

18 Oct 2017

## Restructure of Montepuez Graphite Project will revolutionise its economics

### HIGHLIGHTS

- **Value engineering study highlights the potential to substantially increase the financial returns from the Montepuez Graphite Project in Mozambique**
- **Key findings of the study include:**
  - **Capex reduced to US\$42.3m from US\$126m**
  - **Opex reduced from US\$422/t to US\$337/t**
  - **Payback cut from 4.75 years to less than two years**
- **Grade increased to 12% total graphitic carbon (TGC) from 8.8% TGC**
- **Initial flake production rate would be reduced to 45-50ktpa from 100ktpa**
- **Mine life greater than 10 years <sup>1</sup>.**
- **Concentrate grade increased to 96.7% TGC from 96%**
- **Concentrate recoveries increased to 80% from 73%**
- **The new strategy will see Montepuez generate strong financial returns by supplying the rapidly growing lithium battery industry**
- **Significant exploration upside remains at Montepuez**

1. Based on the Ore Reserve released to ASX on 15 Feb 2017 –First 10+ years at 12% TGC and then next 10+ years at 7-8% TGC.

Battery Minerals (ASX Code: BAT) is pleased to advise that a value engineering study has been completed by the Company and that a restructure of its Montepuez Graphite Project in Mozambique will result in the development generating outstanding financial returns.

The study questioned every key financial and operational assumption contained in the Montepuez Definitive Feasibility Study, which was released in February (see ASX release dated February 15, 2017).

The value engineering study, which was commissioned May this year, found Montepuez would enjoy extremely strong economics if a series of key operating changes were adopted.

The study found that the project's capital cost could be slashed from US\$126M to just US\$42.3M and operating costs could be cut from US\$422/t to US\$337/t.

These substantial cost reductions would stem from a combination of a staged production ramp-up, smaller infrastructure footprint, a refined mine plan producing a higher head grade, adopting

an owner-operator mining strategy, lower water consumption and increased recoveries supported by additional metallurgical and processing test work.

Graphite is the dominant anode material used in manufacturing re-chargeable lithium ion batteries (LiB). With ever increasing momentum around LiB's and electric vehicles, this is unlikely to change in the medium term. Battery Minerals remains focused on becoming a significant provider of ethically-produced, high-quality material for this market.

Battery Minerals Executive Chairman David Flanagan said the study showed Montepuez had outstanding potential.

"We have identified the optimum operating and financial balance for Montepuez and the outcome is extremely strong," Mr. Flanagan said.

"By restructuring the size, mine life and some other key aspects of this project, we can increase the head grade significantly, slash the capex and opex, and cut the payback period by more than half.

"With this robust development strategy now clearly mapped out, we will now move to secure our mining concession, progress the detailed engineering and design work and step up offtake and funding discussions."

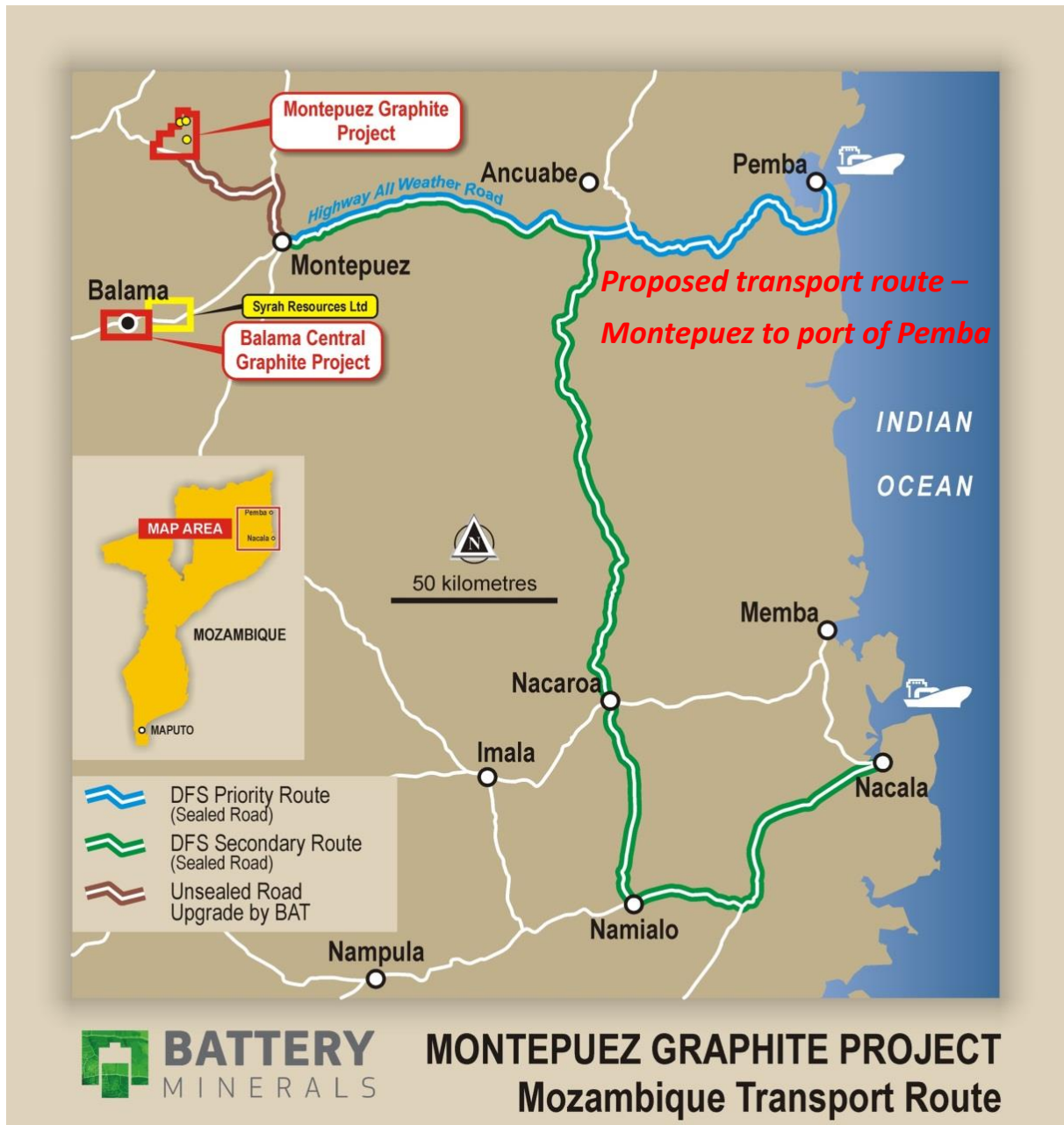
"In addition, we have a very exciting drilling program which we will be kicking off in the coming weeks"

**A summary of the key Montepuez Value Engineering Study (VES) findings** (compared to the February 2017 DFS findings) are shown below:

	October 2017 VES	February 2017 DFS
<b>LoM years</b>	10 <sup>(1)</sup> (Initial)	30
<b>Annual concentrate production tonnes</b>	45,000 - 50,000t pa	100,000t pa
<b>Project payback period years</b>	<2 years	4.75 years
<b>Grade of graphite mined (TGC %)</b>	12%	8.8%
<b>OPEX <sup>(2)</sup></b>	US\$337/t	US\$422/t
<b>CAPEX estimate (pre-production)</b>	US\$42.3 million	US\$126 million
<b>Average annual EBITDA<sup>(3)</sup></b>	>US\$20 million	US\$27 million
<b>Ave Grade of graphite concentrate shipped (TGC %)</b>	96.7%	96%

Notes to table

1. Based on the Ore Reserve released by the Company to ASX on 15 February 2017 – First 10+ years at 12% TGC and then next 10+ years at 7-8% TGC
2. Total cash costs FOB Pemba – all site costs plus transport, excluding royalties
3. Company used US \$798/t as a long-term basket price for its concentrate in the Feb 2017 DFS. Current Independent market commentators supported by our detailed market analysis indicates long term basket price in a range US \$847-950/t. The Company continues to use conservative long-term pricing assumptions while pursuing operating costs in the lower quartile of global operations.



Battery Minerals (ASX Code: BAT) is pleased to advise that it has completed its Value Engineering Study on its Montepuez Project (VES) with CAPEX now down to US\$42.3M and OPEX per tonne of concentrate of US\$337/t based on processing ~500,000t of ore at a grade of 12%TGC and producing 45,000 - 50,000t pa of graphite flake concentrate at up to 97% TGC.

Battery Minerals' VES has targeted key development capital and operating cost elements defined in the DFS. The objective of the VES was to significantly improve financial returns by optimizing the processing plant through modularization, refining the mine plan to produce a higher head grade, adopting an owner operator mining and accommodation model to remove the use of contractors, reducing the size of the initial tailings dam and water supply facility and increasing concentrate recoveries through a series of successful metallurgical and processing test work.

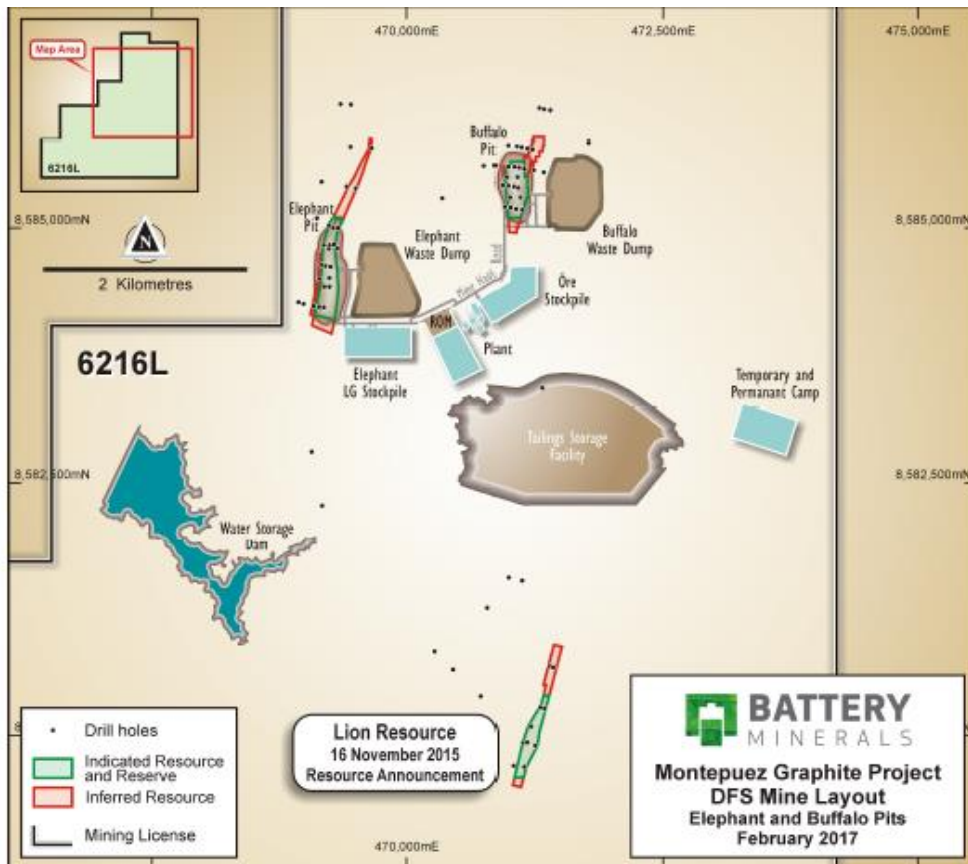


Figure. Mine layout and design showing location of the Buffalo and Elephant Pits and waste dumps and mine infrastructure locations for plant ore stockpile, tailings storage facility, water storage dam and temporary and permanent camp

### Mine layout and design

The VES final mine design will not be dissimilar from the DFS design. The mine infrastructure items have been extensively and carefully designed to minimise environmental impact whilst maintaining efficient capital expenditure and ongoing life-of-mine operating costs. The processed tailings will be deposited in the Tailings Storage Facility (TSF) and process water will be recycled back into the processing plant for re-use. The TSF is expected to be centrally located adjacent to the processing plant. In the current model, lower grade stockpiles created during the mining of both Buffalo and Elephant will feed the plant for a further 10 years.



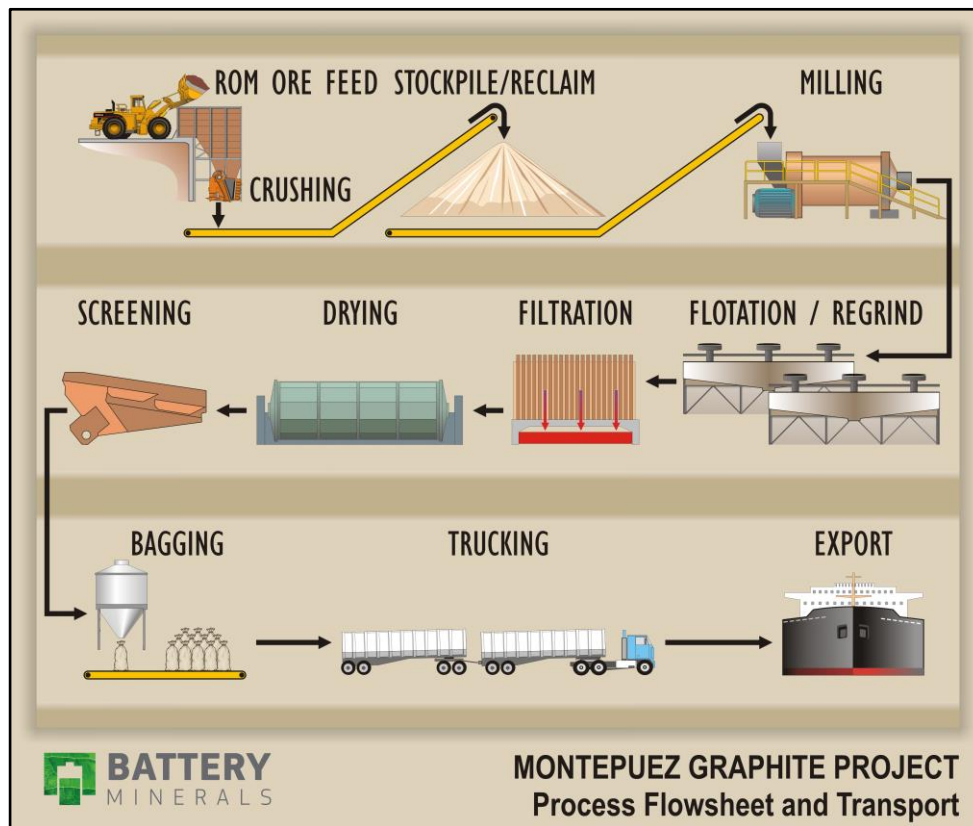


Figure. Diagrammatic flow explaining the Montepuez Graphite Project mine design and flowsheet including transport method.

### Processing Facility

Under the VES, the Montepuez process plant will initially process run of mine (ROM) ore at an average rate of ~500,000tpa at 12% TGC to produce 45,000 to 50,000 tonnes annually of dry graphite concentrate with an average grade of 96.7% TGC. The flowsheet has been developed based on the results of test work performed on representative samples. The Montepuez process flowsheet comprises:

- ROM pad, designated stockpile areas and ability to blend ore on pad or in ROM bin.
- Primary jaw crusher and crushed ore stockpile (COS)
- Primary closed-circuit rod mill.
- Rougher flotation.
- Concentrate regrinding and concentrate cleaning.
- Concentrate filtration.
- Concentrate drying, screening, and bagging.
- Tails thickening and disposal.

- Water and Air services.
- Reagents.

### Montepuez CAPEX

The total estimated pre-production establishment capital cost for the project is US\$42.3M, including contingency, as summarised in below table:

CAPEX	
Area	US\$
Process Plant	20,869,000
Mining fleet and maintenance workshops	2,112,000
Camp infrastructure and fit-out	2,499,000
Tailings Storage Facility and other earthworks	2,751,000
Mine Offices and workshops	2,305,000
Owners costs	2,390,000
Pre-production Costs	4,488,000
Other	4,919,000
<b>Total Capex</b>	<b>42,333,000</b>

### Montepuez OPEX

The operating cost summary (average blended ore) for the project is detailed below FOB Pemba:

OPEX		
Area	US\$ pa	US\$/t
Mining	2,299,000	\$46.32
Processing	6,370,000	\$128.35
Maintenance	1,741,000	\$35.07
G&A	3,235,000	\$65.17
Logistics	3,070,000	\$61.87
<b>Total Operating Costs</b>	<b>\$16,715,000</b>	<b>\$336.78</b>

Notes: 1) Above table excludes Government Royalties.  
 2) Above table based on average blended ore of 45 to 50,000 tpa TGC production rate and ~1.1Mtpa mined and process run of mine (ROM) ore at an average rate of ~500,000tpa at 12% TGC

## Product size and specification

### Flake Graphite Concentrate Sizing

Flake size	Flake size (mesh)	Flake size (micron)	% of concentrate	TGC grade
Fine	-100 Mesh	0 - 150	71.9%	97%
Medium	+100 Mesh	+150 -180	10.2%	96%
Large	+80 Mesh	+180 -300	13.5%	96%
Jumbo	+50 Mesh	+300	4.4%	96%

Market feedback is that a product of minimum 94% TGC grade is typically the minimum required concentrate produced. Based on test-work, Battery Minerals has chosen to produce 96% TGC and 97% TGC concentrates. This approach has been discussed with the market and the feedback has been that the proposed 97% premium fines product to be produced by Battery Minerals will be sought after and provide a point of differentiation against other projects in the market. This is currently attracting a significant premium to normal 94% TGC product.

## Project Delivery Schedule

The Project Delivery Schedule for the Montepuez Mine & Concentrator is as follows:

Activity	2017	2018				2019			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Montepuez Graphite Mine</b>									
Value Engineering Study completed									
Project Approvals									
Design									
Procurement									
Construction									
Commissioning									
Ramp Up									
Steady State Production and Shipping									

### Investor Enquiries:

#### Battery Minerals Limited

David Flanagan, Executive Chairman	Tony Walsh, Company Secretary
Tel: +61 8 6148 1000	Tel: +61 408 289 476

### Media Enquiries:

Read Corporate  
 Paul Armstrong

Tel: (+61 8) 9388-1474  
 Email: paul@readcorporate.com.au

#### Important Notice

This ASX Announcement does not constitute an offer to acquire or sell or a solicitation of an offer to sell or purchase any securities in any jurisdiction. In particular, this ASX Announcement does not constitute an offer, solicitation or sale to any U.S. person or in the United States or any state or jurisdiction in which such an offer, tender offer, solicitation or sale would be unlawful. The securities referred to herein have not been and will not be registered under the United States Securities Act of 1933, as amended (the "Securities Act"), and neither such securities nor any interest or participation therein may not be offered, or sold, pledged or otherwise transferred, directly or indirectly, in the United States or to any U.S. person absent registration or an available exemption from, or a transaction not subject to, registration under the United States Securities Act of 1933.

#### Forward Looking Statements

Statements and material contained in this document, particularly those regarding possible or assumed future performance, resources or potential growth of Battery Minerals Limited, industry growth or other trend projections are, or may be, forward looking statements. Such statements relate to future events and expectations and, as such, involve known and unknown risks and uncertainties. Such forecasts and information are not a guarantee of future performance and involve unknown risk and uncertainties, as well as other factors, many of which are beyond the control of Battery Minerals Limited. Information in this presentation has already been reported to the ASX.

#### Competent Persons Statement

All references to future production and production & shipping targets and port access made in relation to Battery Minerals are subject to the completion of all necessary feasibility studies, permit applications, construction, financing arrangements, port access and execution of infrastructure-related agreements. Where such a reference is made, it should be read subject to this paragraph and in conjunction with further information about the Mineral Resources and Ore Reserves, as well as the relevant competent persons' statements.

Any references to Ore Reserve and Mineral Resource estimates should be read in conjunction with the competent person statements included in the ASX announcements referenced in this report as well as Battery Minerals' other periodic and continuous disclosure announcements lodged with the ASX, which are available on the Battery Minerals' website.

The information in this report that relates to Battery Minerals' Mineral Resources or Ore Reserves is a compilation of previously published data for which Competent Persons consents were obtained. Their consents remain in place for subsequent releases by Battery Minerals of the same information in the same form and context, until the consent is withdrawn or replaced by a subsequent report and accompanying consent.

The information in this Presentation that relates to Mineral Resources and Ore Reserves is extracted from the ASX Announcement titled 'Montepuez Graphite Project Mineral Resource and Ore Reserve Estimate' dated 15 February 2017 and DFS and PFS information is extracted from the ASX announcement entitled 'Lithium Ion Battery anode PFS and Montepuez Graphite DFS confirm robust economics' dated 15 February 2017, both of which are available at Battery Minerals website at <http://www.batteryminerals.com.au> in the ASX announcements page.

Battery Minerals confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the market announcements continue to apply and have not materially changed. Battery Minerals confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

#### Notes to this announcement:

- Operating Cost projections excludes provision for National Ownership (anticipated to be -5%), Community investment and 32% corporate income tax rate and 20% mineral resource rent tax.
- Ore Reserves quoted in this announcement are based on Ore Reserves included in Battery Minerals' ASX release dated 15 February 2017) prepared by a competent person in accordance with the requirements in Appendix 5A (JORC Code)
- Accuracy on VES and DFS numbers is +/-15%



## Appendix 1 – Montepuez Mineral Resources and Ore Reserves

Battery Minerals published its updated Mineral Resources and Ore Reserves Estimations for the Montepuez Project on 15 February 2017 (see ASX Announcement dated 15 February 2017).

### Summary of Montepuez Graphite Project Mineral Resource and Ore Reserve

#### ELEPHANT RESOURCE JANUARY 2017 @ 2.5% TGC cut off

Classification	Type	Elephant Mineral Resource				
		Tonnes	TGC	V2O5	Cont. Graphite	Cont. V2O5
		Mt	%	%	Mt	Kt
Indicated & Inferred	Weathered	7.80	7.70	0.19	0.60	15.00
	UnWeathered	59.40	7.50	0.19	4.50	114.00
	<b>Total</b>	<b>67.20</b>	<b>7.50</b>	<b>0.19</b>	<b>5.10</b>	<b>129.00</b>

#### BUFFALO RESOURCE DECEMBER 2016 @ 2.5% TGC cut off

Classification	Type	Buffalo Mineral Resource December 2016				
		Tonnes	TGC	V2O5	Cont. Graphite	Cont. V2O5
		Mt	%	%	Mt	Kt
Indicated & Inferred	Weathered	5.20	8.14	0.22	0.40	11.30
	UnWeathered	33.50	7.90	0.21	2.60	70.90
	<b>Total</b>	<b>38.70</b>	<b>7.93</b>	<b>0.21</b>	<b>3</b>	<b>82</b>

#### MONTEPUEZ GRAPHITE PROJECT – ORE RESERVE STATEMENT @ 4% TGC cut-off - January 2017

Pits	Ore Type	Classification	Ore Reserve	TGC	Contained Graphite
			Mt	%	Mt
Buffalo & Elephant	Weathered	Proved	-	-	-
		Probable	8	8.5	0.68
	Fresh	Proved	-	-	-
		Probable	33.5	8.8	2.96
	<b>Total</b>	<b>Proved</b>	-	-	-
		<b>Probable</b>	<b>41.4</b>	<b>8.8</b>	<b>3.64</b>

Note: See ASX Announcement dated 15 February 2017 for full details.

## Appendix 2 –VES - Key Non-Process Infrastructure

The VES evaluation included the following Non-Process mine infrastructure.

### 1. Power

Plant power will be generated on-site by six 0.7 MW high-speed generators for a total installed continuous capacity of 4.2 MW. Under normal conditions 5 generators will be running allowing for 1 on standby. The engines will be diesel fired and housed in a power station located at the process plant. The electrical output of the power station will be 415 V, 3 phase, 50 Hz. The expected average power draw for the project is 2.8 MW.

### 2. Accommodation Village

A 100 person accommodation village will be constructed approximately 3 km from the process plant. The village will comprise air conditioned motel style junior staff and senior staff accommodation, messing, laundry, commissary and other facilities including recreation facilities. The accommodation village will be constructed in three stages during the construction and mine commissioning phase.

### 3. Site Development and roads

General two-way mine roads, unsealed 6m side carriageways with 1m wide shoulders and side drainage for all weather access shall be constructed. Borrow pits will be required to supplement fill quantities to construct the access roads. Minor access roads to the Tailings Storage Facility will have 4-5m carriageway constructed from compacted gravel. General road access will also be constructed for the Processing Plant and Mine Services Facilities. Segregation of heavy and light vehicle traffic for safety purposes. Road drainage has been designed for one in fifty year rain in accordance with Knight Piesold's flood study. Open drains will be constructed around the mine services and processing facility and the accommodation village will drain using natural existing drainage courses.

### 4. Water Supply

Water supply requirements are summarised below

- Raw Water; water will be pumped from bore fields and the river to a water storage tank at the plant and this water will then be piped to the Processing Plant and Accommodation Village.
- Waste Water; all waste water shall be treated to meet relevant regulatory standards relating to effluent criteria. Waste water from the mine and processing facilities will be piped to the Tailings Storage Facility.
- Potable water will be produced by treating from the Raw Water holding tank at the process plant and pumped to the accommodation village. The Raw water

tank will house the emergency fire water for the plant. Additional tanks will be installed at the accommodation village to house emergency fire water.

- Fire water; fire water will be reticulated to each of the mine, process plant and village facilities and fire hydrants shall be installed to provide coverage to all buildings and facilities complying to building codes and standards.

## Appendix 3 – Montepuez VES Power, Headcount and Logistics

### Montepuez Power

<b>Diesel</b>	<b>Diesel Consumption</b>	
	<b>Litres pa</b>	<b>\$/t</b>
Power Generation Plant	5,052,257	62.64
Power Generation Camp/Admin	610,596	7.57
Mining Fleet	1,506,283	18.68
Mobile Fleet	163,059	3.29
<b>Total</b>	<b>7,169,135</b>	<b>\$92.17</b>
Diesel - % of total costs		27%

### Montepuez Headcount

<b>Headcount</b>	<b>Headcount Operations</b>	<b>Headcount Operations</b>
<b>Department</b>	<b>No.</b>	<b>\$/t</b>
Mining	27	14.94
Processing	46	24.73
Maintenance	25	19.01
Admin	41	20.69
Security	44	6.07
<b>Total</b>	<b>183</b>	<b>\$85.43</b>
% of total costs		25%
Construction Headcount	~150	

### Montepuez Logistics

<b>Haulage/logistics</b>	<b>\$pa</b>	<b>\$/t</b>
Montepuez to Pemba Warehouse	1,075,287	21.67
Warehouse to Port	1,526,080	30.75
Pemba Port Fees	468,991	9.45
<b>Total Freight FOB Pemba</b>	<b>3,070,358</b>	<b>\$61.87</b>
% of total costs	19%	19%