

ASX ANNOUNCEMENT

20 MARCH 2023

OPTIMISATION TRANSFORMS RAZORBACK IRON ORE PROJECT

HIGH-VALUE IRON PEAK DEPOSIT LEADS TO SUPERIOR 'GREEN STEEL' POSITIONING

Highlights:

- **5 million tonnes per year Stage 1 'DR-grade' production confirmed as best-case**
- **Supported by 340% increase in Razorback JORC Ore Reserves to 1.6 billion tonnes**
- **High-grade Iron Peak deposit now under assessment for maiden Ore Reserve to support expansion to 10 million tonnes per year**
- **Clear logistics pathway to global markets**
- **Competitive power and water services identified**
- **Premium grade concentrates to serve Green Steel and South Aust green iron hub**

Magnetite Mines CEO Tim Dobson commented:

"These outstanding optimisation study results highlight the exceptional value of our 100%-owned Razorback Iron Ore Project and validate Magnetite Mine's decision to incorporate market feedback into a larger, higher-value Stage 1 development scenario.

The Project has been optimised on all fronts, headlined by a substantial, but manageable, Stage 1 production scenario capable of producing of 5 million tonnes per year, with potential staged expansion up to 10 million tonnes a year.

We are now prioritising the assessment of Iron Peak for Ore Reserves, enabling the completion of financial modelling for the new Project configuration, and taking advantage of Iron Peak's superior mass recovery and metallurgy.

Magnetite Mines is creating an extraordinary opportunity to capitalise on the fast-growing momentum towards Green Steel, with the focus of regional steelmakers now increasingly on supply from tier 1 jurisdictions with renewable energy grids and emerging green hydrogen production such as South Australia.

We are well positioned to now enter a final study phase and deliver a DFS based on a superior project design, which will generate significant, sustainable value for all shareholders."

SUMMARY

Magnetite Mines Limited (ASX:MGT) is pleased to announce the results of optimisation studies carried out for its 100%-owned Razorback Iron Ore Project, in the emerging Braemar Iron Ore Province of South Australia. Launched in September last year¹, these studies have identified the optimum development pathway for the Project, commencing with an initial capacity of 5Mtpa concentrate output.

Key outputs from this comprehensive program of work include:

1. Best-case Project configuration confirmed as a staged development commencing with Stage 1 capacity of 5Mtpa concentrate output, with potential to expand to 10Mtpa after 5 years.
2. New JORC-compliant Probable Ore Reserve calculated with a 340% increase in tonnage from 473Mt to 1,615Mt based on a 5Mtpa production scenario, **not including Iron Peak**.
3. DFS-quality metallurgical studies completed, substantially de-risking process design, flowsheet; equipment selection – all based on well-proven, industry standard technologies².
4. 100% of Stage 1 concentrate production to be DR-grade, pellet feed quality: 68.5% Fe with low major impurities (3.0% combined silica + alumina)². This feature establishes Razorback as a key contributor of the Green Steel supply chain.
5. Stage 1 to take advantage of existing product transport infrastructure with road transport planned to rail siding, and then rail to port. MoU with SIMEC firms Whyalla as logical Stage 1 port for Razorback concentrate export³.
6. Renewable energy supplied from South Australia's electricity grid confirmed, with transmission and connection design well advanced in conjunction with SA's electricity transmission provider ElectraNet⁴.
7. Three technically and economically viable Project water supply options costed. Preferred option is currently undergoing commercial in confidence negotiations.

MGT is now completing mining studies on the recently upgraded high-grade Iron Peak Resource to support Ore Reserve estimation and enable completion of financial modelling for the new Project configuration with results expected in the near future.

The Company has also commenced a value engineering (VE) program to reduce capital and operating costs for the new Project configuration prior to DFS-level engineering. Other priorities include securing the preferred water supply option, producing concentrate samples for customer assessment, completing geotechnical field work to support DFS-level engineering, and advancing negotiations with infrastructure partners.

OPTIMISATION STUDIES DEFINE BEST-CASE PROJECT CONFIGURATION

In September 2022, MGT announced that it was halting studies for a modest-scale Project (2.5Mtpa) and commencing optimisation studies to define a minimum 5Mtpa Project scale based on market feedback and economies of scale advantages identified in previous expansion studies⁵. A full program of work was planned and commenced immediately for completion by March 2023:

- Geology – Razorback & Iron Peak Mineral Resource upgrade
- Mining – Mine scheduling, ore haulage, blasting studies, Ore Reserve update
- Processing - Plant capacity (minimum 5Mtpa), metallurgy, flowsheet, equipment selection
- Tailings – placement methodology, dam design
- Concentrate transport – road, rail, port
- Utilities - Electricity supply, water supply

Upgraded Iron Peak Resource radically improves Project

On 9 February 2023, MGT announced that the Iron Peak deposit Mineral Resource Estimate, part of the wider Razorback Iron Ore Project, was extensively upgraded based on new drilling completed in 2022. The improved mass recovery (19.4%) enabled improved metallurgical response and the production of premium, DR-grade concentrates. This work escalated the 503 million tonne Iron Peak Resource to be the highest quality deposit within MGT's portfolio.

Commencing operations with the highest-grade ore available is a well-proven strategy for de-risking economic performance during the critical first years of a new mine. Accordingly, MGT plans to prioritise Iron Peak for initial plant feed with the selected 5Mtpa Stage 1 and expanded 10Mtpa cases now potentially benefiting from Iron Peak ore exclusively for the first 10 years of the Project.

Best-case Project configuration identified

Optioneering was carried out to compare various combinations of Project options identified during the optimisation studies, with the objective of identifying the best-case Project configuration in. Key assessment criteria were relative project economics and development / technical risk.

An initial plant capacity of 5Mtpa concentrate production was identified as the optimum Stage 1 scale for Razorback, balancing capital intensity, use of existing infrastructure and operational complexity, with customer expectations and economies of scale.

With 4.5 billion tonnes in Resources at Razorback, full value for the Project will be best realised through staged expansion over time. Following the successful commissioning and ramp up of Stage 1 operations, the Company's objectives will be to:

- Optimise plant metallurgical response, product quality and operating costs
- Achieve brand recognition in the market and build reputation as a reliable supplier
- Produce positive cash flows in support of project financing for a Stage 2 expansion to 10Mtpa in Year 5.

Razorback Ore Reserves upgrade, excluding Iron Peak

As detailed in a separate release by the Company, JORC-compliant Ore Reserves have been estimated for the 5Mtpa capacity case, utilising only material from the Razorback deposit (i.e. does not include the Iron Peak deposit) at Indicated classification as follows⁶:

Table 1. March 2023 Probable Ore Reserves at 8% mass recovery cut-off

Razorback Deposit	Tonnes Mt	Mass Recovery (eDTR) %	Fe %	Mag %
Total	1,615	14.2	17.6	13.6

This represents a 340% increase from the current Razorback Ore Reserves of 473Mt.

The Iron Peak Mineral Resource is currently being assessed for Ore Reserves to enable completion of financial modelling in support of the new Project configuration, with results expected in the near future.

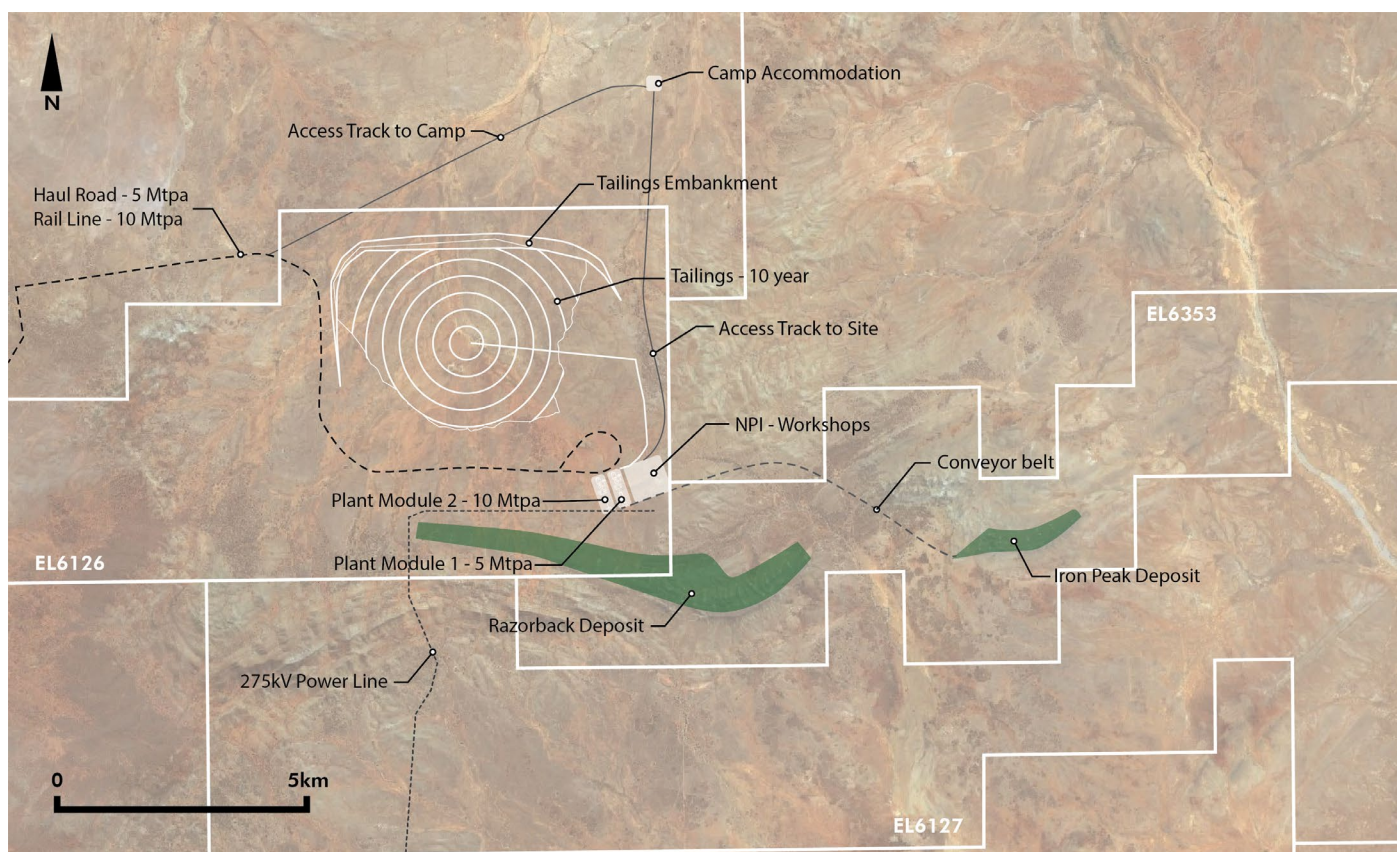


Figure 1. Site General Arrangement showing location of Iron Peak relative to Razorback and Process Plant

Iron Peak remains open along strike and at depth, and there is considerable potential for further drilling to expand the deposit further.

Process Plant design based on DFS-level metallurgy

Leveraging off the extensive metallurgical and engineering studies completed to date², the optimisation studies focussed on economies of scale benefits related to increased capacity plant configurations to take advantage of larger, or more efficient, equipment such as increased primary crusher sizing to support two production lines.

SAG milling, a widely used primary grinding technology, has been selected for the new Project configuration. In addition to initial capital efficiencies, SAG mills offer a smaller footprint and reduced operational risk owing to its maturity in mining applications.

Tailings: Central Thickened Discharge (CTD) design selected

To maximise water recovery and to reduce capital costs, two alternate tailings deposition methodologies were considered: conventional medium-density (60% solids) wet tailings dam; and a thickened (65-70%) central discharge style (CTD), with the latter selected for the new Project configuration based on its increased water recovery, smaller embankments, reduced environmental and permitting risk and reduced capital aspects.

The construction of the tailings dam wall will include the use of classified coarse tailings generated following rougher magnetic separation. Use of this ~0.14mm material for dam wall construction was confirmed by testwork and the methodology is currently used in similar large capacity tailings operations globally.

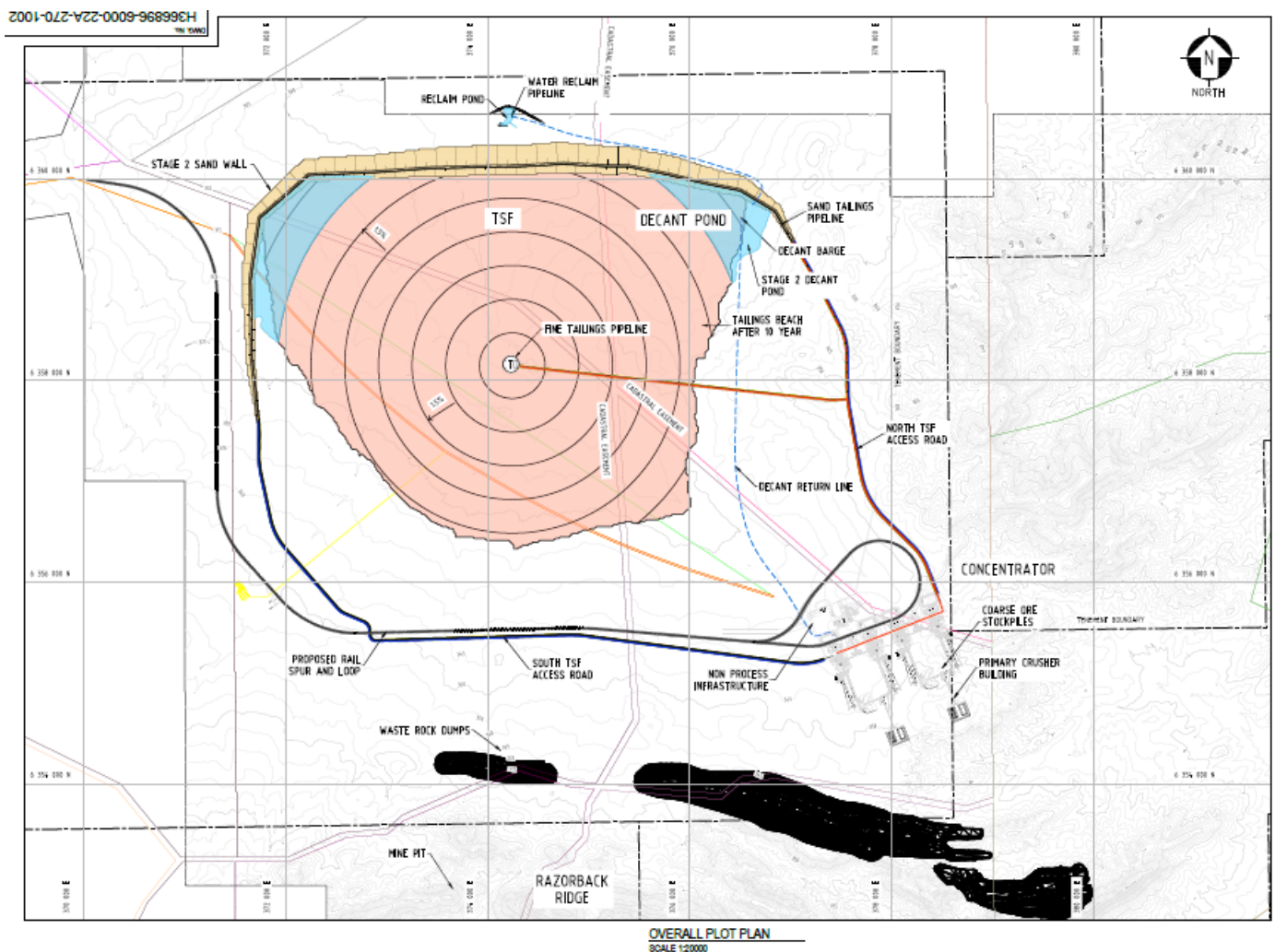


Figure 2. The Razorback tailings dam with CTD design after 10 years deposition, relative to access road, rail loop, process plant and mine pits

CONCURRENT INFRASTRUCTURE STUDIES CONFIRM VIABLE PATHWAYS

Concentrate Transport

The scale of the Project requires efficient transport of concentrate products, and capital intensity was prioritised for initial production scenarios, together with expansion optionality for expanded production scenarios. The optimisation studies assessed a number of transport options for the bulk transport of the Project's concentrate products:

- Trucking – From the mine site to existing rail corridor and siding area
- Conveyor – From the mine site to existing rail corridor and siding area
- Rail line extension and balloon loop – From the mine site to existing rail corridor and siding area
- Slurry Pipeline – From mine site to coastal port of Port Pirie

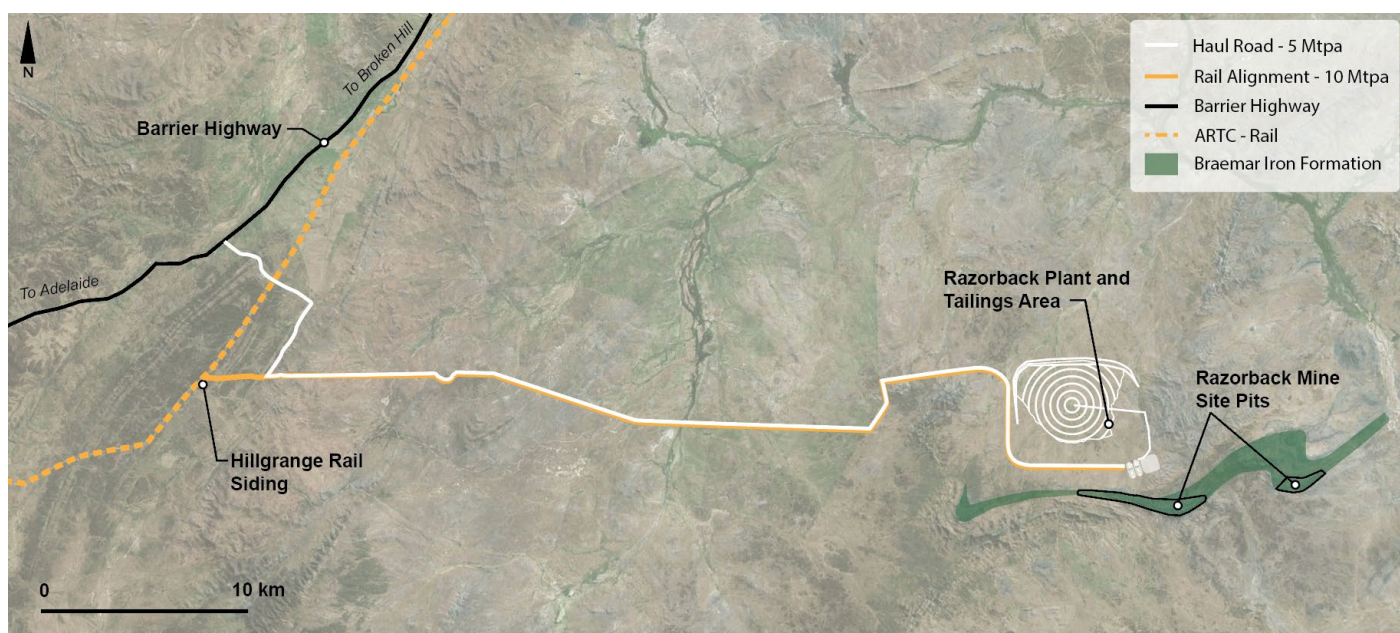


Figure 3. Schematic haul road and rail design and alignment

Stage 1 (5Mtpa) Case – Trucking with Haul Road

Trucking along a dedicated 55km haul road to the Hillgrange siding site was identified as the most cost-effective option for 5Mtpa Stage 1 operations together with the lowest permitting and capital risk. The truck option also provides a site access corridor for construction, personnel and goods and a logical route alignment for the anticipated rail spur required for the expanded production scenario at 10 Mtpa.

Stage 2 (10Mtpa Expansion) Case – Rail spur line and balloon loop

At 10Mtpa, economic analysis favours rail transportation direct from the mine site to port and a dedicated rail spur line and balloon loop that extends from the proposed siding at Hillgrange to the mine site has been incorporated into the Stage 2 design.

Power supply

Taking advantage of South Australia's renewable energy grid has long been a feature of the Razorback Project, with the high-voltage transmission line and substation design now designed for both 5Mtpa and 10Mtpa production stages with reliability of supply and future expansion capacity in mind.

The planned infrastructure consists of an expansion of the Bunday Substation, approximately 130 kilometres of new 275 kV transmission line, and new substation near the Razorback Mine Project site.



Figure 4. Proposed overhead transmission line alignment, Razorback to Bunday Substation

Water supply

A sustainable and affordable water supply for Razorback has long been recognised as a key technical risk for the project and the Project's increased production scale means that water supply requirements have increased proportionally.

In line with the Company's commitment to sustainable development and ESG goals that include water efficiency, the process design, equipment selection and tailings placement methodology have been carefully selected to maximise water recovery and reuse.

In 2022, the Company drill-tested local groundwater targets and identified enough potential groundwater in fractured-rock aquifers to support construction activities for the Project, but not operations. Accordingly, MGT has sought alternative water supply options for the Project. As a result of these investigations, three large-volume water supply options were identified for the Project:

1. Coastal supply – Delivering desalinated or partially-desalinated water to the mine site from the Spencer Gulf via pipeline
2. Groundwater supply – Sourcing groundwater, via bore fields and pipeline, from the Murray Basin, located at various distances from the Project (50 to 100km), where groundwater resources are understood to be more prospective.
3. Option 3 (preferred by MGT) – currently subject to ‘commercial in confidence’ negotiations. The Company will provide details of this option when security of supply is confirmed.

COMPELLING PROJECT SUSTAINABILITY CREDENTIALS

MGT has implemented a structured program of sustainability-focused initiatives and actions to support the optimisation studies and provide the necessary platform for the sustainable development of the Project. These initiatives have successfully brought focus to key environmental and social aspects within the Project’s development planning and decision-making process to maximise the sustainability performance and enable relevant and transparent ESG disclosures.

Decarbonisation: Enabling the Green Steel transformation imperative

Steelmaking currently produces 8% of global CO₂ emissions, and steel consumption continues to grow annually in concert with the growing global economy. To meet the Paris Agreement 2°C scenario, a 90% decrease in carbon emissions from steelmaking is required by 2050.

As part of the optimisation studies, MGT commissioned an independent analysis by industry experts Dazmin Consulting to assess the decarbonisation impacts that will be realised using Razorback 68.5% iron concentrates as a feedstock for Green Steel (low carbon steelmaking).

Key findings of this assessment include:

- In today’s market, MGT’s planned 68.5% Fe concentrate will be the best quality Australian iron ore product available and will reduce Blast Furnace (BF) scope 3 emissions by 14% (286 kilograms CO₂ per tonne of steel) compared to using 62% Fe iron ore.
- For natural-gas fed Direct Reduction – Electric Arc Furnace (DRI-EAF) facilities, the emissions saving will be 31% (650 kilograms CO₂ per tonne of steel) compared to using 62% Fe iron ore.

On-grid 100% renewable energy by 2030

The Project’s location proximate to the Bunday Substation and validated grid connection plan provides the opportunity for MGT to leverage South Australia’s low-carbon energy profile while enjoying high-reliability supply performance on a balanced intra-state electricity grid. The Company is now in early discussions with several leading renewable energy supply companies and consultants active in South Australia to support its targeted 100% green power supply for Razorback – a proposal that will effectively deliver a ‘net zero’ Scope 2 emissions profile for on-site fixed plant and infrastructure.

Community & First Nations support

A Partnering Agreement with the Ngadjuri Nation Aboriginal Corporation (NNAC) is under development and anticipated to be finalised in the June 2023 Quarter. This agreement will provide a strong foundation for subsequent Project activities, including the negotiation of a Native Title Agreement.

Reflecting the heightened positive interest in the Project from the regional community, MGT has recently tabled a draft Memorandum of Understanding with the District Council of Peterborough. This novel agreement envisages a model of collaboration on community engagement, local economic participation and the management of shared-use infrastructure.

Commitment to embedding sustainability standards and ESG reporting

MGT is embarking on a process to embed relevant performance (or assurance) standards into its corporate and Project-based operations. The Company's first action is to participate in the piloting of the "IRMA-Ready" program, with a view to seeking certification against the full IRMA Standard as the Project progresses.

The IRMA Standard is an accepted yardstick for mining operators, is increasingly required by global steelmakers and downstream steel customers and is recognised within the ResponsibleSteel global certification program⁸. By achieving IRMA certification, MGT can reliably partner with leading steelmakers in the pursuit of socially and environmentally responsible production of low carbon steel.

NEXT STEPS

MGT is now focussed on completing the work required to transform the optimisation study results into a Definitive Feasibility Study (DFS) for a 5Mtpa operation expandable to 10Mtpa:

- **Iron Peak Ore Reserve** – Incorporation of the Iron Peak deposit Mineral Resource into the Razorback Project Ore Reserve, enabling the completion of financial modelling for the new Project configuration and estimation of Project economics.
- **Value Engineering** – Completion of value engineering (VE) for the new Project configuration, and important project development step that ensures that the most cost efficient Project design is adopted prior to cost-intensive, DFS-level engineering.
- **Water Supply** – The Project's key technical risk is water supply, and the Company is focussed on securing a sustainable and affordable water supply option to enable the completion of a DFS.
- **Infrastructure and corridors** – Remaining work to support the completion of a DFS includes security of land access, cultural heritage and environmental clearance, commercial negotiations with third party providers, community support and government regulations. Each of these areas are being methodically addressed, as evidenced by the Company's recent ASX releases.
- **Partner Engagement** – The Company is currently engaged in discussion and due diligence with multiple parties for potential Project partnering and offtake. MGT's Braemar-sourced magnetite concentrate products will be completely new to the market, and a program of work is being designed to produce premium-grade concentrate samples from both the Razorback and Iron Peak deposits to enable customer assessment as a essential pre-cursor to binding negotiations.

This announcement has been authorised for release to the market by the Board.

For further information contact:

Gemma Brosnan
General Manager - External Affairs
+61 8 8427 0516

ABOUT MAGNETITE MINES

Magnetite Mines Ltd is an ASX-listed iron ore company focused on the development of magnetite iron ore resources in the highly-prospective Braemar iron region of South Australia. The Company has a 100% owned Mineral Resource of 6 billion tonnes of iron ore and is developing the Razorback Iron Ore Project, located 240km from Adelaide, to meet accelerating market demand for premium iron ore products created by iron & steel sector decarbonisation, with the potential to produce high-value Direct Reduction (DR) grade concentrates. Razorback is set to become a very long-life iron ore project with expansion optionality in a tier 1 jurisdiction that will produce a superior iron ore product sought by steelmakers globally. For more information visit magnetitemines.com.

References

1. ASX announcement – 9 Feb 2023 - [Iron Peak Mineral Resource Significantly Improved](#)
2. ASX announcement – 28 Feb 2023 - [Metallurgy Confirms Flowsheet and DR Pellet Feed Potential](#)
3. ASX announcement – 6 Feb 2023 - [MGT and GFG Alliance Sign Port Services MOU](#)
4. ASX announcement – 23 Feb 2023 - [Renewable Grid Power For Razorback Project](#)
5. ASX announcement – 11 Sep 2022 - [MGT Transforming To Meet Growing High-Grade Market](#)
6. ASX announcement - 20 Mar 2023 - [Razorback Iron Project Ore Reserves Increases 340%](#)
7. World Steel Association – 17 May 2021 - [Climate change and the production of iron and steel - worldsteel.org](#)
8. ResponsibleSteel - 14 Sep 2022 - [ResponsibleSteel-Standard-2.0.1.pdf, Criterion 3.4.1, Pg 37](#)