# Premium Magnetite – Sought After

## Lake Giles: Advanced Magnetite Project with Existing Infrastructure

The key strategic focus for Macarthur Minerals (MIO) is completing a definitive feasibility study (DFS) on its flagship Lake Giles Iron Project and advancing the project through construction into commercial production. Lake Giles is a large magnetite resource and is amongst the most advanced magnetite projects in the Yilgarn region of Western Australia. The Yilgarn hosts a combination of existing road, rail, and port facilities servicing the mining industry, providing significant capital cost advantages for the project.

## Glencore Offtake Agreement – Strong Endorsement from an Industry Heavyweight

In March 2019, MIO secured a binding 10-year offtake agreement with Glencore for up to 4 mtpa with an option to extend for a further 10 years. This agreement with Glencore provides significant endorsement for Lake Giles from a large and secure counterparty as well as bringing global marketing expertise. The agreement also offers MIO a key advantage in the funding process for the project.

## Clear Pathway to Commercialisation

Lake Giles is planning to complete its **definitive feasibility study (**DFS) in Q1 CY2022 and is progressing metallurgical process test work, detailed mine planning and infrastructure design. While the project scope will be defined as the study progresses, MST estimates commercial production of high-grade magnetite concentrate will commence at Lake Giles in CY 2025.

## Premium Iron Ore – Towards Green Steel

Magnetite concentrate is high grade and low in impurities and increases the efficiency of the steel making process. The increased efficiency contributes to lower emissions. With the path to decarbonisation and the production of green steel firmly set, we expect the demand for magnetite concentrates to increase.

## Valuation – A$0.68; A Premium Project – Funding the Key

Our risked NPV for MIO is A$0.68 per share on a fully diluted basis. The project is favourably positioned within a highly attractive mining jurisdiction in Western Australia and will produce a highly sought-after product. Key risks include DFS outcomes, access to critical infrastructure (rail & port), and access to financing.

MACARTHUR Minerals

Macarthur Minerals Limited (MIO) is an iron ore development company that is focused on bringing its 100% owned Lake Giles magnetite iron ore project in Western Australia to production.

https://macarthurminerals.com/

| | |
|---|---|
| **Stock** | Macarthur Minerals |
| **Price** | A$0.35 |
| **Market cap** | A$50m |
| **Valuation** | A$0.68 |

| **Next steps** | |
|---|---|
| Feasibility Study Completion | Metallurgical Test Work |
| Process Design Confirmed | Project Funding |

**MIO share price 1 year**


Source: FactSet.

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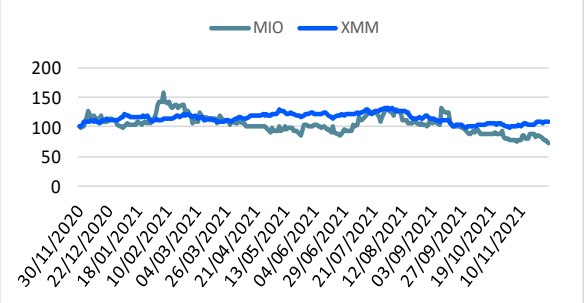
## Exhibit 1 – Company summary, year-end 31 March

| MARKET DATA | | |
|---|---|---|
| Share Price | A$/sh | **0.35** |
| 52 week high/low | A$/sh | 0.74/0.35 |
| Valuation | A$/sh | 0.68 |
| Market Cap (A$m) | A$m | 50 |
| Net Debt / (Cash) (A$m) | A$m | (5) |
| Enterprise Value (A$m) | A$m | 45 |
| Shares on Issue | m | 145 |
| Options/Performance shares | m | 52 |
| Other Equity | m | 360 |
| Potential Diluted Shares on Issue | m | 556 |

| INVESTMENT FUNDAMENTALS | | Mar-20 | Mar-21 | Mar-22e | Mar-23e |
|---|---|---|---|---|---|
| Reported NPAT | A$m | (4) | (16) | (5) | (5) |
| Underlying NPAT | A$m | (4) | (16) | (5) | (5) |
| | | | | | |
| EPS Reported (undiluted) | ¢ps | (4.8¢) | (13.0¢) | (3.7¢) | (1.6¢) |
| EPS Underlying (undiluted) | ¢ps | (4.8¢) | (13.0¢) | (3.7¢) | (1.6¢) |
| Underlying EPS Growth | % | 0.0% | 171.9% | -71.7% | -56.3% |
| P/E Reported (undiluted) | x | n/m | n/m | n/m | n/m |
| P/E Underlying (undiluted) | x | n/m | n/m | n/m | n/m |
| | | | | | |
| Operating Cash Flow / Share | A$ | (0.04) | (0.03) | (0.03) | (0.01) |
| Price / Operating Cash Flow | x | (9.7) | (11.4) | (9.9) | (35.1) |
| | | | | | |
| Free Cash Flow / Share | A$ | (0.07) | (0.04) | 0.03 | (0.01) |
| Price / Free Cash Flow | x | (4.8) | (9.1) | 10.1 | (33.4) |
| Free Cash Flow Yield | % | -20.7% | -11.0% | 9.9% | -3.0% |
| | | | | | |
| Book Value / Share | A$ | 0.60 | 0.45 | 0.48 | 0.64 |
| Price / Book | x | 0.57 | 0.77 | 0.72 | 0.54 |
| | | | | | |
| NTA / Share | A$ | 0.60 | 0.45 | 0.48 | 0.64 |
| Price / NTA | x | 0.57 | 0.77 | 0.72 | 0.54 |
| | | | | | |
| Year End Shares | m | 102 | 140 | 141 | 501 |
| Market Cap (spot) | A$m | 35 | 48 | 49 | 173 |
| | | | | | |
| Net Debt / (Cash) | A$m | (5) | (5) | (10) | (262) |
| Enterprise Value | A$m | 31 | 43 | 39 | (89) |
| | | | | | |
| EV / EBITDA | x | (13.2)x | (2.9)x | (9.6)x | (9.6)x |
| Net Debt / Enterprise Value | | (0.1) | (0.1) | (0.2) | (5.8) |

**12-Month Relative Performance vs S&P/ASX Metals & Mining**




| Profit & Loss (A$m) | Mar-20 | Mar-21 | Mar-22e | Mar-23e |
|---|---|---|---|---|
| Sales | 0 | 0 | 0 | 0 |
| Expenses | (3) | (15) | (5) | (5) |
| **EBITDA** | **(3)** | **(15)** | **(5)** | **(5)** |
| D&A | (0) | (0) | (0) | (0) |
| **EBIT** | **(3)** | **(16)** | **(5)** | **(5)** |
| Net Interest | (1) | (0) | (0) | (0) |
| Profit Before Tax | (4) | (16) | (5) | (5) |
| Tax | 0 | 0 | 0 | 0 |
| **Underlying NPAT** | **(4)** | **(16)** | **(5)** | **(5)** |
| Exceptionals | 0 | 0 | 0 | 0 |
| **Reported Profit** | **(4)** | **(16)** | **(5)** | **(5)** |

| Balance Sheet (A$m) | Mar-20 | Mar-21 | Mar-22e | Mar-23e |
|---|---|---|---|---|
| Cash | 5 | 5 | 10 | 648 |
| Receivables | 0 | 0 | 0 | 0 |
| Inventory | - | - | - | - |
| PP&E | - | - | 0 | 0 |
| Other | 67 | 69 | 69 | 69 |
| **Assets** | **72** | **74** | **79** | **717** |
| Creditors | 1 | 1 | 1 | 1 |
| Debt | - | - | - | 386 |
| Leases | 0 | 0 | 0 | 0 |
| Provisions | 0 | 0 | 0 | 0 |
| Other | 9 | 11 | 11 | 11 |
| **Liabilities** | **10** | **12** | **12** | **397** |
| **Net Assets** | **62** | **63** | **68** | **320** |

| Cashflow (A$m) | Mar-20 | Mar-21 | Mar-22e | Mar-23e |
|---|---|---|---|---|
| Cash From Operations | (3) | (4) | (5) | (5) |
| Interest | (1) | (0) | (0) | (0) |
| Tax | - | - | - | - |
| **Net Cash From Operations** | **(4)** | **(4)** | **(5)** | **(5)** |
| Capex | (0) | - | (0) | (0) |
| Exploration | (4) | (1) | (0) | (0) |
| Investments (Net) | - | - | 10 | - |
| **Free Cash Flow** | **(7)** | **(5)** | **5** | **(5)** |
| Proceeds from issue of shares / (buy | 4 | 6 | - | 257 |
| Proceeds / (Repayment) of Borrowin | 7 | (0) | - | 386 |
| Dividend | - | - | - | - |
| **Net Increase / (Decrease) in Cash** | **4** | **1** | **5** | **638** |

Source: MIO, MST estimates.

# Investment Thesis: In the Right Place – Green Steel Premium Product Gets Vote of Confidence from Glencore

Macarthur Minerals (ASX: MIO, TSX: MMS) is a minerals exploration and development company dual listed on the Toronto Stock Exchange and the ASX. MIO originally listed on the TSX in 2002 and since then has developed from an exploration company to a prospective producer of high-quality magnetite iron ore concentrate in Western Australia (WA). MIO owns three iron ore projects in the Yilgarn region of WA. The company also has interests in multiple gold, copper and lithium projects in the Pilbara region of WA on top of lithium brine interests in the Railroad Valley, Nevada, USA. Non-core assets are being spun out to Infinity Mining, with the IPO in progress.

## Understanding the Flagship Lake Giles Iron Project: A Large Magnetite Deposit

MIO's flagship Lake Giles Iron Project features a large undeveloped magnetite project with a total Mineral Resource consisting of ~1.3 billion tonnes (Bt).

Magnetite ore generally has a much lower in-situ iron content (30-35% Fe) than in-situ hematite ores (58-64% Fe) but has less impurities. It must be upgraded by an ore treatment process (beneficiation) to produce a high-grade (+65% Fe) concentrate for steelmaking. However, it is its magnetic properties that enable magnetite to be refined to a high-grade premium iron ore concentrate product that is globally accepted and highly sought after to produce high quality, low impurity steel. The treatment and beneficiation of magnetite ore requires crushing, screening, high-pressure grinding, magnetic separation, filtering and drying to produce a premium, high iron grade concentrate with very low impurities.

The mining scenario is yet to be detailed and will be published in the DFS. However, MIO anticipates the preferred scenario will involve a staged sequence of mining across multiple target pit shells commencing at the Moonshine North deposit and moving to the Moonshine deposit to the south.

### Infrastructure: well positioned in WA with established rail and port

A key to establishing a route to market for a bulk commodity such as iron ore is to have strong infrastructure support. Abundant infrastructure exists in close proximity to Lake Giles, including bulk commodity rail transport infrastructure and a bulk commodity export port that are in operation for other projects. The existing infrastructure relieves MIO of the otherwise immense infrastructure development costs to support the commercialisation of bulk commodity exports.

### Offtake agreement with Glencore: a big partner in MIO's corner

MIO has in place a binding 10-year offtake agreement with Glencore for up to 4 mtpa with an option to extend for a further 10 years. This agreement provides significant stability for Lake Giles by reducing credit risk with a large and secure counterparty, as well as bringing MIO broader access to Glencore's global marketing expertise. Glencore will do the hard work of obtaining customers and will take all the supply risk.

### Magnetite: premium product plays to global decarbonisation/ green steel themes

Magnetite will play a critical role in global decarbonisation. Green steel can be produced using high-grade magnetite iron ore pellets combined with scrap steel in electric arc furnaces. Magnetite concentrate is high-grade iron ore with low impurities and attracts a premium above the benchmark iron ore price.

The process of creating green steel through an electric arc furnace vs traditional blast furnaces reduces CO2 emissions by between 40-60%. Given that steel production accounts for 7% of global greenhouse gas emissions we see the transition towards green steel as a key to a low carbon future.

## Other Projects: Potential Upside with Successful Exploration

These assets, which are described briefly in the report and in detail in Appendix 2, include:

- **Ularring DSO Iron Ore Project (WA)**: an 80m tonne hematite mineral resource, the project contains areas of high grade hematite nodes at Snark and Drabble Downs deposits which could be selectively mined for a DSO product in favourable market conditions.
- **Treppo Grande Iron Ore Project (Mt Manning, WA):** drill program intercepts have included 17.5m @ 65.49% Fe from 2.5m and 40.4m @ 55.77% Fe from 3.6m
- **Two Pilbara iron ore projects (WA):** Strelley Gorge and Tambourah (both hematite)
- **Nevada Lithium Project (Nevada, USA):** 210 placer claims on a total area of 17 sq km, with soil sampling strongly suggesting that anomalous lithium exists.

## Infinity Spin-off: Strategy and Asset Restructuring to Facilitate Focus on Lake Giles

The company recently embarked upon a strategic consolidation program. With the DFS for the Lake Giles iron ore operation advancing rapidly towards completion in Q1 CY2022, this project will require the allocation of most of MIO's resources and management focus. As part of this program the company's non-iron ore (gold, copper and lithium) Pilbara assets have been transferred into a new entity called Infinity Mining, with other iron ore tenements to remain within Macarthur Group. Infinity is expected to list on the ASX in December this year. MIO will retain 19.6% ownership in Infinity Mining.

## Financials

MIO had A$4.7m cash as at 30 September 2021. Completion of the feasibility study is scheduled for Q1 CY2022. Assuming the feasibility study outlines a compelling project from both an economic and technical perspective (as we expect), the development pathway will proceed to securing financing and final investment decision (FID) to commence full construction. As such, while full project financing negotiations remain in the early phase of consideration, we anticipate they will be a blend of debt and equity (we assume 60 debt/ 40 equity in our valuation) with potential for a sell-down in equity at the project level to provide an additional funding mechanism. In the near term, we expect MIO is likely to require a small amount of additional funding to advance through to FID.

## Valuation – NPV A$0.68 Fully Diluted

Our risked NPV for MIO is A$0.68 per share on a fully diluted basis. We have assumed a 3.3mtpa (65% magnetite concentrate) operation commencing in 2025, with an expansion to 6.6mtpa in Year 6 of the operational life of the project. Based on the current large-scale defined Mineral Resource of 1.3bn tonnes of ore grading 30.1%, there is potential for a long mine life (we assume to 2040). We assume Phase 1 capex of US$450m, benchmark 62% fines (US$/dmt CFR China) of US$100/t, and life-of-mine average cash costs of US$65/t. We assume the magnetite concentrate attracts a 20% premium to the benchmark price.

Key risks include the DFS outcomes, access to critical infrastructure (rail & port), cost escalation, access to financing iron ore price volatility, permitting and approvals. Our valuation is particularly sensitive to the iron ore price, FX and costs.

## Potential Near-Term Catalysts

- DFS delivery Q1 CY 2022
- Advancement of project financing
- Further advancements on infrastructure options

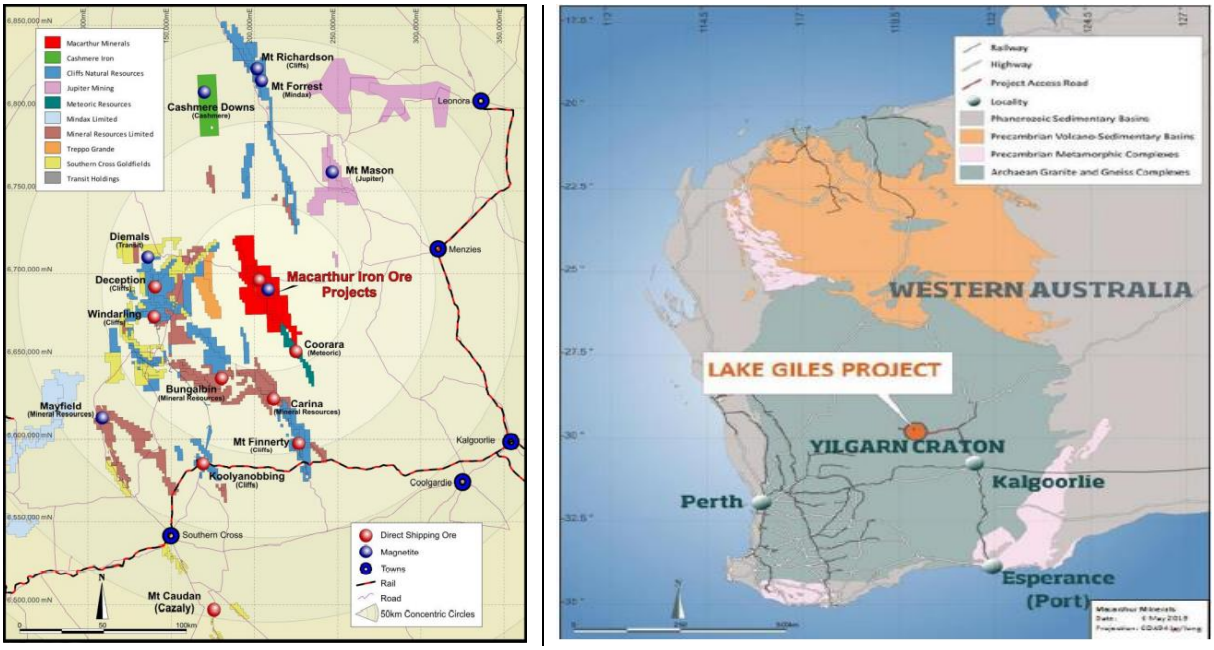
## Recent Events (2021)

- 24 November – MIO $10m IPO spinout of Infinity Mining Limited closes oversubscribed
- 21 October – MIO spins out non–iron ore assets into Infinity Mining Limited to focus on Lake Giles.
- 12 October – Geotechnical and mine planning work advanced
- 7 October - DFS Update – Rail and port concept plan of operations advanced
- 1 October – DFS Update – Metallurgical and infrastructure design advanced
- 10 September – Tenement transfer to secure iron ore extension strategy

## Lake Giles: A High-Grade, Long-Life Magnetite Iron Ore Operation

The key strategic objective for MIO is to bring the Lake Giles Iron Project into commercial production. Lake Giles is an advanced magnetite iron ore project presently undergoing a feasibility study. The Lake Giles project is located ~450 km east of Perth and ~150 km northwest of Kalgoorlie, WA. It is ~90 km from the existing railway which has a direct connection to the Port of Esperance in WA. The company manages 15 contiguous tenements covering a total area of 62 sq km.

Exhibit 2 – Lake Giles Iron Project proximity to regional iron ore projects, towns and infrastructure (left); Map of Lake Giles Project in WA (right)




Source: MIO.

### Timeline of Development – Feasibility Study Underway

The feasibility study is currently underway which will define the scope of the key project parameters that underpin the financing process and proceed into construction. The primary Lake Giles high-grade magnetite concentrate operation is likely to require a construction period of approximately 18 months (MST estimate) after the financing process is completed. Assuming the feasibility study is completed on schedule in 2022, we estimate commencement of production at the Phase 1 operation of the Lake Giles magnetite concentrate operation of CY2025.

### Offtake Partnership with Glencore – Support of a Big Player a Huge Advantage

In 2019 MIO secured a life-of-mine offtake agreement with Glencore for ~4mtpa over the first 10 years, with an additional option to extend for a further 10 years. Notably, the agreement allows MIO to diversify its offtake partners once the project financing is secured, by facilitating the release of up to 70% of Glencore's agreed offtake volumes (subject to other offtake agreements being signed).

The offtake with Glencore is a significant advantage for the Lake Giles project and a strong signal of support from Glencore, a large and highly sophisticated commodities specialist. The agreement provides MIO with the strength of Glencore's global marketing expertise as well as the dependence on a strong counterparty in terms of product acceptance and credit risk. Under the agreement, Glencore is responsible for marketing, shipping, delivery and freight insurances.

The offtake agreement also represents a distinct advantage for MIO when negotiating financing for the project.

## Resource and Reserve Position

The Lake Giles Iron magnetite hosts a large resource of 53.9mt at 30.8% Fe (Measured), 218.7mt at 27.5% Fe (Indicated) and 997mt (Inferred) at a grade of 28.4% Fe.

Magnetite ores require initial crushing and screening but undergo a second stage of processing that relies on the magnetic properties of the ore and involves magnetic separators to extract the magnetite and produce a finished product – the concentrate. Further processing involves the agglomeration and thermal treatment of the concentrate to produce pellets that can be used directly in blast furnaces, or in direct reduction steel-making plants and EAFs. Magnetite's more intensive processing requirements result in higher production costs.

High-grade magnetite product typically attracts a premium because it is more valuable in the steelmaking process than benchmark hematite ore.

### Mineral Resource Overview

The Lake Giles project is a large undeveloped magnetite project. The project features high- concentrate grade (MST estimates >65% Fe as specified in Glencore agreement) and mass recovery observed as high as 45-50% in some samples[1] from initial low-intensity magnetic separation test work at Moonshine. The mineral resource deposits at Lake Giles are shown in Exhibit 3.

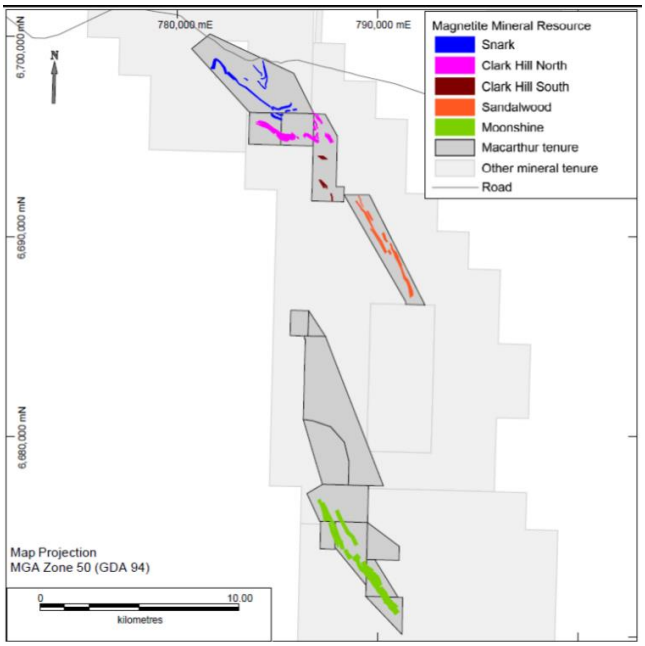
Exhibit 3 – Lake Giles Mineral Resource Estimate, all deposits.

| Category | Tonnes (Mt) | Head Grade (%) | Concentrate Grade (%) |
|---|---|---|---|
| | | Fe | Fe |
| Measured (Moonshine) | 53.9 | 30.8 | 66.0 |
| Indicated (Moonshine) | 218.7 | 27.5 | 66.1 |
| **Sub-total** | **272.5** | **28.1** | **66.1** |
| Inferred (Moonshine ) | 449.1 | 27.1 | 64.6 |
| Inferred (Others) | 548 | 29.5 | 64.3 |

Source: MIO.

[1] Actual mass recovery percentage will be determined and reported as part of the current DFS.

Exhibit 4 – Lake Giles magnetite mineral resources

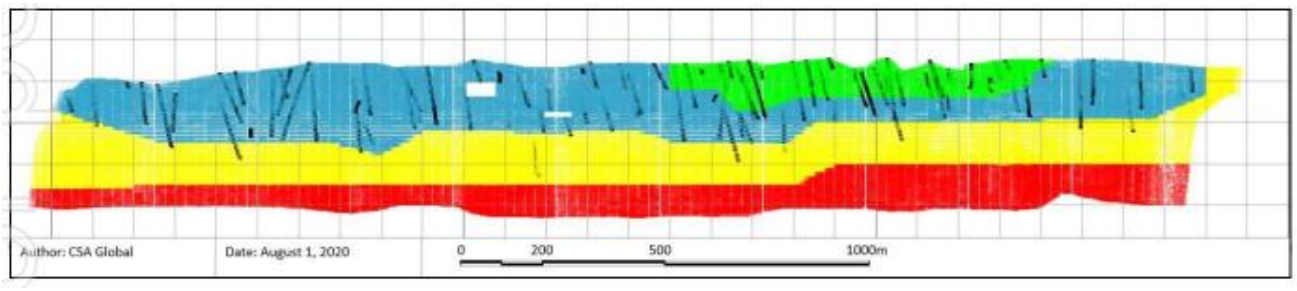



Source: MIO.

## Geology and Mineralisation

MIO's tenements cover a portion of the Yerilgee Greenstone Belt, which is over 80 km in length, up to 10 km wide and lies within the Southern Cross Province of the Yilgarn Craton. The Yilgarn Craton consists of multiple lenticular greenstone belts. The greenstone belts consist of metamorphosed ultramafic, mafic and sediments, including banded iron formations.

Exhibit 5 – Longitudinal section of Moonshine (west) domain, showing mineral resource classification




Green = Measured; cyan = Indicated; yellow = Inferred; red = unclassified. Black traces are drill hole intercepts. Grid square 100m. View to east.
Source: MIO

# Mining

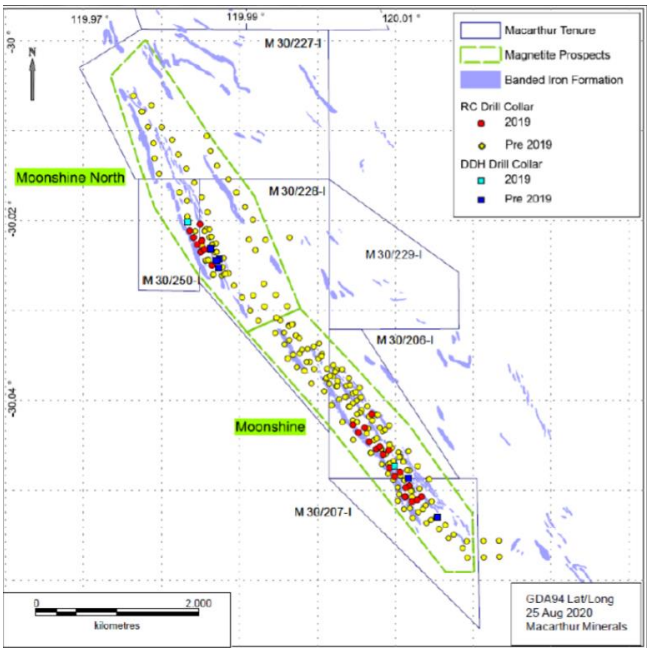
## Mine plan

We expect the mining approach to involve a staged sequence of mining across multiple target pit shells, commencing at the Moonshine North deposit and moving to the Moonshine deposit to the south. The precise mine plan will be finalised upon completion of the work presently being undertaken by Orelogy Consulting Pty Ltd as part of the DFS. Final pit shell designs are expected to be completed shortly.

## Mining method

Mining will be conducted by a conventional drill, blast, load and haul mining method. Waste rock will be hauled to either ex-pit waste dumps or mined-out pits (where possible). Ore will be hauled to the run of mine (RoM) pad for crushing, and then the ore product will be conveyed to a concentrate plant.

Exhibit 6 – Drill collar plot, Moonshine and Moonshine North – showing drill collars by type and program, mapped BIF outcrop and tenure

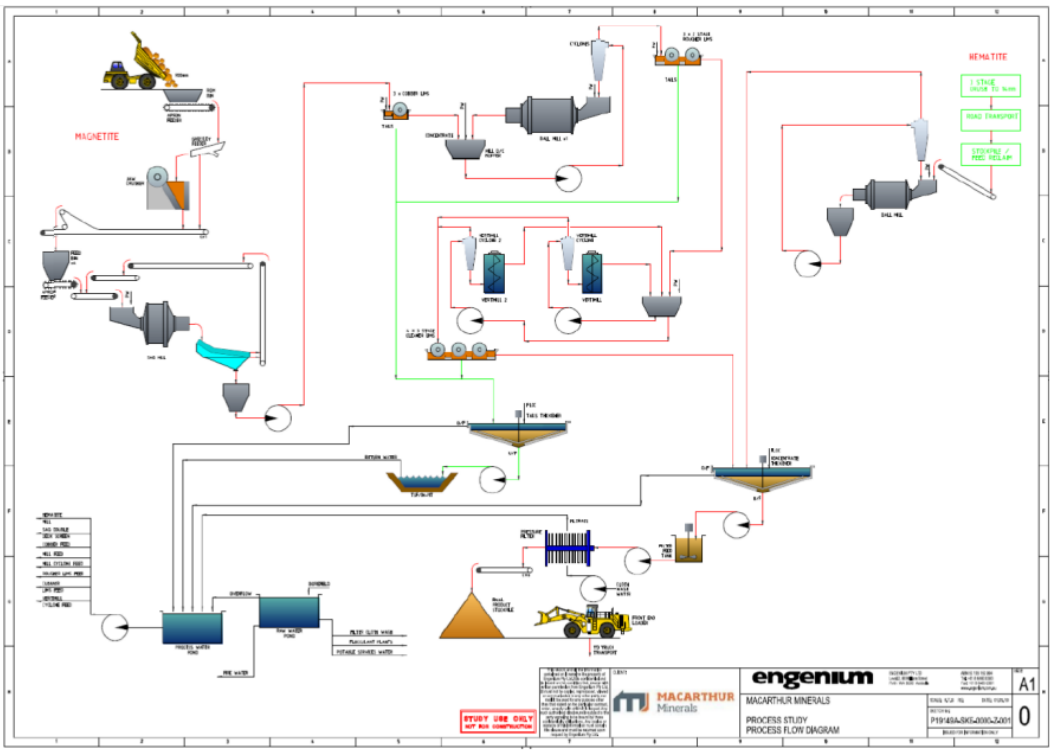



Source: MIO.

# Processing

Process flow sheet for the magnetite concentrate process plant is presently being finalised as part of the current DFS. Magnetite processing begins with primary crushing to a size suitable for feed to a semi-autogenous mill. The cobbing stage should reject the initial tailings while maintaining a high level of magnetite recovery. This is a three-stage drum which gives a progressively cleaner product grade and helps eliminate any contamination owing to entrapment. MIO's final blend dynamics will be primarily determined by the recovery and grade of the magnetite concentrate.

Exhibit 7 – Indicative Process flow diagram




Source: MIO.

## Geographic Advantages

### Advantages of operating in Australia and WA

Australia is globally recognised as a stable, Tier-1 mining investment jurisdiction. Australia has played a prolific role in the iron ore industry since the 1960s. WA is the largest iron ore supplier in the world, accounting for 39% of global supply in 2020, followed by Brazil (17% of global supply).

Furthermore, WA's iron ore miners are among the world's lowest-cost seaborne iron ore exporters. This is largely due to the close proximity of WA's major iron ore ports to the largest iron ore market in Asia. The strategic location of the ports significantly reduces shipping costs relative to competitors.

According to Wood Mackenzie, Western Australia's iron ore freight rate to China fell 1% to an average of US$6.7/t 2020, well below Brazil's rate of US$15.2/t. The average total cash cost of Western Australia's iron ore exports was US$34.5/t in 2020, below the world average of US$45.3/t, and below its main competitor in Brazil (US$36.0/t).

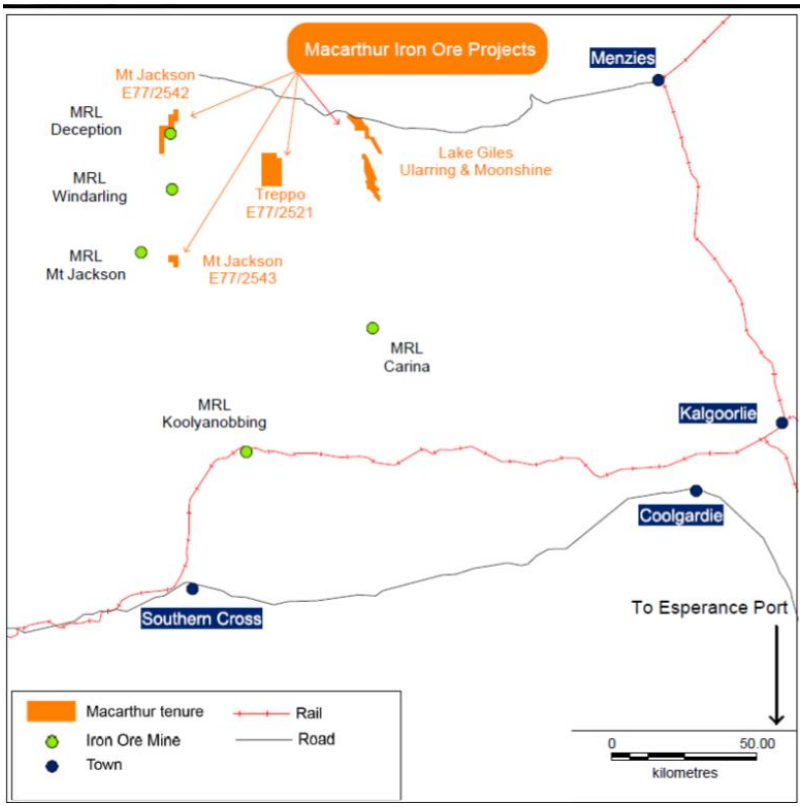
## Advantages of operating at Lake Giles, in a well-established mining district

The Lake Giles Iron Project is located in a well-established mining district near Kalgoorlie with existing iron ore producers located nearby. It is approximately 450km east-northeast of the coastal city of Perth, WA and is approximately 115km west of the town of Menzies. The broader region contains one existing iron ore producer and several projects in the exploration and development stages. The region has a variety of existing infrastructure, including open-access rail and iron ore export facilities at the Port of Esperance.

The project can be easily accessed from Kalgoorlie via the sealed Menzies Highway north for approximately 130km, then west from the town of Menzies for approximately 115km along the un-graded Evanston to Menzies Road. A dedicated semi-sealed haul road will be constructed from the project to a new rail siding to be constructed east of the existing rail siding at Jaurdi (close to Koolyanobbing – see figure below).

Lake Giles is located within approximately 90km of the open access Kalgoorlie-Esperance railway (owned by Arc Infrastructure) which in turn runs directly south to the Port of Esperance (owned by the WA State Government through Southern Ports Authority).

Exhibit 8 – Map of MIO iron ore projects




Source: MIO.

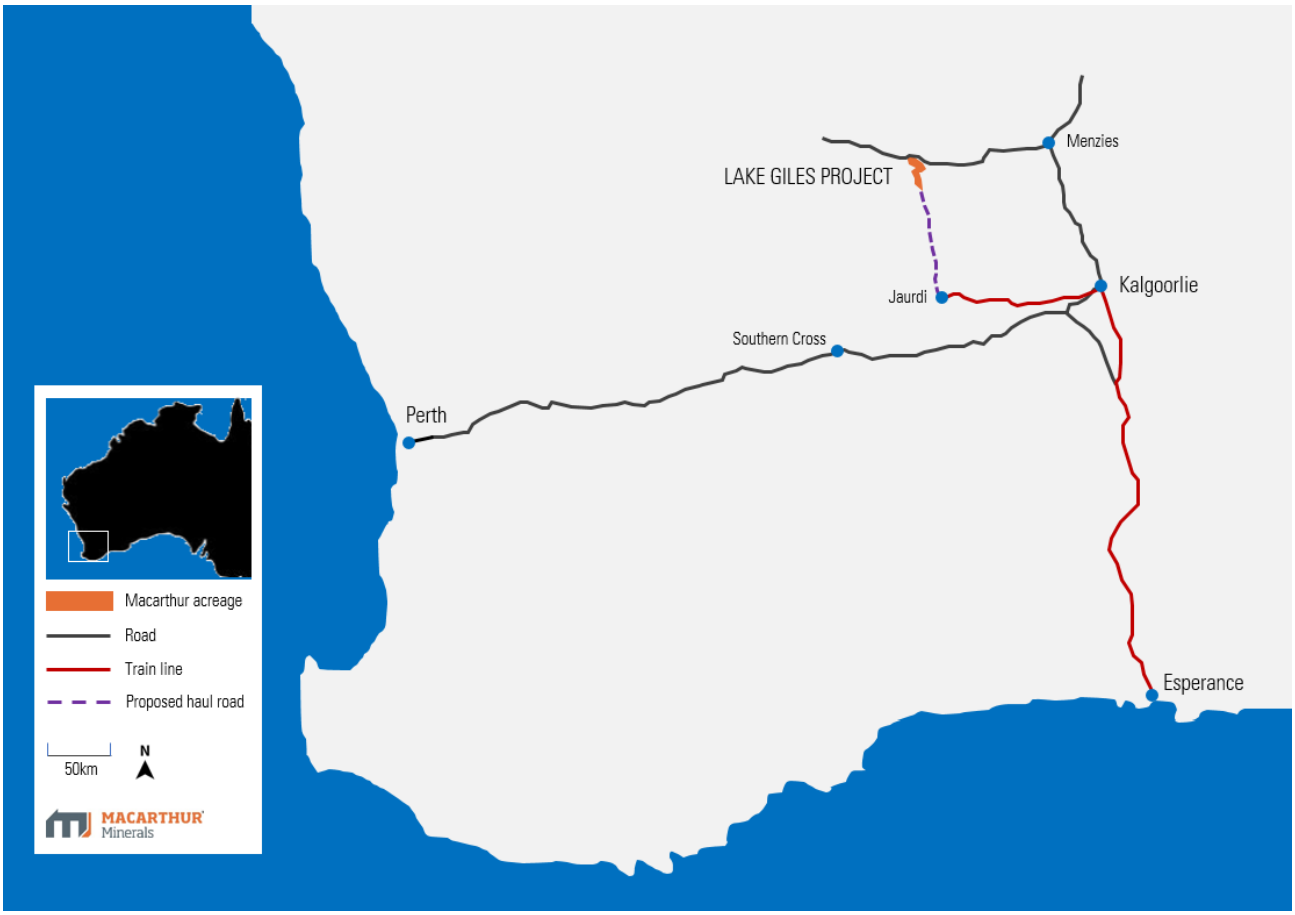
## Route to Market – Established Infrastructure the Key to Iron Ore

The Lake Giles iron ore project is close to established regional rail and port infrastructure that provides substantial capital cost benefits. Total project costs do not need to include large investments for the construction of new rail and port facilities, as can be the case for many new iron ore developments. MIO anticipates, with some incremental off-balance sheet investment into existing common-user rail and port assets, that it will be able to use existing infrastructure links to facilitate the delivery of Lake Giles product to seaborne markets. The DFS for the Lake Giles Iron Project will contain a concept plan of operations for road, rail and port transport logistics.

Key elements contributing to substantial cost savings include:

- use of the open access rail line running between Kalgoorlie and Esperance Port. In July 2020, MIO announced that it had received a proposal from Arc Infrastructure which provides an agreed pathway to develop a commercial track access agreement for below-rail capacity from the company's Lake Giles iron project to the Port of Esperance
- access to the export infrastructure at the Port of Esperance.

Exhibit 9 – Rail line at Lake Giles Project




Source: MIO.

## Rail

The company has conducted an extensive body of work on rail and port logistics including the construction of a rail siding. Transport will form a key part of operating costs for the Lake Giles Project. MIO is currently advancing a concept plan of operations for rail logistics to ensure that it can achieve the most efficient and lowest-cost transport solution.

### Below-rail access

An Indicative Track Access Pricing (ITAP) proposal was received from Arc Infrastructure in July 2020 and contained a number of operating assumptions. This 2020 ITAP was recently reconfirmed by Arc based on updated operating details provided by MIO's study consultants in October 2021.

The updated ITAP provided MIO with the most up-to-date details of the required weekly train paths and the number of train paths necessary to support the company's operations. This has allowed MIO to reconfirm below-rail network capacity and access pricing for the Lake Giles Iron Project. Firm pricing under a Commercial Track Access Agreement is expected to be finalised in 2022.

### Above-rail access

**Rail wagon pricing** is being consolidated based on updated quotes received from above-rail providers. This includes additional costs which will be incurred in Australia, including offloading, handling and wagon certification.

**Rail haulage services:** RFPs have been issued to above-rail providers for pricing of rail haulage services from the rail loop to Esperance Port, with firm pricing under a Rail Haulage Contract expected to be finalised by 2022.

## Port of Esperance

The Port of Esperance is located approximately 600km east-southeast of Perth. The port is a vital trade hub and connects key industries in regional WA to the rest of the world. Esperance features high-quality infrastructure that can handle large volumes of trade. The various capabilities of the port are as follows:

- Esperance Port is capable of handling Cape Class vessels up to 200,000 dead weight tonnes (DWT), plus fully loaded Panamax Class vessels up to 75,000 DWT
- existing bulk iron ore loader available: 3,200 t/h
- 1 Mt of existing iron ore storage sheds with proposal to build a 200–300 kt shed dedicated to MIO
- the Port is licenced for 12Mtpa of bulk iron ore loading, but Southern Ports Authority (SPA) is currently nearing completion of a new masterplan (recently released in draft form) which is examining an upgrade to Berth 3 (including ship loader load increase) and a significant reconfiguration of the rail system within the Port to support improved throughput capacity.

## Port of Esperance Masterplan

A master plan has recently been undertaken for the infrastructure requirements at Esperance up to 2050. Macarthur has been incorporated in the planning process and has actively participated with other stakeholders throughout the process. The draft masterplan for the Port was released by the Southern Ports Authority in October 2021. The draft outlined key development items and outlined how the Port could look in the future under short, medium, and long-term infrastructure and development solutions.

## Approach to Port Infrastructure under DFS

MIO's DFS for the Lake Giles Iron Project is focused on defining a rail unloading solution, iron ore storage shed and associated infrastructure that can facilitate sufficient throughput required to support the project.

The DFS outputs will include operating cost assumptions for the preferred port infrastructure development solution, and engineering designs that will deliver an overall capital cost that is expected to be funded off–balance sheet under a third-party funding solution.

Exhibit 10 – Short- and medium-term port development items


Source: Southern Ports Authority.

## Energy and Water at Lake Giles

### Net zero emissions pathway

MIO is also looking at enhancing the sustainability of its operations by powering the Lake Giles microgrid partially with renewable energy. MIO plans to target a 'no upfront capital' solution for the microgrid, expecting that the chosen mix will deliver energy to the project at a competitive project cost over the life of the mine, with a pathway to achieving net zero emissions over this period. As part of this plan, wind power generation will be deployed at the site. MIO is also considering a solar and gas hybrid solution, with a renewables content that could equal or exceed 40%to account for limits on the level of deployable wind generation at the site (due to capital and other constraints) once operations start.

### Water requirements

The magnetite processing operations at Lake Giles will require process water to produce a magnetite concentrate product. MIO has made tenure applications for Miscellaneous Licences that are required to support planned groundwater search activities. Recently completed Tempest AEM surveys covered an extensive area of the Rebecca Palaeovalley, which is close to the Lake Giles Iron Project where a large quantity of groundwater is believed to be present. AEM survey results are being interpreted and drill targets will be defined to test the quality and quantity of water to support magnetite processing requirements. MIO is working with hydrogeologists to design a groundwater drilling exploration program and production borefield across prospective zones identified from the AEM survey.

# Industry Context for Lake Giles Iron Project: Magnetite Iron Ore – High-Grade Feed for Green Steel

## Decarbonisation Theme Pushing the Industry to Green Steel

The term 'green steel' refers to the production of steel with the low or net zero emissions. The iron and steel sector is highly energy intensive, with coal currently accounting for around 75% of its energy inputs. In 2019, the consumption of coal in the steelmaking sector was approximately 900m tonnes of coal equivalent.

Ultimately the potential premium that MIO may be able to realise for its product as a result of the 'green steel' thematic is yet to be fully understood. Nonetheless, we flag this rapidly emerging theme as a potential upside catalyst for MIO and a factor which could see the Lake Giles Project screen well for potential funding opportunities.

## Iron Ore Grades Declining –Magnetite Concentrate Solution

Iron ore grades in Australia and globally are generally in decline and with an increasing appetite for high grade, low impurity iron ore products that can help the achievement of global emissions targets by 2050, a natural opportunity exists for magnetite to step into the breach.

The pathway to transitioning to production of magnetite iron ore has been identified by major iron ore producers in Australia. FMG's strategy to bring its Iron Bridge Project online (which will push FMG's average product grade above 60% for the first time), Hancock Prospecting's recent acquisition of a 30% stake in the less advanced Legacy Iron Mt Bevan magnetite project in the Yilgarn region, and Mineral Resources Limited's announcement that it would be winding down hematite operations across its Yilgarn Hub and pivoting to potential exploration and development of magnetite underscores the very clear shift that is now occurring. MIO is now one of the most advanced iron ore projects in the Yilgarn region.

## Magnetite Efficiency in the Steel Making Process

Steel can be produced via either of two main processes:

- using an integrated blast furnace (BF)
- using an electric arc furnace (EAF).

Traditional steelmaking via a BF is energy-intensive, producing millions of tonnes of greenhouse gases (mostly carbon dioxide) every year. Most of the iron and steel industry's emissions occur during production of iron in the blast furnace, where coal and coke are used as fuel and as a reducing agent The steelmaking industry is one of the largest consumers of coal.

Magnetite is exothermic, releasing heat as it oxidises, reducing the energy requirements in the furnace.

Magnetite concentrate high grade and lower levels of impurities reduces the carbon emissions from BF and can also be blended with lower grade ores to improve the overall grade and increasing efficiency.

The EAF steel production process is more environmentally friendly than is BF. Lower emissions are emitted by using a combination of high-grade magnetite iron input (via pellets or Direct Reduction Iron) with scrap steel in EAFs.

Magnetite's qualities reduce production costs, increase productivity, improve competitiveness and leave a smaller environmental footprint for steelmakers.

If green hydrogen is used as the reductant, only pelletised magnetite combined with scrap steel in electric arc furnaces can achieve the production of 'green steel'.

Exhibit 11 – Steel producers are evaluating decarbonisation strategies – Magnetite a key

| | $CO_2$ reduction | | | Full decarbonization possible | | |
|---|---|---|---|---|---|---|
| | **Blast furnace efficiency (BOF)** | **Biomass reductants** | **Carbon capture and usage** | **Electric are furnace (EAF)** | **Magnetite Pellets / DRI plus EAF using natural gas** | **DRI plus EAF using $H_2$** |
| **Strategy** | Make efficiency improvements to optimize BF/BOF operations | Use biomass as an alternative reductant or fuel | Capture fossil fuels and emissions and create new products | Maximize secondary flows and recycling by melting more scrap in EAF | Increase usage of Magnetite Pellets / DRI in the EAF | Replace fossil fuels in Magnetite DRI process with renewable energy in $H_2$ |
| **Examples** | Optimized BOF inputs (Magnetite DRI, scrap), increased fuel injection in BF (e.g., hydrogen, PCI) | Tecnored process | Bioethanol production from $CO_2$ emissions | EAF – usage to melt scrap | Current Magnetite DRI / Pellets plus EAF plants using natural gas (NG) | MIDREX DRI process running on $H_2$<br>HYL DRI process running on $H_2$ |
| **Current outlook** | Technology readily available at competitive cost | Process possible in South America and Russia, due to biomass availability | Not available on an industrial scale | Technology readily available at competitive cost | Technology readily available | Technology available at high cost |

Source: McKinsey

# MIO's Other Projects - Successful Exploration Could Provide Potential Upside

MIO's other assets outside of the Lake Giles Iron Project are described briefly below. Further detail is in Appendix 2.

## Ularring DSO Iron Ore Project: A DSO Option in the right market conditions

The Ularring Hematite Project is located in WA and is well positioned among established regional iron ore projects. It is situated on fully granted mining leases and features an 80m tonne hematite mineral resource.

MIO has received environmental approval to develop an iron ore mine and associated infrastructure at the project location. Additional environmental surveys are required over certain areas not covered by these approvals, but the company believes this will likely be a relatively straightforward process. There are no Native Title or cultural heritage issues, and the final environmental approvals are at an advanced stage.

To support the development of the vision for a large-scale long-life project at Lake Giles, MIO has made a licence application for 74 hectares adjacent to the higher grade Snark deposit of the Ularring Hematite Project, which given the appropriate market conditions may support a potential initial small-scale direct shipping ore (DSO) hematite operation at Ularring, which would focus on mining the high grade sections of the Snark Deposit.

## Treppo Grande Project

The Treppo Grande Iron Ore Project covers an area of 68 sq km at Mt Manning and is located approximately 32km west of Lake Giles. Treppo is in close proximity to established rail infrastructure with access to the Port of Esperance and is also 35km east of current iron ore producer Mineral Resources Ltd (formerly Cliffs' Asia Pacific Iron Ore Operations).

A drill program consisting of two diamond holes have penetrated the hematitic iron stone at the J-Hook prospect. Significant intercepts include 17.5m @ 65.49% Fe from 2.5m and 40.4m @ 55.77% Fe from 3.6m.

The iron-rich mineralisation (>55% Fe) is centred on the J-Hook prospect that contains occurrences of massive, fissile and specular hematite.

## Pilbara Iron Ore Projects – Strelley Gorge and Tambourah

### Strelley Gorge – hematite (E45/4735)

The Strelley Gorge tenement lies within two banded iron units prospective for DSO iron ore – the Paddy Market Formation on the eastern side and the Cleaverville formation on the west. The latter hosts past iron mining operations of the Abydos project owned by Atlas Iron on the western edge of the tenement.

### Tambourah – hematite (E45/5324)

The Tambourah tenement has 5.5km strike length of Banded Iron Formation (BIF) which hosts the iron ore deposits previously mined as part of the Atlas Iron's Mt Webber project 10km to the northeast.

Reporting by Atlas Iron in 2012 highlighted the iron potential of the Pincunah BIF within the tenement.

## Nevada Lithium Project – Looking for a Partner

Macarthur Lithium Nevada Limited (MLN) holds 210 placer claims in the Railroad Valley region of Nevada covering a total area of 17 sq km which has the potential to be prospective for lithium brine. No specific drilling completed to date has tested and sampled the playa sediments, bedrock and groundwater for their lithium-bearing potential. Soil sampling completed by MIO however strongly suggests that anomalous lithium exists. MIO is now looking for a partner to jointly advance the project.

## Infinity – Non-Core Assets Spin-Out

The company recently embarked upon a strategic consolidation program. With the DFS for the Lake Giles iron ore operation advancing rapidly towards completion, this project will require the allocation of most of MIO's resources and management focus. As part of this program the company's non-iron ore (gold, copper and lithium) Pilbara assets have been transferred into a new entity called Infinity Mining, with other iron ore tenements to remain within Macarthur Group. Infinity has conducted an IPO of $10m on Infinity with the IPO closing oversubscribed. On completion MIO will own 19.6% of Infinity Mining.

### Panorama Gold Project

The Panorama Project includes three contiguous tenements covering an area of approximately 253 sq km. The Panorama Gold Project is located 265km south-south-east of Karratha in the Pilbara Region of WA.

This area was previously identified from a historical rock chip sampling program with values of up to 3.5 g/t Au.

### Hillside Gold Project and Pilbara Lithium Projects

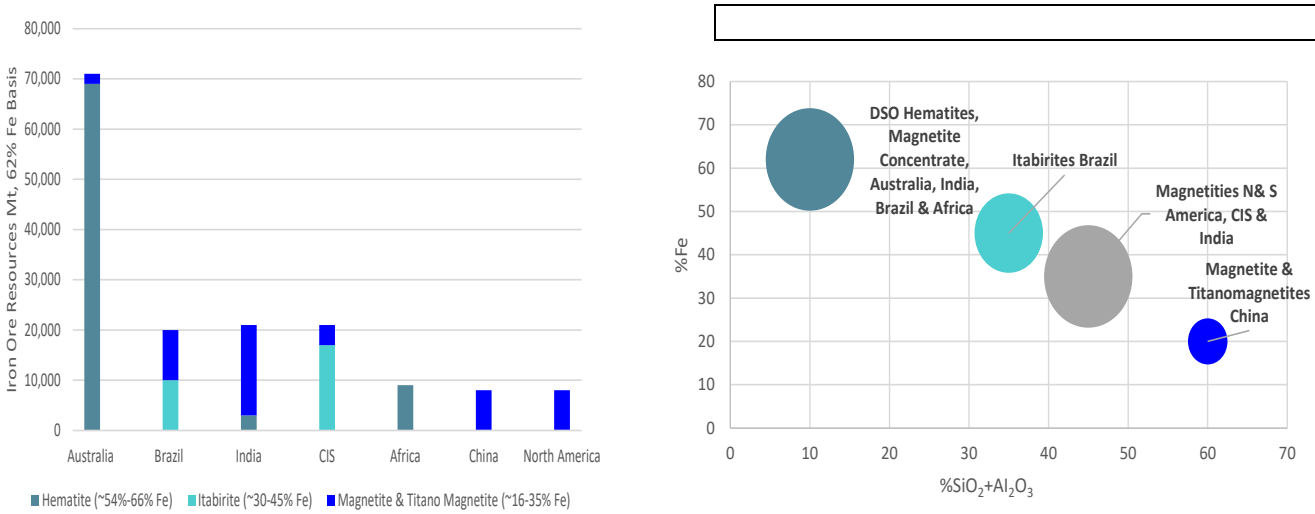
Infinity will have 100% of the gold and lithium projects in the Pilbara.

Pilbara Lithium Projects Macarthur holds 18 exploration licences covering a total approximate area of 1,281 sq km in the Pilbara. Assays received from rock chip sampling returned very promising results of up to 1.47% lithium (Li2O), confirming the presence of lithium-bearing pegmatites.

# Understanding the Global Market Dynamics for Iron Ore

Iron ore comes in several forms include magnetite and hematite. Mining iron ore entails excavating sedimentary rocks and extracting the metallic iron. The ore is then generally transported by rail and shipped to markets around the world. The exported (seaborne) iron ore market was approximately 1.5 bn tonnes in 2021. MIO iron ore is classified as magnetite, which is the smallest percentage of exported (seaborne) iron ore. The finished product is generally classified as lump, pellets or concentrate.

Exhibit 12 – Key iron ore–producing countries: Iron ore resources (Mt) (left); Quality (right)




Source: MST estimates, company reports, CISA publications, USGS reports.

## Usage

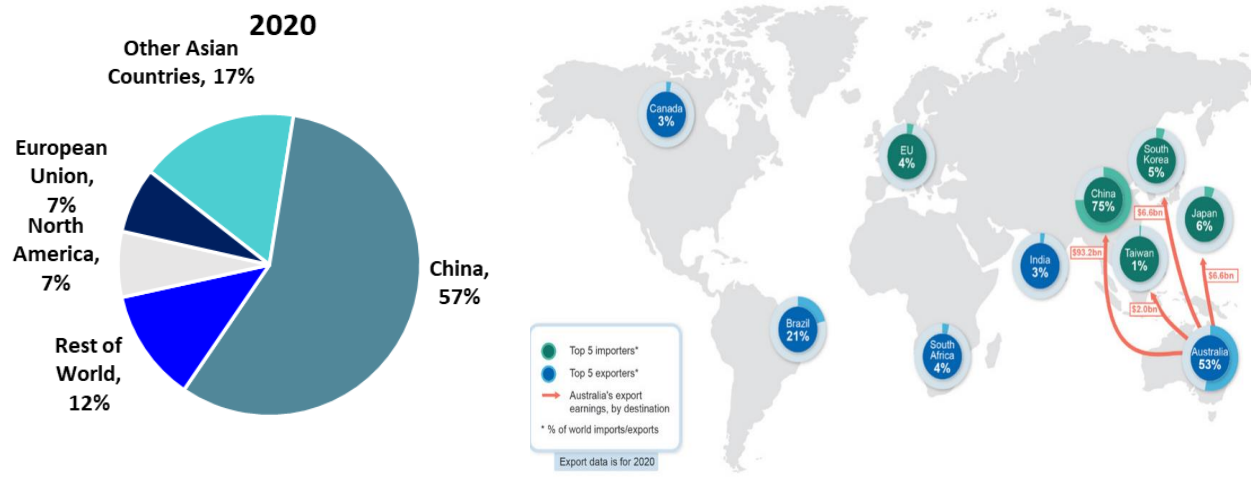
Iron ore is used to produce steel, which is used in engineering applications, repair and construction of maritime equipment and vessels, automobile manufacture, construction and general industrial activities.

## China Dominates the Demand Picture and Australia Supply

China dominates the iron ore market with ~50% of global consumption (~80% of seaborne iron ore trade) and is the largest producer of steel in the world. Construction activity is a key driver of its economy, which creates steelmaking demand. Approximately two tonnes of iron ore are needed to produce one tonne of steel.

On the supply side, global iron ore production totals 1.5bn tonnes annually. The iron ore market has been relatively tight over the last few years as the world's leading high-grade iron ore producers in Brazil and Australia experienced supply constraints. Australian miners are depleting iron ore resources with low impurities and replacing them with lower-quality, higher-impurity resources. In Brazil, the January 2019 Vale tailings dam collapse and its aftermath resulted in the country banning all cheap upstream dams and reduced global iron ore production by around 75m tonnes.

Exhibit 13 – Global steel imports

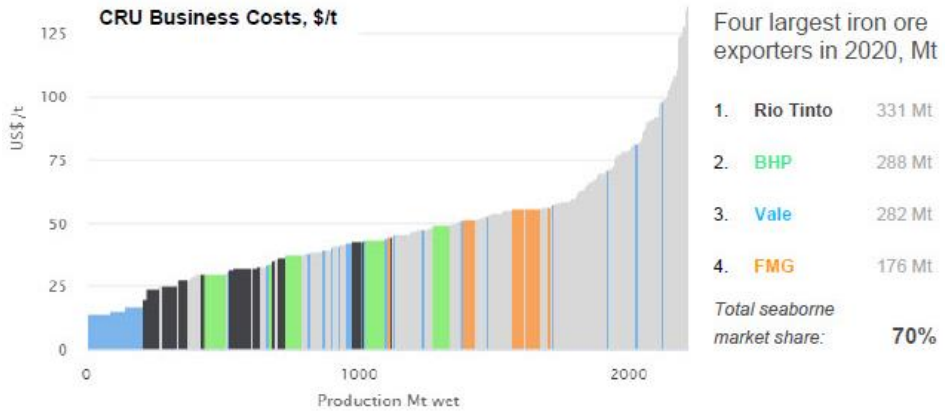



Source: MST estimates.

## Comparable Cost Curves

WA's iron ore miners are among the world's lowest-cost seaborne iron ore exporters. Given the DFS is not yet released for MIO, detailed information concerning the operating cost of the mine remains limited. Magnetite ore requires further processing and therefore will always be higher cost than hematite DSO. However, high-grade magnetite attracts a significant premium over benchmark 62% fines iron ore.

Exhibit 14 – CRU business costs from the four largest iron ore exporters, 2020

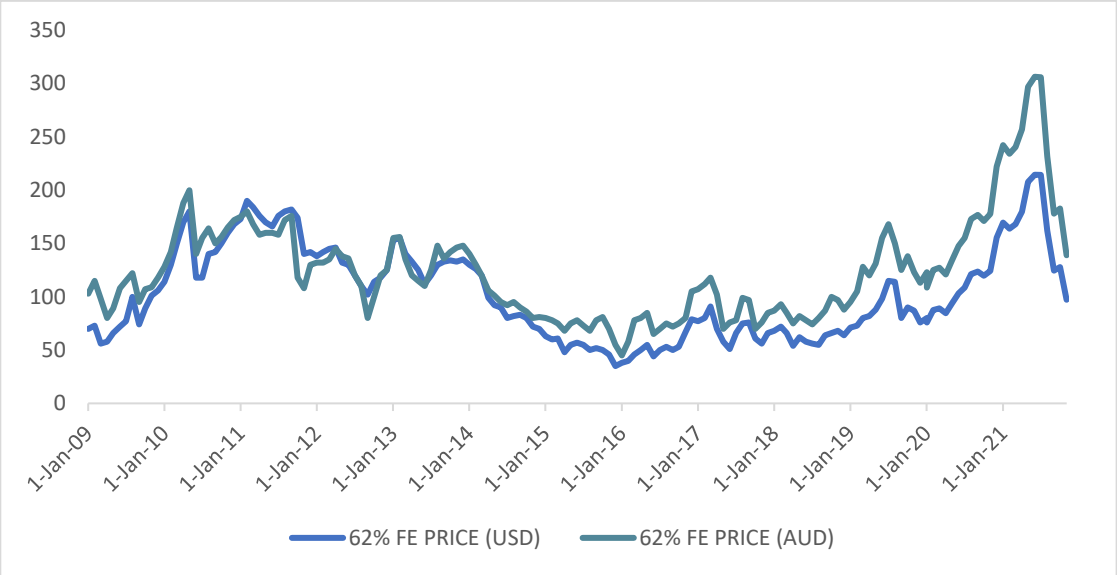



Note: Business costs take 'value-in-use' into account, meaning the prices received for each product are factors included in the business costs estimates. Source: CRU's Iron Ore Cost Analysis.

## Price

The most commonly used benchmark iron ore price is based on iron ore fines (used for sintering and making up 70% of iron ore trade) and an average grade of 62% Fe. MIO's magnetite concentrate is expected to be of approximately 66% Fe and will attract a premium to this benchmark (potentially up to 25%).

Exhibit 15 – Iron ore spot prices – 62% Fe USD/t and AUD/t (left);

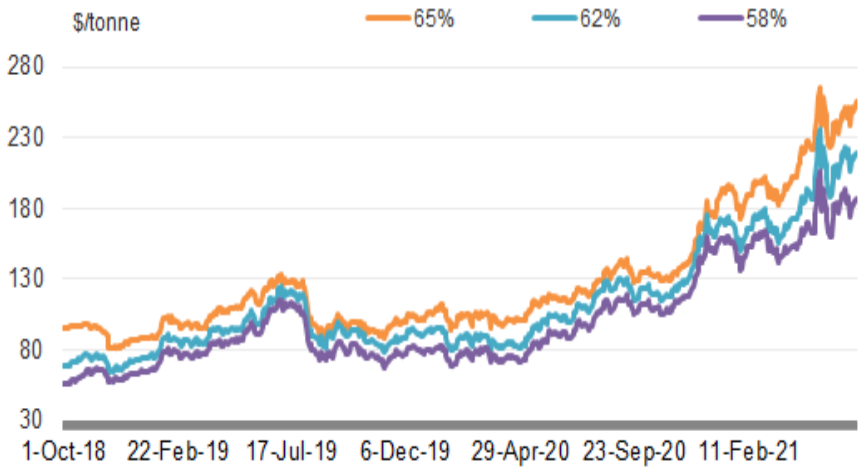



Source: MST estimates, Bloomberg 2022, Department of Industry Science, Energy and Resources (Australia, 2021).

## Iron Ore Grades

As a general rule, the higher-grade iron ore products attract premium prices, with the premium/discount range relative to the benchmark grade of 62% fluctuating within a relatively consistent range over a historical time series.

Exhibit 16 – Price for 65%, 62% and 58% iron ore in China, 2018–2021




Source: MST estimates, Refinitiv Eikron, Argus Media, Reuters, ABS (2021) Mineral and Petroleum Exploration, 8412.

## Magnetite vs Hematite

The Lake Giles project will produce high-grade magnetite concentrate.

Hematite Direct Ship Ore (DSO) requires a relatively simple crushing and screening process before being exported for use in steelmaking.

Like hematite ores, magnetite ores require initial crushing and screening, but undergo a second stage of processing that relies on the magnetic properties of the ore and involves magnetic separators to extract the magnetite and produce a finished product – the concentrate. Further processing involves the agglomeration and thermal treatment of the concentrate to produce pellets that can be used directly in blast furnaces and EAF's, or in direct reduction steel-making plants. Magnetite's more intensive processing requirements result in higher production costs.

However, high-grade magnetite product typically attracts a premium because it is more valuable in the steelmaking process than benchmark hematite ore.

Exhibit 17 – Magnetite concentrate vs hematite

| | Magnetite | Hematite |
|---|---|---|
| Iron Ore Content | Higher | Lower |
| Benefits for Plant Users | Higher Iron Output | Lower Iron Output |
| Carbon | Lower | Higher |

Source: MST

# Valuation – Lake Giles Is A Cornerstone Asset

## Valuation of A$0.68 – Feasibility Study to Be Delivered, then Funding the Key

We have derived a valuation for MIO using sum-of-the-parts analysis. Our valuation focuses in on the key Lake Giles asset. Lake Giles is MIO's most significant asset given its scale and stage of development, and as such our overall value for MIO is highly dependent on the valuation applied for Lake Giles. With the DFS still underway, we have relied upon technical information published in prior reports on Lake Giles, as well and our estimates where no information was yet available. We estimate the will be completed in Q1 CY2022, and with this more detailed and reliable information will be available concerning the range of assumptions required to formulate a detailed DCF valuation.

### Valuation of A$0.68/share

We value MIO at A$0.68/share. We believe the company will outline a robust premium iron ore project at Lake Giles we estimate can come into production in CY2025. We estimate only nominal valuations for the other projects within MIO's portfolio, but flag that with investment in successful exploration these projects have the potential to provide further upside for MIO.

Exhibit 18 – Valuation summary

| NPV OF PROJECTS | US$M | Ownership | Risk Weight | A$M | A$/share | Valuation Methodology |
|---|---|---|---|---|---|---|
| Lake Giles | 568 | 100% | 50% | 406 | 0.73 | Risked Project NPV |
| Other Iron Ore Assets | 10 | 100% | 100% | 14 | 0.03 | Nominal Value |
| Infinity | 7 | 19% | 100% | 2 | 0.01 | Infinity Mining Spin off |
| **Enterprise NPV** | **568** | | | **406** | **0.77** | |
| Corporate Costs | (35) | 100% | 100% | (50) | (0.10) | NPV of Corporate Costs |
| Net Cash (Debt) | 4 | 100% | 100% | 5 | 0.01 | Cash at 30 June 2021 |
| **Total** | **536** | | | **361** | **0.68** | |

| | |
|---|---|
| **WACC** | **10.0%** |
| AUDUSD | 0.70 |
| Shares on issue (Undiluted) | 144 |
| Options | 52 |
| Additional Equity Required | 360 |
| Shares on issue (Fully Diluted) | **556** |

Source: MST estimates.

### Key assumptions

We assume the Lake Giles magnetite operation comes into production in CY2025.

We assume a Phase 1 operation producing 3.3mtpa of magnetite concentrate, with operating costs of US$65/t. Our operating costs are based on high-level estimates, and we highlight that at present limited information is available particularly concerning the transport costs which are likely to be a meaningful component of the total cost of production. Further information will be made available in the feasibility study results.

Our benchmark iron ore assumption is US$100/t with a 25% premium for magnetite concentrate. We assume a Phase 2 expansion which doubles production in Year 6 of the operation, which continues through to 2040. Based on the currently defined mineral resource we flag potential for a longer mine life, depending on ongoing exploration success and the conversion of the current mineral resource into an ore reserve.

We assume Phase 1 construction capex of US$450m and Phase 2 expansion capex of US$100m. Capital cost is a critical assumption and we have adopted these assumptions with reference to the prior project studies. However, we note that the project scope has changed significantly since and as such the forthcoming feasibility study will provide more up-to-date estimates which will have a higher degree of certainty. The debt equity ratio we assume is 60/40 and have assumed a share price of $A0.50 per share for the equity portion of the funding. We have risked the project at 50% due to its pre DFS stage.

Exhibit 19 – Key modelling assumptions

| Assumptions | |
|---|---|
| **PROJECT ASSUMPTIONS** | |
| Project Ownership (%) | 100% |
| Strip Ratio (waste : ore) | 2:1 |
| Processing Plant Throughput (mtpa) | 9.6 |
| Mine Life (years) | 16 |
| Average Production (wmt) | 3.3 |
| Mineral Resource (mt) - Moonshine Magnetite | 1,316 |
| Grade (% Fe) - Moonshine Magnetite | 30.1% |
| Recovery (%) | 31.0% |
| | |
| **COST & FINANCING ASSUMPTIONS** | |
| Discount Rate (%) | 10.0% |
| Capital Cost (US$m) | 450 |
| Cash Cost (US$/dmt) | 65.0 |
| | |
| **PRICING & EXCHANGE RATE ASSUMPTIONS** | |
| AUDUSD | 0.70 |
| Benchmark Potash Price (US$/t FOB Vancouver) | 100 |
| Royalties (%) | 5.0% |
| Tax Rate (%) | 30.0% |

Source: MST estimates.

## Key Valuation Sensitivities: Iron Ore Price, FX, Costs

Key sensitivities are the iron ore price as well as operating and capital costs. A broad array of critical assumptions are highly sensitive determinates of the valuation of the Lake Giles iron ore project. However, we focus on the most sensitive to show how our valuation is affected by a change in these key assumptions. Exhibit 20 shows our valuation's sensitivity to a range of benchmark iron ore prices and operating cost assumptions.

Exhibit 20 – Sensitivity analysis: iron ore price and operating cost

| 62% Fines CFR (US$/dmt) | Cash Costs (US$/dmt) | | | | |
|---|---|---|---|---|---|
| | 55 | 60 | 65 | 70 | 75 |
| 95 | 0.78 | 0.63 | 0.48 | 0.33 | 0.18 |
| 100 | 0.98 | 0.83 | 0.68 | 0.53 | 0.38 |
| 105 | 1.18 | 1.03 | 0.88 | 0.73 | 0.58 |

Source: MST estimates.

We further consider the impact of a change in the discount rate applied (see Exhibit 21).

Exhibit 21 – Sensitivity analysis: risk weighting

| 12% | 11% | 10% | 9% | 8% |
|---|---|---|---|---|
| 0.52 | 0.60 | 0.68 | 0.77 | 0.87 |

Source: MST estimates.

## Positive Catalysts for the Share Price and Valuation

**Feasibility study results** should significantly boost investors' confidence in the project scope and economic underpinnings of Lake Giles. A better-than-expected outcome in the DFS would likely be a positive event for MIO shares.

**Project financing:** Obtaining project financing is key to the development of the assets through to commercialisation. The announcement of a secured project finance facility would be a significant de-risking step for the project.

**Faster than expected transition towards 'green steel':** As the world decarbonises, if 'green' steel steadily becomes more lucrative & expensive, this would have a positive effect on MIO shares.

**Early project delivery** of any of the projects would mean cash flows were generated sooner and would reflect positively on management, which would likely boost the valuation.

**Resource upgrades:** The Lake Giles project has a substantial defined mineral resource. However, the bulk of the resource remains in the Inferred category which implies the lowest level of confidence. Upgrades to the classification of the resource would provide a higher degree of confidence in the orebody as well as the mine-plan parameters.

**Further exploration success** at Lake Giles or other projects would be a potential positive for MIO.

**Iron ore price increases** would have a positive effect on the valuation and share price.

**Capital cost and/or operational cost savings** would benefit the valuation and reflect positively on management.

## Risks to the Share Price and Valuation

**Access to funding risk:** MIO faces the risk of not being able to obtain enough funding for the development of projects and further exploration. The company has not yet identified the sources of funding for this development. Poorly timed equity raisings could potentially dilute our valuation.

**Commercialisation risk:** An inability to commercialise projects, due to technical or operating risks, could hurt the cash flow of the business and weigh on the share price.

**Iron ore price decreases** would be a negative for the valuation of MIO shares. Iron ore prices represent the key sensitivity for the valuation.

**Reserves and resources risk:** The testing and appraisal of existing projects may not lead to the definition of an ore reserve, which would be negative for the stock.

**Disappointing exploration results:** As a key driver of potential upside in the valuation, any disappointment in exploration results would be a negative.

**Key person risk:** MIO's future success depends, to a significant extent, upon the continued service of the members of its management team. The loss of senior managers could harm the company's business and its prospects.

**Delays to project delivery** would have a negative effect on the valuation and may reflect negatively on management.

**Increase in project capital cost and/or operational costs** would detract from the valuation and reflect negatively on management.

**Infrastructure access:** MIO relies heavily on critical infrastructure links to transport its product from the mine site to export markets. Inability to obtain access or sufficient capacity would constrain the company's ability to meet operational and financial targets.

# Financials

## Funding

In the short term, the focus of MIO's funding is to ensure the company is adequately financed to complete the feasibility study, as well as to provide stability while the project financing process is negotiated.

At 30 September 2021, MIO had A$4.7m in cash and no debt. We anticipate some additional funding will be required to see the company through to the full project financing negotiations.

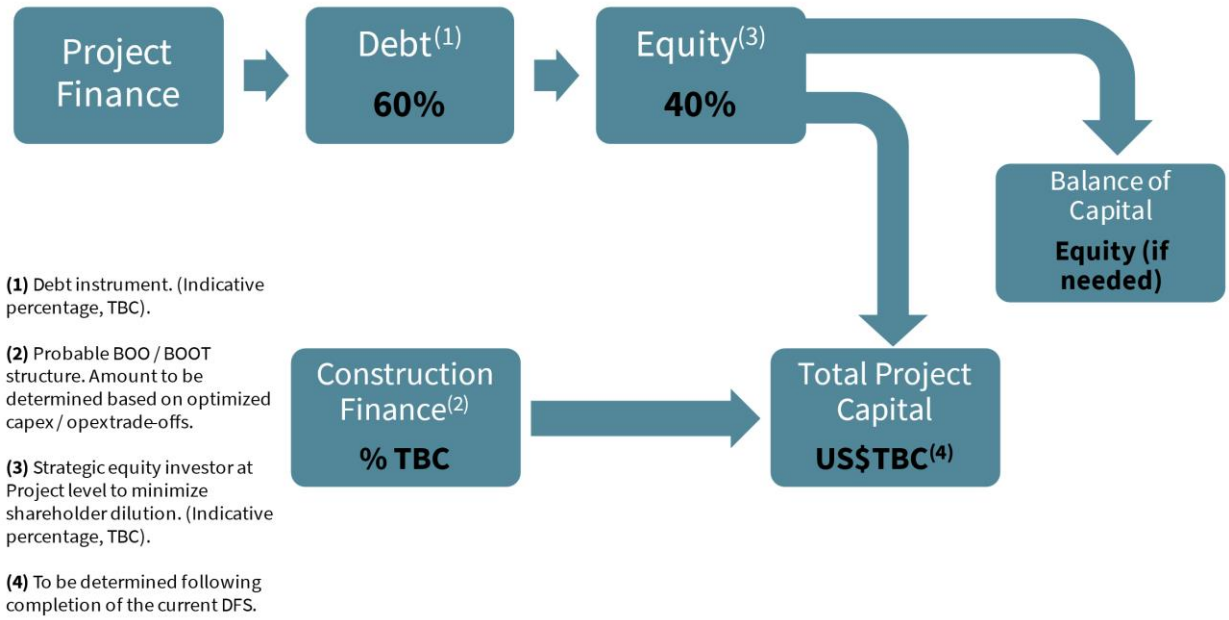
We have assumed Phase 1 project capex of US$450m to bring Lake Giles into production. We believe that the project will be well positioned to attract strong interest from debt funders, given:

- the project is located in WA, a very attractive region for mining investment
- Lake Giles is a high-grade project which fits into the 'green steel' thematic
- the project has the backing of Glencore, with an established offtake agreement for all of the expected production at Lake Giles from Phase 1.

We have assumed a 60/40 split of debt/equity funding for the project capex, however we see potential for higher debt levels given the attractiveness of the high-grade concentrate and potential for "green" funding. The DFS will give a clearer picture of the final funding structure.

We assume the equity component of project funding is secured at a price of A$0.50/share.

Exhibit 22 – Our expectations for project financing: Lake Giles Iron Project




Source: MIO.

# Environmental, Social and Governance (ESG)

ESG factors play an integral role in many investors' decision-making. We believe the key ESG issues that may affect MIO's business and share price relate predominantly to environmental and social issues. The company's projects can contribute positively to Australia's economic welfare. However, operating in an environmentally and culturally sensitive region presents challenges, particularly in obtaining approvals and ensuring Native Title is correctly managed.

## Environmental

Our assessment of MIO's environmental credentials falls into two categories:

- environmental assessment of the project
- environmental assessment of MIO's key product – iron ore.

All extractive industries and industrial processes have an impact on the environment—this is a direct impact of iron ore mining and its subsequent processing into steel. MIO has recognised the importance of environmental responsibility and is aiming to implement industry-leading environmental practices within its project.

### Environmental impact of the project

The company's projects are subject to state and federal laws and regulations regarding environmental matters. Many of the company's activities and operations cannot be carried out without prior approval from relevant authorities and compliance with their requirements. Resource activities can be environmentally sensitive and can give rise to substantial costs for environmental rehabilitation, damage control and losses. MIO intends to conduct its activities in an environmentally responsible manner and in accordance with all applicable laws.

Over the course of the last decade, the Company has undertaken extensive environmental survey and clearance work in the Lake Giles project region. However, given its pre-development stage, the environmental approval process that will be specific to the magnetite project will require further advancement once the impact zones for the mining operations have been finalised under the DFS. The mining process will initially require the clearing of vegetation-and has the potential to impact groundwater dependent ecosystems.

The major environmental issue for the mining and processing will be waste rock and tailings management. Overburden and tailings material will be initially stored in out-of-pit (i.e. external) waste dumps and subsequently placed in mined-out pits when it becomes operationally feasible to do so. Prima facie this appears to be a satisfactory way of dealing with waste rock and tailings. However, as the project is in the early stages of the environmental approval process, it will need to be fully detailed and scoped during the DFS process and approved by the environmental authorities. There will be particular notice taken of the tailings management, given the recent experience of tailings dam failings in the Brazilian iron ore industry.

MIO has not yet commenced preparation of the Mining Proposal and has not disclosed estimated closure costs (this will be in the DFS).

### Environmental impact of MIO's product—iron ore

**Shoring up green steel credentials:** MIO has signed an MOU Strategic Partnership and Collaboration agreement with LAVO Hydrogen Technology Holding to investigate the facilitation of a staged technology solution, which would represent a step toward green steel. However, any sale of iron ore to non-green steel importers would lessen MIO's claims of being a green steel producer, given the end-to-end impact.

**Direct emissions from production:** The iron ore commodity and the overall steel industry contributes to worldwide carbon dioxide ($CO_2$) emissions. On average in 2020, 1.8 tonnes of $CO_2$ were emitted for every tonne of steel produced. The global steel industry generates 7%–9% of direct emissions from the use of fossil fuels, with loading and hauling making the largest contributions (approximately 50%) to the total greenhouse gas emissions for the mining and processing of iron ore (11.9kg $CO_2e$/t respectively).

Many of China's steel manufacturing plants use a process called 'sintering', which involves a thermal agglomeration process that is applied to a mixture of iron ore fines, recycled ironmaking products, fluxes, slag-forming agents, and

solid fuel (coke). The purpose of the sintering process is manufacturing a product with suitable characteristics (thermal, mechanical, physical and chemical) to be fed to the blast furnace.

**Considering renewable power:** MIO is also considering a solar and gas hybrid solution.

## Social

The social aspects of MIO's business are key to operating successfully.

The company:

- will target zero injuries
- will look to employ predominantly local staff and engages local contractors for most of its work

The construction and continuing operations of MIO's projects will stimulate the WA economy and provide a new mining product in WA. MIO expects the project will create substantial economic benefits for the local community in the form of employment, investment, payment of taxes and royalties, and investment in social infrastructure.

A key issue will the ability to attract a skilled workforce given the uncertainty of COVID and already tight labour conditions in WA.

## Governance

MIO is committed to following the corporate governance guidelines and recommendations set out by the ASX Corporate Governance Principles and Recommendations (ASX Guidelines).

The board consists of two independent directors out of 4 directors satisfying the 50% independent condition.

Exhibit 23 – Board of directors

| Directors | | Skills | | | | | |
|---|---|---|---|---|---|---|---|
| Name | Position | Independent | Capital Markets | Resources Industry | Mining/ Geology | Finance / Accounting | Listed Company |
| Mr. Cameron McCall | Executive Chariman | - | ✓ | ✓ | - | ✓ | ✓ |
| Mr. Joe Phillips | Managing Director | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mr. Alan Phillips | Non ExecutiveDirector | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| Mr. Andrew Suckling | Non ExecutiveDirector | ✓ | ✓ | ✓ | ✓ | - | ✓ |

Source: MIO, MST Access.

## Management – Well-Balanced Management Team

**Joe Philips – Managing Director:** Mr Philips has been at the company for 12 years, having been previously CEO and now as an Executive Director. Mr Phillips was previously the Company's CEO in 2015 and responsible for the original funding and development of the Company's significant iron ore assets, having completed its 2012 Prefeasibility Study for the Ularring Hematite Project and obtaining environmental approvals. Mr Phillips holds a Bachelor of Economics and has had an extensive career in government holding senior roles and working on large transactions.

**Andrew Bruton – CEO:** Andrew has been CEO for one year and has been executive general manager for 1 and a half years earlier. Mr Bruton is currently a director of Andean Resources Pty Ltd, Lithium Resources Pty Ltd and is also a director of Eight Wave Resources Australia. He has been a director of companies developing large scale renewable energy projects and providing technology platforms to the oil and gas industry. Prior to this experience, Andrew was a Partner at HWL Ebsworth Lawyers (the largest legal partnership in Australia) for 10 years where he lead the firm's national energy and resources industry team and was also Group Head of the firm's corporate practice in Brisbane. He was a partner at TressCox Lawyers for 3 years where he headed up the firm's national energy and resources industry team and was the regional head of the Queensland office. Prior to that he was a senior energy and resources lawyer at Clayton Utz, a top tier national law firm where he worked for 14 Years on large resources and energy projects. Mr Bruton's top tier law firm experience with a transaction facing focus has enabled him to become well regarded in the mining, energy and infrastructure sectors. His deep operating knowledge of the mining sector, together with an extensive background in large scale infrastructure (port and rail) projects, and in the conventional and renewable energy sectors gives him a uniquely appropriate skillset to drive the Lake Giles Iron Project forward. Andrew holds both a Bachelor of Laws and a Bachelor of Business (Accountancy) from the Queensland University of Technology.

**Dean Carter – General Manager, Projects:** Dr Carter has been MIO's Project Manager for over 8 years and was also made General Manager in 2017. He has over 19 years' experience in environment research and managing the regulatory approval of mining and infrastructure projects across various commodities. Dr Carter has been involved in several projects from exploration through to construction and production and previously played a key role in the approval and construction of Mount Gibson Mining's Extension Hill iron ore project. Dr Carter holds a Bachelor of Science (Hons) and a Doctor of Philosophy (PhD).

**Richard (Jonghyun) Moon – General Manager, International Sales and Marketing:** Mr Moon joined MIO in 2020, bringing a wealth of experience in international iron ore and commodities sales, marketing and mining investment. He has a career of over 20 years in the resources industry, including multiple executive positions with Glencore International AG, POSCO, and Hyundai Steel, including Chief Representative for Hyundai Steel in 2013–2017. Mr Moon has established key relationships within the mining and commodities industry throughout his 20+ year career. He holds a Bachelor of Commerce, Yeungnam University, Korea and a Master of Arts in Asian Studies, University of Birmingham, United Kingdom.

**Bernard Holtshousen – Senior Consulting Mine Engineer:** Mr Holtshousen is a highly experienced mining engineer professional. He has served on the Board of many publicly listed and unlisted mining companies, and as a Director, Managing Director and Chairman in companies based all over the world. Mr Holtshousen has held senior Board and management positions at Sigma Minerals, Equatorial Mining, MIM Holdings, Gencor, and Rand London Corporation. Mr Holtshousen holds a Bachelor of Science, Engineering (Mining) from the University of Witwatersrand in South Africa, a Master of Science (Management) from Stanford University in California, USA, and a Management Diploma from Utah State University, USA.

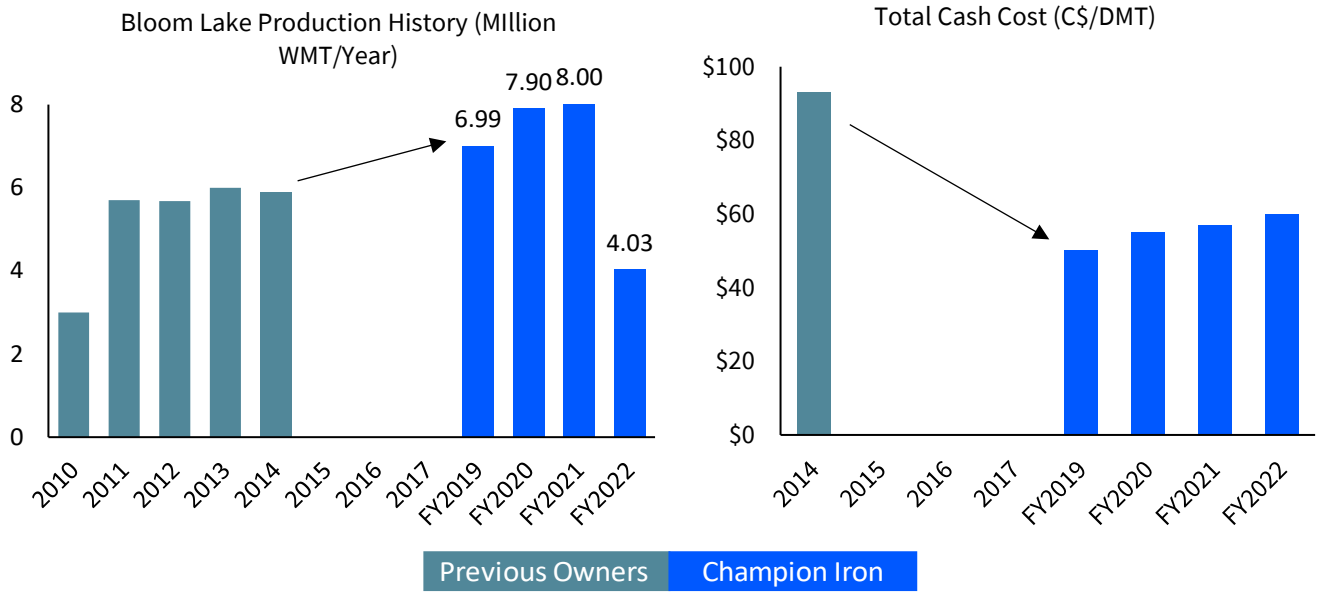
# Appendices

## Appendix 1 – A Study in Iron Ore Concentrate Success – Champion Iron

### Background and recent performance

Champion Iron, an iron ore concentrate success story (with a resource of around 30% Fe with a mix of hematite and magnetite), is located in a top-tier jurisdiction in Quebec, Canada that holds the second largest hub for high-grade iron ore exports globally. The company ships ore to customers in China, Japan, South Korea, India, Europe, the Middle East and Canada. Its primary asset is Bloom Lake, which has received over US$4bn of invested capital since inception. Bloom Lake's expected mine life is 20 years with largely high-grade 66.2% Fe after beneficiation and low levels of impurities. The mine has been in production for more than a decade, producing more than 53m wmt since 2010. This excludes a period between 2015-17 when the mine was not operating, prior to Champion Iron's acquisition and recommissioning.

Exhibit 24 – Bloom Lake production history (left); Bloom Lake total cash cost history (right)




Source: Champion Iron.

Current capacity from Phase I of Champion Iron's overall development is ~8.0Mtpa (nameplate capacity of 7.4Mtpa).

Champion's most recent results for the six months to 30 September 2021, where the mine achieved production of 4.03m wmt (consistent with an annual run rate of 8.0m wmt) at a recovery rate of approximately 83%, altogether contributing to EBITDA of $605.8m and net income of $338.9m.

Factors that have contributed to this strong performance include:

- product quality premium and subsequent benefits from pricing, which help offset the freight differential when compared to other Australian producers
- Champion's position as a cost leader in the industry (62% Fe equivalent) with total cash cost of $41.0/t FOB
- close access to infrastructure (463km to port), including renewable energy through hydroelectric power which accounts for 65% of the energy used by Champion Iron.

## Higher-quality ore contributes to lower emissions

As iron ore resources have been depleted over the past three decades, the average grade quality has gradually declined with increasing amounts of contaminants. The sinter feed grade (Fe %) has fallen from 63.9% in 1998 to 61.9% in 2019, according to Champion Iron. For many major producers, rising contaminant issues have resulted in larger discounts to the 62% index. In the case of Bloom Lake, the higher purity has not been subject to any contaminant penalties, allowing it to maintain higher prices and returns, while still minimising emissions in the production process.

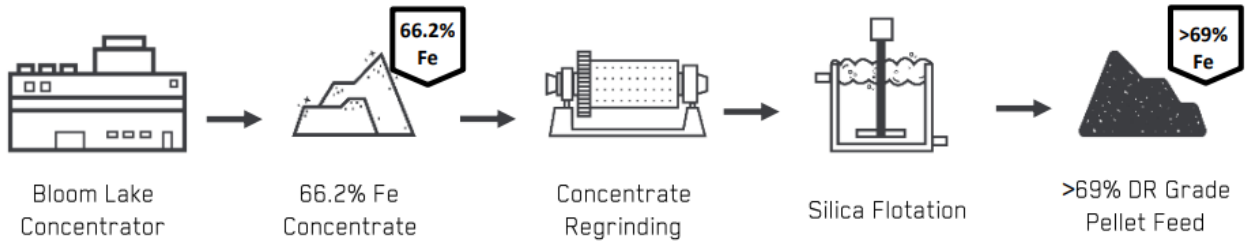
Champion Iron also produces >67.5% Fe Direct Reduction (DRI) quality iron ore concentrate. This capability allows Champion Iron to participate in both BF/BOF and DRI/EAF steel making processes. Importantly, the company's ability to produce this DRI-quality ore positions it well to take advantage of structural changes to steel production and processing, given the lower levels of CO2 emissions that result from its production of magnetite concentrate. This should further enable the company to broaden and increase its customer base, given it is one of few global deposits that can more easily transition to product that is suited to DRI and EAF over traditional BF and BOF. Champion Iron already has one of the lowest CO2 footprints globally for iron ore production. To understand how CO2 emissions are affected by production, we note that:

- producing 66.2% concentrate reduces emissions by ~10% in the BF/BOF steelmaking process compared to benchmark 62% iron ore
- producing >67.5% pellet feed concentrate enables EAF production, which creates steel with ~50% reduction in emissions compared to BF/BOF steel processing.

## R&D and future phase II developments

Champion Iron's quality ore concentrate also positions it to lab-test production of >69% Fe concentrate. Preliminary results indicate an ability to upgrade Bloom Lake using mild regrinding and a silica flotation stage as highlighted in Exhibit 13. A further feasibility study has commenced to determine required infrastructure. This higher grade would position Champion Iron to further engage DRI-EAF–based iron and steel producers, increase product pricing and further reduce emissions in the steelmaking process.

Exhibit 25 – Bloom Lake production process




Source: Champion Iron.

Champion Iron's success is also highlighted by its continued investment and pipeline. The anticipated completion of Phase II in mid-2022 is expected to double production capacity to 15Mtpa. The Bloom Lake Mine is also less than 60km from 7 other iron-rich properties. Champion Iron acquired the adjacent Kami project in April 2021 with a historical estimated resource of ~1.3bt (7.8mtpa as Measured and Indicated). The company also owns the consolidated Fire Lake North project, approximately 40km away, where it completed a 2013 feasibility study proposing a 9.3Mtpa iron ore project over a 20-year mine life.

# Appendix 2 – Details of MIO's Other Projects

This appendix provides further detail on MIO's additional projects:

- Ularring DSO Iron Ore Project (WA)
- Treppo Grande Project (WA)
- Pilbara Iron Ore Projects – Strelley Gorge and Tambourah (WA)
- Nevada Lithium Project (Nevada, USA).

## Ularring DSO Iron Ore Project – A DSO Option

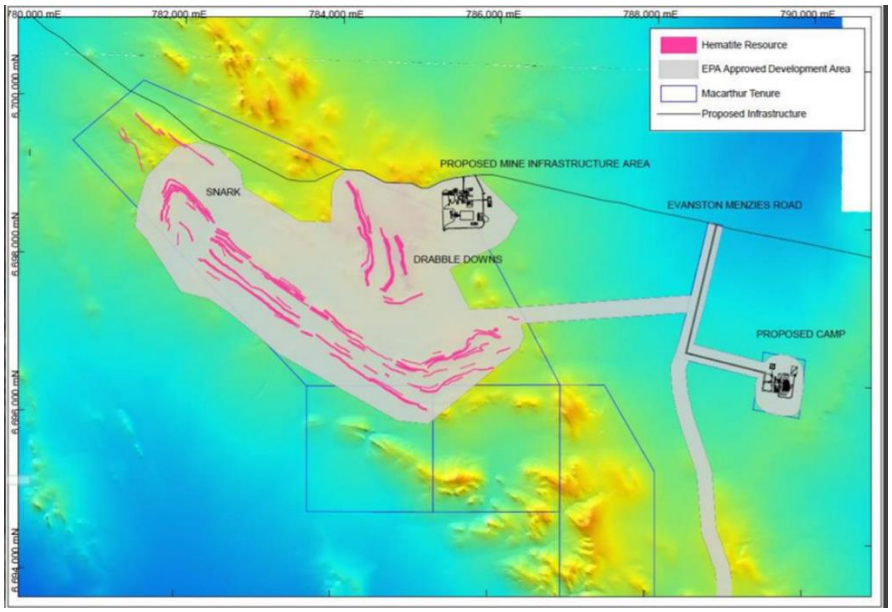
The Ularring Hematite Project is located in WA and is well positioned among established regional iron ore projects. It is situated on fully granted mining leases and features an 80m tonne hematite mineral resource,

### Licence application to support DSO hematite operation at Ularrring

To support the development of the vision for a large-scale long-life project at Lake Giles, MIO has made a license application for 74 hectares adjacent to the Snark deposit of the Ularring Hematite Project to support a potential initial small-scale direct shipping ore (DSO) hematite operation at Ularring. If market conditions are appropriate.

Mine planning is underway and the initial development is expected to include non-process support infrastructure such as vehicle workshops, water storage, offices, fuel supply, stockpiles and product loadout. To achieve an export opportunity, the company would leverage previous studies undertaken on the Ularring Hematite Project – a previously identified and widely regarded strong opportunity for a viable DSO operation. Initial targets will be the Snark and Drabble Downs deposits at Lake Giles. The project could have a short lead time (less than 12 months) to development, subject to a supportive iron ore price environment and efficient transport logistics solution, including port access.

Exhibit 26 – Ularring site layout




Source: MIO.

## Advanced development potential

The Ularring project is at an advanced stage with the following historic work having been completed:

- Environmental Protection Authority approval (including Native Title, heritage and base line studies)
- an exploration history which includes 1,817 drill holes totalling over 107,000m
- mineral resources delineated over five separate areas.

## Rail haulage agreement with Aurizon

In September 2021 a binding rail haulage agreement was secured with Aurizon for the transport of up to 500ktpa of DSO lump and fines product between Kalgoorlie and Kwinana to support the commercialisation of Ularring.

## Offtake agreement with GWR Group and rail agreement with Pacific National

MIO secured a signed term-sheet for 400ktpa DSO purchased at the mine-gate with GWR Group Limited (ASX: GWR) over an initial two-year period (including an additional 2-year extension option). GWR's flagship C4 iron ore mine in Wiluna began production earlier in 2021. A partnering 400ktpa rail freight services agreement with Pacific National (including rolling stock) is expected to mobilise to support the agreement in Q12022.The MIO-GWR mine-gate purchase deal aligns perfectly with the Pacific National deal. Subject to securing matching port capacity at Esperance, the two deals provide the potential to develop a bridge of cash flow before Ularring comes online, as well as providing optionality for physical or virtual blending with future DSO production from Ularring.

# Treppo Grande Project (Mt Manning)

The Treppo Grande Iron Ore Project covers an area of 68 sq km and is located approximately 32km west of the MIO Projects. Treppo is in close proximity to established rail infrastructure with access to the Port of Esperance and is also 35km east of current iron ore producer Mineral Resources Ltd (formerly Cliffs' Asia Pacific Iron Ore Operations). An ethnographical cultural heritage survey conducted by the Traditional Owners has cleared the area for sites of significance. Additionally, Treppo has already benefited from flora and fauna baseline surveys indicating the conservation values of Mt Manning are a lower priority than surrounding BIF ridges.

**Previous exploration history:** Kalgoorlie Prospector Mr Mel Dalla-Costa has held his area under an Exploration Licence (EL77/1208). During this time, approval was granted for an exploration program of diamond drilling and geophysical mapping. The area was explored in recent years for high grade hematite iron ore mineralisation. Mr Dalla-Costa's exploration program identified three potentially economic styles of DSO mineralisation including massive dense hematitic ironstones, specular hematite and oxidised Indurated Detrital Ironstone.

**Drill programme results:** A drill programme consisting of two diamond holes has penetrated the hematitic iron stone at the J-Hook prospect. Significant intercepts include:

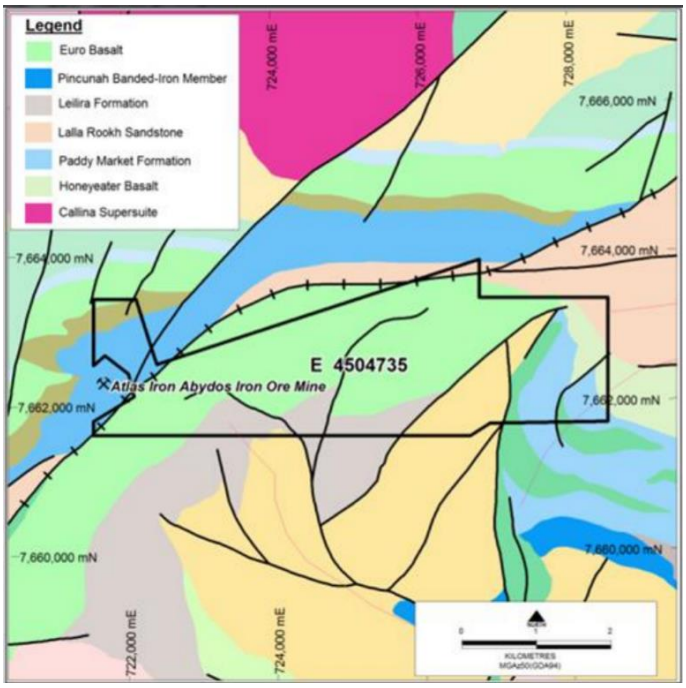
- 17.5m @ 65.49% Fe from 2.5m
- 40.4m @ 55.77% Fe from 3.6m.

The iron-rich mineralisation (>55% Fe) is centred on the J-Hook prospect that contains occurrences of massive, fissile and specular hematite.

# Pilbara Iron Ore Projects – Strelley Gorge – Hematite (E45/4735)

The Strelley Gorge tenement lies within the Lalla Rookh syncline composed of mainly Euro Basalt (A-Kee-b) metamorphosed basalt, komatiitic basalt and serpentinised periodotite. The tenement also contains two banded iron units prospective for DSO iron ore – the Paddy Market Formation on the eastern side and the Cleaverville formation on the west. The latter hosts past iron mining operations of the Abydos project owned by Atlas Iron on the western edge of the tenement. Atlas Iron has also obtained EPA approval to commence the Sandtrax iron ore mine located in the BIF unit towards the north-eastern boundary.

Exhibit 27 – 500k geology of the Strelley Gorge Project




Source: MIO.

**Reconnaissance rock sampling** was conducted by Fe Limited (ASX: FEL) on the outcropping BIF along strike from the previously mined Atlas Abydos project which returned high iron grades (61.3% and 58.11% Fe).

Exhibit 28 – Reconnaissance rock sample results at Strelley Gorge

| STRELLEY Rock Chip Assay Results | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE | Latitude | Longitude | $Al_2O_3$ | Fe | MgO | Mn | P | S | $SiO_2$ | LOI |
| | | | % | % | % | % | % | % | % | % |
| ST002 | 21°7'33.02''S | 119°8'14.99''E | 0.72 | 61.3 | 0.01 | 0.047 | 0.012 | 0.034 | 3.97 | 7.39 |
| ST003 | 21°7'30.83''S | 119°8'15.50''E | 1.38 | 58.11 | 0.05 | 0.099 | 0.152 | 0.008 | 3.6 | 11.21 |

Source: FE Ltd ASX announcement, 5 September 2019.

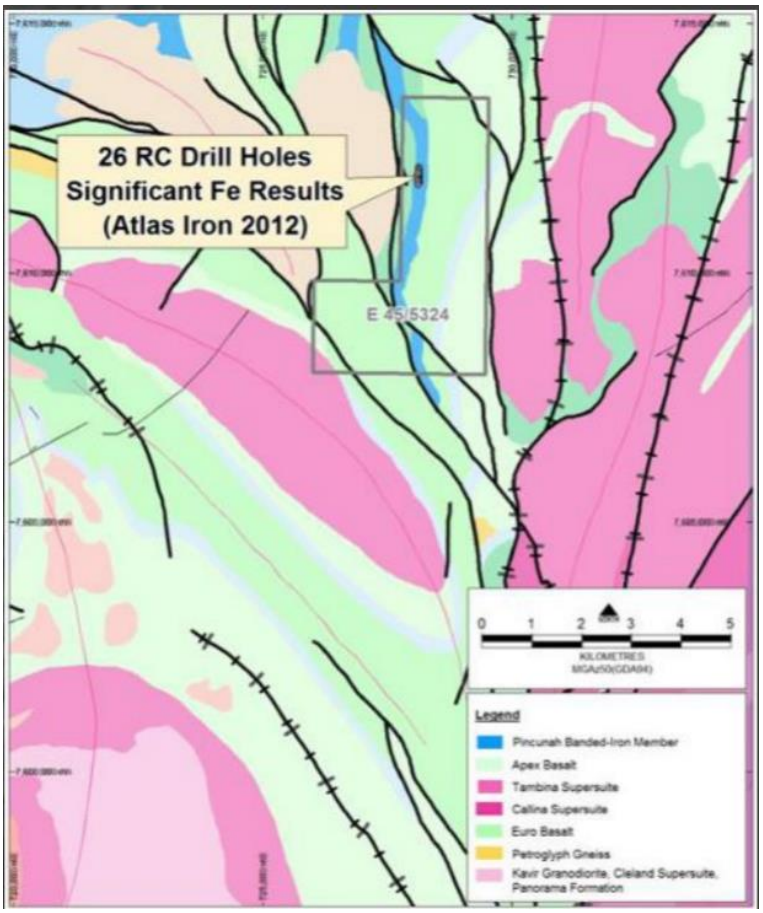
## Pilbara Iron Ore Projects – Tambourah – Hematite (E45/5324)

The Tambourah tenement lies within the Shaw Batholith comprised of the Callina Supersuite (A-CL-mg) – metadiorite to metasyenogranite; massive to gneissic rocks and the Tambina Supersuite (A-TA-mg) – metatonalite and metagranodiorite. The tenement also encompasses approximately 5.5km strike length of the Pincunah Banded Iron member. The Pincunah BIF hosts the iron ore deposits previously mined as part of the Atlas Iron's Mt Webber project 10km to the northeast.

Reporting by Atlas Iron in 2012 highlighted the iron potential of the Pincunah Banded Iron formation within the tenement.

**Drilling history:** Atlas Iron's report 'Mt Webber Project Annual Technical Report (28 September 2012)' was prepared for the Department of Mines and Petroleum. The report outlines how its drilling of the MW08 Prospect returned significant iron results over the 400m of strike that was tested with RC drilling. The drilling recorded significant intercepts in 14 of the 26 drillholes drilled on the MW08 prospect – predominantly within goethite and goethitic haematite.

Exhibit 29 – 500k geology of the Tambourah Gorge Project




Source: MIO.

## Nevada Lithium Project – Reynolds Springs

Macarthur Lithium Nevada Limited (MLN) holds 210 placer claims in the Railroad Valley region of Nevada covering a total area of 17 sq km which has the potential to be a lithium brine prospect. The claims are located near the town of Currant, in Nye Country, Nevada. No specific drilling completed to date has tested and sampled the playa sediments, bedrock and groundwater for their lithium-bearing potential. Soil sampling completed by MIO however strongly suggests that anomalous lithium exists.

### Basic geology

MIO collected a total of 206 soil samples across the full extent of the Reyn`olds Spring Project. Lithium values in the soil samples ranged from a low of 39.3ppm to a high of 405ppm. These results are amongst the highest observed outside of the Clayton Valley and are considered high when compared to the majority of non-lithium producing 'playas'. More exploration work is required on these mining claims to determine the future value potential of lithium on the tenements.

### Infrastructure

Macarthur Reynolds spring project is located approximately 180 miles (300km) North of Las Vegas, Nevada and 330 miles (531 km) southeast of Tesla's new Gigafactory, which has a planned production capacity of 35 gigawatt-hours per year by 2020.

### Recent history

MIO is now looking for a partner to jointly advance the project.

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