	*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 the drill collar locations and appropriate sectional views.*	Refer to figures in this report and in previous releases. These are accessible on the Company's webpage.
Balanced reporting	*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.*	All results are included in this report and in previous releases. These are accessible on the Company's webpage.
Other substantive exploration data	*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.*	Limited lateritic duricrust has been variably developed at Kasiya, as is customary in tropical highland areas subjected to seasonal wet/dry cycles. Lithological logs record drilling refusal in just under 2% of the HA/PT drill database. No drilling refusal was recorded above the saprock interface by AC drilling. Slimes (-45 µm) averages 46wt% in the Indicated Resource at a 0.7% rutile bottom cut. Separation test work conducted at AML demonstrates the success in applying a contemporary mineral sands flowsheet in treating this material and achieving excellent rutile recovery. Sample quality (representivity) is established by geostatistical analysis of comparable sample intervals. Several generations of QEMSCAN analysis of the NM performed at ALS Metallurgy fraction shows dominantly clean and liberated rutile grains and confirms rutile is the only titanium species in the NM fraction.
Further work	The nature and scale of planned further work (e.g. test for lateral extensions or depth extensions or large-scale step-out drilling).	Further AC drilling will allow the definition of a more extensive saprock-interface basement and should continue to deliver additional resources below the HA/PT-drilled regions. A greater understanding of the lithological character and extent of those basement units, where high-grade (>1%) rutile persists at the saprock interface, may assist in focussing further resource definition and exploration targeting. Further metallurgical assessment is suggested to characterise rutile quality and establish whether any chemical variability is inherent across the deposit. Trialling drill definition at a 100m spacing is suggested for Measured Resource assessment.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Refer to diagrams in the body of this report and in previous releases. These are accessible on the Company's webpage.

SECTION 3 - ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	JORC Code explanation	Commentary
Database integrity	*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.*	Data are manually entered into database tables according to SOPs and conforming to company field names and classifications. These are then migrated to Datashed5 cloud-hosted database managed internally by the Company with validation and quarantine capability. Relevant tables from the database are exported to csv format and forwarded to Placer for independent review.
	Data validation procedures used.	Validation of the primary data include checks for overlapping intervals, missing survey data, missing assay data, missing lithological data, missing and mis-matched (to Lithology) collars. Statistical, out-of-range, distribution, error and missing data validation is completed by Placer on data sets before being compiled into a de-surveyed drill hole file and interrogated in 3D using Datamine Studio RM software. All questions relating to the input data are forwarded to the client for review and resolution prior to resource estimation.
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	Perth Laboratory visits have been completed by the Competent Person, Mr Richard Stockwell. Field and in-country lab visits were complete over a 1-week period in May 2022. A high standard of operation, procedure and personnel was observed and reported.
	If no site visits have been undertaken indicate why this is the case.	Not applicable
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	There is a high degree of repeatability and uniformity in the geological character of the Kasiya Deposit demonstrated by lithological logging of AC, PT core and HA samples. Satellite imagery and airborne geophysical data provided guidance for interpreting the strike continuity of the deposit. Drill hole intercept logging and assay results (AC, PT and HA), stratigraphic interpretations from drill core and geological logs of drill data have formed the basis for the geological interpretation. The drilling exclusively targeted the SOIL, FERP, MOTT and SAPL weathering horizons, with no sampling of the SAPR and below the upper level of the fresh rock (**FRESH**) domain.
	Nature of the data used and of any assumptions made.	No assumptions were made.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations on Mineral Resource Estimation are offered.
	The use of geology in guiding and controlling Mineral Resource estimation.	The mineral resource is constrained by the drill array plus one interval in each of the X, Y and Z axes. The topographical DTM constrains the vertical extent of the resource. Rutile, enriched at surface by deflation and elluvial processes, is constrained internally by a hard boundary at the base of the SOIL and FERP horizons that overly the (generally less-mineralised) MOTT and SAPL horizons. In this way, continuity of rutile, observed in surface drilling results, is honoured between drill lines rather than being diluted by averaging with underlying, lower-grade material. The base to mineralisation is arbitrarily designated at effective drill depth plus one (average sample width) interval in the Z orientation in HA/PT drilling. The effective drill depth is where HA drilling intersects the static water table, rather than being a true depth to un-mineralised basement. Deeper drilling using the AC method has shown rutile enrichment persists to bedrock and a material resource increase is anticipated upon application of this method to a broader area. A base to mineralisation of BOH plus 2.7m (-2.7 RL) is retained for this estimate, where drilled by HA/PT methods. This basement horizon is interpreted on 200m north sections and accounts for artifacts of ineffective drilling terminating in soil or ferp horizons. It is applied consistently to both Indicated and Inferred resource areas. AC drilling has accurately defined depth to basement at the saprock interface, which has been modelled where intersected in the updated MRE.
	The factors affecting continuity both of grade and geology.	Rutile grade is generally concentrated in surface regolith horizons. Deposit stratigraphy and weathering is consistent along and across strike. Rutile grade trend is oriented at 45 degrees at Kasiya North and 360 degrees at Kasiya South, which mimics the underlying basement source rocks and residual topography. Rutile varies across strike as a result of the layering of mineralised and non-mineralised basement rocks.
Dimensions	*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.*	The Kasiya mineralised footprint strikes NE – SW and currently occupies an area of about 201km^2. Depth to basement is described previously.
Estimation and modelling techniques	*The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme*	Datamine Studio RM and Supervisor software are used for the data analysis, variography, geological interpretation and resource estimation. Key fields are interpolated into the volume model using a range of parameters and interpolation

Criteria	JORC Code explanation	Commentary
	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.	methods to establish best fit for the deposit. For the Kasiya MRE update, the Inverse Distance weighting (power 4) method was seen to perform a superior interpolation of informing data and replication of the high-value and thin, surface (SOIL/FERP) grade distribution. This was assisted by the (customary) application of a Dynamic Anisotropy search, informed by the results of variography, Suitable limitations on the number of samples and the impact of those samples, was maintained. Extreme grade values were not identified by statistical analysis, nor were they anticipated in this style of deposit. No top cut is applied to the resource estimation. Interpolation was constrained by hard boundaries (domains) that result from the geological interpretation.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	This is the fourth MRE for the Kasiya Deposit. Bulk-scale test work has been completed and results support the view of the Competent Person that an economic deposit of readily separable, high-quality rutile is anticipated from the Kasiya Deposit. The recovery of a coarse-flake graphite by-product was achieved by the test work.
	The assumptions made regarding recovery of by-products.	A graphite co-product was modelled as recoverable TGC.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	No significant deleterious elements are identified. A selection of assay, magnetic separation and XRF results are modelled and are reported.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The average parent cell size used is equivalent to the average drill hole spacing within the Indicated Resource (200m*200m). Cell size in the Z-axis is established to cater for the composite sample spacing and definition of the Topsoil domain. This resulted in a parent cell size of 200m x 200m x 3m for the volume model with 5 sub-cell splits available in the X and Y axes and 10 in the Z axis to smooth topographical and lithological transitions. Both parent cell and sub-cell interpolations were completed and reported. The sub-cell interpolation was again applied to this MRE as it better reflected the geological interpretation and a reasonable graduation of informing data through intermediate cell areas. A Topsoil horizon has been defined at 0.3m thickness throughout the Indicated Resource area to support anticipated ore reserve calculation and mining studies. Topsoil is disclosed separately but remains in the MRE in recognition of advanced rehabilitation studies in the PFS by Agreenco.
	Any assumptions behind modelling of selective mining units.	No assumptions were made regarding the modelling of selective mining units. The resource is reported at an Indicated level of confidence and is suitable for optimisation and the calculation of a Probable Reserve.
	Any assumptions about correlation between variables.	No assumptions were made regarding the correlation between variables.
	Description of how the geological interpretation was used to control the resource estimates.	Interpolation was constrained by hard boundaries (domains) that result from the geological interpretation.
	Discussion of basis for using or not using grade cutting or capping.	Extreme grade values were not identified by statistical analysis, nor were they anticipated in this style of deposit. No top cut is applied to the resource estimation.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Validation of grade interpolations was done visually In Datamine by loading model and drill hole files and annotating, colouring and using filtering to check for the appropriateness of interpolations. Statistical distributions were prepared for model zones from both drill holes and the model to compare the effectiveness of the interpolation. Distributions of section line averages (swath plots) for drill holes and models were also prepared for each zone and orientation for comparison purposes. The resource model has effectively averaged informing drill hole data and is considered suitable to support the resource classifications as applied to the estimate.
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	Tonnages are estimated on a dry basis. No moisture content is factored.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	The resource is reported at a range of bottom cut-off grades in recognition that optimisation and financial assessment is outstanding. A nominal bottom cut of 0.7% rutile is offered, based on preliminary assessment of resource value and anticipated operational cost.
Mining factors or assumptions	*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*	Hydro-mining has been determined as the optimal method of mining for the Kasiya Rutile deposit. The materials competence is loose, soft, fine and friable with no cemented sand or dense clay layers rendering it amenable to hydro-mining. It is considered that the strip ratio would be zero or near zero.

Criteria	JORC Code explanation	Commentary
	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.	Dilution is considered to be minimal as mineralisation commonly occurs from surface and mineralisation is generally gradational with few sharp boundaries. Recovery parameters have not been factored into the estimate. However, the valuable minerals are readily separable due to their SG differential and are expected to have a high recovery through the proposed, conventional wet concentration plant.
Metallurgical factors or assumptions	*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.*	Rigorous metallurgical testwork on rutile and graphite recoverability and specifications has been completed on numerous bulk samples since 2018. Rutile recovered to product is modelled at 100% and graphite recovered to product is modelled at 67.5%. Both products have best-in-class chemical and physical specifications. Refer to text for further details.
Environmental factors or assumptions	*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 greenfields 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.*	A large portion of the Mineral Resource is confined to the SOIL, FERP and MOTT weathering domains, and any sulphide minerals have been oxidised in the geological past. Therefore, acid mine-drainage is not anticipated to be a significant risk when mining from the oxidised domain. The Kasiya deposit is located within a farming area and has villages located along the strike of the deposit. Sovereign holds regular discussions with local landholders and community groups to keep them well informed of the status and future planned directions of the project. Sovereign has benefited from maintaining good relations with landowners and enjoys strong support from the community at large. Kasiya is in a sub-equatorial region of Malawi and is subject to heavy seasonal rainfall, with rapid growth of vegetation in season. Substantial vegetation or nature reserve is absent in the area.
Bulk density	*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.*	Density was calculated from 310 full core samples taken from geographically and lithologically-diverse sites across the deposit. Density is calculated using a cylinder volume wet and dry method performed by Sovereign in Malawi and calculations verified by Placer Consulting. Density data was loaded into an Excel file, which was flagged against weathering horizons and mineralisation domains. These results were then averaged, by domain and applied to the MRE.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vughs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	As above.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	An average density of 1.65 t/m^3 was determined for the total weathering profile. This incorporates and average density of 1.39 t/m^3 for the SOIL domain, 1.58 t/m^3 for the FERP domain, 1.66 t/m^3 for the MOTT domain, 1.69 t/m^3 for the PSAP domain, 1.97 t/m^3 for the SAPL domain, and 1.95 t/m^3 for the LAT domain. Density data are interpolated into the resource estimate by the nearest neighbour method.
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.*	Classification of the MRE is at an Indicated and Inferred category. Minor regions of unclassified material occur in sparsely drilled, typically extraneous regions of the mineralised area. These are excluded from the resource inventory. Inferred classification is attributed to those areas with drilling spaced at 400m x 400m. Indicated classification is attributed to those areas with drilling spaced at 200m x 200m.
	Whether appropriate account has been taken of all relevant factors (i.e. 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).	All available data were assessed and the competent person's relative confidence in the data was used to assist in the classification of the Mineral Resource.
	Whether the result appropriately reflects the Competent Person's view of the deposit	Results appropriately reflects a reasonable and conservative view of the deposit.
Audits or reviews	*The results of any audits or reviews of Mineral Resource estimates.*	Independent audit of the MRE construction was contracted to Datamine Australia by Placer prior to delivery to SVM. A third party is engaged by SVM for a further verification of the MRE.

Criteria	JORC Code explanation	Commentary
Discussion of relative accuracy/ confidence	*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.*	Substantial additional mineralisation was expected to occur below the effective depth of HA and PT drilling. This has been confirmed by the deeper AC drilling. A high-degree of uniformity exists in the broad and contiguous lithological and grade character of the deposit. Drilling technique have been expertly applied and data collection procedures, density assessments, QA protocols and interpretations conform to industry best practice with few exceptions. Assay, mineralogical determinations and metallurgical test work conform to industry best practice and demonstrate a rigorous assessment of product and procedure. The development of a conventional processing flowsheet and marketability studies support the classification of the Kasiya Resource.
	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.	The estimate is global.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	No production data are available to reconcile model results.

SECTION 4 – ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	*Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	The Minerals Resource Estimate ("MRE") declared on 5 April 2023 underpins the Ore Reserve. Sovereign engaged independent geological and mining consultants Placer to complete the MRE for the Kasiya deposit. The principal resource geologist Mr Richard Stockwell is highly experienced with more than 25 years in resource estimation and mine geology. Mr Richard Stockwell is a Competent Person for the purposes of the MRE as defined and in accordance with the JORC Code 2012. The MRE as reported in this document is inclusive of the Ore Reserve declared in this document. The Ore Reserve does not include Inferred Mineral Resources.
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	Site visits have been carried out by the following personnel: • Mr Ryan Locke, as representative for the Competent Person Mr Ross Cheyne for the JORC Reserve Estimate has been to site on multiple site visits prior to and since the discovery of the Kasiya Deposit. • Mr Richard Stockwell, the Competent Person for the JORC Mineral Resource Estimate and a representative of Placer Consulting Pty Ltd has conducted one site visit. • Mr Samuel Moyle, the Competent Person for Exploration Results and Exploration Manager of Sovereign Metals Ltd has conducted multiple site visits since the discovery of the Kasiya deposit;
Study status	*The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.* *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.*	The technical and financial information in this release is at PFS-level enabling the declaration of Ore Reserves. The studies carried out have determined a mine plan that is technically achievable and economically viable with all material Modifying Factors having been considered. The Ore Reserve was underpinned by a mine plan detailing mining locations, ore and waste quantities; plant feed quantities and plant head grades. Scheduling was undertaken in annual and quarterly periods. Mine planning activities included an updated pit optimisation, development of mineable pit geometries, scheduling, mining cost estimation and financial analysis in order to confirm the ability to economically mine the Kasiya Ore Reserve. Modifying factors considered during the mine planning process included pit slope design criteria, mining costs, mining dilution and ore loss, processing recoveries, processing costs, selling costs, general and administration costs and product price.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	Pit cut-off grades varied between 0.7% and 0.9% rutile with cut-offs selected to provide the most tonnage whilst minimising the pit footprint to have as little environmental/social impact as possible. The selected cut-off grades are above the final project breakeven cut-off grade of approximately 0.40% rutile.

Criteria	Explanation	Commentary
Mining factors or assumptions	*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).* *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.* *The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.* *The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).* *The mining dilution factors used.* *The mining recovery factors used.* *Any minimum mining widths used.* *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* *The infrastructure requirements of the selected mining methods.*	The Kasiya MRE released by Sovereign in on 5 April 2023 was used as the basis for the PFS Ore Reserve estimate. Mineral Resources were converted to Ore Reserves in line with the material classifications which reflect the level of confidence within the resource estimate. The Ore Reserve reflects that portion of the Mineral Resource which can be economically extracted by open pits utilising a combination of hydro mining and limited truck/shovel methodologies. The Ore Reserve considers the modifying factors and other parameters detailed in the relevant sections of the PFS report, including but not limited to the mining, metallurgical, social, environmental, approvals, tenure, statutory and financial aspects of the project. In line with the JORC 2012 guidelines, the Kasiya Probable Ore Reserve is based on Indicated classified Mineral Resources. There is no Measured classified Mineral Resource at Kasiya and consequently no Proved Ore Reserve. Inferred classified material is not included in the Ore Reserve and therefore is not considered for mining. The reported MRE is inclusive of the resources converted to Ore Reserves. The Ore Reserve includes an allowance for mining dilution and ore loss on the basis that all material within the shell is classified and extracted as ore. The open pit geometries developed for the purposes of mine planning, and which define the subsequent Ore Reserve, are based on Whittle pit shells edited to comply with practical mining requirements and identified exclusion zones. **Selection of Mining method** The mining options were evaluated in detail during the PFS to determine the best suited mining method for the operation. The criteria for selection were based not only on capital and operating cost, but ESG considerations and infrastructure requirements. Sovereign performed testwork on ROM material and conducted an independent assessment and trade-off analysis for all possible mining methods. The outcomes of this work resulted in hydro mining being determined as the optimal method for mining the Kasiya rutile- graphite deposit. Due to the consistent particle size distribution through the reserve, favourable operating and capital costs, low carbon footprint and air pollution (low dust and no diesel emissions) as well as the support of infrastructure and water availability within the project designated footprint. Hydro-mining is defined as the excavation of material from its in-situ state using pressurised water. A stream of high-pressure water is directed at the ore with the purpose of mechanically breaking and softening the material so that it can be carried away by the created gravitational slurry flow. The mineralisation at Kasiya is largely homogenous and has relatively consistent physical properties throughout the MRE and contained Ore Reserve. The material competence is described as loose and friable, soft and well weathered with no cemented particles or dense clay layers. The particle size distribution (PSD) is favourable for hydro-mining due to its high content of -45µm fines and the fines component effectively increases the viscosity of the slurry created, which enhances the slurry's ability to carry sand and heavy mineral particles. Hydro mining is a proven technology and has been successfully applied on heavy mineral sand operations in Africa. Hydro mining for the PFS is based on the block-mine and top-down methodologies. The top-down operational method has advantages in terms of safety, achieving and maintaining design slurry densities, achieving and maintaining design production rates and ease of planning and control. Sovereign Mining engaged Fraser Alexander, a highly experienced mining contractor and consultancy specialising in hydro-mining to provide engineering and cost inputs for hydro-mining in the PFS. Dry mining methods are required where hydro mining is inefficient and will be required to push approximately 11% of the Ore Reserve. These are the "basin" of the hydro mining areas which need selective "floor clean-up" mining. **Pit Optimisation** An open pit optimisation utilising Whittle™ software was carried out on the Kasiya deposit using Indicated Mineral Resources only (in line with the JORC 2012 guidelines). The latest parameters available were used to determine the economic extent of the open pit excavation. The process plant production parameters were supplied by Sovereign with an initial rate of 12mtpa and a ramp up in production from years 5 – 7 to an annual rate of 24Mtpa. The intention to hydro-mine the majority of the defined Ore Reserve means that there is no ability to selectively mine and all material will be extracted and sent as plant feed. Therefore, all material within the "shell" will be extracted and fed to the plant as ore and any interstitial waste and/or sub-economic grade material will be likewise treated as diluent material. However, due to the relatively homogenous and continuous nature the orebody, the quantities of this material will be relatively small and therefore a simple 5% dilution was applied within the Whittle™ tool to approximate this assumption. For the PFS, an overall slope angle of 20 degrees has been applied within the optimisation, in line with a conservative stable angle for a mineral sands operation.

Criteria	Explanation	Commentary
		Mineable Pit Geometries Based on the cut-off grades applied, the optimization shells were further were further refined to develop a mineable geometry. The process applied the following constraints: – A minimum depth of 5m for the hydro mining method. – Removal of any small, isolated pits. – Pit extents limited to mineable areas and to remain outside of identified exclusion areas wherever reasonably possible. Sovereign identified all local village areas and areas of cultural or environmental significance within the potential mining envelope that should not be disturbed during the mining phase of the Project.
Metallurgical factors or assumptions	*The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.* *Whether the metallurgical process is well-tested technology or novel in nature.* *The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* *Any assumptions or allowances made for deleterious elements.* *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* *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet specifications?*	**Rutile** Sovereign completed bulk rutile testwork programs at the globally recognised AML in Perth, Australia. The latest program was supervised by Sovereign's Head of Development, Paul Marcos. Mr Marcos is a metallurgist and process engineer and a mineral sands industry veteran. Bulk test-work programs have confirmed premium grade rutile can be produced via a simple and conventional process flow sheet. Processing engineering was completed by DRA Global who developed the process plant design and associated cost estimate for the Study. An average product grade of 96% TiO_2 with 100% recovery to rutile product was assumed for the PFS. **Graphite** Sovereign has conducted graphite testwork across ALS Laboratory in Perth and SGS Lakefield in Canada. Veteran graphite metallurgist Oliver Peters, MSc, P.Eng., MBA (Consulting Metallurgist for SGS and Principal Metallurgist of Metpro Management Inc.) was engaged to supervise and consult on the testwork programs. Mr Peters has over 25 years' experience in metallurgy on graphite and other commodities. He has operated numerous graphite pilot plants and commissioned a number of full-scale processing facilities. DRA's Senior Engineer, Stewart Calder and Manager Metallurgy, John Fleay supervised and advised on sample selection, testwork scope and results from the latest testwork programs. Both consultants are considered to have the appropriate capabilities and similarities with the material and the early stage of the project. An average product grade of 96% C^t with 67.5% recovery to product was assumed for the PFS. **Rutile & Graphite** It is acknowledged that laboratory scale test-work will not always represent actual results achieved from a production plant in terms of grade, chemistry, sizing and recovery. Further test-work will be required to gain additional confidence of specifications and recoveries that will be achieved at full-scale production. Overall, the process flow-sheet is conventional for both rutile and graphite with no novel features or equipment incorporated.
Environmental	*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.*	An Environmental Impact Assessment (ESIA) is currently commencing with reference to applicable Malawian and international environmental and social permitting and baseline requirements for the Kasiya Project. Sovereign is committed to conduct its activities in full compliance to the requirements of national regulations, its obligations under international conventions and treaties and giving due consideration to international best practices and policies. Sovereign has appointed an experienced environmental consultant to manage the ESIA process, and environmental and social baseline studies have commenced with appropriately qualified independent experts. Sovereign has also completed a high-level risk assessment to identify major environmental and social risks which could affect the development of the Project, along with mitigating strategies to allow identified risks to be addressed early in the project design phase. Sovereign has embarked on several exercises with the communities in the area and there is a general positive acceptance of the Project. Based on the current assessments and commenced ESIA, the Competent Person believes there are no environmental issues currently identified that cannot be appropriately mitigated in accordance with standard practices adopted for the development of mining projects.
Infrastructure	*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.*	Kasiya is located approximately 40km northwest of Lilongwe, Malawi's capital, and boasts favourable access to services and infrastructure. The proximity to Lilongwe gives the project access to a large pool of professionals and skilled tradespeople, as well as industrial services. Sovereign appointed JCM to design a preliminary IPP solution for Kasiya. JCM is a Canada-headquartered IPP which develops, constructs, owns and operates renewable energy and storage projects in emerging markets across the globe. JCM provided an estimated, levelized cost of energy (**LOCE**) on a Power Purchase Agreement (**PPA**).

Criteria	Explanation	Commentary
		Logistics cost estimates, including rail and port infrastructure and handling, were provided by Thelo DB, Nacala Logistics and Grindrod based on market data, suppliers' quotations, industry databases, industry contacts and the consultant's existing knowledge of southern African transport infrastructure and freight markets. The above consultants are independent with appropriate experience in the management of transport logistics studies in southern Africa.
Costs	*The derivation of, or assumptions made, regarding projected capital costs in the study.* *The methodology used to estimate operating costs.* *Allowances made for the content of deleterious elements.* *The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.* *Derivation of transportation charges.* *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* *The allowances made for royalties payable, both Government and private.*	Capital estimates for the procress plant have been prepared by DRA Global, together with input from Sovereign and other contributing consultants using combinations of cost estimates from suppliers, historical data, benchmarks and other independent sources. The accuracy of the initial capital cost estimate for the Project is -20% and +25%. Capital costs include the cost of all services, direct costs, contractor indirects, EPCM expenses, non-process infrastructure, sustaining capital and other facilities used for the mine. Capital costs make provision for mitigation expenses and mine closure and environmental costs. Working capital requirements (including contingency) for plant commissioning and full ramp-up have been included in the headline capital estimate reported under construction, owner's and start-up costs. Mining costs have been estimated by Fraser Alexander, a regional leader in hydro-mining and materials handling. Mining costs have been built up from first principles based on equipment, vendor, and contractor quotations, local unit cost rates, and benchmarked costs. Labor costs have been developed based on a first-principles build-up of staffing requirements with labor rates benchmarked in Malawi and expatriate rates benchmarked for professionals from South Africa and other jurisdictions. A Government royalty of 5% (applied to revenue) and a vendor profit share of 2% (applied to gross profit) has been included in all project economics. A 0.45% royalty (applied to revenue) has been applied for the community development fund. Rehabilitation and mine closure costs are included within the reported operating cost and sustaining capital estimates.
Revenue factors	*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.* *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*	Sales pricing for both products is based on current market analysis by an independent party (see below)
Market assessment	*The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.* *A customer and competitor analysis along with the identification of likely market windows for the product.* *Price and volume forecasts and the basis for these forecasts.*	Sovereign obtained independent market assessments for both products. **Rutile** Sovereign engaged market leading TZMI to provide a bespoke marketing report to support the Study. TZMI is a global, independent consulting and publishing company which specialises in technical, strategic and commercial analyses of the opaque (non-terminal market) mineral, chemical and metal sectors. TZMI's assessment has confirmed that, based upon their high-level view on global demand and supply forecasts for natural rutile, and with reference to the specific attributes of Kasiya, there is a reasonable expectation that the product will be able to be sold into existing and future rutile markets. Given the premium specifications of Kasiya's natural rutile, the product should be suitable for all major natural end-use markets including TiO_2 pigment feedstock, titanium metal and welding sectors. **Graphite** Sovereign engaged Fastmarkets, a specialist international publisher and information provider for the global steel, non-ferrous and industrial minerals markets, to prepare a marketing report for graphite. Fastmarkets' assessment has confirmed that based upon their high-level view on global demand and supply forecasts for natural flake graphite, and with reference to the specific attributes of Sovereign's projects, there is a reasonable expectation that the product from Sovereign's projects will be able to be sold into existing and future graphite markets. Given the extremely low-cost profile and high-quality product, it is expected that output from Kasiya will be able to fill new demand or substitute existing lower quality / higher cost supply.

Criteria	Explanation	Commentary
		Project considerations taken by Fastmarkets in forming an opinion about the marketability of product include: – Low capital costs (incremental) – Low operating costs – High quality concentrate specifications Industry participants confirm that the highest value graphite concentrates remain the large, jumbo and super-jumbo flake fractions, primarily used in industrial applications such as refractories, foundries and expandable products. These sectors currently make up the significant majority of total global natural flake graphite market by value. Fastmarkets have formed their opinion based solely upon project information provided by Sovereign Metals to Fastmarkets and have not conducted any independent analysis or due diligence on the information provided.
Economic	*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* *NPV ranges and sensitivity to variations in the significant assumptions and inputs.*	Key parameters are disclosed in the body of the announcement, and include: – Life of Mine: 25 years – Discount rate: 8% – Tax rate: 30% – Resource Rent Tax (RRT) of 15% after tax profit – Royalty rate: 5% royalty (Government), 2% of gross profit (Original Project Vendor) and 0.45% Community Development Fund. – Pricing: Rutile average price of US$1,484 per tonne and Graphite average basket price of US$1,290 per tonne The PFS financial model has been prepared internally by Sovereign using inputs from the various expert consultants and has been reviewed by BDO Australia – Perth, an independent leading accountancy, tax and advisory services firm to validate the functionality and accuracy of the model. NPV sensitivity to costs and price were assessed utilising the Project financial model developed by Sovereign. As is the case for most commodity-based projects, the NPV is most sensitive to changes in price, with a +/-30% price variation generating a +/-60% variation in project value. It is moderately sensitive to operating cost changes, with a +/-30% cost change producing a -/+ 18% fluctuation in value. Approximately 4% of this value change is attributable to mining costs, 5% to logistics costs and the remaining 9% to processing/labour/G&A related costs. The project is less sensitive to capital cost changes, with a +/-30% variation in capital affecting NPV by -/+10%.
Social	*The status of agreements with key stakeholders and matters leading to social license to operate.*	Sovereign expects to enter into a Community Development Agreement (“CDA”) with the surrounding communities. Significant engagement with these communities has occurred over the exploration phases and is ongoing ahead of negotiation of the CDA which is expected to be concluded during the DFS stage.
Other	*To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* *Any identified material naturally occurring risks.* *The status of material legal agreements and marketing arrangements.* *The status of government agreements and approvals critical to the viability of the project, such as mineral tenement status and government and statutory approvals. There must be reasonable 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.*	No identifiable naturally occurring risks have been identified to impact the Kasiya Ore Reserve. Sovereign has no existing binding offtake agreement in place. Sovereign is yet to apply for a Mining Licence (“ML”) covering the footprint of the project, however it is not anticipated for there to be any objections in obtaining the necessary government approvals.
Classification	The basis for the classification of the Ore Reserves into varying confidence categories. Whether the result appropriately reflects the Competent Person’s view of the deposit. The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).	The Kasiya PFS Ore Reserves comprise Indicated Mineral Resource material converted to “Probable” reserves. In line with JORC 2012 guidelines, Inferred Mineral Resource material has not been included. 100% of the Kasiya PFS Ore Reserve is in the Probable Reserves category.
Audit or reviews	The results of any audits or reviews of Ore Reserve estimates.	No external audits or reviews have been carried out to date.

SOURCES

APPENDIX 2 – MINERAL SANDS PEER INFORMATION

Reference	Company	Project	Stage of Development	Revenue to Cost ratio	Source
Ilmenite - Madagascar	Base Resources	Toliara	FS Complete	3.5	ASX Announcement: https://wcsecure.weblink.com.au/pdf/BSE/02426235.pdf
Ilmenite - Kenya	Base Resources	Kwale	Production	2.6	ASX Announcement (Quarterly Report): https://wcsecure.weblink.com.au/pdf/BSE/02689519.pdf
Ilmenite – Western Australia	Strandline	Coburn	Construction	2.4	Investor Presentation: https://cdn-api.markitdigital.com/apiman-gateway/ASX/asx-research/1.0/file/2924-02641224-6A1139803?access_token=83ff96335c2d45a094df02a206a39ff4
Zircon – Western Australia	Sheffield Resources	Thunderbird	Construction	2.3	Investor Presentation: https://www.sheffieldresources.com.au/site/pdf/ff58d7eb-b9a1-450a-b126-4462767a646e/Investor-Presentation.pdf
HMC – Western Australia	Image Resources	Boonanarring	Production	1.8	ASX Announcement (Quarterly Report): https://cdn-api.markitdigital.com/apiman-gateway/ASX/asx-research/1.0/file/2924-02691913-6A1160840?access_token=83ff96335c2d45a094df02a206a39ff4
HMC – Western Australia	Image Resources	Bidaminna	PFS Complete	1.7	ASX Announcement: https://cdn-api.markitdigital.com/apiman-gateway/ASX/asx-research/1.0/file/2924-02679921-6A1155680?access_token=83ff96335c2d45a094df02a206a39ff4
Rutile – Sierra Leone	Sierra Rutile	Mine Area 1	Production	1.4	ASX Announcement (Quarterly Report): https://cdn-api.markitdigital.com/apiman-gateway/ASX/asx-research/1.0/file/2924-02690469-6A1160073?access_token=83ff96335c2d45a094df02a206a39ff4

APPENDIX 3 – GRAPHITE PEERS OPERATING COST INFORMATION

Company	Project	Stage of Development	Operating Costs (FOB) *US$/t*	Steady State Production *Tpa*	Current Production *tpa*	Source
Focus Graphite	Lac Knife	FS updated	415	47,781	n/a	Company Announcement: Focus Graphite Announces Benchmark Feasibility Study Update for its Lac Knife Graphite Project, Québec (6 March 2023)
Nouveau Monde	Matawinie	DFS complete	443	103,328	n/a	Company Announcement: NextSource Materials Announces Preliminary Economic Assessment for a Mine Expansion of 150,000 Tonnes per Annum of SuperFlake® Graphite Concentrate (28 February 2022)
Black Rock Mining	Mahenge	DFS complete	466	89,000	n/a	Company Announcement: Black Rock Completes Front End Engineering Design, Reconfirming Mahenge as Tier 1 scale project with compelling projected returns (10 October 2022)
Renascor	Siviour	DFS complete	472	150,000	n/a	Company Announcement: Siviour Battery Anode Material Study Results (8 August 2023)
NextSource Minerals	Molo	PEA complete	479	150,000	n/a	Company Announcement: NextSource Materials Announces Preliminary Economic Assessment for a Mine Expansion of 150,000 Tonnes per Annum of SuperFlake® Graphite Concentrate (28 February 2022)
Blencowe	Orom-Cross	PFS complete	499	101,000	n/a	Company Announcement: Major Milestone as Blencowe Delivers US$482M NPV Pre-Feasibility Study for Orom-Cross Graphite Project (19 July 2022)
EcoGraf	Epanko	Pre-development	508	73,000	n/a	Company Announcement: Epanko Pre-Development Program Delivers Outstanding Results (28 April 2023)
Syrah Resources[1]	Balama	Production	565	240,000	129,000	Company Presentation: Q2 2023 Quarterly Activities Report (18 July 2023)
SRG Mining	Lola	DFS updated	585	94,000	n/a	Company Announcement: SRG Announces Positive Economic Results of Updated Feasibility Study for Lola Graphite Project (27 February 2023)
Magnis Energy	Nachu	DFS updated	639	236,000	n/a	Company Presentation: BFS Update 2022 (2 November 2022)
Evion Group	Maniry	DFS complete	658	52,000	n/a	Company Announcement: DFS forecasts strong returns for Maniry Project (3 November 2022)
Northern Graphite	Okanjande	PEA complete	666	31,000	n/a	Company Announcement: Northern Graphite Completes Preliminary Economic Assessment on Relocating Processing Plant for Namibian Operations (28 August 2023)
Volt Resources	Bunyu	FS updated	670	24,780	n/a	Company Announcement: Feasibility Study Update for Bunyu Graphite Project Stage 1, Tanzania, delivers significantly improved economics (14 August 2023)
Evolution Energy	Chilalo	DFS complete	773	52,000	n/a	Company Announcement: FEED and updated DFS confirms Chilalo as a standout high margin, low capex and development-ready graphite project (20 March 2023)
Graphite One	Graphite One	PFS complete	1,394	51,813	n/a	Company Announcement: Graphite One Advances its United States Graphite Supply Chain Solution Demonstrating a Pre-tax USD$1.9B NPV (8%), 26.0% IRR and 4.6 Year Payback on its Integrated Project (29 August 2022)

Note: Canadian dollar (CAD) costs converted to US$ at exchange rate per source documentation.
1. Operating costs shown are last reported C1 cash costs as at April 2023; Steady State Production relates to company guidance; current production is total of production reported in last four quarters

APPENDIX 4 – RUTILE MINERAL RESOURCES INFORMATION

Ref	Company	Project	Status	Source
1	Sierra Rutile	Sierra Rutile	Production & Development	https://sierra-rutile.com/our-operations-assets/ore-resources-and-mineral-resources/
2	Iluka Resources	Balranald	Development	Iluka Resources Limited Annual Ore Reserve and Resources as at 31 December 2022: https://iluka.com/media/k40pfhj5/resource-and-reserve-deposit.pdf?lang=en-AU
3	Base Resources	Kwale	Production	2023 Mineral Resources and Ore Reserves Statement (released on ASX 11 August 2023)

Detailed Mineral Resources by Category

1. Sierra Rutile – Sierra Rutile			
	Mt	**Rutile Grade***	**In-situ Rutile**
Measured	181	1.3%	2.4
Indicated	314	1.0%	3.1
Inferred	284	0.9%	2.7
Total	**779**	**1.0%**	**8.1**
2. Iluka Resources - Balranald			
	Mt	**Rutile Grade***	**In-situ Rutile**
Measured	6	5.7%	0.3
Indicated	35	4.1%	1.2
Inferred	13	3.0%	0.4
Total	**54**	**3.7%**	**2.0**
3. Base Resources - Kwale			
	Mt	**Rutile Grade***	**In-situ Rutile**
Measured	112	0.2%	0.2
Indicated	69	0.2%	0.2
Inferred	3	0.2%	0.1
Total	**184**	**0.2%**	**0.5**

* Rutile grade calculated as HM% times rutile % of assemblage

APPENDIX 5 – GRAPHITE RESOURCE INFORMATION

Ref	Company	Project	Project Status	Source
1	Syrah Resources	Balama	Production	https://www.syrahresources.com.au/our-business/reserves-resources
2	Volt Resources	Bunyu	FS Complete	https://voltresources.com/assets/bunyu-graphite-project/
3	Black Rock Mining	Mahenge	FS Complete	ASX Announcement: https://blackrockmining.com.au/wp-content/uploads/BlackRockCompletesFEEDAndeDFSUpdate.pdf
4	Mason Graphite	Lac Gueret	FS Complete	Mason Graphite's Corporate Presentation released July 2021
5	Magnis Energy	Nachu	BFS Complete	Magnis' Corporate Presentation released February 2022
6	NextSource Materials	Molo	PEA Complete	https://www.nextsourcematerials.com/graphite/molo-graphite-project/
7	Graphite One	Graphite One	PEA Complete	https://www.graphiteoneinc.com/graphite-one-increases-tonnage-grade-and-contained-graphite-of-measured-and-indicated-and-inferred-resources-in-updated-mineral-resource-estimate/
8	Focus Graphite	Lac Tetepisca	Resource	https://focusgraphite.com/focus-graphite-reports-major-maiden-mineral-resource-estimate-at-lac-tetepisca-quebec/

Detailed Mineral Resources by Category

1. Syrah Resources – Balama			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	22	17.0%	3.7
Indicated	240	13.0%	31.2
Inferred	774	11.0%	85.1
Total	**1,036**	**11.6%**	**120.0**
2. Volt Resources - Bunyu			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	20	5.3%	1.1
Indicated	155	5.0%	7.8
Inferred	286	4.9%	14.0
Total	**461**	**4.9%**	**22.6**
3. Black Rock Mining – Mahenge			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	32	8.6%	2.7
Indicated	85	7.8%	6.6
Inferred	97	7.4%	7.2
Total	**213**	**7.8%**	**16.6**
4. Mason – Lac Gueret			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	19.0	17.9%	3.4
Indicated	46.5	16.9%	7.9
Inferred	17.6	17.3%	3.4
Total	**83.2**	**17.6%**	**14.7**

5. Magnis - Nachu			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	63	4.7%	3.0
Indicated	61	5.7%	3.5
Inferred	50	5.8%	2.9
Total	**174**	**5.4%**	**9.3**
6. NextSource - Molo			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	160	0.3%	0.3
Indicated	91	0.2%	0.2
Inferred	13	0.2%	0.2
Total	**254**	**0.2%**	**0.7**
7. Graphite One – Graphite One			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	2	8.0%	0.1
Indicated	9	7.7%	0.7
Inferred	92	8.0%	7.3
Total	**103**	**8.0%**	**8.2**
8. Focus – Lac Tetepisca			
	Mt	**TGC (%)**	**In-situ TGC**
Measured	-	-%	-
Indicated	59	10.6%	6.3
Inferred	15	11.1%	1.6
Total	**74**	**10.6%**	**7.9**

APPENDIX 6 – GRAPHITE RESOURCE GLOBAL WARMING POTENTIAL

Ref	Company	Project	Project Status	GWP (CO_2e)	LCA Boundary	Source
1	Syrah Resources	Balama	Production	0.42	FOB Nacala	ASX Announcement: Syrah approves Balama solar and battery system final investment decision (released 6 Apr 2022)
2	Northern Graphite (Electric Fleet Scenario)	Bisset Creek	FS & PEA	0.45	Cradle-to-gate	TSX Announcement: Northern Graphite Plans to Further Reduce Carbon Footprint of Bissett Creek Project (released 9 Mar 2022)
3	Evolution Energy	Chilalo	DFS Underway	0.49	Cradle-to-gate	ASX Announcement: Independent life cycle assessment demonstrates Chilalo's low carbon footprint (released 6 Oct 2022)
4	Other Tanzania Production	n/a	n/a	0.60	Cradle-to-gate	Provided by LCA Manager, Minviro Ltd
5	China Production	n/a	n/a	1.20	Cradle-to-gate	Provided by LCA Manager, Minviro Ltd
6	Northern Graphite	Bisset Creek	FS & PEA	2.20	Cradle-to-gate	TSX Announcement: Northern Graphite Plans to Further Reduce Carbon Footprint of Bissett Creek Project (released 9 Mar 2022)

APPENDIX 7 – GRAPHITE PEERS PRICING INFORMATION

Company	Project	Graphite Concentrate Price (US$/t FOB)	Source
Northern Graphite	Lac-des-Iles	$1,601	Technical Report on the Lac-des-Iles Quarry, Quebec Report for Ni 43-101 (22 December 2021)
Nouveau Monde	Matawinie	$1,675	Company Announcement: NextSource Materials Announces Preliminary Economic Assessment for a Mine Expansion of 150,000 Tonnes per Annum of SuperFlake® Graphite Concentrate (28 February 2022)
Magnis Energy	Nachu	$1,847	Company Presentation: BFS Update 2022 (2 November 2022)
Black Rock Mining	Maniry	$1,709	Company Announcement: Black Rock Completes Front End Engineering Design, Reconfirming Mahenge as Tier 1 scale project with compelling projected returns (10 October 2022)
Evion Group	Mahenge	$1,448	Company Announcement: DFS forecasts strong returns for Maniry Project (3 November 2022)
SRG Mining	Lola	$1,400	Company Announcement: SRG Announces Positive Economic Results of Updated Feasibility Study for Lola Graphite Project (27 February 2023)
Evolution Energy	Chilalo	$1,614	Company Announcement: FEED and updated DFS confirms Chilalo as a standout high margin, low capex and development-ready graphite project (20 March 2023)
Focus Graphite	Lac Knife	$1,679	Company Announcement: Focus Graphite Announces Benchmark Feasibility Study Update for its Lac Knife Graphite Project, Québec (6 March 2023)
EcoGraf	Epanko	$1,800	Company Announcement: Epanko Pre-Development Program Delivers Outstanding Results (28 April 2023)
Northern Graphite	Okanjande	$1,550	Company Announcement: Northern Graphite Completes Preliminary Economic Assessment on Relocating Processing Plant for Namibian Operations (28 August 2023)
Volt Resources	Bunyu	$1,288	Company Announcement: Feasibility Study Update for Bunyu Graphite Project Stage 1, Tanzania, delivers significantly improved economics (14 August 2023)

SOVEREIGN METALS LIMITED

ONE PROJECT - TWO CRITICAL MINERALS

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