

Board approves Kwale Phase 2 mine optimisation project to deliver enhanced economics

KEY BENEFITS

- Brings forward revenue by maintaining current production levels for the remainder of the mine life, overcoming the declining ore grades in the current Ore Reserve through the de-constraining of the mine and concentrator plant.
- Faster mining and processing of Ore Reserves over a 24-month shorter period¹ eliminates approximately US\$60 million in fixed costs, with a commensurate reduction in average operating cost per tonne produced, significantly enhancing project economics compared with the current mine plan.
- Increases the importance of, and value leverage from, potential mine life extensions emerging from the exploration program that is underway.

FEATURES

- Mining rates increased to 2,400tph as ore grade declines, achieved through increasing the hydraulic mining capacity to three 800tph hydraulic mining units, with the existing dozer-trap mining unit gradually phased out, realising estimated mining operating cost savings of up to 20% per tonne mined.
- Wet concentrator plant and tails management upgraded to accommodate the increased mining rate.
- Incremental capital requirement to implement Kwale Phase 2 is a modest US\$13.1 million, which will be fully funded from operating cashflows.

IMPLEMENTATION MILESTONES

- Following finalisation of the front-end engineering design, a nine-month implementation period will see construction completed in the June quarter of 2018.
- Upgrading of the existing HMU from 400tph to 800tph and commissioning of two additional 800tph HMUs in FY 2018, gradually ramping up to the target 2,400tph mining rate through the course of the 2018 year.
- The transition of mining from the Central Dune to the South Dune is scheduled for the second half of 2019.

African mineral sands producer, **Base Resources Limited** (ASX & AIM: BSE) ("**Base Resources**" or the "**Company**") is pleased to announce that, following completion of the Definitive Feasibility Study ("**DFS**"), the Board has approved implementation of the Kwale Phase 2 project ("**KP2**") at its Kwale Mineral Sands Operations ("**Kwale Operations**") in Kenya, East Africa. The DFS confirmed the opportunity for significant improvement in the financial returns for Kwale Operations through further optimisation of the remaining mine life. The DFS was completed internally by Base Resources' project development team, supported by several specialist consulting firms, and included an independent peer review process.

The objective of the KP2 project is to maximise the overall Kwale Operations economic returns by implementing a solution to maintain maximum concentrate feed to the Mineral Separation Plant ("**MSP**"), and therefore final production volumes, in the

¹ Refer to graph below showing Kwale Operations annual production profile of KP1 and KP2 mine plans.

face of declining ore grades expected from mid-2018 onwards. The KP2 DFS has established that this objective can be effectively and efficiently achieved.

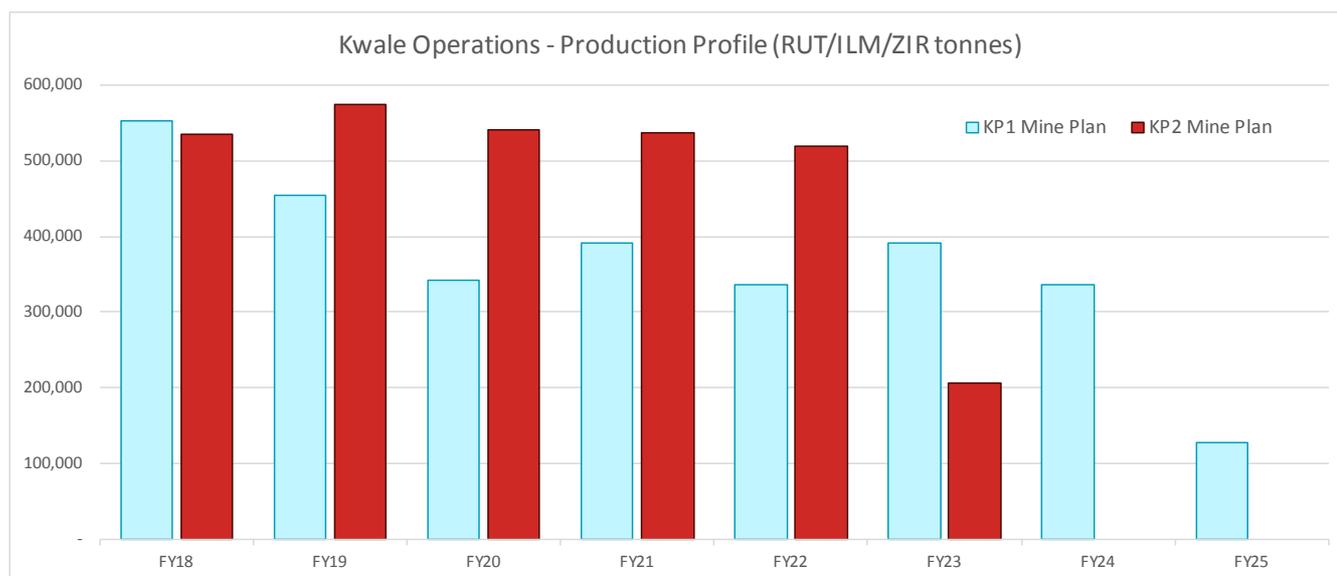
The key results and underlying assumptions for both the current mine plan (referred to as Kwale Phase 1 or “KP1” mine plan) and the outcomes of the KP2 DFS are outlined in the table below:

Description	KP2 DFS Mine Plan	KP1 Mine Plan
Mining method	Three HMUs	DMU + one HMU
Maximum mining rate	2,400tph	1,800tph
Total tonnes mined (from April 2018)	85.4 million tonnes	85.4 million tonnes
End of mine life (based on current Ore Reserves)	November 2022	November 2024
WCP maximum spiral starts (currently 1,180)	1,992 spiral starts	1,360 spiral starts
Capital cost estimate to increase to maximum mining rate (includes mining equip, WCP and tails upgrade and additional infrastructure)	US\$25.3 million	US\$13.3 million
Capital cost estimate to transition mining from Central Dune to South Dune	US\$8.4 million	US\$7.3 million
Average full year production from July 2018 – Rutile	93,000 tonnes	68,000 tonnes
Average full year production from July 2018 – Ilmenite	414,000 tonnes	307,000 tonnes
Average full year production from July 2018 – Zircon	34,000 tonnes	25,000 tonnes

The above average full year production forecasts are based on the following assumptions:

- Mining of 85.4Mt at an average HM grade of 4.18%, all from Ore Reserves².
- MSP feed rate at an average of 85 tonnes per hour (“tph”), up to a maximum of 91tph where heavy mineral concentrate stocks permit, consistent with recent performance.
- MSP product recoveries of 102% for ilmenite and 100% for rutile, and 78% for zircon, consistent with past performance and planned recovery improvements from MSP optimisation.

A comparison of the forecast production profile of the KP1 and KP2 mine plans is shown in the graph below:



² The Ore Reserves estimates underpinning the above production forecasts were prepared by Competent Persons in accordance with the JORC Code (2012 edition). The above production targets are the result of detailed studies based on the actual performance of the Kwale mine and processing plant. These studies include the assessment of mining, metallurgical, ore processing, environmental and economic factors.

Mining optimisation

Mining at the Kwale Operations was originally based on a conventional dozer trap mining unit (“DMU”), using Caterpillar D11T dozers to feed the DMU. Historically, when mining the high-grade areas of the Kwale Central Dune, DMU mining rates of up to 1,400tph have been required to ensure the wet concentrator plant (“WCP”) is fully utilised. To offset the declining ore grades expected from mid-2018, the KP1 mine plan assumed an increase in the mining rate to 1,800tph. To achieve this higher mining rate, with the DMU alone, requires the addition of a third D11T dozer.

The KP2 pre-feasibility study determined that the optimal mining rate to maximise the economic returns of Kwale Operations was 2,400tph. The KP2 pre-feasibility study identified hydraulic mining as the preferred method to compliment the DMU to achieve the targeted 2,400tph mining rate. Operating dual mining units has the additional benefit of being able to concurrently mine both the high and low grade ore, which assists in smoothing the grade profile to create a more consistent feed to the WCP.

In August 2016, as part of the DFS, a 400tph hydraulic mining unit (“HMU”) was commissioned to trial the concept. The HMU has proven to be extremely well suited to mining Kwale ore, achieving higher availabilities and at lower unit operating costs than the DMU. Following the success of the HMU trial, the DFS concluded that the optimal mining setup for Kwale Operations was three HMUs mining at an average rate of 800tph each to give a combined total of 2,400tph.

A comparison of the mining profile of the KP1 and KP2 mine plans is shown in the graph below:





The HMU in operation at Kwale Central Dune

Wet concentrator plant upgrade

At the lower ore feed grades and higher mining rates anticipated from mid-2018, the WCP must be upgraded to maintain optimal heavy mineral recoveries. A comprehensive pilot plant program and spiral modelling work undertaken by mineral sands industry specialist consultants, Mineral Technologies, was employed to determine the optimal equipment configuration for different mining rates and ore grades. The modelling established that an increase in the number of spirals is required to accommodate the mining rates contemplated under the KP1 (15% increase) and KP2 (69% increase) mining plans. In addition, modifications and equipment upgrades are required to the primary screens, feed de-sliming circuit, tailings cyclones, various pumps and piping. Other than increasing the capacity of the overflow pipework, tests confirm the capability of the two existing thickeners to manage the increased solids loading at the higher KP2 mining rate.

Changes to the WCP process flow sheet are minimal. No changes are required to the MSP.

Infrastructure requirements

Existing off-site and on-site infrastructure is sufficient to support operations under the KP2 mine plan, with the exception of the water supply infrastructure. The water supply constraints of the KP2 mine plan are largely the product of the daily extraction limits from the Mukurumudzi Dam imposed by licence conditions. To overcome this constraint, the existing Gongoni borefield will be expanded and a further borefield constructed near the tailings storage facility (“TSF”), both of which are fully permitted.

The cost to develop the TSF borefield is included in the KP2 capital estimate. However, the decision to develop this infrastructure will be subject to further assessment following recently implemented water saving initiatives.

Project execution and timeline

The KP2 project will be executed on an owner-implementation basis, as the Company has the requisite internal capability to do so, realising significant cost savings on EPCM indirect costs and contractor installation costs.

Front end engineering and design (“FEED”) is currently underway and scheduled for completion by the end of June 2017. Whilst the FEED is in progress, the main mechanical, structural and piping contract will be awarded, based on the comprehensive tenders received during the DFS, and long lead items ordered.

Construction is scheduled for completion in the June quarter of 2018 after a one month shut of the WCP to tie in the plant modifications and equipment upgrades. Ahead of the WCP shut, heavy mineral concentrate stock levels will be managed to ensure that MSP production continues without interruption.

The implementation schedule will see the second of the 800tph HMU units commissioned in the June quarter of 2018, with the third commissioned in mid-2018. The three HMUs will ramp up to full capacity (2,400tph) through the course of 2018, with the DMU gradually being phased out over the same period.

Engineering and design work for the transition of mining from the Central Dune to the South Dune will commence in mid-2018, with construction completion scheduled for the second half of 2019.

Capital cost estimate

The estimated capital cost to complete the transition from the Central Dune to the South Dune and implement KP2 is US\$32.6 million, US\$13.1 million more than the estimated capital required for KP1. A breakdown of capital cost estimate by area of expenditure for both KP1 and KP2 is shown below (in US Dollars):

Area	KP2	KP1	Variance
Mining operations (KP2: 3 x HMUs less sale of D11Ts and DMU; KP1: mobile equipment)	\$0.9m	\$2.7m	-\$1.8m
Wet concentrator plant (plant modifications and equipment upgrades, incl. additional spirals)	\$10.5m	\$3.0m	\$7.5m
Field services (additional water and tailings pumping systems and piping)	\$7.4m	\$4.5m	\$2.9m
Indirect costs (EPCM labour and expenses)	\$3.3m	\$1.0m	\$2.3m
Contingency	\$3.2m	\$2.1m	\$1.1m
Total capital cost estimate to implement KP2	\$25.3m	\$13.3m	\$12.0m
Mining transition from Central Dune to the South Dune (including contingency)	\$8.4m	\$7.3m	\$1.1m
Total capital cost estimate	\$33.7m	\$20.6m	\$13.1m

Anticipated timing of KP2 capital expenditure is shown below (in US Dollars):

FY17	FY18	FY19	FY20	Total
\$1.1m	\$24.0m	\$4.1m	\$4.5m	\$33.7m

The capital cost will be fully funded from operating cashflows.



Community and environment

Implementation of KP2 is not expected to impact the community to a greater extent than the current operations. The impact of current mining operations on the community primarily relate to household resettlement required at the southern end of the South Dune and temporary relocation for households close to the mining lease boundary north of the Central Dune.

The main environmental impact from implementation of the KP2 mine plan is increased water demand, which will require enhanced groundwater monitoring. The Mine Site Environmental and Social Management Plan and Water Resources Environmental and Social Management Plan will be reviewed and revised as required, with mitigation controls implemented and monitored. Aside from the increased water demand, no other significant environmental impact is expected from implementation of KP2.

Forward Looking Statements

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ENDS.

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