



**Queensland  
Government**

## **Gladstone Nickel Project**

### **TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT STATEMENT**

**UNDER PART (4) OF THE QUEENSLAND *STATE DEVELOPMENT  
AND PUBLIC WORKS ORGANISATION ACT 1971***

**THE COORDINATOR-GENERAL**

**MARCH 2006**

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## PREAMBLE

### Project Background

Gladstone Pacific Nickel Limited proposes to determine the feasibility of a nickel and cobalt laterite mine and High Pressure Acid Leach (HPAL) plant in Central Queensland, Australia (the Project), in order to partially fill a widening gap between the current global nickel metal production and world demand. The Stage 1 plant would produce approximately 64,000 tonnes per annum of nickel and nearly 5,300 tonnes per annum of cobalt.

It is proposed that the HPAL plant for the Project be sited at the industrial deepwater Port of Gladstone, with access to the world class infrastructure of this region. The processing plant will source upgraded ore directly from a proposed nickel and cobalt laterite mine at Marlborough, approximately 175km north west of Gladstone, via a dedicated ore slurry pipeline. This ore supply will be supplemented with higher quality nickel laterite ore to be imported from the South West Pacific, a region reported to have approximately two thirds of currently quoted global nickel laterite reserves.

### Project Proponent

The project proponent is Gladstone Pacific Nickel Limited (GPNL), a public company formed in 2003 as the Pearce Matheson Group Pty Ltd (PMG), and which has acquired the entire issued share capital of Marlborough Nickel Pty Limited (MNPL) from Preston Nickel Holdings Pty Ltd, a subsidiary of Preston Resources Limited, a company listed on the Australian Stock Exchange as at 30 December 2003. Contact details for the proponent are as follows:

Gladstone Pacific Nickel Limited  
Suite 309  
320 Adelaide Street  
BRISBANE QLD 4000

GPNL has raised funds through a prospectus and listing on the London Stock Exchange's Alternative Investment Market (AIM) to carry out a Definitive Feasibility Study (DFS), including infill drilling of the Marlborough deposits and design and costing of the beneficiation plant, the slurry pipeline and the HPAL plant for Stage 1 of the Project. The company is also proposing to use such funds to complete a Preliminary Feasibility Study (PFS) for Stage 2 of the Project.

If the DFS and PFS prove the viability of the Project, the Company proposes to invite one or more major resource or associated industry companies to either purchase the Project outright or to enter into a joint venture, taking a majority interest in and control of the Project. GPNL would, except in the case of an outright sale, retain a minority interest in the Project.

### Project Components and Staging

Although the final form of the overall proposals will be determined during the Definitive Feasibility Study and the Preliminary Feasibility Study, GPNL currently proposes that the facility be developed in two stages.

**Stage 1** of the Project involves the following elements:

- developing the mine at Marlborough;
  - Stage 1(a) of a HPAL plant and nickel and cobalt metal refinery at Yarwun to produce 36,000 tonnes of nickel and 1,650 tonnes of cobalt per annum using ore sourced from the nickel laterite deposits at Marlborough owned by MNPL, a wholly owned subsidiary of GPNL;
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- Stage 1(b) – duplication of Stage 1(a) of the HPAL plant and nickel and cobalt metal refinery to increase production to 64,400 tonnes of nickel and 5,300 tonnes of cobalt per annum by supplementing the Marlborough ore with imported ore sourced from the South West Pacific area utilising Capesize bulk ore carriers that can be accommodated at both Gladstone and the proposed offshore loading points;
  - a tailings storage facility at Aldoga;
  - slurry and water pipelines of approximately 175km length to transport ore and sea water between the mine at Marlborough and the Yarwun plant site; and
  - sulphur handling facilities and ore handling facilities at the Port of Gladstone.

The proposed Marlborough lateritic nickel mining project has previously been subjected to environmental impact assessment and Environmental Authority No: MIM800078102 for the mining leases has been issued. No further environmental impact assessment is required for this element of the Project.

**Stage 2** is currently proposed to commence in Project Year 11. Stage 2 will involve a further expansion of the proposed HPAL processing plant and refinery at Gladstone. Total production at Stage 2 is estimated to be approximately 135,100 tonnes of nickel and 11,200 tonnes of cobalt metal per year. It is expected that most of the ore would be imported for Stage 2.

The Yarwun precinct of the Gladstone State Development Area (GSDA) has been nominated by the GPNL for the plant site because of its close proximity to the proposed Wiggins Island Port being developed by the Central Queensland Ports Authority. This will facilitate the sourcing of higher quality nickel laterite ore from the South West Pacific utilising Capesize bulk ore carriers. These Capesize ships are too large to access the Fisherman's Landing wharves.

GPNL advises that a considerable area of land is needed for a tailings storage facility to receive solid material as a waste by-product of the leach process. A general area for this purpose has been identified in the Aldoga precinct of the GSDA.

Further studies and investigations are underway prior to selecting the exact location of the tailings storage facility and the design of the pipeline to carry this material from the plant site to the tailings storage facility. For Stage 1 there is adequate storage in an identified area of the GSDA and this will be addressed in the environmental studies for Stage 1. Additional waste disposal areas for Stage 2 are also being investigated and will be subject to the environmental approvals to be sought eventually for the longer term.

GPNL is also undertaking engineering studies and a route selection investigation for the slurry pipeline from Marlborough to Gladstone. Full details including the preferred route and available access arrangements for the pipeline will derive from the Environmental Impact Statement investigations undertaken in respect of Stage 1 of the Project.

The focus of the Environmental Impact Statement (the Project) is the whole of Stage 1 (parts (a) and (b)) involving:

- a greenfield HPAL plant and refinery in the Yarwun precinct of the GSDA;
- the slurry and water pipelines of approximately 175km to transport ore and sea water between the mine at Marlborough and the GSDA plant site;
- the tailings storage facility in the GSDA; and
- the sulphur and ore handling facilities at the Port of Gladstone.

Stage 2 will be the subject of a separate environmental impact assessment at some future time and will depend on the outcome of the Preliminary Feasibility Study to be undertaken by the proponent.

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Further details of the Project are available in the Initial Advice Statement (IAS), a copy of which can be downloaded from The Coordinator-General website at: <http://www.coordinatorgeneral.qld.gov.au>.

## **ADMINISTRATIVE DETAILS FOR THESE TERMS OF REFERENCE**

### **The Legislative Framework**

The Project was declared to be a “significant project” under Section 26 of the Queensland *State Development and Public Works Organisation Act 1971 (SDPWOA)* by the Coordinator-General (CG) on 10 November 2005. Matters considered by the CG in making this declaration included information in an Initial Advice Statement prepared by GPNL (the Proponent), the level of investment necessary for the Project, employment opportunities provided by the Project, potential impact on the environment, potential effects on relevant infrastructure and the significance of the Project to the region and State. The declaration initiates the statutory environmental impact assessment procedure of Part 4 of this Act, which requires the Proponent to prepare an Environmental Impact Statement (EIS) for the Project.

The CG has invited relevant Commonwealth, State and Local Government representatives and authorities to participate in the process as Advisory Agencies.

The first step in the impact assessment process is the development of Terms of Reference (ToR) for the preparation of an EIS. The process involves the formulation of draft ToR which are made available for public and government agency comment. The CG has regard to all comments received on the Draft ToR in finalising the ToR, which will be presented to the Proponent. This document represents the Draft Terms of Reference for public comment.

The statutory impact assessment process under the *SDPWOA* is also the subject of a bilateral agreement between the Queensland and the Commonwealth Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. The Proponent referred the Proposal to the Commonwealth Minister for the Environment and Heritage in accordance with the provisions of the *EPBC Act*, which is administered by the Environment Assessment and Approvals Branch of the Department of Environment and Heritage (DEH). The Commonwealth Minister decided, on 18 November 2005, that the Proposal constituted a controlled action under Section 75 of the *EPBC Act*.

The Proponent will prepare a draft EIS to address the ToR. Once the EIS has been prepared to the satisfaction of the CG, a public notice is advertised in relevant newspapers circulating in the district and the State. The notice will state: where copies of the EIS are available for inspection and how it can be purchased; that submissions may be made to the CG about the EIS; and the submission period. The Proponent may be required to prepare a Supplementary Report to the EIS to address specific matters raised in submissions on the EIS.

At the completion of the EIS phase, the CG will prepare a report evaluating the EIS and other related material, pursuant to Section 35 of *SDPWOA*. The CG Report will include an evaluation of the environmental effects of the proposed Project and any related matters. The Report will reach a conclusion about the environmental effects and any associated mitigation measures, taking into account all of the relevant material including: the EIS; all properly made submissions and other submissions accepted by the CG; and any other material the CG considers is relevant to the Project, such as a Supplementary Report to the EIS, comments and advice from Advisory Agencies, technical reports on specific components of the Project and legal advice.

The Project will require a material change of use application and decision by the CG under Section 9 of the Development Scheme for the GSDA as the HPAL plant, the refinery and the tailing storage facility components of the overall project are to be developed in the GSDA. This process should be identified in the EIS.

Should the project involve development that would require other applications for development approval for material change of use and/or impact assessment under the *Integrated Planning Act 1997 (IPA)*, the CG may, under s.39 of *SDPWOA*, state for the assessment manager one or more of the following:

- the conditions that must attach to the development approval;
- that the development approval must be for part only of the development;
- that the approval must be preliminary approval only.

Alternatively the Report must state for the assessment manager –

- that there are no conditions or requirements for the Project; or
- that the application for development approval be refused.

Further, the Report must:

- give reasons for the statements (above); and
- be given by the CG to the assessment manager for the application.

Under s.45 of the *SDPWOA*, the CG's report may state conditions for a proposed mining lease granted under the *Mineral Resources Act 1989 (MRA)*. If conditions are included in the report –

- the report must state reasons for their inclusion; and
- the CG must give the MRA Minister a copy of the report; and
- the conditions of the proposed mining lease are, subject to any inconsistency with native title issues conditions that have paramountcy under s.47 of *SDPWOA*, taken to include the CG's conditions.

Similarly, the CG's report may, under s.49 of *SDPWOA*, state conditions for any draft environmental authority under the *Environmental Protection Act 1994 (EP Act)* for a proposed environmental authority (mining lease). If conditions are included in the report -

- the report must state reasons for their inclusion; and
- the CG must give the *EPA* Minister a copy of the report.

Further to the above approvals, other legislation under which other approvals are likely to be required may include: the *Environmental Protection Act 1994*, the *Mineral Resources Act 1989*, the *Vegetation Management Act 1999*, the *Water Act 2000*, the *Nature Conservation Act 1992*, the *Fisheries Act 1994*; and the *Aboriginal Cultural Heritage Act 2003*.

Where the design of the Project is not included as part of the EIS process, the Proponent should provide information regarding the stage at which the design will be lodged to enable Agencies to identify the timing of the licensing and permitting processes pursuant to the relevant legislation.

These ToR provide information in two broad categories:

- Part A – Information and advice on the preparation of the EIS;
- Part B – Specific requirements – Contents of the EIS.

For further inquiries about the EIS process for the Project, please contact:

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Major Projects  
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## ABBREVIATIONS

The following abbreviations have been used in this document:

<b>ACH Act</b>	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
<b>AHD</b>	Australian Height Datum
<b>CA</b>	Cement Australia Pty Limited
<b>CHMP</b>	Cultural Heritage Management Plan
<b>CO</b>	Carbon Monoxide
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>CG</b>	The Coordinator-General of the State of Queensland
<b>CQPA</b>	Central Queensland Ports Authority
<b>DEH</b>	Commonwealth Department of the Environment and Heritage
<b>DNRM</b>	Queensland Department of Natural Resources and Mines
<b>EIS</b>	Environmental Impact Statement, as defined by Part 4 of the <i>State Development &amp; Public Works Organisation Act 1971</i>
<b>EMP</b>	Environmental Management Plan
<b>EP Act</b>	<i>Environmental Protection Act 1994 (Qld)</i>
<b>EPA</b>	Queensland Environmental Protection Agency
<b>EPBC Act</b>	<i>Environment Protection &amp; Biodiversity Conservation Act (C'wlth) 1999</i>
<b>EPP</b>	<i>Environmental Protection Policy</i>
<b>ERA</b>	Environmentally Relevant Activity
<b>GSDA</b>	Gladstone State Development Area
<b>HPAL</b>	High Pressure Acid Leach
<b>IAS</b>	Initial Advice Statement, as defined by Part 4 of the <i>State Development &amp; Public Works Organisation Act 1971</i>
<b>IPA</b>	<i>Integrated Planning Act 1997 (Qld)</i>
<b>Mtpa</b>	Million tonnes per annum
<b>NCA</b>	<i>Nature Conservation Act 1992 (Qld)</i>
<b>NOx</b>	Nitrous Oxides
<b>SDPWOA</b>	<i>State Development &amp; Public Works Organisation Act 1971(Qld)</i>
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>ToR</b>	Terms of Reference as defined by Part 4 of the <i>State Development &amp; Public Works Organisation Act 1971</i>

# Part A: INFORMATION AND ADVICE ON PREPARATION OF THE EIS

## 1. Introduction

These Terms of Reference (ToR) for an Environmental Impact Statement (EIS) for the Gladstone Nickel Project have been developed in accordance with the requirements of Sections 29 and 30 of the *State Development & Public Works Organisation Act 1971 (SDPWOA)*. The objective of the ToR is to identify those matters that should be addressed in the EIS. The ToR are based on the initial outline of the proposed Project given in the Initial Advice Statement (IAS).

The State and local governments, from which the Project Proponent requires approvals, may request additional information on any matter not adequately dealt with in the EIS. In order to clarify the nature and level of investigations that are envisaged in the ToR, the Proponent may contact relevant Government agencies (known as Advisory Agencies), peak community interest organisations and relevant individuals and groups as necessary. However the Coordinator-General (CG) reserves the final decision on interpretation of the requirements of the ToR.

Reference to any culturally sensitive confidential information should be indicative only and disclosure of any such information must be negotiated with traditional custodians; other confidential information supplied by or to the Proponent must be clearly identified and placed in discrete attachments to the main report.

## 2. EIS Objectives

The objective of the EIS is to identify potential environmental, social and economic impacts and to ensure that such impacts are avoided where possible. Unavoidable impacts (direct, indirect and cumulative) must be examined fully and addressed, so that the development of the Project, including the selection of the preferred sites for each of the Project elements, is based on sound environmental protection and management criteria. Consistent with this objective, the EIS should be a self-contained and comprehensive document containing sufficient information to make an informed decision on the potential impacts.

The document should provide:

- For interested bodies and persons: a basis for understanding the Project, alternatives and preferred solutions, the existing environment that would be affected, both on and off the sites, the impacts that may occur, and the measures to be taken to mitigate all adverse impacts.
- For groups or persons with rights or interests in land: an outline of the effects of the proposed Project on that land including access arrangements.
- For the CG and other Government decision makers: a framework against which decision-makers are able to consider the environmental aspects of the proposed Project in view of legislative and policy provisions and decide whether the Project can proceed or not; to set conditions for approval to ensure environmentally sound development as appropriate, and where required by legislation, recommend an environmental management and monitoring program.
- For the Proponent: a definitive statement of measures or actions to be undertaken to minimise any adverse impacts during and following the implementation of the proposed Project. A draft Environmental Management Plan that describes acceptable impacts and environmental management strategies to agreed performance criteria is the recommended means of achieving this objective.

Completion of the EIS to the satisfaction of the final ToR does not mean the Project will necessarily be approved.

### **3. Main EIS Guidelines**

The EIS should relate to the entire life of the Project including construction, operation, maintenance, and decommissioning. The EIS should enable reasonable economic and technically achievable conditions to be developed to ensure that the impact of the Project is reduced to acceptable levels. The level of analysis and detail in the EIS should reflect the level of significance of particular impacts.

The EIS should state the following about information given in the EIS:

- the source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

Where possible, information provided in the EIS should be clear, logical, objective and concise, so that non-technical persons may easily understand it. Where appropriate, text should be supported by maps and diagrams. Factual information contained in the document should be referenced wherever possible. Where applicable, aerial photography and/or digital information (e.g. of Project sites, road, rail and pipeline and/or conveyor corridors etc) should be presented.

The terms “describe”, “detail” and “discuss” should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate.

Within these ToR, the term “Project” includes all activities undertaken within the GSDA associated with the HPAL plant, sulphuric acid plant, nickel refinery, power generation, materials handling, storage and transport facilities as well as activities outside the GSDA and supporting Project infrastructure (e.g. any new or expanded rail infrastructure, water pipelines, tailings storage dams, powerlines etc), as well as transport, handling, storage and shipment of the nickel ore between the Marlborough Mine and the GSDA. Where existing facilities are to be used to support the Project (e.g. existing rail and port facilities), the potential for a significant increase in environmental impact arising from Project activities is to be discussed. Where there is a likelihood of a significant increase in environmental impact, the impact should be described and detailed.

For the purposes of the EIS, the “Project” does not include the mining proposals at Marlborough which have previously been subjected to environmental impact assessment and Environmental Authority No:MIM800078102 for the mining lease has been obtained. No further environmental impact assessment is required for this aspect of the Project.

### **4. Stakeholder Consultation**

To facilitate the assessment process, the Proponent is strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process.

It is the responsibility of the Proponent, in consultation with Advisory Agencies, to identify legislation, policies and methodologies relevant to the EIS process, and to determine appropriate parts of the community which should be consulted during the EIS preparation stage. It is recommended that an open community consultation process be carried out in addition to the legislated environmental impact assessment process. Copies of the EIS will be provided to all Advisory Agencies and on request to relevant individuals and peak groups with an interest in the Project.

## **5. General EIS format**

The EIS should be written in a format matching the ToR or include guidelines (preferably as an appendix) describing how the EIS responds to the ToR.

The main text of the EIS is to include appendices containing:

- a copy of the final ToR;
- a list of persons and agencies consulted during the EIS;
- a list of Advisory Agencies with an appropriate contact; and
- the names of, and work done by, all personnel involved in the preparation of the EIS.

Maps, diagrams and other illustrative material should be included in the EIS.

The EIS should be produced on A4-size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS should also be produced on CD ROM. CD ROM copies should be in ADOBE® \*.pdf format for placement on the internet. All compression must be down-sampled to 72 dpi (or ppi). PDF documents should be no larger than 500 kB in file size. The executive summary should be supplied in HTML 3.2 format with \*.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 500kB file size.

## **Part B: SPECIFIC REQUIREMENTS – CONTENTS OF THE EIS**

### **Executive Summary**

The Executive Summary should be written as a stand-alone document, able to be reproduced on request for interested parties who may not wish to read or purchase the EIS as a whole. The structure of the executive summary should follow that of the EIS, though focused strongly on the key issues allowing the reader to obtain a clear understanding of the proposed Project, its environmental and socio-economic implications and management objectives.

The summary should include:

- the title of the Project;
- name and contact details of the Proponent and its commitment to effective environmental management;
- a concise statement of the aims and objectives of the Project;
- the legal framework, decision-making authorities and agencies involved;
- an outline of the background to, and need for, the Project, including the consequences of not proceeding with the Project;
- an outline of the alternative options considered and reasons for the selection of the proposed development option;
- a brief description of the Project (pre-construction, construction and operational activities) and the existing environment, utilising visual aids where appropriate; and
- an outline of the principal environmental impacts predicted, and proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts.

### **Glossary of Terms**

A glossary of technical terms and acronyms should be provided.

#### **1. Introduction**

The introduction should explain the function of the EIS, why the EIS has been prepared and what it sets out to achieve. In particular, the introduction should outline the level of detail of information required to meet the level of approval being sought. It should also define the audience to whom it is directed, and contain an overview of the structure of the document. Factual information contained in the document should be referenced wherever possible. The EIS should state the type of approval desired under the *Integrated Planning Act 1997*.

##### **1.1 PROJECT PROPONENT**

This section should provide details of the Proponent, Gladstone Pacific Nickel Limited, and postal addresses and key contact details for the Proponent's Project staff and any Project consultants.

##### **1.2 PROJECT DESCRIPTION**

This section should provide a brief description of the key elements of the Project including associated infrastructure requirements with specific locations illustrated on maps. This section should clearly indicate the individual sites for the HPAL plant and nickel refinery, the tailings

storage facility and the slurry pipeline corridor, and describe the relationship of the Project with the existing and new infrastructure such as port facilities, specifically in relation to any proposed infrastructure sharing arrangements and issues for any transportation by rail.

The project description should also identify the project scope and road infrastructure should the proposed Wiggins Island Coal Terminal project not proceed. Maps should be at an appropriate scale and level of detail.

A brief description should be provided of studies or surveys which have been undertaken for the purposes of developing the Project and preparing the EIS. This should include reference to relevant baseline studies and investigations undertaken previously for the Project sites and surrounding areas.

### **1.3 PROJECT OBJECTIVES, RATIONALE AND ALTERNATIVES**

This section should provide a statement of the objectives which have led to the development of the proposal and a brief outline of the events leading up to the proposal's formulation, envisaged time scale for implementation and Project life, anticipated establishment costs and actions already undertaken within the Project areas.

The EIS should outline the current status of the Project and the relationship of the Project to other developments or actions that may relate to it, whether or not they have been approved.

The rationale and justification for the Project should be explained in relation to current issues in the nickel industry and any relevant policy or regulatory framework, Australian or overseas market requirements and expected local, regional, State or national benefits. Justification for the Project should be described, with particular reference to the environmental, economic and social costs and benefits, including employment and spin-off business development, which the Project may provide.

The interdependencies of the Project components should be explained, particularly in regard to how each of any industrial developments, or various combinations of industrial developments, and any infrastructure requirements relate to the viability of the proposal. Should water supply, power, transport and/or storage infrastructure be included as an element of the proposal, this section should include a description of, and rationale for, such infrastructure.

The EIS should describe any prudent and feasible conceptual, technological and locality alternatives to the Project, or specific elements of the Project. The consequences of not proceeding with the Project must be discussed. Alternatives should be discussed in sufficient detail to support the preferred option, including the net effects of all alternatives as justification for the ultimate selection of the preferred option. Options for future local road alternatives should be considered including access to the Wiggins Island Coal Terminal and via the proposed Queensland Rail relocated general freight facility to the south east of the Gladstone Nickel project site. Compliance with government policy and with the principles and objectives of ecologically sustainable development should be included in this discussion.

### **1.4 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

#### **1.4.1 Methodology of the EIS**

This section should make clear the objectives of the EIS process under the *SDPWOA*, development approval under the *IPA* and the *EP Act*. This section should include a description of the impact assessment process steps, timing and decisions to be made for relevant stages of the Project.

In particular, this section should outline mechanisms in the process for public input and the public release of an EIS that will specify all responses to stakeholder submissions. This section

should further outline the necessity for the Proponent to undertake wide consultation as part of the impact assessment process.

#### **1.4.2 Objectives of the EIS**

This section should provide a statement of the objectives of the environmental impact assessment process, detail how the relevant legislation will be addressed and highlight the EIS as the key environmental document for providing advice to decision makers considering approvals for the Project. It should be highlighted that the purpose of the EIS is to:

- provide public information on the need for, and likely effects of the Project;
- set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values; and
- demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values.

The relationship of other Project environmental management planning documentation, conditions, approvals and environmental authorities should be discussed in relation to the EIS.

#### **1.4.3 Submissions**

Interested and affected persons should be made aware of how submissions on the EIS will be addressed and taken into account in the decision-making process. The EIS should inform the reader on:

- how to make submissions;
- what form the submissions should take; and
- when submissions must be made to gain standing for any appeal process.

### **1.5 PUBLIC CONSULTATION PROCESS**

This section should outline the methodology that will be adopted to identify and mitigate environmental, social and socio-economic impacts that may arise from the Project and include details of consultation that has already been undertaken. Details of the consultation process from the planning stages of the Project through construction, commissioning and operation should be included.

The key objectives of the consultation program should be to:

- inform the different interest groups about the Project proposal;
- seek an understanding of interest group concerns about the proposal;
- explain the impact assessment research methodology and how public input might influence the final recommendations for the Project;
- provide an understanding of the regulatory approval process;
- seek local information and input in the Project; and
- provide the community with a sense of ownership in the Project.

The public consultation program should be incorporated into the EIS and provide ongoing opportunities for community involvement, feedback and education. Details should be provided on programs for public meetings, interest group meetings, production of regular summary information and updates and any other consultation mechanisms for encouraging and facilitating active public consultation. A list of affected persons and interested stakeholders, which includes information on consultation with each party, should be included.

### **1.6 PROJECT APPROVALS AND LEGISLATIVE FRAMEWORK**

The aim of this section is to provide the reader with an explanation of the legislation and policies controlling the approvals process for the Project. Reference should be made to the *SDPWOA*,

*EP Act, IPA, Aboriginal Cultural Heritage Act (2004), Vegetation Management Act 1999 Coastal Protection and Management Act 1995, Fisheries Act 1994* and other relevant Queensland Laws. All requirements of the *EPBC Act* and *Native Title Act 1993* should also be included.

The EIS should describe the approvals process resulting from the gazettal of the Project as a 'significant project' pursuant to the *SDPWOA* and outline the linkage to other relevant State and Commonwealth legislation. The EIS should indicate the level of approvals anticipated by the Proponent for each Project element in order for approval agencies to be able to determine the completeness of the information presented and the scope to generate the anticipated approvals. Reference should also be made to the *Transport Infrastructure Act 1994*, the *Transport Planning and Coordination Act 1994*, the *Transport Operations (Road Use Management) Act 1995* and *Main Roads Guidelines for Assessment of Road Impacts of Development Proposals* as these will guide consideration of conditions of impacts mitigation measures for transport infrastructure and operation.

In addition, local government planning controls, local laws, and policies applying to the Project should be described, and a list of the approvals required for the Project should be provided. A description of the Environmentally Relevant Activities necessary for each aspect of the Project should be given.

### **1.7 ACCREDITED PROCESS FOR CONTROLLED ACTIONS UNDER COMMONWEALTH LEGISLATION**

Projects that are undergoing an EIS under a State statutory process may also be controlled actions under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). In which case, the Commonwealth may accredit the State's EIS process for the purposes of the Commonwealth's assessment under Part 8 of the EPBC.

When a State EIS process has been accredited, it will be necessary for the terms of reference to address potential impacts on the matters of National Environmental Significance (NES) that were identified in the 'controlling provisions' when the project was declared a controlled action.

As a minimum requirement, the terms of reference and the EIS should provide separate discussions under sub-headings in the relevant sections that describe the values and address the potential impacts on NES matters. The locations of those sub-headings should be readily identifiable from the Table of Contents. For example, if one of the controlling provisions was 'Listed threatened species and communities', then subsections, headed 'Matters of National Environmental Significance', should be placed in Section 3.4 (Nature Conservation) under both the Description of environmental values and Potential impacts and mitigation measures headings. Those subsections should address exclusively and fully the issues relevant to the controlling provisions.

Alternatively, a stand-alone report could be provided as an appendix to the EIS that exclusively and fully addresses the issues relevant to the controlling provisions. In which case, it should follow the following template outline:

1. Introduction
2. Description of Proposed Action (as it would impact on NES matters)
3. Description of the Affected Environment Relevant to the Controlling Provisions (i.e. describe the features of the environment that are NES matters protected under the EPBC)
4. Assessment of Impacts on NES Matters and Mitigation Measures
5. Conclusions
6. References



## **2. Description of the Project**

The objective of this section is to describe the Project through its lifetime of construction, operation and decommissioning to allow assessment of all aspects of the life of the proposal.

### **2.1 LOCATION AND GENERAL DESCRIPTION**

This section should include a detailed description of the proposed sites including plans of the areas in relation to the surrounding features and land uses. Mapping should include details of:

- the location of the facilities in a regional and local context;
- land tenures;
- mining and exploration tenure;
- mineral deposits and key resource areas
- present land uses and Planning Scheme zonings;
- surrounding industries and other land uses;
- features of State and National environmental significance;
- proposed buffer zones;
- locations and layout of new structures;
- location of the Wiggins Island Coal Terminal proposal;
- location of all existing and proposed road and rail infrastructure;
- location of slurry pipeline, gas pipeline, conveyors, stockpiles and drainage paths;
- location of other probable developments;
- photo images at appropriate scales;
- marine plants;
- potential waterway crossings for the ore slurry pipeline; and
- potential waterway crossings for any proposed seawater intake pipelines

The EIS should provide details on adjacent areas that could be affected by the Project and existing infrastructure facilities available on, and adjacent to, the sites, including the slurry pipeline corridor.

### **2.2 ON SITE OPERATIONS – PROJECT INFRASTRUCTURE**

The location and nature of all facilities and the processes involved in all aspects of the Project should be described and illustrated on maps and flow charts. Concept and layout plans should indicate proposed buildings, structures, plant and equipment associated with the process. If a development permit is required for works on State coastal land (Curtis Coast Coastal Management District), then detailed concept plans of these works, as outlined in the EPA's guideline Operational work on State coastal land, should be provided.

A full description of the facilities should include details of all plant and equipment, processes involved, their capacities, raw materials to be used, all buildings and infrastructure, site access, services access, buffer areas, car parks, landscaping and beautification proposals and site boundaries.

Indicative process flow-sheets should be provided showing material balances, and the anticipated rates of inputs, along with similar data on products, wastes and recycle streams. Additional detail on waste and recycle streams should be included in Section 2.7.

The process and criteria for selecting the facilities should be described and the rationale for the preferred option should be explained.

Information should be provided on the workforce numbers employed, hours of operation, expected life of the operation and the timing for any future expansion proposals. Stages of

development should be indicated with proposed plans for each stage, including anticipated dates for start of construction, plant testing and final commissioning.

### **2.3 CONSTRUCTION**

The extent and nature of the Project's construction phase should be described. The description should include:

- type and methods of construction to be employed;
- construction timetable, including expected start-up dates, hours of operation and commissioning of plant dates;
- construction equipment to be used;
- materials or plant (including large prefabricated components) to be transported onto the construction sites;
- the extent of surface disturbance;
- the estimated number of personnel to be employed during the construction phase, including labour histogram;
- an examination of the practicality of using directional drilling to lay pipelines under waterlines;
- potential waterway barrier works associated with waterway crossings for the ore slurry pipeline; and
- potential waterway barrier works associated with waterway crossings for any proposed seawater intake pipelines

### **2.4 PROCESS INPUTS, HANDLING AND STORAGE**

This section of the EIS should be directly related to Section 2.2 (On Site Operations – Project Infrastructure) and provide details of the types, sources, quantities, storage and methods of transportation of all materials involved in the Project. This information should include a brief outline of transport requirements such as proposed routes and methods. Transport requirements are covered in more detail in Section 2.6.1.

The EIS should include details on the nature, sources, location and quantities of all materials to be handled, stored or stockpiled on site, which will be used during modification, construction, installation or operation of the new equipment.

The EIS should document procedures for loading and unloading materials including contingency plans for spillages. Details of any Project-related hazardous materials to be stored, handled or used in all aspects of the Project should be given (see Section 3.13 for more detailed information on hazards and risks). This information should include:

- the name of the material and sufficient information to clearly identify it, including the chemical name, the UN number and any trade names;
- the classification of the material according to the relevant Australian Dangerous Goods Codes;
- the maximum quantity of the material to be stored on site at any one time;
- the maximum quantity of the material within the process at any one time;
- measures to be employed to minimise the risk of spill and to contain spills; and
- a plan showing the location of the material within buildings and on the site.

### **2.5 PROCESS OUTPUTS, HANDLING AND STORAGE**

The EIS should provide details of the characteristics, quantities, storage locations and methods of transportation of all materials produced by the Project. A brief outline of transport requirements such as proposed tonnages, routes and methods should be included with details covered in Section 2.6.1.

The EIS should document procedures for loading and unloading materials including contingency plans for spillages. Additional detailed information on hazards and risks should be included in Section 3.13.

## **2.6 SUPPORT INFRASTRUCTURE REQUIREMENTS**

This section should provide descriptions, with concept and layout plans, of requirements for constructing, upgrading or relocating all infrastructure in the vicinity of the Project areas. The matters to be considered should include roads, rail, port facilities, bridges, power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for all services (whether underground or above).

### **2.6.1 Transport – Road, Rail, Pipelines and Shipping**

The EIS should detail all requirements for the transport of plant, equipment, raw materials, product, wastes and personnel during the construction, operational and decommissioning phases of the Project. The description should address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure. This information should cover all transportation modes (road, rail, pipelines and shipping) required for all aspects of the Project and include:

- methods of movement (including transportation type and volume of transport modes likely to be used);
- the volume composition (types and quantities), origin and destination of goods to be moved including construction materials, plant, raw materials, wastes, hazardous materials and finished products;
- anticipated times at which each type of transportation movements may occur;
- the effect on rail freight demand on the Rockhampton to Gladstone line and rail infrastructure at the Port of Gladstone;
- details of vehicle traffic including haulage routes and transport of heavy and oversize indivisible loads (including types and composition);
- proposed road closures (temporary or permanent);
- the volume of traffic generated (including information on peak traffic flows) by workforce personnel and service vehicles;
- the ability of existing transport infrastructure to support the additional demand;
- the proposed transport routes;
- the number of ships and their size; and
- any requirements for new transport facilities, upgrades (e.g. new access requirements) and increased maintenance.

The detail should include the need and extent of port facilities required for the Project and the storage and handling arrangements needed to import sulphur and ore shipments and export the nickel/cobalt product. The EIS should address alternative transport options should Wiggins Island Coal Terminal not proceed or not be complete prior to the commencement of stage 1B operation. Specific shipping requirements should include expected berth duration, the wharf facilities and any issues associated with ship movements within the Port.

The description shall also include brief information of other infrastructure and industrial projects in the vicinity of the project that may impinge on or be impacted on by the project on account of cumulative effects.

The slurry pipeline route and pipeline construction should be identified and addressed as a specific issue.

## **2.6.2 Energy Requirements**

Electricity supply requirements for the construction and operation of the Project should be provided and locations of any associated easements should be shown on an infrastructure plan. Timeframes should be provided for the anticipated dates for the commencement of construction of supply facilities, testing and final commissioning. This section of the EIS should include details on energy demand and annual consumption.

Energy conservation should be described in the context of any Commonwealth, State and local government policies.

## **2.6.3 Water Supply & Management**

The EIS should nominate the proposed and optional sources of water (e.g. bores, any surface storages such as dams and weirs, municipal water supply pipelines, sea water, etc) required through construction and operation for all aspects of the Project and quantify the demand for raw and treated water for the various processes. Details on the estimated rates of supply from each source (average and maximum rates) should be included. The following details on daily, seasonal and/or peak operational requirements should be provided:

- quality of water required, including strategies to prevent contamination;
- maximum hourly demand;
- maximum daily demand;
- mean day maximum monthly demand;
- total annual consumption;
- any additional water supply infrastructure; and
- requirements for fire-fighting or other emergency services.

A determination of potable water demand and supply requirements for each phase of the Project should be made, including existing town water supply to meet such requirements. Any on site water storage and treatment (including sewage) proposals for use by the workforce should be described.

An assessment of the capability of the water network to provide the necessary demand should include the following data:

- current and projected raw and treated water consumption;
- current and projected on-site raw and treated water storage;
- contingency plans for planned and non-planned supply failures; and
- projected dates for increased raw and treated water supplies.

The EIS should describe the site layout plans for all aspects of the Project which incorporate requirements and conceptual plans of stormwater management structures, including descriptions of any discharge requirements for both the construction and operational stages. This should include proposals for drainage structures and dams, and an overall site water balance. The topography of the site and adjacent areas should be discussed if any run-off is expected to leave the site.

The EIS should provide volume estimates of industrial and domestic effluent that will be produced and the proposed method of disposal. This should include the physical and chemical characteristics of such effluent. If discharging into an existing sewerage system, an assessment of the capacity of the existing system to accept the effluent should be provided.

The EIS should include details of strategies for conservation, reuse, recycling and efficiency monitoring of water throughout the life of the Project. Any changes in water use in conjunction with industrial neighbours should be described.

The EIS should include a description of any processes or infrastructure required to prevent translocation of aquatic fauna between drainage catchments at all stages of the construction and operation of the project.

The EIS should examine the impacts of any increased water harvesting on the flow of water for the environment at all stages of the construction and operation of the project.

#### **2.6.4 Telecommunications**

The EIS should provide details of telecommunication requirements, sources and methods, describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc) and identify the owners of any existing infrastructure.

#### **2.6.5 Workforce, Accommodation & Support Infrastructure**

The EIS should provide information on the number of personnel to be employed and the sources (local, regional and overseas) for the workforce during the construction and operational phases for each aspect of the Project. Estimates should be provided according to occupational groupings and variations in the workforce numbers over the duration of the Project. This shall include estimates of locational profile of the workforce accommodation. Information should include requirements for any offsite workforce requirements and the expected indirect or flow-on effects to be generated.

An assessment of the accommodation requirements for the workforce should be provided and include assessment of the ability of existing facilities in the Gladstone region to support workforce fluctuations. Any additional accommodation and social infrastructure requirements to support the workforce should be detailed.

The assessment of the accommodation requirements for construction and the ability of existing facilities to support this demand should take into account any cumulative impacts from other projects' construction timetables in the region. The EIS should also provide information on any proposed construction camps, their intended locations and support infrastructure required for these sites.

### **2.7 WASTE MANAGEMENT**

The EIS should provide details of waste management methods which demonstrate that waste minimisation and cleaner production techniques and designs have been implemented through the selection of processes, equipment and facilities to prevent or minimise environmental impacts. This information should include:

- descriptions of processes, equipment and facilities to be incorporated into the overall Project specifically for the purpose of avoiding waste generation, reusing or recycling wastes, or treating wastes to lessen their effect on the natural environment; and
- proposed means for management of wastes produced under circumstances other than as a result of normal Project development, including wastes generated during modification (run-off, chemical cleaning before commissioning), unusual conditions when the facilities are operating (start-up, maintenance, shut-down) and domestic sewage and refuse.

Details on natural resource use efficiency (e.g. energy and water), integrated processing design, co-generation of power and by-product reuse as shown in a material/energy flow analysis should be presented.

### **2.7.1 Solid and Liquid Wastes**

An inventory should be provided of all solid and liquid (including wastewater and sewage) wastes generated by each stage of the Project through construction, operational and maintenance stages, including the characteristics and expected generation rates of each waste.

The management of each waste stream should be described including the handling, storage, treatment and disposal methods. This should include a detailed description of the management, handling and storage of any hazardous or regulated waste materials.

The proposals for waste avoidance, reuse, recycling, treatment and disposal should be described, having regard for best practice waste management strategies and the *Environmental Protection (Waste Management) Policy 2000 (EPP (Waste))*. Information should also be provided on the variability, composition and generation rates of all waste generated by the Project.

If off site disposal of wastes is to be used, detailed information should be provided (see Section 3.8).

### **2.7.2 Air & Noise Emissions**

The EIS should provide details of the quantity and quality of all air emissions, including particulates, fumes and odours from the Project during construction and operation of facilities at the plant and the port. Methods for the reduction, treatment and management of emissions should be provided.

The EIS should provide information on the location, type, volume and concentrations of air emissions (i.e. process, safety relief and fugitive) and in particular sources of emission of particulates, carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), nitrous oxides (NO<sub>x</sub>) and other toxic air emissions. This should include a description of air emissions during atypical circumstances. More detailed information requirements for air emissions, to be presented in the EIS, are set down in Section 3.5.2.

A description of noise emissions should be provided and include principal noise sources, any noise abatement measures and expected noise emission levels, including those for routine operations and any atypical circumstances (e.g. descriptions of sound pressure levels at reference distances or sound power levels). The EIS should identify the location of noise emission sources and in particular those which are steady, transient and of low frequency. More detailed information requirements for noise emissions, to be presented in the EIS, are set down in Section 3.7.2.

## **2.8 DECOMMISSIONING**

This section should present the strategies and methods for final closure, decommissioning, and rehabilitation of the Project. Decommissioning of the Project, in terms of the removal of plant, equipment, structures and buildings should be described and the methods proposed for the stabilisation of the affected areas should be given, and any proposed reuse of infrastructure/materials.

## **3. Environmental Values & Management of Impacts**

This section of the EIS should:

- describe the existing environmental values of the areas affected by the proposal through reference to background information and studies;
- describe the potential adverse and beneficial impacts of the proposal on the identified environmental values, including analysis of any cumulative impacts on the environment;
- present environmental protection objectives, standards and measurable indicators; and

- examine viable alternative strategies for managing impacts based on objectives and standards to be achieved through discussion of available techniques and best practice.

The EIS should detail environmental protection measures which are to be incorporated in the planning, construction, operations, decommissioning and associated works for the Project. Measures proposed in the EIS should aim to minimise environmental harm and maximise socio-economic and environmental benefits of the proposal.

Particular attention should be given to strategies for the protection of environmentally sensitive areas or areas of a high conservation value and the requirements of any Commonwealth strategies, State planning policies, including *State Planning Policy 1/02 Development in the Vicinity of Certain Airports and Aviation Facilities*, local authority planning schemes, environmental protection policies under the *Environmental Protection Act 1994 (EP Act)* and any catchment management plans prepared by local water boards or land care groups.

### **3.1 LAND CHARACTERISTICS**

#### **3.1.1 Description of Environmental Values**

This section describes the existing environment values of the land areas that may be affected by the Project in the context of environmental values as defined by the *EP Act* and *Environmental Protection Policies (EPP)*. It should also define and describe the objectives and practical measures for protecting or enhancing environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

#### **Topography & Geomorphology**

Maps should be provided locating the Project and its environs in both regional and local contexts. The topography of the proposal site should be detailed with contours at suitable increments and the location of the Highest Astronomical Tide (HAT) and Lowest Astronomical Tide (LAT) clearly shown with respect to Australian Height Datum (AHD). Significant features of the landscape and any environmentally sensitive areas or areas of a high conservation value should be included on the maps and discussed.

#### **Geology & Soils**

The EIS should provide a description, map and a series of cross-sections of the geology of the Project areas, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. Geological properties that may influence: ground stability (including seismic activity, geological faults and associated geological hazards); occupational health and safety; rehabilitation programs; or the quality of wastewater leaving any area disturbed by the proposal should be described.

A description of the soil types and properties should include erosion potential, engineering and structural properties, dispersion characteristics, and permeability. Descriptions should be supported by soil survey data for the areas affected by the proposed development. Where no detailed soils information exists, surveys should be conducted at a scale of 1:5000 as per Reid, R.E. (1988) *Soil Survey Specifications in Australian Soil and Land Survey Handbook - Guidelines for Conducting Surveys* (eds. Gunn, R.H., Beattie, J.A., Reid, R.E., van de Graaff, R.H.M) (Inkata Press Melbourne & Sydney).

Landform descriptions and soil profiles should be described according to the *Australian Soil and Land Survey Field Handbook* (McDonald et al, 1990) and *Australian Soil Classification* (Isbell, 1996), and must include horizon differentiation and depths, field texture, colour, mottles, soil structure, erosion hazard rating, pH and electrical conductivity, dispersibility, permeability, attenuation/absorption characteristics and engineering and structural properties.

Details should be provided on any disturbance of soil or sediment to occur at or below plus 5 metres AHD, and which would trigger a detailed acid sulfate soil investigation to assess the potential impact of disturbing acid sulfate soils by excavation, filling, or extracting groundwater. An investigation should also be undertaken for wetland areas where the natural hydrology (surface or groundwater) may be affected by the proposal such that oxidation of potential acid sulfate soils may occur. These investigations should be undertaken in accordance with the relevant sections of the *State Planning Policy 2/02 Guideline: Acid Sulfate Soils* in order to comply with the stated outcomes in *State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils*. Site observation density and sampling procedures for the purposes of assessing any acid sulfate soils is to accord with the '*Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998*' (Ahern et al.). Possible strategies (including staged testing) should be discussed with acid sulfate soil specialists from the Department of Natural Resources and Mines (DNRM).

### **Land Contamination**

A description of land known to be contaminated by hazardous substances (such as arsenic, DDT, or oil) which may pose a risk to human health or the environment should be provided. In addition, past land use activities identified as being likely to cause land contamination (e.g. activities listed as 'notifiable activities' in Schedule 2 of the *EP Act*) should be identified and a land contamination assessment provided. Such an assessment should incorporate a Stage 1 preliminary site investigation of the site consistent with Appendix 5 of the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*. The results of the preliminary site investigation should be summarised in the EIS and provided in detail in an appendix.

If the results of the preliminary site investigation indicate potential or actual contamination, a Stage 2 detailed site investigation progressively managed in accordance with the stages outlined in Appendix 5 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* should be undertaken and reported in the EIS.

### **Land Use & Tenure**

The EIS should provide a description of current land tenures and land uses, including native title issues, in all of the Project areas, with particular mention of land with special purposes. The location and owner/custodians of native title in the areas and details of native title claims should be provided.

Maps at suitable scales showing existing land uses and tenures, and the Project locations, should be provided for the entire Project area and surrounding land that could be affected by the development. The maps should identify areas of conservation value and marine areas in any locality that may be impacted by the proposal. The location of existing dwellings and the zoning of all affected lands according to any existing town planning scheme should be included.

### **Infrastructure**

The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes and the like, covering the affected land should be shown. Locations of gas and water pipelines, power lines, port infrastructure and any other easements should also be indicated and the environmental values affected by this infrastructure described.

### **Sensitive Environmental Areas**

The EIS should identify environmentally sensitive areas which could be affected, directly and indirectly, by the Project. In particular, the EIS should indicate if the land affected by the Project is, or is likely to become part of the protected area estate, or is subject to any treaty.

The Commonwealth's *EPBC Act* should be referenced in relation to national environmentally significant matters that should be described, including any declared World Heritage property, Ramsar wetland, threatened ecological community or species, migratory species, Commonwealth marine area or Commonwealth land.



### **Visual Amenity & Scenic Values**

This section should provide an outline of the existing visual quality or landscape character of the Project and the surrounding areas and its local prominence. The visual amenity and scenic value should be described in terms of the view from places of residence, work, and recreation, from roads, from the air and other known vantage points during the day and night, as it relates to the surrounding landscape.

#### **3.1.2 Potential Impacts & Mitigation Measures**

This section of the EIS defines and describes the objectives and practical measures for protecting or enhancing land resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Identify and assess the impact of exposure of sodic soils and the subsequent potential for gully erosion. Identify remediation measures to limit the impact of gully erosion on surrounding landscapes.

### **Land Disturbance & Soil Erosion**

A strategy should be developed with a view to minimising the amount of land disturbed at any one time. This section of the EIS should provide information on land disturbance management methods to be used for the proposal, including backfilling, covering, re-contouring, topsoil handling and revegetation, and include:

- topsoil management such as transport, storage, re-use on disturbed areas and storage;
- consideration to the use of threatened plant species during any landscaping and revegetation; and
- erosion and sediment control.

For each area of disturbance identified, erosion potential (wind and water) through the removal of vegetation and erosion management techniques should be outlined. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during monitoring, should also be outlined. Methods proposed to prevent or control erosion should be specified and should be developed with regard to:

- preventing soil loss in order to maintain land capability/suitability;
- reducing wind-generated dust concentrations; and
- preventing significant degradation of local waterways by suspended solids.

Where dams, roads and other infrastructure are to be constructed, proposals for the management of these structures after the completion of the proposal should be given. A contour map of the areas should be provided and the final drainage and seepage control systems and any long-term monitoring plans described.

### **Land Contamination Potential**

The EIS should describe the possible contamination of land from aspects of the proposal including waste, product, and spills at chemical and fuel storage areas. The means of preventing land contamination (within the meaning of the *EP Act*) should be addressed and methods proposed for preventing, recording, containing and remediating any contaminated land outlined. Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the land, processing plant site and product storage areas after proposal completion.

### **Land Use Suitability**

The potential for the construction and operation stages of the Project to change existing and potential land uses of the proposal site and adjacent areas should be detailed. Post operations

land use options should be detailed including suitability of the areas to be used for agriculture, industry, or nature conservation. The factors favouring or limiting the establishment of those options should be given in the context of land use capability or suitability prior to the proposal and minimising potential liabilities for long-term management.

Existing or potentially incompatible land uses adjacent to all aspects of the Project should be highlighted. Essential and proposed ancillary developments or activities and areas directly or indirectly affected by the construction and operation of these activities should be identified and measures to avoid unacceptable impacts defined.

### **Visual Amenity & Scenic Values**

This section should provide an outline of the resulting visual quality/landscape character of the Project and the surrounding areas and its local prominence. Detail should be provided on the impact of the intended proposal design.

The visual impact, in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, from roads, from the air and other known public vantage points day and night, during all stages of the Project as it relates to the surrounding landscape is to be analysed and discussed. The assessment will address the local and broader visual impacts of the Project structures and associated infrastructure.

### **Lighting**

An assessment of all potential impacts of lighting of the Project, during all stages of construction and operation, is to be provided, with particular reference to:

- the visual impact at night;
- night operations/maintenance and effects of lighting on fauna, flora and residents;
- the potential impact of increased vehicular traffic; and
- changed habitat conditions for nocturnal fauna and associated impacts.

### **Decommissioning**

The strategies and methods for the rehabilitation of the environment disturbed by the Project and related activities should be described in the context of the expected final landform and potential final land uses.

The means of decommissioning the Project, in terms of removal of plant, equipment, concrete footings and foundations, hardstand areas, storage tanks and buildings should be described. The methods proposed for the stabilisation of the affected areas should be given. Final rehabilitation of the plant site should be discussed in terms of ongoing land use suitability, management of any residual contaminated land and other land management issues.

A rehabilitation strategy should be developed with a view to minimising the amount of land disturbed at any one time. The strategic approach to progressive and final rehabilitation should be described.

Where dams are to be constructed, proposals for the management of these structures after the completion of the Project should be given. Also, the final drainage and seepage control systems and long-term monitoring plans should be described.

## **3.2 CLIMATE**

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect air quality within the environs of the proposal. Extremes of climate (droughts, floods, cyclones, storm tides, etc) should also be discussed with particular reference to water management at the Project sites. The vulnerability of the areas to natural or induced hazards, such as floods and bushfires, should also be addressed. The

relative frequency, magnitude and risk of these events should be considered. More detailed information on hazards and risks is to be provided in Section 3.13.

### **3.3 WATER RESOURCES**

#### **3.3.1 Description of Environmental Values**

##### **Surface Water**

The EIS should provide a description of existing surface water features and their quality and quantity in the areas affected by the Project with an outline of the significance of these waters to the river catchment system in which they occur. Details should be provided on any requirements under the Water Act 2000 for a Riverine Protection Permit. A Riverine Protection Permit may be required if it is proposed to destroy vegetation, excavate or place fill in a watercourse, lake or spring. Details should include a description of:

- existing surface drainage patterns;
- flows in major streams and wetlands;
- seasonal variations;
- physical, chemical and biological parameters;
- the topography and likelihood of flooding;
- the level of flood immunity to be conferred upon the new plant and how the new structures will prevent the intrusion of floodwaters;
- history of flooding including extent, levels and frequency; and
- present and potential water uses downstream;

The EIS should detail baseline information on seawater quality and existing contamination of sediments, including heavy metals, suspended solids, acidity, pH, turbidity and oil in water at the proposed port site and at the proposed barren liquor discharge point. The interaction of site runoff flows and discharges with marine waters and sediments, and its significance in relation to marine flora and fauna adjacent to the proposed materials handling, storage and transport area at Gladstone should be described.

The environmental values of the surface waterways of the affected areas should also be described in terms of:

- values identified in the *Environmental Protection (Water) Policy 1997 (EPP (Water))*;
- sustainability, including both quality and quantity;
- any regional coastal plan and state coastal management plan;
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form; and
- any water resource plans, land and water management plans relevant to the affected catchment.

##### **Groundwater**

The EIS should review the quality, quantity and significance of groundwater in the Project areas, together with groundwater use in neighbouring areas. Data should be provided on surveys of existing groundwater supply facilities (bores, wells, or excavations) and include:

- location;
- pumping parameters;
- draw down and recharge at normal pumping rates; and
- seasonal variations (if records exist) of groundwater levels.

The data obtained from the groundwater surveys should be sufficient to enable specification of the major ionic species present in the groundwater, pH, electrical conductivity and total dissolved solids.

The EIS should provide a description of groundwater resources in terms of:

- geology/stratigraphy - such as alluvium, volcanic, metamorphic;
- aquifer type - such as confined, unconfined;
- depth to and thickness of the aquifers;
- depth to water level and seasonal changes in levels;
- groundwater flow directions (defined from water level contours);
- interaction with surface water;
- interaction with sea/salt water;
- possible sources of recharge; and
- vulnerability to pollution.

The environmental values of the underground waters of the affected areas should be described in terms of:

- values identified in the *EPP (Water)*;
- sustainability, including both quality and quantity; and
- physical integrity, fluvial processes and morphology of groundwater resources.

### **3.3.2 Potential Impacts & Mitigation Measures**

This section should also define and describe the objectives and practical measures for protecting or enhancing water (including coastal) resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

#### **Surface Water**

An assessment should be made of the potential impacts the proposed Project may have on the flow and the quality of surface waters from all phases of the Project, with particular reference to their suitability for the current and potential downstream uses, environmental values and current discharge licences. The impacts of surface water flow on existing infrastructure should be considered in reference to the *EPP (Water)* and *Water Act 2000*. Detailed assessment of the potential impacts of discharges (eg, the proposed slurry disposal to Port Curtis Bay and releases of potentially contaminated stormwater) should be undertaken. The assessment needs to consider both point sources of contaminants and diffuse stormwater runoff. Consideration of the timing of contaminant releases (ie, during wet or dry weather) is necessary.

Any potential environmental harm caused by the Project should be described in the context of environmental values, related water quality objectives (WQOs) and associated coastal resources and processes. WQOs should be developed incorporating information about local reference sites (see the Queensland Water Quality Guidelines). The *State Planning Policy – Planning and Managing Development involving Acid Sulfate Soils 2002* should be addressed as should the *State Coastal Management Plan 2001*, the Curtis Coast Regional Coast Management Plan 2003 and Department of Primary Industries and Fisheries Guidelines for Marine Areas.

Quality characteristics discussed should be appropriate to the downstream, upstream and coastal water uses that may be affected. Chemical and physical properties of any waste water at the point of discharge into natural surface waters should be discussed, including the toxicity of effluent to all flora and fauna and taking into account the potential for bioaccumulation.

Reference should be made to the properties of the disturbed land and process wastes and the techniques to be employed to ensure that contaminated water is contained and successfully treated on site. Specific, quantitative environmental protection objectives should be developed, such as discharge quantities and limits that would lead to achieving the WQOs.

An assessment of impacts (immediate and cumulative) on the flow and the quality of surface waters (including marine waters) and effects on ecosystems should include an assessment of the likely effects on mangrove and other estuarine habitats. Information should be provided on the potential for accumulation of any discharge materials in Port Curtis Bay. Any interaction with impacts associated with other existing discharges into Port Curtis Bay should be discussed. In addition, any impacts on sediments in surface and marine waters from the Project elements should be discussed and mitigation measures proposed.

In relation to water supply, usage and wastewater disposal, the EIS should assess:

- anticipated flows of water to and from the Project areas;
- investigate the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of containment walls where dams, weirs or ponds are proposed;
- quality of water contained in dams;
- flows and quality of water discharged;
- identify bioregional, regional and other significant wetlands as described in the dictionary of the Regional Vegetation Management Codes
- identify lakes as described in the dictionary of the Regional Vegetation Management Codes
- identify springs as described in the dictionary of the Regional Vegetation Management Codes
- maintenance of ecological processes associated with the identified Wetlands, Lakes and Springs
- the use of the site water management technical guidelines in the design of all water storage facilities; and
- the need or otherwise for licensing any dams (including referable dams), under the *Water Act 2000*.

The EIS should include the results of a risk assessment for uncontrolled releases to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts.

The Australian and New Zealand Environment and Conservation Council '*National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters*' (2000) and the *Environmental Protection (Water) Policy 1997* should be used as a reference for evaluating the effects of various levels of contamination.

Management strategies should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained to nominated water quality objectives, including design and relevant performance specifications of control measures. Predicted waste water discharge data for Stage 1 should be quoted and tabulated with sufficient precision to allow major ions (calcium, chloride, manganese, magnesium, sodium and sulphate) expressed in mg/L but with trace elements expressed in µg/L. Appropriately referenced standards should also be tabulated for comparison. Any proposed releases of nickel into Gladstone Harbour should be justified in the context of existing exceedances. Current best practice technology for removing traces of such heavy metals should be proposed.

Monitoring programs, which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the Project, should be described. The programs should include indicators and locations to be monitored that will satisfactorily demonstrate whether the management strategies are successful. The indicators should include those related to aquatic ecosystem health as necessary to provide an overall assessment of waterway condition in affected areas, i.e., indicators of stream/coastal habitat and ecological indicators in addition to physical-chemical indicators of water quality. The program should include auditable quantifiable standards that define the achievement of the relevant objectives.

The EIS should include a description of any temporary or permanent structure (causeway, Bridge, culvert etc) to be constructed in waterways in relation to pipeline construction.

### **Groundwater**

The EIS should include an assessment of the potential environmental harm caused by the proposal to local groundwater resources. The impact assessment should define the extent of the areas within which groundwater resources are likely to be affected by the proposed operations and the significance of the Project to groundwater depletion or recharge, and propose management options available to monitor and mitigate any effects.

An assessment should be undertaken of the impact of the Project on the local ground water regime caused by the altered porosity and permeability of any land disturbance.

An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination should be discussed.

## **3.4 NATURE CONSERVATION**

### **3.4.1 Description of Environmental Values**

This section describes the existing environment values for nature conservation that may be affected by the proposal in the context of environmental values as defined by the *EP Act* and *EPP*, and the *Nature Conservation Act 1992 (NCA)*.

The EIS should provide descriptions of the environmental values of nature conservation for the affected areas in terms of:

- integrity of ecological processes, including habitats of rare and threatened species;
- conservation of resources;
- biological diversity, including habitats of rare and threatened species;
- integrity of landscapes and places including wilderness and similar natural places; and
- aquatic and terrestrial ecosystems.

Key flora and fauna indicators should be identified for future ongoing monitoring.

### **Terrestrial Flora**

Terrestrial vegetation mapping at a suitable scale (i.e. 1:10,000) should be provided, with descriptions of the units mapped. Vegetation mapping should include all relevant Project sites including new transport infrastructure and port facilities. Site mapping should be compared with mapping produced by the Queensland Herbarium, and any difference discussed. Mapping should be derived from aerial photographs and ground truthing and indicate the following:

- the location and extent of vegetation types using the EPA's regional ecosystem type descriptions in accordance with *The Conservation Status of Queensland's Bioregional Ecosystems* (Sattler P.S., & Williams R.D., 1997) and the EPA's web site listing the conservation status of regional ecosystems;
- the location of vegetation types of conservation significance based on EPA's regional ecosystem types and occurrence of species listed as Protected Plants under the *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments, as well as areas subject to the *Vegetation Management Act 1999*;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges etc); and
- the location and abundance of any exotic or weed species.

Sensitive or important vegetation communities should be highlighted, including any marine littoral and sub-tidal zone and riparian vegetation and marine plants, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types.

The existence of rare or threatened species should be specifically addressed in the EIS.

Vegetation survey data should include species structure, assemblage, diversity and abundance.

Within each defined (standard system) vegetation community, a minimum of three sites should be surveyed for plant species, as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database;
- the minimum site size should be 10 by 50 metres;
- a complete list of species present at each site should be recorded;
- the relative abundance of plant species present should be recorded;
- any plant species of conservation, cultural, commercial or recreational significance should be identified; and
- specimens of species listed as *Protected Plants under the Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

Existing information on plant species may be used instead of new survey work provided that the data is derived from surveys consistent with the above methodology. Methodology used for flora surveys should be specified in the appendices to the report.

### **Terrestrial Fauna**

The terrestrial and riparian fauna occurring in the areas affected by the Project should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. The description of the fauna present or likely to be present in the areas should include:

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that are poorly known but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement;
- the existence of feral or exotic animals;
- existence of any listed rare, threatened or otherwise noteworthy species/communities in the study areas, including a discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of Protected Area Management Plans); and
- use of the areas by migratory birds, nomadic birds, fish and terrestrial fauna.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the province where the Project site occurs.

### **Aquatic Biology**

The aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways and/or associated marine environments. The description of the fauna and flora present or likely to be present in the areas should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected areas, and/or those in any associated marine environment;
- any listed rare or threatened marine species, particularly the dugong and its habitat;
- aquatic plants;

- marine plants;
- aquatic and benthic substrate; and
- habitat downstream of the Project or potentially impacted due to currents in associated lacustrine and marine environments.

### 3.4.2 Potential Impacts & Mitigation Measures

This section should define and describe the objectives and practical measures for protecting or enhancing nature conservation environmental values, how nominated quantitative standards and indicators may be achieved for nature conservation management and how the achievement of the objectives will be monitored, audited and managed.

The discussion should cover all likely direct and indirect environmental harm to flora and fauna, particularly sensitive species and communities including:

- important habitats of species listed under the *NCA* and/or *EPBC Act* as presumed extinct, endangered, vulnerable or rare. In particular the impacts on the listed migratory Eastern Curlew (*Numenius madagascariensis*), the Dugong (*Dugong dugong*), Flatback Turtle (*Natator depressus*) and Green Turtle (*Chelonia mydas*). The EIS should therefore make specific reference to these species (and any other listed threatened species that might be found on site). This would be included by reporting the results of targeted surveys in the development area, and the measures proposed to avoid, minimise, or if this is not possible, offset any likely impacts. A discussion of the potential impacts on the population(s) involved should also be included in the EIS;
- regional ecosystems recognised by the EPA as 'endangered' or 'of concern' and/or ecosystems listed as presumed extinct, endangered or vulnerable under the *EPBC Act*;
- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites listed under international treaties such as RAMSAR wetlands and World Heritage areas;
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species;
- protected marine plants;
- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA);
- sites containing common species which represent a distributional limit and are of scientific value or which contain feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance;
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term;
- sites containing other special ecological values, for example, high habitat diversity and areas of high endemism;
- ecosystems which provide important ecological functions such as: wetlands of national, state and regional significance; coral reefs; riparian vegetation; important buffer to a protected area or important habitat corridor between areas;
- protected areas which have been proclaimed under the *NCA* and *Marine Parks Act 1982*, or are under consideration for proclamation; and
- areas of major interest, or critical habitat declared under the *NCA* or high nature conservation value areas or areas vulnerable to land degradation under the *Vegetation Management Act 1999*.

Strategies for protecting World Heritage Properties, and any listed rare or threatened species should be described, and any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations (i.e. JAMBA, CAMBA) should be discussed. Emphasis should



be given to potential environmental harm to benthic and intertidal communities, seagrass beds and mangroves.

The area of each regional ecosystem to be cleared should be stated for each of the elements of the Project. The potential environmental harm to the ecological values of the areas arising from the construction, operation and decommissioning of the Project including clearing, salvaging or removal of vegetation should be described, and the indirect effects on remaining vegetation should be discussed. Short-term and long-term effects should be considered with comment on whether the effects are reversible or irreversible. Mitigation measures and/or offsets should be proposed for adverse impacts. Any departure from no-net-loss of ecological values should be described.

The potential environmental harm on flora and fauna of any alterations to the local surface and ground water environment should be discussed with specific reference to environmental harms on riparian vegetation or other sensitive vegetation communities. Measures to mitigate the environmental harm to habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described.

The provision of buffer zones and movement corridors, and strategies to minimise environmental harm on migratory, nomadic and aquatic animals should be discussed.

Weed control strategies aimed at containing existing weed species (e.g. parthenium and other noxious weeds) and ensuring no new invasive weeds are introduced to the areas should be described. Reference should be made to the local authorities' pest management plans when determining control strategies.

Rehabilitation of disturbed areas should incorporate provision of nest hollows and ground litter, where appropriate.

### **3.5 AIR**

#### **3.5.1 Description of Environmental Values**

A description of the existing air shed environment should be provided having regard for particulates and gaseous and odorous compounds. The background levels and sources of suspended particulates, SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>2</sub> and any other major constituent of the existing air environment which may be affected by the proposal should be discussed.

Sufficient data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modelling of air quality environmental harms within the air shed. Parameters should include air temperature, wind speed and direction, atmospheric stability, mixing depth and other parameters necessary for input to the models.

The environmental values of the air shed for the affected areas should be described in terms of the *Environmental Protection (Air) Policy 1998 (EPP(Air))*.

#### **3.5.2 Potential Impacts & Mitigation Measures**

The EIS should describe local and regional climatic and meteorological factors affecting air quality impacts. An examination of the effects of adverse conditions (e.g. inversions) and mixing heights on air quality impacts should be provided. The potential for interaction between the emissions from the plant and emissions in the air shed, and the likely environmental harm from any such interaction, should also be detailed.

Where appropriate, the predicted average ground level concentrations in nearby areas should be provided. These predictions should be made for both normal and expected maximum emission conditions, the worst case meteorological conditions and upset conditions such as power failure,

start up and typical plant failures should be identified and modelled where necessary. Ground level predictions should be made at any residential, industrial and agricultural developments believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained.

The assessment of the Project's impact on air quality should consider the following matters:

- The extent to which NO<sub>x</sub> and volatile hydrocarbon emissions from the Project and existing emission sources within the region will contribute to the generation of photochemical smog;
- The extent to which SO<sub>x</sub> emissions from the Project and existing emission sources within the region will contribute to the generation of acid rain or acidification of other atmospheric condensation, such as dew;
- The human health risk associated with emissions from the facility;
- The potential for the Project to generate a dust nuisance during and after construction;
- The potential for odour impacts and an assessment of the overall odour nuisance potential;
- The potential for gaseous emissions from the Project and existing emission sources within the region to impact on vegetation;
- Records of any complaints made in the areas regarding air quality;
- Features of the Project designed to suppress or minimise emissions, including dusts and odours;
- Air quality aspects for forecast emissions derived from other similar projects;
- Air shed management and the contribution of the proposal to air shed capacity in view of existing and future users of the air shed for assimilation and dispersion of emissions.

Where there is no single atmospheric dispersion model that is able to handle the different atmospheric dispersion characteristics exhibited in the proposal areas (i.e. sea breezes, strong convection, terrain features, temperature inversions and pollutant re-circulation), a combination of acceptable models will need to be applied. The limitations and accuracy of the dispersion models used for calculating ground level concentrations and a sensitivity analysis of each model to variations in the input parameters should be discussed.

Air quality predictions should be compared to the relevant goals in the National Environmental Protection Council (Ambient Air Quality) Measure, the National Health and Medical Research Council and the *EPP (Air)* goals.

### **3.6 GREENHOUSE GAS EMISSIONS**

Greenhouse Gas Emissions should be described in the context of relevant protocols and agreements including:

- an inventory of projected future emissions, both on-site and off-site, attributable to the Project, expressed as total mass CO<sub>2</sub> equivalents per annum and, if possible, as a percentage of Queensland's and Australia's annual greenhouse gas emissions;
- the intended measures to avoid, minimise or offset greenhouse emissions, including any sink-enhancement activities; and
- an analysis of comparable technologies, processes and equipment to demonstrate the degree to which the selected option minimises emissions.

### **3.7 NOISE & VIBRATION**

#### **3.7.1 Description of Environmental Values**

The EIS should describe the existing environmental values that may be affected by noise and vibration from Project activities.

If Project activities could adversely impact on the noise environment, baseline monitoring should be undertaken at a selection of noise sensitive sites affected by the proposal. Noise sensitive places in relation to the Project should be identified on a map at a suitable scale. Long-term measured background noise levels should take into account seasonal and meteorological variations. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described.

Sufficient data should be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby sensitive sites should be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the day and night. Monitoring methods should adhere to relevant EPA Guidelines and Australian Standards, and any relevant requirements of the *Environmental Protection (Noise) Policy 1997 (EPP (Noise))*.

Comment should be provided on any current activities near the Project areas that may cause a background level of noise and ground vibration (e.g. other industry, railway, major roads, etc).

### **3.7.2 Potential Impacts & Mitigation Measures**

Information, including mapped noise contours from a suitable acoustic model, should be submitted on the proposed generation of noise. The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. This should also include environmental harm on terrestrial and marine animals and avifauna, particularly migratory species.

An estimate should be made of the cumulative noise level at the boundaries of the sites of the Project and at the boundaries of existing and future land uses likely to be affected by noise from the Project. This estimate should include noise from construction, operation and from transport movements. Consideration should be given to the impacts of emission of low-frequency noise (noise with components below 200Hz) from major items of plant or equipment and, if necessary, measures should be described for reducing the intensity of these components.

Proposals for buffers to minimise or eliminate these effects including details of any screening, buffers, insulation, or enclosures should be provided. Timing schedules for construction and operations should be discussed with respect to minimising the environmental impacts from noise.

Off-site transport noise and vibration factors due to road and rail should be described and include a discussion on existing speed zones, scheduled transport movements and industry.

## **3.8 WASTE IMPACTS**

This section should complement other items outlined in Section 3 of the ToR by providing technical details of waste treatment, minimisation and management, with proposed emission, discharge and disposal criteria. Reference should be made to each of the waste streams described in Section 2.7 and to environmental values described in Section 3 of the ToR.

This section should assess the potential impact of all wastes to be generated including that to be placed in the Residue Storage Facility and provide details of each waste in terms of:

- the type and amount of wastes produced;
- collection, handling and fate of all wastes including storage;
- the separation of wastewater from solid waste;
- on-site treatment methods proposed for the wastes;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- the potential level of impact on environmental values;

- proposed disposal criteria for liquid and solid wastes;
- methods to prevent seepage and contamination of groundwater from stockpiles;
- market demand for recyclable waste (where appropriate); and
- opportunities for waste avoidance and minimisation techniques.

Where solid (or liquid) wastes are to be disposed of off site the following details should be provided:

- the name and location of the facility to which each waste will be sent for disposal;
- confirmation from each facility that it will accept the type, concentration and quantity of the nominated wastes;
- an assessment that the proposed facilities are capable of accepting this waste without creating an adverse environmental impact; and
- details that the transport of the wastes from the plant to the disposal facility will comply with all requirements of the relevant acts governing the transport of hazardous wastes.

The EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner production technology options during the construction and operating phases of the proposal, having regard for the *Environmental Protection (Waste Management) Policy 2000 (EPP (Waste))* and its guidelines.

Describe in detail the major sources of potential environmental harm associated with the disposal of wastes to the Residue Storage Facility. Some examples of sources of harm are:

Source of Harm	Commentary
Tailing mud flow	Tailings need to be contained until they drain, dry out, desiccate and become contained. To this end the containment embankments need to be stable now and in the foreseeable future.
Salt in Tails	The proposal uses sea water as a transport mechanism. This will have to be contained securely to prevent impact on the surrounding environment, including groundwater.

The EIS should present the methods to avoid stormwater contamination by raw materials, wastes or products and present the means of containing, recycling, reusing, treating and disposing of stormwater, having regard for the requirements of the *EPP (Water)*. Where no-release water systems are to be used, measures to minimise any accidental release or the likelihood of such a release should be described and the fate of salts and particulates in release water should be discussed.

Stormwater management should also address the following:

- nominated stormwater discharge points and discharge criteria;
- design criteria, diversions, volume and capacity of any retention ponds, process tanks or bunded areas, as well as those reasonable and practicable measures proposed to prevent the likely release of contaminated stormwater to any drain or waters;
- potential impacts during extreme rainfall events;
- details of contaminants in controlled discharges of wastewater and stormwater (e.g. chemical composition, particulates, metals, effluent temperature and pH), proposed management systems and impacts of discharges on all potential receiving waters;
- effects on the downstream environment of stormwater releases; and
- information on the collection, treatment and disposal of contaminated stormwater runoff from the plant and associated materials handling facilities.

Waste minimisation and treatment, and the application of cleaner production techniques, should also be applied to gaseous wastes, particularly NO<sub>x</sub>, SO<sub>2</sub>, CO<sub>2</sub> and particulates. Particular attention should be paid to measures that will maximise energy efficiency and minimise internal energy consumption in the proposal.

Cleaner production waste management planning should be detailed, especially as to how these concepts have been applied to preventing or minimising environmental impacts at each stage of the Project. Details on natural resource use efficiency (e.g. energy and water), integrated processing design, co-generation of power and by-product reuse as shown in a material/energy flow analysis should be presented.

### **3.9 CULTURAL HERITAGE**

#### **3.9.1 Description of Environmental Values**

The EIS should describe the existing cultural heritage values that may be affected by the Project activities.

A cultural heritage study should be undertaken to describe indigenous or aboriginal and non-indigenous or aboriginal cultural heritage sites and places, and their values. The indigenous or aboriginal component of the study must be conducted by the appropriate Aboriginal Party and/or an appropriately qualified cultural heritage practitioner, in accordance with the *Aboriginal Cultural Heritage Act 2003 (ACH Act)*. Non-indigenous or aboriginal cultural heritage is administered under the *Queensland Heritage Act 1992*.

The study should include:

- consultation with:
  - the Register of the National Estate (maintained by the Australian Heritage Commission);
  - the Queensland Heritage Register (maintained by the EPA);
  - the Aboriginal and Torres Strait Islander Database (maintained by the DNRM);
  - any local government heritage register; and
  - any existing literature relating to the affected areas;
- liaison, in accordance with the requirements of the *ACH Act*, with the Aboriginal party for the areas concerning:
  - places of significance (including archaeological sites, natural sites, story sites etc);
  - and
  - appropriate involvement in field surveys;
- a systematic survey of the proposed development areas to locate and record Aboriginal cultural heritage is not required if the timing and arrangements for the survey are addressed in the CHMP or Native Title Agreement for the development area; and
- a report of work done, which includes background research, relevant environmental data and methodology, as well as results of field surveys, and recommendations (having due regard for any confidentiality requirements specified by community representatives).

Cultural heritage surveys previously undertaken in the areas should be described and the findings stated.

#### **3.9.2 Potential Impacts & Mitigation Measures**

Potential environmental harm to indigenous or aboriginal cultural heritage values in the vicinity of the Project will be managed under a cultural heritage management plan (CHMP) or native title agreement developed in consultation with the traditional owners specifically for the Project in accordance with the *ACH Act*. The CHMP or native title agreement will provide a process for the management of cultural heritage items and places. It is usual practice for the CHMP or native title agreement to be based on information contained in archaeological and/or anthropological reports

on the survey areas and cultural reports and/or information from affiliated traditional owners. The CHMP should address and include the following:

- a process for including Aboriginal people associated with the development areas in protection and management of indigenous or aboriginal or aboriginal cultural heritage;
- processes for mitigation, management and protection of identified cultural heritage places and material in the Project areas, including associated infrastructure developments, both during the construction and operational phases of the Project;
- provisions for the management of the accidental discovery of cultural material, including burials;
- the monitoring of foundation excavations and other associated earthwork activities for possible sub-surface cultural material;
- cultural awareness training or programs for Project staff; and
- a conflict resolution process.

### **3.10 SOCIAL ENVIRONMENT**

#### **3.10.1 Description of Environmental Values**

The amenity and use of the proposal areas and adjacent areas for other should be described through consideration of:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community (including size, age structure, gender composition, education level, residency, labour force and unemployment rates);
- local community values, vitality and lifestyles;
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected areas;
- impact to recreational, commercial and indigenous or aboriginal fisheries through the loss of access to fishing grounds both permanent and temporary i.e. during construction;
- health, emergency services and educational facilities; and
- number of properties directly affected by the Project.

The social values for the affected areas should be described in terms of:

- the integrity of social conditions, including amenity and liveability, sense of community, access to recreation, and access to social and community services and infrastructure.; and
- public health and safety (refer to Section 3.13).

Information should also be provided on the existing housing market, with an emphasis on:

- the size of the private rental market in the area;
- the vacancy rate of rental accommodation, including assessment of seasonal fluctuations;
- typical rents for the area;
- the availability and typical cost of housing for purchase in the area;
- the level of social housing in the area and demand;
- constraints and opportunities for new housing construction in the area, including the capacity of the local land development and housing construction industries to provide new housing; and
- land for residential purposes including available serviced residential lots, land under development and undeveloped broad acre land that is appropriately zoned.

### **3.10.2 Potential Impacts & Mitigation Measures**

This section aims to define and describe the objectives for protecting or enhancing social values, and how the achievement of the objectives will be monitored, audited and managed.

The social impact assessment of the Project should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the Project's impact, both beneficial and adverse, on the local community and the measures proposed by the proponent to mitigate any adverse impacts. The impacts of the Project are to be analysed and discussed for all stages of the development. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The assessment of impacts should describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level.

Attention should be paid to:

- impacts on demographic, social, cultural and economic profiles;
- impacts on local residents, current land uses and existing lifestyles and enterprises;
- impacts on affected and adjoining landowners/occupiers resulting from any land resumption;
- impacts (including potential demand) on health care services and providers (public and private) located in the vicinity of the proposed development;
- impacts on local and state labour markets, with regard to the source of the workforce with the information presented according to occupational groupings of the workforce;
- impacts of both the construction and operational workforces and associated contractors on housing demand, community infrastructure and services and community cohesion;
- how much household income and jobs from the Project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the Project; and
- impacts on local residents values.

An assessment of the predicted impacts of the Proponent's activities (including activities by any sub-contractors) on the local and regional housing markets should also be undertaken. The assessment should refer to the projected accommodation needs for the Project in both the construction and operational phases, and estimate of

- the capacity of local and regional housing markets to meet the accommodation needs of the Project workforce, including the potential displacement of low-income residents from affordable rental accommodation and diminished availability of accommodation;
- any possible cumulative impacts on the local and regional housing market due to the presence of other existing or proposed major projects in the areas, and seasonal employment factors; and
- the impact of the construction and operation phases of the proposal on the local and regional residential development and housing construction industry, with particular reference to the demand for local contractors.

In regard to affected Indigenous or aboriginal and non-Indigenous or aboriginal communities respectively, particular attention should be paid to the effects on:

- the ability of both Indigenous or aboriginal and non-Indigenous or aboriginal people, to live in accordance with their own values and priorities;
- the access to existing human and commercial services and housing;
- the ability to participate in regional and local employment and training opportunities; and

- the new Project workforce and their families.

The potential environmental harm on the amenity of adjacent areas used for recreational, commercial, indigenous or aboriginal fisheries, cropping, grazing, forestry, recreation, industry, education, aesthetics, scientific or residential purposes should be discussed in relation to impacts on social values. The implications of the Project for future developments in the local areas including constraints on surrounding land uses should be described.

The educational impact of the proposed development should be analysed and described, particularly in regard to:

- primary, secondary and tertiary educational sectors; and
- environmental education for the general public.

For identified impacts on social values, proposed mitigation and enhancement strategies should be described, and approaches to facilitate initial negotiations towards community acceptance of these strategies identified. Practical monitoring regimes should also be discussed.

### **3.11 ECONOMIC ENVIRONMENT**

#### ***3.11.1 Description of Environmental Values***

This section should describe the existing economic environment that may be affected by the proposal. The character and basis of the local and regional economies should be described including:

- economic opportunities, including existing economic base and economic activity, potential economic opportunities, and current local and regional economic trends;
- identification of existing labour force and unemployment statistics;
- existing housing market, particularly rental accommodation which may be available for the Project workforce;
- types and numbers of businesses;
- availability and prices of goods and services;
- historical descriptions of large scale industrial developments and their effects in the region; and
- the availability of suitable land for support industrial uses.

The economic impact statement should include estimates of the opportunity cost of the Project, and the value of ecosystem services provided by natural or modified ecosystems to be disturbed or removed during development.

#### ***3.11.2 Potential Impacts & Mitigation Measures***

This section of the EIS should define and describe the objectives for protecting or enhancing economic values, and how the achievement of the objectives will be monitored, audited and managed.

The effect on local and State labour markets should be discussed with regard to the source of the workforce. This information should be presented according to occupational groupings of the workforce. In relation to the source of the workforce, clarification is required as to whether the Proponent or contractors are likely to employ locally or through other means and whether there are initiatives for local employment opportunities.

The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed. The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the Project should be discussed.



The impact on the proposed pipeline on any of the key resource areas, mineral development licenses, or mining leases in the vicinity of the proposed routes should be discussed.

Any new skills and training to be introduced in relation to the Project should be identified. Adequate provision should be made for apprenticeship and worker training schemes. The EIS should indicate the occupational skill groups required and potential skill shortages anticipated.

To implement the Local Industry Policy, a Local Industry Participation Plan is required which is to contain information on the country and place of the source of materials and employees, and commitments which demonstrate compliance with the Local Industry Policy and Local Industry Participation Plan.

The Proponent is to demonstrate commitment to utilising local contractors and employees in the design, mobilisation, construction and operation stages of the Project.

An economic analysis should be presented from national, state, regional and local perspectives as appropriate to the scale of the Project. The general economic benefits from the Project should be described. The analysis should include:

- the relative significance of this proposal in the local and regional economic context;
- the short and long-term beneficial (e.g. job creation) and adverse (e.g. competition with local small business) impacts that are likely to result from the development;
- the potential, if any, for direct equity investment in the Project by local businesses or communities;
- the need for any additional infrastructure provision by all levels of government;
- implications for future development in the locality (including constraints on surrounding land uses and existing industry);
- the distributional effects of the Project, including proposals to mitigate any negative impact on disadvantaged groups;
- the effects of the proposal including proposals to mitigate any negative impacts on the economic productivity of commercial and recreational fisheries.
- the extent to which local and other Australian goods and services will be used; and
- impacts on local property values.

### **3.12 IMPACTS ON TRANSPORT INFRASTRUCTURE**

#### ***3.12.1 Description of Environmental Values***

This section should describe existing infrastructure facilities within and adjacent to the Project area. The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes easements and the like, covering the affected land should be shown. The locations and descriptions of all existing roads, railways, gas and water pipelines, power lines, telecommunications systems, constructed waterways, and any other infrastructure within the Project area, or likely to be affected by Project activities, should be provided. Any environmental values likely to be affected by this infrastructure should be described. Transport infrastructure also includes the transport operations that utilise that infrastructure. Maps should be provided at an appropriate scale and level of detail.

#### ***3.12.2 Potential Impacts & Mitigation Measures***

This Section of the EIS should detail impacts of the Project on existing roads, railways, port facilities, powerlines, pipelines, telecommunication lines, and other built infrastructure in relation to the transportation requirements outlined in Section 2.6.1. This evaluation should include any potential requirements to reschedule existing infrastructure construction, rehabilitation and maintenance programs.

All impacts resulting from the transport of plant, equipment, raw materials, wastes and personnel during the construction, operational and decommissioning phases of the Project should be described and analysed. The description and analysis should address the capacity of existing facilities to support the requirements and any additional requirements for the construction, upgrading or relocation of any transport related infrastructure required by the Project directly and as a result of potential cumulative impacts. The analysis should also address any requirements for new or changed services in road reserves.

Special reference should be made to any relationship between Project road works and works proposed in the current Roads Implementation Program of the Department of Main Roads (DMR). Road infrastructure should be described and assessed according to DMR's *Guidelines for Assessment of Road Impacts of Development Projects (Nov 2000)* or as amended. The EIS should discuss the results of consultation with the relevant district and regional officers of DMR and local government regarding the potential impacts of the Project on the road network. Where reference is made to the planning schemes of the relevant local governments, it is suggested that this also include any publicly available draft planning schemes.

Site filling has the potential to impact on the State-controlled road both with respect to the road asset within the road reserve as well as any impact on stream flow which may impact on drainage structures and pavements. All mitigation measures/ameliorative treatments will need to be designed and constructed to Main Roads procedures, standards and practices in consultation with the relevant Main Roads District and Regional office.

This section should address how transport elements and impacts of the Project, taking into account future demand growth, (including the potential impact of other major infrastructure and industrial projects in the nearby area) relate to Queensland Transport's and the DMRs' existing transport strategies for the Central Queensland area and the future infrastructure needs of this area as presented in State Government documents, including: *Statements of Intent for Road Link Development*; *Gladstone Integrated Regional Transport Plan 2001 – 2030*; and *Capricornia Integrated Regional Transport Plan 2004 – 2030*. It is also necessary to make reference to the planning schemes of the relevant local governments.

The EIS should specifically document and analyse various road access and road use options to facilitate the construction and operation of the plant and to mitigate the impacts on the road system. Consultation shall take place with DMR and other government infrastructure agencies (for example, QT, CQPA, QR and The Coordinator General) as well as Gladstone and Calliope local governments with respect to developing an integrated approach with this and other projects, particularly the proposed Wiggins Island Coal Terminal"

The EIS should address the transportation of the nickel ore from the Marlborough mining lease. The proponent should discuss alternative modes of transport for the nickel ore should the slurry pipe line construction be delayed or not proceed as proposed

The Regional Harbour Master Gladstone should be adequately consulted regarding maritime issues relating to the import of ore and the export of nickel and cobalt. The EIS should discuss the results of the consultation. The EIS should also outline arrangements made with the Central Queensland Ports Authority for the storage, handling and import of ore to the plant.

Detail on product spill management for transport infrastructure should be addressed in other relevant sections of the EIS.

### **3.12.3 Traffic**

This section of the EIS should address the impact of traffic generated by the Project on both the local government and state-controlled road network in terms of adverse road impacts, including pavement and structures degradation, intersection performance, road link and road network performance, road safety, required infrastructure improvements (eg, intersections), access

requirements, noise impact, air quality and existing drainage near roads. The traffic impacts on local residents and business operations should also be addressed. This includes the effect of any proposed new or upgraded rail operations and/or infrastructure on the 'risk score' of rail/road and rail/private level crossings along the entire route.

Strategies for managing all road impacts of the Project, including road safety, should be presented.

The impacts of any increased traffic (due to construction activities and/or on-going operations) on existing school bus routes and services should be discussed. Necessary measures to eliminate or minimise the impact on the operation of these services and any infrastructure proposed (such as bus pull-off areas) to maintain current safety standards should be presented.

A comparison of the traffic situation and road conditions with and without the Project should be shown. The EIS should include traffic management measures as part of a draft road use management plan that deals with mitigating the impacts of both the construction and operational phases of the Project on the road network. The draft road use management plan should cover issues related to traffic, operational performance, safety, and other aspects. The final version of the road use management plan will form part of the Environmental Management Plan (or plans) as proposed in Section 4.

### **3.13 HEALTH & SAFETY**

This section of the EIS should define and describe the objectives for protecting or enhancing health and safety community values. It should detail any impacts of the Project during construction and operation on the health and safety of the community, workforce, suppliers and other stakeholders, in terms of health, safety and quality of life from factors such as air emissions, odour, dust, pests, traffic noise and vibration, waste and water. This includes health and safety matters associated with onsite and offsite workforce accommodation. It should include details of:

- compliance with relevant Health and Safety legislation;
- security arrangements;
- emergency plans and safety management strategies, as well as corroboration of the effectiveness of such systems;
- details of on-site emergency response capabilities (e.g. on-site paramedic or first-aid officer), for both the construction and operational phases of the Project, which should include personnel trained for fire suppression and containment, rescue and first aid;
- the risk assessment conclusions reached and the level of off-site risk from the proposed developments; and
- the location and nature of sensitive sites including, but not limited to, residences and schools, within the surrounding 10 kilometre radius.

An onsite Occupational Health and Safety Risk Assessment should be completed by the Proponent.

Safety management strategies and control measures to be used to minimise the risks of incidents on site and to minimise the consequences of any incident under known operating conditions should be included in the EIS. This information should include:

- the handling of reworked or recycled material;
- the prevention and handling of fires on site;
- the segregation of incompatible products and ingredients;
- the containment of hazardous materials;

- the collection, treatment and disposal of any spillage of hazardous materials and wastes (provide details of the design, volume and capacity of any retention ponds, process tanks, waste holding tanks or bunded areas);
- the application of safety distances to the various activities on site to minimise consequences of incident;
- quality control of products and raw materials on site, including handling of non-conforming material;
- maintenance of critical items of equipment;
- the training of operatives; and
- emergency procedures, including evacuation procedures where necessary.

In regard to fires, the EIS should address the following:

- building fire safety measures for any construction or permanent accommodation;
- details of any changes to existing emergency response plans and bushfire mitigation plans under the SPP 1/03;
- details of the system for transferring the steam from the acid plant to the power station i.e. route, safety control points, etc.;
- on-site fire fighting equipment provided and the level of training of staff (if any) who will be sourced with emergency management activities;
- detailed maps showing the plant outline, hazardous material store, incident control points, fire fighting equipment, etc.;
- details of any dangerous goods stores associated with the plant operations including fuel storage and emergency response plans; and
- details of the rail spur to be constructed and location points for emergency vehicle access.

An assessment should be made of any areas where mosquitos may breed (e.g. areas with poor drainage or where water ponds) and mitigation measures developed to prevent the harbourage and breeding of mosquitoes and other pests of public health significance. The EIS should include a discussion on the site planning, management, mitigation and monitoring of potential pest impacts by considering Division 2 of Part 8 of the *Health Regulation 1996*. This section should draw on the information in Queensland Health's *Guidelines to Minimise Mosquito and Biting Midge Problems in New Development Areas (March 2002)*.

### **3.13.1 Hazard/Risk Analysis**

A hazard identification exercise should be conducted in order to identify the nature and scale of all hazards which might occur during the Project, such as the potential for release of gaseous or particulate pollutants or any other hazardous material used, produced or stored on the site. The construction and operation of the project must comply with the *Dangerous Goods Safety Management (DGSM) Regulation 2001*. This should include the impact on the Project of any natural events such as cyclones, earthquakes, bushfires or local flooding. Any identified impact on the Project should also be extended to determine the resultant impact on the surrounding areas and community. The hazard identification exercise must include a risk assessment consistent with *Australian / New Zealand Standard for Risk Management 4360:2004*.

A preliminary analysis of the consequences of these incidents on people, property and the biophysical environment should be conducted to identify potential impacts.

If this preliminary analysis predicts significant off-site impacts, a risk analysis should be performed. This will require an evaluation of the likelihood of each scenario occurring in order to calculate the level of risk in surrounding areas due to the presence of the facility. Risk contours should be presented on a suitably scaled location map.

The risk analysis is to address the potential impacts that may occur on the normal on-site day-to-day activities during the construction of the facilities. Furthermore, the Proponent must determine the level of change that may result on the risk contours of other industrial facilities in the areas as a result of the proposed Project. The risk contours are to be prepared in accordance with the protocol used in *Industrial/Residential Interface Buffer Arrangements, Wynnum* (Peter J Turnbull Pty Ltd & UniQuest Ltd, April 1999).

The risk analysis required under section 3.13.1 of the ToR include a Quantitative Risk Assessment (QRA) including individual fatality risk contours at 0.5, 1.0, 5.0, 10 and 50 ( $\times 10^{-6}$  per year) and injury risk contours at 10 and 50 ( $\times 10^{-6}$  per year).

The proponent is required to address the potential for a major accident at the proponent's facility to impact on the Orica Yarwun facility and alter their risk contours.

The proponent should be aware that the Orica Yarwun facility will be required to update the QRA for their facility; such an update being triggered by the application to develop a site in proximity to the Orica Yarwun site.

Any changes to operating or storage procedures that would reduce the possibility of these events occurring, or reduce the severity of the events should they occur, are to be identified and adopted where appropriate. A set of representative incident scenarios should be selected. This set should initially include worst case scenarios (e.g. a catastrophic failure of a storage vessel or processing unit).

The acceptability of the risk to surrounding land uses should be assessed by referring to nationally-adopted risk criteria presented in the New South Wales Department of Urban Affairs and Planning's *Hazardous Industry Planning Advisory Paper No. 4 "Risk Criteria for Land Use Safety Planning"*.

Details of the methodology and results of each step described above should be presented in the EIS.

### **3.13.2 Safety Systems and Emergency Planning**

Details of the design and operation of proposed safety systems, including fire prevention and protection, leak detection and minimisation, and emergency shutdown systems and procedures, should be presented. The contingency procedures to respond to an emergency, equipment failure or other malfunction that results in the release of contaminants should be discussed.

Details of the emergency planning procedure to be adopted, and a copy of the emergency plans and procedures developed to date should be included. The development of emergency planning and response procedures is to be determined in consultation with regional emergency service providers.

## **4. Environmental Management Plans**

This section of the EIS should present environmental management plans (EM Plans) developed for the Project. It is expected that all EM Plans will be prepared in accordance with the EPA Guideline "*Preparing environmental management plans*". Separate EM Plans should individually address the discrete Project elements such as the plant, management of the slurry pipeline corridor, operation of the pipeline, tailings storage facility, Road Use Management and port operations. The EM Plans should be developed from the preceding information in the EIS.

An EM Plan should provide life-of-proposal control strategies in accordance with agreed performance criteria for specified acceptable levels of environmental harm. In addition, EM Plans should identify:

- potential impacts on environmental values;
- mitigation strategies;
- relevant monitoring;
- appropriate indicators and performance criteria;
- reporting requirements; and
- appropriate corrective actions, should an undesirable impact or unforeseen level of impact occur.

The aims of an EM Plan are to provide:

- commitments by the Proponent to practical and achievable strategies and design standards (performance specifications) for the management of the Project to ensure that environmental requirements are specified and complied with;
- an integrated plan for comprehensive monitoring and control of impacts;
- local, State and Commonwealth authorities, stakeholders and the Proponent with a common focus for approvals conditions and compliance with policies and conditions; and
- the community with evidence that the environmental management of the Project is acceptable.

The recommended structure of each element of the EM Plan is:

<b>Element/issue:</b>	Aspect of construction or operation to be managed (as it affects environmental values).
<b>Operational Policy:</b>	The operational policy or management objective that applies to the element.
<b>Performance Criteria:</b>	Measurable performance criteria (outcomes) for each element of the operation.
<b>Implementation Strategy:</b>	The strategies, tasks or action program (to nominated operational design standards) that will be implemented to achieve the performance criteria.
<b>Monitoring:</b>	The monitoring requirements to measure actual performance (i.e. specified limits to pre-selected indicators of change).
<b>Auditing:</b>	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.
<b>Reporting:</b>	Format, timing and responsibility for reporting and auditing of monitoring results.
<b>Corrective Action:</b>	The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

An EM Plan should commit to manage, enhance or protect identified environmental values. The commitments should contain the following components for performance criteria and implementation strategies:

- environmental protection objectives for enhancing or protecting each relevant value;
- indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved;

- environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective; and
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
  - (a) continuous improvement;
  - (b) environmental auditing;
  - (c) monitoring;
  - (d) reporting;
  - (e) staff training; and
  - (f) a decommissioning program for land proposed to be disturbed under each relevant aspect of the proposal.

## **5. References**

All references used in the preparation of the EIS should be presented in a recognised format such as the Harvard standard (refer to the Style Guide, Australian Government Publishing service). This standard lists references by presenting in the following order: author (date of publication) title, publisher, and place of publication.

## **6. Recommended Appendices**

### **6.1 Final Terms of Reference**

The finalised Terms of Reference should be included as an Appendix to the EIS.

### **6.2 Development Approvals**

A list of the development approvals required by the Project should be provided.

### **6.3 Consultation Report**

A list of advisory agencies should be provided in a summary Consultation Report, which should also list the Commonwealth, State and Local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

The EIS should summarise the results of the community consultation program, providing a summary of the groups and individuals consulted, the issues raised, and the means by which the issues were addressed. The discussion should include the methodology used in the community consultation program, including criteria for identifying stakeholders and the communication methods used.

Information about identifying affected parties (as defined by the *EPBC Act*) and interested and/or affected persons (as defined by the *EP Act*) should be included.

### **6.4 Study Team**

The qualifications and experience of the study team and specialist sub-consultants should be provided.

### **6.5 Technical Data and Baseline Studies**

Relevant supporting data and information generated from specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- geology;
- soil survey and land suitability studies;
- land use and land capability studies;
- waterway hydrology and groundwater;
- flora and fauna studies, including the subregional analysis of representativeness and adequacy of protection for the terrestrial/riparian vegetation communities and their component flora and fauna taxa within the affected areas;
- an integrated assessment of relative biodiversity/conservation values, based on the methodology outlined in “Biodiversity Assessment and Mapping Methodology (EPA 2002)”;
- air pollution, noise and vibration;



- transport and traffic studies;
- housing and accommodation studies;
- economic studies and/or cost-benefit analyses; and
- hazard and risk studies.

## **6.6 List of Proponent Commitments**

A list of all commitments made by the Proponent in the EIS should be provided, together with a reference to the relevant section in the EIS.