BLACK ROCK MINING COMPLETES COMPELLING DFS FOR MAHENGE GRAPHITE PROJECT DEMONSTRATING MAJOR GEOLOGICAL AND GEOGRAPHICAL ADVANTAGES

HIGHLIGHTS

- Definitive Feasibility Study (**DFS**) completed demonstrating major geological and geographical advantages including:
  - Highest purity flake graphite achieved from conventional flotation circuit processing;
  - Lowest cost to customer given access to rail and major East African port from rail; and
  - Lowest peak capital per annual tonne of product.
- DFS supported by largest pilot plant of any graphite developer of 90k tonnes that delivered 8k tonnes of graphite concentrate.
- Construction underwritten by binding off take with Heilongjiang Bohao Graphite, one of the largest vertically integrated graphite producers in China, for 30k tonnes in year one, 50k tonnes in year two and up to 90k tonnes in year three.
- Exceptional financial metrics supported by defendable pricing assumptions of:

Post-tax, unlevered NPV_{10}	US$895m
Post-tax, unlevered IRR	42.80%
Capex for Phase One (83k tonnes per annum)	US$115m
Contingency for Phase One	10% (included in US$115m)
Capex for Phase Two (83k tonnes per annum)	US$69.5m
Capex for Phase Three (83k tonnes per annum)	US$84.2m
Contingency for Phases Two and Three	15% (included in US$69.5m and US$84.2m)
Life of Mine C1 Costs, FOB Dar	US$401 /t
Life of Mine All in Sustaining Costs, FOR Dar*	US$473 /t
Concentrate basket FOB Dar es Salaam**	USD $1,301/t
Life of Mine	32 years
Average steady state production rate	250k tonnes per annum
Total Life of Mine Concentrate production	6.6m tonnes
Ore reserves	70m tonnes @ 8.5% TGC
Reserve life	23 years
Resources	212m tonnes @ 7.8% TGC

** AISC includes all post start up capex including module 2&3 expansion*

***Basket is LOM average price for 97.5% LOI sized concentrate packed in 1 tonne bulka bags*

- Work ongoing with Yantai Jinyuan targeting capex reduction through Chinese procurement.
- Additional offtake discussions continuing to further underwrite production profile.
- Mining licence application to be lodged over the coming weeks supported by environmental approvals received in August 2018.
- Company to move quickly into finality of detailed engineering with a construction commencement target of mid CY2019 and initial production in mid CY2020.

Tanzanian graphite developer Black Rock Mining Limited (BKT: ASX) ("Black Rock" or "the Company") is pleased to announce it has completed the Definitive Feasibility Study (**DFS**) for its 100% owned Mahenge Graphite Project located in Ulunga province, south central Tanzania. The DFS builds on an optimised Pre-Feasibility Study that was completed in July 2017.

A detailed summary of the DFS is attached to this release.

Commenting on the completion of the DFS, Black Rock Mining CEO, John de Vries:

> "When setting out to deliver our Definitive Feasibility Study our primary objective was to develop the study to point where it would support a bankability level of due diligence. With over 25,000 person hours using consultants and contractors with real graphite mine construction and operations' experience, I am very confident we have differentiated ourselves, and delivered that on that outcome.
>
> The core element of the DFS was the operation of the 90 tonnes pilot plant, the largest plant ever run in the graphite sector at DFS stage. The plant provided invaluable data and operating performance for process plant design and flow sheet optimisation. Critically, the plant also delivered eight tonnes of concentrate with which we could engage customers and develop a dialogue around preferences and product attributes. We are confident that our approach to market segmentation, and a focus on channel strategy based on credible volumes of real products, will yield results with product offtake.
>
> This DFS leverages a number of competitive advantages unique to Mahenge. From a geology perspective, we established capacity to deliver the world's highest grade floatation concentrate of +99% LOI Mahenge *ULTRA PURITY-FP*™. Being able to produce the highest grade concentrate available without chemical or thermal refining effectively future proofs the company as markets increasingly shift towards higher quality concentrates.
>
> Geographically, we have established the lowest cost logistics solution, by proving the viability, and preference for rail haulage to the Port of Dar es Salaam, the largest port in our region. We have put in place material solutions to move the environmental best practice and manage the site water balance through dry stacking. We have invested in Operational Readiness to avoid a post commissioning performance drop off, and to support our Tanzania centric operating model.
>
> We anticipate improvements in our capital cost once Yantai Jinyuan complete a program of metallurgical test work, and have run a small pilot plant as part of their due diligence process, however this has not been factored into the study economics.
>
> This study is about building a mine. The attention to detail, the level of data support, the effort and the engagement with stakeholders, positions the Company to move into financing and construction."

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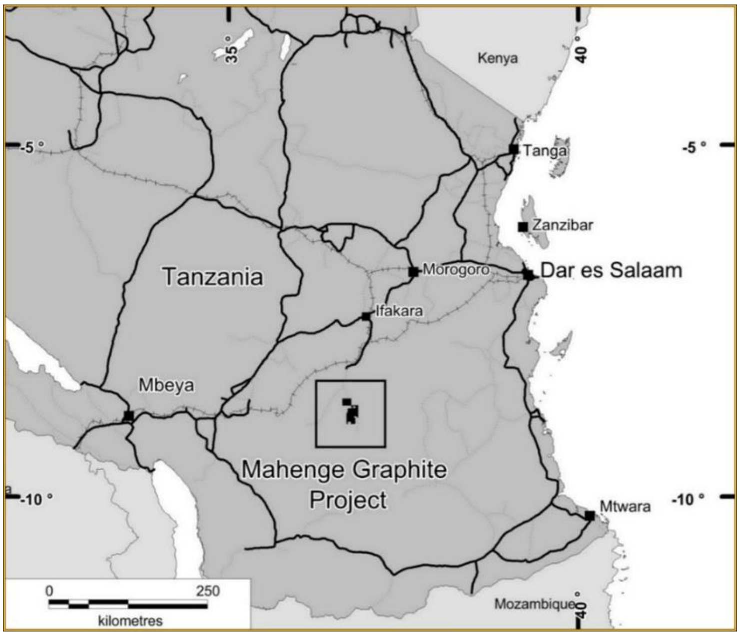
About Black Rock Mining

Black Rock Mining Limited is an Australian-based company listed on the Australian Securities Exchange. The Company owns graphite tenure in the Mahenge region of Tanzania.

The Company's 100%-owned Mahenge Graphite Project is one of the largest JORC-compliant flake graphite Mineral Resource Estimates globally, with a Mineral Resource Estimate of 211.9m tonnes at 7.8% TGC for 16.6m tonnes of contained graphite. Importantly, more than 50% of the Mineral Resource is in the Measured and Indicated categories and is in accordance with the company's previous announcement on its Measured & Indicated Resource released on 20 July 2017. The Company confirms that it is not aware of any new information that materially affects the resources estimate.

For further information on the Company's development pathway, please refer to the Company's website at the following link: http://www.blackrockmining.com.au and the corporate video presentation at http://www.blackrockmining.com.au/#video.



Location of Black Rock's Mahenge Graphite Project within Tanzania

BLACK ROCK MINING LIMITED

MAHENGE GRAPHITE PROJECT

FEASIBILITY STUDY

Executive Summary

October 2018

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1 INTRODUCTION

Black Rock Mining Limited (Black Rock) is an ASX-listed graphite exploration and development company (ASX:BKT). Black Rock is focused on developing the 100%-owned Mahenge Graphite Project (MGP), situated in the East African country of Tanzania.

The project site is located 450 km by road from Tanzania's largest port, Dar es Salaam and is contained within 520 km^2 of exploration tenements in the Ulanga district. The Mahenge deposit is the fourth largest (JORC compliant) contained graphite resource in the world.

The project development area will be around the Ulanzi and Cascade deposits, which provide a nominal mine life of more than 32 years. Black Rock has recently further optimised the mine plan to significantly reduce the mining footprint by adopting processes to dewater mine waste, thereby avoiding the need for large areas of tailings facilities.

Black Rock has completed a feasibility study (FS) on the Mahenge Project and is moving towards securing project financing and progressing into construction and operations with first production targeted in 2020.

The financial analysis indicates a net present value (NPV) @10% (post tax, ungeared after 16% free carry) of US$895M for the base case production profile and price assumptions, which provide for an internal rate of return (IRR) of 46.9% (post tax, real). A maximum cash draw of US$120.5M is incurred 18 months after the commencement of construction.

The financial performance of the project is summarised in Figure 18-1.

Figure 1-1 LOM Cash Flow Profile (US$ real)

The financial analysis indicates the project is financially viable and results in strong financial returns. With a short payback period of 3.1 years from first ore processed, the project has relatively low exposure to the key risk factor of long term commodity prices, mitigating exposure to the financial risk associated with the project's capital funding requirements. The strong financial returns under the base case assumptions provide a positive risk versus reward assessment.

2 PROJECT BACKGROUND

2.1 Project Location

The Mahenge Project is located in south-eastern Tanzania, approximately 250 km north of the border with Mozambique. 250 km west of the coastal port city of Mtwara on the Indian Ocean and 300 km southwest of Tanzania's largest city, Dar es Salaam as shown in Figure 2-1.

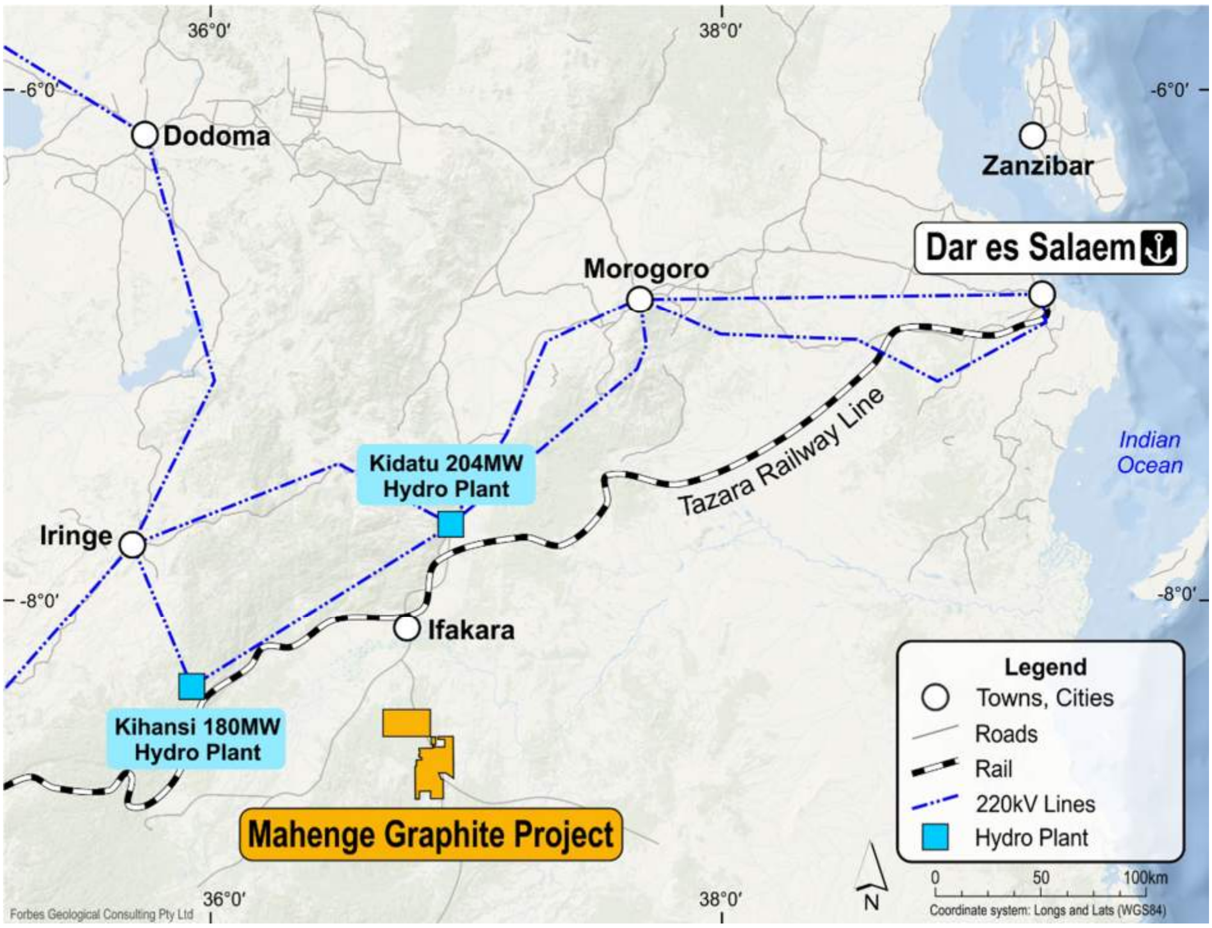


Figure 2-1 Location of the Mahenge Project

The natural ground level in the project area generally slopes to the north with some localised steeper valley areas, up to 75 m deep. Watercourses cross the site towards the north. The ore bodies are located toward the top of the valley sides.

The project site is an open area between hilly terrain. The process plant is located approximately 600 metres (m) north of the Ulanzi open pit at an elevation of 487 metres above sea level (masl).

2.2 Site Access

The MGP is accessed from driving west from Dar es Salaam to Morogoro and then southwest and south passing through the regional township of Ifakara and then onto Mahenge (Figure 2-1). Access to the property is predominantly by sealed and local dirt roads.

From Dar es Salaam, the bitumen section on the A7 to Mikumi (via Morogoro) is well maintained. The roads from Mikumi to Ifakara consist of tarmac for the first third of the sector followed by dirt road for the remainder. The dirt road from Ifakara to site features many bridges and rough road sections including a hilly section in the last 7 km to site.

The road passes through several villages and is used by pedestrians, bicycles, cars and trucks for commuting and commercial purposes.

The project site is approximately 70 km by road from the nearest train line, the Tanzania Zambia Railway Authority (TAZARA) line, that runs to Dar es Salaam, Tanzania's principal port.

There is no air strip near the project site and one will not be constructed for the project. All travel to/from the project site is by road.

2.3 Political Overlay

Since the election of President Magufuli in 2015 Tanzania's investment landscape has been altered across all key industries with a sharp focus on mining. Although Tanzania retains many of the hallmarks of stability that mining companies look for when considering long-term, capital-intensive investments, regulatory tightness in the short to mid-term has increased, as has the onus on mining companies to constructively engage with critical stakeholders. At a high level:

- Tanzania's transition to independence continues to shape the psyche of politics and the role of the private sector in contributing to the broader Tanzanian economy. The influence of socialism continues to impact government decision making and engagement between the public and private sectors.
- Tanzania's democratic dominant party state that has seen Chama Cha Mapinduzi (CCM) hold power since 1977, coupled with the lack of violent overthrow or large-scale election-related violence, has allowed investors to avoid some of the cyclical risks associated with elections in many sub-Saharan African countries.
- Tanzania's internal stability, strategic location and a degree of sustained domestic security experienced by few of its neighbours, have seen it long-considered an ideal place for investment in sub-Saharan Africa.
- Tanzania's economic development and aim of attaining middle-income status as directed by the country's Second Five Year Development Plan 2016/17 – 2020/21, outlines the county's aim to increase the contribution of the mining sector from its current level of 4% to 10% of GDP by 2025. Overall the country's current growth rates are estimated between 6% to 7%.
- Since the election of President Magufuli, Tanzania's ranking on key anti-corruption metrics has improved. The ease of doing business indicators however have fallen

slightly – confirming the success of President Magufuli's anti-corruption campaign, but also reinforcing concerns voiced by the private sector around significant changes in personnel, restructuring of multiple ministries and agencies and a less friendly approach to private sector engagement.

- President Magufuli's time in office has had a significant impact on the country. He has been criticised for his crackdown on opposition groups and media freedoms, aggressive tax policies and insufficient levels of engagement with the private sector, including the country's largest investors. However, the country's anti-corruption drive has been well received by both the private sector and the broader public and the last 6 to 12 months appears to have seen an increased engagement between the highest levels of government and the private sector.
- President Magufuli has led a significant overhaul of the country's mining sector – changing the sector's legislative framework and governance structures. The changes made, some of them retroactively, led to a loss of confidence across the sector with many companies choosing to divest or delay projects while they tried to understand and navigate the new situation. For those that stayed it has become evident that although Tanzania remains open for business, companies need to ensure that their engagement is positive, inclusive, involves meaningful local content and seeks to empower Tanzanians and assist in the country's growth and industrialisation agenda thereby aligning with the country's development plans while paying respect to the country's political and ideological roots.

2.4 Environmental Data

The MGP is located on the hilly terrains of the Mahenge District, forming part of isolated mountain blocks of the Eastern Arc Mountains. The climate is warm and temperate with monthly average temperatures ranging from a minimum of 17°C to a maximum of 33°C. The average annual relative humidity is 70%.

The Mahenge District generally experiences a bi-modal rainfall pattern with long rains between March and April and short rains between November and January. The typical dry season extends from May to October. In winter (June to September) there is less rainfall than in the summer (December to April).

The annual rainfall is approximately 1,870 mm and evaporation is 1,170 mm so the overall water balance is positive and therefore a shortage of water is not expected. Figure 2-2 shows the monthly average rainfall and evaporation for the project.

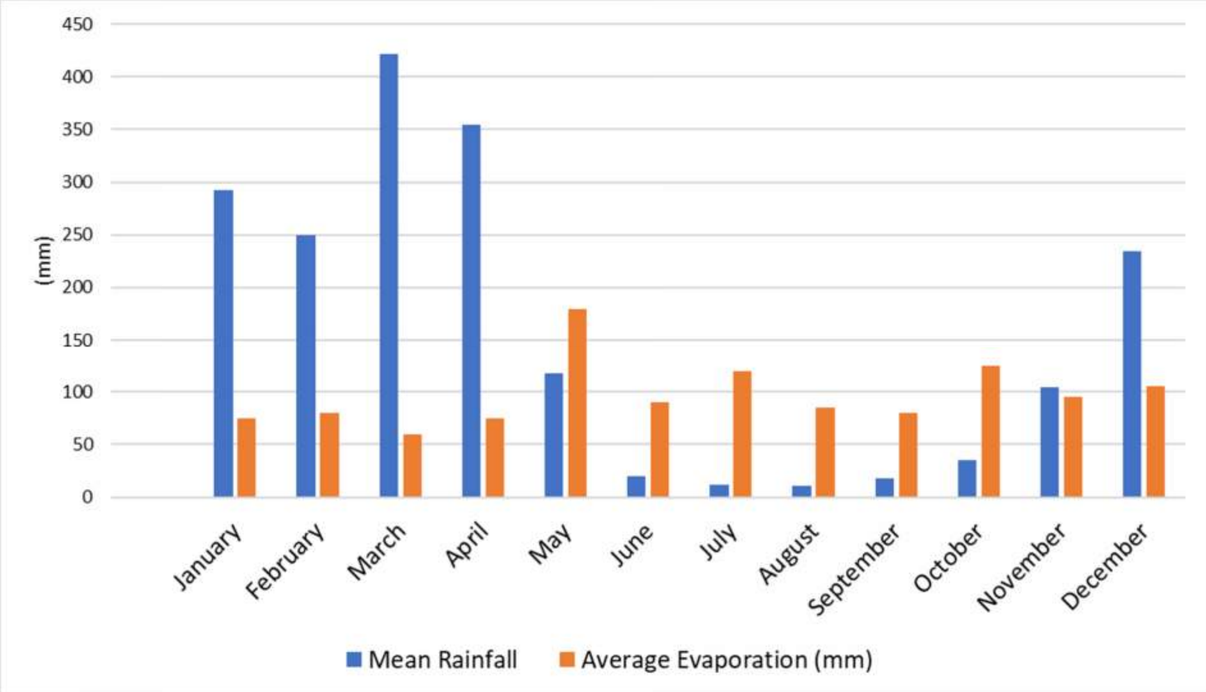


Figure 2-2 Average Monthly Rainfall and Evaporation

The site has an overall average net positive water positive balance of 700 millimetres per year (mm/y). The highly seasonal nature of the wet season results in generation of decant water and a requirement during the dry season to access stored water.

The topography of the Mahenge area is mountainous, with steeply-dipping hills and scarps. Vegetation in the region is diverse and includes sub-montane and montane forest types, although the project area has been heavily degraded by the local people and is now predominantly clear of any forest.

The project is in a low earthquake hazard area.

2.5 Site Topography and Drainage

The MGP is located on the edge the Mahenge Mountains, which rise to 1500 m above sea level. The project area is characterised by north-south orientated steep hills and valleys. It is well drained with rapid to moderate water infiltration rates and rapid run-off on mountain slopes. The mountains have linear slope gradients ranging between 70% to 85% while the U-shaped valleys are nearly flat with average slope gradient of about 18%.

The Mbaha River is a local watercourse that crosses the proposed Ulanzi mining pit and potential mill residue dry stack area. It joins the Luri River, which is one of the only permanent rivers in the region. Other local rivers include the Shilangazi (Epanko), Iroko and Mdindo Rivers.

The locations of the principal local rivers within the proposed mining area are shown in Figure 2-3.

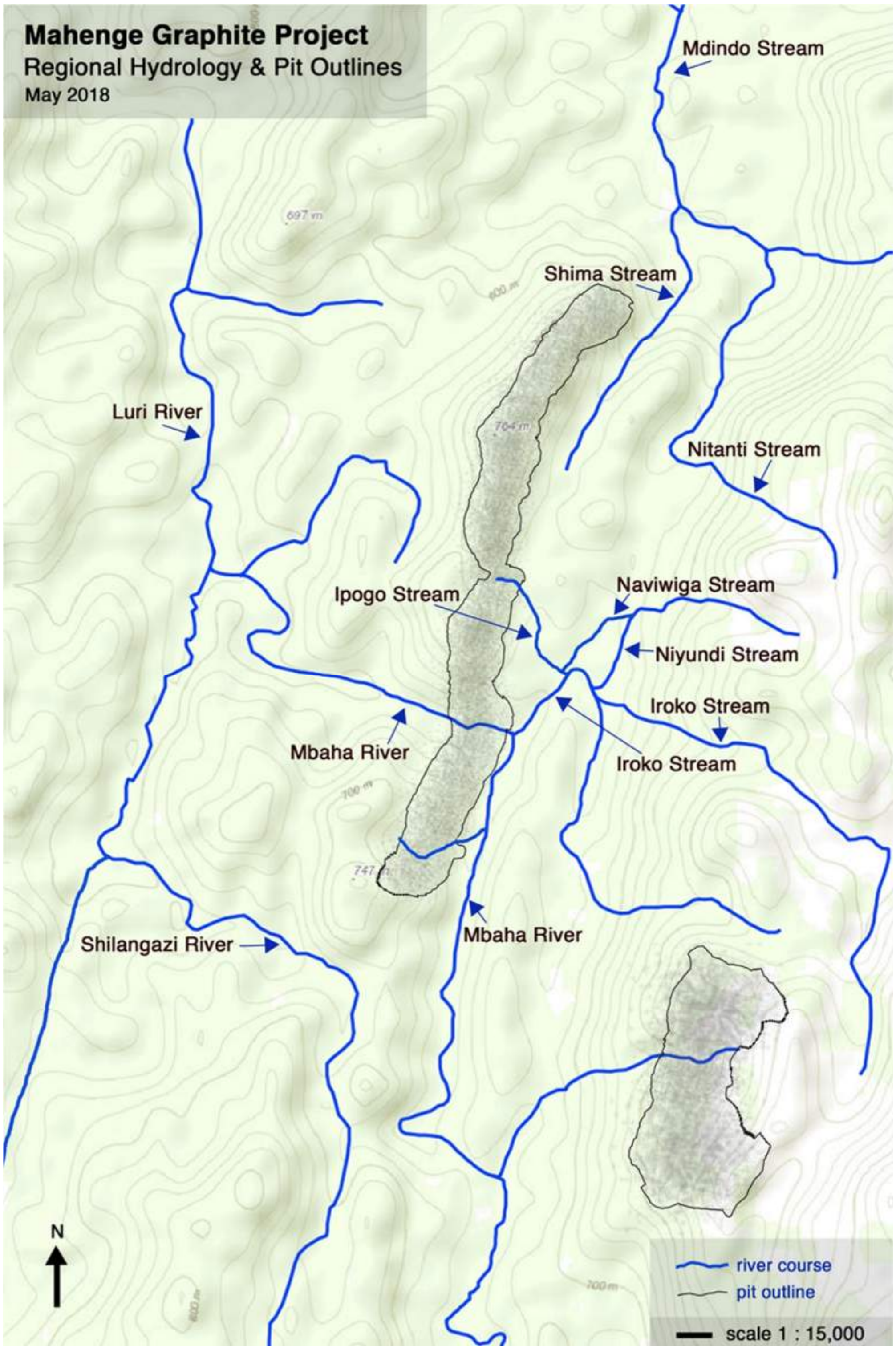


Figure 2-3 Regional Hydrology and Pit Outlines

2.6 Existing Infrastructure

The closest port is Dar es Salaam. The project area is situated in the Morogoro district and is approximately 60 km to the south of the town of Ifakara which is close to the railway line running to Dar es Salaam. There is also an airstrip at Ifakara. Grid power is currently available from Ifakara from the Kidatu Hydroelectric Scheme. Basic lodge accommodation is readily available, and for the duration of the work programs described here the site staff stayed at the 'Mbega Hilltop Lodge'.

Communication with GSM cellular network is generally good with the Vodacom and Tigo networks providing good coverage in the Mahenge area.

3 OWNERSHIP AND LEASES

The Mahenge Graphite Project (MGP) comprises four prospecting licences PL7802/2012, PL10111/2014, PL10426/2014 and PL10427/2014, which surround the town of Mahenge. The Mineral Resource estimate lies entirely within PL7802/2012 (Figure 3-1, Figure 3-2 and Table 3-1).

The licences are 100% owned by Black Rock through its Tanzanian subsidiary Mahenge Resources Limited. Black Rock acquired the licences in 2014 and all four licences were granted for Graphite Industrial Minerals under section 32 of the Tanzanian Mining Act 2010 by the United Republic of Tanzania Ministry of Energy and Minerals.

A prospecting license allows the company to explore for graphite and other nominated minerals for an initial period of 4 years and then 2 successive renewal periods for an additional 5 years. In total the license can be held for 9 years. A 35 km^2 Special Mining Lease (> US$100 M CAPEX project) can be applied for a period of 10 years upon presentation of an accepted suitable feasibility study, environmental impact study and employment plan. PL10111 has been successfully renewed.

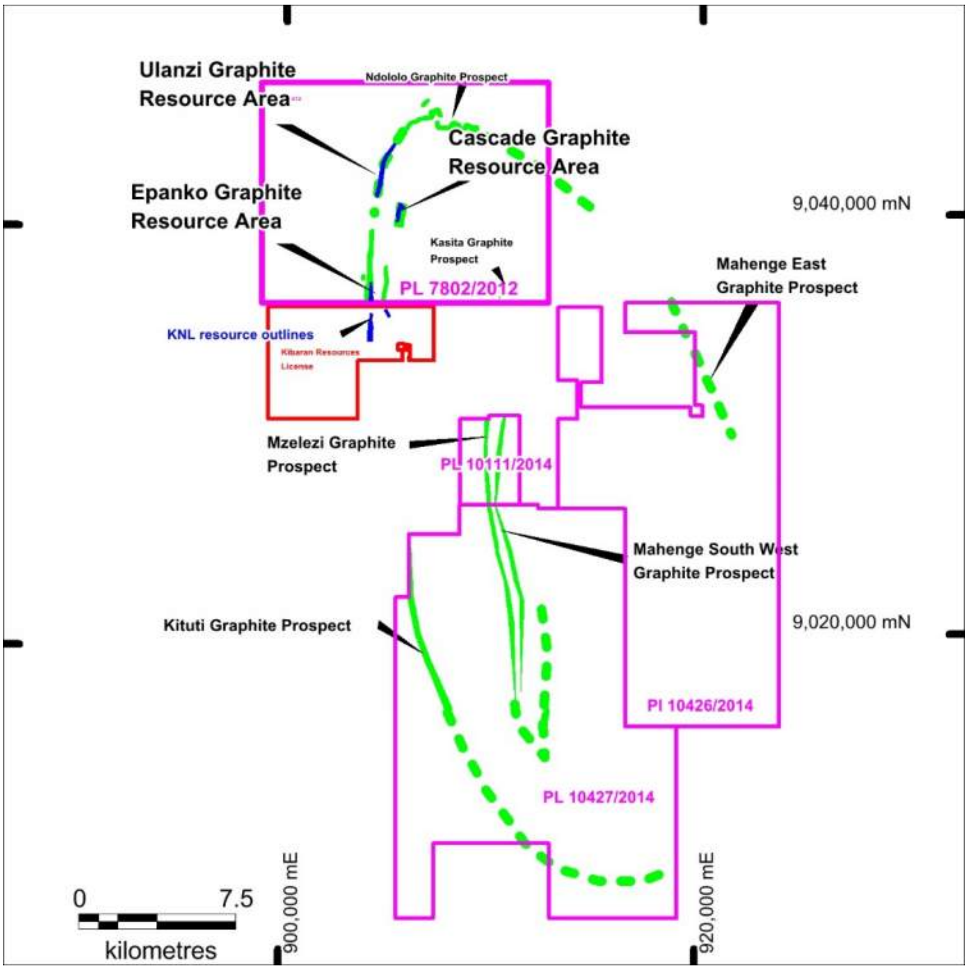


Figure 3-1 Tenements for Key Exploration Targets on the Mahenge Property

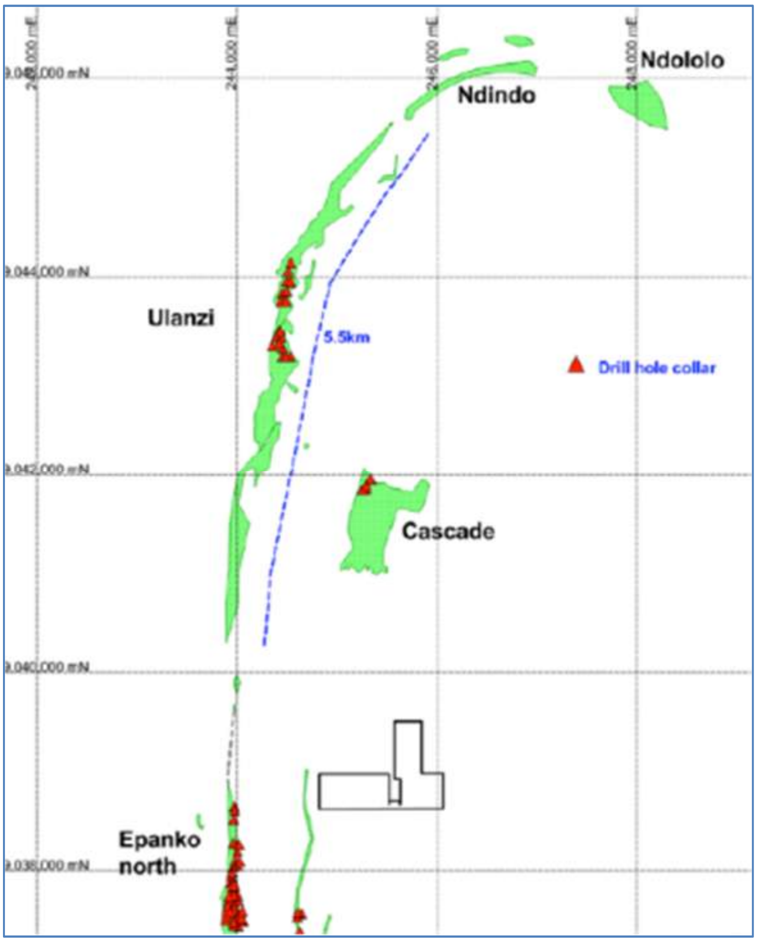


Figure 3-2 Key Exploration Projects on the Mahenge Property

Table 3-1 Summary of Licence Tenure

Licence type	Licence Number	Area (km²)	Date Granted	Expiry Date	Black Rock Ownership (%)
PL	7802/2012	143.91	03/04/2012	02/04/2019	100%
PL	10111/2014	12.55	13/08/2014	12/08/2020	100%
PL	10426/2014	154.96	02/12/2014	01/12/2018	100%
PL	10427/2014	208.67	02/12/2014	01/12/2018	100%
Total		520.09			

4 GEOLOGY AND RESOURCES

In June 2017, Black Rock requested that Trepanier Pty Ltd update the Mineral Resources estimate for the Cascade Graphite Deposit, which together with the Ulanzi Graphite Deposit and the Epanko North Graphite Deposit form the MGP.

The MGP is located within the rocks of the Proterozoic Mozambique Orogenic Belt that extends throughout eastern Africa. It consists of high-grade mid-crustal rocks with a Neoproterozoic metamorphic overprint. The Mozambique Belt is divided into the Western

Granulite and the Eastern Granulite, the latter of which hosts the MGP as shown in Figure 4-1. The two granulites are separated by flat-lying thrust zones and younger sedimentary basins of the Karoo.

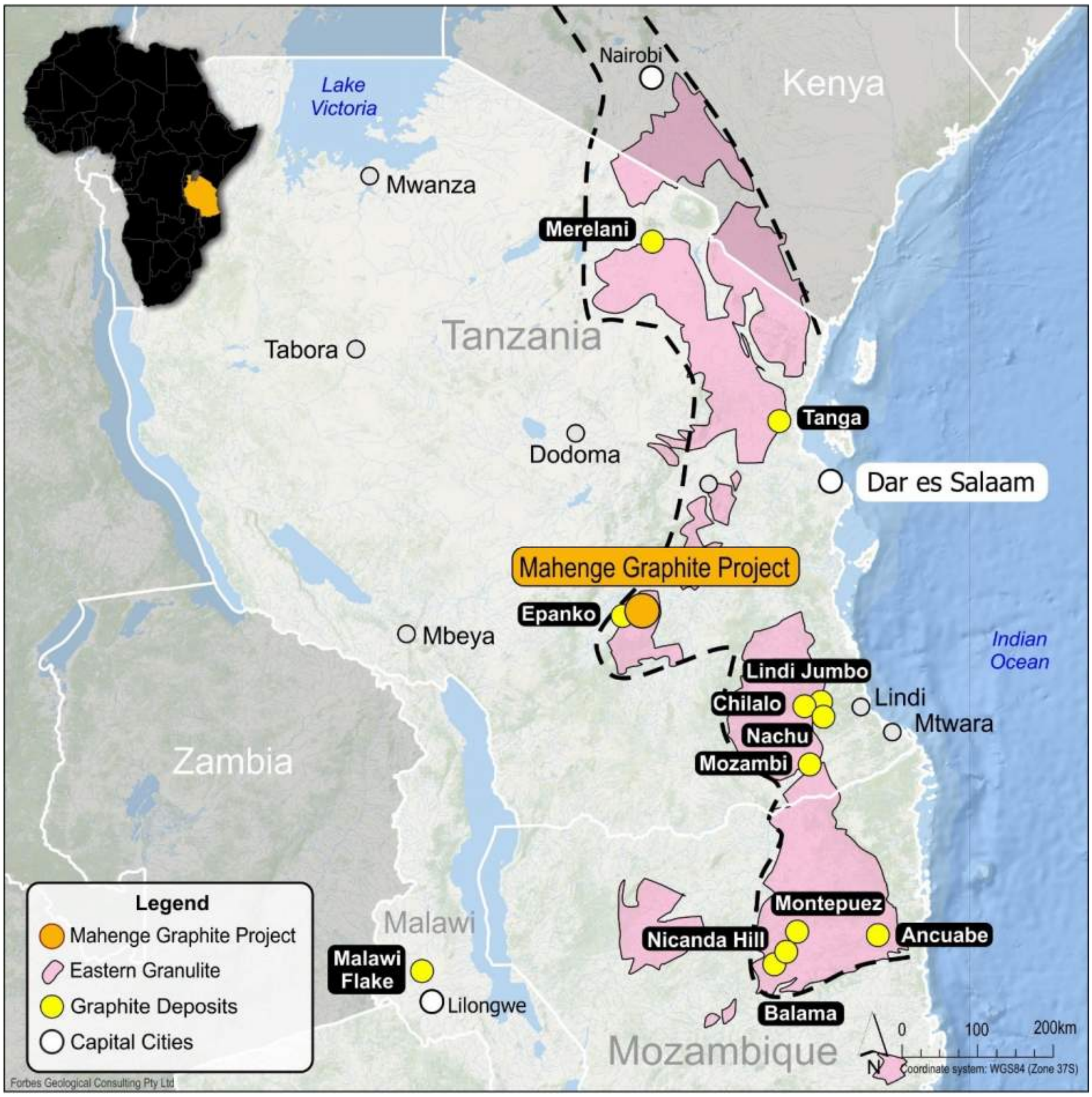


Figure 4-1 Geological Location of the Mahenge Graphite Project

The belt has undergone granulite phase metamorphism that has been subsequently retrograded to upper amphibolite facies. Structurally, the Mahenge region has undergone intense deformation forming a tight poly-phase sequence of marble, mafic and felsic gneisses and graphitic schists as part of the kilometre-scale Mahenge Synform. The Mineral Resources are located on the western flank of the synform where the bedding and foliation dip between 60° and 80° towards the east. The units typically strike to the north and rotate to the northeast as they wrap around the fold nose.

The geological interpretation used in the Mineral Resource estimate was based on mapping of surface outcrop, multiple pits and trenches in conjunction with two phases of reverse circulation (RC) and diamond (DD) drilling. The 3D geological wireframes were created using well-defined foot-wall and hanging-wall boundaries based primarily on changes from graphite-dominated gneiss to mica or garnet gneissic units, which as expected also reflected a decrease in the graphite grade. The wireframes were extrapolated along strike to half-section spacing.

The latest resource model is based on information from 175 RC drill-holes for 15,166.7 m and 34 diamond drill-holes[1] for 3,911.0 m, all drilled by Black Rock. Black Rock has used 100 m by 100 m, 100 m by 50 m and 50 m by 50 m grid drill spacing, which has been sufficient to confirm geological and grade continuity. The drilling has been oriented perpendicular to the mineralisation or as close to perpendicular as possible subject to drill access.

Grade envelopes have been wireframed to an approximate 4% to 5% total graphitic carbon (TGC) cut-off, allowing for continuity of the zone. Based on visual and statistical analysis of the drilling results and geological logging of the graphite rich zones, this cut-off tends to follow a natural geological change and coincides with the contact between the graphite rich schists and the other host rocks (i.e. biotite schists and gneisses, garnet gneisses and occasional dolomites).

Black Rock completed specific gravity test work on 1,078 drill core samples across the Epanko, Ulanzi and Cascade deposits using hydrostatic weighing (uncoated). Of these, 587 are from within the modelled mineralised domains. Statistical analysis of the samples and comparison against depth and TGC grade identified a subjective relationship between bulk density (BD) and TGC grade. As such, the BD used for fresh material was the average for the deposits (90% confidence interval) at 2.73 t/m^3 and 2.74 t/m^3 at Cascade (with a standard deviation of 0.05).

Directional variograms were modelled by domain using traditional variograms. Nugget values for TGC are low to moderate (around 15% to 30%) and structure ranges up to 270 m. The four Ulanzi domains were top-cut between 16.0% and 17.6% TGC prior to variogram generation, however, no top-cuts were required at Cascade. Grade estimation was completed using ordinary kriging (OK). The OK estimates were constrained within the discrete wireframe domains for each deposit and generated with multiple estimation passes completed with expanded sample searches.

The Mineral Resource has been classified based on confidence in the geological model, continuity of mineralised zones, drilling density, confidence in the underlying database and the available bulk density information. The Mahenge Mineral Resources have been classified as Measured, Indicated and Inferred according to JORC (2012) and are shown in Table 4-1.

[1] Includes diamond drilled “tails” on existing RC drill-holes

Table 4-1 Global Mineral Resource Estimate for the Mahenge Graphite Project

Prospect	Category	Tonnes (Mt)	Grade (% TGC)	Contained Graphite (Mt)
Ulanzi	Measured	13.3	8.9	1.2
	Indicated	49.7	8.2	4.1
	Inferred	50.2	8.1	4.1
	Sub-total	**113.3**	**8.2**	**9.3**
Cascade	Measured	12.1	8.3	1.0
	Indicated	20.8	8.3	1.7
	Inferred	27.3	7.9	2.2
	Sub-total	**60.2**	**8.1**	**4.9**
Epanko	Measured	-	-	-
	Indicated	17.6	6.4	1.1
	Inferred	20.8	5.9	1.2
	Sub-total	**38.4**	**6.1**	**2.3**
Combined	Measured	25.5	8.6	2.2
	Indicated	88.1	7.9	6.9
	Inferred	98.3	7.6	7.4
	Total	**211.9**	**7.8**	**16.6**

Note: Appropriate rounding applied

Since reporting of the above resource in 2017, the following geology and resource associated work programs have been completed:

- Diamond core drilling at Ulanzi (31 holes for 1,890m) to collect material for metallurgical testwork and pilot plant testing.
- Geostatistical study to simulate grade control drill spacings.
- Planning of sterilisation drillholes targeting proposed infrastructure sites at Mahenge.

5 MINING

During the DFS, key mining items were addressed, and design was advanced from the PFS which included:

- optimisation of the mining fleet
- resolution of the mining operating approach (owner mining vs contracting),
- simplification of the haul road network
- mining below natural streams

- ore category simplification
- ore handling controls
- ore stockpile management
- dry mill residue and waste rock management
- responding to overall site layout changes and revised mining schedule
- material sequencing to meet key requirements.

The mineral resource, pit inventory, pit design and staging, staged milling development and throughputs used in the DFS have remain unchanged since the updated PFS. For the DFS, the mining schedule was updated to reflect the improved haulage networks, changes in the site layout and revised mining equipment adopted for the study.

The 86.0 million tonnes (Mt) of resource in the mining schedule consists of 69.6 Mt of ore reserves and 16.4 Mt of Inferred and sub-Inferred resource representing 81% and 19% of mill feed respectively. The material distribution by resource classification of ore fed to the mill at the process plant over the life of mine (LOM) is presented in Figure 5-1. The inclusion of the Inferred and sub-Inferred resource and its distribution over the second half of the mine life exceeding 30 years is not a determining factor in the project's viability.

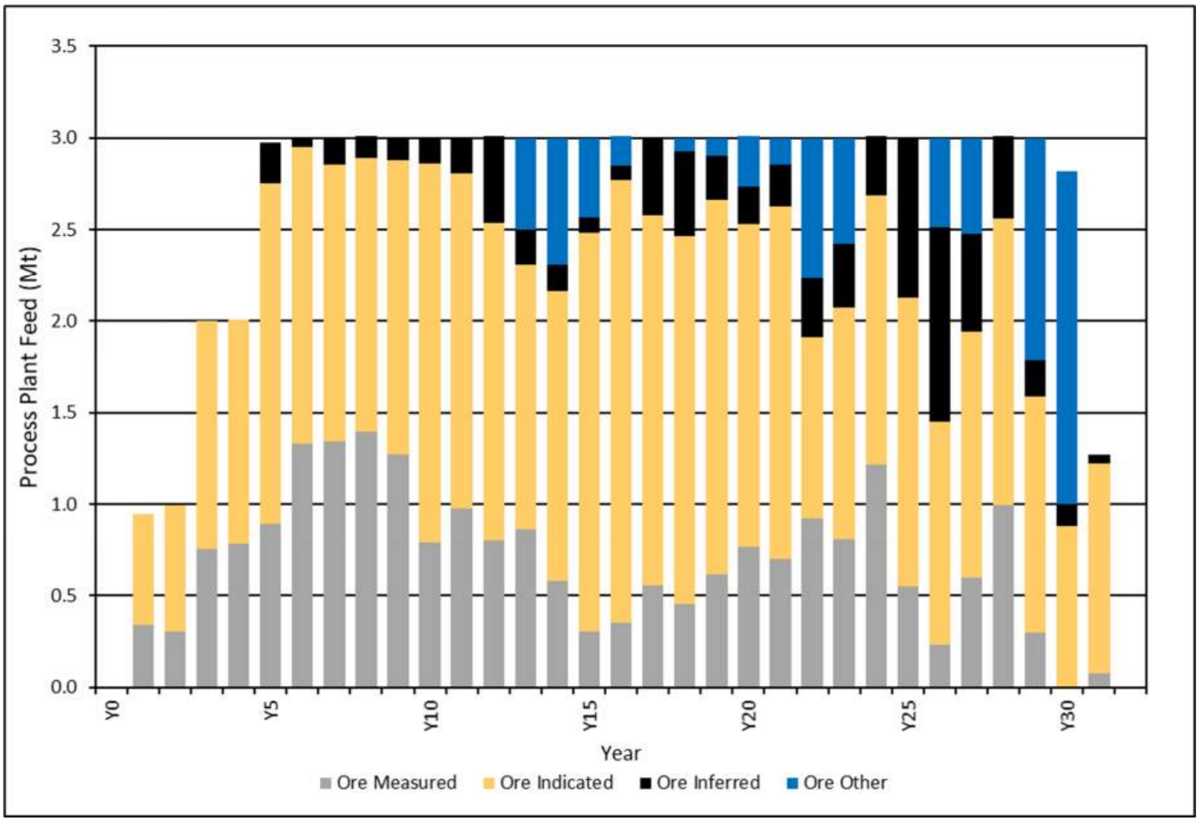


Figure 5-1 Ore to the Process Plant by Resource Classification

The MGP will be an open pit mining operation based on mining the Ulanzi and Cascade deposits using a conventional truck and shovel operation. Mining commences at Ulanzi in Year 0 followed by Cascade in Year 4. In the early periods, widely available 20-tonne (t) rear tipper trucks will be matched to 45 t class excavators for site establishment and pioneering works. Once sufficient workspace is established, and pit development has matured, the mining fleet will be upgraded to a larger 50 t class articulated dump trucks and 90 t class excavators to increase mine productivity and attain economies of scale. In additional to mining, the mining fleet will be required to undertake mill residue handling and ore stockpile rehandling activities on a campaign and as required basis. The mining fleet build-up from pre-production through the first five years is shown in Table 5-1.

An owner operator mining approach including drill and blast and pit dewatering, is adopted for the LOM. Blast consumables will be sourced from a reliable and reputable supplier. Mine assay samples will be sent to the onsite laboratory for analysis and enable a quick turnaround for results. This follows the outcome of a vendor capability and capacity study conducted for a range of equipment suppliers and service providers during the DFS.

The open pit mining activities have been sequenced and scheduled by pit staging to optimise cashflow, provide a continuous ore feed to the processing plant, minimise stockpile inventory and provide a managed waste rock schedule for constructing key infrastructure.

Initial waste rock generated from mining is to be used for constructing key infrastructure such as upgrading the haul road to the Ulanzi processing plant, ROM pad construction, causeway construction, reshaping drainage terrain and surface water embankments. The remaining LOM waste will be diverted to a central waste dump to be located east of the Ulanzi deposit and west of the Cascade deposit.

Initial dewatered mill residue generated from the process plant will be deposited next to the dewatering facility. Dewatered mill residue will then be trucked to the final deposition site, levelled and stacked in layers with each layer roll compacted using impact rollers. Further details of the mill residue stacking can be found in Section 8.5.

The total material movement over the LOM is shown in Figure 5-2.

Table 5-1 Mining Fleet Build-up First Seven Years

	Pre-production	Year 1	Year 2	Year 3	Year 4	Year 5
Mining Shifts per Day	1	1	1	2	2	2
Mining – Ulanzi	Prestrip	Ops	Operating	Operating	Operating	Operating
Mining – Cascade	-	-	-	-	Prestrip	Operating
Processing	-	Stage 1	Stage 1	Stage 1 & 2	Stage 1 & 2	Stage 1, 2 & 3
Equipment – Make/Model						
Small Truck – Sinotruk 20 t	3	8	9	13	20	23
Big Truck – Bell B60E	-	-	-	-	-	-
Large Excavator – Caterpillar 390F	-	-	-	-	-	-
Small Excavator – Caterpillar 349D2L	1	1	1	2	3	3
Front End Loader – Caterpillar 980M	1	2	2	3	4	5
Drill – Epiroc FlexiRoc D50	1	1	1	2	2	3
Dozer – Caterpillar D7R	1	1	1	2	4	4
Grader – Caterpillar 140K	1	2	2	3	5	5
Water Truck – SinotrukWC	1	1	1	2	4	4
Maintenance Truck – Sinotruk with Crane	1	1	1	1	1	1
Service Truck – Sinotruk	1	1	1	1	1	1
Tractor – CaseIH Optum 270	1	1	1	2	2	3
Compactor Towed – Broons HD1300	1	1	1	2	2	3
Compactor Self Propelled – Caterpillar CS-563E	1	1	1	1	1	1

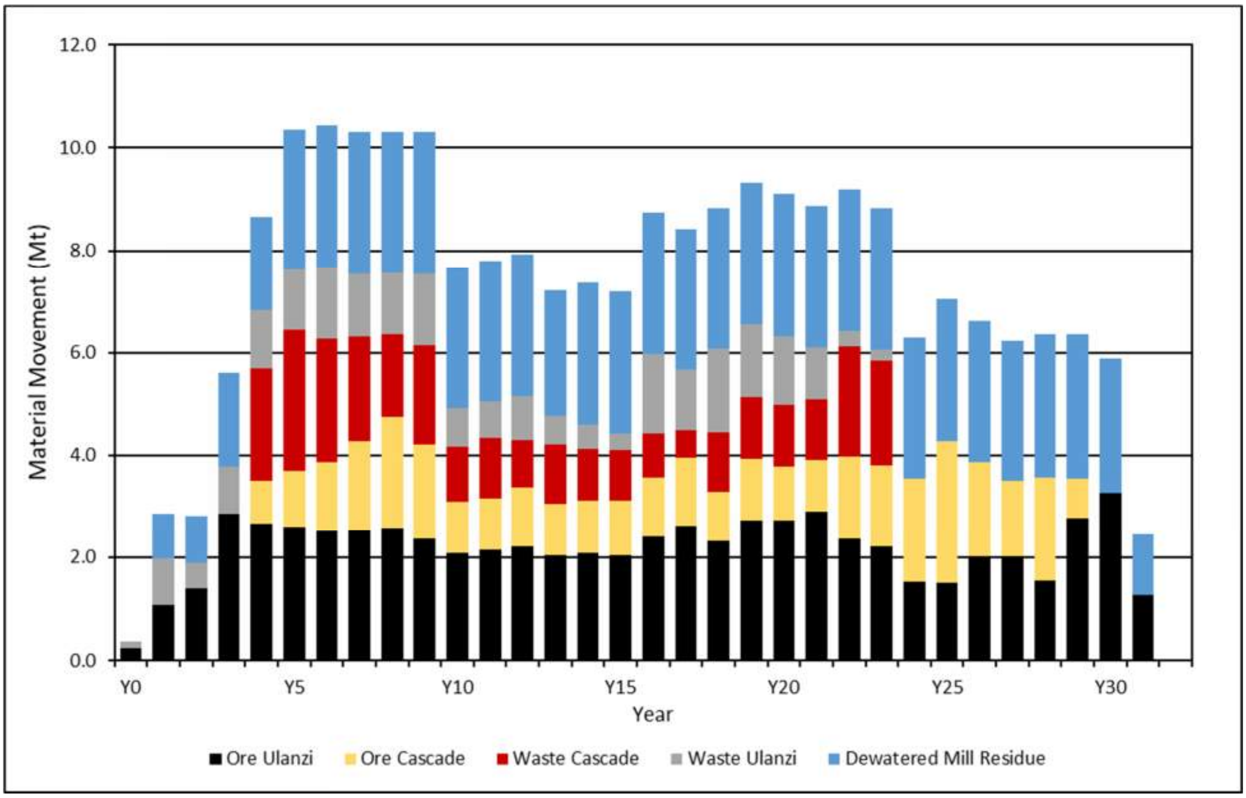


Figure 5-2 Total Material Movement

6 METALLURGY

The focus of testwork for this DFS was to determine the optimum flowsheet for processing ore from the Ulanzi deposit. Ore from the Cascade deposit underwent some testing however this was put on hold at an early stage in the process to focus solely on Ulanzi to align with the mining production schedule.

Historical testwork as well as an upcoming pilot plant flowsheet was reviewed based on CPC experience and it was initially determined that the proposed split flowsheet, whereby larger and finer flakes are classified mid-flotation and processed in separate trains, would result in the highest overall product value. Subsequent optimisation testwork and piloting in Pilot Plant 1 (PP1) demonstrated that this was not warranted when considering the financial and operability benefits of employing a single flotation-filtration-drying train, and therefore a single train flowsheet was adopted.

The product specification targets are based on marketing feedback and testwork indicated that product graphite grades can be tailored to 95, 97.5 or 99% TGC, by varying the number of stages of polishing and flotation. The flowsheet to produce 95 and 97.5% TGC concentrates was determined in lab scale optimisation testwork and confirmed in a 40 t pilot plant. Samples of the final product exceeding 99% TGC was generated in both sighter lab scale tests and using un-optimised pilot plant scale equipment.

Testwork showed that the graphite particle size distribution (PSD) is generally weighted towards the market-defined coarse product fractions, as opposed to the medium flake product fractions. Good alignment was seen between lab scale PSDs and PP1 PSDs, with P_{80} values regularly above 300 µm.

Comminution testwork showed that the ore was relatively soft, however competent with a medium abrasiveness, lending itself to a relatively low energy comminution circuit. No clay issues were identified.

Variability testwork showed that target concentrate grades can be achieved when feeding different parts of the Ulanzi deposit through the flowsheet. The variability testwork however also indicated varying hardness across the deposit which should be addressed in further testwork.

Equipment suppliers were approached to determine technology suitability and design data for a variety of unit operations including, thickeners (Outotec), filters (Outotec), dryers (Drytech) and dry screens (Rotex and Great Western Manufacturing). Results of the equipment supplier findings include:

- The mill residue thickens well in a high rate thickener and filters well under vacuum in both belt and disc style vacuum filters.
- The concentrate thickens relatively well in a high rate thickener and filters effectively under pressure in a Larox style pressure filter.
- The concentrate can be dried using either a flash or rotary dryer though further investigation is required to determine if conventional flash dryers result in particle burring.
- The dry concentrate was reported to be difficult to screen by Rotex (linear vibrating screen) however an efficient split can be achieved in both instances. Great Western Manufacturing (plansifter) had better results requiring fewer screening units.

Materials handling testwork was undertaken by Jenike & Johanson (J&J) to define mechanical design criteria for solids handling components within the process plant flowsheet. Results showed that the crushed ore exhibits a higher than normal propensity to hold-up and rathole. Chutes and bins have been sized in accordance with the recommendations from the J&J report.

The following additional testwork is recommended:

- mill residue geochemical and geotechnical characterisation testwork on fresh ore (testwork on oxide ore completed)
- variability comminution testwork
- additional variability flotation testwork
- Ultra circuit optimisation
- SMM (equipment supplier) testwork, including investigation on effects on particle shape
- flash dryer degradation investigation testwork
- dry solids transportation (vendor) testwork

- mill residue slurry rheology testwork
- dust explosivity testwork
- froth factor determination testwork
- additional materials handling testwork on crushed ore at lower moisture
- raw water quality survey (following final selection of raw water source)

Pilot Plant 2 (PP2), which is to process 500 t of drill core, will produce samples to send to specialist vendors where required and address items noted above.

7 PROCESS PLANT

The Mahenge ore will be processed over the life of mine (LOM) using a three-staged approach which will initially process 1 million tonnes per year (Mt/y) in Stage 1, increase to 2 Mt/y in Stage 2 and finally process 3 Mt/y after the completion of Stage 3.

The three stages will be developed over the initial years of the mine with current resource tonnes indicating a LOM of 32 years, after which time the current defined deposits will be depleted. Stage 1 and Stage 2 will process ore predominantly from the Ulanzi deposit and Stage 3 will process ore from the Cascade deposit.

Table 7-1 Key Process Parameters for the LOM

Parameter	Units	Stage 1	Stage 2	Stage 3	Total
Commence Operation	year	1	3	5	-
Nominal Mine Life	years	-	-	-	32
Process Throughput	kt/y	1,000	1,000	1,000	-
LOM Ore Treated	Mt	31.0	27.8	26.3	85.1
Average Feed Grade	TGC %	8.23	8.20	8.44	8.28
Recovery	%	93.0	93.0	93.0	93.0
Average Concentrate Grade	TGC %	96.15	96.11	96.01	96.09
Graphite Concentrate Production	Mt	2.46	2.21	2.15	6.82

The focus of the feasibility study was to develop the Stage 1 process plant design.

The Stage 1 process plant will be fed run of mine (ROM) ore at an average grade of 8.74% total graphitic carbon (TGC) and will recover 93% of this graphite to produce approximately 83,000 t of graphite products per year.

The Stage 1 process plant has been designed to produce various graphite products targeted at specific graphite end users. Each grade is classified into size fractions relevant to specific graphite end users. The three broad classifications of products have been defined as follows:

- Mahenge Standard Flake – 95% LOI
- Mahenge Premium Flake – 97.5% LOI

- Mahenge ULTRA PURITY-FP™ Flake – 99%+ LOI.

The proposed process plant as shown in Figure 7-1 can be summarised into the following processing stages:

- three stage crushing of ROM
- primary milling in a rod mill and rougher flotation, including a ball mill regrind-scavenger flotation circuit
- primary polishing in a ball mill and three stage cleaner flotation (Ulanzi Standard production)
- secondary polishing in a stirred mill and one stage cleaner flotation
- tertiary polishing in a stirred mill and two stage cleaner flotation (Ulanzi Premium production)
- two stages of ultra-polishing in stirred mills, each followed by one stage cleaner flotation (Ulanzi Ultra production)
- concentrate dewatering using a thickener and pressure filter, followed by a dryer
- product classification using screens
- product bagging
- process plant mill residue is thickened, vacuum filtered and dry stacked.

The process plant is located approximately 600 metres (m) north of the Ulanzi open pit at an elevation of 487 metres above sea level (masl). The location for the process plant has been selected in a clearing that is large enough to accommodate the layout for both Stage 1 and Stage 2 while minimising earthworks. The terrain surrounding the mine is hilly which restricts the suitability of several areas.

The Stage 3 process plant will be a duplicate of the Stage 1 process plant and will require the same footprint as Stage 1. The Stage 1 layout and equipment selection is duplicated for Stage 2.

Stage 2 includes some shared equipment with Stage 1 including the bagging plant and building infrastructure. However, this is relatively minimal. A feeder circuit breaker in the 33 kV switchboard for Stage 1 will feed a new 33 kV switchroom. The process area switchrooms and MCCs will be duplicated for Stage 2.

A process plant control philosophy was developed to support the feasibility study. Required control system infrastructure has been outlined and P&IDs have been developed to estimate instrumentation and input/output (I/O) requirements. The process plant is to be semi-automated where practical and will have remote capabilities to allow for off-site analysis and troubleshooting.

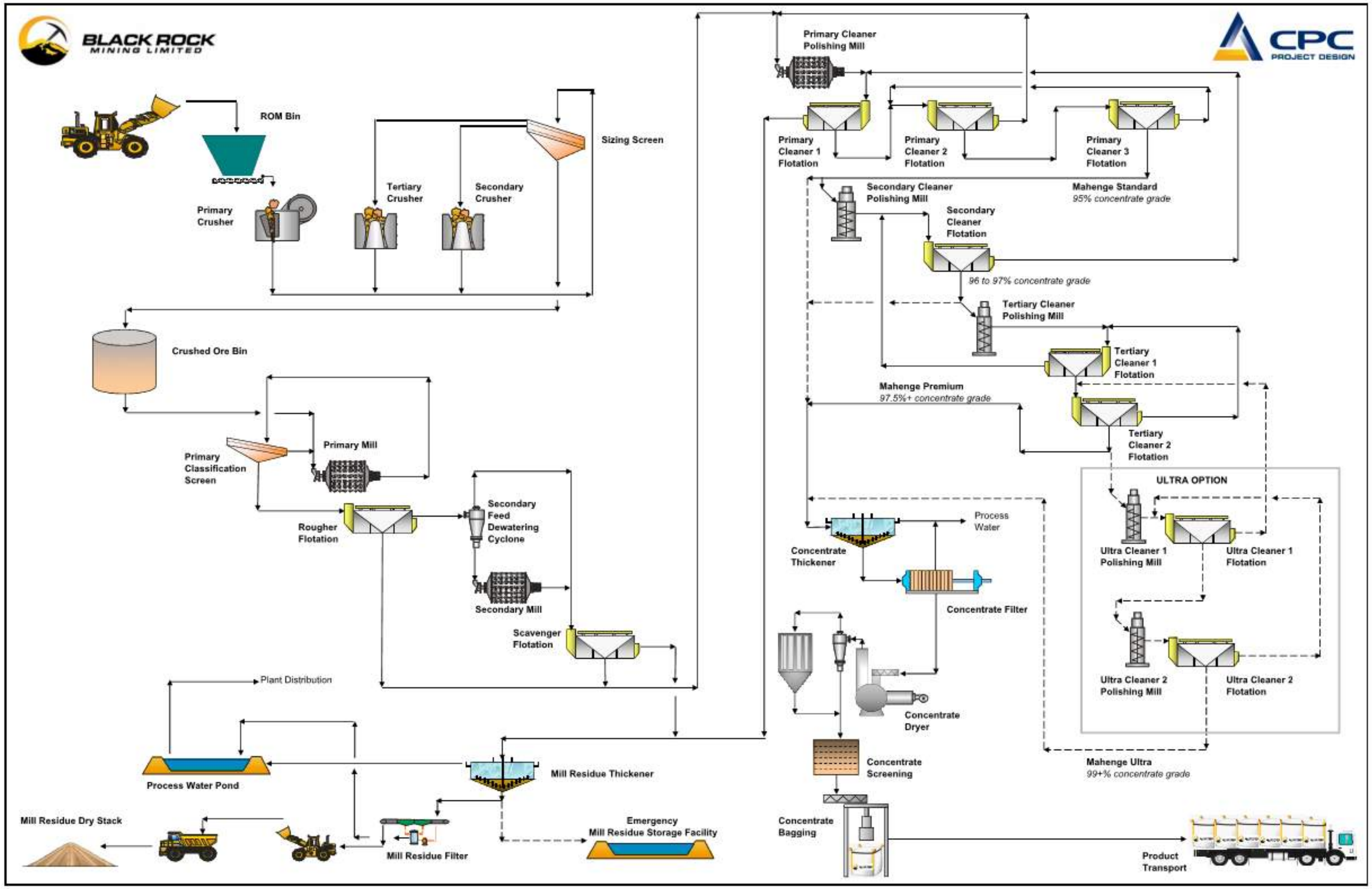


Figure 7-1 Simplified Process Diagram

8 INFRASTRUCTURE

8.1 Site Layout

The plant and infrastructure located on site will consist of:

- Processing facilities for processing Ulanzi ore (Stage 1 and Stage 2) and for Cascade ore (Stage 3) including product warehouses, reagents storage and truck loading area.
- Stockpiles for mined ore and ROM pads (one shared ROM pad for Stage 1 and Stage 2 and one for Stage 3).
- Water ponds.
- Mine waste dumps.
- Mining workshop and staging area.
- Explosives magazine.
- Site buildings (administration offices, medical clinic, canteen, metallurgical laboratory, workshops, etc.)
- Security/gatehouse.
- Mill residue filtering plant.
- Dry stack areas.
- Camp facilities complete with kitchen and mess, recreation area and gymnasium.

The Stage 1 and Stage 2 (future) process plants have been located in close proximity to the Ulanzi deposit which is the first ore feed source. The majority of infrastructure is also located within this area as it is close to the site gatehouse and camp facilities.

The processing plant for Stage 3 (future) will be located remotely near the Cascade open pit (approximately 5 km from Ulanzi) and will utilise most of the existing infrastructure from the Stage 1 plant.

The site layout for the project can be found in Figure 8-1.

Figure 8-1 Site Layout

8.2 Roads

The current road into Mahenge is a narrow road that has steep winding inclines in places. Access to the mine site is currently via a single lane track from the main Ifakara to Mahenge road which will be upgraded to a two-lane unsealed road. The Black Rock accommodation village is also accessed from this road.

An alternative road route has been identified that follows the currently unused colonial access track. This approximately 7 km long road is relatively flat and avoids the steep inclines of the existing road. Discussions have been held with the Tanzania Rural and Urban Road Agency (TARURA) regarding the new road route. TARURA have reviewed the road route and indicated they will document and gazette it. The road will be for public use and used as the main public access road to Mahenge town. The colonial access road will also open new areas suitable for resettlement and farming.

Other roads that will be created include:

- plant site and mine services area access road
- magazine access road.

8.3 Mine Services Area

A mine services area will be established with facilities that include:

- Mine workshop and mine production office consisting of containers with dome shelter roof between each container.
- Vehicle wash bay.
- Ablution facilities.

8.4 Explosives Magazine

The explosives magazine has been located northwest of the Ulanzi deposit and to the east of the Stage 1 and (future) Stage 2 processing areas. They are located to achieve the require safety distances to other facilities with a blast radius of 500 m. The magazine is accessed by a single lane track from the plant site access road. Explosives can be transported to the mine without going through the process plant and associated facilities.

The mine magazine consists of sea containers with security fencing and will be constructed in accordance with Australian and Tanzanian standards. Explosives materials are stored in approved explosives containers. Initiation products (electric and non-electric detonators, surface delays) must be stored in separate magazines to HE (Packaged explosives, detonating cord and blasting agents).

8.5 Accommodation Village

The accommodation village has been designed to house 120 residents in single accommodation rooms with en-suite bathrooms for Stage 1, with 20 additional rooms added for Stage 2 and a further 20 rooms for Stage 3. This provides sufficient space for the expat and national labour that will be required during operations. The size of the accommodation village has been minimised given that most of the workforce is sourced from the local communities.

The size of the accommodation village has been sized solely to accommodation expatriate and national workers. With the majority of the workforce being locals the

Common facilities in the accommodation village will be sized for the full 160-person village from start of operations and will include a kitchen, dining area, recreation room, gymnasium and laundry.

The village will be a self-contained facility independent from the main plant and managed by an independent camp management company. During the construction phase the intent will be to use a combination of the camp village and local available accommodation for the construction crews working on site.

8.6 Site Buildings

Site buildings will be constructed from a variety of methods to suit the application.

To promote local content while having robust buildings suitable for the LOM, buildings constructed utilising blockwork construction will include:

- Security/gatehouse
- administration office
- canteen
- gatehouse
- clinic
- ablutions

- substation buildings.

Structural steel framed clad buildings will include:

- plant warehouse
- product storage warehouse
- reagents storage
- compressor shed.

Containers with dome shelter roofs between them are used for:

- light vehicle workshop and maintenance
- plant workshop.

The plant and crusher control room swill be prefabricated modular buildings constructed on a steel frame suitable for installation on a steel structure.

Both the clinic and metallurgical laboratory will be contractor operated and fitted out.

8.7 Fuel Storage and Distribution

A fuel farm will be installed with a capacity of approximately 201 cubic metres (m^3) of diesel fuel, which will provide approximately two weeks storage of fuel for the operation. Diesel fuel is stored on site for the following purposes:

- mine fleet
- light vehicles
- dryer
- reagents (collector)
- raw water bore pumps.

The fuel storage facility will include separate off-loading and fuel bowser stations which are designed to minimise the interaction between light mobile vehicles and heavy mining equipment. An automatic vehicle identification (AVI) system will be installed to only allow authorised users to dispense fuel. The AVI system will also compile data from each refueling transaction and record which operator withdrew the fuel, into which vehicle, how much was used and when.

Fuel used for processing (dryer operation and reagents) will be trucked from the fuel storage facility into a tank located near the process plant. Fuel will then be pumped into the process as needed.

8.8 Water Supply and Distribution

8.8.1 Raw Water

Raw water is supplied via the raw water source pumps and the raw water pond pump. For most of the year, raw water will be sourced from the nearby waterways which will be dammed to form the raw water pond. In times of low rainfall, the raw water source pumps (borefield pumps) will be used to supply raw water to site via an overland pipeline.

The raw water source pumps and the raw water pond pumps supply water to the raw water tank which has 12 hours of process surge capacity plus additional capacity for fire water.

8.8.2 Potable Water

Bore water from the raw water source pumps is sent to the camp potable water treatment feed tank. The tank has 48 h residence time and feeds the potable water treatment plant. Treated potable water is stored in the camp potable water storage tank which has an additional 48 h of residence time.

Allowance has been made for sediment removal, UV treatment and chlorine dosing and monitoring.

From the camp potable water storage tank, the treated potable water can be sent to two destinations:

- the camp potable water pump for distribution to the camp site
- the site potable water storage tank for distribution around the plant site.

At site, potable water is distributed to the safety shower ring main, as well as to the various general users such as the plant ablutions, laboratory, and the administration building.

8.9 Waste Disposal

Provision has been included for a waste water treatment plant (WWTP) located at the accommodation village. The activated sludge bed bioreactor plant has been sized based on peak flows estimated for up to 160 persons using the ablutions at the village, or up to 300 persons using the toilets at the plant site.

Sewage generated at the village will flow via gravity into two sewerage macerator pump pits, which will pump to the 50 m^3 central collection pit, acting as a balance tank to feed the WWTP.

Sewage generated at the plant site will flow via gravity into several smaller pits that will be emptied as required by a vacuum truck and transported to the central collection pit at the village.

Treated water from the sewage treatment plant will be directed to a spray field. In the future, this water may be used for irrigation of vegetated areas or for dust control, subject to approval by the authorities.

8.10 Power Supply

Tanzania Electric Supply Company Limited (TANESCO) have performed a prefeasibility study (PFS)to upgrade the power network to supply the proposed MGP load and service other expected growth in consumption in the region.

The proposed power network upgrade includes running a 220 kV powerline from Ifakara to Ndororo (Mahenge). A 220/33 kV step down substation is proposed at Ndororo (Mahenge). The proposed substation includes two 60 MVA transformers.

The TANESCO proposal also includes running a 33 kV powerline for 6 km from Ndororo (Mahenge) to the project site.

The installed site load, maximum demand (peak power for 30 minutes) and average load are shown in Table 8-1 for the three stages of the project.

Table 8-1 Power Loads under Varying Conditions

Throughput	Installed Load (kW)	Maximum Demand (kW)	Average Load (kW)
Stage 1 (1 Mt/y)	11,877	8,679	8,150
Stage 2 (2 Mt/y)	23,077	16,533	15,707
Stage 3 (3 Mt/y)	34,457	24,716	23,481

8.11 Communication System Infrastructure

Communications to the site is via a 24 core Optical Ground Wire (OPGW) on the powerline from the Ndororo (Mahenge) substation.

This connects to the 33 kV switchroom communications panel which forms part of the site fibre-optic ring.

Each building requiring communications is equipped with a communication panel containing fibre-optic cable termination equipment and at least one Ethernet switch with Gigabit backbone capability. These are housed in a clean air-conditioned room.

Communications between the process plant and the remote areas (mining, mill residue and accommodation village) is via the 33 kV powerline OPGW.

Wireless internet has been provided in the administration building, mine production office and the Ifakara office.

A UHF radio system has been provided at the plant site and the Ifakara facility. The system includes base stations, hand held radios and vehicle radios for a limited number of vehicles.

A PABX (private automatic branch exchange) communications server has been provided in the administration building for the site Voice Over Internet Protocol (VOIP) telephone system.

Telephones have been provided in the administration building, plant warehouse office, mine production office, Ifakara office, process plant control rooms and process plant switchrooms.

A facial recognition access system has been provided in addition to a standard card access system at the plant gate.

9 MILL RESIDUE DRY STACKING

A mine surface water and groundwater management study was completed in 2017 to investigate methods of mill residue disposal. The study concluded that up to eight mill residue storage dams would be required over the LOM which raised several economic, environmental and social risks for the project. Subsequently, a further review in late 2017/early 2018 examined alternative approaches to mill residue management and resulted in wet mill residue dams being replaced in the design with dewatering and dry stacking of the mill residue. The single dry stack facility option resulted in:

- a significantly reduced water management risk as the site has an average net positive water balance and the use of dry stacking to store mill residue significantly reduces complexity associated conventional wet tailings management systems
- less infrastructure requirements
- A development footprint that contains the mill residue storage within two areas in the vicinity of the Ulanzi.

A risk assessment conducted in April 2018 confirmed the mill residue dewatering and dry stacking was the preferred design approach.

Mill residue dry stacking facilities and water dams were designed for the MGP as part of the DFS. The designs presented in this report were prepared using the following documents:

- Tanzanian Regulations - Water Resources Management (Dam Safety) Regulations, GN 237, dated 2 August 2013
- ANCOLD (Australian National Committee on Large Dams) Guidelines (2012) 'Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure'

The design objectives of the dry stack mill residue storage facilities (DSMRSFs) are:

- To maximise the storage of mine residue within a restricted footprint area. Studies were carried out to examine storage capacity at selected sites, stack geometry and the optimisation of the project layout which had to incorporate various infrastructure.
- To provide adequate stack stability. Studies were conducted to examine stack geometry, various slope reinforcement methods and stack drainage.
- To reduce environmental impact due to seepage and dusting of the mill residue.
- To provide a solution to excessive decant water management due to the overall average net positive water balance.
- To reduce the risk of catastrophic dam failure.
- To minimize long term capital and operating costs associated with significant dam inventory.

In accordance with the criteria for categorisation of dams based on the Water Resources Management Regulations of Tanzania, the proposed dry stacking of the mill residue can be categorized as Low 'C' for:

- loss of life
- economic and social loss
- environmental and cultural loss.

The water storage dams are also considered to be Low 'C' for the same elements.

Based on the ANCOLD (2012), as far as this document relates to dry stacks, the level of severity rating is considered to be medium, and the consequence rating for the proposed DSMRSFs has been assessed as 'Significant'. A similar level of severity and consequence rating would be applicable for the water storage dams.

The proposed method of mill residue storage is by stacking after filtering/screening to form a side-hill free standing structure. The mill residue will be thickened in the process plant and pumped to the filtering/screening plant adjacent to the storage area. After processing to reduce the moisture content of the residue, it will be delivered to the active face of the storage area by trucks. The filtered/screened mill residue is expected to have a maximum moisture content not exceeding 20%.

There are two areas proposed for dry stacking. The northern DSMRSF (NDSMRSF), which will be commissioned first, with the tailings initially being placed in the southern section of the NDSMRSF. This area provides approximately four years of storage capacity and will then be covered by low grade ore stockpiles. Stacking will continue to the north and the NDSMRSF have a total life of approximately 20 years. The western DSMRSF (WDSMRSF) will be commissioned later in the project life and store the final 5.6 years of mill residue production. The LOM dry stacks are shown in Figure 9-1.

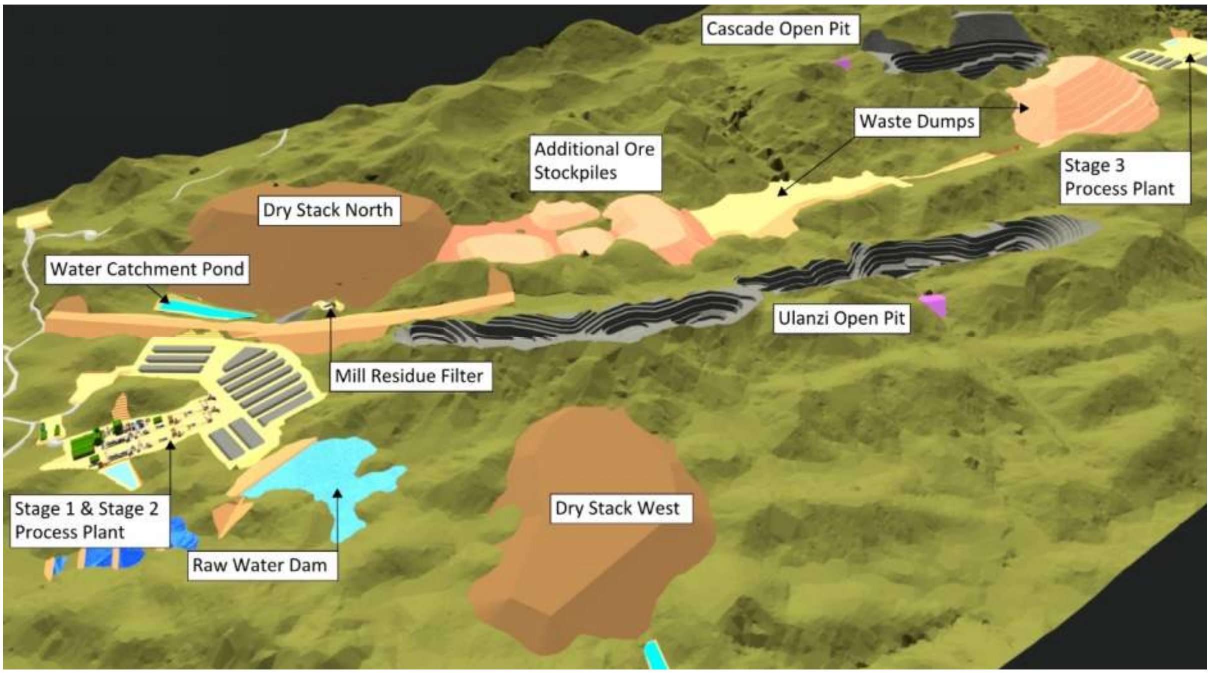


Figure 9-1 LOM Dry Stacks

The two DSMRSFs will accommodate approximately 76.5 Mt of mill residue at an in-situ dry density of 1.7 t/m^3. The NDSMRSF will have a maximum height of 140 m and the WDSTSF will have a maximum height of 56 m. Stacking rates will vary according to the operational requirements. Assuming continuous operation at plant design capacity the average stacking rate would be approximately 319 t/hr (with all three stages operating).

The filtered/screened mill residue will initially be placed at the southern end of the NDSTSF, on an area lined with a bituminous geomembrane (BGM). The base of the lined portion of the facility will incorporate an under-drainage layer of quarried gravel and rock above the liner. The base of the stack will slope towards downstream water ponds such that leachate will flow under-gravity to the ponds. Rainfall runoff falling on the top of the stack will flow via finger drains down the side of the stack to the base drain. Rainfall falling on the stack batters will also be diverted to the downstream pond. Diversion drains will be cut into the sides of the valley as the DSMRSF rises to direct runoff away from the stack. As the stack is raised the vegetation and soils will be stripped from the sides of the valley, with the vegetation mulched and redeployed with the soil on the out perimeter of the stack to promote rehabilitation.

The stacked mill residue will be built as a series of terraces using the equipment deployed to move the mill residue away from a static deposition point following filtering/screening. The proposed terrace or bench height is 5 m. A compacted outer perimeter of oxide mill residue is to be placed in advance and is raised with each lift. As each layer is placed, the mill residue will be compacted by a compactor or roller to achieve the design density. An impact roller will be used, which will allow the height of each compacted lift to be increased compared to the height of each compacted lift using conventional compaction equipment. It is preferred that when oxide mill residue is being processed that this material be placed in the outer compacted perimeter of the stack with the primary mill residue placed and compacted within the central zone of the stack. The exposed final batters of the stack will be covered with geotextile, mine waste, soil and mulch, which is recovered from the sides of the valley forming the confinement as each section of the stack has reached a lift height of 5 m. This is important as capping of the stack batters after the final height is reached will not be possible.

The mill residue stack has been designed with a slope of 1:2.5 (vertical:horizontal). Stability analyses have been performed to confirm overall stack stability and define the operating criteria which will constrain the stacking.

It is expected that during the dry season, evaporation will have a significant impact by readily removing moisture during transportation and stacking of the mill residue. The risks of instability will therefore be lower during the dry season.

Instability of the mill residue stack may occur if the material is too wet, particularly during the wet season when rain storm events may result in ponding of the water on the surface of the mill residue stack. In order to manage the phreatic (water) surface within the stack, the following processes will be incorporated into the construction of the DSMRSF:

- Sloping of the top surface stack to internal drains (rather that to external batters).
- Internal or finger drains down the sides of the valley and interface with the stack linked into the underdrain at the base of the facility.
- During the wet season, the mill residue will be placed and compacted with temporary covers such as low-density polyethylene (LDPE) deployed as part of operations to shed water from the surface and limit vertical infiltration. Some internal drainage such as a

drain-coil or similar can be place in the stack for every 5 m lift at 20 m intervals to intersect water ingress into the stack as required as part of operations.

During the wet season stacking operations will need to be confined to smaller working fronts and may need to cease for short periods during storm events. An emergency stacking location is to be provided for these events. Where stacking ceases during storm events, the stack area must be assessed by qualified geotechnical personnel before stacking can resume. Emergency storage of mill residue will also be provided in the raw water dam (RWD).

9.1 DSMRSFs Water Management

Surface water will be removed from the DSMRSFs by internal finger drains which run down the side of the stack and link with the main underdrain in the base of the stack. This underdrainage system will deliver water under gravity to an external water pond downstream of each DSMRSF. Water collected in the downstream pond will be monitored and pumped either to the process plant or RWD near the plant for reuse in processing.

Water that falls on the stack batters will be diverted to the downstream water ponds. Runoff from the perimeter drains cut into sides of the valley up-slope of the stack will, where practical be diverted through silt traps around the downstream ponds and discharge downstream.

9.2 Raw Water Dam (RWD) and Polishing Water Dam (PWD)

The RWD has been designed in lifts. Lift 1 will have a capacity of 300,000 m^3 (crest reduced level (RL) 515 m with 2 m freeboard). The Lift 1 embankment will be raised by 5 m using downstream methods to provide a total final capacity of 600,00 m3 (Lift 2, crest RL 520 m with 2 m freeboard). The RWD can also be used as for emergency mill residue storage when the mill residue filter/screening plant is not operational.

The PWD will comprise a series of embankments with water flowing through the facility to attenuate the flow and promote settling of contaminates. There will four embankments in total with flow between the cells within the PWD via spillways. The total capacity of the PWD cells below the spillways will be 40,500 m^3.

The RWD and PWD have been designed as cross-valley facilities with homogeneous embankments with a cut-off trench under the upstream zone to reduce seepage. A geomembrane will be installed on the upstream side to reduce wave action and erosion. Finger drains on the downstream side of the embankment will counteract the uplift pressures and enhance stability.

The design of the RWD and PWD includes spillways to remove excess water from these facilities.

10 PRODUCT LOGISTICS

10.1 Logistics Operation

Product logistics will be managed directly by Black Rock. Bagged graphite product will be transported on flatbed trucks from site to Ifakara approximately 70 km away. Trucks will haul

15 t of bagged product seven days a week for a period of 12 hours each day, making two return trips per day. This requires a fleet of eight trucks for Stage 1 product transport. The trip time is expected to reduce as the road is upgraded progressively throughout the mine life.

In Ifakara, allowance has been made for Black Rock to purchase land for intermediate product handling. Bags are temporarily stored in a warehouse with one day plant production storage capacity and consolidated into shipments based on customer orders and loaded into 20' shipping containers. Each container will contain 20 bags of graphite product.

Containers will be consolidated into shipments and dispatched as a total order. Shipments are loaded onto rail cars at Ifakara and transported on the TAZARA rail line to Dar es Salaam which is located approximately 470 km northeast of the project site. Figure 10-1 shows the location of the port in Dar es Salaam relative to the project site along with other smaller ports in the region.

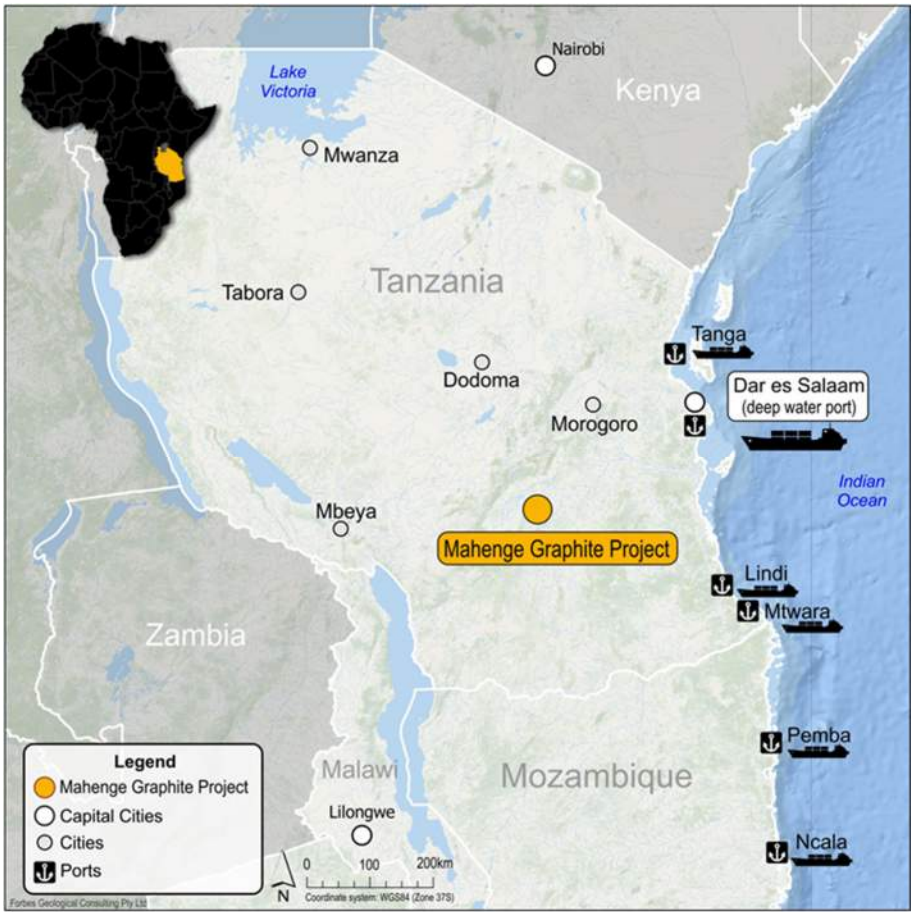


Figure 10-1 Port of Dar es Salaam and Smaller Ports Relative to the Project site

Unloading of the product containers from the rail line, delivery to the ship, stevedoring and all other associated port management will be contracted to a local logistics management and freight company. The logistics contractor will also be responsible for returning empty containers back to the rail line for shipping to Ifakara.

All costs associated with transport of the product from site to FOB (free on board) the ship are included in the operating cost estimate discussed in Section 14.

10.2 Port Selection

The port of Dar es Salaam was selected as the preferred port for export of graphite product. Dar es Salaam port is the principal deep-water port for Tanzania and handles approximately 95% of the Tanzanian international trade.

The port also serves the landlocked countries of Malawi, Zambia, Democratic Republic of Congo, Burundi, Rwanda and Uganda. The port is not seasonal with consistent annual operations.

Dar es Salaam port is strategically placed to serve as a convenient freight linkage not only to and from East and Central Africa countries but also to Asia, Europe, Australia and America. The port has high frequency direct shipping to Asia with a sizeable number of empty containers currently returning to Asia.

Other ports that were considered include Mtwara Port (Tanzania), Pemba Port (Mozambique) and Ncala Port (Mozambique). These ports were not selected for various reasons including distance from the Mahenge mine site, logistics route costs, availability of empty containers and shipping frequency.

Table 10-1 below summarises for each port key characteristics and the container import/export volumes/imbalances.

Table 10-1 Container Import/Export Volumes/Imbalances

Container exports TEU	Dar		Mtwara		Pemba		Nacala	
	Full	Empty	Full	Empty	Full	Empty	Full	Empty
2015	109,554	201,227	N/A	N/A	N/A	N/A	N/A	N/A
2016	99,640	139,447	N/A	N/A	N/A	N/A	N/A	N/A
2017	97,088	191,487	14, 960	4,000	N/A	N/A	23,276	5,356
Nominal annual tonnage (mt dwt)	4.1		N/A		N/A		N/A	
Vessel arrivals (2017)	1,366		N/A		24		200	
Berth Length (m)	2,600		385		199		1,050	
Draft (m)	12		9.5		9		10 to 14	
Service Area	Tanzania, Malawi, Zambia, DRC, Burundi, Rwanda, Uganda		Regional port for oil & gas exploration and cashew export		Mozambique		Mozambique, Malawi, Zambia, Zimbabwe	
Seasonal	No		Yes		Yes		No	

11 ENVIRONMENT AND COMMUNITY

11.1 Environment

11.1.1 Vegetation and Flora

The surveys of the MGP conducted for the Environment and Social Impact Assessment (ESIA) report that the vegetation categories classified within the project footprint are well represented regionally.

An estimated 80% of the project site has been cleared for farmland, although this figure includes abandoned and fallow fields. About 15% of the landscape in total is currently being actively farmed.

The most important vegetation type growing within the project area is 'Riverine Forest', which grows along the rivers and watercourses and is characterised by tall trees, climbers and high species diversity. The vegetation is considered important for maintaining water quality by stabilising the river banks.

11.1.2 Flora and Fauna

The baseline vegetation and flora survey recorded 102 different plant species, of which eight species were considered as being conservation significant. The survey was conducted during the dry season at a time when many annual herbaceous species are not present, and a wet-season survey has been recommended.

The project area hosts a moderate number of native species, including migratory and vagrant birds. Hunting has resulted in larger ungulates (elephants, buffalos, etc) becoming locally extinct; however, smaller, more tolerant species remain in some areas, including wild pigs and Velvet monkey. The African Clawless Otter (IUCN Red List) was recorded in the area, which is widely distributed in permanent waterbodies across the region, but whose habitat is under threat.

11.1.3 Groundwater

The geology of the project area is complex, and few bores have been sunk. A shallow well (4.6 m) exists at Mdindo village and gives fresh water (63 mg/L TDS) but at a low rate (0.4 L/s). The area also supports several small springs, although few had sufficient yield to measure (dry season). Groundwater levels in two deep exploration bores were 56 m below ground level (elevation 743 m) and 13 m below ground level (elevation 675 m).

Groundwater supports the baseflows of the local rivers during the dry season (up to 0.4 m^3/sec), including the Mdindo River.

11.2 Social factors

11.2.1 Population Centres

The nearest regional population centre is Mahenge, located approximately 10 km southeast from the centre of the MGP. The population of the Mahenge district is around 10,000.

Within the project envelope (Ulanzi area), the Mdindo village is located and has an estimated population of around 1,500 people. To the south, the village of Kisewe (est. population 990 people) is located about 1.3 km from the edge of the Cascade pit. The villages of Kwiro and Nawenge are located approximately 1.5 km to the southeast of the Cascade pit. These two villages are contiguous with the Mahenge township.

11.2.2 Land Ownership and Use

Land in the project area is largely under customary ownership. There are no government reserves within the footprint, including nature reserves. Within the customary land tenure system, agricultural land (including fallow land) is held by individual households or families; other rural lands are communal community land. Some areas may also be owned by the Catholic Church and are typically associated with church and school buildings.

11.2.3 Socio-economic Context

The population of the area is predominantly Tanzanian of the Pogoro ethnic group, though there are a small number of households spread throughout the hamlets from other tribes (and regions) of Tanzania, including the Sukuma tribe from the Mwanza Region brought to the area for small scale mining opportunities.

Kiswahili and Kipogoro are the main spoken languages used in the villages, with limited amounts of English spoken by some households. Kiswahili and English are taught in the local (Kisewe) Primary school, with Kiswahili being used as the main written language in the villages. A secondary school is located at Nowenge, and also at Mahenge. The nearest health care centres are also in Mahenge.

Agriculture is the main source of income, with the majority of households undertaking subsistence agricultural activity. The crops grown include maize, rice, cassava, banana trees and vegetables. Involvement in waged labour is relatively low and centres around employment in the mining industry with a number of artisanal and small-scale mining companies in the region. Some individuals supplement income by harvesting building materials, specifically bamboo from community land and forested slopes and gather plants with cultural significance at certain times of the year, as well as foraging for medicinal plants, forest fruits and fungi. Some households within each hamlet undertake small scale business activities, including restaurants, maize milling, and the sale of local beer. There is no industrial activity in the project area.

Over the past decade, the area has seen some out-migration of younger people seeking employment opportunities in Mahenge, Morogoro and Dar es Salaam.

12 PROJECT IMPLEMENTATION

12.1 Staged Construction Approach

The project will be executed in three stages to accommodate a staged development around the two currently identified deposits, Ulanzi and Cascade.

Stage 1 will be the first Ulanzi process plant module capable of a nominal throughput of 1 Mtpa to produce an average of 83,000 t/y of graphite concentrate. Stage 1 will include infrastructure to support Stage 1 and Stage 2 and will be the initial production plant.

Stage 2 consisting of the second Ulanzi process plant module is based on using the same design as the first module and will double the plant throughput, increasing graphite concentrate production to an average of 167,000 t/y. The Stage 2 process plant will be commissioned approximately 3 years after Stage 1.

The Stage 3 process plant module will be located near the Cascade deposit and will use the same design as the first module, tripling the Stage 1 throughput and increasing graphite concentrate production to a total average of 250,000 t/y. The Stage 3 process plant will be commissioned approximately 5 years after Stage 1.

Figure 12-1 shows the implementation schedule for the three stages.

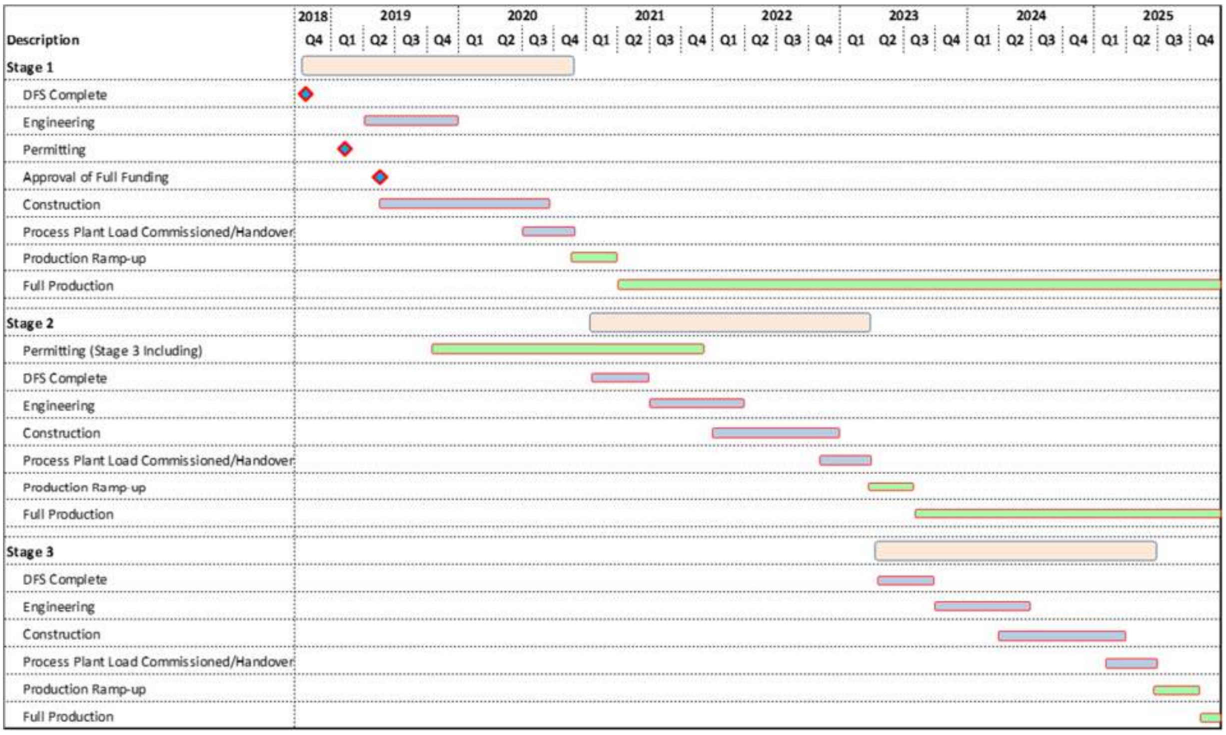


Figure 12-1 Staged Project Implementation Schedule

12.2 Implementation Plan

Black Rock will establish a project delivery team to execute the MGP which will consist of experienced management and technical personnel necessary to administer all aspects of the project. An engineering consultant with proven systems and procedures in the execution of mining resource projects will be appointed by Black Rock to form a combined project delivery team with Black Rock to deliver the project.

The project delivery team prime responsibilities will include:

- safety management
- contract management

- technical review
- establishment of appropriate controls and reporting
- construction and commissioning management
- liaising with statutory bodies and owners.

The services of various specialised consultants and engineers, such as for the mill residue dry stack and water embankments design will be appointed as required throughout the course of the project to support and assist in the project execution.

An operations team will be mobilised early in the project development to develop and implement a business readiness plan and ensure a smooth transition from construction to operations. The business readiness plan will include implementation of systems, recruitment and training of all operations personnel for the project. The operations team will also support the project delivery team.

12.3 Contracting Strategy

The process plant and associated plant infrastructure will be executed as a lump sum turn key (LSTK) engineering, procurement and construction (EPC) package using a Chinese contracting partner. The process plant EPC contract will include:

- detailed engineering
- modular off-site fabrication
- shipment to site
- assembly on site
- commissioning.

Process plant handover to the operations team will be subject to acceptance testing to ensure plant operations are consistent with design parameters.

The project delivery team using the resources of the engineering consultant will review the EPC contractors design to ensure it is in accordance with Australian and Tanzanian standards and operating practices, in accordance with the required quality requirements and monitor the overall progress.

Process plant earthworks and concrete construction will be managed by the project delivery team with the design prepared by the process plant EPC contractor. A civil contractor will be appointed to perform the works.

The design and construction of the site infrastructure including access roads, accommodation village, site services, non-process plant buildings and Ifakara rail terminal will be managed by the project delivery team. Any detailed design not completed by the process plant EPC contractor will be completed by either the project delivery team or external specialised consultants.

This contracting strategy will ensure Black Rock involvement through all phases of the project while minimising the construction interface issues and risks. Implementation Schedule

A project master schedule has been developed for the project covering all major activities from project approval through to commissioning and hand-over to the operations team. It also includes key milestones for the project, some of which are imposing constraints. The schedule will be extended to the next level of detail with inputs from contractors and suppliers once the project is approved and contractors are appointed.

The schedule consists of a logic-networked critical path schedule based on project requirements and acknowledges current manufacturing periods for major equipment which may change due to global demand.

The schedule is summarised in Figure 12-2.

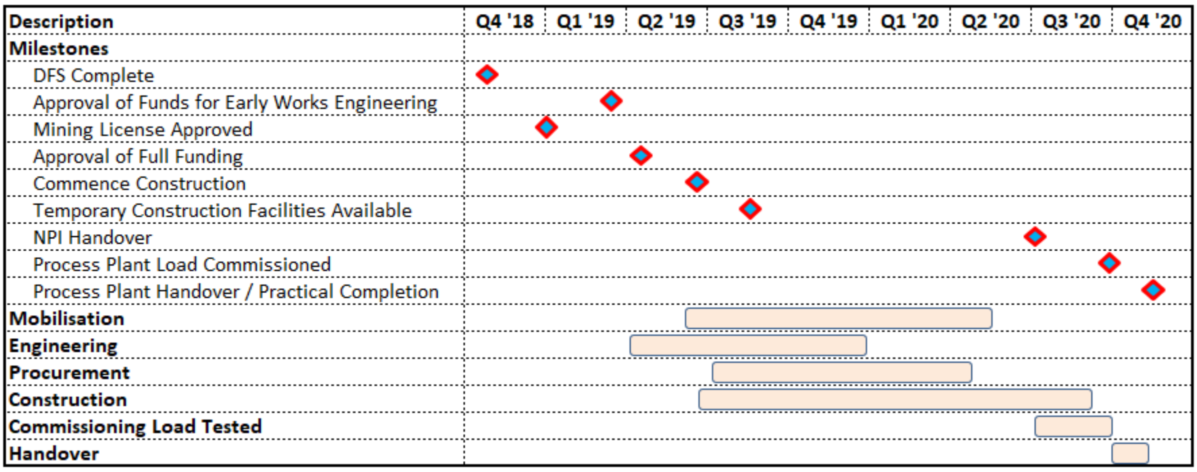


Figure 12-2 Schedule Summary

Following the necessary approvals, critical or near critical activities include:

- appointment of process plant EPC contractor
- construction of initial accommodation village facilities
- design and construction of access roads
- plant site bulk earthworks
- plant site civil works
- design and construction of process plant
- grid power connection
- process plant commissioning and handover.

Key equipment packages that have long lead durations are outlined in Table 12-1.

Table 12-1 Key Equipment Packages with Long Lead Durations

Equipment Package	Ex-works Lead Time (weeks)
Mobile Crushing and Screening	16-20
Dry Screens	18-20
Polishing (Attrition) Mills	18-20
Rod Mill	22-26
Ball Mills	16-18
Flotation Cells	24-26
Concentrate (Press) Filter	30-32
Mill Residue (Belt) Filter	25
Thickeners	20-22
Flotation Air Blowers	16-18
On Stream Analyser	34
Concentrate Dryer	28-30
Concentrate Bagging Plant	26-30
Screw Feeder	28

12.4 Early Engineering

To ensure that site mobilisation, engineering and construction activities commence as soon as project financing and Black Rock board approval has been obtained the following activities shall be completed:

- Process plant EPC contract will be prepared and ready for award. This will include verification metallurgical testwork and pilot plant by the potential EPC contractor, finalisation of the scope of work, agreement of contract price and commercial terms and conditions.
- Tender of the accommodation village, selection of preferred contractor and preparation of contract ready for award.
- Tender of the mobile crushing and screening plant will be ready for award.
- Design of the plant access roads including colonial road.
- Process plant bulk earthworks terrace design.
- Concrete works tender will be ready for award. This will include preparation of the scope of work, tendering and selection of preferred contractor.
- Continuation of discussions with TANESCO on the grid power connection.
- Continuation of the resettlement process to ensure access to the plant site area for commencement of construction activities.

13 OPERATIONAL READINESS

A comprehensive risk-based program has been developed to ensure Black Rock has the requisite capability and systems to operate the Mahenge Project successfully from day one.

This approach commenced with a thorough enterprise-wide risk assessment and identification of the standards, controls and systems which will be required to mitigate these risks through the life of the operation. The outcome is an intellectual architecture comprising of well thought through and effective operating systems, which is designed to ensure operational readiness and logical prioritisation of the project's many moving parts.

The process is deliberately more detailed and involves a higher level of operational systems design than is typically undertaken by single asset sponsors for new projects of this scale. This is done primarily due to the high bar of performance that Black Rock has set for the project and the strong business imperative to have the asset predominantly run and operated by Tanzanians. In addition, Black Rock recognizes that the graphite mining industry is an emerging industry and thus has less established practices and a lesser depth of expertise than is typical in other sectors of the mining industry.

The key aims of this approach are:

- To rigorously and effectively manage the project execution and the project start up and ramp-up to full capacity, thereby avoiding operational start-up dip.
- To align the company with ISO 9000 quality compliance through effective controls and management of those controls governing product quality.
- To control the scope of roles within the company and to manage the amount of discretion that people have in their roles so that they are positioned to focus on the right 'stuff'.
- To facilitate role clarity and enabling effective decision making, successful team work, and accountability.
- To the achieve the company's vision of being ***"a globally significant graphite producer, who is recognised for our great people, and great products produced safely and ethically"***.
- To achieve the company's planned localisation targets and strategy, which will provide sustainable business opportunities and jobs for Tanzanians, and a sense of ownership of the asset within the country.
- To minimise the dependence on expensive expatriate resources.
- To drive safety, productivity and product quality through an in-built and inherent business improvement mindset.
- To enable the most efficient management of the asset in a global market, with all the inherent challenges involved in managing multiple time zones, markets and cultures.

KPMG's Mining Consulting Group (KPMG) were engaged for their proven, risk-based operational readiness methodology, and worked closely with Black Rock's expert team to develop the program. The process commenced with a series of risk workshops to identify all the risks and opportunities facing the project from feasibility through financing, permitting, project construction and into operations.

13.1 Company Values

A simple but powerful set of company values, known as the Reaching for the STARS Values, has been firmly established within Black Rock and will underpin the operational strategy of the company.

***Safety**: All of us have an equal right to go home safely.*

***Team Work**: We achieve superior results by working together.*

***Accountability**: We are accountable to our family, our community and our colleagues – do them proud, give it your best.*

***Respect**: We are a diverse organisation who respect each other.*

***Stakeholders**: Our stakeholders measure our success – our customers, our investors and our community - all have expectations of us.*

13.2 Operational Strategy

Black Rock is a new company staffed by global mining and graphite industry experts. Lean, experienced and nimble, the team have a clear opportunity to provide a fresh approach to operations of a Tanzanian graphite mine and processing facility, and a global marketing function, with best operating and management practice guaranteed through effective Australian (Perth) head office governance.

The Mahenge mine and processing facility will be operated by a predominantly Tanzanian workforce and a Tanzanian leadership team (TLT), with minimal long-tern reliance on permanent expatriate personnel. This strategy will create a high level of government and community acceptance and pride in the project.

To ensure the project is run safely and will reliably produce an on-specification product at nameplate capacity and cost from day one, a robust suite of management systems and operating standards will be developed jointly by an early recruited leadership team and the Perth head office and will be implemented during commissioning. Figure 13-1 shows the top two levels of a three-level management systems hierarchy which contains 86 management systems in total.

Capable Tanzanian operational staff will be recruited with sufficient lead time to be fully trained in the operation of mine and plant with emphasis on the key controls and expectations by which their performance will be measured.

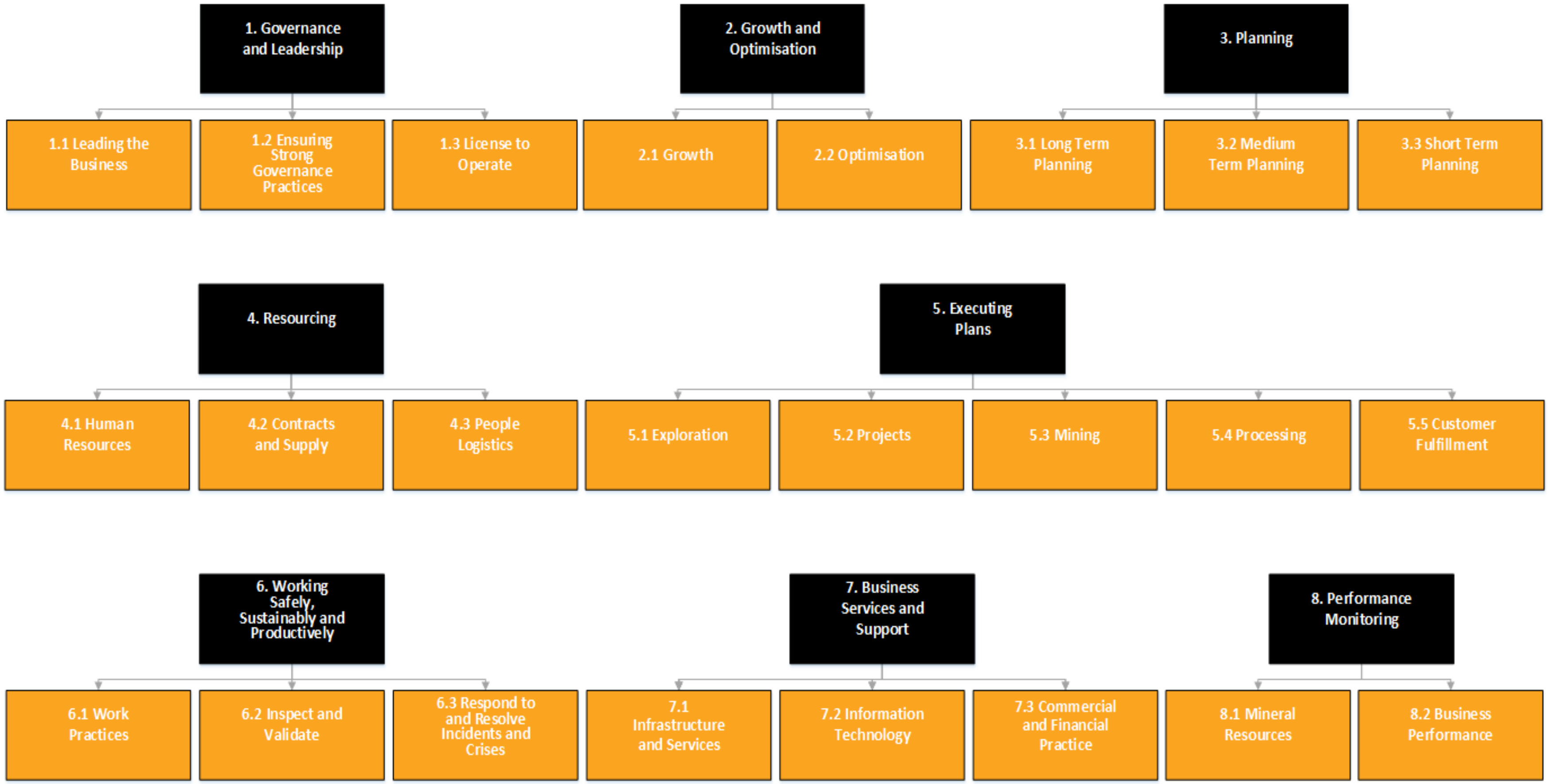


Figure 13-1 First Two Levels of the Management Systems Hierarchy

There will be early recruitment of key management and technical roles for the express purpose of developing and implementing the management systems, and then training the operating staff in the lead up to operations.

The design of the organisation structure and operational systems will be fit for purpose striking the right balance between the required level of governance and operating efficiency which will ensure sustained performance of safe, efficient, on specification operational delivery through the life of the project.

13.3 Risk Based Approach

An operational readiness plan has been developed using a strong risk-based approach. The lesson from other projects is that where there is a failure to fully understand and prepare for operational risks early, projects are exposed to significant value loss arising from production shortfall, out of specification product, and cost increases, collectively referred to as “start-up dip”. In addition, there is often a high level of safety and environment incidents.

Project risk workshops identified the following key project risks:

- failure to achieve project financing
- failure to achieve project permitting and land compensation arrangements
- project cost overrun or delay resulting in significant dilution of value for existing shareholders
- excessive working capital requirements for the project and possible loss of market niche for Mahenge’s high value graphite products, due to:
    - inadequate orebody knowledge or unexpected complexity
    - inadequate operational preparedness and capability resulting in out of specification product
    - product logistics delays
    - sales and marketing issues
    - production issues
- loss of government or community support for the project
- health, safety and environmental (HSE) risks.

These risks have been captured in a comprehensive and detailed risk register containing over 400 detailed risks. The approach has been to “leave no stone unturned”, and to prepare mitigation strategies accordingly.

Risk controls have been identified for all risks, comprising:

- mitigation actions to be completed prior to commencement of operations
- operational standards and management systems which will govern operations and mitigate risks through the life of the project.

Risk mitigation actions include:

- Specific studies to ensure full anticipation of technical, quality, reliability and environmental issues.
- Engagement of specialist consultants to advise on critical technical, marketing and government and community aspects of the project.
- Design reviews to ensure engineering controls are included in plant design.
- Specific obligations to include in third-party contracts that will be critical to safety, environment, production and product quality.
- Identification of key points of difference between Mahenge and its competitors in financial, labour and product markets and in the eyes of government and community.
- Definition of infrastructure upgrades and government co-commitments.
- Establishment of a project controls for construction management.
- Planned and targeted early recruitment and training.

On-going control of risk through the life of the operation will be through effective implementation of 44 standards and 86 management systems.

In particular, the controls for HSE risks are documented in a set of HSE standards and systems which collectively define the Health, Safety and Environment Management System (HSEMS) for the project. The HSEMS, consists of a set of 24 Health and Safety standards, 7 Environment standards, and 23 systems which are critical to effective HSE management. This provides a comprehensive risk management framework for the project.

13.4 Development of Operational Readiness Plan

These risk mitigation actions have been prioritised and sequenced into a comprehensive work plan for operational readiness. The work plan also includes completing the design of standards and systems in a prioritised way and implementing these as required for the project construction phase and for the operations phase of the project.

The operational readiness project plan has clear links to the financing, permitting, and construction project plans.

The process to build the operational readiness plan is summarised in Figure 13-2.

Risk Register – 400 risks

Risk Description	Standard(s)	Development and Project Phase Considerations and Actions
	Risk Controls	
Product quality not to specification due to inadequate orebody knowledge	Product Quality Standard	1. Complete comprehensive geo-metallurgical studies for all geological ore domains 2. Pilot plant trials
Damage to product packaging in containers due to transit	Product Quality Standard	3. Design packaging and handling equipment to minimise risk of container and packaging damage
Process plant doesn't achieve product quality due to asset unreliability	Product Quality Standard	5. Undertake FMECA/RCM design of asset management strategy for process plant
Process plant doesn't achieve product quality due to inadequate operator capability	Product Quality Standard	6. Ensure operations control is intuitive and visual as far as possible 7. Develop a process plant simulator for operator training

Standards – (44)

Defines what is required to manage each risk during operations :

Product Quality Standard

- Requirement for grade control models for detailed delineation of orebody
- Requirement for product freight contracts to include product stewardship provisions
- Requirement to optimise maintenance strategy for process plant
- Requirement for process plant operations manual and decision support tool
- Requirement to train process plant operators to strict operations protocols

Management Systems – (86)

Defines the Processes, Responsibilities, Software, Management Controls to ensure requirements are consistently met over time

Grade Control Modelling System

General Contract Management System

Reliability and Maintenance Tactics Planning

Employee Work Practices Management System

Competency Management and Development

Operational Readiness Plan

A comprehensive plan :

- *to complete all of the Development and Project phase actions*

  and
- *to design and implement the Management Systems for the operation*

Figure 13-2 Process Used to Build the Operational Readiness Plan

13.5 Implementation of the Operational Readiness Plan

The operational readiness plan will be implemented by an early recruited operations team, supported by expert consultants where required, and with a Project Management Office (PMO) function to track and report on status throughout. The recruitment schedule is aligned with the operational readiness plan to ensure just-in-time on-boarding of key roles to complete work plan tasks. The clear remit of early recruited roles will be to build the organisational systems and to have their teams fully operationally-ready at start of operation.

KPMG's operational readiness methodology will be used to support key aspects of the implementation including coaching and training on standards and systems design, access to a comprehensive library of checklists and requirements from equivalent operations design, and executive leadership advice where required.

There is a close relationship between the operational readiness plan and the human resources strategy for the project. In particular, the design of the standards and systems will provide clear role clarity for all operations positions. The training and development of personnel recruited into leadership roles will include training in standards and systems design methodology and in the style of leadership required of Black Rock managers at all levels to ensure that the management systems are effectively utilised.

14 HUMAN RESOURCES

There are many human resources (HR, also referred to as personnel) considerations required to establish the MGP and move from construction to commissioning through to steady state production. The requirements and inputs to establish the department as well as the capabilities and ongoing requirements and inputs to manage the function longer-term and the implications of this for the company and Tanzania (host country) have all been given due consideration.

The total permanent workforce for Stage 1 is estimated at 413 people consisting of 346 Black Rock employees and 67 contractors. The organisational structure is shown in Figure 14-1. The labour ramp up through pre-production into the first seven years of production is shown in Figure 14-2 and outlines expatriates, nationals and locals. The workforce peaks at 966 people in year 8 with all three stages are in operation.

	#	Level
Vice President of Operations	1	EL1a
Vice President of Operations Assistant	1	EL10a

PROCESS

	#	Level
Plant Manager	1	EL2
Production Superintendent	1	EL3
Operations Leader	3	EL5
Shift Supervisor	4	EL7
Operator - Crushing	4	EL9
Operator - Milling	4	EL9
Operator - Flotation	4	EL9
Operator - Concentrate Handling	8	EL9
Operator - Tailings Filtration	4	EL9
Operator - Control room	8	EL9
Day Crew/Reagents	8	EL9
Senior Plant Metallurgist	1	EL4
Plant Metallurgist	2	EL5
Bureau Veritas Staff:		
Expat Manager	1	C3a
Second-in-Command	1	C3a
Lab Technicians	8	C3b
Sample Preparers	14	C3b
Maintenance Manager	1	EL2
Maintenance Foreman	1	EL6
Maintenance Shift Supervisor	4	EL7
Boilermaker	4	EL8
Fitter/Mechanic Day Shift	6	EL8
Fitter/Mechanic Night Shift	2	EL8
Electrical & Instrumentation Supervisor	2	EL7
Electrician Day Shift	4	EL9
Electrician Night Shift	2	EL9
Instrumentation/Process Control Technician	4	EL9
Maintenance Planner Supervisor	2	EL7
Maintenance Planner	2	EL4
Mechanical Engineer	1	EL5
Mechanical Engineer (National)	1	EL5a
Electrical Engineer	1	EL5
Electrical Engineer (National)	1	EL5a
Process plant total employees:	**114**	

ADMINISTRATION

	#	Level
Administration Manager	1	EL2a
Administration Manager Assistant	1	EL10a
Camp Manager	1	C2a
Deputy Camp Manager	1	C2a
Camp Staff	12	C2b
Camp Staff (Local)	26	C2c
Finance Superintendent	1	EL3a
Accounts Secretary	1	EL10a
Accounts Officer	1	EL10a
Pay Roll Controller	1	EL10a
Accountant	3	EL5a
Public Relations Officer	1	EL10a
Receptionist	1	EL10a
HS&E Manager	1	EL2
Safety Superintendent	2	EL3a
Safety Officer	2	EL5a
Paramedic	0	C1a
Doctor	1	C1b
Clinical Officer	2	C1c
Training Officer	1	EL5
Training Officer (National)	1	EL5a
IT Superintendent	1	EL5a
IT Technician	2	EL8a
HR Superintendent	1	EL3a
HR Officer	2	EL10a
Recruiter	1	EL10a
Travel Department	2	EL10a
Environmental Superintendent	1	EL3a
Environmental Officer	4	EL5a
Supply Superintendent	1	EL3a
Procurement Supervisor	1	EL7
Procurement Officer	2	EL10
Store Supervisor	2	EL7
Store Personnel	4	EL11
Security Superintendent	1	EL3a
Security Supervisor	4	EL7
Security Guard	64	EL11
Administration total employees:	**154**	

LOGISTICS

	#	Level
Logistics Manager	1	EL2a
Logistics Manager Assistant	1	EL10a
Logistics Superintendent	2	EL3a
Plant Logistics Shift Supervisor	4	EL7
Plant Logistics Shift Operators	16	EL9
Logistics Road Transport Drivers	16	EL9
Ifakara Inland Port Logistics Supervisor	4	EL7a
Ifakara Inland Port Logistics Operators	16	EL9a
Ifakara Inland Port Maintenance Supervisor	2	EL7a
Ifakara Inland Port Maintenance Operators	4	EL9a
Logistics employees:	**66**	

MINING AND GEOLOGY

	#	Level
Mine Manager	1	EL2
Mine Clerk	2	EL10
Mine Superintendent	1	EL3a
Senior Mining Engineer	1	EL4a
Mining Engineer	2	EL5a
Senior Geologist	1	EL4a
Mine Geologist	2	EL5a
Senior Surveyor	1	EL4a
Surveyor	1	EL5a
Pit Samplers	4	EL10
Technical Services Superintendent	1	EL3a
Mine Shift Supervisors	2	EL7
Operations Clerk	2	EL10
Operators	32	EL9
Drill & Blast Supervisor/Shotfirer	1	EL7
Blast Crew	4	EL9
Maintenance Superintendent	1	EL3a
Maintenance Planner	2	EL4a
Maintenance Clerk	2	EL10
Mine Training Officer	2	EL8
Maintenance Supervisors	2	EL7
Maintenance (Technical)	10	EL8b
Maintenance	2	EL11
Mine employees:	**79**	
Total employees:	**413**	

Figure 14-1 Stage 1 Organisational Chart

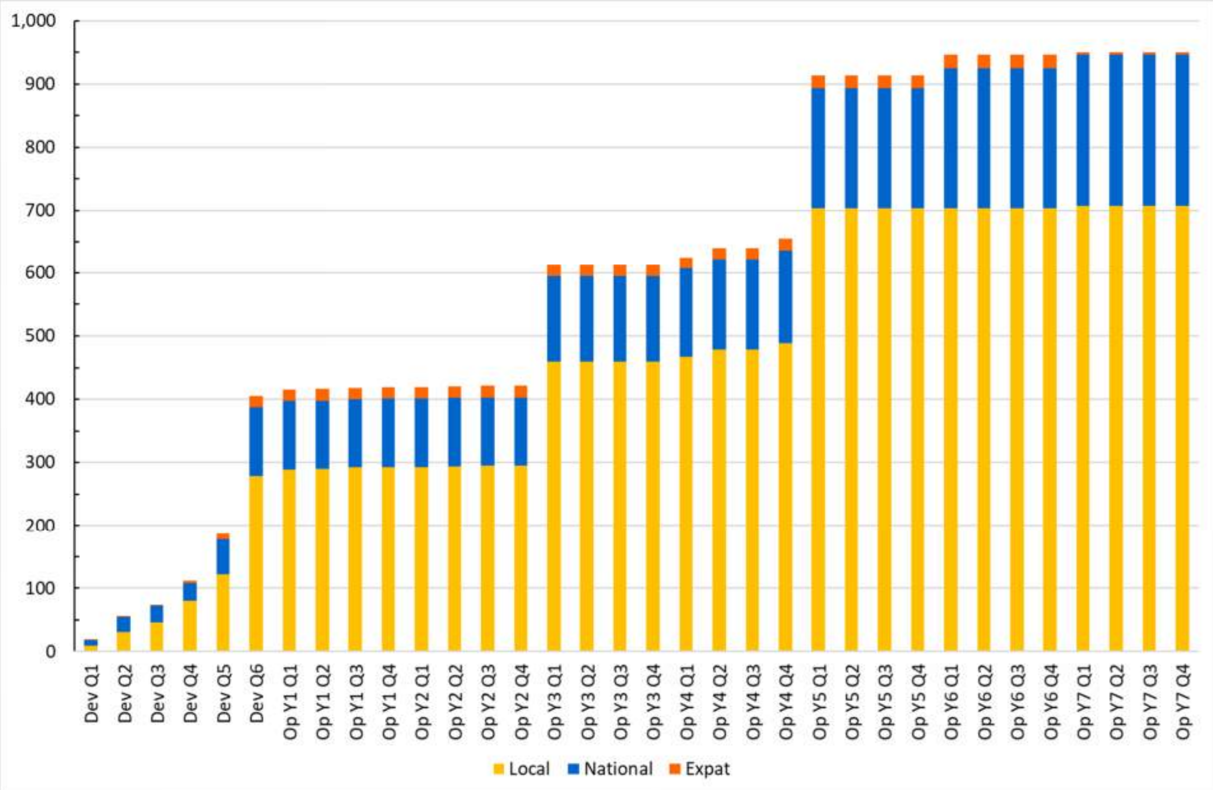


Figure 14-2 Labour Ramp from Pre-production through 7 Years of Production

Black Rock's people strategy and approach is driven by their business strategy. Continued alignment between the two strategies is crucial to the ongoing success of the project. Black Rock's vision is "to be a globally significant graphite producer, who is recognised for our great people, and great products produced safely and ethically."

The company's values articulate what Black Rock stands for and define the required behaviors expected from everyone who joins the team from this point forward. The values form the acronym STARS which is easy to remember and incorporates all the important elements for an effective team and workforce.

Safety is the number one company value and priority for its people. Black Rock is committed to all its people having an equal right and expectation to go home safely. A safety management system focused on People, Process and Place will be developed to ensure that all aspects are combined and directed at managing safety so that the company and its people can uphold the company values. Australian and Tanzanian safety standards will be applied (processes, behaviours and standards) and embedded as the number one, non-negotiable priority, using a Safety by Design approach.

To establish a functioning and flourishing personnel function and team, 7 key aspects are required and planned to be addressed by Black Rock. These 7 essential elements of effective teamwork and leadership combine to address and get the right results, the right way and at the right time for the organisation and the host country. The 7 Strategic HR pillars are:

- Self and team awareness to get the best out of people.

- Shared vision, values and communicate business strategy.
- Clarity of roles and processes, legal compliance and technology.
- Develop, build and maintain commitment and trust.
- Appreciating differences (diversity and inclusion).
- Accountability and clarity.
- Individual competence and organizational capability.

Each of these pillars underpins the development and maintenance of a thriving, engaged, committed and high performing team for the duration of the project. To deliver the right company culture, Black Rock will develop a common and shared ethos of success. The systems and processes to be developed will establish a common measure of success for the project through its people.

Black Rock is clear regarding the progressive and performing culture it wishes to establish and maintain, aligned with the company values. The Employer Value Proposition, employer brand and early start employees and leaders will start off the culture, but it’s only brought to life by the employees living it. This expectation will be communicated to candidates throughout the recruitment process and will be re-enforced during onboarding and throughout the employment relationship.

The workplace culture will be fundamentally underpinned by two key philosophies:

- Equal employment opportunity for all: meaning no religion or gender or other bias will form part of decision making processes around recruitment, progression or performance.
- Local, permanent workforce wherever possible: meaning Black Rock will recruit locally against skills and experience requirements and then look internationally if required. Where local talent is not available in the first instance and international talent is required, Black Rock’s commitment is to train local people up to the standard required to perform the roles in the longer term. The company will also implement an apprenticeship program in the longer term to deliver on this commitment.

The expectations of every single person employed or engaged by Black Rock is for them to be a valued team member, committed to safe behaviours and competency, fairness and respect. Black Rock is committed to having people in permanent roles wherever possible and developing talent in-country. Black Rock will implement a robust program to manage talent, career paths, internal mobility and localisation. This is a key component of the company’s commitment to localise positions wherever possible.

Black Rock will comply with (and seek local legal advice as appropriate) the Employment and Labour Relations Act 2004 as well as the Labour Institutions Act 2004 and the subsequent Government Notices for Employment and Labour Relations Regulations and the Fundamental Rights and Protections and Employment Standards. All employment conditions and leave provided to Tanzanian nationals will align and conform to the statutory requirements and all HR processes and systems will be compliant with the laws of Tanzania.

The work required to establish the necessary processes and level of readiness to complete the work required from a personnel perspective should be considered to increase exponentially as the mine progresses from DFS through the next stages. Prior to Black Rock recruiting positions for the construction, commissioning and production phases of the project, various processes will need to be established before moving onto the next phases from a people perspective. These processes are outlined in further detail in the report.

15 OPERATING COST ESTIMATE

An operating cost estimate (OPEX) was developed for the MGP and is presented in US dollars (US$) using prices obtained in, or escalated to, the third calendar quarter of 2018 (Q3 2018). The estimates have an accuracy of ±10% and were developed by CPC Project Design Pty. Ltd. (CPC), using inputs from other study sub-consultants and Black Rock where appropriate.

The estimate covers all costs associated with mining, processing and transporting the final concentrate to end users and includes general and administration (G&A) costs associated with the project.

The average LOM operating costs for the project are summarised in Table 15-1. The costs exclude all taxes, permitting costs, corporate administrative costs and other government-imposed costs unless otherwise noted with no allowance for escalation or inflation.

Mining costs have been based on the expected mining schedule tonnage movements and all in mining cost developed by Black Rock from first principles. This cost includes all labour and fuel costs based on owner operated mining with the direct purchase of the mining fleet.

The processing cost estimate is based on new processing facilities for graphite production built in three stages consisting of near identical processing trains staggered in development with each stage bringing on a plant feed throughput of 1 Mt/y beginning with Stage 1 in year 1, followed by Stage 2 starting in year 3 and finally, Stage 3 in year 5.

Labour workforce requirements have been estimated for direct maintenance, operations, administration and logistics personnel. Labour salaries and on-costs were provided by Mercer.

Electrical power draw quantities were derived from the mechanical equipment list and are based on utilisation and expected demand. Cost for purchasing power and associated tariffs has been provided by TANESCO, the in-country provider of power.

Diesel fuel consumption is based on estimates from suppliers for equipment and mobile fleet. Diesel pricing was quoted by a local provider.

Maintenance costs are taken as a percentage of initial equipment capital costs. This accounts for replacement of wear parts and other miscellaneous components for the equipment.

Administration costs includes general site costs, insurances, vehicles, Ifakara operating expenses and other ancillary costs associated with operating the project. Contracts for operation of the camp, medical and first aid facility and laboratory have been sourced and budget pricing was obtained for use in the opex.

All product logistics will be managed by Black Rock. Transport and shipping costs have been developed for trucking of bagged product from site to Ifakara, containerising the bags at Ifakara and transporting by rail to Dar es Salaam.

The LOM operating cost summary is show in Table 15-1. The operating costs for the first two years of production (Stage 1 operations only) are shown in Table 15-2.

Table 15-1 Summary of LOM Average Operating Costs

Area	LOM Average		
	US$M/y	US$/t ore feed	US$/t graphite product
Mining	21.6	7.9	98.2
Processing	38.6	14.1	175.5
Administration	4.8	1.8	22.0
Logistics (Black Rock)	5.5	2.0	25.2
Transport and Freight	16.7	6.1	76.0
Total	**87.3**	**31.8**	**396.8**

Table 15-2 Summary of Stage 1 Average Operating Costs

Area	Stage 1 Average		
	US$M/y	US$/t ore feed	US$/t graphite product
Mining	7.7	7.6	89.4
Processing	18.0	18.0	212.7
Administration	4.6	4.6	54.5
Logistics (Black Rock)	2.5	2.5	29.8
Transport and Freight	6.4	6.4	76.0
Total	**39.3**	**39.1**	**462.4**

15.1 PFS Comparison

Figure 16-1 outlines the major items contributing to the opex change from the PFS.

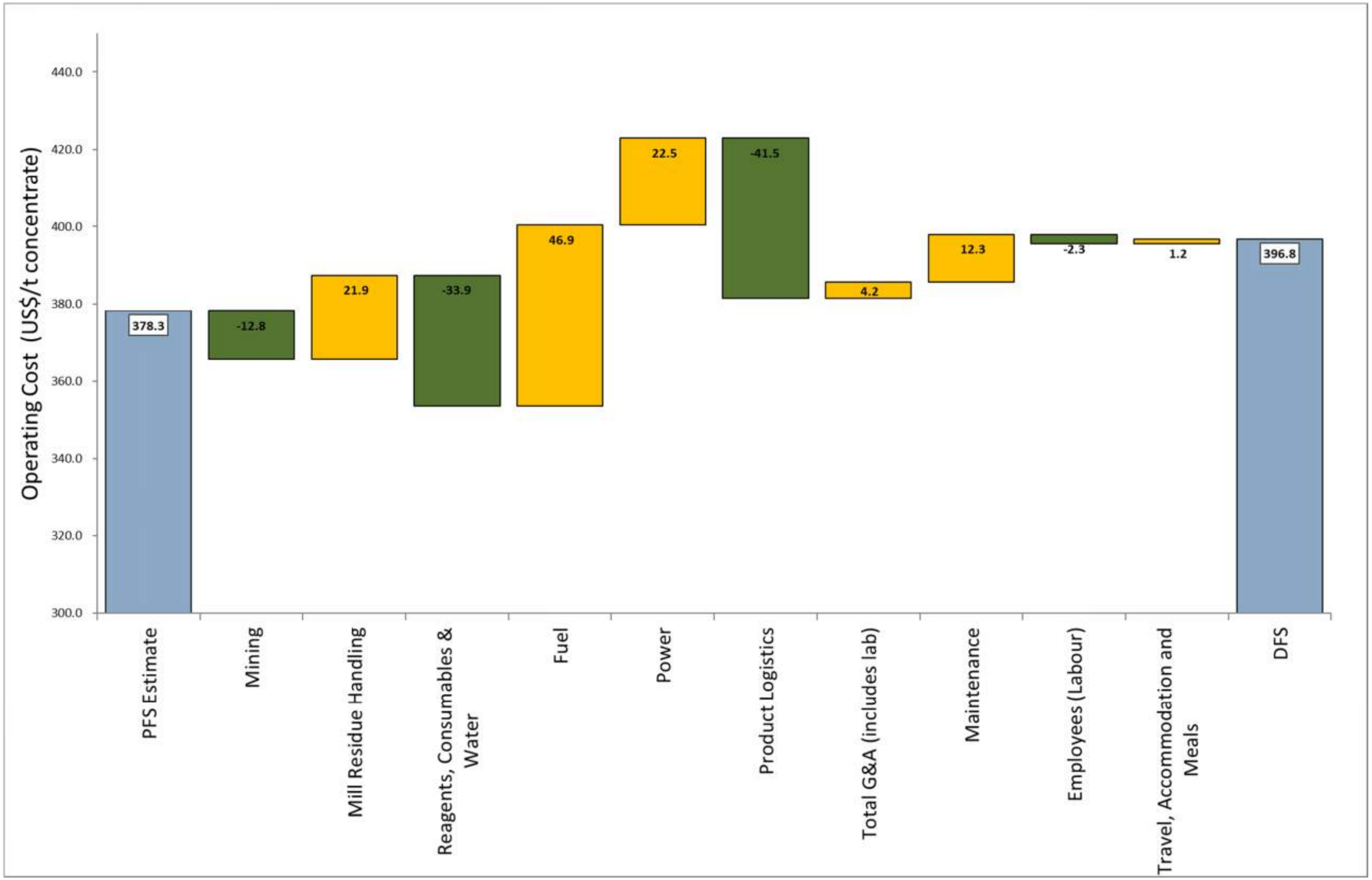


Figure 15-1 PFS to DFS Opex Movement

16 CAPITAL COST ESTIMATE

The capital cost estimate (capex) has been compiled by CPC and is based on the design, supply, fabrication, construction and commissioning of a new graphite process plant in Tanzania and includes supporting infrastructure and indirect costs. In addition, mine establishment and infrastructure costs are included.

The capex covers the design and construction of the MGP process plant and all associated infrastructure, equipment and ancillaries. The estimate has a base date of Q3 2018 and is reported in US$. No allowances were made for the costs of escalation, pre-implementation studies, financing, taxation, mining rights, rehabilitation and closure.

The capex has been classified as a Class 3 estimate with an accuracy of ±10% as defined by AACE International. The estimate relies predominantly on supplier and/or contractor quotations and/or tenders. Preliminary material take offs (MTOs) for earthworks, structural steel, platework, concrete, piping, valves, instrumentation and cables were developed to determine quantities for estimating.

The capital cost required to develop the project is estimated at US$115.15 million (M) for Stage 1 with an additional US$10M added over and above to the estimate as an HV power connection provision.

Where appropriate, capital costs were deferred and included in the sustaining costs of the project. This applies to construction of both Stage 2 and Stage 3 processing facilities, mill residue dry stacking lifts, final pond embankments, storm water embankments and mobile equipment addition/replacement.

The estimated capital costs for all three stages are reported in Table 16-1.

Table 16-1 Summary of Capital Costs

Area (WBS Level 1)	Stage 1 '000 US$/y	Stage 2 '000 US$/y	Stage 3 '000 US$/y
Mining	10,122	-	-
Ifakara	1,366	1,041	727
Infrastructure	14,315	3,325	4,737
Process Plant	50,877	45,300	53,244
Site Support (Temporary Services)	1,767	194	194
Indirects	9,904	6,955	8,468
Owners Costs	15,803	5,160	6,294
Contingency	11,000	7,500	10,500
Subtotal	**115,154**	**69,474**	**84,164**
HV Power Connection Provision	10,000	-	-
Total	**125,154**	**69,474**	**84,164**

A summary of the major cost components included in Stage 1 of the capex is shown in Table 16-2.

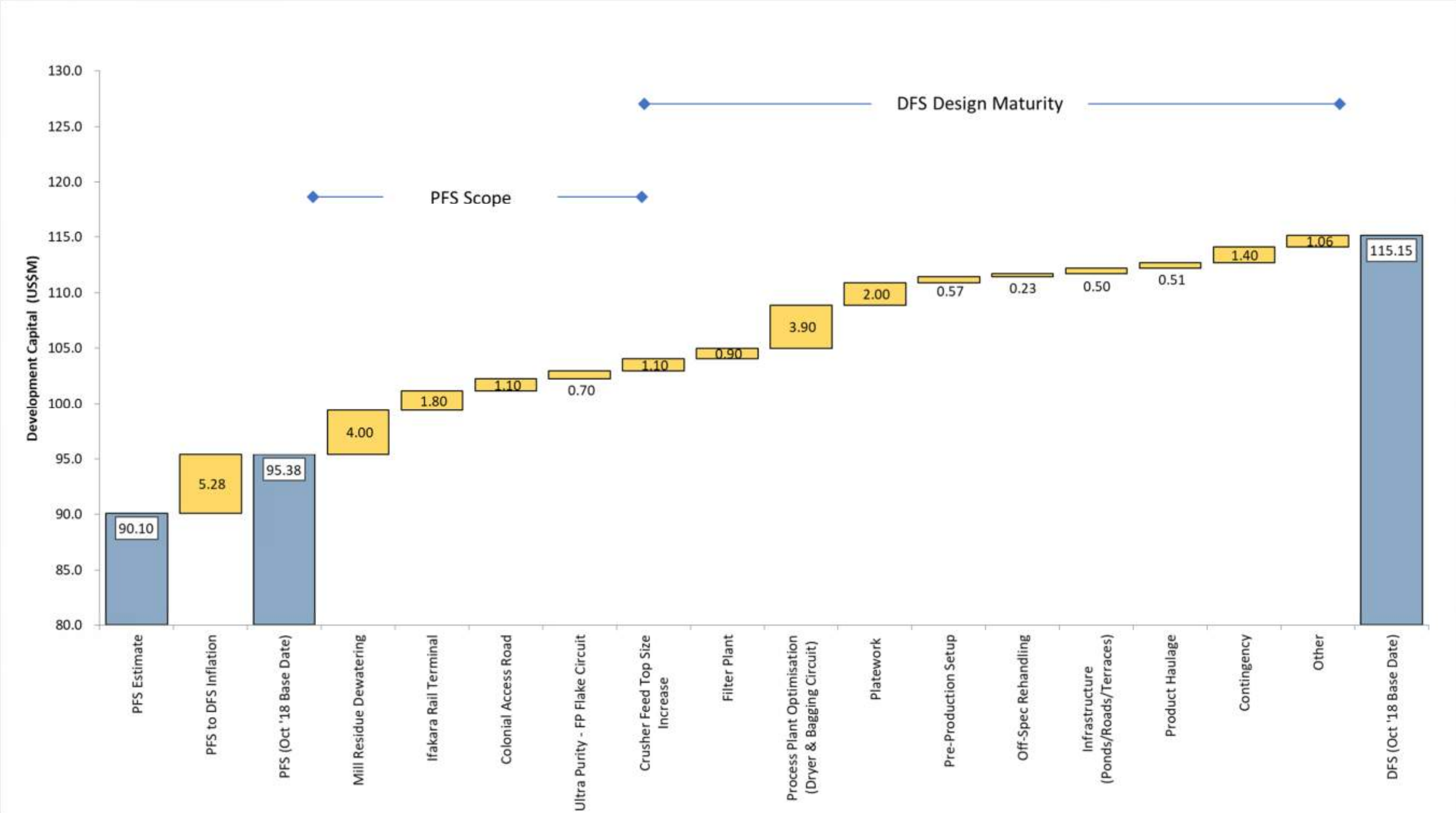
Table 16-2 Major Capex Cost Driver Quantities

Trade Description	Major Commodity	Unit	Total
Architectural	Brick and Block Building	m^2	971
Bulk Earthworks	Bituminous Liner	m^2	133,178
	Bulk Excavation	m^3	146,131
	Bulk Filling	m^3	188,380
	Clear and Grub	m^2	553,250
	Quarried Marble	m^3	273,710
Civil	Reinforced Concrete	m^3	6,906
Cladding	Cladding	m^2	22,596
Electrical	Cable	m	268,888
	Cable Terminations	no.	19,740
	Conduit	m	36,882
	Fibre Optic	m	7,820
Flooring	Grating	m^2	8,738
	Kick Plate	m	10,581
Hand Railing	Hand Railing	lm	3,527
Platework	Platework	t	412

Trade Description	Major Commodity	Unit	Total
Steel	Structural Steel	t	1,178

16.1 PFS Comparison

Figure 16-1 outlines the major items contributing to the capex change from the PFS.



*excludes HV power connection provision

Figure 16-1 PFS to DFS Capex Movement

16.2 Range Analysis

Contingency is a specific monetary provision in the estimate of a project with a defined scope of work that accounts for the uncertainties associated with the various estimate elements (e.g. quantities, unit prices, and schedule activity durations) and is fundamentally aimed at deriving an expected final cost outcome.

Given the inherent nature of contingency, namely that it is a specific monetary provision for known items with an unknown cost impact, rather than unknown items with an unknown cost impact, it does not cover scope changes, specification changes, or project exclusions. In accordance with best practice associated with capital cost estimating, contingency was determined by developing a probabilistic contingency risk model.

The model was developed using the Oracle "Crystal Ball" software package.

The expected accuracy ranges listed in the AACE estimating guideline were used as a guide for the three point estimate ranges. These three point estimates were summarised at WBS Level 2 and the probabilistic contingency risk model was developed and "run" at this level.

A BetaPERT distribution was selected for all models. The BetaPERT distribution is derived from the beta distribution and is commonly used in project risk analysis for assigning probabilities to task durations and costs and is a continuous probability distribution.

There are three conditions underlying the BetaPERT distribution:

- the minimum value is fixed
- the maximum value is fixed
- the most likely value falls at a peak between the minimum and maximum values, indicative of the fact that values near the minimum and maximum are much less likely to occur than those near the most likely value.

The calculated low and high values from the three point estimates were assigned to the respective minimum and maximum values in the distribution, with the neat estimate value being assigned to the most likely value in the distribution.

The probabilistic contingency risk model was based on 10,000 iterations of the model.

The output from this analysis was based on a distribution of likely outcomes for the total project cost (point estimate value), which can be summarised in a histogram and distribution curve. The histogram (also called a 'Bell-curve') displays the shape of the distribution with the maximum, minimum and mean values.

The results were graphed as a cumulative probability distribution curve (also called an S-curve), from which it is possible to directly determine the amount of contingency required to achieve the desired probability of under-running a certain target (see Figure 16-2).

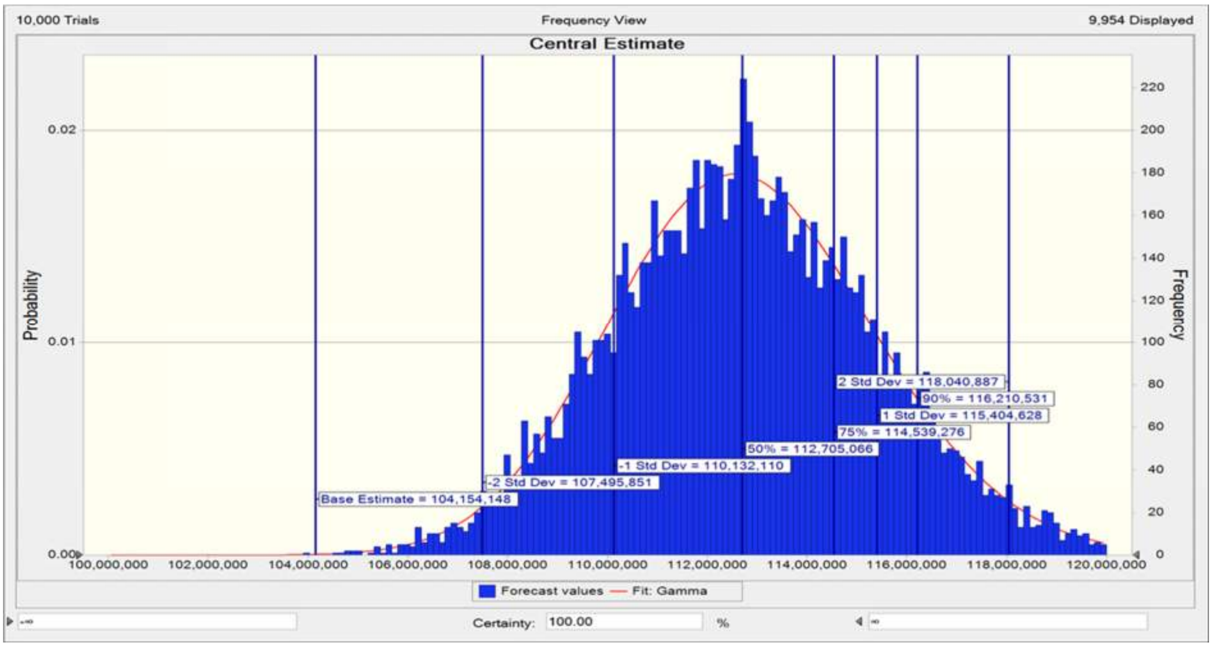


Figure 16-2 Cumulative Probability Distribution Curve

Based on the output, the range analysis advocated a contingency of circa US$8,550M. Subsequent to the outcome of the range modelling the project team took the view of including US$11,000M of contingency into the estimate. Theoretically increasing the project confidence to about P80. Refer to Table 16-3 for reference.

Table 16-3 Probabilistic Outcomes

Percentile	Total (US$)	Contingency	
		Amount (US$)	% of Base Estimate
P0	103,921,834	-232,314	-0.22%
P5	108,522,957	4,368,809	4.19%
P10	109,425,372	5,271,225	5.06%
P20	110,512,057	6,357,910	6.10%
P30	111,339,618	7,185,470	6.90%
P40	112,058,339	7,904,192	7.59%
P50	**112,705,066**	**8,550,918**	**8.21%**
P60	113,354,059	9,199,912	8.83%
P70	114,116,680	9,962,532	9.57%
P75	114,539,276	10,385,129	9.97%
P80	114,976,154	10,822,006	10.39%
P90	116,210,531	12,056,384	11.58%
P95	117,192,935	13,038,787	12.52%
P100	123,415,431	19,261,283	18.49%

17 MARKETING

17.1 Graphite Pricing

Market volume and pricing has historically been led by steel markets, and as a consequence pricing is has been determined by the rate of Chinese industrialisation. The advent of lithium ion batteries (LiB), increased demand for thermal management products particularly in electronics and expanded graphite for fire suppressant is reshaping markets, product types and quality premiums. Two vectors impacting pricing relative to historical trends are increased price premiums attached to higher specification concentrate grades and flake size.

Mine gate pricing is conventionally reported as a weighted average sales price by product and application to arrive at average sales prices. Public pricing information has been sourced from industrial research providers including, Benchmark Minerals, Roskill, Industrial Minerals, and RefWin China. Additionally, customer feedback and access to industry experts has been referenced in developing an appropriate price forecast. Pricing developed in this report is considered realistic and achievable.

Pricing for graphite products is not limited to a single price point for each grade. Multiple price points exist across many applications, and are dependent on several factors including:

- quantities
- documentation
- packaging

- inventory management/safety stock
- take or pay provisions
- length of supply contract or agreement
- credit terms
- Incoterms.

Convention is for pricing to be reported by deposit and is characterised as a deposit signature. Individual characteristics will determine the final price by deposit type. The two flake graphite signatures at Mahenge project are Cascade and Ulanzi.

For simplicity, commercial confidence, and in absence of reported public commercial sales, both signatures have been averaged and are assumed to be common for purposes of economic analysis of this project.

Company specific price estimates vary from external industry sourced data however for external public reporting of valuation, referenced public data has been selected. Pricing has been referenced to Roskill *Natural and Synthetic Graphite: Global Industry, Markets and Outlook, 2018© Roskill, 2018* (Figure 17-1). Roskill estimates have been modified by Black Rock to account for targeted grades not being reported and for flake sizing not considered by Roskill. Time periods have been averaged to generate a real price for project start date.

FOB realised pricing has been generated by evenly weighing for freight between Tanjin, Tokyo and Busan. Nominal frictional costs for agency, long term contract discounts of 2.5% each have been added to generate FOB pricing Dar es Salaam. Pricing used in the economic analysis for 97.5% LOI product, FOB Dar es Salaam is shown in Table 17-1.

Table 17-1 FOB Dar es Salaam Pricing Used in Economic Analysis for 97.5% LOI

Mesh #	Segment Pricing (US$/t)	Basket Weight (%)	Shipping (US$/t)	Channel & Agent (US$/t)	Contract Discounts (US$/t)	Basket (US$/t)
+32	1,579	5	1.65	1.97	1.97	73
+50	1,449	18	5.96	6.52	6.52	242
+80	1,444	36	11.89	12.98	12.98	481
+100	1,379	9	3.06	3.19	3.19	118
-100	1,314	32	10.52	10.44	10.44	386
	1,404	**100**	**33.08**	**35.10**	**35.10**	**1301**

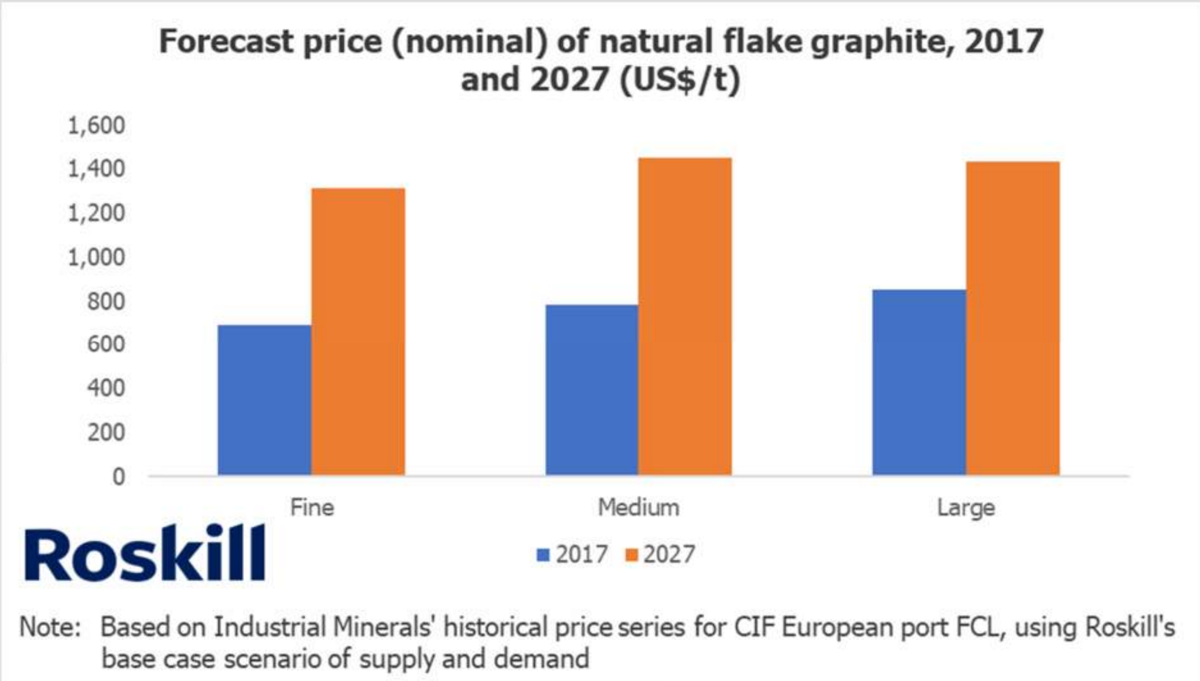


Figure 17-1 Forecast Price for Natural Flake Graphite[2]

17.2 Product Differentiation

Black Rock has identified, qualified and presented flake graphite samples from its first pilot plant to potential customers. Sample sizes ranged from a few kilograms up to 1,000 kg and consisted of sized and graded product. Target purities and sizes supplied were in response to customer requirements and specifications. Concentrating on customer needs translates to qualifying customers, leading to memorandums of understanding (MOU's) and subsequent sales contracts and supply agreements.

Pilot plant production is fundamental to customer qualification as the production plant provides important commercial plant design parameters as well as indicators as to the mesh size fractions that can be effectively produced and the target purities that can be achieved.

[2] Source Roskill. Published in: Natural and Synthetic Graphite: Global Industry, Markets and Outlook, 2018 © Roskill, 2018

Pilot plant output combined with customer feedback has been considered in plant design. Plant design based on customer feedback and potential commitments leads to more efficient production planning, sales forecasting, and providing detailed customer commitments by product for short, medium and long-term revenue and profit margin forecasting.

With the increasing emphasis on battery flake graphite supply, marketing has been directed on applications with lower barriers to entry that provide for higher than average price points. This creates immediate and medium-term cash flows, while also allowing participation in longer term qualifications including battery precursor flake graphite for LiBs. As the supplier landscape stabilises and the electric vehicle (EV) market demonstrates anticipated growth, Black Rock will be a prequalified supplier of battery grade precursor graphite but will also be an established supplier across a wide range of applications and will receive new and reoccurring sales from traditional and high-tech applications.

Black Rock utilised critical resources in graphite expertise and plant design knowledge to develop pilot plant production information from customer specifications, application requirements, and feedback from customer sample evaluations. Black Rock has embraced a quality over quantity methodology as it is imperative to meet customer needs and responding with those specific graphite products.

Due the variances in metallurgical and chemical signatures of natural flake graphite, all graphite must be qualified before any potential customer will move forward with commercial bulk sampling and subsequent commercial supply agreements. Producing high volumes of any graphite grade without prequalified customers to ship finished concentrate strains working capital while anxiously working to qualify unqualified inventory in the market; inevitably selling product at lower prices all in the effort to reduce inventories depressing market prices and upsetting the demand supply equilibrium. Black Rock's focus of understanding customers and their application specifications and needs leads to a commercial plant design that will manage production levels, protecting the graphite market from oversupply, while developing credibility in the graphite sector, increasing customer loyalty, and most importantly, company and brand recognition.

18 FINANCIAL

The financial analysis indicates a net present value (NPV) @10% (post tax, ungeared after 16% free carry) of US$895M for the base case production profile and price assumptions, which provide for an internal rate of return (IRR) of 46.9% (post tax, real). A maximum cash draw of US$120.5M is incurred 18 months after the commencement of construction.

The financial performance of the project is summarised in Table 18-1 and Figure 18-1.

Table 18-1 Financial Performance Summary

Financial Performance Summary	Unit	LOM
Project Life	Years	32.5
Operating Life	Years	31.0
Total LOM Net Revenue	US$M, real	8,873
Graphite Price (Real)	US$/t	1,301
C1 Cost: Real (including withholding tax)	US$/t	401
C3 Cost: Real (including withholding tax)	US$/t	486
All-in-Sustaining Cost (AISC): Real	US$/t	473
Stable State EBITDA (after year 7)	US$M, real	202.5
Project NPV @ 10.0% - Nominal, Post Tax, post 16% Free Carry	US$M, real	895
Project NPV @ 8.0% - Nominal, Post Tax, post 16% Free Carry	US$M, real	1,191
Project IRR – Post Tax, post 16% Free Carry	%, Nominal	42.8
Maximum Project Drawdown	US$M, real	120.5
Maximum Cash Draw Period - from Construction Start	Years	1.5

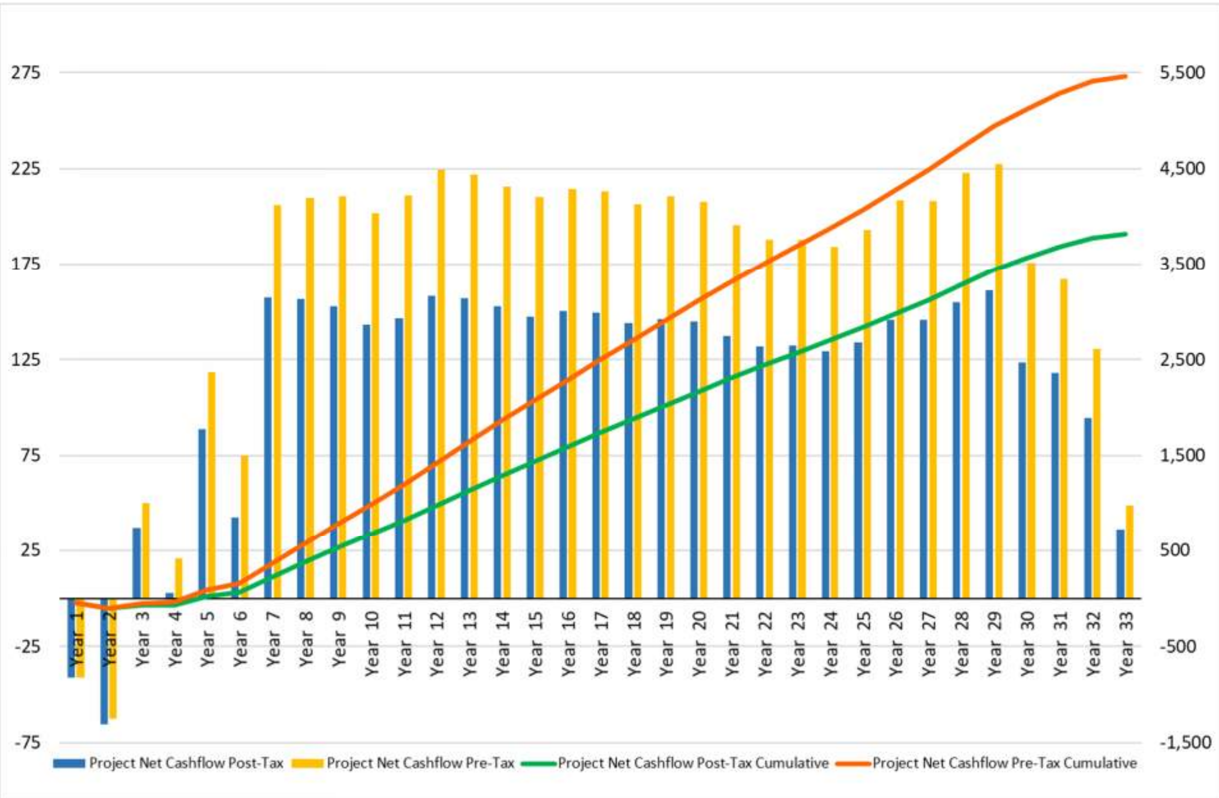


Figure 18-1 LOM Cash Flow Profile (US$ real)

The financial analysis indicates the project is financially viable and results in strong financial returns. With a short payback period of 3.1 years from first ore processed, the project has relatively low exposure to the key risk factor of long term commodity prices, mitigating exposure to the financial risk associated with the project's capital funding requirements. The strong financial returns under the base case assumptions provide a positive risk versus reward assessment.

18.1 Key Financial Assumptions

The key financial assumptions are:

- All amounts have been modelled in US$.
- The financial model is built using real inputs in 2018 dollars. Commodity prices, operating and capital costs are escalated within the cashflows to nominal values by using a general 2% US$ inflation rate to correctly calculate depreciation, corporate taxation and working capital. For valuation purposes resultant nominal cashflows are deflated to real cashflows using the same 2% general US$ inflation rate and the resultant real cashflow is discounted by a real discount rate, which is the equivalent of a 10% nominal discount rate, ie:

$$Real\ discount\ rate = \frac{(1 + nominal\ discount\ rate)}{(1 + inflation\ rate)} - 1 = \sim 7.84\%\ real$$

- The financial model is built in quarters and real and nominal cashflows are assumed to occur at period end. Resultant real cashflows are discounted using mid-point discounting to adjust the valuation to simulate the effect of running a monthly model.
- Pre- and post-production capital and capitalised operating costs are depreciated for tax purposes on a 20% per year straight line basis. The costs of mining pre-production are part of capitalised pre-production operating costs and ore is not carried separately as mining inventory. The resultant tax treatment is conservative.
- Pre- and post-production capital and capitalised operating costs are depreciated for accounting purposes over the LOM. There is no residual value. Accounting depreciation (deflated and expressed as real) is used as the basis for real C2 cash costs.
- No end of LOM rehabilitation costs, mine closure costs or project residual values have been assumed. Operating costs allow for progressive rehabilitation of land throughout the project life and for land to be returned to traditional uses as quickly as possible post mining. The mill residue dry stack operating costs include for progressive rehabilitation which is a requirement for operation of the dry stack.
- Financial analysis is provided at the level of ungeared project cashflows. Analysis is based both on 100% project equity and 84% Black Rock equity after government free carried interest of 16% is deducted. In the context of this financial analysis free carried interest means that Black Rock will pay for initial capital investment before the project generates positive revenues and will also make up the shortfall in its entirety for the construction and financing of future project stages if insufficient funds have been

retained in the project company. Dividend payout ratios are adjusted to ensure that (to the extent possible) the project company first meets the needs of financing future stages before paying a dividend. Dividends are then paid to government (16%) and Black Rock (84%) in line with the government's free carried interest proportion.

- Basket pricing of $1,301/t finished product has been applied. Pricing is FOB Dar es Salaam.
- Taxation inputs for the financial model are based on professional advice from Ernst & Young (Tanzania) and judgements by Black Rock.
  - Corporate income tax of 30.0% is applied to earnings before tax, with the assumption that government royalties are tax deductible for corporate tax purposes.
  - Royalties of 3.0% are applied to gross FOB revenue.
  - Withholding tax is assumed to be paid at 5% of gross (5.26% of net) capital and operating costs.
  - No carried forward tax losses are assumed at the project level. Tax losses incurred during the project are carried forward indefinitely and can be applied to reduce profit before tax in future periods.
- Working capital assumptions are:
  - Finished goods inventory is assumed to be 30 days (production to sale at Dar es Salaam port on embarkation).
  - Creditors: 30 days except for royalties and salaries (which are assumed payable immediately). Capital costs are provided as cash S-curve and assumed payable as incurred.
  - Debtors: 30 days.
  - VAT is assumed to be incurred at 18% on 20% of capital and operating costs. VAT is recouped only in periods when there is tax payable.

18.2 Production Profile

The base case average sales pricing is shown in Table 18-2 and is based on marketing research which is discussed in Section 17.1.

Table 18-2 Mahenge Graphite Signature™ – Base Case Average Sales Price

Project Signature Name	Base Case Average Sales Price US$/t FOB Dar es Salaam
Mahenge - Cascade	1,301
Mahenge Ulanzi	1,301

18.3 Sensitivity Analysis

The sensitivity of the financial performance of the project to variations in commodity price is detailed in Figure 18-2 and Figure 18-3. Figure 18-4 shows the NPV sensitivity to discount rate.

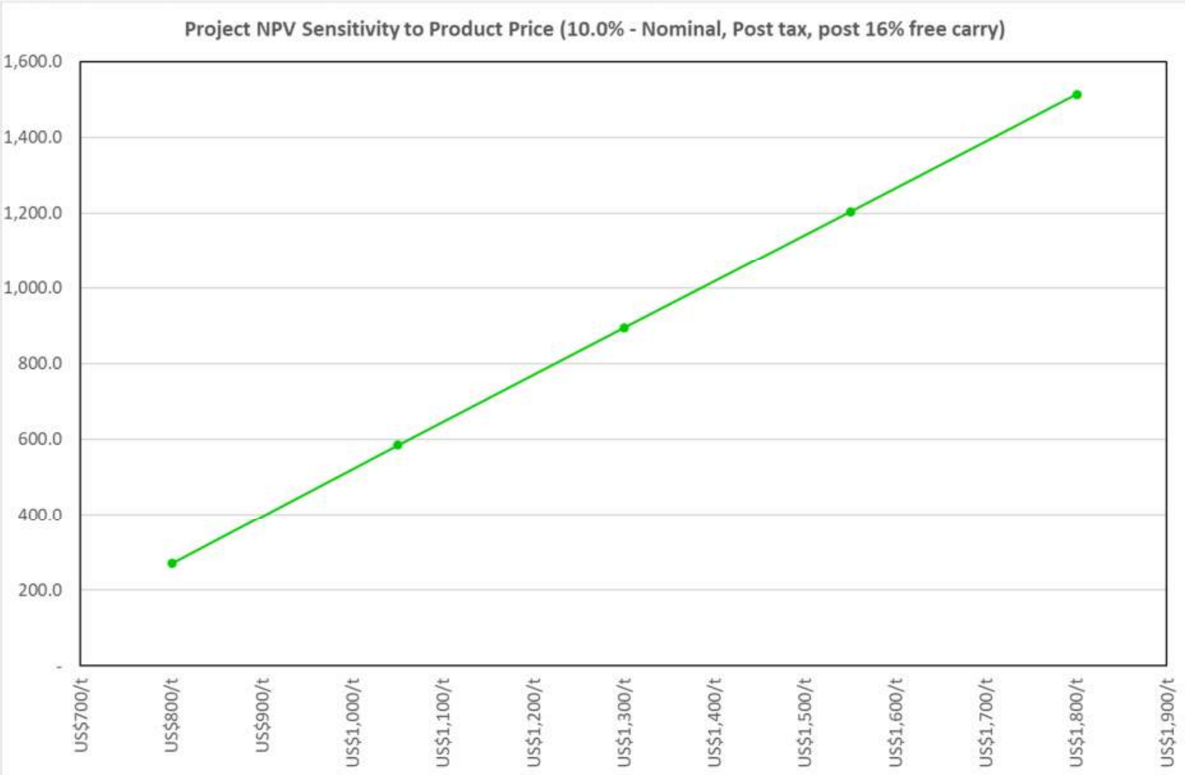


Figure 18-2 NPV Sensitivity Analysis to Product Price (at 10% real, after tax, after 16% free Carry)

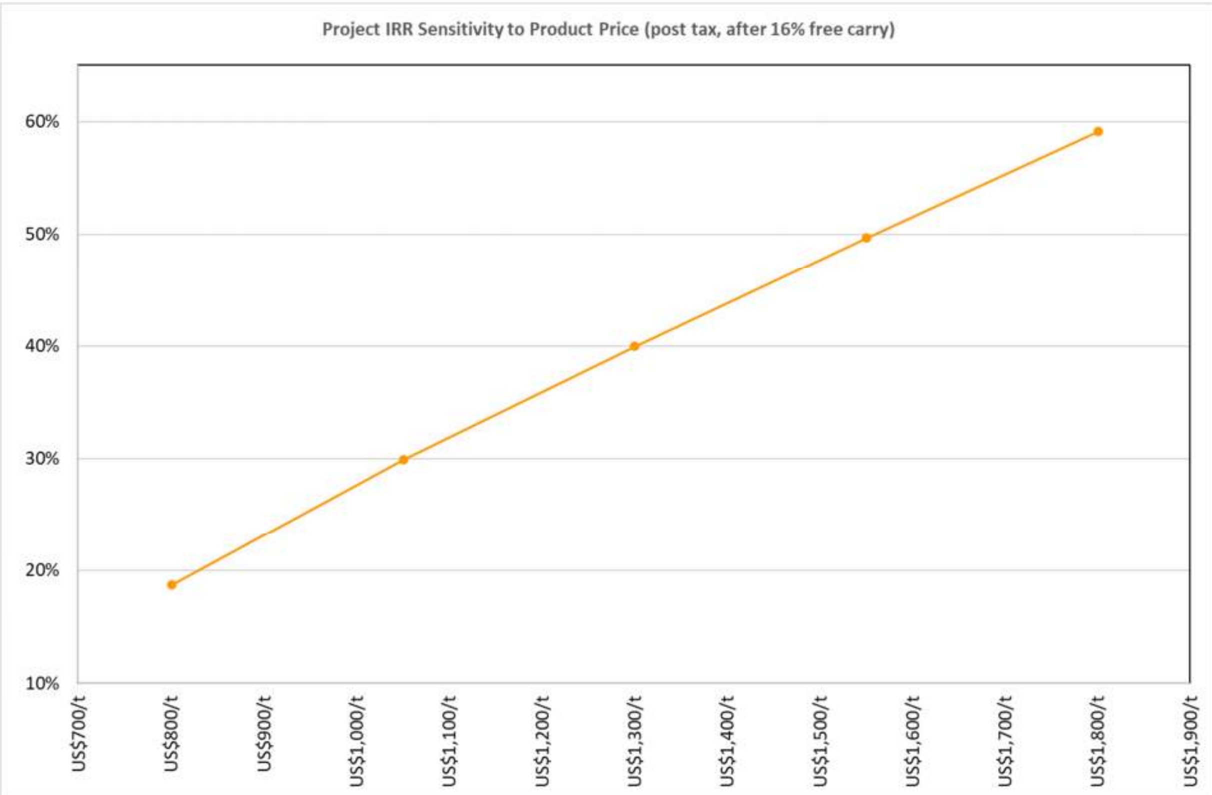


Figure 18-3 Project IRR Sensitivity to Product Price (after tax, after 16% free carry)

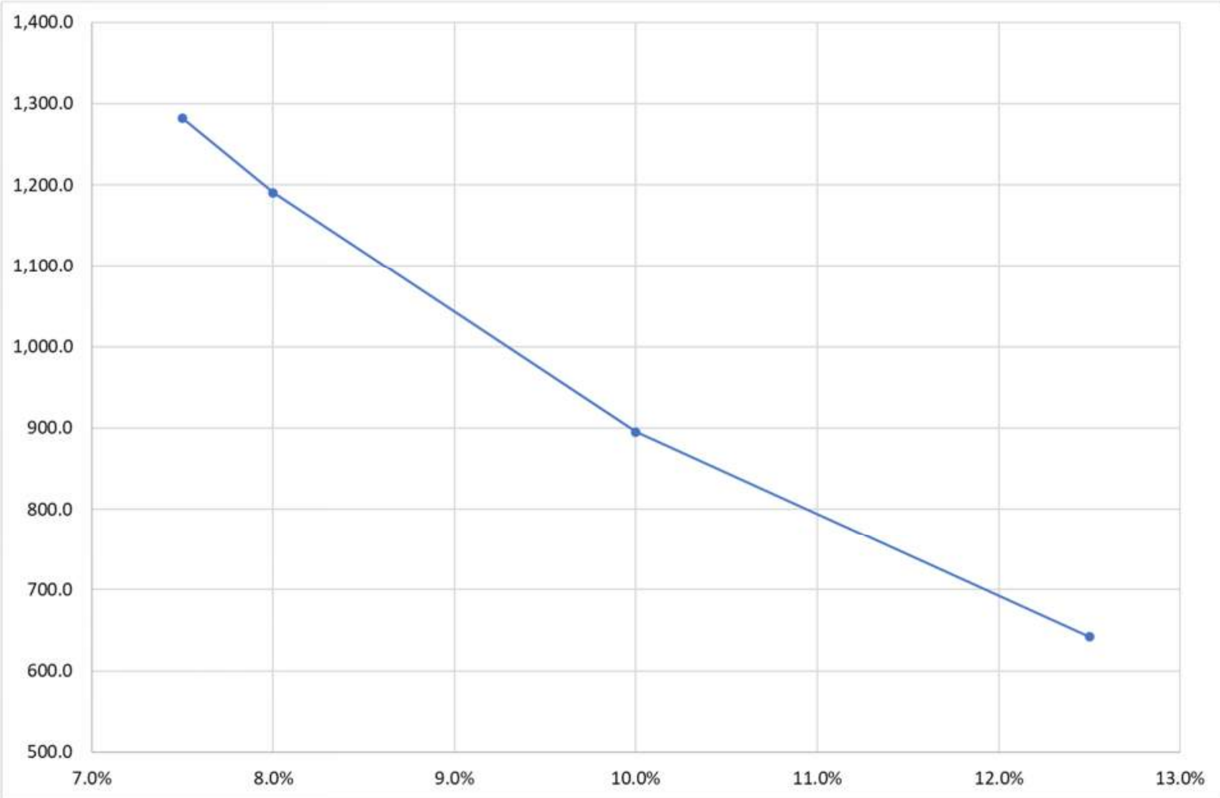


Figure 18-4 NPV Sensitivity Analysis to Discount Rate (after tax, after 16% free Carry)

RESOURCES AND RESERVES

The Mahenge Project JORC Mineral Resource

The Mineral Resource Estimate was completed by Trepanier Pty Ltd, an independent geological consultancy. The summary tables below display the Measured, Indicated and Inferred Mineral Resources for the combined Mahenge Project and individually by each prospect.

Table 1. Mahenge Global Mineral Resource summary table

Category	Tonnes (Millions)	TGC (%)	Contained TGC (Million tonnes)
Measured	25.5	8.6	2.2
Indicated	88.1	7.9	6.9
Inferred	98.3	7.6	7.4
TOTAL	**211.9**	**7.8**	**16.6**

Table 2. Mahenge Mineral Resource breakdown by prospect

Prospect	Category	Tonnes (Millions)	TGC (%)	Contained TGC (Million tonnes)
Ulanzi	Measured	13.3	8.9	1.2
	Indicated	49.7	8.2	4.1
	Inferred	50.2	8.1	4.1
	Sub-total	**113.3**	**8.2**	**9.3**
Cascades	Measured	12.1	8.3	1.0
	Indicated	20.8	8.3	1.7
	Inferred	27.3	7.9	2.2
	Sub-total	**60.2**	**8.1**	**4.9**
Epanko	Measured			
	Indicated	17.6	6.4	1.1
	Inferred	20.8	5.9	1.2
	Sub-total	**38.4**	**6.1**	**2.4**
COMBINED	**MEASURED**	**25.5**	**8.6**	**2.2**
	INDICATED	**88.1**	**7.9**	**6.9**
	INFERRED	**98.3**	**7.6**	**7.4**
	TOTAL	**211.9**	**7.8**	**16.6**

Note: Appropriate rounding applied

Mahenge Project global Mineral Resource Estimate breakdown by cut-off grades

Table 3 and Figure 1 below show the Mahenge global resource at varying cut-off grades and the corresponding grade-tonnage curve, respectively. Of note is that a significant high-grade resource is contained within the global 211.9Mt @ 7.8% TGC resource. At a 9% cut-off, a high-grade portion of 46.6Mt @ 10.6% TGC is available or at a 10% cut-off, a 23.4Mt portion of the Mineral Resource Estimate exists at 11.7% TGC.

Table 3. Mahenge Global Mineral Resource by grade cut-off

Cut-off TGC	Million tonnes	TGC (%)
0	211.9	7.8
1	211.9	7.8
2	211.8	7.8
3	211.5	7.8
4	210.3	7.9
5	202.1	8.0
6	177.3	8.3
7	136.8	8.9
8	91.1	9.5
9	46.6	10.6
10	23.4	11.7
11	12.8	12.8
12	6.9	13.9
13	4.7	14.6

Graph Graph 1. Global Mahenge TGC% grade-tonnage curve

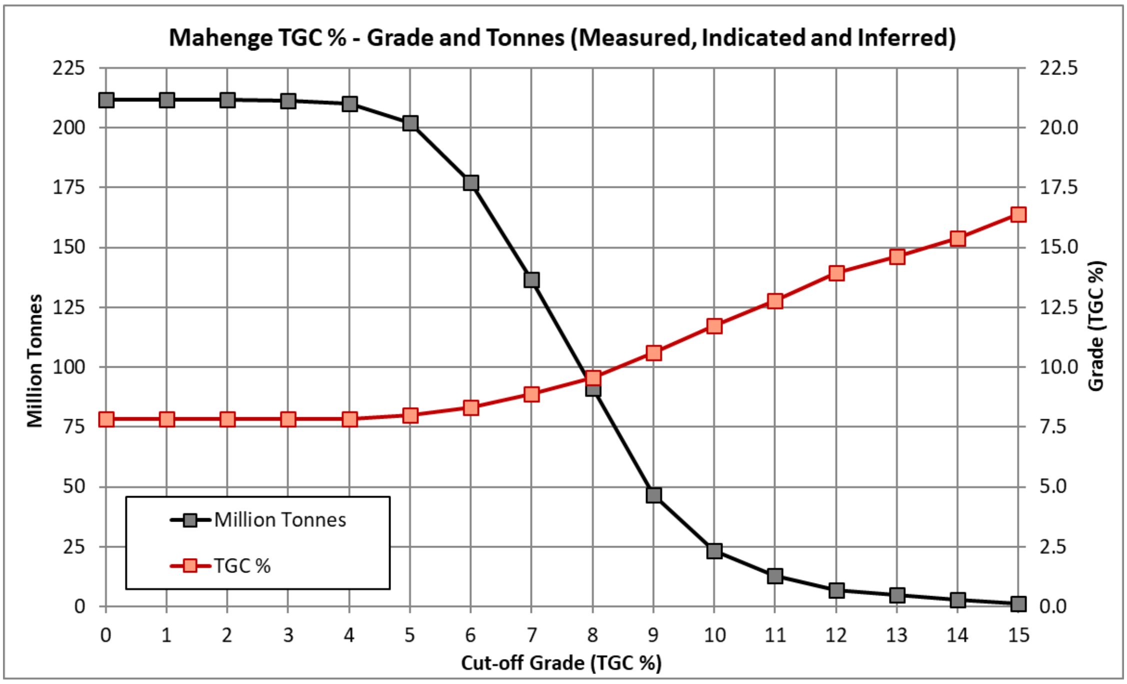


Figure 5. Mahenge Project location map

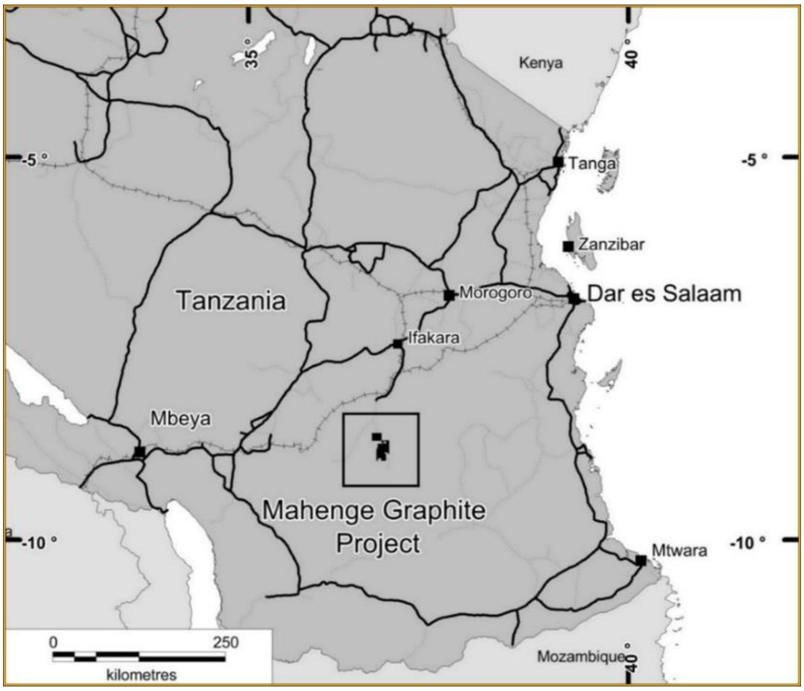
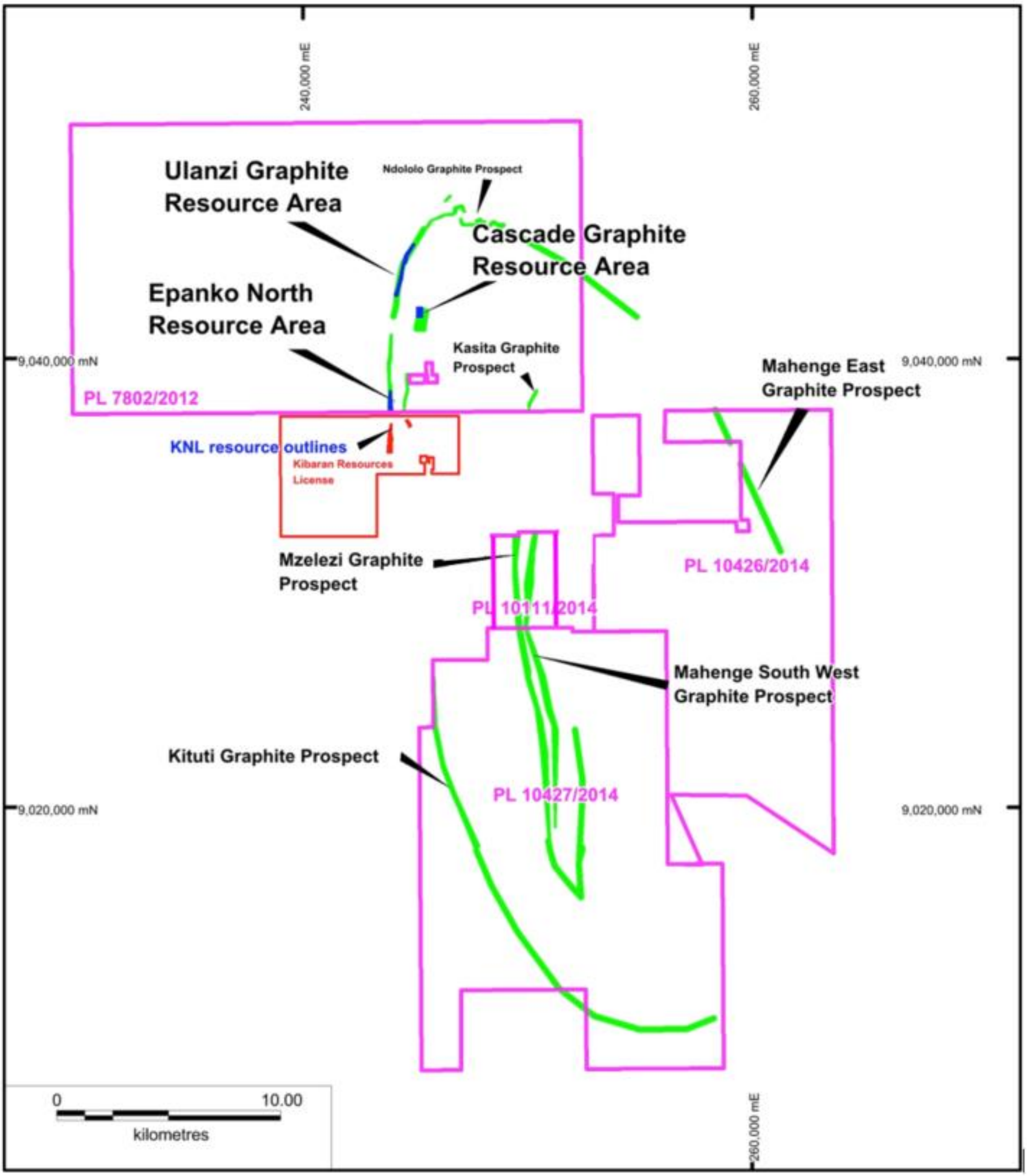


Figure 6. Tenement map.

The resource is contained entirely within PL7802/2012. Green outlines are graphitic gneiss mapped in the tenements; blue solid outlines show the locations of the Ulanzi, Epanko North and Cascade Resource locations



SUMMARY OF RESOURCE ESTIMATE AND REPORTING CRITERIA

As per ASX Listing Rule 5.8 and the 2012 JORC reporting guidelines, a summary of the material information used to estimate the Mineral Resource is detailed below (for more detail please refer to Table 1, Sections 1 to 3 included below in Appendix 2).

Geology and geological interpretation

The Mahenge Mineral Resource is hosted within the rocks of the Proterozoic Mozambique Orogenic Belt that extends along the eastern border of Africa from Ethiopia, Kenya and Tanzania. It consists of high-grade mid-crustal rocks with a Neoproterozoic metamorphic overprint. The Mozambique Belt is divided into the Western Granulite and Eastern Granulite where Mahenge is situated. The Granulites are separated by flat-lying thrust zones and younger sedimentary basins of the Karoo.

The belt has undergone granulite phase metamorphism that has been subsequently retrograded to upper amphibolite facies. Structurally the Mahenge region has undergone intense deformation forming a tight poly-phase sequence of marble, mafic and felsic gneiss and graphitic schists as part of the kilometre scale Mahenge synform. The Mineral Resources are located on the western flank of the synform where the bedding and foliation dips towards the east between 60 and 80˚. The units typically strike to the north and rotate to the northeast as they wrap around the fold nose.

The geological interpretation used in this Mineral Resource estimate has been based on mapping of surface outcrop, multiple pits and trenches in conjunction with reverse circulation (RC) and diamond core (DD) drilling. The 3D geological wireframes were created using well defined footwall and hanging wall boundaries based primarily on changes from graphite dominated gneiss to mica or garnet gneissic units, which as expected also reflected a decrease in graphite grade. The geological wireframes were extended along strike and between areas of drilling approximately half the distance between drill sections.

Drilling techniques and hole spacing

The Mahenge estimation has been based on a combination of drilling and surface trench and pit sampling with the majority of the sample and geological data from RC (6inch) and DD drilling (PQ and HQ). The Company has used 100m x 100m, 100m x 50m and 50m x 50m grid drill spacing, which has been sufficient to clearly show geological and grade continuity. The drilling has been oriented perpendicular to the mineralisation or as close to perpendicular as possible subject to drill access. The drill collars have been surveyed using a high accuracy differential global position (DGPS) measurements for the X, Y and Z co-ordinates and the Z component has been checked by draping the collar position over a high quality digital terrain model and photographic imagery flown for the Company. There is a high degree of confidence in the locations of the collars and trenches based on DGPS pick-ups and the high definition topographic and photographic survey.

Sampling and sub-sampling techniques

Trenches were sampled using 2m composites with samples taken from in-situ oxide, transition or fresh rock as a continuous chip channel sample across the trench wall. Pit samples were taken as individual point samples at the base of the pit. The surface samples weighed between 2.5 and 3.5kg. A high degree of care was taken to ensure no transported material was sampled from the trenches or pits. There was no sub-sampling from the pits or trenches.

At the drill rig the RC samples were split using a 3-tier riffle splitter to 1m intervals then composited as two x 1m samples with a combined weight of approximately 3.0kg. Samples in excess of 3kg were riffle split to reduce the weight to approximately 3kg. The calico samples bags were uniquely numbered and recorded prior to bagging in polyweave bags.

After geological and geotechnical logging the HQ diamond core was half cored and then quarter cored; the PQ diamond core was slivered. The quarter core or sliver was composited to 2m intervals which were placed into uniquely numbered calico bags and then bagged into polyweaves. All of the polyweave bags were secured with a numbered plastic security tag prior to submission to the laboratory. There were no sub-sampling techniques past the sample dispatch from Mahenge.

Sample analysis method

The trench, RC and diamond core samples were sent to Mwanza in Tanzania for preparation and the pulps were then sent to Brisbane for carbon analysis using Total Graphitic Carbon (TGC) C-IR18 LECO Total Carbon. Graphitic C is determined by digesting sample in 50% HCl to evolve carbonate as CO2. Residue is filtered, washed, dried and then roasted at 425C. The roasted residue is analysed for carbon by high temperature Leco furnace with infrared detection. Method precision is ± 15% with a reporting limit of 0.02 to 100%

All TGC analysis has been carried out by a certified laboratory – ALS Global. TGC is the most appropriate method to analyse for graphitic carbon and it is a total analysis. ALSC Global inserted its own standards and blanks and completed its own QAQC for each batch of samples. No failures were reported. Black Rock Mining has employed its own QA/QC strategy that involved field duplicates, blanks, insertion of certified reference material and check analysis using a secondary laboratory. The Company is satisfied that TGC results are accurate and precise and no systematic bias has been introduced. Deleterious element analysis was also conducted using a multi-element ICP method.

Cut-off grades

Grade envelopes have been wireframed to an approximate 4 to 5% TGC cut-off allowing for continuity of the mineralised zones. Based on visual and statistical analysis of the drilling results and geological logging of the graphite rich zones, this cut-off tends to be a natural geological change and coincides with the contact between the graphite rich gneiss and the other adjacent country rocks (i.e. garnet gneisses and occasional marbles). Distinctly higher grade internal veins at Cascade were modelled at approximately a 9 to 10% allowing for continuity.

Estimation Methodology

Drilling, surface test pit, trench sampling and geological mapping data was utilised to control the interpretation of the mineralised zones. Three broader domains with two higher grade internal veins in a main domain were wireframed using Leapfrog™ software's vein modelling tools with contacts determined by coincident geology (graphitic gneiss) and a significant increase in TGC grade (> 4-5% TGC or > 9-10% TGC for the internal higher grade veins).

Grade estimation was by Ordinary Kriging ("OK") for Total Graphitic Carbon (TGC %) using GEOVIA Surpac™ software into the domains. The estimate was resolved into 10m (E) x 25m (N) x 10m (RL) parent cells that had been sub-celled at the domain boundaries for accurate domain volume representation. Estimation parameters were based on the variogram models, data geometry and kriging estimation statistics. Potential top-cuts were evaluated by completing an outlier analysis using a combination of methods including grade histograms, log probability plots and other statistical tools. Based on this statistical analysis of the data population, no top-cuts were required.

Classification criteria

The Mineral Resource has been classified on the basis of confidence in the geological model, continuity of mineralised zones, drilling density, available mapping, pit sampling and trenching data, confidence in the underlying database and the available bulk density information. The Mahenge Mineral Resource in part has been classified as Measured and Indicated with the remainder as Inferred according to JORC 2012.

Minimum drill spacing for Measured Resources is 50m (northing) by 50m (easting), for Indicated Resources is 50-100m (northing) by 50-75m (easting) with larger drill spacing zones categorized as Inferred Resources.

Mining and metallurgical methods and parameters

Initial indications are that the Mineral Resources at Mahenge will be amendable to conventional open pit mining with low strip ratios and conventional crush, grind and flotation processing to produce a potential saleable graphite concentrate.

Metallurgical sample composites were prepared at Bureau Veritas Minerals laboratory in Perth from half cut diamond drill core from the DD drilling programmes. The representative composite samples comprise: Epanko North fresh, Epanko oxide, Ulanzi fresh and Ulanzi oxide materials. The ore composites were generated to assess the ore's amenability to beneficiation by froth flotation and also to identify the nature, flake size and occurrence of the graphite in a selection of drill core samples and flotation products. Cascades oxide and primary mineralisation has been tested with similar results to that of Ulanzi mineralisation.

An 1,800m metallurgical drill program was conducted from December 2017 to January 2018. The core was quarter cut with the remining 30 tonnes of core shipped to SGS Canada for metallurgical test work. At the time of this Resource update the core had not been processed.

Preliminary metallurgical test work on the oxide and primary mineralisation at Ulanzi and Epanko north has consistently returned up to 99% TGC concentrates.

- High purity and coarse flake concentrate made from a straightforward four-stage flotation process using exploration samples
- Laboratory based metallurgical performance of recovery, concentrate grade and flake distribution supported by large scale 90 tonne bulk sample composed of fresh and oxide drill core, and surface bulk samples.
- Independent expandable graphite testing indicates that Mahenge concentrates are highly suitable for this application with superior expansion ratios to current Chinese expandable graphite on the market
- Independent spherical graphite test work indicates that Mahenge concentrates can meet/exceed battery grade graphite specifications with conventional processing and purification methods. Acid purification of spherical graphite has returned up to 99.98% TGC and thermal purification has returned > 99.999% assays.

- Extended battery cycling over 300 cycles indicates that Mahenge concentrates are highly suitable as a Lithium Ion Battery (LiB) anode material

A 120t bulk sample of Ulanzi and Cascades oxide and primary mineralisation was delivered to SGS metallurgical testing facility in Canada for bulk flotation and pilot scale processing. This programme was completed in April 2018 and has successfully delivered an optimised processing flowsheet for equipment selection undertaken by CPC Engineering Perth.

Initial (sighter) testing in Canada has returned up to 99.6% TGC concentrates from an amended four stage flotation test circuit, confirming that straightforward flotation can deliver exceptionally pure final products ready for end user applications.

The Company believes that the combination of large tonnage, high graphite grades, potential low cost mining and conventional processing, the Mahenge Project could produce a saleable graphite concentrate and shows good potential for economic development.

Summary

- The global Mineral Resource Estimate for the Mahenge Graphite Project is 211.9M tonnes at 7.8% TGC. This makes it the fourth largest JORC Resource globally and it is still open along strike.
- Mineral Resources in the Measured category are now 25.5Mt and Indicated at 88.1Mt combined representing 54% of the total Mineral Resource.
- Within this Mineral Resource is a higher grade portion of 46.6Mt at 10.6% TGC.

  Project de-risking achieved by:

  - Delivering the highest grade zones to date and further increasing resource category quality.
  - Metallurgical test work indicates that 99% TGC concentrates can be processed through a relatively simple flotation process. Low Risk
  - End-product validation. Independent testing indicates that battery grade spherical graphite and high quality expandable graphite can be made from Mahenge concentrates.

JORC Code, 2012 Edition Table 1.

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *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 30g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.*	• *The Company has taken all care to ensure no material containing additional carbon has contaminated the samples.* • *The trenches were sampled using 2m composites with samples taken from in situ oxide, transition or fresh rock as a continuous chip channel across the trench walls or along a clean exposed trench floor* • *The pit samples were taken as individual point samples at the base of the pit.* • *All samples are individually labelled and logged.* • *Diamond drill sampling consisted of quarter core sampling of HQ diamond core or a sliver (~1/5th) of PQ diamond core, on a 2m sample interval.* • *RC samples were riffle split on an individual 1m interval then composited as two x 1m samples which were submitted to the laboratory.* • *The company maintains a secure storage area for all samples and core held on site.*
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).*	• *Both diamond core (HQ and PQ single tube) and reverse circulation (6" face sampling) drilling methods have been used. All core is oriented using a spear or ACT back-end orientation device.*

Criteria	JORC Code explanation	Commentary
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *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.*	• *Diamond drill sample recoveries have been measured for all holes and found to be acceptable. Method was linear metre core recovery for every metre drilled.* • *RC recoveries were estimated by measuring the weight of every 1m interval. Grade /recovery correlation was found to be acceptable.* • *Twin hole comparison of RC vs Diamond indicates that no sample bias has occurred for graphite.*
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.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• *Pits and trenches were logged for geology and structures, and photographs were also recorded for the trench samples.* • *All drill holes have been comprehensively logged for lithology, mineralisation, recoveries, orientation, structure and RQD (core). All drill holes have been photographed. Sawn diamond core has been retained for a record in core trays. RC chips stored in both chip trays and 1-3kg individual metre samples as a record.*
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *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.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• *The pit and trench samples were not sub sampled.* • *HQ diamond core samples were halved with one half then quartered. A quarter core sample was taken for laboratory analysis. The remaining quarter core sample is retained for a record and a half core sample retained for metallurgical test work. PQ diamond core was slivered with a core saw and the sliver (~20%) taken for laboratory analysis. The remaining core was retained for metallurgical test work and for a record.* • *RC samples were collected for every down-hole metre in a separate RC bag. Each metre sample was split through a three-tier riffle splitter and a 1.5kg sample taken of each metre. Two one-metre samples, totalling 3kg in weight were composited for assay submission. Field duplicates were taken to test precision up to the compositing and splitting stage.* • *Sample sizes for all medium (i.e. trenches, pits, DD and RC drilling) were appropriate for this style of graphite mineralisation.*

Criteria	JORC Code explanation	Commentary
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.* • *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.* • *Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	• *The samples were sent to Mwanza in Tanzania for preparation and pulps were then sent to Brisbane for carbon analysis: Total Graphitic Carbon (TGC) C-IR18 LECO Total Carbon.* • *Graphitic C is determined by digesting sample in 50% HCl to evolve carbonate as CO_2. Residue is filtered, washed, dried and then roasted at 425°C. The roasted residue is analysed for carbon by high temperature Leco furnace with infra-red detection. Method Precision: ± 15%. Reporting Limit:0.02 – 100 %.* • *Some of the samples were analysed for Multi-elements using ME-ICP81 sodium peroxide fusion and dissolution with elements determined by ICP.* • *Some of the samples were analysed for Multi-elements using ME-MS61 for 48 elements using a HF-HNO3-HClO4 acid digestion, HCl leach followed by ICP-AES and ICP-MS analysis.* • *Some of the samples were analysed for Multi-elements using ME-MS81 using lithium borate fusion and ICP-MS determination for 38 elements.* • *All analysis has been carried out by certified laboratory – ALS Global. TGC is the most appropriate method to analyse for graphitic carbon and it is a total analysis. ALS Global inserted its own standards and blanks and completed its own QAQC for each batch of samples. No failures were noted.* • *BKT inserted certified standard material, a blank or a duplicate at a rate of one in twenty samples.* • *Approximately 1/40 sample pulps from the 2015 drilling were re-submitted from the primary Laboratory (ALS Global) to a secondary Laboratory (SGS) in Johannesburg, South Africa. No bias or issues with accuracy or precision were observed between the two data sets.* • *Based on the QA/QC strategy employed by BKT for the duration of the exploration programs at Mahenge BKT is satisfied the TGC results are accurate and precise and no systematic bias has been introduced.*

Criteria	JORC Code explanation	Commentary
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• *The data has been manually updated into a master spreadsheet and a GIS database, considered to be appropriate for this exploration program.* • *Drill intersections have been checked by a consultant geologist as part of the data validation process and errors corrected prior to resource estimation.* • *Twin holes were used to compare diamond vs RC drilling. Correlation of results was excellent.* • *There has been no adjustment of assay data.*
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.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• *A handheld GPS was used to identify the positions of the pits in the field.* • *The handheld GPS has an accuracy of +/- 5m.* • *The datum used is: WGS84, zone 37 south.* • *Drill collars have been surveyed with a DGPS for sub-metre accuracy for the X, Y and Z components and the Ulanzi, Cascade and Epanko North prospects have been surveyed with a high resolution aerial drone to generate an accurate contour map and high resolution photo image. The Z component has also been checked by draping the collar position over a high quality digital terrain model and comparing to the DGPS Z reading.* • *The locations and RLs of the trenches have been checked using the detailed aerial/topo survey and modified accordingly for both x/y and z components.* • *BKT is satisfied the location of trenches, pits and drill holes have been located with a high degree of accuracy.*
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *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.* • *Whether sample compositing has been applied.*	• *Data spacing and distribution is considered to be appropriate for the estimation of a Mineral Resource.* • *The company has used 100 x 100m or 100 x 50m or 50 x 50m grid spacing which has been sufficient to show geological and grade continuity.* • *The drill spacing is appropriate for Resource Estimation.* • *No further sample compositing has been applied post the sub-sampling stage.*

Criteria	JORC Code explanation	Commentary
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.* • *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.*	• *Drilling is oriented perpendicular to mineralisation or as close to perpendicular to mineralisation as possible.* • *The orientation of the drill direction has not introduced a sample bias.*
Sample security	• *The measures taken to ensure sample security.*	• *The samples were taken under the supervision of an experienced geologist employed as a consultant to BKT.* • *The samples were transferred under BKT supervision from site to the local town of Mahenge where the samples were then transported from Mahenge to Dar es Salaam, and then transported to Mwanza where they were inspected and then delivered directly to the ALS Global process facility.* • *Chain of custody protocols were observed to ensure the samples were not tampered with post-sampling and until delivery to the laboratory for preparation and analysis.* • *Tamper proof plastic security tags were fastened to the samples bags. No evidence of sample tampering was reported by the receiving laboratory.* • *Transport of the pulps from Tanzania to Australia was under the supervision of ALS Global.*
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• *Trenching and drilling information collected by BKT has been evaluated for sampling techniques, appropriateness of methods and data accuracy by an external geological consultant.*

Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and 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 environmental settings.* • *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 sampling was undertaken on granted license PL 7802/2012.* • *It has an area of 293km^2.* • *The license is 100% owned by BKT.* • *Landowners of nearby villages are supportive of the recently completed sampling and exploration program.*
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• *Previous explorers completed some limited RC drilling and rockchip sampling but the original data has not been located apart from what has been announced via ASX releases by Kibaran Resources during 2011 and 2013.*
Geology	• *Deposit type, geological setting and style of mineralisation.*	• *The deposit type is described as schist hosted flaky graphite.* • *The mineralisation is hosted within upper amphibolite facies gneiss of the Mozambique Mobile Belt.* • *Over 95% of the exposures within the tenement comprise 3 main rock types that include alternating sequences of:* • *Graphitic schist – feldspar and quartz rich varieties.* • *Marble and,* • *Biotite and hornblende granulites.* • *Less common rock types include quartzite.*

Criteria	JORC Code explanation	Commentary

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 northing 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*
	  ○ *hole length.*
	• *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.*
		• *A summary of all material drill intervals is provided in Appendix 1.*

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.* • *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.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• *Exploration results have been reported as weighted averages allowing up to 2m of internal waste and minimum grades at 5% TGC.* • *No maximum or top- cutting was applied during the calculation of drill holes intersects.* • *Drill intervals are provided in Appendix 1.*

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *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').*	• *Drill hole results are reported as down-hole metres.* • *Sufficient drilling, mapping and trenching has been completed at the main prospects to understand the orientation of mineralised lodes. A range of drill holes angles were used during the exploration program with the majority drilled at -60˚ (refer to Appendix 1).*
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 drill hole collar locations and appropriate sectional views.*	• *Figures show plan location of drill holes, appropriately scaled and referenced.* • *Refer to images in the main body of the text*

Criteria	JORC Code explanation	Commentary
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 drill holes have been reported in their entirety.* • *All drilling results have been reported in past Exploration announcements.*
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.*	• *1 in 10 samples from the first drill programme were assayed for deleterious elements using a 40 element ICP method. No deleterious elements were observed, with background (low) levels of uranium and thorium.* • *1,078 bulk density measurements using the water displacement method from the oxide (limited) transitional and fresh zones.* • *The samples for the bulk density measurements were taken from diamond drill core.* • *Every diamond hole drilled used in this Resource Estimate has had intervals tested for bulk density generating a high quality dataset.*
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• *Additional drilling was conducted in the second half of 2016 to define further extensions of mineralisation at Cascades, with the intention of defining additional high grade, near surface resources* • *Ongoing metallurgical test work – flotation and particle size optimization.* • *Additional bulk density test work is planned, particularly focused on the oxide and transition material.*

Section 3 Estimation and Reporting of Mineral Resources

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

Criteria	JORC Code explanation	Commentary
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 validation procedures used.*	• *The drillhole database was compiled by BKT as Excel spreadsheets.* • *Maps, lithology, drill holes, trenches and test pit samples were also supplied for use in GIS format (MapInfo/Discover) and Excel spreadsheets.* • *The data have then been imported into a relational SQL Server database using DataShed™ (industry standard drillhole database management software).* • *The data are constantly audited and any discrepancies checked by BKT personnel before being updated in the database.* • *Normal data validation checks were completed on import to the SQL database and when viewing in Surpac and Leapfrog.*
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• *Steven Tambanis, Competent Person, has regularly worked on site from July 2014 to 2017, covering all aspects of work from early exploration through to 2017.* • *Aidan Platel, Competent Person, completed a site visit in August 2016 covering all aspects of site work for the current drilling programme.*
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• *The confidence in the geological interpretation is considered robust for the purposes of reporting Measured, Indicated and Inferred Resources. Graphite is hosted within graphitic gneisses of the Mahenge Scarp. These graphite rich zones generally strike N-S and dip to the east at 60-80° and are interpreted to originate from graphitic sedimentary units of the Mahenge Scarp.* • *The geological interpretation is supported by geological mapping and drill hole logging and mineralogical studies completed on drill programmes.* • *Weathered zones (oxide and transition) were interpreted based on the geological logs and coded into the block model.* • *No alternative interpretations have been considered at this stage.* • *The graphitic gneiss units are known to be continuous in strike length for up to 22km.*

Criteria	JORC Code explanation	Commentary
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 modelled mineralized zone for Ulanzi has dimensions of 2,500m (surface trace striking 020°) with four zones averaging in thickness of between 50-60m and ranging between 400m and 760m RL (AMSL).* • *The modelled mineralized zone for Epanko has dimensions of 1,025m (surface trace striking 000°) averaging in thickness of between 55-80m and ranging between 640m and 1,025m RL (AMSL).* • *The modelled mineralized zone for Cascade has dimensions of 900m (surface trace striking 020°) averaging in thickness 70m and ranging between 560m and 900m RL (AMSL).*

Criteria	JORC Code explanation	Commentary
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• *Grade estimation using Ordinary Kriging (OK) was completed using Geovia Surpac™ software for TGC (%).* • *Drill spacing typically ranges from 50m to 100m.* • *Drillhole samples were flagged with wireframed domain codes. Sample data was composited for TGC to 2m using a best fit method with a minimum of 50% of the required interval to make a composite. These were combined with 2m spaced trench samples plus individual 50m by 50m spaced base of test pit assays.* • *Potential influences of extreme sample distribution outliers were investigated to determine whether they needed to be reduced by top-cutting on a domain basis. The investigation used a combination of methods including grade histograms, log probability plots and statistical tools. Based on this, it was determined that some top cuts were required. The four Ulanzi domains were top-cut between 16.0% and 17.6% TGC. No top-cuts were required at Cascade.* • *Directional variograms were modelled by domain using traditional variograms. Nugget values for TGC are low to moderate (around 15 to 30%) and structure ranges up to 270m.* • *Block model was constructed with parent blocks of 10m (E) by 25m (N) by 10m (RL) and sub-blocked to 5m (E) by 12.5m (N) by 5m (RL). All estimation was completed to the parent cell size. Discretisation was set to 5 by 5 by 2 for all domains.*

Criteria	JORC Code explanation	Commentary
		• *Three estimation passes were used with differing distances at Epanko vs. Ulanzi and Cascade. This was done due to a tighter drill spacing at Epanko and Cascade. At Ulanzi the first pass had a limit of 150m, the second pass 300m and the third pass searching a large distance to fill the blocks within the wireframed zones. At Epanko and Cascade, the first pass had a limit of 75m, the second pass 150m and the third pass searching a large distance to fill the blocks within the wireframed zones. Each pass used a maximum of 24 samples, a minimum of 8 samples and maximum per hole of 5 samples.* • *Search ellipse sizes were based primarily on a combination of the variography and the trends of the wireframed mineralized zones. Hard boundaries were applied between all estimation domains.* • *Validation of the block model included a volumetric comparison of the resource wireframes to the block model volumes. Validation of the grade estimate included comparison of block model grades to the declustered input composite grades plus swath plot comparison by easting, northing and elevation. Visual comparisons of input composite grades vs. block model grades were also completed.*
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• *Tonnes are estimated on a dry basis.*
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• *Grade envelopes have been wireframed to an approximate 4 to 5% TGC cut-off allowing for continuity of the mineralised zones. Based on visual and statistical analysis of the drilling results and geological logging of the graphite rich zones, this cut-off tends to be a natural geological change and coincides with the contact between the graphite rich gneiss and the other adjacent country rocks (i.e. garnet gneisses and occasional marbles).*

Criteria	JORC Code explanation	Commentary
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 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.*	• *As graphite mineralisation is consistent along strike, has consistent widths and outcrops on steep ridges or ridge slopes (indicating low strip ratios), open pit mining methods are assumed.*
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.*	• *This estimate was prepared for the Pre-Feasibility Study as managed BatteryLimits Pty Ltd and released in April 2017. The Pre-Feasibility Study included a suite of comprehensive metallurgical test work programmes conducted by Bureau Veritas of Perth. Rock types sampled consist of oxide and primary mineralisation at Epanko North and Ulanzi plus oxide mineralisation at Cascades. Cascades primary mineralisation is being tested. These samples (taken as surface outcrop and diamond core) are considered to be representative of the mineralised zones.* • *A pilot plant consisting of 50 tonnes of Cascades and 40 tonnes of Ulanzi was conducted at SGS Lakefield Laboratory, Ontario Canada in April 2018. Ore types consisted of a mix of fresh drill core and surface sampled oxides from Ulanzi and Cascades. An extensive metallurgical test work program has been conducted as part of Definitive Feasibility Study, extending the work previously conducted in the PFS. The DFS program supported recovery and flake size estimates developed in PFS including grind and polishing performance.* • *All rock types tested from both lodes have returned high quality concentrates with coarse flake sizing and high purities.* • *Refer to earlier ASX announcements.*

Criteria	JORC Code explanation	Commentary
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.*	• *Environmental licence EC/EIA/2018/0352 has been granted for all PL's in the Mahenge project area on 29 August 2018. No conditions are attached to the licences.*
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.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• *The Company has completed specific gravity test work on 1,078 drill core samples across the Mahenge Project using Hydrostatic Weighing (uncoated).* • *Of these 1,078 samples, 587 are from within the modelled mineralised domains, primarily from fresh material (556 samples) and transition (37 samples).* • *Statistical analysis of the samples and comparison against depth and TGC grade identified a subjective relationship between bulk density (BD) and TGC grade. As such, the BD used for fresh material was the average for the deposits (90% confidence interval) at 2.73 g/cm3 and 2.74 g/cm3 at Cascade (with a standard deviation of 0.05).* • *For the modelled oxide/transition zone, there were only 37 samples available. Whilst the analysis of these samples produced the same BD as the fresh material, it was decided to use a slightly reduced BD of 2.6 g/cm3 at Ulanzi and 2.5 g/cm3 at Cascade. It is planned to increase the number of measurements on transition material samples in the next phase of work.* • *For the modelled oxide zone, there were 2 BD measurements completed to date. It is planned to complete a representative number of measurements on oxide material samples in the next phase of work using appropriate measuring techniques for the material type. For this resource, an oxide BD of 1.9 g/cm3 has been assumed.*

Criteria	JORC Code explanation	Commentary
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *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).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• *The Mineral Resource has been classified on the basis of confidence in the geological model, continuity of mineralised zones, drilling density, confidence in the underlying database and the available bulk density information. Maximum drill spacing for Measured Resource classification is 50m (northing) by 50m (easting). Indicated Resource classification is 100m (northing) by 50-75m (easting). Wider drill spacing is categorised into the Inferred Resources.* • *All factors considered; the resource estimate has in part been assigned to Measured and Indicated with the remainder as Inferred Resources.* • *The result reflects the Competent Person's view of the deposit.*
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• *Whilst Mr. Barnes (Competent Person) is considered Independent of the Company, no third party review has been conducted.*
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.* • *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.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• *The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resources as per the guidelines of the 2012 JORC Code.* • *The statement relates to global estimates of tonnes and grade.*

JORC Compliance Statement

Resource

The information in this report that relates to Mineral Resources is based on and fairly represents information compiled by Mr Lauritz Barnes, (Consultant with Trepanier Pty Ltd) Mr Aidan Platel (Consultant with Platel Consulting Pty Ltd) and Mr Steven Tambanis (previous Managing Director of Black Rock Mining Limited). Mr Barnes Mr Platel and Mr Tambanis are members of the Australian Institute of Mining and Metallurgy and have sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Tambanis is the Competent Person for the database and geological model, Mr Barnes is the Competent Person for the resource. Both Mr Platel (independent of Black Rock Mining) and Mr Tambanis completed the site inspections. Mr Barnes, Mr Platel and Mr Tambanis consent to the inclusion in this report of the matters based on their information in the form and context in which they appear. Mr Tambanis holds performance rights in the company as part of his total remuneration package.

Reserve

The information in this report that relates to the Ore Reserve Statement, has been compiled in accordance with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code – 2012 Edition).

The Ore Reserves have been compiled by internally by Black Rock Mining, under the direction of Mr John de Vries, who is a Member and Chartered Professional of the Australasian Institute of Mining and Metallurgy. Mr de Vries is the CEO and an Executive Director of Black Rock Mining and holds performance options in the company as part of his total remuneration package. Mr de Vries has sufficient experience in Ore Reserve estimation relevant to the style of mineralisation and type of deposit under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Mineral Resources and Ore Reserves."

Table 1 – JORC Table 1, 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.*	The Mahenge Project includes the Ulanzi, Cascade and Epanko North deposits. Resource estimate updates for Ulanzi (October 2016) and Cascade (July 2017) were prepared by Mr Lauritz Barnes (Trepanier Pty Ltd) the competent person for these resource estimations. At a cut-off grade of 3% Total Graphitic Carbon (TGC), the Ulanzi resource contains 111.8Mt of Measured, Indicated and Inferred materials with an average grade of 8.2% TGC. At a cut-off grade of 3% TGC, Cascade contains 60.0Mt of Measured, Indicated and Inferred materials with an average grade of 8.1% TGC. The Measured and Indicated proportions of these two resources were used as a basis for the conversion to the Ore Reserve. Epanko North resource has been excluded from the Definitive Feasibility Study (DFS) and is not represented in the Reserve estimate.
	Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.	The Mineral Resources are reported inclusive of the Ore Reserves.
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	The Competent Person (Mr John de Vries) first visited the proposed mining site of the project in February 2017 and on numerous occasions during 2018. The following observations are made: • The mining area is located near the town of Mahenge, Ulanga province Tanzania. The site is 480km south west of the capital Dar Es Salaam. • The site is connected by road to Dar Es Salaam. A rail connection (between Ifakara and Dar Es Salaam) is 70km from the project site. Travel time by road to Dar Es Salaam is 12 hrs, travel time to Ifakara is 2 hrs. • The port of Dar Es Salaam is the fourth largest Indian Ocean port in Africa, is has facilities suitable for export of containerised graphite concentrate. • Population density of the site area is relatively low without any substantial communities. The nearest town, Mahenge (population 8,000) is approximately 5 km to the east. • There is no power or water supply on site. Power supply to the town of Mahenge is inadequate to operate a processing plant, although 220kV national grid connections are available at Ifakara 70km away. TANESCO, the national electric company of Tanzania, have completed line upgrade studies and are planning to upgrade the power supply to Mahenge which will also supply the site with grid power. • The nearest railway line to site offering both freight and passenger transportation is a bi-national railway linking Zambia and Tanzania operated by TAZARA (Tanzania and Zambia Railway Authority). TAZARA has a railway terminal and rail siding facility at Ifakara. • The mining area is in rugged terrain with hills and valleys, there are few flat spots. The deposits occur along the ridges and substantial pioneering will be required to establish the mining areas. • Oxidised rock outcrops occur on the ridges while the valleys are covered with highly weathered transported materials. Some of the

Estimation and Reporting of Ore Reserves

Criteria	Explanation	Commentary
		highly weathered materials appear to be "free dig" without the need for drilling and blasting. • Diamond drill core indicates competent (fresh) rock conditions with high RQD values. This is favourable for pit walls and unfavourable for blasting. • There is a presence of sulphides, visible in the drill core. These may have an adverse impact of acid drainage. • The project area lies in a strongly defined wet and dry season climate. A net positive rainfall balance exists. • The site is positioned within the headwaters of the Kilombero River which is part of the Rufiji catchment basin. The water is used for agricultural and village drinking water. • There are creeks providing for local drainage. These can flow during the wet season which lasts from December to April. • While contour mining takes place (before the pit goes below the topography) free drainage is available with no risk of flooding. After this adequate pit dewatering will have to be established but no hydrological information is available to establish these dewatering needs. Water diversion works will be required during operation as the Ulanzi pit goes below the Mbaha river.
Study status	*The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.*	The DFS for the Mahenge Graphite Project is the basis for conversion of Resources to Reserves. The study was compiled in March 2018 and updated by CPC Engineering in October 2018.
	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 DFS was underpinned by a mine plan detailing mining locations, ore and waste quantities, mill feed quantities, and mill head grades. Scheduling is reported in monthly, quarterly and semi-annual periods for the first five years then annually for the rest of life of mine (LoM). Mine planning activities included pit optimisation, interim staged and final pit designs, mine and waste disposal scheduling, concentrate production estimation, and mining cost estimation. Modifying factors considered during the mine planning process included slope design criteria, mining dilution and ore loss, process plant recoveries, processing costs, general and administration costs, concentrate price and royalties, land access and permitting. For tailings management, the DFS has included dry stack tailings disposal system. Black Rock believes this disposal system offers a superior solution for tailings management and lowers project risk for a site located in a net positive rainfall environment and within the headwaters region of the large Rufiji catchment basin. The results of the DFS support the results from the PFS Optimisation Study completed in August 2017 and demonstrate that the Mahenge Graphite Project is technically achievable and economically viable.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	The mine plan adopted a processing plant feed grade of 8.75% TGC. To achieve this target, cut-off grades of 7.0% TGC and 3.8% TGC were applied at Ulanzi and Cascade respectively. These grades are designed to deliver the maximum NPV at the NPV max LoM planned grade of 8.75%. The mine plan is based on Measured, Indicated and Inferred resource materials however only the Measured and Indicated materials were converted to Ore Reserves. Inferred material included in reserves pit shells has been treated at zero value.

Estimation and Reporting of Ore Reserves

<table>
<tr><th>Criteria</th><th>Explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>No other quality parameters were applied during the reserve determination.</td></tr>
<tr><td>Mining factors or assumptions</td><td>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).</td><td>The pit optimisation and pit design work from the PFS Optimisation Study form the basis of the DFS. Pit inventory reported within the interim staged and final pit designs were used to generate a mining schedule which incorporates both Ulanzi and Cascade.

Factors such as slope design criteria, mining dilution and ore loss, processing recoveries, processing costs, general and administration costs, concentrate price and royalties were applied as part of the pit optimisation process. These have not materially changed during the DFS.</td></tr>
<tr><td></td><td>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.</td><td>A conventional open pit mining method using proven technology was chosen as the basis for the DFS due to the near surface and outcropping presentation of the graphite mineralisation, the relatively low stripping ratio and availability of land required to support the selected mining method.

This method is suitable as it is well proved with standard off-the-shelf equipment (i.e. low risk) and, due to the low population density, the presence of mine infrastructure such as pits and waste dumps will have limited negative land use impact on the local population.

Mine design criteria include minimum mining width, ramp width and gradient, pit exit location and slope design parameters.

The mining fleet consisting of 45t excavators matched with 20t 6x4 mine tipper trucks was selected to initially develop site access, site establishment works and subsequent development of mining areas including the requirement to excavate highly weathered materials, high in clay content. Following the pioneering activities, a fleet of 55t articulated dump trucks and 90t excavators are used to take advantage of improved mining conditions where higher productivity and lower mining cost can be obtained with the larger units.</td></tr>
<tr><td></td><td>The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.</td><td>The geotechnical parameters from the PFS Optimisation Study form the basis of the DFS. A high level geotechnical assessment was undertaken by geotechnical consultants Peter O'Bryan and Associates resulting in pit slope design guidelines. These guidelines, which vary with weathering classification appear appropriate and had been applied in the pit optimisation and pit design activities. The final pit designs were then validated by Peter O'Bryan and Associates for adherence to the design guidelines.

Ulanzi pit slope parameters:
<table>
<tr><td>Eastern Wall</td><td>0-30m below surface</td><td>30-40m below surface</td><td>>40m below surface</td></tr>
<tr><td>Face Height</td><td>5m</td><td>10m</td><td>20m</td></tr>
<tr><td>Face Angle</td><td>60 deg</td><td>60 deg</td><td>70 deg</td></tr>
<tr><td>Berm Width</td><td>4.5m every 5m</td><td>7m</td><td>7m</td></tr>
</table>

<table>
<tr><td>Western Wall</td><td>0-30m below surface</td><td>30-40m below surface</td><td>>40m below surface</td></tr>
<tr><td>Face Height</td><td>5m</td><td>10m</td><td>20m</td></tr>
<tr><td>Face Angle</td><td>60 deg</td><td>60 deg</td><td>65 deg</td></tr>
</table></td></tr>
</table>

Estimation and Reporting of Ore Reserves

Criteria	Explanation	Commentary
		(continued tables below)

Berm Width	4.5m every 5m	7m	7m

End Walls	0-30m below surface	30-40m below surface	>40m below surface
Face Height	5m	10m	20m
Face Angle	60 deg	60 deg	75 deg
Berm Width	4.5m every 5m	7m	7m

Cascades pit slope parameters:

	Completely to Highly Weathered	Moderate to Slightly Weathered	Moderate to Slightly Weathered
Face Height	5m	10m	20m
Face Angle	60 deg	60 deg	70 deg
Berm Width	4.5m	5m	7m

A geostatistical study to simulate grade control drill hole spacing was conducted by Trepanier Pty Ltd for potential grade control patterns applicable to the initial mining areas at Ulanzi. Based on the various combinations, a 15m (across strike) x 30m (along strike) drill pattern was selected as the initial drillhole pattern. Drill holes will be drilled at 60 degree inclination at 30m passes, overlapping at each bench and providing minimal disruption to the mining operation.

Drill hole cuttings will be sampled manually at every 1m interval using a three-tier riffle splitter for grade control then combined to form 2m composites. Grade control samples will be analysed at an onsite lab facility to be established next to the process plant. Assaying cost has been obtained from Bureau Veritas Perth to establish this facility. The grade control drill pattern will be optimised at operational phase when further data becomes available.

Criteria	Explanation	Commentary
	The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).	The Mineral Resource Estimates used as a basis for the conversion to the Ore Reserve were the Ulanzi October 2016 resource model (bkt_mahenge_2016_09_v1_bm_Surpac) and the Cascade July 2017 resource model (bkt_mahenge_cascade_2017_03_v1). Pit slope design criteria and processing recoveries were applied in the pit optimisation process together with mining, processing, "General & Administration" and concentrate transport cost estimates, concentrator performance, including recovery and concentrate grade predictions, and revenue projections.
	The mining dilution factors used.	To allow for the effects of material mixing during blasting and the effects of ore-waste delineation inaccuracies in the pit, the resource models were reblocked with smoothing to model mixing of materials and by applying dilution and ore loss to edge blocks. For Ulanzi the process was applied to Measured and Indicated resource materials, for Cascade it was applied to Measured, Indicated and Inferred materials. This method reduces the Ulanzi Measured and Indicated resource materials from 46.5Mt @ 8.7%Cg to 46.5Mt @ 8.4%TGC (at 7% TGC cut-off grade) and the Cascade Measured, Indicated and Inferred resource materials from 28.8Mt @ 8.9%Cg to 28.8Mt @ 8.6%TGC (at 3.8% TGC

BLACK ROCK MINING LIMITED

Estimation and Reporting of Ore Reserves		
Criteria	**Explanation**	**Commentary**
		cut-off grade). These reductions are a combination of dilution and recovery.
	The mining recovery factors used.	See above.
	Any minimum mining widths used.	Ulanzi: Dual lane ramps: 18m wide road surface, 10% gradient max. Single lane ramps: 13m wide road surface, 10% gradient max. Minimum mining width 30m, 20m in final bench and good-bye cuts. Cascade: Dual lane ramps: 22m wide road surface, 10% gradient max. Single lane ramps: 16m wide road surface, 10% gradient max. Minimum mining width 30m, 20m in final 2 benches and good-bye cuts. Pit staging sequence and cutbacks are based on pit designs from the PFS Optimisation Study and repeated for the DFS.
	The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.	No Inferred resource materials have been included in the Ore Reserve estimate. The milling schedule includes Inferred resource materials. The Others material category consist of Inferred, Unclassified and Mineralised Waste materials. The percentage of Others materials processed is nil during the first 4 years and 7% the following 8 years. Thereafter from Year 13, it gradually increases. The risk of including the Inferred materials in the processing schedule is low as: • The volumes during the first 12 years are low. • Further refinements in scheduling may reduce the dependency on Inferred materials during the earlier years. • A budget allowance to upgrade the Inferred materials to Indicated level has been included in the project cost estimate (from Year 13 onwards).
	The infrastructure requirements of the selected mining methods.	The infrastructure for mining include fuel & oil storage facilities, fuel bay, workshops, wash bay, magazines, bulk emulsion storage facility, offices, lunch and ablution facilities, and a first aid room.
Metallurgical factors or assumptions	*The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.*	The concentrator plant utilises crushing, grinding and flotation technology to produce a minimum graphite concentrate grade of 95% TGC. Additional circuits have been designed and costed to produce graphite concentrate grades of 97.5% and 99%. The concentrate will be transported in loose 1t bulka bags which will be XXX and containerised at Ifakara The initial concentrator proposed at Ulanzi has a nameplate capacity of 1Mtpa of ore with a feed grade of 8.75% TGC. At Year 3, a second module is commissioned doubling total capacity with ore processed at a rate of 2Mtpa. An additional module is added and commissioned in Year 5 tripling the original ore process throughput rate to 3Mtpa. This third module will be fitted in a second concentrator proposed at Cascade.

Estimation and Reporting of Ore Reserves		
Criteria	**Explanation**	**Commentary**
		Each concentrator process was designed and costed by CPC Engineering to achieve a graphite recovery of 93%.
	Whether the metallurgical process is well-tested technology or novel in nature.	The concentrator flowsheet is common for the treatment of graphitic carbon ores and metallurgical laboratory test work undertaken by SGS at Lakefield (Canada) has been used as a basis for the plant design. A total of 90t of drill cores and surface bulk sample was run through a pilot plant an initial phase of testing in early 2018. This testwork underpins the confidence that the plant is to meet expectations for throughput, recovery, concentrate grade and concentrate flake size. A further 500t of drill cores and bulk samples obtained in early 2018 as part of a metallurgical drill program is currently awaiting further testwork.
	The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.	Metallurgical test work was carried out by SGS in Lakefield (Canada). Flowsheet selection was based on results of numerous flotation/attrition tests undertaken on a bulk composite which provided high recoveries and high graphite purity. Variability follow up work was conducted on several drill hole samples and fresh and oxide ores to ensure the results were repeatable along strike and down dip in the significant mineralized zones. When the samples were subjected to the same flowsheet, consistent and repeatable results were obtained suggesting low variability with regard to recovery outcomes while targeting high concentrate grade. Pit optimisations are sensitive to concentrate pricing, and by definition flake size distribution and purity. Pricing assumptions used in the pit optimisation are based on Chinese export pricing 2015, 2016 and 2017 as supplied by Benchmark Minerals March 2016. Subsequent marketing work during the DFS has indicated potentially higher prices as realisable. These higher prices have not been considered in the ore reserve price assessment. For mine planning purposes an assumption of a homogenous distribution of flake distribution has been made. Short term variance in performance is managed by finger chevron feed strategy on the ROM.
	Any assumptions or allowances made for deleterious elements.	Metallurgical testwork had not identified any deleterious or radioisotopes. During the reserve estimation, no allowances have been 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	No further testwork was carried out beyond the batch testing outlined above.
	For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet specifications?	Not Applicable
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 was completed between December 2016 and January 2017. The assessment did not indicate any contra indications for the project. Subsequent to, the EIA, an Environmental Impact Study (EIS) process commenced in February 2017. However a review and resulting changes to the Tanzanian Mining Law during the second half of 2017 resulted in the withholding

Estimation and Reporting of Ore Reserves

Criteria	Explanation	Commentary
		of the EIS application. The EIS process will recommence following the release of this DFS. The project has been designated Application Reference Number (ARN) 6259 by the National Environmental Council of Tanzania. An environmental licence EC/EIA/2018/0352 for the project was granted on 29 August 2018. A receipt of a positive EIS review for the project will positively support the application for a Mining Licence. The company has no reason to believe that a mining licence will not be granted, upon application for a mining licence. The presence of sulphides has been observed in the drill cores. Mill tailings from the recent pilot plant testwork are currently undergoing long term stability testing at Graeme Campbell and Associates laboratory in Bridgetown WA.
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.*	The project is located 3km from the Mahenge access road. The project assumes on site power will be provided through grid power at project commencement. Black Rock has also made provision for diesel generators to be available to ensure availability of power at project commencement. Grid power cost assumptions are based industry standard costs and quotes from TANESCO (Tanzania national power authority). Onsite water treatment and an on site accommodation (120 man camp) are considered as part of the project. In line with Black Rock policy and meeting the Local Content requirements of the updated Mining Law, a majority of personnel will be sourced locally. Land for development of pits, plant and tailings storage facilitates is present within the project area. A well-defined process exists within Tanzania for land access for mining projects with a quantifiable pathway for determining compensation for loss of amenity or relocation. The close proximity of the scattered settlement to the revised plant site will require relocation of this village. Provision for compensation has been included in the capital estimate. Transportation of concentrates will be via Ifakara to the port of Dar Es Salaam. The concentrates will be hauled from site in bulka bags to Ifakara. Black Rock will construct and operate a new rail siding at Ifakara. Each bulka bag will be customs cleared before loaded into 40' sea containers prior to railing by TAZARA to the port of Dar Es Salaam.
Costs	*The derivation of, or assumptions made, regarding projected capital costs in the study.* *The methodology used to estimate operating costs.*	Mining costs were estimated from first principles for an owner operator scenario. Basis for the estimate are the mining schedule, haulage profiles and productivity assumptions, to estimate the resources for the activities (Clearing, Topsoil removal, Haulroad construction, Grade control drilling, Drilling, Blasting, Loading, Hauling, Rehandle) required to meet the schedule.

Estimation and Reporting of Ore Reserves

Criteria	Explanation	Commentary
		Mining capital costs were estimated from the initial equipment requirements and their replacement costs during the life of the operation using March-June 2018 equipment prices. Mining operating costs include equipment maintenance and operating costs such as personnel, fuel, tyres, explosives, ground engaging tools. Capital and operating costs for milling and onsite infrastructure have been obtained from vendor pricing and estimated from a first principals' basis where necessary. Vendor pricing forms greater than 80% of the estimated capital costs for the concentrator. In addition, Black Rock has formed a strategic agreement with Yantai Jinyuan Mining Machinery Ltd (Yantai), a major graphite process plant engineering company based in China's Shandong Province, to supply process plant machinery for the project. Freight estimates are based on firm quotes from reputable, in country logistics suppliers and TAZARA (Tanzania Zambia Railway Authority) a bi-national railway freight provider standard rates.
	Allowances made for the content of deleterious elements.	Metallurgical testwork had not identified any deleterious elements or radioisotopes. No allowances have been made for deleterious elements during the Reserve estimation.
	The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co- products.	Product sales are by long term contracts, on a peer to peer basis. Public price data is considered competitive industry intelligence with little disclosure of long term pricing, other than through third party consulting organisations. Graphite basket pricing used in this Reserve estimate has referenced natural graphite flake pricing sourced from Roskill 2018. Market pricing is forecast price FOB China. This is considered as spot pricing. Basket prices used in reserve assessment is based on sub baskets of flake of different sizes and composited to form a weighted average price for each deposit. Basket pricing is set out below for 97.5% product.

Mesh	95% Segment FOB Dar	97.5% Segment FOB Dar	99% Segment FOB Dar
32	1230	1467	1705
50	1106	1343	1581
80	1101	1339	1576
100	1039	1277	1514
-100	977	1215	1452
	1,063	1,301	1,538

Criteria	Explanation	Commentary
	Derivation of transportation charges.	Transport changes are based on quotes from reputable in country logistics providers including TAZARA (Tanzania Zambia Railway Authority) a bi-national railway freight provider. These have been accounted in derivation of price FOB Dar Es Salaam.

Estimation and Reporting of Ore Reserves		
Criteria	**Explanation**	**Commentary**
	The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.	Pricing basis is FOB Dar es Salaam. See above for derivation of graphite basket price.
	The allowances made for royalties payable, both Government and private.	All royalties, a 16% free carried interest and taxes have been considered in the assessment. VAT is assumed to be fully refunded on export of product.
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.*	A premium of 2.5% has been applied to account for the increased purity (98%-99%) of Black Rock's product relative to the reference Chinese basket of 94% - 95%. A further adjustment was made to equalise freight between China and Dar es Salaam to ensure pricing is based on equivalent basis. Pricing basis is FOB Dar es Salaam. Marketing and realisation costs have been considered as part of the operating cost.
	The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.	Company specific price estimates vary from external industry sourced data, however for external public reporting of valuation, referenced public data has been selected. Pricing has been referenced Roskill Natural and Synthetic Graphite: Global Industry, Markets and Outlook, 2018 © Roskill, 2018. Roskill estimates have been modified by Black Rock to account for targeted grades not being reported, and for flake sizing not considered by Roskill. Time periods have been averaged over time to generate a real price for project start date. FOB realized pricing has been generated by removing an evenly weighing for freight between Tanjin, Tokyo and Busan from prices FOB China. Nominal frictional costs for agency, long term contract discounts of 2.5% each are then added to generate prices FOB Dar es Salaam.
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.*	Graphite flake is an internationally traded industrial mineral concentrate. Traditional uses include refractory, lubrication and expanded flake for insulation. Significant growth in the Lithium Ion Battery sector, of which graphite is a key input, is widely forecast to increase volumes in the near term.
	A customer and competitor analysis along with the identification of likely market windows for the product.	Chinese production currently dominates freely traded graphite production, and is considered to form spot pricing. The discovery of the East African graphite province has led to a number of projects being identified. Development of all projects will exceed current projection for demand. Mahenge's staged development strategy is designed to ensure market shocks associated with significant increases in available volume are managed.

Estimation and Reporting of Ore Reserves		
Criteria	**Explanation**	**Commentary**
		Mahenge's product profile is for 70% flake and 30% fines. The flake market is already in deficit and subject to successful pre-qualification market is assumed to support volume and pricing.
	Price and volume forecasts and the basis for these forecasts.	Graphite is sold by contract based on the performance of market samples provided to customers. Current graphite market volumes are estimated at 800 Kt, with most production being of Chinese origin. Industry analyst Roskill estimate that by 2025, the global volume will rise to 1600kt. Existing mine closure of 0.4mt indicate new production of 1.2mt will be needed by 2025. Black Rock's product of above average industry purity, is well suited for the energy storage market and other high end industrial applications (eg. fire cladding material). In the absence of transparent pricing and contracted volumes, the Reserve is considered to be of a Probable level of confidence.
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.*	The project economic analysis has been performed by PCC on behalf of CPC Engineering and Black Rock. The assumptions used in the Ore Reserve analysis are as follows: • All Inferred material assigned zero value and assumed to be waste • 10% discount real • LoM Cash costs $401 USD • Payback Period 3.1 years from first production • NPV $1,593M USD Real before tax • NPV $1,093M USD Real after tax • IRR 58.5% Real before tax • IRR 46.9% Real after tax • Capital stage 1 - 116.4M USD for 1Mtpa throughput • Capital stage 2 – 69.5M USD Capital stage 3 – 113.2M USD
	NPV ranges and sensitivity to variations in the significant assumptions and inputs.	The project is relatively insensitive to capital and operating costs. However it is sensitive to product grade and price obtained. A 10% change in grade impacts NPV by 16%, and a 10% change in price impacts NPV by 19%.

Estimation and Reporting of Ore Reserves

Criteria	Explanation	Commentary
Social	*The status of agreements with key stakeholders and matters leading to social licence to operate.*	The EIS process commenced in February 2017. The EIS process was withheld due to changes in the Tanzanian Mining Law during the second half of 2017. The EIS process will recommence following completion of the DFS for an on scheduled receipt of a mining licence ahead of project development in Q1 2019.
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.*	A risk analysis was undertaken and summarised by CPC Engineering. Three key risks were identified: • Delays to the project would result in the project missing the anticipated capital and offtake market windows • Risk of funding not being available to find the project to construction and full operation • Risk that Black Rock is not able to achieve full pricing for it's product
	The status of material legal agreements and marketing arrangements.	Mining licence application is underway as part of the EIS process. It is on hold pending the availability of updated information contained in this DFS. There is no reason to believe the EIS will be unreasonably withheld.
	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 part on which extraction of the reserve is contingent.	EIS application is on hold. It is anticipated that an application for a mining licence will be completed by December 2018. In the absence of a granted Mining Licence the reserve is considered to be of a Probable level of confidence.
	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).	Because there is no certainty that all assumptions will materialise the Measured and Indicated materials within the schedule have been converted to the Probable reserve category.
Classification	*The results of any audits or reviews of Ore Reserve estimates.*	No external audits have been undertaken.
Audits or reviews	*Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.*	The Reserve is based on a current DFS completed in October 2018. Economic assumptions are based on current pricing as at September 2018 and reflect current economic circumstances. The Resource estimate was completed in October 2016 and July 2017. Statistical investigations have been undertaken on 2m composites within the mineralised domains (zones), as applied to an Ordinary Kriged grade estimate. The relative precision of an estimate is consistent with the JORC classification methodology. A very low portion of non-classified material is noted for the first 20 years of the mine schedule with increasing portions thereafter. A large portion of resource is classified as Measured in the production schedule. All Ore

BLACK ROCK MINING LIMITED

Estimation and Reporting of Ore Reserves		
Criteria	**Explanation**	**Commentary**
		Reserve estimates are considered as Probable due to marketing considerations and a fully granted Mining Licence.
Discussion of relative accuracy/ confidence	*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 resource, and hence the associated reserve, relate to global estimates.
	Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.	The project is at the study stage. Continued advancement through pilot plant and Front End Engineering Design Study will reduce risk to the invest cost and operating parameters of the project. This will be expressed as a reduction of contingency applied to the capital estimate, EPC estimate and operating cost estimate. Irrespective of reduced contingency as a consequence improved study precision, the Reserve will continue to classified as Probable until there is enforceable offtake agreement for an economically important volume of production.
	It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Project has completed a Pre-Feasibility study in March 2017 and a subsequent update PFS Optimisation study in August 2017. An absence of production data precludes comment further comment.