

## ROBUST MUNGLINUP DFS RESULTS ALLOW MRC TO MOVE TO 90% OWNERSHIP OF MUNGLINUP GRAPHITE PROJECT

### Highlights

#### DFS Results

- **Post-tax - Net Present Value ("NPV<sub>7</sub>") US\$111M (AU\$160M)**
- **Post-tax project - IRR 30%**
- **Capex - US\$61M (AU\$88M)**
- **Opex - US\$491/tonne (FOB) (AU\$720/tonne)**
- **Life of Mine average EBITDA - US\$31M pa (AU\$45M)**
- **Life of Mine net cash flow - US\$240M (AU\$352M)**
- **Payback period - 2.7 years**
- **Life of Mine - 14 years**
- **Life of Mine processing throughput - Yr 1-6 400ktpa — Yr 7-14 500ktpa**
- **Life of Mine average graphite concentrate production - 52ktpa**
- **Average concentrate grade - >95% TGC**
- **Ore Reserve - 4.24 million tonnes @ average grade 12.8% TGC**
- **JV Earn-in Notice issued to increase Project ownership to 90%**
- **Environmental permitting targeted for completion Q3 2020**
- **DFS – Substantiates MRC's integrated, downstream value-adding strategy**

Mineral Commodities Limited ("MRC" or "the Company") is pleased to release the outcomes of the Definitive Feasibility Study ("DFS") on a concentrate only production scenario at the Munmlinup Graphite Project ("Munmlinup") in the south of Western Australia. The DFS confirms the Company's view that Munmlinup will become a crucial asset in its overall ambition to supply natural graphite into the key high-demand battery anode markets.

Executive Chairman Mark Caruso said, "This is an important milestone in the anticipated development of the Munmlinup Graphite Project which continues to deliver robust project economics as a standalone graphite concentrate producer. The DFS further enhances the Company's ambitions to build a global, vertically integrated carbon business based on two global strategic operating production centres in Tier 1 jurisdictions, Australia and Norway, producing sustainable natural graphite concentrate as a crucial raw material for the production of precursor and active anode materials."

## Key Investment Findings

NPV <sub>7</sub> (at a discount rate of 7%), post tax, real	US\$ millions	111
<i>NPV<sub>7</sub> (at a discount rate of 7%), pre-tax, real</i>	<i>US\$ millions</i>	<i>172</i>
IRR post-tax, real	%	30
<i>IRR pre-tax, real</i>	<i>%</i>	<i>36</i>
Development Capex	US\$ millions	61
Capital Payback Period	Years	2.7
LOM Operating Costs (FOB Fremantle)	US\$/t ore	491
LOM Revenue	US\$ millions	853
LOM EBITDA	US\$ millions	426
LOM post-tax net cash flow	US\$ millions	240
Average annual EBITDA	US\$ millions	31

The DFS was completed with the support of Mondium (a joint venture between Lycopodium and Monadelphous) and BatteryLimits. Mondium have signed off a +15/-5% level of accuracy for the capital estimate and operating costs estimate.

## Key Project Parameters

LOM (Life of Mine)	Years	14
Ore Reserve ( <i>Probable</i> )	Mt	4.24
Process throughput (years 1-6)	Kt/y	400
Process throughput (year 7 onwards)	Kt/y	500
Average Feed Grade	% TGC	12.8
Recovery rate of graphite concentrate	%	88
Nominal concentrate grade	% TGC	>95
Average annual concentrate production	Kt/y	52
Average basket price	US\$/t	1,144

## Mineral Resource and Reserve

Mineral Resource and Ore Reserve Statement as at 8 January 2020					
Mineral Resource <sup>1</sup>			Ore Reserve <sup>2</sup>		
Category	Mt	TGC (%)	Category	Mt	TGC (%)
Measured			Proven		
Indicated	4.49	13.1	Probable	4.24	12.8
Inferred	3.50	11.0			
<b>Total</b>	<b>7.99</b>	<b>12.2</b>	<b>Total</b>	<b>4.24</b>	<b>12.8</b>

Ore Reserve <sup>3</sup>			
Flake Size	Sieve Size (µm)	Mass (%)	TGC Grade (%)
Jumbo	300 – 500	6.5%	95%
Large	180 - 300	16.9%	95%
Medium	150 - 180	8.0%	95%
Small	75 - 150	29.8%	95%
Fine	< 75	38.8%	95%

In Pit Resources <sup>4</sup>		
Category	Mt	TGC (%)
<b>Inferred</b>	<b>2.75</b>	<b>11.1</b>

1. Mineral Resource estimated at a 5% TGC cut-off
2. Ore Reserve uses a variable cash flow cut-off grade
3. Ore Reserve flake size distributions are for recovered graphite product
4. In-Pit Resources comprise Inferred material inside the designed pit designs using a variable cash flow cut-off grade and do not constitute part of the Ore Reserves

## Acquisition of further interest in Munglinup Joint Venture

MRC Graphite Pty Ltd ("MRCG"), a wholly-owned subsidiary of the Company, has provided Gold Terrace Pty Ltd ("GT") with an "Earn-in Notice" to increase its interest in Munglinup to 90% in accordance with the Farmin and Joint Venture Agreement announced to the ASX on 11 September 2017.

Having completed the DFS, MRC has received board approval and intends to increase its ownership in Munglinup from 51% to 90% by:

- paying AU\$800,000 to GT; and
- issuing GT with 30 million fully paid ordinary shares in MRC.

MRCG and GT will then consider and formulate the development strategy and program for Munmlinup.

### **Next Steps**

The Company intends to implement a vertically integrated development strategy that will provide a broader range of higher value products, which diversifies the risks associated with supplying the traditional natural flake graphite market.

The Company will continue ongoing test work and comprehensive market analysis as part of a determined integrated downstream value-adding strategy focused on the production of precursor and active anode materials for consumption in the growing lithium-ion battery sector. The Company will continue technical and economic study work, considering the production of purified, micronised, spheronised and coated Munmlinup Concentrate to identify the optimal economic outcome from the deposit.

### **Cautionary Statements**

The DFS discussed herein has been undertaken to determine the feasibility to mine and process graphite ore from a production plant constructed at Munmlinup. The DFS is predicated on a Pre-Feasibility Study ("PFS") (see ASX announcement dated 30 May 2018) completed in May 2018 and is based on the same project sizing as developed during the PFS. The DFS is a continued technical and economic study of the PFS considering the development of the Munmlinup Graphite Deposit. It is based on a revised Ore Reserves estimate of 4.24 million tonnes at an average grade of 12.8% TGC and builds on the mine design and engineering assessment described in the PFS. The operating parameters of the DFS differ materially from the plan and assessments described in the PFS and are based on feasibility-level technical and economic assessments. The DFS evaluation work and appropriate studies have provided feasibility-level estimates of cost and rates of return to provide an assurance of an economic development based on the DFS.

The production targets underpinning financial forecasts included in the DFS includes 61% Indicated Resources and 39% Inferred Resources over the 14-year mine life. No exploration target material has been included in the economic valuation or production target of Munmlinup. There is a lower level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of additional Indicated Mineral Resources or that the Inferred Mineral Resources will add to the economics of Munmlinup. However, in preparation of the production target and associated NPV, each of the modifying factors was considered and has therefore passed the "economics test".

The DFS is based on the material assumptions outlined elsewhere in this announcement. These include assumptions about the availability of funding.

While MRC 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 DFS will be achieved. To achieve the range of outcomes indicated in the DFS, additional funding will likely be required. Investors should note that there is no certainty that MRC will be able to raise the amount of funding required. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of MRC's existing shares. It is also possible that MRC could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of Munmlinup. If it does, this could materially reduce MRC's proportionate ownership of Munmlinup.

### Supporting Information

This announcement is intended to be a summary of key DFS findings and is to be read together with the supporting detailed presentation titled "Munmlinup Graphite Project DFS Summary Outcomes", which discloses details of the material assumptions and underlying methodologies for deriving the above forecast financial information and production targets, including material price assumptions and operating cost assumptions.

### Reasonable Basis for Forward-Looking Statements

This document and the supporting presentation contain a series of forward-looking statements. The Company has concluded that it has a reasonable basis for providing these forward-looking statements and the forecast financial information included in this document and the supporting slides. The detailed reasons for these conclusions are disclosed in the supporting slides.

This document and the supporting slides have been prepared in accordance with the requirements of the JORC Code (2012) and the ASX Listing Rules.

**END**

**Issued by Mineral Commodities Ltd ACN 008 478 653** [www.mineralcommodities.com](http://www.mineralcommodities.com)

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**About Mineral Commodities Ltd:**

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

The Company is a leading producer of zircon, rutile, garnet and ilmenite concentrates through its Tormin Mineral Sands Operation, located on the Western Cape of South Africa. In October 2019, the Company completed the acquisition of Skaland Graphite AS, the owner of the world's highest-grade operating flake graphite mine and one of the only producers in Europe. The planned development of the Munglinup Graphite Project, located in Western Australia, builds on the Skaland acquisition and is a further step toward an integrated, downstream value-adding strategy which aims to capitalise on the fast-growing demand for sustainably manufactured Lithium-Ion Batteries.

# MUNGLINUP GRAPHITE PROJECT DFS SUMMARY OUTCOMES

January 2020



# Caution Statements

This document has been prepared by Mineral Commodities Ltd (MRC or the Company) and comprises written materials/slides for a presentation concerning MRC. This is not a prospectus, disclosure document or offering document.

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Nothing in these materials shall under any circumstances create an implication that there has been no change in the affairs of MRC since the date of this presentation. The information, if any, in this presentation which relates to Exploration Results, Mineral Resources or Ore Reserves for Tormin is based on information compiled by Dr Joseph A.P. Drake-Brockman, who is a Member of the Australasian Institute of Mining & Metallurgy (“AusIMM”) and is an independent consultant to the Company. Dr Drake-Brockman is an employee of Drake-Brockman Geoinfo Pty Limited and has over 36 years of exploration and mining experience in a variety of mineral deposits and styles. Dr Drake-Brockman has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the JORC Code (2012). The information from Dr Drake-Brockman was prepared under the JORC Code (2012). Dr Drake-Brockman consents to inclusion in the presentation of the matters based on this information in the form and context in which it appears.

The information, if any, in this presentation which relates to Mineral Resources for Munglinup is based on information compiled by Mr Chris De Vitry who is a member of the AusIMM and an independent consultant to the Company. Mr De Vitry is the Director and Principal Geologist of Manna Hill GeoConsulting Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person as defined by the JORC Code (2012). The information from Mr De Vitry was prepared under the JORC Code (2012). Mr De Vitry consents to inclusion in the presentation of the matters based on this information in the form and context in which it appears.

The information, if any, in this presentation which relates to the Ore Reserve for Munglinup is based on information compiled by Mr Daniel Hastings, who is a Member of the AusIMM. Mr Hastings is an employee of Hastings Bell Pty Ltd and a consultant to the Company. Mr Hastings has sufficient experience relevant to the type of deposit under consideration to qualify as a Competent Person as defined by the JORC Code (2012). Mr Hastings consents to the inclusion in the presentation of the matters based on the reviewed information in the form and context in which it appears.

The information, if any, in this presentation which relates to Exploration Results, Mineral Resources or Ore Reserves for Xolobeni is based on information compiled by Mr Allen Maynard, who is a Member of the Australian Institute of Geosciences (“AIG”), a Corporate Member of the AusIMM and independent consultant to the Company. Mr Maynard is the Director and Principal Geologist of Al Maynard & Associates Pty Ltd and has over 38 years of exploration and mining experience in a variety of mineral deposit styles. Mr Maynard has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the Australasian Code for reporting of Exploration Results, Exploration Targets, Mineral Resources and Ore Reserves (“JORC Code (2004)”). This information was prepared and first disclosed under the JORC Code (2004). It has not been updated to comply with the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (“JORC Code (2012)”) on the basis that the information has not materially changed since it was last reported. Mr Maynard consents to inclusion in the presentation of the matters based on this information in the form and context in which it appears.



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US\$ **853** M  
LOM revenue

**2.7** years  
Payback period

**30%**  
Post-tax IRR

US\$ **61** M  
Pre-production capital cost

US\$ **491** t  
Operating cost per tonne of product (FOB)

US\$ **111** M  
Post-tax NPV (7%)

US\$ **426** M  
LOM EBITDA

US\$ **240** M  
LOM post-tax net cash flow

US\$ **31** M  
Average annual EBITDA

END → 278.9

# FINANCIAL ANALYSIS

- A financial model was built for the purpose of analysing the cash flows that would be generated by the Project. The model was used to evaluate the cash flow effects of the mining schedule and process plant.
- The Net Present Value (“NPV”) and Internal Rate of Return (“IRR”) estimates are base case only and reflect robust EBITDA performance, debt funding of initial pre-production capital costs with payback within three years and US\$102 million in forecasted corporate tax payments to the Australian government.
- Cash flows were modelled on a ‘real’ basis with no cost escalation, no sales price escalation, and no inflation. In addition, a discount rate of 7% was applied for the calculation of the Project NPV. The discount rate applied reflects the weighted average cost of capital expected from debt funding the Project.

Financial Metrics

Item	Value
LOM revenue	US\$853M
LOM post-tax net cash flow	US\$240M
LOM EBITDA	US\$426M
Average annual EBITDA	US\$30.6M
Operating cost per tonne of product (CIF)	US\$573/t
Pre-production capital cost	US\$61M
Pre-tax NPV (7% discount rate)	US\$172M
Pre-tax IRR	36.4%
Post-tax NPV (7% discount rate)	US\$111M
Post-tax IRR	30.0%
Post-tax payback period	2.7 years

Financial Metrics

Financials	Value
Receipts from customers	US\$853M
Payments to suppliers and employees	(US\$426M)
Income tax paid	(US\$102M)
Pre-production capital cost	(US\$61M)
Sustaining capital	(US\$25M)
Cash inflows from financing	US\$62M
Cash outflows to financing	(US\$62M)

# MINERAL COMMODITIES

## GLOBAL OVERVIEW

### Skaland

#### Flake Graphite

**Production** – Ore grades of ~28%  
Carbon at 10ktpa flake graphite concentrate production

### Tormin

#### Mineral Sands

**Production** - 2.4Mtpa Processing facility producing: garnet, ilmenite, zircon and rutile concentrates.

### Xolobeni

#### Mineral Sands Development

JORC Compliant Resource  
346Mt @ 5% THM

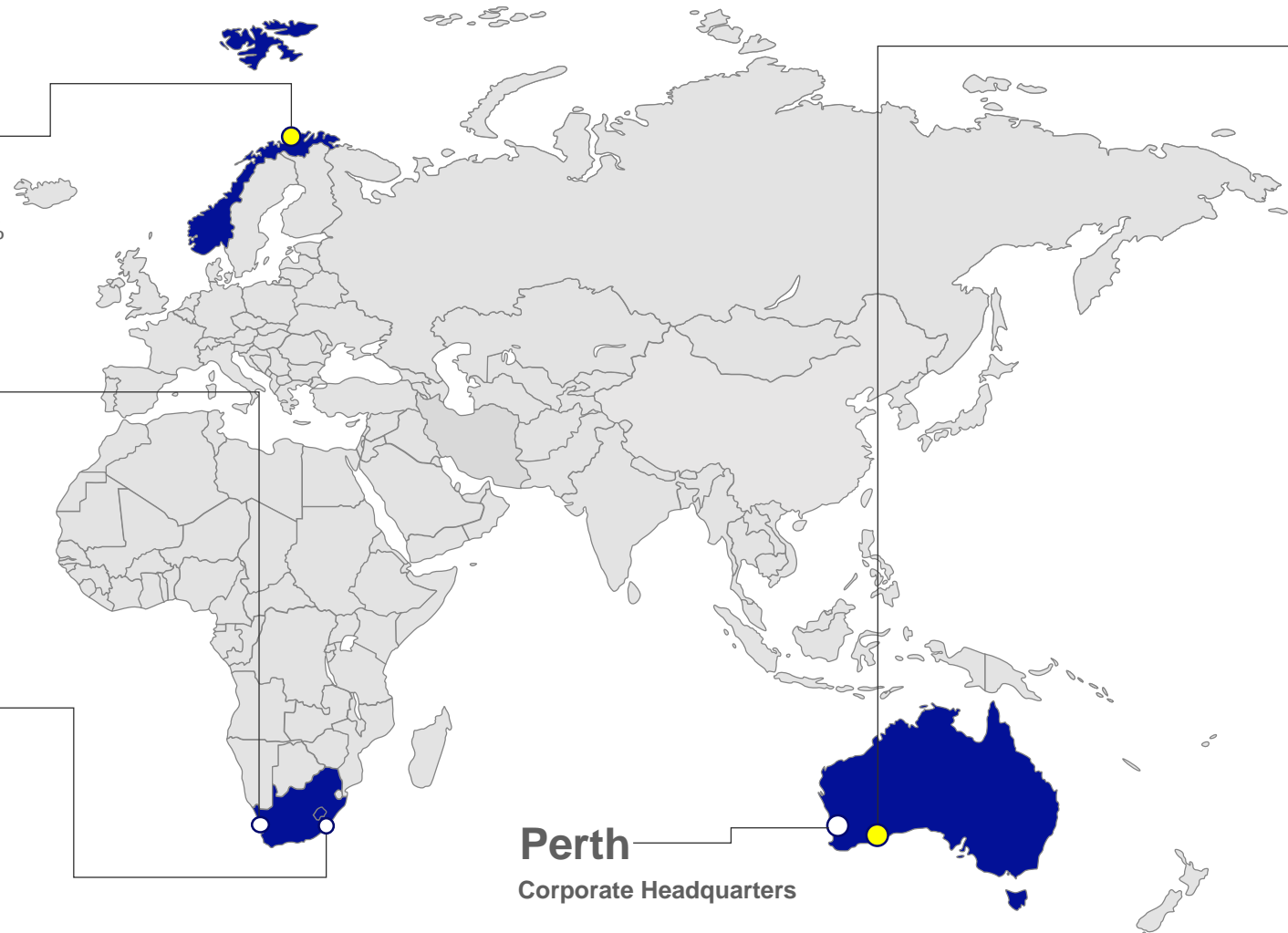
### Perth

Corporate Headquarters

### Munglinup

#### Graphite Development

Ore Reserve (Probable) of 4.24Mt at 12.8% TGC supporting mine life of 15 years with anticipated production of ~52ktpa of >95% purity graphite concentrate. Mineralisation open in all directions.



# BACKGROUND & INTENT

MRC's wholly owned subsidiary MRC Graphite Pty Ltd ("MRCG") entered into a Joint Venture Agreement on 17 November 2017 with Gold Terrace Pty Ltd ("Gold Terrace"), to Farm-In to the Munglinup Graphite Project. The Stage 1 Agreement gave MRC an initial 51% interest in the Project. In addition, there were provisions that allowed for the acquisition of a further interest in the Joint Venture.

Stage 1 Joint Venture Farm-In to 51%:

- AU\$3.2M cash payment representing acquisition cost to date incurred by Gold Terrace; and
- MRC issuing 10M ordinary shares.

Stage 2 Joint Venture Farm-In Agreement to acquire a further 39% Interest (from 51% to 90%):

- Completing a DFS by 17 November 2019\*; and
- AU\$0.8M cash payment and MRC issuing 30M ordinary shares to the Vendor.

Stage 3 Joint Venture Farm-In Agreement to acquire a further 10% (from 90% to 100%).

Vendor can elect that MRC acquires remaining 10% interest for full MRC ownership by:

- MRC issuing 10M ordinary shares; or
- MRC granting the Vendor a 1% gross royalty on all minerals produced; or
- Otherwise standard vendor contribution or watering down provisions to apply.

\* Due to delays, MRC requested and was granted from Gold Terrace an extension for the completion of the original DFS. The extension was granted until 31 December 2019.



# MUNGLINUP DEFINITIVE FEASIBILITY STUDY - OVERVIEW

The Munglinup Graphite Project (“the Project”) lies along the border of the shires of Esperance and Ravensthorpe on Western Australia's Fitzgerald Coast approximately 640km southeast by road from Perth. The Project is 4km north of the township of Munglinup on the South Coast Highway, 107km west of Esperance and 81km east of Ravensthorpe.

The Port of Esperance handles bulk grain and mineral exports and currently supports the export of nickel concentrates and iron ore from mining operations in Western Australia. Esperance has a regional airport with 3 flights per day to and from Perth. The flight time is approximately one and a half hours. The Project is 610km by road from the Port of Fremantle, where it would export its graphite concentrate product.

The Pre-Feasibility Study (“PFS”) was completed in May 2018 and was predicated on the Project to mine and process 400ktpa of graphite ore grading 15.9% TGC over 9 years, producing a nominal 54ktpa of flake graphite concentrate resulting in an ore reserve of 3.4Mt at 15.9% TGC. The financial metrics from the PFS demonstrated robust project economics.

Following completion of the PFS, MRC made the decision to proceed directly to a Definitive Feasibility Study (“DFS”) based on the same project sizing as developed during the PFS.



# CAPITAL COST

Prepared by BatteryLimits Pty Ltd, Mondium and MRCG, with the capital cost estimate for the process plant, infrastructure, associated equipment and project management costs at +15/-5%. The financial model allocated capital costs as either development capital, sustaining capital or pre-strip costs. Development capital reflects initial capital requirements to construct the process plant, project infrastructure and indirect capital requirements. Annual sustaining capital cost has been set at 3% of development and pre-strip capital.

## Capital Cost

Capital	Project Total US\$M
Development Capital	56.3
Sustaining Capital	25.5
Pre-Strip Capital	4.3
<b>Total</b>	<b>86.1</b>

## Project Development Capital

Capital	Project Total US\$M
Construction Distributables	4.3
Treatment Plant Costs	21.5
Reagents & Plant Services	7.0
Infrastructure	8.5
Management Costs	8.1
Owner's Project Costs	6.9
<b>Total</b>	<b>56.3</b>

## Sustaining Capital

Capital	Project Total US\$M
Sustaining Capital	25.5
<b>Total</b>	<b>25.5</b>

## Pre-Strip Capital Expenditure

Capital	Project Total US\$M
Clear/Topsoil Removal	2.3
Haul Roads	0.9
Mob/Establishment	0.8
Owner's Costs	0.3
<b>Total</b>	<b>4.3</b>

# OPERATING COST

The Project operating cost estimate includes costs associated with mining, processing, infrastructure and site-based general and administration costs.

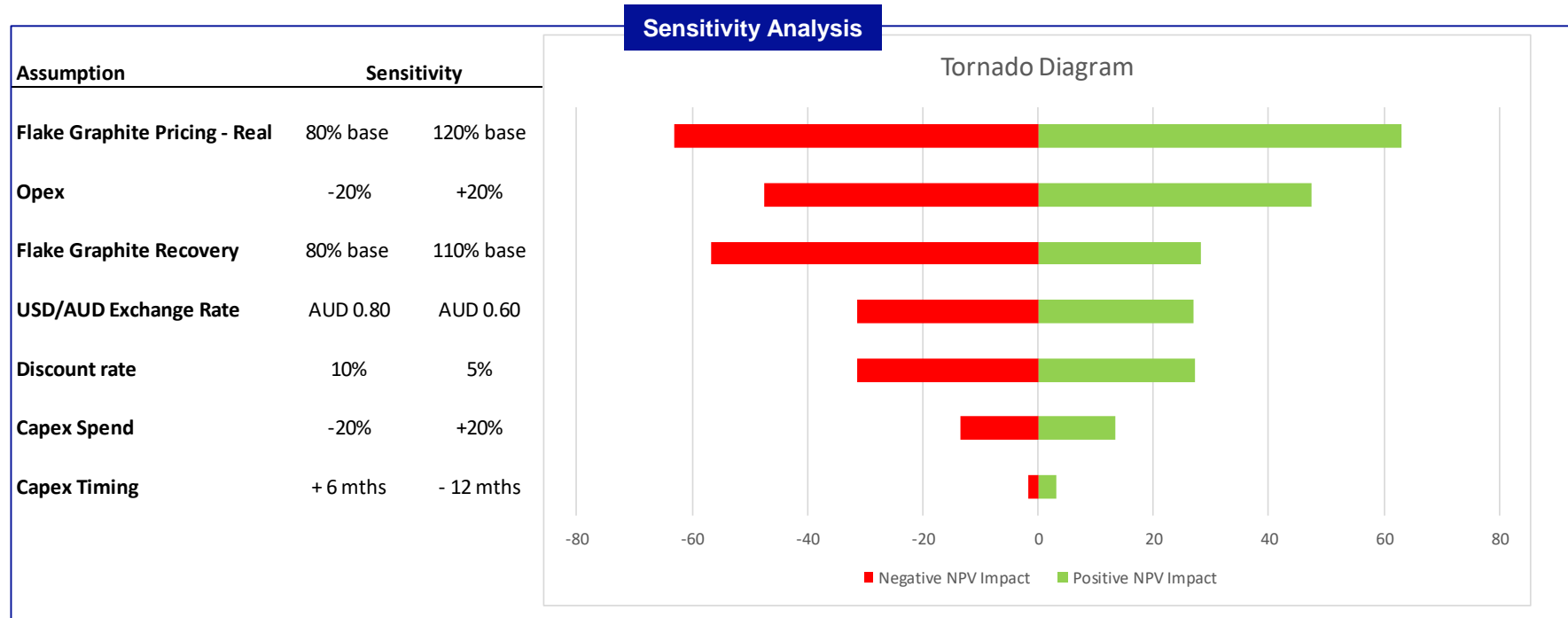
Operating Costs	US\$ M	US\$/t Sold
Mining	135.4	182
Processing	140.1	188
Indirect Production Costs	30.8	41
Trucking	60.0	80
<b>Total (FOB Fremantle)</b>	<b>366.3</b>	<b>491</b>
Shipping	14.0	19
Royalties	46.7	63
<b>Total (CIF)</b>	<b>427.0</b>	<b>573</b>

- Financial model functional currency of US\$ and operating cost estimates have been converted at an exchange rate of ~AU\$1.00=US\$0.70.
- The operating cost estimate has been prepared to an accuracy of +15/-5%.





# SENSITIVITY ANALYSIS



- Sensitivities of the NPV to changes in key assumptions were analysed. These were run on the following key model assumptions: flake graphite pricing, flake graphite recovery, exchange rate, discount rate, operating costs, capital costs and construction schedule (capex timing).
- In each case, the effect of the sensitivities were considered based on historical observation of mining projects.
- The tornado diagram above shows the variance to the base case post-tax NPV for the Project (US\$111M). The most sensitive metrics are flake graphite pricing, opex and flake graphite recovery.
- The upside case for the flake graphite pricing forecast (120% base pricing forecast from Roskill) demonstrates a post-tax NPV at US\$174M. The downside case (80% base pricing forecast from Roskill) demonstrates a post-tax NPV of US\$48M.

# GEOLOGY & RESOURCE

- MRC has undertaken two additional drilling programs and re-estimated the Mineral Resource since acquiring the Project. The latest Mineral Resource has been prepared in accordance with the 2012 JORC Code and is estimated at **7.99 million tonnes at 12.2% TGC** using a 5% cut-off.
- The graphite deposits are located in the northern foreland of the Albany-Fraser Orogen and are hosted by paragneisses of the Munglinup Gneiss. Structurally the prospect is located adjacent to the intersection between the northeast trending Fraser Range Fault and the northwest trending Merredin Fault.

Mineral Resource<sup>1</sup> Statement

Classification	Cut-off (%)	Resource Mt	Total Graphitic Carbon (%)	Contained Graphite kt
Indicated	5	4.49	13.1	588 kt
Inferred	5	3.50	11.0	383 kt
<b>Total</b>	<b>5</b>	<b>7.99</b>	<b>12.2</b>	<b>971 kt</b>

1. Mineral Resource estimated at a 5% TGC cut-off

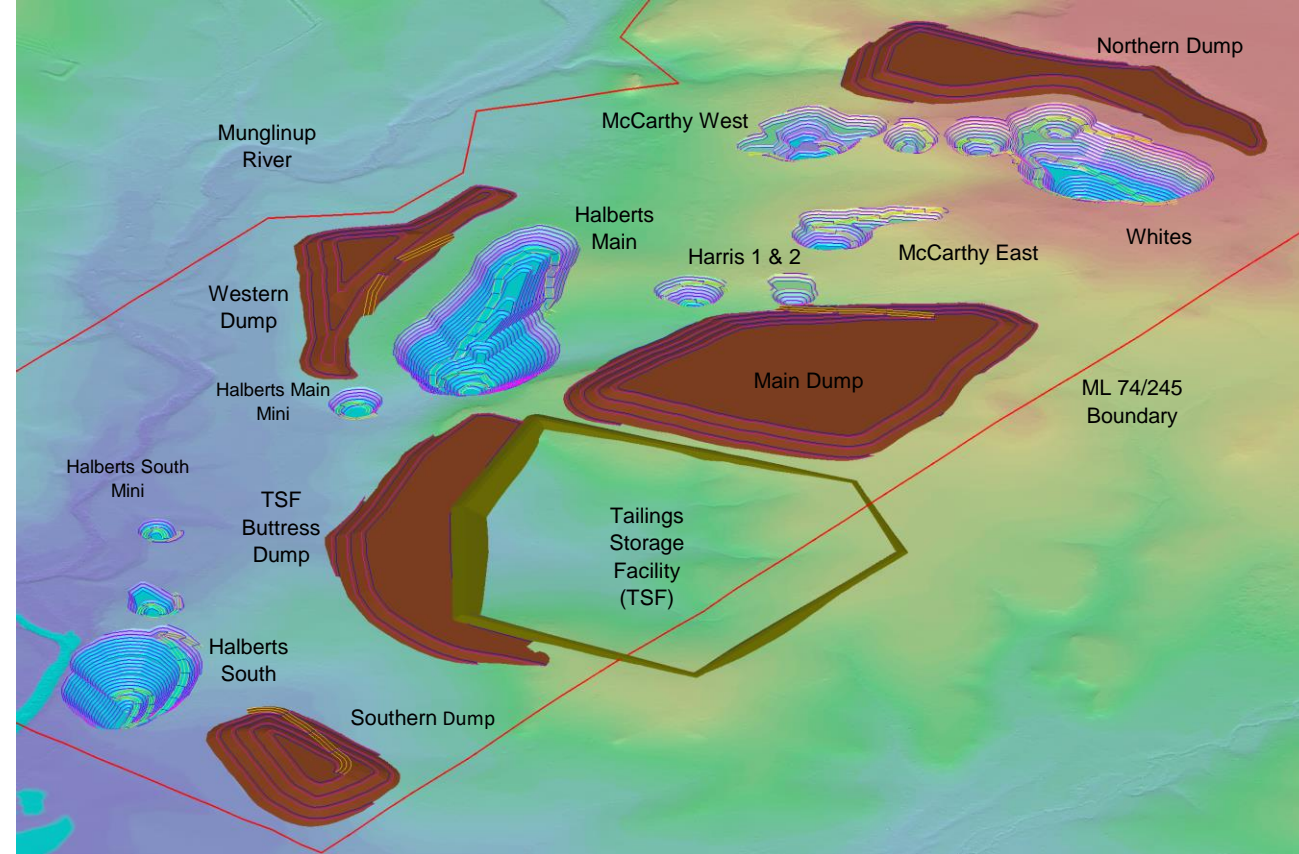
Tenement	Area	Holder	Granted	Expiry
M74/245	685 ha	MRC Graphite Pty Ltd Gold Terrace Pty Ltd	26/08/2010	25/08/2031
E74/565	48 BL	MRC Graphite Pty Ltd	05/08/2015	04/08/2020
E74/505	2 BL	MRC Graphite Pty Ltd Gold Terrace Pty Ltd	23/10/2012	22/10/2022
L74/55	129 ha	MRC Graphite Pty Ltd	11/07/2019	10/07/2040
L74/56	21 ha	MRC Graphite Pty Ltd	Pending	
G74/9	26 ha	MRC Graphite Pty Ltd	11/07/2019	10/07/2040

The Munglinup graphite deposits occur as discrete layers in a zone of graphitic schists within a sequence of hornblende and hornblende-garnet gneisses. The rocks have been broadly folded about a WNW/ESE axis, with superimposed minor anticlinal and synclinal flexures. Complex small-scale folding and faulting is common in the relatively incompetent graphitic rocks and the enclosing competent hornblende gneisses appear to be less deformed.

Targeted graphitic mineralisation occurs within saprolite consisting of clays, quartz, graphite (up to 42% flake) and goethite. Weathering extends down to at least 60m.

# MINING & ORE RESERVE

- The graphite distribution at Munglinup is well constrained and outcrops at surface. The mineralised zones lie within the weathered horizon, generally dipping to the east at around 50°. Material hardness measurements show that the deposit is free-dig with possible blasting required at the base of the deepest pits.
- The general mine layout has been developed so that dumps and infrastructure do not encroach on areas of likely continuing mineralisation that have yet to be drilled. Exclusion areas have also been established around significant environmental and heritage areas.
- Inferred material that is within the designed pits was included in the mine schedule using the same variable cut-off grade as the Ore Reserve. This material is generally included in designed cutbacks and predominantly scheduled later in mine life. This material will be upgraded by further drilling as part of the continuing resource development program.
- The optimised shells selected comprised 6 open pit areas, mined over 2 stages, which initially target the higher value areas earlier in the mining plan. The stage 1 pits were optimised on the Measured and Indicated material while stage 2 optimisations include Inferred material.



Ore Reserve <sup>1</sup>		
Category	Mt	TGC (%)
Proven	-	-
Probable	4.24	12.8
<b>Total</b>	<b>4.24</b>	<b>12.8</b>

In Pit Resources <sup>2</sup>		
Category	Mt	TGC (%)
Inferred	2.75	11.1

**Current mine life stands at 14 years with the mineralisation open along strike and at depth**

1. Ore Reserve uses a variable cash flow cut-off grade

2. In-Pit Resources comprise Inferred material inside the designed pits using a variable cash flow cut-off grade and do not constitute part of the Ore Reserves.

# MINING & ORE RESERVE

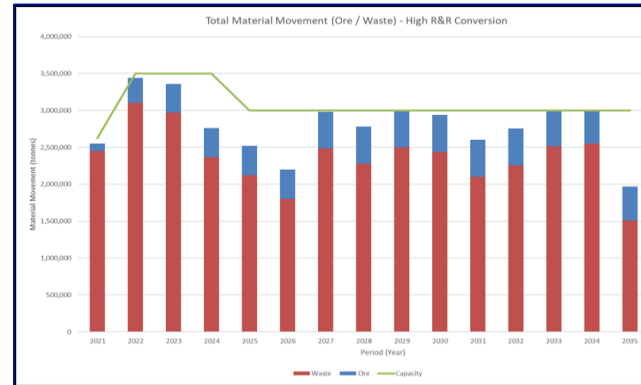
Continued.

- The mining method adopted is based on open pit mining and was evaluated assuming a traditional truck and hydraulic excavator operation.
- The operational philosophy is to only operate the mine during day shift, on a 5/2 roster. Run of Mine (“ROM”) operations will continue 24/7 and be owner operated, managed by the process plant. This arrangement will reduce noise/light issues and be more attractive to potential employees. This will also enable employees to reside in Esperance and operate on a daily bus-in/bus-out plan.
- Annual material movement is planned to be limited to 3.5Mt per annum for the first 3 years of operation then reducing to a maximum of 3Mt per annum.

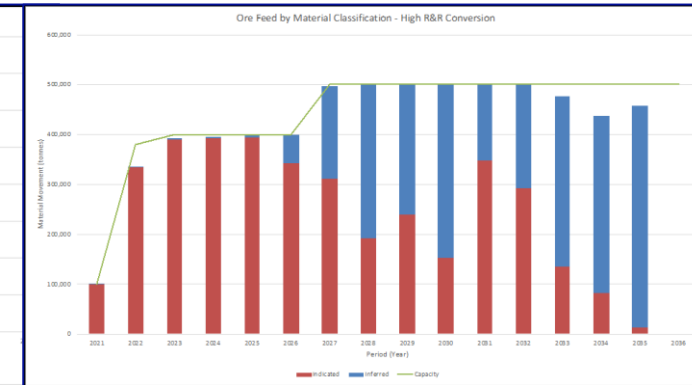
## Total Inventory

Total Tonnes	Ore Tonnes	Waste Tonnes	Strip
41,864,276	6,987,996	34,876,280	4.99

### Annual Material Movement



### Annual Ore Feed by Material Classification



### Grade and Distribution of Final Graphite Product

Flake Size	Sieve Size $\mu\text{m}$	BF1059 Bench Scale Test		BF1065 Bulk Test		Schedule Estimate	
		Mass Dist'n (%)	TGC Grade (%)	Mass Dist'n (%)	TGC Grade (%)	Mass Dist'n (%)	TGC Grade (%)
Super Jumbo	> 500	1.56	97.8	0.43	97.0	2.1	94.0
Jumbo	300 – 500	9.42	97.1	5.30	95.3	11.6	94.0
Large	180 - 300	17.6	96.7	16.0	97.5	20.8	94.0
Medium	150 - 180	8.88	96.2	12.5	98.2	8.4	94.0
Small	75 - 150	30.2	95.1	33.3	98.1	27.7	94.0
Fine	< 75	32.4	90.5	32.5	96.0	29.4	94.0
Calculated P80 ( $\mu\text{m}$ ) and TGC Grade (%)		238	94.2	193	97.2	193	94.0

# METALLURGY

- Significant historical metallurgical testwork exists with more than 20 metallurgical studies undertaken on the Munglinup Graphite mineralisation. These studies focused on maximising the recovery of coarse flake by minimising grinding and using multi-stage leaching to upgrade the concentrate grade.
- **Samples and head assay** - The DFS Master Composite was formed from 86 intervals obtained from Halberts Main and Halberts South. The resulting composite contained 18% ironstone ore type and approximately 10% of near surface material.
- **Variability testwork program** - results showed that the high-grade final concentrates can be consistently produced with TGC grades ranging from **95.0% to 98.3%** after multiple stages of cleaner flotation.
- The DFS Master Composite was prepared and underwent large batch flotation tests in order to produce concentrate for vendor and marketing purposes. The flotation scheme was based on optimisation test work and utilised larger laboratory equipment.
- A 480kg bulk run produced a concentrate with a distribution close to that achieved in the smaller bench scale tests. The coarse flake fraction contained 48.6% of the mass with a TGC grade averaging 95.8%. The fines accounted for 51.4% of the mass with a TGC grade averaging 96%.

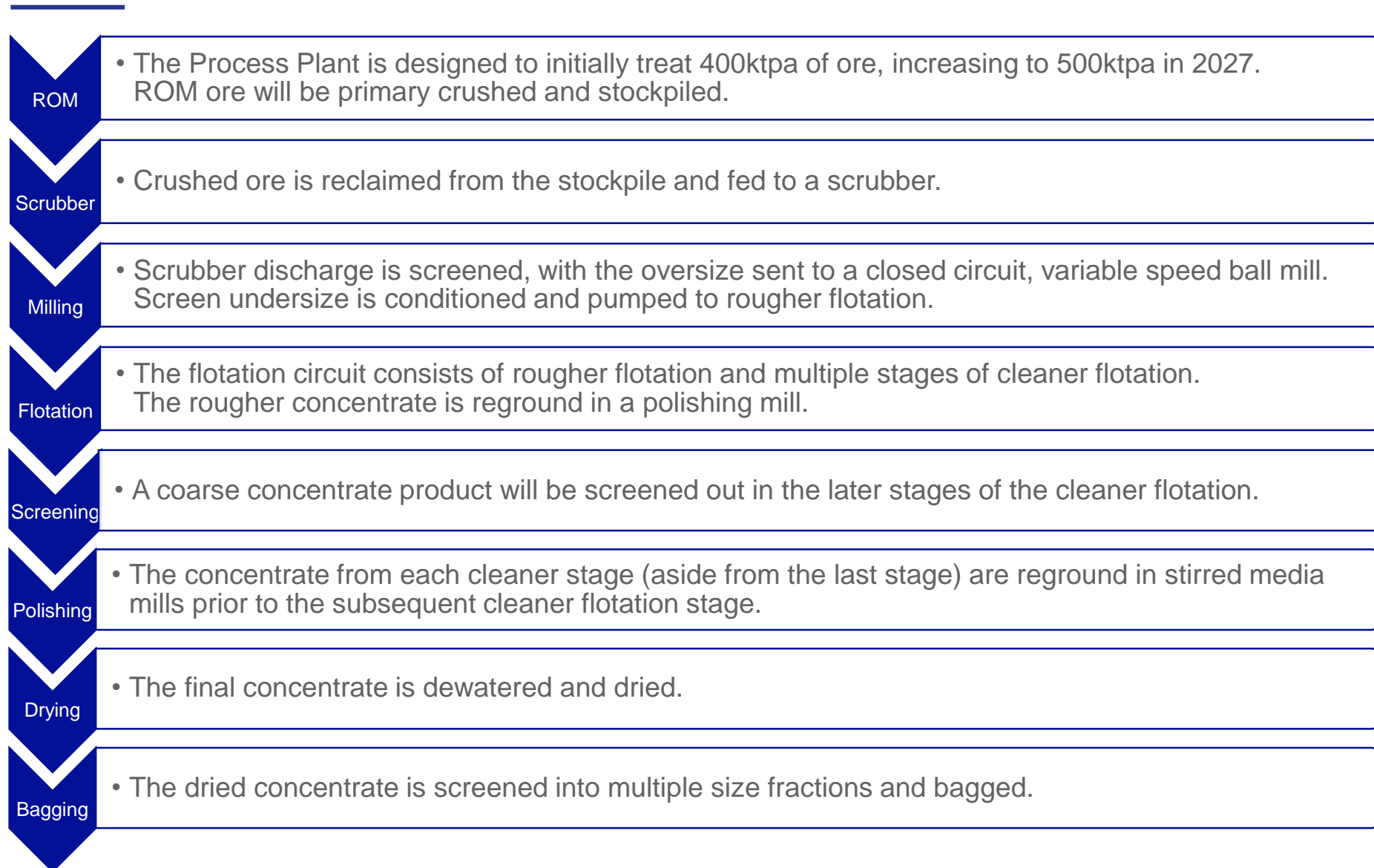
Final Bulk Concentrate Size and Grade Distribution

Flake Size	Micron (µm)	Mesh	Bulk sample Test BF1287	
			Mass (%)	Assay TGC (%)
Jumbo	300 – 500	50	17.7	96.0
Large	180 – 300	+80 -50	24.5	95.5
Medium	150 – 180	+100 -80	6.43	96.1
Small	75 – 150	+200-100	24.6	97.8
Fines	– 75	-200	26.8	94.4
Calculated P <sub>80</sub> (µm) and TGC Grade (%)			289	95.8

Flotation Results for the DFS Master Composition

Test ID	Final Concentrate				Total TGC Recovery
	+150 µm (Coarse)		-150 µm (Fine)		
	% Mass	% TGC Grade	% Mass	% TGC Grade	
BF1273	44.0	97.3	56.0	93.9	88.7
BF1281	48.4	97.7	51.6	94.2	86.6
BF1282	56.2	95.2	43.8	91.0	89.4
BF1289	57.0	95.7	43.0	97.2	86.4
BF1304	47.7	96.5	52.3	94.1	87.1
BF1305	46.4	96.5	53.6	98.3	84.9
BF1306	54.1	97.4	45.9	97.9	84.6
BF1334	51.4	95.1	48.6	97.6	85.8
BF1360					83.9
BF1363	49.3	97.1	50.7	95.6	67.0
BF1371	57.9	89.7	42.1	97.1	86.3

# PROCESS PLANT



# INFRASTRUCTURE & LOGISTICS

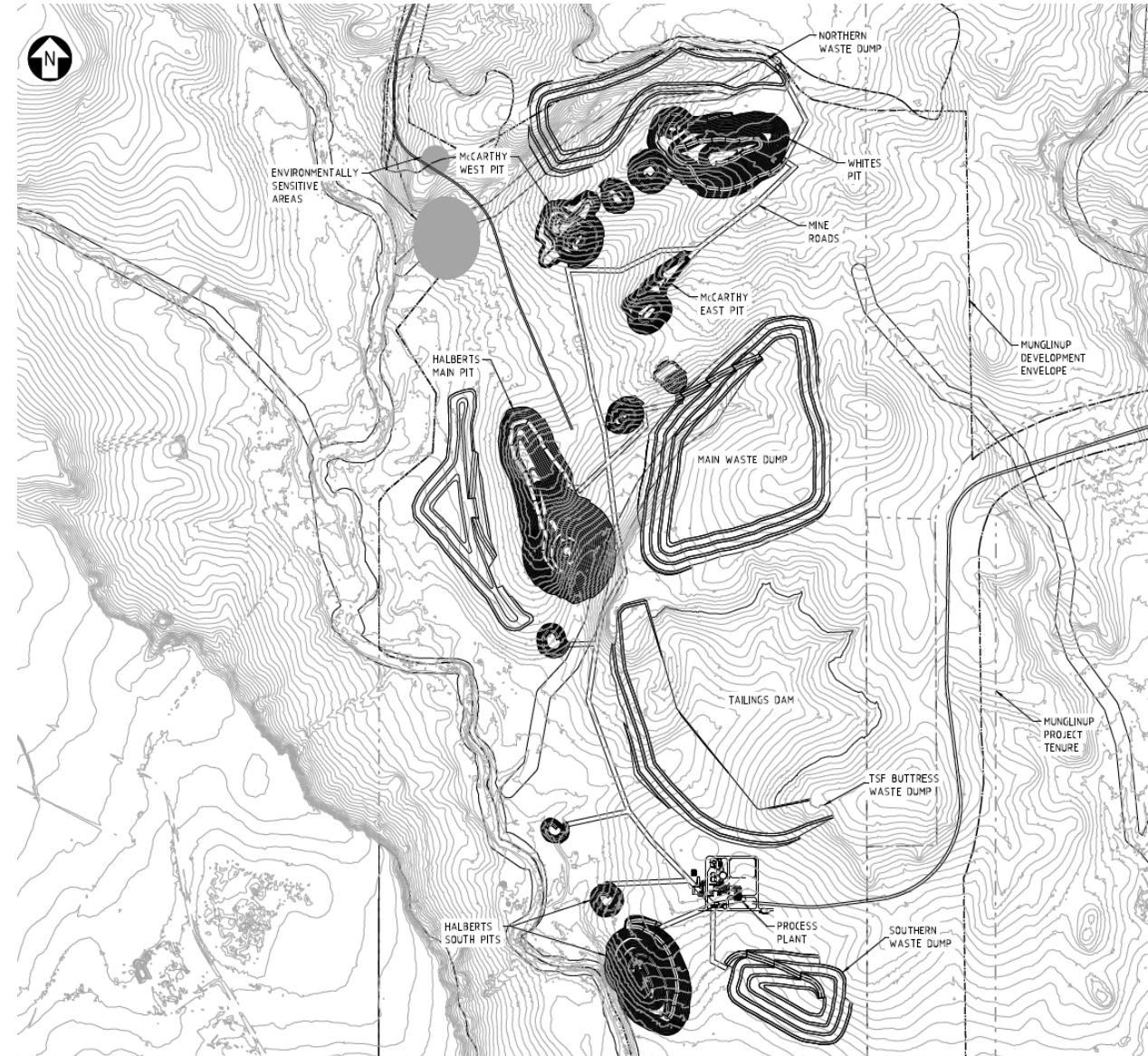
**Power** - The power requirements for the main process plant have been calculated at a total installed load of 5.3MW including all duty and standby equipment with an estimated average demand of the project being 2.5MW with a peak of 2.8MW.

Power is proposed to be supplied by a 4.0MW power station supplying power to the plant at 415V. The location of the power station and the plant MCCs have been optimised to eliminate the need for high voltage transmission and transformers. The power station will be fuelled by trucked LNG based on an onsite storage and vaporisation facility with a storage capacity design allowance of a nominal 10-11 days.

**Water** - A bore field with several production bores has been drilled and pump tested to ensure that the bore field will support the operation.

**Buildings** - Plant, administration, and infrastructure areas will be modular/prefabricated or containerised. An onsite laboratory will be constructed to support the operation. Accommodation for personnel is planned to be available in nearby townships.

**Logistics** - Product will be transported via road train travelling 610km for delivery to the Port of Fremantle. Product will be loaded into bulka-bags with a nominal weight of one tonne prior to transport via tautliner trailers. Approximate product weight per trip is 60-65 metric tonnes. It is estimated that approximately 3 triple road-train combinations will transport product to Port of Fremantle each day on a 5 day per week basis.



# HEALTH, SAFETY, ENVIRONMENT & COMMUNITY

**Land Use** - The Project is situated within Mining Reserve R24714 which is vested to the Department of Mines, Industry Regulation and Safety (“DMIRS”).

**Tenure** – MRCG and Gold Terrace are the tenement holders for tenure associated with the Munglinup Graphite Project. Four tenements are required to develop the Project under the Mining Act 1978 (WA). Project tenure includes the granted M74/245 and General Purpose Lease G74/9, and two Miscellaneous Licences, L74/55 and L74/56.

**Native Title** - Native Title has been found to be extinguished within the Mining Reserve.

**Community Development** - A comprehensive Community Engagement Plan has been developed which identifies key stakeholders and interest groups on which the Project may have an impact or could provide a social or economic benefit to, and how MRCG plans to interact and communicate with them.

## Status of Environmental Approvals

Following directions from the WA Environmental Protection Authority and the Commonwealth Department of Energy and Environment in July 2019, additional studies are required for EPA and EPBC Assessment. These studies cover:

- Level 2 terrestrial fauna
- Level 2 SRE fauna assessment
- Additional hydrology and hydrogeological assessment
- Supplementary flora assessment
- Additional dieback assessment
- Ecological linkage assessment

It is expected these **additional studies will be completed in March 2020** and that a final submission to the EPA would be made shortly thereafter. Providing there are no issues, the **EPA and EPBC approvals for the Project will be completed in Q3 2020.**

Role	Persons
Site Management and Administration	8
Owner’s Mining Team	2
Processing	35
Maintenance	10
<b>Subtotal Plant Workforce</b>	<b>55</b>
Laboratory Contractor	3
<b>Total Workforce</b>	<b>58</b>

**Human Resources** - total operational workforce is estimated to comprise 55 personnel, of which 21 will be employed on a continuous shift-based roster and the remaining will be employed on a Monday to Friday, daytime only roster. Mining will be undertaken by an additional mining contractor. Workforce recruitment for the Project will focus around the Esperance Shire and surrounding regional areas with a bus service to site daily to mitigate risks arising from fatigue.



# MARKETING

- Average 52,000tpa graphite concentrate production commencing Q4 2021.
- Concentrate Flake distribution
- - 58% <150µm
- - 34% >180µm
- Flake <150µm product utilised for Battery Anode Material production
- MRC is positioning itself to be a Specialty and High Value Graphite Producer

Product	Price (USD/t )	Quantity	Total (US\$'000)
S Jumbo	\$2,787	15,273	42,561
Jumbo	\$1,990	86,548	172,269
Large	\$1,130	155,053	175,228
Medium	\$1,077	62,851	67,712
Small	\$930	206,588	192,189
Fine	\$927	218,708	202,641
<b>Total</b>		<b>745,022</b>	<b>852,600</b>

Weighted Average Price

**\$1,144**

## Proposed Standard Products

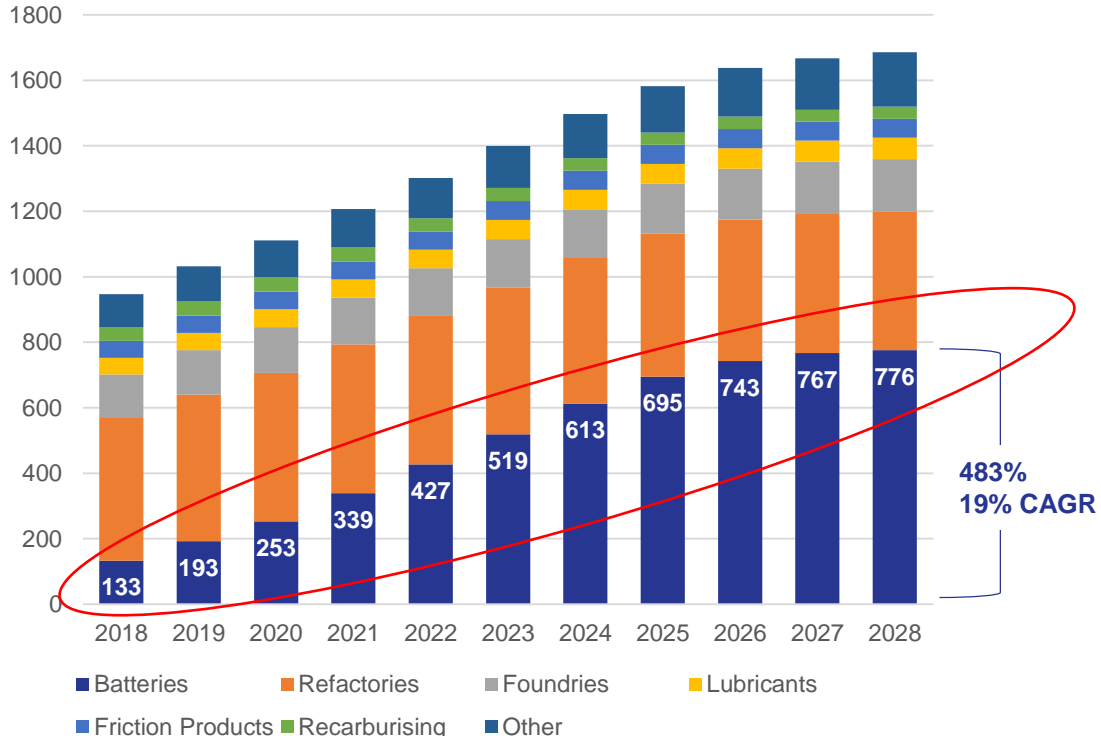
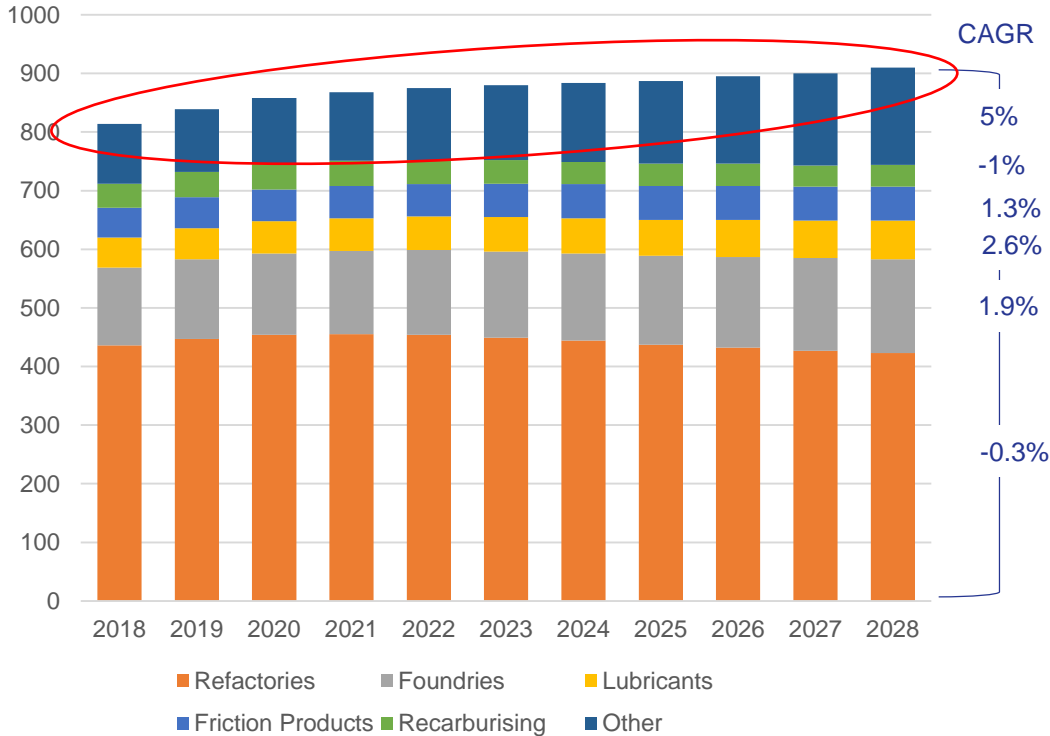
Size	Product
<b>500µ / +35 #</b>	MRC35/MRC Super Jumbo
<b>300µ / +50#</b>	MRC50/MRC Jumbo
<b>180µ / +80 #</b>	MRC80/MRC Large Flake
<b>150µ / +100 #</b>	MRC100/MRC Flake
<b>75µ / +200 #</b>	MRC-100/MRC Fines
<b>25µ / +550 #</b>	

# TRADITIONAL v BATTERIES NATURAL FLAKE GRAPHITE MARKET

10 year forecast – Traditional natural flake graphite demand is forecasted to grow just 12%. Battery demand will grow by 483%.

**TRADITIONAL APPLICATIONS**      **12% Total Growth**  
**1.12% CAGR**

**+ BATTERY APPLICATIONS**      **483% Total Growth**  
**19% CAGR**



Source: Roskill, Base case, World Forecast demand for natural graphite by application, 2018-2028. Roskill Natural & Synthetic Graphite, Outlook to 2028, 12<sup>th</sup> Edition. July 2019.



# KEY DOWNSTREAM VALUE PHASES

Ongoing

## PURIFICATION

Purification of high grade fines using non-HF chemical approach being developed within CRC-P and alternatives to produce BAM feed. Produce high value 'low ash' expandables feed and higher grade refractory coarse flakes.

1

VALUE ADD TO EXISTING CONCENTRATE

4

## EXPANDABLES

Evaluate expansion characteristics of coarse concentrates (both standard grade and purified samples). Development of expandables strategy from Graphite Intercalated Compounds ("GIC") to expanded graphite sheets and foils.

2

3

## SPHERONISATION

Ongoing evaluation of micronising and spheronising the fines concentrate into unpurified spherical graphite onsite leveraging existing infrastructure to produce battery anode precursor materials.

## BATTERY ANODE MATERIAL ("BAM")

Electrochemical evaluation of batteries produced from micronised, spheronised and coated purified fines concentrate. Production of samples for customer evaluation.

# PROJECT IMPLEMENTATION

A Project Execution Plan (PEP) provides certainty in terms of Project delivery schedule and cost.

## Three Phase Project Execution Strategy

### 1. Phase 1 – ECI: An initial Early Contractor Involvement (ECI)

EPC Contractor will work in collaboration with the DFS Consultants to define the project scope – **COMPLETED Q4**.

### 2. Phase 2 – FEED: Post-DFS

Engineering Project Management (EPM) works to generate detailed pricing including engagement of Early Works Contractors and ordering long lead equipment items until the finalisation of permitting and decision to mine.

### 3. Phase 3 - EPC Delivery:

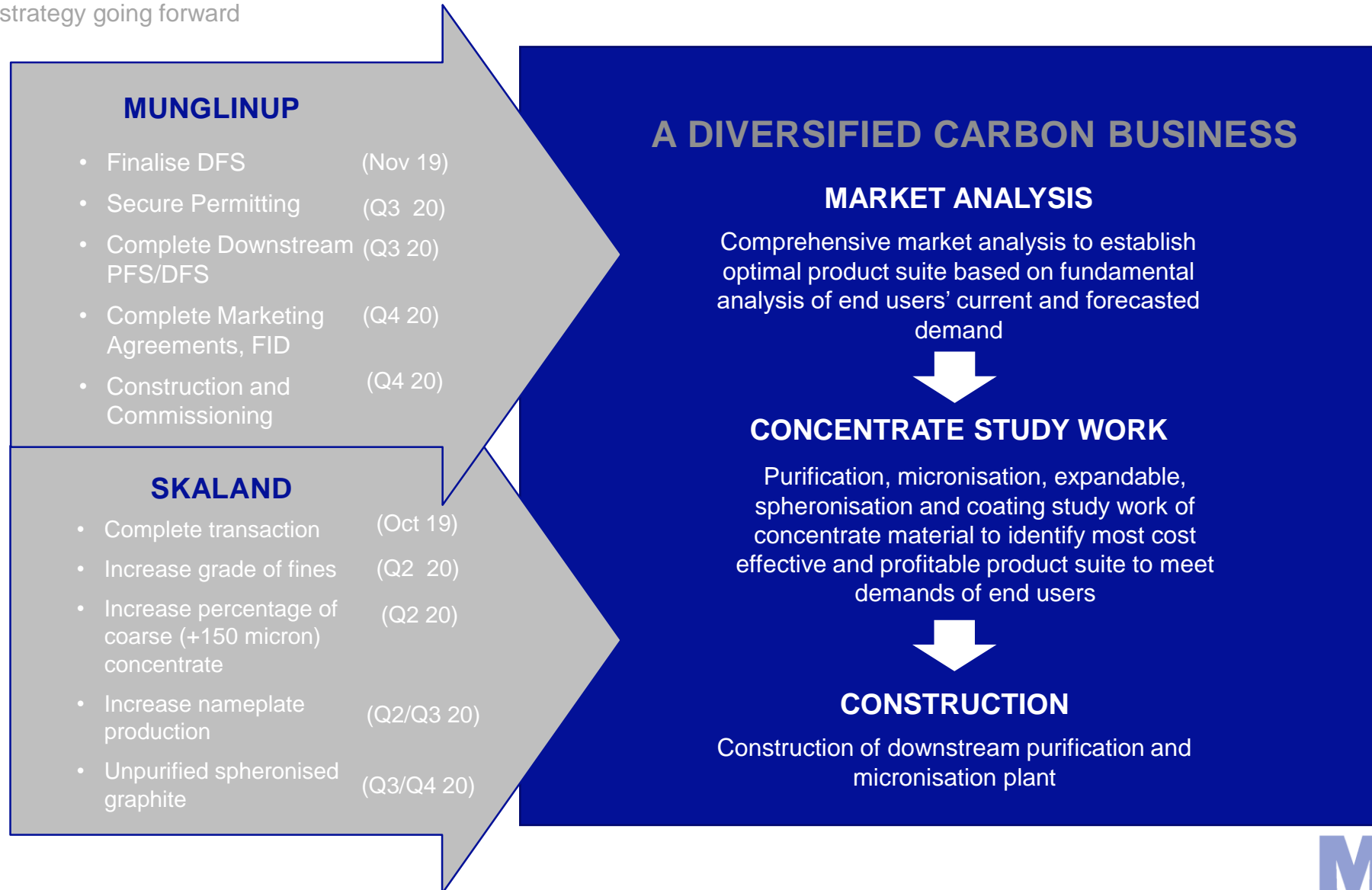
Based on either a Fixed Price Contract (FPC) or Target Cost Estimate (TCE).

## Project Schedule/Milestone

Description	Target
Decision on EP Act & EPBC Act Referral	Mar 2019
Completion of Feasibility Study	Jan 2020
Supplementary EP Act Submissions	Apr 2020
Front End Engineering and Design (FEED)	Jul, 2020
Decision on Environmental Approval	Aug 2020
Start Construction and Earthworks	Q4, 2020
Commissioning	Q3, 2021
Production and Ramp-up	Q4, 2021

# FOCUS FOR FUTURE SUCCESS

MRCG strategy going forward



# ASX ANNOUNCEMENTS

- 11/09/2017 MRC to acquire 51% interest in Munglinup Graphite Project
- 13/09/2017 Further Resource Information - Munglinup Graphite Project
- 27/11/2017 Munglinup Graphite Project Scoping Study Results
- 13/12/2017 MOU with Doral - Spheroidisation & Purification of Graphite
- 08/02/2018 Munglinup Met Tests Confirms Premium Flake Graphite
- 08/05/2018 Munglinup Expandable Graphite Testwork Results Positive
- 10/05/2018 Additional Expandable Graphite Testwork Results Information
- 30/05/2018 MRC Munglinup Graphite PFS Confirms Robust Project
- 05/06/2018 High Grade Extension Drilling Results At Munglinup
- 08/06/2018 MRC Acquires Strategic EL Adjacent to Munglinup
- 06/09/2018 Munglinup Testwork Delivers Positive Variability Results
- 22/10/2018 Positive Munglinup Graphite Optimisation Testwork Results
- 17/12/2018 MRC and Doral Extends Downstream Graphite Processing MOU
- 27/03/2019 MRC Awards Early Start Engineering Contract To Mondium
- 17/04/2019 Up to 49.3% TGC High Grade Results at Munglinup



## JORC Code, 2012 Edition – Table 1, Munглинup Graphite Deposit

### Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections)

Criteria	Commentary
<i>Sampling techniques</i>	<ul style="list-style-type: none"> <li>The current resource database consists of 161 air core holes, 26 RC holes and 46 diamond holes representing 8,332m of drilling and 3,569 analysed drill samples.</li> <li>Air core (undertaken by Graphite Australia) ore zone intervals were sampled every meter using a scoop spear and the material bagged and numbered. Waste was not sampled except for a small buffer either side of the mineralisation.</li> <li>Diamond drilling (undertaken by Graphite Australia) ore zone intervals were sampled every meter except for ore boundaries where a longer or shorter interval was taken. Waste was not sampled except for a small buffer either side of the mineralisation.</li> </ul>
<i>Drilling techniques</i>	<ul style="list-style-type: none"> <li>Diamond drilling was done using HQ triple tube.</li> <li>The mineralisation occurs from surface and drilling was done to a maximum of 91m depth.</li> </ul>
<i>Drill sample recovery</i>	<ul style="list-style-type: none"> <li>No continuous data was recorded on core or chip recovery. Only poor sample quality and recovery was recorded for air core.</li> <li>Due to the style of the deposit it is considered that any material loss is not significant to the estimation of mineralisation. However, statistical analysis of core recovery is still to be completed.</li> </ul>
<i>Logging</i>	<ul style="list-style-type: none"> <li>Holes were initially logged by on-site geologists. Diamond core was relogged and resampled in 2016.</li> <li>The data and results obtained from the 2012-2013 (Graphite Australia) drilling campaign were compared with the new logging and lab results from 2016 (AEMCO) as well as the historical logging and grades from the 1986 diamond holes by Sons of Gwalia. The two datasets were correlated to an acceptable level.</li> <li>A comprehensive logging system was developed and included alteration (type, style and intensity), grain size, rock type / lithology, colour, minerals, textures, fabric, parent rock (where fresh), sedimentary setting and, graphite class and grade.</li> <li>Geotechnical aspects in the form of RQD parameters were also recorded for the diamond core as well as specific structures and details in this regard, e.g. alpha angles.</li> </ul>
<i>Sub-sampling techniques and sample preparation</i>	<ul style="list-style-type: none"> <li>Air core was sampled using a scoop spear.</li> <li>Diamond core was cut by a diamond impregnated blade core saw and half core sampled. Re-sampling of the remaining core in 2016 for data validation purposes (422 core samples including 26 duplicates and 19 repeat samples) used quarter core.</li> <li>Duplicates (quarter core) were taken every 20 meters during the Graphite Australia drilling program.</li> </ul>

Criteria	Commentary
<i>Quality of assay data and laboratory tests</i>	<ul style="list-style-type: none"> <li>• Standards were inserted every 20 meters. No blanks were used in addition to normal laboratory QA/QC protocols.</li> <li>• Sample analysis was undertaken by Nagrom in Perth for the Graphite Australia samples.</li> <li>• The graphite content is reported as Total Graphitic Carbon (TGC). Prepared samples are dissolved in HCl over heat until all carbonate material is removed. The residue is then heated to drive off organic content. The final residue is combusted in oxygen with a Carbon-Sulphur Analyser and analysed for TGC.</li> <li>• Sample analysis was undertaken by Analabs in Perth for the Gwalia Minerals NL samples. Two methods were used: <ul style="list-style-type: none"> <li>• Fixed carbon (&gt;40%C) – C graphite is determined as an expression of fixed carbon, which is calculated by subtracting the sum of the percentages of moisture in the sample, volatile matter and ash from 100 (BS1016 methodology).</li> <li>• Fixed carbon (&lt;40%C) - the sample is washed with organic solvents, filtered and washed with NaOH solution. The sample is then attacked with hot 1:1 HCL to remove carbonates, washed and dried at 105°C, the residue is analysed for carbon by converting the carbon to CO<sub>2</sub> in a Leco furnace and measuring by infra-red.</li> </ul> </li> <li>• Eleven check samples (pulp) from Analabs were sent to Classic Laboratories for cross checks. Classic Laboratories washed the samples with dilute HCL to remove carbonates, ash at 450°C to remove organic carbon and assay by Leco furnace for the remaining fixed carbon / C graphite. Check assays (&gt;10% fixed carbon) were all within ±10% of the original Analabs assay. Analabs assays within the range 5% - 10% fixed carbon was approximately 15% lower than Classic's check assays.</li> </ul>
<i>Verification of sampling and assaying</i>	<ul style="list-style-type: none"> <li>• Four twin holes were drilled by Graphite Australia near (8-14m) the historical diamond holes by Sons of Gwalia.</li> <li>• The database containing drilling data and results was provided by Graphite Australia. A review of the data was done by the project field geologist Mr Luke Forti and the accuracy of the data was discussed with him during a number of meetings with AEMCO during 2015. Confirmation on the integrity and accuracy of the data was provided.</li> <li>• A visual review of the diamond core was then done by AEMCO in 2016 to confirm the historical logging by Graphite Australia. Any outstanding information was recovered from the diamond core and updated geological logs were created.</li> <li>• Diamond core was relogged and resampled in 2016. 422 core samples were re-analysed by Nagrom during April 2016, including 26 duplicate and 19 repeat samples to confirm grade results. GGC01, GGC08 &amp; GGC09 standards were used.</li> <li>• The data and results obtained from the 2012-2013 (Graphite Australia) drilling campaign were compared with the new logging and lab results from 2016 (AEMCO) as well as the historical logging and grades from the 1986 diamond holes by Sons of Gwalia. Any discrepancies or errors were either corrected or the results rejected.</li> </ul>
<i>Location of data points</i>	<ul style="list-style-type: none"> <li>• All exploration drillhole collars were re-surveyed to 0.05m accuracy by Esperance Surveys in July 2016. In total 90% (179 holes) were re-surveyed to confirm location integrity. Average variation from the original field survey in all directions was less than 2m.</li> </ul>



Criteria	Commentary
	<ul style="list-style-type: none"> <li>Holes drilled since 2016 have had their collars picked up by GPS. These hole collars will be surveyed in the future.</li> <li>Air core holes were down hole surveyed at the end of the hole only. Diamond drill holes were surveyed at 30m depth and the end of hole.</li> <li>Local grids were established at each of the prospects then later converted to GDA94. Hole collars were originally surveyed by GPS only.</li> </ul>
<i>Data spacing and distribution</i>	<ul style="list-style-type: none"> <li>Drill spacing: <ul style="list-style-type: none"> <li>Halberts Main Zone: (Drill Grid 40 x 20m to 50 x 20m).</li> <li>Halberts South Zone: (Drill Grid 40 x 20 &amp; 40 x 10 infill)</li> <li>Harris Area: (Drill Grid 40 x 20m)</li> <li>Wright West Area: (Drill Grid 40 x 20)</li> <li>Wright East (Mcarthy) Area: (Drill Grid 40 x 10)</li> </ul> </li> </ul>
<i>Orientation of data in relation to geological structure</i>	<ul style="list-style-type: none"> <li>The deposits were drilled at approximately -60° to intersect the mineralised zones approximately orthogonal to the interpreted dip and strike of the geological units.</li> </ul>
<i>Sample security</i>	<ul style="list-style-type: none"> <li>Graphite Australia followed a disciplined QA/QC process as is evident from their database and chain of command documents. AEMCO followed the same procedure and personally took all resampled material to Nagrom and recovered the processed sample material for storage with the remaining core and air core samples at a secured location in Welshpool, WA.</li> </ul>
<i>Audits or reviews</i>	<ul style="list-style-type: none"> <li>An audit was conducted by Coffey Mining Pty Ltd in 2011 prior to the additional drilling undertaken by Graphite Australia. The review stated: "Resources and reserves are assessed to be non-JORC compliant, given the age and the lack of available core. However, given the level of documentation provided, and the extent to which an auditable trail exists in relation to the modelled resources and reserves, the metrics presented are credible and serve as the basis for project decision-making."</li> <li>The 2012-2013 exploration work done by Graphite Australia was reviewed and completed by AEMCO in 2015 and 2016 and from this review a maiden JORC 2012 resource was determined.</li> </ul>

## Section 2 Reporting of Exploration Results

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

Criteria	Commentary
<i>Mineral tenement and land tenure status</i>	<ul style="list-style-type: none"> <li>The tenements (M74/75 &amp; E74/505) are situated on the Ravensthorpe SI 51-5 and North-Over 3031, 1:250,000 and 1:100,000 geological sheets respectively.</li> <li>Mining Lease 74/245 was granted on 26 August 2010 for a term of 21 years. The Lease is 685 hectares in area.</li> <li>Exploration License 74/505 of 2 block size was granted on 23 October 2012 for a period of 5 years.</li> <li>Gold Terrace Pty Ltd are the current registered owners of the Munglinup Mining Lease (M74/245) and Exploration License E74/505.</li> <li>There is a caveat on the tenements relating to a 2% gross royalty liability with Adelaide Prospecting as the beneficiary.</li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>The fully granted mining lease is valid to August 2031.</li> <li>The tenements are located in a fully gazetted mining reserve, with no native title or private land ownership issues.</li> </ul>
<i>Exploration done by other parties</i>	<ul style="list-style-type: none"> <li>Metals Exploration NL – (1971-1972)</li> <li>Norseman Gold Mines – (1979-1980)</li> <li>Pioneer Concrete – (1985-1986)</li> <li>Gwalia Minerals NL – (1988 – 1989)</li> <li>Sons of Gwalia – Gwalia Minerals: Feasibility Studies – (1989 to 1991)</li> <li>Adelaide Prospecting – (2007-2010)</li> <li>Graphite Australia (2010-2013)</li> <li>Gold Terrace (2014–2016)</li> </ul>
<i>Geology</i>	<ul style="list-style-type: none"> <li>The Munглиnup area comprises Archean to Paleoproterozoic, metamorphosed granitic and other metamorphic rocks of the Albany–Fraser Orogen, typically hornblende (± garnet) gneiss and migmatite.</li> <li>Within the gneissic rock mass, rocks containing the Munглиnup graphite deposits consist of a succession of tightly folded metasedimentary rocks with a consistent dip from north north east to the south.</li> <li>The classification scheme most widely accepted for graphite deposits was introduced by Cameron (1960). It classifies known graphite deposits into five categories reflecting the different types of graphite.</li> <li>Using this classification scheme, it is most likely that the Munглиnup deposit can be characterised as a type 1, disseminated flake graphite in silica-rich meta-sediments deposit.</li> </ul>
<i>Drill hole Information</i>	<ul style="list-style-type: none"> <li>No exploration results are being reported.</li> </ul>
<i>Data aggregation methods</i>	<ul style="list-style-type: none"> <li>No exploration results are being reported.</li> </ul>
<i>Relationship between mineralisation widths and intercept lengths</i>	<ul style="list-style-type: none"> <li>Inclined air core and diamond drilling (HQ3) was done to try and intersect the different graphite zones as close to true width as possible. Average dip angle was 60°.</li> </ul>
<i>Diagrams</i>	<ul style="list-style-type: none"> <li>No exploration results are being reported.</li> </ul>
<i>Balanced reporting</i>	<ul style="list-style-type: none"> <li>No exploration results are being reported.</li> </ul>
<i>Other substantive exploration data</i>	<ul style="list-style-type: none"> <li>No exploration results are being reported.</li> </ul>
<i>Further work</i>	<ul style="list-style-type: none"> <li>To be announced to the market in the near future.</li> </ul>

## Section 3 Reporting of Mineral Resources

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

Criteria	Commentary
<i>Database integrity</i>	<ul style="list-style-type: none"> <li>• Data is currently stored in a secure third party (Maxwell Geoscience) cloud hosted and maintained geological database solution (WebShed). A review of the data was done by the project field geologist Mr. Luke Forti and the accuracy of the data was discussed with him during a number of meetings with AEMCO during 2015. Confirmation on the integrity and accuracy of the data was provided.</li> <li>• A visual review of the diamond core was then done by AEMCO in 2016 to confirm the historical logging by Graphite Australia. Any outstanding information was recovered from the diamond core and updated geological logs were created.</li> <li>• Diamond core was relogged and resampled in 2016. 422 core samples were re-analysed by Nagrom during April 2016, including 26 duplicate and 19 repeat samples to confirm grade results. GGC01, GGC08 &amp; GGC09 standards were used.</li> <li>• The data and results obtained from the 2012-2013 (Graphite Australia) drilling campaign were compared with the new logging and lab results from 2016 (AEMCO) as well as the historical logging and grades from the 1986 diamond holes by Sons of Gwalia. Any discrepancies or errors were either corrected or the results rejected.</li> </ul>
<i>Site visits</i>	<ul style="list-style-type: none"> <li>• No site visit was undertaken as all drilling, survey work and site rehabilitation had been completed before this resource assessment started.</li> </ul>
<i>Geological interpretation</i>	<ul style="list-style-type: none"> <li>• The overall continuity of the graphitic schist is very strong yet local geometric complexity can be high.</li> <li>• Geological logging, and to a minor degree assay, have been used to generate estimation domains. Unassayed intervals have been set to zero before estimation. The minimum interpreted thickness of mineralisation and internal waste was 1m.</li> <li>• The strike and dip of the deposit is well understood. The mineralisation is sometimes tabular but can also be geometrically complex. Mineralisation pinches and swells and bifurcates. There may also be small scale faulting and faulting which is still not well understood and, while probably not impacting on global tonnes and grade, can impact significantly on the local geometry.</li> </ul>
<i>Dimensions</i>	<ul style="list-style-type: none"> <li>• The mineralised zones consist of numerous thin (2-20m wide) steeply dipping folded zones reflecting a cover nappe system with late stage granite and pegmatite intrusions.</li> <li>• Halberts Main Zone:             <ul style="list-style-type: none"> <li>○ Length: 730m</li> <li>○ Width: 90-130m</li> <li>○ Depth: surface to -90m</li> </ul> </li> <li>• Halberts South Zone:             <ul style="list-style-type: none"> <li>○ Length: 560m</li> <li>○ Width: 20-50m</li> <li>○ Depth: surface to -60m</li> </ul> </li> <li>• Harris Area:             <ul style="list-style-type: none"> <li>○ Length: 435m</li> <li>○ Width: 30-70m</li> </ul> </li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>○ Depth: surface to -35m</li> <li>• McCarthy West Area: <ul style="list-style-type: none"> <li>○ Length: 290m</li> <li>○ Width: 100-110m</li> <li>○ Depth: surface to -55m</li> </ul> </li> <li>• McCarthy East Area: <ul style="list-style-type: none"> <li>○ Length: 260m</li> <li>○ Width: 12-20m</li> <li>○ Depth: surface to -30m</li> </ul> </li> </ul>
<i>Estimation and modelling techniques</i>	<ul style="list-style-type: none"> <li>• Leapfrog Geo was used to model the lithology-based estimation domains.</li> <li>• Exploratory data analysis and variography was completed in Isatis while estimation occurred in Minesight.</li> <li>• 1m composites were used for estimation. The total graphitic carbon has a low coefficient of variation of about one and top cuts were required.</li> <li>• Kriging was into 5m x 5m x 5m blocks while the drill hole spacing was generally 40x10m to 40x20m. Small blocks were required because the modelled mineralisation can be as narrow as 1m.</li> <li>• Sample to block distances are generally with 20-30m for Indicated while Inferred resources are generally within 50m.</li> <li>• Domain boundaries were treated as hard during estimation.</li> <li>• Anisotropic search distances were used.</li> <li>• Minimum of six composites to estimate a block except for the Halberts Main area where the minimum was reduced to 3 so that all blocks could be estimated.</li> <li>• No quadrant or octant searching was used.</li> <li>• Maximum number of 30 composites to estimate a block except for the McCarthy area where this reduced to a maximum of 15.</li> <li>• Discretisation of 5x5x5.</li> <li>• Search dimensions of 300m x 300m x 50m.</li> <li>• The kriged estimate was validated by alternative nearest neighbour, inverse distance and kriged estimates.</li> <li>• Estimate was visually checked against composite grades and swath plots were generated.</li> <li>• No biproducts are present.</li> <li>• No deleterious elements have been estimated.</li> </ul>
<i>Moisture</i>	<ul style="list-style-type: none"> <li>• The resource tonnages are based on a dry basis at a Bulk Density of 1.</li> </ul>
<i>Cut-off parameters</i>	<ul style="list-style-type: none"> <li>• The current reported resource was declared at a cut-off grade of 5%. The industry standard median grade for commercial graphite mine development is considered to be approximately 7-10% TGC. The cashflow model developed for mine optimisation included some blocks as low as circa 6% TGC as economic, given favourable metallurgical response estimations and material location (i.e. short haul distances).</li> </ul>
<i>Mining factors or assumptions</i>	<ul style="list-style-type: none"> <li>• Mining of the deposit will be by open pit surface mining methods involving standard truck and haul mining techniques.</li> <li>• It has been assumed that no drill and blast will be required given the weathered nature of the deposit and corresponding weak material strength.</li> </ul>

Criteria	Commentary
<i>Metallurgical factors or assumptions</i>	<ul style="list-style-type: none"> <li>• Extensive metallurgical testing has been done on the deposit which include the following studies:</li> <li>• Amdel (for Picon) – 1986</li> <li>• Leach and Flotation test work – Chemistry Centre – 1990</li> <li>• Settling Tests – Chemistry Centre – 1991</li> <li>• Flotation Tests – Chemistry Centre – 1991</li> <li>• Screening Test – Chemistry Centre - 1992</li> <li>• Coffey Mining - 2011</li> <li>• Metallurgical study – TF Brittliffe – 2011</li> <li>• Nagrom tests 2011-2016 and Petrographical studies by Roger Townend and Associates</li> <li>• BatteryLimits supervised testwork at ALS Metallurgy labs in Perth – 2018 <ul style="list-style-type: none"> <li>○ See Section 4 for more detail</li> </ul> </li> </ul>
<i>Bulk density</i>	<ul style="list-style-type: none"> <li>• The bulk density is based on historical density calculation for the material at 2.0 g/cm<sup>3</sup></li> <li>• The host geology comprises weathered metamorphic material. Visual inspection of core indicates little loss of material due to vugs or discontinuities.</li> <li>• All material within the mineralisation domains were assumed to be a combination of graphitic gneiss, graphitic ironstone and graphitic magnesite.</li> </ul>
<i>Classification</i>	<ul style="list-style-type: none"> <li>• Classification is Indicated for 40m spaced drilling.</li> <li>• Inferred resources are up to 100m from the nearest drill hole but extrapolation distances of 30-50m would be more common. Inferred resources are generally in areas where the mineralisation is considered thicker and more continuous.</li> <li>• These resource classifications are considered appropriate by the competent person for the style of mineralisation and quality of data.</li> </ul>
<i>Audits or reviews</i>	<ul style="list-style-type: none"> <li>• No formal review or audit of the Mineral Resource model has been completed.</li> <li>• The model was informally reviewed by Mr. Andrew Scogings of CSA Global who is a highly experienced geologist with expert knowledge of industrial minerals exploration, mining and processing, product development, market applications and commercialisation processes. Andrew has published several papers on the requirements of JORC 2012 Clause 49 and is an AIG Registered Professional Geologist specialising in industrial minerals.</li> </ul>
<i>Discussion of relative accuracy/ confidence</i>	<ul style="list-style-type: none"> <li>• The Munglinup graphite deposit has been mapped, drilled, mined and investigated numerous times over the past 100 years. The high-grade nature of the resource and its potential is well documented.</li> <li>• While large scale continuity of the mineralised domain is good, variogram ranges are short and local estimation accuracy is often low.</li> <li>• The resource estimate compares favourably with historical production grades of 19%.</li> <li>• Conditional simulations of total graphitic carbon were generated in 2019 for Halberts Main. The indicated resource was divided into three elevation-based zones each equating to about 12 months production. The uncertainty in predicted tonnes of graphite was <math>\pm 14\%</math>. This, however, does not include uncertainty for the geological interpretation and density which may be significant.</li> </ul>

## Section 4 Estimation and Reporting of Ore Reserves

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

Criteria	Commentary
<i>Mineral Resource estimate for conversion to Ore Reserves</i>	<ul style="list-style-type: none"> <li>• The Mineral Resource was updated in April 2019. Mr. Chris De-Vitry is the Mineral Resources Competent Person for the purposes of the Mineral Resource Estimate as defined and in accordance with the JORC Code 2012.</li> <li>• Leapfrog Geo was used to model the lithology-based estimation domains.</li> <li>• Exploratory data analysis and variography was completed in Isatis while estimation occurred in Minesight.</li> <li>• 1m composites were used for estimation. The total graphitic carbon has a low coefficient of variation of about one and top cuts were required.</li> <li>• Kriging was into 5m x 5m x 5m blocks while the drill hole spacing was generally 40x10m to 40x20m. Small blocks were required because the modelled mineralisation can be as narrow as 1m.</li> <li>• Sample to block distances are generally with 20-30m for Indicated while Inferred resources are generally within 50m.</li> <li>• Domain boundaries were treated as hard during estimation.</li> <li>• Anisotropic search distances were used.</li> <li>• Minimum of six composites to estimate a block except for the Halberts Main area where the minimum was reduced to 3 so that all blocks could be estimated.</li> <li>• No quadrant or octant searching was used.</li> <li>• Maximum number of 30 composites to estimate a block except for the McCarthy area where this reduced to a maximum of 15.</li> <li>• Discretisation of 5x5x5.</li> <li>• Search dimensions of 300m x 300m x 50m.</li> <li>• The kriged estimate was validated by alternative nearest neighbour, inverse distance and kriged estimates.</li> <li>• Estimate was visually checked against composite grades and swath plots were generated.</li> <li>• No biproducts are present.</li> <li>• No deleterious elements have been estimated.</li> </ul>
<i>Site visits</i>	<ul style="list-style-type: none"> <li>• Numerous site visits have been undertaken since October 2017. The nearby Towns of Ravensthorpe and Esperance have also been visited to assess regional infrastructure and support capabilities. Historical core from the site has also been examined at various times by both the Mineral Resource and Ore Reserve CP's.</li> <li>• Surface mineralisation was examined along with locating of previous drill collars and review of recent drilling programs while being conducted. Access and exploration of possible mining issues were assessed along with a general geographic overview of the area.</li> </ul>
<i>Study status</i>	<ul style="list-style-type: none"> <li>• This study is assessed as being at a Definitive Feasibility Study Level.</li> <li>• Historical study work on the Munglinup Deposit is extensive.</li> <li>• The Definitive Feasibility Study evaluated Geology and Resource, Mining, Metallurgy, Process Plant and Tailings, Infrastructure and Logistics, Environment and Permitting, Human Resources, Marketing, Implementation Plan and Schedule, Capital and Operating Costs, Financial Assessment, Risk Management and other activities/issues that could impact the proposed operation as contained in the DFS report.</li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>• The Definitive Feasibility study considered the technical, engineering and cost components, as well as the health and safety, and social and community impacts</li> <li>• Metallurgical test work shows that an acceptable minimum level of recovery and concentrate grade can be obtained with confidence.</li> </ul>
<i>Cut-off parameters</i>	<ul style="list-style-type: none"> <li>• A simplified cashflow script was developed to generate at a block level all of the required attributes to calculate the cashflow grades for the proposed processing permutation for subsequent use in pit optimisation and strategic mine schedule optimisation.</li> <li>• The basis for the application of the cut-off grade is a simplified variable cash flow per tonne. This approach provides the most mathematically efficient inputs to solve the objective function as used consistently in the optimisation models developed, which is to maximise the real, pre-tax NPV.</li> <li>• The cash flow script provides the linkage between the block model, the metallurgy models and the scheduling models and therefore needs to accurately reflect the input assumptions. The cash flow script, and the cash flow grade which it generates is current industry best practice, and supersedes other forms of cut-off grade such as a graphite break-even estimation as used in the historical studies.</li> <li>• The cash flow script was built with the current economic assumptions to accurately reflect the proposed operating cost profiles. The throughput and recovery calculation steps were based on the ALS testwork throughput and recovery estimations.</li> <li>• Blocks where the cash flow per tonne is positive are designated ore and negative blocks designated waste.</li> </ul>
<i>Mining factors or assumptions</i>	<ul style="list-style-type: none"> <li>• The pit shells were developed in Whittle 4x using the variable cashflow cut-off grade estimated in the block model. The optimisation shells selected comprised 13 open pits, mined over 2 stages, which initially target the higher value areas earlier in the mining plan. The stage 1 pits are optimised on the Measured and Indicated material while stage 2 optimisations include Inferred material.</li> <li>• A revenue factor of 1 was used for the stage 1 shells and 0.45 was used for the stage 2 shells. The lower revenue factor used in the stage 2 shells was deemed appropriate given the lower geological confidence. This resulted in selection of inferred material that is likely well above the cut-off grade and robust in terms of remaining economic within the variability of other modifying factors.</li> <li>• Dilution was set to 5% and ore recovery at 3%</li> <li>• All the selected pit shells had detailed pit designs created which aligned with the shells while retaining the geotechnical recommendations provided by Mining One.</li> <li>• The deposits will be mined in multiple stages using conventional open pit operation and will utilise conventional load-haul mining methods. Each bench will be mined using 130 tonne to 150 tonne class excavators and 100 tonne class rigid frame trucks.</li> <li>• A minimum mining width for pits of 35 meters based on the use of CAT 777 class rigid frame trucks.</li> <li>• Haul road widths designed to 22m for dual lane traffic and 15m for single lane, based on the use of CAT 777 class rigid frame trucks, with all ramp gradients to be limited to 1:10 (10%).</li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>• Mineralisation extends to surface so only limited pioneering and soil collection works are required. There is no pre-strip.</li> <li>• The high-grade nature of the deposit results in pit optimization shell sizes increasing incrementally with revenue factor.</li> <li>• Access to the area is straight forward with council maintained roads available to within 2 kilometers of the mining area.</li> <li>• The topography is gently undulating rises and it is anticipated that no significant issues associated with mining are likely.</li> <li>• Historical work included a systematic examination of drill core to assess the requirement for drill and blast during mining and to assess open pit stability. The examination was based largely on RQD parameters and concluded that drill/blast of the ore zone was unlikely to be necessary or desirable. Drill and blast of the west wall gneiss may however be required at depth. This has been costed in the contract mining proposals but not included in the financial model at this stage. Further detailed work on material hardness at depth will be conducted when appropriate.</li> <li>• Infrastructure requirements for the selected mining method are minimal. Annual material movement is planned to be limited to 3.5Mt per annum for the first 3 years of operation then reducing to a maximum of 3Mt per annum.</li> <li>• This level of mining activity is minor and will only require the most basic of infrastructure such as a small workshop, office, crib and ablution block and equipment hard stand.</li> <li>• The average strip ratio is 5:1 (waste:ore).</li> <li>• Based on the block model, the total mined mine waste rock volumes are expected to be approximately 35.3 million tonnes over a 15-year mine life. This equates to 19.3 million cubic meters of loose material at an average in-situ bulk density of 2.45 and a swell factor post mining of 35%.</li> <li>• Halbert's Main will be required for waste dumping once the pit has been finalised at the end of 2026. Available volume in Halbert's Main is 6.3 million cubic meters. Total waste material remaining post completion of the Halbert's Main pit is 9.79 million loose cubic meters.</li> </ul>
<p><i>Metallurgical factors or assumptions</i></p>	<ul style="list-style-type: none"> <li>• The metallurgical process proposed is comprised of standard graphite flotation processing. Flotation is a standard processing method for graphite flake deposits.</li> <li>• Flotation technology is well tested and understood.</li> <li>• Significant historical metallurgical testwork has been undertaken. Overall, more than 20 specific metallurgical studies were undertaken on the Munglinup Graphite mineralisation, predominantly in the late 1980's and early 1990's. In 2017 a metallurgical testwork program was undertaken at ALS Laboratory (ALS) in Perth to assess the ore's amenability to beneficiation by gravity and froth flotation. The results from this testwork program were used to support the process design and engineering for the 2017 PFS. In 2018 and 2019 further drilling was conducted to generate samples for additional metallurgical testwork programs to support the DFS.</li> <li>• An 8t bulk sample was extracted from the Halberts Main deposit to be used for metallurgical test work undertaken by Nagrom in 2011. This sample does include material from the three mineralisation types. The sample has ultimately been deemed only partially representative as it does not include material from depth. Future metallurgical testwork is utilizing a master composite derived from historical drilling core and that has been selected to provide high representivity of the deposit.</li> </ul>



## Criteria

## Commentary

- The 2018 PFS testwork utilised core that had been drilled in 2013 in Halberts Main and Halberts South areas. The variability program utilised core from eight drill holes from the 2018 program, located at Halberts Main and Halberts South at varying depths and lithology.

Sample ID	TC (%)	TGC (%)	SiO2 (%)	S(t) (%)	Al (%)	Ca (%)	Fe (%)	Mg (%)
<b>PFS Master Composite</b>	19.2	16.9	33.0	0.06	4.28	1.20	13.6	3.68
Var1	11.9	7.20	17	0.04	4.96	1.00	19.0	9.36
Var2	36.2	31.5	36.4	0.04	5.72	1.30	2.00	1.32
Var3	27.6	24.9	42.4	0.04	7.28	1.00	3.68	0.84
Var4	16.8	16.5	45.6	<0.02	5.72	<0.01	11.4	1.12
Var5	28.3	27.3	39.4	0.08	4.48	<0.01	10.5	0.40
Var6	17.4	16.8	41.2	0.06	5.00	0.20	15.5	0.64
Var7	13.6	14.0	45.4	0.1	4.96	0.30	14.7	0.76
Var8	23.4	22.1	43.4	0.04	8.92	<0.01	3.86	1.6
Var9	27.5	24.6	48.2	0.16	7.04	0.40	2.18	0.84
Var10	22.7	21.9	44.8	0.02	6.76	0.30	3.82	0.28
Var11	28.9	26.3	40.6	0.04	6.96	0.30	6.96	0.40
Var12	10.3	9.51	10.4	0.06	0.76	1.50	42.1	2.88
Var13	8.67	6.81	12.6	0.04	2.20	1.10	41.4	2.08
Var14	33.2	33.0	39.6	0.04	6.44	1.60	2.40	1.24
Var15	16.9	16.7	49.8	0.62	8.72	0.30	2.66	0.2
Var16	15.9	14.6	44.2	0.02	7.32	0.20	0.48	3.68
Var17	18.2	16.8	22.4	0.02	9.68	0.10	10.0	3.36
Var18	9.36	8.79	14.2	0.04	4.4	0.40	33.2	0.48
Var19	24.8	24.3	27.2	0.04	9.04	<0.01	9.76	0.12
Var20	13.2	12.8	41.8	2.34	6.32	0.20	6.50	0.64
<b>DFS Master Composite</b>	16.3	14.3	33.0	0.23	6.64	2.00	9.86	2.96

- Comminution testwork was undertaken on the Master Composite, near surface scrubber feed samples that were relatively soft, and additional samples targeted to provide more spatial variability as well as more competent material based on visual selection of the core. The tests included:
  - SAG Mill Comminution test (SMC)
  - Bond Ball Work Index (BBWi)
  - Bond Rod Work Index (BRWi)
  - Bond Abrasion Index (Ai)
- The ore is naturally very friable, weathered and can generally be considered to be soft.
- Initial flotation testwork was undertaken on the variability composites of Halberts Main and Halberts South at varying depths and lithology. The TGC recoveries were variable ranging from 56.0 to 97.5 % within the distribution. The composites with poor recoveries were either those in the ironstone-rich or

## Criteria

## Commentary

near surface zones. A size analysis of the final concentrates showed that all these composites contained little amounts of coarse flakes with most of the material in the -75 µm size fraction.

- The feed size P100 of 1000 µm was selected as the primary grind for the rougher circuit. Generally, the test procedure involved desliming the ground material at 25µm followed by rougher flotation. The rougher concentrate then underwent a secondary grind, as there were some coarse composites that needed to be liberated, before undergoing multiple cleaning stages. Prior to each cleaning stage the concentrate was reground in a stirred mill using ceramic media. This procedure aimed to increase graphite particle liberation whilst trying to avoid the break-up of coarser flakes.
- The flotation reagent scheme was relatively simple, consisting of kerosene as the collector, and a frother. All flotation tests were carried out at natural pH.
- The TGC recoveries were variable ranging from 56.0% to 97.5 %. The results showed that the high-grade final concentrates can be consistently produced with TGC grades ranging from 95.0% to 98.3% after 5 stages of cleaner flotation.
- The results showed that the coarse flake fraction (+150µm) can be maintained at around 50% proportion of the concentrate at high average TGC grades (up to 97.7%) and that high-grade fines (-150µm) concentrate can be produced with up to an average of 98.3% TGC.

Test ID	Final Concentrate				Total TGC Recovery
	+150 µm (Coarse)		-150 µm (Fine)		
	% Mass	% TGC Grade	% Mass	% TGC Grade	
BF1273	44.0	97.3	56.0	93.9	88.7
BF1281	48.4	97.7	51.6	94.2	86.6
BF1282	56.2	95.2	43.8	91.0	89.4
BF1289	57.0	95.7	43.0	97.2	86.4
BF1304	47.7	96.5	52.3	94.1	87.1
BF1305	46.4	96.5	53.6	98.3	84.9
BF1306	54.1	97.4	45.9	97.9	84.6
BF1334	51.4	95.1	48.6	97.6	85.8
BF1360					83.9
BF1363	49.3	97.1	50.7	95.6	67.0
BF1371	57.9	89.7	42.1	97.1	86.3

- In 2019 further drilling was conducted to generate samples for a metallurgical testwork program to support the DFS.
- A DFS Master Composite was produced and test work focused on optimising the flake size distribution and final grades of the concentrate. The testwork also investigated adjusting reagents addition rates, the number of cleaning and recleaning flotation stages, the number of polishing grinds, alternate reagents and intermediate screening. Processing was generally in Perth water with additional tests conducted using site water.

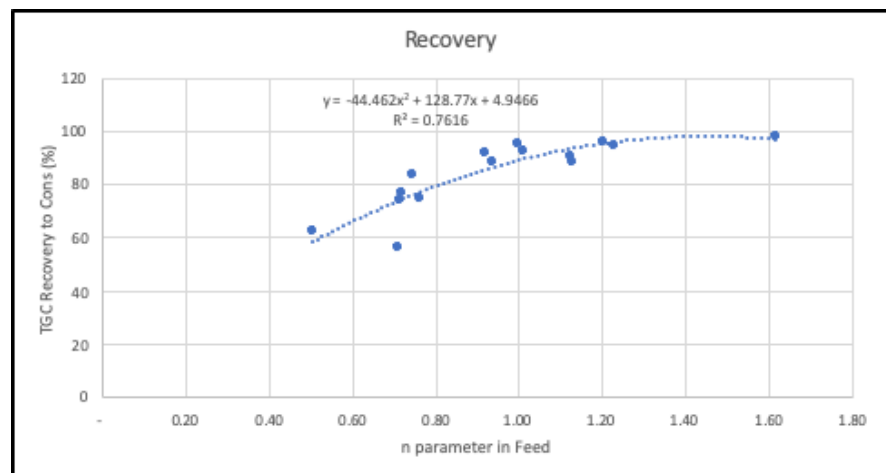
**Criteria**

**Commentary**

- The results showed that the coarse flake fraction (+150µm) can be maintained at around 50% proportion of the concentrate at high average TGC grades (up to 97.7%) and that high-grade fines (-150µm) concentrate can be produced with up to an average of 98.3% TGC.
- A 480 kg bulk sample of the DFS Master Composite was prepared and underwent large batch flotation tests in order to produce concentrate for vendor and marketing purposes. The flotation scheme and was based on the optimisation test work and utilised larger laboratory equipment. The coarse flake fraction was contained 48.6% of the mass with a TGC grade averaging 95.8%. The fines accounted for 51.4% of the mass with a TGC grade averaging 96.0%.

Flake Size	Micron (µm)	Mesh	Bulk sample Test BF1287	
			Mass (%)	Assay TGC (%)
<b>Jumbo</b>	300 – 500	50	17.7	96.0
<b>Large</b>	180 – 300	+80 -50	24.5	95.5
<b>Medium</b>	150 – 180	+100 -80	6.43	96.1
<b>Small</b>	75 – 150	+200-100	24.6	97.8
<b>Fines</b>	– 75	-200	26.8	94.4
<b>Calculated P<sub>80</sub> (µm) and TGC Grade (%)</b>			<b>289</b>	<b>95.8</b>

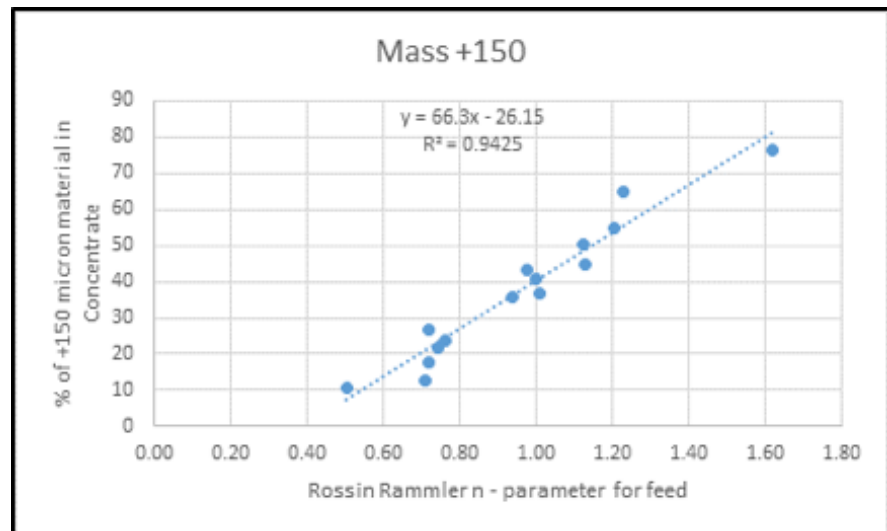
- Test work also included scrubbing, thickening, filtration, and rheology.
- Thickener testwork results indicated that both tailings and concentrate can be thickened by high rate thickening over a range of fluxes. The tailings reached densities up to 50.2% solids (w/w) while the final concentrate reached densities up to 36.8% solids (w/w).
- Comparative filtration testwork found that the most efficient method was pressure filtration over vacuum filtration. A final cake moisture of around 15% w/w was achieved with extensive air blowing.
- Graphite flake size distribution is set using a Rosin-Rammler Regression model.
- Analysis of the variability test work data shows that the n (dispersion) parameter on the Rosin-Rammler TGC feed distribution is a good predictor of the TGC Recovery.



## Criteria

## Commentary

- The distribution was also used to determine the product flake size distribution. This estimation also correlated well with the variability test work data.



- No specific allowances have been made for deleterious elements. Any non-graphite material that reports to the graphite concentrate is deemed to be dilutionary in nature only and does not attract any specific penalties beyond the reduction in concentrate price based on the graphite concentrate purity as is standard in the industry.
- Both historical and recent work has been done on the mineralogy of the deposit. The latest petrographical study was conducted on 12 samples from drill core that are representative of the deposit. The petrographical nature of the graphite mineralisation at Munglinup is well understood and shows that the final product will be able to meet the required specifications mineralogically.

## Environmental

- Significant environmental assessment work has been undertaken. The deposit lies entirely within a granted mining lease and information from the DMR suggests that only limited additional information will be required to proceed with operations.
- The potential mine waste associated with the Project is dominated by Non-Acid Forming (NAF) and uncertain material, a small proportion of the waste is Potentially Acid Forming (PAF). The PAF material will need to be managed during operations. The Project wastes were also found to contain metals above local soil concentration that can be potentially harmful to the environment such as arsenic, copper, lead, nickel and zinc, however only copper, nickel and lead are of concern and may require specific management during operation and closure. No metals were found to exceed health investigation level. All materials tested were found to have Exchangeable Sodium Percent (ESP) values >15% indicating that the wastes are strongly sodic and potentially dispersive.
- Flood assessments for a 1-in-100 and 1-in-2000-year flood events are not envisaged to impact on the Project, with the exception of a small creek line adjacent to the Halberts Main pit
- Results of geochemical characterisation associated with two tailings solids and one tailings liquor. The results indicate that the Munglinup tailings are Potentially Acid Neutralising (PAN), and that Molybdenum and Selenium are potential constituents of concern in leachate from dry tailings.

Criteria	Commentary
	<ul style="list-style-type: none"> <li>• Seven soil types have been identified and mapped within the Project area. The majority of soil types within the Project are nutrient deficient, and typically very shallow (2-5cm) with an organic material layer which included leaf litter and degrading material with topsoil. Four of the soil types show high exchangeable sodium percentage (ESP), and have a higher clay content and high sodium levels, which indicates that these soils are potentially dispersive (ISPL 2018). The most common soil type within the Project area is the Brown Loam Duplex, with the majority of available growth medium likely to come from this soil type (ISPL 2018).</li> <li>• The Project lies within the Esperance Coast Topographic Drainage Division and the Munghlinup River sub-catchment, with drainage trending southwards via two main features, the Munghlinup River and its tributary, Clayhole Creek.</li> <li>• A Munghlinup River Assessment Report was completed by Wetland Research and Management in 2018. Concentrations of heavy metals are mostly below the limit of detection and are not of ecological concern.</li> <li>• Two vegetation survey have been completed over the proposed Project area, one by Ecologia Environment in 2014 and the second by Woodman Environmental in 2018</li> <li>• In 2018, a Phytophthora Dieback assessment was completed within the main Mining Area. This assessment found no Phytophthora Dieback infestations, however the majority of the vegetation within the Project was mapped as uninterpretable due to an insufficient coverage of reliable indicator species (Glevan Consulting 2018).</li> <li>• No known groundwater users are expected to be impacted by the Project groundwater abstraction.</li> <li>• Three fauna surveys have been completed across the Project Area, one in 2014 by Ecologia Environment and two by Red Dog Environmental in 2018. Field records from fauna surveys and database records determined the 85 fauna taxa were recorded from direct sightings and indirect evidence (scats, tracks and calls). Two conservation significant species have been recorded in the area, one an endangered species - Carnaby's Black Cockatoo and the second a priority 4 species – Quenda.</li> </ul>
<i>Infrastructure</i>	<ul style="list-style-type: none"> <li>• The mining lease is currently devoid of any structures or buildings. Access to the site from Munghlinup township, 4km to the south, is by gravel road either from the west across the Munghlinup River or by station tracks from the east. Both access roads are in need of an upgrade.</li> <li>• The power requirements for the main process plant have been calculated at a total connected load of 5.3 MW including all duty and standby equipment with an estimated average demand of the project being 2.5MW with a peak of 2.8MW. This running load was determined from the estimated plant load plus allowances for losses.</li> <li>• Power is proposed to be supplied by POWERWEST with a 4.0 MW power station comprising 4 x containerised Jenbacher J320 - 1,057kWe reciprocating generator sets (gensets) operating with an n+1 strategy. The power station will supply power to the plant at 415V.</li> <li>• The power station will be fuelled by liquefied natural gas (LNG) supplied by EVOL LNG (a division of Wesfarmers), based on an onsite storage and vaporization facility comprising a single 135 tonne LNG storage tank, associated ancillary equipment and telemetry systems with a storage capacity design allowance of a nominal 10-11 days.</li> </ul>

Criteria	Commentary
	<ul style="list-style-type: none"> <li>• The Project will transport product via road train combinations travelling 610 km from the Project via a third-party logistics provider (3PL) for storage, handling, packing of containers for export, and delivery to the Port of Fremantle (POF). Product will be loaded into bulka-bags with a nominal weight of one tonne prior to transport via tautliner trailers. Approximate product weight per trip is 60-65 metric tonnes.</li> <li>• The Esperance-Goldfields region has a deep pool of mining trained employees engaged primarily in the gold sector but also in other mining projects. It is planned that employees will be recruited to a base location in Esperance.</li> <li>• The Project is located approximated 105 km west of Esperance. Site access is proposed via the South Coast highway; <ul style="list-style-type: none"> <li>○ North on Farmer Rd - 8.8 km</li> <li>○ West on Clayhole Rd - 3.6 Km</li> <li>○ Primary site access eastern road – 6 km</li> <li>○ Secondary site access western road</li> </ul> </li> <li>• The new site access roads will be constructed in accordance with appropriate Restricted Access Vehicle (RAV) requirements. In addition, both Farmer and Clayhole roads will be upgraded as required to comply with RAV road standards.</li> <li>• A borefield location has been investigated with several production bores drilled and pump tested to ensure that the borefield will support the operation. Water from the bores will be pumped to the raw water storage.</li> <li>• Generally, the project benefits from excellent infrastructure requiring only minimal additional expenditure.</li> <li>• Tailings will be thickened and pumped to a conventional paddock type TSF. The TSF will require storage of approximately 5.25 Mt of non-acid forming tailings produced at a rate of 0.35 Mtpa for a design life of 14 years.</li> <li>• The stability analysis of the Munglinup Graphite TSF embankment was carried out using the 2D limit equilibrium slope stability analysis software SlopeW (Geostudio 2018). Models were constructed for sections through both the South Western corner and Western embankments. Two representative cross-sections were analysed using the Morgenstern-Price method. The results of the stability analyses indicate that the estimated Factor of Safety against failure is greater than the Australian National Committee on Large Dams (ANCOLD) (2012) recommended minimum values.</li> <li>• A simplified dam break flow path assessment and hazard categorising was carried out for the TSF. The TSF is classified as a Category 1 dam according to DMIRS (2013). This classification is based on a High C hazard rating as defined in ANCOLD (2012b) and an embankment height greater than 15m.</li> </ul>
Costs	<ul style="list-style-type: none"> <li>• Mondium has prepared a preliminary capital cost estimate for the Munglinup Graphite Project</li> <li>• The Project includes engineering, design, procurement and construction of a 400,000 tpa graphite concentrator, using conventional crushing, scrubbing, screening, milling, flotation, drying, sizing and packaging technologies.</li> <li>• The capital estimate has been prepared by Battery Limits Pty Ltd, Mondium and MRC Graphite, with the capital cost estimate for the process plant, infrastructure, associated equipment and project management costs at +15/-5%.</li> </ul>

Capital	Project Total US\$M
Development Capital	55.5
Sustaining Capital	25.5
Pre-Strip Capital	4.3
<b>Total</b>	<b>85.3</b>

Capital	Project Total US\$M
Construction Distributables	4.3
Treatment Plant Costs	21.5
Reagents & Plant Services	7.0
Infrastructure	8.5
Management Costs	8.0
Owners Project Costs	6.2
<b>Total</b>	<b>55.5</b>

- Contingency of US\$5.7 million, representing some 11.5% of direct costs is included in the Project total development capex (US\$55.5 million).
- Sustaining capital expenditure is US\$25.5 million. This reflects the development capital of US\$55.5 million being sustained at three percent per annum for the 14 years life of mine.
- Pre-development mining costs including mining mobilisation, clear and grub works, topsoil removal, haul road development and MRC Graphite costs are budgeted at US\$4.3 million.
- The operating cost estimate for the Project includes all costs associated with mining, processing, infrastructure and site-based general and administration costs.
- The operating cost estimate has been prepared to an accuracy of  $\pm 15\%$ .
- Industry standards, quotations from vendors or information from the operating cost database and information from the process design criteria underlie the basis of the estimate.
- The operating costs have been compiled by Mondium from a variety of sources and additional consultants including:
  - Budget quotations received from suppliers
  - Operating cost database
  - Wages and salaries provided by MRC Graphite
  - General and Administration costs by MRC Graphite
  - HSEC costs inputs by ISPL and MRC Graphite
  - Product logistics by MRC Graphite
  - Estimates based on industry standards from similar operations
  - First principle estimates based on typical operating data
- The mining operating cost estimates have been prepared by MRC Graphite, with inputs from Mining Contractor.

## Criteria

## Commentary

Operating Costs	US\$ M	US\$/t Sold
Mining	135.4	182
Processing	140.1	188
Product Logistics (CIF)	74.0	99
Royalties	46.7	63
Indirect Production Costs	30.8	41
<b>Total (CIF)</b>	<b>427.0</b>	<b>573</b>

- Royalties have been calculated conservatively using a WA mineral royalty rate of five percent payable to the Western Australian government and a trailing residual royalty rate of an additional one percent payable to the original mining rights owners. Royalty payments are expected to be paid net of logistics expenditure.
- All amounts have been modelled in US dollars with foreign estimated inflows/outflows converted to US dollars at an average exchange rate forecast for the relevant transaction year. The forecast exchange rate used reflects long term exchange forecasts from a third-party foreign exchange provider and range from USD/AUD 0.68 to 0.70 over the life-of-mine.

### *Revenue factors*

- Revenue from the project is derived from the sale of graphite product. Testwork has established that the Munglinup graphite product can be produced at a minimum of 94% graphite and, if produced to a minimum of 94% graphite in product, can expect to receive premium or near premium pricing levels.
- Head grade delivered to the processing plant was derived from the underlying block model. A calculated recovery was used based on previous metallurgical testwork.
- Testwork to date shows that there are no by-products, co-products or deleterious elements in the concentrate.
- Revenue estimates are based on independent market pricing and life-of-mine concentrate production of 745,022t at an average 52,000 tpa of production.
- Prices are expected to rise in the long-term with rapid growth in demand from the lithium-ion battery industry underpinned by uptake of electric vehicles and energy storage systems.
- The basket price used in the model has been calculated based on pricing obtained from Roskill Information Services Ltd's latest market report: "Natural and Synthetic Graphite: Outlook to 2028, 12th Edition" ("Roskill Report").
- Forecast prices (real) for natural flake graphite (94-97% carbon) 2018-2028 for fine, medium and large flake were incorporated into the model.
- Graphite prices were modelled from 2029 onwards in line with the 2028 forecast.
- Prices for small flake product were modelled conservatively to largely reflect fine product pricing.
- Prices for jumbo size flake graphite carry a 50-100% price premium over the published price of 94-97% carbon large size flake, with a 75% premium modelled.



## Criteria

## Commentary

- Super jumbo products have been modelled with a further 40% premium on jumbo product.
- Revenue estimates are base case only, reflecting average graphite grades of 95%.
- MRC will continue test work to optimise grade performance towards 99% carbon concentrate production. Per the Roskill Report prices of 99% carbon grade flake typically attract 55-65% higher prices than those of 95% carbon, representing significant upside to MRC.

Product	Price US\$/t	Quantity (t)	Total US\$'000
Super Jumbo	2,787	15,273	42,561
Jumbo	1,990	86,548	172,269
Large	1,130	155,053	175,228
Medium	1,077	62,851	67,712
Small	930	206,588	192,189
Fine	927	218,709	202,640
	<b>1,144</b>	<b>745,022</b>	<b>852,599</b>

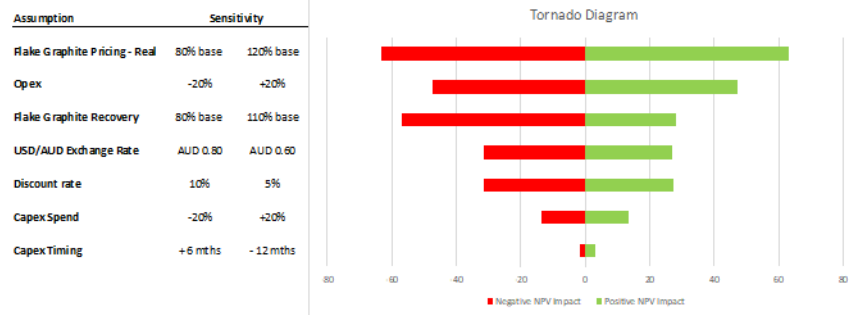
### Market assessment

- Graphite, a form of pure Carbon, has two main types - Natural and Synthetic. The combined Natural and Synthetic graphite has a market size of some 2.52 million tonnes (2018). Natural graphite accounts for 38% of this market.
- The graphite market is an opaque market where most information is not readily available and market analysis is based on some available data combined with estimations.
- Production of Natural Graphite, including all three forms of it (Amorphous, Flake, Vein), is 0.95 million tpa.
- China, with 60% share, is the biggest producer and seller.
- The refractory market still has the biggest share in graphite consumption and graphite mainly goes into Magnesite Carbon bricks for iron and steel production. It is estimated that around 0.5 kg of natural graphite is consumed per tonne of steel, besides the given market share of 28%. In reality it is estimated that refractories consume 600,000 tonnes of graphite every year.
- Total graphite market size could be beyond what was reported. It should be also considered that different graphite types could potentially substitute each other, and natural flake graphite is the only graphite type that could possibly substitute all other types of graphite, including synthetic graphite.
- Battery markets, especially Lithium-ion Batteries, represent the fastest growing market and their main demand driver is Electric Vehicles.
- Both synthetic and natural graphite are mainly used as anode material in LiBs.
- Natural graphite requires spheroidization, purification and coating processes before being used in batteries.
- To produce one tonne of natural spherical graphite, an average of two tonnes of natural graphite concentrate is required, mainly because of the rejection of non-spheroidized material during the process.
- Natural spherical graphite and synthetic graphite are generally used together in the LiBs, with a mixture of 60% natural and 40% synthetic.
- It is also estimated that 1 kg of graphite is required for each 1kWh of batteries.

Criteria	Commentary
	<ul style="list-style-type: none"> <li>• Global production of LiBs was some 146 GWh in 2018. Roskill forecasts this level to grow to some 1,771 GWh in 2028. As a result, the demand for graphite is forecast to grow substantially.</li> <li>• Roskill forecasts that demand for natural graphite will grow from 947kt in 2018 to 1,686kt in 2028 – a CAGR of some 5.9% p.a.</li> <li>• Prices for natural graphite with higher carbon content declined through the second half of 2018 and into 2019 with increasing supply, mainly from Africa, and a temporary slowdown in demand for lithium-ion batteries. Despite the decline they remain relatively high when compared to recent protracted lows.</li> <li>• Growing supply coupled with existing overcapacity in China is expected to push prices even lower through 2019. More supply will be available to come online through the early 2020s from the ramp-up/expansion of existing operations and potentially from some of the new projects currently under construction, although start-ups will likely be hindered by the current climate of weakening prices.</li> <li>• Such is the high level of forecast demand from lithium-ion batteries, however that prices could begin to strengthen again as early as 2021-22 with the market becoming tight in specific grades preferred for use in batteries.</li> <li>• Rising prices through the early 2020s could encourage a second wave of new projects, many of which are already well developed and might take it into production with the correct investment and offtake contracts in place. The release of new supply into the market could then result in a downwards recovery in prices towards 2028.</li> <li>• Based on MRC's market approach, the main focus will be: <ul style="list-style-type: none"> <li>○ Possible value additions to our product, producing high purity graphite, developing expandable production etc</li> <li>○ Specialty product markets, targeting Alkaline batteries, Lubricants, Powder Metallurgy, Conductive additives, etc</li> <li>○ Diversified and customer specific products, closely engaging with customers and developing the right products for the customers' requirements</li> <li>○ Total value proposition: packaging, logistics, offering short delivery times, fast response times, consistent quality etc</li> </ul> </li> <li>• Short-Term (1 to 3 years) – Selling concentrates with the highest possible price and developing value-added products and markets. Expansion could be considered in the short-term</li> <li>• Mid-Term (3 to 7 years) – Supplying the value-added product market (BAM)</li> <li>• Long-Term (&gt;7 years) – New and downstream products (graphene for energy storage, coated spherical graphite etc).</li> </ul>
<i>Economic</i>	<ul style="list-style-type: none"> <li>• A discount rate of 7% (real). The discount rate applied reflects the weighted average cost of capital expected from debt funding the project.</li> <li>• Sensitivities of the NPV to changes in key assumptions have been analysed. These were run on the following key model assumptions: flake graphite pricing, flake graphite recovery, exchange rate, discount rate, operating costs, capital costs and construction schedule (capex timing).</li> <li>• In each case, the sensitivities run were regarded as a possible downside scenario and a possible upside scenario based on the historic experience of mining projects.</li> </ul>

## Criteria

## Commentary



- The upside case for the flake graphite pricing forecast (120% base pricing forecast from Roskill) demonstrates a post-tax NPV at US\$174M. The downside case (80% base pricing forecast from Roskill) demonstrates a post-tax NPV of US\$48M.
- All cashflows have been prepared in real terms, assuming 2019 dollars, with no inflation of graphite concentrate prices.

## Social

- ML74/245 is a mining lease in the Esperance area granted on 26 August 2010 for a term of 21 years, expiring on 25 August 2031.
- There are no complaints of other applications currently registered with respect to the tenement and no native title claims.
- The tenement is in a Mining Reserve specifically set aside from agricultural release. The surrounding land use is primarily farmland. Proximal to mining lease 74/17A are reserves set aside for timber, recreation, water supply, parklands (recreation) and rubbish disposal.
- An Archaeological Heritage survey across M74/245 identified five archaeological features, two ethnographic features and an additional 35 isolated finds. Following submission to the Department of Planning, Lands and Heritage (DPLH) for assessment, the Munmlinup River (Site Id 37695), Mungan Wilgie Koort (Site ID 37631) and Munmlinup Standing Stone (Site Id 37798) were registered as an Aboriginal Site (Applied Archaeology Australia 2018).
- The two ethnographic features lie outside of the required Munmlinup development envelope.
- A section 18s application was submitted to the ACMC and subsequently granted to enable development of the project in areas registered as Aboriginal sites.
- The Munmlinup deposit (Munmlinup) is located with the Shire of Esperance, a predominantly rural area with a population in the order of 14,242 residents. The closest town to the Project is Munmlinup, which is 4km to the south. Esperance is the main town and administrative centre for the region, located approximately 105 km to the east.
- Whilst the Munmlinup operations will be new, the local community is generally familiar with the characteristics of mining, processing and product transport, as other resource extraction operations occur within the Shire. Stakeholder consultation conducted to-date has identified that the majority of the community are supportive of the Project. During the public consultation period for the Project referral, four submissions were received, suggesting that the community is not concerned about the Project.

Criteria	Commentary																																																																				
<i>Other</i>	<ul style="list-style-type: none"> <li>The Company is currently undergoing review of the environmental impact submission by the EPA and EPBC under an accredited process to gain an environmental operating permit.</li> <li>As there is a Mining Lease in place, no economic evaluation or justification is required.</li> </ul>																																																																				
<i>Classification</i>	<ul style="list-style-type: none"> <li>The current Mineral Resource classifies all mineralisation at Munglinup as Indicated and inferred only.</li> <li>Given predominantly the proposed mining rate and uncertainty of mineralisation at the local scale, no measured material has been defined under the JORC guidelines.</li> <li>Currently, 100% of the Ore Reserve has been derived from Indicated Mineral Resources.</li> <li>A comprehensive resource development and grade control drilling program has been developed and is planned for execution upon granting of project environmental permits.</li> <li>Pit optimisations and the proposed mining schedule are cognisant of the Mineral Resource classification.</li> <li>The first 6 years of ore feed is almost entirely classified as probable with the current schedule, including inferred material as “In-Pit Resources” in later years of production. The inferred material will be upgraded to indicated or measured prior to the third year of production.</li> </ul> <div data-bbox="523 1025 1465 1563" data-label="Figure"> <p>Ore Feed by Material Classification - High R&amp;R Conversion</p> <table border="1"> <thead> <tr> <th>Period (Year)</th> <th>Indicated (tonnes)</th> <th>Inferred (tonnes)</th> <th>Capacity (tonnes)</th> </tr> </thead> <tbody> <tr><td>2021</td><td>100,000</td><td>0</td><td>100,000</td></tr> <tr><td>2022</td><td>330,000</td><td>0</td><td>380,000</td></tr> <tr><td>2023</td><td>390,000</td><td>0</td><td>400,000</td></tr> <tr><td>2024</td><td>390,000</td><td>0</td><td>400,000</td></tr> <tr><td>2025</td><td>390,000</td><td>0</td><td>400,000</td></tr> <tr><td>2026</td><td>340,000</td><td>60,000</td><td>400,000</td></tr> <tr><td>2027</td><td>310,000</td><td>190,000</td><td>500,000</td></tr> <tr><td>2028</td><td>190,000</td><td>310,000</td><td>500,000</td></tr> <tr><td>2029</td><td>240,000</td><td>260,000</td><td>500,000</td></tr> <tr><td>2030</td><td>150,000</td><td>350,000</td><td>500,000</td></tr> <tr><td>2031</td><td>350,000</td><td>150,000</td><td>500,000</td></tr> <tr><td>2032</td><td>290,000</td><td>210,000</td><td>500,000</td></tr> <tr><td>2033</td><td>130,000</td><td>340,000</td><td>500,000</td></tr> <tr><td>2034</td><td>80,000</td><td>350,000</td><td>500,000</td></tr> <tr><td>2035</td><td>10,000</td><td>450,000</td><td>500,000</td></tr> <tr><td>2036</td><td>0</td><td>0</td><td>500,000</td></tr> </tbody> </table> </div>	Period (Year)	Indicated (tonnes)	Inferred (tonnes)	Capacity (tonnes)	2021	100,000	0	100,000	2022	330,000	0	380,000	2023	390,000	0	400,000	2024	390,000	0	400,000	2025	390,000	0	400,000	2026	340,000	60,000	400,000	2027	310,000	190,000	500,000	2028	190,000	310,000	500,000	2029	240,000	260,000	500,000	2030	150,000	350,000	500,000	2031	350,000	150,000	500,000	2032	290,000	210,000	500,000	2033	130,000	340,000	500,000	2034	80,000	350,000	500,000	2035	10,000	450,000	500,000	2036	0	0	500,000
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<i>Audits or reviews</i>	<ul style="list-style-type: none"> <li>Only internal reviews of the Ore Reserve methodology and estimates have been done.</li> <li>Metallurgical and process design has been reviewed by Orway Metallurgical Consultants (OMC).</li> <li>Capital and operating costs were reviewed by Lycopodium and Monadelphous personnel prior to approval by Mondium.</li> </ul>																																																																				
<i>Discussion of relative accuracy/confidence</i>	<ul style="list-style-type: none"> <li>A degree of uncertainty is associated with the Geological and Mineral Resource estimates and the Ore Reserve classification also reflects the level of confidence in the Mineral Resources. The Mineral Resource model is an implicit model that has been translated to a conventional, regularized block model for optimisation and mine planning purposes. Any conversion of this type of a</li> </ul>																																																																				

Criteria	Commentary
	<p>geological model, will introduce minor inconsistencies due to the change estimation and reporting methodology. At all stages the model was reconciled back to the previous model to ensure any variability was understood and acceptable.</p> <ul style="list-style-type: none"> <li>• The design, schedule and financial model on which the Ore Reserves are based has been completed to a Definitive Feasibility Study standard with a corresponding level of confidence (+15%/-5%).</li> <li>• There is a degree of uncertainty regarding estimates of material hardness at depth, geotechnical rock mass characterisation and mineralisation at the local scale. This has been accounted for in the Mineral Resource and subsequent Ore Reserve material categorisation. The Competent Person is satisfied that a suitable margin exists that the Ore Reserve estimate would remain economically viable with any negative impacts applied to these factors or parameters.</li> <li>• There is a degree of uncertainty in the commodity price used, however the Competent Person is satisfied that the assumptions used to determine the economic viability of the Ore Reserves are based on reasonable current data.</li> </ul>