Terms of reference for an environmental impact statement

South of the Embley project

Under Part 4 of the *State Development and Public Works Organisation Act 1971*

The Coordinator-General
April 2009

Queensland the Smart State

Queensland Government
Department of Infrastructure and Planning

Contents

Synopsis

Rio Tinto Aluminium Limited (RTA), a wholly owned subsidiary of Rio Tinto, proposes to expand its bauxite mining operations in the Weipa area by opening a new mine south of the Embley River. The South of the Embley project involves a new open-cut bauxite mine, a beneficiation plant, new port and stockpile facilities near Boyd Point, south of Weipa, as well as ancillary infrastructure.

The project would ensure continuation of RTA's mining in the region for the next 40 years, as resources at the company's existing mining operations at East Weipa and Andoom/Ely north of the Embley River become depleted and are progressively phased out by 2023.

The Coordinator-General has declared the project to be a significant project requiring an environmental impact statement (EIS) under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971*.

The Australian Government has determined that the project constitutes a controlled action pursuant to the *Environment Protection and Biodiversity Conservation Act 1999*. Controlling provisions are:

- sections 18 and 18A (listed threatened species and communities)
- sections 20 and 20A (listed migratory species).

The declaration of the South of the Embley project as a significant project does not indicate support for, or approval of, the project by the Coordinator-General or the Queensland Government. Rather it is a requirement for the project to undergo a rigorous EIS process.

The EIS process is being coordinated by the Department of Infrastructure and Planning on behalf of the Coordinator-General.

The terms of reference (TOR) set out the requirements, both general and specific, that the proponent should address in preparing an EIS for evaluation by the Coordinator-General. These TOR have been prepared by the Coordinator-General having regard to comments received from advisory agencies and the public on the draft TOR which were publicly advertised over the period 17 January 2009 to 16 February 2009.

The TOR are divided into two parts:

- Part A —general information and administrative procedures
- Part B—specific requirements and structure of the EIS

Abbreviations

The following abbreviations have been used in this document:

CG	Coordinator-General of the State of Queensland
CHMP	Cultural Heritage Management Plan
CLR	Contaminated Land Register
DERM	Qld Department of the Environment & Resource Development
DEWHA	Australian Government Department of Environment, Water, Heritage and the Arts
DIP	Qld Department of Infrastructure and Planning
DEEDI	Qld Department of Employment, Economic Development & Innovation
DME	Former Qld Department of Mines and Energy – now part of DEEDI
DMR	Former Qld Department of Main Roads – now part of DTM
DPIF	Former Qld Department of Primary Industries and Fisheries – now part of DEEDI
DTM	Qld Department of Transport & Main Roads
EIS	Environmental impact statement
EMP	Environmental management plan
EMR	Environmental management register
EP Act	*Environmental Protection Act 1994*
EPA	Former Qld Environmental Protection Agency – now part of DERM
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008

EPP (Waste)	Environmental Protection (Waste) Policy 2000
EPP (Water)	Environmental Protection (Water) Policy 1997
ESD	Environmentally sustainable development
IAS	Initial advice statement as defined by Part 4 of the *State Development and Public Works Organisation Act 1971*
IPA	*Integrated Planning Act 1997*
Mdptpa	million dry product tones per annum
MNES	Matters of national environmental significance, as defined under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
MRA	*Mineral Resources Act 1989*
NRW	Former Qld Department of Natural Resources and Water – now part of DERM
ROM	Run of mine
RTA	Rio Tinto Aluminium Limited
SDPWOA	*State Development and Public Works Organisation Act 1971*
The project	South of the Embley project
The proponent	Rio Tinto Aluminium
TOR	Terms of reference as defined by Part 4 of the *State Development and Public Works Organisation Act 1971*

Part A—general information and administrative procedures

1. Project summary

Rio Tinto Aluminium (RTA) has operated its Weipa bauxite mining operation since 1963. RTA propose to extend its existing bauxite mining operations located north of the Embley River at East Weipa and Andoom on western Cape York Peninsula to areas within existing mining lease 7024 located south of the Embley River. The northern existing bauxite reserves are gradually depleting while at the same time, international demand for bauxite remains strong.

Resource assessment from drilling programs has identified significant bauxite reserves that could sustain a mining operation south of the Embley River for about 40 years, depending on annual mine production. The South of the Embley project (the project) would provide for the long term continuation of mining in the Weipa region and enable continued bauxite supply to major alumina refineries in Queensland.

Initial production from the project would begin in about 2013 and reach 15 million dry product tonnes per annum (Mdptpa) within a year, replacing depleting East Weipa reserves. Production would later rise to 30 Mdptpa in about 2026 to replace depleted Andoom reserves. The project would be designed to enable expansion up to 50 Mdptpa, subject to market conditions.

Due to the presence of the Embley River estuary, development of the reserves south of the Embley River poses logistical challenges to the use of existing Weipa infrastructure. Studies have identified that new stand-alone infrastructure would be required to develop the reserves south of the Embley River. The proposed project consists of the construction and operation of a bauxite mine and associated beneficiation, infrastructure and port facilities. Water would be supplied from new artesian bores and new surface water dams.

The project would employ about 350 people during the initial construction phase. At 15 Mdptpa, the overall number of direct employees working on the combined north and south of the Embley River operations would average about 870 people, slightly more than current operations. About 400 of these would be working on the project. The construction workforce would be housed in a fully serviced camp on site and the operational workforce would remain based in Weipa and commute on a daily basis.

The project would consist of the following components as shown in **Figure 1**:

- Bauxite mining—conventional bench mining of the bauxite with excavators, loaders and haul trucks would be undertaken initially in the Boyd Point and Pera Head areas and would then progress to the Norman Creek area with ore being transported from the mine via overland conveyor across Norman Creek. Mined areas would be progressively rehabilitated.
- Bauxite processing—the crude bauxite would be transported to a truck dump station located approximately 2 km south of Boyd Point and the bauxite would be processed in a beneficiation plant located adjacent to the ROM stockpiles. A second beneficiation plant would be constructed south of Norman Creek when the reserves in the Norman Creek area are mined. Beneficiation involves separation of the bauxite and waste materials through screening, crushing, grinding, washing and dewatering.

- Bauxite stockpiles—a stacker-reclaimer would be established adjacent to the port facilities to service product stockpiles capable of expansion up to a maximum capacity of 5.2 million dry product tonnes (Mdpt). Should ore from neighbouring mines operated by third parties be shipped through the proposed port, such ore would be conveyed by others across mining lease 7024 to a stockpile near the RTA stockpile.
- Ancillary infrastructure—diesel-fuelled power station, workshops, warehouse, administration facilities, vehicle wash-down facilities, tyre bay, package sewerage treatment plan, general waste disposal, diesel storage (generally located in the vicinity of the beneficiation plants).
- Water infrastructure—initially two freshwater dams on tributaries of Norman Creek are likely to be required, plus pipelines and several artesian bores. Combined surface area for the two dams when full will be approximately 900 ha. Increases in production above 15 Mdptpa are likely to require additional dams in the Norman Creek and Ward River catchments. Water infrastructure for the project will operate independently of the existing Weipa operations.
- Barge/ferry facilities—RTA would construct and operate a new roll-on roll-off barge/ferry terminal at Hornibrook Point and a new barge/ferry terminal on the western bank of the Hey River. These would be used to transport workforce and equipment between Weipa and the project.
- Mine access road—construction of approximately 40 km of new ‘on-lease’ access road from the Hey River terminal to the mine infrastructure area. The road would have an all-weather sealed pavement.
- Port and ship-loading facilities—construction and operation of new port and ship-loading facilities by RTA between Boyd Point and Pera Head. Works would include a jetty, berths, ship-loader and dredging of berth pockets and departure areas. In the initial phase, RTA propose to construct a port capable of shipping 30 Mdptpa, with provision to enable future expansion up to 63 Mdptpa. This would allow for the option to ship an additional 13 Mdptpa from third parties in addition to RTA's maximum production of 50 Mdptpa. RTA’s initial phase of mining operations will be developed to reach 15 Mdptpa in 2014. If agreement is reached with third party producers, capacity could be provided within the initial development to allow commencement of third party shipments. As total port capacity demand increases, port facilities would be expanded up to 63 Mdptpa within which up to 13 Mdptpa would be available for third party shipments.
- Approximately 250 000m^3 of dredged spoil from the initial port development would require disposal offshore at a proposed new disposal ground approximately 15km west of the proposed port site. An extra berth would be added if ship loading capacity was increased to 63Mdptpa and approximately 90 000m^3 of additional dredged spoil would be generated for disposal in the same manner.

Figure 1— locality map

2. Project proponent

The project would be developed and operated by RTA (a company in the Rio Tinto Alcan group). RTA supplies bauxite, alumina and primary aluminium to Australia, New Zealand and export markets. The company provides about 26 per cent of Australia's total production of bauxite, 14 per cent of its alumina and 26 per cent of its primary aluminium. The business is a wholly owned subsidiary of Rio Tinto Limited.

RTA's head office for mining and refining is based in Brisbane, Australia, with mining and refining interests in Queensland including the existing Weipa mine and the Yarwun and Queensland Alumina Limited alumina refineries. RTA also operates the Boyne aluminium smelter in Gladstone.

Contact details for Rio Tinto Aluminium are as follows:

Manager—South of the Embley project
Rio Tinto Aluminium Limited
GPO Box 153
Brisbane Qld 4001
tel 1800 308 938 (freecall)
fax + 61 7 3867 1892
infoeis@riotintoalcan.com

3. Legislative framework

On 13 June 2008, RTA lodged an initial advice statement (IAS) and a request for 'significant project' declaration with the Queensland Coordinator-General (CG). The IAS provides an outline of the proposed project, including the project rationale and its potential impacts. The IAS was subsequently updated on 3 November 2008.

The project was declared a 'significant project for which an environmental impact statement (EIS) is required' pursuant to section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWOA) on 21 November 2008, by the CG. Matters considered by the CG in making this declaration included information contained in the IAS, relevant planning schemes and policy frameworks, infrastructure impacts, employment opportunities, environmental effects, complexity of local, state and Australian Government requirements, level of investment and the project's strategic significance.

The declaration initiates the statutory environmental impact assessment procedure under Part 4 of the SDPWOA which requires the proponent to prepare an EIS for the project.

RTA referred the project to the Australian Government Minister for the Environment, Heritage and the Arts for a decision as to whether the project constituted a controlled action under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Referral No. 2008/4435). On 2 October 2008, the project was declared a 'controlled action' and the relevant controlling provisions were:

- listed threatened species and communities (section 18 and 18A)
- listed migratory species (sections 20 and 20A).

In accordance with the minister's decision on the assessment approach, the project will be assessed under the bilateral agreement with the Queensland Government. Under the bilateral agreement, the Australian Government has accredited the Queensland

SPDWOA EIS process to meet the impact assessment requirements under both federal and state legislation.

Consequently, the term 'EIS' used in these terms of reference (TOR) should be interpreted as satisfying the impact assessment requirements of all relevant Queensland and Australian Government legislation. The project will require approval from the Australian Government Minister for the Environment, Heritage and the Arts on MNES under Part 9 of the EPBC Act before it can proceed.

The Department of Infrastructure and Planning (DIP) is coordinating the EIS process on behalf of the CG. Relevant Australian, Queensland and local government authorities have been invited to participate in the EIS process as advisory agencies.

The first step in the impact assessment process under SDPWOA is the development of TOR for the EIS. The process involves the formulation of draft TOR that are made available for public and advisory agency comment. The CG will have regard to all properly made submissions received when finalising the TOR, which will be presented to the proponent. This document represents the draft TOR for public and advisory agency comment.

The proponent will prepare an EIS to address the TOR. Once the EIS has been prepared to the satisfaction of the CG, a public notice will be advertised in relevant newspapers. The notice will state where copies of the EIS can be viewed or purchased, the submission period and where the submissions should be sent. The proponent may be required to prepare a supplementary EIS to address specific comments submitted by advisory agencies and members of the public.

At the completion of the EIS phase, the CG will prepare a report (CG's report) evaluating the EIS and other relevant material, pursuant to section 35 of SDPWOA. The CG's report will include an assessment and conclusion about the environmental effects of the project and any associated mitigation measures. Material that will be assessed includes: the EIS, properly made submissions and other submissions accepted by the CG and any other material the CG thinks relevant to the project such as a supplementary report, comments and advice from advisory agencies and other entities, technical reports and legal advice.

The CG's report will be publicly notified by placing it on the Department of Infrastructure and Planning website at www.dip.qld.gov.au/projects. The CG's report will also be presented to the proponent, the assessment manager/s (under the *Integrated Planning Act 1971* (IPA)), the Australian Government Minister for Environment, Heritage and the Arts (under the EPBC Act), the Queensland Minister for Climate Change and Sustainability and the Queensland Minister for Natural Resources, Mines and Energy and Minister for Trade.

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

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

Similarly, the CG's report may, under section 49 of SDPWOA, state conditions for any draft environmental authority under the *Environmental Protection Act 1994* (EP Act) for

the proposed environmental authority (mining activities). If conditions are included in the report :

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

Finally, if the project involves development requiring an application for a development approval under IPA, the CG's report may, under section 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
- that the application for development approval be refused.

4. EIS objectives

The objective of the EIS is to ensure that all potential environmental, social and economic impacts of the project are identified and assessed and, where possible, how any adverse impacts would be avoided or mitigated. Direct, indirect and cumulative impacts must be fully examined and addressed. The project should be based on sound environmental protection and management criteria.

The EIS should be a self-contained and comprehensive document that provides sufficient information for an informed decision on the potential impacts of the project and the management measures employed to mitigate adverse impacts. The EIS document should provide information for the following persons and groups, as the project stakeholders:

- **for interested bodies and persons** —a basis for understanding the project, prudent and feasible alternatives, affected environmental values, 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 government agencies and referral bodies** —a framework for decision-makers to assess the environmental aspects of the proposed project with respect to legislative and policy provisions, and based on that information, to make an informed decision on whether the project should proceed or not, and if so, subject to what conditions, if any
- **the proponent** —a mechanism by which the potential environmental impacts of the project are identified and understood, including information to support the development of management measures, such as an environmental management plan, to mitigate the effects of adverse environmental impacts of the development.

The proponent is required to address the TOR to the satisfaction of the CG before the EIS is made publicly available. It should be noted that the CG does not evaluate the EIS until public notification is completed and the CG has obtained any other

material the CG considers relevant to the project, including additional information or comment about the EIS and the project from the proponent.

5. General EIS guidelines

The EIS is to provide stakeholders with sufficient information to understand the type and nature of the project, the potential environmental, social and economic impacts, and the measures proposed by the proponent to mitigate all adverse impacts on the natural, social and economic environment. It should be recognised that Australian, Queensland and local governments, special interest groups and the general public will have an interest in the EIS.

All phases of the project should be described in the EIS including pre-construction, construction, operation and decommissioning, including final rehabilitation of the mine site and any redundant infrastructure. Direct, indirect and cumulative impacts should be identified and assessed with respect to environmental values and potential extent of impacts. Cumulative impacts include impacts accumulating over time and impacts exacerbated by intensity or scale or frequency or duration of impacts both at project sites and areas remote from these.

Specifically, the EIS should provide:

- an executive summary of the potential environmental impacts of the project
- an overview of the proponent and its existing operations
- a description of the project's objectives and rationale, as well as its relationships to strategic policies and plans
- a description of the entire project, including associated infrastructure requirements
- a description of feasible alternatives capable of substantially meeting the proposal's objectives
- an outline of the various approvals required for the project to proceed
- descriptions of the existing environment, particularly where this is relevant to the assessment of impacts
- measures for avoiding, minimising, managing and monitoring adverse impacts, including a statement of commitment to implement the measures
- rigorous assessment of the risks of adverse and beneficial environmental impacts arising from the project and relevant alternatives on environmental, social and economic values, relative to the 'no project' scenario
- any information derived from baseline and predictive studies, the required extent of which will be commensurate to risks
- a description of stakeholder consultation undertaken
- responses to issues raised during public and stakeholder consultation.

The main EIS report needs to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. In preparing the EIS, the approach to be adopted requires that:

- predictions of environmental impacts are based on scientifically supported studies

- the EIS is to present all technical data, sources or authority and other information used to assess impacts
- the methods used to undertake any specialist studies are outlined, together with any relevant assumptions and professional or scientific judgements
- the scientific reliability of investigations and predictions is indicated, including the estimated degree of certainty or, if possible, statistical confidence wherever appropriate
- proposed measures to mitigate and manage identified issues are described and evaluated
- residual impacts that are not quantifiable are described qualitatively, in as much detail as reasonably practicable.

The assessment of all environmental impacts needs to encompass both potential impacts on and uncertain risks to the environment. The level of investigation of potential impacts or particular risks needs to be proportionate to both the severity of the potential consequences of possible events and the likelihood of those events occurring.

Specific types of relevant impacts requiring investigation are set out in Part B. However, the EIS will need to address other issues or aspects that may emerge during the investigations and preparation of the EIS. Ultimately, it is the proponent's responsibility to ensure that adequate studies are undertaken and reported.

The EIS should state the criteria adopted in assessing the proposed project and its impacts, such as compliance with relevant legislation, policies, standards, community acceptance and maximisation of environmental benefits and minimisation of risks.

Any prudent and feasible alternatives should be discussed and treated in sufficient detail, and reasons for selection of the preferred option should be clearly identified.

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 site, etc) should be presented.

The term '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. Should the proponent require any information in the EIS to remain confidential, this should be clearly indicated, and separate information should be prepared on these matters.

6. Stakeholder consultation

The proponent should undertake a comprehensive and inclusive program of consultation with the stakeholders identified in section 4 Part A. The consultation program should provide stakeholders with the opportunity to obtain information about the project, to raise issues and express their concerns and to receive feedback on how the proponent intends to address the issues and mitigate all adverse impacts of the project.

Consultation with advisory agencies should be the principal forum for identifying legislation, regulations, policies and guidelines relevant to the project and EIS process.

Where appropriate, information bulletins can be used to disseminate information to a wider audience. These bulletins can also be used to inform stakeholders of the proponent's progress in the EIS process and on specific investigations.

The proponent is encouraged to provide opportunities for the general public to obtain information about, and comment on, the project through public information sessions.

As part of this EIS process, consultation should also be undertaken to better understand the social impacts of the proposed project and opportunities for mitigation of those impacts.

Specific requirements for stakeholder consultation are covered in section 1.9 Part B.

7. EIS format and copy numbers

The EIS should generally be presented in a format consistent with that outlined in Part B.

Maps, diagrams and other illustrative material should be included in the EIS to assist in the interpretation of the information.

The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS document should not contain watermarks across the body of the text. The EIS should also be produced on CD-ROM/DVD.

Two separate CD-ROM/DVD copies should be provided:

1. CD-ROM/DVD—resolution equivalent to the printed document for distribution to the stakeholders.
2. CD-ROM/DVD—for placement on the internet. Copies should be in Adobe® PDF format. All compression must be down-sampled to 72 dpi. PDF documents should be no larger than 1 MB 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 1 MB file size.

The final nature and number of EIS copies required to be submitted and made available, should be discussed and agreed with the CG in the early stages of the EIS process.

8. Further information

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

EIS Project Manager—South of the Embley project
Significant Projects Coordination
Department of **Infrastructure and Planning**
PO Box 15009
Brisbane City East Qld 4002
tel + 61 7 3224 8351
fax + 61 7 3225 8282

SOE@dip.qld.gov.au
www.dip.qld.gov.au

Part B—specific requirements and structure of the EIS

It is preferred that the EIS generally follows the format and content outlined in this part of the TOR. If this is not possible, guidelines describing how the EIS responds to the TOR should be included in the appendices.

Executive summary

The function of the executive summary is to convey the most important aspects and options relating to the project to the reader in a concise and readable form. It should use plain English and avoid the use of jargon and esoteric terms. The executive summary should be written as a standalone document, able to be reproduced on request and distributed to 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, and focus strongly on the key issues to enable the reader to obtain a clear understanding of the project and its potential adverse and beneficial environmental, social and economic impacts and the management measures to be implemented by the proponent to mitigate all residual impacts.

The executive summary should include:

- the title of the project
- name and contact details of the proponent, and a discussion of previous projects undertaken by the proponent and their commitment to effective environmental management
- a concise statement of the aims and objectives of the project
- the legal framework, decision-making authorities and advisory agencies
- an outline of the background and need for the project, including the consequences of not proceeding with the project
- a description of 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
- an outline of the principal environmental impacts predicted and the proposed environmental management strategies (including waste minimisation and management, mitigation measures and environmental offsets) and commitments to minimise the significance of these impacts
- detailed maps of the proposed project location.

Glossary of terms

A glossary of technical terms, acronyms and abbreviations, that appear in the EIS, should be provided.

1. Introduction

The introduction should clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. It should also define the audience to whom it is directed, and contain an overview of the structure of the document.

1.1 Project proponent

This section should describe the experience of the project proponent, including the nature and extent of business activities, experience and qualifications, role and responsibilities and environmental record, including the proponent's environmental policy.

1.2 Project description

This section should provide a brief description of the key elements of the project particularly the mining, beneficiation and port facilities and associated processes. The location of the project and its infrastructure requirements should be described and mapped. Detailed descriptions of the project should follow in section 2.

1.3 Project rationale

This section should provide a statement of the objectives of the project and a brief outline of the events leading up to the project's formulation, envisaged time scale for implementation and project life, anticipated establishment costs and actions already undertaken within the project area.

The justification for the project should be described, with particular reference made to the economic and social benefits, including employment and flow-on business development, which the project may generate. The status of the project should be discussed on a regional, state and national context. This discussion should examine, the infrastructure needs of the state and far north Queensland economies and the project's role in supporting state development and environmental policies and strategies.

1.4 Relationship to other projects

This section should also describe how the project relates to any other projects, of which the proponent should reasonably be aware, that have been, or are being taken or that have been approved in the area affected by the project.

Consequential impacts as defined under the EPBC Act, and projects which will be considered as part of cumulative impact assessment (section 7) should be identified and their relevance discussed.

1.5 Socio-economic cost and benefits of the project

Section 4 deals with social values, impacts and their management and section 5 deals with economic impacts and their management. This section should summarise the short and long-term:

- economic costs and benefits of the project to businesses and the wider community, including direct and indirect employment and local business involvement
- any increased demands on local and regional community services and facilities
- direct social costs and benefits, including community disruption, related land use changes, employment, skills development and any workforce accommodation issues
- any increased demand for natural resources as a result of the project.

1.6 Alternatives to the project

This section should describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project. Alternative beneficiation technologies, such as in-pit dry screening of bauxite should be discussed.

Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Where relevant, comparative environmental impacts of each alternative should be summarised.

The interdependencies of the various project components should be explained, together with any infrastructure requirements that may affect the viability of the project. Should water supply, power, transport and/or storage infrastructure be included as an element of the project, this section should include a description of and rationale for such additional infrastructure.

The reasons for selecting the preferred options should be outlined and include technical, commercial, social and environmental aspects where relevant. In particular, compliance with government policy and with the principles and objectives of ecologically sustainable development should be included in this discussion.

1.7 Co-location opportunities

Opportunities may exist for efficiency gains and the mitigation of environmental and property impacts through the co-location of any proposed linear infrastructure project elements within existing or other proposed linear infrastructure (such as rail corridors, gas pipelines and electricity transmission and distribution easements). There may also be opportunities to co-locate proposed linear infrastructure from third parties in, near or parallel to the proposed linear infrastructure project elements.

The project proponent should identify any third party proposals to develop infrastructure within the vicinity of project investigation corridors. Such proposals

would be limited to those projects which are in the public arena during the period of preparation of this EIS and for which a proponent can be readily identified.

It would be the responsibility of any such third parties to provide the required information to the proponent. The Department of Infrastructure and Planning can, at the proponent's request, assist with the facilitation of meetings with known proponents of other linear infrastructure and common user infrastructure in the project area.

It would be inappropriate for this EIS to evaluate the environmental impacts of other infrastructure not directly required for this project. However, the EIS should describe the implications of locating other forms of linear infrastructure within or near proposed project corridors. Where co-location may be likely, the EIS should consider opportunities to coordinate or enhance any of the impact mitigation strategies proposed for the project through cooperation with other proponents in the locality. In particular, the potential implications of any infrastructure co-location on corridor widths and alignment should be described.

1.8 The environmental impact assessment process

1.8.1 Methodology of the EIS

This section should outline the stages of the EIS process under the SDPWOA, including information on the relevant stages of the approvals process, Commonwealth referrals, statutory and public consultation requirements, any associated licence or permit application processes and any interdependencies that exist between approvals (details of specific approvals should be presented under section 1.10). The information in this section is required to ensure:

- stakeholders are informed of the EIS process to be followed
- stakeholders understand the relationships between the EIS and other associated approvals
- stakeholders are aware of any opportunities for input and participation
- relevant legislation is addressed.

1.8.2 Objectives of the EIS

This section should provide a statement of the objectives of the environmental impact assessment process. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The purpose of the EIS is to:

- provide public information on the need for and likely effects of the project on the natural, social and economic environment
- identify relevant environmental values, impacts (both beneficial and adverse) on environmental values and propose mitigation measures, based on acceptable standards
- demonstrate how unavoidable environmental impacts can be managed through the protection and enhancement of the environmental values.

The role of the EIS in providing information for the formulation of the environmental management plan (EMP) for the project should be discussed. Discussion of options and alternatives is a key aspect of the EIS.

1.8.3 Submissions

The reader should be informed as to how and when public 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 and what form the submissions should take.

1.9 Public consultation process

An appropriate public consultation program is an important component of the EIS process. The public consultation program should provide opportunities for community involvement and education. It may include interviews with individuals, public communication activities, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern to local and regional communities and interest groups and address issues from project planning through commissioning and project operations.

A consultation plan should be prepared during the initial phase of the EIS process. This should identify:

- the types of activities to be undertaken
- timing
- target the Stakeholder/community representatives
- integration with other EIS activities and the project development process
- consultation responsibilities
- communication protocols
- reporting and feedback arrangements.

This section should outline the methodology adopted to:

- identify stakeholders and how their involvement was facilitated
- identify the process conducted to date and future consultation strategies and programs, including during the operational phase of the project
- indicate how consultation involvement and outcomes were integrated into the EIS process and future site activities, including opportunities for engagement and provision for feedback and action if necessary.

Detailed results of the consultation process should be provided as a Consultation Report and presented as an Appendix to the EIS. A summary of the key processes and outcomes should be provided in this section.

1.10 Project approvals

1.10.1 Relevant legislation and policy requirements

This section should identify and explain the legislation and policies controlling the approvals process and should identify all the approvals, permits and licences that will need to be obtained for the development of the proposed project including those on strategic port land.

Key pieces of legislation that will need to be addressed in terms of implications for project approval include:

Australian Government

Environment Protection and Biodiversity Conservation Act 1999

Environment Protection (Sea Dumping) Act 1981

Native Title Act 1993

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

Civil Aviation Regulations 1988 and Civil Aviation Safety Regulations 1988

Queensland Government

State Development and Public Works Organisation Act 1971

Integrated Planning Act 1997

Environmental Protection Act 1994

Coastal Protection and Management Act 1995

Vegetation Management Act 1999

Nature Conservation Act 1992

Fisheries Act 1994

Aboriginal Cultural Heritage Act 2003

Water Act 2000

Land Act 1994

Mineral Resources Act 1989

Queensland Heritage Act 1992

Transport Infrastructure Act 1994

Transport Operations (Marine Pollution) Act 1995

Transport Operations (Marine Safety) Act 1994

Land Protection (Pest and Stock Route Management) Act 2002

Commonwealth Aluminium Corporation Limited Agreement Act 1957

Alcan Queensland Pty Limited Agreement Act 1965

Wild Rivers Act 2005

The approvals interrelationship between the *Commonwealth Aluminium Corporation Limited Agreement Act 1957* and the *Alcan Queensland Pty Limited Agreement Act 1965* with other relevant approvals legislation should be addressed.

1.10.2 Planning processes and standards

This section should discuss the project's consistency with existing land uses or long-term policy framework for the area (e.g. as reflected in local and regional plans) and with legislation, standards, codes or guidelines available to monitor and control operations on site. This section should refer to all relevant Queensland and regional planning policies. This information is required to demonstrate how the proposal conforms to state, regional and local plans for the area.

1.10.3 Accredited process for controlled actions under Commonwealth legislation

The project is a controlled action under the Australian Government's EPBC Act and a significant project under the SDPWOA. The EIS will be developed pursuant to the bilateral agreement between the Australian and Queensland Governments for the purposes of the Australian Government's assessment under Part 8 of the EPBC Act.

The EIS should address potential impacts on the MNES that were identified in the controlling provisions when the project was determined to be a controlled action.

A stand-alone report should be provided as an appendix to the EIS that exclusively and fully addresses the issues relevant to the controlling provisions. It should comply with the following outline:

1 Introduction

2 Description of proposed action (as it would impact on MNES)

3 Description of the affected environment relevant to the controlling provisions (i.e. describe the features of the environment that are MNES protected under the EPBC Act)

4 Assessment of impacts on MNES and mitigation measures (in accordance with available guidelines and species recovery plans), including consideration of any potential offsets to ameliorate residual impacts

5 Conclusions

6 References.

2 Description of the project

The objective of this section is to describe the project (mine, port, processing plant etc) through its lifetime of construction and operation and decommissioning (including rehabilitation). This information is required to allow assessment of all aspects of the project, including which approvals may be required and how they may be managed through the life of the project.

2.1 Overview of project

The EIS should provide an overview of the project to put it into context. This section should include:

- a description of the key components of the project through the use of text and design plans where applicable
- the expected cost and overall duration and timing of the project
- the employment benefits from the construction and operational phases of the project
- a summary of any environmental design features of the project.

2.1.1 Mine

This section should provide a description of bauxite mining and the layout of key components:

- the mine life and mineral resources
- the mining methods and ore handling methods to be used, including the major equipment to be used in the various components of the operation
- the location and boundaries of proposed mining areas, illustrated on maps
- mine development sequence and timeframes
- any proposed stream diversions or public road diversions
- the final landform and any final voids to be left at the cessation of mining.

2.1.2 Beneficiation

This section should provide a description of the bauxite beneficiation process and the layout of key components of the plant including:

- description of key plant and equipment, processes, capacities and raw materials to be used
- indicative material balances for the processing plant, and the anticipated rates of inputs along with similar data on products and tailings streams
- data on any chemicals be used
- location of propose tailings disposal areas
- description of the types, quantities and characteristics of the products produced
- product handling.

2.1.3 Port facilities

This section should provide a description of the port and the layout of key components including:

- port boundaries
- details of the port authority, existing port limits, facilities and Strategic Port Land in the area
- details of area to be dredged and dredged spoil disposal areas
- details of capital and maintenance dredging equipment and methods
- jetty and wharf alignment
- ship loading equipment
- berths for tugs and other non-bulk carrier vessels
- offshore ship mooring locations
- any other associated facilities including maritime safety.

2.1.4 Associated infrastructure

This section should provide a description of associated infrastructure. The location and a description should be provided of the following:

- power plant, power lines, workshops, offices and warehouses
- fuel and chemical storage facilities
- access roads and telecommunications
- fuel and chemical storage facilities
- water supply dams and bores and water pipelines
- barge landings and ferry terminals
- permanent and temporary accommodation facilities.

2.2 Location

The regional and local context of the project should be described and illustrated on maps at suitable scales and reference points. Real property descriptions of the project site should be provided. Maps should show the precise location of the project area, and in particular:

- the location of the resource to be explored, developed or mined
- the location and boundaries of land tenures, in place or proposed, to which the project area is or will be subject to (including tenures for facilities in marine waters)
- the location and boundaries of mining tenures, granted or proposed, to which the project area is or will be subject to
- the location and boundaries of the project footprint showing all key aspects, including mine, beneficiation plant, port, power station, stockpiles, areas of fill, watercourses, plant locations, water storages, buildings, roads, bridges hardstands, car parks and any final void to be left at the cessation of mining etc

- any part of the resource not intended to be mined and any part of the resource that may be sterilised by the proposed mining operations
- the location of all proposed project transport infrastructure for inputs and outputs for each elements of the project
- the location of any proposed buffers surrounding the working areas
- the identification of all site access points to, from and within the project on maps, to assist in the assessment of emergency planning.

Consideration should be given to providing a rectified air photo enlargement to illustrate components of the project in relation to the land and mining tenures and natural and built features of the area.

2.3 Construction

The extent and nature of the project's construction phase should be described (as well as any works required off-site enabling construction to commence) including a map at reasonable scale that shows the footprint of the mine and construction works. The description should include the type and methods of construction, the construction equipment to be used and the items to be transported onto the construction site.

Any staging of the project should be described and illustrated showing site boundaries, development sequencing and timeframes.

2.3.1 Mine

This section should provide a description of construction activities relating to the project including:

- site access:
  - vegetation clearing
  - provision of site access, power, telecommunications, water supply and other infrastructure
  - establishment requirements for construction facilities
- construction requirements, including source and extraction of construction inputs and materials, including construction water:
  - details of the method of construction of the mine and volumes of material required
  - any staging of construction activities
- type, source, quantity and method of transport of construction materials
- general construction standards and site management, including environmental and safety management
- an assessment of expected physical and chemical properties and quantities of soil/rock to be excavated
- details of any potential disruption to flows of waterways during construction and any diversion works required
- details of any potential disruption to groundwater flow and groundwater/surface water interaction during construction and any aquifer dewatering works required

- relocation of existing infrastructure
- timetable for construction, particularly noting seasonal rainfall or flows
- the hours of operation
- emergency aid/medical facilities to be provided on site
- the construction methods and containment/disposal of construction spoil
- solid and liquid waste handling.

2.3.2 Port, beneficiation plant and other infrastructure

This section should provide a description of construction activities relating to the project's associated infrastructure including:

- a map showing location of any works
- on-site plans, layouts, boundaries and elevations
- detailed concept and staging (if any proposed) for additional transport facilities and locations
- plant and machinery likely to be involved
- supply and storage of materials—volume, composition, handling and storage during construction
- where dredging is involved:
  - expected frequency and duration
  - volume of material to be disposed of and disposal area
  - geotechnical properties of dredged material
  - type of dredge
- extent that service corridors will be used during construction and maintenance
- width of vegetation clearing required. This information must indicate where vegetation to be cleared has significant conservation value (such as sensitive environmental areas and creek crossings), and must also reference where in the EIS the impacts on such vegetation have been addressed
- typical crossing techniques including restoration works that would be used at creek crossings, provisions for fish passage, road, rail, and other service corridor crossings
- disposal of plant-matter left after clearing vegetation
- cleanup and restoration (rehabilitation) of areas used during construction including any accommodation facilities and storage areas
- disposal/reuse of surplus excavated material and if this material can be coordinated with concurrent construction activities in the vicinity.

2.4 Operations

This section should describe the activities involved in operating all aspects of the project, in particular:

2.4.1 Mine

2.4.1.1 Mine life and mineral resource base

Specific details should be provided of the following:

- the proposed mine life and an outline of the mineral resource base (further detail should be provided in section 3.2.2, Geology)
- the quantity of mineral to be mined annually including any proposed ramping up of production or staging of development.

2.4.1.2 Mining methods and equipment

Specific details should be provided of the following:

- the mining type and methods to be used, including the major equipment to be used in the various components of the operation
- the use of different techniques in areas of different topographic or geo-technical character
- chemicals to be used.

The description should refer to, and be complemented by, the figures previously presented in section 2.2, showing the locations of key aspects of the project. Additional figures should be provided if required.

2.4.1.3 Mine sequencing

Specific details should be provided of the following:

- the proposed sequence and timing of mining of each seam/ore body within the mining lease
- the physical extent of excavations, location of stockpiles of overburden and/or mineral reject to be handled during the project's operation or left after mining ceases—the description should include the rate of throughput of stockpiles of product, reject and overburden
- the proposed progressive backfilling of excavations
- the area disturbed at each major stage of the project
- the progressive rehabilitation of disturbed areas.

2.4.1.4 Ongoing evaluation and exploration activities

This section should describe the extent and nature of any proposed ongoing exploration or geological/geo-technical evaluation within the project area that may be required over the life of the project.

2.4.2 Bauxite beneficiation plant

This section should describe the quantities and characteristics of the products produced on an annual basis. Indicative process flow-sheets should be provided showing material balances for the processing plant, and the anticipated rates of inputs, along with similar data on products, wastes and recycle streams. The proposed mineral handling methods and facilities to be used for mineral product storage and transfer to the port facility, should be described.

The proposed methods and facilities to be used for bauxite storage and for transferring product to ship should be described and shown on plans at an appropriate scale. A summary of any environmental design features of the new facilities should be provided.

2.4.3 Port

The location and nature of the processes and operations associated with the long-term operation of the port should be described including:

- a general description of the operations of the terminal
- the capacity of stockpiling, in loading and out loading operations for each stage of the port's development
- the expected shipping frequency and intensity
- tug operations
- refuelling arrangements
- hours of operation
- expected access, navigational and anchorage arrangements
- capital and maintenance dredging operations
- potential threats from aquatic pests originating from ballast water or other discharges in the Gulf as shipping tonnages increase
- environmental management measures incorporated in the operation of the port.

Concept and layout plans should be provided highlighting the port boundary, proposed structures, plant and equipment associated with port operations. The proposed methods and facilities to be used for loading product to ship should be described and shown on plans at an appropriate scale.

2.5 Decommissioning and rehabilitation

This section should describe the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by the project. The strategic approach to progressive and final rehabilitation should be described. A preferred rehabilitation strategy should be developed with a view to minimising the amount of land disturbed at any one time. The final topography of any excavations, waste areas and dam sites should be shown on maps at a suitable scale.

The strategies and methods presented for progressive and final rehabilitation of disturbed areas should demonstrate compliance with the objectives of the Environmental Management Policy for Mining in Queensland (1991), and the EPA's A Policy Framework to Encourage Progressive Rehabilitation of Large Mines (2004), or with updated versions of that policy available at the time of drafting the EIS. Land suitability assessment should follow the technical guidelines for the Environmental Management of Exploration and Mining in Queensland (1995). In particular, the strategies and methods should have the following objectives:

- Mining and rehabilitation should aim to create a landform with land use capability and/or suitability similar to that prior to disturbance unless other beneficial land uses are pre-determined and agreed.

- Mine wastes and disturbed land should be rehabilitated to a condition that is self-sustaining, or to a condition where the maintenance requirements are consistent with an agreed post-mining land use.
- Surface and ground waters that leave the lease should not be degraded to a significant extent. Current and future water quality should be maintained at levels that are acceptable for users downstream of the site.

The means of decommissioning 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. Information should be provided regarding decommissioning and rehabilitation of the plant site, removal of processing plant, rehabilitation of concrete footings and foundations, hardstand areas, storage tanks and wharfage (including any potential for reuse of these facilities). Options and methods for the disposal of wastes from the demolition of plant and buildings should be discussed in sufficient detail for their feasibility and suitability to be established.

Proposals to divert creeks during operations, and, if applicable, for the reinstatement of the creeks after operations have ceased, should be provided. In this case, hydrological processes should be restored as far as possible to resemble those which occurred prior to mining. 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.

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed.

Detail of the impacts of the preferred rehabilitation strategy should be discussed in the appropriate subsections of section 3—Environmental values and management of impacts, particularly with regard to such issues as final landform stability, rehabilitation of flora and the long-term quality of water in any final voids. Implications for the long-term use and fate of the site should also be addressed, particularly with regard to the on-site disposal of waste and the site's inclusion on the environmental management register or contaminated land register.

Future land tenure arrangements post decommissioning of the project should be discussed.

2.6 Associated infrastructure

This section should detail requirements for new infrastructure or the upgrading/ relocating of existing infrastructure to service the project. Matters to be considered include workforce accommodation, transportation, water supply, energy supply, telecommunications, stormwater and sewerage.

2.6.1 Workforce and accommodation

This section should describe the number of personnel to be employed, the skills' base of the required workforce and the likely sources (i.e. local, regional or overseas) for the workforce during the construction and operational phases for each component of the project. The estimated number of people to be employed during construction and operations and arrangements for their transport to and from the project areas, including the proposed use of regional or charter air services should be provided.

Reference should be made to the expected cumulative impacts on local workforce and accommodation needs the project would have in relation to other major projects, which are currently occurring or planned for the region. This information should also include the timing of employees travelling from larger urban centres, detailing likely routes on the state-controlled and local government road networks.

Estimates should be provided according to occupational groupings and variations in the workforce numbers for the duration of the project. The information should show anticipated peaks in worker numbers during the construction period.

The EIS should provide an outline of recruitment schedules and policies for recruitment of local indigenous and non-indigenous workers, and non-local workers.

This section should also discuss an accommodation strategy for the construction workforce that addresses the estimated housing needs of both single and accompanied construction workers. This should include details of the size, location and management of any temporary worker accommodation that will be required either on-site or off-site. Maps should be included as necessary to illustrate the site and should include the location of any proposed construction workers' accommodation on-site or in the vicinity of the project. The strategy should also include details of the operational workforce and how such accommodation is proposed to be supplied.

If camp sites are to be used to accommodate the workforce, details on the number, location (shown on a map), proximity to the construction site and typical facilities for these sites should be provided. Information should include data relating to facilities for:

- food preparation and storage
- licensed premises or alcohol storage facilities
- ablution facilities
- vector and vermin control
- fire safety
- dust and noise control in relation to proximity of camp site to the construction area
- the service personnel required to maintain the camp and the supply of services to each construction camp including visiting police and emergency services to deal with major incidents or investigations
- any local government approvals required for establishment and operation of such camps should be outlined.

2.6.2 Transport

This sub-section should describe arrangements for the transport of plant, equipment, products, wastes and personnel during both the construction phase and operational phases of the project. The description should address the use of existing local and regional facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure (e.g. road, ports, airstrips, barge and ferry facilities etc.).

Full details of transport volumes, modes and routes available in both the wet and dry seasonsalong with the assessment of transport impacts on existing infrastructure and impact mitigation measures should be provided in accordance with section 3.9.

2.6.3 Water supply and storage

The EIS should provide information on water usage by the project, including the quality and quantity of all water supplied to project sites. In particular, the proposed and optional sources of water supply should be described (e.g. artesian and non-artesian bores, any surface storages, municipal water supply pipelines). If infrastructure is required for the purpose of supplying water to the project, for example, pipelines from water supplies to the project, then the impacts of such infrastructure are to be assessed as part of the project and discussed at each of the relevant sub-sections in section 3.

Estimated rates of supply from each source (average and maximum rates) should be given along with estimates of demand from each source and an overall water balance presented. Any proposed water conservation and management measures should be described. Any proposed recycling measures should be fully described, including necessary storage and other infrastructure and estimated concentrations of potential contaminants in operational storages to enable hazard and risk assessments of those structures.

Determination of potable water demand should be made for the project, including the temporary demands during the construction period. Details should be provided of any existing town water supply to meet such requirements. If water storage and treatment is proposed on site, for use by the site workforce, then this should be described.

2.6.4 Stormwater drainage

A description should be provided of the proposed stormwater drainage system and the proposed disposal and/or re-use arrangements, including any off-site services and downstream impacts. Each element of the project needs to be addressed (e.g. mine, beneficiation and product handling) Further details should be provided in section 3.4.

2.6.5 Sewerage

This section should describe, in general terms, the sewerage infrastructure required to service each project component. Volume estimates of existing and likely industrial and domestic effluent that will be produced should be provided and the proposed method of disposal identified. This should include the expected physical and chemical characteristics of such effluent. Further details should be provided in section 3.8.

2.6.6 Energy

The EIS should describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the project. The locations of any easements should be shown on an appropriate plan.

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

Any proposed power station should be described, including type of equipment, fuel use and expected emissions to air.

2.6.7 Telecommunications

The EIS should describe the telecommunications proposed for the project and any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc). Infrastructure owners need to be identified.

3 Environmental values and management of impacts

The functions of this section of the EIS are to:

- Describe the existing environmental values of the area which may be affected by the project. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS.
- Describe the potential adverse and beneficial impacts of the project on the identified environmental values. Any likely environmental harm to the environmental values should be described.
- Describe any cumulative impacts on environmental values caused by the project, either in isolation or by combination with other known existing or planned sources of impact.
- Present environmental protection objectives and the standards and measurable indicators to be achieved.
- Describe the control strategies, proposed actions and technologies to be implemented for managing impacts to achieve the stated objectives and standards. Where relevant, alternative techniques to control and manage impacts to the nominated objectives should be discussed.
- Describe any likely residual environmental harm on environmental values, why it cannot be avoided and discuss potential offsets in accordance with Queensland Government specific-issue offsets policies.

This section should detail the environmental protection measures incorporated in the planning, construction, operations, decommissioning, rehabilitation and associated works for each component of the project. Measures should prevent, or where prevention is not possible, minimise environmental harm and maximise socio-economic and environmental benefits of the project. Preferred measures should be identified and described in more detail than other alternatives.

The EIS should describe any computational models used to make predictions of impacts and/or outcomes of mitigation measures. The description should address the inputs, assumptions, limitations, sensitivities, accuracy and precision of the models.

This section should address all elements of the environment such as land, freshwater, marine waters, coast, air, noise, nature conservation, cultural heritage, social and community, economy, waste, health and safety, hazards and risk, in a way that is comprehensive and clear.

It is recommended that the EIS follow the heading structure shown below. The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the environmental management plan (EMP) for the project (see section 8).

3.1 Climate and climate change adaptation

3.1.1 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 management of the project. Historic weather patterns in the project area and seasonal conditions (e.g. cyclones, thunderstorms, floods and storms) that may influence timing and/or construction methods should be discussed, including how this would be managed. Extremes of climate (e.g. droughts, floods, etc) should be discussed with particular reference to water management at the project site.

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion should be addressed in section 3.2. The impacts of storm events on the capacity of waste containment systems (e.g. site bunding / stormwater management and tailings dams) should be addressed in section 3.4 with regard to contamination of waterways and in section 3.8 with regard to the design of the waste containment systems. The impacts of winds, rain, humidity and temperature inversions on air quality should be addressed in section 3.6.

3.1.2 Climate change adaptation

The implications of climate change on the project's environmental and commercial feasibility should be assessed in detail.

Impacts of climate change risks and adaptation measures should include the following:

- analyse risks to the project from climate change impacts (e.g. increased risk and severity of flood; increased vulnerability to more intense bushfires, sea level rise etc
- identify adaptation measures to minimise risk to the project from climate change impacts, particularly where there may be a significant impact to human safety or property.

3.2 Land

This section should describe the existing environmental values of the land area that may be affected by the project. It should also define and describe the objectives and practical measures for protecting or enhancing land-based 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.

3.2.1 Topography and geomorphology

3.2.1.1 Description of environmental values

Maps based on latitudes and longitudes using the Geocentric Datum of Australia (GDA94) should be provided locating the project in both regional and local contexts. The topography of the project site should be detailed with contours at suitable

increments, shown with respect to Australian Height Datum. Commentary on the maps should be provided highlighting the significant topographical features.

The environmental values of the cultural landscapes of the affected area, in terms of the physical and cultural integrity of the area, should be described.

3.2.1.2 Potential impacts and mitigation measures

The potential impacts of the landscape character of the project site and the surrounding area should be described. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, such as due to spoil dumps, excavated voids and broad-scale clearing.

Details should be provided of measures to be undertaken to mitigate or avoid the identified impacts.

3.2.2 Geology

3.2.2.1 Description of environmental values

The EIS should provide a description, map and a series of cross-sections of the geology of the project area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. The general suitability of the mine site overburden material for road building (or other productive use) should be discussed briefly.

Geological properties of all project sites which may influence stability, occupational health and safety, rehabilitation programs, or the quality of waste water leaving any area disturbed by the project should be described.

Investigations into the physical, geo-mechanical and chemical properties of waste rock in both fresh and weathered forms needs to be determined for slope stability, rehabilitation and possible acid generation for waste rock dump design.

This section should also consider the geology underlying the proposed infrastructure corridors for bauxite transport, electricity easements, pipeline easements and any off-mine infrastructure. Of particular interest are any other mineral resources that may be impacted or sterilised by the infrastructure.

The EIS should provide a summary of the results of studies and surveys undertaken to identify and delineate the bauxite mineral resources within the project area (including any areas underlying related infrastructure).

The location, tonnage and quality of the bauxite resources within the project area should be described in detail and include the modifying factors and assumptions made in arriving at the estimates The resources should be estimated and reported in accordance with the Australasian code for reporting of mineral resources and ore reserves (the JORC Code available at www.jorc.org/main.php) and the principles outlined in the Australia guidelines for the estimating and reporting of inventory bauxite reserves as appropriate.

3.2.2.2 Potential impacts and mitigation measures

The EIS should analyse the effectiveness of the mining proposal in achieving the optimum utilisation of the bauxite resources within the project area and consider its impacts on other resources. It should demonstrate that the mining proposal will ‘best develop’ the bauxite resources, minimise resource wastage and avoid any unnecessary sterilisation or loss of these or any other of the state’s coal, mineral, and

petroleum (including gas and coal seam methane) resources that may be impacted upon or sterilised by the mining activities or related infrastructure.

3.2.3 Soils

3.2.3.1 Description of environmental values

A soil survey of the sites affected by the project should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the land. Information should also be provided on soil stability, suitability for construction of proposed facilities and any approved soil conservation plans.

Soil profiles should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (McDonald et al, 1990) and Australian Soil Classification (Isbell, 1996). An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the Planning Guidelines: The Identification of Good Quality Agricultural Land (DPI & DHLGP, 1993), and the State Planning Policy 1/92: Development and the Conservation of Agricultural Land (DME, 1995).

The requirement for soils mapping in terms of area and mapping scale should follow the Queensland Department of Mines and Energy: Technical Guidelines for Environmental Management of Exploration and Mining in Queensland (1995). These guidelines recommend that disturbed areas be mapped more intensively than non-disturbed areas and provide guidance on acceptable mapping scale and site intensity.

Acid sulphate soil (ASS) investigations are required to meet State Planning Policy 2/02, Planning and Managing Development involving ASS where the proposed development would trigger one of the criterion listed in section 2.3 of that policy. All investigations should be conducted in accordance with the SPP2/02 guideline and the Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998. Where disturbance to ASS is unavoidable, an ASS Management Plan should be prepared in accordance with the Queensland Acid Sulfate Soil Technical Manual – Soil Management Guidelines.

3.2.3.2 Potential impacts and mitigation measures

Possible erosion rates and management techniques should be described for all permanent and temporary landforms. The erosion potential (wind and water) and erosion management techniques should be outlined for each soil type identified. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during monitoring, should also be outlined. Mitigation strategies should be developed to achieve acceptable soil loss rates, levels of sediment in rainfall runoff and wind-generated dust concentrations.

The EIS should include an assessment of likely erosion effects for all disturbed areas such as:

- areas cleared of vegetation
- waste dumps
- stockpiles
- dams, banks and creek crossings

- the port area and surrounding buildings
- the mine site, including buildings
- access roads or other transport corridors
- areas under rehabilitation.

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, and preventing significant degradation of local waterways by suspended solids.

Consideration should be given to the amendment or revocation of any approved soil conservation plans as a result of project activities.

3.2.4 Land use and tenure

3.2.4.1 Description of environmental values

The EIS should provide a description of current land tenures, current land uses and identify the areas covered by Native Title claims in all project and relevant adjacent areas, with particular mention of land with special purposes. Additional land tenures required for the project should also be listed.

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 on maps of a suitable scale. Locations of gas and water pipelines, power lines and any other easements should be indicated. The environmental values affected by this infrastructure should be described.

Maps at suitable scales showing existing land uses, tenures and infrastructure such as roads, railways, stock routes, pipelines, electricity and the like, should be provided at the project component locations, as well as the 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 project. The location of existing dwellings and the zoning of all affected lands according to any existing town or strategic plan, or port land use plan should be included.

The land use suitability of the affected area in terms of the physical and economic attributes should be described. The assessment should set out soil and landform subclasses assigned to soil mapping units in order to derive land suitability classes. The limitations and land suitability classification system to use is that in Attachment 2 of Land Suitability Assessment Techniques in the Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995).

A land suitability map of the proposed and adjacent area should be provided, setting out land suitability and current land uses, e.g. for grazing of native and improved pastures and horticulture. Land classified as ‘good quality agricultural land’ in the Department of Natural Resources’ land classification system should be shown in accordance with the planning guideline, The Identification of Good Quality Agricultural Land, which supports State Planning Policy 1/92.

3.2.4.2 Potential impacts and mitigation measures

The potential for the construction and operation of the project to change existing and potential land uses of the project site and adjacent areas should be detailed. Consideration should be given to impacts arising from property disruption and severance, construction and maintenance. Post operations land use options should be

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

The potential environmental harm caused by the project on the adjacent areas currently used for agriculture, urban development, recreation, tourism or other business and the implications of the project for future developments in the impact area including constraints on surrounding land uses should be described. If the development adjoins or potentially impacts on good quality agricultural land, then an assessment of the potential for land use conflict is required. Investigations should follow the procedures set out in the planning guideline, The Identification of Good Quality Agricultural Land, which supports State Planning Policy 1/92.

Incompatible land uses, whether existing or potential, adjacent to all aspects of the project, including 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.

3.2.5 Landscape character and visual amenity

3.2.5.1 Description of environmental values

This section should describe in general terms the existing character of the landscape that will be affected by the project. It should comment on any changes that have already been made to the natural landscape since European settlement. It should describe the general impression of the landscape that would be obtained while travelling through and around it.

This section should also describe existing landscape features, panoramas and views that have, or could be expected to have, value to the community whether of local, regional, state-wide, national or international significance. Information in the form of maps, sections, elevations and photographs should be used, particularly where addressing the following issues:

- identification of elements within the proposal and surrounding area that contribute to their image of the town/city as discussed in the any local government strategic plan—city image and townscape objectives and associated maps
- major views, existing viewing outlooks, ridgelines and other features contributing to the amenity of the area
- focal points, landmarks (built form or topography), gateways associated with project site and immediate surrounding areas, waterways, and other features contributing to the visual quality of the area and the project site
- character of the local and surrounding areas including character of built form (scale, form, materials and colours) and vegetation (natural and cultural vegetation) directional signage and land use
- identification of the areas of the proposal that have the capacity to absorb land use changes without detriment to the existing visual quality and landscape character
- the value of existing vegetation as a visual screen.

3.2.5.2 Potential impacts and mitigation measures

The potential impacts of the project landscape character of the site and the surrounding area should be described. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, such as due to spoil dumps, excavated voids and broad-scale clearing. Details should be provided of measures to be undertaken to mitigate or avoid the identified impacts.

This section should analyse and discuss the visual impact of the project on particular panoramas and outlooks. It should be written in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, from road, cycle and walkways and other known vantage points day and night, during all stages of the project as it relates to the surrounding landscape. The assessment is to address the visual impacts of the project structures and associated infrastructure, using appropriate simulation. Sketches, diagrams, computer imaging and photos are to be used where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations.

Special consideration is to be given to public roads, public thoroughfares, and places of residence or work, which are within the line-of-sight of the project.

Details of the design and colour of any major structures, buildings or fixed plant and all proposed screenings either vegetative or material should be described and discussed where relevant to the minimisation of the visual impacts of the project. Where plantings for screening or landscaping are proposed, details should be provided of the species that will be used, and their likely provenance. Preference should be given to species native to the area.

The obstruction of sunlight due to the construction of buildings or alteration of landforms should be considered, as well as major illumination or reflection impacts on adjacent properties or roads.

Detail should be provided of all management options to be implemented and how these will mitigate or avoid the identified impacts.

Management of the lighting of the project, during all stages, is to be provided, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid:

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

3.2.6 Land contamination

3.2.6.1 Description of environmental values

This section should discuss the potential for land contamination within the project area from existing and past uses, based on known land use history and the nature and concentrations of any contaminants. The review should identify land within the proposed mine, associated infrastructure corridors and any other areas affected by the proposed works, which has been used, or is being used, for a Notifiable Activity as listed in Schedule 2 of the EP Act, or is potentially contaminated, or is on the environmental management register or contaminated land register.

The EIS should include a preliminary site investigation for all properties that have been impacted by existing and past land uses that could have resulted in land contamination.

3.2.6.2 Potential impacts and mitigation measures

The EIS should discuss the management of any contaminated land and potential for contamination from construction, commissioning and operation, in accordance with EPA's Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (1998) and the National Environment Protection (Assessment of Site Contamination) Measure 1999.

The EIS should also describe the possible contamination of land from aspects of the project, including waste, saline water from coal seam gas extraction used for dust suppression, reject bauxite, overburden, bauxite washing plant and spills at chemical and fuel storage and handling areas.

This section should describe strategies and methods to be used to prevent and manage any land contamination resulting from the project, including the management of any acid generation or saline impacts from the mining activities and the management of chemicals and fuels to prevent spills or leaks.

3.2.7 Land disturbance

3.2.7.1 Potential impacts and mitigation measures

The EIS should contain strategies aimed at minimising the amount of land disturbed at any one time. The strategic approach to progressive rehabilitation and final decommissioning should be described. The consistency of the approach with relevant guidelines and the results of recent research should be described.

Management of all dams, roads, rail, port, electricity and other infrastructure during construction, operation and decommissioning phases should be described in detail.

The methods to be used for the project, including backfilling, covering, re-contouring, topsoil handling and revegetation, should be described. Consideration should be given to the use of threatened plant species during any landscaping and revegetation.

Where creeks and waterways are proposed to be diverted, the impact on land use due to hydrology changes, both upstream and downstream, should be described.

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

Proposed decommissioning of project operations should be described in detail, including consolidation, revegetation, fencing, and monitoring. Discussion of any decommissioning works should address rehabilitation of concrete footings and foundations, hard stand areas and storage tanks (including any potential for reuse of these facilities). Reference should also be made to section 2.5.

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas. The topsoil management should also outline how soil from Good Quality Agricultural Land will be best utilised. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed. Erosion and sediment control measures should be described, particularly in relation to the management of sodic and saline overburden material.

3.3 Nature conservation

This section should describe the existing environmental values for nature conservation that may be affected by the project in terms of:

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

In assessing environmental values and impacts, regard should be given to the regional, national and international environmental significance of the Cape York Peninsula.

3.3.1 Sensitive environmental areas

3.3.1.1 Description of environmental values

The EIS should identify areas that are environmentally sensitive in proximity to the project. Environmentally sensitive areas should also include areas classified as having national, state, regional or local biodiversity significance, or flagged as important for their integrated biodiversity values. Consideration should be given to nature refuges, national parks, conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, declared wild rivers or rivers subject to a declaration proposal, heritage/historic areas or items relating to biodiversity, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, Japan-Australia Migratory Bird Agreement, China-Australia Migratory Bird Agreement, Republic of Korea-Australia Migratory Bird Agreement), areas of cultural significance relating to biodiversity and scientific reserves.

The proximity of the project to any environmentally sensitive areas should be shown on a map of suitable scale. Areas that would be regarded as sensitive with regard to flora and fauna have one or more of the following features:

- important habitats of species listed under the *Nature Conservation Act 1992* and/or the EPBC Act as ‘presumed extinct’, ‘critically endangered’, ‘endangered’, ‘vulnerable’ or ‘rare’
- regional ecosystems recognised by the EPA as ‘endangered’ or ‘of concern’ or ‘not of concern’ but where permits are no longer granted due to being at threshold levels, and/or ecosystems listed as ‘presumed extinct’, ‘critically endangered’, ‘endangered’ or ‘vulnerable’ under the EPBC Act
- ecosystems that provide important ecological functions, such as riparian vegetation, important buffer to a protected area, refugia or important habitat corridor between areas and wetlands
- protected areas which have been proclaimed under the *Nature Conservation Act 1992* or are under consideration for proclamation.

3.3.1.2 Potential impacts and mitigation measures

This section should discuss the following:

- the impact of the project on species, communities and habitats of local, regional or national significance
- proposals to mitigate impacts (e.g. timing of works, minimise width of disturbance, proposed rehabilitation of in-stream and floodplain disturbances)
- planned rehabilitation of vegetation communities and any relevant previous experience/experiments rehabilitating these communities
- offsets relating to residual impacts with regard to the Queensland Government specific-issues Environmental Offsets Policies, the Policy for Vegetation Management Offsets (NRW 2007)—refer to the Regional Vegetation Management Code for Western Bioregions, as well as the draft policy statement on the use of environmental offsets under the EPBC Act.

Potential impacts and associated mitigation measures should be discussed further under section 3.3.2 Terrestrial flora, and section 3.4 Water resources.

3.3.2 Terrestrial flora

3.3.2.1 Description of environmental values

The terrestrial vegetation communities within the affected areas should be described at an appropriate scale with mapping produced from aerial photographs and ground truthing, showing the following:

- location and extent of vegetation types including recognised regional ecosystem type descriptions and any areas of national, state or regional significance
- location of vegetation types of conservation significance
- vegetation map unit descriptions, including their relationship to regional ecosystems. Sensitive or important vegetation types should be highlighted and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types discussed
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected areas (e.g. national parks, conservation parks, resource reserves, nature refuges)
- any plant communities of cultural, commercial or recreational significance
- the distribution and abundance of significant exotic and weed species.

The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests. The assessment should also include a description of vegetation (including re-growth and restored areas in addition to remnant vegetation) to indicate any areas of state, regional or local significance.The description should also include, where relevant, MNES identified within the EPBC Act.

For each defined vegetation community likely to be impacted by the project, vegetation surveys should be undertaken at an appropriate number of sites, allowing for seasonal factors, as follows:

- all data requirements of the Queensland Herbarium CORVEG database should be collected

- appropriate minimum site sizes should be selected, observing recognised sampling approaches and to provide an adequate sample of surveyed communities
- a list of species present at each site should be recorded
- the relative abundance and community structure of plant species present should be recorded
- any plant species of conservation, cultural, commercial or recreational significance should be identified
- vegetation mapping and data should be submitted to the Queensland Herbarium to assist the updating of the CORVEG database
- 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.

The existence of rare or threatened species should be specifically addressed under sensitive areas. Any special landscape values of natural vegetation communities should be described.

Existing information on plant species may be used instead of new survey work provided that the data are derived from surveys consistent with the above methodology and describe existing conditions. Methodology used for flora surveys should be specified in the appendices to the report. Any existing information should be revised and comments provided on whether the areas are degraded, cleared or affected in ways that would affect their environmental value.

The occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Pest and Stock Route Management) Act 2002* and weeds of national significance (WONS) should be shown on a map at an appropriate scale. A weed management strategy should be provided.

The location of any horticultural crops in the vicinity of the project area should be shown.

3.3.2.2 Potential impacts and mitigation measures

This section should discuss all foreseen direct and indirect effects on terrestrial flora and the potential level of environmental impact identified. Action plans for protecting rare or threatened species and vegetation types identified as having high conservation value should be described and any obligations imposed by state or federal government biodiversity protection legislation or policy should be discussed.

Construction and operation of the project involving clearing, salvaging or removal of vegetation should be described, and indirect impacts on vegetation not cleared should be discussed.

Impacts during construction and operation of the project should be assessed. The number of hectares of remnant vegetation proposed to be cleared (by conservation status and regional ecosystem type) for the mine and each proposed infrastructure component should be identified. These figures should be discussed in terms of the long-term sustainability of these ecosystems to remain in the landscape at a regional level. Short- and long-term durations should be considered.

Measures to mitigate the impacts of the project on vegetation types identified as having high conservation values, listed species and sensitive habitat or the inhibition of propagation should be described. This should also include the identification of

potential offset areas, in an 'offset strategy', consistent with Queensland Government specific-issues offsets policies, to compensate for any loss of vegetation.

With regard to the project area, this section should include:

- the significance of impacts at a local, catchment, bioregional, state or national levels
- impact on any plants of potential or recognised environmental or economic significance
- a discussion of the ability of identified stands of vegetation to withstand any increased pressure resulting from the project and measures proposed to mitigate impacts
- a description of the methods to ensure rapid rehabilitation of disturbed areas following construction, including the species chosen for revegetation which should be consistent with the surrounding associations. Details of any post construction monitoring programs and what benchmarks would be used for review of monitoring should be included. Consideration should be given to the establishment of reference sites (at least two for each ecosystem type being rehabilitated) that could be established and monitored to provide benchmarking for rehabilitation activities
- a plan to systematically check areas to be cleared over the projected 40 years of the mine life. A commitment to undertake ongoing flora surveys should be a component of the EMP
- a draft weed management plan in an EMP, to be developed and finalised in consultation with land protection officers from the Department of Primary Industries and Fisheries (DPIF) and local government environmental officers, to cover construction, rehabilitation and operation periods
- a description of the potential for the introduction and/or spread of weeds or plant disease, including:
  - identification of the origin of construction materials, machinery and equipment
  - vehicle inspection regime, which addresses the need for vehicle and machinery wash-down and any other hygiene protocols, including the requirement that all vehicles and equipment must be cleaned before starting the job and that these wash down areas contain water/soil away from creeks and gullies
  - staff/operator education programs
  - determination of the potential for the introduction of, or facilitation of, exotic, non-indigenous and noxious plants.

The above assessment should also include, where relevant, MNES identified within the EPBC Act.

3.3.3 Terrestrial fauna

3.3.3.1 Description of environmental values

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. Wildlife corridors and refugia should be identified and mapped.

The description of the fauna present or likely to be present in the area should include:

- species diversity (i.e. a species list) and indicative abundance of animals, including amphibians, birds, reptiles, mammals (including bats)
- any species that are poorly known but suspected of being rare or potentially threatened
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement
- the existence of feral or exotic animals, including maps of major pest infestations
- existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of protected area management plans)
- use of the area by migratory and nomadic birds in particular areas for breeding or significant congregations.

The EIS should contain results from surveys for species listed as threatened or migratory under the EPBC Act. Surveys should be conducted at the appropriate time of the year when the species is known to be present on the site, so that identification and location of these species is optimal.

Methodology used for fauna surveys should be specified in the appendices to the report. The EIS should indicate how well any affected significant communities and species are represented and protected elsewhere in the region where the site of the project occurs. Relevant site data should be provided to the EPA in a format compatible with EPA WildNet database for listed threatened species.

3.3.3.2 Potential impacts and mitigation measures

This section should discuss all foreseen direct and indirect effects on terrestrial fauna. Strategies for protecting rare or threatened species should be described, and any obligations imposed by state or federal government threatened species legislation or policy should be discussed.

Any recovery plans for potentially affected threatened species should be outlined, and strategies for complying with the objectives and management practices of relevant recovery plans should be described. Measures to mitigate the impact on habitat or the inhibition of normal movement, breeding or feeding patterns, and change to food chains should be described. Any provision for buffer zones and movement corridors, or special provisions for migratory or nomadic animals should be discussed.

With regard to terrestrial and riparian fauna, the assessment of potential impact should consider:

- impacts the project may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values, including:
  - direct and indirect impacts due to loss of range/habitat, food supply, nest sites, breeding/recruiting potential or movement corridors
  - cumulative effects of direct and indirect impacts
  - impacts on rare and threatened or otherwise noteworthy animal species
  - identification of the conservation importance of identified populations at the regional, state and national levels

- measures to minimise wildlife capture and mortality during construction and operation
- details of the methodologies that would be used to avoid injuries to livestock and native fauna as a result of the project's construction and operational works, and if accidental injuries should occur the methodologies to assess and handle injuries
- methods for minimising the introduction of feral animals, and other exotic fauna such as declared pest ant species (fire ants and yellow crazy ants)
- review of control measures to prevent increases in local populations and spread of biting insect species of pest and health significance associated with construction activities and disposal of construction wastes.

These would also include, where relevant, MNES identified within the EPBC Act.

3.3.4 Freshwater aquatic flora and fauna

3.3.4.1 Description of environmental values

The aquatic flora and fauna occurring in the areas affected by the project should be described, noting the patterns and distribution in the waterways. A description of the habitat requirements and the sensitivity of aquatic flora and fauna species to changes in flow regime, water levels and water quality in the project areas should be provided. The discussion of the fauna and flora present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians and aquatic invertebrates occurring in the waterways within the project area, including any feral and exotic fauna species
- aquatic (waterway) macrophytes including native and exotic/weed species
- wetlands listed by the EPA as areas of national, state or regional significance, and their values and importance
- a description of terrestrial species that are ecologically associated with wetlands or waterways and are likely to be affected by the project
- aquatic substrate and stream type.

These would also include, where relevant, MNES identified within the EPBC Act.

Wetlands should be mapped , described and analysed in a similar manner to that of regional ecosystems.

3.3.4.2 Potential impacts and mitigation measures

This section should discuss all foreseen direct and indirect effects on aquatic flora and fauna, including strategies for protecting rare or threatened species and any obligations, legislation or policies imposed by the state and federal governments. The discussion should include:

- measures to minimise wildlife injury and mortality during construction and operation
- details of the methodologies that would be used to avoid injuries to native fauna as a result of the project's construction and operational works, and if accidental injuries should occur the methodologies to assess and handle injuries
- details of measures to be used to maintain fish passage in creeks that will be affected

- methods for minimising the introduction of feral species, and other exotic fauna
- review of control measures to prevent increases in local populations and spread of biting insect species of pest and health significance associated with construction activities and disposal of construction wastes
- identification of necessary permits/authorities required by the project
- description of mitigation measures to prevent the creation of new mosquito and biting midge breeding sites during construction
- description of the potential for and mitigation measures to prevent the introduction, transfer or facilitation of exotic, non-indigenous and noxious plants and water borne insect pests.

3.3.5 Marine flora and fauna

3.3.5.1 Description of environmental values

Marine flora and fauna occurring in the areas affected by the proposal should be described noting the patterns and distribution in coastal waters and estuaries. The description of the fauna and flora present in the areas should include:

- fish species, mammals, reptiles and crustaceans occurring in marine waters, including pest species
- marine plants, including seagrass and mangroves
- benthic, rocky shore and reefal habitats
- habitat for commercial and recreational fisheries
- particular reference habitat of any rare or threatened species
- proximity to declared Fish Habitat Areas
- presence of marine mammals and marine turtle foraging areas and nesting areas in vicinity of the proposed port
- sea floor habitat and benthic macroinvertebrate communities in the vicinity of the spoil ground
- where relevant, MNES identified within the EPBC Act.

3.3.5.2 Potential impacts and mitigation measures

The potential impacts of the project on benthic habitat and marine fauna and flora, including sea grass beds, marine plants, other fish habitats and other rare or threatened species should be assessed. The EIS should also discuss the potential for damage to these ecosystems (including dependent faunal species). Mitigation methods to reduce impacts on identified environmental values should be outlined. Restoration of the disturbed area (especially where marine plants have been removed) should also be outlined.

The proponent should also identify and describe potential offsets, if required, for marine fish habitats and ecosystems in accordance with the Queensland Government Environmental Offsets Policy (QGEOP) and its specific issue policy, Fish Habitat Management Operational Policy (FHMOP005).

Vectors for an introduction of a marine pest, possible impacts of a marine pest incursion and proposed mitigation measures, should be discussed together with on-going monitoring for marine pests in the port and proposed response arrangements if a marine pest incursion occurs.

Assessments should include, where relevant, MNES identified within the EPBC Act.

3.4 Water resources

This section should describe the existing environment for water resources that may be affected by the project in the context of environmental values as defined in the Queensland water quality guidelines for region-specific parameter values, and such documents as the EP Act, Environmental Protection (Water) Policy 1997 (EPP (Water)) and the Australian and New Zealand Environment and Conservation Council, State of the Environment Reporting Taskforce 2000 (ANZECC 2000). The definition of waters in the EPP(Water) includes the bed and banks of waters, so this section should address impacts on benthic sediments as well as the water column.

Where a licence or permit will be required under *the Water Act 2000* to take or interfere with the flow of water, this section of the EIS should describe the amount of water to be taken and the details of the works to be constructed, and impacts of the works. Works that may require a dam failure impact assessment under the Water Act should be described. Similarly, waterway barrier works may need approval under the *Fisheries Act 1994*, and if so should be addressed in the EIS.

3.4.1 Surface water and watercourses

3.4.1.1 Description of environmental values

A description should be given of the surface watercourses and their quality and quantity in the area affected by the project with an outline of the significance of these waters to the river catchment system in which they occur. Details provided should include a description of existing surface drainage patterns and existing and historical flow regimes in major streams and wetlands. Details should also be provided of the likelihood of flooding, history of flooding including extent, levels and frequency, and a description of present and potential water uses downstream of the areas affected by the project. Flood studies should include a range of annual exceedance probabilities for affected waterways, based on observed data if available or use appropriate modelling techniques and conservative assumptions if there are no suitable observations. The flood modelling should include local flooding due to short duration events from contributing catchments on site, as well as larger scale regional flooding including waterways downstream.

The EIS should provide a description, with photographic evidence of the geomorphic condition of any watercourses likely to be affected by disturbance or stream diversion. The results of this description should form the basis for the planning and subsequent monitoring of rehabilitation of the watercourses during or after the operation of the proposal.

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the proposal. The basis for this assessment should be a monitoring program, with sampling stations located upstream and downstream of the proposal. Complementary stream-flow data should also be obtained from historical records (if available) to aid in interpretation.

The water quality should be described, including seasonal variations or variations with flow where applicable. A relevant range of physical, chemical and biological parameters should be measured to gauge the environmental harm on any affected creek or wetland system.

The EIS should describe the environmental values of the surface waterways of the affected area in terms of:

- values identified in the EPP(Water)
- sustainability, including both quality and quantity
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form
- any water resource plans, land and water management plans, declared or nominated wild river areas relevant to the affected catchment.

3.4.1.2 Potential impacts and mitigation measures

The water management systems for all project elements should be described, addressing surface water quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby surface water should be discussed, along with any proposal for the diversion of affected creeks during mining, and the stabilisation of those works.

Where it is proposed to divert creeks during construction or operations, provision should be made for either the reinstatement of the creeks or decommissioning and rehabilitation, such that the long-term risk of environmental harm, due to regional and local flooding, is no greater than that prior to mining. Fish passage and access to fish habitats needs to be addressed where creeks and waterways are to be diverted.

Analysis of potential impacts of the diversion of affected creeks on existing and proposed relocated roads should also be carried out. This analysis should identify any likely inundation and duration, as this may affect emergency vehicle access.

Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the project. Monitoring programs should also be designed to evaluate changes in the physical integrity and geomorphic processes associated with stream diversions.

If on-site storage of water sourced from waste water treatment plants is proposed, the EIS should detail how this water would be managed to ensure environmental harm is avoided. The EIS should also describe the design features of any such storages to effectively contain saline water and other harmful constituents.

Key water management strategy objectives include:

- maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses and environmental values of those waters (including maintenance of aquatic ecosystems) in accordance with EPP (Water)
- protection of the integrity of the marine environment
- maintenance or replication of the existing geomorphic conditions of local watercourses
- minimisation of impacts on flooding levels and frequencies both upstream and downstream of the project.

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

The potential environmental harm to the flow and the quality of surface waters from all phases of the proposal should be discussed, with particular reference to their suitability

for the current and potential downstream uses, including the requirements of any affected riparian area, wetland, estuary, littoral zone, and any marine and in-stream biological uses. The impacts of surface water flow on existing infrastructure should be considered with reference to the EPP (Water) and *Water Act 2000*

The EIS should describe the proposed mine stormwater drainage system and the proposed disposal arrangements, including any off-site services and downstream impacts. Options for storage and/or disposal of surplus groundwater (if applicable) should be discussed, including the beneficial and adverse impacts of each option. Licensing requirements for each option should be identified.

Where dams, weirs, voids or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of the containing walls, and the quality of water contained, and flows and quality of water discharged.

A dam failure impact assessment should be carried out for any proposed dams that, due to their size, trigger the need for such an assessment under the *Water Act 2000*. Any dams that are likely to be referrable under the *Water Act 2000* should be noted and emergency response procedures incorporated into the project's environmental management plan (EMP).

The need, or otherwise, for licensing of any dams (including referable dams) or creek diversions, under the *Water Act 2000*, should be discussed. The process for water allocation and water discharge should be established in consultation with the EPA and NRW. Consideration should also be given to any water allocation and management plans.

Hydrologic/hydraulic studies should be undertaken to estimate the impacts on operational water storages, drainage and containment systems from local and regional storm events of relevant annual exceedance probability (AEP), in accordance with EPA guidelines, commensurate with hazards associated with failure scenarios.

Consideration should be given to the potential impacts of the project on floodplain hydrology (including changes to flooding characteristics), existing land use and infrastructure and the integrity of any watercourses. Minimising risk to life and property and the protection of water (flood harvesting) entitlements are also issues that should be addressed. Potential impacts to the natural environment from stream diversions should also be discussed.

The environmental values of the surface waters potentially affected by the project should be identified in accordance with the EPP (Water). Surface water quality objectives should be determined after consideration of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (NWQMS 4, 2000).

Risks to farmland from potentially contaminated surface water flow, particularly during flood events and/or failure of levee banks, should be assessed.

Options for flood mitigation and the effectiveness of mitigation measures should be discussed with particular reference to sediment, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna. Proposals for maintenance of flood levees post-mining should be discussed.

3.4.2 Groundwater

3.4.2.1 Description of environmental values

The EIS should review the quality, quantity and significance of artesian and non-artesian groundwater resources within the project area. The review should include a

survey of existing groundwater supply facilities (bores, wells, or excavations). The information to be gathered for analysis should include:

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

A network of observation points which would satisfactorily monitor groundwater resources both before and after commencement of operations should be developed.

This section should include reference to:

- Nature of the aquifer(s):
  - geology/stratigraphy—such as alluvium, volcanic, metamorphic
  - aquifer type—such as confined, unconfined
  - depth to and thickness of the aquifers
- Hydrology of the aquifer(s):
  - 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
  - vulnerability to pollution.

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

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

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

3.4.2.2 Potential impacts and mitigation measures

The EIS should include an assessment of the potential environmental impact caused by the project (and its associated project components) to local groundwater resources, including the potential for groundwater induced salinity.

The impact assessment should define the extent of the area 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 these effects. The response of the groundwater resource to the progression and finally cessation of the proposal should be described.

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.

Any potential for the project to impact on groundwater dependent ecosystems should be assessed and described. Avoidance and mitigation measures should be described.

The proponent should address potential impacts of surface water storage volumes on groundwater pressure and levels in relation to the sea/freshwater interface and associated ecology of wetlands.

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

3.5 Coastal environment

This section should describe the existing coastal environment, which may be affected by the project in the context of coastal values identified in State of the Coastal Zone Reports and environmental values as defined by the EP Act and environmental protection policies.

This section should also identify actions associated with the project that are assessable development within the coastal zone and will require assessment under the provisions of the *Coastal Protection and Management Act 1995.*

3.5.1 Marine water and sediment

3.5.1.1 Description of environmental values

Information should be provided on water quality in the sea and in estuaries below the limit of tidal influence, including salinity, heavy metals, acidity, turbidity and oil in water. Interaction of freshwater flows with marine waters, its significance in relation to marine flora and fauna in and adjacent to the port area, should be discussed.

Environmental values of the coastal seas of the affected area should be described, as relevant, in terms of:

- values identified in the EPP (Water)
- the state coastal management plan and any regional coastal plan

An assessment of physical and chemical characteristics of sediments should be provided for:

- the area to be dredged
- if offshore disposal is proposed, the disposal location for dredged material.

Any contaminants and implications for management of the dredged material should be described. The description of sediment characteristics should be based on the results of sediment sampling and analysis conducted as per a sampling and analysis plan (SAP) approved under the *Environment Protection (Sea Dumping) Act 1981*.

The chemical and physical characteristics of the material to be dredged, the spoil ground and control sites should be summarised. If the material is to be disposed in an offshore area, a statement as to the suitability of the sediment for unconfined ocean disposal should be made using the framework within the National Ocean Disposal Guidelines for Dredged Material (DEWHA 2002).

3.5.1.2 Potential impacts and mitigation measures

This section defines and describes the water quality objectives and practical measures for protecting or enhancing coastal environmental values, to describe how nominated

quantitative standards and indicators may be achieved, and how the achievement of the water quality objectives will be monitored, audited and managed.

Describe the water quality objectives used (including how they were developed), and how predicted activities will meet these objectives (refer to the EPA's Queensland water quality guidelines and the Australian and New Zealand guidelines for fresh and marine water quality, ANZECC, 2000).

The potential environmental harm caused by the project on coastal resources and processes should be described in the context of controlling such effects. The State Planning Policy—Planning and Managing Development involving Acid Sulfate Soils 2002 should be addressed as should the State Coastal Management Plan 2001 and DPIF Guidelines for Marine Areas.

The role of buffer zones in sustaining fisheries resources through maintaining connectivity between coastal and riparian vegetation and estuarine and freshwater reaches of catchments should be discussed.

Impacts on water quality due to increased water turbidity and other contaminants from the sediment due to dredging and sea disposal of material, if required, should be addressed and strategies developed to address potential impacts.

In addition to the above considerations, the following guidelines and standards should be considered:

- the EPP (Water), and any recent or proposed amendments that incorporate recommendations of the National Environment Protection Measures
- ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters (2000)
- amelioration or mitigation measures to address each activity identified to impact on local and regional water quality
- any monitoring of water quality recommended during the dredging activities to ensure environmental values are protected.

The potential impacts of sediment quality on the marine environment should be discussed. This assessment should be guided by the suitability of the sediment for ocean disposal as determined by the framework outlined in the National Ocean Disposal Guidelines for Dredged Material (DEWHA 2002).

3.5.2 Coastal processes

3.5.2.1 Description of environmental values

Describe the physical processes of the adjacent marine environment, including but not limited to currents, tides, storm surges, freshwater flows and their interaction in relation to the assimilation and transport of potential pollutants entering marine waters from the project area .

Describe the environmental values of the coastal resources of the affected area in terms of the physical integrity and morphology of landforms created or modified by coastal processes. Assessment should be based on hydrodynamic investigations and include a description of:

- the physical properties of the sediments likely to be dredged
- sediment dynamics at the off-shore disposal ground based on the influence of tides, waves, currents and turbidity.

The relationship of these processes to marine flora and fauna and biological processes within the study area should also be discussed. The relationship between currents, wave actions and extreme events (such as cyclones) and how they influence coastal processes should be discussed.

3.5.2.2 Potential impacts and mitigation measures

The impacts of development of the berth area on hydrodynamic processes within the port study area should be described. In particular, impacts on siltation and any implications for marine flora and fauna and/or biological processes should be discussed, including generation and migration of turbid plumes. Information on currents in the region should be used to predict impacts and these impacts on marine environmental values should be assessed.

3.6 Air quality

3.6.1 Description of environmental values

This section of the EIS should describe the existing air quality that may be affected by the project in the context of environmental values as defined by the EP Act and EPP (Air).

Ambient air quality conditions in terms of particulate matter and any other major constituent of the air environment that may be affected by the proposal should be described for any sensitive localities such as residences. These descriptions should include any baseline monitoring results.

3.6.2 Potential impacts and mitigation measures

The following air quality issues and their mitigation should be considered:

- quality and quantity of air emissions within the project area expected during construction and operational activities
- impacts of dust generation from construction activities (including blasting, excavation and extraction), especially in areas where construction activities are adjacent existing road networks or are in close proximity to sensitive receivers
- identification of climatic patterns that could affect dust generation and movement
- impact on terrestrial flora and fauna
- predicted changes to existing air quality from operational activities including mining, processing, stockpiling and loading of bauxite, dust generation along haulage roads, vehicle emissions, electricity generation and shipping
- impacts on air quality from gaseous emissions including greenhouse gas emissions and ozone depleting substances
- the human health risk associated with emissions from the project of all hazardous or toxic pollutants, whether they are or are not covered by the National Environmental Protection Council (Ambient Air Quality) Measure or the EPP (Air) that may reasonably be expected to impact human health.

3.6.3 Greenhouse gas emissions and abatement

This sub-section of the EIS should:

- provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO_2 equivalent' terms
- estimate emissions from upstream activities associated with the proposed project, including fossil fuel based electricity consumed
- briefly describe the method(s) by which estimates were made.

Greenhouse gas abatement measures should be proposed, assessed and include:

- a description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from activities of the project, including such activities as transportation of products and consumables, and energy use by the project
- an assessment of how the preferred measures minimise emissions and achieve energy efficiency
- a comparison between preferred measures for emission controls and energy consumption with best practice environmental management in the relevant sector of industry
- a description of any opportunities for further offsetting greenhouse gas emissions through indirect means.

The environmental management plan in the EIS should include a specific module to address greenhouse abatement. That module should include consideration of the following:

- commitments to the abatement of greenhouse gas emissions from the project with details of the intended objectives, measures and performance standards to avoid, minimise and control emissions
- commitments to energy management, including undertaking periodic energy audits with a view to progressively improving energy efficiency
- a process for regular review of new technologies to identify opportunities to reduce emissions and use energy efficiently, consistent with best practice environmental management
- any voluntary initiatives such as projects undertaken as a component of the national Greenhouse Challenge Plus program, or research into reducing the lifecycle and embodied energy carbon intensity of the project's processes or products
- opportunities for offsetting greenhouse emissions, including, if appropriate, carbon sequestration and renewable energy uses
- commitments to monitor, audit and report on greenhouse emissions from all relevant activities and the success of offset measures.

3.7 Noise and vibration

3.7.1 Description of environmental values

This section should describe the existing environmental values that may be affected by noise and vibration from project activities.

If the proposed activity could adversely impact on the noise environment, baseline monitoring should be undertaken at a selection of sensitive receptors affected by the proposal. Sensitive receptors are defined in the Environmental Protection (Noise) Policy 2008 (EPP(Noise)). Long-term measured background noise levels should take into account seasonal variations. The locations of sensitive sites should be identified on a map at a suitable scale. 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 receptors should be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the night. Monitoring methods should adhere to accepted best practice methodologies, relevant EPA guidelines and Australian standards, and any relevant requirements of the EPP (Noise).

Comment should be provided on any current activities near the project area that may cause a background level of ground vibration (for example: major roads, quarrying activities, etc.).

3.7.2 Potential impacts and mitigation measures

The need or otherwise for noise modelling should take into account the distance of relevant project sources of noise from neighbouring sensitive receptors such as residential and commercial developments believed to be sensitive to the effects of noise. Noise from mining, beneficiation and power generation components of the project should be modelled, where appropriate, using a suitable acoustic model covering the construction and operational phases.

The assessment of noise impacts, neighbouring sensitive receptors, should include matters raised in the document The health effects of environmental noise – other than hearing loss published by the enHealth Council, 2004 (or later editions), ISNB 0 642 82304 9.

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 and measurable indicators. Particular consideration should be given to emissions of low-frequency noise that is, noise with components below 200Hz.

The assessment should also include environmental impacts on terrestrial animals and avifauna, particularly migratory species. Proposed measures for the minimisation or elimination of impacts should be provided, including details and illustrations of any screening, lining, enclosing or bunding. A discussion should be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise. This description should also include temporary sensitive places, if applicable.

Information should be supplied on blasting which might cause ground vibration or fly rock on, or adjacent to, the site with particular attention given to places of work, residence, recreation, worship and general amenity. The magnitude, duration and frequency of any vibration should be discussed. A discussion should be provided of measures to prevent or minimise environmental nuisance and harm. Blasting noise and vibration limits are provided in the EP Act, section 440ZB Blasting. Reference should also be made to the EPA Guideline: Noise and vibration from blasting.

The assessment should also address off-site noise and vibration impacts that could arise due to increased road or other transportation directly resulting from the project.

Any potential for ground vibration effects on underground pipelines and telecommunication lines should be examined.

3.8 Waste

3.8.1 Waste generation

This section should provide technical details of waste generation, treatment, minimisation and management. All sources of waste to be generated during the construction, operational and decommissioning stages of the project should be identified and described in this section. Refer to each of the waste streams previously described and provide references to more detailed descriptions of the relevant environmental values in other sections of the EIS.

3.8.2 Waste management

The EIS should provide details of waste management strategies (including reduction, reuse, recycling, storage, transport and disposal of waste) 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 section should assess the potential impact of all wastes to be generated during the construction, operational and decommissioning stages of the project, and provide details of each waste in terms of:

- operational handling and fate of all wastes including storage
- 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 discharge/disposal criteria for liquid and solid wastes
- measures to ensure stability of any dumps and impoundments should be described
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or dumps should be given
- market demand for recyclable waste (where appropriate) should be addressed
- waste minimisation techniques processes proposed
- decommissioning of the site.

Having regard for best practice waste management strategies and the Environmental Protection (Waste) Policy 2000, the proposals for waste avoidance, reuse, recycling, treatment and disposal should be described in the appropriate sub-section below. Information should also be provided on the variability, composition and generation rates of all waste produced at the site and processing plant.

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 proposal. Measures to improve natural resource use efficiency (e.g. energy and water), integrated processing design, any co-generation

of power and by-product reuse as shown in a material/energy flow analysis should be presented.

This information is required to enable the resource management agencies and other stakeholders to assess the efficiency of resource use, and allocation issues.

- **Air emissions**—this section should provide information on air emissions, including particulates, fumes and odours, during the construction and operation stages of the project. Particulate emissions include those that would be produced by any industrial process, or disturbed by wind action on stockpiles and conveyors, or by transportation equipment (e.g. trucks, either by entrainment from the load or by passage on unsealed roads). The methods to be employed in the mitigation of impacts from air emissions should be described in the section 3.6 Air.
- **Excavated waste**—this section should describe and show the location, design and methods for constructing dumps for waste rock and subsoil. The location of the dumps should be shown on a map relative to topography and other natural features of the area.
- **Tailings**—this section should describe the tailings waste produced by preparation and/or processing plants and the proposed methods for its disposal. Describe alternative options for tailings disposal including the proposed location, site suitability and volume of any tailings storage and/or disposal site(s), including the method of construction.

  Describe the approximate quantity of tailings to be produced by the project and its processing plant annually for the life of the mine. Tailings characterisation information should also be presented in this section.

  The construction of the tailings storage facility should be described with regards to construction material and design. The EIS should address how the tailings storage facility complies with relevant codes for the construction of such containment systems.

  Describe the strategies to monitor and manage seepage into ground and surface waters. The location of the storage and/or disposal site with regard to adjacent creeks and rivers should be described.
- **Solid waste disposal**—describe the quantity and quality of solid wastes (other than waste rock, subsoil and tailings addressed in other sections) and the proposed methods of their disposal. The proposed location, site suitability, dimensions and volume of any landfill, including its method of construction, should be shown.
- **Liquid waste**—a description should be presented of the origin, quality and quantity of wastewater, sewerage, contaminated runoff and any immiscible liquid waste originating from the project other than that addressed in other sections. Particular attention should be given to the capacity of wastes to generate acid, and saline or sodic wastewater and the potential for this water to contain metals and metalloids.
- **Ship waste**—details should be provided on the management of ship waste, including:
  - handling, treatment and disposal of solid quarantine waste
  - ship's sewage
  - ship's washings and slops

Details of expected volumes of ballast water to be discharged in port, the source of the ballast, location of ship discharges, risk of introducing marine pests and proposed controls, including ballast water inspections, should all be specified. The management of ballast water and risk of introduced marine pests should be discussed in the context of Commonwealth requirements and systems.

3.9 Transport

3.9.1 Transport methods and routes

The assessment of transport impacts should be presented as separate sub-sections of the EIS, for each project-affected mode, as relevant (road, rail, air and sea). The assessment should provide sufficient information to allow an independent assessment to be made of how existing transport infrastructure will be affected by project transport at the local and regional level.

The EIS should detail:

- any proposed new or alterations to transport-related infrastructure required by the project (as distinct from impact mitigation works). This includes modifications to roads for access works and realignments, rail lines (including level crossings and services) and air and sea port facilities. The EIS should also include the construction of any project-related plant and utilities, within or impacting on the jurisdiction of any transport authority
- expected volumes/tonnage of project inputs and outputs of transported raw materials, wastes, hazardous goods, finished products and so on for all phases of the project
- how identified project inputs and outputs will be moved through the transport network (volume/tonnage, composition, trip timing and routes)
- traffic generated by workforce personnel including visitors (mode,volume, composition, timing and routes)
- likely heavy and oversize/indivisible loads (volume, composition, timing and routes) highlighting any vulnerable bridges and structures along proposed routes.

3.9.2 Potential impacts and mitigation measures

The impact assessment should include:

- details of assessment methodology adopted with a summary of consultation undertaken with transport authorities (for example, DMR, local government and Queensland Transport) regarding the scope of the impact assessment and methodology to be used
- details of all base data assumptions, including current condition of the affected network and its performance
- details on possible interruptions to transport operations
- details of any impacts on the natural environment within the jurisdiction of an affected transport authority (for example road and rail corridors)
- details on the nature and likelihood of product-spill during transport if relevant

- **road impacts**—in assessing road impacts, reporting should be in general accordance with DMR, Guidelines for Assessment of Road Impacts of Development (2006), available on the DMR website: l**www.mainroads.qld.gov.au** and include:
  - an assessment of project impacts (from either transport or project operations) on the safety, efficiency and condition of road operations and assets
  - an assessment of project impacts on overland water-flows and their interaction with the road network
  - an assessment of driver fatigue for workers travelling to and from regional centres and key destinations
  - an assessment of project impacts on any existing or proposed pedestrian/ cycle networks
  - an assessment of project impacts on any existing public transport networks (assets and services).
- **rail Impacts**—in assessing rail impacts, the proponent should consider:
  - project impacts on the amenity and health of adjacent land users as a result of dust, noise and vibration
  - impacts on passenger transport and services, should the project generate large public transport trip movements.
- **air and sea ports**—in assessing air and sea impacts, the proponent should consider project impacts on the ongoing operation of existing air and sea port facilities, including capacity of throughput and any land-use impacts as a result of the project's operations. The impact of the project on the Port of Weipa, particularly, how the operation of a new port at Boyd Point will affect the existing Port of Weipa, should be addressed.

Mitigation strategies to address project impacts should be included for each project-affected transport mode. The proponent should discuss and recommend how identified impacts will be mitigated so as to maintain safety, efficiency and condition of each mode. These mitigation strategies should be prepared by the proponent in close consultation with relevant transport authorities and include:

- consideration of any transport authority's works program and forward planning
- proposed construction plans of all required transport infrastructure works in accordance with relevant and accepted authority standards and practices
- timing and responsibilities of these works (when and by whom)
- a summary of relevant approvals and legislative requirements needed to implement mitigation strategies including transport infrastructure works required by the project.

3.10 Indigenous cultural heritage

3.10.1 Description of indigenous cultural heritage values

The EIS should describe the known indigenous cultural heritage values that may be affected by the project. An indigenous cultural heritage survey (as part of the Cultural Heritage Management Plan (CHMP) process or otherwise) should be undertaken for

significant indigenous objects and significant indigenous areas. The indigenous cultural heritage survey should:

- refer to the NRW Indigenous Site Database and any existing literature relating to the affected areas
- refer to:
  - the consultation and negotiation with traditional owners and the outcomes about:
    - significant indigenous objects and significant indigenous areas
    - confidentiality of culturally sensitive information
  - the involvement of traditional owners in field surveys.
- include locations of significant indigenous objects and significant indigenous areas identified during the survey and which are likely to be impacted by the project
- provide a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and conclusions and management recommendations (having due for any confidentiality requirements specified by community representatives).

3.10.2 Potential impacts and mitigation measures

The management of indigenous cultural heritage impacts should be detailed in either a native title agreement with traditional owners or in a CHMP, with the native title agreement or plan to be developed in a form that complies with the provisions of Part 7 of the *Aboriginal Cultural Heritage Act 2003,* thereby meeting the cultural heritage duty of care. The agreement or plan must provide a process for the conduct of comprehensive cultural heritage investigations and the identification of significant indigenous objects and significant indigenous areas in the proposed project area. It is also to provide a process for the management of those objects, areas and values identified in the proposed project area.

The agreement or plan should include the following:

- a process for including indigenous communities or indigenous parties in the identification, management and protection of indigenous cultural heritage in the project area
- a process for undertaking a comprehensive and systematic cultural heritage assessment
- processes for the mitigation, management and protection of identified cultural heritage objects and areas in the project area, and in any areas to be affected by development of any associated infrastructure, both during construction and operational phases of the project
- provision for the management of the accidental discovery of cultural material, including burials, in the project area
- processes for determining any requirements for monitoring of the project during construction, and measures by which any monitoring program is to be implemented

- Indigenous cultural heritage induction and awareness programs for project staff, subcontractors and staff, consultants and agents of the project
- a conflict resolution process.

The development of the agreement or plan should be negotiated with all relevant stakeholder representatives, subject to any confidentiality specified by the indigenous community, registered native title applicants, and/or indigenous parties as appropriate.

As a minimum, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care under the *Aboriginal Cultural Heritage Act 2003* and the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cwlth)*.

If a CHMP has not been approved by the submission of the EIS to the CG then the following should be provided:

- a outline of the draft CHMP, subject to any confidentiality provisions, with the position of the endorsed cultural heritage parties
- details of the proposed steps and timeframes for seeking the ratification of the CHMP.

3.11 Non-Indigenous cultural heritage

3.11.1 Description of non-indigenous cultural heritage values

The EIS should describe the existing environmental values for non-indigenous cultural heritage that may be affected by the project activities. The non-indigenous cultural heritage survey should:

- refer to:
  - the Australian Heritage Places Inventory
  - the EPA Queensland Heritage Register and other information regarding places of potential non-indigenous cultural heritage significance
  - local government heritage register
  - any existing literature relating to the affected areas
- refer to consultations and negotiations with the local community and historical societies about:
  - places of non-indigenous cultural heritage significance
  - the significance of any non-indigenous cultural heritage places located or identified
- include locations of culturally significant sites likely to be impacted by the project
- provide a constraints' analysis of the proposed development area to identify and record non-indigenous cultural heritage places
- provide the location of mining areas with historical significance should be shown on maps

- provide a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and conclusions and management recommendations (having due regard for any confidentiality requirements specified by community representatives).

As a minimum, investigations and consultation should be undertaken in such manner and detail to satisfy statutory responsibilities and duties of care, under the EPBC Act and *Queensland Heritage Act 1992*.

3.11.2 Potential impacts and mitigation measures

The proponent should provide an assessment of any likely effects on sites of non-indigenous cultural heritage values, including but not limited to the following:

- description of the significance of artefacts, items or places of conservation or non-indigenous cultural heritage value likely to be affected by the project and their values at a local, regional and national level
- recommended means of mitigating any negative impacts on non-indigenous cultural heritage values and enhancing any positive impacts
- where relevant, negotiations with Queensland Heritage Council and the EPA regarding management of places of historic heritage significance, taking account also of community interests and concerns
- documented management strategies in accordance with the outcomes of negotiations with Queensland Heritage Council, EPA and the community.

As a minimum, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care, including those under the EPBC Act and *Queensland Heritage Act 1992*.

4 Social values and management of impacts

4.1 Social

4.1.1 Description of social values

This section should describe the existing social values that may be affected by the project including effects at both footprint and benefited area locations. The social amenity and use of the project area and adjacent areas for rural, agricultural, forestry, fishing, recreation, industrial, educational, cultural or residential purposes, should be described. In the development of this community profile, consideration should be given to:

- Indigenous communities
- rural properties, farms, croplands and grazing areas
- community infrastructure and services, access and mobility
- population, demographics and family structure of the affected community
- local community characteristics, identity, values, vitality and lifestyles
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected area
- recreational, commercial and Indigenous fishing areas and livelihoods
- health and educational facilities
- local government and public facilities
- number of properties directly affected by the project
- number of families directly affected by the project (including Indigenous Traditional Owners and their families), this should include not only property owners but also families of workers either living on the property or workers where the property is their primary employment.

Social, economic and cultural values are not as easily separated and therefore it may be necessary for some material in this section to be cross-referenced to other sections of the EIS.

The EIS should give an overview of the project's near neighbours and local communities at the level of Indigenous communities, townships, district, region and state and be comprised of:

- a definition of the local community area, developed in consultation with the DIP Social Impact Unit
- the location of other relevant proposals or projects within the local community area
- other features in the local community area, including social infrastructure and human services.

The EIS should include a social baseline study which describes the profile and demographics of the local community, including:

- the identity, characteristics and aspirations of each community within the project area, including Indigenous communities
- the name and location of the community, size, history, and spatial distribution
- land use and land ownership patterns
- key social and political organisations including local government, non-government organisations and other civil society organisations
- major trends/changes in the population make-up that may be occurring irrespective of the project
- total population (the total enumerated population for the local community area and the full time equivalent (FTE) transient population)
- population growth and population forecasts with and without the project
- age and gender distributions (including Indigenous communities)
- education including schooling levels
- occupation and ethnic characteristics
- median individual and household incomes
- employment, unemployment and not in the labour force
- housing costs (monthly housing repayments) (per cent of dwellings in each category), and weekly rent (per cent dwellings in each category), housing tenure type and landlord type, household and family type
- social and economic index for areas and index of disadvantage—score and relative ranking
- disability prevalence
- crimes, including domestic violence and crimes against the person
- a description of social issues currently faced by local communities should be outlined. Regard should be given to any other recent social impact work done in the Western Cape area
- other such indicators that may be determined by the community as relevant.

The EIS should provide a profile of the local business community including:

- a description of the key industries
- the number of properties and families directly affected by the project including Indigenous families and families of workers either living on the property or workers where the property is their primary employment
- use of the project area for forestry, fishing and recreation tourism, if applicable
- Indigenous and non-Indigenous traditional and significant sites.

4.1.2 Potential impacts and mitigation measures

The social impact assessment of the project should be carried out in consultation with affected local authorities/communities and relevant state authorities including the

DIP Social Impact Unit. 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 local and regional level.

The social impact assessment of the project should consider the information gathered through a community engagement program (public consultation program – section 1.9) and the analysis of the existing socio-economic environment, and describe the project's impact, both beneficial and adverse, on the Indigenous, local and regional community. The impacts of the project on Indigenous, local and regional residents' community services and recreational activities should be analysed and discussed for all stages of the development. The nature and extent of the community engagement program should be described and a summary of the results incorporated in the EIS.

The social impact assessment should include sufficient data to enable affected local authorities and state authorities, to make informed decisions about how the project may affect their business and plan for the continuing provision of public services in the region of the project.

Cumulative impacts—direct, indirect and secondary impacts resulting from existing projects, the proposed project and anticipated future projects, should be identified including the important cause and effect of relationships between human activities and resources, ecosystems, traditional Indigenous lands, and human communities. The magnitude and significance of these cumulative effects should be determined.

The EIS should provide an assessment of the following, taking into account relevant demographic, social, cultural, Indigenous, and economic profiles:

- impacts on Indigenous, local and regional residents, current land uses, cultural land use and existing lifestyles and enterprises
- impacts on local, regional and state labour markets, with regard to the source of the workforce. This information should be presented according to occupational groupings and whether the proponent, and/or contractors, are likely to employ local and Indigenous residents or through other means and whether there are initiatives for local Indigenous business opportunities.
- impacts on both construction and operational workforces and associated contractors on housing demand, housing affordability, community services and community cohesion. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project should be discussed at a local, regional and state scale, including direct impacts on Indigenous people.
- proposed new skills and training related to the project, including the occupational skill groups required and potential skill shortages anticipated
- the degree of service revenue and project work (e.g. provisioning, catering and site maintenance) likely to flow to existing communities in the area of the project, particularly if a fly-in, fly-out workforce is proposed
- the ability of both affected Indigenous and non-Indigenous communities to live in accordance with their own values and priorities
- use of, and access to, culturally important areas and landscapes
- access to existing human and commercial services and housing
- ability to participate in local and regional employment and training opportunities

- any influx of a new project workforce and their families
- impacts on the various educational sectors.

The proponents initiatives to promote environmental and cultural awareness for the general public should be described.

Mitigation and enhancement strategies for identified impacts to social values should be outlined. Practical monitoring regimes for project-related impacts should be recommended and a procedure to establish a complaints register and a conflict resolution mechanism should be incorporated.

The social impact mitigation strategies should address:

- strategies to address all project-related Indigenous issues including effective ongoing consultation
- the sourcing of the construction and operational workforce and the social and cultural implications this may have for the host community, particularly if any part of the workforce is sourced from overseas
- an accommodation strategy, where necessary, in consultation with relevant state government agencies, with proposals that avoid, mitigate or offset any short and medium term adverse effects on the local and regional housing market
- the demographic changes in the profile of the region and the associated sufficiency of current infrastructure and services
- the development of a community engagement plan that promotes an active and on-going role for impacted communities including Indigenous communities and is inclusive of relevant demographic groups such as young people, men, women, elders etc.

The social impact assessment should contain an evaluation of the net social impacts of the proposed project including a summary table of net social impacts identified by the study, and an estimation of the overall significance of those impacts.

The EIS should discuss any social responsibility initiatives proposed by the proponent, including:

- modifications or alternatives to avoid, minimise, or mitigate significant cumulative effects
- key policies and procedures to be adopted or used by the proponent that would mitigate or enhance impacts
- key government documents outlining proposed local, state or Australian Government initiatives or plans that would mitigate or enhance impacts. Uncertainty should be addressed through the design of an effective monitoring system.

A Social Impact Management Plan should be prepared to address social impacts arising from the project. In particular, the plan should identify potential impacts and outline mitigation strategies, commitments and management measures to ameliorate the impacts identified.

4.2 Health and safety

4.2.1 Description of environmental values

This section should describe the existing community values for public health and safety that may be affected by the proposal. For projects proposing air emissions, and/or those with the potential to emit odours, nearby and other potentially affected populations should be identified and described. Particular attention should be paid to those sections of the population, such as children and the elderly, that are especially sensitive to environmental health factors.

4.2.2 Potential impacts and mitigation measures

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

The EIS should assess the effects on the project workforce of occupational health and safety risks and the impacts on the community in terms of health, safety, and quality of life from project operations and emissions. Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety, quality of life from factors such as lighting, air emissions, odour, dust, noise and vibration.

Map(s) should be provided showing the locations of sensitive receptors, such as, but not necessarily limited to, kindergartens, schools, hospitals, aged care facilities, residential areas, and centres of work (e.g. office buildings, factories and workshops). The EIS, illustrated by the maps, should discuss how planned discharges from the project could impact on public health in the short and long term, and should include an assessment of the cumulative impacts on public health values caused by the proposal, either in isolation or by combination with other known existing or planned sources of contamination.

The EIS should address the project's potential for providing disease vectors. Measures to control mosquito and biting midge breeding should be described.

Potential public health risks to drinking water supplies should be assessed and mitigation measures outlined to ensure compliance with the Australian Drinking Water Guideline 2004. If the proponent must register as a water service provider, provision of potable water and recycled water must comply with the *Water Supply (Safety and Reliability) Act 2008* administered by NRW.

Any use of recycled water should be assessed for its potential to cause infection by the transmission of bacteria and/or viruses by contact, dispersion of aerosols, and ingestion (e.g. via use on food crops). Similarly, the use of recycled water should be assessed for its potential to cause harm to health via the food chain due to contaminants such as heavy metals and persistent organic chemicals. Practical monitoring regimes should also be recommended in this section.

5 Impacts on the state and local economies and management of impacts

5.1 Economy

5.1.1 Description of affected local and regional economies

This section should describe the existing economy in which the project is located and the economies materially impacted by the project. In particular, the following should be addressed:

- define the economy in which the project is to be located
- describe the economy including:
  - gross regional product or other appropriate measure of annual economic production
  - population
  - labour force statistics
  - infrastructure
- describe the regional economy's key industries and their contribution to regional economic income
- discuss regional resource endowment, competitive advantage and expected future growth
- describe the key regional markets relevant to the project:
  - labour market
  - housing and land markets
  - construction services and building inputs market
- with regard to the region's key industries:
  - provide information on current input costs (wage rates, building costs, housing rent etc)
  - provide information on land values in the region by type of use.

5.1.2 Potential Impacts and mitigation measures

The potential impacts should consider regional, state and national perspective as appropriate to the scale of the project.

The analysis should include the direct economic impacts on industry and the community including:

- property values
- industry output
- employment

- factor incomes.

The analysis should also:

- assess any forgone industry output from the project
- assess any forgone opportunities and impacts to households (eg recreation, increased travel times)
- assess the indirect impacts likely to flow to other industries and economies from the development of the project. This should also consider the implications of the project for future development

5.1.2.1 Strategies for local participation

The assessment of economic impacts should outline:

- strategies for assessing the cost effectiveness of sourcing local inputs from the regional economy during the construction, rehabilitation and operation of the project
- employment strategies for local residents including members of Indigenous communities including a skills assessment and recruitment and training programs to be offered
- strategies to meet obligations under any existing Indigenous Land Use Agreement
- strategies responding to government policy, where relevant, relating to:
    - employment opportunities for Indigenous people arising from the Western Cape Regional Partnership Agreement
    - the level of training provided for construction contracts on Queensland Government building and construction contracts, with regard to the *Queensland Government Building and Construction Contracts Structured Training Policy* (the 10 per cent policy)
    - Indigenous employment opportunities, with regard to the *Indigenous Employment Policy for Queensland Government Building and Civil Construction projects* (the 20 per cent policy)
    - the use of locally sourced goods and services, with regard to the *Local Industry Policy* (Department of State Development, 1999).

5.1.2.2 Strategies to mitigate disruption to the local economy during construction and operation

The economic assessment should:

- identify all potential changes to industry practices likely to occur during construction and operation of the project
- identify all potential impacts on households (travel time, noise etc) likely to occur during construction and operation of the project
- estimate the cost of these changes if material
- describe the measures to be taken to minimise disruption or alleviate cost impacts of the project.

5.1.2.3 Impact upon property management

This section should address the current and future management processes for adjacent properties which are likely to be impacted by the project during construction and/or operation. Mention should be made of:

- the impact of the project on existing agricultural land uses and management practices, e.g. disruption to stockyards, fences, water points, sowing or harvesting of crops, movement of livestock, agricultural machinery and any loss of agricultural land
- the range of measures required to mitigate real and potential disruptions to rural practices and management of properties.

5.2 Sustainable development

The EIS should provide a comparative analysis of how the project conforms to the objectives for 'sustainable development' (see the National Strategy for Ecologically Sustainable Development (1992), available from the Australian Government Publishing Service).

This analysis should consider the cumulative impacts (both beneficial and adverse) of the project from a life-of-project perspective, taking into consideration the scale, intensity, duration and frequency of the impacts to demonstrate a balance between environmental integrity, social development and economic development.

This information is required to demonstrate that sustainable development aspects have been considered and incorporated during the scoping and planning of the project.

6 Hazard and risk

6.1 Hazard and risk assessment

This section of the EIS should describe the potential hazards and risks that may be associated with the project and should incorporate all known hazards, which may include:

- identification of potential hazards, accidents, spillages and abnormal events occurring during all stages of the project, including possible frequency of occurrence
- indication of cumulative risk levels to surrounding land uses
- identification of all hazardous substance to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards such as snakes and disease vectors.

The EIS should deal with on-site risks. External risks to the project should also be considered. External risks from natural hazards could be determined on the basis of Australia/New Zealand Standard on Risk Management AS/NZS 4360:2004. The study should assess risks during the construction, operational and decommissioning phases associated with the project. These risks should be assessed in quantitative terms where possible. Possible hazards, accidents, and abnormal events that may arise for the project, both during construction and in operation should be described, including:

- accidental release of hazardous goods or other materials
- fires associated with incidents arising from the project activities
- vulnerability of the project area to bushfire, flooding and cyclones and other natural disasters.

Analysis of the consequences of each of these events on safety and environmental damage in the project area should be conducted, including direct harm to the environment as a result of project hazards. The analysis should examine the likelihood of these consequences being experienced, both individually and collectively. In regard to the on-site handling and storage of explosive raw material, consultation is encouraged with the Department of Emergency Services Chemical Hazards and Emergency Management Services Unit.

Details should be provided on the safeguards that would be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites within and adjacent to the project area.

6.2 Emergency management plan

An outline of the proposed emergency management procedures should be provided for the range of situations identified in the above risk assessment where there are measurable risks. This should include an overview of the objectives and management principles to be adopted for the preparation of a detailed emergency plan (including emergency response and recovery/cleanup procedures) in consultation with the relevant emergency services. Planning should include reference

to State Planning Policy 1/03, Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.

In particular, the following should be presented:

- contingency plans to deal with hydrocarbon (e.g. diesel, lubricating oils) oil spills during construction, operation and maintenance of the project
- contingency plans to account for natural disasters such as storms, flooding and fires during the construction, operation and maintenance phases
- emergency planning and response procedures that have been determined in consultation with state and regional emergency service providers
- plans for involvement of the relevant state agencies (such as the Department of Emergency Services, which includes the Queensland Ambulance Service, Queensland Fire and Rescue Service, Queensland Police Service and Emergency Management Queensland) in relation to emergency medical response and transport and first aid matters.

7 Cumulative impacts

The purpose of this section is to provide clear and concise information on the overall impacts of the project, and to discuss the interrelationship of these impacts. This is in addition to the discussion of cumulative impacts which feature in the relevant sections. The cumulative impacts as they relate to particular issues (e.g. water management, cultural heritage, social and economic costs and benefits, community disruption and accommodation etc.) may also be discussed in this section. These impacts should be considered over time or in combination with other impacts because of the scale, intensity, duration or frequency of the impacts.

The cumulative impacts of the project, in combination with other proposed mining projects , on the biodiversity and ecological function of the Western Peninsula bauxite plateau, should be assessed within the EIS. Specific issues that should be covered include impacts on:

- regional ecosystems associated with the western Cape York Peninsula bauxite plateau
- the natural integrity of Cape York Peninsula as a whole
- key habitats (e.g. riparian, wetland, threatened species habitat) which retain connections with adjacent remnant vegetation and habitat
- hydrologically connected surface water and groundwater systems that support wetlands and base flows in rivers and creeks.

The requirements of any relevant state planning policies, environmental protection policies, national environmental protection measures, water resource planning and any other relevant plans should also be addressed.

The methodology to be used to determine the cumulative impacts of the project should be discussed. The methodology should detail the range of variables to be considered including, where applicable, relevant baseline or other criteria upon which the incremental aspects of the project should be assessed.

8 Environmental management plan

This section of the EIS should detail the EMP developed for the project. The EMP should be developed from, and be consistent with, the preceding information in the EIS and be consistent with the EPA Guideline 'Preparing an Environmental Management Overview Strategy for non-standard mining projects'.

An EMP should provide control actions in accordance with agreed performance criteria for specified acceptable levels of environmental harm.

In addition, the EMP should identify:

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

The aim of the EMP is 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 federal government authorities, stakeholders and the proponent with a common focus for approvals conditions and compliance with policies and conditions
- the community with evidence that the environmental management of the project is acceptable.

The recommended structure of the EMP is:

Element/issue	Aspect of construction or operation to be managed (as it affects environmental values)
Operational policy	The operational policy or management objective that applies to the element
Performance criteria	Measurable performance criteria (outcomes) for each element of the operation
Implementation strategy	The strategies, tasks or action program (to nominated operational design standards) that would be implemented to achieve the performance criteria
Monitoring	The monitoring requirements to measure actual performance (i.e. specified limits to pre-selected indicators of change)
Auditing	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria
Reporting	Format, timing and responsibility for reporting and auditing of monitoring results
Corrective action	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 EMP 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
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
  - communication
  - continuous improvement
  - environmental auditing
  - monitoring

- reporting
- staff training
- a decommissioning program for land proposed to be disturbed under each relevant aspect of the project.

9 Conclusions and recommendations

The EIS should make conclusions and recommendations with respect to the project based on the studies presented, the EMP and conformity of the project with legislative and policy requirements.

10 References

All references consulted should be presented in the EIS in a recognised format.

11 Recommended appendices

11.1. Final TOR for this EIS

A copy of the final TOR should be included in the EIS.

11.2. TOR cross-reference table

A cross reference table should be provided which links the requirements of each section/subsection of the TOR with the corresponding section/subsection of the EIS where those requirements have been addressed.

11.3. Development approvals

A list of the development approvals required by the project should be presented.

11.4. EPBC report

A report addressing MNES and potential impacts of the project should be provided.

11.5. Consultation report

A list of advisory agencies should be provided in a summary consultation report, which should also list the federal, 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.

11.6. Study team

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

11.7. Glossary of terms

A glossary of technical terms and acronyms should be provided.

11.8. Specialist studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- 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 EP Act
- air pollution, noise and vibration
- waterway hydrology
- groundwater
- geology
- economic studies and/or cost-benefit analyses
- hazard and risk studies
- land use and land capability studies.

11.9. Corporate environmental policy

The proponent should attach a copy of its corporate environmental policy and planning framework document.

11.10. 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 report.