30 January 2019

BlackEarth Minerals NL

ACN: 610 168 191

Level 1
675 Murray Street
West Perth WA 6005

PO Box 1088
West Perth WA 6872

Mobile 0411 475 376
info@blackearthminerals.com.au
blackearthminerals.com.au

ASX Announcement

BlackEarth announces positive Scoping Study results for the Maniry Graphite Project

Highlights

- **Pre-tax NPV of USD103m and 42% IRR**
- **Payback period from first ore is 2.7 years (Phase 1)**
- **Majority of Resource sits within a 40 year granted Mining Licence**
- **Project Life of 10 years based on Indicated Resources only**
- **Start-up capital estimated at a low USD$41M (Phase 1)**
- **High recovery and quality product produced**
- **Phase 2 expansion (doubling output) USD$29M planned to commence production Year 4**
- **Sensitivity analysis indicates that the project is most sensitive to price and grade assumptions**
- **Scoping study completed within 9 months from first drill results and 12 months since IPO**

BlackEarth Minerals NL (ASX: BEM) ("**BlackEarth"**, the "**Company"**) is pleased to provide the outcomes on the scoping study for the Maniry Graphite Project which covers a total of 142 km^2 in southern Madagascar.

The Scoping Study, completed by BatteryLimits in Perth, was based on extensive metallurgical testing, including variability work, completed on the Company's Indicated Resource only. The bulk sample was taken from the Razafy Resource and was derived using BEM's significant assay, XRF, XRD and mineralogical database results obtained over the life of the project.

The Indicated Resource of 8Mt at 7.22% total graphitic carbon (TGC) falls within the Project's substantial Exploration Target of 260-380Mt at 6-8% TGC announced in August 2018, highlighting the enormous potential that the Company now has to build and subsequently expand its Maniry Graphite Project, whilst maintaining a long mine life.

A summary of the Scoping Study results is tabled below. The full Scoping Study summary, as produced by Battery Limits for BEM is attached to this ASX release.

Managing Director, Tom Revy commented:

"The Company has now transitioned from graphite explorer to developer with the completion of the Scoping Study.

This is a milestone moment in the Company's brief but extremely productive history since its initial listing on 19 January 2018. The Company is close to finishing its detailed strategy for 2019, which includes the commencement of a detailed BFS, and product testing and marketing ahead of construction planned for 2020."

Scoping Study: Cautionary Statements

The Scoping Study referred to in this announcement has been undertaken in regards to providing the outcomes for the Maniry Graphite Project inclusive of a sensitivity analysis across a number of key parameters. The Scoping Study is a preliminary technical and economic study of the potential viability of the Maniry Graphite Project. It is based on low level technical and economic assessments that are not sufficient to support the estimation of ore reserves.

Further exploration and evaluation work and appropriate studies are required before BlackEarth will be in a position to estimate any ore reserves or to provide any assurance of an economic development case. The Scoping Study is based on the material assumptions outlined below. These include assumptions about the availability of funding. While BlackEarth considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, funding will be required for both the feasibility study and the capital required to implement phases 1 and 2 of the Project and are currently estimated to be in the range of USD$40-70 million. Investors should note that there is no certainty that BlackEarth will be able to raise that amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of BlackEarth's existing shares. It is also possible that BlackEarth could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the project. If it does, this could materially reduce BlackEarth's proportionate ownership of the project, which is currently 100%.

Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Scoping Study.

TABLE 1

Financial Performance Summary		LOM
Project Life (processing)	(years)	10.0
Total LOM Net Revenue	(US$ M, real)	629.5
Total LOM EBITDA	(US$ M, real)	309.7
Total LOM Net Cash Flows Before Tax	(US$ M, real)	222.3
Total LOM Net Cash Flows After Tax	(US$ M, real)	177.8
NPV @ 10.0% - before tax	(US$ M, real)	103.3
NPV @ 10.0% - after tax	(US$ M, real)	78.4
IRR - before tax	(%, real)	41.9%
IRR - after tax	(%, real)	35.4%
Project Capital Expenditure - Stage 1 (Year 0)	(US$ M, real)	41.0
Project Capital Expenditure - Stage 2 (Year 3)	(US$ M, real)	28.7
Sustaining Capital Expenditure - (LOM)	(US$ M, real)	16.6
Operating cost FOB (Port of Ehoala)	(US$ /t, real)	593
Payback Period - before tax-from 1st ore Phase 1	(years)	2.7
Payback Period - before tax-from 1st ore Phase 2	(years)	3.7

The metallurgical results released to the market in December 2018 highlighted Maniry's favourable mineralogy and consequently resulted in the robust economics released today. These results, together with other work undertaken as part of the Scoping Study highlight the following advantages.

- Attractive return of the Maniry Project which results in a short payback period in a well-regarded jurisdiction;
- Advantage and value of the Company's granted 40 year mining lease 5394, on which the Indicated Resource largely sits;
- Justification for the planned expansion to be completed in Year 4 which will largely be funded from Phase 1; payback for Phases 1 & 2 = 3.7 years;
- Significant proportion of large and jumbo flakes (50%) in the concentrate which can attract high product premium pricing;
- Low mining strip ratio (LOM 0.9) which has a positive impact on mining costs; and
- Soft to medium ore hardness and low abrasion which should have a positive impact on mining and processing costs.

Sensitivity Analysis

Sensitivity analysis indicates that the project is most sensitive to price and grade assumptions, followed by operating expenditure and capital expenditure assumptions and is summarised in Figure 1 to Figure 4.

Figure 1 Sensitivity Analysis (NPV, before tax, real)

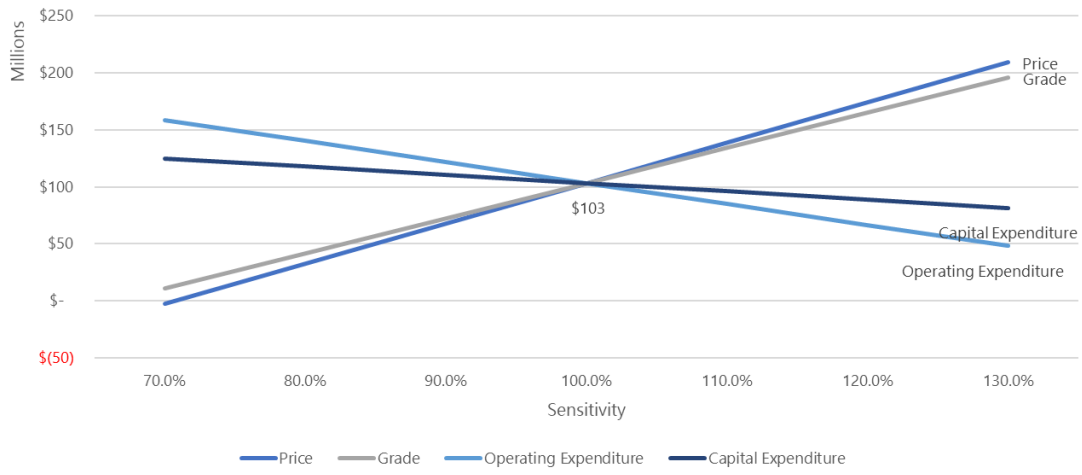


Figure 2 Sensitivity Analysis (IRR, before tax, real)

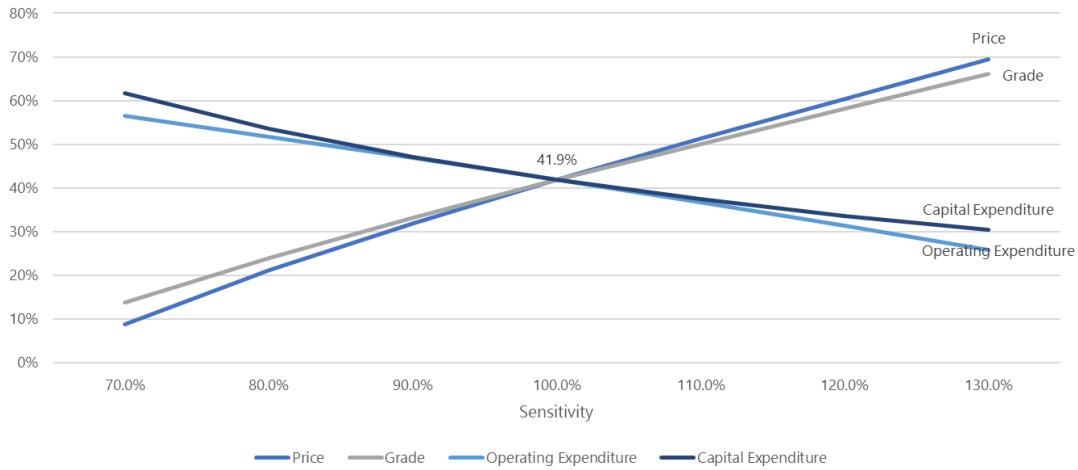


Figure 3 Sensitivity Analysis (NPV, before tax, real)

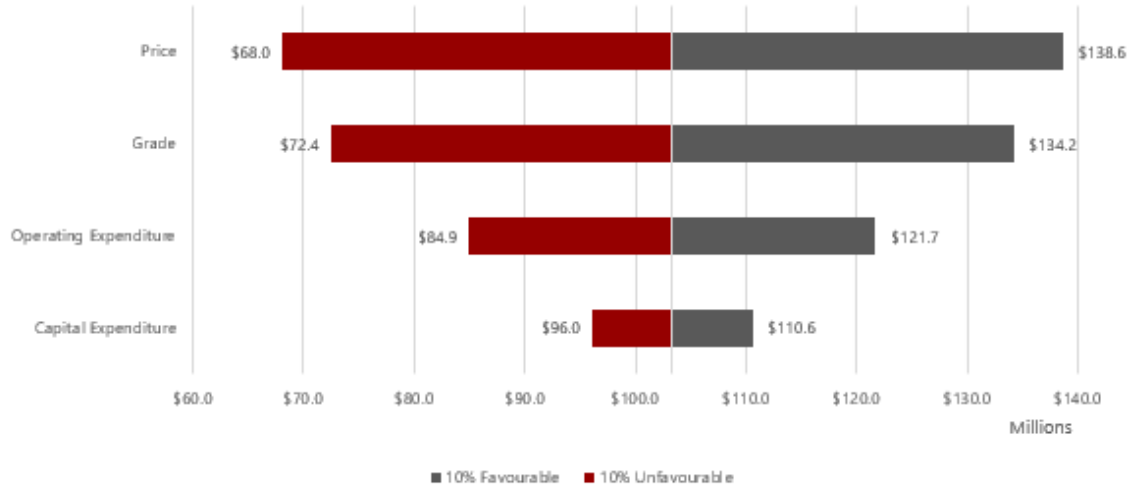
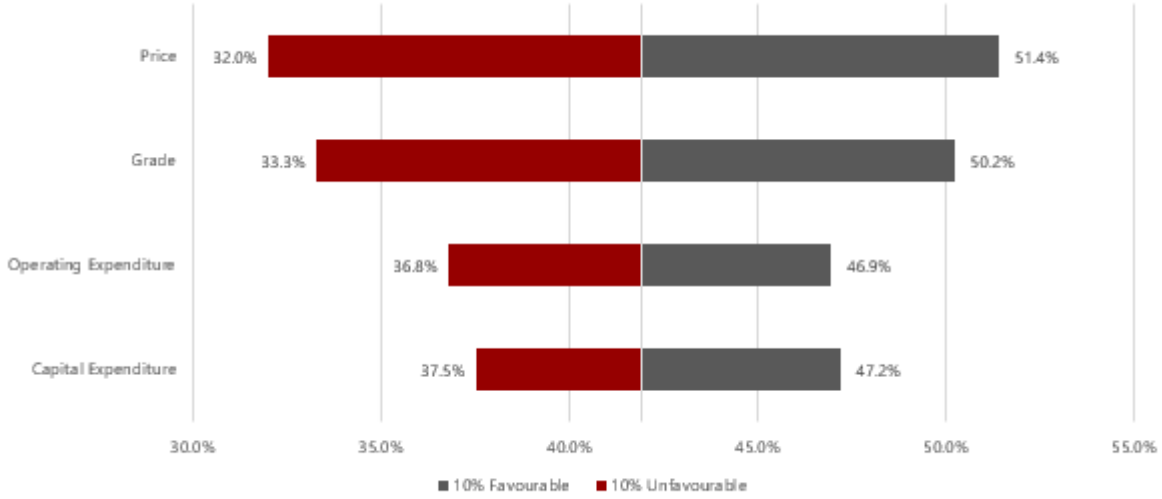


Figure 4 Sensitivity Analysis (IRR, before tax, real)



The financial analysis indicates the project delivers good financial returns, with moderate capital expenditure requirements in the context of the relatively long project life of 10 years after first ore processed. A relatively short payback period (before tax) of 2.7 years for Phase 1 and 3.7 years for Phases 1 & 2 after first ore processed mitigates financial risk relating to exposure to unfavourable outcomes in key variables such as long-term commodity prices. The Project can sustain significant unfavourable outcomes in key variables while still delivering positive financial returns.

Further information about these factors is contained within the attached summary.

CONTACTS

Tom Revy	BlackEarth Minerals NL	08 6145 0289 | 0411 475 376
Jane Morgan	Investor and Media Relations	0405 555 618

BlackEarth encourages investors to update their contact details to stay up to date with Company news and announcements here: http://www.blackearthminerals.com.au/update-details/

BlackEarth Minerals will be holding a special online investor briefing on January 30 to discuss these Scoping Study results and plans for 2019. Investors are invited to attend the online briefing and can register at: http://www.blackearthminerals.com.au/webinar

Competent Person's Statement

The information contained in this report that relates to Exploration Results and Mineral Resources is based on information compiled by Mr. Peter Langworthy, a member of The Australasian Institute of Mining and Metallurgy. Mr. Langworthy is an employee of OmniGeoX Pty Ltd which is a consultant to BlackEarth. Mr. Langworthy has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity that he is undertaking to qualify as a Competent Person as defined in the 2012 edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves." Mr. Langworthy consents to the inclusion in this report of the matters based on the information in the form and context in which it appears.

The information in this report that relates to the Exploration Target for the Maniry Graphite Project is extracted from the report entitled "Exploration Target Update" dated 14 August 2018 and is available to view on the Company's website (www.blackearthminerals.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in this report that relates to the Maiden Resource Estimation for Razafy at the Maniry Graphite Project is extracted from the report entitled "Update – Maiden Resource Estimation for Razafy at the Maniry Graphite Project" dated 14 August 2018 and is available to view on the Company's website (www.blackearthminerals.com.au). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The information in this document that relates to metallurgical test work results is based on information compiled and reviewed by Mr David Pass, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Pass is an employee of BatteryLimits. Mr Pass has sufficient experience relevant to the mineralogy and type of deposit under consideration and the typical beneficiation thereof to qualify as a Competent Person as defined by the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition). Mr Pass consents to the inclusion in the report of the matters based on the reviewed information in the form and context in which it appears.

For more information – www.blackearthminerals.com.au

Attachment A – BatteryLimits Executive Summary

BlackEarth Minerals NL

ACN 610168191

BATTERYLIMITS

BlackEarth Minerals NL

Maniry Graphite Project

Executive Summary

Revision: 1

Date: 28/01/2019

QA/CA

Revision	Purpose	Prepared By	Reviewed By	Date	Final Sign Off
C	Internal Review	David Pass	Josh Hearse	18/01/19	
D1	Internal Review	David Pass	Josh Hearse	18/01/19	
0	Client review	David Pass	T Revy	21/01/19	
1	Final	David Pass	T Revy	28/01/19	

Disclaimer

This document has been prepared by BatteryLimits (Pty Ltd) for the use of BlackEarth Minerals NL ("the Recipient"), based on the assumptions identified throughout the text and upon information and data supplied by third parties. While BatteryLimits (Pty Ltd) has used its reasonable endeavours (following methodology and procedures, and exercised due care consistent with the intended level of accuracy, using its professional judgement and reasonable care) to verify the accuracy and completeness of information provided to it and on which it has relied in compiling the document, it cannot provide any warranty as to the accuracy or completeness of such information to any person.

Any reliance by the Recipient or any other parties on this document is entirely at their own risk. BatteryLimits (Pty Ltd) does not accept any responsibility for any interpretation, opinion or conclusion that the recipient or any other parties may form as a result of examining the document; or to inform the recipient or any other parties of any matter arising or coming to BatteryLimits' notice which may affect or qualify any information which BatteryLimits (Pty Ltd) provides to the Recipient.

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1. Executive Summary

1.1 Project Description

BlackEarth Minerals NL (BlackEarth) is an Australian-based exploration company, listed on the Australian Securities Exchange with key exploration projects located in Madagascar including the Maniry Graphite and Ianapera Graphite Projects.

This Scoping Study relates to the development of the Maniry Graphite Project (Maniry or the Project).

In August 2018, BlackEarth announced a maiden Mineral Resource Estimate for the Razafy deposit, which is part of Maniry, of 11.2 Mt @ 7.1% Total Graphitic Carbon (TGC). The principal ore source for the Project is anticipated to be the Razafy deposit.

Table 1.1 Razafy Mineral Resource Estimate

Classification	Tonnage (Mt)	Total Graphitic Carbon (%)	Tonnage Percentage
Indicated	8.0	7.22	71%
Inferred	3.2	6.80	29%
Total	**11.2**	**7.10**	**100%**

In addition to resource definition drilling, a drill program was completed to generate core samples for metallurgical testwork. The drill core samples were used to generate representative composite samples for testwork aimed at providing initial process design information as well as graphite flake size and concentrate grades and recoveries for the Scoping Study.

The Scoping Study proposes the Maniry Project comprises the staged development of an open pit mine, processing plant and associated infrastructure including water supply, power generation, accommodation village and tailings storage facility. The plant will be initially designed to process 500kt/y and will be expanded by the addition of a second parallel module during its third year of production to process a total of 1Mt/y of ore at the commencement of year 4.

Preliminary pit optimisation and mining schedule have been completed with mining expected to be undertaken by conventional open cut mining techniques, on a contract basis to deliver 500 kt/y of ore increasing to 1 Mt/y of ore in year 4. The estimated LOM diluted mine ore grade is 6.3% TGC at a waste to ore ratio of 0.9:1.

The proposed method of graphite recovery will be by well-proven crushing, grinding and flotation processes. A product grade of 96% TGC (average) at nominal 93% recovery will be filtered, dried, screened and bagged ready for transport to market. Tailings will be stored in a tailings dam on the mining lease. The bagged product will be transported approximately 330 km to Port d'Ehoala on the south-east coast of Madagascar.

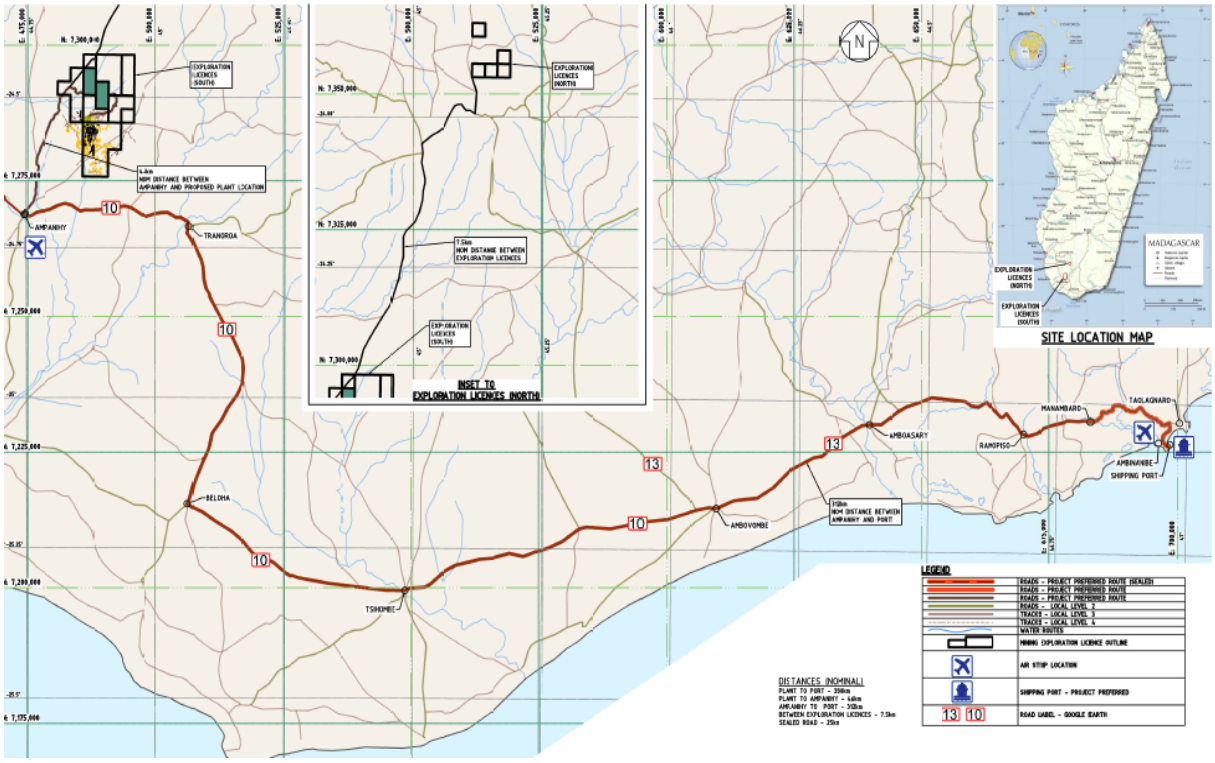
The primary water source is expected to be from a nearby bore field.

Power is expected to be supplied from an onsite diesel power station.

1.2 Location

The Maniry Graphite Project is in southwest Madagascar approximately 180 km south-east of Toliara, the capital of the Toliara Region and 225 km north-west from Port d'Elohoa. Access to the Maniry Project is initially via the arterial sealed road 'Route 7' to Andranovory and then via unsealed road to Ampanihy, the local township to the project. The Project is located 20 km northeast of this town via an unsealed road. The location and road to port are shown in Figure 1.1.

Figure 1.1 Project Location



1.3 Key Project Parameters

The key project parameters are summarised in Table 1.2.

Table 1.2 Key Project Parameters

Parameter	Units	Stage 1 and 2
Mine life (indicated ore)	years	10
Process throughput	Mt/y	0.5 Mt/y for Year 1 to 3 1.0 Mt/y from Year 4
Average feed grade	% TGC	6.3
Recovery rate for graphite	%	93
Nominal concentrate production	kt/y	30 for Year 1 to 3 60 from Year 4 to 10

1.4 Geology & Mineral Resource Estimate

The Maniry Graphite Project consists of multiple folded graphitic schists and gneiss strata with a surficially exposed strike length of 500-1000m. The Razafy deposit is located on the north-west limb of the Maniry Graphite Project and is comprised of three parallel lenses of graphitic mineralisation. The Razafy graphite mineralisation occurs as disseminated flakes within a quartz-feldspar-sillimanite schist.

The Razafy Mineral Resource Estimate (MRE) is based on 74 diamond drillholes drilled on 100m section lines with 30m drill spacing on sections. The MRE which forms the basis of the Scoping Study, classified as Indicated and Inferred, was prepared by a Competent Person and was reported in accordance to the JORC Code (2012 Edition) on 14th August 2018.

The Razafy MRE was estimated by ordinary kriging within constraining grade envelopes defined at a nominal 3% TGC cut-off grade. In accordance with Clause 49 of the JORC Code, the product specifications and general product marketability determined by the testwork program described in this document are considered to support the Mineral Resource Estimate for Industrial Minerals.

The Total MRE is 11.2 Mt @ 7.10% TGC at a 6% TGC cut-off grade with a resource category breakdown as presented in Table 1.3.

Table 1.3 Razafy Mineral Resource Estimate at a 6% TGC Cut-off Grade

Classification	Tonnage (Mt)	Total Graphitic Carbon (%)	Sulphur (%)	Tonnage Percentage
Indicated	8.0	7.22	1.30	71%
Inferred	3.2	6.80	1.60	29%
Total	**11.2**	**7.10**	**1.39**	**100%**

1.5 Mining

For the Scoping Study, preliminary pit optimisation was undertaken based on the BlackEarth provided Resource block model. The work undertaken included pit optimisations of several scenarios to create pit shells which were used to prepare a mining and processing schedule and mining costs.

A preliminary optimisation was run on Indicated and Inferred Resource using Whittle and Datamine software. The preliminary optimisation run included graphitic carbon revenue and assumed processing of all material above cut-off. The resulting shells provide the basis for schedule of the of up to 18 years of plant feed (Indicated only resource). The LOM pit shell and two staging shells (staging shell 1A and staging shell 1B) are shown in Figure 1.2. A second optimisation was run on Indicated Resource only shown in Figure 1.3.

Figure 1.2 Optimised Pit Shell Results for Indicated and Inferred Resource

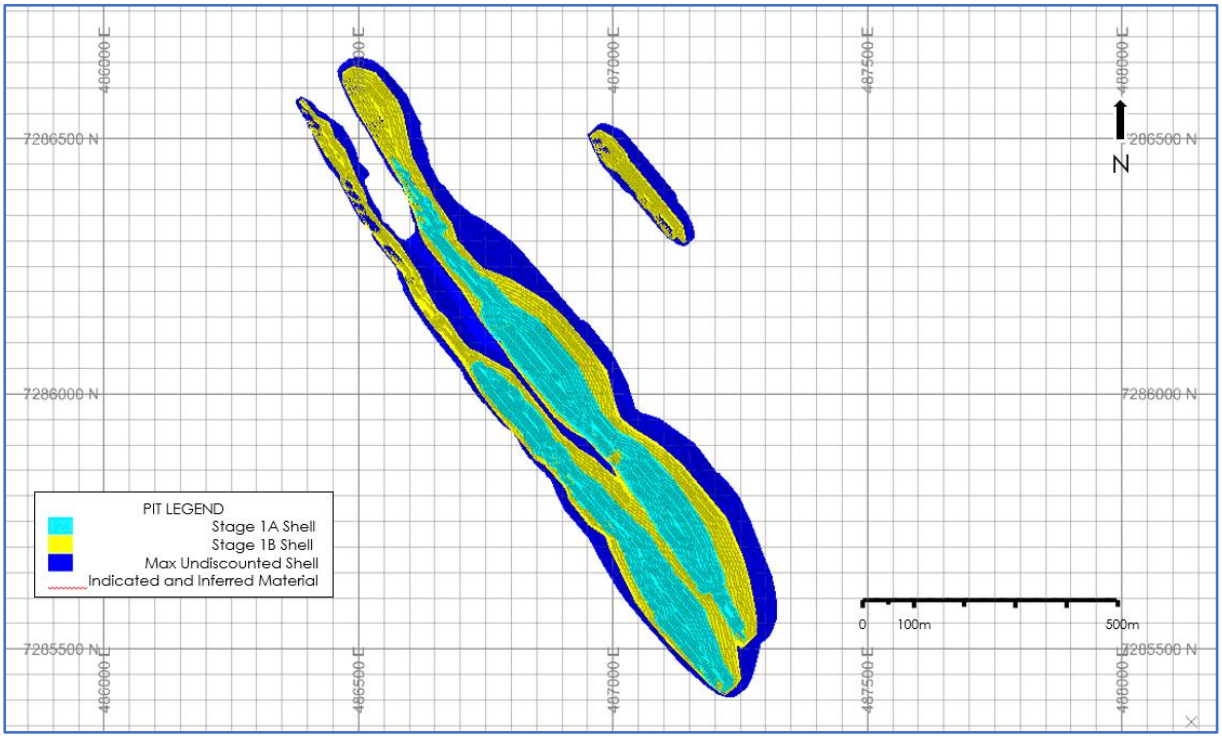
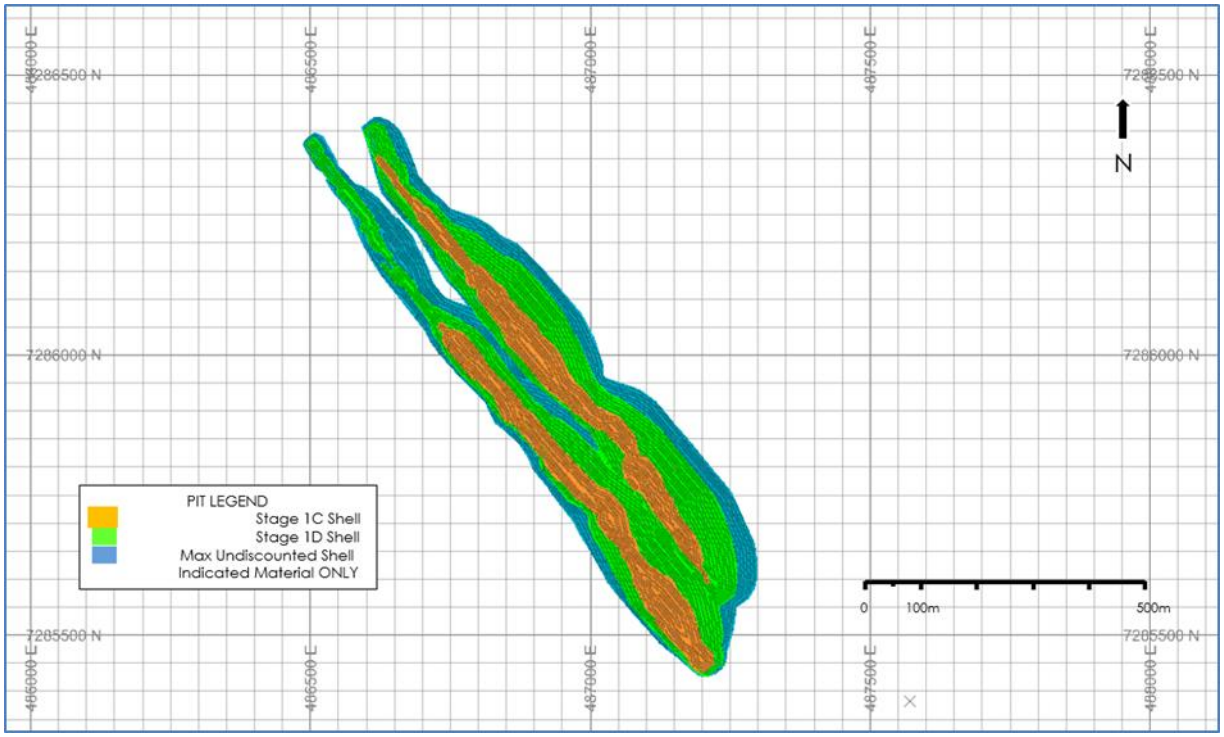


Figure 1.3 Optimised Pit Shell Results for Indicated Resource only



Six scheduling scenarios were run based on a 500 kt/y ore production rate and a staged expansion from 500 kt/y to 1 Mt/y ore production rate with a combination of pit shells based on both indicated and inferred resources and indicated resource only. The production schedule adopted for the study was based on the staged ore production rate 500 kt/y to 1 Mt/y comprising indicated resources only resulting in a 10-year mine life.

The plant feed schedule is shown in Figure 1.4. Concentrate Production is shown in Figure 1.5.

Figure 1.4 Plant Feed Schedule- Indicated Resource Only

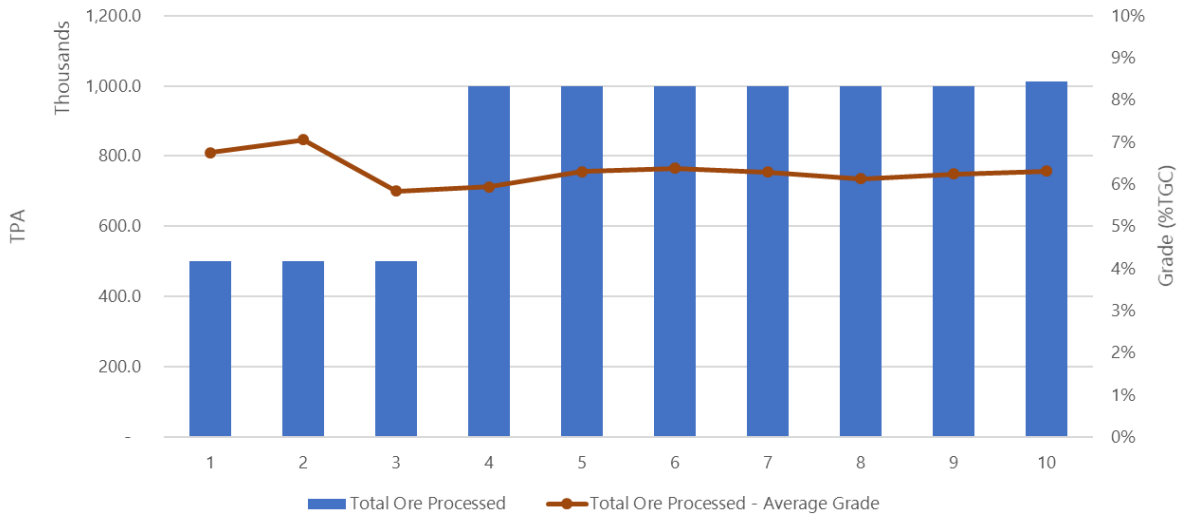
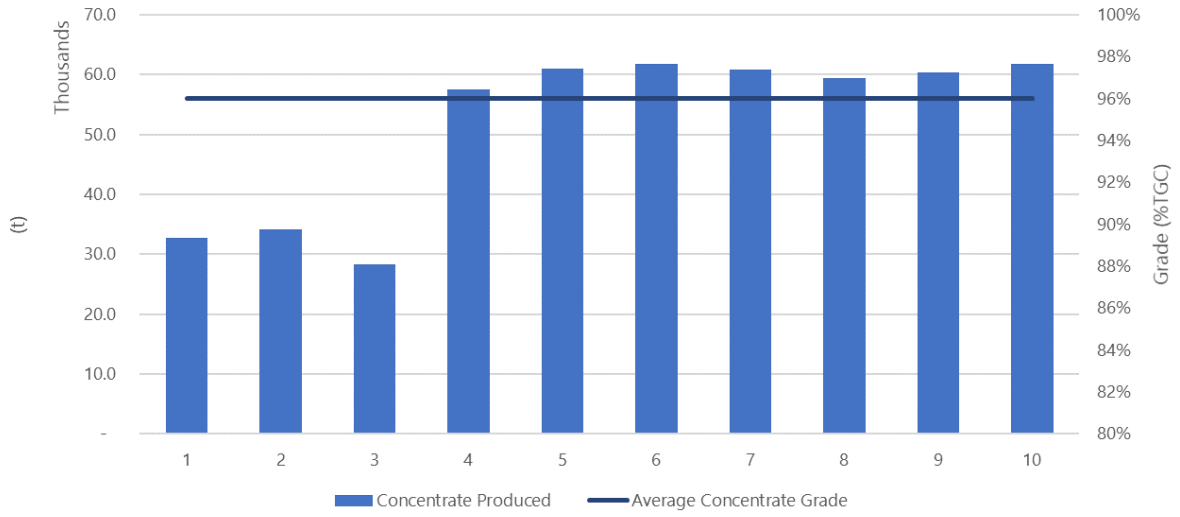


Figure 1.5 Concentrate Production



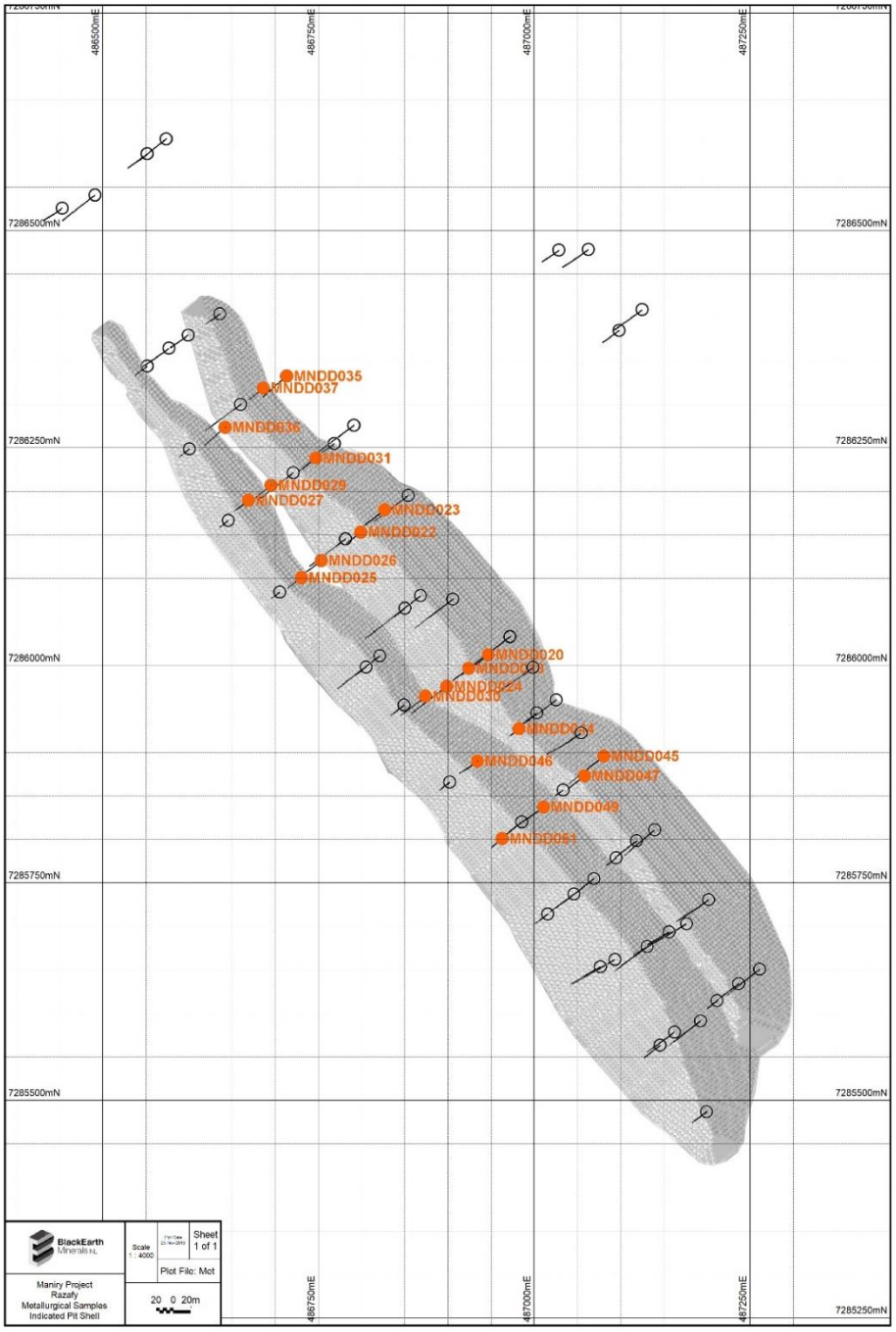
The mining will be by conventional open pit methods and assumes a contract mining model with costs estimated based on other similar projects.

1.6 Metallurgy

A diamond core drill program was conducted in early 2018 to generate samples for metallurgical testwork. The metallurgical testwork program was managed and supervised by BatteryLimits and was undertaken at ALS Laboratory (ALS) in Perth.

Selected interval samples of cut diamond drill core, from twenty drill holes, were used to generate ten composite samples. Approximately 800 kg in total was sent to ALS. Metallurgical drill hole locations are shown in Figure 1.6 with respect to the east/west veins.

Figure 1.6 Razafy Drill Hole Locations for Metallurgical Testwork



The composites were formed based on grades, mineralisation, spatial locations over the two east/west veins. Geochemistry characteristics were used to separate the chosen composites into groups or clusters, with homogeneous geochemical signature for variability testing. The Upper composites consisted of intervals with an RL number of over 260 while Lower composites have RL numbers under 260. The Master Composite was formed by proportionally combining all clusters.

A summary of head assays results for the composite samples is shown in Table 1.4.

Table 1.4 Composite Head Analysis

Composite ID	Number of Intervals	Total Carbon (%)	Total Graphitic Carbon (%)	SiO2 (%)	Sulphur (%)
Cluster 2	6	11.6	9.39	51.0	0.04
Cluster 7	5	8.10	8.04	51.6	1.16
Cluster 4	25	9.21	9.12	59.4	1.18
Cluster 3 Upper West	19	8.01	7.92	59.8	0.72
Cluster 3 Lower West	27	8.85	8.58	63.8	0.92
Cluster 3 Upper East	50	8.73	8.37	55.8	0.70
Cluster 3 Lower East	26	9.18	9.00	68.4	1.76
Upper Zone	C3 Upper and C4 Upper	8.67	8.70	62.0	1.30
Lower Zone	C3 Lower and C4 Lower	8.43	8.22	63.2	0.98
Master Composite	All Clusters	9.00	9.00	60.4	1.08

Testwork conducted on two Comminution composites show low to moderate ore hardness and competency which reflects the high depth of weathering and consequently has the potential to positively impact processing costs.

Metallurgical testwork achieved excellent results with flotation tests on the Master Composite. The testwork produced an overall final concentrate grade of 96% TGC with recoveries above 90% with a typical concentrate size distribution shown in Table 1.5.

Table 1.5 Final Concentrate Size and Grade Distribution

Flake Size	(microns)	Mesh	Master Composite	
			Mass (%)	TGC (%)
Super Jumbo	> 500	38	2.8	95.8
Jumbo	300 – 500	+50-38	17.3	96.1
Large	180 – 300	+80-50	29.8	95.6
Medium	150 – 180	+100-80	9.1	95.0
Small	-150+75	+200-100	23.6	96.8
Fine	< 75	-100	17.4	96.1

At the time of publishing this Scoping Study, a variability program is being conducted on the various Cluster Composites using an optimised flotation scheme. This program is expected to be completed shortly, the results of which will be included in the final Maniry flow sheet.

A further bulk sample is planned to be treated in early 2019 to produce graphite concentrate for marketing purposes.

1.7 Processing, Infrastructure and Logistics

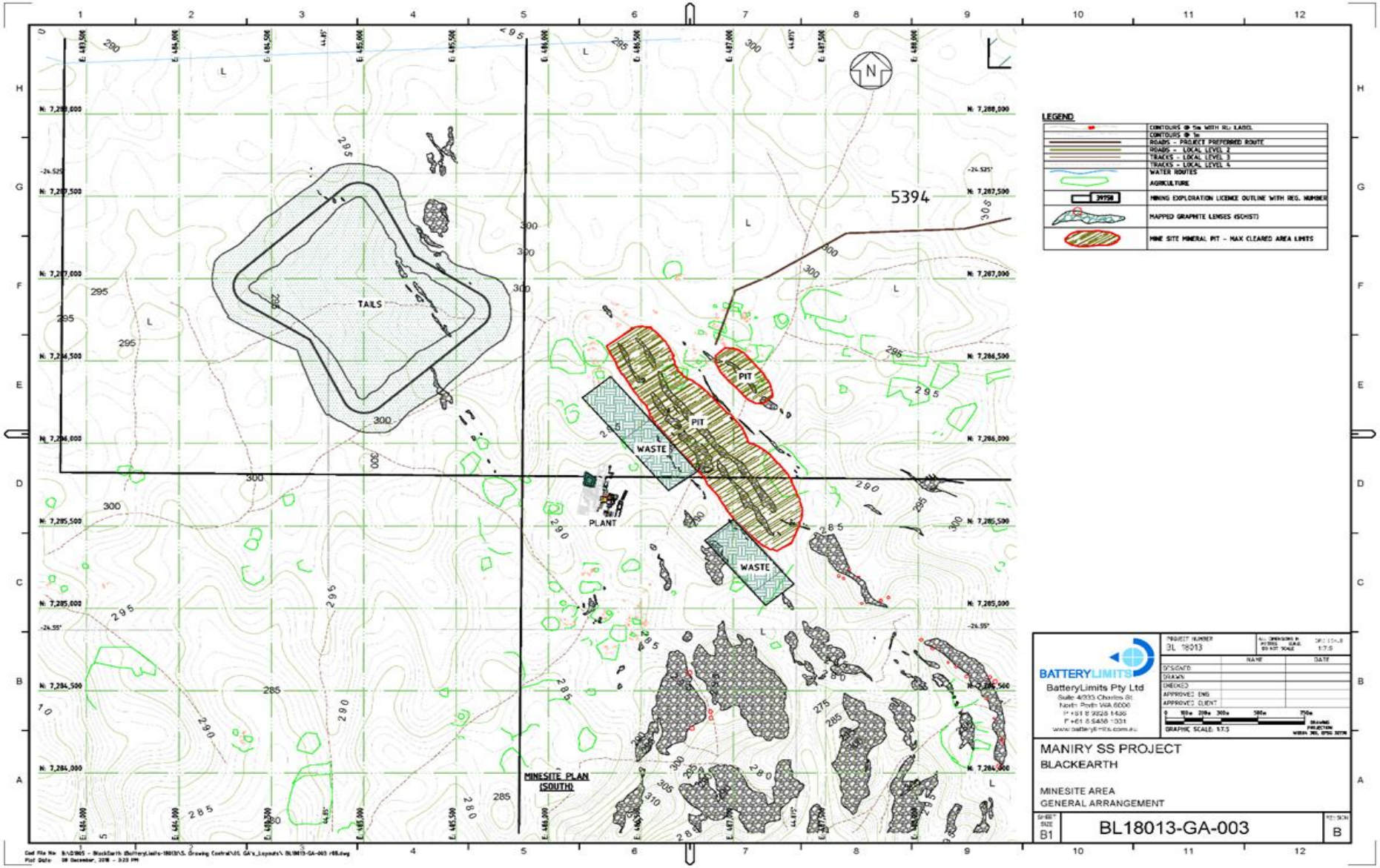
The plant and infrastructure will comprise:

- Process plant complete with complementary equipment, office and plant buildings
- Diesel power station
- Tailings storage facility
- Water supply/ Water catchment dam
- Accommodation village
- Access roads within the plant and the project site.

For the staged expansion there will be an increase in the TSF size to accommodate the higher deposition rate, increased on site power generation, water supply and camp facilities and an allowance for access roads upgrade.

A general site layout is shown in Figure 1.7.

Figure 1.7 Site Project Layout

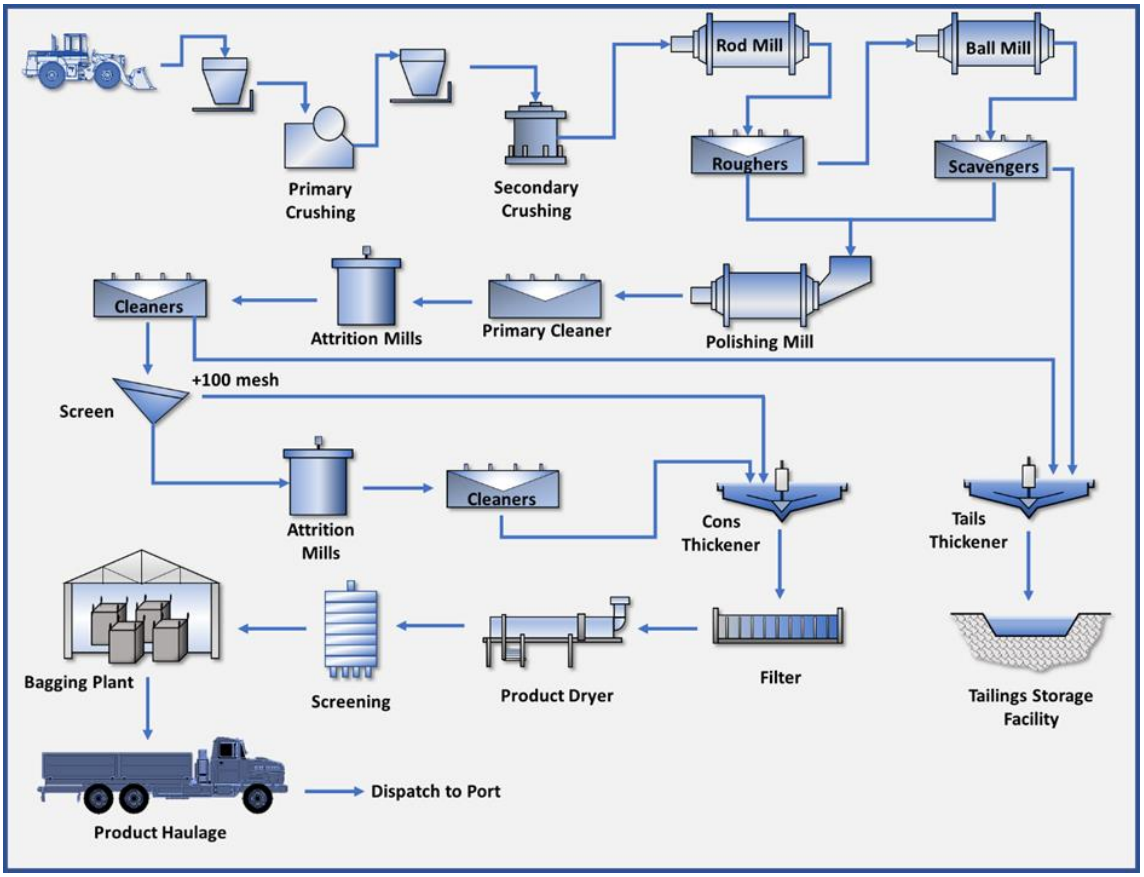


The basic process flowsheet proposed to treat the Maniry ore will include:

- 2 – Stage crushing
- Primary Rod mill to feed the rougher flotation cells with rougher tails being reground in a ball mill prior to a scavenging circuit
- Coarse and fine flotation with the screening of coarse material followed by inter-stage re-grind milling of the undersize to improve liberation and product purity
- Concentrate dewatering by thickening, filtration and drying
- Screening and bagging plant to produce the final products
- Stage 2 project expansion involves the installing of a second equivalent processing plant module:
    - Stage 1 comprising a 0.5 Mt/y plant
    - Stage 2 comprising an identical 0.5 Mt/y plant to be constructed adjacent to the Stage 1 plant increasing capacity to 1.0 Mt/y.
- The Stage 2 plant construction to be completed in year 3 commencing operation in year 4, with a resulting mine life based on the current indicated resource of 10 years
- Both stages to be independent with no significant capital pre-investment in Stage 1.

A summary flow sheet is shown in Figure 1.8.

Figure 1.8 High-Level Process Flow Sheet Schematic



Power is expected to be produced from an onsite owner operated power station.

The water sources are expected to be, in addition to the water recovered for reuse from in-plant thickeners, a combination of water abstracted from bores within the lease, pit seepage and inflow, and water from the tailings storage facility.

An initial stage 100-man accommodation village will be constructed with the remainder of the workforce expected to be accommodated in the local communities.

The Port of d'Ehoala will be used for export of product and import of consumables and equipment due to accessibility by road. The bagged graphite will be road hauled to Port of d'Ehoala and packed into containers at the port for shipment.

1.8 Financials

Product revenue assumptions and other key commercial assumptions are shown in Table 1.6.

Table 1.6 Key Inputs for Financial Model

Financial Parameter	Units	Value
Graphite average basket price	(US$ /t, real)	1215
Discount Rate	%	10
Exchange Rate	AU$: US$	0.73

Financial performance is summarised in Table 1.7.

Table 1.7 Financial Performance Summary

Financial Performance Summary		LOM
Project Life (processing)	(years)	10.0
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Project Capital Expenditure - Stage 1 (Year 0)	(US$ M, real)	41.0
Project Capital Expenditure - Stage 2 (Year 3)	(US$ M, real)	28.7
Sustaining Capital Expenditure - (LOM)	(US$ M, real)	16.6
Operating cost FOB (Port of Ehoala)	(US$ /t, real)	593
Payback Period - before tax - from 1st ore	(years)	3.7

1.8.1 Sensitivity analysis

Sensitivity analysis indicates that the project is most sensitive to price and grade assumptions, followed by operating expenditure and capital expenditure assumptions and is summarised in Figure 1.9 to Figure 1.12.

Figure 1.9 Sensitivity Analysis (NPV, before tax, real)

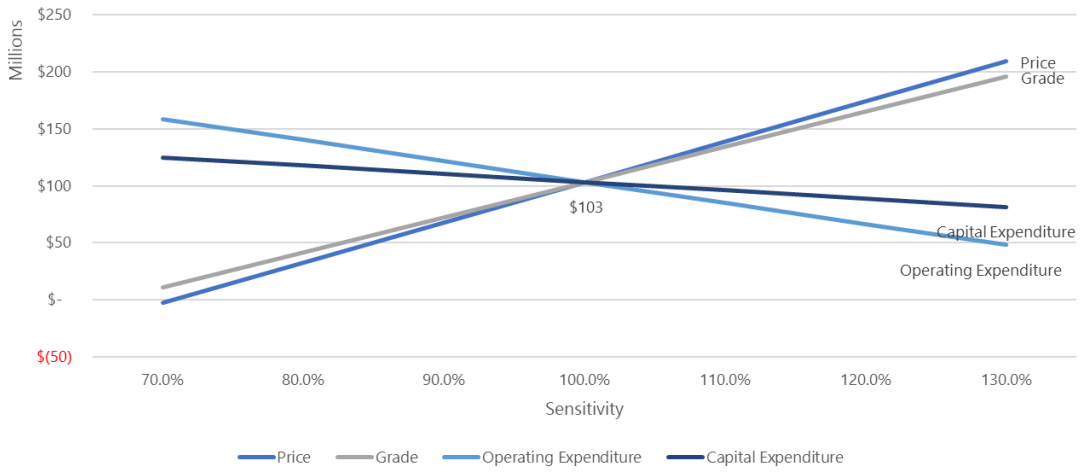


Figure 1.10 Sensitivity Analysis (IRR, before tax, real)

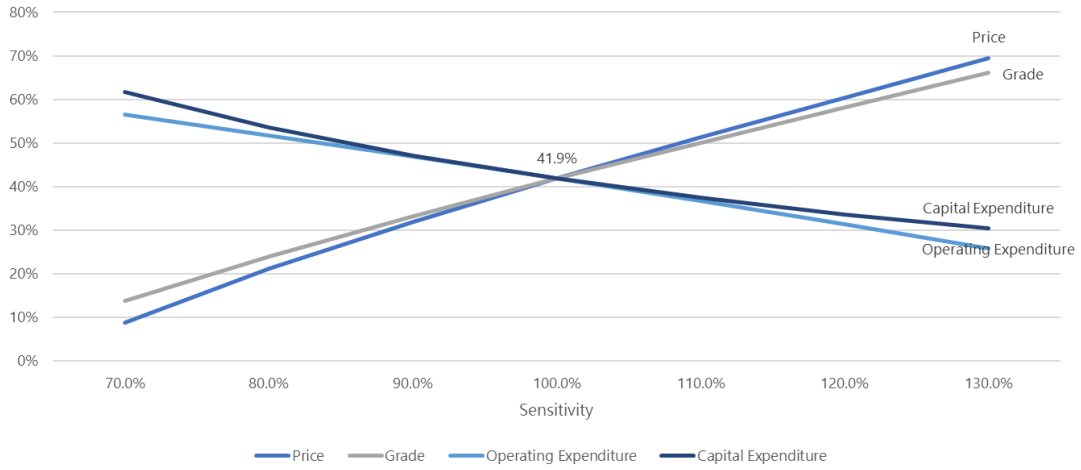


Figure 1.11 Sensitivity Analysis (NPV, before tax, real)

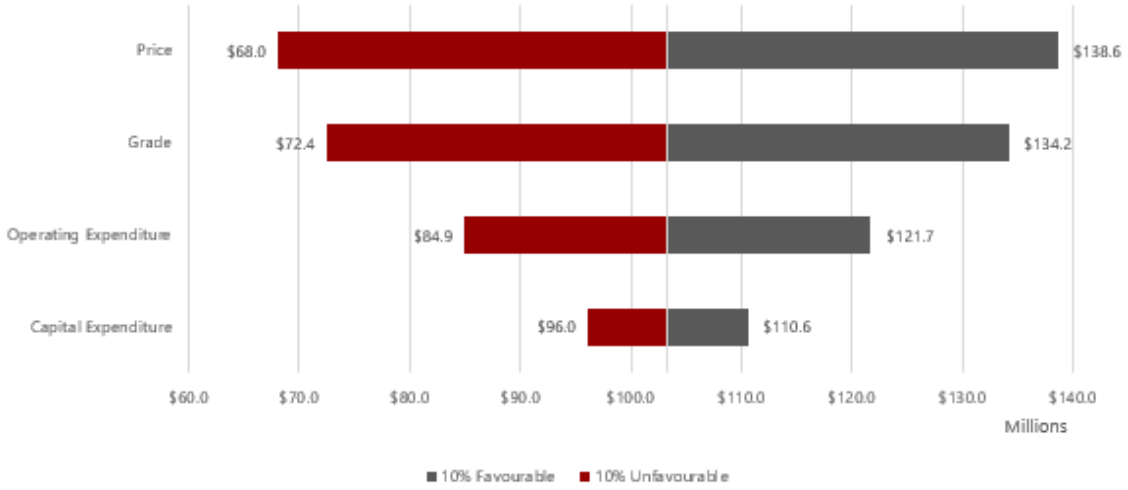
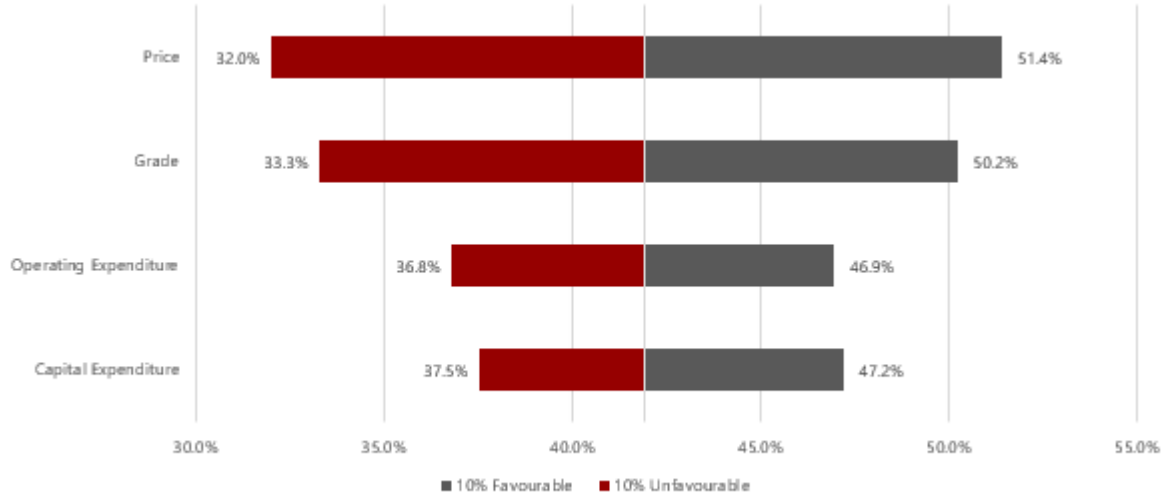


Figure 1.12 Sensitivity Analysis (IRR, before tax, real)



1.8.2 Conclusion

The financial analysis indicates the project delivers good financial returns, with moderate capital expenditure requirements in the context of the relatively long project life of 10 years after first ore processed. A relatively short payback period (before tax) of 3.7 years after first ore processed mitigates financial risk relating to exposure to unfavourable outcomes in key variables such as long-term commodity prices. The Project can sustain significant unfavourable outcomes in key variables while still delivering positive financial returns.

1.9 Capital and Operating Costs

The capital and operating cost estimates are presented in US dollars (US$) with a base date of Q4 2018 with no allowance for escalation. Operating costs have been prepared to an accuracy of ±30% and capital costs to ±35%. The costs have been estimated on a factored basis by BatteryLimits based on its database and benchmarked against comparable projects.

The capital and operating costs are shown in Table 1.8 and Table 1.9 respectively.

Table 1.8 Capital Costs

Cost Component	Stage 1 Capex (US$ '000)	Stage 2 Capex (US$ '000)
Process Plant	16,694	15,711
Project Infrastructure	12,192	6,508
Indirect Costs	12,144	6,524
Total	41,030	28,743

Table 1.9 LOM Average Annual Operating Costs

Annual Operating Costs	Av. Total (US$ k/y)	Total Cost (%)	Feed (US$/t)	Product (US$/t)
Technical Services & Mining	5,489	19.7%	6.47	117
Processing	14,701	52.7%	17.32	312
General & Administration	2,523	9.0%	2.97	54
Product Logistics (FOB)	5,189	18.6%	6.11	110
Total	**27,902**	**100.0%**	**32.88**	**593**

1.10 Marketing and Sales

For the purpose of this study, the price assumptions for the likely graphite products have been based on internal market studies into potential graphite prices and investigations into forward prices adopted by peer companies. The assumed average price per tonne of product for each flake size category is shown in Table 1.10.

Table 1.10 Assumed Average Price of Graphite Product

Flake Size	Microns	Mesh	Mass Dist.	Grade TGC %	Price (US$/t)	Basket Sales Price (US$/t)
Super Jumbo	> 500	35	2.8	>95	2,500	70
Jumbo	300 – 500	15	17.3	>95	2,200	381
Large	180 – 300	30	29.8	>95	1,400	417
Medium	150 – 180	20	9.1	>95	950	86
Small	75 – 150	100	23.6	>95	700	165
Fines	<75	-200	17.4	>95	550	96
Weighted Basket Sales Price (Mass Dist. % x Price)						**$1,215**

BlackEarth has not established any contracts or committed any of its production to an off-take agreement at this stage.

1.11 Environment, Social and Community

Potential environmental and socio-economic impacts that are likely to occur from the Project are:

- Water quality and quantity
- Dust
- Physical and economic displacement
- Employment and economic diversification
- Population influx
- Community health & safety
- Heritage impacts.

An Environmental Social and Impact Assessment (ESIA) process will be followed to provide the basis for environmental authorisation for the commencement of the project.

1.12 Conclusions and Recommendations

Following completion of the Scoping Study, conclusions are:

- The Maniry Graphite Project has a mining inventory to support an initial 10 year mine life
- The graphite flake size is coarse commanding a high value for the product
- The process plant design is based on proven conventional technology
- Project capital estimate for Stage 1 is $41 M with Stage 2 an additional $29 M will result in an average graphite product opex of $593 /t (FOB) with a resulting IRR of 41.9 % and NPV (nominal, at 10% discount factor) of US$ 103 M pre-tax and demonstrates strong financial returns based on the assumptions used. With a 10-year LOM combined with low Stage 1 capital costs and good margins the Project exhibits a strong NPV and IRR and provides a convincing case to advance the Project to the next stage of feasibility study
- Key risks are mainly associated with funding and securing offtake agreements and the impact of permitting on the project schedule. These risks are expected to be mitigated as the Project proceeds into its next phases of development.

BatteryLimits recommends that:

- BlackEarth proceeds with the project and commences next stage feasibility studies, including all project technical and engineering aspects comprising mining, metallurgy, hydrology, geotechnical, process design and process plant engineering, schedule and infrastructure
- The mining schedule is reviewed to optimise feed grade and strip ratio in years 1 to 5
- BlackEarth commences environmental processes leading to approvals and permitting for the project
- BlackEarth commences an intensive product marketing program to place the product into binding sales contracts

		Attachment B – Material Assumptions
Item	Criteria	Commentary
1.	Mineral Resource estimate used for assessment of potential Production Target	• For the purpose of this Scoping Study, the Mineral Resource Estimate (MRE) as published in the ASX announcement dated 14th August 2018 has been used. This estimate was prepared by a Competent Person in accordance with the JORC Code (2012 Edition)

2.	Parties participating in the Scoping Study	The following parties provided input to the Scoping Study:
		• BatteryLimits Pty Ltd managed the study as an independent consultant completing to the following inputs:
		  ○ Report Compilation
		  ○ Metallurgy
		  ○ Processing
		  ○ Processing Operating Costs
		  ○ Processing Capital Costs
		  ○ Transport and Logistics
		  ○ Overall Capital and Operating Costs
		  ○ Environment and Community
		  ○ High Level Implementation Plan and Schedule
		• BatteryLimits contributed to the following inputs:
		  ○ Infrastructure
		  ○ HR and Health and Safety
		  ○ High Level Risk Assessment
		  ○ Marketing and Product Pricing
		• Sigma Blue completed the geology and resource inputs for the study
		• OreWin Pty Ltd completed the Mining Capital Costs and Mine Optimisation
		• Modus Capital completed the Financial Analysis

3.	Study Status	• The Scoping Study has not been used to convert Mineral Resources to Ore Reserves. Modifying Factors based on information currently available have been applied to the Scoping Study

4.	Cut-off parameters used in potential mine analysis	• The portion of the Mineral Resource Estimate (MRE) above 2.34% graphitic carbon was reported
		• Marginal Cut-off grades, expressed as percentage (%) of graphitic carbon is defined as the grade where the value of the block is equal to the processing, and general and administration cost
		• The following inputs were used to estimate revenue per tonne of graphitic carbon:
		  ○ Graphitic carbon price: US$1300/t
		  ○ Metallurgical recovery: 93%
		  ○ Concentrate grade: 95%
		  ○ Government royalty: 2%
		• The following were estimated for the pit optimisation and cut-off grade analysis:
		  ○ Mining cost
		  ○ Process cost
		  ○ General and administration cost

		Attachment B – Material Assumptions
5.	Mining factors or assumptions used in the Scoping Study	• No conversion of the Mineral Resource to Ore Reserves was conducted as the work is for a Scoping Study • Mining inventory estimation: A pit optimisation was undertaken using the block model and processing parameters. This optimisation included the Indicated and Inferred Resource in the model with a second optimisation using the Indicated Resource only. From this pit shells and staging shells were selected for mine scheduling. The financial model was based on Indicated Resources only • Mining method: Open pit, staged, conventional truck and shovel has been selected as the basis of the Scoping Study. This mining method is deemed appropriate for the deposit • Ore body access: a pit ramp at either end of the pit is assumed due to the long nature of the deposit and the assumption of a waste dump at either end • Operating model: Mining contractor • Geotechnical considerations: Pit optimisations were performed with pit slopes of 40 degrees • Dilution: The optimisation allowed for 5% dilution • Further geotechnical investigation and assessment will be required as the study work progresses • Indicated and Inferred Resource have been included in the study. An Indicated only case was prepared that is used for the financial analysis. • Infrastructure: The Scoping Study includes allowances for infrastructure to facilitate the mining activities proposed including mining, processing, administrative and workshop infrastructure
6.	Metallurgical factors or assumptions used in the Scoping Study	• The metallurgical process proposed is a 2-stage crushing circuit feeding a primary rod mill so as not to overgrind any coarse flakes. The ground ore then is processed in a flotation rougher circuit before the rougher tails is reground for a scavenger circuit. This allows for coarse flake retention as well as added overall recovery • Comminution testwork has shown the ore to be soft to moderate, which will mean moderate power requirements in the comminution/milling circuit • The cleaner circuit is a conventional stirred mill followed by mechanical trough cells, which have been used widely by the Chinese graphite producers • A metallurgical program has been conducted at the ALS metallurgical services in Perth on a Master Composite as well as variability samples that represent the ore zones • Optimisation test work was conducted on the Master Composite prior to testing the variability composites • Variability has been shown to be limited • A 50 kg bulk sample, from the Master Composite, is being processed for marketing purposes • Further metallurgical test work and process design studies will continue as the project evolves investigating where further improvements can be made within the process
7.	Environmental	• The Maniry project area is located on both granted exploration and mining leases. It is expected that the project will have a manageable impact on the environment due to mining and processing operations • Proposed mining areas for the project fall within the granted leases • For statutory approvals and permitting requirements it is expected that surveys will be conducted for Flora and Fauna, Surface and Ground Water • Tailings will be thickened and stored onsite

		Attachment B – Material Assumptions

8.	Infrastructure	• Access to the project will be by road
		• Current infrastructure at the site consists of access roads and a small soft walled camp. New infrastructure for the project will include:
		  ○ Mining (pit, Waste Dump, Tailing Storage Facility)
		  ○ Processing
		  ○ Power
		  ○ Offices/workshops
		  ○ Camp
		• Above infrastructure will be within the tenement

9.	Capital and operating Costs	• Cost estimates are based on conceptual designs for the mine, process plant and site infrastructure • Capital costs have been estimated by Battery Limits for the process plant and related infrastructure, and OreWin for mining costs • The basis of capital estimates includes: a preliminary mining schedule and unit rates; pricing of processing equipment from database costs and vendor quotations; factored costs for delivery and installation; estimation of access road cost based on distance and unit rates; estimate of TSF costs based on volumes appropriate for the project site, and unit rates from reference projects; factored costs for EPCM and contingency • Mine operating costs are based on the mining schedule and typical unit rates. Other operating costs are based on usages and unit rates which typically apply to a graphite plant of this type in an African context • The cost estimate bases and results are considered to be consistent with the standards required for a scoping study • Costs were estimated in US$
10.	Revenue Factors	• A graphite concentrate basket price of US$ 1,215/t FOB has been used for economic modelling • The price assumptions for the likely graphite produced have been based on an internal market study into potential graphite prices and investigations into forwarding prices adopted by peer companies
11.	Market Assessment	• BlackEarth expects to carry out a full market analysis and product marketing program to place product into binding sales contracts

12.	Economic Evaluation	• A financial model was built to analyse the cash flows that would be generated by the Project. Financial performance is stated below:
		  ○ Total LOM Net Revenue (US$ M, real) 629.1
		  ○ NPV @ 10.0% - before tax (US$ M, real) 103.3
		  ○ IRR - before tax (%, real) 41.9%

13.	Social	• Proposed mining and infrastructure lie within the exploration and mining leases • ESIA & an ESMP will be conducted including residual baselining
14.	Other	• Not applicable
15.	Classification of Ore Reserves	• Not applicable as no Ore Reserve estimates made
16.	Ore Reserve Audits or Reviews	• Not applicable as no Ore Reserve estimates made
17.	Discussion of relative accuracy/confidence	• No Ore Reserve estimate has been made for the study • Metallurgical recoveries have been based on testwork data • Costs have been estimated by independent consultants utilising budget quotations, factoring, and cost data from similar projects • The estimated accuracy for the Scoping study is ±30% for operating costs and ±35% for capital costs

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 (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	Diamond drilling program - Sampling will consist of 2m composite samples of quarter core - typical 3-5Kg. Samples will be cut using a diamond blade core saw. Duplicate samples will be collected every 20th sample for QAQC purposes. CRM's will be inserted every 20th Sample for QAQC purposes. Sampling is considered to be comprehensive and representative. Remaining core was retained as a permeant reference. Total Graphitic Carbon content is measured at a laboratory using a CS analyser (Intertek Genalysis (Perth). Metallurgical samples were obtained from diamond drilling, ½ core . A split of crushed sample was used for head grade analysis , the remainder retained for metallurgical test work.
Drilling techniques	· *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	Diamond drilling. Core size is HQ and NQ typically in 0.5-1.5m runs. Core from a select number of holes will be orientated.
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.*	Core recovery is routinely recorded every metre by a trained geologist. No bias or relationship is observed at this point between recovery and grade. Recovery is typically +80% within weathered rock, and +95% in fresh rock in nearly all instances.
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.*	All holes are logged by a qualified and experienced geologist. All logging included descriptions of geotechnical, mineralisation, structural and lithological aspects of the core and was digitally recorded using an industry standard code system. Core is formally photographed. Data collected offers sufficient detail for the purpose of interpretation and further studies.
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.*	Quarter core will be cut using a diamond core saw and collected for assay. 2 metre composite sampling are deemed to be comprehensive and representative for the style/type of mineralisation under investigation. Duplicate samples are taken (remaining quarter core) every 20th sample for QAQC purposes
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 (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	Assaying is undertaken by Intertek Genalysis in Perth (Aus). Samples are pulverised to 75 micron, roasted to 420deg and digested with a weak acid. Final analysis is undertaken by CS analyser (Code: C73/CSA). This method is considered total. Standards and duplicates are routinely inserted every 20th sample by the BEM technical team as well as internal QAQC from the laboratory. No issues been observed with QAQC. Metallurgical work was undertaken by ALS Metallurgy Perth, managed by BatteryLimits Pty Ltd.
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.*	Significant intersections have been verified by alternative company personnel. No twin holes have been undertaken. All date is recorded digitally using a standard logging system and files are stored in a industry standard database.
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.*	All collars have been loacted using a DGPS (acuartee to 1cm) Projection and grid systems used: UTM (WGS84 Z38S). The down hole azimuth and dip is recoded using a Magshot down hole instrument (Accurate to 1deg)
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.*	Sample intervals are typically between 0.5-2.0m taken consistently through all ore zones. This spacing and distribution is considered sufficient for mineral resource estimations.
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.*	The orientation of the drilling is not expected to introduce sampling bias. Most drill holes have intersected the mineralisation at a sufficint angle to the strike and dip of the mineralised units.
Sample security	· *The measures taken to ensure sample security.*	Samples are cut and sampled on site before being transported to the company sample preparation facility in Antananarivo for preparation. Samples will then be freighted by DHL to Intertek Genalysis in Perth (Aus) for assay. It is reasoned that the samples will be under sufficient security.
Audits or reviews	· *The results of any audits or reviews of sampling techniques and data.*	Sampling procedures has been reviewed by an external auditors Sigma Blue Pty. Ltd. and OMNI GeoX Pty. Ltd. plus site visits at the beginning of the program.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

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.*	Work was undertaken upon permits 5394 & 39751 • The tenements are located within the inland South West of Madagascar approximately centred on the township of Ampanihy. • Tenements are held 100% by Mada-Aust SARL Ultimately a wholly owned subsidiary of BlackEarth Minerals NL. through Madagascar Graphite Ltd. • No overriding royalties are in place • There is no native title agreement required • Tenure does not coincide with any historical sites or national parkland • Semi-arid, thinly vegetated, relatively flat to low lying hills with sub-cropping rock. • Tenements are currently secure and in good standing.
Exploration done by other parties	· *Acknowledgment and appraisal of exploration by other parties.*	Regional mapping by BRGM, Historical diamond drilling and trenching by Malagasy Minerals. Ltd. (2014-2016)
Geology	· *Deposit type, geological setting and style of mineralisation.*	The project overlies a prominent 20km wide zone consisting of a folded assemblage of graphite and quartz-feldspar schists (<60% graphite), quartzite and marble units, with lesser intercalated amphibolite and leucogneiss. This zone, termed the Ampanihy Belt is a core component of the Neoproterozoic Graphite System. The belt is interpreted as a ductile shear zone accreted from rocks of volcanic and sedimentary origins.
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:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *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.*	Metallurgical testwork was undertaken on the drill hole samples referred to in the announcement.
Data aggregation methods	· *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* · *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.*	Metallurgical samples were composited across sample intervals interpreted to be geological units.A master composite was compiled from sub composites for further metallurgical testwork representative of the modelled orebody
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 (eg 'down hole length, true width not known').*	Drilling has intersected the mineralised units at near perpeniculat to strike and dip. True widths can be observed through the multiple holes drilled on sections.
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.*	Refer to figures within text
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 significant results reported
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.*	Refer to BEM Prospectus.
Further work	· *The nature and scale of planned further work (eg 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.*	Further exploration proximally to Razafy. Further metallurgical testwork planned

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.*	All data sets have been automatically loaded into an industry standard database. All files have been automatically validated at point of loading and routienly throughout the program.
	• *Data validation procedures used.*	
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	Annick Manfrino, Competent Person for the resource estimate visited the site in March-April 2018
	• *If no site visits have been undertaken indicate why this is the case.*	All drilling, sampling and sample preparation procedures were considered of industry standard, well supervised and carried out
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	The confidence of the geological interpretation of the graphitic lenses is considered robust for the purpose of estimating and reporting Indicated and Inferred resources.
	• *Nature of the data used and of any assumptions made.*	Graphite is hosted within graphitic schists and gneiss
	• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*	The complete extent of the two main lenses outcrop and can be followed by mapping at surface.
	• *The use of geology in guiding and controlling Mineral Resource estimation.*	Trenches have been used with success in early exploration stages to confirm the strike continuity
	• *The factors affecting continuity both of grade and geology.*	No major faulting or other structural disruption has been mapped in the project area and the location of the drilling intercepts of the graphitic mineralisation confirms the anticipated position of the lenses
		The boundary between graphitic schists and gneiss and the surrounding material is usually sharp with TGC grades below 0.5% in background material changing to +3% grades in the graphitic lenses, leaving few options to shift the boundaries position.
		Mineralisation envelopes were interpreted on section using a nominal +3% TGC cut-off grade.
		Only rare occurrences of non-mineralised material are included in the two main lenses
		Logged graphitic rich zones correlate extremely well with TGC assay results
		No alternative interpretation has been considered at present
		The weathered horizon (oxide) can easily be interpreted from the sulphur depletion observed in the assay data. The oxide horizon is approximately 20m thick. The transition zone is usually of very limited thickness when present
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 Mineral Resource encompasses the Razafy deposit and a new prospect named East Razafy
		The Razafy deposit comprises two major lenses -East Main and West Main lenses-, and four minor graphitic lenses adjacent to the main zones,
		The solids interpreting the two main lenses are 1450m long with a maximum plan width of 65m for the East main lens and 60m for West main lens in the south part of the deposit. The two main lenses extend 155m depth below surface and define the lowest depth below surface at which a resource has been estimated
		The Razafy block model extents 1 625m along strike, 900m across strike and 200m depth to cover the East Razafy prospect area
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.*	Total graphitic carbon and sulphur have been estimated by ordinary kriging using a 140m across strike by 50m down dip by 12m across strike search ellipse which defines the outmost distances to which blocks can be extrapolated from drillholes
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*	Drill section are spaced regularly at 100m (with the exception of the first northern section which is 200m away from the second section) with drillholes spaced at 30m across sections
	• *The assumptions made regarding recovery of by-products.*	Kriging parameters for both TGC and sulphur were obtained from modelling the directional variograms (normal variograms) for the two main lenses.
	• *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).*	Nugget values are 20% of the total sill for both elements
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*	The grade estimation was completed using GEMS mining software with partial blocks to honour the volume of the grade envelope solids
	• *Any assumptions behind modelling of selective mining units.*	The block model is based on 25m along strike by 5m across strike by 5m Z, which is considered adequate given the current drill spacing of 100m section lines by 30m spacing
	• *Any assumptions about correlation between variables.*	Mineralisation envelopes were used as hard boundaries during the interpolation
	• *Description of how the geological interpretation was used to control the resource estimates.*	The base of oxide surface was used as a hard boundary for the sulphur estimation but as a soft boundary for the total graphitic carbon estimation
	• *Discussion of basis for using or not using grade cutting or capping.*	No top-cut measure was used as there is no evidence of outliers. The maximum total graphitic carbon value for the 2m sample assays is 15%
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	The grade estimates were validated visually and statistically to ensure that they honour spatially and statistically the input data.
		No previous estimate exists for this deposit
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	The Resource is reported on a dry tonnage basis
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	Mineralisation envelopes have been wireframed to an approximate 3% TGC cut-off grade which corresponds to a natural break between background material, which usually presents TGC grades below 0.5%, and the graphitic schists and gneiss with TGC grades greater than 3%.

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.*	Based on the orientations, thicknesses and depths to which the graphitic lenses have been modelled and their estimated TGC, the potential mining method is considered to be open pit mining
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.*	Metallurgical testwork program has been undertaken on drill core samples taken from a drill program completed in 2018. A total of 20 diamond drill holes were sampled totalling 800kg of material, to create representative composite samples. Testwork was undertaken by ALS Metallurgy in Perth WA , managed by BatteryLimits. The test work primarily focussed on flotation to recover high grade graphite concentrates. The flotation tests typically inVloved , a 1kg sub-sample stage ground in a rod mill to 100% passing 1mm. The samples underwent rougher flotation. The rougher concentrate underwent multiple stages of cleaning (up to 6), with recleaning and intermediate screening of coarse material in some tests. The results indicated that high grade (95% TGC) concentrates can be produced at a recovery of 93%. Some comminution testwork has also been undertaken with the results indicating the material is soft to moderate hardness . No deleterious elements in the concentrates have been identified to date.
Environmen-tal 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.*	It is assumed that the processing of ore will have a minimal environmental impact. This is based upon other graphite processing operations and basic assumptions on how graaphite ore will be processed at Maniry.
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 used to report the Mineral Resource is based on 19 measurements made by water displacement method by the Intertek Perth laboratory
	• *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.*	A 2.07 t/m^3 value was used for the oxide material and 2.17 t/m^3 for the fresh material
	• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.*	The two main lenses are continuous over the strike of the deposit.
	• *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).*	They can be followed on surface by mapping without interruption and are not disrupted by faulting
	• *Whether the result appropriately reflects the Competent Person's view of the deposit.*	Trenches completed during the early exploration stages, but not used in the resource estimate, confirm the location at surface of the thickness of the mineralisation estimated by the model
		With a 100m drill section spacing, and search ellipses of 140mx50mx12m, extrapolation of blocks is limited
		All minor lenses, including the East Razafy prospect have been classified as Inferred material
		For the East and West Main lenses, the kriging slope of regression obtained for the total graphitic carbon estimate was used to separate Indicated from Inferred resource at depth. Blocks with a slope of regression greater than 0.5 were classified as Indicated, the other blocks were classified as Inferred
		The classification is based on a high degree of geological understanding of the mineralisation occurrence and spatial distribution, correlated by systematic drilling information with limited extrapolation
		The Mineral Resource estimate appropriately reflects the view of the Competent Persons
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	No audit nor review were undertaken for this Mineral Resource Estimate
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 relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the JORC Code (2012 Edition).
	• *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 mineral resource is a global estimate of tonnes and grade.
	• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	Relative tonnages and grade above the nominated cut-off grades for TGC are provided in the body of this report.
		The contained graphite values were calculated by multiplying the TGC grades (%) by the estimated tonnage on a block by block basis.
		No production data is available to reconcile results with.