ENVIRONMENTAL SCOPING DOCUMENT

Pilbara Iron Ore & Infrastructure Project:
East-West Railway and Mine Sites (Stage B)
(Assessment No. 1520)

for
Fortescue Metals Group Limited

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EXECUTIVE SUMMARY

The Proposal

Fortescue Metals Group Limited (FMG) holds a number of mining tenements that cover substantial iron ore resources in the Pilbara that are currently “stranded” consequent to the existing privately owned rail and port infrastructure being inaccessible to potential third party users. FMG therefore proposes to develop the Pilbara Iron Ore and Infrastructure Project (the Project), which involves a series of iron ore mines north of the town of Newman, port facilities at Port Hedland and a connecting railway system. The Project is located in the Pilbara region of Western Australia (Figure 1). Progressive development of the Project will include satellite ore bodies within the Chichester Ranges that will be assessed and developed at a later date.

FMG (the Proponent) proposes to gain environmental approval for the Project in two stages:

Stage A: Proposed port and North-South rail infrastructure; and
Stage B: Development of the mining operations and connecting East-West railway spur.

The Stage A assessment process is well underway with the scoping document approved on the 29 April 2004. The Stage A Public Environmental Review (PER) was released for an eight week public review period commencing 20 September 2004.

This Environmental Scoping Document has been prepared as required for projects with a PER level of assessment, under Part IV Division 1 of the Environmental Protection Act 1986 for Stage B of the project. The purpose of this document is to provide an indication of the proposed scope of works for Stage B and to provide a basis of understanding with the EPA regarding the assessment of this proposal as well as providing an indicative timeline for the assessment.

Project Justification

World steel production has recently undergone a significant expansion, substantially driven by production growth in China. The resultant outcome is a global demand for iron ore that exceeds supply, a situation which is forecast to continue. As a result, the central and eastern Pilbara region is the focus of a new wave of major iron ore mining developments. Consolidation of the iron ore industry in WA has lead to the rail network now being owned by two companies, BHP Billiton Iron Ore (BHPBIO) and Hamersley Iron (HI) (part of the Rio Tinto Group of Companies), restricting the development of the Western Australian iron ore industry to its full potential.

FMG’s Pilbara Iron Ore and Infrastructure Project will contribute significantly to meeting the demands of the global steel production industry. The provision of a commercially competitive multi-user rail and port infrastructure for the export of iron ore which will also allow the development of iron ore and resource projects in the Pilbara region, other than FMG’s, that are currently unable to gain access on to existing rail and port infrastructure.
Key Project Characteristics

The Stage B Project will include the proposed mining developments at:
- Christmas Creek located approximately 100 km north of Newman;
- Mt Lewin located approximately 110 km north of Newman;
- Mt Nicholas approximately 95 km northeast of Newman; and
- Mindy Mindy mine located approximately 75 km northwest of Newman.

Stage B incorporates a proposed 160 km railway line that runs along the southern edge of the Chichester Ranges, to connect to FMG’s proposed north-south railway that extends between the Mindy Mindy mine site and Port Hedland (part of the Stage A Project). Key project characteristics of the Stage B Project are summarised in Table E1.

Table E1: Stage B Project Key Characteristics

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Life</td>
<td>20 years+</td>
</tr>
<tr>
<td>Mine Site Infrastructure</td>
<td>Semi-mobile primary crusher</td>
</tr>
<tr>
<td></td>
<td>Overland conveyors, haul roads and/or slurry pipelines</td>
</tr>
<tr>
<td></td>
<td>Secondary crushers, screening plant and beneficiation plant(s)</td>
</tr>
<tr>
<td></td>
<td>Product stockpile and train loading yard</td>
</tr>
<tr>
<td></td>
<td>Mobile plant and machinery workshop</td>
</tr>
<tr>
<td></td>
<td>Power station (s) and transmission lines</td>
</tr>
<tr>
<td></td>
<td>Bulk hydrocarbon storage</td>
</tr>
<tr>
<td></td>
<td>Explosive and detonator, ammonia nitrate storage and magazine</td>
</tr>
<tr>
<td></td>
<td>Accommodation and camp facilities</td>
</tr>
<tr>
<td></td>
<td>Administration and ancillary support facilities</td>
</tr>
<tr>
<td></td>
<td>Haul roads and access tracks</td>
</tr>
<tr>
<td></td>
<td>Borefield and associated pipelines</td>
</tr>
<tr>
<td></td>
<td>Airstrip upgrade</td>
</tr>
<tr>
<td></td>
<td>Concrete batching plant (during construction)</td>
</tr>
<tr>
<td></td>
<td>Process water supply reticulation</td>
</tr>
<tr>
<td>Railway Infrastructure</td>
<td>160 km of rail track</td>
</tr>
<tr>
<td></td>
<td>Sidings, passing bays and loading loops</td>
</tr>
<tr>
<td></td>
<td>Train loader</td>
</tr>
<tr>
<td></td>
<td>Rail maintenance track</td>
</tr>
<tr>
<td></td>
<td>Borrow pits and ballast quarry(s)</td>
</tr>
<tr>
<td>Resource (pre-resource estimate)</td>
<td>1 billion tonne resource</td>
</tr>
<tr>
<td>Ore produced</td>
<td>45 Mtpa</td>
</tr>
<tr>
<td>Target Grade</td>
<td>58-60% Fe</td>
</tr>
</tbody>
</table>
## Project Component

<table>
<thead>
<tr>
<th>Waste rock</th>
<th>Characteristic</th>
</tr>
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<tbody>
<tr>
<td>Average waste to product ratio</td>
<td>0.6:1</td>
</tr>
<tr>
<td>Approximate tonnes per annum</td>
<td>60 Mtpa disposed of in the first 2 years to above ground waste dumps, after which in-pit disposal will be used where mining methods and schedules allow.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rejects</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average rejects to product ratio</td>
<td>0.54:1</td>
</tr>
<tr>
<td>Approximate tonnes per annum</td>
<td>25 Mtpa disposed of in the first 2 years to an above ground storage facility, after which in-pit disposal will be used where mining methods and schedules permit.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 MW from gas and/or diesel power station(s) or transmission lines from Newman</td>
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<table>
<thead>
<tr>
<th>Process Water</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11 GL E1</td>
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</table>

<table>
<thead>
<tr>
<th>Water source and supply</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A dedicated borefield is proposed, supplemented by water from mine dewatering.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Sewerage</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Package treatment plant and/or septic systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approximate area of mine site disturbance (life of mine)</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt Nicholas</td>
<td>2900 ha</td>
</tr>
<tr>
<td>Christmas Creek</td>
<td>6750 ha</td>
</tr>
<tr>
<td>Mt Lewin</td>
<td>4100 ha</td>
</tr>
<tr>
<td>Mindy Mindy</td>
<td>800 ha</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approximate area of railway disturbance</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway construction (corridor, access tracks, burrow pits, lay down areas etc)</td>
<td>1,600 ha</td>
</tr>
<tr>
<td>Railway operations (~50 m wide corridor)</td>
<td>800 ha</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commencement of construction</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3/Q4 2005 (subject to environmental approvals)</td>
<td></td>
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<table>
<thead>
<tr>
<th>Personnel for mines and infrastructure</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>800 personnel accommodated in on-site camps</td>
</tr>
<tr>
<td>Operation</td>
<td>500 personnel accommodated in on-site camps and/or local towns</td>
</tr>
</tbody>
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E1 Investigations are underway to reduce this water requirement through recovery of water from the reject stream.
Existing Environment

The Project is located within the arid Pilbara Bioregion as described in the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell, 1995; Environment Australia, 2000). The proposed mining areas and railway occur within three major physiographic units within the Fortescue District. These are:

- Chichester Plateau - a plateau of mainly basalts forming a watershed between numerous rivers flowing north through the Abydos Plain to the coast, and the Fortescue drainage on the southern side of the range. The plateau supports shrub steppe characterised by Acacia pyrifolia over Triodia pungens hummock grass. Snappy Gum (Eucalyptus leucophloia) tree steppes occur on ranges. The Mt Nicholas, Mt Lewin and Christmas Creek mine sites are located on the southern edge of this unit.

- Fortescue Valley - occupying a trough between the Chichester and Hamersley Plateaux; the eastern portion drains into the Fortescue Marshes, while the western portion drains through a valley through the Chichester Plateau (Beard, 1975). These alluvial plains and river frontages support salt marsh, mulga/bunch grass, and short grass communities. River Gum (Eucalyptus camaldulensi) / Coolibah (Eucalyptus victrix) woodlands fringe the drainage lines. This is the northern limit of Mulga (Acacia aneura). (IBRA Revision 5.1; Environment Australia, 2000). The rail spur from Mt Nicholas follows the northern edge of the Fortescue Valley where it meets the Chichester Plateau.

- Hamersley Plateau - rounded hills and ranges, mainly of jaspilite and dolomite with some shale, siltstone and volcanics (Beard, 1975). This plateau supports Mulga low woodland over bunch grasses on fine textured soils and Snappy Gum over hummock grass (Triodia brizoides) on skeletal sandy soils of the ranges. (IBRA Revision 5.1; Environment Australia, 2000). This subregion contains the Mindy Mindy mining area.

The main land uses in the region are the pastoral industry, mining and tourism. The Project is located on or near to Roy Hill, Balfour Downs, Hillside and Marillana pastoral stations.

Community Consultation

The Stage B Project is within the Shires of the Eastern Pilbara and Ashburton. Consultation has commenced with local, State and Commonwealth government departments, the local Aboriginal communities, pastoralists, the wider public at open forums, and other interested parties. Consultation will continue throughout the Projects development to identify any issues associated with the Project. The consultation process has involved group meetings with the community and government agencies. As part of the consultation process FMG is continuing to acquire contact details of interested parties and stakeholders who will be kept informed through the circulation of the FMG Newsletter and by other means.
The Stage B Project occurs within the Nyjiaparli, Martu Idja Banyjima and Palyku Native Title claims. FMG continues to meet with Working Groups established by these claimant groups to discuss its intention to seek approval to construct and operate its proposed Pilbara Iron Ore and Infrastructure Project. Protocols including those for Aboriginal Heritage surveys, have been agreed with these three claimant groups, and also an additional assistance protocol with their legal representative body, the Pilbara Native Title Services (PNTS).

Environmental Impacts and Management

Key environmental issues for the Stage B Project are likely to relate to:

- hydrogeology;
- surface drainage;
- significant flora and fauna;
- revegetation; and
- mine waste management.

Decommissioning and Rehabilitation

The Project life is expected to be 20+ years. In the event that all or part of the infrastructure is no longer required by FMG or another party, the unused facilities will be decommissioned and the site rehabilitated to return the environment as close to its original state as possible. A conceptual mine closure plan will be developed for decommissioning and rehabilitation of the mine. This closure plan will include information on progressive rehabilitation of areas as they become available and present draft completion criteria against which the progress of the rehabilitation can be assessed.

Rehabilitation will require monitoring to assess the effectiveness of the methodology and to undertake remedial works as required. This may include repair of eroded areas, weed control, and seeding or planting of areas where vegetation has not established from natural seed sources in the topsoil and mulch applied to rehabilitated areas. The Closure Plan presented in the PER will include draft completion criteria to determine when a rehabilitated area can be considered self-sustaining, or indicate a continuous positive trend towards a stable community.
ENVIRONMENTAL SCOPING DOCUMENT

Pilbara Iron Ore & Infrastructure Project:
East-West Railway and Mine Sites (Stage B)

for
Fortescue Metals Group Limited

1. INTRODUCTION

1.1 THE PROPOSAL

Fortescue Metals Group Limited (FMG) holds a number of mining tenements that cover substantial iron ore resources in the Pilbara that are currently “stranded” consequent to the existing privately owned rail and port infrastructure being inaccessible to potential third party users. FMG therefore proposes to develop the Pilbara Iron Ore and Infrastructure Project (the Project), which involves a series of iron ore mines north of the town of Newman, port facilities at Port Hedland and a connecting railway system. The Project is located in the Pilbara region of Western Australia (Figure 1).

FMG proposes to gain environmental approval for the Project in two stages:

Stage A: Proposed port and north-south rail infrastructure; and
Stage B: Development of the mining operations and connecting east-west railway.

The approvals for the Project have been broken into the two stages primarily due to the longer time associated with field surveys for the port and north-south rail infrastructure. Survey data for the mining areas and the east-west railway has now also been collected and assessed by specialist consultants.

FMG also holds exploration tenements covering other potential satellite ore bodies within the Chichester Ranges and these ore bodies may be developed in the future subject to separate referral and assessment at a later date.

An Environmental Referral for Stage A was submitted to the Western Australian Environmental Protection Authority (EPA) on 2 December 2003. The EPA advertised the level of assessment for Stage A of the Pilbara Iron Ore and Infrastructure Project as a Public Environmental Review (PER) on 15 December 2003. An appeal against the level of assessment for the Stage A Project was dismissed by the Minister for the Environment and Heritage on 3 March 2004 and the PER level was set as the level of assessment. An Environmental Scoping document for Stage A has been prepared and submitted to the EPA as required for projects with a PER level of assessment, under Part IV Division 1 of the Environmental Protection Act 1986.

FMG understands that should it gain approval for the Stage A Project that this in no way ensures that the Stage B Project will be approved and this represents a commercial risk that FMG understands and
undertakes. FMG is currently pursuing the State Agreement process (the Government of Western Australia has indicated this is their preference). However, this is an extended process and it is possible that FMG may not be able to obtain a State Agreement Act within the timeframe required to secure project funding. If this is the case FMG may be obliged to apply for tenure for the Project under the Mining Act. FMG are currently pursuing both processes in parallel. Unconditional performance bonds will be lodged to ensure that sufficient funds will be available for rehabilitation of any disturbance should the Project be unable to proceed.

Currently it is proposed that Stage A will utilise Miscellaneous Licences under the Mining Act 1978 to obtain rail tenure for the Project and as such will be required to lodge unconditional performance bonds such that should the Project become unviable, sufficient funds will be available for rehabilitation of any disturbance. Similarly, General Purpose Leases under the Mining Act 1978, or a Land Administration Act 1997 Sub-Lease from the Port Hedland Port Authority will form part tenure for the Project.

An Environmental Referral for Stage B was submitted to the Western Australian Environmental Protection Authority (EPA) on 7 April 2004. The EPA advertised the level of assessment for Stage B of the Pilbara Iron Ore and Infrastructure Project as a Public Environmental Review (PER) on 3 May 2004.

This Environmental Scoping Document has been prepared as required for projects with a PER level of assessment, under Part IV Division 1 of the Environmental Protection Act 1986. The purpose of this document is to provide an indication of the proposed scope of works for Stage B and to provide a basis of understanding with the EPA regarding the assessment of this proposal as well as providing an indicative timeline for the assessment.

This document provides:

- the project description for the mining areas and east-west railway line;
- applicable legislation and guidelines;
- a description of the existing environment;
- the key environmental factors and where further investigation is required to understand the potential impacts of the Project;
- the proposed scope of work to be included in the PER;
- project assessment schedule;
- a stakeholder consultation plan; and
- information on the study team and proposed peer review process.
1.2 NEED FOR THE PROJECT

World steel production has recently undergone a significant expansion predominately driven by production growth in China. The resultant outcome is a global demand for iron ore that exceeds supply, a situation which is forecast to continue. As a result, the Pilbara region is the focus of a new wave of major iron ore mining developments. HI opened its Yandicoogina mine in 1999, which included an extension of its rail line from Marandoo and provided a link to the HI main line network to Dampier. BHPBIO’s adjacent Yandicoogina operation has been subject to capacity upgrades since its start up in 1992, and provides the rail spur linkage to BHPBIO’s main line network to Port Hedland. New projects now on line in this area include Rio Tinto’s West Angelas and BHPBIO’s Mining Area C (MAC).

Current infrastructure utilisation in the Pilbara (controlled exclusively by BHPBIO and HI) is restricting the development of the Western Australian iron ore industry to its full potential. To date no third parties have been able to gain access to this infrastructure, although specific provision has been made by Government within operating agreements with these companies. The Hope Downs (Hancock/Kumba) project has received environmental approval to construct its own mine, railway and port facility, but is still attempting to negotiate access to BHPBIO’s existing rail and port infrastructure. However, there is currently no true multi-user agreement for third party use of existing or proposed rail and port infrastructure that will stimulate resource development across the Pilbara.

FMG proposes to develop the iron ore deposits around the Christmas Creek, Mt Lewin, Mt Nicholas and Mindy Mindy resource areas (Figure 1), and to provide an east-west railway that will join the north-south railway being assessed under Stage A of the overall Project. FMG proposes that its port and railway infrastructure will be multi-user and will be made available at commercially competitive rates and time slots to other parties/users.

1.3 PROJECT BENEFITS

The development of the Project will provide a number of significant benefits including:

- multi-user infrastructure that will facilitate the development of other third party stranded mineral resources and offer open access to such third parties at competitive commercial rates. Initially at least, it is perceived that such projects will be for mining/mineral processing and not public access;
- sufficient rail capacity for all of FMG’s proposed Projects with additional capacity for other operations in the area, such as the proposed Hope Downs Iron Ore Project and any other third parties;
- creation of significant direct and indirect employment opportunities through materials purchase, construction, operation and support services;
- a total expenditure of approximately A$1.85 billion for Stage A and Stage B; and
- improved regional community support through local employment opportunities, including specific targets for indigenous employment. FMG will seek to locate the majority of its operational workforce within the regional centres of Newman and Port Hedland.
1.4 PROPOSED PROJECT

The Proposer and owner of the Pilbara Iron Ore and Infrastructure Project is Fortescue Metals Group Limited. The address is:

Fortescue Metals Group Limited
Fortescue House
50 Kings Park Road,
West Perth WA 6005
www.fmgl.com.au

Telephone: +61 8 9266 0111
Facsimile: +61 8 9266 0188
ACN 002 594 872

The relevant contacts are:

Fortescue Metals Group Limited
Laura Todd, Head of Environment
ltodd@fmgl.com.au

ENVIRON Australia Pty Ltd
Brian Bell
Principal, Environmental Consultant
Telephone: +61 8 9225 5199
Facsimile: +61 8 9225 5155
bbell@environcorp.com

All correspondence should be addressed to Ms Laura Todd.

The Mindy Mindy resource will be developed by Pilbara Iron Ore Pty Ltd (ACN 100 410 295), which is a 50–50 joint venture between FMG and Consolidated Minerals Limited. FMG is the main contact and is responsible for project regulatory approvals and considered the Proposer for the Mindy Mindy Joint Venture Iron Ore mine.
2. PROJECT DESCRIPTION

2.1 PROJECT LOCATION

2.1.1 Christmas Creek Iron Ore Mine

The proposed Christmas Creek Iron Ore Mine is located approximately 100 km north of the town of Newman in the Pilbara on the Roy Hill pastoral station (Figure 2). It is proposed to use one or a combination of conveyors, haul roads, or slurry pipelines to transport crushed ore to the processing plant(s) or to the rail load-out facility. The mine and associated infrastructure will be located within mineral tenements, held by the Proponent.

2.1.2 Mt Nicholas Iron Ore Mine

The proposed Mt Nicholas Iron Ore Mine is located approximately 110 km northeast of the town of Newman in the Pilbara (Figure 3) on the Balfour Downs pastoral station. The mine and associated infrastructure will be located within mineral tenements, held by the Proponent. One or a combination of conveyors, haul roads or slurry pipelines will be used to transport crushed ore to the processing plant(s).

2.1.3 Mt Lewin Iron Ore Mine

The proposed Mt Lewin Iron Ore Mine is located approximately 95 km northeast of the town of Newman in the Pilbara on the Roy Hill pastoral station and 35 km northwest of Mt Nicholas (Figure 3). One or a combination of conveyors, haul roads or slurry pipelines will be used to transport crushed ore to the processing plant(s).

2.1.4 Mindy Mindy Iron Ore Mine

The proposed Mindy Mindy Iron Ore Mine is located approximately 75 km northwest of the town of Newman in the Pilbara on the Marillana pastoral station (Figure 4). After primary crushing and screening the ore will be transported to Port Hedland via the Proponent’s north-south railway proposed as part of Stage A.
2.1.5 Processing Plant(s)

One single processing plant located in the Christmas Creek/Mt Lewin area or two smaller processing plants (one at Christmas Creek and the other at Mt Lewin) will be used to beneficiate the crushed ore. A decision on where to locate the processing plant(s) will be based on the outcomes of technical, economic and environmental studies currently underway. ‘Direct Ship Ore’ will be transported from the minesites to the load out point. Ore requiring beneficiation will be transported to the processing plant(s) by either conveyors, haul roads, or slurry pipelines, and following up-grading will join the ‘Direct Ship Ore’ to be transported by rail to Port Hedland.

2.1.6 East-West Railway and Infrastructure Corridors

The Christmas Creek, Mt Lewin and Mt Nicholas mining areas will be linked to the main Port Hedland to Mindy Mindy railway proposed in Stage A, via a 160 km railway spur, which will run along the southern slopes of the Chichester Ranges (Figure 3). Access roads will also be constructed to link these project areas.

2.2 KEY PROJECT CHARACTERISTICS

The total volume of iron ore mineralisation is significant and consists of two major areas:

1. An area around Christmas Creek, Mt Lewin and Mt Nicholas north of the Fortescue River and the Fortescue Marshes that is primarily Marra Mamba ore; and
2. Mindy Mindy, which is predominantly pisolite channel in-fill ore, south of the Fortescue River.

A portion of the ore is considered likely to be of such quality as to warrant direct shipment, whilst a simple beneficiation process will treat other ore targeting a product containing 58% to 60% Fe, depending on the chosen mining cut-off grade. Exploration and detailed testwork will be ongoing during 2004.

The Project’s key characteristics are summarised in Table 1.
### Table 1: Stage B Project Key Characteristics

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Life</strong></td>
<td>20 years+</td>
</tr>
<tr>
<td><strong>Mine Site Infrastructure</strong></td>
<td>Semi-mobile and mobile primary crusher&lt;br&gt;Overland conveyors, haul roads and/or slurry pipelines&lt;br&gt;Secondary crushers, screening plant and beneficiation plant(s)&lt;br&gt;Product stockpile and train loading yard&lt;br&gt;Mobile plant and machinery workshop&lt;br&gt;Power station(s) and transmission lines&lt;br&gt;Bulk hydrocarbon storage&lt;br&gt;Explosives and detonator, ammonia nitrate storage and magazine&lt;br&gt;Accommodation and camp facilities&lt;br&gt;Administration and ancillary support facilities&lt;br&gt;Haul roads and access tracks&lt;br&gt;Borefield and associated pipelines&lt;br&gt;Airstrip upgrade&lt;br&gt;Concrete batching plant (during construction)&lt;br&gt;Process water supply reticulation</td>
</tr>
<tr>
<td><strong>Railway Infrastructure</strong></td>
<td>160 km of rail track&lt;br&gt;Sidings, passing bays and loading loops&lt;br&gt;Train loader&lt;br&gt;Rail maintenance track&lt;br&gt;Borrow pits and ballast quarry(s)</td>
</tr>
<tr>
<td><strong>Resource</strong> (pre-resource estimate)</td>
<td>1 billion tonne resource</td>
</tr>
<tr>
<td><strong>Ore produced</strong></td>
<td>45 Mtpa</td>
</tr>
<tr>
<td><strong>Target Grade (after beneficiation)</strong></td>
<td>58-60% Fe</td>
</tr>
<tr>
<td><strong>Waste rock</strong></td>
<td>Average waste to product ratio 0.6:1&lt;br&gt;Approximate tonnes per annum 60 Mtpa disposed of in the first 2 years to above-ground dumps, after which in-pit disposal will be used where mining methods and schedules allow.</td>
</tr>
<tr>
<td><strong>Rejects</strong></td>
<td>Average rejects to product ratio 0.54:1&lt;br&gt;Approximate tonnes per annum 25 Mtpa disposed of in the first 2 years to an above-ground storage facility, after which in-pit disposal will be used where mining methods and schedules permit.</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>60 MW from diesel and/or gas power station(s) or transmission lines from Newman</td>
</tr>
<tr>
<td><strong>Process Water</strong></td>
<td>11 GL^1</td>
</tr>
</tbody>
</table>
Project Component | Characteristic
--- | ---
Water source and supply | A dedicated borefield is proposed, supplemented by water from mine dewatering.
Sewerage | Package treatment plant and/or septic systems

Approximate area of mine site disturbance (life of mine)

<table>
<thead>
<tr>
<th>Location</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mt Nicholas</td>
<td>2,900</td>
</tr>
<tr>
<td>Christmas Creek</td>
<td>6,750</td>
</tr>
<tr>
<td>Mt Lewin</td>
<td>4,100</td>
</tr>
<tr>
<td>Mindy Mindy</td>
<td>800</td>
</tr>
</tbody>
</table>

Approximate area of railway disturbance

<table>
<thead>
<tr>
<th>Description</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway construction (corridor, access tracks,</td>
<td>1,600</td>
</tr>
<tr>
<td>burrow pits, lay down areas etc)</td>
<td></td>
</tr>
<tr>
<td>Railway operations (~50 m wide corridor)</td>
<td>800</td>
</tr>
</tbody>
</table>

Commencement of construction

Q3/Q4 2005 (subject to environmental approvals)

Personnel for Mines and Infrastructure

<table>
<thead>
<tr>
<th>Role</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>800 personnel accommodated in on-site camps</td>
</tr>
<tr>
<td>Operation</td>
<td>500 personnel accommodated in on-site camps and local towns</td>
</tr>
</tbody>
</table>

Note 1. Investigations are underway to reduce this water requirement through recovery of water from the reject stream.

The PER will include a firm proposal for transportation, mine design, project management and processing plant. Specifically, the PER will include detail on:

- access roads;
- borrow pits and their location;
- rehabilitation plans; and
- power requirements, supply source and transmission corridors (unless contracted to an external supplier).

All feasible alternatives to the Project design will be considered to minimise the potential impacts of this proposal.

2.2.1 Mining and Processing

Initial mine development is expected to be at Christmas Creek with Mt Lewin and Mt Nicholas subsequently developed as the Christmas Creek ore bodies become depleted and/or for blending purposes. Mine pits are expected to be relatively shallow and will advance as a series of long strips.
from a northerly direction towards the south. Parallel ‘en echelon’ pit faces will continually be moving away from the initial face. As soon as practicable after the ore is removed from a strip it will be back-filled with waste and/or reject material from the process plant(s). The back-filled strip will be contoured and superficial material being stripped from advancing strips be placed over the area as part of the rehabilitation programme, where practicable.

Primary crushing is planned using semi-mobile crushing units. The modular design of these units will allow reuse and relocation of the equipment as necessary. Overland conveyors, haul roads and/or slurry pipelines will convey the crushed ore to the central processing plant(s).

The waste to ore stripping ratios are expected to be in the following ranges:

- **Christmas Creek:** 1.0 – 1.5 waste to 1.0 ore;
- **Mt Nicholas:** 1.09 – 2.0 waste to 1.0 ore
- **Mt Lewin:** 1.7 – 2.2 waste to 1.0 ore
- **Mindy Mindy:** 0.7 – 1.2 waste to 1.0 ore.

Initially, for at least two years, waste will be disposed of to above ground waste rock dumps, which will be rehabilitated, and then as the mining faces progress the concurrent waste rock product will be placed within the pit voids, where practicable. For every two tonnes of screened ore processed the beneficiation process generates approximately one tonne of rejects.

Initial estimates for the size of the rejects storage facility are 2.5 km x 3.5 km with lifts of 2 m per year (height of 4 m). Studies are currently underway to investigate water recovery from the rejects after two years, which would facilitate a reduction in the footprint of the storage facility.

The rejects consist of two streams of material, one of these is a solid material stream and the other is a slurry. It is estimated that 60% of the rejects will be solids and it is proposed to convey these to the mined-out pits for disposal with waste rock from the mining operation. Thickened slurry rejects will be added as a final component of the ‘fill’. Water drained from the slurry after deposition will be collected in sumps and returned to the process plant(s) for further use.

The process plant(s) will beneficiate the ore, which involves upgrading the crushed ore to increase its iron content and reduce impurities. The secondary crushed and screened ore is beneficiated using various unit processes such as screening, wet gravimetric processes and magnetic separators to reduce contamination and increase the ore grade to a marketable product. This process is completely inert and does not involve the use of chemical additives and therefore will not result in the production of chemical pollutants.

The processing plant(s) will include:

- primary crushed ore stockpile;
- secondary crushing and screening facilities;
• beneficiation plant consisting of four modules with flexible design to cater for a variety of ore types. A module will include dry screening, wet screening, jigs, hydraulic classifier and cyclones;
• lump and fines products combined for conveying to the central train loading yard for transport to the port;
• solid waste conveyed back to the pits for disposal; and
• slurried rejects thickened and deposited in-pit with the waste rock, where mining methods allow this to occur.

Power will be provided from a combination of diesel and gas power generation plants, or via transmission lines from Newman.

Water source and supply options will require dedicated borefields, supplemented by mine dewatering, to supply an expected requirement of 11 GLpa of water. Investigations are currently underway to reduce this water requirement via recovery of water from the reject streams.

Other infrastructure will include offices, workshops, warehouses, site access, airstrips, and accommodation camp. Initial infrastructure may be concentrated adjacent to the train loading yard. The train loading yard will include train loading bins, a stacker and reclaimer, and stockpiles.

### 2.2.2 Rail Infrastructure

The proposed east-west railway commences at the Mt Nicholas mine site and travels west to the Proponent’s proposed north-south railway, which runs from Port Hedland to Mindy Mindy. The east-west railway will connect to the north-south railway where it crosses the Chichester Ranges. The east-west railway transects a number of different landforms over its 160 km length. This length of the rail is likely to vary slightly as the specific route and train loadout facilities at the mining operations are refined during the PER studies. Detailed studies, including environmental, Aboriginal heritage and engineering constraint analyses are currently being undertaken. Once these constraints and baseline information have been obtained they will be utilised to optimise the railway design and route selection.

The proposed railway will be constructed using specifically profiled concrete sleepers and a continually welded rail. These will be bedded on a layer of ballast around 200 mm deep and rail formation. The trains could potentially weigh up to 35,600 t and be in the order of 2.5 km long, comprising three locomotives and up to 240 ore cars. Initially the operations are anticipated to comprise 200 to 220 ore cars.

A series of culverts will support the rail track across major surface drainage features, such as creeks and floodways. Where major waterways, such as rivers, need to be crossed then elevated bridges will be constructed to support the rail track (see Figure 5).
A series of low profile borrow pits will be required to supply suitable transition and sub-ballast material for the railway embankment and formation. The location of borrow pits are constrained by the availability of suitable construction material. However, they will be located away from sensitive areas, such as significant vegetation, surface drainage and heritage sites. Wherever practicable, material removed during the construction of rail cuts will be used in the rail formation where fill material is required.

Approximately 1,450 m³/km of track ballast will also be needed, and this will be sourced from one or more suitable hard rock quarry sites. The location of suitable hard rock for ballast material is currently being investigated.

2.3 CONSTRUCTION

Wherever practicable, construction activities will follow the sequence and management measures as outlined in Table 2. All contracts and contractors will be appointed and directly contracted to the Proponent.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Construction Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railway</td>
<td>Detailed Surveying</td>
<td>Engineering, environmental, archaeological and anthropological surveys are used both in routing and to determine any special construction techniques or mitigation measures required. Once the rail route and design has been defined by the known constraints and with input from stakeholders, then the engineering aspects are finalised and detailed survey is undertaken to identify project layout and constraints to be avoided.</td>
</tr>
<tr>
<td>Clear and Grubbing</td>
<td></td>
<td>Graders, bulldozers and scrapers are used to clear the rail corridor ready for construction to commence. During this process, sites of heritage significance and priority flora are excluded, severed pastoral fences are repaired, and topsoil and vegetation are removed and stored separately for re-establishment once the railway is completed.</td>
</tr>
<tr>
<td>Temporary Facilities</td>
<td></td>
<td>Temporary facilities such as construction camps, water supply, mobile workshops, batching plants etc are all established. Many of these facilities are established progressively with the active front of construction.</td>
</tr>
<tr>
<td>Bulk Earthworks and Rail Formation Construction</td>
<td></td>
<td>Once initial clearing and grubbing has been completed, a fleet of heavy earthmoving equipment such as graders, bulldozers, scrapers, dump trucks, water carts, compact rollers and loaders are utilised in the construction of the rail embankment and formation. Excavation and placement of suitable material must be undertaken in a specific manner to ensure the integrity of the rail formation is maintained and able to withstand the weight of the loaded rolling stock and weathering by the natural elements.</td>
</tr>
<tr>
<td>Aspect</td>
<td>Construction Activity</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Culvert Construction</td>
<td></td>
<td>The location of culverts will be identified during the surveys of natural drainage systems. Placement of corrugated, galvanised iron culverts will be undertaken during the bulk earthworks stage. The culverts will be surrounded by concrete stabilised fill, placed at specific heights to enable uninterrupted water flow and protected both upstream and downstream with rock armour. Culverts will be designed to allow no rail formation over topping for peak flow average return interval (ARI) of 1 in 20 years.</td>
</tr>
<tr>
<td>Blasting</td>
<td></td>
<td>In areas that have large amounts of rock, blasting will be used to break up the rocks. For this Project a detailed cut to fill model will be established to minimise the practicable extent of blasting required and also the need to source additional borrow material.</td>
</tr>
<tr>
<td>Borrow Pits and Quarries</td>
<td></td>
<td>A number of borrow pits will be required to supply suitable construction material. These will be opened and rehabilitated progressively to keep pace with the active front of rail formation earthworks. If an existing quarry cannot be utilised to source ballast material then another quarry will need to be developed to supply this material.</td>
</tr>
<tr>
<td>Bridge Construction</td>
<td></td>
<td>Independent bridge construction crews will work on separate bridges at the same time to ensure their completion and integration with the rail formation being built by other contractors. Bridges will be built off-site and located to specific areas for assembly where more than one span is required. An ARI for which a bridge shall not be over topped will be 1 in 50 years.</td>
</tr>
<tr>
<td>Site Rehabilitation</td>
<td></td>
<td>Site rehabilitation will be undertaken progressively wherever practicable. However, much of the rehabilitation works can only be undertaken towards the end of construction activities and once the bulk of disturbance has been generated. Disturbed areas will be used as temporary laydown areas for sleepers and culverts to help minimise the extent of disturbance.</td>
</tr>
<tr>
<td>Sleeper Laying</td>
<td></td>
<td>Once the rail formation has been sufficiently progressed by the earthworks construction crew, sleeper laying will commence. Triple road trains will be used to transport concrete sleepers to site and these will be unloaded next to the rail formation. Forklifts will be used to place the sleepers onto the formation in piles, where a specialised sleeper laying machine will evenly distribute the sleepers along the top of the formation. Earthwork construction will take place on several faces along the rail track simultaneously to expedite the construction process.</td>
</tr>
<tr>
<td>Track Laying</td>
<td></td>
<td>Once the concrete sleepers have been laid a train carrying lengths of pre-welded track, approximately 400 m in length, will be used to transport the track to site. The track will then be pulled off the train by a tractor and clipped into place on the sleepers. The train will then roll forward over the newly laid track and another length or iron track will be pulled off and clipped into place.</td>
</tr>
<tr>
<td>Ballast Laying</td>
<td></td>
<td>Ballast will be brought in via ballast trains and dumped over the recently laid track. Specialist train equipment such as rail tampers and regulators will be utilised to compact and form-up the ballast bed to around 100-150 mm around the rail sleepers and track. A super-lift to 200 mm will be conducted as the rail track nears operational status.</td>
</tr>
<tr>
<td>Signals</td>
<td></td>
<td>Signals and communications will be incorporated into the track during and after construction, including signal lights, level crossings and switch pads.</td>
</tr>
<tr>
<td>Commissioning</td>
<td></td>
<td>Commissioning will comprise the running of light high-rail vehicles along the new railway, followed by a series of short empty trains and then incrementally loaded trains until fully loaded train are run and the rail track is opened for operations.</td>
</tr>
<tr>
<td>Aspect</td>
<td>Construction Activity</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Demobilisation and Final</td>
<td>Prior to departure the supervising</td>
<td>Rehabilitation works, completing any outstanding rehabilitation and repair work, demobilise construction camps and temporary facilities, remove waste materials and repair pastoral fences etc.</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mine Development</td>
<td>Detailed Surveying</td>
<td>Engineering, environmental, community, archaeological and anthropological studies are used to determine any special construction techniques or mitigation measures required. Once the mine design (including pits, plant site, waste dumps and support facilities etc) has been defined by the known constraints, then detailed survey is undertaken to identify and locate project layout and avoidance of known constraints.</td>
</tr>
<tr>
<td>Clear and Grubbing</td>
<td>Front end loaders, graders, bulldozers and scrapers are used to progressively clear the mine area, waste and rejects storage, access roads and plant site footprint ready for construction to commence. During this process, sites of heritage significance and environmental sensitivity are fenced off, and topsoil and vegetation removed and either immediately used or stored separately for use during rehabilitation.</td>
<td></td>
</tr>
<tr>
<td>Temporary Facilities</td>
<td>Temporary facilities will include construction camp, offices, laydown areas, ablution facilities, mobile workshops etc. Many of these facilities will be used repeatedly by the different contractors on site as the construction project progresses.</td>
<td></td>
</tr>
<tr>
<td>Borrow Pits</td>
<td>Borrow pits will be required to supply suitable construction material to raise and develop the foundation of haul roads, stock yard and structural erections (e.g. ore crushing, screening and handling facilities, administration buildings, product conveyor etc). Borrow pits will be preferably located in areas designated for pit and waste dump disturbance and will be opened and rehabilitated progressively to minimise disturbance.</td>
<td></td>
</tr>
<tr>
<td>Bulk Earthworks</td>
<td>Once initial clearing and grubbing has been completed, heavy earthmoving equipment such as graders, front end loaders, bulldozers, scrapers, dump trucks, water carts, compact rollers and loaders will be utilised in the construction of the foundation for the stockyard, ore handling facilities, product conveyor and mine pit.</td>
<td></td>
</tr>
<tr>
<td>Pit Preparation and Initial</td>
<td>Waste material from the pits will also be used where practicable in site preparation works to minimise the need for additional borrow pits. In addition, initial pit development and ore extraction will commence to develop the Run of Mine (ROM) and ore stockpiles ready for plant commissioning and the first shipment of ore.</td>
<td></td>
</tr>
<tr>
<td>Mining</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ReJECTS Storage</td>
<td>Material removed during initial pit development and from suitable borrow pits will be used to construct the rejects storage facility.</td>
<td></td>
</tr>
<tr>
<td>Plant Foundations</td>
<td>Prior to the structural erection being raised the foundation must first be prepared. This requires the excavation of the footings and the placement of reinforced iron and concrete to form the foundations. Concrete will be sourced from a temporary batching plant located on site.</td>
<td></td>
</tr>
<tr>
<td>Structural Steel Erection</td>
<td>Independent construction crews/contractors will work on separate parts of the processing plant, concurrently where possible. Structural steel erection comprises the construction of the primary and secondary crushing facilities, screens, beneficiation plant, overland conveyors, stacker and reclaimers beds, and train loader. Wherever structural erection can be prefabricated off site this will be undertaken to speed the process of on-site erection and minimise on-site disturbance.</td>
<td></td>
</tr>
<tr>
<td>Aspect</td>
<td>Construction Activity</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Machinery (i.e. Stackers and Reclaimer)</td>
<td>Similar to the structural erection of the support facilities, wherever practicable the ore handling machinery will be prefabricated off site and then pieced together on-site to speed the process of erection and minimise on-site disturbance.</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>Power, lighting, communications, water (for process and potable use) will be developed progressively throughout mine site construction phase.</td>
<td></td>
</tr>
<tr>
<td>Administrative and Support Buildings</td>
<td>Administrative buildings, control rooms, accommodation camp and support buildings such as amenities and ablution facilities will be constructed progressively. With the exception of the accommodation camp the remaining facilities will be grouped and located as a central administrative hub, close to the centre of operations while maintaining a safe working distance.</td>
<td></td>
</tr>
<tr>
<td>Commissioning</td>
<td>Commissioning will comprise no-load commissioning of all machines, pumps, motors and support equipment without ore. Subsequently, load commissioning will be undertaken where all machinery and equipment is run under pressure/load.</td>
<td></td>
</tr>
</tbody>
</table>
| Demobilisation, Clean-up and Rehabilitation | Prior to departure the supervising engineers will retain a small team of construction equipment and contractors to undertake final rehabilitation works including:  
  - demobilising construction equipment and temporary facilities;  
  - removing waste materials and undertaking rehabilitation of any disturbed areas not required as part of operations.  
  The ‘construction site’ will then be handed to the mining contractors for active operations and further mine development. |

2.4 OPERATIONS

Project commissioning is scheduled for the second quarter of 2006, resulting in the first shipment of iron ore in the second half of 2006.

The anticipated environmental and social impacts are expected to primarily occur during the Project’s construction stage and in the active mining areas. These environmental and social impacts will be strictly managed and, with the exception of the mine footprint, will be of short duration. The day to day activities of both the mine and railway operation are expected to have relatively low level adverse impacts on the surrounding environment and community. Engineering solutions, procedural management and workforce training is expected to eliminate and/or minimise impacts. Through the careful monitoring of the surrounding environment and transparent community consultation, any adverse impacts will be immediately addressed.

2.4.1 Mining

Although it has not been finalised, operational mining is expected to be via contract mining with overall project management and responsibility remaining with the Proponent. The contract miner will be responsible for the supply and operation of the mining fleet and plant site.
Mining will occur within the pit footprint with waste rock and overburden removed utilising draglines or stripping shovels working with crushers and conveyors or via haul-pak dump trucks to its place of disposal. Ore will be removed from the active face using large excavators. Ore will be transported within the pit via haul-pak dump trucks or a conveying system to the crusher(s). The secondary crushed and screened ore will either be directly transported to the rail load out location, or it will be beneficiated in the processing plant using various unit processes such as screening, wet gravimetric processes and magnetic separators to reduce impurities and increase its grade to a marketable product. The rejects from this process are filtered and thickened to reduce the water content and conveyed back to the pit void (or disposed of to the rejects storage facility in the first two years).

Mine disturbance will occur progressively as will the site’s rehabilitation. It is expected that Performance Bonds will need to be considered with regards to revegetation. The environmental management of the site will be in accordance with the Proponent’s Environmental Management System that will be developed to ISO 14000 standards, and site specific environmental management plans which will be regularly reviewed.

### 2.4.2 Rail Infrastructure

It is anticipated that iron ore delivery and scheduling will be controlled remotely from a train operations control centre. Depending on the ramp up and scheduling of mining operations, demand by customers and use by third parties, it is anticipated that the number of train movements along the railway infrastructure will vary. For the transport of 45 Mtpa from all four mine sites, an average of five train consignments per day are expected.

Day-to-day operations of railway iron ore transport are well known and pose few direct environmental issues. Field operators will undertake regular route inspections and maintain ongoing liaison with the community, pastoralists, tenement holders and other stakeholders. They will respond to maintenance requirements such as track, ballast, and formation repairs; erosion, noise, dust, fire and weed control.

Inspection work associated with the railway will be conducted in accordance with all statutory requirements and the specific operator’s inspection and maintenance program developed for this Project.

### 2.5 PROJECT TIMING

It is anticipated that the baseline and technical studies will be completed by mid October 2004 to allow finalisation of the PER for submission in late October 2004. A project assessment schedule is presented in Section 8.

Subject to all Project approvals being in place, construction of the east-west railway and mine facilities associated with Stage B are programmed for commencement in the Q3/Q4 of 2005.
The key constraints to the schedule are:

- environmental approval timelines;
- environmental approval under the EPBC Act 1999 (should it be required; see Section 3.2);
- grant of land tenure;
- Native Title negotiations;
- completion of ethnographic and archaeological surveys;
- availability of construction materials, supplies, plant and equipment; and
- efficiency of construction and commissioning phases (dependent on equipment and personnel availability, weather, environmental constraints etc.).

**2.6 ALTERNATIVES CONSIDERED**

As part of the Proponent’s business planning and project feasibility studies a number of alternatives for the transportation, mine design and project management have been considered. Some of these alternatives have been eliminated, while others are still being considered.

The mine design and means of operation is determined by the location of ore, type and characteristics of ore, environment in which it occurs and project economics. Key mining characteristics continue to be optimised including mine layout (i.e. placement/configuration of waste dumps, rejects storage, plant site, and support facilities etc.), means of ore transport to the processing facilities, train loader, and mine management. These alternatives are still in the process of being evaluated and their selection will depend on the results of the detailed feasibility studies and environmental impact assessment.

There is currently no existing railway or infrastructure in the vicinity of FMG’s eastern resources that are available to transport ore from the Proponent’s operations to the proposed port facilities. Transport alternatives from the mine sites, to the Stage A proposed railway, that have been evaluated and eliminated due to cost and safety reasons include the use of road trains and overland conveyors. Over long distances rail is considered to be the only efficient means of transport for large quantities of material such as those involved in this Project. However, roads and overland conveyors may be utilised for the transport of ore over short distances, particularly between the mines and process plant/train loader or nearby railway sidings.

With the selection of railway as the preferred means of transport various alignment options are being evaluated.

**2.7 PROJECT JUSTIFICATION**

The introduction of FMG brings another iron ore player into production, representing an attractive alternative in a competitive market, while enhancing competition by the provision of multi-user infrastructure. Of particular significance is the enormous expansion in world steel production, which is substantially driven by production growth in China. The resultant outcome is a demand for iron ore
that exceeds supply, a situation which is forecast to continue. By 2007, accounting for current expansions planned by all major global companies and smaller prospective projects, it is conservatively estimated that there will be a shortfall in global seaborne trade in iron ore of at least 80 Mtpa. Australia, and in particular the Pilbara, is well positioned to meet significant amounts of this global supply shortfall if additional projects can be expediently brought on line.

The current restrictive use of private infrastructure in the Pilbara is restricting the development of the Western Australian iron ore industry to its full potential. FMG will develop true multi-user rail and port infrastructure that will stimulate resource development across the Pilbara and potentially catalyse the longer-term rationalisation of new and existing infrastructure. In addition to iron ore from FMG’s own mines, the infrastructure will enable iron ore and other mineral resources from other isolated resources in the region to be carried to the port, thereby opening up the region’s resources and its growth.

An outline of the potential benefits of the Project are presented in Section 1.3.

The “no project” option would result in the loss of opportunity to add value to Australia’s raw materials, loss of employment, economic and social opportunities particularly within local regional communities and loss of potential for future developments in downstream processing of raw materials. The World’s increasing demand for iron ore would then be met through the development of other overseas projects with the loss of the associated benefits to the Pilbara, Western Australia and Australia.

There is also good argument that the provision of multi-user infrastructure by FMG will be a catalyst in establishing more open access to existing rail and port infrastructure within the Pilbara region of Western Australia and the introduction of more competitive commercial regimes.
3. APPLICABLE LEGISLATION AND GUIDELINES

3.1 STATE GOVERNMENT LEGISLATION

State legislation relevant to the Project includes the following:

- *Aboriginal Heritage Act 1972*
- *Agriculture and Related Resources Protection Act 1976*
- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- *Environmental Protection Act 1986*
- *Explosives and Dangerous Goods Act 1961*
- *Dangerous Goods (Transport) Act 1998*
- *Land Administration (Amendments) Act 1997*
- *Local Government Act 1995*
- *Mining Act 1978*
- *Mines Safety and Inspection Act 1994*
- *Occupational Safety and Health Act 1984*
- *Private Railways (Level Crossings) Act 1966*
- *Rail Safety Act 1998*
- *Rights in Water and Irrigation Act 1914*
- *Soil and Land Conservation Act 1945*
- *Wildlife Conservation Act 1950*

The *Environmental Protection Act 1986* is the principal statute relevant to environmental protection in Western Australia. The Act makes provision for the establishment of the Environmental Protection Authority (EPA), for the prevention, control and abatement of pollution and for the conservation, preservation, protection, enhancement and management of the environment.

This Act provides for the control and licensing of potentially polluting activities and is the Act under which the State environmental approvals process operates.

The process for submission and assessment of a PER is outlined below:

1. The Proponent refers the proposal to the EPA to set the level of assessment (completed 7 April 2004);
2. The EPA determines the level of assessment, set as a PER for Stage B and advertises this decision and the length of the public review period, subject to appeal (completed 17 May 2004);
3. The Proponent prepares an Environmental Scoping Document (this document) outlining the scope of works for the PER assessment;
4. The EPA agrees to the Environmental Scoping Document as a basis for the PER;
5. A draft PER is prepared by the Proponent and submitted to the EPA Service Unit for comment;
6. The final draft of the PER is submitted to the EPA for authorisation to release as a public document;
7. The PER is released for public review period of 8 weeks (plus an extra two weeks for the Christmas/New Year period);
8. Any submissions received by the EPA at the end of the review period are provided to the Proponent, for the Proponent to summarise and respond;
9. The EPA undertakes an assessment of the proposal;
10. The EPA ‘Report and Recommendations’ is published;
11. A two week statutory appeal period commences;
12. The Minister determines any appeals on the EPA’s Report and Recommendations, and consults with the key Decision Making Authorities to seek agreement on whether or not, and in what manner the proposal may be implemented; and
13. The Minister issues a Statement (provided approval for the Project is given).

A predicted schedule for this process is outlined in Section 8.

Once approval for a project is obtained under Part IV of the Environmental Protection Act 1986, licensing of construction and operations is required under Part V of the Act. This requires Works Approval Applications and Applications for Licences to Operate to be submitted to the Department of Environment (DoE). Approvals from the Department of Industry and Resources (DoIR) through submission of a Notice of Intent are also required under the Mining Act 1978.

3.2 COMMONWEALTH GOVERNMENT LEGISLATION

Commonwealth legislation likely to be relevant to the Project includes the following:

- Environment Protection and Biodiversity Conservation Act 1999; and
- National Native Title Act 1993.

Under the Environment Protection and Biodiversity Conservation Act 1999, (EPBC Act) an action requires approval from the Federal Environment Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance such as:

- World Heritage properties;
- Ramsar wetlands of international importance;
- listed threatened species and communities;
- migratory species protected under international agreements;
- nuclear actions; and
- the Commonwealth marine environment.
Migratory species protected under international agreements, such as wading birds are also covered under the EPBC Act. This Project is in the process of being referred to the Federal Department of Environment and Heritage (DEH), due to the possible presence of listed threatened fauna within or near the Project area, although FMG do not believe the proposal to be a “controlled action” under the EPBC Act.

### 3.3 GUIDELINES AND STANDARDS

A number of State and National guidelines and standards are applicable to this Project. These guidelines and standards will be observed during the scoping and implementation of studies as well as Project design and management. With regards to assessment of environmental impacts, the following EPA Guidance Statements are of relevance:

- No. 8 Environmental Noise (Draft), June 1998;
- No. 12 Minimising Greenhouse Gases, October 2002;
- No. 34 Linkage between EPA Assessment and Management Strategies, Policies, Scientific Criteria, Guidelines, Standards and Measures Adopted by National Councils, April 2004;
- No. 41 Assessment of Aboriginal Heritage, April 2004;
- No. 51 Terrestrial flora and vegetation surveys for Environmental Impact Assessment in Western Australia, June 2004;
- No. 54 Consideration of subterranean fauna in groundwater and caves during environmental impact assessment in Western Australia, December 2003;
- No. 55 Implementing best practice in proposals submitted to the environment impact assessment process, December 2003; and
- No. 56 Terrestrial fauna surveys for Environmental Impact Assessment in Western Australia, June 2004.

In addition, the EPA have released the following Position Statements of relevance to the Project:

- No. 2 Environmental Protection of Native Vegetation in Western Australia, 1 December 2000; and
- No. 3 Terrestrial Biological Surveys as an Element of Biodiversity Protection, 1 March 2002.
- No. 4 Environmental Protection of Wetlands, Preliminary, June 2001;
- No. 6 Towards Sustainability, August 2004;
- No. 7 Principles of Environmental Protection, August 2004;
- No. 9 Environmental Offsets, Preliminary, July 2004;

The Department of Industry and Resources has several guidelines relevant to mining projects such as:

- Guidelines for Mining in Arid Environments, June 1996;
- Safety Bund Walls Around Abandoned Open Pit Mines, Guideline, December 1997;
- Guideline to Help You Get Environmental Approval for Mining Projects in Western Australia, March 1998; and

For the assessment of water quality, air quality and noise emissions, the following guidelines will be used:

- Environmental Protection (Noise) Regulations 1997; and

The following international and Australian standards are also relevant:

- Australian Standard AS 1940-1993 Storage and handling of flammable and combustible liquids;
- Australian Standard AS 2436-1981 Guide to noise control on construction, maintenance and demolition sites; and
4. EXISTING ENVIRONMENT

4.1 REGIONAL SETTING

The Project is located within the Pilbara Bioregion as described in the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway and Cresswell, 1995; Environment Australia, 2000). The IBRA bioregions are used as a framework for conservation planning and sustainable resource management in a bioregional context. IBRA regions represent a landscape-based approach to classifying the land surface from a range of continental data on environmental attributes. This classification system is being used to develop the National Reserve System for Australia.

The Pilbara Bioregion is listed as a high priority for funding for land purchase under the National Reserves System Co-operative Program due to the limited representation of the region in conservation reserves. A “Mulgalands Conservation Park”, east of Karijini National Park, has been proposed to provide for reservation of species and floristic communities that are not present or are inadequately represented within the National Park (particularly Mulga communities) (van Leeuwen and Bromilow, 2002). The proposed Conservation Park extends from the vicinity of Mt Meharry some 70 km to the south and east almost to Mt Newman, with the Great Northern Highway forming the eastern boundary. In addition, portions of numerous pastoral leases in the Pilbara have been nominated to be released to the conservation estate in 2015 or set aside for conservation management within the pastoral leases under conservation agreements.

The proposed mining areas and railway line occur within three major physiographic units within the Fortescue District. These are:

- Chichester Plateau - a plateau of mainly basalts, with included siltstone, mudstone, shale, dolomite and jaspilite; forming a watershed between numerous rivers flowing north through the Abydos Plain to the coast, and the Fortescue drainage on the southern side of the range (Beard, 1975). The plateau support shrub steppe characterised by *Acacia pyriformis* over *Triodia pungens* hummock grass. Snappy Gum (*Eucalyptus leucophloia*) tree steppes occur on ranges.’ (IBRA Revision 5.1; Environment Australia, 2000). The Mt Nicholas, Mt Lewin and Christmas Creek mine sites are located on the southern edge of this unit.

- Fortescue Valley - occupying a trough between the Chichester and Hamersley Plateaus; the eastern portion drains into the Fortescue Marshes, while the western portion drains through a valley through the Chichester Plateau (Beard, 1975). These alluvial plains and river frontages support salt marsh, mulga/bunch grass, and short grass communities. River Gum (*Eucalyptus camaldulensis*) / Coolibah (*Eucalyptus victrix*) woodlands fringe the drainage lines. This is the northern limit of Mulga (*Acacia aneura*). (IBRA Revision 5.1; Environment Australia, 2000). The rail spur from Mt Nicholas follows the northern edge of the Fortescue Valley where it meets the Chichester Plateau.
• Hamersley Plateau - rounded hills and ranges, mainly of jaspilite and dolomite with some shale, siltstone and volcanics (Beard, 1975). This plateau supports Mulga low woodland over bunch grasses on fine textured soils and Snappy Gum over hummock grass (*Triodia brizoides*) on skeletal sandy soils of the ranges. (IBRA Revision 5.1; Environment Australia, 2000). This subregion contains the Mindy Mindy mining area.

### 4.2 CLIMATE

The inland Pilbara region is classified as arid, with most rain falling during the hot summers. The closest Bureau of Meteorology weather station is at Newman (www.bom.gov.au). Climatic data from this station indicates that peak rainfall occurs in the summer months between January and March with a smaller peak in May and June (Table 3).

Climatic conditions in the Pilbara are influenced by tropical cyclone systems predominantly between January and March. These cyclones normally develop over the ocean north of Australia and follow a south-westerly course parallel to the northwest coast. However, at some point, two thirds of these cyclones change direction and head southeast, crossing the coast and moving inland, bringing heavy rainfalls. Rainfall during May and June is generally a result of cold fronts moving across the south of the State, which occasionally extend into the Pilbara.

Annual average rainfall for the Pilbara ranges from 180 mm to over 400 mm (Beard, 1975) with the Bureau of Meteorology data indicating an average of 312 mm at Newman. Average maximum summer temperatures are generally between 35°C and 40°C and winter maximum temperatures generally between 22°C and 30°C. In this climate, annual evaporation rates greatly exceed the mean annual rainfall.

Winds are predominantly east-south-easterly at Newman between May and August with stronger west-north-westerly winds between September and March and an annual average wind speed of 9.4 km/hr.
Table 3: Climatic Data for Newman

<table>
<thead>
<tr>
<th>Newman</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Ann</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Daily Max. Temp (°C)</td>
<td>38.8</td>
<td>37.2</td>
<td>35.8</td>
<td>31.6</td>
<td>26.2</td>
<td>22.4</td>
<td>22.2</td>
<td>24.8</td>
<td>29.4</td>
<td>33.6</td>
<td>36.5</td>
<td>38.5</td>
<td>31.3</td>
</tr>
<tr>
<td>Mean Daily Min. Temp (°C)</td>
<td>25.3</td>
<td>24.4</td>
<td>22.5</td>
<td>18.5</td>
<td>13.3</td>
<td>9.6</td>
<td>8</td>
<td>10.2</td>
<td>13.7</td>
<td>18</td>
<td>21.5</td>
<td>24.1</td>
<td>17.3</td>
</tr>
<tr>
<td>Mean 9am Rel. Hum. (%)</td>
<td>35</td>
<td>41</td>
<td>37</td>
<td>41</td>
<td>49</td>
<td>56</td>
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<td>30</td>
<td>25</td>
<td>24</td>
<td>30</td>
<td>39</td>
</tr>
<tr>
<td>Mean 3pm Rel. Hum. (%)</td>
<td>22</td>
<td>26</td>
<td>23</td>
<td>26</td>
<td>32</td>
<td>34</td>
<td>29</td>
<td>24</td>
<td>17</td>
<td>14</td>
<td>14</td>
<td>19</td>
<td>24</td>
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<tr>
<td>Mean monthly rainfall (mm)</td>
<td>51</td>
<td>80</td>
<td>39</td>
<td>25</td>
<td>23</td>
<td>25</td>
<td>13</td>
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<td>4</td>
<td>4</td>
<td>10</td>
<td>27</td>
<td>312</td>
</tr>
<tr>
<td>Highest monthly rainfall (mm)</td>
<td>226</td>
<td>286</td>
<td>199</td>
<td>212</td>
<td>119</td>
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<td>Highest recorded daily rainfall (mm)</td>
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</tr>
<tr>
<td>Mean 3pm wind speed (km/hr)</td>
<td>10.1</td>
<td>10.7</td>
<td>8.8</td>
<td>7.7</td>
<td>7.9</td>
<td>8.3</td>
<td>9.3</td>
<td>9.2</td>
<td>10.2</td>
<td>11</td>
<td>10.2</td>
<td>9.6</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Source: Bureau of Meteorology (www.bom.gov.au)

1. Data for Newman from 1965 to 2003

4.3 EXISTING LAND USE

4.3.1 Pastoral Activities

The pastoral industry in the Pilbara is increasingly geared to overseas exports of live cattle, mainly through Port Hedland, with fewer animals being sent to the Midland (Perth) market. The cattle industry currently contributes about $15 million per annum to the Pilbara economy. Sheep numbers in the Pilbara are steadily declining and the annual value of wool and meat production in 2000 was estimated to be around $2 million per annum (Dames and Moore, 2000).

Pastoral leases in the area are generally considered to be of poor grazing quality, with large areas required for grazing and some areas that were never alienated for pastoral operations or were abandoned in the 1940’s (Dames and Moore, 2000).

Mining companies hold many of the pastoral leases in the Project Area and throughout the East Pilbara to ensure security of access to land adjacent to mines and infrastructure.

The lease for Marillana Station on which the Mindy Mindy mine will be located, is held by BHPBIO. The Christmas Creek and Mt Lewin mines will be located on Roy Hill Station and Mt Nicholas mine is located on Balfour Downs Station, both, which are privately leased pastoral stations. These stations are still active pastoral stations, but stocking rates have been reduced in the last decade to reduce grazing pressure, which have had a significant impact over the years.
4.3.2 Mining

The central Pilbara generates approximately 87% of Western Australia’s iron ore production, estimated at 125 Mtpa and with a value of over $3,000 million per year (Dames and Moore, 2000). Development of the iron ore rich deposits was accelerated in the 1960s after the Commonwealth lifted the export embargo on iron ore.

Development of the iron ore industry in the region has historically focused on the exploitation of high grade (65-66% Fe) Brockman ores. More recently exploitation has moved to pisolithic Channel Iron Deposits and Marra Mamba ore. Iron ore mining operations in the Pilbara are currently restricted to those owned by BHPBIO and HI.

4.3.3 Tourism

Besides mining and pastoral activities, tourism provides the only other significant economic driver in the central Pilbara. In 1994, tourism was worth $75 million to the Pilbara with annual growth projected at around 6% (Dames and Moore, 2000). The Karijini National Park is the primary tourism focus in the Central Pilbara.

4.4 TOPOGRAPHY AND SURFACE DRAINAGE

Within the Newman area, the regional topography is dominated by the Hamersley Plateau in the south and the Chichester Ranges in the north, with the two features divided by the Fortescue Valley. The main drainage is the Fortescue River, which flows northwards on Ethel Creek Station and then flows northwest on Roy Hill Station into the Fortescue Marshes.

The topography of the project areas and proposed railway can best be described as gently undulating, with a maximum relief from the Fortescue valley (400 – 450 mRL) to the Chichester Ranges (500 – 600 mRL) of approximately 50 - 200m. The mean gradient for the east-west railway line will be designed at 0.33 percent and will predominantly follow the contour of the land. The Chichester Ranges and the major drainage system of the Fortescue valley to the south, trend towards west-northwest, while the Mt Nicholas topography has north-northeast trend.

Surface water occurs mainly after rainfall, and is usually limited to the periods of January to March and to a lesser extent, May to June. The water is typically of low salinity and turbidity, although the amount of suspended material does increase after periods of flooding. Groundwater can usually be found at a depth below surface of approximately 30 m and is also of low salinity. However, where groundwater occurs at shallow depths it is expected that the salinity will be increased due to the greater presence of soluble salts in the upper parts of the weathering profile.
4.4.1 Christmas Creek, Mt Lewin and Mt Nicholas Project Areas

The topography of these project areas is influenced by the eastern end of the Chichester Ranges. The area is hilly to undulating, sloping south-southwest towards the Fortescue River Valley, containing the Fortescue Marshes (also known as Roy Hill Marshes). Elevations of the project areas are between 440 mRL and 500 mRL at Christmas Creek, 430 mRL and 460 mRL at Mt Lewin, 470 mRL and 485 mRL at Mt Nicholas.

4.4.2 Mindy Mindy Project Area

The Mindy Mindy tenements are located in an undulating hilly landscape, straddling two catchment areas, with Weeli Wolli Creek to the west and Coondiner Creek to the east. Drainage flows northwest towards the Weeli Wolli Creek and east to Coondiner Creek before heading north out to the Fortescue Marshes. The average elevation of the Mindy Mindy project area is between 480 mRL and 590 mRL.

The Mindy Mindy tenements are on Marillana Station which is one of the pastoral leases proposed for inclusion in the conservation estate after 2015. FMG will assess the potential impacts of proposed mining on this future conservation area.

4.4.3 East - West Railway Line

The proposed east-west railway line follows the contour to the north of the Fortescue Marshes and the southern foothills of the Chichester Ranges. The railway line extends from the Mt Nicholas mining area in a westerly direction and joins the proposed Port Hedland to Mindy Mindy railway (Stage A). This area slopes gently to the southwest towards the Fortescue Valley and the railway will intersect a number of drainage lines that flow from the Chichester Ranges into the Fortescue Marshes. The railway line will also cross Kulkinbah Creek at the eastern end of the Fortescue Marshes.

The railway line will be constructed along the contour at an elevation sufficient not to be inundated or impacted during severe flooding of the Fortescue Marshes and to prevent the need for major earthworks and drainage interruption. Elevation along the railway corridor ranges from 470 to 500 mRL.

Several of the pastoral stations through which it is proposed to construct the railway, notably Mulga Downs, Hillside, and Roy Hill Stations, have been nominated to be released to the conservation estate in 2015 or set aside for conservation management within the pastoral leases under conservation agreements. Potential impacts from the proposed railway include direct clearing, interruption to surface hydrology and impacts on mulga groves that are reliant on surface water sheet flows.

FMG will clarify the likely boundaries of pastoral excisions in the area proposed for the railway, and will assess the potential impacts on the proposed conservation estate in the area.
4.5 FORTESCUE MARSHES

The Fortescue Marshes in the upper reaches of the Fortescue River are listed on the Australian Heritage Commission Register of the National Estate as an “Indicative Place”, and in the Directory of Important Wetlands in Australia (Environment Australia, 2001).

It is recognised by the Department of Conservation and Land Management (CALM) as supporting a rich diversity of migratory birds when in flood. Much of the northern Fortescue Marsh area is being sought by CALM during the review of pastoral leases that will occur when all leases expire in 2015. CALM would like this area to be added to the conservation estate at this time.

“The Marshes occupies a broad valley or small plain between the Chichester and Hamersley Ranges. It has an irregular elongate shape. A sinuous channel occurs at the upstream (eastern) end where the Fortescue River enters; there are no other substantial channels in the place. Near the western end of the place, a poorly defined floodway connects the main part of the Marshes to a discrete basin surrounded by low hills. Flow does not extend west from the place beyond the Goodiadarrie Hills to the lower reaches of the Fortescue River” (Australian Heritage Database, 2004).

The Marshes are considered important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail in the region (Department of Environment and Heritage [DEH], website 2004).

The proposed railway runs parallel to, and north of, the Fortescue Marsh and at its closest point would be approximately 3 km from the significant flood event boundary of the marshes recognised by DEH.

4.6 GROUNDWATER

The hydrogeology in the Christmas Creek, Mt Lewin and Mt Nicholas areas is characterised by the Fortescue River, seasonal marsh system and associated drainage. The main aquifer of the valley system is the Paraburdoo member of the Wittenoom formation, which is overlain by alluvial deposits, of generally low permeability. Groundwater flow is towards the Marsh, which is a result of surface water flow after rainfall and groundwater seepage up through the alluvium.

The Mindy Mindy mining area is located predominantly within the Weeli Wolli catchment area, whilst the infrastructure corridor into the Project is located in the Coondiner Creek and Mindy Mindy catchment. It is likely that the groundwater of the Mindy Mindy mining area is linked to the groundwater systems of Weeli Wolli Creek and also Coondiner Creek systems. The Project is located approximately 20 km downstream of Weeli Wolli Springs and will have no impact on flows at the springs themselves.
4.7 GEOLOGY

The Project locations of Christmas Creek, Mt Lewin and Mt Nicholas have geology belonging to the Proterozoic Marra Mamba Iron Formation (MMIF). The MMIF is the lowest member of the Hamersley Group within the Mt Bruce Supergroup, which conformably overlies the Archaean basement rocks of the Pilbara Craton. The lowest member of the MMIF, termed the Nammuldi Member, is the Proponent’s focus of the mineral exploration and the proposed mining activities.

Locally, the Nammuldi Member is characterised by extensive, thick and podded iron enriched Banded Iron Formation (BIF), separated by equally extensive units of siliceous and carbonate rich chert and shale. The Nammuldi Member rocks are underlain by the black shales and volcanic rocks of the Jeerinah Formation. Although these rocks do not outcrop extensively throughout the project areas, they do form a ridge of low lying hills. The rocks of the Nammuldi Member do not usually contain sulphide minerals that are responsible for acid generation, hence mining activities are not expected to result in acid mine drainage.

Rock outcrop throughout the area is limited due to extended periods of tectonic inactivity. The Nammuldi Member is characterised by low flat hills with relief generally restricted to less than 30 m. Furthermore, the weathering profile is deep with no fresh rock evident at surface. These profiles commonly display Tertiary aged colluvium containing both cemented and uncemented detrital products of BIF, chert and shale within a matrix of finer grained sediments. Percolation of groundwater through the weathering profiles has resulted in precipitation of both calcrete and ferricrete creating resistant horizons within the extensive regolith.

The structural geology of the area is concealed by limited outcrop exposure. However, extensive large-scale faulting has been interpreted in the vicinity of Mt Nicholas. The dominant structural feature across the northern portion of the project area is an east-northeast trending, dextral shear zone referred to as the Springo Fault. Furthermore, Mt Nicholas is located on the south-eastern limb of a regional syncline that plunges shallowly towards the southwest. This fold limb is cross-cut by a number of sub-vertical faults that account for some of the structural complexity within the prospect.

The Mindy Mindy channel iron deposit (Robe Pisolite) is a Tertiary deposit formed in the ancient riverbed of the current day Mindy Mindy Creek. The width of the more or less continuous deposit ranges up to 370 m with an average thickness of 16 m and meanders along strike for approximately 12 km. The mineralised material stands out as low mesas or hills in the south and plunges under the surface in the north of the deposit, where it is covered by approximately 25 m of overburden.

The goethite limonite mineralisation is found in the form of cemented oolite and pisolite with minor ochreous hematite and is similar to ore being exploited in the nearby Yandicoogina mines operated by BHPBIO and HI. The grade and physical characteristics of the material is typical of Robe Pisolite found elsewhere throughout the Pilbara.
4.8 SOILS

Soils of the region are dominated by Tertiary aged colluvium, characterised by angular fragments of BIF, chert and shale. The flanks of hills contain iron rich gravely soils that form extensive sheets of scree which abut the plain levels of lower topography. The floodplains of the Fortescue valley display extensive sheets of silty and sandy soils with increasing clay mineral constituents in closer proximity to the Fortescue Marshes. North-easterly trending ephemeral drainages dissect the Chichester Ranges and commonly display alluvial sediments characterised by silt and sand sized sediments with a red/ochre colour.

Soils along the east-west rail corridor are typically hard alkaline red soils on outwash plains with much coarse surface gravel. Also present are acid red earths with some neutral red earths on plains associated with the Fortescue Valley, where there is a surface cover of stony gravels close to the ranges and hills and red-brown hardpan is absent. Deep cracking clays on alluvial plains occur at the eastern end of the corridor near Mt Lewin. Soils within the corridor between Mt Lewin and Mt Nicholas are deep earth loams with some areas of clay soils on plains; and alkaline red soils of dissected stony pediments and hills with some residuals of more resistant rocks as mesas.

At Mt Lewin soils are predominantly hard alkaline red soils on outwash plains with much coarse surface gravel.

At Mt Nicholas, soils are alkaline red soils of dissected stony pediments and hills with some residuals of more resistant rocks as mesas. On deeply dissected areas lime is released from weathering of more basic rocks.

Soils at Christmas Creek are shallow and stony on ranges, of basic lavas along with dolomites, tuff, BIF and dolerite dykes, with some narrow valley plains and high-level gently undulating areas.

Soils at Mindy Mindy are derived from ranges of banded jaspilite and chert along with shales, dolomites and iron ore formations. Some areas have a ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments.

4.9 LAND SYSTEMS

The main land systems along the proposed east-west rail line are the:

- Jamindie Land System - stony hardpan plains and rises supporting groved mulga shrublands, occasionally with spinifex understorey; and
- Turee Land System - stony alluvial plains with gilgaied and non-gilgaied surfaces supporting tussock grasslands and grassy shrublands.
This is interspersed with the:

- Christmas Land System to the west - stony alluvial plains supporting snakewood and mulga shrublands with sparse tussock grasses;
- Brockman Land System - alluvial plains with cracking clay soils supporting tussock grasslands); and
- Washplain Land Systems - Hardpan plains supporting groved mulga shrublands; at the eastern end of the rail corridor.

The Divide Land System (sandplains and occasional dunes supporting shrubby hard spinifex grasslands) occurs where the rail line terminates at Mt Nicholas.

Land systems at Christmas Creek are dominated by the Newman Land System (Rugged jaspilite plateaux, ridges and mountains supporting hard Spinifex grasslands) and the McKay and Jamindie Land Systems (Hills, ridges, plateaux remnants and breakaways of metasedimentary and sedimentary rocks supporting hard spinifex grasslands).

The Mt Lewin mining area is characterised by McKay Land System and the Jamindie Land System.

The Mt Nicholas areas is characterised by the McKay Land System, which approximately follows where the orebody is located and the Divide Land System.

At Mindy Mindy, the area is predominantly in the Newman Land System (rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands) and some Rocklea Land System (basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands.

4.10 VEGETATION AND FLORA

Beard (1975) mapped the vegetation of the Pilbara at a scale of 1:1,000,000. The entire Project Area lies within the Fortescue Botanical District of the Eremaean Botanical Province as defined by Beard. The vegetation of this province is typically open, and frequently dominated by spinifex, wattles and occasional eucalypts.

According to Beard’s (1975) mapping, vegetation along the proposed east-west rail line is predominantly sparse low mulga woodland discontinuous in scattered groups, with Coolibah (Eucalyptus victrix) trees scattered over various sedges and forbs near Mt Lewin. Where the rail spur terminates near Mt Nicholas, there are hummock grasslands, shrub steppe with Eucalyptus gamophylla over hard spinifex.

Vegetation at Christmas Creek is a mosaic of low woodland with mulga in valleys and hummock grasslands, low open tree steppe with snappy gum (Eucalyptus leucophloia) over Triodia wiseana, and kanji over soft spinifex and Triodia wiseana hummock grasslands. Mt Lewin and Mt Nicholas is
characterised by low mulga woodland and shrub steppe with kanji over soft spinifex and *Triodia wiseana* hummock grasslands.

Mindy Mindy is characterised by low tree steppe with snappy gum over *Triodia wiseana* hummock grasslands.

### 4.10.1 Significant Flora Species

A number of rare or restricted flora have either been recorded in the proposed development areas, or could potentially occur (based on their occurrence in the region and presence of suitable habitat within the areas). Field surveys of likely habitats will be undertaken during the Pilbara flowering season to confirm any occurrence of rare or restricted flora within the Project Area.

The Declared Rare Hamersley Lepidium (*Lepidium catapycnon*) has been recorded near Weeli Wolli Springs. This species could potentially occur in the Mindy Mindy mine area but suitable habitat does not exist in the other development areas.

**Priority flora that could potentially occur within the Project area, include:**

- *Abutilon trudgenii* ms. (Priority 3);
- *Eriachne tenuiculmis* (Priority 3);
- *Hibiscus brachysiphonius* (Priority 3);
- *Sida* sp. Wittenoom (W.R. Barker 1962) (Priority 3);
- *Triumfetta leptacantha* (Priority 3); and
- *Goodenia stellata* (Priority 4).

### 4.11 FAUNA

The most recent fauna survey work in the Pilbara, closest to its own development area, that the Proponent is aware of is the survey work conducted by Hope Downs. This work, along with more historical and/or regional studies, provides a guide to the species of threatened fauna likely to occur within the Project Area. The Hope Downs work identified four species of Schedule fauna (listed under the Western Australian *Wildlife Conservation (Specially Protected Fauna) Notice 1999*), and seven Priority species (listed on CALM’s Priority Fauna database), that are likely to occur in habitats affected by the proposed rail and port.

**Of these threatened fauna species listed under the Western Australian *Wildlife Conservation (Specially Protected Fauna) Notice 1999* the following may occur in the Project Area:**

- Bilby *Macrotis lagotis* (Schedule 1);
- Night Parrot *Pezoporus occidentalis* (Schedule 1);
- Mulgara *Dasycercus cristicauda* (Schedule 1);
• Pilbara Olive Python *Liasis olivaceus barroni* (Schedule 1); and  
• Peregrine Falcon *Falco peregrinus* (Schedule 4).

CALM also keep up to date a priority fauna database, which lists species potentially under threat. Priority fauna that could potentially occur within the Project Area are:

• *Ramphotyphlops ganei* (Priority 1);  
• Ghost Bat *Macroderma gigas* (Priority 4);  
• Short-tailed Mouse *Leggadina lakedownensis* (Priority 4);  
• Western Pebble-mound Mouse *Pseudomys chapmani* (Priority 4);  
• Grey Falcon *Falco hypoleucos* (Priority 4);  
• Australian Bustard *Ardeotis australis* (Priority 4);  
• Bush Stonecurlew *Burhinus grallarius* (Priority 4);  
• Eastern Curlew *Numenius madagascariensis* (Priority 4).

Stygofauna communities have been identified in the vicinity of most of the iron ore mines of the Pilbara (Johnson & Wright, 2001). Based on this it is expected that the Proponent will also encounter stygofauna within their Project Area, particularly within the Mindy Mindy mining area.

FMG completed all field surveys, except for the Mindy Mindy area (survey pending) in July/August 2004 for Stage B of the Project.

**4.12 ABORIGINAL HERITAGE**

The Stage B Project Area is located within claims by the following Native Title claimant groups:

• Nyjiaparli;  
• Martu Idja Banyjima; and  
• Palyku.

The Proponent continues to meet with Claimant Working Groups established by these Native Title claimant groups, which cover the railway line and resources areas, to discuss its intention to seek approval to construct and operate its proposed Pilbara Iron Ore and Infrastructure Project.

Protocols, including those for Aboriginal Heritage surveys have been agreed with these claimant groups, and also an additional assistance protocol with their representative body, the Pilbara Native Title Services (PNTS). The PNTS is a service division of the Yamatji Land and Sea Council, the authorised Native Title representative body for the Pilbara. The agreed protocols identify the manner in which Aboriginal heritage surveys and other Aboriginal matters and interests will be managed and conducted between FMG, the Native Title claimant parties, their legal representative body and the Aboriginal communities within the area.
FMG’s Chief Executive Officer, Mr Andrew Forrest, and his brother Mr David Forrest, who is FMG’s Community Development Adviser, have a long and close association with many of the Aboriginal families in the Pilbara. As children, they were brought up on a pastoral station near Onslow with many of the local Aboriginal children. Many of these Aboriginal people have since moved further out into the Pilbara region from the Onslow area, as major iron ore mines and associated infrastructure have been progressively developed since the mid-1960s. Mr David Forrest has stayed in the Pilbara, operating a small aviation charter business out of Onslow and has continued his close relationships with the traditional land owners.

4.12.1 Archaeological Sites

A number of archaeological studies for Stage B of the Pilbara Iron Ore and Infrastructure Project have been undertaken, with more planned as the Project develops. These studies have been conducted at varying intensities and predominantly focused on the resource and mining areas. The results of these studies, which failed to identify any sites of high archaeological significance, indicate that historic Aboriginal occupancy and/or use was low through much of this area. This is thought to be due to the lack of any permanent water, significant vegetation and the lack of any distinctive landforms. However, it is expected that artefacts and sites of archaeological significance may be identified along the proposed rail corridor.

Based on ongoing discussions with the Aboriginal people, their advisers and consultants the following patterns of distribution for archaeological sites is expected, particularly along the rail corridor:

- The tops and slopes of both high and low ridges or hills will generally be devoid of archaeological sites except where rock shelters, which may contain artefacts, are present in the slopes of this landform.

- Subject to substantive natural water supplies, short, steep valleys and gullies are likely to be rich in archaeological resources where rock shelters may be common. Open sites are seldom found in association with these landforms, due to lack of suitable camping locations and/or removal of archaeological material by floodwater action. The types of artefacts that may be found in rock shelters are grinding material, sparse scatters of stone artefacts, and charcoal on the surface of deposits. Paintings, ground pigment, engravings, dry stone walls, wooden artefacts, and secondary burial sites may also be present. Valleys and gullies may have been used as access corridors by Aboriginal people.

- Subject to substantive natural water supplies, a large quantity of archaeological material is usually found on the broad, level plains and valley floors, between the ranges and hills. Large complex open sites are usually associated with springs and along creek lines where flat ground is available. Along the smaller creeks and minor drainage channels, low-density artefact scatters will occur. Less material may be scattered on open plains, away from drainage courses sometimes in association with grinding material. Stone arrangements may
be present in the foot slopes and stone quarries and rock engravings may occur where suitable outcrops are located.

- Gorges and long, deeply incised valleys, with permanent water sources, may once have had a rich archaeological resources, but these are likely to have been transported and deposited downstream by heavy floodwaters. Open sites may be found intact at the mouths of the valleys and gorges. Rock shelters that are situated above flood levels may contain a wide range of archaeological material, similar to that in the gullies and valleys described above.

4.12.2 Ethnographic Sites

Ethnographic surveys of the Proponent’s eastern resource and mining areas have commenced and only one site of high significance identified. Helicopter ethnographic constraint surveys with each of the three claimant groups have been undertaken within their respective claims over the Project Area. Although some ethnographic sites were identified, only one of these was in close proximity to the rail corridor or mining areas. Extensive consultation, including an on the ground consultation meeting within the site area, has taken place to minimise any impact by FMG activities.

Additional surveys will be conducted independently and/or in association with each of the Aboriginal groups to ascertain if the Project Area intersects any significant ethnographic sites and to manage any associated concerns and issues.

4.13 EUROPEAN HERITAGE

An initial review of European Heritage within the Project Area has revealed no known sites of significance. However, in consultation with local representatives a more detailed assessment will be made, including a review of the databases of the Australian Heritage Commission (AHC), Heritage Council of Western Australia (HCWA), National Trust and the East Pilbara Shires’ Municipal Inventory.
5. KEY ENVIRONMENTAL FACTORS

The key environmental factors that are considered to be significant in the assessment of the environmental impacts of the Project were identified through the Environmental Referral process. These are:

- Terrestrial Flora and Vegetation;
- Declared Rare and Priority Flora;
- Terrestrial Fauna;
- Specially Protected (Threatened) Fauna;
- Stygofauna;
- Water course and wetlands;
- Groundwater;
- Water Supply;
- Mine dewatering;
- Greenhouse Gas Emissions;
- Dust Emissions - Construction and Operations;
- Surface and groundwater quality;
- Waste Management – waste rock, rejects and general;
- Acid Sulphate Soils;
- Decommissioning and Rehabilitation;
- Noise;
- Heritage – Aboriginal and European; and
- Economic and Social Impacts.

Table 4 present the key environmental factors and includes reference to the EPA’s objectives in relation to the issues, the potential impacts, additional investigations required, and applicable standards and guidelines. This information will be further developed in the PER.
### Table 4: Key Environmental Factors and Studies for Assessment of the Project

<table>
<thead>
<tr>
<th>Environmental Factor</th>
<th>Relevant Area</th>
<th>EPA/Project Environmental Objective</th>
<th>Potential Impacts</th>
<th>Additional Investigations</th>
<th>Applicable standards, guidance and policies</th>
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<tr>
<td><strong>INTEGRATION</strong></td>
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| Biodiversity         | Within the following major physiographic units in the Pilbara bioregion:  
  • Chichester Plateau;  
  • Fortescue Valley; and  
  • Hamersley Plateau. | To avoid adverse impacts on biological diversity, comprising the different plants and animals and the ecosystem they form, at the levels of genetic, species and ecosystem diversity.  
To avoid, minimise, mitigate and offset direct and indirect impacts on the critical values of the mulga woodlands (Chichester Ranges foot-slopes) and the Fortescue Marsh. | Significant species or communities could potentially occur within the Project Area and may be affected by land clearing or construction or operational impacts.  
There are potential impacts on the Fortescue Marshes if surface and groundwater is inadequately managed.  
There is the potential for increased risk of wildfires which may adversely impact the biodiversity of areas in and adjacent to the Project area. | Undertake detailed biological surveys commencing in May 2004.  
Undertake surface hydrology and hydrogeology study, which includes an assessment of the potential impacts of the Project on the Fortescue Salt Marshes.  
Include fire management in the draft EMP. | • EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection.  
• EPA Guidance Statement No 6 Towards Sustainability.  
• EPA Guidance Statement No. 7. Principles of Environmental Protection.  
• EPA Preliminary Guidance Statement No. 9, Environmental Offsets. |
| Sustainability        | The Project Area and adjacent areas potentially affected by the Project. | To ensure, as far as practicable, that the proposal meets or is consistent with the sustainability principles in the National Strategy for Ecologically Sustainable Development (Commonwealth 1992).  
To assess the acceptability of large scale-clearing (estimated to be 16,150 ha over the Project life of 20+ years). | Poor design and management of a development such FMG’s proposal could result in unacceptable economic, environmental and social impacts. Conversely, protection of the environment and social values needs to take into consideration economic constraints. | A Sustainability Assessment for the Project will be undertaken. | • National Strategy for Ecologically Sustainable Development (Govt. of Australia 1992).  
• Hope for the future: The Western Australian State Sustainability Strategy (Govt. WA, 2003).  
• EPA Guidance Statement No 6 Towards Sustainability.  
• EPA Guidance Statement No. 7. Principles of Environmental Protection.  
• EPA Preliminary Guidance Statement No. 9, Environmental Offsets.  
• EPA Guidance No. 34. Linkage between EPA Assessment and Management Strategies, Policies, Scientific Criteria, Guidelines, Standards and Measures Adopted by National Councils.  
• EPA Guidance Statement No. 55. Implementing Best Practice in proposals submitted to the Environmental Impact Assessment process. |
| Future Conservation Estate | Pastoral Stations within the Project area proposed for conservation purposes after 2015 (i.e. Mulga Downs, Hillside, Marillana and Roy Hill Stations). | To avoid adversely affecting the future conservation value of the pastoral stations proposed for inclusion in the Conservation Estate, or managed for conservation purposes. | Construction of the railway has the potential to adversely affect large areas of mulga communities within these pastoral stations if surface water sheet flow is not adequately managed.  
Construction of the railway has the potential to disturb and degrade large areas of mulga within and adjacent to the railway corridor.  
Mining impacts at Mindy Mindy on Marillana Station will be localised. | Clarify the likely boundaries of pastoral excisions in the Project area and assess the potential impact on the proposed conservation estate in the area.  
Explore alternative rail routes to avoid wherever practicable and to minimise and manage direct and indirect impacts on the critical values of the mulga woodlands. | • EPA Guidance Statement No. 7. Principles of Environmental Protection. |
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<tr>
<td>BIOPHYSICAL</td>
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<tr>
<td>Terrestrial Flora – Vegetation Communities</td>
<td>Within the following major physiographic units in the Pilbara bioregion: Chichester Plateau; Fortescue Valley; and Hamersley Plateau.</td>
<td>Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.</td>
<td>Land will be required for four mine sites and approximately 160 km of rail corridor. Significant flora species or vegetation communities could potentially occur within the Project Area. Construction of the railway and adjacent access road will interrupt the natural sheet flow of surface water within the vicinity of the rail corridor, potentially affecting mulga groves within the area (e.g. upstream inundation and downstream water starvation). Other impacts may include off-road vehicle impacts, erosion, smothering of vegetation with dust and increased risk of fire (refer to Biodiversity factor).</td>
<td>Undertake detailed studies to identify existing flora species and vegetation communities (including riparian) present in the proposal areas. Undertake a hydrological study to investigate topography, catchment areas, predicted surface water runoff volumes. Investigate alternatives for drainage design for the railway and access road. Prepare a Revegetation Management Plan.</td>
<td>EPA Position Statement No. 2: Environmental Protection of Native Vegetation in Western Australia. EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection. EPA Draft Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.</td>
</tr>
<tr>
<td>Terrestrial Flora – Declared Rare and Priority Flora; flora of conservation significance</td>
<td>Within the following major physiographic units in the Pilbara bioregion: Chichester Plateau; Fortescue Valley; and Hamersley Plateau.</td>
<td>Maintain the abundance, species diversity and geographical distribution of vegetation communities.</td>
<td>Significant vegetation communities could potentially occur within the Project Area.</td>
<td>Undertake baseline studies to identify any Declared Rare Flora, Priority Flora or other species of conservation significance.</td>
<td>EPA Position Statement No. 2: Environmental Protection of Native Vegetation in Western Australia. EPA Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection. EPA Draft Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.</td>
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<td>Terrestrial Fauna</td>
<td>Within the following major physiographic units in the Pilbara bioregion: Chichester Plateau; Fortescue Valley; and Hamersley Plateau.</td>
<td>Maintain the abundance, species diversity and geographical distribution of terrestrial fauna.</td>
<td>Land clearing will disturb some fauna habitats. Terrestrial fauna may be affected by earthworks, noise and blasting vibration.</td>
<td>Undertake baseline studies to identify existing terrestrial fauna throughout the areas to be affected by the proposal.</td>
<td>EPA Guidance Statement No. 56: Terrestrial fauna surveys for Environmental Impact Assessment in Western Australia.</td>
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<tr>
<td>Terrestrial Fauna - Specially Protected (Threatened) Fauna</td>
<td>Within the following major physiographic units in the Pilbara bioregion: Chichester Plateau; Fortescue Valley; and Hamersley Plateau.</td>
<td>Maintain the abundance, species diversity and geographical distribution of terrestrial fauna.</td>
<td>Land clearing may impact significant species if these are present within the Project Area.</td>
<td>Undertake baseline studies to identify Specially Protected (Threatened) Fauna, which may be found within the areas to be affected by the proposal.</td>
<td>EPA Guidance Statement No. 56: Terrestrial fauna surveys for Environmental Impact Assessment in Western Australia.</td>
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<tr>
<td>Stygofauna</td>
<td>Within groundwater supply areas.</td>
<td>Maintain the abundance, diversity and geographical distribution of subterranean fauna.</td>
<td>Abstraction of groundwater for the Project’s water supply may impact on the habitat of subterranean fauna. Identify any potential stygofauna habitat sites. Undertake stygofauna sampling in conjunction with drilling for groundwater resources and hydrogeological investigations. Assess the potential affect on stygofauna from dewatering operations.</td>
<td></td>
<td>EPA Guidance Statement No. 54: Consideration of subterranean fauna in groundwater and caves during environmental impact assessment in Western Australia.</td>
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<td><strong>WATER COURSES AND WETLANDS</strong></td>
<td>Water courses and wetlands within or near the Project Area.</td>
<td>Maintain the integrity, functions and environmental values of watercourses and sheet flow.</td>
<td>The railway crosses a number of creeks that flow into the ephemeral Fortescue Marshes. Incorrect management of surface water runoff could result in water starvation or pollution of downstream ecological communities. Abstraction of groundwater for water supply and pit dewatering has the potential to affect the groundwater dependent areas i.e. Fortescue Marshes.</td>
<td>Undertake baseline studies to identify watercourses, and types of surface water flow including sheetflow throughout the areas to be affected by the proposal to ascertain the need for rail engineering measures or an alternative rail route. Assess the potential impacts on surface water flow rates, drainage patterns, sediment transport, riparian vegetation, pools and dependent vegetation, as a result of development activities. Undertake a hydrogeological study to investigate topography, catchment areas, predicted surface water runoff volumes. Undertake hydrogeological studies including a review of project water demand to identify the volume of water required during the different stages of project development. Undertake an assessment of groundwater interaction at the Fortescue Marsh and the potential impacts of borefield abstraction on the Marsh.</td>
<td>• DoE Stormwater Manual • EPA Preliminary Guidance Statement No. 4, Environmental Protection of Wetlands.</td>
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<td><strong>WATER SUPPLY</strong></td>
<td>Water supply areas.</td>
<td>Maintain (sufficient) quantity of groundwater so that existing and potential uses, including ecosystem maintenance, are protected.</td>
<td>Water supply for construction of the Project will be from local bores or surface water supplies. The main water requirement for the Project will be for beneficiation of ore. The annual water requirement is estimated to be 11 GL. Impacts could occur where the quantity of water abstracted from a source is unsustainable.</td>
<td>A water supply study will be undertaken to investigate sources of water for the Project, and the sustainability of these sources under proposed abstraction rates. A review of water demand will be undertaken to identify the volume of water required during the different stages of project development. A study will detail the hydrogeological systems of the Project Area, existing beneficial uses of groundwater (including ecosystem maintenance) and assessment of potential impact on groundwater systems as a result of groundwater abstraction. Detail proposed measures to manage impacts.</td>
<td>• Water and Rivers Commission (2000). Environmental Water Provisions Policy for Western Australia: Statewide Policy No. 5</td>
</tr>
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<td><strong>REHABILITATION</strong></td>
<td>Progressively throughout the life of the Project, and all areas on completion of the Project.</td>
<td>To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and meets other environmental objectives including biodiversity.</td>
<td>Large areas of land will be progressively cleared (16,150 ha) which will require rehabilitation over the life of the Project (20+ years).</td>
<td>Develop a Conceptual Mine Closure Plan which indicates how rehabilitation will be undertaken, how progress will be monitored, and provide draft completion criteria for rehabilitation.</td>
<td>• ANZMEC &amp; MCA Strategic Framework for Mine Closure.</td>
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<tr>
<td>Environmental Factor</td>
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<tr>
<td>Air – Greenhouse Gases</td>
<td>The Project as a whole.</td>
<td>Minimise greenhouse gas emissions for the Project and reduce emissions per unit product to as low as reasonably practicable, and mitigate greenhouse gas emissions in accordance with the Framework Convention on Climate Change 1992, and with established Commonwealth and State policies.</td>
<td>Greenhouse gas emissions from the Project Area are not expected to be a significant impact.</td>
<td>Undertake a greenhouse gas emissions estimation study.</td>
<td>• EPA Guidance Statement No. 12 for Minimising Greenhouse Gas Emissions.</td>
</tr>
<tr>
<td>Air – Particulate dust emissions during construction</td>
<td>The Project as a whole.</td>
<td>Protect the surrounding land users such that dust and particulate emissions will not adversely impact upon their welfare and amenity or cause health problems.</td>
<td>Dust from earthworks during construction may generate a nuisance.</td>
<td>Undertake a dust impact study to assess the potential impacts of dust on surrounding land users.</td>
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<tr>
<td>Air – Particulate dust emissions during operations</td>
<td>Mining areas, ore stockpiles and loading facilities. Unsealed areas within the Project Area.</td>
<td>Ensure that particulate/dust emissions from FMG’s activities meet appropriate criteria and do not cause environmental or human health problems.</td>
<td>Ore loading, conveying and stockpiling, has the potential to create a dust nuisance for workers and adjacent land users. Due to the remoteness of the sites, the potential for dust impacts on neighbours is expected to be low. Unsealed areas within the Project Area may generate dust, smothering vegetation</td>
<td>Identify sources of particulates/dust and estimates of project-wide emissions. Analyse the significance of these emissions with regard to environmental impacts, in particular, impacts on vegetation. Identify dust mitigation measures.</td>
<td>• NEPC (1998) Ambient Air Quality National Environment Protection Measure.</td>
</tr>
<tr>
<td>Water Quality –Surface water</td>
<td>Waterbodies in or near the Project Area.</td>
<td>Maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the Australian and New Zealand Water Quality Guidelines (ANZECC 2000).</td>
<td>Surface water runoff or discharge of waste water from the Project Area could contaminate, or increase sediments flowing into, nearby waterbodies.</td>
<td>Detail site drainage, modifications to drainage and potential for contamination.</td>
<td>• ANZECC/ARMCANZ 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. • DoE: Stormwater manual.</td>
</tr>
<tr>
<td>Water Quality –Groundwater</td>
<td>Groundwater underlying the Project Area and within groundwater supply areas.</td>
<td>Maintain or improve the quality of groundwater to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the Australian and New Zealand Water Quality Guidelines (ANZECC 2000).</td>
<td>There is potential for spills or contaminated runoff from the Project Area, to seep into the underlying groundwater. Excessive abstraction of groundwater could impact wetlands or ecosystems dependent on this water source.</td>
<td>Detail the existing water quality of groundwater aquifers. Identify potential sources of contamination associated with the proposal.</td>
<td>• ANZECC/ARMCANZ 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.</td>
</tr>
<tr>
<td>Waste Management - Waste Rock - Rejects Dumps -General Waste</td>
<td>Mining areas at Christmas Creek, Mt Lewin, Mt Nicholas and Mindy Minily</td>
<td>To ensure that disposal/management wastes do not adversely affect environmental values, or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.</td>
<td>Incorrect disposal of wastes can lead to contamination of soils, surface and ground water and/or air.</td>
<td>Waste characterisation and geotechnical investigations will be undertaken to develop appropriate management measures for rejects and waste rock, and to minimise the risk of pollution from waste disposal areas.</td>
<td>• Department of Mines and Energy. Guidelines for Mining in Arid Environments. June 1996. • Department of Mines and Energy. Guidelines on the Safe Design and Operating Standards for Tailings Storage. May 1999.</td>
</tr>
<tr>
<td>Contamination - Acid Mine Drainage</td>
<td>Mining and stockpile areas.</td>
<td>Minimise the risk to the environment resulting from potentially acid forming materials.</td>
<td>Waste rock or ore could contain acid-generating materials that may cause acid drainage problems if oxidised. Initial investigations indicate that the rock formations within the Project Area do not normally contain acid-generating sulphide minerals and therefore acid rock drainage is not expected to be a significant issue.</td>
<td>Investigate the potential for acid generating materials in the proposed Project area.</td>
<td>• Identification and investigation of Acid Sulphate Soils and Groundwater (DEP &amp; WRC, 2003)</td>
</tr>
<tr>
<td>Environmental Factor</td>
<td>Relevant Area</td>
<td>EPA/Project Environmental Objective</td>
<td>Potential Impacts</td>
<td>Additional Investigations</td>
<td>Applicable standards, guidance and policies</td>
</tr>
<tr>
<td>----------------------</td>
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</tr>
</tbody>
</table>
| Noise                | Within the vicinity of towns and settlements near the Project Area. | Ensure noise impacts emanating from construction and operation activities comply with statutory requirements and acceptable (and appropriate) standards. | The mining and rail areas are expected to be sufficiently remote to not impact on any nearby residences. | Assess the Project for compliance with the statutory requirements and acceptable (and appropriate) standards for Noise. | • EPA Draft Guidance Statement No. 8: Environmental Noise.  
  • Environmental Protection (Noise) Regulations 1997.  
  • Preliminary draft Guidance for EIA No. 14 – Road and Rail Transportation Noise (Version 3). |
| Decommissioning      | All areas on completion of the Project (unless required by other parties). | To ensure, as far as practicable, that decommissioning achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values. | The Proponent will have to consider the potential long-term environmental impacts (e.g., hydrogeological, hydrological, and ecological impacts) in the development and implementation of the Project’s decommissioning and rehabilitation programme. | Identify closure requirements and prepare a conceptual mine closure plan to be included within the draft PER. | • ANZMEC & MCA Strategic Framework for Mine Closure. |

**SOCIAL SURROUNDS**

**Heritage – Aboriginal culture and heritage**

- The proposed mining areas and rail corridor are within the region covered by Native Title claimant groups;  
  - Nyijaparli;  
  - Martu Idja Banyjima and  
  - Palyku

- Ensure that the proposal complies with the requirements of the Aboriginal Heritage Act 1972.  
- Ensure that changes to the biological and physical environment resulting from the Project do not adversely affect cultural associations with the area.

- Sites of Aboriginal Heritage significance could potentially occur within the Project Area.  
- Identify Aboriginal cultural and heritage sites of significance through archaeological and ethnographic surveys of the Project Area and through consultation with local Aboriginal groups and the Department of Indigenous Affairs.

- It is not expected that any sites of European heritage significance will be affected by the Project.  
- Identify any places listed on the Register of the National Estate (or the Interim List of the Register) that may be adversely impacted by the proposal.

**Heritage – European heritage**

- The Project as a whole.

- Comply with statutory requirements in relation to areas of cultural or historical significance.

- A social and economic impact assessment of the Project will be undertaken.  
- Department of Environment, Interim Industry Guide to Community Involvement, December 2003
6. SCOPE OF WORKS FOR PUBLIC ENVIRONMENTAL REVIEW

The following Scope of Works identifies the purpose and scope of the key environmental factors likely to influence the proposed Project. The Proponent has selected a team of specialist consulting firms and individuals to assist it in undertaking the identified work and optimising the Project. The consultants chosen have been selected for their specialist abilities, knowledge and experience of the Project Area and/or issues.

The Proponent has a policy for open, transparent and interactive consultation with the State’s Decision-Making Authorities (DMAs) and invites their representatives to be actively involved (e.g. as observers of field surveys). The results of the environmental surveys will be made publicly available and shared with Government DMAs and the wider community. A copy of the biological surveys reports shall be provided to the Department of Conservation and Land Management (CALM; Contact S. van Leeuwen) as the custodian of the Pilbara Biological Database.

6.1 PROJECT SUSTAINABILITY ASSESSMENT

6.1.1 Purpose

An assessment of the sustainability of the Project against the broad principles outlined in the National Strategy for Ecologically Sustainable Development will be conducted.

6.1.2 Scope

FMG’s team of specialist engineers and consultants are assessing the economic, environmental and social implications of the proposed project using the principles outlined in the Western Australian State Sustainability Strategy. The following policies and guidance will also be considered in design and proposed management of the Project:

- Hope for the future: The Western Australian State Sustainability Strategy (Govt. WA, 2003).
- EPA Guidance Statement No 6 Towards Sustainability.
- EPA Preliminary Guidance Statement No. 9, Environmental Offsets.

Similarly, representatives from the key DMAs will be consulted during this process to help guide and participate in this assessment and its outcomes.
6.2 HYDROGEOLOGY STUDY

6.2.1 Purpose

To determine the dewatering requirements for the pits, and proposed use or disposal of this water; and to determine the availability of the required volume of water for project construction and operation. The study will assess the sustainability of these identified resources for their proposed use and means through which water use can be minimised.

6.2.2 Scope

Aquaterra (who have significant experience in the Pilbara iron ore industry) have commenced the project hydrogeological study. This includes a review of project water demand to identify the volume of water required during the different stages of project development. The findings of this review are being used, in conjunction with an examination of existing hydrological and hydrogeological information within and around the Project Area, to identify likely available water resources. The study will also investigate the potential impact of the Project on groundwater dependent ecosystems, potential impact on Fortescue marshes and Ecological Water Requirements (EWRs) to maintain a balance within these ecosystems.

Studies are being conducted in consultation with the Water and Rivers Commission (WRC), Local Government authority, pastoralists and other water users in the area. Drilling and pump testing have commenced to confirm available water sources.

This work will be conducted in accordance with the principles of the WRC (now Department of Environment) State-wide Policy No. 5 (Environmental Water Provisions for Western Australia). The Proponent will also consider the EPA Preliminary Guidance Statement No. 4, Environmental Protection of Wetlands.

6.3 SURFACE HYDROLOGY STUDY

6.3.1 Purpose

To examine the natural surface water drainage patterns of the proposed mine sites, rail corridor and support facilities to assist in appropriate design of infrastructure and of surface water control measures.

6.3.2 Scope

Aquaterra will also conduct the project hydrology studies. The studies have begun to investigate topography, catchment areas, predicted surface water runoff volumes, and provide advice to the engineering team with regards to location and design of drainage structures and creek and river crossings. Surface drainage diversion or catchment structures will be designed to ensure that
potentially polluted runoff does not enter natural waterbodies, and is contained before being released to the environment, in accordance with the principles outlined in the DoE Stormwater Manual. The assessment criteria for the water quality of runoff will be the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ, 2000). Design and proposed management of the Project will also consider EPA Preliminary Guidance Statement No. 4, Environmental Protection of Wetlands.

The study will also identify areas of high erosion risk within the Project Area that require site-specific management during construction, operation and rehabilitation. This work will be closely linked to the biological studies.

6.4 WASTE MANAGEMENT (WASTE ROCK AND REJECTS)

6.4.1 Purpose

To determine the physiochemical characteristics of waste material and most suitable design of waste rock and rejects dumps. The study will be undertaken in accordance with applicable standards and regulatory requirements, and to minimise environmental impact.

6.4.2 Scope

The study includes investigating the characteristics of the waste rock, including material from rail cuttings and rejects, to determine the most appropriate management measures and to minimise the environmental impact from the use/disposal of these materials.

The physiochemical parameters of the ore, waste rock, and rejects from the mine sites, including the potential for acid generation and fibrous material has commenced. This work includes a review of available geological and metallurgical data to provide an indication of likely physiochemical parameters and the requirement to undertake more detailed field and laboratory investigations. Definitive studies to date indicate that the waste rock at Mount Nicholas is not acid generating, nor does it contain elevated levels of hazardous/heavy metals or be saline. This characteristic is anticipated to be identical for Christmas Creek.

Should waste rock and rejects be shown to be acid generating, the study will also investigate the presence of acid-neutralising materials for possible use in co-disposal and low-permeability material for capping the waste and rejects dumps.

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1 Acid rock drainage is usually as a result of high levels of sulphides that oxidise on exposure to air and water and create sulphuric acid. If this acid drainage leaches through the waste rock or soil, it can mobilise metals and result in contamination of groundwater, surface water and soils.
6.5 FLORA AND VEGETATION SURVEYS

6.5.1 Purpose

To identify vegetation types present in the Project Area, the location of threatened flora populations and restricted or sensitive vegetation communities. This will enable an assessment of conservation significance with the aim of minimising impacts on significant flora and vegetation types during both construction and operation.

6.5.2 Scope

Biota Environmental Sciences, who have undertaken the biological surveys for the Proponent’s Stage A development and also the biological surveys for the rail corridor associated with the Hope Downs Project, have commenced the flora and vegetation surveys in accordance with the EPA’s Guidance Statement No. 51 for the assessment of environmental factors for terrestrial flora and vegetation.

Due to the size of the Project Area, and limited extent of previous surveys in the region, the survey will adopt a systematic sampling approach, comprising the establishment of standard 50 m x 50 m flora sampling quadrats. This systematic sampling will be supplemented by opportunistic and targeted searches for Threatened Flora taxa and mapping of vegetation types from aerial photography.

The outcomes of these field surveys will enable the Proponent to:

a) verify the accuracy of desktop information;
b) delineate and characterise the flora and range of vegetation types present in the Project Area; and
c) identify the potential impacts of the Project on these features.

The field surveys were undertaken in June through September of 2004 and the conditions were adequate with respect to rainfall and seasonal timing to assess the potential impacts of the Project on flora and vegetation.

6.6 TERRESTRIAL FAUNA STUDIES

6.6.1 Purpose

To document the fauna communities and identify any threatened fauna or significant fauna habitats present. Having determined the status of fauna in the areas of impact, to then formulate best-practice procedures to ensure impacts are minimised.

6.6.2 Scope

Biota have commenced this work, which will be based on its recent experience from the Stage A work and the Hope Downs project, targeting areas most likely to support threatened species. The approach
to the work is similar to that adopted for the flora and vegetation surveys. This involves both opportunistic and systematic sampling work including pitfall traps, Elliott traps, funnel traps and bird transects; with effort targeted at areas that may support Threatened fauna.

Priority is given to searching for evidence of species listed as Schedule 1 under the *Wildlife Conservation Act 1950* and ‘Vulnerable’ under the *EPBC Act 1999*, and other Schedule and Priority listed species previously recorded in the vicinity of the Project Area.

The final scope and methodology for fauna surveys was developed in accordance with EPA Guidance Statement No. 56 terrestrial fauna surveys for Environmental Impact Assessment in Western Australia, with input from CALM and DoE representatives.

### 6.7 STYGOFANA STUDY

#### 6.7.1 Purpose

To determine whether stygofauna are present within the groundwater affected by mine dewatering and for water supply areas proposed for the Project, and if the conservation status of any present populations will be affected by abstraction of groundwater.

#### 6.7.2 Scope

Stygofauna sampling will be conducted in conjunction with drilling for groundwater resources and hydrogeological investigations in accordance with the principles outlined in the EPA Guidance Statement No. 54 on sampling of subterranean fauna and in consultation with representatives from CALM and WA Museum. This work will include detailed taxonomic and genetic work. This work will be based on accepted techniques of plankton haul net sampling and will be geared to the level of risk associated with project hydrological changes.

### 6.8 ASSESSMENT OF DUST

#### 6.8.1 Purpose

To determine the potential for dust emissions from activities such as mining (including blasting), stockpiling, loading and transport as these may impact on the air quality.

#### 6.8.2 Scope

The Proponent’s design team and specialist from ENVIRON will examine the proposed construction and operational activities and their potential to generate dust. This investigative work will determine the potential for the dust emissions to impact on the air quality at the mine sites and the surrounding environment. Effective dust mitigation measures will be identified to be incorporated into the facilities design and operating strategies, where appropriate.
6.9 ASSESSMENT OF NOISE

6.9.1 Purpose

To assess the Project for compliance with the statutory requirements and acceptable (and appropriate) standards for noise.

6.9.2 Scope

The mining and rail areas are expected to be sufficiently remote to not impact on any nearby residences. However, a noise assessment will be undertaken to confirm that the Project complies with the *Environmental Protection (Noise) Regulations 1997* and that noise will be managed in accordance with the EPA Draft Guidance Statement No. 8: Environmental Noise and Preliminary draft Guidance for EIA No. 14 – Road and Rail Transportation Noise (Version 3).

6.10 GREENHOUSE GAS EMISSIONS ASSESSMENT

6.10.1 Purpose

To estimate the Project’s greenhouse gas emissions and determine appropriate measures of minimising these emissions.

6.10.2 Scope

In consultation with the engineering design team, ENVIRON will review the consumption of fossil fuels and CO₂ generation from the Project’s operations including clearing. The findings will be utilised to calculate the expected greenhouse gas emissions for the Project during operations, and compare predicted emissions with other similar infrastructure projects in Australia. The Project will incorporate energy saving strategies, where practicable to ensure that greenhouse gas emissions are minimised.

This study will be undertaken in accordance with the EPA Guidance Statement No. 12 on minimising greenhouse gases and in consultation with the Australian Greenhouse Office.

6.11 ABORIGINAL ARCHAEOLOGICAL STUDY

6.11.1 Purpose

Archaeological surveys will be conducted to determine if the Project will impact any archaeological sites that are of significance to the local Aboriginal people.
6.11.2 Scope

The Pilbara Native Title Service (PNTS) has been commissioned by the Proponent to undertake archaeological studies of the Project Area on behalf of the traditional owners, who can “speak for country” and participate in these surveys. Due to the extent of the Project Area, aerial mapping and an in-field engineering constraints, survey is being used to target areas where more engineering flexibility is required (e.g. around rocky outcrops, drainage channels and river systems) or significant archaeological finds are most likely to be located such as:

- Rock shelters;
- Short, steep valleys and gullies;
- Rivers and creek lines;
- Foot slopes of rock outcrops; and
- Gorges with permanent water sources.

Archaeological surveys have commenced in consultation with the local Aboriginal communities and Native Title claimant groups as part of regular working group meetings and also the Department of Indigenous Affairs (DIA).

6.12 ABORIGINAL ETHNOGRAPHIC STUDY

6.12.1 Purpose

To determine if the Project will potentially affect any sites of cultural significance to Aboriginal people.

6.12.2 Scope

The scope of the study is currently being defined in consultation with the PNTS, Native Title claimant groups and the wider aboriginal community as part of regular Claimant Working Group meetings. The study will be conducted in accordance with the principles in the EPA Guidance Statement No. 41 for the assessment of Aboriginal Heritage and the requirements of the DIA.

Aboriginal people who are acknowledged by their community as ones who can ‘speak for the country’ are being consulted by a suitably qualified and experienced Anthropologist as to the location and cultural significance of ethnographic sites in and around the Project Area. This includes the Anthropologist accompanying the local Aboriginal people in the field to discuss the proposed project and ensure complete understanding and coverage of areas likely to be disturbed.
6.13 SOCIO-ECONOMIC STUDY

6.13.1 Purpose

To assess the benefits and any potentially adverse social and economic impacts of the Project.

6.13.2 Scope

A review of the Project’s socio-economic effects has being undertaken by Environmental Resources Management Australia Pty Ltd (ERM) who have recent experience in this field of expertise. The review includes a study of both direct and indirect benefits and possible disruption to employment, job and wealth creation, regional/state/national economic benefits, effect on local communities and existing land uses/users, demands placed on local services and resources, land and housing availability in the region and alignment with State policy.

The study outlines other opportunities for the Proponent to contribute to the local communities affected by the Project. The study is linked to the Project Sustainability Assessment and stakeholder consultation.

6.14 PREPARATION OF PER

A PER document will be prepared by ENVIRON in conjunction with the Proponent and its sub-consultants involved in the various studies mentioned above. This document will be prepared in accordance with the EPA Guidelines for Preparing and Public Environmental Review/Environmental Review and Management Program (EPA, 2002). The PER will describe the proposal and the receiving environment in detail, outline the potential impacts of the proposal on factors of the environment, identify proposed management strategies to ensure those environmental factors are protected and demonstrate that the Project can be managed to minimise harm and in a way that is environmentally acceptable.

6.15 ENVIRONMENTAL MANAGEMENT PLANS

Within the PER text, broad management measures and strategies will be identified to mitigate and minimise environmental and social disruption/harm. In addition to this, a draft project Environmental Management Plan (EMP) will be prepared to outline in further detail how the key environmental issues and associated impacts of the Project will be managed during construction and operation. This will include specific management strategies and procedures that have been developed during project design, in consultation with the specialist consultants and DMAs. This EMP will be finalised prior to construction and will include separate detailed plans where required, such as the Fire Management Plan.

An employee awareness training program will form part of the EMP and will capture the essence of the Proponent’s commitment to sustainable development and industry best practice environmental
management. The awareness training program will also include an overview of expected environmental management responsibilities and minimum performance requirements from all staff, contractors and visitors.

A copy of the draft EMP will be submitted as an appendix in the PER.

6.16 CONCEPTUAL MINE CLOSURE PLAN

A Conceptual Mine Closure Plan will be developed along the lines of the Australian and New Zealand Minerals and Energy Council (ANZMEC) and Minerals Council of Australia (MCA) Strategic Framework for Mine Closure. This conceptual plan is not intended to be a prescriptive plan for closure of the Proponent’s mine sites and will evolve throughout the development of the Project and as the site-specific environmental and social issues of each site become apparent. The Proponent intends to rehabilitate the sites in the manner of current best practice at the time of rehabilitation.

The Conceptual Mine Closure Plan will indicate how it is proposed to undertake rehabilitation and will outline proposed monitoring, and provide draft completion criteria against which rehabilitation success will be measured. The closure plan will also take into account possible contingency plans for different scenarios, such as drought conditions and long-term climate change.

A separate draft Revegetation Management Plan will also be prepared and released with the PER for public comment.
7. STAKEHOLDER CONSULTATION

7.1 CONSULTATION TO DATE

To date, consultation with local, State and Commonwealth government departments, the local Aboriginal communities, pastoralists, the wider public at open forums, and other interested parties has been undertaken for the Project to identify any issues associated with its development. The consultation process has involved group consultation meetings with the community and government agencies. As part of the consultation process FMG is continuing to acquire contact details of interested parties and stakeholders, who will be kept informed of project developments through the circulation of the FMG Newsletter and by other means.

The Proponent has notified stakeholders by registered mail where the Project Area intersects land in which the stakeholders hold a registered interest. A stakeholder consultation strategy will be implemented to ensure that the concerns and interests of stakeholders are taken into consideration in design and development of the Project.

Table 5 outlines the community consultation undertaken by the Proponent to date.

<table>
<thead>
<tr>
<th>Consultation</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsletters sent out on a Quarterly basis to local community members, Pilbara local businesses, financial partners, customers and other stakeholders, to update them on project progress.</td>
<td>September 2003, December 2003, June 2004</td>
</tr>
<tr>
<td>Various meetings and open consultation with members of the Shire Council and local Chamber of Commerce and Industry representatives.</td>
<td>Since August 2003</td>
</tr>
<tr>
<td>Various presentations to, and consultations with, State Government agencies (i.e. DoE, DoIR, CALM, WRC), both regionally and in Perth.</td>
<td>Since August 2003</td>
</tr>
<tr>
<td>Presentations to, and consultations with, various State Government Ministers, their advisors and independent WA Senators.</td>
<td>Since August 2003</td>
</tr>
<tr>
<td>Open communication with other key iron ore producers, infrastructure owners and proposed projects (e.g. BHPBIO, HI and Hope Downs) in relation to the sharing on information and use (at agreed terms and conditions) of existing/proposed rail and port infrastructure.</td>
<td>Since August 2003</td>
</tr>
<tr>
<td>Presentation to and marketing negotiations with local and foreign consumers of iron ore, which has included the securing of Letter of Intent from a number of steel manufactures for the supply of 25 Mtpa.</td>
<td>Since August 2003</td>
</tr>
<tr>
<td>Regular presentations to, and consultation with, the Nyjiaparli and Martu Idja, Palku, Banyjima Native Title claimant groups during working group meetings in Tom Price.</td>
<td>Since 23 September 2003</td>
</tr>
<tr>
<td>Presentation to and consultation with Port Hedland Shire Council</td>
<td>22 October 2003</td>
</tr>
<tr>
<td>Presentation to, and consultation with, the Newman Shire Council. Public meeting with 120 community members and various pastoralists.</td>
<td>30 September 2003</td>
</tr>
<tr>
<td>Presentation to and consultation with the Port Hedland Shire Council</td>
<td>22 October 2003</td>
</tr>
<tr>
<td>Consultation</td>
<td>Date</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Meeting with Dept of Indigenous Affairs – Port Hedland</td>
<td>23 October 2003</td>
</tr>
<tr>
<td>Meeting with Aboriginal communities</td>
<td>23 October 2003</td>
</tr>
<tr>
<td>Meetings with members of Aboriginal groups &amp; ATSIC member</td>
<td>9 November 2003</td>
</tr>
<tr>
<td>Extensive Consultation with the PNTS and the Aboriginal Native Title claimant groups covering the project areas at various Working Group Meetings and the wider Aboriginal community.</td>
<td>10, 12, 26 and 27 November and 8 December 2003</td>
</tr>
<tr>
<td>Public advertisements via the local radio station notifying the Port Hedland community of FMG’s presentation on the proposed project.</td>
<td>15 November 2003 to 17 November 2003</td>
</tr>
<tr>
<td>Presentation to and consultation with Federal Government agencies (e.g. Invest Australia Dept. of Foreign Affairs and Trade (DFAT).</td>
<td>November 2003</td>
</tr>
<tr>
<td>Consultation with pastoralists within or near the Project Area.</td>
<td>November 2003 and February 2004</td>
</tr>
<tr>
<td>Visits to Pastoralists</td>
<td>2 December 2003</td>
</tr>
<tr>
<td>Aboriginal heritage consultation and surveys with local elders and representatives from the Nyiijaparli, Palyku and Martu Idja Banyjima Native Title claimant groups in the field, during aboriginal heritage surveys.</td>
<td>September and December 2003</td>
</tr>
<tr>
<td></td>
<td>May 2004 to present</td>
</tr>
<tr>
<td>Aboriginal Surveys by helicopter and Aboriginal Heritage consultation with local elders and representatives from the Niyaparli, Palyku and Martu Idja Banyjima Native Title Claimants groups in the field</td>
<td>5 – 8 December 2003</td>
</tr>
<tr>
<td>Field Aboriginal heritage consultation with Niyiaparli people.</td>
<td>September and December 2003</td>
</tr>
<tr>
<td>Presentation to DoIR, CALM, WRC and DoE Karratha regional offices to present an overview of the Project and discuss proposed flora and fauna survey methodology.</td>
<td>6 February 2004</td>
</tr>
<tr>
<td>Working Group meeting with the Kariyarra people</td>
<td>16 March 2004</td>
</tr>
<tr>
<td>Meetings with the Niyiaparli Working Group</td>
<td>26 March, 15 April, 29 June 2004</td>
</tr>
<tr>
<td>Consultation with pastoralists, Shires, wider public</td>
<td>29 March – 8 April 2004</td>
</tr>
<tr>
<td>Meeting with Govt Departments (Land Corp and Land Start)</td>
<td>June &amp; July 2004</td>
</tr>
<tr>
<td>Meetings with Pastoralists directly impacted by the project</td>
<td>5 – 8 April 2004</td>
</tr>
<tr>
<td>Follow up letters to Pastoralists</td>
<td>20 April 2004</td>
</tr>
<tr>
<td>Letters to affected tenure holders</td>
<td>21 April 2004</td>
</tr>
<tr>
<td>Working group meeting with the Niyiaparli People</td>
<td>21 April 2004</td>
</tr>
<tr>
<td>Formal brief to EPA</td>
<td>22 April 2004</td>
</tr>
<tr>
<td>Presentations to Shire Councils (Shire of East Pilbara and Town of Port Hedland)</td>
<td>27 - 28 April 2004</td>
</tr>
<tr>
<td>Presentations to Chambers of Commerce and community members (Newman and Port Hedland)</td>
<td>27 – 28 April 2004</td>
</tr>
<tr>
<td>Public advertisements via local radio station and newspapers notifying Port Hedland community of FMG’s presentation on the proposed project</td>
<td>19 – 28 April 2004</td>
</tr>
<tr>
<td>Aboriginal Heritage Surveys for mine sites</td>
<td>May – July 2004</td>
</tr>
<tr>
<td>Stakeholder Update posted to Pastoralists, Shires and Shire Councillors</td>
<td>27 May 2004</td>
</tr>
<tr>
<td>Meeting with Kariyarra Working Group</td>
<td>31 May 2004</td>
</tr>
<tr>
<td>Meeting with Robin Chapple – Member of Parliament</td>
<td>9 June 2004</td>
</tr>
<tr>
<td>Working group meeting with the Kariyarra people</td>
<td>13 May 2004</td>
</tr>
<tr>
<td>Working group meeting with the Kariyarra people</td>
<td>31 May 2004</td>
</tr>
</tbody>
</table>

Ref: Stage B Scoping final 16 Nov 04
Various letters and verbal communications have been received that express significant stakeholder interest and support for the Project.

7.2 PROPOSED CONSULTATION

The Proponent has commenced the community consultation process and commenced discussion with relevant stakeholders. Stakeholders have the opportunity to become involved and be kept informed on the project. A community consultation and stakeholder engagement program will be prepared and implemented by the Proponent.

The consultation program is expected to consist of an ongoing ‘open-door’ approach. The Proponent encourages members of the community to contact them and be advised of the Project and possible effects that it may have on them. Consultation and information dissemination will be undertaken in a variety of forms. This includes specific verbal and/or written correspondence where the Project will have a direct effect on the stakeholder (i.e. the rail corridor intersecting a pastoral lease, mining tenement or Native Title claim). Interested stakeholders, not directly affected by the project, will be kept informed through the circulation of Company newsletters, advertisements and community presentations.

The Local, State and Commonwealth Decision Making Authorities and other involved/non-government agencies will be consulted and kept informed on an ongoing basis. This will enable them to provided input into the environmental assessment and recommended management measures for the Project.
8. PROJECT AND ASSESSMENT SCHEDULE

The following schedule is proposed for the assessment of environmental impacts of the Project. This timetable is contingent on key information being available for each stage of the study, and smooth development of other aspects of the Project, such as engineering design and land access. The following schedule is indicative and FMG will be looking to ‘fast-track’ the process where possible.

Table 6: Proposed Project and Assessment Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Commencement</th>
<th>Completion</th>
<th>Target Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of Environmental Referral/Scoping Document</td>
<td>Mar 04</td>
<td>3 Sept 04</td>
<td>6 months</td>
</tr>
<tr>
<td>Submission of Scoping Document to EPA for Review and Endorsement</td>
<td>3 Sept 04</td>
<td>21 Oct 04</td>
<td>7 weeks</td>
</tr>
<tr>
<td>Environmental Surveys and Investigations</td>
<td>30 Jan 04</td>
<td>18 Oct 04</td>
<td>10 months</td>
</tr>
<tr>
<td>Stakeholder Consultation</td>
<td>Feb 04</td>
<td></td>
<td>ongoing</td>
</tr>
<tr>
<td>PER Preparation</td>
<td>Jul 04</td>
<td>29 Oct 04</td>
<td>4 months</td>
</tr>
<tr>
<td>Peer Review</td>
<td>25 Oct 04</td>
<td>5 Nov 04</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Submission of Stage B PER to EPA Service Unit</td>
<td>19 Nov 04</td>
<td>8 Dec 04</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Public Review of Stage B PER*</td>
<td>13 Dec 04</td>
<td>21 Feb 05</td>
<td>8 weeks (+2 weeks Christmas break)</td>
</tr>
<tr>
<td>Response to Submissions*</td>
<td>22 Feb 05</td>
<td>15 Mar 05</td>
<td>3 weeks</td>
</tr>
<tr>
<td>EPA Service Unit review of summary of submissions and Proponent’s Response.</td>
<td>16 Mar 05</td>
<td>22 Mar 05</td>
<td>1 week</td>
</tr>
<tr>
<td>Preparation of EPA Report and Recommendations by EPA SU (subject to adequate Peer Review of studies)*</td>
<td>16 Mar 05</td>
<td>2 May 05</td>
<td>6 weeks</td>
</tr>
<tr>
<td>Submission of EPA Report to Minister*</td>
<td>-</td>
<td>2 May 05</td>
<td>(Milestone)</td>
</tr>
<tr>
<td>Appeal Period on EPA Report*</td>
<td>2 May 05</td>
<td>16 May 05</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Appeal Determination*</td>
<td>16 May 05</td>
<td>27 June 05</td>
<td>6 weeks</td>
</tr>
<tr>
<td>Preparation of Notices of Intent/Works Approval Applications (NOIs/WAAs)</td>
<td>16 May 05</td>
<td>8 July 05</td>
<td>2 months</td>
</tr>
<tr>
<td>Commencement of Construction</td>
<td>-</td>
<td>Q3/4 2005</td>
<td></td>
</tr>
</tbody>
</table>

Notes: * Anticipated timing.

This schedule does not take into account any Commonwealth assessment under the EPBC Act, should this proposal be considered a controlled action.
9. STUDY TEAM AND PEER REVIEW

9.1 STUDY TEAM

The environmental impact assessment of the Pilbara Iron Ore and infrastructure Project will be undertaken by an experienced team of specialist consultants and FMG personnel. The Proponent is specifically selecting specialised consultants that have extensive experience in their respective study areas, have Pilbara knowledge and are recognised for their professionalism.

The management of the study team is one of overall strategic understanding by all team members and integration between members and their respective areas of study. This will help to ensure an optimal project, with the best possible environmental, engineering and economic outcomes, are achieved. The Proponent’s final decisions on project design and management commitments will recognise and rely on the specialist advice it receives from its consultants. The Proponent is actively involved throughout the environmental assessment process to ensure ‘ownership’ and ultimate responsibility and accountability is retained by the company and its management.

The Proponent has enlisted the services of ENVIRON, an international technical and scientific consultancy, to provide the Project with strategic environmental advice, co-ordinate baseline environmental studies, undertake the assessment of dust impacts, greenhouse gas emissions and the project sustainability assessment. ENVIRON will liaise with the key DMAs and prepare environmental documentation required for the State EIA, process including the PER in conjunction with FMG staff.

For the biological survey work and investigations the Proponent has commissioned Biota Environmental Sciences Pty Ltd to undertake the work. Staff from Biota undertook the majority of the flora and vegetation surveys (including mangrove assessments) and fauna surveys for the recently approved Hope Downs project and will use this experience in the assessment of the FMG Project.

The hydrological and hydrogeological investigations will be undertaken by Aquaterra who have significant experience in the Pilbara region, in particular with the mining industry.

Environmental Resources Management Australia (ERM) will undertake the socio-economic study, and have recent experience in this area.

Noise management investigations will be undertaken by Lloyd Acoustics, who has recent experience with noise investigations for the proposed Hope Downs port operations at Port Hedland.
9.2 PEER REVIEW

In consultation with the DoE and other relevant DMA representatives the need for peer review of key technical studies will be discussed including the identification of a suitable peer reviewer.

FMG understands that adequate peer review of key technical studies will assist the EPASU in their preparation of the EPA Report and Recommendations within the proposed 6 week timeframe (see Table 6).
10. EXISTING STUDIES AND OTHER REFERENCES

Agwest (authors unknown) (2002). Land Systems Mapping of the Pilbara region, WA. Draft mapping.


Atkins, K.J. (2004). Declared Rare and Priority Flora List for Western Australia. Prepared by the Department of Conservation and Land Management.


Biota Environmental Sciences (in prep.). Night Parrot Survey.


Government of Western Australia (2003). Hope for the future: The Western Australian State Sustainability Strategy


Figure 3

LEGEND

- Resource area
- Rail - existing
- Rail - proposed FMG
- FMG mine site

PILBARA IRON ORE & INFRASTRUCTURE PROJECT
E-W Railway and Mine Sites (Stage B)

MT LEWIN, MT NICHOLAS AND
CHRISTMAS CREEK

Author: FMG
Date: 10/02/2004

Drawn By: FMG
Revised: 12/10/2004

Plan No.: FMG 04022
Report No.: Stage B Referral

Projection: Zone 51 (GDA 94)
Scale: 1:400,000

Kilometers
PILBARA IRON ORE & INFRASTRUCTURE PROJECT
E-W Railway and Mine Sites (Stage B)
Fortescue Metals Group Limited

Typical Culvert Cross Section

Typical Rail in Cut Cross Section

Typical Bridge Section

Scoping Document.

03/09/2004