

## GULF MANGANESE CORP. LTD (ASX: GMC)

Research Analyst: J-François Bertincourt

### Initiation of Coverage: High Value FeMn Project

**Opportunity:** GMC is capitalising on superior raw material to build the first ferromanganese smelting facility in West Timor. Indonesia is endowed with some of the highest grade manganese ore in the world with grades averaging 48% Mn.

**Infrastructure:** The smelting hub facility is next door to four power plants: two coal-fired power plants (historical 32 MW plant plus recently commissioned 30 MW plant), a 120 MW diesel power ship and a new 40 MW gas-fired power plant in construction. The initial need of the smelting hub facility is 17 MW. Power cost has been negotiated at 8.6 cents/kWh for the next five years. GMC has priority over Kupang City for the delivery of energy. GMC's smelter is 4km from Kupang's port that has both bulk and container loading facilities.

**Permitting:** A Direct Shipping Ore (DSO) licence is in place and historical manganese ore mines are actively progressing through permitting to re-open and supply ore for export or for GMC's smelter. We assumed a debt funding facility of US\$40 million with equal repayments over four years and an 18% p.a. interest rate.

**Funding:** GMC is negotiating with several potential off-takers and debt providers to secure the additional capital to fully fund the completion of the Kupang Smelting Hub Facility.

**News Flow:** News flow is accelerating since GMC received its DSO licence. High grade manganese ore mines are progressing rapidly towards re-start. Positive news on debt funding should act as a strong share price catalyst.

**Fast Track to Production:** Once funding is in place, the time to completion is estimated at 8 months. Refurbished furnaces are already on site as well as most of the key components such as electrical and hydraulic equipment. Producing premium low carbon ferromanganese alloy (85%+ Mn, less than 0.5% C).

**Key Assumptions** include LC FeMn price flat at US\$1,900/t, 49% manganese ore at US\$250/t, two additional furnaces from FY2023 for a total of 4 or 32 MVA, then two more (fully funded by cash flow) for a total of 8 or 50 MVA from FY2028. Our financial model considers only the first 20 years of the project to FY2039.

**Valuation:** Considering the significant added value generated by the smelter and robustness of the project, we consider that GMC should reach a market value in the order of A\$168m million within the next eighteen months or \$0.033 per share.

**Upside:** Beyond the leverage on FeMn alloy prices, further valuation upside can come from increased market recognition of product quality in terms of pricing, additional furnaces beyond the six considered, securing high-grade manganese mineral resources.

### Speculative BUY

#### Share Data

|               |                   |
|---------------|-------------------|
| 52-Week Range | \$0.004 - \$0.024 |
| Share Price   | \$0.007           |
| Price Target  | \$0.033           |

#### Corporate Structure

|   |          |
|---|----------|
| Shares on Issue   | 4,937.8m |
| Options (2¢, 31 <sup>st</sup> Dec 20, 5 <sup>th</sup> Sep 21) | 99.0m    |
| Options (3¢, 31 <sup>st</sup> Dec 2020)                       | 25.0m    |
| Performance Rights (Directors)                                | 63.0m    |
| Performance Rights (Employees)                                | 17.5m    |
| Market Capitalisation   | \$34.6m  |
| Cash (30 <sup>th</sup> June 2019)                             | \$4.0m   |
| Enterprise Value  | \$30.6m  |

#### Board

|                 |                        |
|-----------------|------------------------|
| Craig Munro     | Non-Executive Chairman |
| Hamish Bohannon | Managing Director      |
| Andrew Wilson   | Non-Executive Director |
| Tan Hwa Poh     | Non-Executive Director |
| Ian Gregory     | Company Secretary      |



Gulf Manganese Corp. Ltd is an Australian registered company listed on the Australian Securities Exchange (ASX: GMC) with its head office in Perth, Western Australia. The company, through its 74.9% owned subsidiary PT Gulf Mangan Grup, is building the first ferro manganese (FeMn) smelting hub in West Timor, Indonesia.

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## 1. GMC Valuation

### Asset Summary

*GMC is taking the opportunity to build a ferro manganese smelter to unlock and add considerable value to the high grade manganese mineral resources of Indonesia, subject to an export ban.*

Gulf's key asset is the Kupang Smelting Hub facility currently in construction. Kupang will contain multiple furnaces built in stages over about five years, targeting the production of a premium quality manganese alloy (low carbon ferromanganese). At full production, Gulf will aim to purchase and process over 525,000 tonnes of manganese ore per annum, producing over 200,000 tonnes of premium quality manganese alloy.

For Stage 1 (first two furnaces), GMC will process some 110,000 tonnes of manganese ore per annum, to produce about 43,000 tonnes of premium quality 85%+ ferromanganese alloy.

GMC holds a 74.9% interest in Indonesian subsidiary PT Gulf Mangan Grup. PT Jayatama Tekno Sejatera (PT JTS) holds the remaining 25.1%.

### Project Financing

GMC completed a share placement in May 2019 raising \$3.6 million to advance preparations for Direct Shipping Ore (DSO) operations and to provide additional working capital whilst debt funding and off-take negotiations are finalised.

The cost to complete the smelting facility with the first two furnaces is estimated at US\$13 million, which includes first fill for commissioning. The capital cost for an additional two smelter units is estimated US\$20 million. We assumed that US\$35 million is raised through debt funding.

GMC cash balance was at \$3.983 million as at 30 June 2019.

### Capital Structure

GMC capital structure includes some options (total about 2.5% of the current capital structure) which are due to expire on 31 December 2020 and 5 September 2021. The exercise price of those options is \$0.02 and \$0.03, respectively. The options expiring 31 Dec 2020 have been assumed to be exercised and included in our valuation.

GMC capital structure also includes some performance rights (total about 1.6% of the current capital structure). The performance rights up to 20 December 2020 have been considered and included in our valuation.

#### GMC Capital Structure

| Securities                      | Number               | Price    | Expiry    | Notes                   |
|---------------------------------|----------------------|----------|-----------|-------------------------|
| Shares (30 Jul 2019)            | 4,937,746,998        | \$0.007  |           |                         |
| Unlisted Options                | 25,000,000           | \$0.020  | 31-Dec-20 | Assumed to be exercised |
| Unlisted Options                | 25,000,000           | \$0.030  | 31-Dec-20 | Assumed to be exercised |
| Unlisted Options                | 50,000,000           | \$0.020  | 5-Sep-21  | Not considered          |
| Unlisted Options                | 24,000,000           | \$0.020  | 5-Sep-21  | Not considered          |
| Directors Performance Rights    | 18,000,000           | Expiring | 28-Nov-19 | Included                |
| Employees Performance Rights    | 16,000,000           | Expiring | 28-Nov-19 | Included                |
| Directors Performance Rights    | 31,500,001           | Vesting  | 20-Dec-20 | Included                |
| Directors Performance Rights    | 6,725,083            | Vesting  | 5-Mar-21  | Excluded                |
| Employees Performance Rights    | 1,500,000            | Vesting  | 5-Mar-21  | Excluded                |
| Directors Performance Rights    | 6,725,083            | Vesting  | 5-Mar-22  | Excluded                |
| <b>Total used for valuation</b> | <b>5,053,256,999</b> |          |           |                         |

Source: GMC Appendix 3B 30 July 2019

## Valuation

As part of a sum of the parts valuation, we first valued the Kupang Smelter (and DSO operations) project under different price scenarios.

The Base Case generates a healthy NPV and rate of return.

The smelter valuation sensitivity to operating costs and ferromanganese prices is summarised in the table below.

| Kupang Smelter valuation, post-tax un-risked NPV sensitivity, A\$, 74.9% basis |      |         |                           |      |      |     |     |     |      |       |       |
|--|------|---------|---------------------------|------|------|-----|-----|-----|------|-------|-------|
| NPV  |      |         | Change in Operating Costs |      |      |     |     |     |      |       |       |
|  |      |         | -20%                      | -15% | -10% | -5% | 0%  | 5%  | 10%  | 15%   | 20%   |
| FeMn Price US\$/t  | -20% | \$1,520 | 263                       | 211  | 159  | 105 | 51  | (3) | (62) | (130) | (199) |
|  | -15% | \$1,615 | 330                       | 279  | 227  | 175 | 121 | 67  | 13   | (42)  | (109) |
|  | -10% | \$1,710 | 398                       | 346  | 295  | 243 | 191 | 138 | 83   | 29    | (25)  |
|  | -5%  | \$1,805 | 465                       | 413  | 362  | 310 | 259 | 206 | 154  | 99    | 45    |
|  |      | \$1,900 | 532                       | 481  | 429  | 378 | 326 | 275 | 222  | 169   | 116   |
|  | +5%  | \$1,995 | 600                       | 548  | 496  | 445 | 393 | 342 | 290  | 238   | 185   |
|  | +10% | \$2,090 | 667                       | 615  | 564  | 512 | 461 | 409 | 358  | 306   | 254   |
|  | +15% | \$2,185 | 734                       | 683  | 631  | 580 | 528 | 477 | 425  | 373   | 322   |
|  | +20% | \$2,280 | 801                       | 750  | 698  | 647 | 595 | 544 | 492  | 441   | 389   |

Source: Terra Studio analysis

Thanks to the value add of the smelting process and the low operating and capital costs, the Kupang Smelter presents a viable, robust project, with the NPV being a multiple of the up-front capex in all but the worst cases. This is comforted by the range of excellent Internal Rate of Return obtained in most scenarios as indicated in the table below.

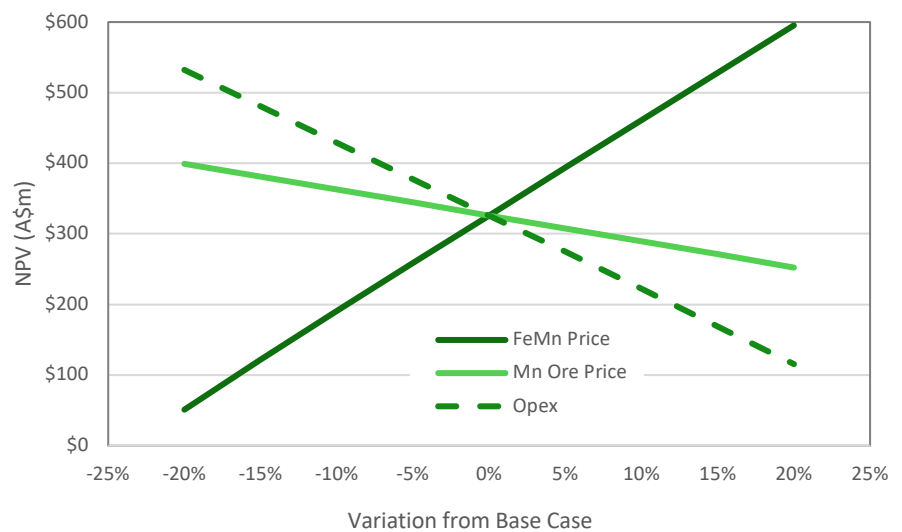
| Kupang Smelter post-tax IRR sensitivity, A\$, 74.9% basis |      |         |                           |       |       |       |       |      |      |      |      |
|---|------|---------|---------------------------|-------|-------|-------|-------|------|------|------|------|
| IRR   |      |         | Change in Operating Costs |       |       |       |       |      |      |      |      |
|   |      |         | -20%                      | -15%  | -10%  | -5%   | 0%    | 5%   | 10%  | 15%  | 20%  |
| FeMn Price US\$/t   | -20% | \$1,520 | 460%                      | 238%  | 129%  | 68%   | 32%   | 6%   | n/a  | n/a  | n/a  |
|   | -15% | \$1,615 | 823%                      | 407%  | 225%  | 129%  | 72%   | 37%  | 13%  | n/a  | n/a  |
|   | -10% | \$1,710 | 1520%                     | 685%  | 368%  | 215%  | 129%  | 75%  | 41%  | 19%  | -3%  |
|   | -5%  | \$1,805 | 3269%                     | 1165% | 591%  | 338%  | 207%  | 128% | 78%  | 45%  | 23%  |
|   |      | \$1,900 | n/a                       | 2120% | 949%  | 523%  | 315%  | 200% | 128% | 81%  | 49%  |
|   | +5%  | \$1,995 | n/a!                      | 4835% | 1573% | 804%  | 472%  | 296% | 194% | 128% | 83%  |
|   | +10% | \$2,090 | n/a!                      | n/a   | 2890% | 1255% | 701%  | 432% | 281% | 189% | 128% |
|   | +15% | \$2,185 | n/a                       | n/a   | 7379% | 2065% | 1047% | 624% | 400% | 268% | 185% |
|   | +20% | \$2,280 | n/a                       | n/a   | n/a   | 3914% | 1611% | 902% | 564% | 373% | 257% |

Source: Terra Studio analysis, some of the extreme IRR values have been omitted.

Further sensitivity analysis is summarised in the Figure 1.1.

The strongest sensitivity relates to ferromanganese prices as expected.

**Figure 1.1 – Kupang Smelter, post-tax un-risked NPV sensitivity**



GMC valuation is most sensitive to FeMn prices as expected.

Source: Terra Studio analysis

Subject to successful construction and commissioning of the smelter in parallel to some manganese ore exports, GMC should reach a market capitalisation in the order of \$168 million or a share price of \$0.033 within 12 to 18 month time.

#### GMC Valuation (12 to 18 month horizon)

| Asset               | Value Range  | Preferred | Risk Factor | Interest        | Per share      |
|---------------------|--------------|-----------|-------------|-----------------|----------------|
| Kupang Smelter      | \$121-\$528m | \$326m    | 90%         | 74.9%           | \$0.044        |
| Exercise of Options |              | \$1.3m    |             |                 | \$0.000        |
| Cash                |              | \$3.0m    |             |                 | \$0.001        |
| Debt                | US\$35m      | (\$51.5m) |             |                 | (\$0.010)      |
| Corporate costs     |              | (\$4.3m)  |             |                 | (\$0.000)      |
| <b>Total</b>        |              |           |             | <b>\$168m *</b> | <b>\$0.033</b> |

Source: Terra Studio. \* market capitalisation

## 2. GMC Corporate Overview

### Strategy

Gulf's strategy is to produce the highest purity, low carbon and medium carbon ferromanganese alloys to fulfil international demand from high grade and specialty steel producers.

Gulf is focused on developing a ferromanganese smelting business in West Timor, Indonesia, with its business partner PT JTS, to produce and sell low carbon ferromanganese alloy. Gulf will own 74.9% of PT Gulf Mangan Grup (PT GMG) with PT JTS owning 25.1% of PT GMG. The Kupang Smelting Hub facility will contain at least six furnaces built in stages over ten years, targeting the production of premium quality manganese alloys.

With four furnaces or 32 MVA, the Kupang Smelter should process 247,000 tonnes of manganese ore per annum to produce 95,000 tonnes of premium quality ferromanganese alloy.

The Kupang Smelter with four furnaces or 32 MVA Smelter at full capacity will produce 95,000 tonnes of premium quality FeMn alloy.

The higher manganese content and lower impurity content of low carbon and medium carbon ferromanganese products achieves premium pricing compared to standard high carbon ferromanganese alloys.

Whilst Indonesia is home to many high-grade manganese deposits the legislation does not allow for the export of untreated ore. As a result, following the implementation of that law in 2012, mining of the manganese ores in Indonesia largely stopped in 2013. The establishment of Gulf's Smelting Hub in Kupang will allow many of these mines to start production again.

Gulf has also progressed with permitting to allow sale and shipment of manganese concentrates (>49% Mn) under the Indonesian provision for smelting and processing companies to sell concentrate during construction to assist with cash flow. A Direct Shipping Ore (DSO) licence is now in place.

*Indonesia manganese ore stands out with the highest grade of manganese combined with very low iron and phosphorous.*

Indonesia manganese ore is one of the highest grade manganese ores available, with a unique combination of very high manganese content, above 49%, combined with low iron and phosphorous. These qualities are in high demand from manganese alloy producers worldwide particularly in China, Korea and India. For the LC ferromanganese alloys, the key markets are mainly Europe and North America, followed the Middle East and South East Asia.

Gulf production facilities in Kupang are ideally located to supply these key markets with access to international container lines and bulk cargo trade routes on its door step.

## Share Register

GMC shares are also tightly held, with the top 20 shareholders representing 48% of the share register. When combined with the Board and management, the total represents in excess of 50% of the share register.

*Top 20 shareholders + Board and management represent in excess of 50% of GMC share register*

### GMC Share Register

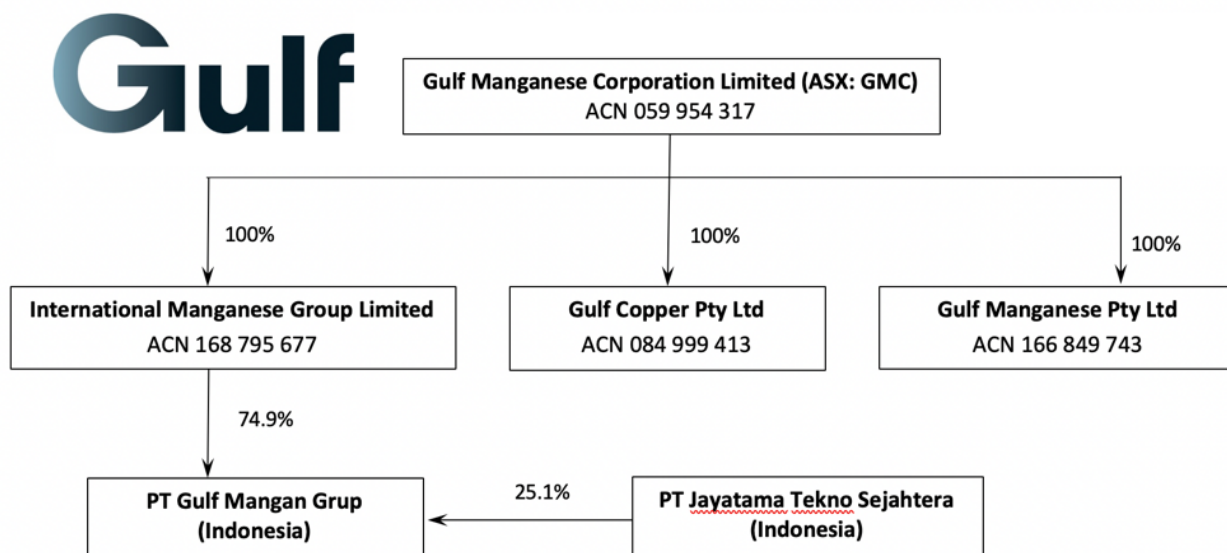
| Entity   | Shares          | % Interest   |
|--|-----------------|--------------|
| Citicorp Nominees Pty Ltd                                | 465.4m          | 9.43         |
| HSBC Custody Nominees (Australia) Ltd                    | 374.6m          | 7.59         |
| PT Jayatama Global Investindo                            | 181.4m          | 3.67         |
| Tan Hwa Poh *  | 152.1m          | 3.08         |
| BNP Paribas Noms Pty Ltd                                 | 149.9m          | 3.04         |
| Eighteen Blue Investments Pty Ltd                        | 133.3m          | 2.70         |
| ABN Amro Clearing Sydney Nominees Pty Ltd                | 126.2m          | 2.56         |
| Tom Hale Pty Ltd   | 98.5m           | 1.99         |
| Ali Santoso Halim  | 83.3m           | 1.69         |
| Sam Boon Beng Lee & Jenny Su Lee Lee                     | 69.9m           | 1.42         |
| John Albert Woodacre                                     | 66.3m           | 1.34         |
| Acuity Capital Investment Management Pty Ltd             | 65.0m           | 1.32         |
| Hamish Bohannan *  | 63.0m           | 1.28         |
| Peter Sheppeard & Associates                             | 62.3m           | 1.26         |
| Kim Yew Lee  | 60.4m           | 1.22         |
| Neil Thompson  | 60.0m           | 1.22         |
| Zhang & Khoe Family Pty Ltd                              | 59.9m           | 1.21         |
| LSG Resources Pty Ltd                                    | 48.0m           | 0.97         |
| Eduardo Siao & Evelyn Siao                               | 45.5m           | 0.92         |
| Arkwright Development Pty Ltd                            | 42.5m           | 0.86         |
| <b>Top 20 shareholders</b>                               | <b>2,407.5m</b> | <b>48.8%</b> |
| Board and Management (including T.H. Poh & H. Bohannan*) | 276.6m          | 5.6%         |
| <b>Total</b>   | <b>2,497.8m</b> | <b>50.6%</b> |
| Total  | 4,937.8         | 100.0%       |

Source: GMC as at 14 August 2019

## Organisational Chart

Gulf Manganese Corporation Limited organisation chart is summarised in Figure 2.1.

Figure 2.1 – Gulf Organisational Chart



Source: GMC

As operations at the Kupang Smelting Hub Facility and associated mines develop, management of the company should progressively move to Kupang.

## 3. Indonesia Country Overview

### Economy and Sovereign Rating

Indonesia has the largest economy in Southeast Asia and is a member of G20.

Indonesia is rated investment grade by the three rating agencies: Fitch, Moody's and S&P; with a stable outlook. Overall the ratings provided by those agencies are equal or better than the ratings provided to Italy or Portugal.

*Indonesia is rated investment grade by the three credit agencies*

*Ratings are equal or better than Italy or Portugal*

### Sovereign Credit Rating: Indonesia, Italy & Portugal

| Agency  | Country   | Rating | Outlook  | Date        |
|---------|-----------|--------|----------|-------------|
| Fitch   | Indonesia | BBB    | Stable   | 14 Mar 2019 |
|         | Italy     | BBB    | -        | 22 Feb 2022 |
|         | Portugal  | BBB    | -        | 24 Mar 2019 |
| Moody's | Indonesia | Baa2   | Stable   | 13 Apr 2018 |
|         | Italy     | Baa3   | Stable   | 19 Oct 2018 |
|         | Portugal  | Baa3   | Stable   | 12 Oct 2018 |
| S&P     | Indonesia | BBB    | Stable   | 31 May 2019 |
|         | Italy     | BBB    | Negative | 26 Oct 2018 |
|         | Portugal  | BBB    | Stable   | 15 Mar 2019 |

Source: Trading Economics.

### Mining Law

Indonesia continues to be a significant player in the global mining industry, with significant production of coal, copper, gold, tin, bauxite, and nickel. Indonesia also continues to be one of the world's largest exporters of thermal coal.



Under the 2009 Mining Law with a new area-based licensing system that is applicable to both foreign and domestic investors and incorporates tendering procedures for granting licences, with the involvement of local and provincial governments, as well as the central government.

Since the ban on the export of unprocessed (or insufficiently processed) mineral ores came into force on 12 January 2014, the Government has issued various implementing regulations to allow mining companies to continue exporting certain types of concentrates, provided that those mining companies have committed to building or supporting the development of processing/refining facilities in Indonesia.

The DSO Licence obtained by GMC is within this regulatory framework.

Based on the Mining Law, there are several terms that are used to describe mining areas, as follows:

- Mining Area (referred to in Bahasa Indonesia as *Wilayah Pertambangan* – “WP”) means a potential area for minerals and/or coal that is not bound by governmental administrative boundaries as part of the national spatial planning;
- Mining Business Area (*Wilayah Usaha Pertambangan* – “WUP”) means a part of a mining area that has already been completed with data, geology potential, and/or information about geology;
- Mining Business Licences (*Izin Usaha Pertambangan*, or “IUP”) are general licences to conduct mining business activities in a WUP area.
- Work Plan and Budget (*Rencana Kerja dan Anggaran Biaya* or “RKAB”) needs to be prepared and submitted annually to the Minister of Energy and Mineral Resources or the Governor. The RKAB needs to be approved to perform any construction, mining, processing and/or refining activities, as well as any transportation and sales activities.

## 4. Manganese Market

### Manganese in Steel Production

90% of all manganese consumed is used in the production of steel

Manganese is the fourth most used metal on earth in terms of tonnage, behind iron, aluminium and copper. It has numerous applications, including objects made of steel, portable batteries, or aluminium beverage cans. In each case manganese plays a vital role in improving the properties of the alloys and compounds involved in each specific application.

Major producers of manganese ore include South Africa, Australia, Gabon, China, Brazil and Ghana. Manganese content typically ranges from 35% to 54% for manganese ore and from 74% to 95% for ferromanganese.

About **90% of all manganese consumed is used in the production of steel**, primarily for its properties as a deoxidizing and an alloying element.

World crude steel production in 2018 was 1.809 billion tonnes, up by 4.6% compared to 2017. Crude steel production increased in all regions in 2018 except in the EU, which saw a 0.3% contraction. China increased its dominant position from 50.3% of global crude steel production in 2017 to 51.3% in 2018.

Steels usually contain from 0.2% to 2% manganese in the form of manganese alloy depending on the grade of steel being produced as manganese is the cheapest alloying element that improves the tensile strength, workability, toughness, hardness and resistance to abrasion. No satisfactory substitute for



manganese in steel has been identified which combines its low cost with outstanding technical benefits.

Stainless steels which represent less than 2% of total world steel production uses chrome and nickel but also contains about 1% manganese. There are also manganese-stainless steels, where nickel is replaced partly or entirely by manganese, giving a manganese content of 4 to 16%, however these are not produced in large quantities, these are known as 200 Series stainless.

### Manganese Alloys

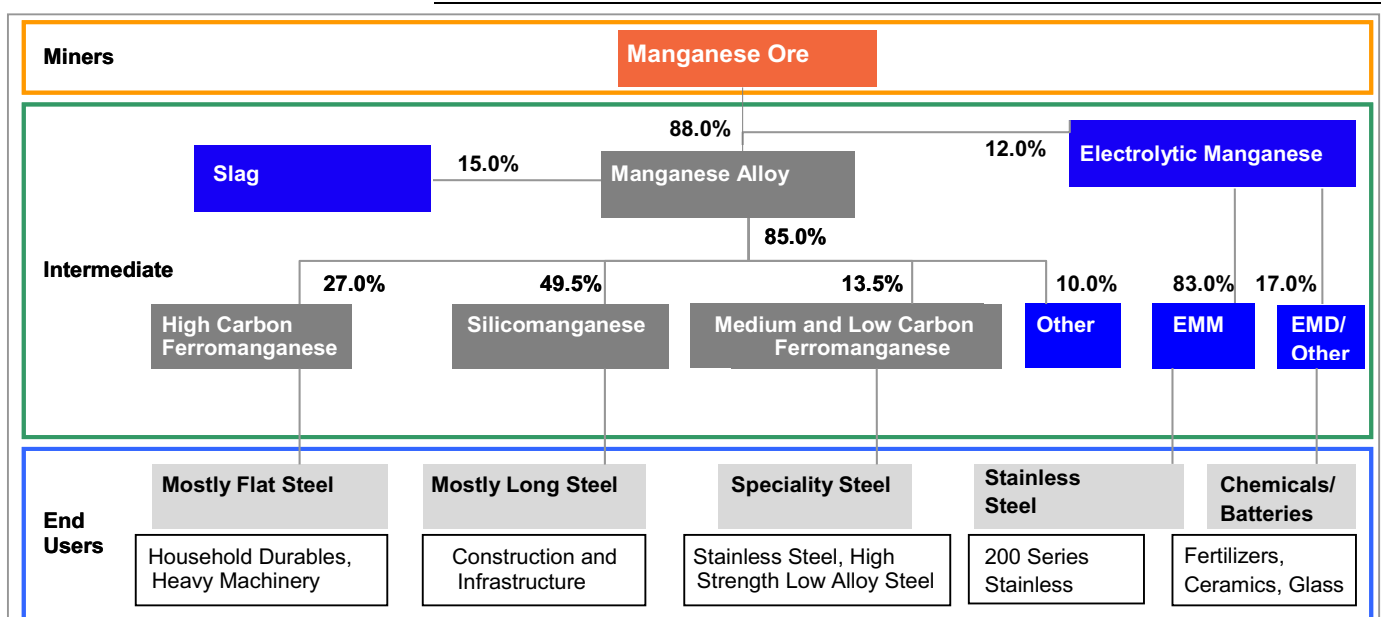
There are two families of manganese alloys called ferromanganese and silico-manganese. Silico-manganese is approximately 60% of overall manganese alloy production and ferromanganese the remaining 40%.

*Manganese alloys are classified and prices according to their Mn content as well as C content*

Ferromanganese, which contains 74-95% manganese, and can be classified into three main sub groups; High Carbon (>2% carbon), Medium Carbon (1.0-2.0% carbon) and Low Carbon (<1% carbon).

Medium and low carbon ferromanganese are commonly referred together as “Refined Alloys”.

**Figure 4.1 – Manganese Value Chain**

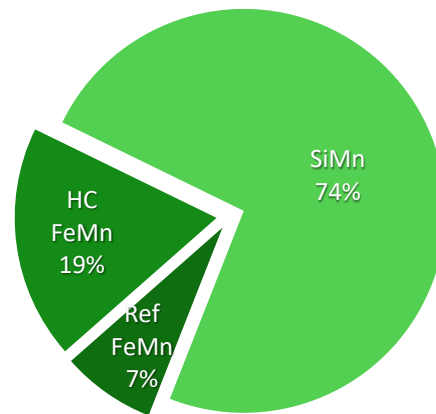


Source: GMC

In 2018, IMnI indicates the following market components of the manganese alloys in terms of volume and uses:

- Silico-manganese (SiMn) 15.959 million tonnes produced, used mainly in lower-grade long steel products, such as rebar for the construction sector in emerging economies
- High carbon ferromanganese (HC FeMn) 4.05 million tonnes, used mainly in flat steel products destined for manufacturing automotive and consumer white goods in developed and emerging economies.
- Refined ferromanganese (Ref FeMn) 1.632 million tonnes, used mainly in higher-grade steels where impurities need to be closely controlled by advanced steelmakers.

**Figure 4.2 –Manganese Alloys Market in 2018**



*The GMC initial production of Ref FeMn is modest and will not trouble the market*

Source: IMnI

Within the Ref FeMn market, GMC production will initially (2 furnaces for 14 MVA) represent 2.6% of the 2018 market.

### Batteries

After steels, the second most important market for manganese (in dioxide form) is for batteries. Manganese dioxide is used as a depolarizer in dry-cell batteries fabrication. Worldwide dry cell consumption exceeds 20 billion units per year. The role of the Mn dioxide is to oxidize the hydrogen and form water. The development of clean energy applications and use in batteries for electric vehicles are seen as significant drivers for future manganese consumption. Manganese could potentially replace the traditional cobalt and nickel as the cathode in a lithium-ion battery:

- Manganese is cheaper and more abundant than both cobalt and nickel;
- Manganese mining is not tainted with ethical issues associated with cobalt mining;
- Research has shown that a manganese-based cathode could potentially store more energy than cobalt or nickel.

For example, BASF has stated that starting in 2021, BASF-designed cathodes will be comprised of 70% manganese and whose end goal is to use 5% or less of cobalt.

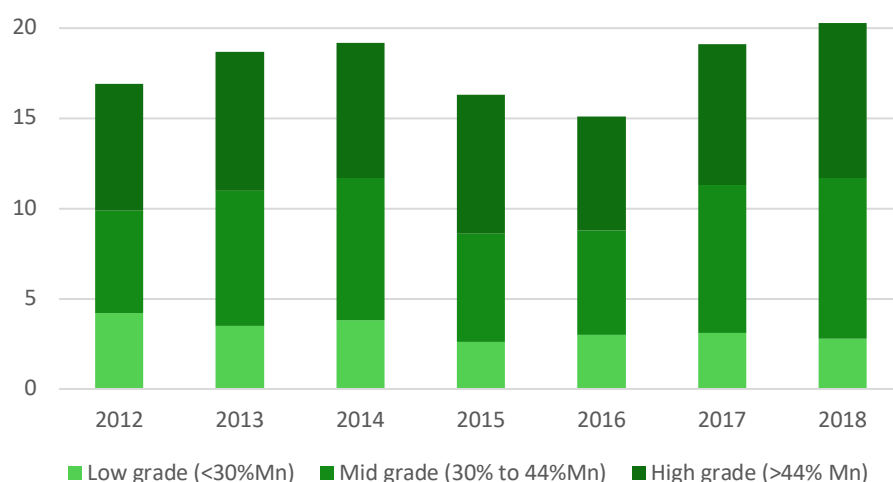
### Other Manganese Uses

Other uses include manganese sulphates as an agricultural fertilizer, in water purification, health vitamins, gasoline additives and colouring glass.

### Manganese Ore

The world's output of manganese ore increased in 2018 for the second consecutive year, on rising demand from manganese alloy smelters. It reached 20.3 million dry mt (Mn contained), up by 6% or 1.2 million dry mt from 2017, exceeding 2014 production of 19.3 million mt and marking a new record high. The additional supply mostly came from Africa and Australia, driven by China, where output decreased because of mine depletion and stricter safety regulations.

**Figure 4.3 – Global Manganese Ore Production**



Source: IMNI

We note that the production of medium and high grade manganese ores have been increasing in line with stronger demand for quality ores.

### Manganese in Indonesia

Indonesia is home to many substantial high-grade manganese deposits, and legislation does not allow for the export of 'untreated' ore.

*Indonesia manganese ore has unique characteristics.*

As a result of this legislation being implemented in 2012, mining of manganese deposits in Indonesia largely ceased in 2013.

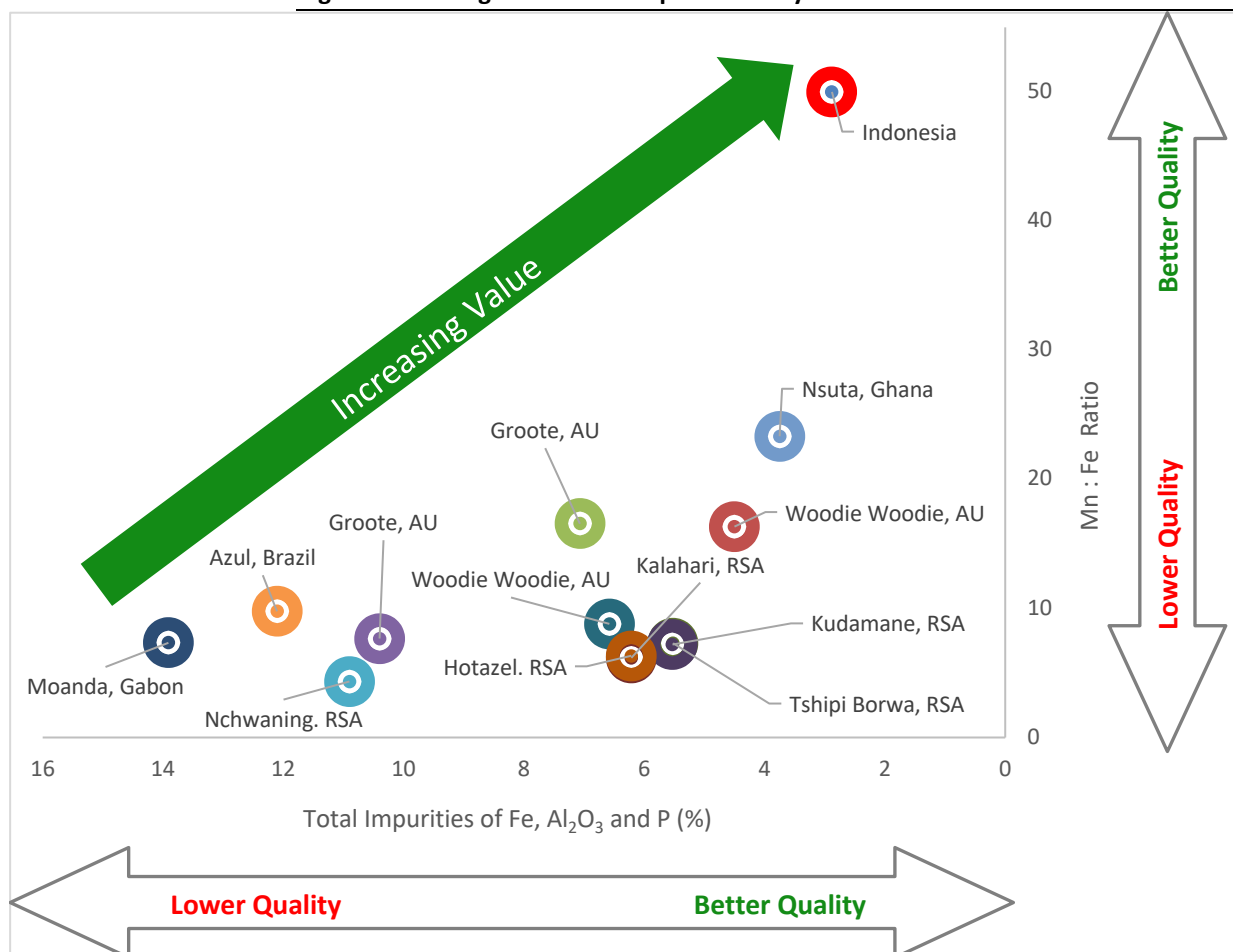
Indonesia manganese ore is one of the highest grade's manganese ores available, with a unique combination of very high manganese content, above 49%, combined with low iron and phosphorous (see Table below). These qualities are in high demand from manganese alloy producer worldwide particularly in China, Korea and India.

**Manganese Ore Typical Specifications**

| Compound                       | GMC         | Eramet - MA | Eramet-MMD | Brazil | MB 44 index | South 32 | RSA Semi-Carbonate | Ghana Carbonate |
|--------------------------------|-------------|-------------|------------|--------|-------------|----------|--------------------|-----------------|
| Mn                             | 50.0%       | 50.0%       | 44.5%      | 44.3%  | 44.0%       | 45.5%    | 36.5%              | 27.5%           |
| Fe                             | 1%          | 3.5%        | 5%         | 4.4%   | 5%          | 6%       | 5%                 | 1.5%            |
| Fe: Mn ratio                   | <b>50:1</b> | 14:1        | 9:1        | 10:1   | 9:1         | 8:1      | 7.3:1              | 18:1            |
| SiO <sub>2</sub>               | 6%          | 4%          | 8%         | 4.7%   | 11%         | 11%      | 6%                 | 14%             |
| Al <sub>2</sub> O <sub>3</sub> | 2%          | 6%          | 8%         | 8%     | 5%          | 6%       | 0.3%               | 2.2%            |
| P                              | 0.08%       | 0.12%       | 0.11%      | 0.11%  | 0.10%       | 0.10%    | 0.03%              | 0.06%           |

Source: Company announcements, GMC.

**Figure 4.4 –Manganese Ore Competitor Analysis**



Source: Company ore specifications. Some may be out of date. AU = Australia, RSA, South Africa

It is Gulf's intention to enable many of Indonesia's high-grade manganese mines to re-start production through the development of the Kupang Smelting Hub Facility, which once in production will produce high purity, low and medium carbon ferromanganese alloys to fulfil international demand from high grade and specialty steel producers.

### Pricing

Manganese ore pricing is principally based on manganese content of the ores with premiums / penalties applied for impurity levels and form of shipment. Ore exported by Gulf will be of significantly higher grade (over 49%) than the quoted grade (44%) and should therefore expect a premium over the quoted price. No premium has been assumed in our financial model.

### Fast Markets / Metal Bulletin

There are two main manganese ore price indexes created by Metal Bulletin:

- 44% Mn ore (CIF Tianjin) representing oxide ores mined in countries such as Australia, Brazil and Gabon and
- 37% Mn ore (FOB Port Elizabeth) representing semi carbonate ore mined in South Africa.

Metal Bulletin index for shipments to China for 44% Mn lump ore was USD\$5.91/dmtu CIF, Tianjin on 12 July 2019 and 37% Mn ore is US\$5.39/dmtu FOB port Elizabeth (2 August 2019).

For example a manganese ore containing 49% Mn will be priced at:

$$US\$5.91 \times 49\% = US\$290/dmt$$

Note this is a conservative price, as the higher the manganese content (and Mn/Fe ratio and lower the impurities), the higher the index price should be. GMC is aiming at progressively getting market recognition for its higher value product.

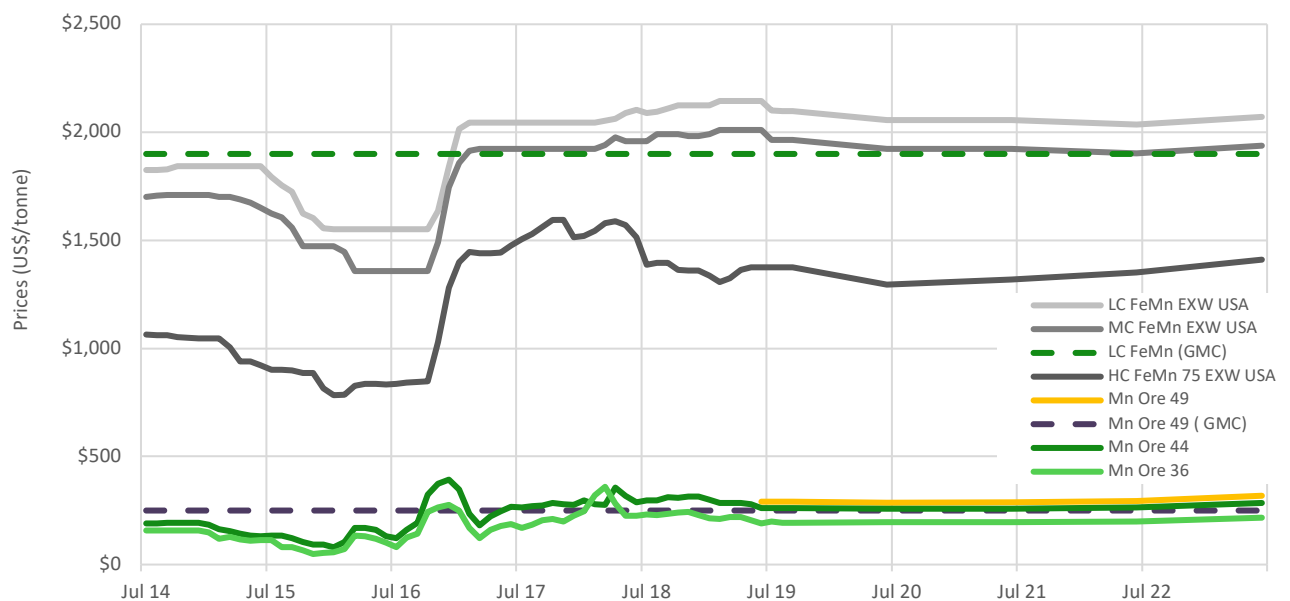
#### Jupiter Mines Limited

As an example, this company publishes the price achieved for its ore sales on a quarterly basis. Based on its latest quarterly report (ended 31 May 2019)<sup>1</sup>, the average price received during the quarter for the sale of 837,531 tonnes of high-grade lumpy ore was \$6.01/dmtu. This compared with \$7.19/dmtu a year earlier and an average of \$6.41/dmtu for the 2018-19 financial year.

#### Historical Prices and Forecast

Figure 4.5 displays historical prices for manganese ore as well as some ferromanganese alloys.

**Figure 4.5 – Manganese Value Chain**



Source: CRU, Metal Bulletin, Terra Studio

#### Price Scenarios

For low carbon ferromanganese, the base case price assumption of US\$1,900/t is conservative as it is lower than the recent and forecasted (CRU) prices for medium carbon ferromanganese.

For high-grade manganese ore (49% Mn) to be exported by GMC, the base case price assumption of US\$250/t is conservative as it is lower than the recent and forecasted (CRU) prices for 44% Mn manganese ore.

<sup>1</sup> Jupiter has a 49.9% beneficial interest in Tshipi é Ntle Manganese Mining Proprietary Limited, which operates the Tshipi Borwa Manganese Mine in the southern portion of the Kalahari manganese field.

Our analysis includes both positive and negative price scenarios around those assumptions. For example for ferromanganese, a -20% scenario represents a price of US\$1520/t, which is the low point touched for less than a year (in 2015-2016) by the LC FeMn price above.

## 5. Manganese Ore

### Mineral Resources Endowment

Manganese deposits are most prolific in eastern Indonesia and typically are associated with

1. Mn nodules in deep-sea (pelagic) sediments,
2. Stratabound ore deposits in mostly red calcareous shales within limestone-dolomite masses; and
3. Hydrothermal replacement of limestone in Volcanic Massive Sulphide (VMS) systems.

Exploration for Mn mineralisation within the Indonesian Archipelago is extensive. Currently, there are 277 exploration concessions (527,180 ha) and 172 mine/production concessions (145,504 ha). The majority of Mn concessions are located on the island of Timor. As of 1 February 2015, there are 171 exploration and 49 mining/production IUPs on West Timor respectively (IUP = *Izin Usaha Pertambangan* or permit to conduct a mining business).

Despite these numbers, only one deposit on the island of Romang (previously held by Robust Resources Limited) has a mineral resource reported in accordance with JORC Code (2012) guidelines.

In 2015, SRK estimated the total tonnage of prospective Mn stratigraphy (covered by IUPs) on West Timor as follows:

#### Total Tonnage of Prospective Mn Stratigraphy, West Timor

| Parameter                         | Mine/Production             | Exploration                  | Total                        |
|-----------------------------------|-----------------------------|------------------------------|------------------------------|
| Total Area of IUP                 | 374 million m <sup>2</sup>  | 1,149 million m <sup>2</sup> | 1,514 million m <sup>2</sup> |
| No. of IUP intersecting Formation | 47                          | 135                          | 182                          |
| Average Area of IUP               | 7.96 million m <sup>2</sup> | 8.44 million m <sup>2</sup>  | 8.32 million m <sup>2</sup>  |
| Average Strike Length             | 2,116 m                     | 2,179 m                      | 2,163 m                      |
| Total Prospective Strike Length   | 99,000 m                    | 294,000 m                    | 394,000 m                    |
| Prospectivity of IUP              | 8,910,000 m <sup>3</sup>    | 26,460,000 m <sup>3</sup>    | 35,460,000 m <sup>3</sup>    |
| Total Ore Tonnage                 | 29 Mt                       | 85 Mt                        | 114 Mt                       |

Source: GMC. Thereafter annually.

Notes: The following parameters and assumptions for the estimation are used:

- Mn ore zone thickness of 3 m (e.g. based on field observations around Kefa);
- Productive strike length of the IUPs calculated as 75% of the average length of the IUP;
- Mine depth of 30 m;
- Bulk density of 3.2; and
- Relatively flat-lying stratigraphy

An assumed 8.1 Mt of ore feed required over a 30 years life represents only 7% of the total ore tonnage estimated by SRK.

### Production History

There is a significant history of manganese ore production in Timor, which was focused on the concentrate export market. However, the legislative change in 2012/2013 prohibited more of the mining operations from continuing.

The production reached about 250,000 tpa on average over 2008-10. This production is well in excess of Gulf's initial requirement and well below the global resource estimated by SRK.

Historical mining practices used minimal earthmoving equipment and handpicking of the coarse ore (nodules and fragments > 30mm), which meets the current market demand, but leave behind the fine ore. Many previous operations have significant stockpiles of fines, estimated at 500,000 t.

Gulf will be able to optimise the manganese resources as the smelting process can use both coarse and fine ores. Gulf is working with a number of parties to develop the optimum technology for extracting the fine ore from the claystone matrix. The potential is substantial as fine ore represents 2/3 of the total ore within each ore zone on average. With a significant density difference between the ore and the claystone matrix (4.0 vs 2.8 on average) the separation process is expected to be fairly simple and low-cost to develop and operate.

### Manganese Ore Sources

Despite the lack of verifiable Mn resources and data in the public domain, West Timor is considered well-endowed for Mn based on geology, Mn occurrences and informal mining activities.

GMC's strategy is to secure ore supply for both the required smelter feed and well as direct export of concentrate from a variety of sources, namely:

- Gulf owned IUP, managed and operated by GMC subsidiary,
- Locally owned IUP's, where ore would be acquired through purchasing contracts,
- Locally owned IUP's, where Gulf would enter a JV with the owner and manage the mining operation, and
- Other manganese ore sources outside of West Timor, namely other islands in NTT, as well as Timor-Leste.

This strategy will allow for better control of price, as well as variety in grade of both manganese and other elements, for the purpose of blending for smelter feed.

*Gulf's manganese ore requirements are well within the production capacity of the region.*

Gulf now has in place Memorandum of Understandings (MoU) with some 19 local manganese mining companies for the supply of about 10,000 tonnes per month of manganese ore to the Kupang facility. These initial agreements will supply Gulf with the required feedstock to commence commercial production. Gulf's ability to negotiate and secure these agreements is a strong testament to the standing and rapport that the in- country team has within the NTT community.

### Manganese Ore Feed Requirements

| Tonnes   | 2020   | 2021    | 2022    | 2023    | 2024     |
|----------|--------|---------|---------|---------|----------|
| Ore Feed | 25,000 | 100,000 | 180,000 | 260,000 | 290,000* |

Source: GMC. Thereafter annually.

GMC requires an ore-feed with emphasis on the ratios of certain chemical elements, in particular, Mn/ Phosphorus and Mn/ Iron. Therefore, low- to high-grade Mn deposits are suitable as ore sources, as beneficiation and blending can be used to obtain the Mn feed specifications for the smelter.



Following the DSO licence approval (for the export of 103,162 tonnes of high-grade manganese ore per year) received by GMC on 20<sup>th</sup> May 2019, several of the possible manganese ore sources in the Nusa Tenggara Timur Province (NTT) have quickly submitted their RKAB (annual work plan and budget applications). These RKABs have been recommended for approval by the ESDM (Ministry of Energy and Mineral Resources). As at 4<sup>th</sup> July 2019, 13 RKABs had been approved and nine were in progress. Approved applications are waiting for final Provincial Government approval.

These mines were forced to close down under Indonesian government's beneficiation policy in 2013, which banned the export of untreated ores. Gulf expects to see productivity from these mines to build incrementally over the coming months as production is gradually ramped-up, along with the utilisation of key logistical and warehousing infrastructure.

### PIJ - Putra Indonesia Jaya Mine

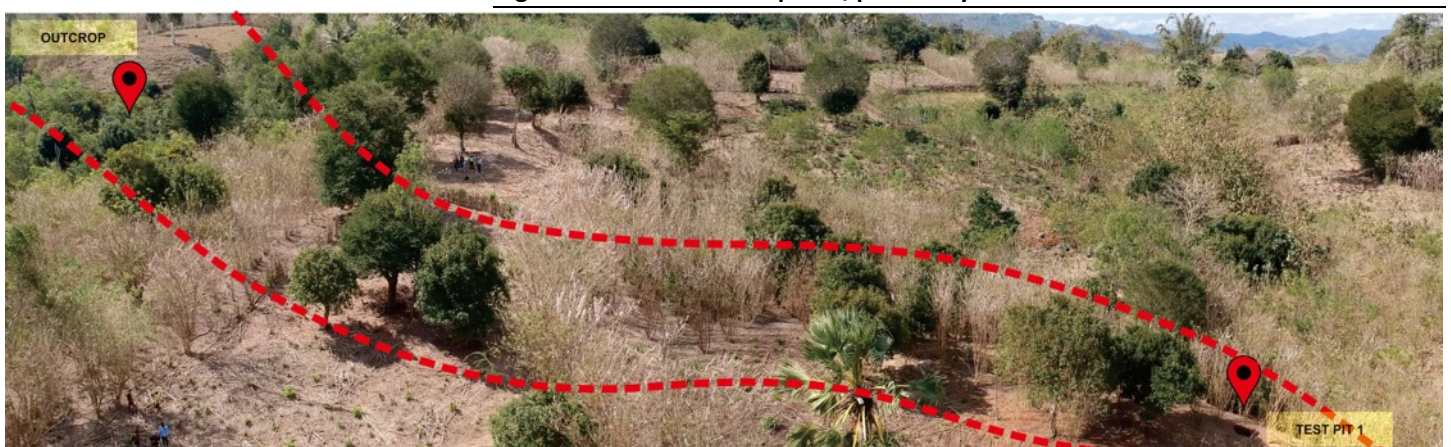
On 4<sup>th</sup> July 2019, GMC announced it had successfully vended the Putra Indonesia Jaya "PIJ" high-grade manganese mine in Timor to its key Indonesian and Singaporean partners. 100% of the ore produced will be supplied to Gulf's operations in Kupang. It is expected that ore supply from PIJ will commence in September 2019 and will steadily increase to about 2,000 tonnes per month by Q1 2020.

This transaction conforms to Gulf's strategy to focus on smelting development and operations rather than mining.

Note as Gulf (through its local subsidiary) hold the permit to export, all the ore has to be sold to Gulf for either export or feed to the Kupang smelting facility.

In the case of PIJ, transferring the ownership and mining operations to a local entity makes perfect sense. PIJ is located very close to a village. It has been mined previously through artisanal methods, whereby a few hundred inhabitants collect manganese nodules with hand tools. While this is labour intensive, it has the benefit to minimise earth movements, undertake ore sorting at the "mine face" and spread financial benefits through the local community.

**Figure 5.1 – One of PIJ Deposits, previously mined**



Source: GMC. Staff members provide a relative scale. The distance between the test pit and the outcrop is estimated at 250m.

The PIJ mine was visited as part of our journey to West Timor. Signs of previous mining activity had basically disappeared thanks to vegetation regrowth. Current evaluation activities consist of pitting and trenching along strike and across strike. Compared to drilling, those methods do not require road access nor water. Furthermore, the manganese mineralisation in the form of layers of nodules strongly folded and faulted, are highly problematic to drill and the lack of representativity of drill samples obtained (nugget effect) has led largely to poor results in the past. A back of the envelope estimate from the Chief Geologist indicates 400,000 t.

**Figure 5.2 – Manganese Nodules Samples and XRF Reading (Mn 58%)**



Source: Terra Studio.

### Mining Operations

Gulf has signed a MoU with PT Bruder, a local mining contractor, to provide contract mining services for the first year, and potentially in the future. At this point, Gulf is open to both the possibility of long-term mining contracts, or leasing/purchasing its own mining fleet aiming at keeping down capital costs and proving operational flexibility prior to making any longer-term commitments.

Gulf is planning a ramp-up of mining and ore purchasing operations, commencing in the second half of 2019. Initial focus will be on ore purchasing, with PIJ coming online by the end of September 2019, followed by others in late 2019/early 2020.

### New NTT Governor

In 2018, a new Governor was elected to lead NTT. During an interview, he made a claim to stop mining activities in NTT, causing uncertainty and loss of confidence in the Gulf project overall. The official decree issued some months later was actually targeting illegal mining. All existing IUP needed to have their documentation verified by the ESDM / Governor evaluation committee to be able to recommence operations if it was in order.

## Exploration and Diversification

**Figure 5.3 – Satellite Map showing Timor-Leste and the East Nusa Tenggara Province**



Source: Terra Studio

To further de-risk the ore supply, GMC is investigating some supply alternatives outside the NTT Province, such as Timor-Leste. On 2<sup>nd</sup> Aug 2019, CMC announced it had entered into an agreement to acquire a strategic 20% interest in Iron Fortune Pty Ltd (“Iron Fortune”), a private Australian-based minerals and exploration company focused on Timor-Leste. This acquisition is an excellent opportunity to diversify its asset base beyond the NTT Province and Indonesia while remaining in the same geological region, where similar high grade manganese is likely to be sourced. According to the terms of the agreement GMC can earn up to 100% of Iron Fortune in line with various milestones. Timor-Leste is progressing its Mining Act, which is a condition precedent to get Exploration Leases granted. In the meantime, field reconnaissance has identified on surface high grade manganese mineralisation with similar characteristics to mineralisation found across the border.

### DSO operations

On 15<sup>th</sup> May 2019, GMC received its final ratification and formal receipt of its Direct Shipping Ore (DSO) licence from the Ministry of Trade.

The licence will allow GMG to export up to 103,162 tonnes of high-grade (+49%) manganese ore per year. Gulf’s DSO will be in high demand due to its high manganese content and low impurities and very high manganese to iron ratio and as such should command a premium price over lower grade ores.

Final preparations are currently being made to commence initial ore supply from Sumbawa, with first ore expected to be loaded in containers and transported to Kupang for processing before the end of this quarter.

With regard to sourcing additional ore, some twenty two mines have responded to the granting of our DSO export permit by completing their RKAB applications to the NTT Ministry of Energy and Mineral Resources (ESDM) to recommence mining operations. These mines were forced to close down under Indonesian government’s beneficiation policy in 2013, which banned the export of untreated ores. Gulf expects to see the productivity of these mines build



incrementally over the coming months as production is gradually ramped-up, along with the utilisation of key logistical and warehousing infrastructure.

Of these 22 applications, 13 have been approved by EDSM with a further nine in process. Approved RKAB applications are now waiting for final approval from the Provincial Government.

Following an initial shipment of about 100 tonnes to test the logistics route from the mine to market, GMG expects monthly exports to commence at 1,000 tonnes per month and ramp up to 10,000 tonnes per month by Q1 2020. This ramp-up in operations will be supported by supply of additional ore from the PIJ mine which is anticipated to come online in September.

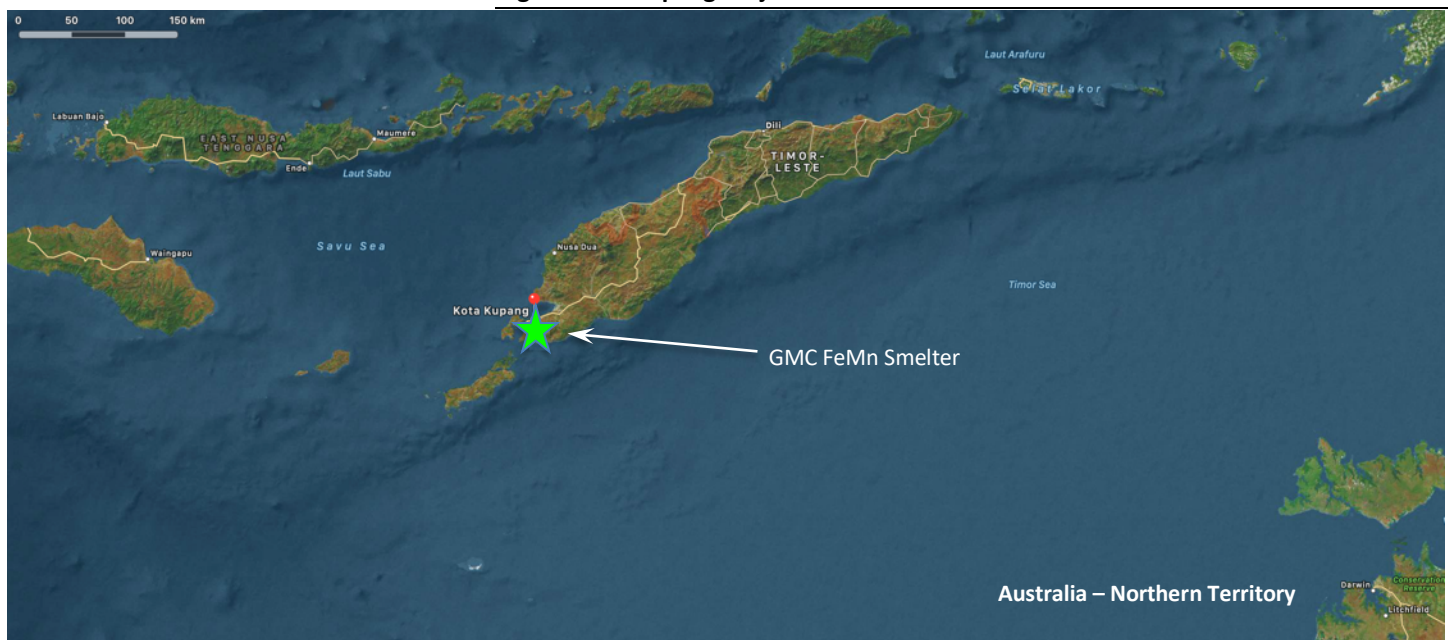
## 6. Kupang Smelting Hub Facility

### Location and infrastructure

The Kupang Smelter is ideally located on Timor Island where the majority of the Indonesian high grade manganese mineralisation occurs.

The Kupang Facility is also ideally located to supply key global markets with direct access to international container lines and bulk cargo trade routes on its door step.

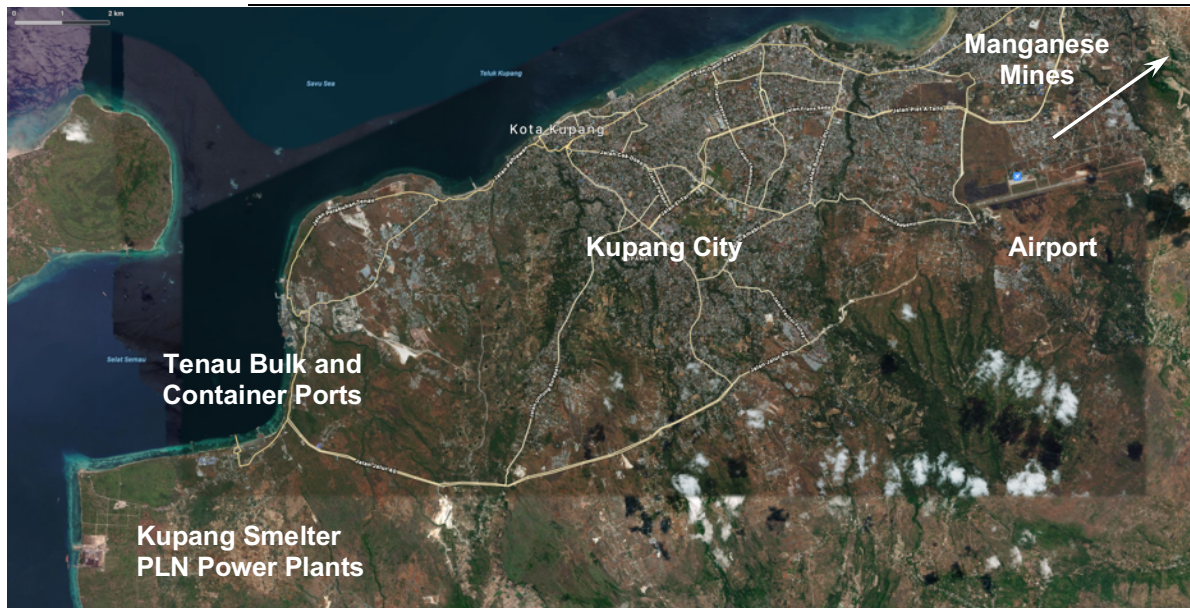
**Figure 6.1 – Kupang Project Location**



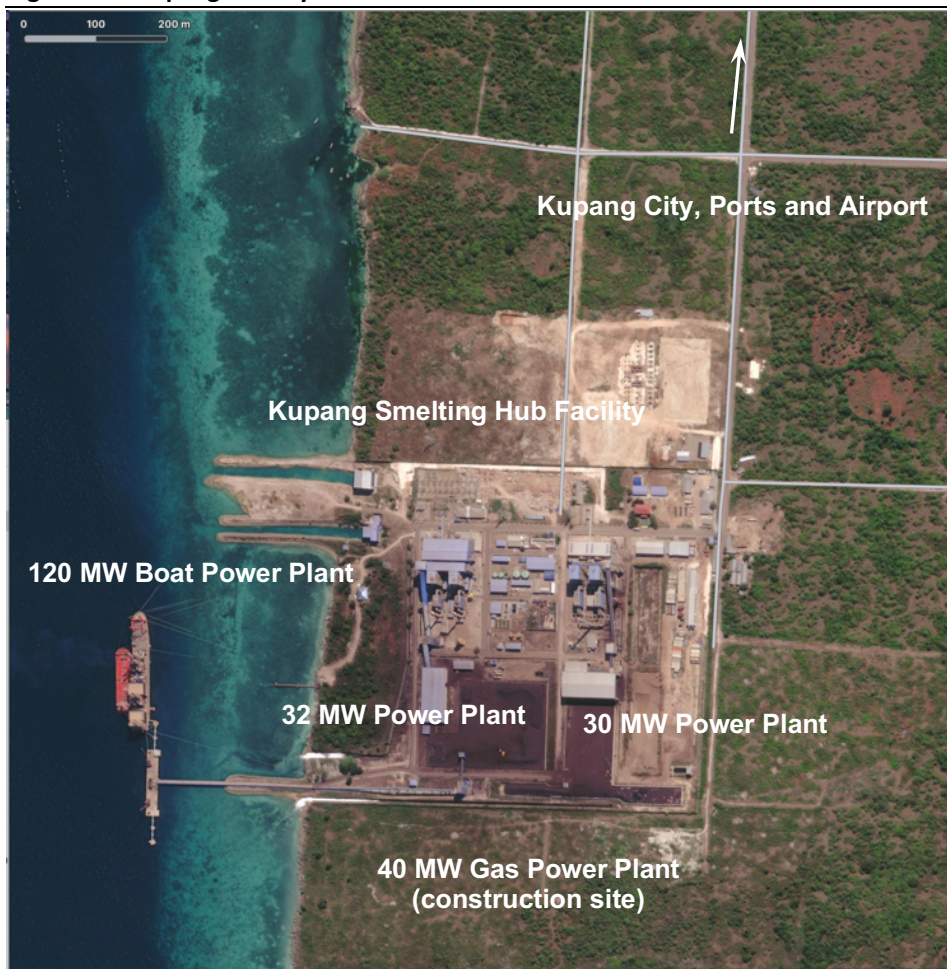
Source: Apple Maps. Eastern Indonesia including the East Nusa Tenggara Province

The largest industry in the NTT Province is cement manufacture and associated limestone mining, including illegal mining.

**Figure 6.2 – Kupang Site Regional Plan**



**Figure 6.3– Kupang Site Layout**



Source: Terra Studio



**Figure 6.4– Tenau Port (4km north-east of the Kupang Smelter)**



Source: GMC

### Development Timeline

The Kupang Smelter development timeline is summarised as follows:

- July 2017: smelter refurbishment commences in South Africa
- August 2017: dismantling of smelter equipment
- January 2018: furnace equipment containerized in South Africa and concrete slabs poured in Indonesia
- April 2018: concrete foundations completed
- May 2018: smelters transported by road to Durban for shipping to Kupang
- Aug 2018: smelters arrival at Tenau Port, Kupang and start of smelter reassembly
- Sep 2018: new Governor of NTT Province calling a moratorium on all mining activities
- Oct 2018: A\$10.8 cornerstone investment not proceeding due to uncertainty created by moratorium on mining activities. Construction halted.
- May 2019: Gulf secured its DSO licence to export up to 103,162 tonnes of high-grade manganese ore per year

At this time, and based on purchase orders made and the level of engineering work undertaken by XRAM (the EPCM contractor) the project is 60% complete.

Subject to financing, the smelter construction with the first two furnaces can be completed in about eight months.

### Land Lease

The Kupang Smelting Hub site is situated on the Bolok Industrial Estate, directly adjacent to the government-owned power station. Gulf has successfully finalised rental terms for the Bolok land lease covering the initial 10 hectares out of 35-hectare project site, and as part of the agreement, Gulf paid five years' rent in advance to the Government of East Nusa Tenggara Province.

### Power Supply

The Indonesian state-owned electricity company PT *Perusahaan Listrik Negara* (PLN) owns and operated a power plant complex which shares a boundary with the Kupang Smelter site. The power plant complex is made of:

- A 32 MW coal-fired power plant
- A floating diesel power plant contracted to supply 60 MW, but has a capacity of 120MW
- A recently commissioned 30 MW coal fired power plant

Hence the total power available currently in the West Timor power network is 182 MW however only 152 MW is utilised. The current peak load for West Timor is 70 MW, so there is a spare 82 MW available. With an annual consumption growth of 10% and further expansion plans (40 MW gas-fired power plant) by PLN on West Timor, there are no power issues for the Kupang Smelter in the foreseeable future.

In April 2018, Gulf executed a five-year contract with PLN which guarantees the provision of up to 20 MVA power supply, with an energy cost of 8.6 ¢/kWh. As a premium customer, Gulf is guaranteed power supply in a load shedding event, which is critical to maintaining consistent operations during periods of power reduction.

### Environmental and Building Approvals

In January 2018, Gulf receiving the Environmental License approval from the Environmental Department of the Provincial Government Kupang, for the development of the Kupang Smelting Hub Facility. The IMB Licence (Building Permit) was also granted at that time.

### Permitting

In August 2018, PT Gulf received its Operating Licence for the Kupang Smelting Hub Facility. The Operations Permit is valid for 30 years for the buying, selling and transporting of manganese ore within Indonesia for smelting, and to conduct overseas sales of ferromanganese alloy in accordance with the provisions of the laws and regulations in Indonesia.

In May 2019, GMC received final ratification and formal receipt of its Direct Shipping Ore Licence (DSO) from the Ministry of Trade, this follows the related approval for the DSO from the Ministry of Energy and Mineral Resources a week earlier.

### Kupang Smelter Raw Materials

As well as manganese ore, the Kupang smelter requires the following raw materials, based on the first two furnaces:

#### Kupang Raw Materials Requirements

| Raw Material    | tpa     |
|-----------------|---------|
| Manganese Ore   | 112,000 |
| FeSi 75%        | 14,071  |
| Burnt Lime      | 29,422  |
| Electrode Paste | 949     |

Source: GMC

### Construction

Positive discussions continue with several potential offtake partners and debt providers to secure the requisite capital to fully fund the completion of the Kupang Smelting Hub Facility construction program. Following recent discussions, it is anticipated that construction activity will recommence once the



appropriate funding has been secured, with commissioning of the first two smelters remaining on target for June quarter 2020.

### Processing

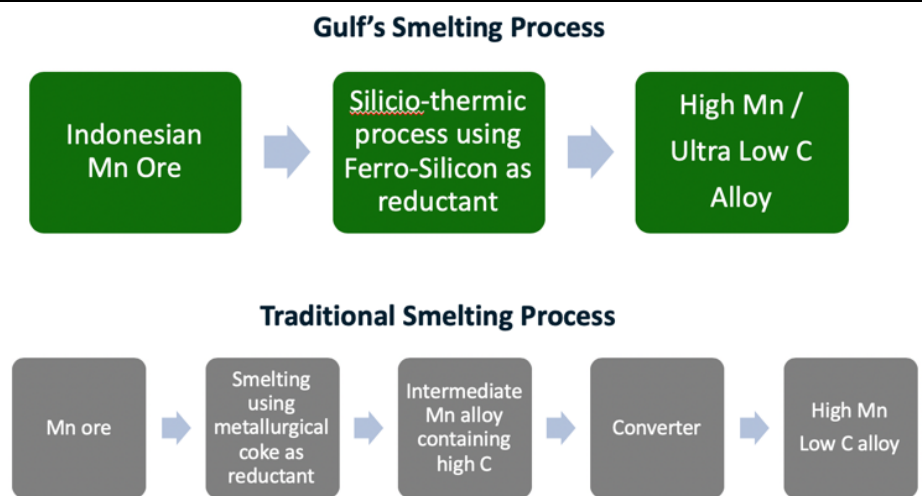
Thanks to a high manganese content and a very high Mn:Fe ratio, the smelting process can be simplified using ferro-silicon as a reductant, rather than coke. The use of coke results in an intermediate manganese alloy containing high carbon, which has to be removed using an additional converter step.

Gulf's silicothermic process is summarised in Figures 6.5 and 6.6.

The silicothermic process is used occasionally by other smelters, subject to the availability of adequate manganese ore.

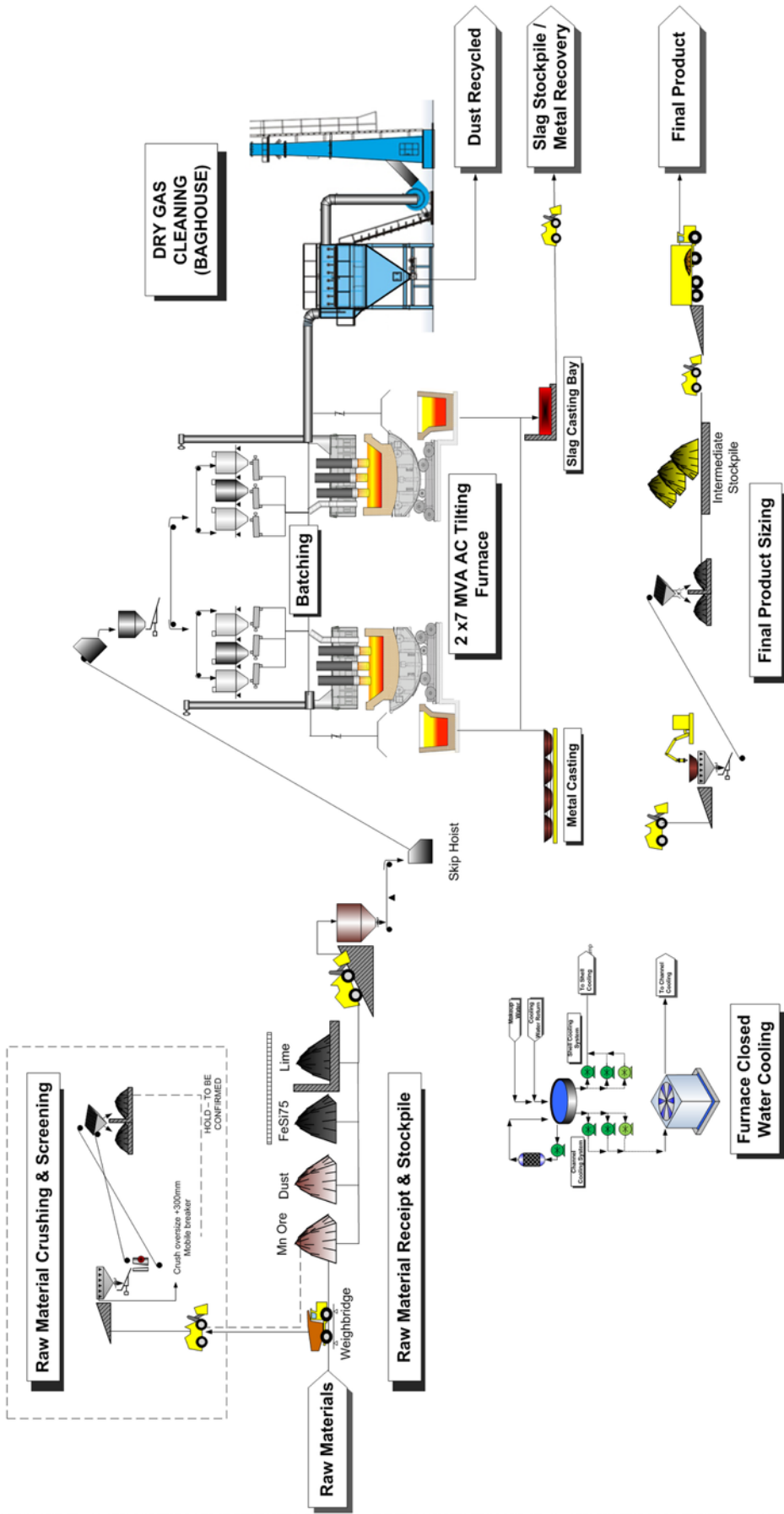
*The silicothermic process is commonly known but its use is restricted by the availability of adequate manganese ore*

**Figure 6.5 – Comparison between Silicothermic and Traditional Smelting Processes**



Source: GMC

Figure 6.6 – Kupang Process Flow Chart



Source: GMC

The raw materials (manganese ore, ferro-silica, and burnt lime) are loaded into the 2 x 3 feed bins using the skip host. From the feed bins, the raw materials are weighted and fed into the furnaces or to the ladles (ferro-silica) using a conveyor. The burnt lime is used to lower the overall melting point and to fluidise the slag so it goes to surface more easily.

Furnaces can be topped up as required. Electrode paste is continuously fed to re-generate the 15m long electrodes. The temperatures reached in the furnace are 1,800 to 2,200°C. A pour is scheduled every two hours. Melted metal is poured into ladles containing ferro-silica. Slag is removed by slight tipping and ladles are poured into each other to assist the chemical reactions while temperatures remained above 1,490°C. Within half an hour, the ferromanganese alloy is cast into the casting bays. The ferromanganese alloy is left to cool at ambient temperature, while the slag is cooled with water.

Once cooled, the ferromanganese alloy, which is brittle, can easily be packaged in bulk bags and containers for export. Ferromanganese is a lumpy material with a silvery metallic surface.

| Process Plant Products         |          |          |
|--------------------------------|----------|----------|
| Product                        | Tonnes   | Analysis |
| MC FeMn Alloy                  | 41,265 t |          |
| Mn                             |          | 86.7%    |
| Fe                             |          | 10.9%    |
| Si                             |          | 1.9%     |
| C                              |          | 0.29%    |
| P                              |          | 0.22%    |
| S                              |          | 0.02%    |
| Slag                           | 80,755 t |          |
| MnO                            |          | 27.7%    |
| Al <sub>2</sub> O <sub>3</sub> |          | 2.2%     |
| SiO <sub>2</sub>               |          | 32.1%    |
| CaO                            |          | 35.1%    |
| MgO                            |          | 1.0%     |

Source: GMC

## Capital Costs

The cost to complete the first two smelter units including refurbishment and installation as well as the working capital to ramp up the operation has been estimated at US\$15 million.

We assumed that the additional two smelter units can be purchased and installed for a capital cost of US\$20 million over financial year 2022 (FY2022). Our financial model considered an additional two furnaces for a capital cost of US\$22 million over FY2024.

| Preproduction Capital Cost Estimates                |               |
|---|---------------|
| Item  | Amount        |
| First two smelter units (currently being installed) | US\$15m       |
| Additional two smelter units FY 2022                | US\$20m       |
| Additional two smelter units FY 2024                | US\$22m       |
| Sustaining Capital                                  | US\$0.5m/year |

Source: Terra Studio analysis

## Operating Costs

See Financial Assumptions section further below.

## Commissioning

Gulf has appointed Steven Pragnell (see section 7) as President Director, Commissioning and Technical Director to work closely with XRAM Technologies (the EPCM contractor) to ensure successful delivery of the plant. XRAM Technologies will assist the transition into operations by providing commissioning engineers.

## Production

At full production, the first two furnaces will process some 112,000 tonnes of manganese ore per annum, to produce about 43,000 tonnes of premium quality 85%+ ferromanganese alloy.

## Port Access

Arrangements have been confirmed so that Gulf can utilise high quality port infrastructure located at the Port of Tenau Kupang for both bulk and container loading.

## Financial Assumptions

In its February 2019 corporate presentation, GMC provided a number of physical and financial parameters summarised in the table below. Revenues and costs are basically proportional to the smelter throughput.

| Assumptions and Key Financial Parameters    |             |              |              |              |              |             |
|---|-------------|--------------|--------------|--------------|--------------|-------------|
| Kupang Smelter Hub Facility                 |             |              |              |              |              |             |
| Furnaces (+ additional)                     | 2 x 7       | + 2 x 9      | +2 x 9       | + 2 x 9      |              |             |
| Total Installed Capacity                    | 14          | 32           | 50           | 68           |              |             |
| Mn Ore Purchased                            | 112,000 tpa | 247,000 tpa  | 385,000 tpa  | 524,000 tpa  |              |             |
| FeMn Alloy Sold                             | 43,000 tpa  | 95,000 tpa   | 148,000 tpa  | 201,000 tpa  |              |             |
|   | US\$m       | US\$m        | US\$m        | US\$m        | US\$/t       | %           |
| Manganese Ore                               | 19.3        | 42.5         | 66.2         | 90.1         | 448          | 33%         |
| FeSi 75%                                    | 17.6        | 38.9         | 60.6         | 82.3         | 409          | 30%         |
| Burnt Lime                                  | 2.1         | 4.6          | 7.2          | 9.8          | 49           | 4%          |
| Electrode Paste                             | 0.6         | 1.3          | 2.1          | 2.8          | 14           | 1%          |
| Power                                       | 7.0         | 15.5         | 24.1         | 32.7         | 163          | 12%         |
| Salaries/Wages                              | 1.7         | 3.8          | 5.9          | 7.9          | 39           | 3%          |
| Laboratory                                  | 0.4         | 0.9          | 1.4          | 1.9          | 9            | 1%          |
| Smelter Consumables                         | 2.0         | 4.4          | 6.9          | 9.3          | 46           | 3%          |
| Logistics                                   | 0.7         | 1.5          | 2.4          | 3.3          | 16           | 1%          |
| Maintenance                                 | 1.0         | 2.2          | 3.4          | 4.7          | 23           | 2%          |
| Fuels/Oils                                  | 0.1         | 0.2          | 0.3          | 0.5          | 2            | 0%          |
| Environmental                               | 0.1         | 0.2          | 0.3          | 0.5          | 2            | 0%          |
| <b>Smelting (excluding Mn Ore Purchase)</b> | <b>33.3</b> | <b>73.5</b>  | <b>114.6</b> | <b>155.7</b> | <b>775</b>   | <b>57%</b>  |
| General & Administration                    | 2.1         | 4.6          | 7.2          | 9.8          | 49           | 4%          |
| Sales & Marketing                           | 3           | 6.6          | 10.3         | 14           | 70           | 5%          |
| Overheads                                   | 0.4         | 0.9          | 1.4          | 1.9          | 9            | 1%          |
| <b>Total Overheads</b>                      | <b>5.5</b>  | <b>12.1</b>  | <b>18.9</b>  | <b>25.7</b>  | <b>128</b>   | <b>9%</b>   |
| <b>Total Operating Costs</b>                | <b>58.1</b> | <b>128.1</b> | <b>199.7</b> | <b>271.5</b> | <b>1,351</b> | <b>100%</b> |
| Revenue                                     | 81.7        | 180.5        | 281.2        | 381.9        | 1,900        |             |
| <b>Net Operating Margin</b>                 | <b>23.6</b> | <b>52.4</b>  | <b>81.5</b>  | <b>110.4</b> | <b>549</b>   |             |

Source: GMC Scoping Study ASX announcement 11 Apr 2019. Note those financial parameters do not include DSO revenues and costs.

Ferromanganese exports are subject to a 2.5% income tax. There is also a 2.5% royalty to GMC's partner JTS Group for alloy sales from the first two smelters. The corporate tax rate in Indonesia is 25%.

### Financial Modelling

The table summarises the results of the financial model. Financial years from 2025 to FY2027 are identical in terms of revenues and costs to FY2024. Financial years beyond FY2028 are identical in terms of revenues and costs.

The project funding is assumed through a US\$35m debt facility with equal repayments over three years to FY2023, with an interest rate of 18%. Sustaining capital is assumed to amount to US\$0.5m per annum. No earned interest assumed over the increasing cash balance.

Manganese ore sales have been assumed to terminate in FY2024.

#### Financial Model Summary

| PHYSICAL                            | FY2020   | FY2021    | FY2022    | FY2023    | FY2024[   | [...] | FY2028    |
|-------------------------------------|----------|-----------|-----------|-----------|-----------|-------|-----------|
| Smelter Units                       | 2        | 2         | 2         | 4         | 4         |       | 6         |
| Total Installed Capacity            | 14 MVA   | 14 MVA    | 14 MVA    | 32 MVA    | 32 MVA    |       | 50 MVA    |
| Mn Ore Purchased                    | 50,000 t | 215,162 t | 215,162 t | 350,162 t | 247,000 t |       | 385,000 t |
| Mn Ore Sold (DSO) @ US\$250/t       | 35,000 t | 103,162 t | 103,162 t | 103,162 t | -         |       | -         |
| Smelter Feed                        | 10,000 t | 112,000 t | 112,000 t | 247,000 t | 247,000 t |       | 385,000 t |
| FeMn Alloy Sold @ US\$1,900/t       | 3,846 t  | 43,000 t  | 43,000 t  | 95,000 t  | 95,000 t  |       | 148,000 t |
| FINANCIAL SUMMARY                   | US\$m    | US\$m     | US\$m     | US\$m     | US\$m     |       | US\$m     |
| Net Revenue after royalties and tax | 15.7     | 103.4     | 103.4     | 199.5     | 173.7     |       | 271.8     |
| Operating Costs                     | (12.1)   | (75.9)    | (75.9)    | (146.2)   | (128.5)   |       | (200.2)   |
| Operating Margin                    | 3.6      | 27.5      | 27.5      | 53.3      | 45.3      |       | 71.7      |
| Net Cash Flow                       | (2.5)    | 6.9       | 2.9       | 38.9      | 33.6      |       | 53.4      |
| Cash at Bank                        | 35.5     | 65.4      | 79.4      | 118.2     | 151.8     |       | 289.4     |
| Capital Cost                        | (3.0)    | (13.0)    | (20.5)    | (0.5)     | (0.5)     |       | (0.5)     |
| NPV @10% GMC 74.9% interest         | A\$293.9 | A\$326.1  | A\$351.1  | A\$383.0  | A\$378.4  |       | A\$400.6m |

Source: Terra Studio analysis

Net cash flows have been discounted with a discount rate of 10% and a A\$/US\$ exchange rate of 0.68 has been assumed to derive the NPVs.

## 7. Directors & Management Team

### Craig Munro, Non-Executive Chairman

Craig is a qualified accountant and was previously a Fellow Certified Practising Accountant, Fellow of the Australian Institute of Mining and Metallurgy and a Fellow of the Institute of Company Directors. He has over 35 years' experience with ASX, AIM and TSX listed companies as Chairman, Finance Director and General Manager, and in positions relating to corporate governance, financial reporting and equity raisings.

Craig started his career in the iron ore industry and has added a number of success stories to his CV including Aquarius Platinum and Anvil Copper.

### Hamish Bohannon, Managing Director & CEO

Hamish holds an Honours Degree in Mining Engineering from the Royal School of Mines UK and a MBA from Deakin University. He has extensive corporate and

operational experience in public companies within Australia and overseas in the capacity of Managing Director or CEO.

Hamish has built a career developing exciting projects around the world and has a reputation for high standards in community liaison, environmental excellence and developing a safety culture.

#### **Andrew Wilson, Non-Executive Director**

Andrew, a Bachelor of Commerce (Marketing) and a Master of Laws, has over 30 years' of legal experience, including 16 years with BHP where he was President Director PT BHP Billiton Indonesia from 2000 until 2007.

Andrew has been a director of various public companies, including: Herald Resources Ltd, Robust Resources Ltd, PT Resource Alam Indonesia TBK, and director or chairman of various not for profits. He is a Fellow of both the Australian Institute of Company Directors and the Australasian Institute of Mining and Metallurgy, and a member of the Risk Management Institution of Australasia..

#### **Tan Hwa Poh, Non-Executive Director**

Mr Tan Hwa Poh works as a private business consultant, essentially bridging businesses between Singapore, Indonesia, Thailand and Hong Kong. His strengths lie in liaising with the respective country's government departments and embassies, helping to reduce the effect of "red tape" and bringing together the business and government sectors to create efficient and lasting partnerships. Concurrently, Mr Tan Hwa Poh is the Business Development agent for his family's group of hotels located across the Asia Pacific region. In addition to his business development activities in Asia, he is passionate about developing meaningful jobs and improving conditions for those less fortunate. As such, he is fully committed to the construction of temples, hospitals and 911 highway rescue teams across Thailand.

#### **Robert Ierace, CFO**

Robert is a Bachelor of Commerce and Chartered Accountant and Secretary with over 20 years' experience, predominantly with ASX and AIM listed resources, oil and gas exploration and production companies. He has extensive experience in financial and commercial management including experience in corporate governance, debt and capital raising, risk management, treasury management, insurance and corporate acquisitions and divestment. Robert has previously served in senior financial roles for various resource and oil and gas companies, including Bullseye Mining Limited, Key Petroleum Limited, Amadeus Energy Limited, Kimberley Diamond Company NL and Rio Tinto Iron Ore.

#### **Ian Gregory, Company Secretary**

Ian previously acted as Gulf's Company Secretary between 2 July 2018 until 20 November 2018 and is a professionally well-connected Director and Company Secretary with over 30 years' experience in the provision of company secretarial and business administration services. Ian holds a Bachelor of Business degree from Curtin University and is a Fellow of the Governance Institute of Australia, the Financial Services Institute of Australia and a Member of the Australian Institute of Company Directors. Ian currently consults on company secretarial

*The Directors have strong backgrounds in mineral exploration, project development, finance and accounting, with considerable Indonesian experience.*

and governance matters to several listed and unlisted companies and is a past Chairman of the Western Australian Branch Council of Governance Institute of Australia.

### Peter Allen, General Manager Marketing

Peter is an experienced Marketing Executive with over 20 years' sales and marketing experience in the commodity export, sales and bulk logistics industries. He has held senior executive positions, including General Manager, Director and Managing Director of Marketing roles with various companies, including Consolidated Minerals. Peter has developed a significant network within Asia in the steel raw material sector.

*The experience and track record of Steven Pragnell is quite impressive.*

### Steven Pragnell, President Director / Commissioning Director

Steve spent 6 years in the Royal Australian Air Force and is a commercial helicopter pilot. He has over 30 years' experience in various positions in operations, maintenance and senior management within the mining and smelting sectors. Steve has vast experience in smelter design and commissioning as summarised in the table below.

| Dates                  | Name                  | Location             | Facility / Work  | Operator   | Role   |
|------------------------|-----------------------|----------------------|--|--|--|
| 1983-1989<br>2007-2008 | Wellesley/<br>Bunbury | Western<br>Australia | Commission and operate<br>2x 18.5 MW silicon furnaces and<br>2x charcoal retorts   | SIMCOA (Silicon Metal<br>Company of Australia)                             | Commissioning,<br>operation and<br>supervision             |
| 1983                   | Kwinana               | Western<br>Australia | Commissioning of<br>Smelt Reduction Vessel (SRV) &<br>Cokeless Cupola  | Hismelt Corporation  | Commissioning Engineer<br>and Team Manager                 |
| 1984-1998              | George Town           | Tasmania             | Refurbish and commission of<br>Furnace 3 and Sinter strand   | Tasmanian Electro<br>Metallurgical Co<br>(TEMCO) (ex-BHP, now<br>South 32) | Team Manager and<br>Production Coordinator                 |
| 1998-2005              | Jubail                | Saudi Arabia         | Refurbish, commission, operate<br>and optimize a failed<br>commissioning of 2x 20 MW<br>silicon furnaces and 2x 20 MW<br>FeSiMn furnaces | Gulf Ferro Alloys<br>Corporation (Sabayek)                                 | Production Manager   |
| 2005-2006              | Jubail                | Saudi Arabia         | Convert complete raw materials<br>feed system to convert<br>2x 20 MW silicon furnaces to<br>2x 20 MW FeSiMn furnaces                     | Gulf Ferro Alloys<br>Corporation (Sabayek)                                 | Consultant   |
| 2006                   | Karaganda             | Kazakhstan           | Design and build 2x 18.5 MW<br>silicon furnaces  | Silicium Kazakhstan  | Managing Director  |
| 2006                   | Perth                 | Western<br>Australia | Feasibility study for chrome<br>furnace  | Consolidated Minerals  | Consultant   |
| 2007-2009              | New Haven             | West Virginia        | Refurbish and restart<br>1x 40 MW FeSiMn furnace   | Felman Production<br>Company   | Chief Executive Officer                                    |
| 2009-2011              | New York              | USA                  | Business strategy for mine<br>development and furnace<br>troubleshooting   | Globe Specialty Metals   | Acquisitions and Vice<br>President Business<br>Development |
| 2015-2017              | Helguvik              | Iceland              | Design, build and commission<br>1x 36 MW silicon furnace   | United Silicon HF  | Chief Operating Officer                                    |



| Dates      | Name   | Location   | Facility / Work  | Operator   | Role   |
|------------|--------|------------|--|--|--|
| 2018       | Bakki  | Iceland    | Commission<br>2x 24 MW silicon furnaces                        | PCC Bakki Silicon HF   | Consultant                                   |
| Since 2018 | Kupang | West Timor | Construct, commission and<br>operate 2x 7 MVA FeMn<br>furnaces | PT Gulf Mangan Grup<br>(subsidiary of Gulf<br>Manganese Corp.) | President Director and<br>Technical Director |

Source: Steven Pragnell

## 8. Investment Risks

GMC is exposed to a number of risks including:

- **Geological risk:** the actual characteristics of an ore deposit may differ significantly from initial interpretations.
- **Resource risk:** all resource estimates are expressions of judgment based on knowledge, experience and industry practice. Estimates, which were valid when originally calculated may alter significantly when new information or techniques become available. In addition, by their very nature, resource estimates are imprecise and depend to some extent on interpretations, which may prove to be inaccurate.
- **Feasibility risk:** once mineral deposits are discovered, it take a number of years from the initial phases of drilling until production is possible, during which the economic feasibility of production may change. Substantial time and expenditures are required to:
  - establish mineral reserves through drilling;
  - determine appropriate mining and metallurgical processes for optimizing the recovery of metal contained in ore;
  - obtain environmental and other licenses;
  - construct mining, processing facilities and infrastructure required for greenfield properties; and
  - obtain the ore or extract the minerals from the ore.
- **Commodity price risk:** the revenues GMC will derive through the sale of manganese ore and ferro manganese alloys expose the potential income to manganese and ferro manganese price risks. Those price prices fluctuate and are affected by many factors beyond the control of GMC. Such factors include supply and demand fluctuations, technological advancements and macro-economic factors.
- **Exchange Rate risk:** The revenue GMC derives from the sale of manganese products exposes the potential income to exchange rate risk. International prices of various commodities are denominated in United States dollars, whereas the costs base is in Indonesian Rupiah (IDR) and USD and the financial reporting currency of GMC is the Australian dollar, exposing the company to the fluctuations and volatility of the rate of exchange between the IDR, USD and AUD as determined by international markets.
- **Mining risk:** A reduction in mine production would result in reduced revenue.

- **Processing risks:** A reduction in plant throughput would result in reduced revenue. In all processing plants, some metal is lost rather than reporting to the valuable product. If the recovery of metal is less than forecast, then revenue will be reduced.
- **Operational cost risk:** an increase in operating costs will reduce the profitability and free cash generation of the project.
- **Management and labour risk:** an experienced and skilled management team is essential to the successful development and operation of mining and smelting projects.

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## RESEARCH ANALYST

*This Research Report reflects the views of the research analyst, Jean-François Bertincourt, who visited the Company's material operations in West Timor.*

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