13TH MARCH 2024

Scoping Study – High Purity Manganese Sulphate Project

Jupiter Mines Limited (ASX.JMS) **(Jupiter** or the **Company)** is pleased to provide an update to its five year Company Strategy, released on 31 March 2023. The accompanying document is a summary of a completed Scoping Study evaluating the opportunity to supply High Purity Manganese Sulphate Monohydrate **(HPMSM)** to the electric vehicle **(EV)** battery market (the **Project**).

Jupiter's Scoping Study for HPMSM production has yielded promising results, confirming successful laboratory scale production with potential for optimisation and scaling up. The Project plans an initial capacity of 50ktpa for the first three years, increasing to 100ktpa from 2030. Financial projections are strongly supportive of advancing further study work for the Project, with base case assumptions arriving at an unlevered post-tax base case IRR of 25% and a peak EBITDA of US$179M per annum at full-scale production. The capital cost for the 100ktpa plant is estimated at US$430M, in line with other advanced projects in the sector.*

The decision to study the feasibility of a HPMSM production facility has been undertaken due to Jupiter's strong competitive advantages that can be leveraged as a dedicated pure-play manganese mining company with significant existing mining operations.

The financial outcomes of the HPMSM Project have been assessed on a stand-alone basis. All assumptions are based on arms-length inputs so that this Study may be considered independently.

Notwithstanding, Jupiter is favourably positioned as a credible and low-risk counterparty for major offtake partners in the HPMSM Project. Jupiter can also generate additional value from synergies from its existing investment in the Tshipi mine:

- Jupiter has immediate access to ~2Mt (Million Tonne) of readily available stockpiled manganese ore with an in-situ grade of >30%. Within the mine, the lower-grade manganese resource has also been declared as measured and has the potential to continue to be extracted as a by-product of the existing mining operation at a substantially reduced cost and without any further processing necessary for over 100 years. No new or dedicated mine would therefore be required and meaningful additional value can be derived from the sale of this mineral resource. The ore cost contribution to HPMSM, as estimated by Benchmark Mineral Intelligence (Benchmark), ranges from 12% - 25% depending on mineral deposit type and HPMSM process methodology. On a like-for-like basis, Jupiter could therefore realise a meaningful operating cost advantage within this range; once operational. Jupiter's aim is to be the most cost efficient ex-China supplier of HPMSM. The competitive advantages explained in this Scoping Study position the Company to achieve that aim;
- Jupiter is unlevered and generates a strong annual cashflow. It is not dependent on external funding for the study phases of this Project;

*Opex and Capex assumptions are based on a scoping level of study with an accuracy of ±30% and ±50% respectively.

- Jupiter can leverage existing infrastructure, skills and manganese industry experience;
- Jupiter has large long-standing Investors namely AMCI and POSCO with strong financial and industry experience both with downstream processing across the battery mineral value chain.

Optimal plant location options in the US and Canada have been identified as part of the base case, ensuring strategic positioning within the North American market. This is in line with the strong US federal governmental focus on the EV sector. As the EV battery industry develops, alternative locations may be considered by Jupiter if deemed more attractive from a business case perspective.

Following these findings, the next steps include a pre-feasibility study starting in March 2024. This phase, estimated to cost up to US$2.9M and last 12 months, will be funded as part of general overhead costs by Jupiter.

This announcement has been authorised for release by the Board of Directors of Jupiter Mines Limited.

Cautionary Statement

The Scoping Study referred to in this announcement has been undertaken to explore the feasibility of developing a production facility to produce and supply High Purity Manganese Sulphate Monohydrate to the electric vehicle battery market (**HPMSM Project**). It is a preliminary technical and economic study of the potential viability of the HPMSM Project.

The Scoping Study outcomes, production targets and forecast financial information referred to in this announcement are based on low level technical and economic assessments. Further evaluation work and appropriate studies are required before Jupiter will be in a position to provide any assurance of an economic development case.

The Scoping Study is based on material assumptions outlined elsewhere in the announcement. These include assumptions about the availability of funding. While Jupiter considers each material assumption to be made on reasonable grounds, there is no certainty that these material assumptions will prove to be correct or that the range of outcomes indicated by the Scoping Study will be achieved.

To achieve the range of outcomes indicated in the Scoping Study, funding of in the order of US$430M will likely be required, comprising overall Project study costs of US$15M and an initial Project capital expenditure of approximately US$415M. Ongoing, self funded annual Project sustaining capital costs of approximately US$3M per year are envisaged. Investors should note that there is no certainty that Jupiter will be able to raise that amount of funding when needed. It is possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of Jupiter's existing shares. It is also possible that Jupiter could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture in respect of the business and operations of the HPMSM Project. If it does, this could materially reduce Jupiter's proportionate ownership of the business and operations of the HPMSM Project.

However, Jupiter has concluded it has a reasonable basis for providing forward-looking statements included in this announcement and believes that it has a reasonable basis to expect it will be able to fund the development of the HPMSM Project which will potentially include funding from external sources such as government grant funding and or co-investment by off-take partners where applicable.

While it is Jupiter's current intention to utilise existing ore reserves and mineral resources from the Tshipi mine in connection with the HPMSM Project, the financial success of the HPMSM Project is not dependent on the use of such ore reserves and mineral resources. The procurement of ore feed for the HPMSM Project could be ordinarily and readily procured in the open market. However, for completeness, details of the latest mineral resources and ore reserve statement in respect of Tshipi, which have been prepared by a 'Competent Person' in accordance with the requirements of the JORC Code (2012), are available in Jupiter's latest annual report for the four-month period to 30 June 2023, released to the ASX on 29 September 2023 and available on Jupiter's website at https://www.jupitermines.com/. Jupiter confirms it is not aware of any new information or data which materially affects the information included in that release. All material assumptions and technical parameters underpinning the estimates in the Competent Person's Report (CPR) continues to apply and have not materially changed.

Given the uncertainties involved, investors should not make any investment decisions based solely on the information in this announcement.

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For further information on Jupiter, visit www.jupitermines.com or email investorrelations@jupitermines.com

JUPITER MINES LTD

Scoping Study

High Purity Manganese Sulphate Monohydrate (HPMSM) Project

MARCH 2024

ASX:JMS
jupitermines.com

Highlights

Raw Material Advantage

Tshipi 30% Mn ore is suitable for HPMSM production, offering a cost advantage as it is a by-product from the Tshipi Manganese mine in South Africa and does not carry high extraction costs.

Location for Plant

Plant's base case strategic North American location identified for diverse advantages, including the burgeoning EV battery market, potential EV incentives, favourable investment legislation, and robust industrial base.

Plant Capacity

The HPMSM Project is considering a plant with a proposed capacity of between 80ktpa to 120ktpa balancing operational as well as demand and supply risk and production efficiency.

Capital Expenditure

The HPMSM Project involves an initial capital expenditure of ~US$430M with additional annual sustaining capital costs of ~US$3M. The capital estimate is commensurate with a Scoping Study level of accuracy at +/-50% and is inclusive of a 20% overall project contingency.

Attractive Returns

Under base case assumptions, the HPMSM Project has an IRR of 25% and a payback period of ~4.3 years, with a $NPV_{12\%}$ of US$260M.

Market Growth

The forecasted demand for manganese particularly in EV batteries is promising, with consumption outside China expected to significantly increase by 2030 in line with the OEM demand outlook for EV's, indicating a robust market for HPMSM.

Next Steps

The pre-feasibility study for the HPMSM Project is scheduled to start in Q1 CY2024, marking the next phase in the Project's progression.

"We are excited by the results of this Scoping Study on Jupiter's opportunity to enter the market to supply battery grade manganese to the electric vehicle manufacturing industry. We believe that Jupiter can leverage its competitive advantages, including access to a suitable, substantial, long life and secure source of ore from Tshipi, to add significant value to our stakeholders through the execution of this strategy. While there is more work to do, we are very encouraged by the opportunity and returns outlined in this Study, as well as our work so far, including discussions with numerous potential customers and partners."

BRAD ROGERS
Managing Director, Jupiter Mines

Introduction

Jupiter Mines Limited **(Jupiter, or JMS)** has completed a Scoping Study to explore the feasibility of producing and supplying High Purity Manganese Sulphate Monohydrate **(HPMSM)** for the electric vehicle **(EV)** battery market. This strategic initiative positions Jupiter at the forefront of an emerging market, driven by the increasing demand for advanced battery technologies in the rapidly growing EV industry. The transition towards manganese-rich cathodes in EV batteries has significantly amplified the need for HPMSM, a critical component in enhancing battery safety, performance, and cost-effectiveness. Figure 1 illustrates the forecasted increase in global demand for HPMSM, showing a significant increase over the next 16 years.

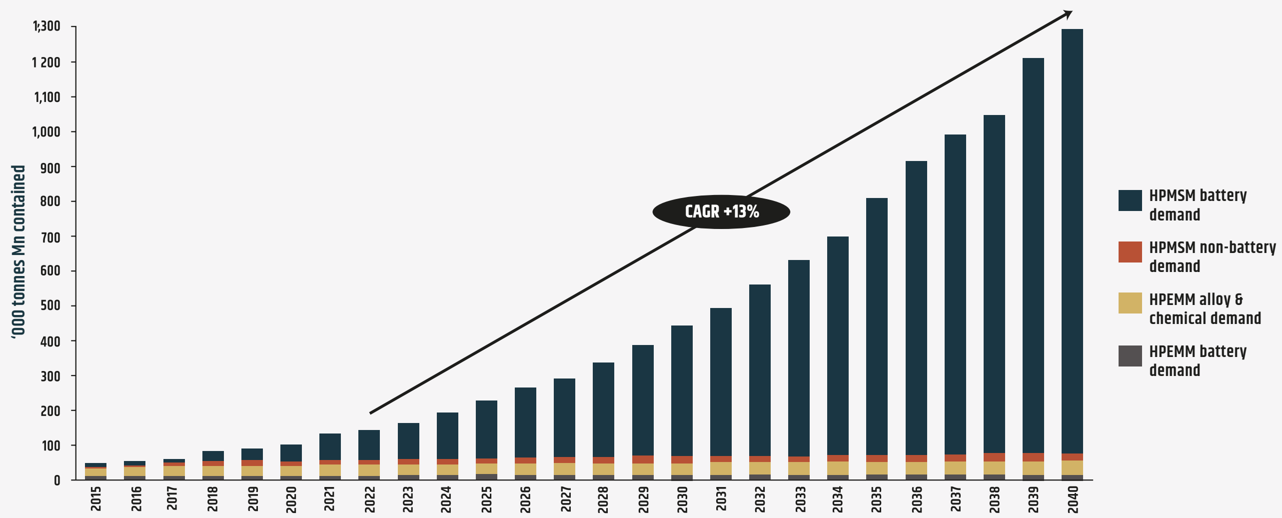


Figure 1: Forecasted Global HPMSM Demand[1]

Amidst this backdrop, Western governments, (particularly the USA) are proactively incentivising the domestic production of critical minerals, including manganese, to reduce dependence on foreign supply sources, particularly those influenced by China. These market dynamics present Jupiter with a unique opportunity to capitalise on the growing demand for HPMSM and establish itself as a prominent supplier in the EV battery supply chain.

The Study includes an in-depth analysis of the optimal location for establishing a HPMSM production facility, with a particular focus on North America at this stage. This region offers strategic benefits, such as proximity to a burgeoning EV battery market, favourable government policies, and an existing gap in manganese demand between current planned battery plants and their supply chains including precursor Cathode Active Material **(pCAM)** facilities. To align with the forecasted market demand and achieve production efficiencies, Jupiter is considering a plant with a capacity ranging from 80ktpa to 120ktpa. This capacity is carefully chosen to balance the dynamics of market demand with production efficiency and risk management.

1) Jupiter: HPMSM Location and Demand Study (Jupiter Internal Project Study), Benchmark Mineral Intelligence, 2023

Business Base Case and Commercial Rationale:

Cashflow (~25 Years)	EBITDA (~25 Years)	NPV (12%)	IRR	Payback	Project Capex	Production (Annual)
US$1.5bn	US$2.2bn	US$260M	25%	~4.3 years	US$430M	100ktpa

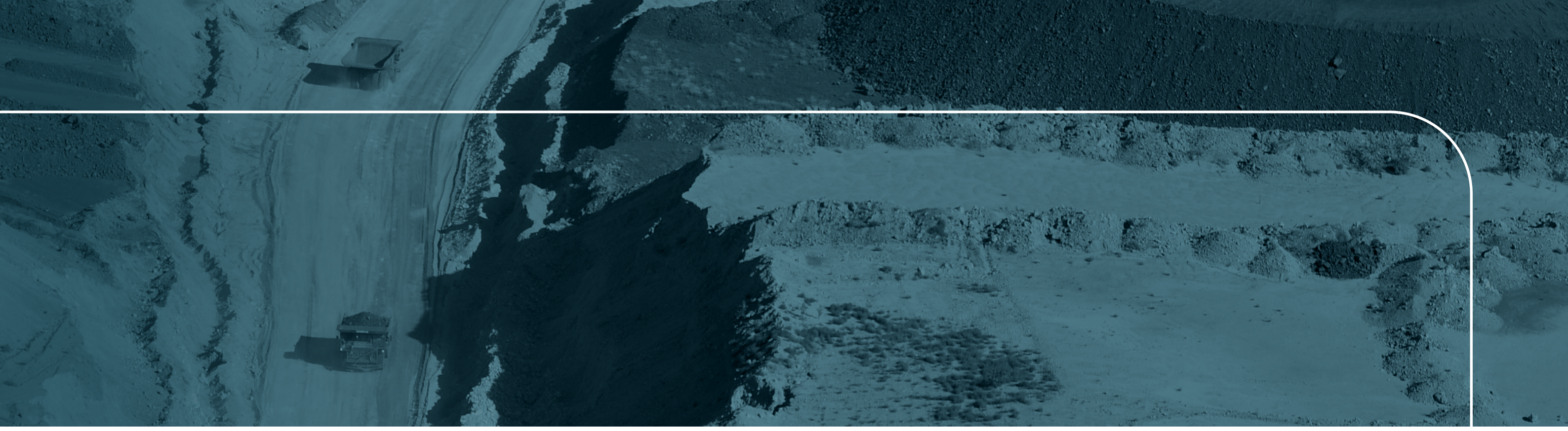
One of the key benefits to the Jupiter HPMSM Project is its competitive advantage in raw material sourcing and production. The availability of Tshipi low-grade ore, which is suitable for HPMSM production, presents Jupiter with a distinct advantage. This ore, a >30% grade by-product at Tshipi, offers a higher manganese grade than most competitor resources dedicated to HPMSM, making it a cost-effective and efficient source of raw material with no additional carbon emissions footprint from mining activities for the HPMSM ore supply. Furthermore, the proposed production process at Jupiter is expected to achieve high metal recovery rates, enhancing the overall efficiency and sustainability of HPMSM production.

The forecasted demand for EV batteries outside of China is expected to rapidly grow over the next 8-10 years as the EV market builds demand momentum. While the adoption rate of manganese in EV battery cathode chemistries and the rate of planned development for required pCAM facilities evolves, Jupiter has adopted a conservative approach to the Scoping Study business case, particularly around the production ramp-up and the assumptions around HPMSM pricing.

Financial Modelling and Projections

Jupiter has based it's valuation assumptions on a timeline to meet anticipated production commencement in 2028 and applied an unlevered and post-tax equity equivalent discount rate of 12% for the valuation. This discount rate does not include grant funding or other potential lower-cost project finance for critical minerals currently being considered by Western governments. All assumptions are based in real monetary terms as at 1 January 2024.

While a base case project cashflow model was developed, the Project valuation will be subject to changes in underlying assumptions over time. From a base case perspective, the following financial modelling outcomes were determined.



CALENDAR YEAR	UNITS	2024[2]	2025[2]	2026[2]	2027[3]	2028[3]	2029	2030	2031	2032	2033	2034	2035	...	2050
Production	kt	-	-	-	-	20	50	50	80	100	100	100	100		100
Capex[4]	US$M	(3)	(12)	(29)	(254)	(13)	(15)	(108)	(2)	(3)	(3)	(3)	(3)		(2)
Post tax FCF	US$M	(3)	(12)	(29)	(254)	24	87	(27)	118	148	148	148	68		72

		BASE CASE			DISCRETE RANGE
$NPV_{12\%}$ (Post-tax, Real)	**US$M**		**260**		**170 – 530**
IRR	**%**		**25%**		**~18% – ~28%**
Payback Period[5]	**Years**		**~4.3**		
Annual Period		**2024-2030**	**2031-2035**	**2036-2050**	
Cumulative Cashflow (Undiscounted)	US$M	(210)	629	1,075	
HPMSM Pricing approach	US$/t HPMSM	3,000		1,800	
Capital Expenditure	US$M	(430)	(3) per year		
Average Operating Costs[2]	**US$/t HPMSM**	**1,120**	**1,020**	**985**	
-Raw Materials Costs	US$/t HPMSM	590	600	600	
-Energy Costs	US$/t HPMSM	200	200	200	
- Fixed/Other Costs	US$/t HPMSM	330	220	185	
Average EBITDA	US$M/yr		96		
Average Free Cashflow (post tax)	US$M/yr		85		

2) Study phase, demonstration plant, engineering design, property acquisition and site establishment.

3) Plant construction and commissioning.

4) Opex and Capex assumptions are based on a scoping level of study with an accuracy of ±30% and ±50% respectively.

5) Payback period is measured from the date of first production and is exclusive of any financing costs and dependent on agreed pricing.

Financial Sensitivity

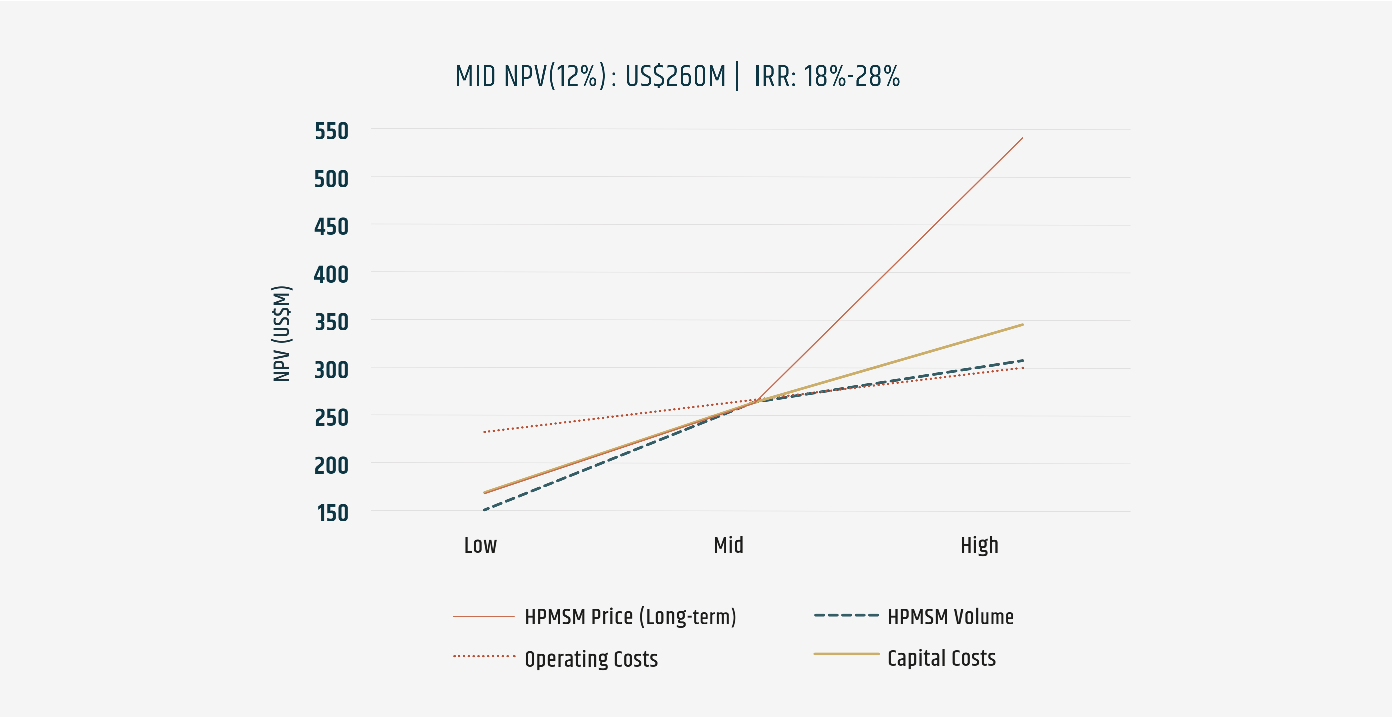


Figure 2: Project Sensitivity Analysis[6]

Assumptions and estimates used in determining a base case value for the Project have been based on conservative inputs and these assumptions and estimates will be assessed in more detail in subsequent project phases. Such inputs and costs would be driven around decisions such as a specific plant location which will be materially influenced by the lowest cost drivers including logistics, energy supply as well as acid costs. The NPV and IRR impact based on discrete sensitivities around the key value drivers are shown in Figure 2 above. Collectively applying the sensitivities result in an IRR range of between 13% - 40% for the Project.

Sensitivities to volume include a low case of a 20% overall reduction in long-term saleable volumes or alternatively a high case of a more opportunistic earlier ramp-up to full production.

Sensitivities to operating and capital costs include a global 30% variation in input assumptions.

The Project value is materially sensitive to HPMSM pricing and the NPV range around this at varying discount rates is shown below.

NPV (US$M)		Long term HPMSM Price (US$/t)				
		1,400	1,800	2,200	2,600	3,000
DISCOUNT RATE (%)	15%	98	159	221	283	344
	12%	172	261	351	440	529
	10%	237	353	468	584	699
	8%	319	470	622	773	925

6) Jupiter internal analysis

Plant Capacity and Design

Based on the anticipated supply and demand for HPMSM, a plant with a production capacity of between 80ktpa – 120ktpa for the Jupiter Project was deemed suitable from a risk and optimal production perspective.

Production ramp up is anticipated to commence from 2028 and reach full capacity by 2032. This was considered in line with the forecasted growth in HPMSM demand outside of China. This will continue to be assessed as the Project studies continue.

Market Valuation Outcomes

The HPMSM Project's early valuation is shaped by initial costs, production scale-up and product pricing that is reflective of the HPMSM supply and demand balance over time. As the EV sector's demand for HPMSM grows, the Project's value is expected to increase, reflective of the rising need for manganese. Jupiter has modelled financials across various market maturity stages, incorporating macro-economic risks and pricing trends. Valuations will adjust as the market evolves, aiming for competitive pricing and realistic market behaviour projections.

HPMSM Pricing

Due to the highly limited volumes of HPMSM currently produced outside of China together with the early growth phase of manganese in the EV battery industry, ex-China HPMSM pricing forecasts vary widely between US$2,500/t to US$4,200/t using estimates provided by industry research companies as well as companies considering HPMSM projects. Pricing in the short and medium term will largely be dependent on the nature of offtake requirements by Original Equipment Manufacturers (OEM) and the ability for the industry to supply the required HPMSM volume and quality. Furthermore, research from Benchmark, UN Comtrade and Asian Metal indicate that HPMSM pricing in Europe has recently ranged between US$1,500/t to US$4,000/t historically during 2022. Jupiter's short-term price estimate of US$3,000/t has taken into consideration an average of these market price range estimates. However, in the long term, the forecasted supply and demand for HPMSM is expected to balance and the ex-China HPMSM price will likely revert toward a global parity price including a premium for localised supply benefits as well as specific product quality requirements.

While such a balanced market price is not known at this stage, in line with industry long-term forecast methodology, Jupiter has assumed that incremental new HPMSM volume would typically be supplied at a representative inducement price, being the sum of the average operating and capital cost per tonne of product which is anticipated to be ~US$1,800/t HPMSM for this stage of the Project study. This is supported by the historical average HPMSM imported price trend toward US$1,800/t from 2016-2022 (discerned from trade data) as estimated by Benchmark.

Operating Costs

Operating costs are reflective of the required raw material and operating inputs of the proposed flowsheet and take into consideration the associated costs of the plant based in the proposed location of North America. This includes the ore and raw material logistics costs as well as the costs of procuring reasonable energy supply, particularly natural gas for heating and electricity for plant operations. Where applicable, raw material pricing is based on a mean average trend of historical commodity prices procured in North America. Energy prices are based on current published or traded average utility costs in North America. Ore prices are based off on the latest published Consesus Economics forecasts. Other costs are benchmarked off research carried out by the Project team.

OPERATING COST (BASE CASE)	US$/T HPMSM	COMMENTS
Ore Feed	261	Market Price (Consensus Economics Forecast)
Energy Costs	202	Commodity indices long term average
Reagents & Acid Cost	336	Commodity indices long term average
Waste Handling	18	Project benchmarked estimate
Raw Materials & HPMSM Transport	131	Industry quotes
Labour Costs	72	Project benchmarked estimate
Average Total Cost	**1,020**	

As manganese is deemed a critical mineral in terms of the USA Inflation Reduction Act (IRA), moderate applicable incentive benefits have also been assumed for the Jupiter Mines HPMSM Project in the financial analysis.

Capital Costs

Capital costs are based on the proposed flowsheet design and are scaled according to the level of accuracy appropriate for the current scoping level of study but are commensurate with levels of capital for similar plants of this nature. The capital costs are at an order of magnitude of ±50% and inclusive of a 20% contingency. The capital estimate will continue to firm as the level of project certainty and engineering design evolves.

CAPITAL CATEGORY (US$M)	TOTAL
Project Indirect Costs	46.2
Process Plant	86.2
Ancillary Equipment	9.7
Waste Handling	39.9
Site Infrastructure	175.8
Contingency	62.3
Land Purchase	10.0
Total Project Capital	430.1
Sustaining Capital	10.1
Total Capital Cost	475.4

Raw Material Advantage

Jupiter commissioned Benchmark to provide expert input to Jupiter's HPMSM Study.

As part of this work, Benchmark advised Jupiter on the likely cost composition of competing HPMSM projects, across various manganese ore types. This work was conducted on the basis that the various projects would need to procure their manganese ore, on either an arm's length basis (ie from a third-party supplier of the ore) or on an integrated basis (ie the HPMSM project would utilise an internal manganese mining project, that would mine and beneficiate the ore to supply a manganese ore to the planned HPMSM project). The cost associated with the mining and beneficiation would then form the ore/feedstock cost to the HPMSM project.

On this basis, Benchmark estimates that the cost of manganese ore feedstock would comprise between 12% and 25% of the total operating cost of an HPMSM project, depending on the type of manganese ore used. On average, across the potential sources of manganese ore studied, Benchmark's work suggests that the cost of manganese ore would be 19% of the total operating cost of a given project as shown below in Figure 3.

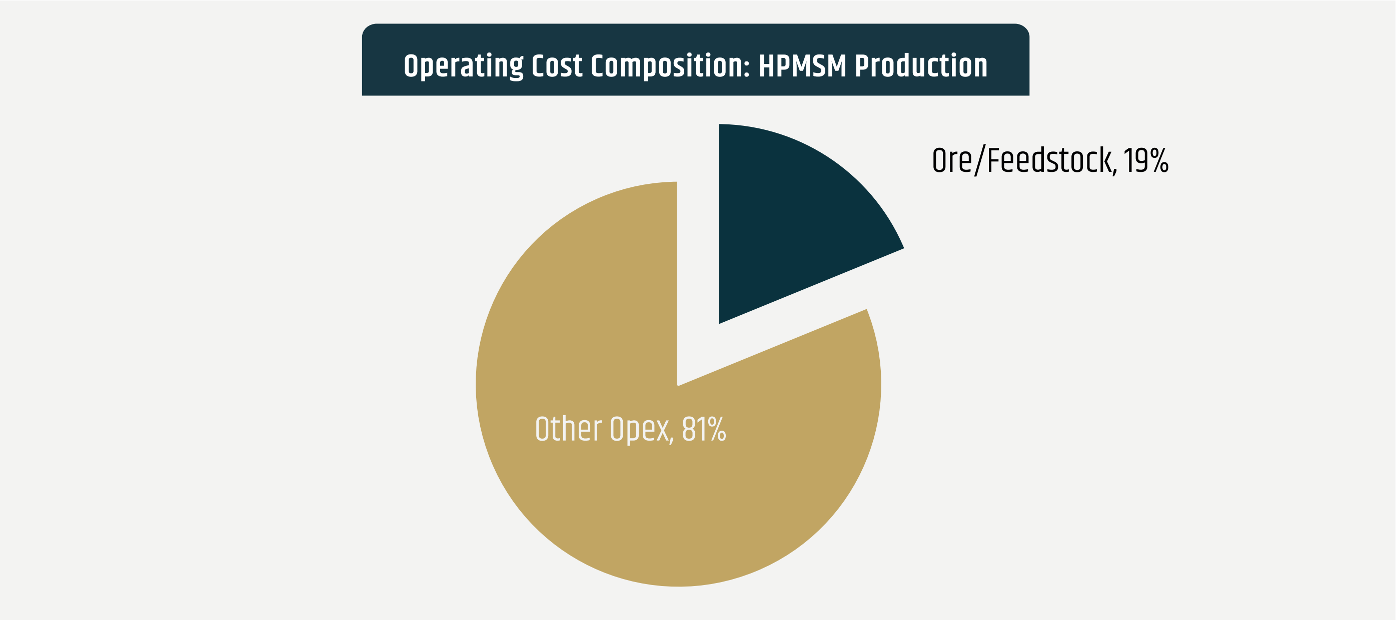


Figure 3: Estimated HPMSM Production Operating Cost Composition[1]

Jupiter's Scoping Study assumes, conceptually, that it will pay an arm's length procurement cost of manganese ore, for input into its HPMSM conversion process. Jupiter has also made prudently conservative assumptions for its other operating cost assumptions.

It is therefore not possible, at this stage, to compare Jupiter's Scoping Study operating costs to those published by other planned HPMSM producers in order to understand Jupiter's competitive advantage with respect to the relative operating costs of Jupiter's planned HPMSM Project.

The Project plans to purchase low-grade ore that is currently produced as part of the annual production plan from Tshipi, for the proposed production of HPMSM. Over the life of the Project, Tshipi is forecast to continue to produce ~3.6Mt of graded ore production annually for sale into the open market. This graded ore comprises approximately 17% (~600kt) of low-grade (~30% Mn) ore and 83% (3Mt) of high-grade (~36% Mn) product respectively.

In addition to this production, Tshipi currently has a low-grade Run of Mine (ROM) product stockpile of around two million tonnes that Jupiter could also alternatively utilise for its HPMSM Project. This ore has been produced to date as a by-product to Tshipi's production of higher grade ore which is sold into the steel market. Since this material is produced as a by-product, it does not carry significant incremental cost.

As outlined in the Mineral Resources and Ore Reserves statement, ore is mineralised by zones within the Tshipi mine. Higher grade ore is extracted from within the M, C and N mineralised zones while the low-grade ore is produced primarily from the Z mineralised zone. However, low-grade ore from the X & Y zones is also stockpiled on a ROM stockpile. All low-grade ore to be purchased from Tshipi would either come from the in-situ low-grade proved ore reserve, existing stockpile or measured mineral resource.

TSHIPI ANNUAL PRODUCTION SPLIT		2022 (ACTUAL)	2023 (PLANNED)	2024 (PLANNED)	2025 (PLANNED)	...	LT /YR (PLANNED)
Total ROM	**Mt**	**3.3**	**3.6**	**3.6**	**3.6**		**3.5**
High-grade Ore (M,C & N Zones)	Mt	2.9	3.0	3.0	3.0		3.0
Low-grade Ore (Z Zone)	Mt	0.4	0.6	0.6	0.6		0.5

HPMSM ORE SOURCE		2028	2029	2030	2031	2032	2033	...	LONG TERM /YR
Resource/Reserve				**Proved Reserve**					**Measured Resource**
Low-grade ore Mined (Z Zone[7])	kt	600	600	600	600	600	600		500
Low-grade ore planned purchase	kt	26	65	65	104	130	130		130
Proportion of low-grade production to be used by the Project	%	4.3%	10.8%	10.8%	17.3%	21.6%	21.6%		26.0%

At full scale, Jupiter's HPMSM Project will require ~130kt of lower-grade ore. Given Jupiter owns 49.9% of Tshipi, this means that Jupiter "owns" already mined, stockpiled feedstock that would support at least 7.5 years of full-scale operation of the envisaged HPMSM Project. In addition, ~2.6Mt of proved and probable lower-grade ore reserves at Tshipi would provide an additional attributable 20 years of ore feed supply. A further ~49Mt of lower-grade declared measured mineral resources are also available for potential extraction.

7) As referred to in the Tshipi Resources and Resources Statement

Access to significant and appropriate by-product ore feedstock, based on the Benchmark analysis, should provide Jupiter with an operating cost advantage of between 12% and 25%, compared to projects that will need to source their ore on a fully costed basis.

This is the case with most of the HPMSM projects that have been announced to date. A pictorial representation of Jupiter's competitive advantage (relative to these projects) is shown below in Figure 4.

HPMSM Feedstock Production Process	Typical HPMSM Project		Jupiter's HPMSM Project	
	Incremental Cost?	Typical Mn Grade %	Incremental Cost?	Typical Mn Grade %
1 Mining	Yes	10 – 12%	**No – By Product**	**30% - 32%**
2 ROM Stockpile	Yes	10 – 12%	**No – By Product**	**30% - 32%**
3 Crushing/Screening	Yes	10 – 12%	**No – By Product**	**30% - 32%**
4 Ore Stockpile	Yes	10 – 12%	**No – By Product**	**30% - 32%**
5 Beneficiation	Yes	30% – 32%	**No – Unnecessary**	**30% - 32%**
6 HPMSM Feed Stockpile	Yes	30% – 32%	**No – By Product**	**30% - 32%**

Figure 4: Jupiter's Feedstock Competitive Advantage

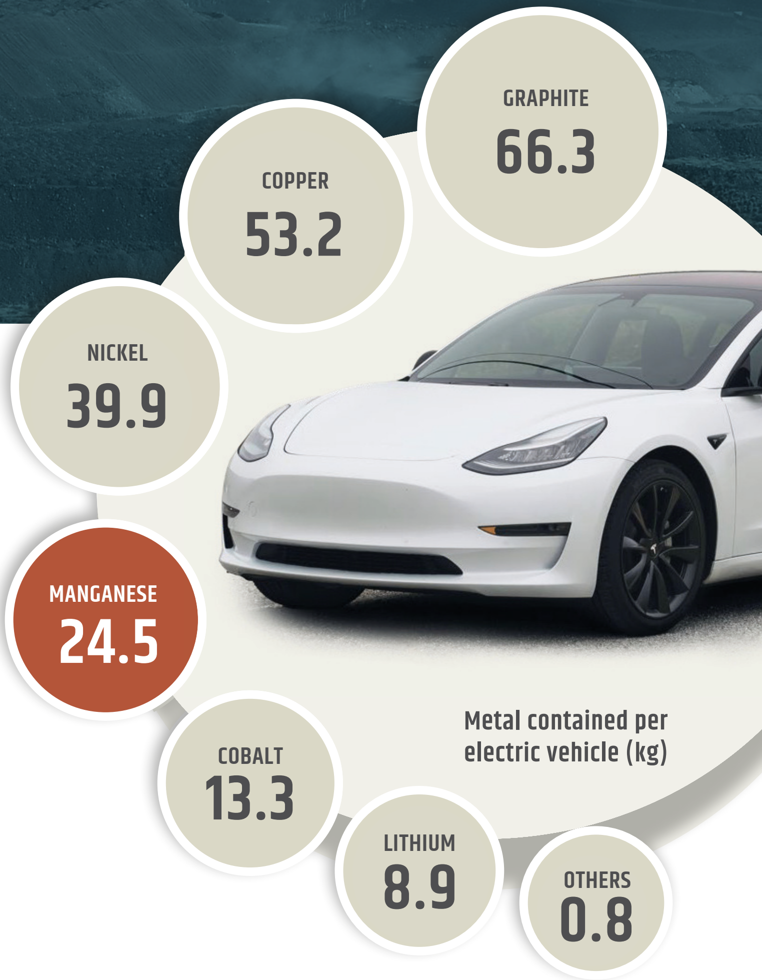
As can be seen above, Jupiter will utilise ore which is by-produced at the required grade (30% to 32%) to then produce HPMSM. On this basis, Jupiter will benefit from the fact that it will not have incremental HPMSM feedstock cost – resulting in an average 19% operating cost advantage over competitors who will be mining 10% to 12% manganese ore for the purpose of creating a HPMSM process feedstock.

Jupiter's aim is to be the most cost-efficient ex-China supplier of HPMSM. The competitive advantages explained above position the Company to achieve that aim.

Market Analysis

Demand Forecast

As the EV industry accelerates, so does the demand for critical battery components like HPMSM. Our detailed forecasts show a substantial rise in demand for manganese used in EV batteries, with a projected growth in HPMSM from approximately 160ktpa (52ktpa Mn metal contained) currently, to in excess of 1.2Mtpa (400ktpa Mn metal) by 2030. These figures underscore the rapid expansion of the market and the crucial role manganese plays in the development of high-performance EV batteries.



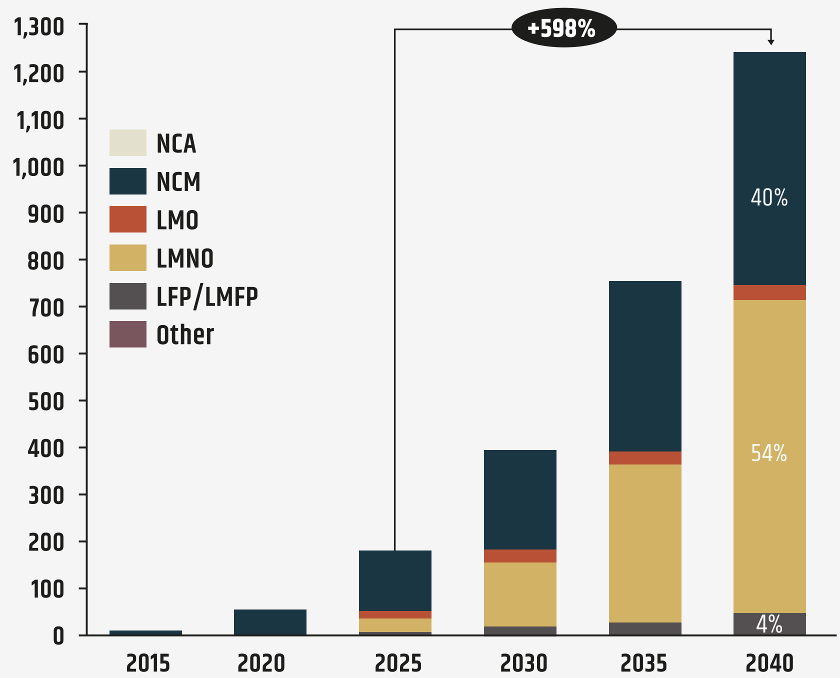
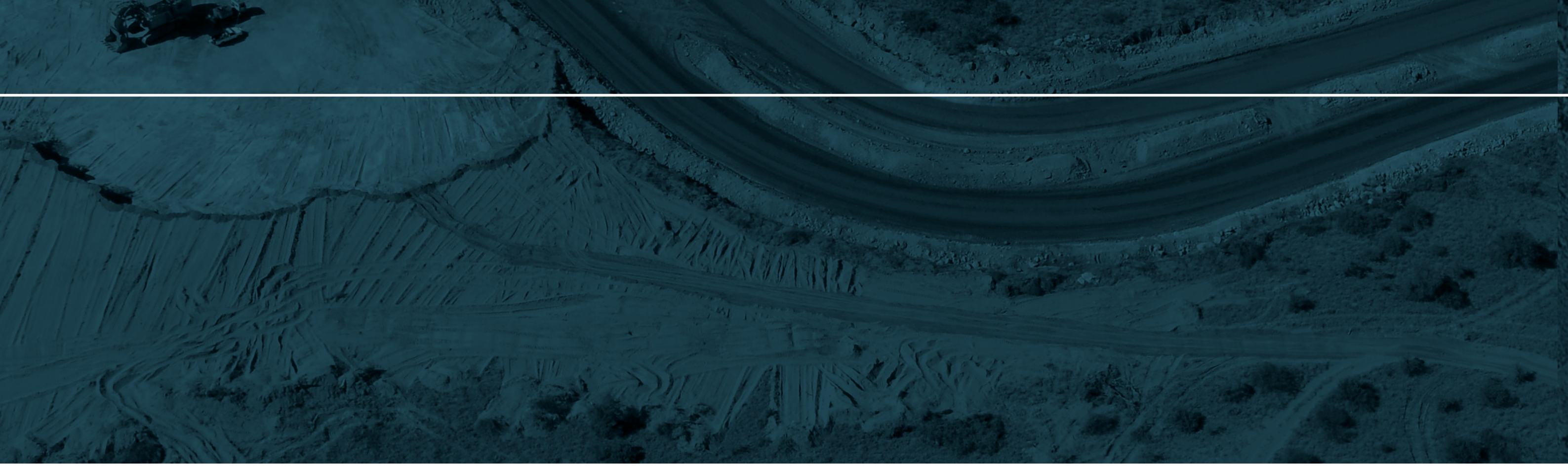


Figure 5: Manganese demand from cathodes, kilo-tonnes Mn contained, 2015-2040[8]

8) High-Purity Manganese Sulphate Monohydrate Study (Jupiter Internal Project Study), Benchmark Mineral Intelligence, 2022

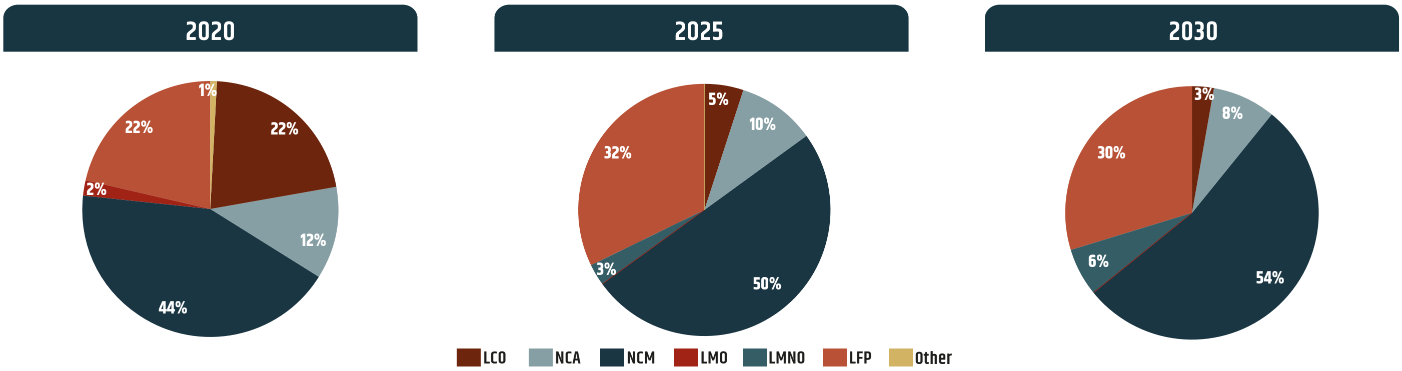


Supply Considerations

The present supply of HPMSM, particularly outside China, is poised to become increasingly critical as the EV market expands. With China producing ~98% of global HPMSM, current production facilities and projected capacities outside of China must be scaled to meet the rising demand, ensuring a stable and reliable supply chain. Jupiter's analysis, incorporating both internal research and third-party studies from entities like Benchmark, is aligned with feedback from EV OEMs. This comprehensive approach reveals a landscape where the current HPMSM supply is highly concentrated, particularly from China but will require diversification to mitigate future risks associated with supply to meet market growth and demand spikes.

Jupiter's insights suggest that to maintain an overall supply-demand equilibrium, the Sulphate industry will need to focus on enhancing production capabilities and exploring new resource deposits.

Figure 6 below illustrates the substantive forecasted growth in manganese use as manganese-rich cathode chemistries evolve.

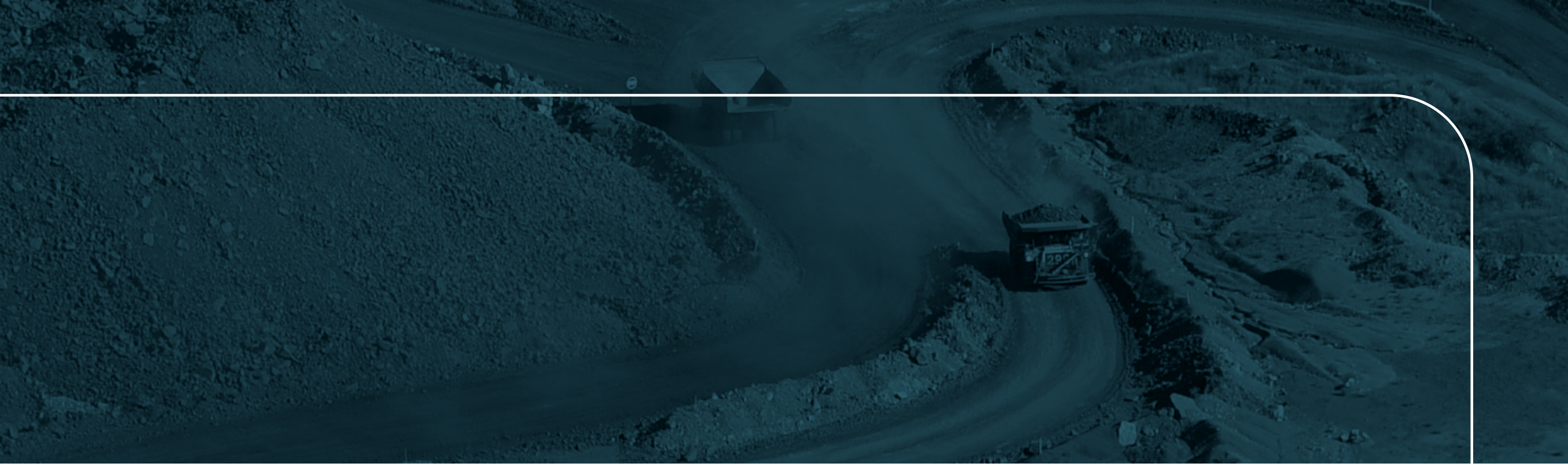


52,162 Tonnes Mn contained	177,569 Tonnes Mn contained	393,599 Tonnes Mn contained

Figure 6: ex-China Manganese metal global demand by battery type[8]

The HPMSM Production Process

Jupiter has validated the use of Tshipi low-grade ore in the production of HPMSM. The ore's high manganese content, approximately 30%, offers distinct advantages in processing volume and logistics over competitors' resources, which typically contain less than 15% manganese. A key competitive advantage for Jupiter is the cost-effectiveness of utilising this higher-grade ore, which is mined and stockpiled as a by-product at Tshipi. This approach negates the need for expensive and dedicated mining operations for HPMSM production and has resulted to date, in approximately two million tonnes of the ore being readily available on-site, contributing to significant cost savings. Furthermore, at least 600ktpa of the low-grade (~30%) ore reserve and measured mineral resources can be extracted as part of ongoing mining operations.



A flowsheet was developed to extract manganese metal from the ore. This involves grinding and milling of the ore to a suitable particle size fraction for optimal leaching followed by an impurity removal step to remove critical impurities such as iron, calcium and magnesium, amongst others.

A further series of purification steps are undertaken using appropriate extractants, reductants and acid to target the precipitation and extraction of manganese metal from the process solution which is then crystallised into HPMSM.

The flowsheet will continue to be optimised particularly on a large and more continuous basis for manganese extraction in the pre-feasibility study.

Waste generated from the various process stages will also be assessed for potential re-purpose and use in other industrial activities.

In terms of production efficiency, the ore undergoes an effective recovery process, with initial leaching achieving between 93% to 95% recovery of manganese metal from the ores and the overall recovery rate stands conservatively at approximately 89%.

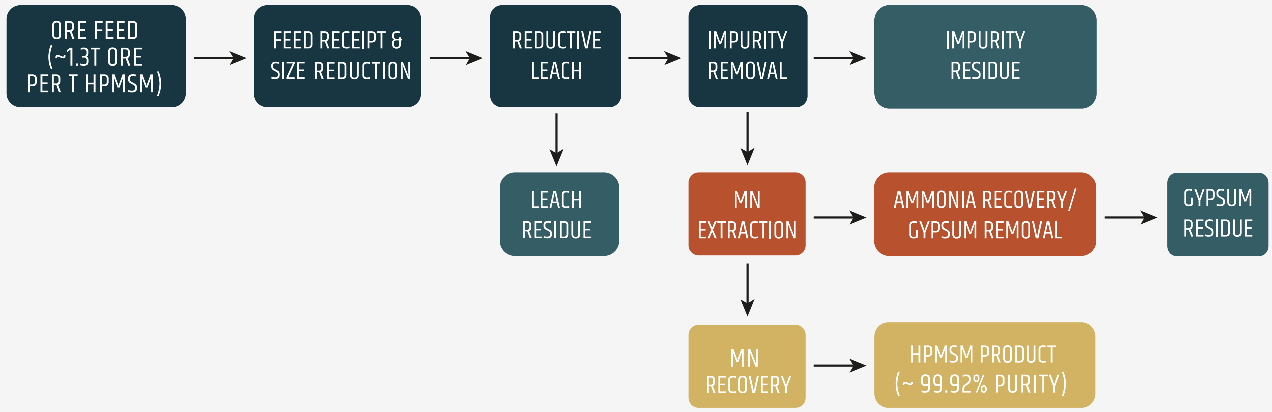


Figure 7: Jupiter Mines indicative HPMSM process flowsheet[9]

This level of efficiency contributes to the underlying project economics, allowing for the majority of extracted manganese to be converted into the high-purity end product.

Initial small scale batch lab testing of the flowsheet process resulted in an HPMSM purity of 99.92% and impurity levels being within acceptable indicative industry specifications.

9) Manganese Sulphate Plant Overview, Jupiter Internal Study, CM Solutions, 2023

Figure 8: Announced and actual North America pCAM Facilities[10]

Location Study

Site Selection Criteria

Under the base case, North America was focused on as preferred location for its HPMSM production plant. Jupiter carefully considered factors such as the current EV battery production location facilities together with the actual and proposed pCAM industries. The criteria for site selection were primarily focused on logistical efficiency, such as the distance to existing and potential pCAM facilities and EV battery manufacturers. Other practical considerations included access to lower-cost raw materials and reagents, abundance of lower-cost and more sustainable energy sources as well as skilled local labour market conditions, infrastructure availability, and regulatory environment.

The site needed to offer practical advantages within the competitive North American EV market, especially as demand for advanced battery components grows. The aim was to ensure the site would allow for supply flexibility and seamless integration into the supply chains of key customers, particularly pCAM manufacturers, who require reliable and sustainable HPMSM supplies.

Jupiter will however continue to monitor the development of the global EV battery industry and should an alternative country or continental location be deemed more suitable from a financial or business case perspective, this will be considered as part of the next study phase.

Investment Gap Analysis

An assessment of the North American investment landscape indicated a disparity between the growth and construction of battery manufacturing facilities and underlying pCAM facilities required to ultimately supply the cathode materials. This investment gap suggests a potential shortfall of localised pCAM facilities required to meet the battery cathode supply demand, particularly as the number of battery facilities increases to meet the growing demand for EVs.

With the significant growth in EV battery facilities, there is an opportunity for Jupiter to become a key HPMSM supplier in North America as legislation is aimed at promoting a greater focus on regional and localised procurement across the entire EV value chain. There is a notable gap in the regional upstream supply chain of EV battery materials required to support the battery production facilities and by addressing this gap, Jupiter intends to support the expansion of the EV battery industry by providing a critical raw material for cathode production.

10) Phase 1: Project Mobilization and Location Screening Update (Jupiter Internal Project Study), Jupiter, BLS 2023

Figure 9: Proposed Jupiter HPMSM Plant Site Focus Areas[10]

Environmental and Waste Management

From an environmental perspective, by virtue of the nature of the HPMSM production process, process waste will be generated. While the current characterisation of the waste is not materially hazardous, it will require treatment to reduce acidity prior to disposal and the business case assumes and provisions for the waste to be disposed of in a designated facility. There are options that will be explored by Jupiter in terms of re-purposing this waste for use in other industrial applications. The extent of waste repurposing will be dependent on the outcomes of flowsheet optimisation in future studies, as well as the ultimate quality of the waste product.

Jupiter is also committed to ensuring that the CO_2 (e) emissions from the production of HPMSM are minimised. While the current CO_2 (e) emissions estimates are ~2.6t CO_2 (e)/t HPMSM on average, Jupiter will undertake a detailed life-cycle analysis and explore opportunities to reduce the emissions through optimised bulk logistics and materials transportation (eg. via rail) as well as procurement of clean energy and electricity as well as improve plant heating efficiencies etc.

	t CO_2 (e)/t HPMSM	
Scope 1[11]	1.3 - 1.6	On-site generated (eg. gas steam heating etc)
Scope 2[12]	0.4 - 0.8	Imported electricity
Scope 3[13]	0.3 - 0 8	Logistics/transportation (trucks and sea freight)
Average Range	**2.0 - 3.2**	

11) Jupiter internal calculations of gas requirements based on flow-sheet design; and Emission intensity factors - EPA Centre for Corporate Climate Leadership, EPA, 2024 Emissions Factors Hub, accessed from https://www.epa.gov/climateleadership/ghg-emission-factors-hub

12) Jupiter internal calculations of electricity requirements based on flow-sheet design; and: Emissions Intensity factors - IEA, Average CO2 intensity of power generation from coal power plants, 2000-2020, IEA, Paris. Accessed from https://www.iea.org/data-and-statistics/charts/average-co2-intensity-of-power-generation-from-coal-power-plants-2000-2020, IEA. (Licence: CC BY 4.0)

13) Jupiter internal calculations logistics requirements requirements based on approximate plant location; and Ragon, Pierre-Louis & Rodríguez, Felipe (2021), CO2 Emissions from trucks in the EU: An Analysis of the heavy-duty CO2 Standards Baseline Data, Working Paper, ICCT. Accessed from https://theicct.org/publication/co2-emissions-from-trucks-in-the-eu-an-analysis-of-the-heavy-duty-co2-standards-baseline-data/ and; Bulk Carrier Emissions Factors (2021), Climatiq. Accessed from https://www.climatiq.io/data/emission-factor/549a66e2-b970-4a3a-8052-c7053222c228

In comparing the CO_2 (e) emissions relative to other battery related products, Figure 10 below illustrates that the carbon emissions intensity for HPMSM production is relatively low due to the nature of the contained chemical extraction process and limited energy requirements.

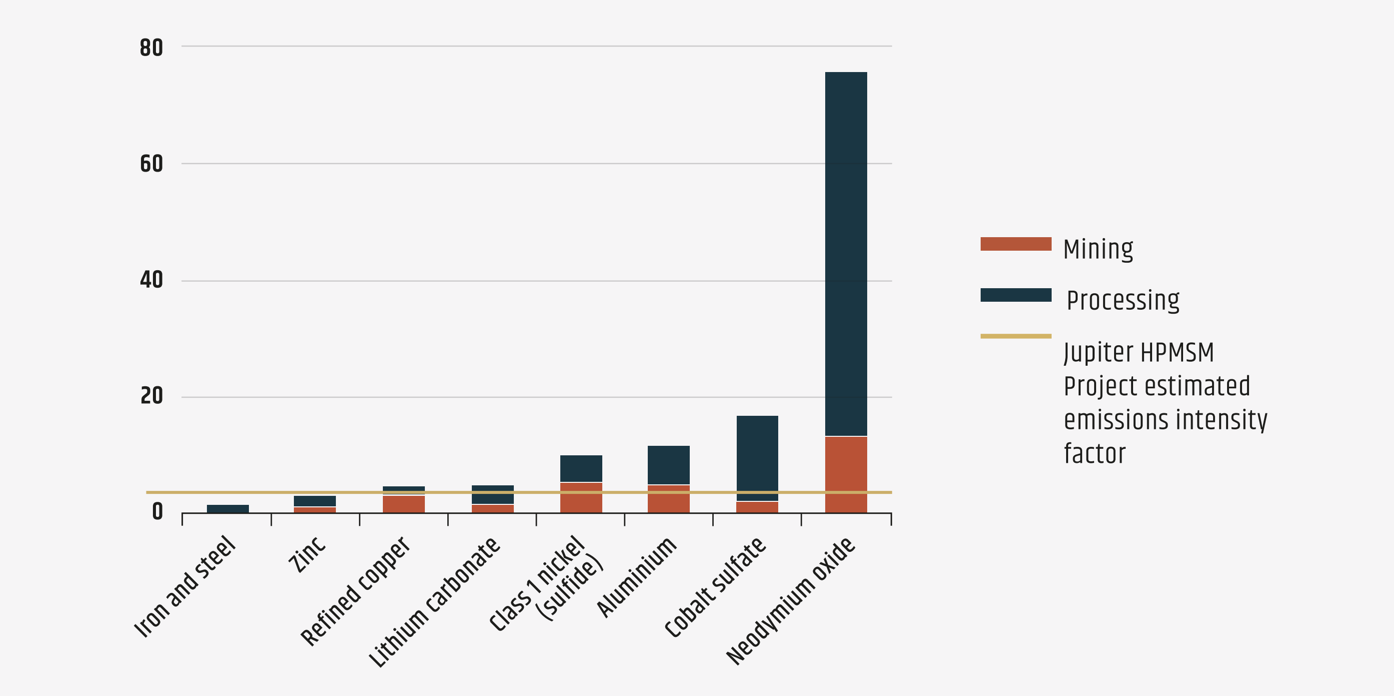


Figure 10: Indicative industry CO_2 (e) emissions intensities[14]

Risk Assessment

Demand and Supply Risks

- The speed and development of the forecasted growth in cathode chemistries and manganese use in the EV sector.
- The degree of governmental support for manganese as a critical mineral, which could affect regional supply strategies and location of our facility.

Technology

- Scaling the production process to achieve continuous, industrial-scale HPMSM production.
- Need for further optimisation in key process areas.

Location and Value Chain Considerations

- The fragmented battery value chain and the limited number of ex-China pCAM facilities will ultimately influence the facility location decision.
- The importance of OEM engagement and securing offtake agreements to inform the final global plant location and site selection.

14) AIEA (2021), Average GHG emissions intensity for production of selected commodities, IEA, Paris. Accessed from https://www.iea.org/data-and-statistics/charts/average-ghg-emissions-intensity-for-production-of-selected-commodities, IEA. (Licence: CC BY 4.0)

Next Steps

Pre-Feasibility Study Advancement

Given the positive outcomes from the initial Scoping Study, the Project will now progress to a pre-feasibility study. This next phase will provide a more in-depth analysis of the Project's technical and economic aspects, further solidifying the foundation for a full feasibility study and eventual project development. The work proposed under the pre-feasibility study is expected to take 12 months to complete at a cost up to US$2.9M. This will be funded internally by Jupiter.

Technical Assessment and Optimisation

To advance the HPMSM Project, a thorough technical assessment and optimisation of the current flowsheet will be undertaken. This step may refine the process where opportunities or improvements are identified.

Commercial Opportunities and Engagements

Proactively securing offtake agreements and cultivating engagements with OEMs are essential. These agreements will underpin the Project's financial model and contribute to the overall commercial strategy.

Location Decision Factors

North America has been identified as the preferred base case location for the production facility due to its strategic advantages, including market proximity, available incentives and cost benefits. Further work will be undertaken to validate this assumption.

Demonstration Plant Development

The construction of a demonstration plant is planned. This facility will serve to validate the optimised production process on a larger scale and will help provide accurate cost estimates, ensuring the Project's commercial feasibility. While this plant will only likely be constructed as part of the feasibility study phase, the design of such will be undertaken during the pre-feasibilty study.

Investment and Funding

Development of the processing facilities to produce battery grade manganese will require significant investment. This Scoping Study estimates this investment to be up to US$430M, most of which will be spent from calendar year 2027 to 2029. This capital estimate includes contingency and is subject to engineering and process refinement over the coming stages of work.

The next stage of work will also develop an investment funding model. Jupiter's intention is that the eventual investment requirement will be funded on a standalone basis – with all investment and returns being structured within an entity incorporated for this purpose. Jupiter will refine the opportunities to raise co-investment funds from sources including relevant governments, non-recourse loans and strategic partners.

The costs of the work to be undertaken during the next stage of work over a 12 month period are relatively minor (up to US$2.9M) and will be funded internally by Jupiter.

Background

Jupiter Mines

Jupiter is a pure-play manganese mining producer listed on the ASX. Headquartered in Perth, Western Australia, Jupiter's core asset is a 49.9% stake in Tshipi é Ntle Manganese Mining (Pty) Ltd ("Tshipi") which operates the Tshipi manganese mine in South Africa's Kalahari region. Jupiter has a track record of returning value to shareholders, including through regular dividends, and a strategy to grow its exposure to manganese, a key metal used in steel and – increasingly – in the renewable energy space. On 31st March 2023 following a comprehensive strategic review of its environment and opportunities, Jupiter released a Company Strategy.

The strategy outlines the Jupiter's five-year plan to become the leading manganese producing company in the world by 2028, with a reputation for reliability, responsibility and robust returns. Jupiter will achieve these objectives through strategies to improve operating efficiency, grow production volume and enter the EV battery market, while being accountable to a new ESG framework.

Tshipi Mine

Tshipi is one of the world's largest and lowest-cost open pit manganese mines in the Kalahari manganese field, located in the Northern Cape in South Africa. Tshipi has a declared mineral resource of 425Mt of which 75.7Mt has been declared as proved and probable ore reserves. Tshipi has been in production since 2012 and at the average ROM production rate of 3.6Mtpa has more than 100 years of mine life remaining.

Tshipi produces approximately 3.6Mt of graded ore product annually for sale to the open market which is comprised of 83% of high-grade ore (~36% Mn) from the M, C and N mineralised zones and 17% of low-grade ore (~31% Mn) from the Z mineralised zone. Low-grade ore extracted from the X and Y zones are stockpiled onto a low-grade ROM stockpile for future use which is currently at ~2Mt.

A summary of the Ore Reserves and Measured Mineral Resources from the latest Tshipi Reserves and Resource statement at 30 June 2023 is provided below. The full reserve and resource statement can be found in the published Jupiter 2023 annual financial statements with full details contained in the published Tshipi competent persons report[15].

Approximately 39% of the total measured resources are classified as low-grade ore.

Ore Reserves	Tonnes	Mn	Fe
	Mt	%	%
Z Zone	**2.6**	**31.2**	**6.9**
Proved	2.6	31.2	6.9
Probable	–	–	–
M, C & N Zones	**73.1**	**36.1**	**4.2**
Proved	51.2	36.5	4.6
Probable	21.9	35.3	3.7
Total Reserve[16]	**75.7**	**35.6**	**3.7**

Measured Mineral Resources	Tonnes	Mn	Fe
	Mt	%	%
X,Y & Z Zones	**49.3**	**29.6**	**5.5**
X	27.7	31.5	4.8
Y	9.1	21.1	5.8
Z	12.5	31.7	6.6
M, C & N Zones	77.4	36.5	4.5
Total Measured Resource	**126.6**	**33.8**	**4.9**

*Tshipi Ore Reserves and Measured Mineral Resources summary as at 30 June 2023

15) Full Tshipi Competent Person's report dated 3 April 2018 and published by Jupiter on 16 April 2018.

16) Ore Reserves are inclusive of Mineral Resources

Scoping Study contributors

COMPANY	SCOPE
Benchmark Mineral Intelligence	Market analysis & industry incentives
Biggins Lacy Shapiro & Co	North American location study, US incentives and taxation overview
CM Solutions	Laboratory test work and flowsheet development
IE Natural Resources	Financial modelling
March Consulting	HPMSM Industry, supply & demand assessment
WSP	Waste characterisation and environmental legislation review

Competent Persons Statement – Resources and Reserves

The Company confirms that in the case of estimates of the Mineral Resource and Ore Reserve, all material assumptions and technical parameters underpinning the estimates in the CPR issued by Jupiter in relation to the Tshipi mine on 16 April 2018 continue to apply and have not materially changed. The Company further confirms that while Tshipi ore has been used for the basis of laboratory-scale test work, the performance or success of the Project will not result in any alteration or change to production profile or Ore Reserve and Mineral Resource of Tshipi.

The information in this report as it relates to the Mineral Resources and Ore Reserves of Tshipi mine is published in the 30 June 2023 Jupiter annual financial statements and the published CPR for the Tshipi mine dated 3 April 2018 for which details of the competent persons and requisite consent is provided therein.

Competent Persons Statement – Metallurgical Results

The metallurgical results included in this statement are based on the outcomes of test-work results carried out by CM Solutions (Pty) Ltd which is an ISO 9001 accredited laboratory based in Johannesburg, South Africa. The results and processes were reviewed by Mr Lloyd Chester Bradford (Pr Eng, BSc Chemical Engineering, MSAIMM, MMMA). Mr Bradford is not an employee of Jupiter Mines and is independent of the Company. Mr Bradford is familiar with the metallurgical test-work and processes used in the laboratory testing process for HMPSM and consents to the inclusion in the report of matters based on the information made available to him, in the form and context in which it appears.

JORC Table 1 – HPMSM Metallurgical Test work

Section 1 Sampling Techniques and Data

All data in relation to ore reserves and mineral resources from the Tshipi mine are contained in the Tshipi CPR dated 3 April 2018 and published by Jupiter on the 16 April 2018. The information below relates to the metallurgical test-work undertaken in the production of an HPMSM laboratory scale sample.

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	• A total of 18 discreet low-grade samples were taken from low-grade stockpile and split into two halves for testing to ensure consistency and representivity of the ore feed sample. • Samples were analysed by the mine via X-Ray Fluorescence (XRF) prior to shipment to the lab to assess presence of key elements material to HPMSM production such as Mn, Fe, Si, Ca, Mg, Al, P & S. • Samples were re-tested at an external off-site laboratory and cross-checked by the project team and laboratory team against results provided by the mine.
Drilling techniques	• Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	• No drilling was required for metallurgical test-work of the stockpile sample. Samples were selected discreetly by hand from random locations on the stockpile.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples. • Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• Material selected for sampling and lab-testing was crushed fines material of <5mm to ensure samples were homogonous and each sample was limited in size to ~ 10kg each and stored in sealed bags. • Physical inspections were done, and pictures of the packaging were captured to identify signs of damage and for recording purposes. • The sample boxes were properly sealed and inspected at the lab for any signs of tampering with the sample bags. Samples were deemed fit for test work and stored in a contamination-free and covered area awaiting further test work.

Criteria	JORC Code explanation	Commentary

Logging

JORC Code explanation

- Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.
- Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.
- The total length and percentage of the relevant intersections logged.

Commentary

- Samples were sent to the lab in 9 boxes each with 2 labelled bags.
- Samples were logged according to the labels, counted, weighed and photographed.
- Data for each sample taken was recorded on a spreadsheet and provided to the Project personnel and external laboratory for record purposes.

SAMPLE ID	SAMPLE NO	Result Mn	Result Fe	Result SiO2	Result CaO	Result MgO	Result Al2O3	Result P	Result S
SPECIAL LGF 16/05/2023	SAMPLE: 18 - B	28.45	6.07	5.46	21.24	3.83	0.218	0.014	0.029
SPECIAL LGF 16/05/2023	SAMPLE: 18 - A	28.45	6.07	5.44	21.26	3.82	0.218	0.014	0.030
SPECIAL LGF 16/05/2023	SAMPLE: 17 - B	28.94	5.34	5.12	21.40	3.84	0.213	0.013	0.028
SPECIAL LGF 16/05/2023	SAMPLE: 17 - A	29.09	5.39	5.12	21.52	3.86	0.215	0.014	0.028
SPECIAL LGF 16/05/2023	SAMPLE: 16 - B	29.64	5.25	4.75	21.34	3.93	0.205	0.014	0.025
SPECIAL LGF 16/05/2023	SAMPLE: 16 - A	29.61	5.25	4.77	21.42	3.91	0.203	0.013	0.026
SPECIAL LGF 16/05/2023	SAMPLE: 15 - B	28.61	5.51	4.78	21.91	3.9	0.215	0.014	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 15 - A	28.6	5.53	4.75	21.88	3.84	0.211	0.013	0.023
SPECIAL LGF 16/05/2023	SAMPLE: 14 - B	28.74	5.34	4.75	21.79	3.86	0.207	0.013	0.034
SPECIAL LGF 16/05/2023	SAMPLE: 14 - A	28.75	5.38	4.82	21.85	3.81	0.207	0.014	0.035
SPECIAL LGF 16/05/2023	SAMPLE: 13 - B	28.59	5.91	5.47	21.26	3.86	0.229	0.014	0.026
SPECIAL LGF 16/05/2023	SAMPLE: 13 - A	28.47	5.91	5.46	21.36	3.84	0.230	0.014	0.026
SPECIAL LGF 16/05/2023	SAMPLE: 12 - B	28.4	6.16	5.55	21.18	3.78	0.224	0.014	0.024
SPECIAL LGF 16/05/2023	SAMPLE: 12 - A	28.44	6.19	5.55	21.14	3.74	0.22	0.015	0.026
SPECIAL LGF 16/05/2023	SAMPLE: 11 - B	29.18	5.59	5.03	20.98	3.91	0.217	0.014	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 11 - A	29.28	5.66	4.99	21.06	3.92	0.214	0.014	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 10 - B	29.68	5.18	4.83	21.25	3.87	0.198	0.013	0.025
SPECIAL LGF 16/05/2023	SAMPLE: 10 - A	29.57	5.17	4.87	21.39	3.90	0.210	0.014	0.025
SPECIAL LGF 16/05/2023	SAMPLE: 09 - B	28.88	5.81	5.26	21.24	3.80	0.202	0.014	0.030
SPECIAL LGF 16/05/2023	SAMPLE: 09 - B	28.79	5.82	5.22	21.26	3.80	0.205	0.014	0.030
SPECIAL LGF 16/05/2023	SAMPLE: 08 - A	29.12	5.56	5.20	21.22	3.88	0.210	0.013	0.031
SPECIAL LGF 16/05/2023	SAMPLE: 08 - A	28.95	5.56	5.08	21.50	3.91	0.223	0.014	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 07 - B	29.95	5.66	5.13	20.40	3.85	0.207	0.014	0.045
SPECIAL LGF 16/05/2023	SAMPLE: 07 - A	29.90	5.52	5.14	19.06	3.84	0.189	0.014	0.018
SPECIAL LGF 16/05/2023	SAMPLE: 06 - B	30.03	5.52	5.18	19.39	3.86	0.187	0.013	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 06 - A	29.83	5.68	5.12	19.16	3.82	0.191	0.014	0.019
SPECIAL LGF 16/05/2023	SAMPLE: 05 - B	29.82	5.77	4.94	18.95	3.61	0.181	0.013	0.017
SPECIAL LGF 16/05/2023	SAMPLE: 05 - A	28.81	5.73	5.05	18.89	3.57	0.183	0.013	0.015
SPECIAL LGF 16/05/2023	SAMPLE: 04 - B	29.66	6.06	5.39	18.91	3.74	0.191	0.015	0.020
SPECIAL LGF 16/05/2023	SAMPLE: 04 - A	29.64	5.90	5.28	18.92	3.70	0.184	0.013	0.020
SPECIAL LGF 16/05/2023	SAMPLE: 03 - B	29.76	5.76	5.21	18.79	3.68	0.19	0.014	0.023
SPECIAL LGF 16/05/2023	SAMPLE: 03 - A	29.71	5.71	5.15	19.04	3.69	0.184	0.014	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 02 - B	30.18	5.93	5.08	18.93	3.73	0.187	0.014	0.021
SPECIAL LGF 16/05/2023	SAMPLE: 02 - A	30.16	5.77	5.09	19.15	3.71	0.182	0.013	0.022
SPECIAL LGF 16/05/2023	SAMPLE: 01 - B	31.14	5.31	5.14	18.73	3.69	0.182	0.014	0.020

Sub-sampling techniques and sample preparation

JORC Code explanation

- If core, whether cut or sawn and whether quarter, half or all core taken.
- If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.
- For all sample types, the nature, quality and appropriateness of the sample preparation technique.
- Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.
- Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.
- Whether sample sizes are appropriate to the grain size of the material being sampled.

Commentary

- Semi-quantative X-Ray Diffusion (XRD) on nine random samples to ensure the consistency of the elemental composition of the ore was undertaken.
- Head assays were undertaken by the laboratory in triplicate
- Samples were also screened and analysed for mineral content by size fraction from 6µm - 6300µm to verify any potential distortion in test-work results.
- Base-line leach testing under controlled conditions was undertaken to provide a suitable reference point for ongoing test-work.

Quality of assay data and laboratory tests

JORC Code explanation

- The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.
- For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.
- Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.

Commentary

- The samples were analysed and tested by CM Solutions which is an ISO 9001 accredited laboratory. The samples used for the laboratory test-work were re-analysed via a standard procedure XRF process and validated against the mine's on-site laboratory XRF results.
- Samples were routinely checked through the HPMSM testing process.
- Multiple samples were tested to ensure consistency of ore-feed. This was reviewed by CM Solutions staff.
- Test-work results were reviewed on an ongoing basis by the project personnel.

Criteria	JORC Code explanation	Commentary
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel. • The use of twinned holes. • Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. • Discuss any adjustment to assay data.	• For the HPMSM Project, sampling data verification results were recorded in electronic (MS excel) format. • All data was reviewed by senior CM Solutions staff members in addition to the laboratory staff and provided to the Jupiter Project team. • No adjustments were made to the assay data. • Certificate of final analysis was issued by CM Solutions.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• N/A for the HPMSM Project.
Data spacing and distribution	• Data spacing for reporting of Exploration Results. • Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• N/A for the HPMSM Project Metallurgical testing.
Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• N/A for the HPMSM Project Metallurgical testing.
Sample security	• The measures taken to ensure sample security.	• The 18 samples taken from Tshipi mine in the HPMSM Project test-work were bagged in small sealed 10kg-12kg bags, placed in 9 sealed boxes and shipped directly to the CM Solutions laboratory in Johannesburg by a specialised private courier company overnight. Details of the shipment and tracking were managed by the mine and the Project team.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• Sampling techniques undertaken by the mine for the HPMSM test-samples are consistent with all other sampling undertaken on mine. • Sampling techniques undertaken by the laboratory for the HPMSM test-samples are consistent with all other sampling undertaken for multiple clients for which the lab provides metallurgical test-work sampling. • Test-work results were reviewed on an ongoing basis by senior lab staff, the Jupiter Project staff as well as the independent competent person. • An independent peer-review of the HPMSM production process and flow-sheet was also undertaken for the Project.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• Jupiter holds a 49.9% equity interest in the Tshipi mine. Ntsimbintle Mining hold the other 50.1%. • Mining rights have been in place since 2008 and the mine has been in commercial production for over 10 years. • Jupiter holds a right to market and sell its representative share of production.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• N/A for the HPMSM Project Metallurgical Testing.
Geology	• Deposit type, geological setting and style of mineralisation.	• Refer to Tshipi CPR dated 3 April 2018 for full details of this report for the declared ore reserves and mineral resources. • Ore procured for HPMSM test work forms part of standard saleable product produced from Tshipi mine.
Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: » easting and northing of the drill hole collar » elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar » dip and azimuth of the hole » down hole length and interception depth » hole length • If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	• N/A for the HPMSM Project Metallurgical testing.
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. • Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	• Samples were tested for uniformity and consistency prior to blending. • Samples used for metallurgical testing were blended as required to meet the necessary volumes required for test-work. • HPMSM production test work is not governed by product specification limits or cut-offs, but an average grade of between30% - 32% Manganese was used for test-work.

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. • If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').	• Samples were selected from discreet positions from the stockpile to ensure a uniform representivity of mine product for feed material for testing. • Drilling N/A for the HPMSM Project Metallurgical Testing
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	• N/A for the HPMSM Project Metallurgical testing.
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• Lab test-work for HPMSM was undertaken on a small batch scale. Test-work results were compared where repeatability was required but a single-final HPMSM product sample was produced.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples - size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Test-work confirmed the compatibility of Tshipi ore to the production of HPMSM in a controlled and small-scale laboratory test work environment. Indicatively, on a larger, continuous basis, chemical processes (including process duration) were observed (or anticipated) to vary in effectiveness in removing impurities or metal extraction. Further large-scale test-work would be undertaken in future study phases to confirm or address any variations in metallurgical testing processes. These changes may vary the indicative plant and flow-sheet design.
Further work	• The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). • Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Larger-scale laboratory test work for HPMSM production will be undertaken in future studies.

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