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Orokolo Bay Industrial Sands Updated DFS

23 January 2024

Mayur Resources Limited (ASX:MRL) (**Mayur** or **the Company**) is pleased to present an updated overview of the Orokolo Bay Definitive Feasibility Study (**DFS**). The original DFS, announced in September 2020 – "Orokolo Bay Industrial Sands Project DFS confirms low-cost operation with strong economics", was subject to refinements in March 2022. The results from these refinements were formally communicated to our investors on 4 April 2022, under the announcement "Investor Presentation – Ortus Resources Spin Out".

The Company has recently become aware that although the substance of the DFS update was disclosed in April 2022, the Company has not provided full details of the DFS to market. Accordingly, the Company presents the following information for completeness.

Refinements:

- Updated product pricing consensus forecasts for Iron ore, zircon concentrate, construction sands and DMS
- Reviewed AUD/USD exchange rates
- Reviewed shipping rates from PNG to China (Mag Conc and Zircon Concentrate) and Australia (DMS and Construction Sand)
- Reviewed project timing, capital expenditure and capital phasing:
    - Initial Construction Capex of US$13.2 m in Q1-4/22 and US$2.0 m in Q1/23, First Magnetite production in Q1/23 ramping up to 100% in Q4/23;
    - DMS plant Capex of US$1.1 m in Q2/24, First DMS production in Q3/24 ramping up to 100% in Q1/25; and
    - Sand and ZR plant Capex of US$2.4 m in Q2-3/24, First Sand and Zr Conc production in Q4/24 ramping up to 100% in Q2/25.
- Mining and Reserves remain unchanged from the September 2020 DFS (i.e. 5 Mtpa (ROM) mining operation)

Mayur is pleased to re-affirm the key outputs previously announced on 4 April 2022 and confirms that all material assumptions and technical parameters underpinning the information and results contained in that release continue to apply and have not materially changed, with the exception of project timing.[1]

Key outputs :

- Post-tax (real) NPV of US$131 m (10% discount rate) and IRR of 90%
- Forecast life-of-project (LOP) revenue of US$1,027 m and Life-of-Project EBITDA of US$381 m over an estimated 15-year life
- Low initial CAPEX of US$15.23 m to establish a 5 Mtpa (ROM) mining and processing operation
- Payback of 2.0 years from start of operations
- Supported by the maiden Ore Reserve and 15-year production target for the Project

[1] As per Mayur's December 2022 Quarterly Report released on the 30 January 2023, Mayur advised the market that "Site enabling works at the Orokolo Bay site have been put on hold pending the securing of required development funding." This announcement resulted in the delaying the timetable which had previously been communicated on 4 April 2022, under the announcement "Investor Presentation – Ortus Resources Spin Out" .

- Mine schedule has resulted in achieving a DTR cut-off of 5.5% DTR and average DTR grade of 10.58%
- Production of titano-magnetite concentrate (VTM) - 0.4 Mtpa, magnetite for Dense Media Separation (DMS) - 0.1 Mtpa, zircon concentrate – 8,000 tpa, and silica construction sands - 1.0 Mtpa
- Pricing assumptions for magnetite product (excludes DMS) are calculated at approximately 83% of the 62% Fe CFR China long term reference price of US$79/t.

Further details in relation to the DFS are annexed to this document.

ENDS

This announcement was authorised by the Board of Directors of Mayur Resources Limited..

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ABOUT MAYUR RESOURCES

Mayur Resources Limited is focused on the development of natural resources and renewable energy in Papua New Guinea. Our diversified asset portfolio spans iron and industrial sands, lime and cement, nature based forestry carbon credits, battery minerals and renewable power generation (geothermal and solar). Mayur also holds a 43% interest in copper gold explorer/developer Adyton Resources, a company listed on the TSX-V (TSXV:ADY).

Mayur's strategy is to serve PNG and the wider Asia Pacific region's path to decarbonisation by developing mineral projects that deliver higher quality, lower cost, and "net zero" inputs for the mining and construction industries, as well as constructing a renewable energy portfolio of solar, wind, geothermal, nature based forestry carbon credit estates, and battery storage.

Mayur is committed to engaging with host communities throughout the lifecycle of its projects, as well as incorporating internationally recognised Environmental, Social and Governance (ESG) standards into its strategy and business practices.

DFS Summary

Delivery team

Given the integrated nature of the project, the company assembled a multi-disciplined team of industry and technical experts to advise and input the various key aspects of the DFS as outlined in Table 1 below.

Area	Consultants
DFS lead and study management	Siecap Pty Ltd
Resource and Reserve Estimation	Groundworks Plus
Mine Planning and Design	Groundworks Plus
Metallurgical Test work	IHC Robbins / CRL
Plant Design	CRTH / Siecap Pty Ltd
Barging System Design	Siecap Pty Ltd / TAMS
Environmental	Coffey/Tim Omundsen
Social	Social Environmental & Research Consultancy Limited / Tim Omundsen
Financial Modelling and Evaluation	Siecap Pty Ltd

Table 1: DFS Delivery team

Mineral Resources & Reserves

A Mineral Resource estimate was released by Mayur in May 2020, and subsequent to this a maiden Ore Reserve statement was released on the ASX by Mayur on 2 July 2020, and both were prepared by a Competent Person in accordance with the JORC code.

Groundworks Plus completed a mine schedule on which it based its Reserve report. This schedule formed the basis of the 15-year mine plan and material quantities.

Please see the Mineral Resource outlined in Table 2 and the Mineral Reserves in Table 3.

Category	Mt	DTR %	Fe %	Ti %	Zircon ppm	Construction Sand Mt
Measured	1.64	10.08	11.35	1.94	712	-
Indicated	70.1	6.82	9.13	1.17	508	38.6
Inferred	137.8	5.43	8.19	1.02	454	74.2
Total	**209.5**	**5.93**	**8.53**	**1.08**	**474**	**112.8**

Table 2: Orokolo Bay Project – JORC Mineral Resource. Refer to estimate contained in ASX release dated 28 May 2020, "Mayur banks 40% resources upgrade at Orokolo Bay Mineral/Industrual Sands Project". Mayur confirms that it is not aware of any new information or data that materially affects the information included in that release. All material assumptions and technical parameters underpinning that release continue to apply and have not materially changed.

Category	Mt	DTR %	Fe %	Ti %	Zircon ppm	Construction Sand Mt
Proved	1.0	13.99	14.01	2.46	900	-
Probable	29.6	11.36	12.22	1.69	682	15.2
Total	**30.6**	**11.45**	**12.28**	**1.72**	**689**	**15.2**

Table 3: Orokolo Bay Project - JORC Mineral Reserves. Refer to estimate contained in ASX release ASX dated 2 July 2020 "Mayur converts Measured & Indicated JORC Resources into Ore Reserves at Orokolo Bay Project". All material assumptions and technical parameters underpinning that release continue to apply and have not materially changed.

Metallurgical test work

A significant amount of metallurgical test work has been conducted by Mayur and previous explorers on the Orokolo Bay resource. Over the life of the project, numerous metallurgical testing programs have been undertaken to develop a robust and comprehensive metallurgical definition for Orokolo Bay. Figure 1 overleaf shows the chronological steps behind the development of the metallurgical definition for the resource.

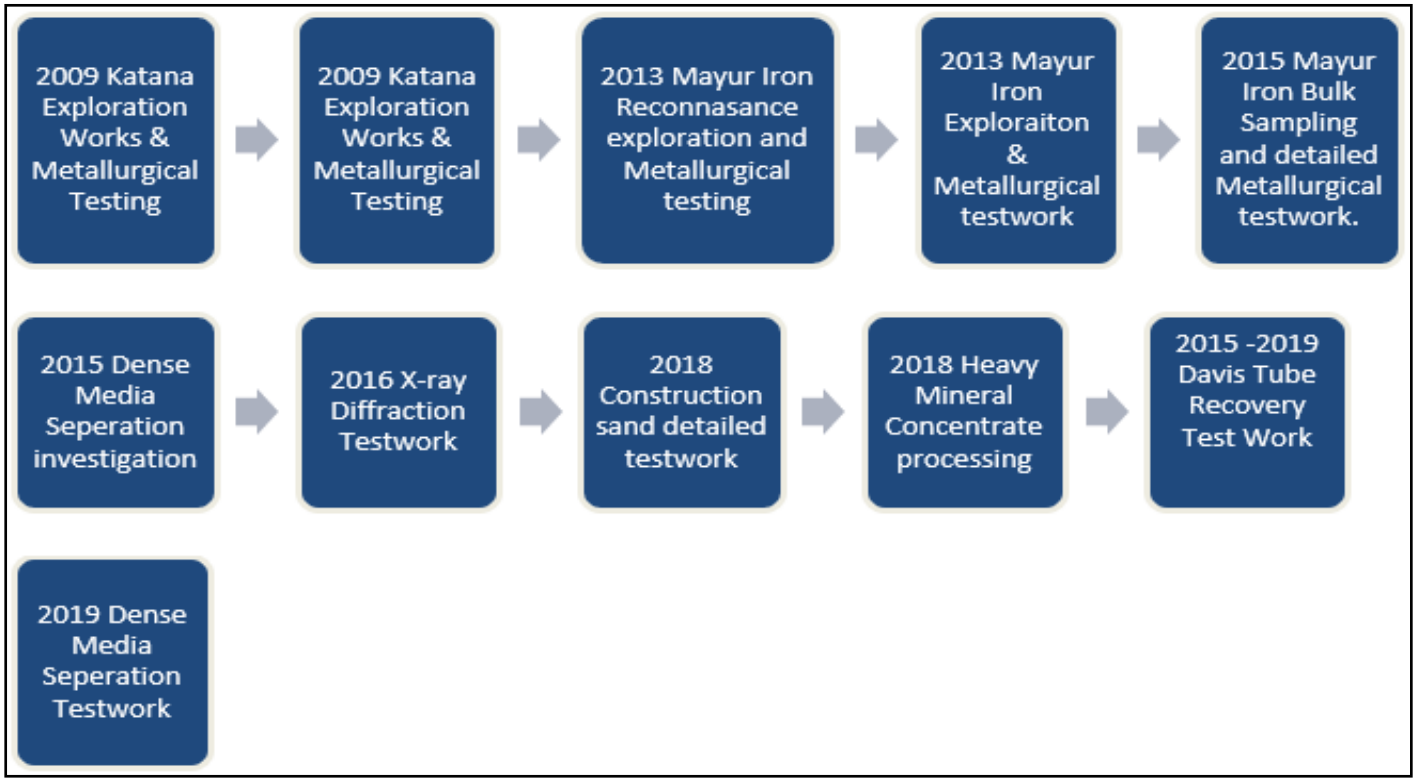

Figure 1: chronology of metallurgical testwork

In summary the metallurgical test work concluded the following:

- 58% to 61% Fe, 9% to 11% TiO2 titano magnetite product can be achieved using Davis Tube
- Al2O3 and SiO2 in the range of 1.5% to 3%, which is very low.
- Low phosphorus of 0.05% P.
- Low sulphur.

The metallurgical test work further concluded that a simple flow sheet combining spirals with magnetic separation would enable beneficiation without a grinding circuit to achieve the following product specifications.

Titano-magnetite concentrate

- Fe - 57%

- SiO2 – 1.8%
- Al2O3 – 2.01%
- TiO2 - 10 -12%
- P – 0.05%
- V2O5 – 0.48%

In addition, and as by-products to the processing of titano-magnetite, a zircon heavy mineral concentrate containing ZrO_2 (circa 20%) and a silica construction sand suitable for concrete and asphalt blends can be produced.

Further test work was undertaken to test the suitability of the magnetite product for Dense Media Separation (DMS). This test work concluded that with grinding down to approximately 53 micron the product was suitable for DMS and that the next steps should be commercial scale trials.

Processing

The proposed processing circuit involves delivery of the run-of-mine (ROM) ore to one of two relocatable 2.5 Mtpa concentrators by front end loader (FEL) or haul trucks, where the material will be fed through a vibrating screen to remove +3mm organic and oversized material followed by desliming and two stage ore upgrading. The first stage is a gravity circuit (spirals) to remove lower density gangue material to produce a heavy mineral (HM) concentrate. The lower density material would be routed through an up-current classifier to remove fines and organic components, producing a material suitable for use as a construction sand. The HM concentrate would be treated by wet LIMS to make an iron rich magnetite HM concentrate and non-magnetic, zircon-rich HM concentrate. Plant tailings would be pumped to a previously mined area to backfill the void. A simplified process flow is shown below in Figure 2.

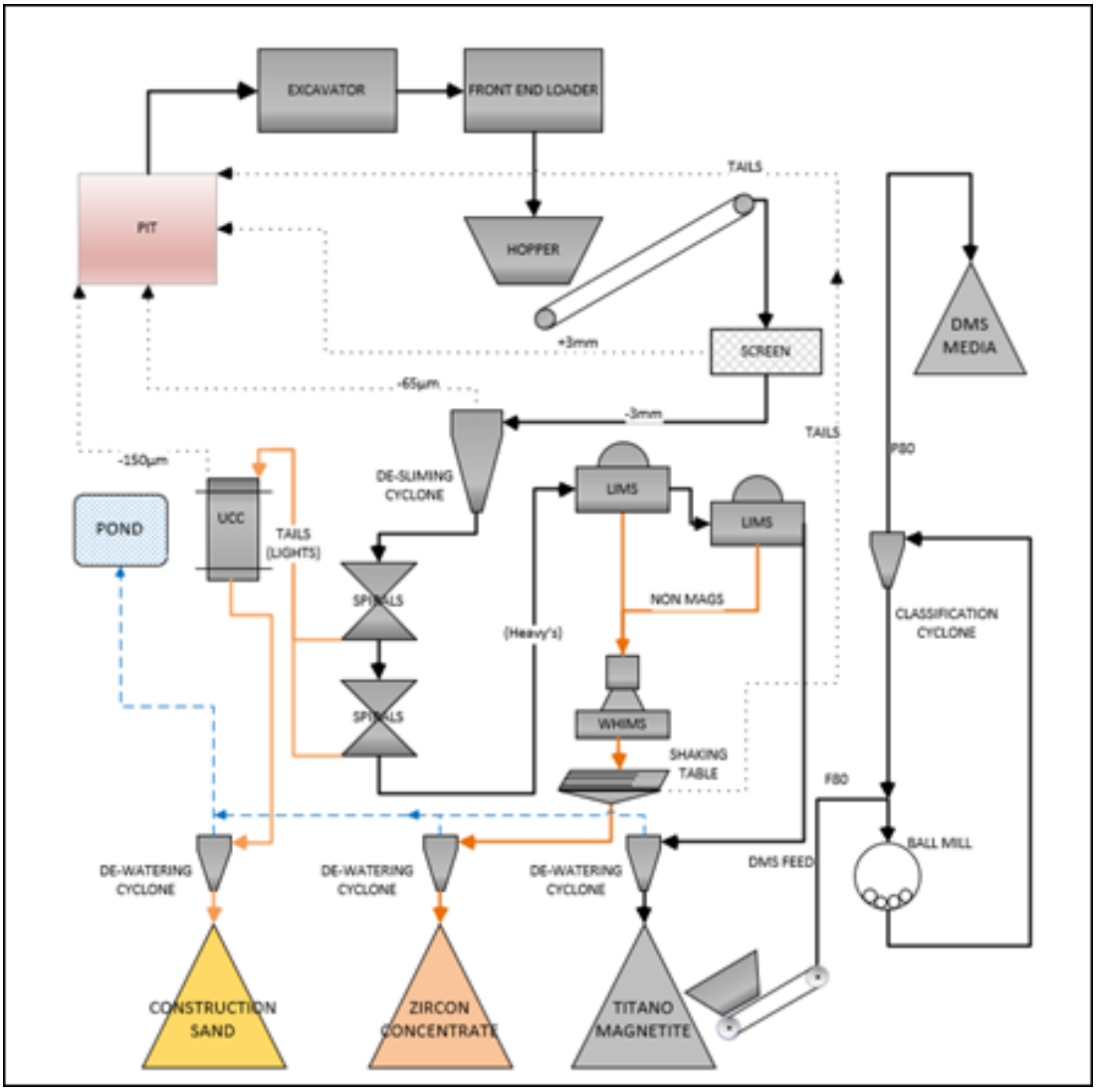

Figure 2 Simplified Project Process flow

Transport and logistics

The Orokolo Bay Project is supported by a simple, low cost and flexible barging and transshipping solution modelled on Indonesian operations. Barging avoids using expensive infrastructure that can take significant time to construct, and which often requires additional approvals. Several other industries incorporate barging into their supply chains, including PNG's timber industry which currently

operates barges in the Purari River as well as other nearby river systems. At the Orokolo Bay Project, a barge loader has been purchased (currently stored in Port Moresby) and low-cost jetty designed which can be easily implemented. To date, product movement across the logistics chain has been extensively modelled using dedicated stockpiles, prevailing tides, and climatic conditions.

Figure 3: Orokolo Bay Mine to Ship Logistics

Infrastructure and utilities

The infrastructure and utilities required for the Project would include administration facilities, maintenance facilities, accommodation, airport, power, water, fuel, waste and communications.

Offices and accommodation facilities

An accommodation area is to be located on site. These include administrative office, canteen, staff dormitory, canteen & shower room, warehouse etc.

Water

Site water management involves the management of stormwater runoff, rising rivers, water management for any dust suppression, firefighting and the management of potable water and wastewater.

A water balance model has been completed to determine the minimum size of the storage pond and required amount of additional water transfer, whilst simultaneously satisfying all the specified watering requirements and minimising pond overflow during heavy rainfall periods.

Environmental water management is integrated within the existing water system described above. All stormwater runoff from the site is collected in a storage pond and allowed to naturally drain from site when the sedimentation levels are within tolerance as described in the environmental management plan.

The potable water plant is designed to treat ground/surface to achieve potable water quality and will involve pre filtration, RO desalination and a CIP system for membrane cleaning.

Power

The mining operations have been designed to operate independently. The largest single power draw for each mining operation is the two processing plants and thus the most appropriate power solution would be to have diesel fuelled power generators located at each land-based plant. Calculated total power draw is 5.5MW, hence 6MW of power generation capacity would be required for the project.

The generators would be 500kVA 415V synchronised units. Each plant would also have a reconditioned standby generator that allows servicing and breakdown redundancy.

Mayur would provide for a nominally 200kVA generator system at the administration area to provide power for the offices, maintenance and port facilities whilst the camp provider would allow for a separate generator set up at the accommodation village.

Fuel storage

Apart from the main fuel farm located at the Muro wharf area, Twenty thousand litres of diesel fuel would be stored in relocatable ISO fuel farms near each processing plant in the event that unseen conditions i.e. weather, breakdown etc. prevent regular supplies being provided from the port fuel farm

Plant fuel supplies will be replenished every three to four days using a fuel supply tanker that would service each location.

Operations management

Mayur will manage the operations from a PNG base with its head office in Port Moresby. This PNG base would report to Mayur's corporate headquarters in Brisbane and Singapore which would be the base for executive functions including general management, marketing, sales, administration, information technology and ship planning.

During the construction and start-up phase of the mine, Mayur will use a combination of its own employees and a contracting company to establish and run the operations.

Such an arrangement would likely be an operational joint venture with Mayur having key oversight roles around geology, mine planning, survey, quality and transhipping. The contracting company should have the ability to manage and evaluate all aspects of operating a mineral sands style mine.

Professional and trades personnel would be sourced from the PNG contracting company's workforce. Operators could be sourced from various localities around rural PNG in the Gulf Province, and new operators would be trained and educated as required.

Mayur would where possible recruit locally within PNG utilising national labour and service providers and promote local business development.

FIFO from Port Moresby, the Philippines and/or Brisbane would provide a good source of skilled people who could live in location and be long-term employees of the operations. These already competent employees would build the site knowledge bank that leads to greater efficiency and a reduction in training costs over time.

Environmental and social impact assessment

The two most important pieces of PNG legislation regulating the environmental and socio-economic aspects of the project are the Mining Act 1992 (Mining Act) and the Environment Act 2000 (Environment Act).

Bulk sample environmental permit

The environmental permit authorises the carrying out of a mineral exploration program and the extraction of a bulk sample within the Orokolo Bay exploration licence. This permit approves level 2 (Sub-category 2.4) activities related to mineral exploration and mining associated with the extraction of no greater than 100,000t per annum.

Full-scale mining environmental permit

The environmental permit authorises the development of a mechanised mining project within the Orokolo Bay mineral sands mining project area. The permit was issued 15 March 2019 for a term of 25 years with a date of expiry on 16 March 2044. This permit allows for:

- The discharge of waste into the environment from its premise while carrying out Level 2 (sub-category7.2) activities associated with mechanised mining on a Mine Lease issued under the Mining Act 1992 involving the non-chemical processing of more than 50,000t per annum.

- To extract water from surface and groundwater resources within the premise while carrying out a level 2 (sub-category 7.2) activity for purposes associated with mechanised mining on a Mining Lease issued under the Mining Act 1992 involving the non-chemical processing of more than 50,000t per annum.

- A Mining Lease cannot be granted by the Minister for Mining until an Environment Permit has first been granted by CEPA.

Socio-economic and cultural heritage impacts

To be considered a success the Project must have an enduring positive impact at all levels of PNG society. Some of the positive impacts include direct capital investment, gross taxation revenue, royalty payments, the potential for new industrial development and employment and training opportunities.

As required under Section 155 of the *Mining Act 1992*, a Compensation Agreement has been successfully negotiated between Mayur and the landholders (customary landowners and holders of leases over government land) of the land currently planned for development in phase 1 of the project. Negotiations with the landholders impacted by phase 2 of the project is underway. The Compensation Agreement was negotiated and executed with the agents of the landowning clans and sub clans.

Project execution

The Project requires the development of a 5 Mtpa mining project with multiple products, plus all associated transhipping infrastructure located in the Gulf Province of PNG. The scope of works to be completed under this Project provides infrastructure and operating systems necessary for the efficient operation of mine, processing, stockpiling and transhipping facilities.

The project is being developed in two distinct phases i.e. 1 & 2, with phase 1 providing all the capability and infrastructure for a trial phase . Phase 1 allows Mayur to extract and beneficiate 100,000t of titano-magnetite for use in smelting trials in China. The processing methodology for Phase 1 is constrained to a single module containing the wet magnetic beneficiation circuit to provide the required tonnages for the trial program.

Phase 2 entails the installation of the entire suite of beneficiation circuits i.e. Spirals, WHIMS, Up-current Classification, Shaking tables and DMS media production as well as the extension of the Phase 1 capability.

After careful consideration with regards to the appropriate contracting strategy for the Project, taking into account the phased development, the scale of the Project and the requirement to lock in long term resources as a key considerations, it was decided to execute the project using an integrated owners team led by a Project Director.

A small full-time owner's representative project management team would be engaged as part of the detailed design phase. Selection would be based on job descriptions to match the functional area of management required.

Products and Marketing

The Project will produce a number of different products that have different applications and markets. Products and applications are shown in the below table.

Ref	Product	Description	Volume	Target Market
1	Titano-magnetite	A source of iron ore, also known as vanadium titanomagnetite "VTM" or iron sand concentrate.	~400,000 tpa	For export to steel mills /manufacturers in China / North Asia or traders
2	Magnetite use as Dense Media Separation for Coal Washing	For use in coal washing as a dense media separation (DMS)	100,000 tpa	For export to customers in Australia (coal mining companies).
3	Zircon Heavy Mineral Concentrate	A semi-processed zircon concentrate (20% Zr)	~8000 tpa	For export to customers / traders in Asia (e.g. industrial sands processors in Hainan, China)
4	Silica Construction Sands	High quality silica sands for use in concrete, pavements & roadway construction	~1 Mtpa	For export to customers in Sydney, Australia or Singapore

Table 2: Product table with volumes and target markets

Titano-magnetite

Mayur has a condition precedent binding offtake agreement in place with Qingdao Shinebest (Shinebest) in China for the supply of vanadium titano-magnetite (VTM) product sands from the Orokolo Bay Project.

The agreement covers the initial requirement for a bulk sample of VTM, that is subject to statutory approvals, from the Orokolo Bay Stage 1 (Pilot Plant) to be used for commercial scale acceptance testing. The agreement also includes a commercial framework for the offtake of 200,000t of product per annum. This framework is to apply upon acceptance of product quality from the Pilot Plant stage testing, and when the project is expanded to a full-scale production (Stage 2).

The proposed specification for the VTM is outlined below.

Typical Chemical Analysis after processing		Typical Size Distribution	
Fe	57-58.0%	Aperture (µm)	Wt % Retained)
SiO_2	1.8 - 2.3%	+300	0.7
Al_2O_3	2.1%	+ 150	33.2
TiO_2	12.9%	+ 125	19.4
P	0.06%	+ 106	17.0
V_2O_5	0.48%	+ 90	18.9
S	0.012%	+ 75	7.1
CaO	0.40 - 0.55%	+45	3.0
MnO	0.68%	- 45	0.7
MgO	1.60 - 1.70%		**100%**
K_2O	0.030%		
Specific gravity	5.0 g/cm^3		
Bulk density	2.74 g/m^3		
Angle of repose	30°		
Hardness (MOHS)	5.5-6.5		
Melting Point	1565° C		
Free moisture content at 105° C	Max 7%		

Figure 4: Titano-magnetite specification sheet

The above specification is based upon a range of test work from 4 pit samples spaced across the entire Project resource. The specification compares favourably to other VTM specification ores being currently consumed by the Asian market

Pricing assumptions for the magnetite are based on conservative forward forecasts with the long-term Iron Ore price assumed at USD$78.8/t on a CFR China real basis. Magnetite (FE 57%) pricing has been determined from the 62 % Fe CFR China reference price with applicable grade and impurity adjustments.

Product	Unit	Basis	2023	2024	2025	2026 +	Long Term	Source
Iron Ore (FE 62%)	US$/t real	CFR China Real	94.7	83.1	79.3	81.1	78.8	*Consensus forecast sourced by Management from Bell Potter in Feb 2022*
Mayur Magnetite (FE 57 – 58%)	US$/t real	CFR China Real	70.1	68.7	65.8	67.0	65.4	*Consensus pricing with Fe adjustment and discount applied*

Table 3:Iron ore (Fe 62%) and VTM (57%) pricing assumptions

Magnetite use as Dense Media Separation for coal washing

Another potential market for the magnetite product is for dense media in coal washing in Australia (either Queensland or New South Wales or both). Various test work undertaken by ALS and CRL Energy

laboratories in Wellington identified that the Mayur magnetite once taken through a grinding circuit with sufficient retention time to meet end users sizing requirements is suitable for this application.

Mayur has a number of Letters of Intent (LOI's) in place with major Coal producers in Queensland and New South Wales. Magnetite product allocated for the DMS market will be sourced from Mayur's proposed Titano magnetite product for export to the steel industry.

The DFS contemplates grinding of the Magnetite product on-site in Papua New Guinea (via a ball mill) to achieve customer sizing specifications. The product will then be shipped in up to 30,000t parcels to be distributed to Queensland based customers from a Mackay based storage facility and NSW based customers through the Port of Newcastle.

Mayur has secured an option to a land site at Mackay harbour which could be used as a ship receival, storage, handling and dispatch yard. Mayur is also in discussions with companies holding land areas at the Port of Newcastle for a receival, storage and dispatch yard.

Pricing assumptions for DMS product remain commercial in confidence, however it should be noted that the Project's low cost extraction (at surface mining and no drill and blast along with its proximity to Mackay and Newcastle will afford it a significant cost advantage compared to the existing suppliers from Tasmania or South Africa.

Zircon Heavy Mineral Concentrate

In addition to the magnetite product the in-situ ore at Orokolo Bay also contains valuable non-magnetic heavy minerals, this includes zircon. To maintain the technical simplicity of the Project (and also keep additional CAPEX to a minimum) the plan will be to produce a 20% ZrO2 concentrate at mine site and suitable for further upgrading by others. Metallurgical test work conducted by IHC Robbins for Mayur has produced a zircon concentrate with the chemical composition shown below.

Concentrate Chemical Analysis (as shipped)	
ZrO2	16-24%
Fe2O3	25.6%
TiO2	11.5%
Al2O3	3.92%
P2O5	0.38%
CaO	4.56%
MgO	2.62%
SiO_2	21.2%
U	390ppm
Th	318ppm

Table 4: HMC chemical analysis

Mayur has taken a similar approach with its marketing of zircon concentrate as it has done with VTM and has secured a number of LOI to purchase. Given the Project's relatively small saleable zircon production volume, it is likely that this will all be consumed by a single customer through a medium to longer term offtake arrangement. Mayur wishes to underwrite forecast revenues through creditworthy offtake parties via a long-term binding contract arrangement.

Limited published data exists for the global selling price of crude or semi processed zircon concentrates and shipments of heavy mineral concentrates are a fragmented and difficult to quantify. Hence one generally accepted rule-of-thumb for estimating the price of the concentrate is to apply a USD value per % Zr of the concentrate product.

Various estimating factors exist for determining the value of zircon concentrates and most are based on the purified theoretical zircon content minus the expected cost of further processing to get the product to a standard or premium grade and global published pure zircon price. Zircon concentrates, while generally easier to identify in the trade data, range significantly in composition including zircon.

Pricing assumptions for Zircon are shown below.

Product	Unit	Basis	2023-2026	Long Term	Source
Zircon Concentrate Price (20% ZrO2)	US$ per % ZR	CFR China Real	22	19	*Consensus forecast sourced by Management from Bell Potter in Feb 2022*

Table 5: Zircon pricing assumptions

Silica construction sands

Based on a mining rate of 5 Mtpa, it is planned to produce ~ 1 Mtpa of construction grade sand as a by-product from the project for supply into the Sydney or Singapore construction market.

The sand from the project has been tested by a range of end users including Monier and Boral, also independent tests were undertaken by Bureau veritas and BCRC and is regarded as suitable for use in Fine Aggregate in Concrete, Asphalt Aggregate and Unbound Pavements if suitably graded with coarser sands.

The sand contains significant magnetite which is resistant to weathering and unlikely to produce staining. Given the high relative density of magnetite the concrete will display a corresponding increase in density when compared with more silicate rich sands.

For engineering purposes, the sand may be summarised as:

- A fine Quartzo-Lithic Hornblende Sand.
- Well-sorted, clean and composed principally of competent grains (97%) accompanied by limonitic particles or grain accretions (3%).
- Hard, strong and durable.
- Mechanically suitable.
- Containing 47% free silica as quartz.
- Presenting low risk of mild ASR in concrete

Mayur Resources Results		Specification Limits AS 2758.1
Grading		**Uncrushed Fine Aggregate**
Sieve (mm)	**% Pass**	
2.36mm	100	60 to 100
1.18mm	100	30 to 100
0.600mm	96	15 to 100
0.300mm	53	5 to 50
0.150mm	4	0 to 20
0.075mm	0	0 to 5
Fine Aggregate		
Particle Density (SSD)	2.74 t/m³	2.10 to 3.20 t/m³
Particle Density (Dry)	2.68 t/m³	2.10 to 3.20 t/m³
Water Absorption	2.20%	Recommended 2.0% but no fixed value in AS2758.1
Organic Impurities Other Than Sugar	Pass	Pass
Percent Passing 75 micron	0%	5%
Material Finer than 2 micron	0.00%	2%
Chlorides	0.003%	<0.01%
Sulfate	0.03	5% however greater than 0.01% should be reported on
Light Particles	Nil	<1%
Sugar	Not detected	Pass
Sodium Sulfate Soundness Total Weighted Loss of Sample	1.20%	Maximum 6%
Petrographic Examination	47% Free Silica	No specification

Figure 5: Construction sand specifications

Typical chemical analysis and size distributions are shown in the below table.

Typical chemical analysis after processing		Typical size distribution	
Fe_2O_3	6.36 %	Aperture (µm)	Wt % Retained)
SiO_2	66.5 %	+600	4.0
Al2O3	12.7 %	+ 425	16.8
TiO2	0.77 %	+ 300	50.5
P_2O_5	0.104 %	+ 212	89.7
V_2O_5	0.02 %	+ 150	99.7
Cr_2O_3	0.015 %	+ 75	100
CaO	5.02 %		
MnO	0.11 %		
MgO	3.31 %		
Nb_2O_5	0.001 %		
K_2O	1.33 %		
ZrO_2	0.01 %		
U (ppm)	20		
Th (ppm)	15		
SO_3	0 %		

Table 6: Chemical analysis and typical size distribution

Capital cost estimate

The capital cost estimates are presented at a summary level below:

Area	USD$m	Source
Mining	10.9	Market tested and EPC contract with Vanadium Group for Processing Plants
Mineral Processing Equipment		
Mobile Equipment	0	Supplied by HBS
Dense Media Separation Grinding Plant	0	Deferred to Stage 2
Stockpiles and Tailings	0.2	Market tested and EPC contract with Vanadium Group for Processing Plants
Plant, Electrical & Instrumentation	1.1	Supplier Quotes & Estimates
Wharves & Shiploading	0	HBS to complete
Infrastructure	0.45	Supplier Quotes & Estimates
Support Vessels	0	To be supplied by barging contractor
Other / Consumables	0.35	Supplier Quotes & Estimates
Fuel storage facilities	0	To be supplied with fuel supply contract

Area	USD$m	Source
Construction Indirect	0.15	Supplier Quotes & Estimates
EPCM	0.7	Siecap Estimate
Total Direct Costs	*13.85*	
Owners costs	1.39	Siecap Estimate
Risk Allowance	0	Allowed for in EPC contract
Contingency	0	Allowed for in EPC contract
Total Indirect	*1.39*	
Total	*15.23*	
HBS Investment for mobile fleet	6.0	HBS Capital Estimate
Expansion Capital	3.5	Supplier Quotes & Estimates
Grand Total	24.73	

Table 7: Capital cost estimate

Operating cost estimate

The operating estimate have been divided into the areas of mining, processing, logistics and transport, jetty operations, indirect costs and shipping to generate a CFR cost.

The operating cost estimates for the are summarised below.

Cost element	Annual Operating Costs (USD$M)	Life of Mine Operating Costs (USD$m)
Mining	2.45	36.8
Processing (WCP)	4.19	62.9
Processing (DMS)	0.95	14.2
Haulage and Load out	0.65	9.7
Barging and shiploading	8.54	128.1
Indirect costs	2.30	34.5
Site Costs	19.08	286.2
Royalty	1.25	18.78
Shipping & Delivery	22.74	341.1
Total Costs	43.07	646.1

Table 8: Operating cost estimate

Shipping methods for each product are summarised in Table 9 below.

Products	Destination	Sales Basis
Magnetite (VTM)	China	Bulk shipped on CFR basis
HMC (Zr)	China	Bulk shipped on CFR basis
DMS	Bowen Basin, Queensland (Via Mackay)	Delivered (Mine site)
Construction Sand	Sydney	Bulk shipped on CFR basis

Table 9: Shipping methods and destinations

Magnetite and HMC (Zircon) product will be shipped from PNG to China and sold on a Cost and freight (CFR) basis.

Construction sand will be sold into the Australian east coast market on a CFR basis.

The DMS option includes handling and grinding (via Ball mill plant) for 0.1 Mtpa of magnetite on site in PNG before shipping to Mackay (Queensland, Australia), handled at the port, plus an allowance for road transport to customer's mine sites where it will be used in coal washing.

Shipping and handling costs for each product are summarised in Table 10 below. This has been prepared for each of the four products (i.e. Magnetite, DMS, HMC (Zircon) and Construction Sand) in un-escalated (real based) terms.

Description	Unit Rate (USD$/t)	Products	Source / Comments
Shipping - PNG to China	15	Magnetite; HMC (Zr)	Base on CNTI Quote
Shipping - PNG to Mackay	10	DMS	Siecap estimate
Shipping - PNG to Sydney	14	Construction Sand *(DFS base case)*	Siecap estimate
Discharge and Handling at Wharf in Mackay	14	DMS	Source: NQ Bulk Ports, Firm Quotes
Trucking & delivery to site (Bowen Basin)	25	DMS	Transport to Bowen Basin mine site. Siecap estimate

Table 20: Shipping and Handling Costs.

Power and Diesel Pricing

From the mechanical equipment lists, the absorbed power for each relevant area of plant was determined in kWh. This power usage was then determined using the industry standard 0.267 L/kWh conversion factor for absorbed power requirements to determine fuel burn (e.g. litres of diesel).

Aside from the export shipping cost, the main operating expense for the project is in the fuel requirement for the operation. The pricing for fuel has been based on a discounted quote for diesel from offered by one of PNG's larger fuel suppliers at diesel list bulk price.

he fuel price used in the estimates is 2.25 PGK per litre based on pricing from petroleum suppliers in PNG with delivery and reasonable contingency applied.

Both operating and maintenance labour costs were based upon international projects of similar socio-economic background to PNG.

Royalties

Royalties have been applied as per PNG legislation and is based upon 2% Royalty (to Project Area Landowners) and 0.5% Production Levy to the MRA.

Currency Basis

All estimates are based or converted to United States dollars. Rates were obtained in foreign currencies; the following exchange rates have been utilised.

- AUD/USD of 0.73 for the first 2 years of operation then 0.75 thereafter, and
- USD/PGK of 0.28

Escalation

All costs are estimated on the basis of the pricing for labour and materials existing in real terms.

Financial analysis and evaluation

Analysis of discounted cashflows

A discounted cash flow model was used to derive a post-tax net present value (NPV) for the Project. The key valuation results are presented below.

Basis of cashflows	Key results	Ungeared Post-Tax
Real	NPV (@10%)	US$ 131 million
	IRR	90.2%
	Payback Period	2.0 Years

Table 11: Key valuation results – base case

The assumptions used in the base case financial model are as follows:

- Discount rate of 10 % on post-tax cashflows
- Project life of 15 years
- Taxation rate of 30% applied with five-year waiver as an establishment incentive
- PNG Royalty of 2.5% (2% Royalty and 0.5% Production Levy) based on an FOB sales price methodology.
- Straight-line depreciation based on a 10-year period.
- Figures presented on a 100% equity basis for the project
- No terminal value has been added to the NPV, reflecting no extension to the plant and/or mine life.

Sensitivity Analysis

NPV sensitivity analyses have been completed and presented in the tornado chart in

Figure below which highlight that the project is most sensitive to Operating costs, Construction Sand Price, followed by Iron Ore Pricing.

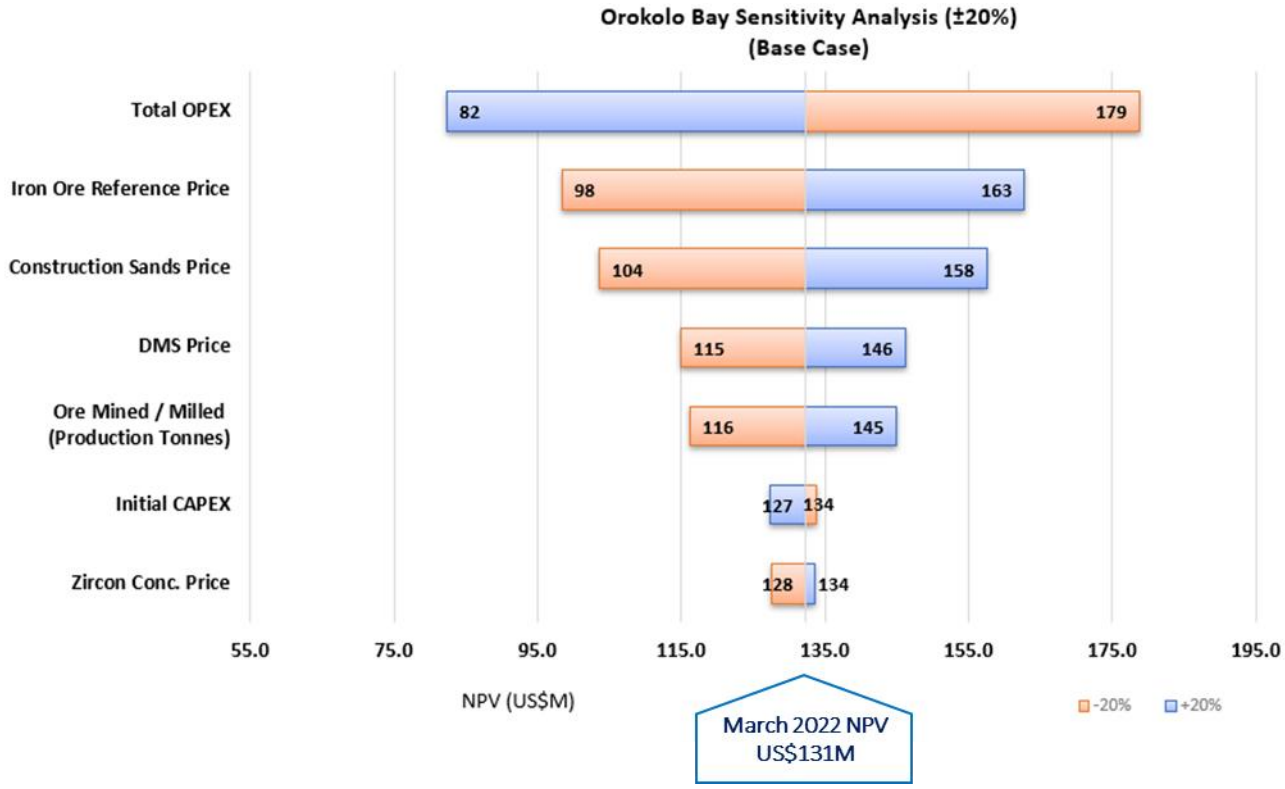

Figure 6: Sensitivity Analysis

Discount Rate sensitivity

Sensitivity to discount rate is also an important consideration. Mayur have assumed a conservative 10% ungeared (real) discount rate; however sensitivities are shown in the below table.

Discount Rate (real)	NPV – Ungeared Post Tax (USD$ m)
5.00%	188
8.00%	150
10.00%	**131**
12.00%	114

Table:32 - NPV at different discount rate