



# GULF MANGANESE CORPORATION LIMITED

78 Mill Point Road  
South Perth WA 6151  
Ph: +61 8 9367 9228  
Fx: +61 8 9367 9229  
Em: info@gulfmanganese.com  
www.gulfmanganese.com  
ACN: 059 954 317

22 June 2015

## Gulf Manganese – Timor Smelter Update – Licensing

Gulf Manganese Corporation Limited (ASX:GMC) is pleased to provide shareholders an update of progress in developing the company's Timor Smelter.

Gulf have been advised the licensing process time has been substantially reduced as a result of the Indonesian Government's introduction of the Investment Coordination Board's (BKPM) "one stop shop" procedure.

The Ministry of Industry, through the BKPM, advise that the Industrial Business Licence (colloquially called an IUI) will take 20 – 25 days from application to be approved. Following the issue of the IUI the next step is to become a Registered Exporter (colloquially called an ET) which the Ministry advise will again take 20 – 25 days from application.

Upon completion of these 2 licences Gulf intends to commence the construction of the first furnace module with the plant expected to come online within 12 months of starting construction.

To fall in line with the advised requirements of both the Ministry and BKPM Gulf has redrafted the Timor Smelter Study to comply with the "one stop shop" process.

The financial analysis of the redrafted Study shows that the project has the potential to return an **EBITDA of US \$374.7 million** over a 10 year period supporting an estimated **Net Present Value of US \$ 160.6 million** using an 8% discount factor.

The project requires a modest start up **capital investment of US \$66 million**, which is staged over 5 years and provides estimated returns supporting an **internal rate of return of 55.6%**.

**As described in the Study, GMC will develop a fully integrated manganese business that provides the following value propositions:**

- Sound project economics
- Operating costs at 80% industry average cost
- Highest quality ore supply (+50% Mn)
- Producing a premium manganese alloy (78%Mn)
- Established port and infrastructure
- Government full support, fiscal incentives of 10 year Tax Holiday
- Board/Management depth of manganese and Indonesian experience
- Global sales network
- Modest capital requirement
- Proposed Singapore listing
- Robust dividend policy with distribution of 50% of profits





A copy of the **Timor Smelter Study** is **attached**.

For more information please visit: <http://www.gulfmanganese.com>

**For further information please contact:**

**Graham Anderson**, Chairman  
**Gulf Manganese Corporation Limited**  
M: 0417 934 535  
E: [graham@gdacorporate.com.au](mailto:graham@gdacorporate.com.au)

**Rod North**, Managing Director  
**Bourse Communications Pty Ltd**  
T: (03) 9510 8309, M: 0408 670 706,  
E: [rod@boursecommunications.com](mailto:rod@boursecommunications.com)



# GULF MANGANESE CORPORATION LIMITED

78 Mill Point Road  
South Perth WA 6151  
Ph: +61 8 9367 9228  
Fx: +61 8 9367 9229  
Em: info@gulfmanganese.com  
www.gulfmanganese.com  
ACN: 059 954 317

## About Gulf Manganese Corporation Limited

Gulf Manganese Corporation Limited is an Australian registered company (ACN 059 954 317) listed on the Australian Securities Exchange (ASX: GMC) with its head office in Perth, Western Australia.

The company is developing an ASEAN focused manganese alloy producer. The facilities based in the West Timor capital Kupang will take advantage of the low cost of ore, labour and power being the majority of operating costs. Production will be a premium quality 78% ferromanganese alloy resulting from the unique qualities of the Indonesian high-grade low impurities manganese ore.

It is proposed to build 8 furnaces over a 5 year period for a total capital cost of US\$66m funded by an IPO on the Catalist board of the Singapore Stock Exchange raising \$US25m, modest project debt and operational cashflow.

The first furnace aims to come online July 2016, with a further two furnaces each year, 2017, 2018, 2019 and a final one in 2020. Each furnace has a capacity of 20,000 tonnes alloy production per year and on today's alloy prices producing US \$22m revenue.

The financial analysis of the redrafted Study shows that the project has the potential to return an **EBITDA of US \$374.7 million** over a 10 year period supporting an estimated **Net Present Value of US \$160.6 million** using an 8% discount factor.

The project requires a modest start up **capital investment of US \$66 million**, which is staged over 5 years and provides estimated returns supporting an **internal rate of return of 55.6%**.

Value adding ores is strongly encouraged by the Indonesian Government to enrich the country's mineral endowment thereby enhancing the economy and creating employment. GMC will benefit from the Government's Financial Incentives Programme which effectively will result in a 10 year tax holiday, together with other tax exemptions.



Ore

Processing

Tapping

Alloy



Developing Premium Indonesian Manganese Alloys



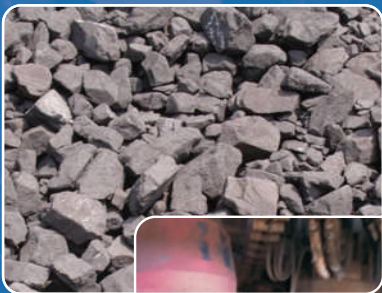


**GULF MANGANESE CORPORATION LIMITED**

ASX : GMC

Indonesian Manganese Alloy Developer

# Timor Smelter Study







# Table of Contents

1	Summary .....	1
2	Gulf Manganese Corporate Profile .....	7
3	Project Description .....	9
4	Financial Analysis .....	24
5	Sensitivity Analysis .....	25
6.	Business Plan Risks .....	26
7	Manganese Market .....	29
8	Indonesia .....	32
	Appendix A - Financial Model and Assumptions .....	34
	Appendix B - Tax Regulations .....	39
	Appendix C - Amdal Preparation Schedule .....	42
	Appendix D - Smelter - Capital Budget .....	43
	Appendix E - Smelter Operating Costs .....	44
	Appendix F - Smelter Ore Balance Check .....	46
	Appendix G - Smelter Drawings .....	47
	Appendix H - Flow Chart Diagram .....	49
	Appendix I - Manganese Ore Feed Options .....	53
	Appendix J - Metallurgical Coal Specifications .....	54
	Appendix K - Cargo Movements Tenau Port .....	55
	Appendix L - Gulf Manganese Corporation - Team .....	56
	Appendix M - Gulf Manganese Corporation - Corporate Directory .....	59

## Important Notice

This study document, its appendices and attachments have been prepared by Gulf Manganese Corporation Limited (GMC) for interested parties.

The document, appendices and attachments are marked Commercial in Confidence that identifies the information belongs to GMC and is of commercial value to GMC, apart from the references from Alloy Consult which are in the public domain. The document, appendices and attachments may not be copied without the written permission from GMC.

The valuations, forecasts, estimates, opinions and projection contained herein involve subjective judgement and analysis. The document, appendices and attachments contain forward looking statements and any estimates or projections are based upon the best judgement of GMC and on currently available information.



# 1 Summary

## Overview

The Gulf Manganese Corporation Limited (ASX: **GMC**) Timor Smelter Study (**Study**) examines the development of a ferromanganese (**FeMn**) smelting and alloy sales business to produce high carbon ferromanganese alloys based in Kupang, Timor, Indonesia.

The project of building and operating a ferromanganese smelting and sales business will be carried out through GMC's subsidiary, the Indonesian incorporated, PT Gulf Mangan Grup, based in Kupang.

### Highlights:

- GMC is an Australian listed company with skilled Directors and Management
- GMC will develop a manganese smelter in Indonesia utilising latest technology processes
- GMC will produce premium ferromanganese alloy
- GMC will toll treat other miner's ore
- Operating costs will be 80% of industry average\*
- Capital Costs US\$66 million spread over 5 years
- Project funding by equity, debt and cash flow
- Government support, assistance and tax benefits
- IPO listing on the Catalist Board Singapore Exchange
- Robust dividend policy with 50% of profits to be distributed

\*Alloy Consult ([www.alloyconsult.com](http://www.alloyconsult.com)) advise the average product-weight cash costs for HCFeMn last 5 years is US\$1,042/tonne.

The financial analysis of the Study shows that the project has the potential to **return a positive EBITDA of US\$ 374.7 million over a 10 year period** supporting an estimated **Net Present Value of US\$ 160.6 million**, using an 8% discount factor. The project requires a modest start-up capital investment of US\$66 million which is staged over 5 years, plus working capital and provides estimated returns supporting an **internal rate of return of 55.6%**.

### Physicals and Financial Summary (10 Year)

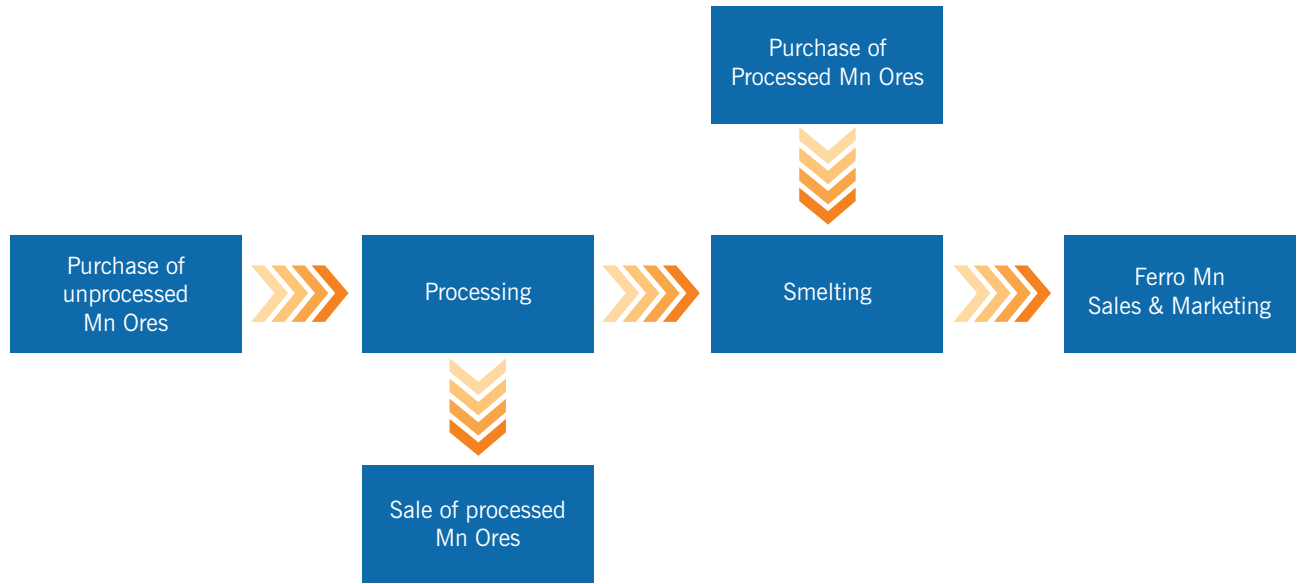
Annual production capacity	155,000 tpa of Ferro Alloys
Project CAPEX (Furnaces, Jigs, Establishment)	US\$66 million staged over 5 years
Total Project Net Turnover	US\$ 1.358 million
Total Project EBITDA	US\$ 374.7 million
Project NPV @8%	US\$ 160.6 million
Project Internal Rate of Return (IRR)	55.6%
Payback Period (Including the construction cost)	2 years

The Study is based on a manganese purchasing, processing and smelting business. High grade manganese ore will be purchased locally from within Indonesia.

The business model can be scaled up or down as ore supply allows which minimises start-up capital requirements. The business model can also be augmented in terms of revenue streams and ore sources permitting early cash flow and future expansion opportunities.

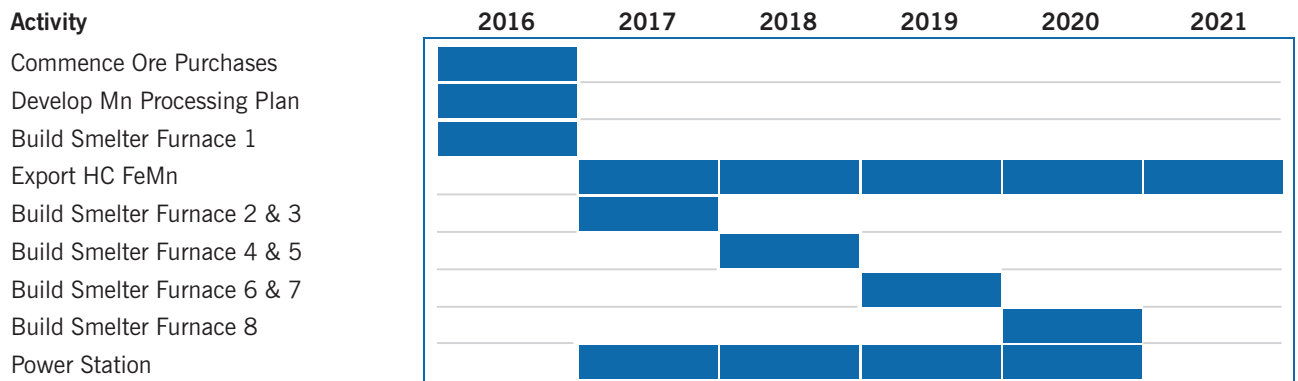


## GMC Business Plan



The development of the business plan to full capacity is staged, which minimises capital expenditure whilst developing the first smelting unit.

## GMC Development Schedule Outline

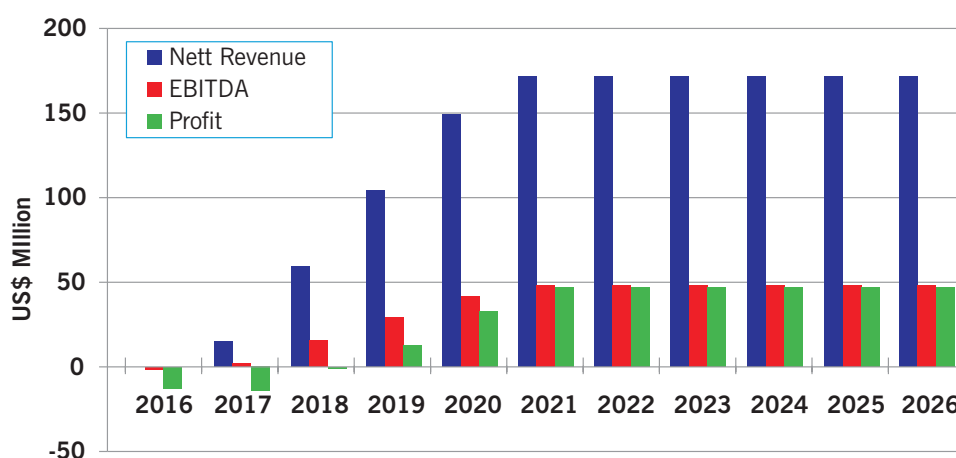




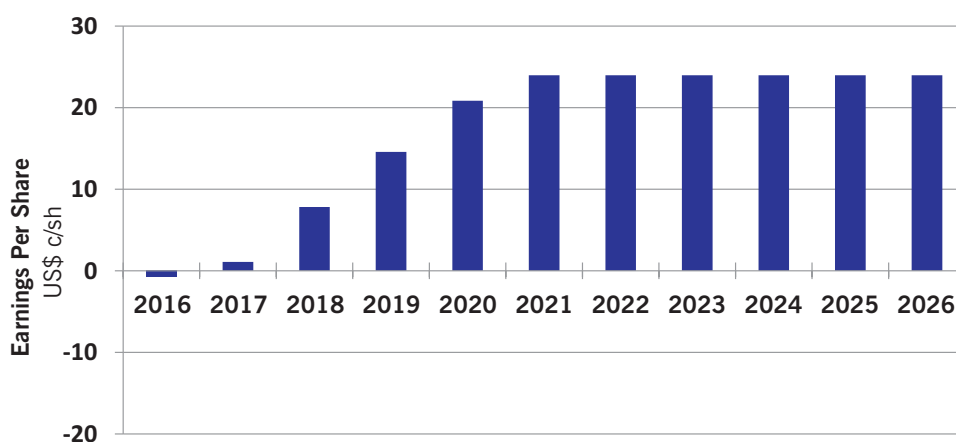
## Value Proposition

- Sound project economics
- Operating costs at 80% Industry average cost
- Highest quality local ore supply (+50% Mn)
- Producing a premium manganese alloy (78% Mn)
- Established port and infrastructure
- Government full support, fiscal incentives, tax holidays
- Board/Management depth with Indonesian and manganese experience
- Global sales network
- Modest capital requirement
- Early cash flow
- Robust dividend policy with 50% of profits to be distributed

### Management Projections



### Earnings per Share





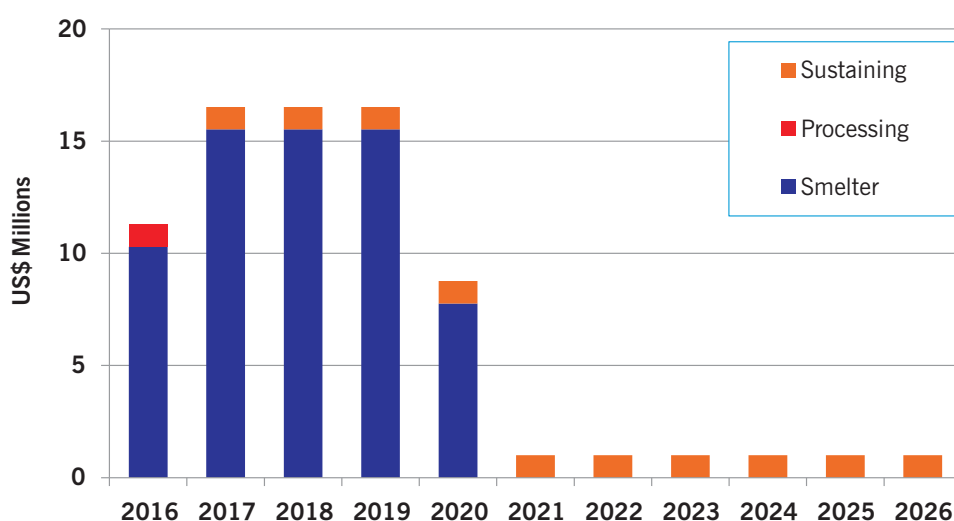


## Project Funding

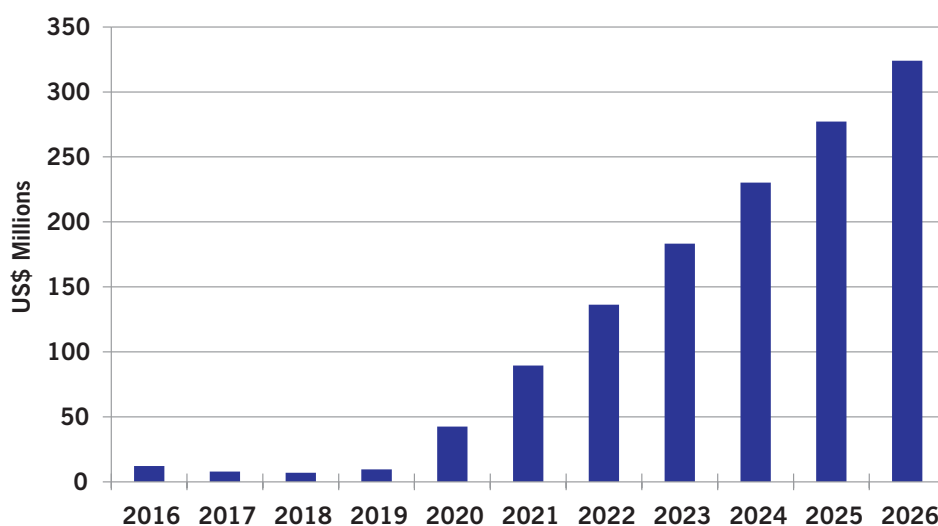
Project Funding The total project capital cost of US\$65.6M is spread over 5 years and will be provided by:

Source of Funds	Quantity	Allocation
Gulf Manganese equity	US\$ 15.0M	1 <sup>st</sup> Stage
Singapore IPO equity	US\$ 25.0M	2 <sup>nd</sup> Stage
Project Debt	US\$ 10.0M	3 <sup>rd</sup> Stage
Project operating cash flow	US\$ 15.6M	4 <sup>th</sup> Stage
<b>Total</b>	<b>US\$ 65.6M</b>	

### Capital Expenditure (US\$ M)



### Cummulative Cashflow (Inc. Capital Raising) (US\$ M)





## Ore Purchases

Manganese ores for the processing and smelting business will be purchased from a number of local suppliers.

To optimise the smelting process high grade ore will be purchased locally from artisanal miners and other sources in Indonesia. The manganese ores in Timor are typically high grade, approximately +50%Mn and make ideal smelter feed. The local Indonesian manganese ores are typically low in iron content, <2% Fe, and as such iron units need to be added.

Iron units are an important component in the smelting process to ensure the product specifications are met with respect to manganese grade. Iron units will be added by the purchase of iron ore from Sumatra.

## Processing of Manganese Ores

Prior to smelting, manganese ores will be processed via industry standard, crushing, screening and mechanical jigging processes. Processing, prior to smelting, is required to remove contaminant and other waste materials as well as ensuring the manganese ores are correctly sized.

The manganese ores in Indonesia have a high specific gravity and as such they are ideal for separation using a jigging process.

The proposed crushing, screening and jigging components are typically used for processing manganese ores and are relatively low technology, low operating cost and suitable for the ore types seen in Indonesia.

The systems are also scalable in that a number of smaller processing sites may be located close to mining operations minimising operating costs.

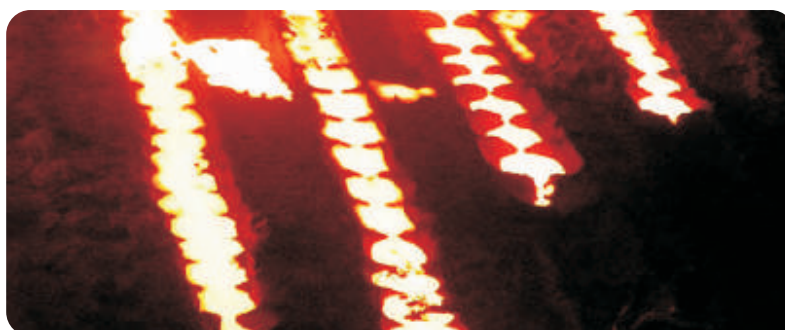
## Processing and Sale of Manganese Alloys

GMC has entered into an agreement to secure 50 hectares of land with the landowners and the local Regent for the development of the proposed smelter. This site was chosen as it is close to the port of Tenau in Kupang which will minimise consumable import costs and export logistics costs, as well as being close to the coast permitting use of sea water for power station cooling systems.

### Smelter Key Drivers

Manganese Ore sourced from Indonesia	320,000 tpa
Total Smelter Feed	290,000 tpa
FeMn Alloy produced	155,000 tpa
FeMn Alloy sale price*	US\$ 1,100 /t
Cost per Tonne Alloy (at full production)	US\$ 793 /t
Operating Margin (at full production)	US\$ 307 /t

\*Alloy Consult (www.alloyconsult.com) Spot Price forecast page 30





## Power Supply

Power for the first 6MVA smelter will be supplied on a user pays basis and sourced from the local Government power supply company PT PLN in Kupang.

GMC is in discussions with power supply infrastructure providers about long term power supply options using a BOOT (Build, Own, Operate and Transfer) arrangement, where a contractor builds and supplies power on a user pays basis and ultimately GMC will purchase the infrastructure and operate the power station in the longer term.

## Taxation

The corporate tax rate in Indonesia is 25%.

Application will be made to have GMC's Indonesian subsidiary, PT Gulf Mangan Grup, classified as a "Pioneer Industry" as the project will have a combined investment of US\$ 141.0 million (US\$ 66 million for the smelter and US\$ 75 million for the Power Plant).

As a Pioneer Industry the company will have access to 10 years of full tax relief followed by another 2 years of 50% tax relief.

## Indonesian Participation

Article 33 of the Constitution of the Republic of Indonesia sets out ... "The land, the waters and the natural resources within shall be under the powers of the State and **shall be used to the greatest benefit of the people**." Article 4 of the Mineral and Coal Mining Law sets out ... "Minerals and coal as non-renewable natural resources shall constitute national property that is controlled by the State in **the greatest prosperity of the people**."

Gulf Minerals acknowledges and endorses these endeavours and as such where possible will engage the maximum number of local people for jobs (at full production 650 direct jobs and 4,500 indirect jobs), local contractors, suppliers and business in order the the greatest benefit of the Smelter Project remains in Indonesia. The engagement of expatriate labour will be kept to an absolute minimum, once all training is completed the number of expatriate labour will not exceed 6 in total.

The benefits of the GMC value adding development to the NTT communities will go far beyond just creating jobs. The project will significantly contribute to export income (at full production US\$170m/ year), help grow the NTT economy, develop regional infrastructure, provide technology transfer, together with improving and increasing skills. The flow on effect will be an increase for standards of living.

Apart from specialised pyrometrical and power producing equipment the balance of all equipment, engineering and construction will be carried out by local contractors, suppliers and businesses.





## 2 Gulf Manganese Corporation Profile

### Introduction

Gulf Manganese Corporation Limited (ACN: 059 954 317), is an Australian listed public company which is proposing to develop a ferromanganese alloy business based in Indonesia.

GMC is based in Perth, Western Australia. Perth is the mining capital of Australia and as such has many commercial and technical service providers available to assist with the project.

The business will be controlled and directed from GMC's Kupang office.

GMC has 81,470,638 shares on issue with a further 15,770,638 unlisted options. The market capitalisation of GMC is approximately AU\$ 4.1 million. The major shareholder, Leprechaun Holdings Pty Ltd, holds 34%.

### GMC Team

The GMC Board and management consists of mining executives with proven experience in the exploration, mining, processing, smelting and marketing of manganese in Australia and globally. The board and management of GMC and its Indonesian operating subsidiary PT Gulf Mangan Grup, consists of:

**Graham Anderson**



**Executive Chairman**  
Corporate Compliance

**Dr. Peter Williams**



**Non-Executive Director**  
Geologist

**Paul O'Shaughnessy**



**Non-Executive Director**  
Production

**Michael Walters**



**Non-Executive Director**  
Marketing

**Michael Kiernan**



**Chairman**  
PT Gulf Mangan

**Kevin Parker**



**Indonesian Advisor**  
PT Gulf Mangan

**Jaques Beylefeld**



**Pyrometrical Engineer**  
PT Gulf Mangan

**John Parker**



**Pyrometrical Advisor**  
PT Gulf Mangan

**Dr Herry Kotta**



**Environmental Advisor**  
PT Gulf Mangan

**Benny Sain**



**Engineering Advisor**  
PT Gulf Mangan

**Beny Roboh**



**Community Advisor**  
PT Gulf Mangan

**Ronald Taopan**

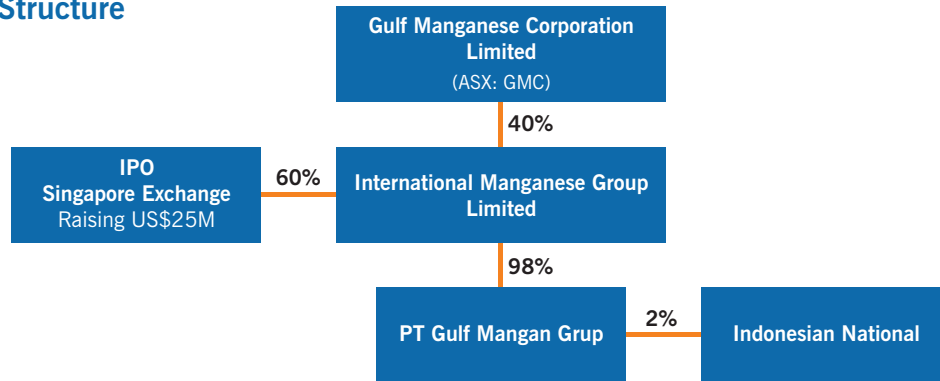


**Health and Safety Advisor**  
PT Gulf Mangan





## GMC Group Structure

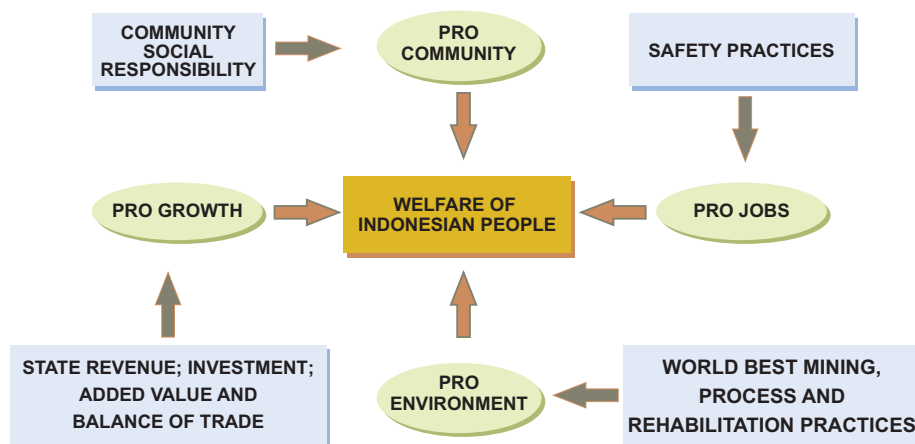


PT Gulf Mangan Grup is a foreign owned Indonesian based PMA company which will hold land tenure and operate the smelting, power station and supply chain enterprise within Indonesia.

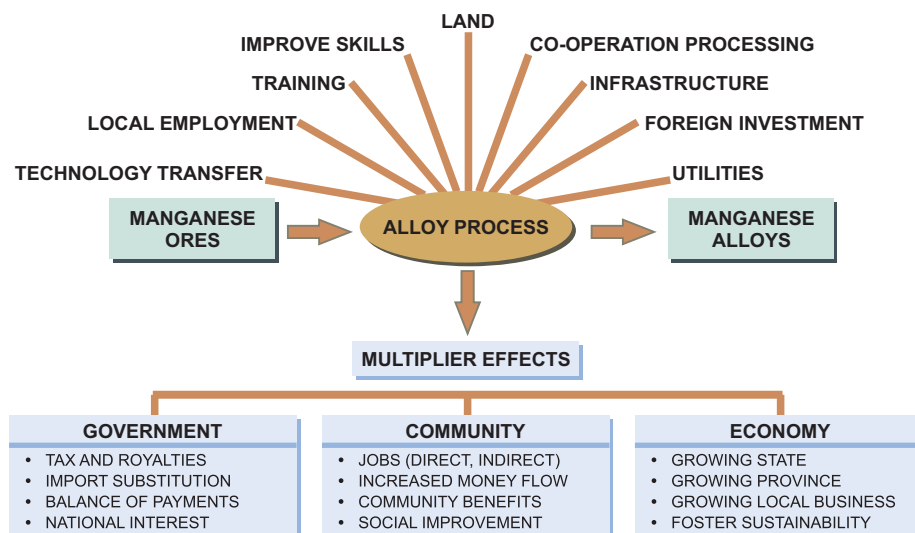
As a locally incorporated Indonesian company it benefits from aspects not readily available to foreign incorporated companies, such as access and security to land, tax concessions and tax holidays (fiscal incentives).

It is proposed to make application in the first half of 2016 to list International Manganese Group Limited, which holds the Indonesian manganese business, on the Catalist Board on the Singapore Exchange by issuing 100,000,000 fully paid shares at US\$ 0.25 per share raising US\$ 25,000,000.

## Gulf Strategy



## Gulf Model





# 3 Project Description

## Project Overview

GMC is planning to develop a ferromanganese smelting and sales business to produce high carbon ferromanganese alloys in Timor, Indonesia

The business will comprise four components all based in Indonesia.

1. Ore purchasing
2. Ore processing
3. Alloy smelting
4. Sales & marketing

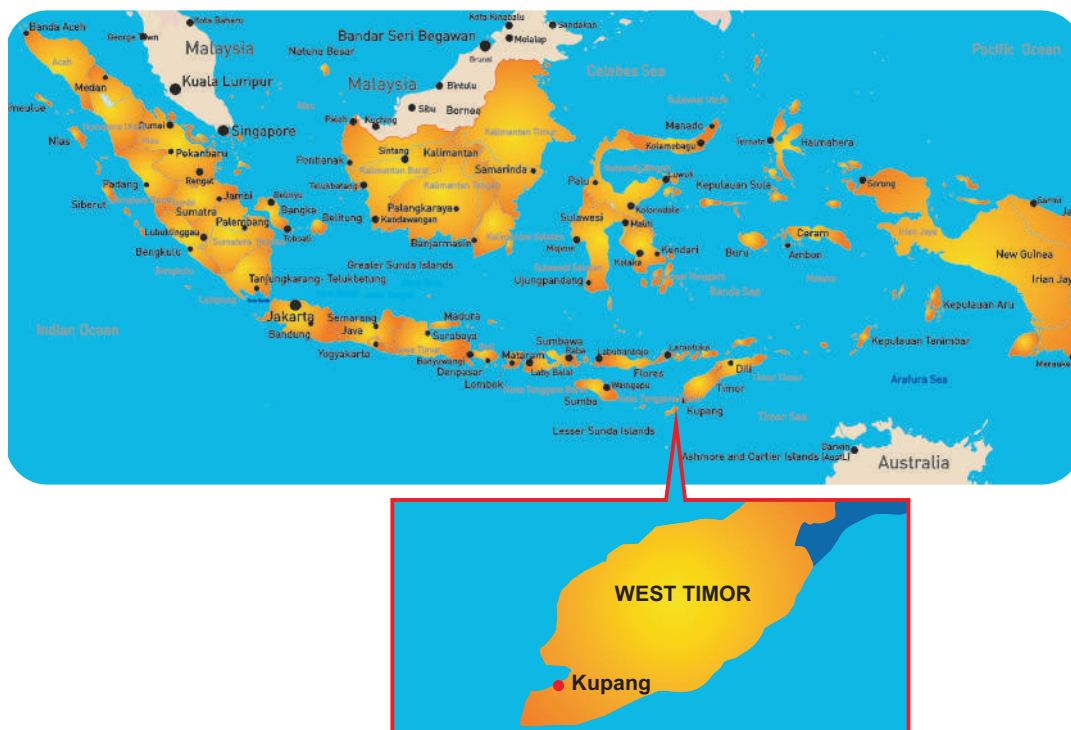
The annual ferromanganese alloy production is set at 155,000 tonnes per annum, generating on today's prices, some US\$ 170,500,000. The Smelter feed will comprise 100% local Indonesian manganese ores (50+% Mn). Production will occur in 8 furnaces in a smelting facility built just out of Kupang.

## Location

Kupang is the capital of the East Nusa Tenggara province and the capital of West Timor.

The GMC proposed smelter site is located approximately 12 km South West of Kupang at approximate coordinate of 10° 16' 25.50" S and 123° 30' 09.07" E and is near the village of Kuanheum. The site is approximately 8 km South West from the port of Tenau.

Kupang Location Map





## Regulatory Environment

### Operating Permit

The business model proposed by GMC for the development of a processing and smelting business in Kupang requires certain Indonesian licensing and with local licensing, GMC will obtain the following licences:

Title	Description	Licensing Body	Authority
Processing licence	Processing licence	IBP (BKPM)	National
Environment Management Plan (EMP)	Environmental management plan	Kabupaten	Local
Environment Management Effort (EME)	Environmental management effort	Kabupaten	Local
Environmental Clearance (AMDAL)*	Environmental Clearance	Kabupaten	Local

\*Refer Appendix C

### Environment

Gulf will always operate as a responsible and ethical company and will promote a culture of responsible environmental management throughout our company. Sustainable development provides a means of integrating environmental and economic goals, to provide outcomes that are both environmentally acceptable and cost effective. Managing the environment in order future generations are not disadvantaged will be a major focus for Gulf.

**Gulf will introduce world-leading value adding processing and environmental practices, thereby creating an environmentally economically sustainable ferromanganese alloying industry centred on Kupang in West Timor.**

Gulf will work closely with local communities, government agencies and key stakeholders to ensure we strive for world's best practice of environmental performance, while operating our business activities.

In particular, Gulf will establish a positive working relationship with the appropriate Provincial and Regency Government Departments together with the local community.

Gulf will establish an ongoing environmental monitoring program to ensure rapid response to any environmental incidents that may occur. All incidents will be investigated so as to implement preventative measures and minimise the likelihood of reoccurrence.

All environmental programs will be monitored by our Environmental Advisor, Dr Herry Kotta.

All activities in the smelter plant and power plant will ensure the effects on the aspects of air quality, surface water and ground water, waste disposal, wildlife and vegetation, as well as socio-economic are minimised and within all acceptable levels set by Government.

The initial key environmental review process to be completed in advance of proceeding to permitting for the project is an Environmental Clearance (AMDAL) and Environmental Management Plan (UKL-UPL). These are to be carried out by PT Adi Banuwa, Dr Herry Zadrak Kotta.

GMC has a commitment to carry out a sustainable development and to provide a means of integrating environmental and economic goals to provide outcomes that are both environmentally acceptable and have high economical value by the introduction of world leading environmental standards.



## Our Community Social Responsibility

### Developing Value Adding Resources

The benefits of value adding resource development to communities extend far beyond creating employment. The industry significantly contributes to export income to grow the economy, taxes, development of regional infrastructure and information technology transfer, together with improving and increasing skills.

Indonesia is primarily a village-based society with nearly 80,000 villages spread throughout the archipelago.

The Timorese village people are the prime focus of Gulf's Community Social Responsibility and the company has developed and will implement when production commences what we call our 5 Star Program (Bahasa – Program 5 Bintang). The Community and Social Responsibility program will be monitored by our Community Advisor Beny Roboh.

The Program covers:

#### Employment/Training

- Provide sustainable jobs
- Provide skills, training and knowledge



#### Education

- Provide community schools assistance
- Provide higher education scholarships



#### Health

- Provide community clinics assistance
- Subsidise medical staff costs



#### Village Support

- Help provide fresh running water
- Help improve village roads



#### Sustainability

- Fostering ongoing business development (Jatropha, Micro Finance)







## Our Health and Safety Responsibility

Gulf's first and overriding value is **"Safety First"** for our people. Every employee is empowered to challenge any colleague, irrespective of their position, if they think safety is being compromised.

Gulf remains focused on continually reinforcing a culture of safety first. Progressively we will be implementing initiatives and programs to put safety at the forefront of all activities. This will be an ongoing activity for our business, as there will always be more to do to make sure the workplace is as safe as possible so all our people return to their homes after their work.

A Visible Safety Leadership (VSL) program will be launched, emphasising the responsibility of leaders in our business to oversee a culture of putting the safety of every employee front and centre of everything that is done and in every activity we do, whether on the processing site or in the office environment.

The focus of the VSL program will be to up-skill leaders and supervisors to be able to make observations to encourage interaction and engagement on safety issues, improve hazard awareness and prevent incidents, and to reinforce a collaborative culture in which safety is a core value in our organisation.

Gulf will adopt a back to basics approach to ensure every area of our business does the best it can to maximise and ensure safety performance. This will lead to what we believe to be a more effective approach to risk management.

A portion of the workforce will be contractors and we view contractors similar to our employees and all incidents involving contractors will be investigated with Gulf's involvement and included in the company's safety reporting. Accordingly, Gulf will work closely with contractors to instil a shared culture of working safely.

Given Gulf's manganese ore and alloys will be transported from mine and smelter sites to ports by contractors, Gulf will establish a Logistics Awards Program (the LAP Award) to encourage, recognise and reward continuous exemplary performance by those involved in transportation within the communities in which we operate.

The Health and Safety program will be monitored by our Health and Safety Advisor Ronald Taopan.



... a Visible Safety Leadership program will be launched with an overriding value that is safety first

## Operating Covenants

**Nationalism** To protect the national interest by building a manganese downstream value adding industry

**Community** To provide shared benefits for Village Communities

**Employment** Create sustainable jobs for local people

**Training** To empower local people through training

**Skills** To improve and increase skills leading to higher standard of living

**Knowledge** Introduce world leading processing knowledge

**Health** To provide medical benefits through Yayasan Komunitas Sehat

**Education** To provide education scholarships benefits through Yayasan Belajar untuk Hidup

**Environment** To introduce and implement world best processing practices and monitoring

**Sustainability** To help develop and foster ongoing income businesses for local people and local economy

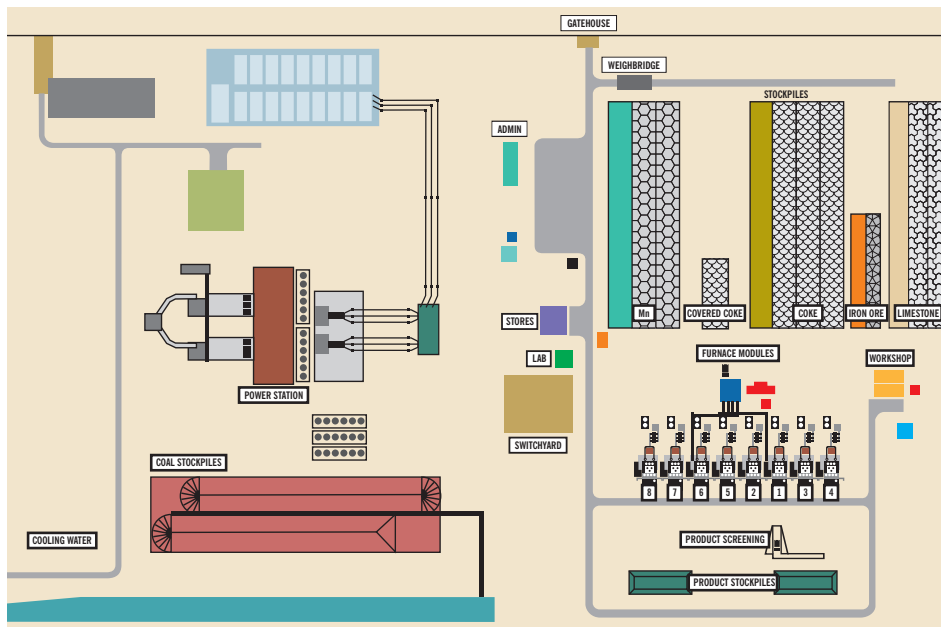
**These 10 Operating Covenants will form the basis and spirit of Gulf's smelter business for the benefit of the people of East Nusa Tenggara and Indonesia**

## Land Acquisitions

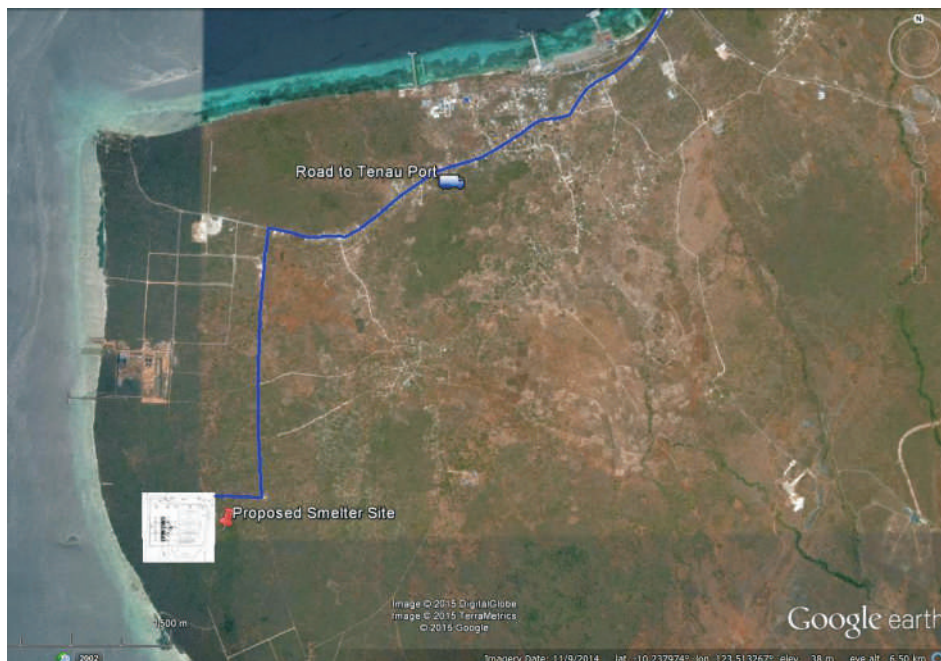
### Smelter and Power Plant

GMC has entered into an agreement to secure 50 hectares of land with the landowners and the local Regent for the development of the proposed smelter near Kupang in East Nusa Tenggara. This is 8 km from the Port of Tenau at Kupang and 500 metres from the beach. The 30 year lease with a 20 year extension provides suitable tenure for GMC's development plans.

### Layout Plan of Proposed Smelter Site at Kupang



### Proposed Smelter Site at Kupang



## Manganese Ore Purchases

Manganese Ore Requirements Alloy Production		
	Smelter Feed (‘000t pa)	FeMn Alloy Exported (‘000t pa)
2017	25	15
2018	100	55
2019	180	95
2020	260	135
2021	290	155
Thereafter	290	155

Locally mined manganese ores are some of the world’s highest commercial grade manganese with manganese grades in excess of 50%Mn. Local manganese ores are low in iron with iron ore from Sumatra being added to make up the iron units.

The higher manganese content in the ore is preferable for smelter feed since less power per alloy unit is required than for lower manganese content ores.

## Typical Ore Analysis

Element	Timor
Mn	52 %
Fe	2 %
SiO <sub>2</sub>	8 %
P	0.08 %
S	<0.01 %

Manganese ores will be delivered to centralised jig separation plants, which will be used to clean-up and size the local ores.

Lump manganese from the jig separation plants will either be transported to Kupang or barged from northern ports of Wini and Atapupu to the Port Tenau, Kupang.

## Manganese Ore Stockpile



## Manganese Ore Separation

### Jig Separation Plant

It is estimated that up to 325,000 tonnes per annum of local ore will be required to meet the smelter feed demands of 290,000 tonnes per annum.

Manganese ores sourced from artisanal miners will be delivered to a centralised separation facility. Separation Jigs will be used to clean-up the local manganese ores prior to smelting. GMC has allowed for a Jig Facility to process the manganese ores prior to shipment to the smelter. The plant has an annual capacity of 350,000 tonnes of ore production.

Typical manganese ores in Indonesia have a density of 3.4-3.8 g/cm<sup>3</sup>, whereas typical waste materials, mostly quartzite or clays, have a density of 2.4-2.7 g/cm<sup>3</sup> and as such jigging is ideal for the separation of the gangue (waste materials) from the manganese ores.

The South African styled jigs are chosen as they are mechanically simple which will suit remote locations in Indonesia, they are modularised and as such easily installed and moved, self-contained and only need power and water to operate and require less capital compared to more complex jigs.

The jigs will be constructed by PT Timeserve, Surabaya.

### Jig Plant Capital - Summary per Plant

Jig Capital Expenditure	US\$
New Jig 1 50 tph	US\$ 250,000
New Jig 2 50 tph	US\$ 200,000
Twin Deck Screen	US\$ 200,000
Power and Water Supply	US\$ 50,000
Office	US\$ 50,000
Contingency	US\$ 50,000
<b>Total Capex</b>	<b>US\$ 800,000</b>

### Jig Plant Operating Cost - Summary

Jig Operating Expenditure	US\$/t Feed
Ore Purchase	US\$ 100.00 /t
Operating Costs	US\$ 12.50 /t
Salaries & Wages	US\$ 2.50 /t
Logistics	US\$ 10.00 /t
<b>Total Opex</b>	<b>US\$ 125.00 /t</b>

### Typical Modular Jig Separation Plant





## Ferromanganese Smelter

GMC are proposing to use semi closed submerged electric arc smelters at a site 12 km from Kupang city in West Timor. The site was chosen due to its location to infrastructure including the local port of Tenau and the adjacent sea.

### Smelter Production Profile

Year	No. Furnaces	Smelter Feed Manganese & Iron ore '000 tpa	Alloy Production '000 tpa
2017	1	30	15
2018	3	115	55
2019	5	200	95
2020	7	280	135
2021	8	325	155
Thereafter	8	325	155

### Target HC - FeMn Alloy Specification

Mn	Fe	C	Si	S	P
78%	14.5%	7.0%	0.5%	0.15%	0.12%

### Ferromanganese Alloy



### Smelting

Smelting is the process of converting manganese ores containing approximately 40-50%Mn into premium manganese alloys containing 70+% manganese in an oxygen starved, high temperature environment.

### Tapping Molten Manganese Alloy



Material and energy requirements for processes in the smelting plant were calculated using mass and energy balances of total feed per annum of 290,000 tonnes high grade manganese ore and 155,000 tonnes high carbon ferromanganese production. Key parameters in processing- refining plant are summarized below.

### Key Smelting Parameters

Number of furnace units	8
Operation time	650 hours per month
Total Smelter Ore Feed	27,100 tonnes per month
Total saleable ferromanganese	13,000 tonnes per month
Ferromanganese composition	78%Mn; 14.5%Fe; 7.0%C; 0.5%Si
Total energy requirement	64 MW

### Ferromanganese Flow Sheet

Ferromanganese alloy is commonly produced through high temperature processing in an alternating current (AC) semi closed submerged electric arc furnace (SAF).

Each tonne of FeMn product requires 1.873 tonnes Mn feed, 0.944 tonnes of metallurgical coal and 0.502 tonnes of limestone.

The smelting process for a submerged electric arc furnace starts with the blending of manganese ore and other additive materials such as metallurgical coal, limestone and iron units when required. These additive materials are required for the following purposes:

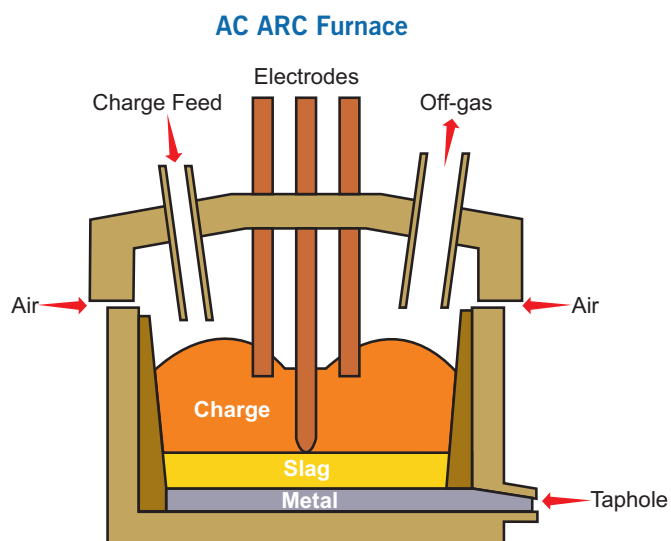
1. Metallurgical coal is added to facilitate the reduction process of manganese minerals in the furnace
2. Limestone is added to lower the melting temperature of the slag.
3. Iron units are added to achieve the required iron content in the ferromanganese alloy.

The smelting process takes place on a continuous basis with slag and metal tapped through a common tap hole. The interval between taps is typically between 90 and 100 minutes. Metal is collected in casting moulds. The hot alloys are naturally cooled until solidified then crushed to -70 mm size. The amount of ferromanganese alloy produced from one furnace is approximately 1,700 tonnes per month.

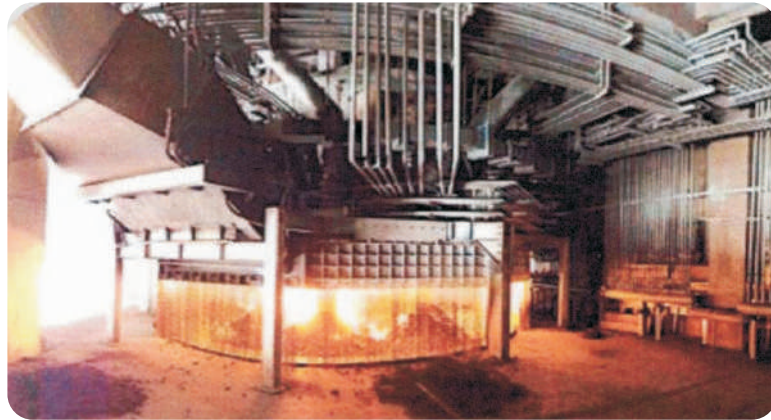
Ultimately the smelter facility will consist of one 6MVA furnace and 7 x 9MVA furnaces capable of processing 30,000 tonnes (6MVA) and 42,500 tonnes (9MVA) of ore feed to produce a total of 155,000 tonnes of alloy product per annum.

The benefits of using an AC Electric Arc Furnace are:

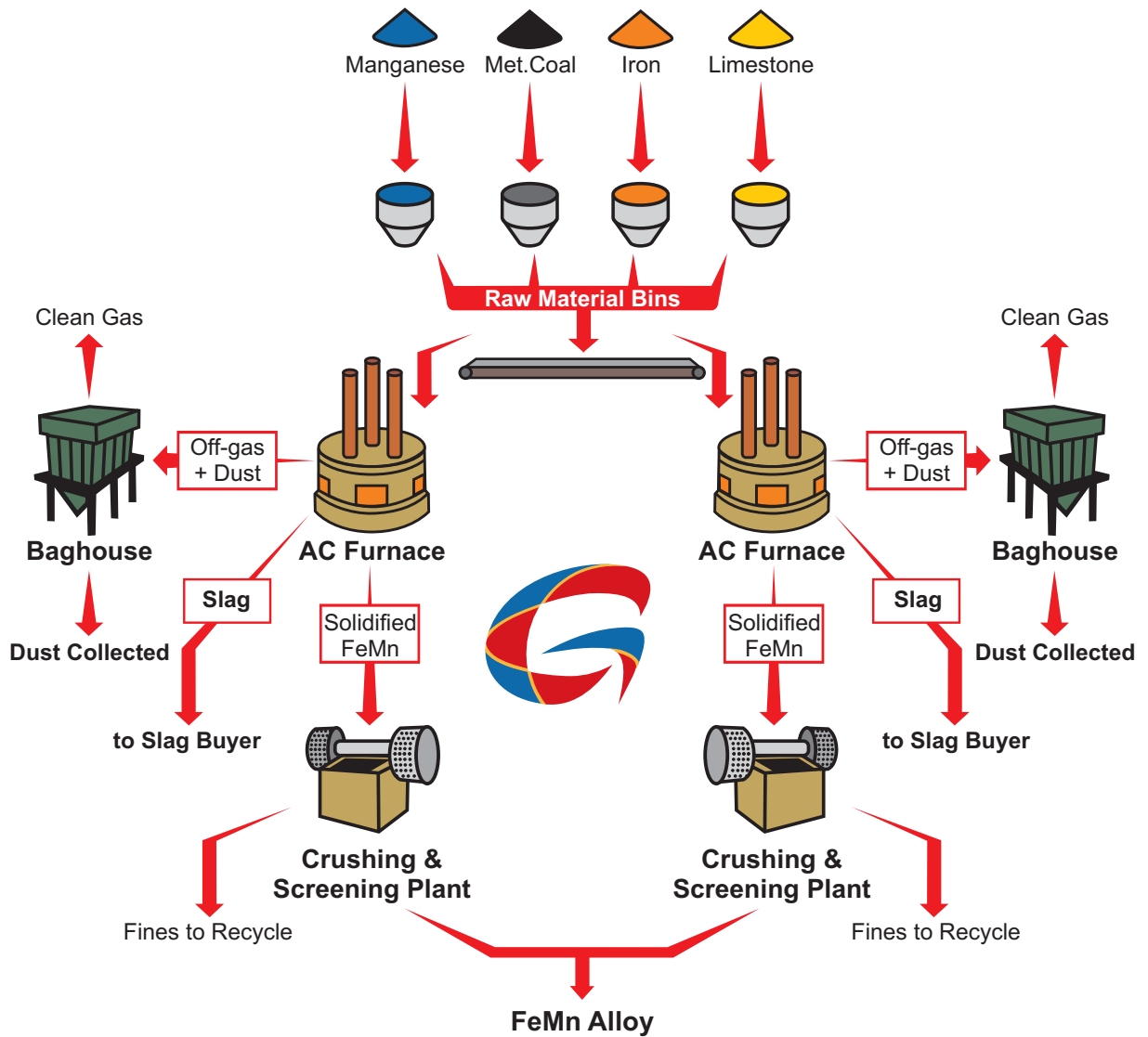
- High temperatures release metal from ore to produce alloy in a cost effective manner
- Proven technology over many years
- South African built in modular form eliminating construction risk



### Ferromanganese Smelter



### Block Diagram for HC - FeMn Production



### Furnace Description

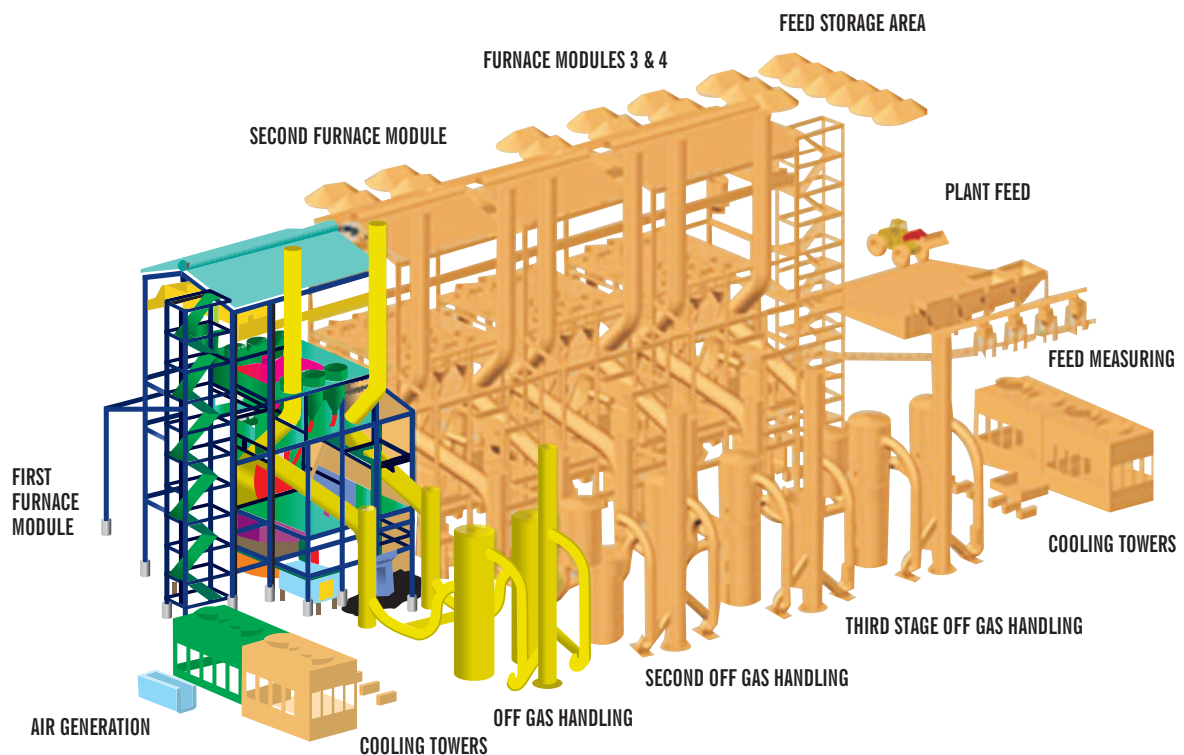
GMC is proposing to utilize South African smelter technology combined with up to date quality control systems and will be the most cost effective investment option. Eight medium-scale SAFs will be used to give flexibility in the capital expenditure and to increase the reliability in day to day operation of smelters. GMC has engaged XRam Technologies (XRAM), a South African based company with significant experience in developing manganese smelters globally.

Modular construction will be carried out by PT Timeserve Indonesia, Surabaya.

**A typical, semi-closed submerged, electric arc furnace**



**Smelter Expansion Stages**





## Furnace Major Components

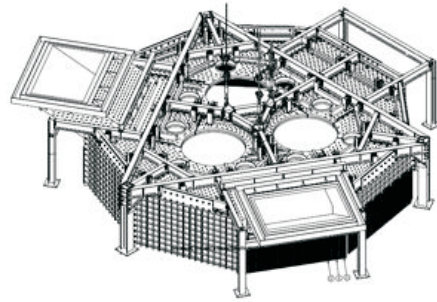
### Electrode Column

- Modular design
- Upper module
  - 'Fail-safe' slipping devices
  - Carbon steel yoke and mantle
- Lower Module
  - Stainless steel lower mantle
  - Stainless steel heat shields
  - Cast / forged HCC pressure rings
  - Rolled HCC contact shoes (High Conductivity Copper)
- Modular water cool bustube system



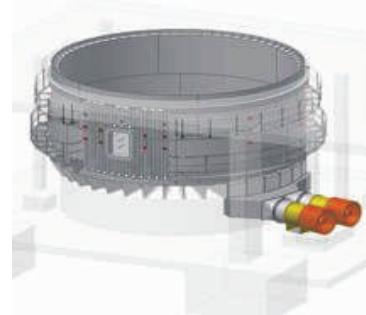
### Furnace Roof

- Semi-Closed
- Refractory lined and water cooled
- Self Supporting
- Modular design to optimize cost, performance and maintenance:
  - Centre - stainless steel
  - Centre ring - stainless/mild steel
  - Outer ring - mild steel



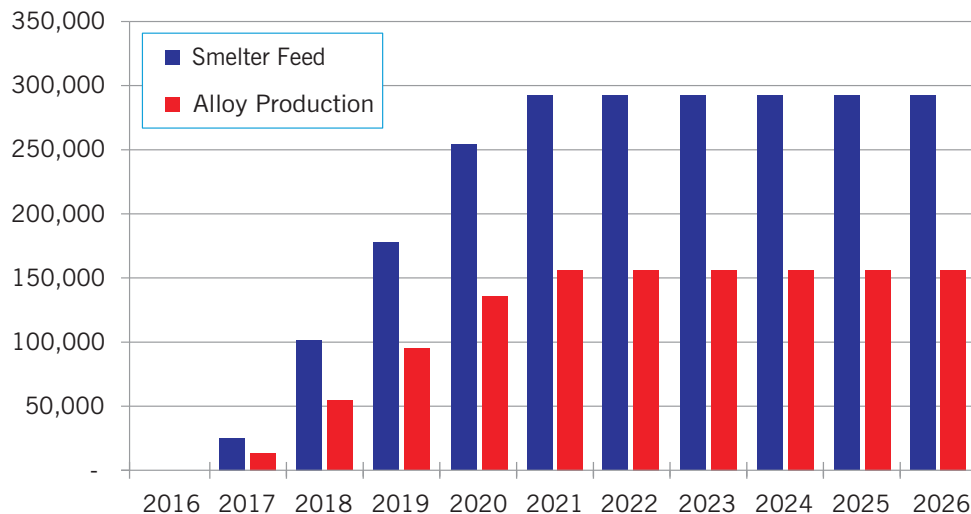
### Furnace Shell

- Robust carbon steel design
- Designed for structural & thermal loading
- Sidewall cooling - air or water
- Bottom cooling - air



## Smelter Production Schedules

Smelter Production (tpa)





## Smelter Capital Cost

### Smelter Capital - Summary

Smelter Capital Expenditure	6MVA Furnace US\$	9MVA Furnace US\$
<b>Establishment</b>	US\$ 2,400,000	
<b>Furnaces</b>		
Smelter Mechanical	US\$ 1,340,000	US\$ 1,340,000
Technology package	US\$ 5,800,000	US\$ 5,800,000
EPCM	US\$ 760,000	US\$ 560,000
<b>Smelter (per furnace)</b>	<b>US\$ 7,900,000</b>	<b>US\$ 7,700,000</b>

Capital and operating costs were supplied by XRam Technologies for the construction and operation of the ferromanganese furnaces. Incrementally building 2 x 9MVA furnaces together enables economies of scale.

### Smelter Operating Costs

Operating costs for smelter are based on the following allowances for smelter inputs.

Cost Component	Unit	Consumption	Unit price
Coal	US\$/t	0.944	85.00
Limestone	US\$/t	0.502	20.00
Iron Ore	US\$/t	0.212	75.00
Salaries/Wages	US\$/t product		57.00
Power	US\$/t product		311.00
Smelter Consumables	US\$/t product		18.00
Logistics	US\$/t product		10.00
Maintenance	% of Smelter Capital		3.0%
Environment	US\$/t product		1.20
Overheads (Site)	US\$/t product		41.00
Overheads (Corporate)	% Net Revenue		5.0%
Royalties	% FOB		6.5%

### Furnace and Power Manufacturer Contracts

The specialist smelter group XRam Technologies have been contracted to provide detailed smelter designs including power and water reticulation circuitry design. The group has extensive experience in the design, construction and operation of alloying smelters.

The Indonesian project engineering group, PT Timeserve Indonesia, have been contracted to provide project engineering, construction and assembly of the modular furnace and ore preparation jigs.

PT Hatch Indonesia, an engineering and construction management group, will project manage the power plant supply and construction activities.

### Smelter Development Schedule

Activity	2016	2017	2018	2019	2020	2021
Commence Ore Purchases	█					
Develop Mn Processing Plan	█					
Build Smelter Furnace 1	█					
Export HC FeMn		█	█	█	█	█
Build Smelter Furnace 2 & 3		█				
Build Smelter Furnace 4 & 5			█			
Build Smelter Furnace 6 & 7				█		
Build Smelter Furnace 8					█	
Power Station		█	█	█	█	



## Labour

The operation of the smelter at Kupang will generate 650 direct local jobs and have a flow on to 4,500 indirect local jobs at full production. Labour will be sourced locally with minimal expat-staff required.

## Power

The first furnace will be powered by electricity sourced from the local Government power supplier, PT PLN in Kupang, requiring 6MW of power.

Power for all subsequent furnaces will be sourced from a power infrastructure group under an arrangement, where the provider will Build, Own, Operate and eventually Transfer the power station to GMC.

Each furnace requires approximately 8MW of power, 7.5MW for the furnace (2.7MW Hr/t alloy) and 0.5MW of ancillary power for dust extraction and water cooling etc. That will require a total of 64MW of power for the proposed 8 furnaces and ancillaries. GMC have received budget estimates for the purchase of power at US\$ 0.095/kwhr.

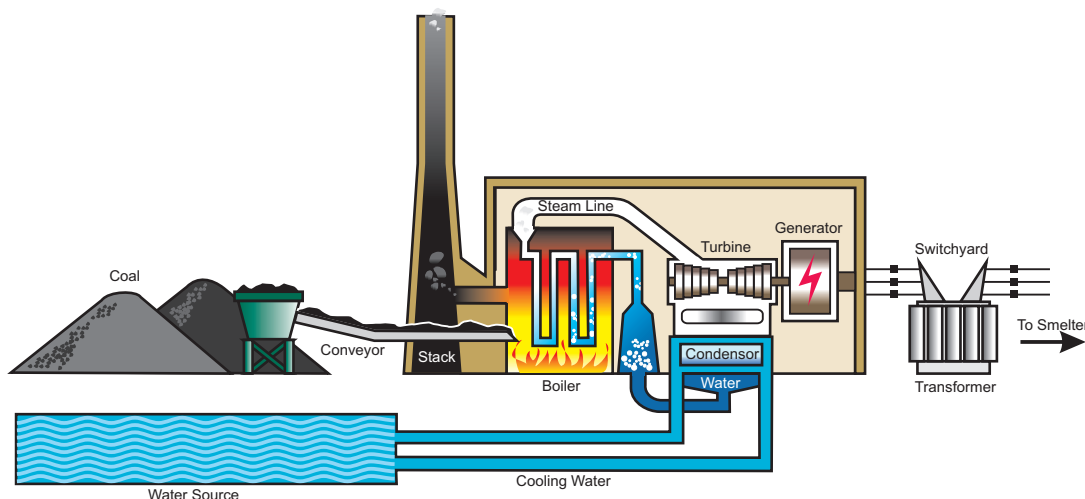
Coal for the power station will be sourced locally from Indonesia and barged to the Tenau port and transported to site by road haulage.

## Water

Minor quantities of potable water will be required for human consumption and in laboratory and cleaning systems and will be sourced locally from a bore field. The water circuit will be equipped with Reverse Osmosis plants and other filtration systems as required to ensure the water is of a suitable quality.

Process water will be required for the cooling of the coal fired power stations and sourced from the sea, approximately 500 meters from the smelting site. Warm water will be returned to the sea as is the standard practice in Indonesia.

**Coal Fired Power Station - Cooling Schematic**



## Raw Materials

Raw materials apart from manganese required for the smelter include metallurgical coal, iron units and limestone.

Coal will be imported from mines in Kalimantan and barged to the Tenau port. GMC have made an allowance of US\$85/t for the purchase of high calorific value metallurgical coal (6,200kcal/Kg). Coal will be used at a rate of 0.944t metallurgical coal to 1 tonne FeMn alloy.

Iron ore will be sourced from mines in Kalimantan and barged to the Tenau port. GMC have made an allowance of US\$75/t for the purchase of iron ore. Iron ore will be used at a rate of 0.212t iron ore to 1 tonne of FeMn alloy.

Limestone will be sourced from a nearby local quarry at Kupang at an allowance of US\$20/t, and will be used at a rate of 0.337 tonne limestone to 1 tonne FeMn alloy.

Material	Current Price Range	Study Assumption
Coal	US\$ 70-80 per tonne	US\$ 85 per tonne
Limestone	US\$ 15-20 per tonne	US\$ 20 per tonne
Iron Ore	US\$ 60-70 per tonne	US\$ 75 per tonne



## Manganese Alloy Sales and Marketing

90% of the ferromanganese product produced by GMC will be marketed overseas to high grade steel producers in Korea, Japan, Europe and China.

The quantity for export is 2.5% of the current global demand which is expected to grow at an annual average of 3.7% for the next 10 years. As such market stability will not be disturbed and consequently the financial analysis of the project can be carried out at a sound reliability level.

The remaining 10% of the product produced by GMC will be available for domestic consumption.

### Marketing Strategy

For overseas marketing, GMC has appointed the following marketing group;

- China - Metacrom Resources Ltd
- Korea - Metacrom Resources Ltd
- Japan - Roxy International Ltd
- Europe - IMC Ores & Alloys GmbH

GMC representatives have worked with these proven marketing groups for over ten years in the sale of ferromanganese alloys in the markets they represent.

### Offtake Agreements

Offtake agreements for the ferromanganese alloys form part of the marketing representation agreements with allocations of:

FERROMANGANESE ALLOYS	
Destination	Allocation
Korea	15%
Japan	25%
Europe	50%
China	10%

## Port and Shipping

### Tenau Port

It is proposed to utilise the nearby commercial port of Tenau. Tenau is a natural and deep bay for ships anchoring and docking with a draft of 9.2m sufficient for ships of up to Handymax size (35- 55,000t).

The wharf is equipped with transfer systems for material handling of solid bulk and containers, as well as firefighting system and lightings. The port operates 24 hours a day. The port will receive bulk coal and iron ore from Indonesian locations and export manganese alloy products in 20 tonne containers. Manganese alloy will be delivered to the port on local roads and stored in 1 tonne bulka bags in a storage shed until loading into sea containers prior to export.

### Wini Port

The Wini container terminal is located in the North Central Timor Regency (Kefamenanu). Separated high grade manganese ore will be barged to the Tenau Port for delivery to the smelter in 5,000 tonne cargoes.

Tenau Port - Kupang



Wini Port





## 4 Financial Analysis

GMC has developed a financial model for its proposed ore purchase, processing and ferromanganese smelting business.

The financial model is based on quotations and known assumptions and utilisations based on similar sized operations. The model, including all cost and revenue assumptions, is calculated in United States Dollars (US\$). No inflation, cost or revenue escalation has been applied to the financial model.

The financial analysis of the Study shows that the project has the potential to return a **positive EBITDA of US\$ 374.7 million over a 10 year period** supporting an estimated **Net Present Value of US\$ 160.6 million**, using an 8% discount factor. The project requires a modest start-up capital investment of US\$66 million which is staged over 5 years, plus working capital and provides estimated returns supporting an **internal rate of return of 55.6%**.

### Physicals and Financial Summary (10 Year)

Annual production capacity	155,000 tpa of Ferro Alloys
Project CAPEX (Furnaces, Jigs, Establishment)	US\$66 million staged over 5 years
Total Project Net Turnover	US\$ 1.358 million
Total Project EBITDA	US\$ 374.7 million
Project NPV @8%	US\$ 160.6 million
Project Internal Rate of Return (IRR)	55.6%
Payback Period (Including the construction cost)	2 years

A summary of the financial model is shown below, with a full financial model in Appendix A.

### Financial Model Summary (5 Year)

Model Dashboard		GULF MANGANESE CORPORATION LIMITED						
Gulf Manganese Corporation Limited								
Business Model								
<b>Timor Smelting Study</b>								
<b>Summary</b>		<b>TOTAL</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Scenario: Pioneer Industry								
Physicals								
Mn Ore Purchased	000 t	2,569,277	-	28	113	198	282	325
Smelter Feed	000 t	2,312,350	-	25	102	178	254	292
FeMn Alloy Sold	000 t	1,234,570	-	14	54	95	136	156
Project Life	Yrs	10						
Revenue								
Total Revenue (Nett)	US\$ M	1,358.0	-	14.9	59.7	104.5	149.2	171.6
Costs								
Processing	US\$ M	314.7	-	3.5	13.8	24.2	34.6	39.8
Smelting	US\$ M	666.6	1.5	8.3	29.2	51.1	73.0	83.9
Other	US\$ M	2.0	-	1.0	1.0	-	-	-
Total Op Costs	US\$ M	983.3	1.5	12.7	44.1	75.3	107.6	123.7
Start-up Capex	US\$ M	65.6	11.3	15.5	15.5	15.5	7.8	-
Sustaining Capex	US\$ M	10.0	-	1.0	1.0	1.0	1.0	1.0
Unit Operating Cost								
Total Cost / Tonne Alloy	US\$/t	795	-	864	794	793	793	793
Cash Flow								
IPO / Capital Raising / Loans	US\$ M	25.0	25.0	10.0	-	(10.0)	-	-
EBITDA	US\$ M	374.7	(1.5)	2.2	15.6	29.1	41.7	47.9
Cash Flow	US\$ M	299.1	(12.8)	(14.3)	(0.9)	12.6	32.9	46.9
NPV @8% DCF	US\$ M	160.6						
IRR	%	55.6%						



## 5 Sensitivity Analysis

The financial model was constructed so that the sensitivity of the models outputs could easily be measured in terms of changes to the inputs.

For the model the following variances were made

Input	Variance
Manganese Sale Price	+/- 10%
Operating Costs	+/- 10%
Capital Costs	+/- 10%
Project Start-up Delay	0, 3 & 6 Months

Once the above changes are made the impact on the financial models KPI's is tabulated:

Model Dashboard		GULF MANGANESE CORPORATION LIMITED						
Gulf Manganese Corporation Limited								
Business Model Active Case = Base case								
Summary		Base case	Mn Price +10%	Mn Price -10%	Opex +10%	Opex -10%	Capex +10%	Capex -10%
Scenario: Pioneer Industry		20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total
<b>Physicals</b>								
Mn Ore Purchasd (Local)	kt	2,569	2,569	2,569	2,569	2,569	2,569	2,569
FeMn Alloy Sold	kt	1,235	1,235	1,235	1,235	1,235	1,235	1,235
Project Life	Yrs	20	20	20	20	20	20	20
<b>Revenue</b>								
FeMn Alloy Sales	US\$M	1,358.0	1,493.8	1,222.2	1,358.0	1,358.0	1,358.0	1,358.0
Total Revenue	US\$M	1,358.0	1,493.8	1,222.2	1,358.0	1,358.0	1,358.0	1,358.0
<b>Costs</b>								
Processing	US\$M	314.7	314.7	314.7	346.2	283.3	314.7	314.7
Smelting	US\$M	666.6	675.3	657.8	732.9	600.2	667.2	665.9
Other	US\$M	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total Op Costs	US\$M	983.3	992.1	974.5	1,081.1	885.5	983.9	982.6
Starup Capex	US\$M	65.6	65.6	65.6	65.6	65.6	72.2	59.1
Sustaining Capex	US\$M	10.0	10.0	10.0	10.0	10.0	11.0	
EBITDA	US\$M	374.7	501.8	247.7	276.9	472.6	374.1	375.4
<b>Pre-tax metrics</b>								
NPV	@8% DCF US\$M	160.6	236.3	84.9	102.3	218.8	154.0	167.1
IRR	%	55.6%	73.3%	35.9%	40.7%	69.3%	50.8%	61.2%
Active Case		✓						
Best / Worst Case			✓	✗				

Variances to the financial indicators due to project implementation delays are shown below

Delay	NPV US\$ million	IRR %
No Delay	160.6	55.6%
3 Months	157.2	54.9%
6 Months	153.9	54.3%

## 6 Business Plan Risks

GMC have undertaken a comprehensive risk management review, which identified key business and operational risks and have developed strategies to mitigate and control these risks.

### Strengths, Weaknesses, Opportunities and Threats

A SWOT analysis documents the Strengths, Weaknesses, Opportunities and Threats to the business plan.

#### Business Model - SWOT Analysis

		Strengths	Weaknesses
Internal		<ul style="list-style-type: none"> <li>Database of geological knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Limited Indonesian proven mineral resource base</li> </ul>
		<ul style="list-style-type: none"> <li>People on the ground with local knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Project funding to be secured</li> </ul>
		<ul style="list-style-type: none"> <li>Multi-level government support</li> </ul>	<ul style="list-style-type: none"> <li>Limited metallurgical work</li> </ul>
		<ul style="list-style-type: none"> <li>Complies with licences and approvals</li> </ul>	
		<ul style="list-style-type: none"> <li>High grade manganese ore available</li> </ul>	
		<ul style="list-style-type: none"> <li>Close to Port</li> </ul>	
		<ul style="list-style-type: none"> <li>Proximity to the mostly Asian Mn markets</li> </ul>	
		<ul style="list-style-type: none"> <li>Proximity to Indonesian Coal/Iron Ore mines for smelter consumables</li> </ul>	
		Opportunities	Threats
External		<ul style="list-style-type: none"> <li>No competition in Processing or Smelting in Timor</li> </ul>	<ul style="list-style-type: none"> <li>First smelter to market will gain a strong hold on ore supply</li> </ul>
		<ul style="list-style-type: none"> <li>Local small scale Mn suppliers can mine and sell Mn ores once a processing route is established</li> </ul>	<ul style="list-style-type: none"> <li>Time to develop a smelter in compliance with Indonesian upstream processing requirements</li> </ul>
		<ul style="list-style-type: none"> <li>High unemployment in Timor will provide a ready source of labour</li> </ul>	<ul style="list-style-type: none"> <li>Other companies entering the smelting business</li> </ul>
		<ul style="list-style-type: none"> <li>Scalability - The operation can be developed in a staged manner</li> </ul>	<ul style="list-style-type: none"> <li>Potential loss of export or other permits if milestones not achieved</li> </ul>
		<ul style="list-style-type: none"> <li>Ore supply potential in neighbouring Islands</li> </ul>	
		<ul style="list-style-type: none"> <li>Mn price is semi-cyclical in nature and is at low levels currently</li> </ul>	

### Risk Mitigation

#### Smelter Inputs

The key input cost areas as % of the total smelter operating costs are:

No.	Cost Area	% of Total Costs
1	Power	39%
2	Ore	33%
3	Manpower	12%
4	Met Coal	10%
5	Other Minor costs	6%
<b>Total</b>		<b>100%</b>



### Power

As power input is the major cost component therefore needs the main focus to ensure cost effective continuous supply, Gulf will develop its own "in-house" coal fired power station and will be self-sufficient and protected against any adverse occurrences.

For the first stage of development Gulf will receive off the grid power from the Government power supplier PT PLN - 6 Mega Watts on a user pay basis. As the enterprise expands into future stages, incrementally building 2 furnaces each year power will be supplied by an infrastructure group, on a user pay basis, who will Build, Own, Operate and Transfer the power plant to Gulf. In this way Gulf conserves upfront capital and upon transfer the project itself pays for the capital cost. Each power module will be built in 16 Mega Watt stages to service 2 furnaces.

### Ore

No.	Source	% of Cost Area	Tonnes per Annum
1	Local Suppliers Mn Ore	75%	292,000
2	Local Suppliers Iron Ore	25%	33,100

For local manganese ores Gulf will enter into a minimum of 6 Ore Supply MoU's together with purchasing on a spot market basis to ensure continuity of supply for the high grade, low iron manganese ores.

For local iron ores Gulf will enter into a minimum of 2 Ore Supply MoU's together with purchasing on a spot market basis to ensure continuity of supply for the iron ore component of the smelter feed.

### Manpower (full production)

No.	Location	No of Employees
1	Furnace Operators	400
2	Backup Operators	50
3	Maintenance Staff	25
4	General Staff	125
5	Office Staff	50
<b>Total</b>		<b>650</b>

West Timor has a high unemployment rate and as such has a large labour pool available. Gulf will selectively engage appropriate skilled personnel as furnace operators and provide process training. Skills will include processing, ore sorting, alloy sorting, smelter feed and ferro alloy stockpiling and general site work.

Maintenance Staff will be fully trained by expat processing personnel while Office Staff will in the main be clerical duties.

General staff will include Health, Safety, Environmental & Community Management and Security staff as well as laboratory and other technical positions.

It is the intention of Gulf to ultimately have the smelter facility totally operated by Indonesian Nationals with minimal expat input.

### Coal

Approximately 150,000 tonnes per annum of high calorific value (6,200 kcal/kg) metallurgical coal will be required at full production. Indonesia is blessed with abundant coal resources and this will ensure continuous supply will not be an issue.

Year	Coal Requirement
Year 1	15,000 tonnes
Year 2	55,000 tonnes
Year 3	100,000 tonnes
Year 4	135,000 tonnes
Year 5	150,000 tonnes





## Market Place

### Overview

As ferromanganese alloys are in general used in higher quality steels the major market will be Japan, Korea and Europe. China has a strategy to move to producing higher quality steels to support an export industry to adequately compete globally. This will lead to increasing demands for ferromanganese.

The current annual consumption of high carbon ferromanganese alloy is 4.2 million tonnes per annum.

The premium quality of Gulf's alloys will ensure a strong demand by quality steel producers. At full production Gulf's output will be 155,000 tonnes per annum which will account for 2.7% of world consumption. World demand for high carbon ferro alloys is forecast to grow at the rate of 10% over the next 5 years.

### Price Cycle

Gulf's operating costs of US\$ 793/tonne for high carbon alloy is some 80% of the global industry average. The forecast for the next 5 years ranges from US\$ 1,000 - US\$ 1,200 per tonne - having peaked at US\$ 2,700/tonne in 2008.

### Gulf's Sales

As the quality of the ferromanganese alloy being produced, annual production being small in the global sense, built up over a 4 year period Gulf is confident its projected sales volumes and prices will be achieved.

Gulf has used a selling price of US\$ 1,100/tonne high carbon alloy which produces an NPV of US\$ 160.6 million (8% discount rate) and an IRR of 55.6%.

### Project Delay

Gulf has used an achievable project development schedule for the development of the project. However delays, in the implementation of the project schedule, are possible and sometimes unforeseen.

The impact implementation delays on the projects NPV and IRR is shown below.

Delay	NPV US\$ million	IRR %
No Delay	160.6	55.6%
3 Months	157.2	54.9%
6 Months	153.9	54.3%

# 7 Manganese Market

## What is Manganese

Manganese is the 12<sup>th</sup> most abundant mineral in the earth crust. It is a hard, brittle metallic element that is listed before iron in the periodic table.

**Manganese Lump Ore**



**High Grade Manganese Ore**



Manganese is the fourth most consumed metal in the world only exceeded by iron, aluminium and copper. Global mine output was 17.3 million Mn units in 2014 with over 90% going into steel production, where there is no viable substitute in the steel making process.

Manganese is an essential ingredient of many industrial processes, especially in steel production where it is primarily used to remove sulphur during the steel making process as well as hardening the steel. Manganese is used to make many things, from spacecraft to batteries. Its compounds are important for purifying water and for glazing pottery and glass. Manganese is an essential mineral in our diet.

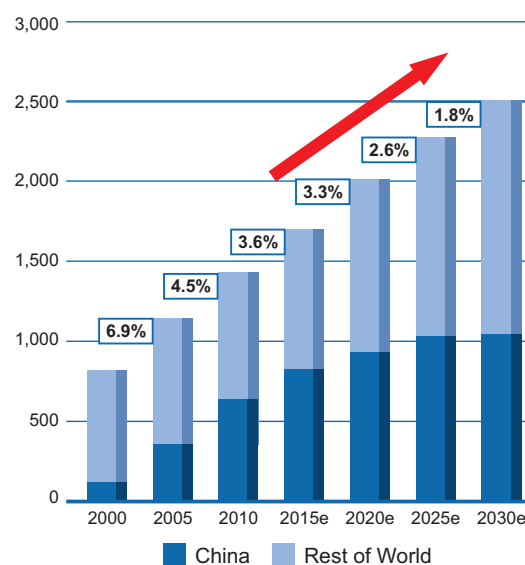
## Supply/ Demand History

Global demand for manganese has been increasing at a higher rate than crude steel production over the 12 year period 2000 to 2012, period driven by two factors.

1. Consumption of manganese per tonne of steel increased from 0.69% to 0.75% over the period
2. Steel demand has been increasing steadily by +5.2% per annum during the period.

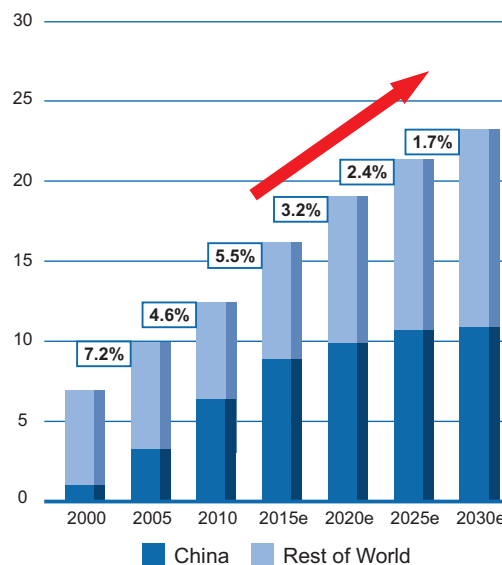
### Demand Projections

**Global steel production**  
(million tonnes)



Source: BHP Billiton, World Steel Association

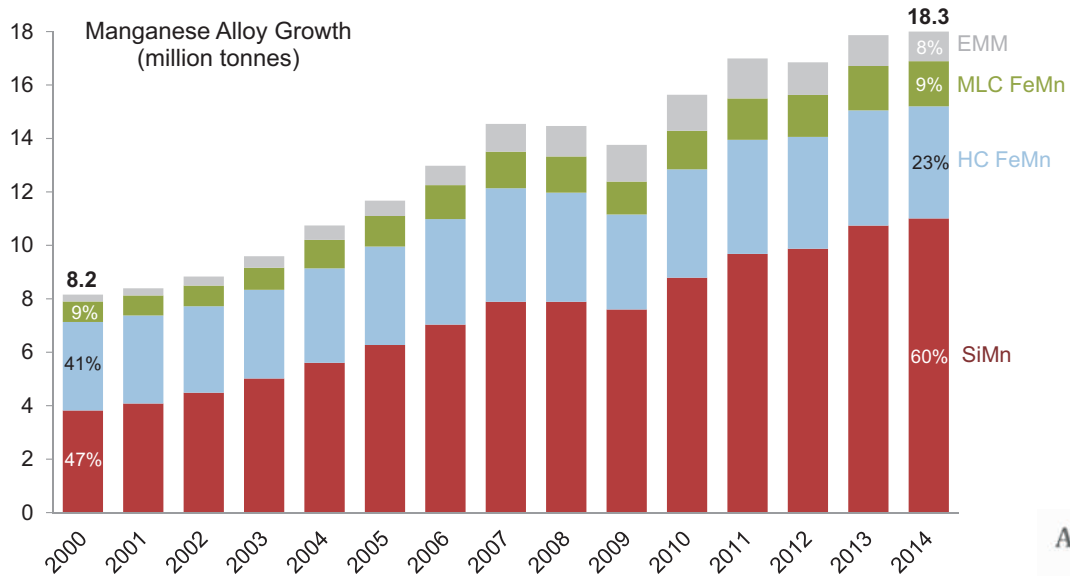
**Global manganese ore in alloys**  
(million tonnes, contained Mn)



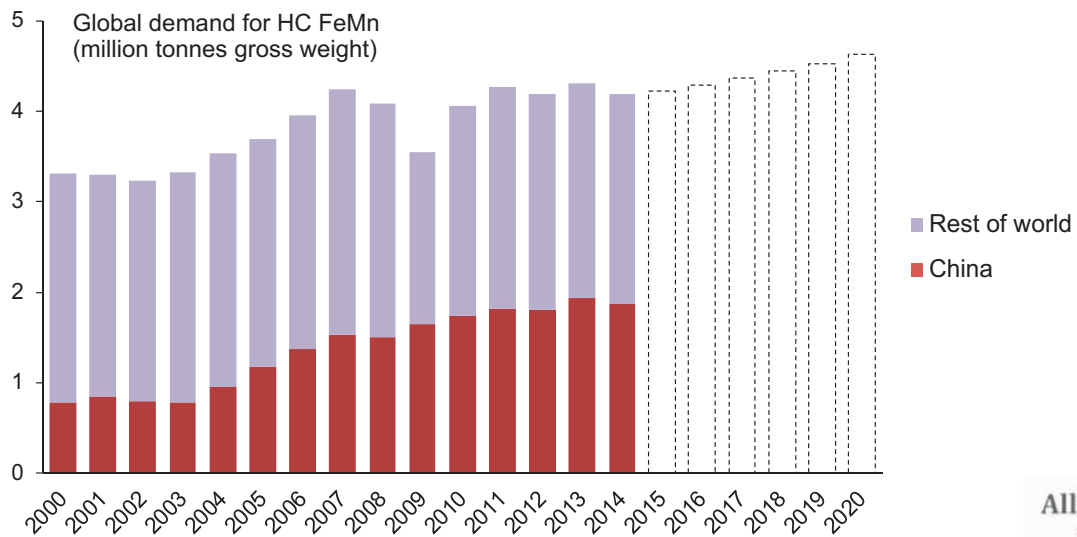
Source: BHP Billiton, IMnI, CRU



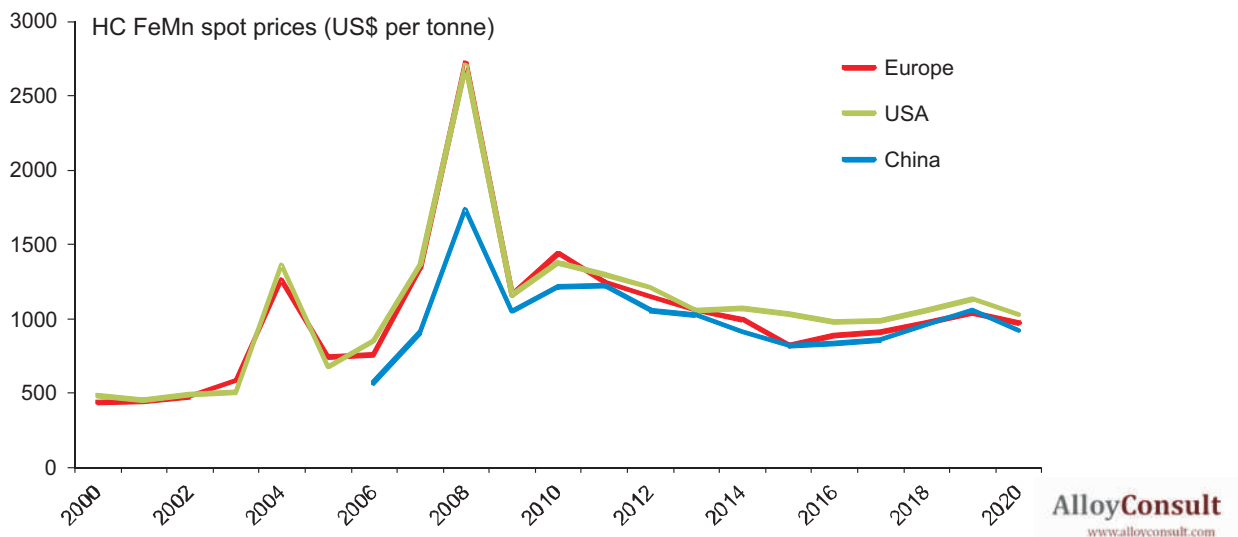
## Mn Alloy Growth



## Forecast FeMn Alloy Growth



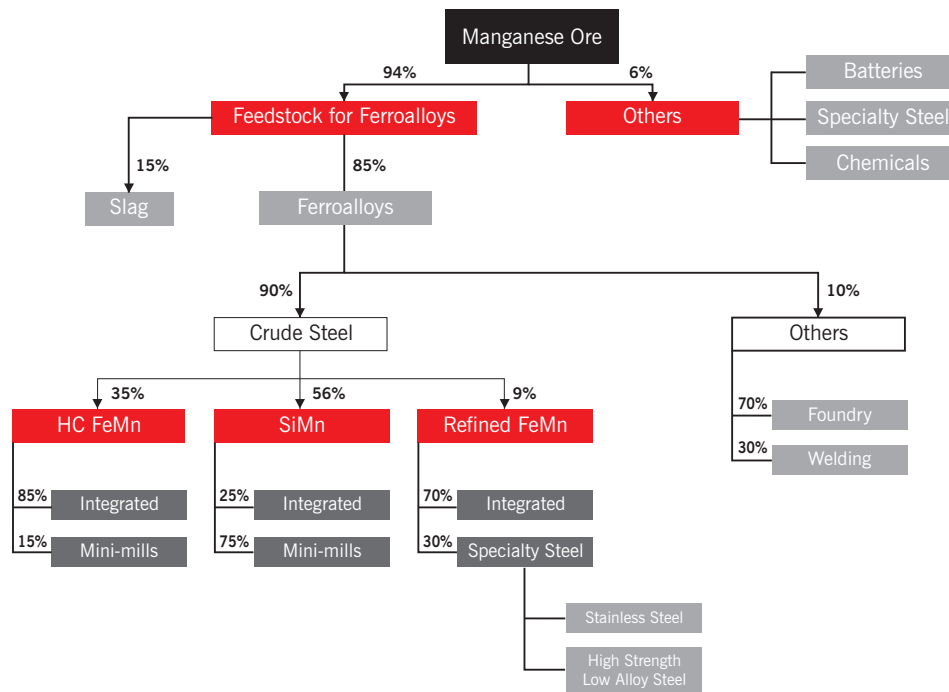
## Forecast HC FeMn prices





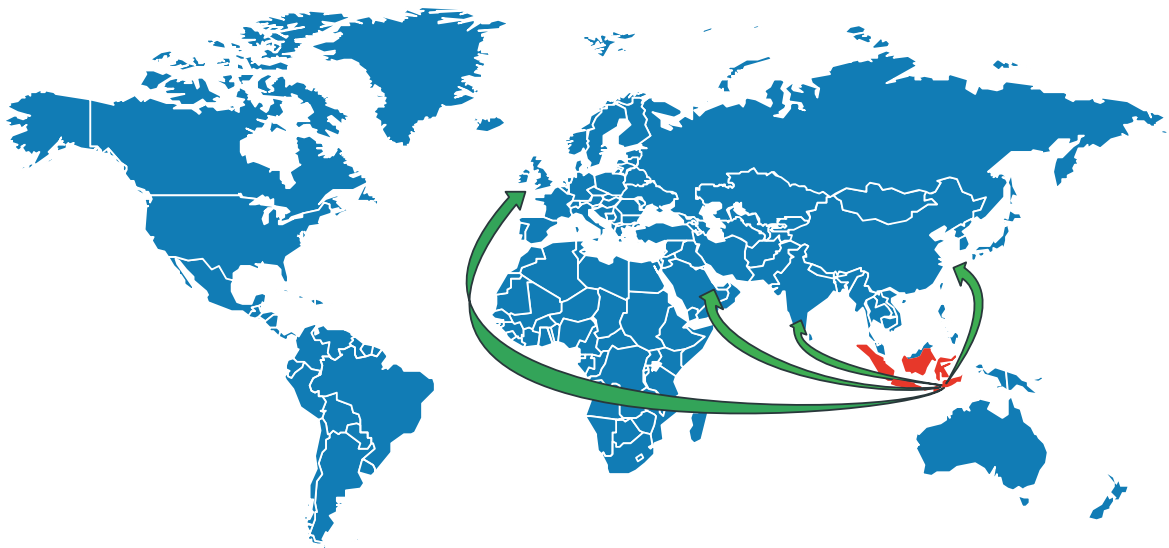
## Markets

### Manganese Market Material Flow



High carbon ferromanganese Alloy (Mn 70-82%) is used in manufacturing normal, low/medium carbon and high-carbon steel. On average 9.71kg of manganese alloy is used in making one tonne of steel. Manganese alloy used per tonne of steel tends to vary across region with Europe accounting for as low as 8.51kg per tonne of steel and China for more than 10.5kg per tonne.

### GMC Marketing Network



GMC's ferromanganese alloy business in Indonesia is ideally located to take advantage of its proximity to the major consumer markets in Asia.



# 8 Indonesia

## Overview

Indonesia is the world's fourth most populous democracy with 248 million people, including the world's largest Muslim population. The archipelago consists of more than 17,500 islands of which 6,000 are inhabited, covering 2 million square kilometres - about a quarter the size of Australia. The country comprises 34 provinces, 510 regencies, 6,793 districts and 79,075 villages.

## Background

Republican forces led by Ir. Soekarno declared independence from the Netherlands in 1945 after 3 centuries of Dutch rule. Economic collapse and political conflict prompted the army, led by General Suharto, to replace Soekarno and take power in 1967. Suharto oversaw 3 decades of authoritarian government before resigning in 1998 amid an economic and social crisis. Indonesia then experienced a time of far reaching political reform, known locally as "Reformansi" period, which ushered in a more democratic government including direct presidential elections.

The July 2014 Presidential elections were won by the popular and successful, Jakarta Governor, Joko "Jokowi" Widodo who is viewed as a progressive "man of the people" to guide Indonesia's future.

## Political Structure

In 2004, the President and Vice-President were directly elected for the first time. The directly elected People's Consultative Assembly now comprises 560-member House of Representatives (the legislature) and the 136-member Regional Representatives Council.

## Policy Issues

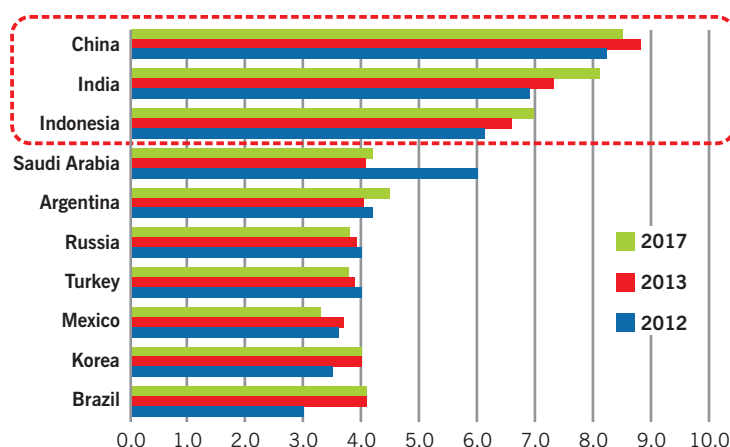
The Indonesian government has given high priority to boosting investment and economic and social development. It has introduced strategies to streamline investment, introduce tax incentives and address corruption issues, which have deterred investment.

## Economy

Indonesia is an emerging global powerhouse in Asia. Indonesia's Investment Coordinating Board BKPM put the country's economic growth at 5.7% in 2013, making it "The World's Most Stable Economy in the past five years" according to The Economist Magazine. Analysts expect Indonesia's GDP growth to continue between 5-6% until at least 2030.

The country's debt to GDP ratio has steadily declined from 83% in 2001 to less than 26% at the end of 2013, the lowest among ASEAN countries, BKPM states. In May 2013, ratings agency Standard & Poors affirmed Indonesia's sovereign credit rating at BB+ level for long-term, a notch below investment grade. The rating reflects Indonesia's resilience to the global financial crisis, improving government controls and the ability to manage challenges to a reform agenda.

Nominal GDP Growth Projections by IMF



The IMF projects Indonesia will be at the top 3 fastest economic growths among G20 countries

International Monetary Fund;  
World Economic Outlook Database April 2012

## Taxation

A 10% Value-Added Tax (VAT) is levied on most goods and services and a special sales tax ranging from 10-75% imposed on luxury items. The corporate tax rate is 25%.

Indonesia offers a number of investment incentives including import duty, tax allowances and tax holidays.

## West Timor

West Timor is the western Indonesian portion of the island of Timor and part of the Province of East Nusa Tenggara with a land area of 15,850 square kilometres and highest point Mount Musa at 2,427 metres.

The temperatures are consistent throughout the year ranging from average maximum of 32°C and minimum 23°C. Average rainfall is 1500mm per annum predominantly from November to March/April.

The province consists of 5 Regencies (Kabupatens) with a population of just under 1.8 million people, 92% Christian and 8% Muslim. Unemployment is estimated at 80% with the average wage of US\$ 150 per month. The current main industry is agriculture consisting of corn, rice, coffee, copra and fruit.

### Location of Proposed Smelter from Kupang



## Doing Business in Indonesia

As the fourth most populous country in the world, supported by good political and economic stability, Indonesia's large domestic market offers a wide range of investment opportunities for foreign and domestic investors. With a target economic growth of more than 6% for the coming years, there is a growing emphasis for the Government of Indonesia on attracting more foreign investment in order for the overall investment to reach the projected levels of Indonesian Rupiah (IDR) 2,000 trillion, or approximately US\$ 200 billion. For the last 10 years the Government of Indonesia has been actively introducing measures directed at encouraging investing in Indonesia and improving the country's regulatory and economic environment.

Indonesia is one of the world's leading emerging economies, and the third-fastest growing economy in Asia. It is also the largest economy in Southeast Asia, supported by:

- GDP of more than US\$ 800 billion in 2013, and forecast to grow by 6.1% in 2015.
- Strong domestic consumption.
- Strong Trade and investment flows, including intra-regional flows.
- An Investor-friendly government.
- An abundance of natural resources.
- An ample and increasingly talented work force, underpinned by the world's fourth-largest population by country.







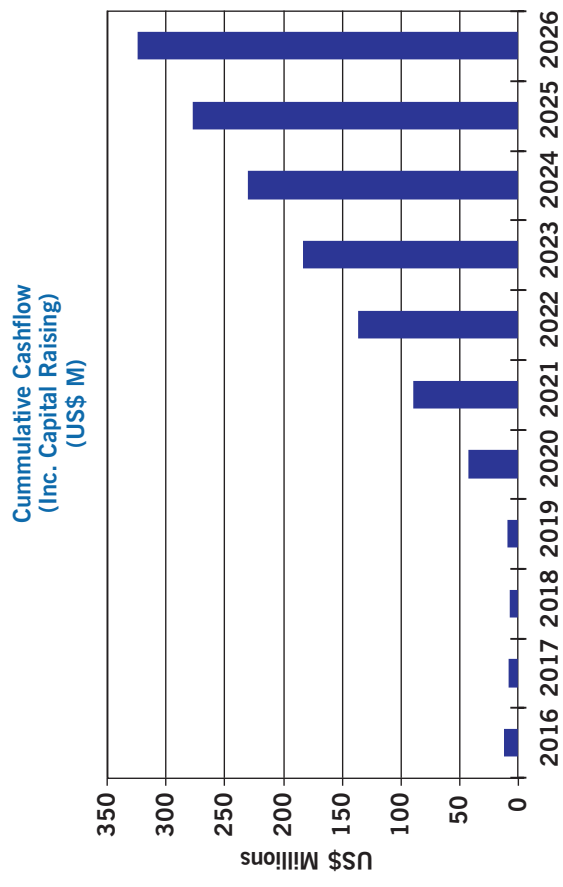
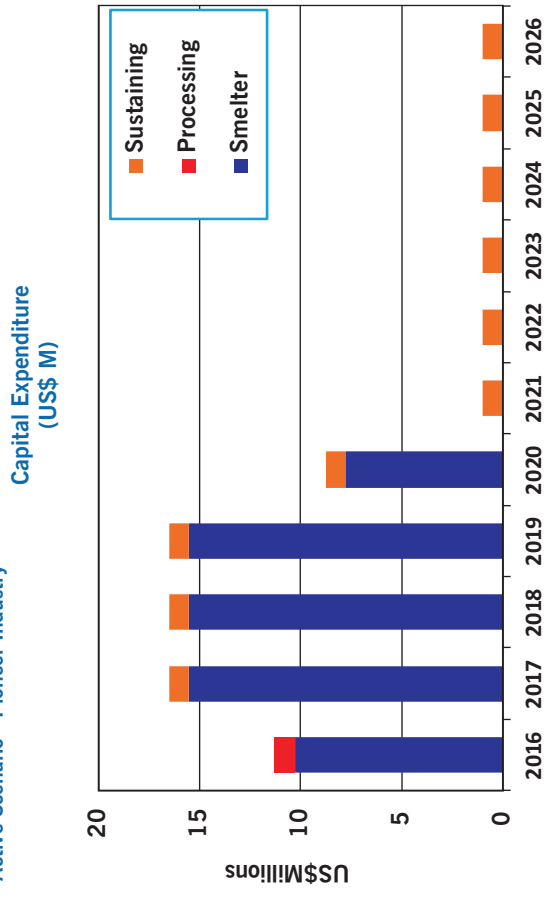
Model Dashboard		GULF MANGANESE CORPORATION LIMITED											
Gulf Manganese Corporation Limited		Business Model											
Timor Smelting Study		Scenario: Pioneer Industry											
Summary		TOTAL	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
<b>Physicals</b>													
Mn Ore Purchased	t	2,569,277	-	28,234	112,936	197,637	282,338	324,689	324,689	324,689	324,689	324,689	324,689
Smelter Feed	t	2,312,350	-	25,411	101,642	177,873	254,104	292,220	292,220	292,220	292,220	292,220	292,220
FeMn Alloy Sold	t	1,234,570	-	13,567	54,267	94,967	135,667	156,017	156,017	156,017	156,017	156,017	156,017
Project Life	Yrs	10											
<b>Revenue</b>													
Total Revenue (Nett)	US\$ M	1,358.0	-	14.9	59.7	104.5	149.2	171.6	171.6	171.6	171.6	171.6	171.6
<b>Costs</b>													
Processing	US\$ M	314.7	-	3.5	13.8	24.2	34.6	39.8	39.8	39.8	39.8	39.8	39.8
Smelting	US\$ M	666.6	1.5	8.3	29.2	51.1	73.0	83.9	83.9	83.9	83.9	83.9	83.9
Other	US\$ M	2.0	-	1.0	1.0	-	-	-	-	-	-	-	-
Total Op Costs	US\$ M	983.3	1.5	12.7	44.1	75.3	107.6	123.7	123.7	123.7	123.7	123.7	123.7
Start-up Capex	US\$ M	65.6	11.3	15.5	15.5	15.5	7.8	-	-	-	-	-	-
Sustaining Capex	US\$ M	10.0	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<b>Unit Operating Cost</b>													
Total Cost / Tonne Alloy	US\$/t	795	-	864	794	793	793	793	793	793	793	793	793
<b>Cash Flow</b>													
IPO / Capital Raising / Loans	US\$ M	25.0	25.0	10.0	-	(10.0)	-	-	-	-	-	-	-
EBITDA	US\$ M	374.7	(1.5)	2.2	15.6	29.1	41.7	47.9	47.9	47.9	47.9	47.9	47.9
Cash Flow	US\$ M	299.1	(12.8)	(14.3)	(0.9)	12.6	32.9	46.9	46.9	46.9	46.9	46.9	46.9
NPV	US\$ M	160.6											
IRR	%	55.6%											



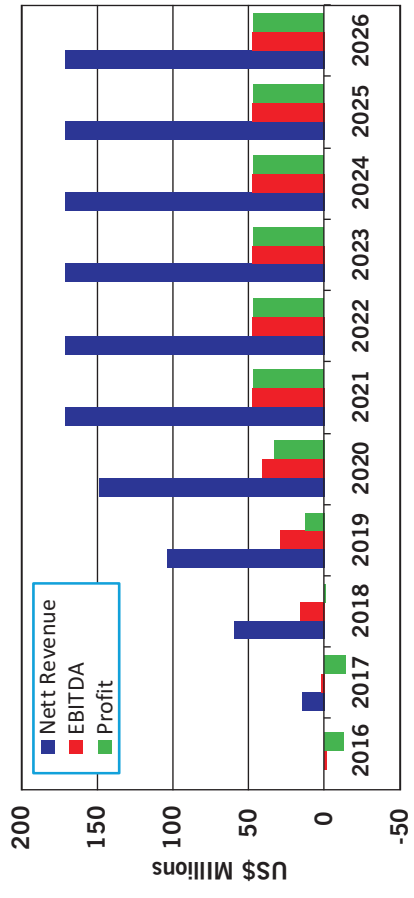
Model Dashboard		Gulf Manganese Corporation Limited						
Business Model		Business Model						
Summary	Scenario: Pioneer Industry	Base case	Mn Price +10%	Mn Price -10%	Opex +10%	Opex -10%	Capex +10%	Capex -10%
		20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total	20 Yr Total
<b>Physicals</b>								
Mn Ore Purchasd (Local)	kt	2,569	2,569	2,569	2,569	2,569	2,569	2,569
FeMn Alloy Sold	kt	1,235	1,235	1,235	1,235	1,235	1,235	1,235
Project Life	Yrs	20	20	20	20	20	20	20
<b>Revenue</b>								
FeMn Alloy Sales	US\$M	1,358.0	1,493.8	1,222.2	1,358.0	1,358.0	1,358.0	1,358.0
Total Revenue	US\$M	1,358.0	1,493.8	1,222.2	1,358.0	1,358.0	1,358.0	1,358.0
<b>Costs</b>								
Processing	US\$M	314.7	314.7	314.7	346.2	283.3	314.7	314.7
Smelting	US\$M	666.6	675.3	657.8	732.9	600.2	667.2	665.9
Other	US\$M	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total Op Costs	US\$M	983.3	992.1	974.5	1,081.1	885.5	983.9	982.6
Startup Capex	US\$M	65.6	65.6	65.6	65.6	65.6	72.2	59.1
Sustaining Capex	US\$M	10.0	10.0	10.0	10.0	10.0	11.0	9.0
EBITDA	US\$M	374.7	501.8	247.7	276.9	472.6	374.1	375.4
<b>Pre-tax metrics</b>								
NPV @8% DCF	US\$M	160.6	236.3	84.9	102.3	218.8	154.0	167.1
IRR	%	55.6%	73.3%	35.9%	40.7%	69.3%	50.8%	61.2%
Active Case		✓	✓	✓	✓	✓	✓	✓
Best / Worst Case								



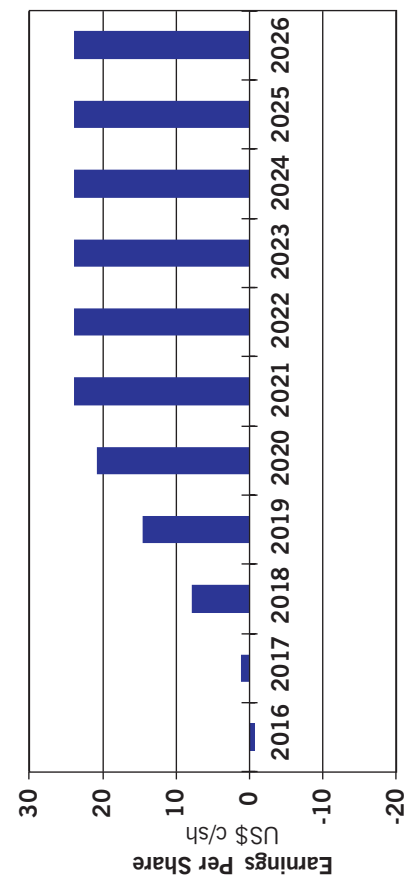
Active Scenario - Pioneer Industry



Management Projections



Earnings per Share Projections





Financial Model		GULF MANGANESE CORPORATION LIMITED												
Gulf Manganese Corporation Limited		Active Case = Pioneer Industry												
Business Model		Total (20 Yr)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Units														
<b>Revenue</b>														
Manganese Alloy	US\$/t		1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Min Alloy Prices	US\$	1,358,027,000	-	-	14,923,700	59,693,700	104,463,700	149,233,700	171,618,700	171,618,700	171,618,700	171,618,700	171,618,700	171,618,700
Net Mn Sales	US\$	1,358,027,000	-	-	14,923,700	59,693,700	104,463,700	149,233,700	171,618,700	171,618,700	171,618,700	171,618,700	171,618,700	171,618,700
Total Revenue	US\$	1,358,027,000	-	-	14,923,700	59,693,700	104,463,700	149,233,700	171,618,700	171,618,700	171,618,700	171,618,700	171,618,700	171,618,700
<b>Operating Costs</b>														
<b>Mn Separation Plant</b>														
Ore Purchase	100.00 US\$/t Proc	256,927,734	-	-	2,823,443	11,293,566	19,763,688	28,233,810	32,468,871	32,468,871	32,468,871	32,468,871	32,468,871	32,468,871
Beneficiation	12.50 US\$/t Proc	28,804,370	-	-	317,637	1,270,526	2,223,415	3,176,304	3,652,748	3,652,748	3,652,748	3,652,748	3,652,748	3,652,748
Laboratory	2.50 US\$/t Proc	5,780,874	-	-	63,527	254,105	444,683	695,261	730,550	730,550	730,550	730,550	730,550	730,550
Logistics	10.00 US\$/Solid	23,123,496	-	-	254,110	1,016,421	1,778,732	2,541,043	2,922,198	2,922,198	2,922,198	2,922,198	2,922,198	2,922,198
Subtotal	US\$	314,736,475	-	-	3,458,718	13,834,618	24,210,518	34,586,417	39,774,367	39,774,367	39,774,367	39,774,367	39,774,367	39,774,367
<b>Smelter</b>														
Iron Ore	75.00 US\$	19,629,663	-	-	215,715	862,845	1,509,975	2,157,105	2,480,670	2,480,670	2,480,670	2,480,670	2,480,670	2,480,670
Coal	85.00 US\$	99,061,897	-	-	1,088,616	4,354,384	7,620,152	10,885,920	12,518,804	12,518,804	12,518,804	12,518,804	12,518,804	12,518,804
Limestone	20.00 US\$	12,895,083	-	-	136,213	544,841	953,469	1,362,097	1,566,411	1,566,411	1,566,411	1,566,411	1,566,411	1,566,411
Salaries/Wages	52.00 US\$	64,197,640	-	-	705,484	2,821,884	4,938,284	7,054,684	8,112,884	8,112,884	8,112,884	8,112,884	8,112,884	8,112,884
Power	278.00 US\$	343,210,460	-	-	3,771,626	15,086,226	26,400,826	37,715,026	43,372,726	43,372,726	43,372,726	43,372,726	43,372,726	43,372,726
Smelter Consumables	10.00 US\$	12,345,700	-	-	135,670	542,670	949,670	1,356,670	1,560,170	1,560,170	1,560,170	1,560,170	1,560,170	1,560,170
Logistics	10.00 US\$	12,345,700	-	-	135,670	542,670	949,670	1,356,670	1,560,170	1,560,170	1,560,170	1,560,170	1,560,170	1,560,170
Maintenance	2.5% US\$	6,526,115	-	-	128,660	322,716	516,772	710,828	807,856	807,856	807,856	807,856	807,856	807,856
Insurance	2.00 US\$	2,469,140	-	-	27,134	108,534	189,934	271,334	312,034	312,034	312,034	312,034	312,034	312,034
Fuels/Oils	1.00 US\$	1,234,570	-	-	13,567	54,267	94,967	135,667	156,017	156,017	156,017	156,017	156,017	156,017
Environmental	2.00 US\$	2,469,140	-	-	27,134	108,534	189,934	271,334	312,034	312,034	312,034	312,034	312,034	312,034
Overheads (Site)	2.5% US\$	33,950,675	-	-	373,093	1,492,343	2,611,593	3,730,843	4,290,468	4,290,468	4,290,468	4,290,468	4,290,468	4,290,468
Overheads (Corporate)	4.0% US\$	56,724,132	-	-	1,500,000	2,387,748	4,178,548	5,969,348	6,864,748	6,864,748	6,864,748	6,864,748	6,864,748	6,864,748
Subtotal	US\$	666,559,914	-	-	8,248,581	29,229,662	51,103,794	72,977,926	83,914,992	83,914,992	83,914,992	83,914,992	83,914,992	83,914,992
Total Operating Costs	US\$	981,296,389	-	-	11,717,300	43,064,280	75,314,311	107,564,343	123,689,359	123,689,359	123,689,359	123,689,359	123,689,359	123,689,359
Unit Operating cost	US\$/t	795	-	-	864	794	793	793	793	793	793	793	793	793
Operating Cashflow	US\$	376,730,611	-	(1,500,000)	3,206,400	16,629,420	29,149,389	41,669,357	47,929,341	47,929,341	47,929,341	47,929,341	47,929,341	47,929,341



Financial Model		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Gulf Manganese Corporation Limited		Gulf MANGANESE CORPORATION LIMITED												
Business Model		Active Case = Pioneer Industry												
Units		Total (20 Yr)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
<b>Capital Summary</b>														
<b>Capital</b>														
Separation Plant	US\$	1,000,000	-	1,000,000	-	-	-	-	-	-	-	-	-	-
Smelter	US\$	64,628,512	-	10,292,790	15,524,492	15,524,492	15,524,492	7,762,246	-	-	-	-	-	-
Sustaining capital	US\$	10,000,000	-	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Total	US\$	75,628,512	-	11,292,790	16,524,492	16,524,492	16,524,492	8,762,246	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
<b>Funding</b>														
IPO	US\$	25,000,000	-	25,000,000	-	-	-	-	-	-	-	-	-	-
Loans	US\$	-	-	10,000,000	-	(10,000,000)	-	-	-	-	-	-	-	-
Interest on Loans	US\$	2,000,000	-	-	1,000,000	-	-	-	-	-	-	-	-	-
<b>Before Tax Evaluation</b>														
EBITDA	US\$	374,730,611	-	(1,500,000)	2,706,400	15,629,420	29,149,389	41,669,357	47,929,341	47,929,341	47,929,341	47,929,341	47,929,341	47,929,341
Net Cashflow	US\$	299,102,099	-	(12,792,790)	(14,318,092)	(895,072)	12,624,887	32,907,111	46,929,341	46,929,341	46,929,341	46,929,341	46,929,341	46,929,341
Discounted Nett Cashflow	US\$	160,557,130	-	(12,309,868)	(12,757,028)	(738,411)	9,648,722	23,274,634	30,733,626	28,457,061	26,349,130	24,397,343	22,590,132	20,916,789
NPV	US\$	160,557,130	-	(12,309,868)	(12,757,028)	(738,411)	9,648,722	23,274,634	30,733,626	28,457,061	26,349,130	24,397,343	22,590,132	20,916,789
IRR	US\$	55.6%	-	12,207,210	7,889,118	6,994,047	9,618,943	42,526,054	89,455,395	136,384,736	183,314,077	230,243,417	277,172,758	324,102,099
Cumm. Nett Cashflow before Tax	US\$		-	12,207,210	7,889,118	6,994,047	9,618,943	42,526,054	89,455,395	136,384,736	183,314,077	230,243,417	277,172,758	324,102,099
<b>Equity</b>														
Net Income	US\$	374,730,611	-	(1,500,000)	2,706,400	15,629,420	29,149,389	41,669,357	47,929,341	47,929,341	47,929,341	47,929,341	47,929,341	47,929,341
Shares on Issue	US\$/sh	80,000,000	80,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000
Earnings per Share	US\$/sh		-	(0.8)	1.1	7.8	14.6	20.8	24.0	24.0	24.0	24.0	24.0	24.0





## Appendix B - Tax Regulations

### Tax Holiday

#### Tax Holiday Regulation of The MoF No. 130/PMK.011/2011

##### Facility

- A taxpayer can be granted a tax relief facility for a period of between 5 and 10 years, starting from the commencement of its commercial production.
- After the expiration of the tax holiday, the taxpayer will be entitled to an income tax reduction of 50% for a further 2 years.
- By considering the purpose of maintaining the competitiveness of national industries and the strategic value of certain business activities, the duration of the tax relief and reduction can be extended based on a decision by the Minister of Finance.

##### Criteria

- Constituting a pioneer industry:
  - Basic metal industries;
  - Oil refinery industries and/or basic organic chemicals originating from oil and natural gas;
  - Machinery industries;
  - Industries in the field of renewable resources;
  - Communication devices industries.
- Having a new investment plan having obtained the approval of competent authorities in a minimum amount of IDR 1 trillion (USD 100 million).

### Incentives

#### Import Duties

All investment projects of PMA as well as PMDN projects which are approved by the Investment Coordinating Board or by the Office of Investment in the respective districts, including existing PMA and PMDN companies expanding their projects to produce similar product(s) in excess of 30% of installed capacities or diversifying their products, will be granted the following facilities:

- Relief from import duty so that the final tariffs become 0 %. Import duty which are mentioned in the Indonesian Customs Tariff Book. (BTBMI). This is stipulated in the Ministry of Finance's Decree No. 176/PMK.011/2009 dated November 16, 2009 which is effective from December 2009.
  - On the importation of capital goods namely machinery, equipments, spare parts and auxiliary equipments for an import period of 2 (two) years, started from the date of stipulation of decisions on import duty relief.
  - On the importation of goods and materials or raw materials regardless of their types and composition, which are used as materials or components to produce finished goods or to produce services for the purpose of two years full production (accumulated production time).
  - However, the decree as above mentioned is not applied to the assembling of cars and motor bikes except for its component industries.
- Exemption from Transfer of Ownership Fee for ship registration deed / certificate made for the first time in Indonesia.



### **Tax Facilities**

- The government has introduced a Tax Bill No's 16, 17, 18, 19 and 20 of 2000 and applied since January 1, 2001. Based on this tax law, the domestic and foreign investors will be granted tax allowances in certain sector and/or area as follows:
  - An Investment Tax Allowance in the form of taxable income reduction as much as 30 % of the realized investment spread in 6 (six) years.
  - Accelerated depreciation and amortization.
  - A Loss carried forward facility for period of no more than 10 (ten) years.
  - A 10 % income tax on dividends, and possibly being lower if stipulated in the provisions of an existing particular tax treaty.
- The government has also introduced provisions No's 146 of 2000 of 2000 and 12 of 2001 on the importation and/or delivery of Selected Taxable Goods, and or the provision of Selected Taxable Services as well as the importation and or delivery of Selected Strategic Goods which are exempted from Value Added Tax.

### **Export Manufacturing**

There are many incentives provided for exporting manufacture products. Some of these incentives are as follows;

- Restitution (drawback) of import on the importation of goods and materials needed to manufacture the exported finished products.
- Exemption from Value Added Tax and Sales Tax on Luxury goods and materials purchased domestically, to be used in the manufacturing of the exported products.
- The company can import raw materials required regardless of the availability of comparable domestic products.

### **Bonded Zones**

- The industrial companies which are located in the bonded areas are provided with many incentives as follows;
  - Exemption from import duty, excise, income tax of Article 22, Value Added Tax on Luxury Goods on the importation of capital goods and equipment including raw materials for the production process.
  - Allowed to divert their products amounted to 50% of their export (in term of value) for the final
  - Allowed to sell scrap or waste to Indonesian custom area as long as it contains at the highest
  - Allowed to lend their own machineries and equipments to their subcontractors located outside
- Exemption of Value Added Tax and Sales Tax on Luxury Goods on the delivery of products for further processing from bonded zones to their subcontractors outside the bonded zones or the other way around as well as among companies in these areas.



## Value Added Tax and Sales Tax on Luxury Goods

In normal cases, 10% Value Added Tax (VAT) is applied to imports, manufactured goods and most services. In addition, there is also sales tax on luxury goods ranging from 10% to 75% (See Government Regulation No. 12/2001 jo. No. 43/2002 jo. 46/2003 and other related tax implementation regulations).

According to the government regulation No. 7 Year 2007;

### 1. Value Added Tax (VAT)

Free Charge of Value Added Tax (VAT) to the importation of certain VAT charged goods having the strategic term, consist of;

- a. Capital Goods in the form of machineries and factory equipments, either in installed or separated, including spare parts
- b. Feed of poultry and fish and raw materials to make feed
- c. Seed and or seeding of agricultural material, plantation, forestry, livestock, aquaculture, or fishery
- d. Agricultural products;

### 2. Free Charge of Value Added Tax Imposition (VAT)

Free charge of Value Added Tax (VAT) to the delivery of certain VAT charge goods having the strategic term, consist of;



- a. Capital goods in the form of machineries and factory equipment, either in installed or separated, excluding spare parts, which is directly needed to produce VAT charge products
- b. Feed of poultry and fish and or raw material to make the feed
- c. Seed and or seeding of agricultural material plantation, forestry, livestock, aquaculture, or fishery
- d. Agriculture products.



**TENTATIVE TIME SCHEDULE  
AMDAL DOCUMENT PREPARATION  
SMELTER CONSTRUCTION AT KUANHEUN AREA, KUPANG DISTRICT  
BY GULF MANGANESE CORPORATION LIMITED**

NO	DESCRIPTION OF ACTIVITY	MONTHS IN 2015/16															
		FIRST			SECOND			THIRD			FOURTH			FIFTH			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	SOCIALISING WITH LOCALS																
2	FIELD VISIT WITH BLHD TECHNICAL TEAM																
3	COLLECTING DATA ON THE LOCATION																
4	LABORATORY ANALYSES																
5	PREPARATION OF KA-ANDAL																
6	PRESENTATION KA-ANDAL DOCUMENT																
7	PERMISSION RECOMMENDATION OF KA-ANDAL																
8	PREPARATION OF ANDAL, RKL AND RPL DOCUMENT																
9	DOCUMENT ASSESSMENT BY BLHD																
10	PRESENTATION OF ANDAL, RKL AND RPL DOCUMENT																
11	FINAL REPORT OF ANDAL, RKL AND RPL DOCUMENT																
12	PERMISSION RECOMMENDATION																
13	ENVIRONMENTAL CLEARANCE																



 <b>GULF MANGANESE CORPORATION LIMITED</b> 		<b>Project Number</b>	
		XRAM GULF/15/01	
		<b>Estimate Date</b>	
<b>Capital Cost Estimate</b> <b>Client:</b> Gulf Minerals Corporation <b>Project:</b> Ferromanganese Modular 6MVA Smelter		08/06/2015 - Rev 6	
		<b>Estimating</b>	
		SM JJB	
		<b>Sub Total</b>	<b>Total</b>
<b>1</b>	<b>Establishment Costs</b>		\$ 2,385,889
1.1	Civil	\$ 803,185	
1.2	Structural	\$ 984,603	
1.3	Electrical	\$ 598,100	
<b>2</b>	<b>Furnace Costs</b>		\$ 5,850,167
2.1	Technology Package	\$ 3,907,019	
2.2	Mechanical	\$ 1,403,420	
2.3	Piping	\$ 408,510	
2.4	Controls	\$ 131,218	
<b>3</b>	<b>EPCM Costs</b>		\$ 1,121,026
3.1	XRAM	\$ 1,121,026	
<b>4</b>	<b>Contingency</b>		\$ 935,708
4.1	Allowance (10%)	\$ 935,708	
<b>5</b>	<b>Total Costs</b>		\$ 10,292,790



## Appendix E - Smelter Operating Costs

GULF MANGANESE CORPORATION LIMITED		OPEX MODEL (C1 NET DIRECT CASH COST) - 6 MVA FURNACE				REV 3	
		Base Case – Indonesian manganese and iron ore				8-Jun-15	
<b>Model Basis:</b>							
- Tapped Metal		13,878 tpa					
- Saleable Metal (3% unrecoverable losses)		13,567 tpa					
Item	Description	Units	Consumption t/t Saleable Alloy (Feed Wet Basis)	Unit Cost Cost USD/ton	Unit Delivery Cost to Plant US\$/ton	Total Cost US\$/ton Alloy (Saleable Alloy)	% Of Total Cost
<b>VARIABLE OPERATING COSTS</b>							
1	<b>FEED MATERIALS (Dry Base)</b>						
	Total Ore	t/t	1.873				
1.1	Indonesian Ore (52% Mn & 73% of ore feed)	t/t	1.873	\$125.00	\$5.00	\$243.47	
1.2	Iron Ore (62% Magnetite)	t/t	0.212	\$75.00	\$0.00	\$15.91	
	Total Reductant	t/t	0.944				
1.3	Met Coal	t/t	0.944	\$85.00	\$0.00	\$80.26	
	Total Fluxes	t/t	0.502				
1.4	Limestone	t/t	0.502	\$20.00	\$0.00	\$10.04	
	<b>Subtotal</b>					<b>\$349.68</b>	<b>43.13%</b>
2	<b>OTHER CONSUMEABLES</b>						
2.1	Electrode paste	t/t	0.020	\$550.00	\$5.00	\$11.35	
2.2	Electrode casings	t/t	0.003	\$25.00		\$0.06	
2.3	Ladle Refractories	t/t	0.016	\$0.00		\$0.00	
2.4	Tap Hole Paste	t/t	0.002	\$250.00		\$0.51	
2.5	Tap Hole Drills & Bits	Unit/t	0.001	\$100.00		\$0.10	
2.6	Tap Hole Mickeys (Carbon)	Unit/t	0.001	\$600.00		\$0.31	
2.7	Oxygen Steel Lances & Prigger bars	t/t	0.001	\$50.00		\$0.05	
2.8	Oxygen	t/t	0.001	\$90.00		\$0.06	
2.9	Thermocouples & Pipes	t/t	0.001	\$0.00		\$0.10	
2.1	Potable Water	m <sup>3</sup> /t	0.679	\$0.13		\$0.09	
2.11	Process Water	m <sup>3</sup> /t	0.951	\$0.13		\$0.12	
2.12	Other Consumables	t/t	1.023	\$0.66		\$0.68	
2.13	Diesel (Materials Handling)	l/t	15.711	\$0.30		\$4.71	
2.14	Water Treatment (Chemical Additions)	t/t				\$0.11	
	<b>Subtotal</b>					<b>\$18.26</b>	<b>2.25%</b>
3	<b>ENERGY</b>						
3.1	Electric Power (Saleable product)	KWh/t	2887	\$0.095		\$274.31	
3.2	Auxillary Power	KWh/t	390	\$0.095		\$37.05	
	<b>Subtotal</b>					<b>\$311.36</b>	<b>38.40%</b>
<b>TOTAL VARIABLE OPERATING COSTS</b>						<b>\$679.30</b>	<b>83.8%</b>
<b>FIXED OPERATING COSTS</b>							
			Unit	Cost (USD\$/yr)			
4	<b>LABOUR</b>						
4.1	Management	\$/yr	8	\$192,000		\$14.15	
	Process Manager	\$/yr	1	\$125,000		\$9.21	
	Supervisors	\$/yr	15	\$180,000		\$13.27	
4.2	Labour	\$/yr	50	\$300,000		\$22.11	
	<b>Subtotal</b>	<b>\$/yr</b>	<b>74</b>	<b>\$797,000</b>		<b>\$58.75</b>	<b>7.2%</b>
5	<b>VEHICLES</b>						
5.1	Maintenance	\$/yr	6	\$36,000.00		\$2.65	
	<b>Subtotal</b>	<b>\$/yr</b>		<b>\$36,000.00</b>		<b>\$2.65</b>	<b>0.3%</b>
6	<b>MAINTENANCE</b>						
6.1	Direct Maintenance (2% of Capital)	\$/yr	2.0%	\$120,000		\$8.85	
6.2	Major Repairs (1% of Capital)	\$/yr	1.0%	\$60,000		\$4.42	
	<b>Subtotal</b>	<b>\$/yr</b>	<b>0.5%</b>	<b>\$180,000</b>		<b>\$13.27</b>	<b>1.6%</b>
7	<b>OTHER COSTS</b>						
7.1	Admin and Overhead Expenses	\$/yr		\$746,170		\$55.00	
	<b>Subtotal</b>	<b>\$/yr</b>		<b>\$746,170</b>		<b>\$55.00</b>	<b>6.8%</b>
8	<b>Environmental</b>						
8.1	Monitoring & Rehabilitation Provision	\$/yr		\$24,000		\$1.77	
	<b>Subtotal</b>	<b>\$/yr</b>		<b>\$24,000</b>		<b>\$1.77</b>	<b>0.2%</b>
<b>TOTAL FIXED OPERATING COSTS</b>						<b>\$131.44</b>	<b>16.2%</b>
<b>C1 PRODUCTION COST - HCFeMn</b>				<b>\$10,999,037.34</b>		<b>\$810.74</b>	
<b>SALES PRICE - HCFeMn (FOB)</b>				<b>\$14,923,404.87</b>		<b>\$1,100.00</b>	
<b>M1 MARGIN</b>				<b>\$3,924,367.53</b>		<b>\$289.26</b>	
REV		No/Date	3	8/06/2015			
PREPARED		By/Date	JJB	8/06/2015			
CHECKED		By/Date					
AUTH		By/Date					






GULF MANGANESE CORPORATION LIMITED		OPEX MODEL (C1 NET DIRECT CASH COST) - 9 MVA FURNACE				REV 4	
					Base Case – Indonesian manganese and iron ore		10-Jun-15
<b>Model Basis:</b>							
- Tapped Metal		20,818 tpa					
- Saleable Metal (3% unrecoverable losses)		20,350 tpa					
Item	Description	Units	Consumption t/t Saleable Alloy (Feed Wet Basis)	Unit Cost USD/ton	Unit Delivery Cost to Plant US\$/ton	Total Cost US\$/ton Alloy (Saleable Alloy)	% Of Total Cost
<b>VARIABLE OPERATING COSTS</b>							
1	<b>FEED MATERIALS (Dry Base)</b>						
	Total Ore	t/t	1.873				
1.1	Indonesian Ore (52% Mn & 73% of ore feed)	t/t	1.873	\$125.00	\$5.00	\$243.47	
1.2	Iron Ore (62% Magnetite)	t/t	0.212	\$75.00	\$0.00	\$15.91	
	Total Reductant	t/t	0.944				
1.3	Met Coal	t/t	0.944	\$85.00	\$0.00	\$80.26	
	Total Fluxes	t/t	0.502				
1.4	Limestone	t/t	0.502	\$20.00	\$0.00	\$10.04	
	<b>Subtotal</b>					<b>\$349.68</b>	<b>44.28%</b>
2	<b>OTHER CONSUMEABLES</b>						
2.1	Electrode paste	t/t	0.020	\$550.00	\$5.00	\$11.35	
2.2	Electrode casings	t/t	0.003	\$25.00		\$0.06	
2.3	Ladle Refractories	t/t	0.010	\$0.00		\$0.00	
2.4	Tap Hole Paste	t/t	0.002	\$250.00		\$0.51	
2.5	Tap Hole Drills & Bits	Unit/t	0.001	\$100.00		\$0.10	
2.6	Tap Hole Mickeys (Carbon)	Unit/t	0.001	\$600.00		\$0.31	
2.7	Oxygen Steel Lances & Prigger bars	t/t	0.001	\$50.00		\$0.05	
2.8	Oxygen	t/t	0.001	\$90.00		\$0.06	
2.9	Thermocouples & Pipes	t/t	0.001	\$0.00		\$0.10	
2.1	Potable Water	m <sup>3</sup> /t	0.679	\$0.13		\$0.09	
2.11	Process Water	m <sup>3</sup> /t	0.951	\$0.13		\$0.12	
2.12	Other Consumables	t/t	1.023	\$0.66		\$0.68	
2.13	Diesel (Materials Handling)	l/t	15.711	\$0.30		\$4.71	
2.14	Water Treatment (Chemical Additions)	t./t				\$0.11	
	<b>Subtotal</b>					<b>\$18.26</b>	<b>2.31%</b>
3	<b>ENERGY</b>						
3.1	Electric Power (Saleable product)	KWh/t	2887	\$0.095		\$274.31	
3.2	Auxillary Power	KWh/t	390	\$0.095		\$37.05	
	<b>Subtotal</b>					<b>\$311.36</b>	<b>39.43%</b>
<b>TOTAL VARIABLE OPERATING COSTS</b>						<b>\$679.30</b>	<b>86.0%</b>
<b>FIXED OPERATING COSTS</b>							
			Unit	Cost (USD\$/yr)			
4	<b>LABOUR</b>						
4.1	Management	\$/yr	8	\$192,000		\$9.43	
	Process Manager	\$/yr	1	\$125,000		\$6.14	
	Supervisors	\$/yr	15	\$180,000		\$8.85	
4.2	Labour	\$/yr	50	\$300,000		\$14.74	
	<b>Subtotal</b>	<b>\$/yr</b>	<b>74</b>	<b>\$797,000</b>		<b>\$39.16</b>	<b>5.0%</b>
5	<b>VEHICLES</b>						
5.1	Maintenance	\$/yr	6	\$36,000.00		\$1.77	
	<b>Subtotal</b>	<b>\$/yr</b>		<b>\$36,000.00</b>		<b>\$1.77</b>	<b>0.2%</b>
6	<b>MAINTENANCE</b>						
6.1	Direct Maintenance (2% of Capital)	\$/yr	2.0%	\$180,000		\$8.85	
6.2	Major Repairs (1% of Capital)	\$/yr	1.0%	\$90,000		\$4.42	
	<b>Subtotal</b>	<b>\$/yr</b>	<b>0.5%</b>	<b>\$270,000</b>		<b>\$13.27</b>	<b>1.7%</b>
7	<b>OTHER COSTS</b>						
7.1	Admin and Overhead Expenses	\$/yr		\$1,119,255		\$55.00	
	<b>Subtotal</b>	<b>\$/yr</b>		<b>\$1,119,255</b>		<b>\$55.00</b>	<b>7.0%</b>
8	<b>Environmental</b>						
8.1	Monitoring & Rehabilitation Provision	\$/yr		\$24,000		\$1.18	
	<b>Subtotal</b>	<b>\$/yr</b>		<b>\$24,000</b>		<b>\$1.18</b>	<b>0.1%</b>
<b>TOTAL FIXED OPERATING COSTS</b>						<b>\$110.38</b>	<b>14.0%</b>
<b>C1 PRODUCTION COST - HCFEMn</b>				<b>\$16,070,056.02</b>		<b>\$789.68</b>	
<b>SALES PRICE - HCFEMn (FOB)</b>				<b>\$22,385,107.31</b>		<b>\$1,100.00</b>	
<b>M1 MARGIN</b>				<b>\$6,315,051.29</b>		<b>\$310.32</b>	
REV		No/Date	3	8/06/2015			
PREPARED		By/Date	JJB	8/06/2015			
CHECKED		By/Date					
AUTH		By/Date					



## Appendix F - Smelter Ore Balance Check

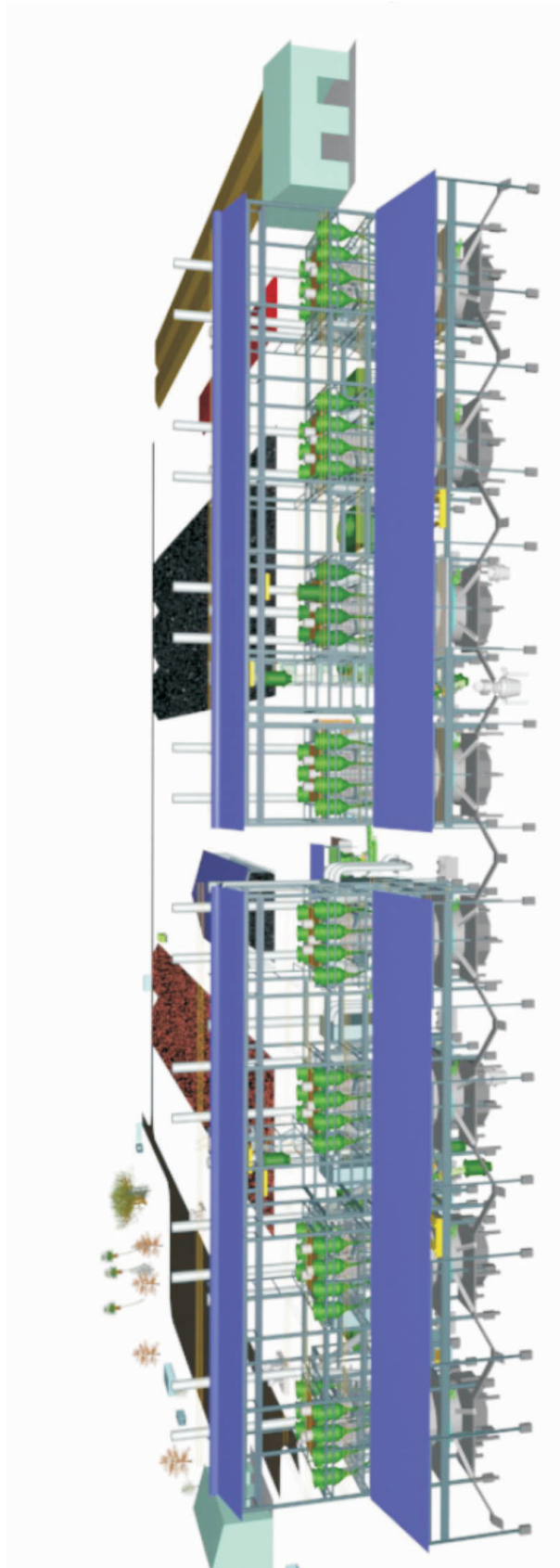
	Manganese Ore Balance Check - BaseCase	09-Jun-15 Preparedby:JJB																														
<p>Mass &amp; energy balance have been done in both Metsim and HSC The following is back-up calculation to confirm manganese consumption rates</p> <p><b>1. Assumptions used:</b>            Indonesian ore is a Pyrolusite (MnO<sub>2</sub>) based ore            See included ore analysis received from Gulf            Reported lab analysis based on MnO (and not MnO<sub>2</sub>)            The Discard Slag practice has been followed to simplify on-site operation            (The High Grade slag process could be followed if Gulf would like to sell a high grade slag as well, or produce SiMn as well)</p> <p><b>2. Basic ore requirements to produce 1 ton HCFeMn</b></p> <p><b>a. For Metal</b></p> <table border="0"> <tr> <td><b>HCFeMn analysis</b></td> <td><b>Mass (t)</b></td> <td><b>Carbothermic reduction</b></td> <td><b>MnO Required (t/t HCFeMn)</b></td> </tr> <tr> <td>Mn = 78%</td> <td>0.78</td> <td>MnO + C = Mn + CO(g)</td> <td>1.007</td> </tr> </table> <p><b>b. MnO in slag with basicity 1.2 and use of Met Coal (Slag/Metal ratio = 0.8)</b></p> <table border="0"> <tr> <td><b>Slag analysis Mass (t/t HCFeMn)</b></td> <td><b>Carbothermic reduction</b></td> <td><b>MnO Required (t/t HCFeMn)</b></td> </tr> <tr> <td>MnO = 21%</td> <td>0.168</td> <td>MnO + C = Mn + CO(g)</td> </tr> <tr> <td></td> <td></td> <td>0.168</td> </tr> </table> <p><b>c. MnOindust(carry-over)</b></p> <table border="0"> <tr> <td><b>MnO in dust</b></td> <td><b>MnO Required (t/t HCFeMn)</b></td> </tr> <tr> <td>0.032</td> <td>0.032</td> </tr> </table> <hr/> <p><b>D. Total MnO input to produce 1 ton tapped HCFeMn</b> <span style="float: right;"><b>1.207</b></span></p> <hr/> <p><b>3. Ore requirement: using MetCoal</b></p> <table border="0"> <tr> <td>This equates to</td> <td>1.799</td> <td>ton of ore on a dry basis (MnO in ore = 67.1%) per ton tapped HCFeMn</td> </tr> <tr> <td></td> <td>1.836</td> <td>ton of ore on a wet basis (assume 2% moisture) per ton tapped HCFeMn</td> </tr> <tr> <td></td> <td><b>1.878</b></td> <td><b>ton of ore on a wet basis/ton Saleable HCFeMn (assume 2.275% unrecoverable losses)</b></td> </tr> </table>			<b>HCFeMn analysis</b>	<b>Mass (t)</b>	<b>Carbothermic reduction</b>	<b>MnO Required (t/t HCFeMn)</b>	Mn = 78%	0.78	MnO + C = Mn + CO(g)	1.007	<b>Slag analysis Mass (t/t HCFeMn)</b>	<b>Carbothermic reduction</b>	<b>MnO Required (t/t HCFeMn)</b>	MnO = 21%	0.168	MnO + C = Mn + CO(g)			0.168	<b>MnO in dust</b>	<b>MnO Required (t/t HCFeMn)</b>	0.032	0.032	This equates to	1.799	ton of ore on a dry basis (MnO in ore = 67.1%) per ton tapped HCFeMn		1.836	ton of ore on a wet basis (assume 2% moisture) per ton tapped HCFeMn		<b>1.878</b>	<b>ton of ore on a wet basis/ton Saleable HCFeMn (assume 2.275% unrecoverable losses)</b>
<b>HCFeMn analysis</b>	<b>Mass (t)</b>	<b>Carbothermic reduction</b>	<b>MnO Required (t/t HCFeMn)</b>																													
Mn = 78%	0.78	MnO + C = Mn + CO(g)	1.007																													
<b>Slag analysis Mass (t/t HCFeMn)</b>	<b>Carbothermic reduction</b>	<b>MnO Required (t/t HCFeMn)</b>																														
MnO = 21%	0.168	MnO + C = Mn + CO(g)																														
		0.168																														
<b>MnO in dust</b>	<b>MnO Required (t/t HCFeMn)</b>																															
0.032	0.032																															
This equates to	1.799	ton of ore on a dry basis (MnO in ore = 67.1%) per ton tapped HCFeMn																														
	1.836	ton of ore on a wet basis (assume 2% moisture) per ton tapped HCFeMn																														
	<b>1.878</b>	<b>ton of ore on a wet basis/ton Saleable HCFeMn (assume 2.275% unrecoverable losses)</b>																														
<p><b>DISCLAIMER</b>            This document is intended for the sole and exclusive use of the management of the Client. XRAM Technologies (Pty) Ltd shall retain all intellectual property rights in all documents and materials produced by it. The Client shall, subject to confidentiality limitations, be entitled to use the Report and copy it only for the Project and the purposes relating to the Project.</p>																																

Analyte	Unit	Method	Detection Limit	Result
Al <sub>2</sub> O <sub>3</sub>	%	XR50	0.1	1.83
CaO	%	XR50	0.01	1.41
Cr <sub>2</sub> O <sub>3</sub>	%	XR50	0.005	0.026
Cr	%	XR50	0.005	0.018
Fe <sub>2</sub> O <sub>3</sub>	%	XR50	0.01	1.75
Fe	%	XR50	0.01	1.23
K <sub>2</sub> O	%	XR50	0.01	0.31
MgO	%	XR50	0.01	0.28
Mn	%	XR50	0.005	53.39
MnO	%	XR50	0.005	68.92
Na <sub>2</sub> O	%	XR50	0.01	<0.01
P <sub>2</sub> O <sub>5</sub>	%	XR50	0.001	0.158
P	%	XR50	0.001	0.082
SiO <sub>2</sub>	%	XR50	0.01	8.75
TiO <sub>2</sub>	%	XR50	0.01	0.13
S	%	XR50	0.002	0.09
BaO	%	XR50	0.005	0.66
Cu	%	XR50	0.002	0.066
Pb	%	XR50	0.002	<0.002
Zn	%	XR50	0.002	0.044
LOI	%	XR50	0.1	10.70

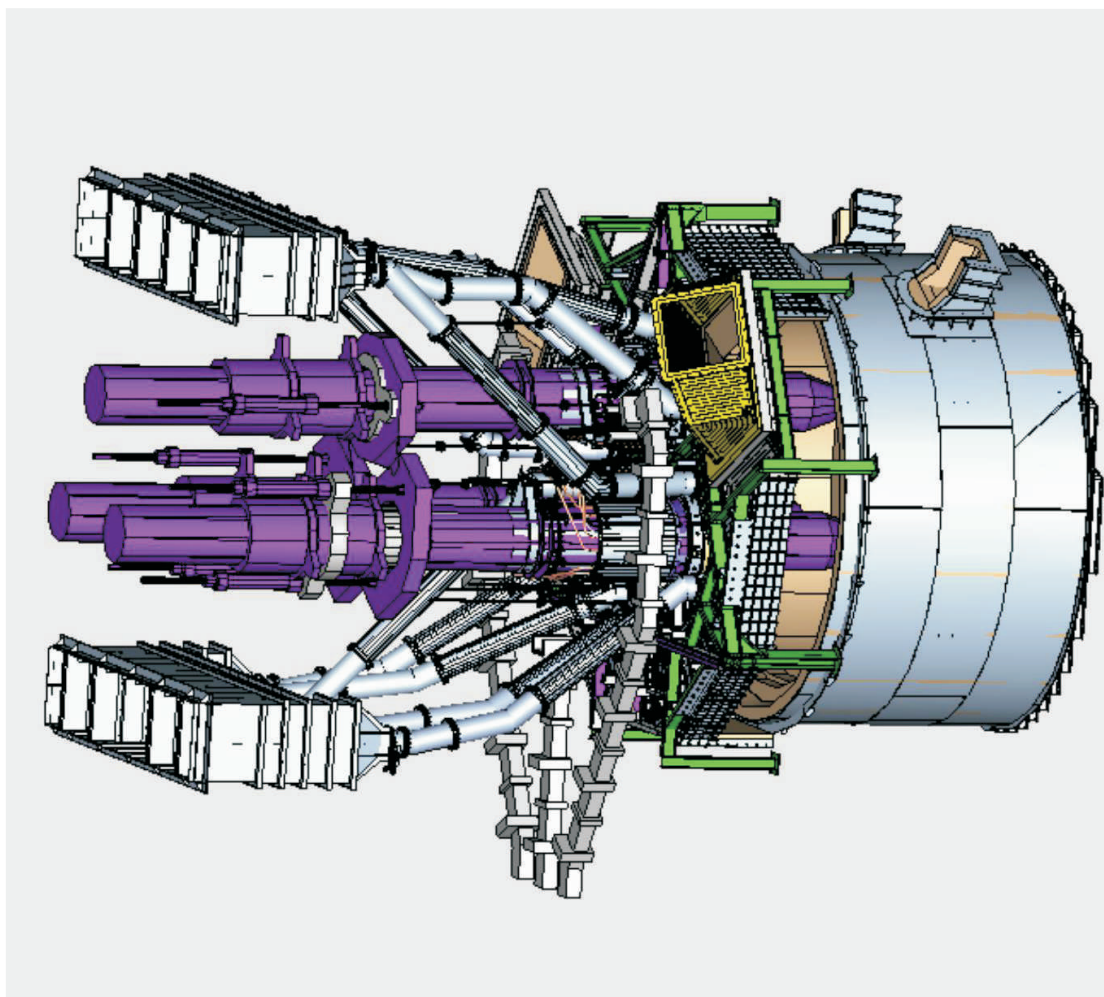
Molar Mass		M (C)	
M(Mn)	54.9	M(MnO <sub>2</sub> )	86.9
M(O)	16.0	M(Mn <sub>2</sub> O <sub>3</sub> )	157.9
M(MnO)	70.9	M(MnCO <sub>3</sub> )	114.9
M(Fe)	55.8	M(MnSiO <sub>3</sub> )	131.0
M(FeO)	71.8	M(Mn <sub>3</sub> O <sub>4</sub> )	228.8
M(Si)	28.1	M(MgO)	40.3
M(SiO <sub>2</sub> )	60.1	M(P)	31.0
M(Ca)	40.1	M(Fe <sub>2</sub> O <sub>3</sub> )	159.7
M(CaO)	56.1	M(Fe <sub>3</sub> O <sub>4</sub> )	231.5
M(CaCO <sub>3</sub> )	100.1	M(P <sub>2</sub> O <sub>5</sub> )	141.9

Analysis by PT Intertek Services

Complete Smelter - 8 Furnaces



Furnace Model - General Arrangements



Semi-closed 6 MVA submerged arc furnace

### 1

## Ore Purchasing

Manganese ores will be purchased from local artisanal miners and other mining companies.

Manganese ore in Indonesia is typically pyrolusite ( $Mn_2O_3$ ) and can have a manganese content between 40 and 50% Mn.

At full production 320,000 tonnes of manganese ore per annum will be purchased.



### 2

## Ore Transport to Processing plant

Manganese ores will be transported to a local processing facility using 8 to 12 tonne trucks.

Trucks will be sourced from local contractors.

At the processing facility the manganese ores will be stockpiled and assayed for quality control purposes.



### 3

## Ore Processing

Manganese ores will require to be processed prior to feed to a smelter. Processing will both remove impurities as well as size the ore to the correct size.

Processing will be conducted by crushing, screening and Jigging.

Section	Proposed Equipment
Crusher	Terex J1175 Jaw Crusher or equivalent
Screen	Terex 663 Triple deck screen or equivalent
Jig	MWE 100tph Mechanical Jig or equivalent

The following table shows the expected results of processing:

	Prior to processing	After processing
Manganese Grade	40-50%Mn	46-52% Mn
Silicon Grade	10-15%Si	3-8% Si
Iron Grade	2-4%Fe	3-5% Fe
Size	0.1-120 mm	10-75 mm
Processing Yield	100%	90%





## 4 Ore Transport to the Smelter

Processed manganese ores will be transported to either the Wini or Atapupa Ports in 8 to 12 tonne trucks. At the ports the processed manganese ores will be stockpiled.

Once a quantity of 3-5,000 has been collected it will be shipped in self-propelled barges to the Tenau Port.

At Tenau Port the barges will be unloaded and the manganese ores transported by road to the smelter stockpiles.

Barging will be supplied by an Indonesian contractor.

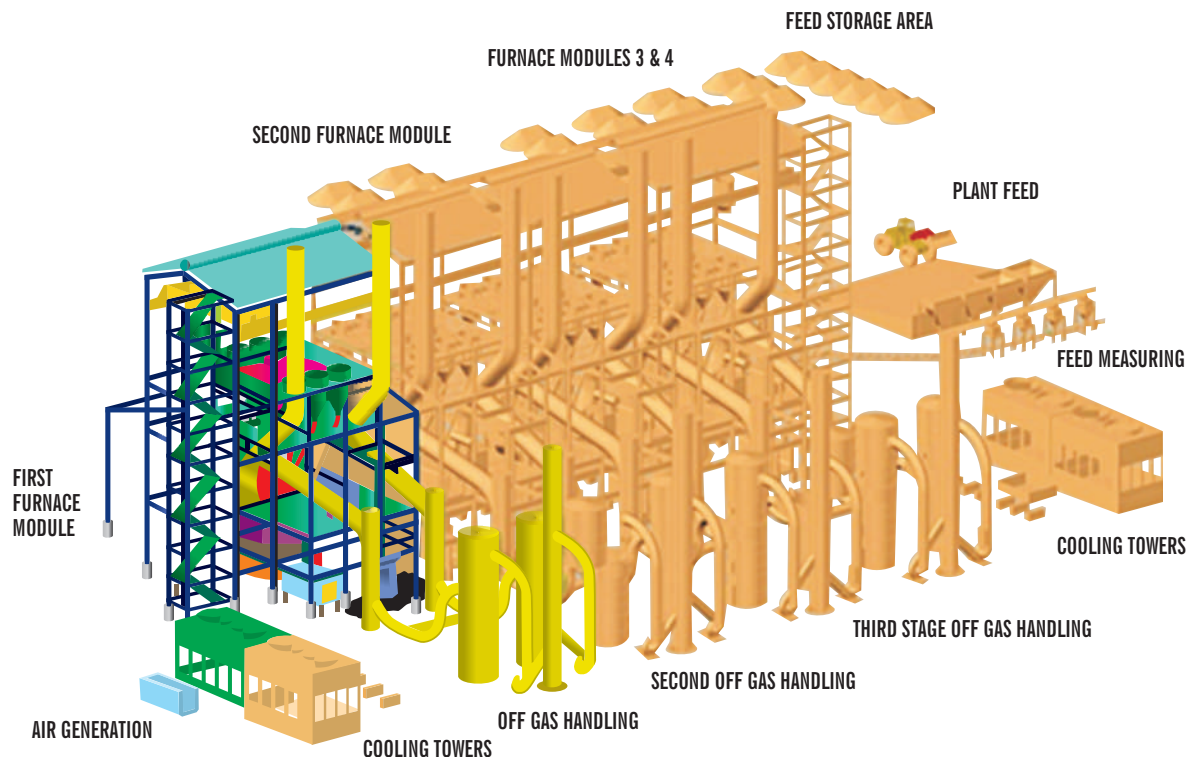


## 5 Smelting

Manganese ore is converted to Ferromanganese alloy in an electric arc furnace.

Ultimately the GMC Facility will have 8 furnaces.

Each furnace operates independently and is fed with Manganese ores, Iron ore, Coal and Limestone.



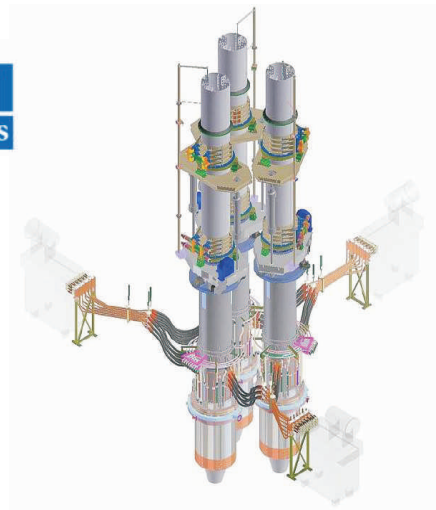


GMC will use the services of the South African XRAM company to design and construct the furnaces. Indonesian companies will be used to supply the structural steel components as well as oversee the engineering and project management activities.



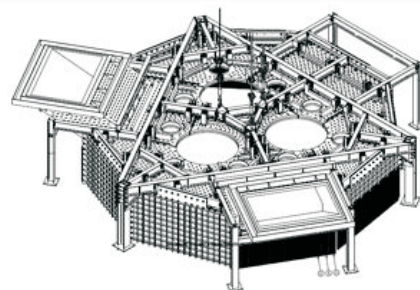
**Electrode Column**

- Modular design
- Upper module
  - 'Fail-safe' slipping devices
  - Carbon steel yoke and mantle
- Lower Module
  - Stainless steel lower mantle
  - Stainless steel heat shields
  - Cast / forged HCC pressure rings
  - Rolled HCC contact shoes (High Conductivity Copper)
- Modular water cool bustube system



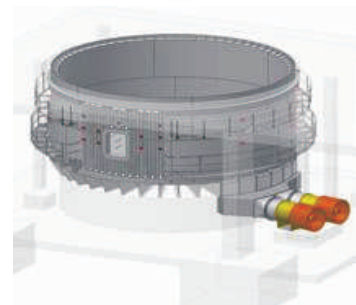
**Furnace Roof**

- Semi-Closed
- Refractory lined and water cooled
- Self Supporting
- Modular design to optimize cost, performance and maintenance:
  - Centre - stainless steel
  - Centre ring - stainless/mild steel
  - Outer ring - mild steel



**Furnace Shell**

- Robust carbon steel design
- Designed for structural & thermal loading
- Sidewall cooling - air or water
- Bottom cooling - air



Once a furnace is operational it is fed a mixture of :

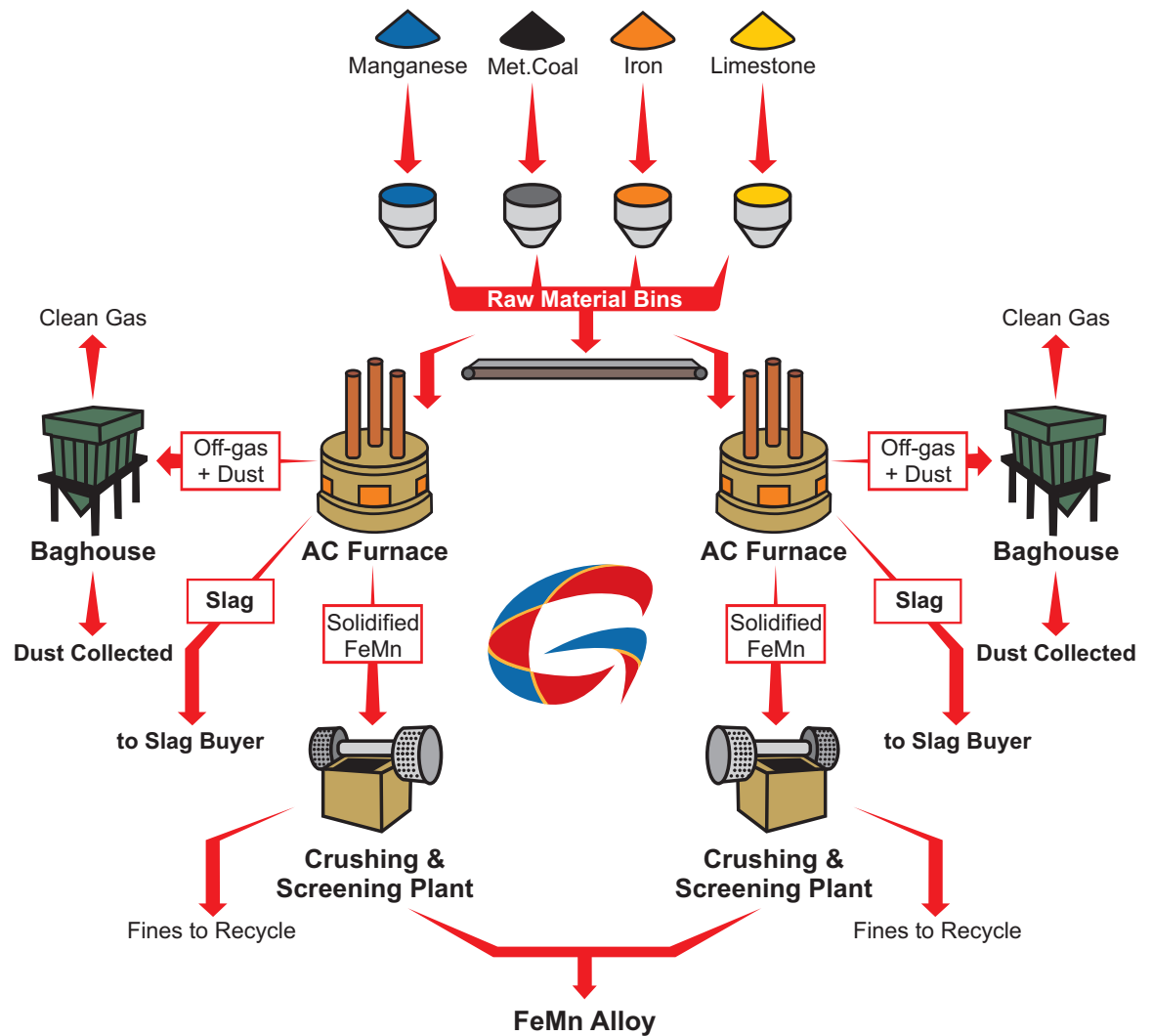
Feed Material	Consumption
Manganese Ore	1.873t/t alloy
Iron Ore	0.212t/t alloy
Coal	0.944t/t alloy
Limestone	0.502t/t alloy



# 5

A Schematic of the smelting process is shown below.

Each furnace will be tapped approximately every 100 minutes. The Ferromanganese is poured into moulds.



# 6

## Final Product Ferromanganese Alloy

Once the ferromanganese cools it is broken with a rock breaker and small jaw crusher and loaded into 1 tonne bulka-bags for transport to the tenau port prior to sale to customers.

The final product will have a composition of:

Mn	Fe	C	Si	S	P
78%	14.5%	7.0%	0.5%	0.15%	0.12%









## Appendix J - Metallurgical Coal Specifications

Stream Specification Sheet – Metallurgical Coal Nuts				Sheet 1 of 1
Stream Category	Raw Material	Plant Location	Kupang, Timor, Indonesia	
Stream Type	Feed to AC SAF	Flow Number		
<b>Stream Description &amp; Comments</b>				
<b>General Data</b>				
Parameter	Units	Design	Range	Comment
<b>Analysis (Dry Basis)</b>				
Fixed Carbon	wt%	55	>50	
P	wt%	0.048	<0.06	
S	wt%	0.8	<0.90	
Ash content	wt%	18	<18	
Volatiles	wt%	25	20 - 40	
Moisture	wt%	4	<6	
Calorific Value	MJ/kg	26	>25	
	kcal/kg	6,208	> 5,970	
<b>Ash Elemental Analysis (Dry Basis)</b>				
FeO	wt%	4		
Al <sub>2</sub> O <sub>3</sub>	wt%	21		
SiO <sub>2</sub>	wt%	44		
CaO	wt%	9		
MgO	wt%	1.7		
<b>Petrography</b>				
Mean random reflectance	%	0.6	0.6 – 0.7	
Vitrinite	%	45	>40	
Inertinite	%	27		
<b>Physical Properties</b>				
CO gas reactivity	cm <sup>3</sup> CO / (s*gcok)	2.3	>	
<b>Physical Properties</b>				
Specific Density	t/m <sup>3</sup>		-	
Bulk Density	t/m <sup>3</sup>	0.85	0.83- 0.95	
Angle of Repose	°	35		
Maximum Conveying Angles	°	24		
<b>Particle Size Distribution</b>				
Particle Size	mm		10 -65	
75 mm	% passing	100		
65 mm	% passing	90		
25 mm	% passing	25		
10 mm	% passing	5		

Rev	Date	Description	Approved Process	Approved Project	This document is the property of XRAM Technologies (Pty) Ltd and subject to confidentiality limitations.		 		
01	5/5/2015	For Information	JJB		Client	Gulf Manganese Corporation Limited			
					Project Title	Manganese Smelter Plant			
					Description	Metallurgical Coal Nuts			
					<b>Document Number</b>				
					Project No	Subdivision	Disc/Doc ID	No	Rev
					15001	D1	00	0001	00

## Appendix K - Cargo Movements Tenau Port

### Development Schedule

Year	No. Furnaces
2017	1
2018	3
2019	5
2020	7
2021	8

### Manganese Ore in Bulk (into Tenau)

Year	Barge(Wini/Atapupu)
2017	25,000t
2018	100,000t
2019	180,000t
2020	260,000t
2021	290,000t
Thereafter/Year	290,000t

### Coal in Bulk (into Tenau for Smelter)

Year	Barge/Kalimantan
2017	15,000t
2018	55,000t
2019	100,000t
2020	135,000t
2021	150,000t
Thereafter/Year	150,000t

### Coal in Bulk (into Tenau for Power Plant)

Year	Barge/Kalimantan
2017	Nil
2018	90,000t
2019	150,000t
2020	210,000t
2021	240,000t
Thereafter/Year	240,000t

### Manganese Alloy in Containers (out of Tenau)

Year	Export Volume	No. Containers
2017	15,000t	750
2018	55,000t	2,750
2019	95,000t	4,750
2020	135,000t	6,750
2021	156,000t	7,800
Thereafter/Year	156,000t	7,800





## Appendix J - Gulf Manganese Corporation - Team

### Board



**Graham Anderson**  
*Executive Chairman*

Graham holds a Bachelor of Business and is a Chartered Accountant with more than 25 years' experience of commercial and corporate dealings with national chartered accounting firms in the auditing and independent expert reports. He has extensive experience and knowledge of the ASX listing rules and the Corporations Act.



**Dr. Peter Williams**  
*Non Executive Exploration Director*

Peter holds a PhD in structural geology and has a wide range of exploration experience in regional structural geology, particularly within Asia. Before retiring he was Managing Director of SRK Australia, one of the country's largest specialist geological consulting groups.



**Michael Walters**  
*Non Executive Marketing Director*

Michael is an engineer with 30 years' experience in the resources industry. Previously he worked with Billiton, Western Mining and Consolidated Minerals where he was part of the team that built CML into the world's 4th largest high grade manganese supplier. He is principal of his own mineral ore marketing business.



**Paul O'Shaughnessy**  
*Non Executive Metallurgical Director*

Paul is a metallurgical engineer with some 40 years of industry experience which includes smelting operations producing both bulk and speciality manganese alloys. He is a graduate from the Royal School of Mines, Imperial College, University of London with a Bachelor of Science Metallurgy with Honours. Paul now operates his own consulting business which includes advising on the manufacturing of ferro alloys.





## Management



**Michael Kiernan**  
*Chairman - PT Gulf Mangan Grup*

Michael has spent 40 years in the mining and transport industries, most notably in the discovery, development and operations of manganese and iron ore. He holds a Bachelor of Business and previously built a resources group to become one of the ASX 200 resource companies.



**Leonard Math**  
*Chief Financial Officer*

Leonard graduated from Edith Cowan University (Western Australia) with a Bachelor of Business majoring in Accounting and Information Systems and a member of the Institute of Chartered Accountants. He has worked with Deloitte as an auditor with public company experience in ASX and ASIC compliance and statutory financial reporting.



**Helen Halliday**  
*Commercial Manager*

Helen previously worked for an investment banking group specialising in venture capital, corporate advisory and funds management and has a diploma of Financial Markets with the Securities Institute Australia. Her role as Administration Manager also included assisting company secretarial requirements in dealing with the ASX and ASIC together with control of documents covering a financial services licence.



**Jacques Beylefeld**  
*Pyrometrical Engineer - PT Gulf Mangan Grup*

Jacques is a metallurgical engineer with over 25 years' experience in the extractive pyrometallurgical environment and holds a Bachelor Engineering and Post Graduate Honours from the University of Pretoria. His expertise in the ferroalloy industry includes feasibility, due diligence studies, technology equipment design, project execution, plant commissioning and operating.



**Dr Herry Kotta**  
*Environmental Advisor - PT Gulf Mangan Grup*

Herry is an Environmental Engineer with a Ph.D in Geology from the Gadjah Mada University, Jogjakarta and is currently a Lecturer at the Nusa Cendana University, Kupang. He has compiled more than 40 Environmental Impact Assessment reports for manganese mining in Timor, Sabu and Flores Islands.



**John Parker**  
*Pyrometrical Advisor - PT Gulf Mangan Grup*

John is a Chemical Engineer with a Bachelor of Science from the University of Cape Town, South Africa and has worked in the metallurgical industry for 30 years. His skills are in the practical application of process technology across minerals processing, pyrometallurgy and hydrometallurgy. Until recently he was Managing Director for SNC-Lavalin South Africa and now operates his own metallurgical consulting group.



**Benny Sain**  
*Engineering Advisor - PT Gulf Mangan Grup*

Benny is a civil engineer having graduated from the Institute of Technology Surabaya and has many years experience advising civil and construction contractors ensuring and monitoring civil works are carried out in accordance with government regulations and requirements.



**Kevin Parker**  
*Indonesian Advisor - PT Gulf Mangan Grup*

Kevin has spent 35 years working in Indonesia and is fluent in Bahasa Indonesia. He has acted in various capacities in technical, mechanical and electrical engineering in areas of mining, expediting and purchasing. Recently he is developing an alternative energy industry based on Jatropha seeds to produce an environmentally sound biodiesel. Kevin has had extensive dealings with various Government Departments.



**Beny Roboh**  
*Community Advisor - PT Gulf Mangan Grup*

Beny is a Social Worker having graduated from the Nusa Cendana and Widya Mandira Universities Kupang specialising in Education Management and Administration. Amongst other roles he spent 9 years with PLAN Indonesia focusing on Child Rights to end poverty and 10 years with UINICEF focusing on community welfare.



**Ronald Taopan**  
*Health and Safety Advisor - PT Gulf Mangan Grup*

Ronald is a qualified Health and Safety manager having graduated from the University of Yogyakarta with an Economics Bachelor's Degree. He currently is a Senior Project Officer from PLAN International Indonesia and previously held Safety, Health and Environment management roles with various groups including a manganese mining group.



## Appendix K - Gulf Manganese Corporation - Corporate Directory

### Board of Directors

Graham Anderson - Executive Chairman  
Peter Williams - Non executive Exploration Director  
Michael Walters - Non executive Marketing Director  
Paul O'Shaughnessy - Non executive Metallurgical Director  
Leonard Math - Company Secretary

### Management

Michael Kiernan - Chairman - PT Gulf Mangan Grup  
Helen Halliday - Commercial Manager  
Jacques Beylefeld - Metallurgical Engineer  
Dr Herry Kotta - Environmental Advisor  
John Parker - Metallurgical Advisor  
Benny Sain - Engineering Advisor  
Kevin Parker - Indonesian Advisor  
Beny Roboh - Community Advisor  
Ronald Taopan - Health and Safety Advisor

### Registered Office

78 Mill Point Road South Perth, WA 6151  
Telephone: +61 8 9367 9228  
Facsimile: +61 8 9367 9229  
www.gulfmanganese.com

### Postal Address

PO Box 884 South Perth, Western Australia 6951

### Legal Advisors

Christian Teo Purwono (Indonesia)  
Lemonis Tantiprasut Lawyers (Australia)  
Steinepries Paganin (Australia)

### Bankers

ANZ Banking Group  
PT ANZ Indonesia

### Australian Securities Exchange

ASX Code : GMC

### Share Registry

Automic Registry Services

### Auditors

Somes Cooke

### Corporate Advisors

GDA Corporate

### Geological Advisors

SRK Geological Consulting (Indonesia)

### Geological Services Advisors

Golder Associates (Indonesia)

### Structural Engineers

PT Timeserve (Indonesia)

### Pyrometallurgical Engineers

Xram Engineering (South Africa)

### Power Engineers

PT Hatch (Indonesia)

### Industry Associations

Indonesian Chamber of Commerce  
Indonesian Smelter Processing Association  
Australian Indonesian Business Council  
Indonesia Institute

### Investor Relations

Bourse Communications



# Sharing Benefits

Working together with local communities in East Nusa Tenggara to develop a rewarding and environmentally responsible manganese business.

Sharing benefits in a real and practical way, maximising benefits to the community through:

- Increased employment skills and training
- Villages support
- Education scholarships
- Medical benefits
- Environment conservation
- Sustainable business opportunities



## GULF MANGANESE CORPORATION LIMITED

Head Office 78 Mill Point Road

South Perth WA 6151 Australia

Telephone: +61 8 9367 9228

Fax: +61 8 9367 9229

[www.gulfmanganese.com](http://www.gulfmanganese.com)

Providing today for tomorrow